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Mainers are known for their ingenuity, self-reliance and neighborly ways. Maine life is about as predictable and constant as our rough landscape and four seasons. Rocky beaches, standing mountains, rolling hills and wooded landscapes are in abundance in this great state. From coastal retreats to working forests, the people of Maine are as unique and independent as Penobscot County and its communities. With varying governments, local services, focuses and futures the people of Penobscot County and its differing regions can experience the hustle and bustle of city life by day and soak in the scenes of the country-side by afternoon. Covering over 3,300 square miles, the 153,923 people of Penobscot County can live very different lifestyles in a matter of miles, from multi-story condominiums to farms and woodlots in the County's portion of the Unorganized Territory. It is where communities can be separated by vast forests and lakes or merely a sign post. Understanding what life is like in a region six hours north of Boston is very difficult without spending time there. The variations from town to town and the local sense of pride within each, leads residents to a sense of ownership in the area, community and a deep connection to the people within it.

These varying differences make mitigation planning very difficult. Combining services, protecting resources and mobilizing people takes some creative ingenuity. Collaborative planning between largely forested, sparsely populated areas and densely populated urbanized areas takes an effort of philosophical change in ones self and community. This developmental change is difficult to comprehend in individual communities because of the varying issues from town to town.

PURPOSE

The purpose of mitigation planning is for state, local, and Indian tribal governments to identify the natural hazards that impact them; to identify actions and activities to reduce any losses from those hazards; and to establish a coordinated process to implement the plan, taking advantage of a wide range of resources.

The purpose of this plan is to fulfill the requirements of the Federal Disaster Mitigation Act of 2000, which mandated that all localities that seek to continue receiving Federal Emergency Management Agency (FEMA) grant funding participate in a FEMA approved hazard mitigation plan. Pursuant to §201.6 of the Interim Final Rule prepared by FEMA, Penobscot County Emergency Management Agency (the County) decided to update their multi-jurisdictional plan to encompass the concerns of the County and its participating municipalities.

The Penobscot County Hazard Mitigation Plan will identify natural hazards, assess the jurisdictions vulnerability to each hazard, and establish community goals and objectives for reducing their effect and select mitigation activities that are appropriate for Penobscot County and its participating municipalities. The goal of these activities is to stimulate awareness that will best address Penobscot County's natural hazard vulnerabilities and to meet the needs of the municipalities in addressing future mitigation and emergency management.

SCOPE

The scope of this plan is to identify and address natural hazards and the towns' and county's, vulnerability to them. Although the rule criteria for local plans recommend that communities include man-made and technological hazards along with natural hazards, the Hazard Mitigation Committee decided to review only natural hazards at this time. This plan will produce a program of activities that will best undertake the County's natural hazards and meet the needs of its communities. Consistent with FEMA planning process guidelines, this plan will accomplish the following objectives:

- Ensure that activities are reviewed and implemented so that disaster related hazards are addressed by the most appropriate and efficient solution;
- Link hazard management policies to specific activities;
- Educate residents about potential hazards that threaten the County and their communities;
- Build public and political support for projects that prevent new problems from known hazards and reduce future losses;
- Fulfill planning requirements for future hazard mitigation project grants; and
- Facilitate implementation of hazard mitigation management activities through an action plan.

DISASTER MITIGATION ACT OF 2000

On October 30, 2000, the President of the United States signed into law the Disaster Mitigation Act of 2000 (DMA 2000) to amend the Robert T. Stafford Disaster Relief and Emergency Assistance Act of 1988. This new legislation reinforces the importance of Hazard Mitigation planning to reduce the Nation's disaster losses, and is aimed primarily to control and streamline the administration of federal disaster relief and mitigation programs.

The Act encourages and rewards local and state pre-disaster planning, promotes stability as a strategy for disaster resistance, and is intended to integrate state and local planning with the aim of strengthening statewide mitigation planning. FEMA approved plans make communities eligible for Flood Mitigation Assistance Grants (FMA), the Hazard Mitigation Grant Program (HMGP) and Pre-Disaster Mitigation (PDM), nationally competitive Grants.

Section 322 (a-d) of DMA 2000, requires that local governments, as a condition of receiving federal disaster mitigation grant funds, have a mitigation plan that describes the process for identifying hazards, risks and vulnerabilities, identify and prioritize mitigation actions, encourage the development of local mitigation and provide technical support.

NATIONAL FLOOD INSURANCE REFORM ACT OF 1994

This plan fulfills the requirements of the National Flood Insurance Reform Act of 1994 (NFIRA). With this Act, Congress authorized the establishment of a Federal grant program to provide financial assistance to states and communities for flood mitigation

planning and activities. The Federal Emergency Management Agency (FEMA) has designated this Flood Mitigation Assistance (FMA).

Under the FMA, FEMA provides assistance to states and communities for activities that will reduce the risk of flood damages to structures insured under the National Flood Insurance Program (NFIP). FMA is a state-administered, cost-share program through which states and communities can receive grants for a flood mitigation plan, technical assistance, and flood mitigation projects.

CONSULTANT

In 2005 Penobscot County contracted with Eastern Maine Development Corporation (EMDC) to assist in preparing the Penobscot County Multi-Jurisdictional Hazard Mitigation Plan. For the 2011 update and again in 2015, Lorna Thompson Consulting, LLC assisted Penobscot County with the necessary steps to review the Hazard Mitigation process and LatLong Logic, LLC provided mapping expertise.

Working directly with the municipalities and the committee representatives, data was collected and analyzed for hazard identification and vulnerability. Penobscot Emergency Management Agency (PEMA) with assistance from Maine Emergency Management Agency (MEMA) created a document consistent with Federal Emergency Management Agency guidelines for Hazard Mitigation and Federal Mandate §201.6.

LIMITATIONS

The Penobscot County Hazard Mitigation Plan has been assembled and compiled with the genuine intent that all of the data and information contained herein is reasonably accurate and correct. The information contained in this plan was gathered from the sources cited. Some of the sources were found to be more detailed and more recent than other sources. Where appropriate, the future application of the information contained in this plan should be preceded by a check of the sources to see if additional or revised information is available. Note that while this information is suitable for general planning, it may not be appropriate for site-specific decisions.

The information used to create the maps contained within this plan has been derived from multiple sources. This product as provided is for reference and planning purposes only and is not to be construed as a legal document or survey instrument. This information is provided with the understanding that it is not guaranteed to be accurate, correct, or complete; that it is subject to revision; and conclusions drawn from such information are the responsibility of the user. Any user of these maps accepts same as is, with all faults, and assumes all responsibility for the use thereof, and further agrees to hold all parties harmless from and against any damage, loss, or liability arising for any use of the maps.

METHODOLOGY

The methodology used for the development of the Penobscot County Hazard Mitigation Plan consists of the following tasks:

- Public involvement
- Coordination with other agencies or organizations
- Natural hazard area inventory
- Problem identification
- Review and analysis of possible mitigation activities and projects
- Local adoption following FEMA “approval pending adoption”
- Periodic review and update of the plan

This plan summarizes the activities outlined above to assess the effects of storm flooding, erosion, and other hazards within Penobscot County and recommends mitigation activities. The Hazard Mitigation Plan contains a list of potential projects and an implementation strategy with identification of responsible party (ies) and time frames for each project or group of projects.

The Hazard Mitigation plan will be evaluated and updated every five years. In addition, the Plan will be updated as appropriate when a disaster occurs that significantly affects Penobscot County whether or not it receives a Gubernatorial or Presidential Declaration. The update will be completed as soon as possible, but no later than 12 months following the date the disaster occurs.

Routine maintenance of the plan will include adding projects, as new funding sources become available, indicating which projects have been completed, or deleting projects that are not feasible.

GENERAL LOCATION

Penobscot County is located in North Central Maine, and borders on Piscataquis and Somerset Counties on the West, Aroostook County to the North, Waldo County to the South and Washington and Hancock Counties on the East. The Penobscot River, Maine's longest river, runs southerly through the county and runs into the Atlantic Ocean at the mouth of the river in Penobscot Bay. Penobscot County is one of Maine's largest counties, covering over 3,345 square miles. The county seat, Bangor, is located in the southeastern corner of the county, and is connected to major transportation and the remainder of the county, with Interstate 95 traveling directly through as the major corridor.

LAND AREA AND DEVELOPMENT

There are 60 municipalities and one sovereign nation within Penobscot County (only 59 municipalities are participating in this plan). Approximately 75 percent or 2668 square miles of the land area of the County are forested, 23 percent is agricultural or open space and 2 percent is classified as urban. Development is heaviest along the corridor of Interstate 95 and the Penobscot River. Select areas along this corridor within the county have become urbanized, most of which have many homes, businesses, and schools. Development within the remainder of the county consists of scattered communities, recreational properties, and timber harvesting.

CLIMATE

Penobscot County's northeastern climate is four seasons and highly changeable -- it can go from sunny to stormy in short order. However, the climate of Penobscot County is primarily cool and humid. Summers in the Penobscot Region, are relatively cool, with highs in the 70's or sometimes reaching the low 80's. Interior areas experience a large range of temperatures in the summer, with some nights in northern areas near freezing shortening the average growing season to 156 days. Winters in Penobscot County are cold and often frigid. January temperatures range from the low teens to mid-thirties towards the coast and zero to the mid-teens the further one travels inland. Continuous snow is generally on the ground from December through February and sometimes from November into March, with occasional snow storms still occurring in April.

The area around the county receives a mean annual precipitation of 239 centimeters, which is the water equivalent of 94 inches of snow. The precipitation is rather evenly distributed throughout the year; however, snowmelt accounts for a large part of the runoff. The mean annual temperature of the county is approximately 41 degrees (Fahrenheit), ranging from means of 19.3 degrees in January to 66.5 degrees in July. Daytime highs gradually increase March through May. In September, the spectacular hardwood colors of fall blaze with sunny cool days and chilly nights.

Since the county is large, weather conditions can vary greatly. As an example, the northern portion of the county lies within the Northern Climate Division and the southern portion of the county is in the Southern Interior Division. It is not unusual for Northern Penobscot County to be receiving snow while Southern Penobscot County is receiving rain.

DEMOGRAPHICS

In 2000, the U.S. Census Bureau reported a total population of 144,919 people in Penobscot County as can be seen in the tables on the following pages. There were 66,847 housing units, with 8,751 reported as vacant where 4,962 of these are reported for seasonal, recreational or occasional use. In 2000 Penobscot County’s density was 43.32 people per square mile and 17.36 occupied housing units per square mile. The median age of a Penobscot County resident was 37.2 years. Over 23 percent of the county’s population was younger than 19 years old, 5.4 percent of the total population was under the age of 5, and 13.1% of the population was 65 or older.

In 2010 US Census demographics showed a total population for Penobscot County at 153,923 and increase of about 5.8% since the 2000 Census. County-wide housing units increased to 73,860 which is an increase of about 9.5%. About 20 percent of the county’s population was younger than 19 years old, 5.2 percent of the total population was under the age of 5, and 14.5 percent of the population was 65 or older.

Of the county’s 73,860 total housing units, about 62, 966 were occupied and 14.7 percent (or 10,894 units) of all housing units were vacant with 6,199 of those vacant units being of seasonal or recreational use.

PENOBSCOT COUNTY GENERAL DEMOGRAPHICS	2000	2010
Area	3,345 sq. miles	3,345 sq. miles
Population	144,919 people	153,923
Median age	37.2 years	39.9 years
Total housing units	66,819 units	73,860 units
Occupied year-round housing units	58,096 units	62,966 units
Average household size	2.38 people	2.33 people
People per square mile	43.32 people	45.3 people
Occupied housing units per square mile	17.36 units	21.7 units

The Table below shows general demographic information for the individual communities in Penobscot County based on the 2000 Census.

PENOBSCOT COUNTY DEMOGRAPHICS BY COUNTY SUBDIVISION 2000 CENSUS							
County Subdivision	Land Area (sq. mi.)	Population	Persons (sq. mi.)	Total Housing Units	Occupied Year-Round Housing Units	Total Housing Units (sq. mi.)	Household Density
Alton	42.39	816	19.25	347	309	8.19	2.64
Argyle	26.73	253	9.47	124	95	4.64	2.66
Bangor	34.45	31,473	913.58	14,587	13,713	423.43	2.30
Bradford	41.30	1,186	28.72	502	434	12.15	2.73
Bradley	49.55	1,242	25.07	614	514	12.39	2.42
Brewer	15.10	8,987	595.17	4,064	3,842	269.14	2.34
Burlington	53.8	351	6.52	308	140	5.72	2.51
Carmel	36.54	2,416	66.12	995	932	27.23	2.59
Carroll Plantation	44.17	144	3.26	96	59	2.17	2.44
Charleston	40.20	1,397	34.75	470	431	11.69	3.24
Chester	32.16	525	16.32	223	201	6.93	2.61
Clifton	34.39	743	21.61	416	303	12.10	2.45
Corinna	38.66	2,145	55.48	981	842	25.38	2.55
Corinth	40.15	2,511	62.54	1,040	959	25.90	2.62

PENOBSCOT COUNTY DEMOGRAPHICS BY COUNTY SUBDIVISION 2000 CENSUS (continued)							
County Subdivision	Land Area (sq. mi.)	Population	Persons (sq. mi.)	Total Housing Units	Occupied Year-Round Housing Units	Total Housing Units (sq. mi.)	Household Density
Dexter	35.17	3,890	110.61	2,054	1,615	58.40	2.41
Dixmont	36.34	1,065	29.31	474	411	13.04	2.59
Drew Plantation	37.6	57	1.52	37	17	0.98	3.35
East Central Penobscot UT	76.67	324	4.23	291	126	3.80	2.57
East Millinocket	7.13	1,828	256.38	877	780	123.00	2.34
Eddington	25.11	2,052	81.72	920	825	36.64	2.49
Edinburg	35.04	98	2.80	54	44	1.54	2.23
Enfield	27.88	1,616	57.96	888	612	31.85	2.64
Etna	24.43	1,012	41.42	427	392	17.48	2.58
Exeter	38.4	997	25.96	452	389	11.77	2.56
Garland	37.78	990	26.20	497	379	13.16	2.61
Glenburn	27.19	3,964	145.79	1,683	1,479	61.90	2.68
Greenbush	43.78	1,421	32.46	600	522	13.70	2.72
Hampden	38.08	6,327	166.15	2,545	2,433	66.83	2.60
Hermon	35.92	4,437	123.52	1,748	1,666	48.66	2.66
Holden	30.92	2,827	91.43	1,320	1,153	42.69	2.45
Howland	34.64	1,362	39.32	616	552	17.78	2.47
Hudson	37.8	1,393	36.85	677	508	17.91	2.74
Kenduskeag	16.79	1,171	69.74	509	470	30.32	2.49
Kingman	24.99	213	8.52	114	91	4.56	2.34
Lagrange	49.44	747	15.11	349	286	7.06	2.61
Lakeville	58.07	63	1.08	361	33	6.22	1.91
Lee	38.58	845	21.90	463	298	12.00	2.84
Levant	29.96	2,171	72.46	829	784	27.67	2.77
Lincoln	67.9	5,221	76.89	2,661	2,108	39.19	2.48
Lowell	38.19	291	7.62	234	120	6.13	2.43
Mattawamkeag	37.42	825	22.05	393	338	10.50	2.44
Maxfield	19.11	87	4.55	52	39	2.72	2.23
Medway	40.94	1,489	36.37	651	587	15.90	2.54
Millford	45.59	2,950	64.71	1,248	1,180	27.37	2.50
Millinocket	10.88	5,203	478.22	2,679	2,295	246.23	2.27
Mount Chase	36.29	247	6.81	238	104	6.56	2.38
Newburgh	30.87	1,394	45.16	602	557	19.50	2.50
Newport	29.49	3,017	102.31	1,574	1,269	53.37	2.38
North Penobscot	1,068.48	443	0.41	1,037	207	0.97	2.14
Old Town	38.28	8,130	212.38	3,686	3,426	96.29	2.37
Orono	18.2	9,112	500.66	2,899	2,691	159.29	3.39
Orrington	25.39	3,526	138.87	1,489	1,396	58.65	2.53
Passadumkeag	22.92	441	19.24	203	172	8.86	2.56
Patten	38.43	1,111	28.91	553	468	14.39	2.37
Plymouth	29.93	1,257	42.00	562	469	18.78	2.68
Prentiss Plantation	38.34	214	5.58	113	82	2.95	2.61
Seboeis Plantation	40	41	1.03	58	17	1.45	2.41
Springfield	38.38	379	9.87	196	150	5.11	2.53
Stacyville	39.93	405	10.14	226	162	5.66	2.50
Stetson	34.88	981	28.13	513	383	14.71	2.56
Twombly	43.88	2	0.05	11	1	0.25	2.00
Veazie	2.92	1,744	597.26	767	722	262.67	2.42
Webster Plantation	36.83	82	2.23	41	27	1.11	3.04
Winn	44.12	420	9.52	193	170	4.37	2.47
Woodville	42.92	286	6.66	125	103	2.91	2.78
Sovereign Nation							
Penobscot Nation	7.8	562	72.05	263	214	33.72	2.63
Penobscot County Total	3,345.61	144,919.00	43.32	66,819.00	58,096.00	19.97	2.49

Sources: Maine State Planning Office Census and Economic Data and U.S. Census Bureau

The Table below shows general demographic information for the individual communities in Penobscot County based on the 2010 Census.

PENOBSCOT COUNTY DEMOGRAPHICS							
BY COUNTY SUBDIVISION							
2010 CENSUS							
County Subdivision	Land Area (sq. mi.)	2010 Population	Persons (sq. mi.)	2010 Total Housing Units	Occupied Year-Round Housing Units	Total Housing Units (sq. mi.)	Household Density
Alton	42.39	890	21.00	385	345	9.08	2.58
Argyle	26.73	277	10.36	146	120	5.46	2.31
Bangor	34.45	33,039	959.04	15,674	14,475	454.98	2.28
Bradford	41.3	1,290	31.23	583	493	14.12	2.62
Bradley	49.55	1,492	30.11	719	625	14.51	2.39
Brewer	15.1	9,482	627.95	4,457	4,163	295.17	2.28
Burlington	53.8	383	7.12	410	166	7.62	2.31
Carmel	36.54	2,794	76.46	1,182	1,097	32.35	2.55
Carroll Plantation	44.17	153	3.46	138	62	3.12	2.47
Charleston	40.2	1,409	35.05	546	481	13.58	2.93
Chester	32.16	546	16.98	266	218	8.27	2.50
Clifton	34.39	921	26.78	468	346	13.61	2.66
Corinna	38.66	2,198	56.85	1,075	926	27.81	2.37
Corinth	40.15	2,878	71.68	1,233	1,125	30.71	2.56
Dexter	35.17	3,895	110.75	2,141	1,651	60.88	2.36
Dixmont	36.34	1,181	32.50	557	498	15.33	2.37
Drew Plantation	37.6	46	1.22	36	15	0.96	3.07
East Millinocket	7.13	1,723	241.65	871	768	122.16	2.24
Eddington	25.11	2,225	88.61	1,037	930	41.30	2.39
Enfield	27.88	1,607	57.64	937	650	33.61	2.47
Etna	24.43	1,246	51.00	559	481	22.88	2.59
Exeter	38.4	1,092	28.44	491	424	12.79	2.58
Garland	37.78	1,105	29.25	552	442	14.61	2.50
Glenburn	27.19	4,594	168.96	2,018	1,808	74.22	2.54
Greenbush	43.78	1,491	34.06	725	602	16.56	2.48
Hampden	38.08	7,257	190.57	3,030	2,862	79.57	2.54
Hermon	35.92	5,416	150.78	2,210	2,075	61.53	2.61

Penobscot County Multi-Jurisdictional Hazard Mitigation Plan – 2016 Update

Section I-Overview

Holden	30.92	3,076	99.48	1,480	1,298	47.87	2.37
Howland	34.64	1,241	35.83	639	523	18.45	2.37
Hudson	37.8	1,536	40.63	786	590	20.79	2.60
Kenduskeag	16.79	1,348	80.29	600	562	35.74	2.40
Kingman	24.99	174	6.96	117	82	4.68	2.12
Lagrange	49.44	708	14.32	380	298	7.69	2.38
Lakeville	58.07	105	1.81	453	55	7.80	1.91
Lee	38.58	922	23.90	546	356	14.15	2.59
Levant	29.96	2,851	95.16	1,146	1,081	38.25	2.64
Lincoln	67.9	5,085	74.89	2,866	2,045	42.21	2.49
Lowell	38.19	358	9.37	315	154	8.25	2.32
Mattawamkeag	37.42	687	18.36	407	317	10.88	2.17
Maxfield	19.11	97	5.08	61	41	3.19	2.37
Medway	40.94	1,349	32.95	658	576	16.07	2.34
Milford	45.59	3,070	67.34	1,385	1,289	30.38	2.38
Millinocket	10.88	4,506	414.15	2,586	2,167	237.68	2.08
Mount Chase	36.29	201	5.54	297	94	8.18	2.14
Newburgh	30.87	1,551	50.24	659	621	21.35	2.50
Newport	29.49	3,275	111.05	1,766	1,410	59.88	2.32
Old Town	38.28	7,840	204.81	3,665	3,382	95.74	2.32
Orono	18.2	10,362	569.34	3,089	2,831	169.73	3.66
Orrington	25.39	3,733	147.03	1,612	1,478	63.49	2.53
Passadumkeag	22.92	374	16.32	197	159	8.60	2.35
Patten	38.43	1,017	26.46	565	447	14.70	2.28
Plymouth	29.93	1,380	46.11	615	537	20.55	2.57
Prentiss Plantation	38.34	214	5.58	185	95	4.83	2.25
Seboeis Plantation	40	35	0.88	114	18	2.85	1.94
Springfield	38.38	409	10.66	281	171	7.32	2.39
Stacyville	39.93	396	9.92	224	162	5.61	2.44
Stetson	34.88	1202	34.46	621	479	17.80	2.51
Veazie	2.92	1,919	657.19	884	828	302.74	2.32
Webster Plantation	36.83	85	2.31	46	30	1.25	2.83
Winn	44.12	407	9.22	210	175	4.76	2.33
Woodville	42.92	248	5.78	137	100	3.19	2.48
Sovereign Nation							
Penobscot Nation	7.8	610	78.21	266	245	34.10	2.49

Penobscot County Total	3,345.61	153,923.00	46.01	73,860.00	62,966.00	22.08	2.44
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Sources: U.S. Census Bureau

The Table below compares general demographic information for the individual communities in Penobscot County based on 2000 and 2010 Census figures.

Community	2000 Census	2010 Census	% Change
Alton	816	890	8.31%
Argyle	253	277	8.66%
Bangor	31,473	33,039	4.74%
Bradford	1,186	1,290	8.06%
Bradley	1,242	1,492	16.76%
Brewer	8,987	9,482	5.22%
Burlington	351	383	8.36%
Carmel	2,416	2,794	13.53%
Carroll Plantation	144	153	5.88%
Charleston	1,397	1,409	0.85%
Chester	525	546	3.85%
Clifton	743	921	19.33%
Corinna	2,145	2,198	2.41%
Corinth	2,511	2,878	12.75%
Dexter	3,890	3,895	0.13%
Dixmont	1,065	1,181	9.82%
Drew Plantation	57	46	-23.91%
East Central Penobscot UT	324	343	5.54%
East Millinocket	1,828	1,723	-6.09%
Eddington	2,052	2,225	7.78%
Enfield	1,616	1,607	-0.56%
Etna	1,012	1,246	18.78%
Exeter	997	1092	8.70%
Garland	990	1105	10.41%

Section I-Overview

Glenburn	3,964	4,594	13.71%
Greenbush	1,421	1,491	4.69%
Hampden	6,327	7,257	12.82%
Hermon	4,437	5,416	18.08%
Holden	2,827	3,076	8.09%
Howland	1,362	1,241	-9.75%
Hudson	1,393	1,536	9.31%
Kenduskeag	1,171	1,348	13.13%
Kingman	213	174	-22.41%
Lagrange	747	708	-5.51%
Lakeville	63	105	40.00%
Lee	845	922	8.35%
Levant	2,171	2,851	23.85%
Lincoln	5,221	5,085	-2.67%
Lowell	291	358	18.72%
Mattawamkeag	825	687	-20.09%
Maxfield	87	97	10.31%
Medway	1,489	1,349	-10.38%
Milford	2,950	3,070	3.91%
Millinocket	5,203	4,506	-15.47%
Mount Chase	247	201	-22.89%
Newburgh	1,394	1,551	10.12%
Newport	3,017	3,275	7.88%
Old Town	8,130	7,840	-3.70%
Orono	9,112	10,362	12.06%
Orrington	3,526	3,733	5.55%
Passadumkeag	441	374	-17.91%
Patten	1,111	1,017	-9.24%
Penobscot Nation Reservation	562	610	7.87%
Plymouth	1,257	1,380	8.91%
Prentiss Plantation	214	214	0.00%
Seboeis Plantation	41	35	-17.14%
Springfield	379	409	7.33%
Stacyville	405	396	-2.27%

Stetson	981	1,202	18.39%
Veazie	1,744	1,919	9.12%
Webster Plantation	82	85	3.53%
Winn	420	407	-3.19%
Woodville	286	248	-15.32%

Source: US Census

EMPLOYMENT

For 2009, the leading industries in Penobscot County were Educational services, and health care and social assistance at 33% and Retail trade at 14%. Among the most common occupations were Management, professional and related occupations 34%; Sales and office occupations 25%; and Service occupations 21%. 76% of people were Private wage and salary employees and 17 % were Federal, state or local government workers. 80% of Penobscot County workers drove to work alone in 2009. Among all of those who commuted to work, it took them on average 22.4 minutes to get to work. The median income of households in Penobscot County was \$39,943.

For 2013, according to the State’s Office of Policy and Management, employment by occupation, Management was the leading category at 34%, with Sales and Office second at 25% and Service third with 20%. These numbers were virtually unchanged when compared to the 2009 information. The most common employment by industry was Education, Health Care and Social Services at 33.8%. About 77% of people were Private wage and salary employees and 16 % were federal, state or local government workers. Again 80% of Penobscot County workers drove to work alone in 2013. Among all of those who commuted to work, it took them on average 22 minutes to get to work. The 2013 estimated median income of households in Penobscot County was \$43,734.

GOVERNANCE

County Government

The County Seat is located at 97 Hammond Street in Bangor. The County Government consists of the County Commissioners, County Sheriff’s Department and County Jail, County Clerk’s Office, County Treasurer’s, Registrar of Deeds, Probate Judge, Assistant District Attorney, and the Emergency Management Agency. County government has no regulatory authority over the communities within its jurisdiction.

Local Units of Government

There are a number of different kinds of local units of government in Penobscot County. The following summary is based in part on the Maine Municipal Association’s report “Local Government in Maine.”

Cities: All cities in Maine have local charters granted by the Maine Legislature that provide for a representative form of government - meaning they have a city council that serves as the legislative body. The city council is elected by and answerable to the citizens. The office of mayor varies considerably from city to city, with only a few acting as chief executive officer. Some mayors are elected by the vote of the people, while others are elected by a vote of their fellow councilors.

Towns: Penobscot County contains 60 organized towns. Towns remain the cornerstone of local government. A Maine community becomes a town when it is incorporated by a special act of the legislature. At that time, it is given certain privileges and responsibilities. Under Home Rule, towns may take any action or change their form of government in any way not denied or precluded by state or federal law. The voters of the town constitute its legislative body. Day-to-day governance of towns has expanded from the original board of selectmen to include town managers, town councils, budget committees, municipal departments and various professional managers. In a small number of mostly larger towns, the council exerts legislative control without a town meeting. In others, a ballot vote is used to approve the budget rather than the open town meeting.

Plantations: There are 4 organized plantations in Penobscot County. Plantations are a type of local government unique to Maine. They originated with the Massachusetts Bay Colony, and were at first intended to be a temporary government to help guide a community in changing from an unincorporated township to an incorporated town. In Maine, they have continued as a basic governmental unit in small rural areas. Plantations are typically rural, heavily forested, and sparsely populated. There is little demand in them for the full menu of public services provided in larger communities. Plantations are similar to towns in that voters at the annual meeting are the legislative body. During the meeting, assessors are elected to carry on the daily operation of government and function much as the selectmen in towns. Taxes are raised and appropriated and voters are registered. Plantations do not have the powers granted to municipalities under Home Rule, and do not have the authority to enact ordinances.

Townships/Unorganized Territory: There are 39 unorganized townships in Penobscot County. Maine is unique among eastern states in having half its land mass, or more than 10 million acres, in its Unorganized Territory. Most of it is in the northern and easternmost counties. There is no local government. For the people living in the Unorganized Territory, taxes are paid to the State. The State's Land Use Planning Commission (LUPC) establishes basic rules. Services are provided by the state, by counties and by contracts with nearby towns and school districts.

Sovereign Nation: **The one Sovereign Nation within Penobscot County** is the Penobscot Indian Nation. Indian tribes have their own form of government with sovereign powers that are separate from federal and state governments. According to Felix Cohen's *Handbook of Federal Indian Law*, tribal sovereignty is described:

as a consequence of the tribe's relationship with the federal government, tribal powers of self-government are limited by federal statutes, by the terms of the treaties with the federal government, and by restraints implicit in the protectorate

relationship itself. In all other respects the tribes remain independent and self-governing political communities.

Section 6206(1) of the Maine Implementing Act provides:

Except as otherwise provided in this Act, ...the Penobscot Indian Nation, within their respective Indian territories, shall have, exercise and enjoy all the rights, privileges, powers and immunities, including, but without limitation, the power to enact ordinances and collect taxes, and shall be subject to all the duties, obligations, liabilities and limitations of a municipality of and subject to the laws of the State, provided, however, that internal tribal matters, including membership in the respective tribe or nation, the right to reside within the respective Indian territories, tribal organization, tribal government, tribal elections and the use or disposition of settlement fund income shall not be subject to regulation by the State.

The Maine Implementing Act also grants to the Penobscot Indian Nation the state constitutional status of a municipality under Maine law.

NOTE: NOT APPLICABLE SINCE THIS IS A MULTI-JURISDICTIONAL PLAN.

2. Adoption by the Local Governing Body	
Requirement §201.6(c)(5): (The local hazard mitigation plan shall include) documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan (e.g. City Council, County Commissioner, Tribal Council).	
Elements	A. Has the local governing body adopted (the) new or updated plan?
	B. Is supporting documentation, such as a resolution, included for each participating jurisdiction?

2. 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?

RESOLUTION

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

Whereas the creation of a Hazard Mitigation Plan is necessary for the development of a risk assessment and effective mitigation strategy; and

Whereas, the communities of Penobscot County as well as Penobscot County (on behalf its portion of the Unorganized Territory) and the Penobscot Indian Nation as a Sovereign Nation are committed to the mitigation goals and measures as presented in this plan;

Therefore, the Penobscot Indian Nation hereby adopts the 2016 Penobscot County Hazard Mitigation Plan and

Therefore, the Penobscot County Commissioners hereby adopt the 2016 Penobscot County Hazard Mitigation Plan on behalf of the Unorganized Territory within its boundaries and

Therefore, the local Councils and Select Boards of the fifty-nine (59) participating communities hereby adopt the 2016 Penobscot County Hazard Mitigation Plan.

MULTI-JURISDICTIONAL PLAN ADOPTION

Participating Penobscot County Communities and the Penobscot Nation

Name of Municipality	
Alton	Lakeville
Bangor	Lee
Bradford	Levant
Bradley	Lincoln
Brewer	Lowell
Burlington	Mattawamkeag
Carmel	Maxfield
Carroll	Medway
Charleston	Milford
Chester	Millinocket
Clifton	Mount Chase
Corinna	Newburgh
Corinth	Newport
Dexter	Old Town
Dixmont	Orono
Drew	Orrington
East Millinocket	Passadumkeag
Eddington	Patten
Enfield	Plymouth
Etna	Seboeis
Exeter	Springfield
Garland	Stacyville
Glenburn	Stetson
Greenbush	Unorganized Territory
Hampden	Veazie
Hermon	Webster
Holden	Winn
Howland	Woodville
Hudson	Sovereign Nations
Kenduskeag	Penobscot Nation
Lagrange	

Note: Individual Adoption Resolutions are on the following pages.

Penobscot County Hazard Mitigation Plan – 2016 Update

2. PREREQUISITES

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 Penobscot 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;

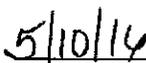
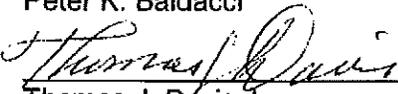
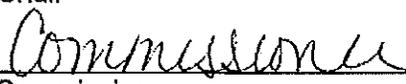
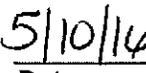
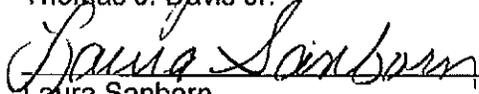
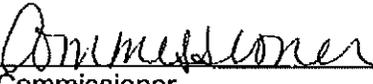
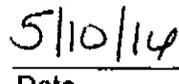
And whereas, this multi-jurisdictional county of 3 cities, 52 towns, 4 plantations and a portion of Maine's Unorganized Territory is committed to the mitigation goals and measures as presented in this plan;

Therefore the City Councils and Boards of Selectmen of the Incorporated Towns and Plantations hereby adopt the Penobscot County Multi-Jurisdictional Hazard Mitigation Plan – 2016 Update; and

Therefore, the Penobscot County Commissioners, acting on behalf of the County and its portion of the Unorganized Territory hereby adopt the Penobscot County Hazard Mitigation Plan – 2016 Update.

Authorizing Signatures

County of Commissioners of Penobscot County

 Peter K. Baldacci	 Chair	 Date
 Thomas J. Davis Jr.	 Commissioner	 Date
 Laura Sanborn	 Commissioner	 Date

Penobscot County Hazard Mitigation Plan – 2016 Update

2. PREREQUISITES

RESOLUTION

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Therefore, the Penobscot County Commissioners, acting on behalf of the County and its portion of the Unorganized Territory hereby adopt the Penobscot County Hazard Mitigation Plan – 2016 Update.

Authorizing Signatures

City/Town/Plantation of Alton

<u>[Signature]</u>	<u>Select man</u>	<u>12/20/16</u>
Name	Position	Date
<u>Jamie Bailey</u>	<u>Selectman</u>	<u>12/20/16</u>
Name	Position	Date
<u>[Signature]</u>	<u>Selectman</u>	<u>12/20/16</u>
Name	Position	Date
_____	_____	_____
Name	Position	Date

Penobscot County Hazard Mitigation Plan – 2016 Update

2. PREREQUISITES

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 Penobscot County;

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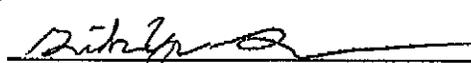
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Therefore, the Penobscot County Commissioners, acting on behalf of the County and its portion of the Unorganized Territory hereby adopt the Penobscot County Hazard Mitigation Plan – 2016 Update.

Authorizing Signatures

City/Town/Plantation of BANGOR

 Name	<u>City Councilor</u> Position	<u>9/26/16</u> Date
 Name	<u>CITY COUNCILOR</u> Position	<u>9-26/16</u> Date
<u>Joseph M. Baldacci</u> Name	<u>City Councilor</u> Position	<u>9-26-16</u> Date
 Name	<u>City Councilor</u> Position	<u>9-26-16</u> Date

Penobscot County Hazard Mitigation Plan – 2016 Update

2. PREREQUISITES

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 Penobscot County;

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Therefore, the Penobscot County Commissioners, acting on behalf of the County and its portion of the Unorganized Territory hereby adopt the Penobscot County Hazard Mitigation Plan – 2016 Update.

Authorizing Signatures

City/Town/Plantation of Broadford

<u><i>Robert W. Murray</i></u> Name	<u>selectman</u> Position	<u>09/08/16</u> Date
<u><i>James J. Berlin</i></u> Name	<u>selectman</u> Position	<u>09/08/16</u> Date
<u><i>Paul A. Hanson</i></u> Name	<u>selectman</u> Position	<u>09/08/16</u> Date
<u><i>Edward J. Nuxell</i></u> Name	<u>selectman</u> Position	<u>09/08/16</u> Date

Penobscot County Hazard Mitigation Plan -- 2016 Update

2. PREREQUISITES

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Therefore, the Penobscot County Commissioners, acting on behalf of the County and its portion of the Unorganized Territory hereby adopt the Penobscot County Hazard Mitigation Plan -- 2016 Update.

Authorizing Signatures

City/Town/Plantation of Bradley

<u>Sally Stewart</u>	<u>Town Council</u>	<u>5/31/2016</u>
Name	Position	Date
<u>M. M. Ketch</u>	<u>Town Council</u>	<u>5/31/2016</u>
Name	Position	Date
<u>Duane Leighton</u>	<u>Town Council</u>	<u>5/31/2016</u>
Name	Position	Date
_____	_____	_____
Name	Position	Date

Penobscot County Hazard Mitigation Plan – 2016 Update

2. PREREQUISITES

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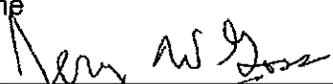
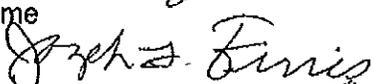
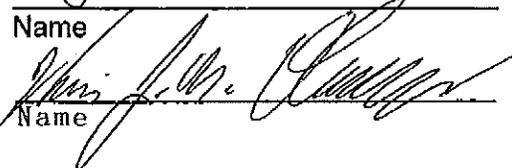
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Authorizing Signatures

City/Town/Plantation of BREWER

	CITY COUNCIL CHAIRPERSON	08/09/2016
Name	Position	Date
	CITY COUNCIL MEMBER	08/09/2016
Name	Position	Date
	CITY COUNCIL MEMBER	08/09/2016
Name	Position	Date
	CITY COUNCIL MEMBER	08/09/2016
Name	Position	Date
	CITY COUNCIL MEMBER	08/09/2016
Name	Position	Date

Penobscot County Hazard Mitigation Plan -- 2016 Update

2. PREREQUISITES

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Authorizing Signatures

City/Town/Plantation of Burlington

<u>Steven J. Sundberg</u> Name	<u>1st Selectman</u> Position	<u>15 Nov 2016</u> Date
<u>Penelope D. Kneeland</u> Name	<u>2nd Selectman</u> Position	<u>11/15/16</u> Date
<u>Aline Smith</u> Name	<u>3rd Selectman</u> Position	<u>11/15/16</u> Date
_____ Name	_____ Position	_____ Date

Penobscot County Hazard Mitigation Plan – 2016 Update

2. PREREQUISITES

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Therefore, the Penobscot County Commissioners, acting on behalf of the County and its portion of the Unorganized Territory hereby adopt the Penobscot County Hazard Mitigation Plan – 2016 Update.

Authorizing Signatures

City/Town/Plantation of Carmel

<u>Susan Rudnicki</u> Name	<u>Selectman</u> Position	<u>8/29/16</u> Date
<u>[Signature]</u> Name	<u>Selectman</u> Position	<u>8/29/16</u> Date
<u>Douglas L. Small</u> Name	<u>Selectman</u> Position	<u>8/29/16</u> Date
<u>[Signature]</u> Name	<u>Selectman</u> Position	<u>8/29/16</u> Date

Penobscot County Hazard Mitigation Plan – 2016 Update

2. PREREQUISITES

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Authorizing Signatures

City/Town/Plantation of Carroll pt.

<u>Anty Duen</u> Name	<u>Assessor</u> Position	<u>12/5/16</u> Date
<u>Annie White</u> Name	<u>Assessor</u> Position	<u>12/5/16</u> Date
<u>N. Sten Clough</u> Name	<u>Assessor</u> Position	<u>12-8-16</u> Date
<u>Haley W. Moten</u> Name	<u>Tax Collector/Treasurer</u> Position	<u>12/5/16</u> Date

Penobscot County Hazard Mitigation Plan – 2016 Update

2. PREREQUISITES

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Authorizing Signatures

City/Town/Plantation of Charleston

<u>Yvonne L. Hall</u> Name	<u>Chairman of Selectmen</u> Position	<u>5-2-16</u> Date
<u>Kathy Sesto</u> Name	<u>Selectman</u> Position	<u>5-2-16</u> Date
<u>Virginia L. Noble</u> Name	<u>Selectman</u> Position	<u>5-2-16</u> Date
_____ Name	_____ Position	_____ Date

Penobscot County Hazard Mitigation Plan – 2016 Update

2. PREREQUISITES

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Therefore, the Penobscot County Commissioners, acting on behalf of the County and its portion of the Unorganized Territory hereby adopt the Penobscot County Hazard Mitigation Plan – 2016 Update.

Authorizing Signatures

City/Town/Plantation of Clifton

<u>Carol Jordan</u> Name	<u>Chair, Select Board</u> Position	<u>June 20, 2016</u> Date
<u>Bill Raul</u> Name	<u>Selectman</u> Position	<u>7-20-2016</u> Date
<u>Nancy Hatch</u> Name	<u>Select Board</u> Position	<u>7-20-2016</u> Date
<u>Ed Beunick</u> Name	<u>Select Board</u> Position	<u>7-20-2016</u> Date

Penobscot County Hazard Mitigation Plan – 2016 Update

2. PREREQUISITES

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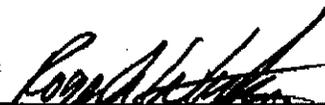
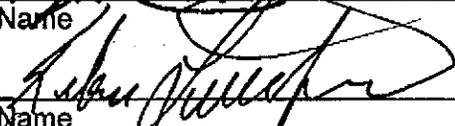
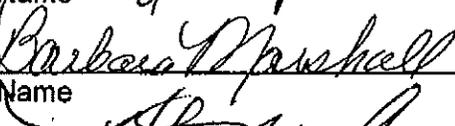
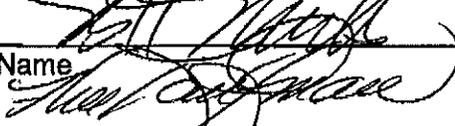
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Therefore the City Councils and Boards of Selectmen of the Incorporated Towns and Plantations hereby adopt the Penobscot County Multi-Jurisdictional Hazard Mitigation Plan – 2016 Update; and

Therefore, the Penobscot County Commissioners, acting on behalf of the County and its portion of the Unorganized Territory hereby adopt the Penobscot County Hazard Mitigation Plan – 2016 Update.

Authorizing Signatures

City/Town/Plantation of Carinna

 Name	<u>Chair, Selectman</u> Position	<u>7-27-16</u> Date
 Name	<u>Selectman</u> Position	<u>7-27-16</u> Date
<u>Barbara Marshall</u> Name	<u>Selectman</u> Position	<u>7-27-16</u> Date
 Name	<u>Selectman</u> Position	<u>7-27-16</u> Date
 Name	<u>Selectman</u> Position	<u>7-27-16</u> Date

- 1- Chair Roger Whitney
- 2- Kerbon Littlefield
- 3- Barbara Marshall
- 4- Brent Mullis
- 5- Francis Lee Kaufman

Penobscot County Hazard Mitigation Plan – 2016 Update

2. PREREQUISITES

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 Penobscot 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;

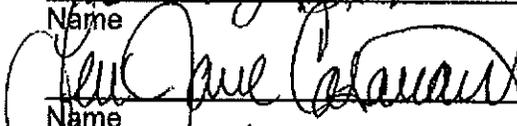
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Authorizing Signatures

City/Town/Plantation of Corinth

	<u>Chairman Selectman</u>	<u>8-4-16</u>
Name	Position	Date
<u>R. Stanley Brian</u>	<u>Selectman (Vice chair)</u>	<u>8-4-16</u>
Name	Position	Date
	<u>Selectperson</u>	<u>8-4-16</u>
Name	Position	Date
<u>Matthew Lassell</u>	<u>Selectman</u>	<u>8-4-16</u>
Name	Position	Date
<u>Charlene E. Chesley</u>	<u>Selectperson</u>	<u>8-4-16</u>

Penobscot County Hazard Mitigation Plan – 2016 Update

RESOLUTION B2016-03

MAY 12, 2016

Resolved, by the Town of Dexter that:

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 Penobscot 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;

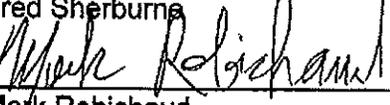
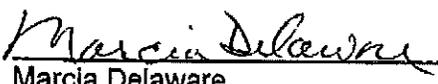
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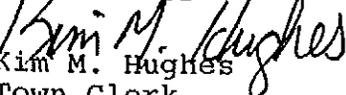
Therefore, the Penobscot County Commissioners, acting on behalf of the County and its portion of the Unorganized Territory hereby adopt the Penobscot County Hazard Mitigation Plan – 2016 Update.

Authorizing Signatures

Town of Dexter

 Michael Blake	Council Chairman Position	May 12, 2016 Date
 Fred Sherburne	Council Vice Chairman Position	May 12, 2016 Date
 Mark Robichaud	Councilor Position	May 12, 2016 Date
 Ron Apel	Councilor Position	May 12, 2016 Date
 Sharon Grant	Councilor Position	May 12, 2016 Date
 Alan Wintle	Councilor Position	May 12, 2016 Date
 Marcia Delaware	Councilor Position	May 12, 2016 Date

A True Copy Attest


Kim M. Hughes
Town Clerk

Filed May 12, 2016
SHARON GRANT

Penobscot County Hazard Mitigation Plan – 2016 Update

2. PREREQUISITES

RESOLUTION

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Therefore, the Penobscot County Commissioners, acting on behalf of the County and its portion of the Unorganized Territory hereby adopt the Penobscot County Hazard Mitigation Plan – 2016 Update.

Authorizing Signatures

City/Town/Plantation of DIXMONT

<u>Charles Chandler</u> Name	<u>1st Select person</u> Position	<u>Nov 1, 2016</u> Date
<u>Don Pendleton</u> Name	<u>2nd Select person</u> Position	<u>Nov 1, 2016</u> Date
<u>Beverly Paré</u> Name	<u>3rd Select person</u> Position	<u>11/1/16</u> Date
_____ Name	_____ Position	_____ Date

Penobscot County Hazard Mitigation Plan – 2016 Update

2. PREREQUISITES

RESOLUTION

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Authorizing Signatures

~~City/Town/Plantation~~ of DREW

James Potter 1st Selectperson / Assessor 11-23-16
Name Position Date

Carol A. Uegelder 2nd Selectman 11-23-16
Name Position Date

Name Position Date

Marlene Potter Town Clerk & Tax Collector 11-23-16
Name Position Date

Penobscot County Hazard Mitigation Plan – 2016 Update

2. PREREQUISITES

RESOLUTION

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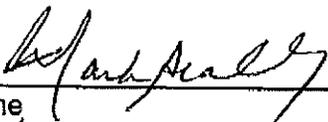
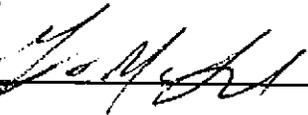
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Authorizing Signatures

City/Town/Plantation of East Millinocket

<u></u>	<u>Chair Board of Selectmen</u>	<u></u>
Name	Position	Date
<u>Kelley Michael</u>	<u>Selectwoman</u>	<u>5/10/16</u>
Name	Position	Date
<u>M. E. Munn</u>	<u>Selectman</u>	<u>5/16/16</u>
Name	Position	Date
<u></u>	<u>Selectman</u>	<u>5/10/16</u>
Name	Position	Date
<u></u>	<u>Selectman</u>	<u>5/10/16</u>
Name	Position	Date

Penobscot County Hazard Mitigation Plan – 2016 Update

2. PREREQUISITES

RESOLUTION

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Authorizing Signatures

City/Town/Plantation of Enfield

<u>June Guy</u> Name	<u>Selectman</u> Position	<u>7/25/16</u> Date
<u>Cathy Hazelton</u> Name	<u>Selectman</u> Position	<u>7-25-16</u> Date
<u>Paul 7 42</u> Name	<u>Selectman</u> Position	<u>7/25/16</u> Date
_____ Name	_____ Position	_____ Date

Penobscot County Hazard Mitigation Plan – 2016 Update

2. PREREQUISITES

RESOLUTION

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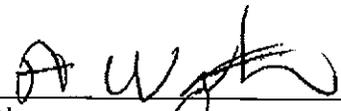
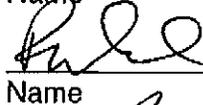
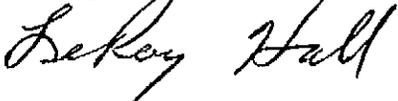
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Authorizing Signatures

City/Town/Plantation of ETNA

<u></u>	<u>CHAIR</u>	<u>6-1-16</u>
Name	Position	Date
<u></u>	<u>Select Board</u>	<u>6/1/16</u>
Name	Position	Date
<u></u>	<u>select board</u>	<u>6-1-16</u>
Name	Position	Date
<u></u>	<u>SELECT BOARD</u>	<u>6-1-16</u>
Name	Position	Date
<u></u>	<u>Asst. Chair</u>	<u>6-1-16</u>

Penobscot County Hazard Mitigation Plan – 2016 Update

2. PREREQUISITES

RESOLUTION

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Authorizing Signatures

City/Town/Plantation of Exeter

<u>Bruce Brown</u> Name	<u>1st Selectman</u> Position	<u>8-24-16</u> Date
<u>Neil Sullivan</u> Name	<u>Selectman</u> Position	<u>9-7-16</u> Date
<u>Gilbert Thiel</u> Name	<u>Selectman</u> Position	<u>9-20-16</u> Date
<u>Richard P. Papp</u> Name	<u>Selectman</u> Position	<u>9-20-16</u> Date
<u>Wyatt S. Holt</u> Name	<u>Selectman</u> Position	<u>9/20/2016</u> Date

Penobscot County Hazard Mitigation Plan – 2016 Update

2. PREREQUISITES

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Authorizing Signatures

City/Town/Plantation of Carland

<u>Linda Clewley</u> Name	<u>Chair, Select Board</u> Position	<u>1/11/2017</u> Date
<u>[Signature]</u> Name	<u>select Bd</u> Position	<u>1/11/17</u> Date
<u>Bonnie Coon</u> Name	<u>Select board</u> Position	<u>1/11/17</u> Date
_____ Name	_____ Position	_____ Date

Penobscot County Hazard Mitigation Plan – 2016 Update

2. PREREQUISITES

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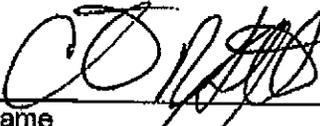
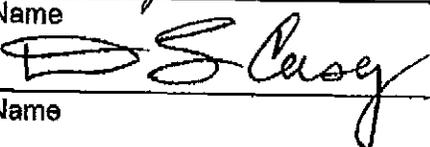
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Authorizing Signatures

City/Town/Plantation of Glenburn

	<u>Councilor</u>	<u>5/5/16</u>
Name	Position	Date
	<u>Councilor</u>	<u>5-5-16</u>
Name	Position	Date
	<u>Council-Chair</u>	<u>5/5/16</u>
Name	Position	Date
	<u>COUNCILOR</u>	<u>5/5/16</u>
Name	Position	Date

Penobscot County Hazard Mitigation Plan – 2016 Update

2. PREREQUISITES

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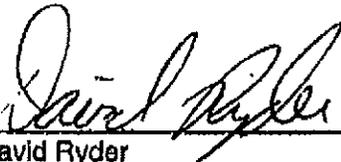
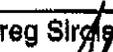
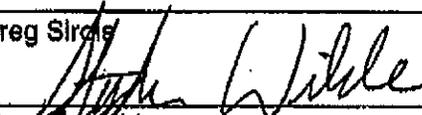
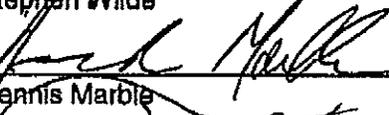
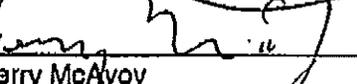
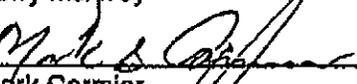
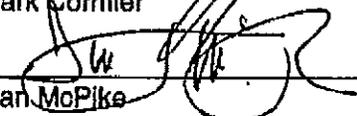
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Authorizing Signatures

Town of Hampden

	_____	_____
David Ryder	Town Council, Mayor	11-14-16 Date
	_____	_____
Greg Sirois	Town Council	Date
	_____	_____
Stephen Wilde	Town Council	Date
	_____	_____
Dennis Marble	Town Council	11-14-16 Date
	_____	_____
Terry McAvoy	Town Council	11-14-16 Date
	_____	_____
Mark Cormier	Town Council	11/14/16 Date
	_____	_____
Ivan McPike	Town Council	11/14/16 Date

Penobscot County Hazard Mitigation Plan – 2016 Update

2. PREREQUISITES

RESOLUTION

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Authorizing Signatures

City/Town/Plantation of Hermon

William Scott Town Council 5/12/16
Name Position Date

Hi McCluskey Town Council 5/12/16
Name Position Date

Doug Sinclair Town Council 5-12-16
Name Position Date

Step Hermon Town Council 5/12/16
Name Position Date

Chae Freeman Town Council 5-12-16
Name Position Date

Name Position Date

Name Position Date

Penobscot County Hazard Mitigation Plan – 2016 Update

2. PREREQUISITES

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Authorizing Signatures

Town of Holden

<u>David R. Black</u>	_____	<u>SEPT. 21, 2016</u>
David R. Black	Chairperson	Date
<u>Thomas Copeland</u>	_____	<u>21 SEP 16</u>
Thomas Copeland	Vice-Chairperson	Date
<u>Paul Amoroso</u>	_____	_____
Paul Amoroso	Councilor	Date
<u>Robert Harvey</u>	_____	<u>Sept. 21, 2016</u>
Robert Harvey	Councilor	Date
<u>Ralph McLeod</u>	_____	<u>9-21-2016</u>
Ralph McLeod	Councilor	Date

Penobscot County Hazard Mitigation Plan – 2016 Update

2. PREREQUISITES

RESOLUTION

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Authorizing Signatures

City/Town/Plantation of HOWLAND

<u>Thomas G. Hunter</u>	<u>Chair of Board</u>	<u>7/18/2016</u>
Name	Position	Date
<u>Andrew P. Pella</u>	<u>Selectman</u>	<u>7/18/2016</u>
Name	Position	Date
<u>W. J. [Signature]</u>	<u>Selectman</u>	<u>7/18/2016</u>
Name	Position	Date
<u>Joseph C. [Signature]</u>	<u>Selectman</u>	<u>7/20/2016</u>
Name	Position	Date

Penobscot County Hazard Mitigation Plan – 2016 Update

2. PREREQUISITES

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Authorizing Signatures

City/Town/Plantation of Hudson

<u>[Signature]</u>	<u>Selectman</u>	<u>10/13/16</u>
Name	Position	Date
<u>[Signature]</u>	<u>Selectman</u>	<u>10/13/16</u>
Name	Position	Date
<u>[Signature]</u>	<u>Selectman</u>	<u>10/13/16</u>
Name	Position	Date
<u>[Signature]</u>	<u>Selectman</u>	<u>10/13/16</u>
Name	Position	Date

Penobscot County Hazard Mitigation Plan – 2016 Update

2. PREREQUISITES

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 Penobscot 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 3 cities, 52 towns, 4 plantations and a portion of Maine's Unorganized Territory is committed to the mitigation goals and measures as presented in this plan;

Therefore the City Councils and Boards of Selectmen of the Incorporated Towns and Plantations hereby adopt the Penobscot County Multi-Jurisdictional Hazard Mitigation Plan – 2016 Update; and

Therefore, the Penobscot County Commissioners, acting on behalf of the County and its portion of the Unorganized Territory hereby adopt the Penobscot County Hazard Mitigation Plan – 2016 Update.

Authorizing Signatures

City/Town/Plantation of Kendusken

Name	Position	Date
<u>Best Maud-eyo</u>	<u>Selectman</u>	<u>9-6-16</u>
<u>Mary Swait</u>	<u>Selectman</u>	<u>9/6/16</u>
<u>Wayne A Bister</u>	<u>Selectman</u>	<u>9/6/16</u>

Penobscot County Hazard Mitigation Plan – 2016 Update

2. PREREQUISITES

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 Penobscot County;

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Therefore, the Penobscot County Commissioners, acting on behalf of the County and its portion of the Unorganized Territory hereby adopt the Penobscot County Hazard Mitigation Plan – 2016 Update.

Authorizing Signatures

Town /City/Plantation of LAGRANGE

JOSEPH E. FORTIER

Name

Fred Weymouth

Name

Paul Weymouth Jr

Corey Roberts

Name

Corey Kalka

1st SELECTMAN

Position

1/3/2017

Date

2nd SELECTMAN

Position

1/3/2017

Date

3rd SELECTMAN

Position

1/3/2017

Date

Name

Position

Date



Penobscot County Hazard Mitigation Plan – 2016 Update

2. PREREQUISITES

RESOLUTION

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Therefore, the Penobscot County Commissioners, acting on behalf of the County and its portion of the Unorganized Territory hereby adopt the Penobscot County Hazard Mitigation Plan – 2016 Update.

Authorizing Signatures

City/Town/Plantation of Lakewood

<u>Shirley A. Lyon</u> Name	<u>Select persons</u> Position	<u>12/13/16</u> Date
<u>Melissa Munro</u> Name	<u>Selectman / clerk</u> Position	<u>12/13/16</u> Date
<u>Robert Jacks</u> Name	<u>Select person</u> Position	<u>12/13/16</u> Date
_____ Name	_____ Position	_____ Date

Penobscot County Hazard Mitigation Plan – 2016 Update

2. PREREQUISITES

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 Penobscot County;

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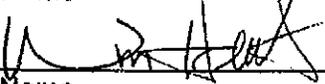
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Authorizing Signatures

City (Town) Plantation of Lee

Name	Position	Date
	Selectman	5/9/2016
	Selectman	5/9/2016
Name	Position	Date

Penobscot County Hazard Mitigation Plan – 2016 Update

2. PREREQUISITES

RESOLUTION

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Therefore, the Penobscot County Commissioners, acting on behalf of the County and its portion of the Unorganized Territory hereby adopt the Penobscot County Hazard Mitigation Plan – 2016 Update.

Authorizing Signatures

City/Town/Plantation of Levant

<u>Matthew C. Arnold</u>	<u>Selectman</u>	<u>4-27-16</u>
Name	Position	Date
<u>Nathan Peary</u>	<u>Selectman</u>	<u>4/27/16</u>
Name	Position	Date
<u>Don Arsen</u>	<u>Selectman</u>	<u>4/27/16</u>
Name	Position	Date
<u>Brent Hill</u>	<u>Selectman</u>	<u>4/27/16</u>
Name	Position	Date
<u>Bruce Call</u>	<u>selectman</u>	<u>4/27/16</u>
Name	Position	Date

Penobscot County Hazard Mitigation Plan – 2016 Update

2. PREREQUISITES

RESOLUTION

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Therefore, the Penobscot County Commissioners, acting on behalf of the County and its portion of the Unorganized Territory hereby adopt the Penobscot County Hazard Mitigation Plan – 2016 Update.

Authorizing Signatures

City/Town/Plantation of Lincoln

_____ Name	_____ Position	_____ Date
<i>A. Wardland</i>	<i>A. Wardland Town Clerk</i>	<i>07/21/2016</i>
_____ Name	_____ Position	_____ Date
<i>R. Weatherbee</i>	<i>R. Weatherbee Town Manager</i>	<i>07-21-2016</i>
_____ Name	_____ Position	_____ Date
_____ Name	_____ Position	_____ Date

Penobscot County Hazard Mitigation Plan – 2016 Update

2. PREREQUISITES

RESOLUTION

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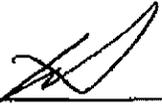
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Authorizing Signatures

City/Town/Plantation of Lowell

 Name	<u>1st Selectman</u> Position	<u>11/15/16</u> Date
<u>April Hogg</u> Name	<u>2nd Selectman</u> Position	<u>11/15/2016</u> Date
<u>R. White</u> Name	<u>3rd Selectman</u> Position	<u>11/15/16</u> Date
_____ Name	_____ Position	_____ Date

Penobscot County Hazard Mitigation Plan – 2016 Update

2. PREREQUISITES

RESOLUTION

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Authorizing Signatures

City/Town/Plantation of Matthews Key

<u>John Whitcomb</u> Name	<u>Selectman</u> Position	<u>10/1/16</u> Date
<u>Paul Leamy</u> Name	<u>Selectman</u> Position	<u>10/1/16</u> Date
<u>[Signature]</u> Name	<u>Selectman</u> Position	<u>10/1/16</u> Date
_____ Name	_____ Position	_____ Date

Penobscot County Hazard Mitigation Plan – 2016 Update

2. PREREQUISITES

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Authorizing Signatures

City/Town/Plantation of MAXFIELD

<u>Margaret Besage</u>	<u>Selectperson</u>	<u>1/12/17</u>
Name	Position	Date
<u>Ernest Dupont</u>	<u>Selectman</u>	<u>1/12/17</u>
Name	Position	Date
_____	_____	_____
Name	Position	Date
_____	_____	_____
Name	Position	Date

Penobscot County Hazard Mitigation Plan – 2016 Update

2. PREREQUISITES

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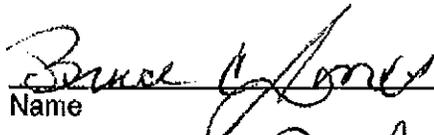
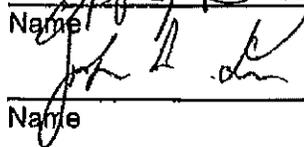
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Authorizing Signatures

Town of Medway

	SELECTMEN	01/09/2017
Name	Position	Date
	SELECTMEN	01/09/2017
Name	Position	Date
	SELECTMEN	01/09/2017
Name	Position	Date
_____	_____	_____
Name	Position	Date

Penobscot County Hazard Mitigation Plan – 2016 Update

2. PREREQUISITES

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Therefore, the Penobscot County Commissioners, acting on behalf of the County and its portion of the Unorganized Territory hereby adopt the Penobscot County Hazard Mitigation Plan – 2016 Update.

Authorizing Signatures

City/Town/Plantation of Milford

<u>William S. Kallala</u> Name	<u>Selectman</u> Position	<u>7/20/16</u> Date
<u>Mark S. Gung</u> Name	<u>Selectperson</u> Position	<u>7-20-2016</u> Date
<u>Jay Durick</u> Name	<u>Selectperson</u> Position	<u>7-20-2016</u> Date
<u>Anna Lucia</u> Name	<u>Selectperson</u> Position	<u>7/20/16</u> Date

Penobscot County Hazard Mitigation Plan – 2016 Update

2. PREREQUISITES

RESOLUTION

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Therefore, the Penobscot County Commissioners, acting on behalf of the County and its portion of the Unorganized Territory hereby adopt the Penobscot County Hazard Mitigation Plan – 2016 Update.

Authorizing Signatures

City Town Plantation of Mt. Vernon

<u>M. O. O. Muehlen</u>	<u>Councilor</u>	<u>9/22/16</u>
Name	Position	Date
<u>Heidi Stratton</u>	<u>Councilor</u>	<u>9/22/16</u>
Name	Position	Date
<u>Tom O. O.</u>	<u>Councilor</u>	<u>9-22-16</u>
Name	Position	Date
<u>Louis Peltier</u>	<u>Councilor</u>	<u>9-22-16</u>
Name	Position	Date
<u>Charles O. O.</u>	<u>Councilor</u>	<u>9-22-16</u>
Name	Position	Date

Penobscot County Hazard Mitigation Plan – 2016 Update

2. PREREQUISITES

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Therefore, the Penobscot County Commissioners, acting on behalf of the County and its portion of the Unorganized Territory hereby adopt the Penobscot County Hazard Mitigation Plan – 2016 Update.

Authorizing Signatures

~~City/Town/Plantation~~ of Mount Chase

<u>Albert Roy</u>	Chairman Selectboard	<u>08/03/2016</u>
Name	Position	Date

<u>Albert Roy</u>	Selectperson	<u>08/03/2016</u>
Name	Position	Date

_____	Position	_____
Name	Position	Date

<u>_____</u>	Selectperson	<u>08/03/2016</u>
Name	Position	Date

Penobscot County Hazard Mitigation Plan – 2016 Update

2. PREREQUISITES

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Therefore the City Councils and Boards of Selectmen of the Incorporated Towns and Plantations hereby adopt the Penobscot County Multi-Jurisdictional Hazard Mitigation Plan – 2016 Update; and

Therefore, the Penobscot County Commissioners, acting on behalf of the County and its portion of the Unorganized Territory hereby adopt the Penobscot County Hazard Mitigation Plan – 2016 Update.

Authorizing Signatures

City/Town/Plantation of

Newburgh

<u><i>Lorne P. Bell</i></u>	<u>Chair</u>	<u>5-2-2016</u>
Name	Position	Date
<u><i>Renee Donald</i></u>	<u>Selectman</u>	<u>5-2-16</u>
Name	Position	Date
<u><i>Stacy Carter</i></u>	<u>Selectman</u>	<u>5/2/16</u>
Name	Position	Date
_____	_____	_____
Name	Position	Date

Penobscot County Hazard Mitigation Plan – 2016 Update

2. PREREQUISITES

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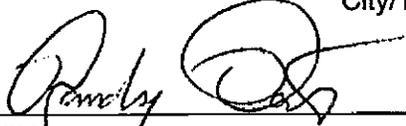
And whereas, this multi-jurisdictional county of 3 cities, 52 towns, 4 plantations and a portion of Maine's Unorganized Territory is committed to the mitigation goals and measures as presented in this plan;

Therefore the City Councils and Boards of Selectmen of the Incorporated Towns and Plantations hereby adopt the Penobscot County Multi-Jurisdictional Hazard Mitigation Plan – 2016 Update; and

Therefore, the Penobscot County Commissioners, acting on behalf of the County and its portion of the Unorganized Territory hereby adopt the Penobscot County Hazard Mitigation Plan – 2016 Update.

Authorizing Signatures

City/Town/Plantation of Newport

	Selectman	9/7/16
_____ Name	_____ Position	_____ Date
	Selectman	9/7/16
_____ Name	_____ Position	_____ Date
	Selectman	9-7-16
_____ Name	_____ Position	_____ Date
	Selectman	9/7/16
_____ Name	_____ Position	_____ Date
	Selectman	9/7/16
_____ Name	_____ Position	_____ Date

**PENOBSCOT COUNTY HAZARD MITIGATION PLAN
2016 UPDATE**

RESOLUTION 2016-3

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 Penobscot 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 3 cities, 52 towns, 4 plantations and a portion of Maine's Unorganized Territory is committed to the mitigation goals and measures as present in this plan;

THEREFORE, Old Town City Council hereby adopts the Penobscot County Multi-Jurisdictional Hazard Mitigation Plan- 2016 Update

Dated this 6th day of September, 2016.

OLD TOWN CITY COUNCIL

Lindsay McLeod
E. J. Curran
Carol & Mary

[Signature]
[Signature]
[Signature]

ATTEST:

Patricia A. Brochu
Patricia A. Brochu, City Clerk

Penobscot County Hazard Mitigation Plan – 2016 Update

2. PREREQUISITES

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Therefore, the Penobscot County Commissioners, acting on behalf of the County and its portion of the Unorganized Territory hereby adopt the Penobscot County Hazard Mitigation Plan – 2016 Update.

Authorizing Signatures

City/Town/Plantation of ORONO

<u>Thomas H. Berry</u> Name	<u>Councilor, Finance Comm. Chair</u> Position	<u>10/7/16</u> Date
<u>Alex W. Wilson</u> Name	<u>Council Chair</u> Position	<u>10/7/16</u> Date
<u>Sophia Wilson</u> Name	<u>Town Manager</u> Position	<u>10/7/16</u> Date

Penobscot County Hazard Mitigation Plan – 2016 Update

2. PREREQUISITES

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Therefore, the Penobscot County Commissioners, acting on behalf of the County and its portion of the Unorganized Territory hereby adopt the Penobscot County Hazard Mitigation Plan – 2016 Update.

Authorizing Signatures

City/Town/Plantation of ORWINGTON

<u>[Signature]</u> Name	<u>SELECTMAN</u> Position	<u>6/27/16</u> Date
<u>Allen Small</u> Name	<u>Selectman</u> Position	<u>6-27-16</u> Date
<u>Charles A. Greer</u> Name	<u>SELECTMAN</u> Position	<u>6-27-2016</u> Date
<u>Keith A. Barden</u> Name	<u>Selectman</u> Position	<u>6-27-2016</u> Date
<u>[Signature]</u> Name	<u>Selectman</u> Position	<u>6/27/2016</u> Date

Penobscot County Hazard Mitigation Plan – 2016 Update

2. PREREQUISITES

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Authorizing Signatures

Town of Passadumkeag

_____	Selectman	12/21/2016
Name	Position	Date
	Selectman	12/21/2016
Name	Position	Date
	Selectman	12/21/2016
Name	Position	Date

Penobscot County Hazard Mitigation Plan – 2016 Update

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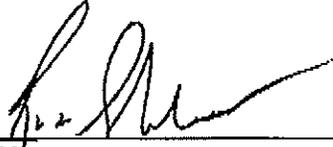
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Authorizing Signatures

City/Town/Plantation of PATTEN

	Selectman, Chairman	11-30-16
Name	Position	Date
<u>Lana Tucker</u>	Select person	11-30-16
Name	Position	Date
<u>Sally Landry</u>	Select person	11/30/16
Name	Position	Date
<u>Ken Perkins</u>	Selectman	11/30/16
Name	Position	Date
<u>NAME</u>	<u>POSITION</u>	<u>DATE</u>

Penobscot County Hazard Mitigation Plan – 2016 Update

2. PREREQUISITES

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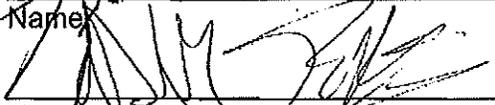
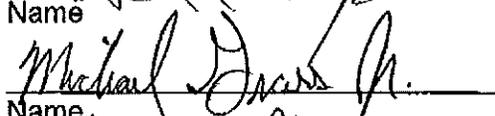
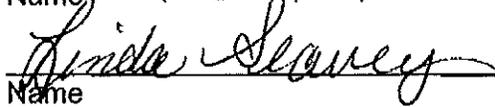
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Therefore the City Councils and Boards of Selectmen of the Incorporated Towns and Plantations hereby adopt the Penobscot County Multi-Jurisdictional Hazard Mitigation Plan – 2016 Update; and

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Authorizing Signatures

City/Town/Plantation of Plymouth

 Name	<u>Chief</u> Position	<u>9-12-16</u> Date
 Name	<u>1st selectman</u> Position	<u>10-10-16</u> Date
 Name	<u>2nd Selectman</u> Position	 Date
 Name	<u>3rd selectman</u> Position	<u>9-12-16</u> Date

Penobscot County Hazard Mitigation Plan – 2016 Update

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Authorizing Signatures

City/Town/Plantation of Seboeis PLT.

<u>Man [Signature]</u>	<u>1st Assessor</u>	<u>11-10-16</u>
Name	Position	Date
<u>Pete [Signature]</u>	<u>2nd Assessor</u>	<u>11</u>
Name	Position	Date
<u>Bob [Signature]</u>	<u>3rd Assessor</u>	<u>11/10/16</u>
Name	Position	Date
_____	_____	_____
Name	Position	Date

Penobscot County Hazard Mitigation Plan – 2016 Update

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Authorizing Signatures

City/Town/Plantation of Springfield

<u>Lisa Kettle</u>	<u>Town Clerk</u>	<u>10-26-2016</u>
Name	Position	Date
<u>Diane Gu</u>	<u>Tax Collector/Treasurer</u>	<u>10-26-16</u>
Name	Position	Date
<u>Brian Burt</u>	<u>1st Selectman</u>	<u>10-26-16</u>
Name	Position	Date
_____	_____	_____
Name	Position	Date

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Authorizing Signatures

City/Town/Plantation of Stacyville

<u>Wendell Best</u> Name	<u>Selectman</u> Position	<u>07/20/16</u> Date
<u>Chris Stewart</u> Name	<u>Selectman</u> Position	<u>07/20/16</u> Date
_____ Name	_____ Position	_____ Date
_____ Name	_____ Position	_____ Date

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Authorizing Signatures

City/Town/Plantation of Stetson

Donald C. Carroll Selectmen 7/27/16
Name Position Date

Chris E. Sighton Selectmen 7/27/16
Name Position Date

Jerry Smith Selectmen 7/27/16
Name Position Date

Deirdra J. Clark Selectmen 7/27/16
Name Position Date

Danny Wilhee selectmen 7/27/16
Name Position Date

Penobscot County Hazard Mitigation Plan – 2016 Update

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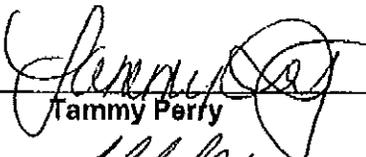
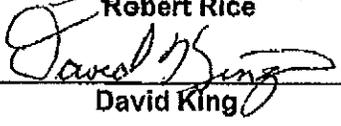
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Town of Veazie

 _____ Tammy Perry	_____ Council Chair	_____ 5/9/16
 _____ Robert Rice	_____ Councilor	_____ 5/9/16
 _____ David King	_____ Councilor	_____ 5/9/16
 _____ Karen Walker	_____ Councilor	_____ 5/9/16
 _____ Chris Bagley	_____ Councilor	_____ 5/9/16

Penobscot County Hazard Mitigation Plan – 2016 Update

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Authorizing Signatures

City/Town/Planation of Webster PIt.

<u>Robin Jensen</u>	<u>1st Assessor</u>	<u>1/5/17</u>
Name	Position	Date
<u>Christy Cole</u>	<u>2nd Assessor</u>	<u>1/5/17</u>
Name	Position	Date
_____	_____	_____
Name	Position	Date
_____	_____	_____
Name	Position	Date

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Authorizing Signatures

City/Town/Plantation of Woodville

<u>Mary US</u>	<u>Selectman</u>	<u>01/01/16</u>
Name	Position	Date
<u>Dan W. Little</u>	<u>Selectman</u>	<u>11/1/16</u>
Name	Position	Date
_____	_____	_____
Name	Position	Date
_____	_____	_____
Name	Position	Date

MULTI-JURISDICTIONAL PLANNING PARTICIPATION

3. Multi-Jurisdictional Planning Participation	
Requirement §201.6(a)(3): Multi-jurisdictional plans (e.g. watershed plans) may be accepted, as appropriate, as long as each jurisdiction has participated in the process. Statewide plans will not be accepted as multi-jurisdictional plans.	
Elements	A. Does the new or updated plan describe how each jurisdiction participated in the plan’s development?
	B. Does the updated plan identify all participating jurisdictions, including new, continuing, and the jurisdictions that no longer participate in the plan?

The key to any multi-jurisdictional plan is participation from all. This Penobscot County Plan update encompasses 59 participating municipalities, the Penobscot Indian Nation, and the County on behalf of the Unorganized Territory within its boundaries. In 2005, as part of Requirement §201.6(a)(3), letters requesting a statement of intent to participate were sent out to all Penobscot County municipalities and the Penobscot Indian Nation to encourage involvement with the County-wide Hazard Mitigation Plan. The letters encouraged participation and warned of the potential financial losses if a municipality or the Penobscot Indian Nation declined participation. Along with this letter participant information forms, participant decline notifications, and Planning committee member nominee forms were sent out. The response was positive as fifty-nine of sixty municipalities and the Penobscot Indian Nation responded, stating their intent to participate in the program. One municipality formally declined (Edinburg).

While seven communities did not respond to numerous attempts to become participating communities, a majority of the communities were very willing and forthcoming with information and assistance to solve the problems that each community and the county had to deal with.

In 2005 and again in 2011 and 2016, the town of Edinburg declined to participate within the program. In 2005 the Town of Holden developed its own hazard mitigation plan and assisted in the development of this plan. In 2011, Holden elected to participate and will formally adopt the county-wide plan. In 2005, three other communities (Enfield, Greenbush, and Howland) developed Hazard Mitigation Plans independently of the county wide plan, but elected to actively participate in and adopt the Penobscot County Multi-Jurisdictional Hazard Mitigation Plan in addition to their own local plan. However by 2016 Bangor, Enfield, Greenbush, Holden and Howland had all decided to forego their own local plan and only participate in the County plan. In 2011, and again in 2016 all of the above referenced towns (except Edinburg) opted to participate in the County’s plan and planning process. The City of Bangor also participated in the 2011 and 2016 County plan and planning process, although they had previously maintained their own local plan.

Prentiss Plantation and Argyle Unorganized Township are two communities that were formally excused from participation in the 2011 and 2016 plan by Penobscot Emergency Management Agency, as they are territories controlled by the county and state as Unorganized Territory and fall under any state or county wide declarations and projects.

In 2005, five of the seven non-responding communities (Burlington, Chester, Maxfield, Mount Chase, Woodville) elected to participate, however did not supply the adequate information required. These communities participated only by submitting a project when approached by a FEMA representative. In 2016 all of the above communities adequately supplied information.

In 2011 and 2016 only one community, Edinburg, chose not to participate with the County or the consultant during the planning process. Therefore Edinburg did not qualify to participate in the multi-jurisdictional hazard mitigation plan and will not be described within this document.

The list of participating communities plus the Penobscot Indian Nation can be found in the following pages.

4. Documentation of the Planning Process	
Requirement §201.6(b): In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include: (1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval; (2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process; and (3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.	
Requirement §201.6(c)(1): (The plan shall document) 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.	
Elements	<p>A. Does the plan provide a narrative description of the process followed to prepare the new or updated plan?</p> <p>B. Does the new or updated plan indicate who was involved in the current planning process? (For example, who led the development at the staff level and were there any external contributors such as contractors? Who participated in the plan committee, provided information, reviewed drafts, etc.).</p>

	<p>C. Does the new or updated plan indicate how the public was involved? (Was the public provided an opportunity to comment on the plan during the drafting stage prior to the plan approval)?</p>
	<p>D. Does the new or updated plan discuss the opportunity for neighboring communities, agencies, businesses, academia, nonprofits and other interested parties to be involved in the process?</p>
	<p>E. Does the planning process describe the review and incorporation, if appropriate, of existing plans, studies, reports, and technical information?</p>
	<p>F. Does the updated plan document how the planning team reviewed and analyzed each section of the plan and whether each section was revised as part of the update process?</p>

Pursuant to FEMA requirements, the planning process for the development of the Penobscot County Hazard Mitigation Plan has been closely documented.

MULTI-JURISDICTIONAL PLANNING

In 2005, Penobscot County developed a comprehensive Hazard Mitigation Plan to meet the needs of local communities and the Penobscot Indian Nation to satisfy state and federal requirements for multi-jurisdictional hazard mitigation planning. With need of assistance in creating the plan, Penobscot County and its Emergency Management Agency (PTEMA) hired Eastern Maine Development Corporation (EMDC) and its consultants to assist in the preparation of the plan. In 2011 and again in 2015-16, the plan was updated by PTEMA working closely with Lorna Thompson Consulting, LLC. Participation letters were sent out, to all communities within the jurisdiction. These letters were sent to the communities and the Penobscot Indian Nation to determine their interest in continued participation and to seek representatives to serve on the Hazard Mitigation Planning Committee.

In 2005, fifty-six (56) of the sixty (60) municipal communities within the county elected to participate as well as the Penobscot Indian Nation. The committee met on seven different occasions (the first Friday of the month) between December 2004 and June 2005. All committee meetings were held as an open public forum, where concerned citizens and interested parties were encouraged to attend and engage in the process.

In 2011, fifty-nine (59) of the sixty (60) organized communities within the county as well as the Penobscot Indian Nation chose to participate and utilized various representatives. They met numerous times with then Deputy EMA Director Michelle Tanguay to discuss hazards, strategies and projects.

In 2016, fifty-nine (59) of the sixty (60) organized communities within the county as well as the Penobscot Indian Nation again chose to participate with the plan. Penobscot EMA was fortunate to have many of the same representatives involved that had participated during the previous plan.

In 2005, after developing a list of municipal and Penobscot Indian Nation participants and developing a committee, informational surveys were sent out to the participating communities to gather information concerning critical facilities, road surface, as well as demographic and community planning information. These surveys were collected by EMDC and reviewed by the committee to assess the extent of vulnerability to hazards within Penobscot County. In 2011, since the original data had already been gathered, copies of the original documents were sent to communities to determine if changes had occurred. The municipalities reviewed the documents and either responded via email, phone conversations or regular mail to provide necessary changes for the plan. Based on conversations with MEMA, the communities and the Penobscot Indian Nation, it was determined that the risk and strategy sections would require extensive updates, while the remaining portions of the plan would require supplemental information. In 2016, copies of the previously submitted 2011 data were sent to communities to request information regarding necessary changes. The municipalities reviewed the documents and either responded via face-to-face meetings, email, phone conversations or regular mail to provide necessary changes for the plan. Based on the new data, it was determined that portions of the plan would only require supplemental information.

In 2005, Critical Facilities Maps were created in ARC/GIS by EMDC and mailed to each individual community for review. These Maps showed state overlay information concerning state, federal, and local critical facilities including but not limited to: fire stations, police stations, hospitals, municipal buildings, schools, salt and sand sheds, and roadways, and their location within each municipality and the Penobscot Indian Nation. Federal information from FEMA's FIRM data regarding floodplains was placed as overlays upon the maps to determine the potential flood damage. These maps were mailed out to each community leader designated on the participation form for updating and relocating any misplaced or omitted facilities and structures. Each community was given two weeks to respond with corrections to be reviewed and updated in ARC/GIS by EMDC technical consultants. In 2011 and again in 2016, PTEMA was assisted by LatLong Logic, LLC who provided the mapping expertise. Again copies of the previous maps were sent to the corresponding communities, who in-turn reviewed the maps and supplied any necessary corrections to PTEMA/ LatLong Logic, LLC.

In 2016 the County was fortunate to be working with many of the same representatives that had participated in past plans, some communities submitted revised versions of their mitigation activities. However, many communities submitted the same projects as a lack of local funding sources limited their mitigation abilities. The County continues public outreach and education by offering National Weather Spotter trainings annually. In addition, the local communities that conduct exercises normally add a weather element into the scenario which utilizes the notification p with the NWS.

The planning committee reviewed:

- the State’s Hazard Mitigation Plan (as submitted to FEMA);
- the previous 2005 and 2011 County Plan;
- events and disaster declarations since the last plan;
- MEMA’s Hazard Mitigation Update Guide ;
- and the input from communities and the Penobscot Indian Nation regarding their planning efforts, including existing plans, studies, reports, and technical information;

This information was then utilized to review and adjust each section of the County’s 2011 plan to create the 2016 Penobscot County Hazard Mitigation Plan.

Upon completion of the plan, the EMA Director can provide the information to towns, cities, and the Penobscot Indian Nation as well as technical assistance. Following approval of the plan by FEMA, the County EMA will send a copy to all municipalities and the Penobscot Indian Nation 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.

SUMMARY OF LOCAL & PENOBSCOT INDIAN NATION PARTICIPATION

Name of Participants	Point of Contact	Meetings	Telephone	Email	Mailings
Alton	RC	X	X	X	X
Bangor	DPW	X	X	X	X
Bradford	RC		X	X	X
Bradley	RC			X	X
Brewer	DPW	X	X	X	X
Burlington	RC	X		X	X
Carmel	RC		X	X	X
Carroll	RC	X		X	X
Charleston	RC	X	X	X	X
Chester	RC	X		X	X
Clifton	RC	X		X	X
Corinna	RC			X	X
Corinth	RC	X		X	X
Dexter	DPW	X		X	X
Dixmont	RC	X		X	X
Drew	RC	X		X	X
East Millinocket	DPW	X		X	X
Eddington	RC	X		X	X
Edinburg	RC		X		
Enfield	RC	X		X	X
Etna	RC	X		X	X
Exeter	RC		X	X	X
Garland	RC			X	X

Section III-Planning

Glenburn	RC	X	X	X	X
Greenbush	RC	X		X	X
Hampden	DPW	X		X	X
Hermon	DPW	X	X	X	X
Holden	DPW	X		X	X
Howland	RC		X	X	X
Hudson	RC		X	X	X
Kenduskeag	RC			X	X
Lagrange	RC	X	X	X	X
Lakeville	RC	X	X	X	X
Lee	RC	X	X	X	X
Levant	RC		X	X	X
Lincoln	DPW		X	X	X
Lowell	RC		X	X	X
Mattawamkeag	RC		X	X	X
Maxfield	RC			X	X
Medway	RC	X		X	X
Milford	DPW		X	X	X
Millinocket	DPW	X	X	X	X
Mount Chase	RC		X	X	X
Newburgh	RC	X	X	X	X
Newport	DPW		X	X	X
Old Town	DPW			X	X
Orono	DPW	X	X	X	X
Orrington	RC	X	X	X	X
Passadumkeag	RC			X	X
Patten	RC		X	X	X
Penobscot Indian Nation	RC		X	X	X
Plymouth	RC			X	X
Seboeis	RC	X		X	X
Springfield	RC	X	X	X	X
Staceyville	RC		X	X	X
Stetson	RC	X		X	X
Unorganized Territory	ROAD AGENT	X	X	X	X
Veazie	RC			X	X
Webster	RC	X		X	X
Winn	RC	X		X	X
Woodville	RC			X	X

Note:

RC- Road Commissioner

DPW- Director of Public Works

DOCUMENTATION OF THE PLANNING PROCESS

Penobscot County Multi-Jurisdictional Hazard Mitigation Plan – 2016 Update

In compliance with **§201.4(c) (1)**, Penobscot County held all its planning meetings as open forums. Press releases and status reports were utilized to advertise and explain the mitigation planning process to the public. The public was invited to comment on the plan at all stages of its formation. Minutes of the Penobscot County Hazard Mitigation Committee meetings were kept by Penobscot County Emergency Management Agency officials and can be found in **Appendix A – Public Participation Documents –Committee Meeting Documentation** for 2016. The documentation is summarized below.

THE 2005 PLAN:

December 3, 2004

This was the first meeting of the Penobscot County Hazard Mitigation Committee. General introduction took place with committee representatives stating community and capacity for which they were at the meeting. JoAnn Mooney from MEMA spoke about the project and what FEMA was looking for to gain approval. She stated that FEMA looked for acknowledgement of hazards and the mitigation goals and objectives, as well as how the actions to mitigate these hazards were addressed. The committee developed a matrix rating scale for determining value and priority of each hazard. The Committee identified and addressed Winter Storms and Flood as the major hazards within the County. Each community was directed to develop at least one project for mitigation.

January 7, 2005

Jim Bruni and Holly Dominie from FEMA were in attendance to discuss the crosswalk for review. The discussion was led by JoAnn Mooney of MEMA, and covered how the plan in reviewed by FEMA, what they look for and how it pertains to each hazard. Holly stated that each participating community needed to have a project to be considered participating. Maps are being created for each community to display critical facilities and flood zones within each jurisdiction within the plan. Letters were sent to each community to solicit their participation, if not, they would not be eligible for grant funding unless they completed their own plan.

February 4, 2005

The committee developed its four major priority hazards to address within the plan. Definitions of emergency management were reviewed and approved for use in the plan. The committee setup regional meetings to create public outreach for the participating communities the opportunity to review the meetings.

March 4, 2005

Discussion was held regarding how to increase community participation. An article was written and published in the Bangor Daily News regarding how community participation was lacking and holding up the development of the plan. The committee developed the

Penobscot County Multi-Jurisdictional Hazard Mitigation Plan – 2016 Update

idea of adding Erosion to the plan as its “point value” within the matrix reaches the goal of 10 points. The completed sections of the plan have been mailed out to committee members for review.

April 1, 2005

Ivy Francis from FEMA came to the meeting to present “Project Identification for Mitigation Action Plans” to identify hazards and appropriate actions to mitigate the problem. Projects need to include the how to’s that will to be completed to implement the project. The committee members were issued a homework assignment to list and identify the mitigation actions that should be considered county wide.

May 6, 2005

The Committee developed Objectives and Actions to combat selected Natural hazards. Developing overall goals and objectives allowed for committee conversation regarding potential mitigation actions to address hazards. The committee took the plan through crosswalk and developed what remaining criteria are needed and what remains to be addressed. A final letter was agreed to be sent out to the towns to solicit for information and projects. JoAnn Mooney stated that it might be a good time for Jim Bruni to contact communities to address concerns of mitigation projects for communities having difficulty developing actions and ideas.

June 10, 2005

A review and approval Section 6, Plan Maintenance took place. It was suggested that we should include a manner to introduce new stakeholders such as Bangor Hydro into the continued public involvement section. JoAnn mentioned that we could have a broad outreach for the PUC’s and businesses along with the Universities. JoAnn mentioned that at MEMA, they have gotten the DOT involved in their EOC as they have tons of data that can be shared.

JoAnn Mooney discussed the process in which grants were now applied for, reviewed, received and awarded, assuming a declaration would come in for applying for grant funds.

JoAnn stated that Jim Bruni, FEMA, still had a few towns he needed to visit to assist in the development of mitigation projects for community participation.

The deadline for final paperwork submitting is today. The group agreed that lack of participation at this point would leave a community on the outside, otherwise, Sorry. Towns that will not be included in the plan can join when the plan is reviewed in 5 years.

Michelle Tanguay from the County EMA office stated that there will be a final public meeting on June 22, at 10AM and 6pm at the University of Maine. This will be to solicit

final public comment on the plan and assist communities with linking projects to the plan. .

It was decided that EMDC will mail out a Compact Disk copy to the plan along with a letter and web address for viewing to all participating towns in Penobscot County.

JoAnn spoke of the MEMA workshops and would like to offer three before the fall in Penobscot County. Grant development, narrative writing workshop and E Grant. These workshops are created to assist municipalities in completing grant applications.

THE 2011 PLAN:

Since the 2005 had been successful, the county chose to build on that success by utilizing many of the same stakeholders while also reaching out to the medical field, large industry, utilities and municipal officials in general. Instead of “reinventing the wheel,” the county used the proven previous techniques, meetings, mailings, emails and personal visits to encourage participation in the plan. Due to the economic factors, and needing a more cost effective approach, this plan relied more on phone conversations and email as many individuals had less available time due to competing meetings and strained budgets.

Again, several communities did not respond to numerous attempts to become participating communities, a majority of the communities were very willing and forthcoming with information and assistance to solve the problems that each community and the county had to deal with. However, with small local governments that have constant turnover in leadership, it is often difficult to maintain a consistent dialogue with one individual. Many times elected officials hold full time jobs and may only be available in the evening or on weekends. Lack of an immediate response from these individuals was not an indication of a lack of interest, but instead, a lack of time.

February 23, 2010

In February a short article was printed in the Bangor Daily News that discussed the purpose of the plan and advertised the upcoming March meeting in an effort to garner community and public input.

March 5, 2010

This was the first meeting for communities interested in the 2011 Penobscot County Hazard Mitigation Plan. This meeting also included stakeholders from health care. Utilities and industrial entities were also invited, but did not attend. A general introduction took place with participants describing their community and their capacity within that community. JoAnn Mooney from MEMA spoke about the plan, the benefits and FEMA’s requirements for plan approval. She stated that FEMA looked for acknowledgement of hazards, mitigation goals and objectives, as well as how the actions to mitigate these hazards were or would be addressed.

May 17, 2010

In May Deputy Director Tanguay and consultant Thompson embarked on a “road trip” through Penobscot County to physically visit a number of who had already committed to the process, but had not returned all the necessary information. These communities were encouraged to compile the necessary documentation, and most completed the information while in the meeting.

July 9, 2010

A meeting was held at the Bangor Police Station meeting room. Stakeholders were invited to further discuss the intent of the plan. Attendees reviewed projects and mapping from the previous plan and reviewed updated portions for accuracy. Input and comments were requested from those in attendance. Some individuals worked one-on-one with Deputy EMA Director Tanguay or consultant Thompson while others from adjoining communities worked in groups. Comments and revisions were provided by the communities that were then integrated into the maps and documents.

September 23, 2010

A meeting for public review of the plan was held in Bangor at the Penobscot County Courthouse in the Commissioners room. Although no one from the general public attended, representatives from various communities reviewed the plan and provided comment on the document.

September 24, 2010

Another meeting for public review of the plan was held in Springfield at the Town Office. This was an attempt to accommodate communities and the public in the northern portion of the county. Individuals were offered the opportunity to review the plan and efforts were made to gather additional public comment.

November 2010

In November the final draft of the document and the updated maps were posted to the County’s website to allow participating communities and the general public a final opportunity to review and comment. Communities were asked to post a public notice for the location of the plan on the web.

In addition to the advertised meetings listed above, then Deputy Director Tanguay and consultant Thompson met more than a dozen times to confirm information and contact individuals for clarification or additional input. During these times, meetings were also conducted with Penobscot County Roads and Mapping as they occupy an office in the same building as the EMA office.

Please see sign-in sheets in Appendix A for documentation of attendees.

THE 2016 PLAN:

Penobscot County Multi-Jurisdictional Hazard Mitigation Plan – 2016 Update

Since the 2005 and 2011 public participation efforts were successful, the same methodology was utilized for the 2016 update. The county again reached out to the medical field, large industry, utilities and municipal officials using the proven previous techniques of meetings, mailings, emails and personal visits to encourage participation and educate entities on the importance of the plan. Economic factors continue to hinder mitigation efforts and again Penobscot County relied on the more cost effective approach of phone conversations and email as many individuals struggled with budget shortfalls.

Again, several communities did not initially respond to numerous attempts to become participating communities. However many communities remain committed to the process, recognizing the benefits and were very willing to participate. Unfortunately, small local governments have constant annual turnover in leadership which causes a huge learning curve and work load for these new officials. In addition most of these elected officials hold full time jobs and are only available in the evening or on weekends. Lack of an immediate response from these individuals was not an indication of a lack of interest, but instead, a lack of time or initial lack of understanding of the importance of participation.

January 2015

In January surveys were sent to all communities to gather input regarding the update for the plan. Communities were asked to review and complete the survey for their town's most probable hazards. Communities were also encouraged to contemplate future mitigation projects.

February 27, 2015

In February a "2016 Plan kick-off" meeting was held at Penobscot County EMA to meet with communities and stakeholders to describe the process and gather interest. This was the first meeting for communities interested in the 2016 Penobscot County Hazard Mitigation Plan. A general introduction took place with participants describing their community and their capacity within that community. Rich Okulski from the NWS did a presentation on current winter and likely spring conditions that might affect flooding potential in the County. JoAnn Mooney from MEMA spoke about the plan, the benefits and FEMA's requirements for approval. The meeting was a tremendous success with over 30 people in attendance representing 27 communities. Public participation during this meeting included updating community maps, verifying project status and discussion of County's risk and priorities.

March 23, 2015

In March Director Tanguay and consultant Thompson again "hit the road" through Penobscot County to physically visit with communities that had already committed to the process, but had not returned all the necessary information. These communities were informed of the importance of participation and encouraged to complete the necessary

documentation. Most meetings concluded with the collection of the completed information.

Summer 2015

Penobscot EMA continued outreach to nonresponsive communities via emails to obtain necessary information and provide education regarding the importance of the process. Initial contact was made with LatLong Logic to obtain updated maps for the community.

Fall 2015

Penobscot EMA continued outreach by calling communities that had not supplied appropriate information and successfully obtained the required information.

December 2015

Penobscot EMA hosted two public comment and review meetings. The first on December 2nd at the Medway Town office and the second at the Penobscot County EMA office on December 9th. The public was encouraged to attend via a public notice in the local print media outlets. Public who attended offered feedback on community maps and project status. Priorities of County’s risk was also a common discussion point.

PARTICIPATING COMMUNITIES

Name of Participants	Participated in 2005 Plan	Participated in 2011 Plan	Participated in 2016 Plan
Alton	No	Yes	Yes
Bangor	Yes	Yes	Yes
Bradford	Yes	Yes	Yes
Bradley	Yes	Yes	Yes
Brewer	Yes	Yes	Yes
Burlington	Yes	Yes	Yes
Carmel	Yes	Yes	Yes
Carroll	Yes	Yes	Yes
Charleston	Yes	Yes	Yes
Chester	Yes	Yes	Yes
Clifton	Yes	Yes	Yes
Corinna	Yes	Yes	Yes
Corinth	Yes	Yes	Yes
Dexter	Yes	Yes	Yes
Dixmont	Yes	Yes	Yes
Drew	Yes	Yes	Yes
East Millinocket	Yes	Yes	Yes
Eddington	Yes	Yes	Yes
Edinburg	No	No	No
Enfield	Yes	Yes	Yes
Etna	Yes	Yes	Yes
Exeter	Yes	Yes	Yes
Garland	Yes	Yes	Yes

Glenburn	Yes	Yes	Yes
Greenbush	Yes	Yes	Yes
Hampden	Yes	Yes	Yes
Hermon	Yes	Yes	Yes
Holden	Yes	Yes	Yes
Howland	Yes	Yes	Yes
Hudson	Yes	Yes	Yes
Kenduskeag	Yes	Yes	Yes
Lagrange	Yes	Yes	Yes
Lakeville	Yes	Yes	Yes
Lee	Yes	Yes	Yes
Levant	Yes	Yes	Yes
Lincoln	Yes	Yes	Yes
Lowell	Yes	Yes	Yes
Mattawamkeag	Yes	Yes	Yes
Maxfield	Yes	Yes	Yes
Medway	Yes	Yes	Yes
Milford	Yes	Yes	Yes
Millinocket	Yes	Yes	Yes
Mount Chase	Yes	Yes	Yes
Newburgh	Yes	Yes	Yes
Newport	Yes	Yes	Yes
Old Town	Yes	Yes	Yes
Orono	Yes	Yes	Yes
Orrington	Yes	Yes	Yes
Passadumkeag	Yes	Yes	Yes
Patten	Yes	Yes	Yes
Penobscot Indian Nation	Yes	Yes	Yes
Plymouth	Yes	Yes	Yes
Seboeis	Yes	Yes	Yes
Springfield	Yes	Yes	Yes
Stacyville	Yes	Yes	Yes
Stetson	Yes	Yes	Yes
Unorganized Territory	Yes	Yes	Yes
Veazie	Yes	Yes	Yes
Webster	Yes	Yes	Yes
Winn	Yes	Yes	Yes
Woodville	Yes	Yes	Yes

PUBLIC PARTICIPATION PROCESS

As was the case in 2005, all meetings and information sessions for the 2011 and 2016 plans were held in an open to the public forum and participation of attendees was heavily encouraged.

In addition to the Planning Committee’s board meetings in 2005, an effort was made to solicit public input during the planning process. In 2005 a general public meeting was

held at the beginning of the formulation of the Planning Team at Eastern Maine Development Corporation on date of first project Meeting.

During the planning process, three separate strategically placed public forums were advertised and held to address public concerns and questions. These meetings were held in the Council Chambers, Lincoln Town Hall, Lincoln, Maine; the Town Meeting Room, Newport Town Hall, Newport, Maine; and Executive Board Room, Eastern Maine Development Corporation, Bangor, Maine. These meetings were arranged to solicit outside public input in the planning process.

It is also anticipated that the same format will be used for the 2016 public forums. Meetings are being planned for East Millinocket and two meetings in the Bangor area. Again public input will be strongly encouraged.

The meetings were also a chance for the individual communities, which were not directly represented on the committee, and the consultants to sit down and verify critical facilities and information within the survey and maps. These maps marked the locations of the critical facilities within each municipality the Penobscot Indian Nation. Each map was mailed out to its respective community or the Penobscot Indian Nation to review, updated, and returned to EMDC to be compiled, reviewed, and updated in GIS. Maps of all the participating municipalities, the Penobscot Indian Nation and townships were created in GIS and can be found at the end of *Section-IV Risk Assessment*. The sign in sheets for these meetings can be seen in *Appendix A–Public Participation Documents – Public Attendance Sheets for 2016 documentation*.

In 2005, as the plan started to develop, it was placed on EMDC’s community services website (<http://www.emdc.org/community/curprojs.cfm>). The plan was summarized with links to drafts of the current sections in PDF format for easily downloading and printing of the plan. An email link was posted for comments to be sent directly to EMDC. In addition to posting on the website, an overview of the plan and listing of the web link were posted in the EMDC Newsletter for May 2005. In 2011, a copy of the plan and maps were placed on Penobscot County EMA’s website for public viewing.

In 2005, several communities assisted in the public awareness of the plan. The cities of Brewer, Bangor, and Orrington placed a link to the Hazard Mitigation plan and created public awareness regarding its development with announcements and encouraging public review of the plan on their websites.

In 2005, towards the end of the process, a final public hearing style, public participation meeting was held at the University of Maine in Orono. This meeting was established to allow the citizens of the local communities’ one final review of the plan and have questions answered as to how to go about taking their projects to the next phase. MEMA representatives were on hand to answer questions and to assist with project and grant development for the communities. There were five (5) people in attendance at the two sessions that were held. The first session, from 10:00am to 12:00 pm had five (5) attendees and discussed. The second session was held from 6:00 to 8:00pm, where zero (0) people were in attendance. The lack of attendance could be attributed to a local EMA

tabletop exercise occurring on campus at the same time as the public hearing. In 2011 as previously mentioned, public forums were held in Bangor and in Springfield to accommodate individuals from all over the county. Copies of the draft plan were available for review and comment. In addition, Deputy Director Tanguay and consultant Thompson were available to answer questions and compile comments.

MITIGATION COMMITTEE

In 2005, the Penobscot County Multi-jurisdictional Hazard Mitigation Plan has been prepared by a Hazard Mitigation Planning Committee. Those individuals were nominated by their community and at times it was difficult due to scheduling conflicts, to find mutually convenient meeting times. In 2010, the core group consisted of local EMA Directors and was supplemented with community leaders. This approach brought a mixture of individuals to the table and provided a broader viewpoint and additional expertise; therefore the same process was utilized for the 2016 plan. These meetings were still hosted by Penobscot County Emergency Management Agency. During the planning process, municipal representatives were needed for two purposes: to provide physical data about their community and to provide input and feedback on the plan as it was created. The Committee member list on the next page summarizes the names and capacities of each member of the plan committee.

Entity	Contact Name & Title	Address	Phone Number
National Weather Service	Rich Okulski, Warning Coordinator	810 Main Street, Caribou, ME 04736	Richard.okulski@NOAA.gov
Penobscot County	Michelle Tanguay EMA Director	97 Hammond Street Bangor, ME 04401	945-4750
Penobscot County	George Buswell, Road Agent	97 Hammond Street, Bangor, ME 04401	942-8566
Alton	Ron Borja, Selectperson	3352 Bennoch Road, Alton, ME 04468	394-2601
Bangor	Tom Higgins, Fire Chief	285 Main Street, Bangor, ME 04401	992-4700
Bradley	Eric Gifford, Fire Chief	PO Box 517, Bradley, ME 04411	827-7725
Brewer	Ralph Cammack, Fire Chief/ EM Director	151 Parkway South, Brewer, ME 04412	989-7002
Burlington	Penelope Kneeland, Selectperson	1523 Long Ridge Road, Burlington, ME 04417	732-3985
Corinna	Allen Emerson, Fire Chief	8 Levi Stewart Drive, Corinna, ME 04928	278-4183
Corinth	Scott Bragdon, Fire Chief	PO Box 309, Corinth, ME 04427	285-3271

Section III-Planning

Dexter	Matt Connor, Fire Chief	PO Box 313 Dexter, ME 04930	924-7351
Dixmont	Judy Dann, Selectperson	758 Western Ave, Dixmont, ME 04932	234-2294
Eddington	Jim Ellis, Fire Chief	906 Main Road, Eddington, ME 04428	843-5233
Etna	Shawn Ryder, Fire Chief	17 Shadow Lane, Etna, ME 04434	269-3551
Glenburn	Chris Lavoie, Fire Department	144 Lakeview Road, Glenburn, ME 04401	942-2905
Greenbush	Lorna Thompson, Assessor	132 Military Road, Greenbush, ME 04418	826-2050
Holden	Chris Beaumont, Fire Department	570 Main Road, Holden, ME 04429	843-5151
Lee	Christine Mallett, Town Clerk	29 Winn Road, Lee, ME 04455	738-2134
Milford	Chris Matson, Fire Chief	PO Box 336, Milford, ME 04461	827-2072
Mount Chase	Craig Hill, Fire Chief	1094 Shin Pond Road, Mount Chase, ME 04765	528-2225
Newburgh	Cynthia Grant, Town Manager	2220 Western Ave, Newburgh, ME 04444	234-4151
Newport	Amanda Chretien, Fire Department	23 Water Street, Newport, ME 04953	368-4410
Old Town	Steve O'Malley, Fire Chief	265 Main Street, Old Town, ME 04468	827-3965
Orono	Rob St. Louis, Fire Chief	59 Main Street, Orono, ME 04473	866-4000
Orrington	Michael Spencer, Fire Chief	PO Box 159, Orrington, ME 04474	825-3340
Passadumkeag	Rachel Webster, Selectperson	PO Box 75, Passadumkeag, ME 04475	732-5111
Veazie	Mark Leonard, Town Manager	1084 Main Street, Veazie, ME 04401	947-2781

RISK ASSESSMENT

A detailed risk assessment is required as part of §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.

Past events, Presidential Disaster Declarations, National Oceanic and Atmospheric Administration (NOAA) and local experiences were reviewed and analyzed by the Penobscot County Hazard Mitigation Committee during the risk assessment for all potential hazards within the county. (NOAA Event History for the County can be found at <http://www.ncdc.noaa.gov/stormevents/choosedates.jsp?statefips=23%.>) This assessment of local and county wide vulnerabilities was used as a baseline for the committee to make educated decisions in identifying and prioritizing mitigation actions and projects to reduce losses from identified hazards.

The subsections of this section are listed below. The numbering system intentionally begins with “#5” and is reflective of the numbering in the Review Crosswalk that is modeled from Federal Regulation.

- IDENTIFYING NATURAL HAZARDS (#5)
- PROFILING HAZARDS (#6)
- ASSESSING VULNERABILITY (#7)
- ASSESSING VULNERABILITY (#8)
 ADDRESSING REPETITIVE LOSS PROPERTIES
- ASSESSING VULNERABILITY (#9)
 IDENTIFYING STRUCTURES
- ASSESSING VULNERABILITY (#10)
 ESTIMATING POTENTIAL LOSSES
- ASSESSING VULNERABILITY (#11)
- ANALYSING DEVELOPMENT TRENDSMULTI-JURISDICTIONAL RISK ASSESSMENT (#12)

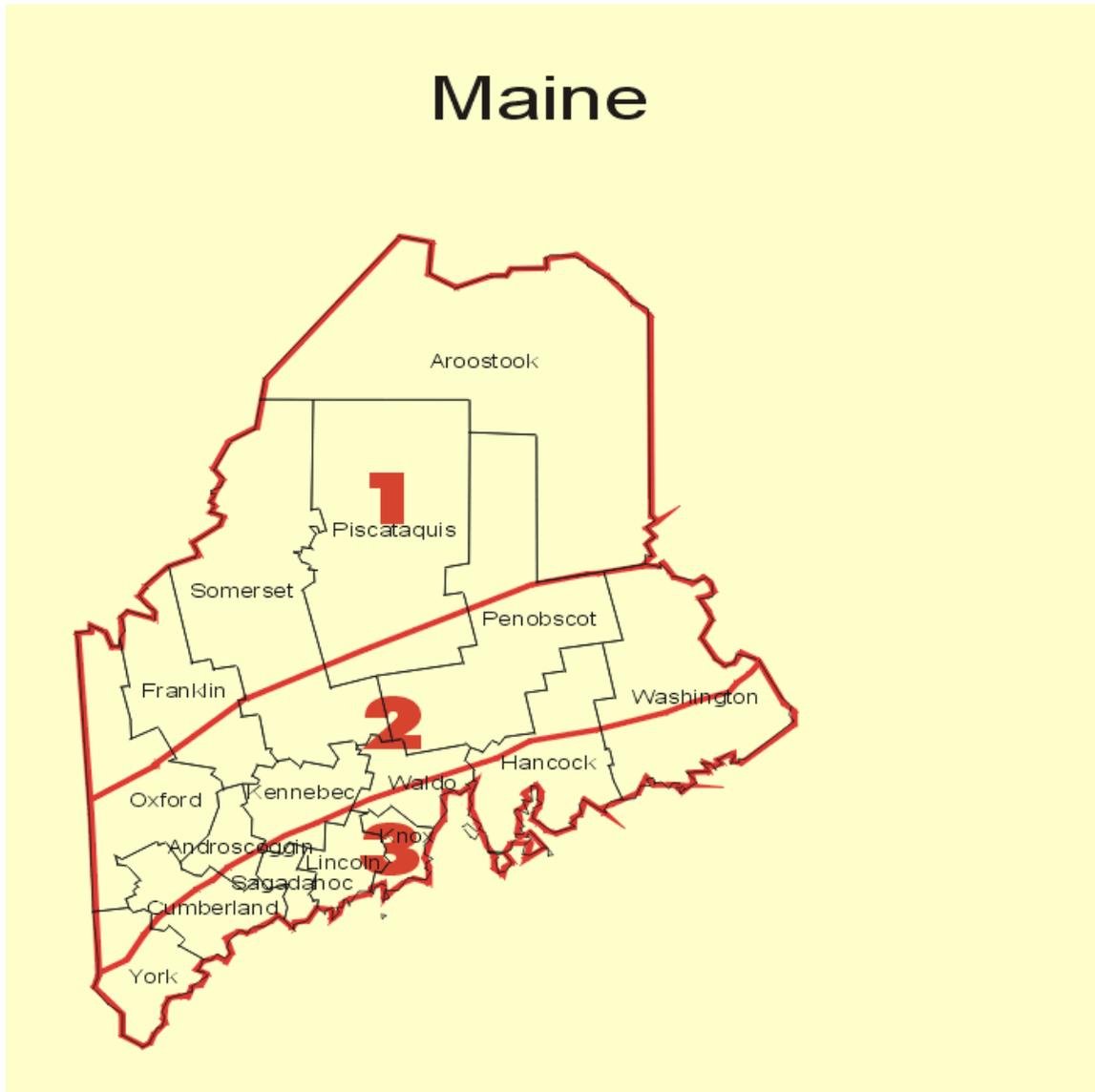
In compliance with *Requirement §201.4(c)(2)* the following section identifies, profiles and assesses the vulnerability of the state to natural hazards. No risk assessment of Maine’s natural hazards can be done, however, without first considering its climate and geography.

Factors such as variable seasonal temperatures, annual precipitation, prevailing wind directions, rising sea levels, and topographic features can all profoundly affect both the occurrence and severity of hazards as diverse as floods and drought.

Climate and Geography. As shown in the figure below, Maine has three distinct climate divisions whose boundaries run parallel to the coastline:

Penobscot County Multi-Jurisdictional Hazard Mitigation Plan-2016 Update

- *The Northern Division (#1)* encompasses the northernmost 17,916 square miles (54%) of the state. This division is least affected by marine influences and it contains most of the central and western mountainous regions.
- *The Southern Interior Division (#2)* contains the 10,307 square miles adjacent to the Northern Division and represents 31% of the state's area.
- *The Coastal Division (#3)* occupies the smallest area, a 20-30 mile band along the coast or 4,992 square miles (15% of the state's area). This division is most affected by the ocean but has minimal elevation change and thus, minimal climatic impact from any topographic controls.



Climate Divisions in Maine from the National Weather Service, Climate Prediction Center.

Climate Variation

The purpose of this part of the plan is not to debate climate change or its causes, but to provide an overview of how climate has changed over time, as documented in various scientific studies, and how that change may be impacting the occurrence and severity of natural hazards in Penobscot 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).

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

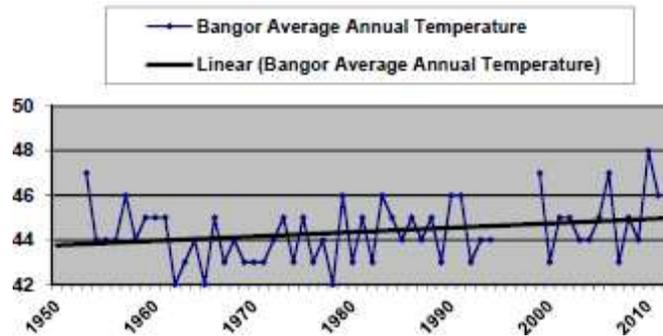
“Average annual temperature across Maine warmed by about 3.0 degrees F between 1895 and 2014....Although the overall warming trend...is clear, Maine’s temperature signal also features significant year to year fluctuations superimposed on a distinct pattern with periods of relative cold...and warmth...”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

The following is an excerpt from the Maine State Hazard Mitigation Plan 2013 Update: “The National Weather Service in Gray, Maine, has compiled monthly average and annual average temperatures for a long period of time at three locations in Maine: The Portland International Jetport (1940-present); the Bangor International Airport (1953-1994 and 1999-present), and the Caribou Airport. The data from all three measuring stations show that annual average temperatures have gradually increased at all three locations...although the increase has been greatest at the Portland Jetport station” (page 3-4).

The chart below, taken from the State’s Hazard Mitigation Plan, page 3-5, shows how temperature has changed at the Bangor International Airport between 1950 and 2010.



According to “Maine’s Climate Future, 2015 Update,” the impacts of rising temperature in Maine include an increase in Lyme disease resulting from more suitable habitat for deer ticks and their hosts, and stresses on Maine’s plant and animal species. The report does not indicate that temperature increases affect the severity of the hazards identified in this plan.

Precipitation Changes: Excerpts from the report “Maine’s Climate Future, 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).

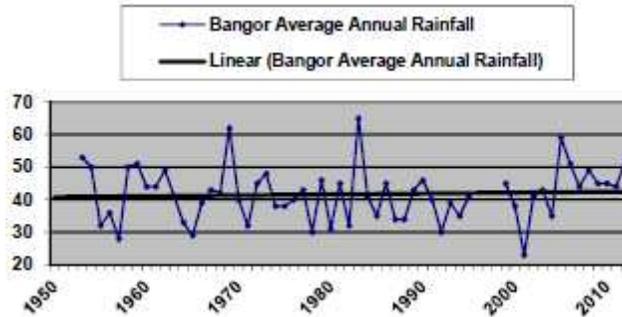
“A significant increase in extreme precipitation events (more frequent and intense storms) has been observed across Maine and other parts of the eastern U.S....we define an extreme precipitation event for this analysis as one in which two or more inches (five or more cm) of precipitation falls within 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).

The following is an excerpt from the Maine State Hazard Mitigation Plan 2013 Update: “The National Weather Service has also compiled monthly average and annual average precipitation at the Portland Jetport, the Bangor International Airport and the Caribou Municipal Airport. The data from all three measuring stations show that average annual precipitation ...has gradually increased at all three locations...The increase has been greatest at the Portland Jetport and the Caribou Municipal Airport” (page 3-5).

The chart below, taken from the State’s Hazard Mitigation Plan, page 3-6, shows how precipitation has changed at Bangor International Airport between 1950 and 2010.



IDENTIFYING NATURAL HAZARDS

5. Identifying Hazards	
Requirement §201.6(c)(2)(i): The risk assessment shall include a description of the type, location and extent of all natural hazards that can affect the jurisdiction.	
Element	A. Does the new or updated plan include a description of the types of all natural hazards that affect the jurisdiction?

Within the above referenced subsections, the potential hazards were identified, described and prioritized based on the extent of the county’s vulnerability to that hazard. After the Committee determining the most probable hazards, they considered the vulnerability in terms of potential damages. Each participating municipality was considered separately and then aggregate risks were analyzed to determine the countywide impact.

To determine the potential risks to Penobscot County communities, the following definitions were reviewed by the committee.

Blight

Blight is any disease, symptom of disease, or injury of plants characterized by or resulting in withering, cessation of growth, and a more or less general death of plant leaves, flowers, or stems caused by fungi or bacteria, viruses, unfavorable climatic conditions, or insect attack.

Vegetation that has been seriously affected by blight becomes more susceptible to serious fires ignited by man or lightning. As root systems die, topsoil becomes more vulnerable to erosion, thus valuable farm and forest land may be impacted or re-vegetation restricted because of inadequate nutrients in existing soils.

Drought

Drought is defined by FEMA as a twelve month period during which precipitation is less than 85% of normal as defined by the National Weather Service (44 inches is the average precipitation level per year). The Palmer Drought Index is used for the purpose of activating the Drought Emergency Plan. The index is a composite of evapo-transpiration, recharge, runoff, loss, and precipitation. The plan is activated at -2.00 on the index (moderate drought) and at -3.00 an Emergency Proclamation is issued by the Governor.

Agricultural losses from drought vary due to the crops affected and the duration of the drought. The effects of wildfires are worsened when water tables are lowered and plants are more susceptible. Lowered water tables affect individual residential wells and some public water supplies. Recreational activities may be severely impacted by substantially reduced precipitation, both in summer and winter. Erosion of the soil occurs when root systems wither.

Earthquake

Maine Geological Society defines an earthquake as a shaking or trembling of the crust of the earth caused by underground volcanic forces or by breaking and shifting of rock that registers 5.5 or more in magnitude. It generally results in considerable property damage and possible casualties.

The effects of earthquakes are largely dependent on the strength of the earthquake as measured by the Richter or other magnitude scales, the concentration of population and extent of development in the impacted area. Slight earthquakes do little damage. As the strength increases, damage increases -- from minor glassware breakage through to total devastation. Utility services could be interrupted, transportation routes cut off, fire potential could increase with gas lines rupturing, live power lines could break, and emergency responders could be unable to reach scenes of these incidents. Personal injury caused by falling debris is also a consideration.

Extreme Heat

Temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks are defined as extreme heat. Humid or muggy conditions, which add to the discomfort of high temperatures, occur when a “dome” of

high atmospheric pressure traps hazy, damp air near the ground. Excessively dry and hot conditions can provoke dust storms and low visibility. Droughts occur when a long period passes without substantial rainfall. A heat wave combined with a drought is a very dangerous situation.

Heat kills by pushing the human body beyond its limits. Under normal conditions, the body's internal thermostat produces perspiration that evaporates and cools the body. However, in extreme heat and high humidity, evaporation is slowed and the body must work extra hard to maintain a normal temperature. Most heat disorders occur because the victim has been overexposed to heat or has over exercised for his or her age and physical condition. Other conditions that can induce heat-related illnesses include stagnant atmospheric conditions and poor air quality.

Flood

Flood is defined as a temporary overflow of water onto lands not normally covered by water and that are used or usable by man, producing measurable property damage/destruction or forcing evacuation of people and vital resources.

Risks of flood include loss of life; property damage and destruction; damage and disruption of communications, transportation, electric service, and community services; crop and livestock damage and loss and interruption of business. Hazards including fire, health and transportation accidents; and contamination of water supplies are likely effects of flooding situations.

Another product of flooding is erosion. Erosive soil is defined as the wearing away and removal of soil particles by running water, waves and currents, moving ice, or wind resulting in severe land destruction and property damage.

The gradual wearing away of arable lands will eventually result in marked decreases in production of crops generally occurring on a progressive basis. Removal of topsoil by water results in siltification of streams and rivers adversely affecting water quality and effecting drinking water supplies, aquatic plants, and wildlife. Erosion in sparsely populated areas poses little or no threat; however, in densely populated areas with extensive shore development, substantial property losses may occur.

Hurricane

A hurricane is a tropical cyclone in which winds reach speeds of 74 miles per hour or more and blow in a large spiral around a relatively calm center. It produces measurable damage/destruction from heavy rainfalls, winds, and flooding.

Risks of a hurricane include injury and loss of life; and structural damage to homes and buildings, which may require the provision of shelter facilities. Flooding may require evacuation of high risk areas -- i.e., trailer parks, floodplains. In addition, heavy winds may damage trees causing interruptions in electric and telephone service; flooding and debris may impede traffic; bridges, culverts, and roads may wash out; agricultural crops may be destroyed; mobile homes may be blown off their bases; and tide surges may flood

coastal areas and heavily damage property. Hurricanes are measured using the Saffir-Simpson Scale found below.

Category One Hurricane: Winds 74-95 mph (64-82 kt or 119-153 kph). Storm surges are generally 4-5 ft above normal. No real damage to building structures. Damage is primarily to unanchored mobile homes, shrubbery, and trees. Some damage to poorly constructed signs. Also, some coastal road flooding and minor pier damage occurs.

Category Two Hurricane: Winds 96-110 mph (83-95 kt or 154-177 kph). Storm surges are generally 6-8 ft above normal. Some roofing material, door, and window damage of buildings. Considerable damage to shrubbery and trees with some trees blown down occurs. Considerable damage to mobile homes, poorly constructed signs, and piers. Coastal and low-lying escape routes flood 2-4 hours before arrival of the hurricane center. Small craft in unprotected anchorages break moorings.

Category Three Hurricane: Winds 111-130 mph (96-113 kt or 178-209 kph). Storm surges are generally 9-12 ft above normal. Some structural damage occurs to small residences and utility buildings with a minor amount of curtain wall failures. There is significant damage to shrubbery and trees with foliage blown off trees and large trees blown down. Mobile homes and poorly constructed signs are destroyed. Low-lying escape routes are cut by rising water 3-5 hours before arrival of the hurricane center. Flooding near the coast destroys smaller structures with larger structures damaged by battering of floating debris. Terrain continuously lower than 5 ft above mean sea level may be flooded inland 8 miles (13 km) or more. Evacuation of low-lying residences with several blocks of the shoreline may be required.

Category Four Hurricane: Winds 131-155 mph (114-135 kt or 210-249 kph). Storm surges generally 13-18 ft above normal. More extensive curtain wall failures with some complete roof structure failures on small residences, shrubs, trees, and all signs are blown down, complete destruction of mobile homes, extensive damage to doors and windows. Low-lying escape routes may be cut by rising water 3-5 hours before arrival of the hurricane center. Major damage may be caused to lower floors of structures near the shore. Terrain lower than 10 ft above sea level may be flooded, requiring massive evacuation of residential areas as far inland as 6 miles (10 km).

Category Five Hurricane: Winds greater than 155 mph (135 kt or 249 kph). Storm surge, generally greater than 18 ft above normal. Complete roof failure on many residences and industrial buildings. Some complete building failures with small utility buildings blown over or away. All shrubs, trees, and signs are blown down. Complete destruction of mobile homes. Severe and extensive window and door damage. Low-lying escape routes are cut by rising water 3-5 hours before arrival of the hurricane center. Major damage to lower floors of all structures located less than 15 ft above sea level and within 500 yards of the shoreline. Massive evacuation of residential areas on low ground within 5-10 miles (8-16 km) of the shoreline may be required.

Landslide / Mudflow

Landslides are a serious geologic hazard common to almost every state in the United States. It is estimated that nationally they cause up to \$2 billion in damages and from 25 to 50 deaths annually. Globally, landslides cause billions of dollars in damage and thousands of deaths and injuries each year.

Some landslides move slowly and cause damage gradually, whereas others move so rapidly that they can destroy property and take lives suddenly and unexpectedly. Gravity is the force driving landslide movement. Factors that allow the force of gravity to overcome the resistance of earth material to landslide movement include: saturation by water, steepening of slopes by erosion or construction, alternate freezing or thawing, earthquake shaking, and volcanic eruptions.

Landslides are typically associated with periods of heavy rainfall or rapid snow melt and tend to worsen the effects of flooding that often accompanies these events. In areas burned by forest and brush fires, a lower threshold of precipitation may initiate landslides.

Mudflows (or debris flows) are rivers of rock, earth, and other debris saturated with water. They develop when water rapidly accumulates in the ground, such as during heavy rainfall or rapid snowmelt, changing the earth into a flowing river of mud or “slurry.” Slurry can flow rapidly down slopes or through channels, and can strike with little or no warning at avalanche speeds. Slurry can travel several miles from its source, growing in size as it picks up trees, cars, and other materials along the way.

Mudflows are covered under the National Flood Insurance Program; however, landslides are not. Driving during an intense storm can be hazardous. Higher shelter, such as a second story should be sought if possible. A trickle of flowing or falling mud or debris may precede larger landslides. Moving debris can flow quickly and sometimes without warning. Embankments along roadsides are particularly susceptible to landslides. Some indications of debris flow include collapsed pavement, mud, and fallen rocks.

***Severe Summer Storms
(Thunderstorms/Lightning/Hailstorms)***

A thunderstorm is formed from a combination of moisture, rapidly rising warm air, and a force capable of lifting air such as a warm and cold front, a sea breeze, or a mountain. All thunderstorms contain lightning. Thunderstorms may occur singly, in clusters, or in lines. Thus, it is possible for several thunderstorms to affect one location in the course of a few hours. Some of the most severe weather occurs when a single thunderstorm affects one location for an extended time.

Thunderstorms can bring heavy rains (which can cause flash flooding), strong winds, hail, lightning, and tornadoes. In a severe thunderstorm; get inside a sturdy building and stay tuned to a battery-operated radio for weather information.

Lightning is an electrical discharge that results from the buildup of positive and negative charges within a thunderstorm. When the buildup becomes strong enough, lightning appears as a “bolt.” This flash of light usually occurs within the clouds or between the clouds and the ground. A bolt of lightning reaches a temperature approaching 50,000 degrees Fahrenheit in a split second. The rapid heating and cooling of air near the lightning causes thunder.

Hail is produced by many strong thunderstorms. Hail can be smaller than a pea or as large as a softball and can be very destructive to plants and crops. In a hailstorm, take cover immediately. Pets and livestock are particularly vulnerable to hail, so bring animals into a shelter. Drive only if necessary. Debris and washed-out roads may make driving dangerous.

Tornado

Commonly known as a Twister, a Tornado is a violently whirling column of air, normally produced in a very severe thunderstorm, extending downward from a cumulonimbus cloud and seen as a rapidly rotating, slender, funnel shaped cloud that has a wind velocity of up to 300 miles per hour at the central core and destroys everything along its narrow ground path.

Measured on the Fujita Scale, the tornado is classified numerically according to wind speeds.

F0: A gale tornado, the F0 classification will cause light damages to chimneys, breaks twigs and branches off trees, will push over shallow rooted trees, and will damage signboards, and break a few windows. The F0 Tornado will have wind speeds of 40-72 miles per hour

F1: A moderate Tornado, the F1 classification will cause moderate damages; winds of 73-112 miles per hour will peel the surfaces off roofs, mobile homes will be pushed off foundation or overturned, outbuildings will be demolished, moving automobiles will be pushed off roads, and trees will be snapped off or broken.

F2: A significant tornado, the F2 classification will cause considerable damages; winds of 113-157 miles per hour will cause roofs of homes to be torn off framed houses, mobile homes will be demolished and destroyed, frame houses with weak foundations will be lifted and moved, boxcars will be pushed off rails, large trees will snap or become uprooted, light objects become missiles as they are projected through the air.

F3: A severe tornado, the F3 classification will cause roofs and some walls to be torn off of well-constructed homes, trains will overturn, most trees in the forest will be uprooted, heavy cars will be uplifted and thrown aside, even weak pavement will be blown off roadways. The 158-206 mile per hour winds are equivalent to that of a category 5 hurricane.

F4: A devastating tornado, the F4 classification has wind speeds of 207-260+ miles per hour. Causing devastating damages, the F4 will level well-constructed homes, weak foundations will cause structures to be blown a significant distance, cars thrown and disintegrated, large missiles are generated from significant debris, trees in the forest can be uprooted and carried some distance away.

Wildfire/Forest Fire

Wildfire is the destruction through burning of a thick growth of trees and underbrush covering an extensive tract of land.

Because the forests of the state represent an enormous natural and economic resource, a major forest fire would have a long-term economic impact affecting industry, causing unemployment, serious erosion, loss of wildlife and agricultural land, and significantly impacting the tourism industry.

Winter Storm

There are four types of severe winter storms. These types of storms include the following and can occur separately or in any combination:

Blizzard

A blizzard is a winter storm with sustained winds of 40 miles per hour (mph) or more or gusting up to at least 50 mph with heavy falling or blowing snow, persisting for one hour or more, temperatures of ten degrees Fahrenheit or colder and potentially life-threatening traveling conditions.

Ice Storm

An Ice Storm is a winter storm where rain 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.

The ice storm of 1998 caused severe damage and left many cities and towns, not only in Penobscot County, but throughout the state, without power. Additionally the fallen trees and branches created extensive fuel for potential forest fires.

Sleet Storm

A sleet storm is when frozen rain drops (ice pellets) bounce when hitting the ground or other objects. Sleet does not stick to objects, but in accumulated depths of two inches or more, produces hazardous driving conditions.

Snowstorm

A snowstorm is snowfall of fifteen inches or more within 12 to 24 hours extensively disrupting transportation systems and public safety departments' response capability.

Risks of all types of severe winter storms include hazardous driving conditions due to ice and snow on highways and bridges; loss of power and telephone service when utility lines yield under the weight of ice and snow; emergency services (police, fire, ambulance) unable to respond due to road conditions; emergency needs of remote or isolated residents for food or fuel, as well as feed, water and shelter for livestock.

**IDENTIFYING NATURAL HAZARDS
 Profiled Hazards vs. Non-Profiled Hazards**

Hazard	Information Source	Discussion
Blight	Review of Entomological Data	Although relying heavily upon agricultural and forestry production, Entomological data does not support the need for hazard identification of Blight within Penobscot County Not Profiled
	Maine Emergency Management Office	
	Maine Department of Agriculture	
	Maine Forest Service	
Drought	Review of NOAA data	Rainfall data does not show significant economic or individual impact to warrant disaster declaration or hazard conditions. Not Profiled
	Maine Emergency Management Office	
Earthquake	Review of Maine Geological Survey	Occurrences in Maine. However usually results are minimal damages. Not Profiled
	Local Input from Citizens	
Extreme Heat	National Weather Service Data	Due to northern climate National Weather Service, places Penobscot County in a low risk area for extreme heat. With issuance of heat index and sun warning, risk is drastically reduced. Not Profiled
	Maine Emergency Management Office	
Flood/Erosion	Local Input from Citizens	Flood: Spring run off, snow melt and flash storms are major contributing factors to flooding. Roadways, and residential and business properties experience repetitive damages. Since Penobscot County contains the states largest watershed with the Penobscot River and its tributaries, flooding is a concern within the County. Erosion: Fluctuating water levels, seasonal flooding and increased development have led to deteriorating roadways, shorelines, and riverbanks throughout Penobscot County. Profiled
	Review of Firm Maps	
	Review of NOAA data	
	Review of Disaster Declarations	
	Risk Assessment	
	Review of NRCS data	
	Maine Emergency Management Office	
	Maine Department of Environmental Protection	
Hurricane	Review of Disaster Declarations	Due to northern proximity susceptibility to hurricanes is low, and usually to secondary effects. Proper preparedness will remove most vulnerability. Not Profiled
	Review of NOAA Data	
Landslide/Mudflow	Review of Maine Geological Survey	Landslides and mudflow are not common in Penobscot County, soil types and slopes are not ideal for landslides and mudflow. Not Profiled
	Local Input from Citizens	
Thunderstorms/Lightning/ Hailstorms (Severe Summer Storms)	Maine Emergency Management Office	A frequent occurrence in Penobscot County. Varying weather patterns present significant damage possibilities. (see wildfire) Profiled
	National Weather Service Data	
Tornado	Review of NOAA data	Tornados are not common in Penobscot County. Averaging less than 0.5 F2 Tornados per year, and do not pose a significant threat to the community. Not Profiled
	Local Input from Citizens	
Wildfire/Forest Fire	Review of Disaster Declarations	A majority of Penobscot County is forest lands, therefore wildfires and forest fires are frequent, and could cause major losses due to rising real estate values and increased development. Profiled
	Review of Maine Forest Service data	
	Local Input from Citizens	
	Risk Assessment	
Winter Storm	Local Input from Citizens	Nor'easters, blizzards and Ice storms regularly hit Penobscot County and paralyze its communities. Major damages are caused to utilities, residential and commercial structures and create dangerous travel situation. Profiled
	Review of Disaster Declarations	
	Review of NOAA data	
	Risk Assessment	

VULNERABILITY MATRIX

To determine the vulnerability of a community or area to a hazard, one must first develop a scale to determine the extent of potential impact. During the compilation of the previous (2005) plan the Penobscot Hazard Mitigation Committee, in conjunction with Eastern Maine Development Corporation developed a sliding scale method of determining the vulnerability for each individual hazard. For this plan, the committee reviewed the methodology from the previous plan and concluded that with only minor revisions to the scale (point scale from one to ten, revised as one to six and clarified definitions), the process was still applicable for this update.

The Penobscot Hazard Mitigation Committee scale compares vulnerability of the identified hazards. As illustrated in the table below, the point value for the scale ranges from zero to six; with zero representing no action or occurrence and six representing a mass/severe impact.

NATURAL HAZARD VULNERABILITY MATRIX					
NATURAL HAZARDS					
Points Scale	Likelihood of Occurrence	Human Damage And Loss	Property Damage and Loss	Economic Impact	Dislocation
0	Improbable in a Century	No Injuries	No damages	No Impact	No Dislocation
1	Remote/ Every Century	Minor Injuries	Minimal Loss of Individual Personal Property	Minimal Economic Impact to Individuals	Individual Dislocation
2	Occasional/ Every Decade	1-5 Injuries	Major Loss of Individual Personal Property	Major Economic Impact to Individuals	Dislocation / Sheltering for Portions of the Community
3	Probable/ 1-3 years	Multiple Injuries	Loss of Individual Real Estate	Minor Economic Impact to Community	Mass Evacuation Community-wide
4	Frequent/ Annual	Mass Injuries	Damages Throughout Community	Major Economic Impact to Community	Mass Evacuation County-wide
5	-	10 or less Deaths/ Severe Injuries	Damages Throughout County	Economic Impact to County	Mass Evacuation County-wide
6	-	Multiple Deaths/ Mass Casualties	Mass Destruction of Structures and Infrastructure	Millions of Dollars of Damages	Mass Evacuation State-wide

Source: Hazard Mitigation Committee

In order to complete the task of comparison, the Committee needed to devise a method for placing value and scale to the predetermined results of each event.

- For determining the likelihood of a hazard occurring, the scale was broken down into common statistical measures from once a year, to the hundred year event or greater.
- Ranging from zero injuries to mass casualties/multiple deaths, the human damage or loss creates a strong personal connection which the committee felt was a very important factor in the measure of the impact of the event. Therefore, it was the committee's perspective that as the number of lost lives increased, so did the significance of the event.
- The measure of property damages and loss created during the hazard event is based upon the extent of personal and public properties lost or damaged.
- The economic impact of a hazard event is measured by the financial impact of the loss. Any financial loss truly impacts the community as a whole but is measured from individual/private losses to losses at state level (i.e. infrastructure).
- Dislocation is measured based on the extent of the evacuation and can range from an individual family to a total evacuation.

IDENTIFIED HAZARDS IN PENOBSCOT COUNTY - HAZARDS TO BE PROFILED

The matrix below identifies hazards that *could* occur in Penobscot County. Hazards were assigned a total point value based on past occurrences, the likelihood of future occurrences, the severity of an occurrence regarding: loss/damages, economic impact, and dislocation. For the purposes of this plan, we will explore only the hazards *most likely* to occur within Penobscot County. Therefore, a risk assessment will be completed for only those hazards with a total point value greater than or equal to 13, as determined by the sum of all points within the scales provided.

This does not insinuate that other natural hazards will not occur. In addition, there are instances where a natural hazard has a secondary effect, such as dams breaking during flooding.

The natural hazards this plan will focus on are: flood-including erosion, severe winter storms, severe summer storms (thunderstorm/lightning/hailstorms), and wildfires. This is based on decision making matrix- see next page.

NATURAL HAZARD OCCURRENCE AND PROBABILITY						
Natural Hazard	Likelihood of Occurrence	Human Damage/Loss	Property Damage/Loss	Economic Impact	Dislocation	Total Point Value
Blight	1	0	2	5	0	8
Drought	1	0	2	5	0	8
Earthquake (5.0+ magnitude)	1	2	1	3	2	9
Erosion-Included in Flood	-	-	-	-	-	-
Extreme Heat	1	3	0	1	0	5
Flood	4	2	4	4	1	15
Hurricane	1	2	3	1	1	8
Landslide/Mudflow	1	1	2	2	1	7
Severe Winter Storm	4	5	1	3	1	14
Severe Summer Storm (Thunderstorm/ Lightning/Hailstorm)	4	2	3	3	1	13
Tornado	1	1	1	1	1	5
Wildfire/Forest Fire	4	2	3	3	1	13

Source: Hazard Mitigation Committee

HAZARD SUMMARY BY JURISDICTION

The Hazard Committee reviewed each community, based on community input and statistical data. The following table shows the most likely threats to each municipality within the county. Although winter and summer storms are more frequent, the dollar impacts are more predominant for flooding. For the 2016 plan update, the hazards for each community were again reviewed and it was determined that the threat potential was unchanged.

Name of Municipality	Flood	Severe Summer Storms	Severe Winter Storms	Wildfire
Alton	X	X	X	X
Bangor	X	X	X	X
Bradford		X	X	X
Bradley	X	X	X	X
Brewer		X	X	X
Burlington		X	X	X
Carmel		X	X	X
Carroll		X	X	X
Charleston	X	X	X	X
Chester	X	X	X	X
Clifton		X	X	X
Corinna	X	X	X	X
Corinth		X	X	X
Dexter	X	X	X	X
Dixmont	X	X	X	X
Drew		X	X	X
East Millinocket	X	X	X	X
Eddington	X	X	X	X

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Enfield	X	X	X	X
Etna		X	X	X
Exeter		X	X	X
Garland		X	X	X
Glenburn	X	X	X	X
Greenbush	X	X	X	X
Hampden		X	X	X
Hermon		X	X	X
Holden		X	X	X
Howland	X	X	X	X
Hudson	X	X	X	X
Kenduskeag	X	X	X	X
Lagrange		X	X	X
Lakeville		X	X	X
Lee		X	X	X
Levant		X	X	X
Lincoln	X	X	X	X
Lowell		X	X	X
Mattawamkeag	X	X	X	X
Maxfield	X	X	X	X
Medway	X	X	X	X
Milford	X	X	X	X
Millinocket	X	X	X	X
Mount Chase		X	X	X
Newburgh		X	X	X
Newport	X	X	X	X
Old Town	X	X	X	X
Orono	X	X	X	X
Orrington	X	X	X	X
Passadumkeag	X	X	X	X
Patten		X	X	X
Penobscot Nation	X	X	X	X
Plymouth		X	X	X
Seboeis		X	X	X
Springfield		X	X	X
Stacyville		X	X	X
Stetson		X	X	X
Unorganized Territory	X	X	X	X
Veazie	X	X	X	X
Webster		X	X	X
Winn	X	X	X	X
Woodville		X	X	X

Source: Communities & Hazard Mitigation Committee. Note: The Unorganized Townships were not listed separately, as it is believed that all of those locations face the same threats.

PROFILING HAZARDS

6. Profiling Hazards	
Requirement §201.6(c)(2)(i): The risk assessment shall include a description of the location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.	
Elements	A. Does the risk assessment identify the location (i.e., geographic area affected) of each natural hazard addressed in the new or updated plan?
	B. Does the risk assessment identify the extent (i.e., magnitude or severity) of each hazard addressed in the new or updated plan?
	C. Does the plan provide information on previous occurrences of each hazard addressed in the new or updated plan?
	D. Does the plan include the probability of future events (i.e., chance of occurrence) for each hazard addressed in the new or updated plan?

FLOOD (INCLUDING DAM FAILURES)

A. Location (i.e., geographic area affected) of flooding/erosion/dam failure hazard:

Flooding occurs annually in Penobscot County at varying extents in various locations. Spring snow melt and heavy rainfall are the most common causes of flooding and may cause rivers to overflow their banks or lakes and ponds to rise above their normal elevations which can also cause erosion.

Additionally in the spring, ice jams may occur and reduce the ability of the water to flow. This causes a higher than normal water level behind the jam and when the jam is removed, it may send a substantial volume of water down river. Ice jams occur at varying extents each year in the Penobscot River.

In more densely developed communities, abnormally high water flow can overwhelm sewer and storm water infrastructure flooding roadways, parking lots and basements.

In rural areas it is not uncommon for “nuisance beavers” to plug culverts and other drainage devices resulting in flooded roadways.

Another potential flooding issue is the breaching of dams or other water retention features that would cause a water surge to downstream locations. The Penobscot watershed has a number of dams/retention waters to control the flowage particularly on the Penobscot River since it plays a vital role in hydro-power generation.

During any of these events it is not uncommon for roads, culverts and other infrastructure to be compromised and for erosion to occur.

Please see the town and county maps in the map section of this document for locations of water bodies.

The Penobscot River Watershed

Penobscot County contains a portion of the Penobscot River Watershed and the Penobscot River, New England's second largest river system and Maine's largest river basin which drains an area of 8,592 square miles. The West Branch of the Penobscot River begins in Piscataquis County near Penobscot Lake on the Maine/Quebec border. The East Branch also begins in Piscataquis County at East Branch Pond near the headwaters of the Allagash River. The main stem empties into Penobscot Bay in Hancock County near the town of Bucksport some 240 miles from the beginning, and at the mouth dispenses 10.1 billion gallons/day (avg.). Named by native people, the word Penobscot means "waters of descending ledge."

Historically the river was tidal from the base of the Veazie Dam (which was removed in 2013) to its mouth near Bucksport (approx. 25 miles) and is brackish to the town of Hampden. The river's total fall from Penobscot Lake on the South Branch is 1,602 feet. The terrain ranges from steep mountains including Maine's highest, Mt. Katahdin to rolling hills and extensive bogs, marshes and wooded swamps. Most of the watershed is forested, and sparsely settled. Since the removal of the dam, the river's tidal influence now extends about a half mile above the prior dam location.

Penobscot County also measures the level of the water in the Penobscot River through the use of a total of 14 river gauges located in the Penobscot River basin. Two new gauges were installed in 2010 to monitor Kenduskeag Stream near Bangor and Penobscot River at Bangor.

Please see the Watershed Map and Tributary Map and community maps located in the map portion of this plan for further information.

Penobscot County Emergency Management Agency also has copies of flood maps for towns that participate in the National Flood Insurance Program. Each of the individual communities generally has copies of their own flood maps.

B. Extent (i.e., magnitude or severity) of flooding/erosion/dam failure:

Flooding

Flooding occurs annually in Penobscot County. Various low-lying areas particularly along the Penobscot River are susceptible to flooding and can cause transportation and utility disruptions, property damage, injuries and loss of life, depending upon the severity of the event. Route 2 in the Mattawamkeag/Howland/Passadumkeag/Greenbush/Milford area is often impassable during a flood event along with Route 11 in the Millinocket/Medway/Grindstone area. Bangor also experiences flooding in the "Downtown" areas. Other areas of concern are Orono/Old Town, Prentiss and Greenfield.

All areas along the Penobscot are also susceptible to spring ice jams which may cause the river to overflow its banks. Historical severity includes: road closures, torn out bridges and culverts, and stranded residents.

In 2012, the Penobscot River Restoration project began the physical removal of the Great Works dam located in the communities of Old Town and Bradley. This activity reflected more than a decade of work by the initiative to restore fish passage in the Penobscot River. In 2013 the Veazie dam was removed with the subsequent removal of the power house in 2014. There are conflicting studies regarding the increased/decreased potential for flooding due to the removal of dams; therefore we concluded the potential threat for flooding was unchanged.

Erosion

All areas are susceptible to erosion in the County. Farming and crop cultivation expose large areas to the effects of wind and water on a seasonal basis for planting and harvesting. Forest areas become vulnerable when all vegetation is removed from vast tracts by the lumbering industry or as a result of fire. Property damages occur when development has been allowed to occur in sensitive areas. Erosion within our County is generally related to flooding. Communities throughout Penobscot County have felt the effects of erosion; however, no data was available to determine the previous extent of eroding river and stream-beds at the time of submission.

Numerous attempts were made to acquire specific sites, dates and areas. The size of the Penobscot River watershed alludes to the possibilities of erosion, and has been linked to damages caused by flooding. In recent history, only the City of Brewer and the Town of Greenbush (within Penobscot County) have reported incidents of erosion to the Hazard Mitigation Committee.

Dams

The following is a listing of high and significant hazard dams for Penobscot County, with their location and their hazard potential. The initials for Hazard Potential found in the table are representative of:

- L=Low, failure would probably only cause damage to the owners property
- H=High, failure would cause loss of life
- S=Significant, failure would cause significant loss of property

HIGH AND SIGNIFICANT HAZARD DAMS

Dam Name	Town	Down-stream Hazard Potential
Wassookeag Lake	Dexter	H
East Millinocket Hydro	East Millinocket	H
Weldon	Mattawamkeag	H

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North Twin	T3 Indian Purchase	H
North Twin - Dike 6	T3 Indian Purchase	H
Stone	Millinocket	H
Stone - Dike 8	Millinocket	H
Dolby	East Millinocket	H
Grand Lake	T06 R08 WELS	S
Long Pond	Lincoln	S
Malletts Mill	Lee	S
Swetts Pond	Orrington	S
North Twin - Dike 1	T3 Indian Purchase	S
North Twin - Dike 2	T3 Indian Purchase	S
North Twin - Dike 3	T3 Indian Purchase	S
North Twin - Dike 4	T3 Indian Purchase	S
North Twin - Dike 5	T3 Indian Purchase	S

Source: State of Maine, (MEMA) Dam Safety

In 2013, the Maine State Dam Safety Law was changed to reflect a different frequency of dam inspections. High and Significant rated dams must be inspected every six years. All dams must be inspected every twelve years to verify their hazard rating. The Federal Energy Regulatory Commission (FERC) regulates 34 H hazard and 12 S hazard dams in Maine and has 5 engineers to do the inspections. The State regulates 26 H hazard and 79 S hazard dams and employs one engineer.

Although located in Piscataquis County, Ripagenous Dam, if breached, is a considerable flooding hazard for Penobscot County. The impoundment of the dam forms Chesuncook Lake, which is Maine’s third largest body of fresh water, and is considered the beginning of the West Branch of the Penobscot River. Three distinct sections of the lake are connected: the main stem is known as Chesuncook Lake; the lower body as Caribou Lake; and a third appendage as Ripagenous Lake. The total impoundment is 26,200 acres, with a maximum depth of 150 feet. This dam is connected to McKay power station, and provides power to industrial facilities in Millinocket and East Millinocket as well as the New England Power grid.

C. Previous Occurrences:

Flood

The following table is a historical overview of major events since 1970.

<u>Historical Summary of Major Flood Events in Penobscot County Since 1970</u>			
<u>Year</u>	<u>Month</u>	<u>Description</u>	<u>Presidential Declaration #</u>
<u>1969</u>	<u>Feb.</u>	<u>Severe storm, ice jams, flooding</u>	<u>284</u>
<u>1973</u>	<u>May</u>	<u>Heavy rains, flooding</u>	<u>384</u>
<u>1974</u>	<u>Jan.</u>	<u>Severe storm, flooding</u>	<u>410</u>

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<u>1987</u>	<u>Mar/Apr</u>	<u>Severe storm, flooding</u>	<u>788</u>
<u>1993</u>	<u>April</u>	<u>Heavy rains, flooding, ice jams and snow melts</u>	<u>988</u>
<u>1996</u>	<u>Jan/Feb</u>	<u>Severe storm, flooding</u>	<u>1106</u>
<u>2001</u>	<u>Mar.</u>	<u>Severe storm, flooding</u>	<u>1371</u>
<u>2008</u>	<u>Apr/May</u>	<u>Severe storm, flooding</u>	<u>1755</u>

Source: MEMA/FEMA

Flood Losses in Dollars by Town for Disaster Declarations since 1987					
Location	Disaster Declarations				
	788 <u>April, 1987</u>	988 <u>April, 1993</u>	1106 <u>Jan 1996</u>	1371 <u>March, 2001</u>	1755 <u>Apr/May 2008</u>
PENOBSCOT CTY	\$ 3,245.00	\$897	\$18,624	-	\$ 125,377.58
ALTON	\$ 3,431.00	-	\$9,082	-	-
BANGOR	\$ 19,495.00	-	\$97,974	-	-
BRADFORD	\$ 11,086.00	\$340,795	-	-	\$ 5,156.97
BRADLEY	\$ 2,465.00	-	-	-	-
BREWER	-	-	\$6,072	-	-
BURLINGTON	-	-	\$9,026	-	-
CARMEL	\$110,441.00	-	\$7,516	-	\$ 15,773.78
CARROLL PLT	-	-	\$20,752	-	-
CHARLESTON	\$ 13,956.00	-	-	-	-
CLIFTON	-	-	\$2,438	-	-
CORINNA	\$ 19,517.00	-	-	-	\$ 21,414.33
CORINTH	\$ 4,327.00	-	-	-	-
DEXTER	\$ 37,110.00	-	-	-	-
DIXMONT	\$ 38,994.00	\$6,216	\$16,851	-	-
EAST MILLINOCKET	-	-	-	-	\$ 25,898.06
EDDINGTON	-	-	\$2,543	-	-
ETNA	\$ 3,055.00	-	-	-	-
EXETER	\$ 10,879.00	-	\$1,924	-	-
GARLAND	\$ 11,534.00	-	-	-	-
GREENBUSH	\$ 8,567.00	\$3,022	-	-	\$ 4,919.00
GREENFIELD	\$ 7,104.00	-	-	-	-
HAMPDEN	\$ 8,296.00	-	\$7,052	-	-
HERMON	\$ 1,672.00	-	\$4,280	-	-
HOLDEN	\$ 3,934.00	-	\$12,559	-	-
HOWLAND	\$ 95,916.00	-	\$17,772	-	\$ 20,302.21
HUDSON	\$ 3,523.00	-	--	-	-
KENDUSKEAG	\$ 2,227.00	-	-	-	-
LAKEVILLE	-	-	\$6,841	-	-

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LAGRANGE	-	\$5,820	-	-	\$ 17,868.10
LEVANT	\$ 11,713.00	-	-	-	-
LINCOLN	-	\$9,565	\$6,803	-	-
MAXFIELD	\$ 24,191.00	-	\$6,824	-	-
MEDWAY	-	-	\$10,728	-	\$ 16,582.37
MILFORD	\$ 6,628.00	\$17,235	\$18,640	-	\$ 42,145.61
MILLINOCKET	-	\$4,669	-	-	\$ 15,355.04
MOUNT CHASE	-	-	\$3,593	-	\$ 23,412.01
NEWBURGH	\$ 42,657.00	\$14,181	\$8,459	-	-
NEWPORT	\$205,889.00	\$3,871	\$4,427	-	-
OLD TOWN	\$ 5,077.00	\$728	-	-	\$ 29,210.09
ORONO	\$ 30,122.00	-	\$6,840	-	-
ORRINGTON	\$ 9,281.00	\$4,716	\$9,200	117,332.49	-
PASSADUMKEAG	\$ 5,492.00	-	-	-	\$ 2,101.75
PATTEN	-	-	\$5,834	-	\$ 35,293.74
PENOBSCOT NATION	\$ 65,949.00	-	\$16,763	-	\$ 29,227.80
PLYMOUTH	\$ 2,078.00	-	\$1,053	-	-
STACYVILLE	-	-	\$1,057	-	\$ 7,333.20
STETSON	\$ 5,104.00	-	-	-	-
VEAZIE	\$ 10,735.00	-	\$2,096	-	-
WEBSTER PLT.	-	\$3,868	-	-	-
Total	\$845,690.00	\$415,583	\$343,623	117,332.49	\$ 437,371.64

Source: MEMA/FEMA

Dams

Many of these dams have exceeded their original life expectancy; but as mentioned above are regulated and inspected. No previous events of dam failure were reported to the committee. Please see table titled “High and Significant Hazard Dams” on the previous pages.

D. Probability of Future Events

Flooding

Floods are described in terms of their extent (including the horizontal area affected and the vertical depth of floodwaters) and the related probability of occurrence. Flood studies use historical records to determine the probability of occurrence for different flood recurrence intervals. The probability of occurrence is expressed in percentages as the chance of a flood of a specific recurrence interval in any given year. The most widely adopted design and regulatory standard for floods in the United States is the 1-percent annual chance flood and this is the standard formally adopted by FEMA. The 1-percent annual flood, also known as the base flood, or regulatory flood, has a 1 percent chance of happening in any particular year. It is also often referred to as the “100-year flood.” This expression is, however, merely a simple and general way to express the statistical likelihood of a flood. Actual recurrence periods are variable from place to place.

Smaller floods occur more often than larger (deeper and more widespread) floods. Thus a “10-year” flood has a greater likelihood of occurring than a “100-year” flood. The following table shows a range of flood recurrence intervals and their probabilities of occurrence.

Flood Recurrence Intervals	Percent Chance of Occurrence Annually
10 year	10.0%
50 year	2.0%
100 year	1.0%
500 year	0.2%

Source: FEMA

As a point of clarification, the 100-year flood does not mean that it will happen once every one hundred years. There is, over an epoch of time, the likelihood that it will average out to once every 100-years but in any given 100 year period there is a 63% chance of the 1% flood.

It is very likely that there will be a future occurrence of flooding in the Penobscot County. Based on discharge and measured high water on the Penobscot River, the estimated recurrence interval is slightly longer than 10 years.

Flooding problems in Penobscot County occur along the Penobscot River, and at scattered locations throughout the remainder of the county with its many brooks, streams, and rivers. Flooding generally occurs as a result of heavy rainfall on snow-covered or frozen ground. Ice jams occasionally compound flooding problems.

The flood of record on the Penobscot River occurred in May, 1923. It has an estimated recurrence interval of 100 years. The most recent high impact flood on the Penobscot River occurred in April 1987. Less severe flooding events have occurred in 1993, 1996, 2001 and 2008. This flood has a recurrence interval estimated to be slightly less than 100 years. Other notable floods have occurred during this period of time and it is expected that at least some minor flood damages will be caused each decade.

Dams

There are no probability statistics or studies available to determine future occurrences of Dam failure. Such failures are not a common event but could occur under the right circumstances.

Regarding the possibility of flooding from dam failure, MRS Title 37-B, Chapter 24, also known as Maine’s Dam Safety Law, classifies dams into three hazard potential ratings: high, significant, and low. Each rating carries different responsibilities for the dam owners and situational awareness on the part of the downstream residents and businesses. Dam owners with “high” or “significant” potential ratings must produce an emergency action plan (EAP) and forward it to MEMA for compliance with the law.

The primary purpose of the EAP is to alert and warn potentially affected residents and businesses in the listed “call down area” when there is a threat of failure or actual breach. Copies are kept by the owner, relevant local, county and state agencies and must be updated regularly. See definition excerpts from the law in the table below.

Hazard Rating	Excerpts from Dam Safety Law Definition
High	“..will probably cause loss of human life,”
Significant	“..no probable loss of human life but can cause major economic loss..”
Low	“..no probable loss of human life and low economic.. losses..”

The majority of Penobscot County dams are located along the Penobscot River. Therefore any downstream communities could possibly be affected. Since East Millinocket Hydro, Weldon, North Twin, North Twin - Dike 6, Stone, Stone - Dike and Dolby are high hazard dams, the towns of: Millinocket, East Millinocket, Medway, Mattawamkeag, Winn, Lincoln, Howland, Enfield, Passadumkeag, Greenbush, Milford, Edinburg, Old Town, Orono, Veazie, Eddington, Bradley, Brewer, Bangor, Hampden, Orrington, and Argyle would be most at risk from a breach. Additionally a breach at Wassookeag Lake (another high hazard dam) would impact Dexter.

A breach at a “significant” dam would most probably cause infrastructure damage especially to downstream roads and bridges. Again, a breach of Grand Lake, North Twin Dike 1, North Twin Dike 2, North Twin Dike 3, North Twin Dike 4, and North Twin Dike 5, which are all along the Penobscot River, could impact the towns of: Millinocket, East Millinocket, Medway, Mattawamkeag, Winn, Lincoln, Howland, Enfield, Passadumkeag, Greenbush, Milford, Edinburg, Old Town, Orono, Veazie, Eddington, Bradley, Brewer, Bangor, Hampden, Orrington, and Argyle. A breach at Long Pond, could impact portions of Lincoln, while a Malletts Mill breach could impact portions of Lee and a breach at Swetts Pond could possibly affect Orrington.

SEVERE WINTER STORMS

Penobscot County is subject to severe winter storm events and conditions can vary from community to community. Part of the reason that Penobscot County has such varying conditions is due to the fact that the northern portion of the county lies within the Northern Climate Division and the southern portion of the county is in the Southern Interior Division. It is not uncommon for more extensive snowfall to accumulate in the Millinocket region while Newport receives “just a dusting”.

The worst storm in the last two decades was the ice storm of 1998. The storm, which nearly destroyed the electrical transmission system throughout the state, caused major damage to forests, covered many roadways with debris and ice and caused some limited building damages. However, most severe winter storms within Penobscot County are major snowstorms, these storms can cause delays in the highway snow removal operations and can cause localized power outages. It is expected that a severe winter storm will cause a limited amount of damage/debris within the county each year.

The major severe winter storm damages occur to roadways and utilities. However, there are also limited damages to structures that can occur during a severe winter storm event.

The primary damage losses that are expected during a Severe Winter Storm would be to overhead utility lines and costs to clear debris covering local roads.

Extreme Cold

Extreme cold often accompanies a winter storm or is left in its wake. Prolonged exposure to the cold can cause frostbite or hypothermia and become life-threatening. Infants and elderly people are most susceptible. Ice jams may form and lead to flooding. Nearly every year, residents of Penobscot County experience extreme cold.

Heavy Snow Storms

Heavy snow can immobilize a region and paralyze a city, stranding commuters, stopping the flow of supplies, and disrupting emergency and medical services. Accumulations of snow can collapse buildings and knock down trees and power lines. Hazard Events shows heavy snow storms, blizzards and ice storms reported for Penobscot County can be found at <http://www.ncdc.noaa.gov/stormevents/choosedates.jsp?statefips=23%2CMAINE> .

Blizzards

Sometimes winter storms are accompanied by strong winds creating blizzard conditions with blinding wind-driven snow, severe drifting, and dangerous wind chill. Strong winds with these intense storms and cold fronts can knock down trees, utility poles, and power lines.

Ice Storms

Heavy accumulations of ice can bring down trees, electrical wires, telephone poles and lines, and communication towers. Communications and power can be disrupted for days while utility companies work to repair the extensive damage. Even small accumulations of ice may cause extreme hazards to motorists and pedestrians.

A. *Location (i.e., geographic area affected) of Severe Winter Storms*

All of Penobscot County is susceptible to Sever Winter Storms. Typically areas from Howland north receive heavier snowfalls during storm events.

B. *Extent (i.e., magnitude or severity) of Severe Winter Storms*

Winter storms typically occur between November and April every year in Penobscot County with varying amounts of snowfall, winds and ice or freezing rain dependent upon the type of weather system that is moving through the area. Snowfall amounts can range

from a few inches to a few feet and can cause transportation and utility disruptions, property damage, injuries and loss of life (especially from automobile accidents) depending upon the severity of the event. To date the worst winter storm damages were from the great ice storm of 1998 with massive power loss, broken pipes from lack of heating, and food spoilage.

C. Previous Occurrences of Severe Winter Storms

The largest storms in recent history for Penobscot County is the 1998 Ice storm. On January 8, 1998, one of history’s most devastating ice storms hit the entire state of Maine. Mild temperatures and rain during the day combined with freezing temperatures at night created ice in layers over several days, coating parking lots and sidewalks.

In an report for FEMA Region 1 regarding the evaluation of the severity of the January 1998 ice storm in Northern New England, the U.S. Army Cold Regions Research and Engineering Laboratory Snow and Ice Division indicate that the 1998 storm is consistent with return periods estimated by their extreme value analysis of between 35 and 85 years for severe ice storms in the Northeast with uniform ice thickness between .75 and 1.25 inches.

During the storm, transportation officials and public works crews worked around the clock and through fatigue, barricading streets where power lines had fallen, clearing fallen brush, and plowing. The ice storm caused more damage to Maine’s electric delivery system than any previous storm. Hundreds of utility poles snapped and power lines were strewn on frozen snow and roads after limbs and crashed to the ground. The nasty ice storm caused what Governor Angus King called “the worst power outage we’ve ever had.” Power outages caused by tree damage to the electrical distribution system were long-lasting because damaged trees needed to be removed in order to gain access to the downed lines. The storm cost Central Maine Power (CMP), the state’s largest power company, \$55 million in repairs. Bangor Hydro-Electric Company paid \$5 million in repairs. At one point during the storm, 275,000 CMP customers were without power with another 50,000 Bangor Hydro customers without power. An estimated 11 million acres of forests were damaged. All 16 Maine counties were declared federal disaster areas.

Although in 2013 the “Christmas Ice Storm” (an event that occurred between December 21, 2013 and January 4, 2014) did not receive a presidential declaration, it is worthy of mention since it did cause considerable damage to roads and local budgets. Additionally in November of 2014, and early snow/ice event caused loss of power to around 20,000 people in Penobscot County for about 5 days.

The following is a summary of the most severe winter storms in Penobscot County since 1970.

<p><u>Historical Summary of Major Severe Winter Storm Events in Penobscot County Since 1970</u></p>
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<u>Year</u>	<u>Month</u>	<u>Description</u>	<u>Declarations #</u>
<u>1993</u>	<u>Mar.</u>	<u>Blizzard, severe winds, snowfall</u>	<u>EM-3099</u>
<u>1998</u>	<u>Jan.</u>	<u>Ice storm</u>	<u>DR-1198</u>
<u>2001</u>	<u>Mar.</u>	<u>Severe winter storm</u>	<u>EM-3164</u>
<u>2003</u>	<u>Dec./Jun.</u>	<u>Extreme winter weather</u>	<u>DR-1468</u>
<u>2004</u>	<u>Dec.</u>	<u>Snowfall</u>	<u>EM-3190</u>
<u>2004</u>	<u>Dec.</u>	<u>Snowfall</u>	<u>EM-3194</u>
<u>2005</u>	<u>Feb.</u>	<u>Snowfall</u>	<u>EM-3206</u>
<u>2005</u>	<u>Mar.</u>	<u>Snowfall</u>	<u>EM-3209</u>

Severe Winter Storm Losses in Dollars by Town for Disaster Declarations since 1993						
Location	Disaster Declarations					
	<u>3099</u> <u>Mar 1993</u>	<u>1198</u> <u>Jan/Feb</u> 1998	<u>3164</u> <u>Mar 2001</u>	<u>1468</u> <u>Dec/Jun</u> 2002-2003	<u>3190</u> <u>Dec</u> 2003	<u>3194</u> <u>Dec</u> 2003
PENOBSCOT CTY	\$276	\$63,467	\$3,728	=	-	-
ALTON	-	\$17,838	-	=	-	-
BANGOR	\$16,925	\$966,045	\$27,041	=	\$48,928	\$71,461
BRADFORD	-	\$19,878	-	=	-	-
BRADLEY	-	\$9,199	-	=	-	-
BREWER	\$5,046	\$233,705	\$14,414	\$39,648	\$18,845	\$16,180
BURLINGTON	-	\$20,519	-	=	-	-
CARMEL	-	\$92,171	-	=	-	-
CARROLL PLT	-	\$2,857.5	-	=	-	-
CHARLESTON	\$1,389	\$45,066	-	=	-	-
CHESTER	-	\$17,055	-	=	-	-
CLIFTON	-	\$6,224	-	=	-	-
CORINNA	\$2,346	\$43,249	5,513	=	-	-
CORINTH	-	\$39,520	-	=	-	-
DEXTER	\$2,605	\$42,012	7,542	=	-	-
DIXMONT	-	\$138,472	3,999	=	\$4,085	\$4,570
DREW PLT	-	\$4,436	-	=	-	-
EAST MILLINOCKET	-	\$35,993	6,958	\$3,423	-	-
EDDINGTON	-	\$21,536	-	=	-	-
ENFIELD	-	\$20,524	-	=	-	-
ETNA	-	\$29,281	-	=	-	-
EXETER	-	\$23,751	-	=	-	-
GARLAND	\$1,072	\$28,121	-	-	-	-
GLENBURN	-	\$39,987.2	-	-	\$6,820	\$3,700
GREENBUSH	-	\$29,064	-	-	-	-

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GREENFIELD	-	-	-	-	-	-
HAMPDEN	\$3,678	\$174,317	10,410	-	\$22,669	\$24,990
HERMON	-	\$83,789	2,869	-	-	-
HOLDEN	\$1,545	\$63,001	4,675	-	\$9,256	\$4,190
HOWLAND	\$1,033	\$28,330	3,412	\$14,595	\$3,225	\$4,976
HUDSON	\$1,284	\$56,452	3,269	-	\$5,058	\$5,850
KENDUSKEAG	-	\$26,162	2,775	-	-	-
LAGRANGE	-	\$11,936	-	-	-	-
LAKEVILLE	-	\$5,764	-	-	-	-
LEE	\$1,241	\$17,886	-	-	-	-
LEVANT	-	\$56,872	-	-	-	-
LINCOLN	\$2,121	\$57,142	12,252	-	\$12,752	\$17,827
LOWELL	-	\$6,225	-	-	-	-
MATTAWAMKE AG	-	\$16,423	-	-	-	-
MAXFIELD	\$543	\$21,801	-	-	-	-
MEDWAY	\$1,286	\$11,286	3,078	-	-	-
MILFORD	\$1,111	\$67,467	3,318	-	-	-
MILLINOCKET	\$1,502	\$39,940	8,569	-	\$11,698	\$7,215
MOUNT CHASE	-	\$6,619	-	-	-	-
NEWBURGH	-	\$64,432	-	-	-	-
NEWPORT	\$1,810	\$78,629	6,568	-	-	-
OLD TOWN	\$2,576	\$181,302	16,221	-	\$15,569	17,530
ORONO	\$2,500	\$268,967	15,164	-	\$22,311	20,087
ORRINGTON	\$1,076	\$109,645	5,736	-	-	-
PASSADUMKEA G	-	\$9,152	-	-	-	-
PATTEN	-	\$7,875	-	-	-	-
PENOBSCOT NATION	-	\$34,195	4,905	-	\$2,846	2,243
PLYMOUTH	-	\$55,197.25	-	-	-	-
SPRINGFIELD	-	\$8,106	-	-	-	-
STACYVILLE	-	-	-	-	-	-
STETSON	-	\$16,374	-	-	-	-
VEAZIE	\$757	\$78,857	3,183	-	-	3,631
WEBSTER PLT.	-	-	-	-	-	-
WINN	-	\$5,319	-	-	-	-
M. S. A. D. #48	-	\$ 31,002	-	-	-	-
The Acadia Hospital	-	\$ 5,150	-	-	-	-
Eastern Me. Med Ctr	-	\$145,912	22,931	-	\$42,737	56,861
Manna, Inc.	-	\$ 17,104	-	-	-	-
Community Hlth & Cl.	-	\$ 9,511	-	-	-	-

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Brewer Hous. Auth.	-	\$ 31,559	=	-	=	=
Hope House, Inc.	-	\$1,915	=	-	=	=
Penob. Christ. Schl.	-	\$ 132	=	-	=	=
Union #34	-	\$ 6,812	=	-	=	=
M. S. A. D. #30	-	\$ 1,541	=	-	=	=
Union #91	-	\$ 7,349	=	-	=	=
Lee Academy	-	\$ 2,677	=	-	=	=
M. S. A. D. #22	-	\$ 39,291	=	\$16,411	=	=
M. S. A. D. #46	-	\$ 4,321	=	-	=	=
N. Penob. Tech. R. 3	-	\$ 515	=	-	=	=
M. S. A. D. #38	-	\$ 5,535	=	-	=	=
M. S. A. D. #23	-	\$ 5,773	=	-	=	=
M. S. A. D. #31	-	\$ 5,774	1,652	-	=	=
Union #90	-	\$19,563	=	-	=	=
M. S. A. D. #63	-	\$ 1,628	=	\$783	=	=
Brewer School Dept.	-	\$ 2,091	=	-	=	=
Bangor Water District	-	\$ 35,663	=	\$143,494	=	=
M. S. A. D. #25	-	\$ 5,874	=	-	=	=
M. S. A. D. #67	-	\$ 3,197	=	-	=	=
Old Town Water Dist.	-	\$ 7,175	=	\$39,740	=	=
Bangor Hous. Auth.	-	\$ 9,616	=	-	=	=
Bangor Childrens Home	-	\$ 1,068	=	-	=	=
Old Town Hous. Auth.	-	\$ 3,667	=	-	=	=
Pt. Nat. Hlth. Dept.	-	\$ 39,442	=	-	=	=
Dexter Util. Dist	-	-	-	\$15,772	=	=
Hampden Water Dist	-	-	-	\$6,879	=	=
Orono-Veazie Water dist	-	-	-	\$39,907	=	=
Lincoln Water Dist	-	-	-	\$8,080	=	=
Total	\$53,722	\$4,110,290	\$200,182	\$328,732	\$226,799	\$261,310

Source: MEMA/FEMA. Please note that no detailed breakdowns were available from MEMA for declarations #3206 and 3209.

D. Probability of Future Events of Severe Winter Storms

There are no probability statistics or studies available to determine future occurrences of Severe Winter Storms. All of Penobscot County is susceptible to winter storms and based on past events, it appears that a high probability exists that each year the County will experience storms between December and April.

SEVERE SUMMER STORMS - (THUNDERSTORMS / LIGHTNING / HAIL)

A severe summer storm in Penobscot County can involve high winds, heavy rains, lightning and hail; but rarely involves hurricanes or tornadoes.

A. Location (i.e., geographic area affected) of Severe Summer Storms

All of Penobscot County is susceptible to Severe Summer Storms because severe summer storms can occur in any location.

B. Extent (i.e., magnitude or severity) of Severe Summer Storms

Damages generally result from flooding which may cause flash floods and erosion. This occurs when a storm track produces heavy rainfall amounts in a short period of time for example 2-3 inches of rain within a few hours. Strong wind gusts can also occur during these months with gusts reaching up to 55mph. Hail, high winds and heavy rain can cause damage to crops, trees, utilities, personal property and real estate. These storms generally occur between June and October.

C. Previous Occurrences of Severe Summer Storms

Summer storms do not have a previous occurrence table as Penobscot County does not normally experience hurricanes, or tornadoes, which are the most common component of a summer storm in other locals. No disaster declarations for this hazard have been declared however; for further information on smaller events please see the tables found at <http://www.ncdc.noaa.gov/stormevents/choosedates.jsp?statefips=23%2CMAINE> . This information was taken from NOAA records for hail, lightning and thunderstorm occurrences within Penobscot County. The Hazard Committee utilized this data to determine that although these components have not produced any Declarations, they indicate that Penobscot County Communities can be impacted annually, but on a personal loss level.

The Penobscot Hazard Mitigation Committee and its consultants have concluded that the frequency of occurrences for severe summer storms could be greater than is depicted by the NOAA tables. Due to the large size and sparse population of Penobscot County, the committee feels that there is a large number of events that have gone unreported.

D. Probability of Future Events of Severe Summer Storms

There are no probability statistics or studies available determine future occurrences of Severe Summer Storms (thunderstorms, lightning or hail). However, based on past

experiences, Penobscot county can expect to experience thunder and lightning as well as hail storms every year, predominantly during the summer months. All of Penobscot County is susceptible to thunderstorms, lightning and hail. Determining the extent and vulnerability of future events caused by thunderstorms, lightning, and hail is very difficult. With a majority of wildfires being caused by lightning strikes, it is assumed that a worst-case scenario can be considered while determining major losses under wildfire and not within this section.

WILDFIRE

Wildfire: A wildfire is an uncontrolled fire spreading through vegetative fuel often exposing or consuming structures. Wildfires often begin unnoticed and spread quickly and are usually sighted by dense smoke. Wildfires are placed into two classifications:

Wildland: Wildland fires are those occurring in an area where development is essentially nonexistent, except for roads, railroads, or power lines.

Urban-Wildland Interface: Urban-Wildland Interface fire is a wildfire in a geographical area where structures and other human development meet or intermingle with wildland or vegetative fuels.

A. Location (i.e., geographic area affected) of Wildfire

All of Penobscot County is susceptible to Wildfires, but at a low acreage occurrence. The more urban areas of the county are particularly vulnerable at their Urban Wildland interface. The rural areas of the county rely heavily on the forest products industry and logging is a common occurrence. (There are 60 municipalities within Penobscot County. Approximately 75 percent or 2668 square miles of the land area of the County is forested, 23 percent is agricultural or open space and 2 percent is classified as urban.) Residential areas bordering forestlands are at risk if fires cannot be controlled.

B. Extent (i.e., magnitude or severity) of Wildfire

While adequate rainfall normally reduces the risk of forest fire, seasonal variations, rapidly draining soil types, and unusually dry periods can change the susceptibility rating considerably. Logging operations provide large amounts of ignitable slash, severe summer and winter storms damage trees providing additional fuel while budworm infestation has killed millions of trees. All of these occurrences provide a future supply of dry fuel on the forest floors, as well as tops of trees to sustain crown fires. Spotting and warning program in effect when forest fire danger is high will enable evacuation and firefighting efforts to begin as soon as possible. Mutual aid agreements between municipal fire departments and regional industry must be developed and maintained. The Bureau of Forestry of the Department of Conservation (Maine Forest Service) has an active role in education, prevention, identification and response to forest fires in the State of Maine.

C. Previous Occurrences of Wildfire

The tables on the next few pages display the recent occurrences of wildfires within the boundaries of Penobscot County. Maine Office of GIS and the Maine Forest Services provided data sets for calculation and historical listings for these results. From 2004 to 2010, there were 451 reported wildfires and a total of 466.5 acres of forest were burned. During the period of 2011-2014 there were 259 fires with only 161.7 acres of forest land being burned. Swift action by Maine Forest Service in coordination with local fire departments helps to minimize the acres that are damaged.

Unlike California, where billions of dollars of homes are impacted, our County is very rural and sparsely populated. Historically, most forest fires are small, and low acreage. The following tables detail these “low acreage” fires.

1995 – 2003 WILDFIRE OCCURENCES AND NUMBER OF ACRES DAMAGED

TOWN	Acres Burned 95	Number Fires 95	Acres Burned 96	Number Fires 96	Acres Burned 97	Number Fires 97	Acres Burned 98	Number Fires 98	Acres Burned 99	Number Fires 99	Acres Burned 2000	Number Fires 2000	Acres Burned 01	Number Fires 01	Number Fires 02	Acres Burned 02	Number Fires 03	Acres Burned 03	Total Area Burned 95-03	Total Number of Fires 95-03
Alton	0	0					0	0	0.2	1	0.1	1			1.25	2	0	0	1.55	4
Argyle Twp	0	0	0.10	1	1.60	2	0	0	0	0	0	0	0.50	1	0.1	1	0.2	1	2.5	6
Bangor	6.1	8	2.40	5			0.9	8	1.5	1	0.3	9	0.85	6	0	0	1.75	3	13.8	40
Bradford	0	0					0	0	0.5	1	0	0	10.20	2	1	1	9.3	1	21	5
Bradley	0	0					0	0	0	0	0	0			3.5	2	0.2	2	3.7	4
Brewer	9.5	1	1.35	3			0	0	3	1	1.5	2	3.80	8	0	0	1.2	3	20.35	18
Burlington	0	0	2.00	1	3.00	2	0	0	0.8	4	0.5	1			0	0	0.5	1	6.8	9
Carmel	4.9	6	3.50	1			0.7	3	1.3	2	0	0	0.60	2	0	0	0	0	11	14
Carroll Plt	0.2	1			0.10	1	0	0	0	0	0	0	3.70	2	0.1	1	0	0	4.1	5
Charleston	0	0			0.30	1	0	0	0.1	1	0	0			0	0	0	0	0.4	2
Chester	1.5	1					0	0	0	0	0.1	1	5.50	2	1.5	1	0	0	8.6	5
Clifton	0	0			2.00	1	0	0	0.5	1	1	1	10.00	5	1	1	1.4	2	15.9	11
Corinna	0	0			11.00	2	4	3	3.5	2	0	0			0.25	1	6	1	24.75	9
Corinth	4.2	3	2.00	1			1.1	3	1.6	2	0	0	0.50	1	3.5	1	1.7	3	14.6	14
Dexter	0	0					0	0	0.25	1	0	0			0	0	0.1	1	0.35	2
Dixmont	0	0					0	0	2	2	0	0			0	0	0.5	1	2.5	3
Drew Plt	0	0					0	0	0	0	0.5	1	269.80	8	0	0	0	0	270.3	9
East Millinocket	0	0					0	0	0	0	0	0	0.30	2	0	0	0	0	0.3	2
Eddington	0	0					0	0	5.2	2	1.6	2	5.50	2	0	0	0	0	12.3	6

Section IV-Risk Assessment

Edinburg	0.2	2					0	0	0	0	0			0.1	1	0	0	0.3	3	
Enfield	0.1	1			0.10	1	5	1	0.1	1	0	0		0.3	3	0.3	1	5.9	8	
Etna	0	0			1.30	5	17.85	4	0.5	3	0	1	1.00	2	0.5	1	0.01	1	21.16	17
Exeter	0	0					0	0	2.25	2	0	0	0.01	1	0	0	7	1	9.26	4
Garland	0.1	1			5.00	1	0	0	0	0	0	0	0.02	1	2	1	0	0	7.12	4
Glenburn	0.1	1			0.50	1	3	3	0.1	1	0	0	2.20	3	0.1	1	0.75	1	6.75	11
Greenbush	2	1	0.50	1	0.70	1	0.1	1	0	0	0	0	5.50	3	0	0	0.1	1	8.9	8
Hampden	2.1	2	0.10	1	1.50	2	0.2	2	3.9	8	0.2	1	0.35	2	0.1	1	1.2	1	9.65	20
Hermon	5.9	4	1.00	1	0.00	1	1.9	4	0.5	1	4	1		0	0	0.95	3	14.25	15	
Holden	0.25	1					0.8	2	4.1	2	0.3	3	2.00	2	0.4	1	0	0	7.85	11
Howland	0	0					0.5	1	0	0	0	0		0	0	0.2	1	0.7	2	
Hudson	0	0					0.5	1	0.6	4	0	0	0.10	1	0	0	2	1	3.2	7
Penobscot Nation	0	0					0	0	0	0	0	0		0	0	0	0	0	0	0
Kenduskeag	0.02	2					5.5	2	5.4	4	0	0		0	0	0	0	10.92	8	
Lowell	0	0					0.3	2	0.4	2	0	0	0.10	1	0	0	2.01	2	2.81	7
Mattawamkeag	0.7	2					0.3	1	3.1	2	0	0	81.90	3	0	0	0	0	86	8
Maxfield	0	0					0	0	0	0	0	0		0	0	0.1	1	0.1	1	
Medway	0	0					0	0	0	0	0.2	1	1.00	1	0.1	1	0.25	1	1.55	4
Milford	0	0	0.20	2			0.1	1	3	2	0	0	0.50	2	0.25	1	0.5	1	4.55	9
Millinocket	0	0					0	0	0	0	0	0	0.90	5	0.2	1	0	0	1.1	6
Mount Chase	0.3	1					0	0	0	0	0	0	1.00	1	0	0	0	0	1.3	2
Newburgh	0	0					9	1	0	0	0	0		0	0	1.6	2	10.6	3	
Newport	0.2	2			3.00	1	1	1	0.9	3	0	0		0	0	0	0	5.1	7	
Old Town	2.5	1			0.10	1	0	0	1.6	3	0	0	1.10	2	0	0	0.1	1	5.4	8
Orono	0	0			0.20	8	0	0	0.7	5	0.1	1		0	0	0	0	1	14	
Orrington	0.1	1			0.10	1	0	0	1.1	2	1.6	3	3.90	6	0.2	2	1.85	5	8.85	20
Passadumkeag	0.4	3					0	0	0	0	0	0		2	3	0	0	2.4	6	
Patten	0.3	1	4.00	5	0.10	1	0	0	0	0	0	0	0.20	1	0.2	2	0.1	1	4.9	11
Plymouth	0.01	1			6.50	4	2.5	2	1.5	2	0.3	1	4.50	6	0	0	0	0	15.31	16
Prentiss Twp T7 R3 NBPP	0.1	1					0	0	0	0	0.2	1	0.10	1	0	0	1	1	1.4	4
Springfield	0.1	1					0	0	0	0	0	0	0.10	1	0.1	1	0.1	1	0.4	4
Stacyville	10.8	5	0.20	3			0.5	1	0.2	4	0	0		0	0	0.35	3	12.05	16	
Stetson	0.51	3	0.10	1	2.00	2	0	0	0.25	1	3	1	0.26	2	0	0	2.5	3	8.62	13
Veazie	0	0	0.10	1	0.20	2	0.1	1	0	0	0	0	33.80	3	0	0	0.3	2	34.5	9
Winn	0.5	1			5.00	1	0	0	0	1	0	0	1.00	1	5.6	2	2	1	14.1	7
Woodville	0	0					1.2	3	0.1	1	0	0		0	0	0	0	1.3	4	

Source: Maine Forest Service

1995 – 2003 WILDFIRE OCCURENCES AND NUMBER OF ACRES DAMAGED

Unorganized Territory																				
Grand Falls Twp	0	0					0	0	0	0	0	0		0.2	1	0	0	0.2	1	
Greenfield Twp	1.1	2			0.50	1	0	0	0.5	2	0	0		0	0	0	0	2.1	5	
Grindstone Twp	0.8	3	3.00	1			0	0	0	0	0.1	1	0.90	2	5.75	2	0	0	10.55	9

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Herseytown Twp	8.6	15	0.24	5	3.00	2	3.3	2	0.2	2	0	0			0.1	1	0.5	1	15.94	28
Hopkins Academy Grant Twp	2	1	0.10	1			0	0	0	0	0	0			0	0	0	0	2.1	2
Kingman Twp	0.1	1					0	0	0	0	0	0	1.00	1	0	0	0	0	1.1	2
Long A Twp	2	1	0.10	1			0	0	0	0	0	0			0.3	2	0.1	1	2.5	5
Mattamiscontis Twp	0	0					0	0	0	0	0	0	0.80	1	0	0	0	0	0.8	1
Pukakon Twp	3	1					0	0	0.2	2	0	0			0	0	0.1	1	3.3	4
Seboeis Plt	0	0	0.10	1			0	0	0.3	1	0	0	0.25	1	0	0	0	0	0.65	3
Soldiertown Twp T2 R7 WELS	0.2	1	0.10	1			0	0	0.2	1	0	0			1.5	2	0	0	2	5
Summit Twp	0	0					0	0	0	0	0	0			0	0	0	0	0	0
T1 R6 WELS	0.3	2					0	1	0	0	0	0	0.10	1	0	0	0	0	0.4	4
T1 R8 WELS	0	0			0.30	2	0	0	0.6	2	0.1	1			0.2	2	0	0	1.2	7
T2 R8 NWP	0	0					0	0	0	0	0.1	1	0.25	1	0	0	0	0	0.35	2
T2 R8 WELS	0.1	1					0	0	1.3	2	0.1	1	10.60	2	0	0	0.5	1	12.6	7
T2 R9 NWP	0.5	1	3.10	2			0	0	0.1	1	0	0	0.60	2	0	0	2	1	6.3	7
T3 Indian Purchase Twp	0	0					0	0	3.3	5	0.1	1	0.60	2	0.1	1	0.2	2	4.3	11
T3 R1 NBPP	1	1					0	0	0.2	2	0	0			0	0	0	0	1.2	3
T3 R7 WELS	0	0	0.00	1			0	0	0	0	0	0	0.10	1	0.25	1	0.1	1	0.45	4
T3 R8 WELS	0	0					0	0	0	0	0	0			0.5	1	0	0	0.5	1
T3 R9 NWP	0	0					0	0	0	0	0.1	1			0.4	3	0	0	0.5	4
T4 Indian Purchase Twp	0.1	1	0.10	1			0.3	3	0.1	1	0	0	0.50	1	0.2	1	0	0	1.3	8
T4 R7 WELS	0.01	1					0	0	0.5	1	0	0			0	0	0.25	1	0.76	3
T4 R8 WELS	0	0					0	0	0	0	0	0			25.1	2	0	0	25.1	2
T5 R7 WELS	0.1	1	0.10	1			0	0	0	0	0	0			0	0	0	0	0.2	2
T5 R8 WELS	0	0					0	0	0	0	0	0	0.10	1	0	0	0	0	0.1	1
T6 R6 WELS	0	0					0	0	0	0	0	0			0	0	0.1	1	0.1	1
T6 R7 WELS	0	0	0.00	1			0	0	2	1	0	0			0	0	0	0	2	2
T6 R8 WELS	0	0			2.00	1	0	0	0	0	0	0			0.1	1	0	0	2.1	2
T6 R8 WELS	0	0			2.00	1	0	0	0	0	0	0			0.1	1	0	0	2.1	2
T7 R6 WELS	0	0					0	0	0	0	0	0			0	0	0.2	2	0.2	2
T7 R7 WELS	0.11	3					0	0	0	0	0	0	1.10	2	0	0	0	0	1.21	5
T7 R8 WELS	0	0					0	0	0	0	0.1	1			0.25	1	0	0	0.35	2
T8 R6 WELS	0	0					0	0	0.5	1	0	0			0	0	0	0	0.5	1
T8 R7 WELS	0.01	1	0.01	1			0	0	0	0	0	0			0.2	1	0	0	0.22	3
T8 R8 WELS	0	0			0.00	1	0	0	0	0	0	0			0.1	1	0	0	0.1	2
TA R7 WELS	0.2	1					0	0	0.5	1	0	0			0	0	1	1	1.7	3
Webster Plt	0.2	2			0.20	1	0	0	0	0	0	0			0	0	0.1	1	0.5	4

Source: Maine Forest Service

2004 – 2010 WILDFIRE OCCURENCES AND NUMBER OF ACRES DAMAGED

COMMUNITY OR UNORGANIZED TERRITORY	Number Fires	Acres Burned												
	2004		2005		2006		2007		2008		2009		2010	
Alton	1	.1					1	.1	2	.6				
Argyle Twp	2	.2	1	3			1	1.2	1	.5			1	.1
Bangor			2	1.75			3	.3	9	3.9	2	2.6	1	2.5
Bradford	1	1.5	1	4.7	4	36.9	1	.1	1	14.8	1	.25		
Bradley							1	1.5	1	2.4	1	.3		
Brewer			1	.7					3	6.3	1	.1		
Burlington			1	.3					1	5				
Carmel	2	3.1	1	.3	3	10.2	2	.75	2	.2	5	.7	4	1.7
Carroll Plt			1	1.3							2	.25		
Charleston	1	1.2	1	1			1	.5			1	.25	1	.1
Chester			1	2.2	4	1.3	2	4			1	.1		
Clifton	1	.1					2	1.6	1	1	2	.2		
Corinna			1	.4	2	.21					1	.1	1	.1
Corinth			2	5.5	2	2.25			1	.1	2	6.5	1	.3
Dexter			2	4.5			1	.2	1	.2	4	1.9		
Dixmont					1	2			1	.14				
East Millinocket	1	.75							1	.1				
Eddington					1	.1			1	10	2	2.9	1	.1
Edinburg	3	.3							1	.2	1	.4		
Enfield	3	.71			2	1.1					1	.1	2	.2
Etna	2	1.5	1	.5	3	2.1	1	3.6	4	2.27	2	.4	4	3.4
Exeter					2	2								
Garland											1	1.1		
Glenburn	2	.85	1	10	3	3.3	1	.5	1	4	3	.95		
Grand Falls Twp			1	1.5										
Greenbush	3	3			3	3.3	1	5.3	1	2	1	.25	1	.1
Greenfield Twp	1	2.5	1	1										
Grindstone Twp	3	.4									1	.1	1	.1
Hampden	2	1.5			2	1.75	2	2.25						
Hermon	1	.1			5	9.85	2	.5						
Herseytown Twp	1	.1	1	.1	1	.1	3	.3			1	3	1	.1
Holden	2	.35	2	.4	3	.8	3	3.2	2	3.7	1	3.1		
Howland					1	.5							4	.5
Hudson			2	2.45	2	.3					2	.75	1	1
Kingman Twp									1	7				
Lagrange	1	.5			1	.1	1	.25			2	.7		
Lakeville									1	.1				
Lee	1	.1	1	.4	4	1.4			1	.1			1	.1

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Levant					2	.6	1	.5						
Lincoln	1	3	2	.4	2	.6	4	3.3	3	.4	8	.8	6	1.7
Long A Twp					1	.1								
Lowell	1	.1			1	.1			1	.1	1	.1	1	.5
Mattamiscontis					1	1	1	1.7						
Mattawamkeag	3	1.36	1	.2	2	1								
Maxfield			1	.1							1	.1		
Medway	3	7	3	20.8	2	.75			1	.5	4	1.4		
Milford	1	.2			3	1.7	3	3.06			1	.1		
Mount Chase							1	.1			2	3.5		
Newburgh	1	5.2									1	1.5	1	1
Newport	1	.01					1	.1			3	.4		
Old Town					2	1.1	1	.1					1	.1
Orono	3	3.2	1	2	4	1.7					1	.1		
Orrington			1	.25	1	7.1	1	.1	2	5.5	1	.1		
Passadumkeag			2	.75	1	25.7			3	4.2				
Patten			1	.1					1	.1				
Plymouth	1	2	1	.8	1	3							3	1
Prentiss Twp T7 R3 NBPP							2	16.1						
Pukakon Twp	1	.1											2	.8
Sebois Plt									1	.5			1	.3
Springfield							1	.1			1	.1		
Stacyville					1	.25	1	.1	1	.5	1	1		
Stetson	4	1.8	1	.3	2	2.9			1	1			3	.7
Summit Twp							1	7						
T01 R06 Wels	1	.2							1	.1				
T01 R08 Wels							1	.3	1	.1				
T02 R08 Wels	2	2.5			1	.5	2	9.2						
T02 R09 NWP	1	1			1	.1			6	.6				
Twp 3 IP	1	.01			1	.1					1	.1	1	.3
T03 R01 NBPP													1	.3
T03 R08 Wels							1	.1						
T03 R09 NWP													2	.9
TWP 4 IP							3	.3	1	.1	3	2.3		
T06 R08 Wels							1	.5					1	.1
T07 R08 Wels											1	.1		
Veazie	1	.1			3	.3			13	15			2	.4
Webster Plt	1	1.5												
Winn	1	.1	1	.2	2	.3								
Woodville	2	1.7			1	.1			1	.1				
Total	64	50	40	68	84	127	56	68	83	95	74	40	50	18.5

Source: Dept. of Conservation, Maine Forestry Service

2011-2014 WILDFIRE OCCURENCES AND NUMBER OF ACRES DAMAGED

Penobscot County Multi-Jurisdictional Hazard Mitigation Plan-2016 Update

Section IV-Risk Assessment

COMMUNITY OR UNORGANIZED TERRITORY	Number Fires	Acres Burned								
	2011		2012		2013		2014		Totals	
Alton			2	.5	2	1.1			4	1.6
Argyle Twp			1	0.2	1	0.1	1	0.1	3	0.4
Bangor	1	0.2	2	0.8			8	1.1	11	2.1
Bradford			3	5.2	5	12.2	2	1.25	10	18.65
Bradley					1	1.5	2	0.4	3	1.9
Brewer					1	0.1			1	0.1
Burlington	1	0.01	1	0.5	1	0.1	1	0.4	4	1.1
Carmel	19	3.53	5	0.5	1	1	2	0.4	27	5.43
Carroll Plt										
Charleston	1	0.01	3	0.8			1	0.25	5	1.15
Chester			1	0.1					1	0.1
Clifton										
Corinna	2	0.2	1	0.1	1	0.5			4	0.8
Corinth	1	0.2	1	0.3	3	.71	1	1	6	2.21
Dexter	2	0.2					1	0.1	3	0.3
Dixmont					1	0.5			1	0.5
East Millinocket										
Eddington	1	0.2			1	0.1			2	0.3
Edinburg										
Enfield	1	0.1	1	0.2	2	3			4	3.3
Etna	1	0.5							1	0.5
0.5Exeter										
Garland			1	0.2					1	0.2
Glenburn	1	1	1	0.2	2	0.35	1	0.5	5	2.05
Grand Falls Twp										
Greenbush			4	0.7			1	0.5	5	1.2
Greenfield Twp					1	5.4			1	5.4
Grindstone Twp					1	2.5			1	2.5
Hampden	3	0.4	2	1.1	1	4	2	0.2	8	5.7
Hermon	1	0.1	3	1.6	2	0.2	1	2	7	3.9
Herseytown Twp	2	0.6	15	5.97					17	6.57
Holden	2	0.3	2	0.2	1	0.1			5	0.6
Howland	2	0.11	2	0.2					4	0.31
Hudson			1	0.3	2	2			3	2.3
Kingman Twp			2	4					2	4
Lagrange	1	0.1	1	0.5	3	1.2			5	1.8
Lakeville	1	0.01	1	0.1			1	0.1	3	0.21
Lee			2	0.2			1	0.1	3	0.3
Levant			1	0.1	1	0.25			2	0.35
Lincoln	1	0.01	3	1.13	1	0.3			5	1.44
Long A Twp										
Lowell			1	0.1	1	0.1			2	0.2

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Mattamiscontis			2	0.2					2	0.2
Mattawamkeag			1	0.1	1	0.2			2	0.3
Maxfield										
Medway			4	0.9	2	1.8	1	0.1	7	2.8
Milford	1	0.5			1	1			2	1.5
Mount Chase					1	0.5			1	0.5
Newburgh					2	12.2			2	12.2
Newport			1	0.03	4	0.4			5	0.43
Old Town	1	0.1	2	0.3	2	0.2			5	0.6
Orono			2	0.2	1	0.2	3	0.5	6	0.9
Orrington	2	0.3	5	3.5	2	0.2	3	1.9	12	5.9
Passadumkeag			2	0.2					2	0.2
Patten	1	0.1	1	0.1					2	0.2
Plymouth			1	0.4	1	0.2			2	0.6
Prentiss Twp T7 R3 NBPP	2	0.2			1	0.1			3	0.3
Pukakon Twp							1	0.1	1	0.1
Sebois Plt										
Springfield	1	0.1			1	0.1			2	0.2
Stacyville							1	7	1	7
Stetson			4	7.7	3	2.95			7	10.65
Summit Twp										
T01 R06 Wels			2	32.2					2	32.2
T01 R08 Wels										
T02 R08 NWP	1	0.4	1	0.2					2	0.6
T02 R08 Wels	1	0.2							1	0.2
T02 R09 NWP			6	1.5	1	0.1			7	1.6
Twp 3 IP					1	0.2	1	.01	2	0.3
T03 R01 NBPP							1	0.1	1	0.1
T03 R07 Wels					1	0.1			1	0.1
T03 R08 Wels										
T03 R09 NWP										
TWP 4 IP										
T06 R07 Wels	1	0.2							1	0.2
T06 R08 Wels			1	0.1					1	0.1
T07 R07 Wels			1	0.1					1	0.1
T07 R08 Wels										
Veazie	1	0.1			1	0.1	1	0.2	3	0.4
Webster Plt										
Winn			2	1.56			2	0.2	4	1.76
Woodville										
Total	56	10.16	101	75.09	62	57.86	40	18.6	259	161.71

Source: Dept. of Agriculture Conservation and Forestry

D. Probability of Future Events of Wildfire

There are no probability statistics available to determine future occurrences of wildfires; but it is likely that there will be a future occurrence of wildfire in Penobscot County since a majority of the county is so densely forested.

ASSESSING VULNERABILITY

7. Assessing Vulnerability: Overview	
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.	
Elements	A. Does the new or updated plan include an overall summary description of the jurisdiction’s vulnerability to each hazard?
	B. Does the new or updated plan address the impact of each hazard on the jurisdiction?

A. Summary Description of Penobscot County’s Hazard Vulnerability

Flooding

Most of the county’s documented flooding occurs along the Penobscot River corridor and its tributaries where residential and commercial developments may have occurred. Route 2 in the Mattawamkeag/Howland/Passadumkeag/Greenbush/Milford area is often impassable during a flood event along with Route 11 in the Millinocket/Medway/Grindstone area. Bangor also experiences flooding in the “Downtown” areas. Other areas of concern are Orono, Old Town, Prentiss and Greenfield. Penobscot County has only had one (1) declaration for a flooding event, which was in 2008. All other events were on a smaller scale and any information can be found on the NOAA website. All areas along the Penobscot are also susceptible to spring ice jams which may cause the river to overflow its banks and may cause road closures, damaged bridges and stranded residents.

Many of the rural area’s road systems are not built to appropriate roadway drainage standards and are subject to flooding during heavy rains.

Severe Winter Storms

Penobscot County’s geographical location in north central Maine makes the county highly susceptible to substantial snowfall during the winter months (primarily between December and March or even early April). The rural nature of the county, with extensive rural roadway network that are maintained by small communities makes the county very vulnerable to the loss of utility services, and closed roadways such as occurred in the 1998 ice storm which impacted many of Penobscot County’s residents and businesses.

Severe Summer Storms

Severe Summer Storms are not widely documented through Presidential Declarations, yet they occur often during the summer months. Damage is usually limited to downed trees, and utility lines, and personal property damage. Lightning strikes may also start forest or structural fires.

Wildfires

Penobscot County contains a large portion of rural area that is heavily forested, and thus susceptible to forest fires. These areas are often serviced by small volunteer fire departments and the Maine Forest Service. Maine Forest Service is very proactive with forest fire prevention education.

Larger urban areas generally have full-time fire protection and their exposure is mostly limited to their urban-wild land interface.

B. Impact of Hazards on Penobscot County

Flooding

Impacts to Penobscot County from flooding include damage to residential and commercial real estate along with loss of personal property and roadway damage, culvert washouts, erosion and road closures which may also have an economic impact on businesses and individuals. Governments may also have increased clean-up costs from debris.

Severe Winter Storms

Impacts to Penobscot County from severe winter storms also include damage to residential and commercial real estate (roof collapses, and roof leaks). Furthermore, prolonged periods of utility loss can result in frozen pipes and burst pipes, along with the loss of personal property. Again, road closures may have an economic impact on businesses and individuals. The large amounts of snow and ice can also place a large strain on town/county and state budgets.

Severe Summer Storms

The impacts of severe summer storms may also include road closures from washouts, downed utility lines and trees resulting in extensive power outages, and loss of income to businesses and individuals due to business closures. Governments may also have increased clean-up costs from debris.

Wildfires

The primary impacts for the urban areas include loss of structures in the urban-wild land interface. Rural areas would be impacted by both the loss forest land and the loss of homes that are located adjacent to the forest.

ASSESSING VULNERABILITY- REPETITIVE LOSS PROPERTIES

8. Assessing Vulnerability: Addressing Repetitive Loss Properties	
Requirement §201.6(c)(2)(ii): The risk assessment must also address National Flood Insurance Program (NFIP) insured structures that have been repetitively damaged (by) floods.	
Element	A. Does the new or updated plan describe vulnerability in terms of the types and numbers of repetitive loss properties located in the identified hazard areas?

The NFIP is a federal program enabling property owners in participating communities to purchase insurance protection against losses from flooding. This insurance is designed to provide an insurance alternative to disaster assistance to meet the escalating costs of repairing damage to buildings and their contents caused by floods. Participation in the NFIP is based on an agreement between local communities and the Federal Government that states if a community will adopt and enforce a floodplain management ordinance to reduce future flood risks to new construction in Special Flood Hazard Areas, the Federal Government will make flood insurance available within the community as a financial protection against flood losses. There are 459 properties within Penobscot County that are listed as having policies with the National Flood Insurance Program.

FEMA maintains a file of repetitive loss properties (properties that have experienced more than one flood loss). The following tables are a summary of the repetitive loss properties in the county:

Town	Mitigated	Insured	Occupancy	No. Losses	Total Paid as of 12-31-09
Bradley	No	SDF	Single Family	7	\$12,933
Bradley	No	Yes	Single Family	2	\$7,397
Glenburn	No	Yes	Single Family	2	\$3,008
Grindstone	No	No	Single Family	2	\$25,504
Grindstone	Yes	No	Single Family	2	\$6,404
Grindstone	Yes	No	Single Family	2	\$1,719
Grindstone	Yes	No	Single Family	4	\$4,269
Medway	No	No	Single Family	3	\$3,232
Medway	No	No	Assmd	2	\$10,276
Milford	No	No	Single Family	3	\$5,150
Milford	No	No	Single Family	3	\$15,995
Milford	No	Yes	Single Family	2	\$1,875
Milford	No	Yes	Single Family	3	\$5,420
Old Town	No	Yes	Single Family	2	\$4,214
Old Town	No	No	2-4 Family	2	\$5,843

Source: Maine Flood Management Program

Community Name	Mitigated	Insured	Occupancy	No. Losses	Total Paid as of 7/31/15
BRADLEY	NO	SDF	SINGLE FMLY	7	\$ 90,533
BRADLEY	NO	NO	SINGLE FMLY	2	\$ 14,795
CHESTER	NO	YES	SINGLE FMLY	2	\$ 38,965
DREW PLANTATION	NO	YES	SINGLE FMLY	2	\$ 24,347
GLENBURN	NO	NO	SINGLE FMLY	2	\$ 6,018
GRINDSTONE T1 R7 WELS	NO	NO	SINGLE FMLY	2	\$ 51,008
MEDWAY	NO	NO	SINGLE FMLY	3	\$ 9,698
MEDWAY	NO	NO	ASSMD CONDO	2	\$ 20,553
MILFORD	NO	NO	SINGLE FMLY	3	\$ 15,452
MILFORD	NO	NO	SINGLE FMLY	3	\$ 47,866
MILFORD	NO	NO	SINGLE FMLY	2	\$ 3,751
MILFORD	NO	NO	SINGLE FMLY	3	\$ 16,260
OLD TOWN	NO	YES	SINGLE FMLY	2	\$ 8,429
OLD TOWN	NO	NO	2-4 FAMILY	2	\$ 11,687

A number of repetitive loss properties are not insured. FEMA’s statistics on repetitive loss properties include only properties that have flood insurance unless the damaged occurred during declared individual disaster assistance. There are other properties that suffer repetitive flood losses but which are not insured. Statistics on these properties are not always tabulated.

ASSESSING VULNERABILITY – IDENTIFYING STRUCTURES

9. Assessing Vulnerability: Identifying Structures	
Requirement §201.6(c)(2)(ii)(A): The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard area.	
Elements	A. Does the new or updated plan describe vulnerability in terms of the types and numbers of existing buildings, infrastructure, and critical facilities located in the identified hazard areas?

<p>B. Does the new or updated plan describe vulnerability in terms of the types and numbers of future buildings, infrastructure, and critical facilities located in the identified hazard areas?</p>

A. Existing Buildings, Infrastructure, and Critical Facilities Located in the Identified Hazard Areas

The Penobscot County Hazard Mitigation Committee used its municipal survey as well as Maine Geographical Information Systems (MEGIS) data to produce critical facilities maps to determine the location of critical facilities within the participating communities.

After the completion of the review process for these maps, the Committee developed a list of the critical facilities within each community. The critical facilities identified within Penobscot County are police and fire stations, municipal offices, schools, post offices, town garages, sand/salt sheds, hospitals, public utilities (electric and communication), water and wastewater treatment, and hazardous waste sites or storage facilities.

Using data collected from MEGIS and community surveys, the Penobscot Emergency Management Agency determined the extent of vulnerability of the county’s critical facilities to the predetermined hazards. It has been previously established that Penobscot County is susceptible to flood (including erosion), Severe Summer storms (lightning and hail storms), wildfire, and Severe Winter Storms.

Flooding/Erosion

Buildings

Flooding has historically occurred in developed areas where there are residential and commercial structures particularly along the Penobscot River and its tributaries.

Infrastructure

Roadways, storm drains and drainage systems are susceptible to damage from flooding. Many rural roadways are not constructed to standards that will withstand floodwaters. Heavy rains and ice jams make this infrastructure vulnerable to damage.

Critical Facilities

The vast majority of critical facilities have been located away from flood prone areas. However, it is sometimes necessary to locate some of these facilities such as wastewater treatment plants within the floodplain.

Severe Winter Storms

Buildings

Buildings county-wide are susceptible to severe winter storms. Damages can vary from broken windows, roofing and siding damage and roof leaks to building collapse from the weight of the snow.

Infrastructure

Infrastructure throughout the county is also vulnerable to severe winter storm damage. Roads and drainage systems can be blocked by falling snow, downed utility lines, debris or ice.

Critical facilities

All critical facilities are also vulnerable to severe winter storms. Damages can vary from broken windows, roofing and siding damage, roof collapse or loss of utilities.

Severe Summer Storms

Buildings

Buildings county-wide are susceptible to severe summer storms, Damages can vary from broken windows, water damage, roofing and siding damage to fire from a lightning strike.

Infrastructure

Infrastructure throughout the county is also vulnerable to severe summer storm damage. Roads can be blocked by fallen trees and utility lines, lightning strikes can also occur at pumping stations and rain can cause flooding.

Critical facilities

All critical facilities are also vulnerable to severe summer storms. Damages can vary from broken windows, roofing and siding damage to fire from a lightning strike.

Wildfire

Buildings

Building located near wooded areas are susceptible to wild fire damage, either as a total loss or as damage resulting from falling embers. Approximately 63.83% of homes within rural areas of the county are situated within the urban wild land interface.

Infrastructure

Utilities are vulnerable to wild fire and can even be damaged from the heat of the fire.

Critical facilities

Critical facilities located near wooded areas are susceptible to wild fire damage, either as a total loss or as damage resulting from falling embers.

PENOBSCOT COUNTY CRITICAL FACILITY ASSETS BY MUNICIPALITY

Municipality	Municipal Offices	Police Station	Fire Station	Public Works	Water Treatment Plant	Wastewater Treatment Plant	Library	School	Hospital	Airport	Public Wells	Post Office	Shelter	Dams	Hazmat Facilities	Salt/Sand shed
Alton	1	0	1	1	0	0	0	1	0	0	2	0	0	1	0	1
Argyle	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Bangor	1	1	3	2	1	1	1	21	2	1	0	1	2	1	4	4
Bradford	1	0	1	0	0	0	1	1	0	0	0	1	0	0	0	1
Bradley	1	0	1	0	0	0	0	1	0	0	0	1	0	4	0	1
Brewer	1	1	1	1	1	1	1	2	1	1	2	1	1	1	3	2
Burlington	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	1
Carmel	1	0	1	0	0	0	1	2	0	1	3	1	0	0	0	3
Carroll Plantation	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0
Charleston	1	0	1	0	0	0	1	1	0	0	2	1	0	0	0	1
Chester	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Clifton	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1
Corinna	1	0	1	1	0	0	1	1	0	0	3	1	0	0	0	1
Corinth	1	0	1	0	0	0	1	3	0	0	0	1	0	0	0	2
Dexter	1	1	1	1	2	1	1	2	1	1	0	1	0	1	0	0
Dixmont	1	0	1	0	0	0	0	0	0	0	0	1	0	0	0	1
Drew Plantation	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
East Millinocket	1	1	1	1	0	1	1	2	0	0	1	1	0	0	2	1
Eddington	1	0	1	0	0	0	0	1	0	0	0	1	0	0	0	2
Enfield	1	0	0	1	0	0	1	2	1	0	0	1	0	0	0	1
Etna	1	0	1	0	0	0	0	0	0	0	0	1	0	0	0	0
Exeter	1	0	0	0	0	0	0	0	0	0	2	1	0	0	0	1
Garland	1	0	1	1	0	0	1	1	0	0	0	1	0	0	0	1
Glenburn	1	0	1	0	0	0	1	1	0	0	3	1	0	0	0	1
Greenbush	1	0	0	0	0	0	0	1	0	0	2	2	0	0	1	1
Hampden	1	1	1	1	0	0	1	2	0	0	2	0	0	0	0	1
Hermon	1	1	1	1	0	0	0	4	0	0	3	1	0	0	1	1
Holden	1	1	1	0	0	0	0	2	0	0	0	1	0	0	0	1
Howland	1	0	1	1	0	0	1	2	0	0	0	1	0	0	0	2
Hudson	1	0	0	1	0	0	0	2	0	0	0	1	0	0	0	1
Kenduskeag	1	0	0	1	0	0	0	1	0	0	0	1	0	0	1	2

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Lagrange	1	0	0	1	0	0	0	1	0	0	0	1	0	0	0	2
Municipality	Municipal Offices	Police Station	Fire Station	Public Works	Water Treatment Plant	Wastewater Treatment Plant	Library	School	Hospital	Airport	Public Wells	Post Office	Shelter	Dams	Hazmat Facilities	Salt/Sand shed
Lakeville	1	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
Lee	1	0	1	1	0	0	1	2	0	0	0	1	0	3	0	1
Levant	1	0	1	0	0	0	0	1	0	0	2	1	0	0	0	1
Lincoln	1	1	1	1	1	1	1	4	1	1	0	1	0	6	1	3
Lowell	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Mattawamkeag	1	0	1	1	0	0	1	1	0	0	0	1	0	0	1	0
Maxfield	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Medway	1	0	1	1	0	0	1	1	0	0	0	1	0	1	0	2
Milford	1	0	1	1	0	0	1	1	0	0	0	1	0	1	0	1
Millinocket	1	1	1	1	1	1	1	2	1	1		1	1	2	1	3
Mount Chase	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Newburgh	1	0	2	0	0	0	0	1	0	0	0	1	0	0	0	1
Newport	1	1	1	1	1	1	1	3	0	0	0	1	0	1	0	1
Old Town	1	1	1	1	1	1	1	4	0	1	1	2	1	4	2	1
Orono	1	1	1	1	1	1	1	3	0	0	0	2	0	1	1	1
Orrington	1	1	1	1	0	0	1	1	0	0	0	1	0	3	0	1
Passadumkeag	1	0	1	0	0	0	0	0	0	0	0	1	0	0	0	1
Patten	1	0	1	1	0	0	1	0	0	0	1	0	0	0	0	1
Penobscot Nation	1	1	1	1	1	1	0	1	1	0	0	0	1	0	0	1
Plymouth	1	0	0	1	0	0	0	1	0	0	1	1	0	1	0	2
Prentiss Plantation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Seboeis Plantation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Springfield	1	0	1	0	0	0	0	1	0	0	0	1	0	0	0	2
Stacyville	1	0	1	1	0	0	0	3	0	0	0	1	0	0	1	0
Stetson	1	0	1	0	0	0	1	0	0	0	0	0	0	1	0	1
Veazie	1	1	1	0	0	1	0	1	0	0	1	0	0	0	1	1
Webster Plantation	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Winn	1	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1
Woodville	1	0	0	0	0	0	0	0	0	0	0	0	0	1	0	0

B. Vulnerability in terms of future buildings, infrastructure, and critical facilities located in the identified hazard areas

Flooding

Buildings and Critical Facilities

The extent of vulnerability of future buildings and critical facilities from flooding should be minimal. State government mandates Shoreland zoning that restricts structures from locating within the floodplain. Additionally the Flood Insurance Program also restricts development. Therefore flooding of future buildings and critical facilities is not expected to be an issue for Penobscot County

Infrastructure

Vulnerability of future roads and drainage systems may continue to be a challenge since many of Penobscot County's existing rural roads originated as logging roads and many are located adjacent to water bodies. Proposed roadways are now, generally, built to specific design standards, which should help to minimize the impact.

Severe Winter Storms

Buildings and Critical Facilities

Vulnerability of future buildings and critical facilities from winter storms will most likely be the same as existing buildings which are susceptible to severe winter storms. Damages can vary from broken windows and pipes, utility loss, roofing and siding damage and roof leaks to even building collapse from the weight of the snow.

Infrastructure

Vulnerability of future infrastructure throughout the county will continue to be a concern regarding severe winter storm damage. Roads and drainage systems can be blocked by falling snow, debris or ice and pipes may burst or utility lines may be down.

Severe Summer Storms

Buildings and Critical Facilities

Future buildings and critical facilities county-wide are susceptible to severe summer storms, Damages can vary from broken windows, water damage, roofing and siding damage to fire from a lightning strike.

Infrastructure

Vulnerability of future infrastructure to severe summer storm damage throughout the county is also a concern. Roads can be blocked by fallen trees and utility lines, lightning strikes can also occur at pumping stations and rain can cause flooding.

Wildfire

Buildings & Critical Facilities

Future buildings located near wooded areas are susceptible to wild fire damage, either as a total loss or as damage resulting from falling embers and smoke damage. The vast majority of homes within the county are situated within the urban-wild land interface. Critical facilities located near wooded areas are susceptible to wild fire damage, either as a total loss or as damage resulting from falling embers.

Infrastructure

Future infrastructure especially utilities is vulnerable to wild fire and can even be damaged from the heat of the fire.

ASSESSING VULNERABILITY – ESTIMATING POTENTIAL LOSSES

10. Assessing Vulnerability: Estimating Potential Losses	
Requirement §201.6(c)(2)(ii)(B): The plan should describe vulnerability in terms of an estimate of the potential dollar losses to vulnerable structures identified in the paragraph (c)(2)(ii)(A) of this section and a description of the methodology used to prepare the estimate.	
Elements	A. Does the new or updated plan estimate potential dollar losses to vulnerable structures?
	B. Does the new or updated plan describe the methodology used to prepare the estimate?

FLOODING:

Determining the extent of damages caused by flooding is dependent upon the values placed on consistent variables, value of homes, and the number of homes vulnerable to flooding. The committee decided to use FIRM (Flood Insurance Rate Maps) and policies data as the base for developing a standards for flooding vulnerability. Any property listed as having a policy with FIRM was considered vulnerable. The use of FIRM data for each community developed potential dollar losses to residential and commercial structures. The data collected on the following page displays the insured cost of homes located and insured within the flood plain.

Additionally the effects of erosion are felt throughout the watersheds of the county. From Roadways and Property, to work and recreation, riverbanks are eroding away and causing damage in increasing amounts creating concern. Currently there are no listed critical facilities determined to be under the threat of erosion, but riverfront homes and businesses are vulnerable to damages. The majority of damages are the threats to these homes, eroding roads and bridges, and personal property along the river banks.

Community	Number of Policies	Total Premium	Total Coverage	Number of Claims Since 1978	Total Paid Since 1978
Alton	1	\$2,035	\$202,500		\$ -
Bangor	68	\$78,450	\$13,115,100	15	\$258,106
Bradley	7	\$4,064	\$808,400	16	\$107,584
Brewer	10	\$11,599	\$2,082,600	1	\$ -
Burlington	1	\$524	\$47,500	0	\$0
Chester	2	\$1,175	\$347,800	1	\$1,842
Clifton	2	\$986	\$420,000	0	\$ -
Corinna	1	\$1,675	\$188,500	2	\$81,782
Corinth	4	\$1,790	\$515,000	0	\$ -
Dexter	10	\$18,595	\$2,260,700	1	\$ -
Dixmont	1	\$856	\$119,000	0	\$ -
Drew Plantation	1	\$639	\$68,400	1	\$5,851
East Millinocket	0	\$ -	\$ -	6	\$3,992
Eddington	2	\$480	\$290,000	1	\$ -
Enfield	9	\$5,987	\$1,202,800	3	\$2,531
Garland	1	\$2,067	\$72,000	0	\$ -
Glenburn	37	\$22,883	\$5,829,600	13	\$50,137
Greenbush	18	\$10,833	\$1,722,700	5	\$22,457
Grindstone	4	\$1,010	\$644,600	14	\$164,643
Hampden	16	\$7,973	\$3,328,900	3	\$21,028
Hermon	4	\$2,486	\$518,500	4	\$2,641
Holden	3	\$1,194	\$743,000	0	\$ -
Howland	22	\$14,570	\$1,578,700	6	\$88,055
Hudson	25	\$15,445	\$3,097,900	2	\$1,659
Kenduskeag	7	\$5,275	\$909,800	1	\$3,597
Levant	4	\$3,057	\$441,300	0	\$ -
Lincoln	22	\$14,800	\$2,975,500	2	\$ -

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Lowell	1	\$1,189	\$290,000	0	\$ -
Mattamiscontis	1	\$348	\$350,000	0	\$
Mattawamkeag	5	\$3,033	\$391,200	4	\$4,455
Maxfield	3	\$882	\$293,000	0	\$ -
Medway	9	\$3,112	\$1,074,900	24	\$120,787
Milford	28	\$18,478	\$3,701,400	51	\$335,182
Millinocket	10	\$5,562	\$1,029,090	9	\$22,574
Mount Chase	2	\$2,005	\$227,700	0	\$ -
Newport	7	\$2,717	\$1,796,300	0	\$ -
Old Town	44	\$38,356	\$5,776,800	16	\$92,741
Orono	30	\$23,669	\$5,523,400	11	\$160,893
Orrington	6	\$4,954	\$858,300	0	\$ -
Passadumkeag	16	\$11,995	\$1,150,100	9	\$17,220
Patten	3	\$1,774	\$176,400	0	\$ -
Plymouth	4	\$2,192	\$557,400	0	\$ -
Stacyville	1	\$189	\$9,700	4	\$30,532
Stetson	4	\$2,496	\$469,300	0	\$ -
T03 R01 NBPP	1	\$361	\$280,000	0	\$
Winn	2	\$648	\$57,500	0	\$0
Penobscot County	459	\$354,608	\$67,544,100	225	\$1,600,289

Source: NFIP insurance report

Roads

Generally the largest expense to municipalities in a flooding event is damage to roadways. For this exercise, roadway damages were defined by length of roadway located within the 100-year flood plain, as well as the local cost of repairs and replacement to these roads. Penobscot County Roads and Mapping estimated that it would cost approximately \$300,000 per mile of paved roadway to replace a road that was washed away.

The following table is a worse case scenario, if all roads and their approximate length in the identified flood zones are lost to flooding. The total potential for damages column has been adjusted for inflation. The website “inflationdata.com” was used to calculate the

inflation rate for the period of July 2010 through July 2015. The established rate of inflation of 9.47% was then used to adjust the prior numbers to provide cost estimates for this plan update.

PENOBSCOT COUNTY POTENTIAL TRANSPORTATION SYSTEM LOSSES FROM FLOOD EVENT			
	Length in Flood Zone (miles)	Replacement Cost (per mile)	Total Potential Damages
Roads in Flood Zone	84.9230	\$300,000	\$ 27,889,562

Source: MEGIS and FIRM DATA

For the 2011 plan, the following table depicts potential flood loss based on the worst flood event (1987) in recent history for Penobscot County. The actual loss figures from 1987 were adjusted for inflation by the 2009 Consumer Price Index of 2.145 (the 2010 figure is not yet available) to create a loss amount in 2009 dollars. The 2009 dollar amount for the entire loss in Penobscot County was then divided by the total population of Penobscot County to determine an estimated loss per capita. Then the 2009 Adjusted Loss column and the Estimated Per Capita loss were compared and the greater of the two numbers was utilized to determine the Greatest Potential Loss.

	1987 Flooding Actual Loss	2009 Adjusted Loss	Estimated Loss Per Capita	Greatest Potential Loss
Penobscot County (UT)	\$3,245.00	\$6,127.22	\$3,335.28	\$6,127.22
Alton	\$3,431.00	\$6,478.43	\$9,041.17	\$9,041.17
Argyle	\$0.00	\$0.00	\$2,596.93	\$2,596.93
Bangor	\$19,495.00	\$36,810.54	\$327,359.87	\$327,359.87
Bradford	\$11,086.00	\$20,932.63	\$13,818.24	\$20,932.63
Bradley	\$2,465.00	\$4,654.42	\$14,865.57	\$14,865.57
Brewer	\$0.00	\$0.00	\$98,095.64	\$98,095.64
Burlington	\$0.00	\$0.00	\$3,986.24	\$3,986.24
Carmel	\$110,441.00	\$208,535.16	\$27,818.17	\$208,535.16
Carroll Plantation	\$0.00	\$0.00	\$1,453.43	\$1,453.43
Charleston	\$13,956.00	\$26,351.78	\$14,940.38	\$26,351.78
Chester	\$0.00	\$0.00	\$5,396.92	\$5,396.92
Clifton	\$0.00	\$0.00	\$8,239.65	\$8,239.65
Corinna	\$19,517.00	\$36,852.08	\$24,868.56	\$36,852.08
Corinth	\$4,327.00	\$8,170.26	\$29,335.72	\$29,335.72
Dexter	\$37,110.00	\$70,071.26	\$39,413.52	\$70,071.26
Dixmont	\$38,994.00	\$73,628.64	\$11,438.30	\$73,628.64
Drew Plantation	\$0.00	\$0.00	\$587.95	\$587.95
East Millinocket	\$0.00	\$0.00	\$18,119.55	\$18,119.55
Eddington	\$0.00	\$0.00	\$23,710.42	\$23,710.42
Enfield	\$0.00	\$0.00	\$16,483.98	\$16,483.98
Etna	\$3,055.00	\$5,768.46	\$11,106.91	\$11,106.91
Exeter	\$10,879.00	\$20,541.77	\$10,518.96	\$20,541.77

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Garland	\$11,534.00	\$21,778.55	\$10,412.06	\$21,778.55
Glenburn	\$0.00	\$0.00	\$51,237.17	\$51,237.17
Greenbush	\$8,567.00	\$16,176.25	\$15,393.60	\$16,176.25
Greenfield	\$7,104.00	\$13,413.80	\$0.00	\$13,413.80
Hampden	\$8,296.00	\$15,664.54	\$73,996.18	\$73,996.18
Hermon	\$1,672.00	\$3,157.08	\$57,704.62	\$57,704.62
Holden	\$3,934.00	\$7,428.20	\$32,711.40	\$32,711.40
Howland	\$95,916.00	\$181,109.00	\$14,185.63	\$181,109.00
Hudson	\$3,523.00	\$6,652.14	\$15,628.78	\$15,628.78
Kenduskeag	\$2,227.00	\$4,205.03	\$12,870.76	\$12,870.76
Kingman	\$0.00	\$0.00	\$2,170.07	\$2,170.07
Lagrange	\$0.00	\$0.00	\$7,686.11	\$7,686.11
Lakeville	\$0.00	\$0.00	\$630.71	\$630.71
Lee	\$0.00	\$0.00	\$9,139.95	\$9,139.95
Levant	\$11,713.00	\$22,116.54	\$28,852.31	\$28,852.31
Lincoln	\$0.00	\$0.00	\$56,657.00	\$56,657.00
Lowell	\$0.00	\$0.00	\$3,324.59	\$3,324.59
Mattawamkeag	\$0.00	\$0.00	\$8,797.87	\$8,797.87
Maxfield	\$24,191.00	\$45,677.55	\$930.03	\$45,677.55
Medway	\$0.00	\$0.00	\$15,436.36	\$15,436.36
Milford	\$6,628.00	\$12,515.02	\$33,331.42	\$33,331.42
Millinocket	\$0.00	\$0.00	\$52,028.23	\$52,028.23
Mount Chase	\$0.00	\$0.00	\$2,586.98	\$2,586.98
Newburgh	\$42,657.00	\$80,545.13	\$16,622.95	\$80,545.13
Newport	\$205,889.00	\$388,760.48	\$33,684.19	\$388,760.48
Old Town	\$5,077.00	\$9,586.41	\$82,099.20	\$82,099.20
Orono	\$30,122.00	\$56,876.49	\$102,452.96	\$102,452.96
Orrington	\$9,281.00	\$17,524.42	\$39,841.63	\$39,841.63
Passadumkeag	\$5,492.00	\$10,370.02	\$4,831.88	\$10,370.02
Patten	\$0.00	\$0.00	\$11,737.62	\$11,737.62
Penobscot Nation	\$65,949.00	\$124,525.18	\$5,729.84	\$124,525.18
Plymouth	\$2,078.00	\$3,923.69	\$14,388.74	\$14,388.74
Prentiss Plantation	\$0.00	\$0.00	\$2,202.14	\$2,202.14
Seboeis Plantation	\$0.00	\$0.00	\$438.29	\$438.29
Springfield	\$0.00	\$0.00	\$3,987.37	\$3,987.37
Stacyville	\$0.00	\$0.00	\$4,051.51	\$4,051.51
Stetson	\$5,104.00	\$9,637.39	\$11,481.06	\$11,481.06
Veazie	\$10,735.00	\$20,269.87	\$20,909.64	\$20,909.64
Webster Plantation	\$0.00	\$0.00	\$833.82	\$833.82
Winn	\$0.00	\$0.00	\$4,511.18	\$4,511.18
Woodville	\$0.00	\$0.00	\$4,211.86	\$4,211.86
	\$808,433.00	\$1,526,486.61	\$1,234,447.70	\$2,681,926.90

For the 2016 plan update, the following table depicts potential flood loss based on the worst flood event (1987) in recent history for Penobscot County. The actual loss figures from 1987 were adjusted for inflation by the 2014 Consumer Price Index of 2.367 (the 2015 figure is not yet available) to create a loss amount in 2014 dollars. The 2014 dollar amount for the entire loss in Penobscot County was then divided by the total population

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of Penobscot County to determine an estimated loss per capita. Then the 2014 Adjusted Loss column and the Estimated Per Capita loss were compared and the greater of the two numbers was utilized to determine the Greatest Potential Loss.

	1987 Flooding Actual Loss	2014 Adjusted Loss	Estimated Loss Per Capita	Greatest Potential Loss
Penobscot County (UT)	\$3,245.00	\$6,762.58	\$9,285.41	\$9,285.41
Alton	\$3,431.00	\$7,150.20	\$10,189.90	\$10,189.90
Argyle	\$0.00	\$0.00	\$3,171.46	\$3,171.46
Bangor	\$19,495.00	\$40,627.58	\$378,274.35	\$378,274.35
Bradford	\$11,086.00	\$23,103.22	\$14,769.63	\$14,769.63
Bradley	\$2,465.00	\$5,137.06	\$17,082.40	\$17,082.40
Brewer	\$0.00	\$0.00	\$108,562.53	\$108,562.53
Burlington	\$0.00	\$0.00	\$4,156.11	\$4,156.11
Carmel	\$110,441.00	\$230,159.04	\$31,989.42	\$230,159.04
Carroll Plantation	\$0.00	\$0.00	\$1,751.75	\$1,751.75
Charleston	\$13,956.00	\$29,084.30	\$16,132.10	\$29,084.30
Chester	\$0.00	\$0.00	\$6,251.33	\$6,251.33
Clifton	\$0.00	\$0.00	\$10,544.83	\$10,544.83
Corinna	\$19,517.00	\$40,673.43	\$25,165.62	\$40,673.43
Corinth	\$4,327.00	\$9,017.47	\$32,951.17	\$32,951.17
Dexter	\$37,110.00	\$77,337.24	\$44,595.13	\$77,337.24
Dixmont	\$38,994.00	\$81,263.50	\$13,521.66	\$81,263.50
Drew Plantation	\$0.00	\$0.00	\$526.67	\$526.67
East Millinocket	\$0.00	\$0.00	\$19,727.19	\$19,727.19
Eddington	\$0.00	\$0.00	\$25,474.75	\$25,474.75
Enfield	\$0.00	\$0.00	\$18,399.07	\$18,399.07
Etna	\$3,055.00	\$6,366.62	\$14,265.86	\$14,265.86
Exeter	\$10,879.00	\$22,671.84	\$12,502.67	\$22,671.84
Garland	\$11,534.00	\$24,036.86	\$12,651.51	\$24,036.86
Glenburn	\$0.00	\$0.00	\$52,598.21	\$52,598.21
Greenbush	\$8,567.00	\$17,853.63	\$17,070.95	\$17,853.63

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Hampden	\$8,296.00	\$17,288.86	\$83,087.77	\$83,087.77
Hermon	\$1,672.00	\$3,484.45	\$62,009.56	\$62,009.56
Holden	\$3,934.00	\$8,198.46	\$35,218.13	\$35,218.13
Howland	\$95,916.00	\$199,888.94	\$14,208.62	\$199,888.94
Hudson	\$3,523.00	\$7,341.93	\$17,586.17	\$17,586.17
Kenduskeag	\$2,227.00	\$4,641.07	\$15,433.69	\$15,433.69
Kingman	\$0.00	\$0.00	\$1,992.18	\$1,992.18
Lagrange	\$0.00	\$0.00	\$8,106.12	\$8,106.12
Lakeville	\$0.00	\$0.00	\$1,202.18	\$1,202.18
Lee	\$0.00	\$0.00	\$10,556.28	\$10,556.28
Levant	\$11,713.00	\$24,409.89	\$32,642.03	\$32,642.03
Lincoln	\$0.00	\$0.00	\$58,219.83	\$58,219.83
Lowell	\$0.00	\$0.00	\$4,098.86	\$4,098.86
Mattawamkeag	\$0.00	\$0.00	\$7,865.69	\$7,865.69
Maxfield	\$24,191.00	\$50,414.04	\$1,110.58	\$50,414.04
Medway	\$0.00	\$0.00	\$15,445.14	\$15,445.14
Milford	\$6,628.00	\$13,812.75	\$35,149.44	\$35,149.44
Millinocket	\$0.00	\$0.00	\$51,590.67	\$51,590.67
Mount Chase	\$0.00	\$0.00	\$2,301.31	\$2,301.31
Newburgh	\$42,657.00	\$88,897.19	\$17,757.91	\$88,897.19
Newport	\$205,889.00	\$429,072.68	\$37,496.55	\$429,072.68
Old Town	\$5,077.00	\$10,580.47	\$89,762.73	\$89,762.73
Orono	\$30,122.00	\$62,774.25	\$118,637.94	\$118,637.94
Orrington	\$9,281.00	\$19,341.60	\$42,740.34	\$42,740.34
Passadumkeag	\$5,492.00	\$11,445.33	\$4,282.05	\$11,445.33
Patten	\$0.00	\$0.00	\$11,643.97	\$11,643.97
Penobscot Nation	\$65,949.00	\$137,437.72	\$6,984.09	\$137,437.72
Plymouth	\$2,078.00	\$4,330.55	\$15,800.07	\$15,800.07
Prentiss Plantation	\$0.00	\$0.00	\$2,450.16	\$2,450.16
Seboeis Plantation	\$0.00	\$0.00	\$400.73	\$400.73
Springfield	\$0.00	\$0.00	\$4,682.78	\$4,682.78
Stacyville	\$0.00	\$0.00	\$4,533.93	\$4,533.93
Stetson	\$5,104.00	\$10,636.74	\$13,762.09	\$13,762.09

Veazie	\$10,735.00	\$22,371.74	\$21,971.26	\$22,371.74
Webster Plantation	\$0.00	\$0.00	\$973.19	\$973.19
Winn	\$0.00	\$0.00	\$4,659.88	\$4,659.88
Woodville	\$0.00	\$0.00	\$2,839.43	\$2,839.43
Total	\$808,433.00	\$1,762,417.96	\$1,234,447.70	\$2,681,926.90

SEVERE WINTER STORM

The primary damage losses that are expected during a Severe Winter Storm would be to overhead utility lines and local roads. In calculating the damage costs, the Planning Team assumed that all local roads would be covered in snow or ice or blocked with tree and utility line debris.

The valuations of the Maine Electric Company and Bangor-Hydro Electric Company were used to determine the number of miles of transmission lines and \$200,000 was used as an average replacement cost per unit of electrical power lines. It was assumed that it would cost approximately \$2,000 per mile to replace telephone lines, which were assumed to be along each of the roads in town belonging to the State or the Town. It was assumed that all local roads would be covered in snow or ice or blocked with tree and utility line debris. It was further estimated that it would cost approximately \$500 per mile for road debris clearance or snow removal. The website “inflationdata.com” was used to determine the inflation rate for Maine between July 2005 and July 2010. The rate (11.57%) was then utilized to adjust the numbers from the 2005 plan to provide cost estimates for the 2011 plan. Again for the 2016 plan the same website was used to calculate the inflation rate for the period of July 2010 through July 2015. The established rate of 9.47% was then used to adjust the prior numbers to provide cost estimates for this plan update.

PENOBSCOT COUNTY POTENTIAL LOSSES FROM SEVERE WINTER STORM			
Critical Facility	Function Lost	Quantity	Damage Cost
Electrical Power Lines	Electricity		\$664,125,684
Telephone Lines	Communication	2520.46	\$686,460
Paved Road Surfaces	Transportation	1353.009	\$825,703
Gravel Road Surfaces	Transportation	374.87	\$228,924

The following is the individual break down of maximum potential critical infrastructure damage for each participating community. The above calculation is the sum of all individual communities within the county. Pieces of information for this calculation were not available at the time of submitting this plan, this information was obtained from the community survey and not all information was available. Information for Electric

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Power damage costs for communities was obtained from Maine Revenue Services 2005 distribution and transmission state valuation and adjusted for inflation.

The following table depicts potential severe winter storm loss based on the worst storm event (1998) in recent history for Penobscot County. The actual loss figures from 1998 were adjusted for inflation by the 2009 Consumer Price Index of 2.145 (the 2010 figure was not available) to create a loss amount in 2009 dollars. The 2009 dollar amount for the entire loss in Penobscot County was then divided by the total population of Penobscot County to determine an estimated loss per capita. Then the 2009 Adjusted Loss column and the Estimated Per Capita loss were compared and the greater of the two numbers was utilized to determine the Greatest Potential Loss.

	1998 Ice Storm Actual Loss	2009 Adjusted Loss	Estimated Loss Per Capita	Greatest Potential Loss
PENOBSCOT CTY	\$ 63,467	\$ 83,519	\$ 11,298	\$ 83,519
Alton	\$ 17,838	\$ 23,474	\$ 30,634	\$ 30,634
Argyle		\$ -	\$ 8,799	\$ 8,799
Bangor	\$ 966,845	\$ 1,272,321	\$1,108,859	\$ 1,272,321
Bradford	\$ 19,878	\$ 26,158	\$ 46,820	\$ 46,820
Bradley	\$ 9,199	\$ 12,105	\$ 50,368	\$ 50,368
Brewer	\$ 233,705	\$ 307,544	\$ 332,372	\$ 332,372
Burlington	\$ 20,519	\$ 27,002	\$ 13,506	\$ 27,002
Carmel	\$ 92,171	\$ 121,293	\$ 94,255	\$ 121,293
Carroll Plantation	\$ 2,858	\$ 3,761	\$ 4,925	\$ 4,925
Charleston	\$ 45,066	\$ 59,305	\$ 50,622	\$ 59,305
Chester	\$ 17,055	\$ 22,444	\$ 18,286	\$ 22,444
Clifton	\$ 6,224	\$ 8,190	\$ 27,918	\$ 27,918
Corinna	\$ 43,249	\$ 56,914	\$ 84,261	\$ 84,261
Corinth	\$ 39,520	\$ 52,006	\$ 99,396	\$ 99,396
Dexter	\$ 42,012	\$ 55,286	\$ 133,542	\$ 133,542
Dixmont	\$ 138,472	\$ 182,222	\$ 38,745	\$ 182,222
Drew Plantation	\$ 4,436	\$ 5,838	\$ 1,992	\$ 5,838
East Millinocket	\$ 35,993	\$ 47,365	\$ 61,376	\$ 61,376
Eddington	\$ 21,536	\$ 28,340	\$ 80,314	\$ 80,314
Enfield	\$ 20,524	\$ 27,009	\$ 55,836	\$ 55,836
Etna	\$ 29,281	\$ 38,532	\$ 37,622	\$ 38,532
Exeter	\$ 23,751	\$ 31,255	\$ 35,631	\$ 35,631
Garland	\$ 28,121	\$ 37,006	\$ 35,269	\$ 37,006
Glenburn	\$ 39,987	\$ 52,621	\$ 173,555	\$ 173,555
Greenbush	\$ 29,064	\$ 38,247	\$ 52,142	\$ 52,142
Greenfield		\$ -	\$ -	
Hampden	\$ 174,317	\$ 229,393	\$ 250,646	\$ 250,646
Hermon	\$ 83,789	\$ 110,262	\$ 195,462	\$ 195,462
Holden	\$ 63,001	\$ 82,906	\$ 110,803	\$ 110,803
Howland	\$ 28,330	\$ 37,281	\$ 48,051	\$ 48,051
Hudson	\$ 56,452	\$ 74,288	\$ 52,939	\$ 74,288
Kenduskeag	\$ 26,162	\$ 34,428	\$ 43,597	\$ 43,597
Kingman		\$ -	\$ 7,351	\$ 7,351

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Lagrange	\$ 11,936	\$ 15,707	\$ 26,035	\$ 26,035
Lakeville	\$ 5,764	\$ 7,585	\$ 2,136	\$ 7,585
Lee	\$ 17,886	\$ 23,537	\$ 30,960	\$ 30,960
Levant	\$ 56,872	\$ 74,841	\$ 97,731	\$ 97,731
Lincoln	\$ 57,142	\$ 75,196	\$ 191,913	\$ 191,913
Lowell	\$ 6,225	\$ 8,192	\$ 11,261	\$ 11,261
Mattawamkeag	\$ 16,423	\$ 21,612	\$ 29,801	\$ 29,801
Maxfield	\$ 21,801	\$ 28,689	\$ 3,150	\$ 28,689
Medway	\$ 11,286	\$ 14,852	\$ 52,287	\$ 52,287
Milford	\$ 67,467	\$ 88,783	\$ 112,903	\$ 112,903
Millinocket	\$ 39,940	\$ 52,559	\$ 176,234	\$ 176,234
Mount Chase	\$ 6,619	\$ 8,710	\$ 8,763	\$ 8,763
Newburgh	\$ 64,432	\$ 84,789	\$ 56,307	\$ 84,789
Newport	\$ 78,629	\$ 103,472	\$ 114,098	\$ 114,098
Old Town	\$ 181,302	\$ 238,585	\$ 278,093	\$ 278,093
Orono	\$ 268,967	\$ 353,947	\$ 347,037	\$ 353,947
Orrington	\$ 109,645	\$ 144,287	\$ 134,955	\$ 144,287
Passadumkeag	\$ 9,152	\$ 12,044	\$ 16,367	\$ 16,367
Patten	\$ 7,875	\$ 10,363	\$ 39,759	\$ 39,759
Penobscot Nation	\$ 34,195	\$ 44,999	\$ 19,409	\$ 44,999
Plymouth	\$ 55,197	\$ 72,637	\$ 48,739	\$ 72,637
Prentiss Plantation		\$ -	\$ 7,459	\$ 7,459
Seboeis Plantation		\$ -	\$ 1,485	\$ 1,485
Springfield	\$ 8,106	\$ 10,667	\$ 13,506	\$ 13,506
Stacyville		\$ -	\$ 13,724	\$ 13,724
Stetson	\$ 16,374	\$ 21,547	\$ 38,890	\$ 38,890
Veazie	\$ 78,857	\$ 103,772	\$ 70,827	\$ 103,772
Webster Plantation		\$ -	\$ 2,824	\$ 2,824
Winn	\$ 5,319	\$ 7,000	\$ 15,281	\$ 15,281
Woodville		\$ -	\$ 14,267	\$ 14,267
MSAD #48	\$ 31,002	\$ 40,797	\$ -	\$ 40,797
Acadia Hospital	\$ 5,150	\$ 6,777	\$ -	\$ 6,777
Eastern ME Med Ctr	\$ 145,912	\$ 192,013	\$ -	\$ 192,013
Manna Inc	\$ 17,104	\$ 22,508	\$ -	\$ 22,508
Community Hlth & Cl	\$ 9,511	\$ 12,516	\$ -	\$ 12,516
Brewer Hse Auth	\$ 31,559	\$ 41,530	\$ -	\$ 41,530
Hope Hse Inc	\$ 1,915	\$ 2,520	\$ -	\$ 2,520
Penob Christ. Schl	\$ 132	\$ 174	\$ -	\$ 174
Union #34	\$ 6,812	\$ 8,964	\$ -	\$ 8,964
MSAD # 30	\$ 1,541	\$ 2,028	\$ -	\$ 2,028
Union #91	\$ 7,349	\$ 9,671	\$ -	\$ 9,671
Lee Academy	\$ 2,677	\$ 3,523	\$ -	\$ 3,523
MSAD #22	\$ 39,291	\$ 51,705	\$ -	\$ 51,705
MSAD #46	\$ 4,321	\$ 5,686	\$ -	\$ 5,686
N Penob Tech R3	\$ 515	\$ 678	\$ -	\$ 678
MSAD #38	\$ 5,535	\$ 7,284	\$ -	\$ 7,284
MSAD #23	\$ 5,773	\$ 7,597	\$ -	\$ 7,597
MSAD #31	\$ 5,774	\$ 7,598	\$ -	\$ 7,598
Union #90	\$ 19,563	\$ 25,744	\$ -	\$ 25,744
MSAD #63	\$ 1,628	\$ 2,142	\$ -	\$ 2,142

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Brewer Sch Dept	\$ 2,091	\$ 2,752	\$ -	\$ 2,752
Bangor Water Dist	\$ 35,663	\$ 46,931	\$ -	\$ 46,931
MSAD #25	\$ 5,874	\$ 7,730	\$ -	\$ 7,730
MSAD #67	\$ 3,197	\$ 4,207	\$ -	\$ 4,207
Old Town Water Dist	\$ 7,175	\$ 9,442	\$ -	\$ 9,442
Bangor Hse Auth	\$ 9,616	\$ 12,654	\$ -	\$ 12,654
Bangor Childrens Home	\$ 1,068	\$ 1,405	\$ -	\$ 1,405
Old Town Hse Auth	\$ 3,667	\$ 4,826	\$ -	\$ 4,826
Pt Nat Hlth Dept	\$ 39,442	\$ 51,904	\$ -	\$ 51,904
Totals	\$ 4,111,090	\$ 5,409,993	\$	\$ 6,516,404

The following table depicts potential severe winter storm loss based on the worst storm event (1998) in recent history for Penobscot County. The actual loss figures from 1998 were adjusted by the inflation rate from 1998 to 2014 (the 2015 figure is not yet available) to create a loss amount in 2014 dollars. The 2014 dollar amount for the entire loss in Penobscot County was then divided by the total population of Penobscot County to determine an estimated loss per capita. Then the 2014 Adjusted Loss column and the Estimated Per Capita loss were compared and the greater of the two numbers was utilized to determine the Greatest Potential Loss.

	1998 Ice Storm Actual Loss	2014 Adjusted Loss	Estimated Loss Per Capita	Greatest Potential Loss
PENOBSCOT CTY	\$63,467	\$92,179	\$31,458.29	\$92,179
Alton	\$17,838	\$25,908	\$34,522.67	\$34,523
Argyle		\$0	\$10,744.69	\$10,745
Bangor	\$966,845	\$1,404,246	\$1,281,566.68	\$1,281,567
Bradford	\$19,878	\$28,871	\$50,038.47	\$50,038
Bradley	\$9,199	\$13,361	\$57,873.95	\$57,874
Brewer	\$233,705	\$339,433	\$367,802.15	\$367,802
Burlington	\$20,519	\$29,802	\$14,080.59	\$29,802
Carmel	\$92,171	\$133,869	\$108,377.90	\$133,869
Carroll Plantation	\$2,858	\$4,151	\$5,934.80	\$5,935
Charleston	\$45,066	\$65,454	\$54,654.42	\$65,454
Chester	\$17,055	\$24,771	\$21,179.07	\$24,771
Clifton	\$6,224	\$9,040	\$35,725.14	\$35,725
Corinna	\$43,249	\$62,815	\$85,259.35	\$85,259
Corinth	\$39,520	\$57,399	\$111,636.21	\$111,636
Dexter	\$42,012	\$61,018	\$151,085.15	\$151,085
Dixmont	\$138,472	\$201,117	\$45,810.41	\$45,810

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Drew Plantation	\$4,436	\$6,443	\$1,784.32	\$6,443
East Millinocket	\$35,993	\$52,276	\$66,834.33	\$66,834
Eddington	\$21,536	\$31,279	\$86,306.66	\$86,307
Enfield	\$20,524	\$29,809	\$62,334.75	\$62,335
Etna	\$29,281	\$42,528	\$48,331.73	\$48,332
Exeter	\$23,751	\$34,496	\$42,358.15	\$42,358
Garland	\$28,121	\$40,843	\$42,862.41	\$42,862
Glenburn	\$39,987	\$58,077	\$178,199.02	\$178,199
Greenbush	\$29,064	\$42,213	\$57,835.16	\$57,835
Greenfield		\$0	\$38.79	\$38.79
Hampden	\$174,317	\$253,178	\$281,495.49	\$281,495
Hermon	\$83,789	\$121,695	\$210,084.00	\$210,084
Holden	\$63,001	\$91,503	\$119,316.54	\$119,317
Howland	\$28,330	\$41,146	\$48,137.78	\$48,138
Hudson	\$56,452	\$81,991	\$59,580.69	\$81,991
Kenduskeag	\$26,162	\$37,998	\$52,288.26	\$52,288
Kingman		\$0	\$6,749.38	\$6,749
Lagrange	\$11,936	\$17,336	\$207.10	\$17,336
Lakeville	\$5,764	\$8,372	\$4,072.90	\$8,372
Lee	\$17,886	\$25,978	\$35,763.93	\$35,764
Levant	\$56,872	\$82,601	\$110,588.90	\$110,589
Lincoln	\$57,142	\$82,993	\$197,244.67	\$197,245
Lowell	\$6,225	\$9,041	\$13,886.65	\$13,887
Mattawamkeag	\$16,423	\$23,853	\$26,648.39	\$26,648
Maxfield	\$21,801	\$31,664	\$3,762.58	\$31,664
Medway	\$11,286	\$16,392	\$52,327.05	\$52,327
Milford	\$67,467	\$97,989	\$119,083.80	\$119,084
Millinocket	\$39,940	\$58,009	\$174,785.54	\$174,786
Mount Chase	\$6,619	\$9,613	\$7,796.69	\$9,613
Newburgh	\$64,432	\$93,581	\$60,162.53	\$93,581
Newport	\$78,629	\$114,201	\$127,035.65	\$127,036
Old Town	\$181,302	\$263,323	\$304,109.77	\$304,110
Orono	\$268,967	\$390,648	\$401,936.92	\$401,937

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Orrington	\$109,645	\$159,248	\$144,801.25	\$159,248
Passadumkeag	\$9,152	\$13,292	\$14,507.28	\$14,507
Patten	\$7,875	\$11,438	\$39,448.93	\$39,449
Penobscot Nation	\$34,195	\$49,665	\$23,661.60	\$49,665
Plymouth	\$55,197	\$80,168	\$53,529.53	\$80,168
Prentiss Plantation		\$0	\$8,300.96	\$8,301
Seboeis Plantation		\$0	\$1,357.63	\$1,358
Springfield	\$8,106	\$11,773	\$15,864.91	\$15,865
Stacyville		\$0	\$15,360.65	\$15,361
Stetson	\$16,374	\$23,782	\$46,624.99	\$46,625
Veazie	\$78,857	\$114,532	\$74,437.07	\$114,532
Webster Plantation		\$0	\$3,297.11	\$3,297
Winn	\$5,319	\$7,725	\$15,787.33	\$15,787
Woodville		\$0	\$9,619.80	\$9,620
MSAD #48	\$31,002	\$45,027	\$ -	\$45,027
Acadia Hospital	\$5,150	\$7,480	\$ -	\$7,480
Eastern ME Med Ctr	\$145,912	\$211,923	\$ -	\$211,923
Manna Inc	\$17,104	\$24,842	\$ -	\$24,842
Community Hlth & Cl	\$9,511	\$13,814	\$ -	\$13,814
Brewer Hse Auth	\$31,559	\$45,836	\$ -	\$45,836
Hope Hse Inc	\$1,915	\$2,781	\$ -	\$2,781
Penob Christ. Schl	\$132	\$192	\$ -	\$192
Union #34	\$6,812	\$9,894	\$ -	\$9,894
MSAD # 30	\$1,541	\$2,238	\$ -	\$2,238
Union #91	\$7,349	\$10,674	\$ -	\$10,674
Lee Academy	\$2,677	\$3,888	\$ -	\$3,888

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MSAD #22	\$39,291	\$57,066	\$ -	\$57,066
MSAD #46	\$4,321	\$6,276	\$ -	\$6,276
N Penob Tech R3	\$515	\$748	\$ -	\$748
MSAD #38	\$5,535	\$8,039	\$ -	\$8,039
MSAD #23	\$5,773	\$8,385	\$ -	\$8,385
MSAD #31	\$5,774	\$8,386	\$ -	\$8,386
Union #90	\$19,563	\$28,413	\$ -	\$28,413
MSAD #63	\$1,628	\$2,365	\$ -	\$2,365
Brewer Sch Dept	\$2,091	\$3,037	\$ -	\$3,037
Bangor Water Dist	\$35,663	\$51,797	\$ -	\$51,797
MSAD #25	\$5,874	\$8,531	\$ -	\$8,531
MSAD #67	\$3,197	\$4,643	\$ -	\$4,643
Old Town Water Dist	\$7,175	\$10,421	\$ -	\$10,421
Bangor Hse Auth	\$9,616	\$13,966	\$ -	\$13,966
Bangor Childrens Home	\$1,068	\$1,551	\$ -	\$1,551
Old Town Hse Auth	\$3,667	\$5,326	\$ -	\$5,326
Pt Nat Hlth Dept	\$39,442	\$57,286	\$ -	\$57,286
Totals	\$4,111,090	\$5,970,947	\$	\$6,928,265

WILDFIRE

The primary damage losses that are expected in Penobscot County during any wildfire event would be destruction of single family residential structures and loss of forest resources. In calculating the damage costs, it was assumed all homes located in the Wildland/Urban Interface would be destroyed in a worst-case scenario. To figure the percentage of homes potentially affected by wildfire, percentages were assigned to the community based on community size, land cover and the total number of fires in the last

Section IV-Risk Assessment

twelve years. Approximately seventy-five percent of Penobscot County is forested, indicating that the county is very rural with moderate land cover.

The total number of housing units 71,534 in Penobscot County (including unorganized territory) was used as a base number to estimate potential losses. Since 75.08 percent of the County is forested; the total housing units were multiplied by 75.08 percent represents an estimated 53,707 housing units. Using the table below to determine the extent of damages to those 53,707 housing units assuming a worst-case scenario, 53,707 was multiplied by 85 percent indicated a total number of 45,651 housing units potentially being destroyed by wildfire. This number was then multiplied by the county's median housing value of \$102,065.

Community Size		Land Cover		Number of Fires from 1995-2003	
Very Rural	+25%	High(75+%)	+25%	Over 30	+35%
Semi-Rural	+10%	Mod (60-75%)	+15%	20-29	+25%
Sub Urban	+5%	Low (>60%)	+10%	10-19	+15%
				1-9	+5%

PENOBSCOT COUNTY POTENTIAL LOSSES FROM WILDFIRE					
	Critical Facility	Percentage of County In Urban Interface	Function Lost	Level of Damage	Damage Costs
Penobscot County	Homes	75.08	Residential	85%	\$4,659,369,315

The table on the following pages displays the damages caused by wildfire potential in each community. Following the same method of calculation as above, each community's potential vulnerability is established and financial losses estimated due to a catastrophic wildfire event in the community.

Municipality	Percentage of Municipality in Wild Land Urban Interface	Number of Homes in Community	Function Lost	Number of Homes in Urban Interface	Level of Des.	Number of Homes Lost	Median Home Cost	Total Financial Loss due to Catastrophic Fire in \$
Alton	60.91	309	Residential	188	45	85	96030	8,162,550
Argyle	85	95	Residential	81	65	52	70000	3,640,000
Bangor	41.68	13713	Residential	5716	50	2858	139200	397,833,600
Bradford	77.57	434	Residential	337	55	185	102070	18,882,950
Bradley	65.22	514	Residential	335	55	184	104840	19,290,560
Brewer	53.3	3844	Residential	2049	50	1024	150380	153,989,120
Burlington	82.56	142	Residential	117	65	76	74650	5,673,400
Carmel	72.36	932	Residential	674	65	438	126220	55,284,360

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Carroll Plantation	86.62	54	Residential	47	55	26	51700	1,344,200
Charleston	100	431	Residential	431	55	237	101970	24,166,890
Chester	100	205	Residential	205	55	113	99890	11,287,570
Clifton	84.66	308	Residential	261	50	130	109590	14,246,700
Corinna	60	842	Residential	505	40	202	105630	21,337,260
Corinth	62.53	959	Residential	600	40	240	104640	25,113,600
Dexter	66.32	1615	Residential	1071	30	321	91080	29,236,680
Dixmont	76.51	411	Residential	314	55	173	119690	20,706,370
Drew Plantation	66.31	119	Residential	79	55	43	63300	2,721,900
East Millinocket	71.84	780	Residential	560	30	168	71780	12,059,040
Eddington	74.16	820	Residential	608	55	334	149650	49,983,100
Enfield	70	612	Residential	428	55	236	99690	23,526,840
Etna	66.47	392	Residential	261	75	195	105340	20,541,300
Exeter	70.2	389	Residential	273	45	123	100290	12,335,670
Garland	66.43	379	Residential	252	45	113	90680	10,246,840
Glenburn	74.72	1479	Residential	1105	50	553	116130	64,219,890
Greenbush	68.55	520	Residential	356	55	196	84150	16,493,400
Hampden	72.49	2433	Residential	1764	55	970	171920	166,762,400
Hermon	66.34	1666	Residential	1105	45	497	131670	65,439,990
Holden	53.03	1153	Residential	611	60	367	155430	57,042,810
Howland	65	559	Residential	363	40	145	92470	13,408,150
Hudson	75.03	508	Residential	381	55	210	106230	22,308,300
Kenduskeag	60.03	470	Residential	282	55	155	100980	15,651,900
Lakeville	67.39	85	Residential	57	55	32	103060	3,297,920
Lagrange	73.03	286	Residential	209	55	115	84940	9,768,100
Lee	70.67	299	Residential	211	75	158	93260	14,735,080
Levant	77.76	784	Residential	610	45	274	166410	45,596,340
Lincoln	67.73	2108	Residential	1428	70	999	100070	99,969,930
Lowell	77.26	123	Residential	95	65	62	99690	6,180,780
Mattawamkeag	75.86	340	Residential	258	65	168	73260	12,307,680
Medway	83.28	587	Residential	489	55	269	72070	19,386,830
Milford	35	1180	Residential	413	35	145	124990	18,123,550
Millinocket	83.89	2295	Residential	1925	40	770	66330	51,074,100
Mount Chase	56.79	105	Residential	60	55	33	83060	2,740,980
Newburgh	67.99	557	Residential	379	55	208	127710	26,563,680
Newport	45	1269	Residential	571	35	200	130690	26,138,000
Old Town	75.32	3425	Residential	2580	30	774	110390	85,441,860
Orono	50.7	2691	Residential	1364	40	546	164450	89,789,700
Orrington	50.03	1394	Residential	697	60	418	179570	75,060,260
Passadumkeag	52.64	174	Residential	92	40	37	97320	3,600,840
Patten	68.57	468	Residential	321	65	209	83060	17,359,540
Penobscot Nation	49.44	215	Residential	106	40	43	66800	2,872,400
Plymouth	83.37	469	Residential	391	75	293	104840	30,718,120
Prentiss Plantation	66.18	87	Residential	58	55	32	38300	1,225,600
Springfield	60.08	150	Residential	90	55	50	71580	3,579,000

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Stacyville	100	161	Residential	161	85	137	67720	9,277,640
Stetson	77.32	383	Residential	296	65	192	102370	19,655,040
Veazie	82.37	722	Residential	595	35	208	125730	26,151,840
Winn	83.98	172	Residential	144	65	94	74050	6,960,700
Woodville	67.03	99	Residential	66	45	30	96320	2,889,600

The total number of housing units according to the Census, Community Facts, 2009-2013 American Community Survey 5 year estimates was 73,805 in Penobscot County (including unorganized territory) was used as a base number to estimate potential losses. Since 75.08 percent of the County is forested; the total housing units were multiplied by 75.08 percent represents an estimated 55,412 housing units. Using the table below to determine the extent of damages to those 55,412 housing units assuming a worst-case scenario 55,412 was multiplied by 85 percent indicated a total number of 47,100 housing units potentially being destroyed by wildfire. This number was then multiplied by the county's median housing value of \$137,700.

PENOBSCOT COUNTY POTENTIAL LOSSES FROM WILDFIRE					
	Critical Facility	Percentage of County In Urban Interface	Function Lost	Level of Damage	Damage Costs
Penobscot County	Homes	75.08	Residential	85%	\$6,485,670,000

Municipality	Percentage of Municipality in Wild Land Urban Interface	Number of Homes in Community 2010 Census	Function Lost	Number of Homes in Urban Interface	Level of Des.	Number of Homes Lost	Total Financial Loss due to Catastrophic Fire in \$
Alton	60.91	385	Residential	235	45	106	14,531,009
Argyle	85	146	Residential	124	65	81	11,107,571
Bangor	41.68	15,674	Residential	6533	50	3266	449,791,762
Bradford	77.57	583	Residential	452	55	249	34,249,874
Bradley	65.22	719	Residential	469	55	258	35,514,550
Brewer	53.3	4,457	Residential	2376	50	1188	163,558,752
Burlington	82.56	410	Residential	338	65	220	30,297,084
Carmel	72.36	1,182	Residential	855	65	556	76,553,197
Carroll Plantation	86.62	138	Residential	120	55	66	9,053,029
Charleston	100	546	Residential	546	55	300	41,351,310
Chester	100	266	Residential	266	55	146	20,145,510
Clifton	84.66	468	Residential	396	50	198	27,278,976

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Corinna	60	1,075	Residential	645	40	258	35,526,600
Corinth	62.53	1,233	Residential	771	40	308	42,466,399
Dexter	66.32	2,141	Residential	1420	30	426	58,656,532
Dixmont	76.51	557	Residential	426	55	234	32,275,281
Drew Plantation	66.31	36	Residential	24	55	13	1,807,916
East Millinocket	71.84	871	Residential	626	30	188	25,848,758
Eddington	74.16	1,037	Residential	769	55	423	58,243,184
Enfield	70	937	Residential	656	55	361	49,674,587
Etna	66.47	559	Residential	372	75	279	38,373,613
Exeter	70.2	491	Residential	345	45	155	21,358,220
Garland	66.43	552	Residential	367	45	165	22,722,169
Glenburn	74.72	2,018	Residential	1508	50	754	103,815,445
Greenbush	68.55	725	Residential	497	55	273	37,639,348
Hampden	72.49	3,030	Residential	2196	55	1208	166,347,914
Hermon	66.34	2,210	Residential	1466	45	660	90,847,754
Holden	53.03	1,480	Residential	785	60	471	64,843,811
Howland	65	639	Residential	415	40	166	22,877,478
Hudson	75.03	786	Residential	590	55	324	44,663,641
Kenduskeag	60.03	600	Residential	360	55	198	27,278,232
Lakeville	67.39	453	Residential	305	55	168	23,120,131
Lagrange	73.03	380	Residential	278	55	153	21,017,523
Lee	70.67	546	Residential	386	75	289	39,849,506
Levant	77.76	1146	Residential	891	45	401	55,218,846
Lincoln	67.73	2866	Residential	1941	70	1359	187,106,658
Lowell	77.26	315	Residential	243	65	158	21,782,742
Mattawamkeag	75.86	407	Residential	309	65	201	27,634,687
Medway	83.28	658	Residential	548	55	301	41,501,447
Milford	35	1385	Residential	485	35	170	23,362,526
Millinocket	83.89	2586	Residential	2169	40	868	119,490,299
Mount Chase	56.79	297	Residential	169	55	93	12,773,942
Newburgh	67.99	659	Residential	448	55	246	33,933,377
Newport	45	1,766	Residential	795	35	278	38,300,567
Old Town	75.32	3,665	Residential	2760	30	828	114,035,346
Orono	50.7	3,089	Residential	1566	40	626	86,262,055
Orrington	50.03	1,612	Residential	806	60	484	66,631,675
Passadumkeag	52.64	197	Residential	104	40	41	5,711,840
Patten	68.57	565	Residential	387	65	252	34,676,072

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Penobscot Nation	49.44	266	Residential	132	40	53	7,243,593
Plymouth	83.37	615	Residential	513	75	385	52,951,726
Prentiss Plantation	66.18	185	Residential	122	55	67	9,272,463
Springfield	60.08	281	Residential	169	55	93	12,785,946
Stacyville	100	224	Residential	224	85	190	26,218,080
Stetson	77.32	621	Residential	480	65	312	42,976,470
Veazie	82.37	884	Residential	728	35	255	35,093,228
Winn	83.98	210	Residential	176	65	115	15,784,923
Woodville	67.03	137	Residential	92	45	41	5,690,314

SEVERE SUMMER STORMS (THUNDERSTORMS, LIGHTNING AND HAIL):

Damages caused by lightning strikes are limited to the extent of the storm. The major damages caused by lightning are wild fires and the potential dollar losses are addressed in the form of wildfires within this section.

Hail storms can cause damage to automobiles, homes, and business structures, in addition to destroying crops, and damages livestock. The extent of damages caused during this event is measurable only to the quantity of automobiles, people, and structures within the county or municipality as a whole. A fiscal analysis of damages caused by hail storms was not developed due to the increasingly variable detail needed as to the location, extent, and duration of such an event that could not be established.

ASSESSING VULNERABILITY – ANALYSING DEVELOPMENT TRENDS

11. Assessing Vulnerability: Analyzing Development Trends	
Requirement §201.6(c)(2)(ii)(C): The plan should describe vulnerability in terms of providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use descriptions.	
Element	A. Does the new or updated plan describe land uses and development trends?

Although our region has not experienced the housing crash that has occurred across the country and in larger urban areas in southern Maine, we have been impacted economically in this recession. Future development within the municipalities and unorganized territory within Penobscot County remain difficult to predict and project in a county that is very diverse.

Population Comparisons

Source: State Planning Office and the 2000 US Census

The following table shows the majority of communities in the southern portion of the county saw an increase in population from 2000 to 2010 while northern communities generally saw a decline within the same period.

Community	2000 Census	2010 Census	% Change
Alton	816	890	8.31%
Argyle	253	277	8.66%
Bangor	31,473	33,039	4.74%
Bradford	1,186	1,290	8.06%
Bradley	1,242	1,492	16.76%
Brewer	8,987	9,482	5.22%
Burlington	351	383	8.36%
Carmel	2,416	2,794	13.53%
Carroll Plantation	144	153	5.88%
Charleston	1,397	1,409	0.85%
Chester	525	546	3.85%
Clifton	743	921	19.33%
Corinna	2,145	2,198	2.41%
Corinth	2,511	2,878	12.75%
Dexter	3,890	3,895	0.13%
Dixmont	1,065	1,181	9.82%
Drew Plantation	57	46	-23.91%
East Central Penobscot UT	324	343	5.54%
East Millinocket	1,828	1,723	-6.09%
Eddington	2,052	2,225	7.78%
Enfield	1,616	1,607	-0.56%
Etna	1,012	1,246	18.78%
Exeter	997	1092	8.70%
Garland	990	1105	10.41%
Glenburn	3,964	4,594	13.71%
Greenbush	1,421	1,491	4.69%

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Hampden	6,327	7,257	12.82%
Hermon	4,437	5,416	18.08%
Holden	2,827	3,076	8.09%
Howland	1,362	1,241	-9.75%
Hudson	1,393	1,536	9.31%
Kenduskeag	1,171	1,348	13.13%
Kingman	213	174	-22.41%
Lagrange	747	708	-5.51%
Lakeville	63	105	40.00%
Lee	845	922	8.35%
Levant	2,171	2,851	23.85%
Lincoln	5,221	5,085	-2.67%
Lowell	291	358	18.72%
Mattawamkeag	825	687	-20.09%
Maxfield	87	97	10.31%
Medway	1,489	1,349	-10.38%
Milford	2,950	3,070	3.91%
Millinocket	5,203	4,506	-15.47%
Mount Chase	247	201	-22.89%
Newburgh	1,394	1,551	10.12%
Newport	3,017	3,275	7.88%
Old Town	8,130	7,840	-3.70%
Orono	9,112	10,362	12.06%
Orrington	3,526	3,733	5.55%
Passadumkeag	441	374	-17.91%
Patten	1,111	1,017	-9.24%
Penobscot Nation Reservation	562	610	7.87%
Plymouth	1,257	1,380	8.91%
Prentiss Plantation	214	214	0.00%
Seboeis Plantation	41	35	-17.14%
Springfield	379	409	7.33%
Stacyville	405	396	-2.27%
Stetson	981	1,202	18.39%
Veazie	1,744	1,919	9.12%

Webster Plantation	82	85	3.53%
Winn	420	407	-3.19%
Woodville	286	248	-15.32%

The following land use development analysis is based on the 2000 and 2010 Census and estimates for 2014:

The City of Bangor, Penobscot County’s largest city, shows a 1.5% population decline based on 2014 population estimates when compared to 2010 Census numbers. However the smaller urban communities surrounding Bangor such as Glenburn, Hampden, and Hermon, are showing population growth within this same period (1%, 2% and 6.4% respectively). When Census data for building permits (homes) are compared, Bangor showed 31 permits in 2010 which dropped to only 13 in 2014 further indicating a decline within the largest city. The building permit data for Hermon shows 34 housing permits for 2010 and 38 in 2014.

As a general statement, communities located in Northern Penobscot County are showing a decline in population when the 2014 estimates are compared. This information follows expectations since there have been so many industrial facilities closing thus forcing families to move to more urban areas for employment. For example, East Millinocket’s population in 2000 was 1,828 which declined to 1,688 in the 2014 estimates. One of the County’s northern most communities, Patten had 1,111 residents in 2000; 1,017 in 2010 and the estimates for 2014 indicate only 1,002 people. However, the number of housing units in these northern communities are not always seeing a similar decline. Many individuals are acquiring homes to use seasonally or are building seasonal units for vacation purposes. For example, while the Town of Lincoln shows a 3% population decline between 2000 and 2014, their number of housing units has increased by almost 8%.

The larger communities in the county have completed comprehensive plans and land use ordinances with designated growth areas with the intent of directing growth into the most appropriate areas. The State of Maine also recently passed legislation and as of 2012 communities with a population of 4,000 or more must enforce the state’s building codes.

Smaller, rural communities rarely have extensive land controls and rely on state laws (such as shoreland zoning and subdivision regulations) to guide their development. All but 7 of the county’s organized communities participate in the National Flood Insurance Program. Additionally, the state’s shoreland zoning law restricts development adjacent to water bodies which helps to minimize the impacts of flooding on new residential structures.

Overall, due to economic decline within the area, Penobscot County has experience minimal change since the prior plan.

MULTI-JURISDICTIONAL RISK ASSESSMENT

12. Multi-Jurisdictional Risk Assessment	
Requirement §201.6(c)(2)(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.	
Element	A. Does the new or updated plan include a risk assessment for each participating jurisdiction as needed to reflect unique or varied risks?

Penobscot County is a large, diverse area consisting of 60 organized communities and unorganized territory with a total land mass of about 3,345 square miles. About 75% of the county is forested and the urban area represents about 2% of the land area.

Based on the 2010 Census, Penobscot County’s density was about 43 people per square mile and 20 housing units per square mile.

The Hazard Mitigation Committee used the vulnerability matrix as well as historical data to determine that the greatest risk within the county is flooding, followed by severe winter storms, severe summer storms and wildfire. See risk section table under “Hazard Summary by Jurisdiction”.

Due primarily to the Penobscot River, flooding impacts a majority of the county. Although some communities do not abut the river, they still are a part of the watershed and are impacted.

Severe winter and summer storms have the ability to affect every community to varying extents depending upon the exact track of the storm. These storms cause major damages and inconveniences to the people throughout the county.

Wildfires are primarily dangerous only for the “fringe” of the urban areas; but could be devastating to a rural community that is surrounded by forested acreage.

Each community may not be directly affected by the results of flooding, or winter or summer storms, or a wildfire, but the connection between each community and how they rely on each other is so great that any damages in one community can cause a ripple effect within is surrounding communities.

PENOBSCOT COUNTY MAPS

MUNICIPAL CRITICAL FACILITY BASE MAPS

MITIGATION STRATEGY

Section V-Mitigation Strategy identifies potential programs, services, and projects that provide a comprehensive approach to mitigating the vulnerability within the town. Below is a list of the five (5) different subsections within this section:

- HAZARD MITIGATION GOALS
- OBJECTIVE IDENTIFICATION AND ANALYSIS OF MITIGATION ACTIONS.
- PRIORITIZATION OF MITIGATION ACTIONS
- IMPLEMENTATION OF MITIGATION MEASURES
- MULITI-JURISDICTIONAL MITIGATION ACTIONS

Within these subsections, detailed descriptions of potential projects and programs are identified and prioritized. These projects are identified through local analysis of vulnerability and exposure to each hazard. Prioritizing each project is done according to the projects ultimate cost to benefit ratio and other controlling factors to the town. After establishing the projects and their value to the community, the procedural process of implementing these projects is necessary. By establishing a priority of completion and responsible parties for implementation, the Hazard Mitigation Committee has developed some accountability standards for each program. Each procedure and/or policy that the Committee created within this plan is given a timeline and estimated dollar amount for completion, in addition to, the specific methods in which they will undertake to complete each identified action.

Projects listed in priority order. Most of the municipalities in Penobscot County identified one or more action items consistent with the County-wide goals and actions and to mitigation hazards at the local level. The jurisdiction, as well as the specific actions they will pursue, are listed in priority order in the excel sheet of projects. The time frames shown are based upon the availability of materials and funding.

Criteria for prioritization. The list of local projects was developed separately by each municipality and in consultation with the County. Local officials did not use formal or written criteria to develop and informally prioritize the list of projects. Local knowledge of the benefits that could result from the projects vs. the assumed costs of the projects were factored as well as local knowledge and past occurrences/history

Use of a cost benefit analysis. Since most of Penobscot County communities have tight budget constraints, in virtually all cases involving expenditure of local funds, there will be a very rigorous, line by line analysis of cost effectiveness during the budget review process and public discussion. 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. For purposes of rant applications, however; MEMA and the County EMA have made it clear to local officials that a formal cost benefit analysis will have to be prepared when they apply for mitigation funding.

Project Status. The projects were initially included in the Plan based on an exception that there would be sufficient federal funds to help pay for many of the projects, but this has not been the case. Many municipalities simply do not have the resources to construct these projects using only local funds, and this has been indicated by the phrase “deferred, no funds”. These projects will be further addressed in the next planning cycle.

Timeframe. Some of the projects have been completed, as indicated in the table of projects. Some are newly listed. However, the vast majority of projects are carry-overs from the last plan update, so an approximate time frame has been assigned to each project, subject to the availability of funds which, in most cases, have not been secured as of this writing. The timeframes start when funding becomes available and permitting is completed.

- Immediate- Within 1 year
- Short Term: 3 to 5 years
- Long Term: 10-15 years

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

<i>Mitigation Strategy</i>	
<i>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:</i>	
<ul style="list-style-type: none"> <i>(i) A description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.</i> <i>(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.</i> <i>(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.</i> <i>(iv) For multi-jurisdictional plans, there must be identifiable action items specific to the jurisdiction requesting FEMA approval or credit of the plan.</i> 	
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?
	D3: Was the plan revised to reflect changes in priorities?

Existing Authorities, Policies, Programs and Resources

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

- **Town/City Manager:** If a community has a Manager, the role varies greatly across the County. In many cases, a manager may also have the roles and responsibilities of the road commissioner or EMA director.
- **Staff Resources:** Staff resources, where available, usually consist of a community development director, GIS technician or planner. There are no towns in Penobscot County with staff resources devoted exclusively to hazard mitigation. Very few communities have a municipal engineer.
- **Public Works or Road Commissioner:** Some of the larger communities have a public works director, but most will have a road commissioner. As previously noted, the road commissioner might also be the manager or board of selectmen.
- **Flood Hazard Ordinance:** All of the cities / towns that are in the Flood Insurance Program have a flood hazard ordinance in effect. Further in this section, please find a table titled “Participation in National Flood Insurance Program” for further information on flood insured communities.
- **All of the cities and towns in Penobscot 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 letter “T” indicates town meeting form of government; a “C” indicates a council form of government, and the designation LUPC indicates that the plantations development (i.e. code enforcement and/or planning board) 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.

Existing Authorities, Policies, Programs, and Resources Available to Accomplish Hazard Mitigation							
Municipality	Manager	Planning Staff	Public Works or Road Comm.	EMA Director	Flood Hazard Ordinance	Shoreland Zoning Ordinance	Form of Government
Alton	X		X	X	X	X	T
Argyle			X		X	X	T
Bangor	X	X	X	X	X	X	C
Bradford	X		X	X	X	X	T
Bradley	X		X	X	X	X	T
Brewer	X	X	X	X	X	X	C
Burlington			X	X	X	X	T
Carmel	X		X	X		X	T
Carroll Plantation			X	X	X	X	T & LUPC
Charleston			X			X	T
Chester			X		X	X	T
Clifton			X	X	X	X	T
Corinna	X		X	X	X	X	T
Corinth	X		X	X	X	X	T

Existing Authorities, Policies, Programs, and Resources Available to Accomplish Hazard Mitigation							
Municipality	Town Manager	Planning Staff	Public Works or Road Comm.	EMA Director	Flood Hazard Ordinance	Shoreland Zoning Ordinance	Form of Government
Dexter	X		X	X	X	X	T
Dixmont			X	X	X	X	T
Drew Plantation			X		X	X	T & LUPC
East Millinocket			X	X	X	X	T
Eddington	X		X	X	X	X	T
Edinburg			X		X	X	T
Enfield	X		X	X	X	X	T
Etna			X	X	X	X	T
Exeter	X		X	X		X	T
Garland			X	X	X	X	T
Glenburn	X		X	X	X	X	T
Greenbush	X		X	X	X	X	T
Hampden	X	X	X	X	X	X	C
Hermon	X	X	X	X	X	X	C
Holden	X	X	X	X	X	X	C
Howland	X		X	X	X	X	T
Hudson			X	X	X	X	T
Kenduskeag	X		X	X	X	X	T
Kingman			X	X	X	X	T
Lagrange			X	X		X	T
Lakeville			X		X	X	T & LUPC
Lee			X	X	X	X	T
Levant	X		X	X	X	X	T
Lincoln	X		X	X	X	X	C
Lowell			X	X	X	X	T
Mattawamkeag			X	X	X	X	T
Maxfield			X		X	X	T
Medway			X	X	X	X	T

Milford	X		X	X	X	X	T
Millinocket	X		X	X	X	X	C
Mount Chase			X	X	X	X	T
Newburgh	X		X	X	X	X	T
Newport	X		X	X	X	X	T
Old Town	X		X	X	X	X	C
Orono	X	X	X	X	X	X	C
Orrington	X		X	X	X	X	T
Passadumkeag			X	X	X	X	T
Patten	X		X	X	X	X	T
Plymouth			X	X	X	X	T
Prentiss Plantation			X	X	X	X	T & LUPC
Seboeis Plantation			X		X	X	T & LUPC
Springfield			X	X		X	T
Stacyville			X		X	X	T
Stetson			X	X	X	X	T
Veazie	X		X	X	X	X	T
Webster Plantation			X		X	X	T & LUPC
Winn			X	X	X	X	T
Woodville			X	X	X	X	T
Sovereign Nation							
Penobscot Nation	X			X			
Penobscot County	X		X	X	X		

While Penobscot County EMA does not have any direct authority to implement hazard mitigation projects in the municipalities, it does oversee the preparation of the County Hazard Mitigation Plan and its updates. The County also supports hazard mitigation training, coordinates with local EMA directors and participates in grant application development.

HAZARD MITIGATION GOALS

Penobscot County Hazard Mitigation Committee has developed goals to address each of the identified hazards within the county while addressing the local goal and initiatives of the participating municipalities. These broad goals meet the needs of assessing the vulnerability of the county to the determined hazards. The most important factor in all hazard mitigation is the reduction in human exposure. Whether it is the creation of a program or the renovation or construction of new facilities, human life is of the utmost importance. The Hazard Mitigation Committee developed the following goals to help reduce the vulnerability of the county to damages; both to personal property and human life.

Goal 1. Reduce damage, injury, and loss of life caused by flooding.

Goal 2. Reduce damage, injury, and loss of life caused by winter storms

Goal 3. Reduce damage, injury, and loss of life caused by wild fire.

Goal 4. Reduce damage, injury, and loss of life caused by Severe Summer Storms (Thunderstorms/Lightning/Hail).

IDENTIFICATION AND ANALYSIS OF MITIGATION ACTIONS

Once goals are set, objectives need to be established to accomplish the desired outcome. The Penobscot County Hazard Mitigation Committee has identified general objectives within the developed goals to reduce the effect of each hazard to each community. Each objective has more specific actions, which address the concern raised by the objective. The objective remains that protection of human life and the services that are needs. By developing these actions, the county and its participating municipalities can in turn develop programs to service and address the original goal of mitigating the vulnerability of the county to the hazard.

IMPLEMENTATION OF MITIGATION ACTIONS

FLOOD

Objective 1.1 *To reduce the impact of future loss of life and personal injury caused by flooding, the Penobscot County will:*

Action 1.1.1 Educate residents on the dangers of crossing flooded roadways;
2009 distributed brochures, 2013, 2014, 2015 Interviewed by Media to raise awareness

Action 1.1.2 Educate the public on proper evacuation procedures and routes;
2009 distributed brochures, 2013, 2014, 2015 Interviewed by Media to raise awareness

Action 1.1.3 Educate the public on the dangers of quickly rising waters and flooded river banks;
2009 distributed brochures, 2013, 2014, 2015 Interviewed by Media to raise awareness

Objective 1.2 *To reduce the financial impact of damages to real and personal property caused by flooding, the Penobscot County will:*

Action 1.2.1 Encourage and assist **owners of flood-prone properties** (both existing and proposed) to relocate, elevate, or retrofit their structures and infrastructure;

2009 Grindstone house acquired/demolished, will continue to identify flood prone locations

Action 1.2.2 Notify communities about grant opportunities for assistance with pgrading ditches, culverts, and roadway drainage systems.

2008 Dixmont project completed, will continue to identify problem locations

Action 1.2.3 Provide communities with educational materials for their residents on erosion dangers when overloading of steep riverbanks and roadways occurs.

Deferred- see town projects

Action 1.2.4 Encourage and assist homeowners and businesses in erosion susceptible areas to relocate, elevate, or retrofit their structures.

2009 Relocated Greenbush home away from eroding riverbank

Action 1.2.5 Encourage participation in the flood insurance program, as well as actions needed to ensure continued municipal compliance with flood insurance requirements (adopt and enforce NFIP ordinances).

Will do as part of future risk map process.

Objective 1.3 *To quickly restore use of critical facilities and transportation paths, Penobscot County will:*

Action 1.3.1 Identify and catalogue critical and emergency facilities and transportation paths within the area.

2010-2011 Maps have been made available at Penobscot County Offices, Updated Maps in 2014

Action 1.3.2 Respond to flooding of local streets by notifying the Sheriff's Department and local law enforcement and notify and warn residents of road flooding with public service announcements;

Response action not mitigation-Defer to local level.

WINTER STORMS

Objective 2.1 *To reduce the impact of future loss of life and personal injury caused by severe winter storms, the Penobscot County will:*

Action 2.1.1 Educate residents on the dangers of severe winter storms;

2009 distributed brochures, 2013, 2014, 2015 Interviewed by Media to raise awareness

Action 2.1.2 Encourage residents to make use of emergency shelters; and

2009 distributed brochures, 2013, 2014, 2015 Interviewed by Media to raise awareness

Action 2.1.3 Develop measures to identify and assist special needs and health populations within the community.

In progress-meetings held in 2010 with regional resource emergency coordinator, 2014 meeting with CDC in regards to alternate methods of communications with said populations.

Objective 2.2 *To reduce the financial impact of damages to real and personal property caused by winter storms, the Penobscot County will:*

Action 2.2.1 Educate homeowners to proper preparation for winter storm possibilities.

2009 distributed brochures, 2013, 2014, 2015 Interviewed by Media to raise awareness

Action 2.2.2 Educate homeowners on the importance of homeowners insurance policies to cover damages caused by winter storm events.

Will distribute brochure about potential damages

Objective 2.3 *To maintain a level of safety for its citizens during a winter storm the Penobscot County will:*

Action 2.3.1 Develop emergency shelters to assist the citizens in a time of emergency.

2008 –2010 Developed list of potential shelters in conjunction with the Red Cross. 2011-Will verify that list is still accurate. Link to Red Cross on County EMA website. 2016 Completed shelter assessments for all Penobscot County Red Cross shelters.

Action 2.3.2 Notify communities of funding opportunities for generators at critical facilities, such as the fire station, public works garage, wastewater treatment plant, schools, and emergency shelters to maintain heating and facility functionality.

Deferred- See community projects.

Objective 2.4 *To quickly restore the use of critical facilities and transportation paths during winter storms, the Penobscot County will:*

Action 2.4.1 Encourage the development and maintenance of Emergency Operations Plans, Snow and Ice Removal Plans and other documents that outline priorities and strategies. **Update Emergency Operations Plan annually. Each January jurisdictions are encouraged to provide updated contact information.**

Action 2.4.2 Encourage the development of local mutual aid agreements with local ATV and snowmobile organizations to maintain emergency access to all residents.

2011-information will be requested and included in Emergency Operations plans. 2014 information received from local ATV groups.

WILDFIRE

Objective 3.1 *To reduce the impact of future loss of life and personal injury caused by wildfire, Penobscot County will:*

Action 3.1.1 Develop a warning and evacuation plan and systems for protecting citizens from fast moving forest fires;

Responsibility of Maine Forest Service. Link to Forest Service on County EMA website. Provide fire protection brochure to municipalities and supply additional brochures upon request.

Action 3.1.3 Educate residents about the dangers of forest fires.

In coordination with Maine Forest Service and local fire protection services.

Objective 3.2 *To reduce the financial impact of damages to real and personal property caused by wildfire, Penobscot County will:*

Action 3.2.1 Encourage a key box for local fire departments on all locked gates within each community;

Include as part of municipal Emergency Operation Plans that are updated annually.

Action 3.2.2 Encourage best forest practices that reduce fire danger;

In coordination with Maine Forest Service.

Action 3.2.3 Encourage utilization of Maine Forest Service’s FIREWISE program such as maintaining a green lawn for 30’ around structure;

In coordination with Maine Forest Service

SEVERE SUMMER STORMS (THUNDERSTORMS/LIGHTENING/HAIL)

Objective 4.1 *To reduce the impact of future loss of life and personal injury caused by thunderstorms, lightening and hail, Penobscot County will:*

Action 4.1.1 Educate residents on the dangers of lightening and hail; and the proper procedures during Thunderstorms, lightening or hail events.

In coordination with the National Weather Service and link on County website to local weather service. Penobscot County hosts annual weather spotter talks to educate residents.

PRIORITIZATION OF MITIGATION ACTIONS

Action Plan and Cost Benefits

To determine the validity and usefulness of each mitigation measure, a decision matrix was developed and adapted to fit the needs of the community. Penobscot County Hazard Mitigation Committee used a quantified method from the Florida Department of Community Affairs’ Local Mitigation Strategy Guidebook and the Hazard Mitigation Plan for Hancock County, which was adapted to meet the needs for this plan and purpose of the Penobscot Hazard Mitigation Committee. Population statistics were adapted as well as criteria requirements to meet the goals and objectives of the community.

A full, more elaborate cost benefit analysis for each project would need to be completed before commencing in any major vulnerability project. However, many of the jurisdictions included in this plan are small towns run by part-time elected officials. These towns do not have the staff or funding to prepare a cost benefit analysis for the projects included in this plan. In virtually all cases involving expenditure of local funds for implementation, there will be a rigorous, line-by-line analysis of cost effectiveness during the budget review process and subsequent public discussion. 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.

The analysis used in the development of this plan was based on estimates of cost for each project completed by the committee from a review of previous projects of similar size, scale, and scope. The numbers that were used are a true prediction, not an accurate estimate.

Each mitigation action was placed in the matrix to determine an overall ranking. These rankings were developed through placement of each proposed mitigation action in the best possible category. The sums of the matrix values develop a priority ranking for the action. The higher

the number, the more beneficial the project or program becomes to the community. The results, as well as the matrix can be seen on the following pages.

Section V-Mitigation Strategy

Criteria Category	4	3	2	1	0
Health and Safety Considerations 1	(over 1000) and/or major portions of Community population	Benefit between 500-999 people	Benefit between 100-499 people	Benefit less than 100 people	No anticipated benefit
Estimated Cost of Implementing the Initiative 2	No quantifiable cost	Less than \$10,000	Between \$10,000 and \$100,000	Between \$100,000 and \$1,000,000	Over \$1,000,000
Cost Impact of the Initiative 3	No quantifiable cost impact	Less than \$50,000	\$50,000 to \$100,000	\$100,000 to \$1,000,000	Over \$1,000,000
Benefit to Cost Ratio 4	More than +5.0	+4.0 to +4.9	+3.0 to +3.9	+2.0 to +2.9	+1.0 to +1.9
Probability of Community Acceptance 5	Likely to be endorsed by the entire community	Benefits only those directly affected and not adversely affecting others	Somewhat controversial with special interest groups or small % of community	Strongly opposed by special interest groups or significant % of community	Strongly opposed by most of general population
Probability of Funding 6	Potential funding sources not readily apparent	Only funding source is post-mitigation funds	Funding could be through matching local funds with others	Funding can probably be obtained through local long term budgeting	Funding can probably be obtained through local short term budgeting
Feasibility of Implementation 7	Immediate Within One Year		Short Term Three to Five years		Long Term Ten to Fifteen years

FLOOD

ACTION	1	2	3	4	5	6	7	TOTAL PTS	PRIORITY
1.1.1	4	4	4	4	3	0	4	23	1
1.1.2	4	3	4	4	3	0	4	22	3
1.1.3	4	4	4	4	3	0	4	23	1
1.2.1	4	4	3	3	3	1	4	22	3
1.2.2	2	4	1	0	2	3	0	12	7
1.2.3	4	3	1	1	4	2	2	17	2
1.2.4	2	2	2	1	4	3	2	16	5
1.2.5	2	3	3	1	4	0	2	15	2
1.3.1	4	4	4	2	4	0	4	22	3
1.3.2	4	4	3	3	4	0	1	19	6

WINTER STORMS

ACTION	1	2	3	4	5	6	7	TOTAL PTS	PRIORITY
2.1.1	4	4	3	4	4	1	4	24	1
2.1.2	4	4	4	4	4	0	4	24	1
2.1.3	2	4	3	3	3	1	1	17	4
2.2.1	4	4	3	4	4	2	1	22	3
2.2.2	4	3	2	1	1	3	0	14	7
2.3.1	4	2	2	2	3	2	2	17	4
2.3.2	4	3	2	2	2	2	2	17	4
2.4.1	4	3	3	2	4	4	4	28	1
2.4.2	1	4	4	2	4	4	4	23	2

WILDFIRE

ACTION	1	2	3	4	5	6	7	TOTAL PTS	PRIORITY
3.1.1	4	3	3	2	3	0	4	19	3
3.1.2	2	3	3	1	2	1	2	14	6
3.1.3	4	3	2	2	4	2	2	19	3
3.2.1	1	4	4	2	3	2	2	18	5
3.2.2	4	4	4	4	4	0	4	24	1
3.2.3	4	4	4	4	4	0	1	21	2

Categories

1. Health and Safety Considerations
2. Estimated Cost of Implementing the Initiative
3. Cost Impact of the Initiative
4. Benefit to Cost Ratio
5. Probability of Acceptance
6. Probability of Funding
7. Feasibility of Implementing

THUNDERSTORMS/LIGHTENING/HAIL

ACTION	1	2	3	4	5	6	7	TOTAL PTS	PRIORITY
4.1.1	4	3	1	1	4	2	2	17	2

Categories

1. Health and Safety Considerations
2. Estimated Cost of Implementing the Initiative
3. Cost Impact of the Initiative
4. Benefit to Cost Ratio
5. Probability of Acceptance
6. Probability of Funding
7. Feasibility of Implementing

IMPLEMENTATION AND ADMINISTRATION OF MITIGATION ACTIONS

The Penobscot County Multi-Jurisdictional Hazard Mitigation Plan consists of projects spanning a wide variety of mitigating factors for the most severe of threats to the county and the participating municipalities. Each project is assigned a strategy for implementation, a time frame, and an estimated cost for completion of the project.

Responsible parties are also assigned to each project. The responsible parties are assumed to be the municipal and state department or department head that would oversee the implementation of the particular action and see the project to completion.

It should be noted that in 2008 the Maine legislature passed the Maine Uniform Building and Energy Code (MUBEC) which requires future buildings and retrofits to be constructed to standards.

The MUBEC was **effective June 1, 2010**, with a six-month transition period during which towns would still enforce their previous codes. Among the new rules:

- Towns with a population of 2,000 that had a building code on August 1, 2008 will be required to begin enforcing the code December 1, 2010.
- Towns with a population of 2,000 that did not have a building code on August 1, 2008 will be required to begin enforcing the code December 1, 2012.
- Towns with a population under 2,000 are not required to enforce the code.
- The MUBEC replaces all local municipal building codes. Cities and towns may not amend any MUBEC provisions, even to make it more stringent.
- Enforcement is the responsibility of local jurisdictions. Municipalities without a CEO certified by the State may authorize a Third-party Inspector to conduct compliance inspections and prepare a report to be given to the municipal CEO as an application for the Certificate of Occupancy.

According to the State of Maine Bureau of Building Codes and Standards:

- **As of September 28, 2011**, a change in law that requires municipalities of 4,000 or more in population (formerly 2,000) to enforce the Maine Uniform Building and Energy Code if they HAD a building code in place by August 2008.
- **As of July 1, 2012**, the MUBEC must be enforced in a municipality with a population of 4,000 residents or more that had NOT adopted any building code on or before August 1, 2008.
- Municipalities of up to 4,000 residents may not adopt or enforce a building code other than the Maine Uniform Building Code (MUBC), the Maine Uniform Energy Code (MUEC) or the Maine Uniform Building and Energy Code (MUBEC).
- Municipalities with less than 4,000 residents are not required to enforce MUBEC, MUEC or MUBC unless they wish to do so and have the following Options:
 1. Chose to adopt and enforce the MUBEC as listed above
 2. Choose to adopt and enforce MUBC (the building code without energy code in it)

3. Choose to adopt and enforce MUEC (the energy code only)
4. Choose to have no code

Maine Uniform Building and Energy Code "MUBEC" consists of the following codes:

2009 International Residential Code (IRC)
2009 International Building Code (IBC)
2009 International Existing Building Code (IEBC)
2009 International Energy Conservation Code (IECC)

These new standards are intended to mitigate future building damages during natural hazard events.

On the following pages, you will see a breakdown for each of the selected mitigation actions. This outline provides a general objective and budget outline for completion. Projects listed provide a general functional overview of the ideas for mitigation within the community. Each project would need to be fully developed and finalized before grant, taxation, or any other funding is requested.

Typical funding resources for these types of mitigation actions can be solicited in grant or low interest revolving loan programs within the state, and the local community. These funding sources are, of course, in addition to local funding through taxation and impact fees.

- Community Development Block Grant
- Municipal Capital Improvement Projects
- Land Use Impact Fees
- Municipal Property Taxes
- Private Donations and Grant Programs
- Hazard Mitigation Program Grants (FEMA)
- Homeland Security Grants
- Transportation Capital Improvements (DOT)
- Pre-Disaster Mitigation Grants (FEMA)
- FIRE Grants (FEMA)

MULTI-JURISDICTIONAL MITIGATION ACTIONS

Penobscot County consists of 60 municipalities, 59 of which have elected to participate in this plan, as part of the Multi-jurisdictional planning process as allowable by federal regulations. Although previously the City of Bangor, the Town of Bradley and the Town of Holden had their own Hazard Mitigation plans, they now only participate in the County’s planning process and multi-jurisdictional plan. The Hazard Mitigation Committee has developed mitigating measures to combat the vulnerability of hazards within the county. These mitigating actions are aimed at controlling not the presence of the hazard, but the extent of damages caused by it. The measures that were created earlier in this section are provided to serve as developments within the County’s Emergency Management Office as to raising the awareness of these hazards and to assist the communities in developing goals and action plans that combat not only the county wide hazards, but those that affect the individual community. The actions that will be taken on by the individual jurisdictions are listed in the attached excel spreadsheet. These actions are the intent of the municipality to assist the county and themselves in mitigating these “pre-disasters”. Each community as an obligation to become eligible, has submitted at least one prioritized project for review and consideration. The reason is to obtain funding and analysis to complete the adequate planning and implementation of these projects.

See Projects List at the end of this document.

PARTICIPATION IN NATIONAL FLOOD INSURANCE PROGRAM

According to FEMA’s Community Status Book Report dated 5-4-15 and found on the web at FEMA.gov the following is the status of Penobscot County communities regarding participation in the National Flood Insurance Program.

Name of Municipality	Participating
Alton	Yes
Bangor	Yes
Bradford	Yes
Bradley	Yes
Brewer	Yes
Burlington	Yes
Carmel	No
Carroll	Yes
Charleston	No
Chester	Yes
Clifton	Yes
Corinna	Yes
Corinth	Yes
Dexter	Yes
Dixmont	Yes
Drew	Yes
East Millinocket	Yes
Eddington	Yes
Edinburg	Yes
Enfield	Yes
Etna	Yes
Exeter	No
Garland	Yes
Glenburn	Yes
Greenbush	Yes
Hampden	Yes
Hermon	Yes
Holden	Yes
Howland	Yes
Hudson	Yes
Kenduskeag	Yes
Lagrange	No
Lakeville	Yes
Lee	Yes
Levant	Yes
Lincoln	Yes
Lowell	Yes
Mattawamkeag	Yes
Maxfield	Yes
Medway	Yes
Milford	Yes

Millinocket	Yes
Mount Chase	Yes
Newburgh	Yes
Newport	Yes
Old Town	Yes
Orono	Yes
Orrington	Yes
Passadumkeag	Yes
Patten	Yes
Plymouth	Yes
Seboeis	Yes
Springfield	No
Stacyville	Yes
Stetson	Yes
Veazie	Yes
Webster	Yes
Winn	Yes
Woodville	Not Listed on FEMA Site
Name of Sovereign Nation	
Penobscot Nation	Not Listed on FEMA Site

The Town of Woodville does not participate in the National Flood Insurance Program (NFIP) and does not have a FEMA issued flood map. The Town of Springfield has a locally adopted Floodplain Ordinance but has never submitted information to the NFIP.

Participating Penobscot County Townships within the county’s portion of the Unorganized Territory

Argyle	T3 R1 NBPP
Grand Falls	T3 R7 WELS
Greenfield	T3 R8 WELS
Grindstone	T3 R9 NWP
Herseytown	T4 R7 WELS
Hopkins Academy Grant	T4 R8 WELS
Indian Purchase 3	T5 R1 NBPP
Indian Purchase 4	T5 R7 WELS
Kingman	T5 R8 WELS
Long A	T6 R6 WELS
Mattamiscontis	T6 R7 WELS
Prentiss Plt	T6 R8 WELS
Soldiertown	T7 R6 WELS
Summit	T7 R7 WELS
TA R7 WELS	T7 R8 WELS
T1 R6	T8 R6 WELS
T1 R8	T8 R7 WELS
T2 R8 NWP	T8 R8 WELS
T2 R8 WELS	Veazie Gore TWP
T2 R9 NWP	

All of the Unorganized Territory participates in the National Flood Insurance Program (NFIP).

Actions Related to Continued Compliance with NFIP

Continued participation in NFIP is encouraged as a top priority since the County already has a high rate of participation.

As a second priority, updating of Floodplain Ordinances, as necessary, for continued management within the Floodplain is also encouraged since the ordinance is a prerequisite for NFIP participation.

Although FEMA alone has the authority to implement Flood Insurance Rate Map changes, the communities and the county will identify errors or omissions and recommend needed changes since many of the current NFIP maps are outdated and obsolete.

Additionally, the County will highlight the importance of participation in NFIP and encourage the non-participating towns to adopt Floodplain Ordinances for participation in NFIP.

Jurisdiction	Mitigation Action and Projects	Hazard Mitigated	Est. Cost	Responsibility	Time Frame	Status
Alton	Upgrade ditches and culverts, elevate road for drainage purposes	Flood	\$40,000	Selectmen	3-5 years	Deferred; no funds
Bangor	Install Emergency Generator for Bangor WW Treatment Plan	All	\$2,300,000	Director of WWTP	3-5 years	Deferred; no funds
	Birch Stream Bank Stabilization	Flood	\$100,000	City Engineer	1-3 years	Deferred; no funds
	Remove discontinued culvert on Sylvan Rd spur	Flood	\$75,000	City Engineer and Public Works Director	1-3 years	Completed 2012
	Upgrade Catch Basins and refine monitoring system to provide advance warning	Flood	Varies by specific project (prioritized list developed annually)	City Engineer and Public Works Director	1-3 years	Deferred; no funds
	Upgrade ditches, culverts and roadway drainage systems	Flood	Varies by specific project (prioritized list developed annually)	City Engineer and Public Works Director	1-3 years	Deferred; no funds
	Update and institute Hazard Mitigation Planning program	All	\$25,000	City EMA, City Engineering, CEO, City Mgr. and PW	1-3 years with use of Town Funds	Deferred; no funds
	Refine and update GIS mapping system for application to EMA	All	\$10,000	Dept. of Information Services, Engineering, Planning	Annual support needed to fully implement	Deferred; no funds
	Survey downtown bldgs. impacted by flooding and storm surges	Flood	\$50,000	Engineer and Public Works Director	1-3 years	Deferred; no funds
	Create and develop rural water supply (fire ponds & dry hydrants)	Wildfire	\$25,000	Bangor Fire, ME Forestry Service, City Engineer, Legal Dept. and Public Works	1-3 years	Deferred; no funds

Bangor, Cont'd.	Install beaver control structure to prohibit damage to city trail system	Flood	\$25,000	City Forester, City Engineer and Public Works Director	1-3 years	Deferred; no funds
	Penjawoc Stream bank stabilization (behind Sam's Club, Mt. Ave, Young St, and Meadow Brook Rd.	Flood	\$100,000	City Engineer, Public Works Director	1-3 years	Deferred; no funds
	Stabilization of the 14 th Street storm water discharge outlet	Flood	\$65,000	City Engineer, Public Works Director	1-3 years	Deferred; no funds
	Implement and refine a stormwater and non-point source pollution control program	Flood	\$50,000	City Engineer	1-3 years With the use of Town Funds	Deferred; no funds
Bradford	Installation of Generators within town shelters at town hall and fire department	All	\$50,000	Town manager, Fire Department	1-3 years	Completed 2008 partial grant & town funds
	Upgrades to new fire department building to meet need and use as a shelter	All	\$100,000-\$350,000	Fire Department	5- 10 years	Deferred; no funds
	Replace/resize bridge on Lagrange Rd	Flood	\$45,000	Selectmen	1-3 years	Deferred; no funds
	Middle Road Bridge -Replace/resize	Flood	\$25,000	Selectmen	1-3 years	Deferred; no funds
	Lagrange Rd. -Replace/resize culverts	Flood	\$10,000	Selectmen	1-3 years	Completed 2013
	Sand Salt Shed	All	\$350,000	Selectmen	1-3 years	Completed 2013
Bradley	Acquire/Relocate/Elevate flood prone homes	Flood	Varies by Situation	Town Manager, Town Council	3-5 years	Deferred; no funds
Brewer	Installation of mobile Generators at Brewer Auditorium to maintain proper use as a shelter	All	\$35,000	Brewer City Manager, Fire Chief, Parks and Recreation Director	1-3 years	Completed 2008 Town Funds
	Stabilization of shoreline near and around Waster Pollution Control Facility	Flood and Erosion	\$300,000	Director of Environmental Services, Fire Chief, Department of Environmental Protection	3-5 years	Completed 2014
	Upgrade culvert on Eastern Road 16wide x10ft high 90 feet long	Flood	\$750,000	Public Works Director	3-5 Years	New Project

Burlington	Sibley Rd. Elevate (2) cottages.	Flood	\$30,000	Board of Selectman	1-3 years	Deferred; no funds
Carmel	Fuller Rd. Upsize (2) 48" x 40' culverts	Flood	\$4,000	Road Commissioner	1-3 years	Completed 2008
	Haskel Rd. scouring of bridge abutments	Flood	\$64,840	Road Commissioner	1-3 years	Completed 2008
	Garland Road Bridge improvement	Flood, Erosion	\$100,000	Road Commissioner	3-5 years	Deferred; no funds
Carroll Plantation	Osgood Rd. Ditch 25,000' & add (4) 18" x 32' culverts.	Flood	\$54,000	Board of Selectman	1-3 years	Deferred; no funds
	Lowell Rd culvert resizing & redo where washed out.	Flood	\$3,000	Board of Selectman	1-3 years	Completed 2014
	Ricker Rd-Drainage, ditching for length of rd.	Flood & Erosion	\$10,000	Board of Selectmen	1-3 years	Deferred; no funds
	Oliver Rd - Regrading & ditching, tree removal	Flood & Erosion	\$3,500	Board of Selectmen	1-3 years	Completed 2013
	Danforth Rd – more drainage for 1 mile of road	Flood & Erosion	\$10,000	Board of Selectmen	1-3 years	New Project
	North Rd – Repaving of 2.2 miles of road, replace culverts & drainage.	Flood & Erosion	\$375,000	Board of Selectmen	1-3 years	Completed 2015
	Ditch 1,200' & add (4) 18" x 32' culverts. Brown Rd & reset culverts	Flood	\$21,500	Board of Selectman	1-3 years	Deferred; no funds
Charleston	Bacon Rd., Ditch 10,000' add (3) 48" x 30' culverts	Flood & Erosion	\$30,000	Road Commissioner	1-3 years	Completed
	Harris Rd., Ditch 5,000' elevate 7,500' x 22' x 16" add (4) 24" x 30' culverts.	Flood & Erosion	\$127,000	Road Commissioner	1-3 years	Completed
	Paine Rd.- elevate 1000', ditch, add fabric & 24" culvert	Flood & Erosion	\$25,000	Road Commissioner	1-3 years	Completed
	Replace culverts on Bacon Rd at Crooked Brook	Flood & Erosion	\$100,000	Road Commissioner	3-5 years	Completed
	Monitor roadway drainage systems and study areas of need for upgrades	Flood & Erosion	\$10,000	Road Commisioners	1-3 years	New Project
Chester	Town Boat Landing. Rip rap 3' x 75' add gravel.	Flood	\$25,000	Board of Selectman	1-3 years	Completed 2012
	Covert community center into shelter. Install generator and purchase 30 cots.	All	\$9,000	Board of Selectman	1-3 years	Completed 2012

Chester, Cont'd.	Monitor roadway drainage systems and study areas of need for upgrades	Flood & Erosion	\$10,000	Road Commissioner	1-3 years	New Project
Clifton	Purchase a diesel generator to supply power to fire station/town office when normal power is out	All	\$5,740	Local EMA	3-5 years	Completed 2013
	Create dry hydrants for fire protection around Hopkins pond	Wildfire	\$350,000	Town manager, EMA Director	3-5 years	Deferred; no funds
	Extend Bangor water district lines into community	Wildfire	\$1,500,000	Town manager, EMA Director	5-10 years	Deferred; no funds
	Develop emergency public water source	All	\$100,000	EMA Director	5-10 years	Deferred; no funds
	Create a fire substation for Eddington fire department	All	\$50,000	Eddington Fire Chief	3-5 years	Deferred; no funds
	Create a town or regional shelter for local community use.	All	\$100,000	Town manager, EMA Director	3-5 years	Deferred; no funds
	Create Emergency Operations and hazards plan, training and equipment	All	\$50,000	EMA Director	3-5 years With the use of Town Funds	Deferred; no funds
Corinna	Sunken Bridge Road, upsize, elevate, and pave roadway	Flood	\$85,000	Road Commissioner	1-3 years	Deferred; no funds
Corinth	Covered Bridge Rd. Upsize (2) 36' x 30' culverts.	Flood	\$3,000	Road Commissioner	1-3 years	completed 2013
	Black Rd Upsize 36" x 30' culvert & repave.	Flood	\$2,000	Road Commissioner	1-3 years	completed 2013
	Monitor roadway drainage systems and study areas of need for upgrades	Flood & Erosion	\$10,000	Road Commissioner	1-3 years	New Project
	Hudson Rd. Install Beaver guard.	Flood	\$1,500	Road Commissioner	1-3 years	completed 2013
Dexter	Complete Engineering Assessment of Wassookeag Dam and complete reconstruction and direction of Dam and Holding Pond	Flood	\$250,000	Town Manager, Dept. of Public Works,	1-3 years	Completed 2008
	Upgrades to town storm water drainage system- Monitor and study improvements needed	Flood	\$1,500,000	Town Manager, Dept. of Public Works,	3-5 years	Deferred; no funds
Dixmont	Upgrades and repairs to culverts and elevating Raven Hill Rd in affected	Flood	\$150,000	Selectmen, and DOT	3-5 years	Completed 2008

Dixmont, Cont'd.	flood areas					
	Upgrade Mitchell Rd	Flood	\$32,000	Public Works Director	3-5 years	Completed 2011
	Upgrade Cates Rd	Flood	\$10,000	Public Works Director	5-10 years	Completed 2013
	Upgrade Jewell Rd	Flood	\$10,000	Public Works Director	5-10 years	Completed 2013
	Install beaver deceivers	Flood	\$10,000	Public Works Director	1-3 years	Completed 2013
	Install Generator at Shelter	Winter Storm	\$5000 (Town Funds)	Select Board	3-5 years	Redesigning plan
Drew Plantation	Elevate Andrews Rd & replace culverts	Flood	\$7,000 spent	Selectmen	3-5 years	Partial Complete 2014
	Develop Winter storm educational material	Winter Storm	\$500	Selectmen	1-3 years With the use of Town Funds	Deferred; no funds
East Millinocket	Conduct Public Education on Flooding and wildfires	All	\$1,000	EMA Director, School Dept.	5-10 years Town Funds	Deferred; no funds
	Conduct Stormwater Runoff Education	Flood	\$500	Public Works Director	5-10 years	Deferred; no funds
	Acquire/Relocate/Elevate flood prone homes	Flood	Varies by situation	Town Manager	3-5 years	Deferred; no funds
	Western Ave storm drain system	Flood	\$69,000	Public Works, MDOT	1-3 years	Deferred; no funds
Eddington	Raise level of Rooks Road, improve drainage at David Pond (road flooded in 2005 due to plugged culvert)	Flood	\$100,000	Town Manager	3-5 years	Deferred; no funds
	Design proposed fire station/town office to include use as an emergency shelter for residents	All	\$1,100,000	Fire Chief, Town Manager, Board of Selectmen	3-5 years	Completed 2008
	Purchase a diesel generator to supply power to the fire station/town office when normal power is out	All	\$20,000	Fire Chief, Town Manager, Board of Selectmen	3-5 years With the use of Town	Completed 2013

Eddington, Cont'd.					Funds	
	Provide town office with educational materials to give to residents	All	\$0.00	Fire Chief, Town Manager	1-3 years	Completed 2008
	Replace Davis Rd bridge	Flood	\$100,000	Town Manager	3-5 years	Deferred; no funds
	Construct new fire station at Clewleyville in conjunction w/ Holden	All	\$50,000	Fire Chief	3-5 years	Deferred; no funds
Edinburg	Not participating	N/A	N/A	N/A	N/A	N/A
Enfield	Develop a Stormwater management Plan	Flood	\$1,500	Town manager, Public Works	1-3 years With the use of Town Funds	Deferred; no funds
	Upgrade and increase size of culverts on town roads	Flood	\$40,000	Town manager, Public Works	1-3 years	Deferred; no funds
	Create and provide educational materials to community about dangers of Wildfires	Wildfire	\$500	Town Manager, Fire Department	1-3 years With the use of Town Funds	Deferred; no funds
	Mohawk Rd - Relocate six homes located in flooding area	Flood	\$300,000	Town Manager, Public Works	5-10 years	Deferred; no funds
Etna	Retrofit Town Hall to act as emergency and evacuation shelter	All	\$5,000	Town manager and Selectman	3-5 years	Deferred; no funds
Exeter	Chamberlain Meeting House Rd. Upsize culvert 48" x 50'.	Flood	\$3,500	Road Commissioner	1-3 years	Deferred; no funds
Garland	Elevate and retrofit Garland Pond Dam to elevate the potential flooding dangers in the community	Flood	\$150,000	Board of Selectman	5-10 years	Deferred; no funds
	Complete floodplain study to determine effects of flooding upon community, involving Updating and reevaluating FIRM maps, and surveying community involvement	Flood	\$50,000	Board of Selectman	1-3 years With the use of Town Funds	Deferred; no funds

Garland, Cont'd.	Whiting Road, reconstruct, elevate 50 ft. due to beaver dam	Flood	\$75,000	Road Commissioner	5-10 years	New Project
	Elevate and upgrading culverts to elevate flooding on necessary roads	Flood	\$85,000	Road Commissioner	1-3 years	Deferred; no funds
Glenburn	McCarthy Rd. Upsize (12) culverts 24" x 30'	Flood	\$12,000	Road Commissioner	1-3 years	Completed 2008
	Lake View Rd. Upsize (2) 24" x 30' culverts.	Flood	\$2,000	Road Commissioner	1-3 years	Deferred; no funds
	Maryman Rd. Upsize (3) 24" x 30' culverts.	Flood	\$3,000	Road Commissioner	1-3 years	Completed 2015
	Relocate Twitchell Home located in Eroding area	Erosion	\$50,000	Town manager		Completed 8/2006
Greenbush	Rebuild Olamon Stream Crossing, Stabilize abutments and rebuild bridge	Erosion, Flood	\$4,000	Town manager	1-3 years	Deferred; no funds
	Install Antenna and base radio systems for emergency communications	All	\$5,000	Town manager	3-5 years	Deferred; no funds
	Rebuild and elevate Lower River Road	Flood	\$20,000	Town manager	3-5 years	Deferred; no funds
	Rebuild and elevate Middle River Road; Partially complete, built second access to Rte. 2 for traffic egress in 2006.	Flood	\$20,000	Town manager	3-5 years	Partially completed 2006
	Penobscot River Bank Stabilization Project.	Erosion	\$250,000	Town manager	5-10 years	Deferred; no funds
Hampden	Installation and upgrades to Subsurface drainage system on Paper Mill Road	Flood	\$9,687	Town Manager, Dept. of Public Works and DOT	3-5 years	Completed
	Upgrade culverts and raise roadway along Meadow Road	Flood	\$300,000	Public Works	3-5 years	Deferred; no funds
Hermon	Develop safety plan for Bangor Airport event.	All		Fire Chief	1-3 years with Town funds	Deferred; no funds
	Intersection Bog Rd. Upsize culvert. Needs Engineering.	Flood	\$15,000	Public Works	1-3 years	Completed 2013
	Fuller Rd.-beaver guard	Flooding	\$1,500	Public Works	1-3 years	Completed 2014
	Generator for heat and power to diesel fuel pump	Winter Storm	\$9,000	Public Works	1-3 years	Deferred; no funds

Holden	Construct new fire station	All	\$450,000	Public Safety Director	3-5 years	Completed 2015
	Install new repeater on Chick Hill	All	\$10,000	Public Safety Director	1-3 years	Completed 2012
	Monitor roadway drainage systems and study areas of need for upgrades	Flood & Erosion	\$10,000	Public Works Director	3-5 years	New Project
	Construct new fire station at Clewleyville in conjunction w/ Eddington	All	\$50,000	Public Safety Director	3-5 years	Deferred; no funds
Howland	Develop a Stormwater management Plan	Flood	\$50,000	Town manager, Public Works	1-3 years with Town funds	Deferred; no funds
	Upgrade and increase size of culverts on town roads	Flood	\$60,000	Town manager, Public Works	1-3 years	Deferred; no funds
	Develop Emergency Warming Shelters by purchasing generators for Church and Municipal Building for emergency electricity during hazard conditions	All	\$5,000	Town Manager, Fire Department	3-5 years	Completed 2013
	Create and provide educational materials to community about dangers of Wildfires	Wildfire	\$500	Town Manager, Fire Department	1-3 years with Town funds	Deferred; no funds
Hudson	Hudson Hill Rd. Upsize 48" x 60' & 60" x 60' culverts, repave	Flood	\$9,000	Road Commissioner	1-3 years	Completed 07/2008
	Create and provide educational materials to community about dangers of Wildfires	Wildfire	\$500	Town Manager, Fire Department	1-3 years with Town funds	Deferred; no funds
	Acquire/Relocate/Elevate flood prone homes & roads	Flood	Varies by situation	Town Manager	3-5 years	Deferred; no funds
Kenduskeag	Townhouse Road, Upsize Culvert and repave	Flood	\$2,500	Road Commissioner	1-3 years	Completed 2007
	Clark Road, Upsize culvert and repave	Flood	\$1,500	Road Commissioner	1-3 years	Completed 2007
	Southard Ave, Upsize culvert and repave	Flood	\$2,500	Road Commissioner	1-3 years	Completed 2007
	Acquire/Relocate/Elevate flood prone homes & roads	Flood	Varies by situation	Town Manager	3-5 years	Deferred; no funds
Lagrange	S. Lagrange Rd. rip rap 1,000' x 6' upsize (2) 48" x 32' culverts.	Flood	\$16,000	Town Manager, Road Commissioner	4 years	Completed 2014
	Town Rd. Elevate 1,000' x 20' x 18" add (6) 24" x 30' culverts.	Flood	\$42,000	Town Manager, Road Commissioner	4 years	Completed 2014

Lagrange, Cont'd.	Geotextile fabric for 1 mile of Medford Road. 12" of gravel to build up road.	Flood	\$50,000	Town Manager, Road Commissioner	3-5 years	New Project
	1,000' x 16" raise So. Lagrange Road	Flood	\$6,000	Town Manager, Road Commissioner	1-3 years	New Project
	Fire Tower Rd. Install Geotextile 1,250' & regrade.	Erosion, Flood	\$12,000	Town Manager, Road Commissioner	4 years	Completed 2014
Lakeville	Upgrade and increase size of culverts on Dill Brook roads	Flood	\$75,000	Board of Selectman	1-3 years	Completed 2007
	Duck Lake Rd.- replace/resize culvert	Flood	\$100,000	Board of Selectman	3-5 years	New Project
Lee	Upgrade and increase size of culverts on town roads.	Flood	\$45,000	Road Commissioner	1-3 years	Deferred; no funds
	Upgrade culvert at Mallett Mill Rd	Flood	\$20,000	Road Commissioner	1-3 years	Completed 2010
Levant	Relocate and Rebuild Fire Dept. out of Flood Zone	Flood	\$950,000	Town Manager	5-10 years	Completed in 2009
	Complete Engineering Study to evaluate Stormwater for retrofit and upgrades of culverts and roadways in flood zone	Flood	\$5,000	Town Manager, Road Commissioner	1-3 years with Town funds	Deferred; no funds
	Upgrade and increase size of culverts on Mt. Pleasant Road, Griffin Road, Tay Road and Lake Road	Flood	\$50,000	Town Manager, Public Works, Road Commissioner	1-3 years	Completed in 2009
Lincoln	Half Township Rd. Ditch 30,000'.	Flood	\$58,000	Town Manager, Public Works, Road Commissioner	1-3 years	Deferred; no funds
	Acquire/Relocate/Elevate flood prone homes	Flood	Varies by Situation	Town Manager	3-5 years	Deferred; no funds
Lowell	Train firefighters in wildfire techniques	Wildfire	\$5,000	Fire Department	1-3 years with Town funds	Deferred; no funds
	Educate homeowners on forest fire dangers and wildfire protection	Wildfire	\$2,000	Board of Selectmen, Fire Department	1-3 years with Town funds	Deferred; no funds
	Install base radio systems and antenna for emergency communications	All	\$7,511	Board of Selectmen, Fire Department	1-3 years	Completed 2010

Lowell, Cont'd.	Upgrade ditches, culverts and drainage for Woodman Mill Rd, area where Mill Pond empties into Passadumkeag River work done on bridge only	Flood	\$20,000	Board of Selectmen, Road Commissioner	3-5 years	Partially Complete 2011
Mattawamkeag	Rebuild 3 miles of River Rd. with ditching and additional culverts.	Flood	\$200,000	Board of Selectman	1-3 years	Deferred; no funds
Maxfield	Katahdin View Rd. Ditch 10,000' add 18" x 32' culvert	Flood	\$21,000	Road Commissioner	1-3 years	Deferred; no funds
	Bunker Hill Rd. Ditch 5,000' upsize (3) 15" x 30' culverts.	Flood	\$12,500	Road Commissioner	1-3 years	Deferred; no funds
Medway	Turnpike Hill RD. Install 3,000' ditch and rip-rap 700' of ditch line.	Flood	150K	Town Manager and Public Works Department	1-3 years	Deferred; no funds
Medway	Nicatou Road, 2 miles of drainage and ditching	Flood	\$500K	Town Manager & Public Works	Phases/Months	New Project
Milford	Replace and Upgrade existing storm water control systems with properly sized culverts and catch basins	Flood	\$150,000	Town Manager, Public Works, DOT	3-5 years	Deferred; no funds
	Greenfield Rd – Elevate and upgrade roadway and culverts.	Flood	\$500,000	Town Manager, Public Works	1-3 years	Deferred; no funds
	County Rd and Call Rd – Construct connector road for evacuation purposes.	All	\$150,000	Town Manager, Public Works	1-3 years	Completed 2015
Millinocket	Millinocket Stream, Restore stream bed 1,500' x 100' between Central & Cherry St.	Flood	\$48,000	Town Manager, Public Works.	1-3 years	Deferred; no funds
	Station Rd, Replace bridge over Little Smith Brook, 40' x 35' x 5'	Flood	\$175,000	Town Manager, Public Works, DOT	1-3 years	Deferred; no funds
	Penobscot Ave Bridge, culverts upgrade	Flood	\$500,000	Town Manager, Public Works	1-3 years	Completed 2015
	Acquire/Relocate/Elevate flood prone homes	Flood	Varies by situation	Town Manager	3-5 years	Deferred; no funds
Mount Chase	Owsboro Rd. upsize Crystal Brook culvert.	Flood	\$178,740	Road Commissioner contractor	5 years	Completed 2016: HMGP DR-1891 grant
	Owsboro Rd. upsize (2) culverts.	Flood	\$150,000	Road Commissioner	1-5 years	Deferred; no funds

Newburgh	North Road Ext. Elevate 1,800' x 22' x 2' upsize (5) 36" x 30' culverts.	Flood	\$58,000	Road Commissioner	1-3 years	Deferred; no funds
Newport	Complete Engineering study to evaluate Storm water drainage system in downtown area	Flood	\$250,000.00	Director of EMA, Fire Department	5-10 years with Town funds	Completed 2014
	Monitor roadway drainage systems and study areas of need for upgrades	Flood & Erosion	\$10,000	Public Works Director	3-5 years	New Project
	Upgrade and update storm water drainage system located within community	Flood	\$1,750,000	Director of EMA, Fire Department	3-5 years	Completed 2014
Old Town	Elevate and upgrade roadway and culvert to alleviate flooding on Kirkland Road	Flood	\$8,000	Town Manager and Public Works Department	1-3 years	Deferred; no funds
	Develop Public awareness materials, pamphlets, and brochures for winter storms	Winter Storms	\$500	Town Manager, Fire Department	1-3 years With the use of Town Funds	Deferred; no funds
Orono	Complete study to find susceptible areas within community	All	\$30,000	Director of EMA, Fire Department	3-5 years with Town Funds	Deferred; no funds
	Create ordinances to develop setbacks and buffer zones to protect rural residential housing.	Wildfire	\$18,000	Director of EMA, Fire Department	3-5 years with Town Funds	Deferred; no funds
	Educate property owners about the importance of insurance for fire hazards	Wildfire	\$2,500	Director of EMA, fire department, police department	immediate With the use of Town Funds	Deferred; no funds
	Complete a schedule for monitoring building codes.	Wildfire	\$6,000	Director of EMA, fire department, police department	3-5 years with Town Funds	Deferred; no funds
	Create educational seminars about proper forestry practices	Wildfire	\$500	Town manager, Director of EMA	on-going With the use of Town Funds	Deferred; no funds

Orono, Cont'd.	Train all firefighters and EMT's in Wilderness emergencies	Wildfire	\$3,000	Town manager, Director of EMA	3-5 years with Town Funds	Deferred; no funds
	Create flyers for public distribution to increase awareness of emergency preparedness	All	\$8,000	Town manager	3-5 years with Town Funds	Deferred; no funds
	Create a system of shelters for public protection	All	\$50,000	Town manager, Director of EMA	3-5 years	Deferred; no funds
	Develop and maintain a relationship with the University of Maine Emergency Management Team	All	\$1,200	Town manager	immediate with Town Funds	Deferred; no funds
	Create program of identification of special populations in need of emergency services.	All	\$500	Director of EMA	5-10 years with Town Funds	Deferred; no funds
	Purchase, maintain, and upgrade generators in town operated shelters.	All	\$35,000	Fire Department, Director of EMA	On-going	Deferred; no funds
	Purchase, maintain and upgrade adequate transportation	All	\$100,000	Public Works, DOT, and Town manager	3-5 years	Deferred; no funds
	Issue Public Service Announcements regarding upcoming flood seasons.	Flood	\$600	Public Works, DOT, and Town manager	on-going With Town Funds	Deferred; no funds
	Encourage and assist in the relocation of home and business owners located within the affected area.	All	\$150,000	Public Works, DOT, Town Manager and Water District	5-10 years With the use of Town Funds	Deferred; no funds
	Hold seminars to inform the general public of the dangers and risks involved with flooding.	Flood	\$500	Town Manager and Fire Department	1-3 years With the use of Town Funds	Deferred; no funds
	Raise roadbeds in areas affected by flood and erosion.	Flood and Erosion	\$200,000	Public Works	3-5 years	Deferred; no funds
	Mitigate erosion by replacing and replanting soils and vegetation in susceptible areas.	Erosion	\$35,000	Public Works	3-5 years	Deferred; no funds

Orono, Cont'd.	Increase stormwater management through culvert replacement, and roadway rebuilding in areas that are consistently susceptible	Flood	\$20,000	Public Works	3-5 years	Deferred; no funds
Orrington	Educate the community of the importance of fire safety	Wildfire	\$2,000.00	Fire Department, Director of EMA	1-3 years With the use of Town Funds	Deferred; no funds
	Install generator at School to upgrade shelter facilities available within the community	All	\$3,000	Fire Department, Director of EMA	1-3 years	Completed 2012
	Elevate and redirect roadways to allow for access during flooding events.	Flood	\$125,000	Public Works	3-5 years	Deferred; no funds
	Construct a new centrally located fire department/ public safety building to properly house firefighting equipment	Wildfire	\$2,000,000	Fire Department, Town manager	5-10 years	Deferred; no funds
	Train all firefighters in Wilderness wildfire techniques	Wildfire	\$5,000	Fire Department	1-3 years use Town funds	Deferred; no funds
Passadumkeag	Community building, Dig Artesian well to replace contaminated well Bldg. demolished	All	\$4,000	Board of Selectman	1-3 years	Deferred; no funds
	Acquire/relocate or elevate flood prone homes & roads	Flood	Varies by situation	Board of Selectman	3-5 years	Deferred; no funds
Patten	Happy Corner Rd, Elevate 500' x'24' 12" and repave upsize 24" x 50' culvert.	Flood	\$38,000	Public Works, Town Manager	1-3 years	Deferred; no funds
Penobscot Indian Nation Reservation	Mattamiscontis Township: Loop Rd, Ditch 3,000' resurface add (3) 18" x 32' culverts.	Flood	\$15,000	Tribal Director of Public Works.	1-3 years	Completed 2014
	Monitor roadway drainage systems and study areas of need for upgrades	Flood & Erosion	\$10,000	Tribal Director of Public Works	3-5 years	New Project

Plymouth	Condon Rd, 1,250' shape, grade and install geotextile elevate 1'.Partially completed, paving remains unfinished.	Flood	\$50,000	Road Commissioner	1-3 years	Partially Completed
	Clark Rd, 1,250' shape, grade and install geotextile elevate 1'.	Flood	\$17,000	Road Commissioner	1-3 years	Completed 2012
Seboeis Plantation	Station Rd, Ditch 700' upsize 18" x 30'culvert.	Flood	\$4,000	Road Commissioner	1-3 years	Completed 2007
	Main Rd by Seboeis Stream Bridge-upgrade ditches & culverts	Flood	\$10,000	Board of Selectmen,	1-3 years	Partially Completed
Springfield	Moores Rd, resize culvert/bridge	Flood	\$30,000	Board of Selectmen, Road Commissioner	3-5 years	New Project
	Pickle Ridge Rd, upgrade ditches and culverts, elevate road for drainage purposes shimming done, stump grinding left, \$2K	Flood	\$20,000	Board of Selectmen, Road Commissioner	1-3 years	Completed 2011
	Station Road, elevate 200 yards of road, widen .3 mile	Flood	\$6,000	Board of Selectmen	3-5 years	New Project
	Coffin Rd, resize culvert/bridge	Flood	\$100,000	Board of Selectmen, Road Commissioner	3-5 years	New Project
Stacyville	Kelly hill Rd. Install check dams along 3 miles of ditches. Add 24" x 32' culvert.	Flood	\$12,000	Road Commissioner	1-3 years	Completed
	Monitor roadway drainage systems and study areas of need for upgrades	Flood & Erosion	\$10,000	Road Commissioner	3-5 years	New project
	Ditching & clean dam at Kelly Hill Rd. near cell tower, 300 yards'	Flood	\$12,000	Road Commissioner	1-3 years	Completed
Stetson	Elevate Road surfaces	Flood	\$100,000	Selectmen and Road Commissioner	1-3 years	Deferred; no funds
	Upgrade dam	Flood	\$250,000	Board of Selectmen	1-3 years	Deferred; no funds
	Upgrade ditches and culverts for drainage purposes	Flood	\$20,000	Board of Selectman	1-3 years	Deferred; no funds
	Create system of Identification of Special Needs population	All	\$1,000	Board of Selectman	1-3 years With the use of Town Funds	Deferred; no funds
	Develop emergency evacuation and	All	\$30,000	Board of Selectman	3-5 years	Deferred; no

Stetson, Cont'd.	operations plan				With the use of Town Funds	funds
	Train and equip Fire Department in Wildland Fire safety	Wildfire	\$5,000	Fire Dept. and Selectmen	1-3 years With the use of Town Funds	Deferred; no funds
	Educate Homeowners on dangers of forest fires and wildfire protection	Wildfire	\$2,000	Selectmen and Fire Dept.	3-5 years With the use of Town Funds	Deferred; no funds
	Create fire ponds located to properly serve a majority of the community	Wildfire	\$10,000	Board of Selectman	3-5 years With the use of Town Funds	Deferred; no funds
UT	Summitt Twp. -Greenfield Road. Ditching would improve drainage, approx. 1800 feet. South end complete	Flood	\$7,230.00 spent	UT Roads Director	1-3 years	Completed 2014
	Summitt Twp. -Greenfield Road. Ditching would improve drainage, approx 1800 feet, North side	Flood	\$7,400	UT Roads Director	1-3 Years	New Project
	Acquire and demolish flood damaged homes in the Grindstone area	Flood	\$300,000	Contractor and County Commissioners	3-5 years	2009 one done with HMGP
	T6 R7 - Scraggly Lake Rd. Elevate 1250' where ditching is prohibited due to ledge and add rip rap.	Flood	\$27,680	UT Roads Director	1-3 years	Deferred; no funds
	Upgrade road and drainage projects. EX: T6 R7 - Scraggly Lake Road. Installing 3 new culverts would minimize washouts and improve drainage. Approx. 700-800 feet of ditching would be required at these locations with 12-18 inches of additional gravel to be installed.	Flood	\$9,800	UT Roads Director	1-3 years	Deferred; no funds

UT, Cont'd.	Mattamiscotis Twp. -3.5 miles of Mattamiscotis Road, Elevate Road above flood stage.	Flood	\$197,111	UT Roads Director	3-5 years	New project
	Prentiss Twp. - Tar Ridge Road, 2 sections of road need culvert upgrades and raise road levels to reduce flooding wash outs.	Flood	\$46,088.00	UT Roads Director	1-3 Years	New Project
	Prentiss Plantation - Mud Pond Road. Addition of 3 culverts and 700' of ditching would greatly improve drainage and minimize base problems.	Flood	\$5,800.00	UT Roads Director	1-3 Years	Completed 2007
	Greenfield Twp -Myra Road. Improving drainage by ditching and overlay 6 inches of gravel in 2 locations.	Flood	\$8.970	UT Roads Director	1-3 Years	Completed 2013
Veazie	Relocate Public Works facility from Flood Plain. 2015 no longer has public works dept. Project N/A	Flood	\$750,000	Town manager	3-5 years	Deferred; no funds
	Upgrade Storm drainage system in Town.	Flood	\$100,000	Town Manager	1-3 years	New Project
Webster Plantation	Tucker Ridge Rd. Elevate 200' x 22' x 12" upsize 24' x 32' culvert & repave.	Flood	\$27,000	Road Commissioner	1-3 years	Deferred; no funds
	Pickle Ridge Rd, Upsize 18" x 32' culvert.	Flood	\$1,200	Road Commissioner	1-3 years	Deferred; no funds
Winn	Philips Rd, Ditch 25,000' add (3) 24" x 32' culverts.	Flood	\$53,000	Road Commissioner	1-3 years	Completed 2009
	Old Military Rd, Ditch 10,000'.	Flood	\$20,000	Road Commissioner	1-3 years	Deferred; no funds
Woodville	Energy Lane, Ditch 2,500' upsize (6) 18" x 36' culverts.	Flood	\$11,000	Board of Selectman	1-3 years	Completed 2014
	Butterfield Ridge Rd. Ditch 22,000' upsize (12) 18" x 36' culverts.	Flood	\$56,000	Board of Selectman	1-3 years	Completed 2015
Woodville	Faloon Road, reconstruct, elevate and repave 1/8 of mile	Flood	\$50,000	Board of Selectman	1-3 years	New Project

PLAN MAINTENANCE PROCESS

18. Monitoring, Evaluating and Updating the Plan	
Requirement §201.6(c)(4)(i): The plan maintenance process shall include a section describing the method and schedule of monitoring, evaluating and updating the mitigation plan within a five-year cycle.	
Elements	A. Does the new or updated plan describe the method and schedule for monitoring the plan, including the responsible department?
	B. Does the new or updated plan describe the method and schedule for evaluating the plan, including how, when and by whom (i.e. the responsible department)?
	C. Does the new or updated plan describe the method and schedule for updating the plan within the five-year cycle?

Monitoring the Plan

Penobscot County has devised a plan to make certain that scheduled review, maintenance, and updating of the Hazard Mitigation Plan takes place. The Penobscot County Emergency Management Agency has created a Hazard Mitigation Committee, consisting of local EMA Directors, which also worked to create this plan. The Committee will remain in place and will act as the monitoring body of the plan and will continue to include members of the medical field, municipal, county, and/or state governments since they have a viable interest in the health and welfare of Penobscot County. The plan will be monitored annually or after a Disaster Declaration.

Evaluating the Plan will also be monitored relevant to any disasters (and new lessons learned) or new legislation.

The evaluation of the Plan will be based on the County’s needs, budget, laws or new federal guidelines. It will be updated as need to reflect hazard changes, additional mapping resources, and regulatory changes or to generally improve mitigation program management.

The annual review meetings will be held to determine the relevance of the mitigation actions and objectives pertaining to state and federal policies, local developments, and changes within the county. Any variations will be noted and monitored by committee members throughout the coming year, and will make recommendations for updating.

Every month the State holds County Director meetings where all 16 County Directors discuss current events, risks and challenges. The State Hazard Mitigation Officer briefs this group on upcoming changes or new requirements for the plan.

Updating the Plan

Although the previous plan’s methods and schedules worked reasonably well, adjustments may be needed. The Penobscot County Hazard Mitigation Committee will meet to discuss reviewing and updating the Penobscot Multi-Jurisdictional Hazard Mitigation Plan. This review will occur after the winter and usual spring flooding months to properly assess any storm damages. Reviews of the risk assessments, mitigation actions and implementation strategies will be completed by the committee. Recommendations and ideas for updating that have been compiled over the previous years will be noted and a full review of The Penobscot County Multi-Jurisdictional Hazard Mitigation Plan will take place.

Each mitigation action will be reviewed. If a mitigation action has been completed, it will be noted in the plan and will include date completed and cost. In reviewing the plan, the relevance of each mitigation action will be addressed as to the changes within the county. As part of this review, the status of ongoing projects shall be included. Revisions to and new actions will be included to continually update and reduce the effects of any hazard.

After a full review of the plan, the Penobscot County Hazard Mitigation Committee will then have one year to officially update and make changes to the plan, or justify with explanation, to the State Hazard Mitigation Officer why there was no need for changes to be made.

INCORPORATION INTO EXISTING PLANNING MECHANISMS

19. Incorporation into Existing Planning Mechanisms	
Requirement §201.6(c)(4)(ii): The plan shall include a process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, where appropriate.	
Elements	A. Does the new or updated plan identify other local planning mechanisms available for incorporating the mitigation requirements of the mitigation plan?
	B. Does the new or updated plan include a process by which the local government will incorporate the mitigation strategy and other information contained in the plan (e.g., risk assessment) into other planning mechanisms, when appropriate?
	C. Does the updated plan explain how the local government incorporated the mitigation strategy and other information contained in the plan (e.g., risk assessment) into other planning mechanisms, when appropriate?

Penobscot County staffing is minimal. The County operates with limited resources and no controlling ordinances over its municipalities. Past and present requirements of residents to adhere to local land use ordinances, shoreland zoning ordinances, and zoning requirements is limited to the permitting provided by the individual municipality and

their use of a Code Enforcement Officer. Each individual town has the authority to create their own Floodplain Management Ordinance and Land Use Regulations. The risks associated with and vulnerability of new developments to any determined hazards for Penobscot County will be considered in any and all growth within the municipalities participating within this plan.

However, with the developments within the Growth Management Act, communities are constantly updating and viewing growth individually within the county. Penobscot County encourages all local governments to place this document under high priority and review upon any developments in and additions to existing and new municipal planning documents. Additionally, the EMA Director can provide information to towns and cities, as well as technical assistance. Following approval of the plan by FEMA, the County EMA will send a copy to all municipalities in the County with a recommendation that local comprehensive planning efforts, municipal road maintenance planning efforts, emergency management programs, emergency operations plans and local fire prevention programs will be utilized to their greatest extent to complete the community's mitigation measures.

The County EMA and 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. Additionally the County EMA provides municipal EMAs and local official's notification of hazard mitigation workshops, other mitigation education and funding sources such as grants via emails and mailings.

The County Emergency Management Agency has provided and will continue to offer guidance to the local jurisdictions and the Penobscot Indian Nation on how they can use the County Hazard Mitigation Plan as a basis for other planning mechanisms such as: local comprehensive plans, state building codes, emergency management and mitigation planning, emergency operations plans (EOP) which include hazardous materials annexes, and the National Flood Insurance Program (NFIP) ordinances.

While larger communities such as Bangor, Brewer, Orono, Old Town, and Hampden, have designated staff that monitor and maintain such planning mechanisms, the smaller communities will rely more heavily on the County Plan and their individual EOPs and ordinances.

Regardless of size and staffing levels, however, all communities have minimum state mandated shoreland zoning.

For project implementation information, please see Section V that outlines the completion date and project costs for completed mitigation projects.

CONTINUED PUBLIC INVOLVEMENT

20. Continued Public Involvement	
Requirement §201.6(c)(4)(iii): The plan maintenance process shall include a discussion on how the community will continue public participation in the plan maintenance process.	
Elements	A. Does the new or updated plan explain how continued public participation will be obtained? (For example, will there be public notices, an on-going mitigation plan committee, or annual review meetings with stakeholders?)

All review meetings of the Penobscot County Hazard Mitigation Plan will be announced and held in open public forum. Public involvement in any region is very important. These meetings will ensure that the protection of lives and property remains the ultimate priority of the Hazard Mitigation Committee. By including the public in the plan updating process, it will allow for varying views and complete coverage of the concerns of the residents of Penobscot County. Public Notices, giving the date, time, and location of these meetings will be published in local print and any other necessary media such as website, email and social media to gain and inform the public of these meetings. The general public, elected officials, business leaders, and educational entities will all be encouraged to participate in order to include a diverse cross section of the public. Partnerships that were created with the public, area businesses, educational entities, and healthcare professionals will continue to be nurtured by Penobscot County to ensure participation in all upcoming planning projects and exercises.

For example, the county in cooperation with the Town of Veazie conducted a mock emergency (relating to a severe summer storm) where transportation corridors were damaged. The county is also planning another exercise in conjunction with the town of Bradley regarding an uncontrolled wildfire. During these exercises, the public is notified often through public access channels, emails, and public service announcements. The county takes advantage of communication technology since staffing is limited. This is the best way to communicate quickly and efficiently. In addition the county is present at the Bangor Hydro utility fair, the Northern Penobscot Vocational school fair, TRIAD, and Maine Partners Conference. In June 2014 Penobscot EMA in conjunction with the Red Cross held a shelter drill at Brewer’s regional shelter. The scenario was winter storm driven with substantial power outages.

The completed plan shall, upon approval, be placed on the Penobscot County EMA website penobscotema.squarespace.com with an email comment section directly to the County EMA Director. This shall provide continued public review and comment during the review period. The website will also be used to announce workshops, exercises and training opportunities and meetings.

In the future, the committee will develop methods for additional outreach. The committee will attempt to contact and include additional stakeholders. The committee will develop methods to include any and all interested public utilities, businesses, non-profits, and local colleges and universities.

All communities that participated in the plan, regardless of the level of participation, and met the needs and requirement of the Hazard Mitigation Committee and FEMA requirements to be considered a participating municipality, will continue to be contacted during the annual review process and solicited for assistance with the further reviews of this plan. This will allow communities to assist with future mitigation efforts, to address hazards and to develop projects for mitigation. Communities or stakeholders that chose not to participate initially will also be welcome to join any future planning efforts.

A digital copy of the plan will be placed on record at the Penobscot County Commissioners Office, at the PTEMA office and at each of the participating town offices or other suitable location within the community for public viewing. Hard copies will also be made available upon request. Notices will be sent to all municipal offices within the county to raise citizen’s awareness of the plan’s existence and to solicit comments about the plan. Included in these notices will be the web address where the plan may be viewed. Any and all public comments will be directed to the Director, of the Penobscot County Emergency Management Agency who can be contacted at:

Director
 Penobscot County Emergency Management Agency
 97 Hammond Street
 Bangor, ME 04401
 Phone: (207) 942-8535
 Fax: (207) 945-6027

PLAN REVIEW

21. Plan Review	
Requirement §201.6(d)(3): A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities and resubmit for approval within 5 years in order to continue to be eligible for mitigation project grant funding.	
Elements	A. Has the updated plan been reviewed and revised to reflect changes in development?
	B. Has the updated plan been reviewed and revised to reflect changes in local mitigation efforts?
	C. Has the updated plan been reviewed and revised to reflect changes in priorities?

Development Changes

This plan update reviewed changes in development where information existed in updated comprehensive plans, tribal master plans, Census figures and/or LUPC comprehensive plan updates. As previously described in the “analyzing development trends” section, the city of Bangor has lost population while some towns surrounding the Bangor area have added housing stock. However, in the present economy it is unclear if the new construction will continue. Also, because populations are small in the outlying areas of the county, an increase in the population of only 8 people (Woodville) shows up on the 2000 Census as a 37.8% increase but this does not reflect significant population growth or a trend.

Local Mitigation Efforts

The mitigation planning efforts from the prior plan have made a difference in the county by reducing vulnerability through the following:

- The river gauges that were installed in the Kenduskeag Stream and the Penobscot River now provide a number of communities downstream advanced warning during flooding events.
- The Millinocket pump station was elevated/relocated which has avoided flooding and alleviated problems with interdependencies.
- The Raven Hill Road has been elevated in Dixmont to mitigate the flood potential.
- The flood damaged house located in the Grindstone Township portion of the Unorganized Territory has been acquired and demolished and the land restricted to open space use.

However, obstacles still remain. Although we have raised the awareness at the local level, the down turn in the economy has limited funding availability and matching ability for projects. The focus of local officials has shifted towards reduced spending and these funding cuts have in some cases reduced staff and made resources scarce. Local officials are not pursuing additional funding but are instead maximizing what they do have to grow the economy and create jobs without creating additional encumbrances.

Changes in Priorities

The number of projects related to relocation and elevation in the 2011 plan increased, lessening the emphasis in the prior plan on just road/culvert/bridge projects. For the 2016 update there was no increase in that type of project as the municipalities expect mostly drainage projects for the next five years. However, in a county without public transportation, protecting transportation routes to work and services and the critical facilities linked to them will remain a top priority.