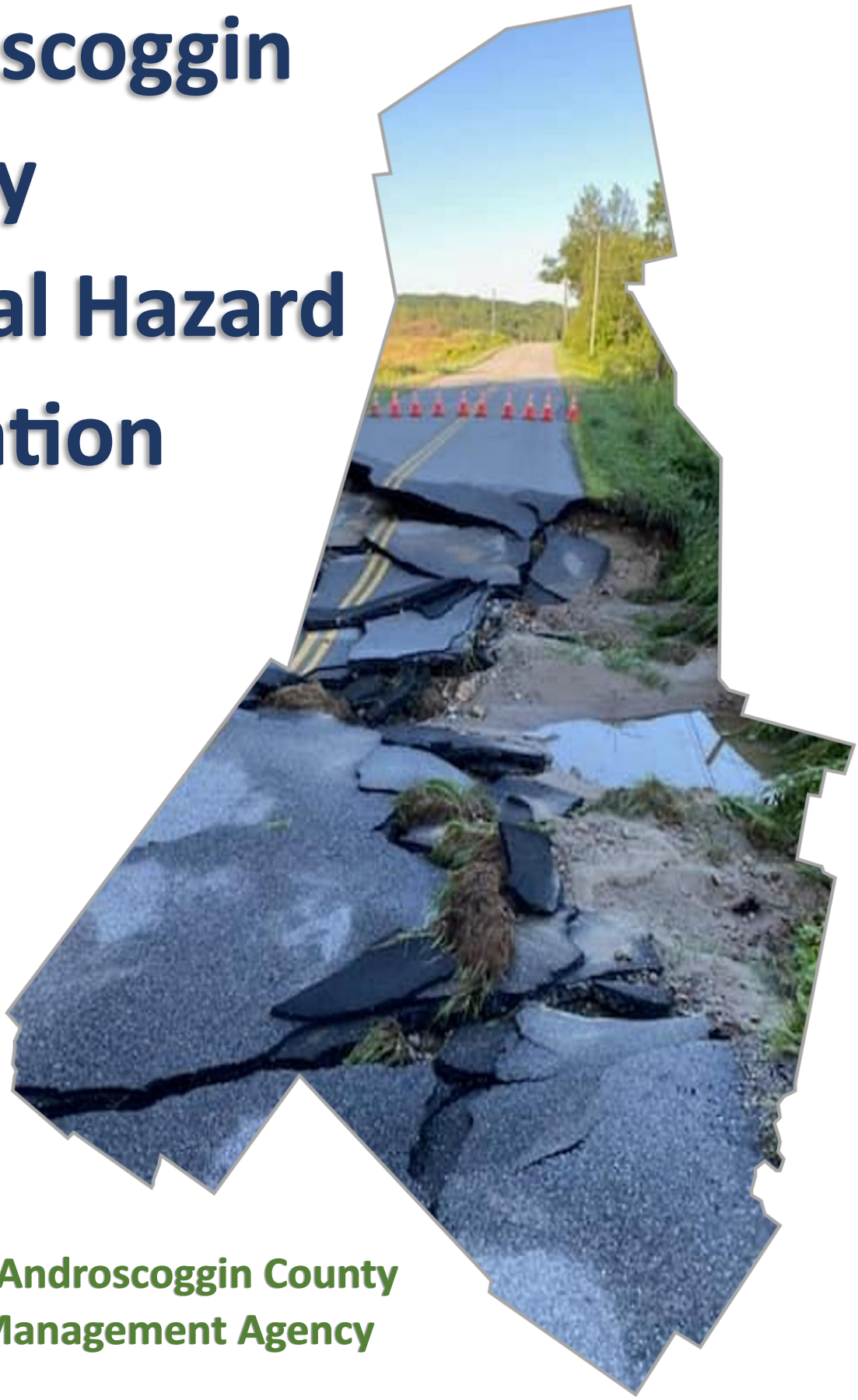
Androscoggin County Natural Hazard Mitigation Plan 2024



Prepared by Androscoggin County Emergency Management Agency

Acknowledgements

The Androscoggin County Natural Hazard Mitigation Plan is a multi-jurisdictional plan, prepared by Androscoggin County Emergency Management Agency for county and the 14 jurisdictions within Androscoggin County. In the State of Maine, County EMAs coordinate with local governments to prepare a multi-jurisdictional plan. The Androscoggin County Emergency Management Agency lead this effort with assistance the Hazard Mitigation Planning Team, the Hazard Mitigation Planning Steering Committee, and Jurisdictional Hazard Mitigation Teams. The activities that brought this plan to fruition were supported and funded by Androscoggin County and the FEMA Emergency Performance Grant Program

Hazard Mitigation Planning Team	
Angela Molino	Director, Androscoggin County Emergency Management Agency
Paul Leonard	Deputy Director, Androscoggin County Emergency Management Agency
Spencer McKeown	GIS Planner, Androscoggin County Emergency Management Agency

Hazard Mitigation Planning Steering Committee	
Angela Molino	Director, Androscoggin County Emergency Management Agency
Paul Leonard	Deputy Director, Androscoggin County Emergency Management Agency
Spencer McKeown	GIS Planner, Androscoggin County Emergency Management Agency
Nan Johnson	Senior Community Planner, FEMA Region 1, Mitigation Division
Heather Dumais	State Hazard Mitigation Officer, Maine Emergency Management Agency
Dr. Samuel Roy	Natural Hazards Planner, Maine Emergency Management Agency
Jonathan Ross	Senior Planner, Maine Emergency Management Agency
Robert Chase	Fire Chief, Auburn Fire Department
Mark Caron	Fire Chief, Lewiston Fire Department

Jurisdictional Teams	
Auburn, City of	Livermore Falls, Town of
Durham, Town of	Mechanic Falls, Town of
Greene, Town of	Minot, Town of
Leeds, Town of	Poland, Town of
Lewiston, City of	Sabattus, Town of
Lisbon, Town of	Turner, Town of
Livermore, Town of	Wales, Town of

In addition to those agencies and individuals named above, a number of different state, local and regional partners contributed to this plan:

Maine Historic Preservation Commission, Maine Department of Agriculture, Conservation & Forestry, National Weather Service-Gray, Maine USDA Farm Service Agency, UMaine Cooperative Extension, Community Concepts, Androscoggin Valley Council of Governments, Lewiston Housing Authority, Maine Forest Service, Central Maine Power, Co., Poland Springs Bottling Co., Department of Business & Community Development, City of Auburn, Maine Center for Disease Control, North East States Emergency Consortium, and to the public, businesses, non-profits and stakeholders who completed the Natural Hazard Mitigation Surveys.

Thank you.

Executive Summary

Hazard Mitigation is any sustained action taken to reduce or eliminate long term risk to human life, infrastructure, and the environment.

The 2024 update to the Androscoggin County Natural Hazard Mitigation Plan was prepared by the Androscoggin County Emergency Management Agency and in accordance with the Disaster Mitigation Act of 2000. DMA 2000 requires states and local governments to prepare HMPs to remain eligible to receive pre-disaster mitigation grant funds available in the wake of federally declared disasters. The Androscoggin County Hazard Mitigation Plan is a multi-jurisdictional plan, a collaborative process. In the State of Maine, County EMAs coordinate with local governments to prepare a multi-jurisdictional plan. The Androscoggin County Emergency Management Agency (ACEMA) is the lead in this effort with assistance from planning teams, the Hazard Mitigation Planning Team, Hazard Mitigation Planning Steering Committee, and Jurisdictional Hazard Mitigation Teams.

Planning Process

Hazard Mitigation Planning Team coordinated, facilitated, and documented the planning process, collected, and analyzed data, risk, and capabilities, sought participation through meetings, surveys, flyers, social media, the Androscoggin County EMA website, and emails. The Hazard Mitigation Steering Committee provided feedback, input, reviewed the planning process materials, documents, planning and outreach strategy via emails or in person meetings. Jurisdictional Teams attended the workshops, the seminar, and project planning meetings. Teams reviewed the 2017 Hazard Mitigation plan, the Natural Hazard Report, participated in the Natural Hazard Risk Assessment, and completed the jurisdiction survey, which provided the status update of the 2017 projects. The jurisdictional teams completed the project worksheets, which resulted in the identification of vulnerabilities, capabilities, and development of mitigation strategies for the plan update. The teams played a vital role in public outreach, through the dissemination of the surveys to the stakeholders and public through meetings, emails, and social media.

Risk Assessment

Androscoggin County Emergency Management Agency conducted an All-Hazards Risk Assessment in 2022, all 14 jurisdictions participated. The jurisdictions rated the impact that each hazard would have on their community using the information provided by Androscoggin County EMA through presentations from SME, hazard reports containing hazard definitions, county context and general consequence analysis. Resulting from the Natural Hazard Identification and Risk Assessment, a review of all available capabilities, and ranking by the jurisdictions

the following hazards have been selected for this Natural Hazard Mitigation Plan, Flooding, Severe Summer Weather, Wildfire, Drought, Severe Winter Weather.

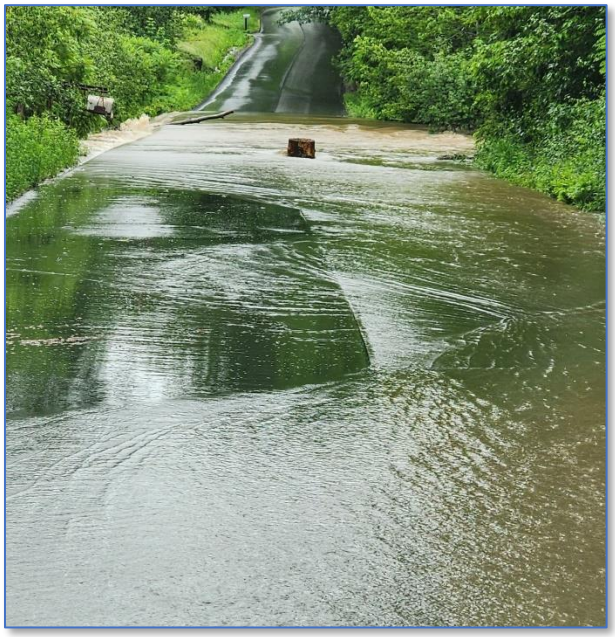
Mitigation Strategy

The 2024 Androscoggin County Natural Hazard Mitigation Plan update features new overarching goals designed to empower communities to navigate mitigation efforts through a fluid risk landscape, positioning the communities within Androscoggin County to address current concerns, future trends, policy requirements, vulnerabilities, and potential impacts from natural disasters. FEMA defines Goals as general guidelines that explain what should be achieved and defines Objectives as strategies or implementation steps to attain mitigation goals, and mitigation actions as specific actions that help to achieve the mitigation goals and objectives. This plan, combines goals, objectives, and actions to provide direction for Androscoggin County and all jurisdictions to reduce risks from identified hazards and improve resilience. All 14 jurisdictions participated, each action or project submitted for inclusion in this plan contributes to the county-wide mitigation strategy. The local mitigation actions or projects paint a picture, illustrating what each community prioritizes and their commitment to hazard mitigation and resilience.

GOALS

- **Minimize loss and disruption of life, property, and the environment**
- **Encourage Continuity of Operations pre, during & post hazard events**
- **Enhance Mitigation Capabilities**
- **Increase Public Awareness and Support for Hazard Mitigation**
- **Increase Resilience of Economy and local Resources**

Plan Maintenance & Update



Plan progress will be monitored through cyclical meetings with MEMA and/or local jurisdictions, as well as following federally declared disasters in Androscoggin County. Annually and following disaster declarations, ACEMA will review the hazards in the risk assessment and mitigation strategies to determine relevancy to variable conditions including land development in the county, as well as changes in state or federal policy to ensure that plan elements reflect current and expected conditions. At year three of the five-year period covered by this plan, a hazard analysis and risk and capabilities assessment will be conducted. In collaboration with the jurisdictions, projects will be updated, and new projects will be added. The plan will come to fruition through a series of compounding meetings, the kickoff meeting, the seminar, and project planning meetings, including emails, surveys, and the website. Once all hazards, projects, maps, and all pertinent data have been updated, and public input recorded, the Androscoggin County Hazard Mitigation Plan draft will be submitted to MEMA for review and recommendations before the final draft is forwarded to FEMA for review and approval pending adoption (APA). After APA, the jurisdictions will adopt the plan for final approval and start another five-year plan cycle.

Adoption

The Androscoggin County Hazard Mitigation Plan 2024 provides a path by which local governments can follow to reduce vulnerabilities and lessen impacts from natural disasters. By adopting this plan, each community is agreeing to continue implementation of strategies aimed at mitigating hazards identified in this Plan. Participation in the planning process and adoption of the plan by a jurisdiction enables that jurisdiction to be eligible for FEMA Hazard Mitigation Assistance (HMA) grant programs, such as the Building Resilient Infrastructure and Communities (BRIC) and Flood Mitigation Assistance (FMA).

Point of Contact. The Androscoggin County Emergency Management Agency leads the effort to adapt and update the Multi-Jurisdictional Hazard Mitigation Plan. As such, ACEMA is determined to continue and improve public involvement by providing an ongoing opportunity for public comment and valued input regarding the hazard mitigation plan, so as to achieve that goal the ACEMA information is embedded below:

Mailing Address: Androscoggin County Emergency Management Agency
2 College Street
Lewiston, ME 04240
Email address: ema@androscoggincountymaine.gov
Website: Androscoggincountyema.gov
Telephone: 207-784-0147

Intersection of East Rd and Avenue Rd, Wales ME, Road flooding. Source: Wales Fire Chief Scott Dimmick.

Acronym Definitions

Acronym	Definitions
ACEMA	Androscoggin County Emergency Management Agency
APA	Approval Pending Adoption
BCA	Benefit Cost Analysis
BFE	Base Flood Elevation
BRIC	Building Resilient Infrastructure and Communities
BTM	Brown tail Moth
CDC	Maine Center for Disease Control
CDS	Congressionally Directed Spending
CDWG	Community Wildlife Defense Grant
CEO	Code Enforcement Officer
CFR	Code of Federal Regulations
CME	Coronal Mass Ejections
CMP	Central Maine Power
CPC	Climate Prediction Center
CRS	Community Rating System
CWPP	Community Wildfire Protection Plan
DACF	Department of Agriculture. Conservation and Forestry
DEP	Department of Environmental Protection
DOT	Maine Department of Transportation
DSP	Dam Safety Program
DWP	CDC Drinking Water Program
EAL	Expected Annual Loss
EAP	Emergency Action Plan
EMA	Emergency Management Agency
EMP	Electromagnetic Pulse
EMPG	Emergency Management Performance Grant
EOP	Emergency Operations Plan
EPA	Environmental Protection Agency
FEMA	Federal Emergency Management Agency
FERC	Federal Energy Regulatory Commission
FMA	Flood Mitigation Assistance
FMAG	Fire Management Assistance Grant
FMP	Floodplain Management Program
GIS	Geographic Information System
HABs	Harmful Algal Blooms
HMA	Hazard Mitigation Assistance
HHPD	High Hazard Potential Dams
HMGP	Hazard Mitigation Grant Program
IA	Individual Assistance
LHMP	Local Hazard Mitigation Plan
LPDM	Legislative Pre-Disaster Mitigation
MUBEC	Maine Uniform Building and Energy Code
MEGIS	Maine Office of GIS

Acronym	Definitions
MEMA	Maine Emergency Management Agency
MFS	Maine Forest Service
MHPC	Maine Historic Preservation Commission
MRSA	Maine Revised Statutes Annotated
MS4	Municipal Separate Storm Sewer Systems EAB
MUBEC	Maine Uniform Building and Energy Code
MWW	Maine Won't Wait
NESEC	Northeast State Emergency Consortium
NESIS	Northeast Snowfall Impact Scale
NFIP	National Flood Insurance Program
NHC	National Hurricane Center
NOAA	National Oceanic and Atmospheric Administration
NOFO	Notice of Funding Opportunity
NWS	National Weather Service
PAR	Population at Risk
RLF	Revolving Loan Fund
PA	Public Assistance
SBA	U.S. Small Business Administration
SFHA	Special Flood Hazard Area
SFM	Office of the State Fire Marshal
SHMP	State Hazard Mitigation Plan
SVI	Social Vulnerability Index
TCI	The Climate Initiative
THIRA/SPR	Threat & Hazard Identification & Risk Assessment/Stakeholder Preparedness Review
UMS	University of Maine System
USDA	U.S. Department of Agriculture
USDM	U.S. Drought Monitor
USEPA	U.S. Environmental Protection Agency
USGS	U.S. Geological Survey
WMO	World Meteorological Organization
WUI	Wildland Urban Interface

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Element A - Planning Process

Element A Requirements
A1. Does the plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement 44 CFR § 201.6(c)(1))
A1-a. Does the plan document how the plan was prepared, including the schedule or time frame and activities that made up the plan's development, as well as who was involved?
A1-b. Does the plan list the jurisdiction(s) participating in the plan that seek approval, and describe how they participated in the planning process?

Multi-Jurisdictional Planning Process

The Androscoggin County Hazard Mitigation Plan is a multi-jurisdictional plan, a collaborative process. In the State of Maine, County EMAs coordinate with local governments to prepare a multi-jurisdictional plan. The Androscoggin County Emergency Management Agency (ACEMA) is the lead in this effort with assistance from the Hazard Mitigation Planning Team, Hazard Mitigation Planning Steering Committee, and Jurisdictional Hazard Mitigation Teams.

Hazard Mitigation Planning Team. Comprised of the Androscoggin County Emergency Management staff coordinated, facilitated, and documented the planning process, collected, and analyzed data, risk, and capabilities, sought participation through meetings, surveys, flyers, social media, the Androscoggin County EMA website, and emails.

Table 1: Hazard Mitigation Planning Team	
Name	Title and Organization
Angela Molino	Director, Androscoggin County Emergency Management Agency
Paul Leonard	Deputy Director, Androscoggin County Emergency Management Agency
Spencer McKeown	GIS Planner, Androscoggin County Emergency Management Agency

Hazard Mitigation Steering Committee. The Hazard Mitigation Steering Committee included ACEMA staff, select Maine Emergency Management Agency staff and representation from jurisdictions, provided feedback, input, reviewed the planning process materials, documents, planning and outreach strategy via emails or in person meetings.

Table 2: Hazard Mitigation Planning Steering Committee	
Name	Title and Organization
Angela Molino	Director, Androscoggin County Emergency Management Agency
Paul Leonard	Deputy Director, Androscoggin County Emergency Management Agency
Spencer McKeown	GIS Planner, Androscoggin County Emergency Management Agency
Nan Johnson	Senior Community Planner, FEMA Region I Mitigation Division
Heather Dumais	State Hazard Mitigation Officer, Maine Emergency Management Agency
Dr. Samuel Roy	Natural Hazards Planner, Maine Emergency Management Agency
Jonathan Ross	Senior Planner, Maine Emergency Management Agency
Robert Chase	Fire Chief, Auburn Fire Department
Mark Caron	Fire Chief, Lewiston Fire Department

Jurisdictional Teams. The Jurisdictional Teams, comprised of representatives from departments that align with the community sectors of emergency management, infrastructure, economic development, land use and development, housing, health and social services, and natural and cultural resources. In some smaller

jurisdictions, one person may have multiple roles or responsibilities, for example, the Fire Chief may also fill the role of the Local EMA Director. Team members attended the workshops, the seminar, and project planning meetings. Teams reviewed the 2017 Hazard Mitigation plan, the Natural Hazard Report, participated in the Natural Hazard Risk Assessment, and completed the jurisdiction survey, which provided the status update of the 2017 projects. The jurisdictional teams completed the project worksheets, which resulted in the identification of vulnerabilities, capabilities, and development of mitigation strategies for the plan update. The teams played a vital role in public outreach, through the dissemination of the surveys to the stakeholders and public through meetings, emails, and social media. To use as an example of jurisdictional teams, the Auburn Jurisdiction Team composition is presented below, the jurisdictional teams are located in Appendix A.

Table 3: Jurisdictional Team - Auburn	
Primary Point of Contact	
Name: Rita Beaudry Title: Grant Manager/ FOAA Officer Address: 60 Court Street, Auburn, ME 04210 Phone Number: 207-333-6601 x 1222 Email: rbeaudry@auburnmaine.gov	
NFIP Floodplain Administrator	
Name: Katherine Cook Title: Planning, Permitting & Code Dept. Planning Coordinator Address: 60 Court Street, Auburn, ME 04210 Phone Number: 207-333-6601 x 1155 Email: kcook@auburnmaine.gov	
Name	Title and Organization
Jason Moen	Police Chief, City of Auburn
Robert Chase	Fire Chief, City of Auburn
Zack Maher	Deputy Director, Economic Development, City of Auburn
Dan Goyette	Director of Public Services, City of Auburn
Kris Beaudoin	Code Enforcement Officer, City of Auburn
Jay Brenchick	Director of Economic Development, City of Auburn
Jill Cunningham	Director of Information Technology, City of Auburn
Denis D'Auteuil	Public Works Director, City of Auburn
Mamie Ney	Library Director, City of Auburn

Documentation of the Planning Process

Because this is a multi-jurisdictional plan, surrounding communities, contiguous counties, jurisdictions, public and private sector stakeholders, and the public were invited to be involved in the update process. For the sake of brevity, emails, agendas, and sign in sheets are located in Appendix D, while flyers and surveys are in Appendix B, the hazard summaries can be found in Appendix C.

Androscoggin County All Hazards Assessment 3/17/2022:

Prior to the official start of the 2024 plan update ACEMA, began the initial research and review of data and reports from various sources, and conducted an All-Hazards Risk Assessment, details are outlined in Element B of this plan. All 14 jurisdictions participated in the Androscoggin County All Hazards Risk Assessment, conducted in 2022. The hazard selections were based on history, likelihood, impact, and vulnerability to sectors specific to Androscoggin County. Specifics, like Hazard location maps, hazard descriptions and other data developed for the risk assessment are located in Element B and Appendix A and C.

Pre-Kickoff Meeting 02/22/2023:

A pre-kickoff meeting, held in February between MEMA and Androscoggin County EMA. The group discussed new FEMA requirements for Hazard Mitigation plans as well as the strategy for engaging with stakeholders, community sectors, and contiguous counties. The project worksheets and surveys were discussed at this meeting, through feedback the worksheets were refined.

Email Notification 05/18/2023:

An invitation email was sent to local and state subject matter experts to present to stakeholders during the Hazard Mitigation Seminar. The presentations addressed the current concerns and future trends of vulnerabilities and potential impacts from natural hazards on community sectors in Androscoggin County and included possible actions jurisdictions may consider when creating natural hazard mitigation projects for the Androscoggin County Natural Hazard Mitigation 2024 Plan update. Emails are available in Appendix D.

Email Notification 06/05/2023:

A notification email was sent out to all 14 jurisdictions and stakeholders representing community sectors announcing the start of the 2024 plan update. The email described the importance of participation, funding opportunities, requirements, expectations, the schedule, outlining the approaching kickoff meeting and registration links. Email details are available in Appendix D.

Kick-off Meetings 06/22/2023, 6/23/2023 and 6/24/2023:

ACEMA provided four opportunities for attendance to jurisdictions. The kickoff meetings were held in Lewiston at the Androscoggin County Emergency Management Agency office, a central location for all communities in Androscoggin. At each of the four meetings, the presentation covered the planning process, risk assessment, mitigation and outreach strategies, and methods to maintain, update and adopt the plan. Attendees were briefed on Federal requirements, roles, expectations, and funding opportunities, followed by a question-and-answer period. Jurisdiction specific maps, the mitigation plan schedule, project worksheets, surveys and information of funding opportunities were distributed during these meetings and in subsequent emails.

Table 4: Kick-Off Meeting June 22, 2023 Androscoggin County EOC, 10:00 AM

Name	Jurisdiction/Organization	Position
Angela Molino	Androscoggin County EMA	Director
Paul Leonard	Androscoggin County EMA	Deputy Director
Spencer McKeown	Androscoggin County EMA	GIS Planner
Samuel Roy	Maine Emergency Management Agency	Natural Hazards Planner
Denis D'Auteuil	City of Auburn	Public Works Director
Jake Rodrigue	Town of Leeds	Public Works Director
Kevin Gagne	City of Lewiston	Water and Sewer Superintendent
Brian O'Malley	City of Lewiston	Assistant City Administrator
John Skelley	City of Lewiston	City Engineer
Mark Caron	City of Lewiston	Fire Chief
Mark Anderson	City of Lewiston	Assistant Fire Chief
Vic Hodgkins	Town of Mechanic Falls	Town Manager
Emily Snape	Town of Sabattus	EMA Director
Matthew Garside	Town of Poland	Town Manager
Ross Gagne	Town of Turner	EMA Director

Table 5: Kick-Off Meeting June 22, 2023 Androscoggin County EOC, 6:00 PM		
Name	Jurisdiction/Organization	Position
Angela Molino	Androscoggin County EMA	Director
Paul Leonard	Androscoggin County EMA	Deputy Director
Spencer McKeown	Androscoggin County EMA	GIS Planner
Jason Moen	City of Auburn	Police Chief
Scott Richmond	Town of Livermore	Selectman
Andrew Berry	Town of Livermore	Assistant Fire Chief/EMA Director
Mark Chretien	Town of Livermore	Selectboard Chair
William O. Austin	Town of Wales	Public Works Director
Scott Dimmick	Town of Wales	Fire Chief/EMA Director

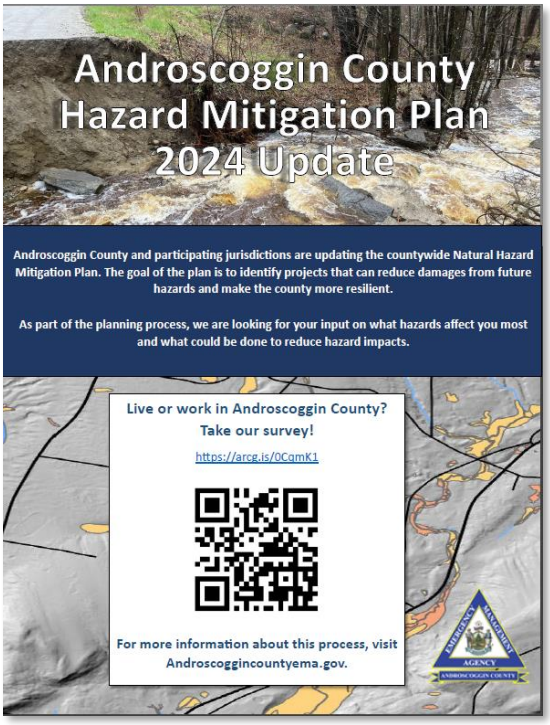
Table 6: Kick-Off Meeting June 23, 2023 Androscoggin County EOC, 1:00 PM		
Name	Jurisdiction/Organization	Position
Angela Molino	Androscoggin County EMA	Director
Paul Leonard	Androscoggin County EMA	Deputy Director
Spencer McKeown	Androscoggin County EMA	GIS Planner
Rob Tripp	Town of Durham	Fire Chief/EMA Director
Melanie Alexander	Town of Lisbon	Assistant Town Manager
Brandon Hobbs	Town of Livermore Falls	Code Enforcement Officer
Fred Sturtevant III	Town of Mechanic Falls	Fire Chief/EMA Director

Table 7: Kick-Off Meeting June 24, 2023 Androscoggin County EOC, 10:00 AM		
Name	Jurisdiction/Organization	Position
Angela Molino	Androscoggin County EMA	Director
Paul Leonard	Androscoggin County EMA	Deputy Director
Matthew Conklin	Town of Greene	Public Works Laborer
Danielle Loring	Town of Minot	Town Administrator/EMA Director

Overview of Planning Process and Timeline

Figure 1 conveys the timeframe and activities that made up the plan's development.

Element A Requirements
A2. Does the plan document 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? (Requirement 44 CFR § 201.6(b)(2))
A2-a. Does the plan identify all stakeholders involved or given an opportunity to be involved in the planning process, and how each stakeholder was presented with this opportunity?



Email Notification 07/07/2023:

An invitation email was sent to stakeholders, representing local government, as well as representatives of business, academia, and other private/ nonprofit organizations, including community-based organizations that work directly with and/or provide support to underserved communities and socially vulnerable populations to attend the Hazard Mitigation Seminar, held at the Auburn City Hall. To garner maximum input from a wide range of sources, email recipients were asked to complete the stakeholder survey and to distribute the public survey to help promote the hazard mitigation plan update. Emails are available in Appendix D.

Hazard Mitigation Seminar 7/20/2023:

The Androscoggin County Natural Hazard Mitigation Seminar was held to provide jurisdictions with information regarding current concerns and future trends of hazard impacts in Androscoggin County, as well as to suggest ideas for potential mitigation projects from local subject matter experts. Presenters represented the six community sectors of Emergency Management, Economic Development, Housing, Health & Social Services, Infrastructure and Natural & Cultural Resources. A complete list of attendees can be found in Table 8, presenters are highlighted in blue.

Figure 2: Jonathan Ross, Maine Emergency Management Senior Planner discusses Critical Infrastructure during the Androscoggin County Natural Hazard Mitigation Seminar, July 20, 2023. Source: City of Auburn.

Table 8: Natural Hazard Mitigation Seminar July 20, 2023 Auburn City Hall, 8:00 AM		
Name	Jurisdiction/Organization	Position
Angela Molino	Androscoggin County EMA	Director
Paul Leonard	Androscoggin County EMA	Deputy Director
Spencer McKeown	Androscoggin County EMA	GIS Planner
Samuel Roy	Maine Emergency Management Agency	Natural Hazards Planner
Heather Dumais	Maine Emergency Management Agency	State Hazard Mitigation Officer
Christine Whalen	Maine Emergency Management Agency	Hazard Mitigation Grant Program Administrator
Bill Guindon	Maine Emergency Management Agency	Mass Care Coordinator
Jonathan Ross	Maine Emergency Management Agency	Senior Planner
Robert Chase	City of Auburn	Fire Chief
Zachary Maher	City of Auburn	Deputy Director, Business & Community Development
Dan Goyette	City of Auburn	Director of Public Services
Kris Beaudoin	City of Auburn	Code Enforcement Officer
Jay Brenchick	City of Auburn	Director of Economic Development
Jill Cunningham	City of Auburn	Director of Information Technology
Denis D'Auteuil	City of Auburn	Public Works Director
Mamie Ney	City of Auburn	Library Director
Rob Tripp	Town of Durham	Fire Chief/EMA Director
Brian O'Malley	City of Lewiston	Assistant City Administrator
Mark Caron	City of Lewiston	Fire Chief
Tyler Michaud	City of Lewiston	Police Sergeant/HAZMAT Team Chief
Kevin Gagne	City of Lewiston	Water and Sewer Superintendent
Glenn Michalowski	Town of Lisbon	Town Manager
Randy Cyr	Town of Lisbon	Public Works Director
Andrew Berry	Town of Livermore	Deputy Fire Chief/EMA Director
Mark Chretien	Town of Livermore	Selectboard Chair
Carrie Judd	Town of Livermore	Administrative Assistant
Brandon Hobbs	Town of Livermore Falls	Code Enforcement Officer
Fred Sturtevant III	Town of Mechanic Falls	Fire Chief/EMA Director
Vic Hodgkins	Town of Mechanic Falls	Town Manager
Danielle Loring	Town of Minot	Town Administrator/EMA Director
Matthew Garside	Town of Poland	Town Manager
Emily Snape	Town of Sabattus	EMA Director

Kurt Schaub	Town of Turner	Town Manager
Sharon Siegel	Town of Wales	Administrative Assistant
William O. Austin	Town of Wales	Public Works Director
Wendy Ouelette	Poland Spring Bottling	Northeast Senior SHE Manager
Scott Maddox	Maine Forest Service	District Forest Ranger
Mary-Rita Rienhard	Community Concepts	Chief Operating Officer
Drexell White	Maine CDC	District Public Health Liaison
Jason Lilley	UMaine Cooperative Extension	Adjunct Professor
Christi Chapman-Mitchell	Maine Historic Preservation Commission	Deputy Director
Fred LaMontagne	Central Maine Power	Senior Manager of Operational Readiness
Silas Leavitt	Lewiston Housing Authority	Development Project Manager
Amy Landry	Androscoggin Valley Council of Governments	Executive Director
Ethan Vinson	Androscoggin Valley Council of Governments	Economic Development Specialist
Brenda Wells	USDA Farm Service Agency - Maine	Regional Director
Joan Walton	Maine DACF Municipal Planning Assistance	Planner
Donald Dumont	National Weather Service Gray	Warning Coordination Meteorologist

Figure 3: Jennings Rd, Leeds, ME May Day Storm 2023 Washout. Source: Leeds Public Works, Jake Rodrigue.

Email Notification 07/24/2023:

A notification email was sent out to all 14 jurisdictional teams following the Natural Hazard Mitigation Seminar. The email emphasized participation, goals, and actions. Attached to the email were the Hazard Mitigation Plan Goals, Example Projects & Funding, Hazard Mitigation Timeline: Mitigation Strategy and project worksheets. Emails are available in Appendix D.

Project Planning Workshops 8/2/2023, 8/9/2023, 8/16/2023 and 8/23/2023:

Project planning workshops were held to allow for jurisdictions to discuss ideas for new hazard mitigation projects as well as funding opportunities. Hazard Mitigation staff from the Maine Emergency Management Agency were present at the meetings to provide input on the projects, as well as potential funding options for those projects.

Table 9: Project Planning Workshop August 2, 2023 Androscoggin County EOC, 8:00 AM		
Name	Jurisdiction/Organization	Position
Angela Molino	Androscoggin County EMA	Director
Spencer McKeown	Androscoggin County EMA	GIS Planner
Dr. Samuel Roy	Maine Emergency Management Agency	Natural Hazards Planner
Emily Snape	Town of Sabattus	EMA Director
Rob Tripp	Town of Durham	Fire Chief/EMA Director
Andrew Berry	Town of Livermore	Deputy Fire Chief/EMA Director
Mark Chretien	Town of Livermore	Selectboard Chair

Table 10:Project Planning Workshop August 9, 2023 Androscoggin County EOC, 8:00 AM		
Name	Jurisdiction/Organization	Position
Angela Molino	Androscoggin County EMA	Director
Spencer McKeown	Androscoggin County EMA	GIS Planner
Heather Dumais	Maine Emergency Management Agency	State Hazard Mitigation Officer
Danielle Loring	Town of Minot	Town Administrator/EMA Director
Ross Gagne	Town of Turner	EMA Director
Tom Printup	Town of Poland	Fire Chief/EMA Director

Figure 4: Gulf Island Dam in 2021 Drought. Source: Lewiston Sun Journal.

Table 11: Project Planning Workshop August 16, 2023 Androscoggin County EOC, 8:00 AM		
Name	Jurisdiction/Organization	Position
Angela Molino	Androscoggin County EMA	Director
Spencer McKeown	Androscoggin County EMA	GIS Planner
Dr. Samuel Roy	Maine Emergency Management Agency	Natural Hazards Planner
Mark Caron	City of Lewiston	Fire Chief
Mark Anderson	City of Lewiston	Assistant Fire Chief
Tyler Michaud	City of Lewiston	Police Sergeant/HAZMAT Team Chief
Kevin Gagne	City of Lewiston	Water and Sewer Superintendent
Fred Sturtevant III	Town of Mechanic Falls	Fire Chief/EMA Director
Jake Rodrigue	Town of Leeds	Public Works Director
Zachary Maher	City of Auburn	Deputy Director of Business & Community Development
Kris Beaudoin	City of Auburn	Code Enforcement Officer
Dan Goyette	City of Auburn	Director of Public Services
Jason Moen	City of Auburn	Police Chief
Jay Brenchick	City of Auburn	Director of Economic Development
Denis D'Autieul	City of Auburn	Public Works Director

Table 12: Project Planning Workshop August 23, 2023 Androscoggin County EOC, 8:00 AM		
Name	Jurisdiction/Organization	Position
Angela Molino	Androscoggin County EMA	Director
Spencer McKeown	Androscoggin County EMA	GIS Planner
Dr. Samuel Roy	Maine Emergency Management Agency	Natural Hazards Planner
Scott Dimmick	Town of Wales	Fire Chief/EMA Director
Matthew Conklin	Town of Greene	Public Works Laborer/Webmaster
Carol Buzzell	Town of Greene	Town Manager
Brandon Hobbs	Town of Livermore Falls	Code Enforcement Officer
Nathan LeClair	Town of Lisbon	Fire Chief

Stakeholder Involvement

The following table documents how each jurisdiction participated in the preparation of the Androscoggin County Natural Hazard Mitigation Plan 2024 Update. Since this is a multi-jurisdictional plan, as previously mentioned, opportunities for local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as stakeholders, representing businesses, academia, and nonprofit organizations to be involved in the planning process were provided in the form of emails, meetings, the Androscoggin County EMA website, flyers, surveys, and phone calls.

Public Comment Period. A notification email was sent to 14 jurisdictions and stakeholders on December 9, 2023, announcing that the plan was open for Public Comment Period from December 9, 2023, through December 16, 2023. Links were embedded in the email notification to a google drive, the website and Facebook for the public review and comment period, which ended December 16, 2023. ACEMA received 1 comment from a stakeholder via email and changes were incorporated into the plan, see Appendix D for details. The stakeholder informed ACEMA the Jurisdiction did not own a transfer station via email, as a result ACEMA removed the reference to a jurisdiction owned transfer station as illustrated in Figure 5: Sector &

Supporting/Coordinating Agencies, A-11 as documented in Appendix D - Emails. Comments/requested revisions were completed, and a final version of the plan was submitted to the State of Maine Natural Hazards Planner for approval and then FEMA Region I Office for review. Once the plan is APA (approved pending adoption) it will be sent to each jurisdiction's legislative body for adoption. Specifics to the plan review and public comment are located on page A-11 and adoption specifics are located in Element F.

Table 13: Summary of Local Participation in 2024 Hazard Mitigation Plan Update*

Jurisdiction	Kick Off Meetings	Hazard Mitigation Seminar	Project Planning Workshops	Hazard Mitigation Survey	Projects	Emails & Phone Calls
Auburn	X	X	X	X	X	X
Durham	X	X	X	X	X	X
Greene	X	-	X	X	X	X
Leeds	X	-	X	X	X	X
Lewiston	X	X	X	X	X	X
Lisbon	X	X	X	X	X	X
Livermore	X	X	X	X	X	X
Livermore Falls	X	X	X	X	X	X
Mechanic Falls	X	X	X	X	X	X
Minot	X	X	X	X	X	X
Poland	X	X	X	X	X	X
Sabattus	X	X	X	X	X	X
Turner	X	X	X	X	X	X
Wales	X	X	X	X	X	X

**"X" indicates participation, "-" indicates non-participation*

Table 14: Summary of Local Participation in 2005 -2017 Hazard Mitigation Plan Updates

Jurisdiction	2005 Participation	2010 Participation	2017 Participation
Auburn	X	X	X
Durham	X	X	X
Greene	X	X	X
Leeds	X	X	X
Lewiston	X	X	X
Lisbon	X	X	X
Livermore	X	X	X
Livermore Falls	X	X	X
Mechanic Falls	X	X	X
Minot	X	X	X
Poland	X	X	X
Sabattus	X	X	X
Turner	X	X	X
Wales	X	X	X

Element A Requirements
A3. Does the plan document how the public was involved in the planning process during the drafting stage and prior to plan approval? (Requirement 44 CFR § 201.6(b)(1))
A3-a. Does the plan document how the public was given the opportunity to be involved in the planning process and how their feedback was included in the plan?

Public Involvement

In addition to the kickoff, the seminar and project planning meetings listed above, in parallel ACEMA sent out three surveys to the jurisdictions, stakeholders, and the public regarding preparedness, hazards, concerns and personal impacts. Advanced notice, reminders and a public notice were posted on ACEMA's website and social media to advertise these surveys. ACEMA received a total of 95 responses from these surveys regarding preparedness of Androscoggin County citizens and hazard mitigation needs in the towns. Results from the Public, Jurisdiction and Stakeholder surveys are embedded later in Element A, the complete survey and response overview is located in Appendix B. No comments from the public were received during the Public comment period, December 9-16, 2023.

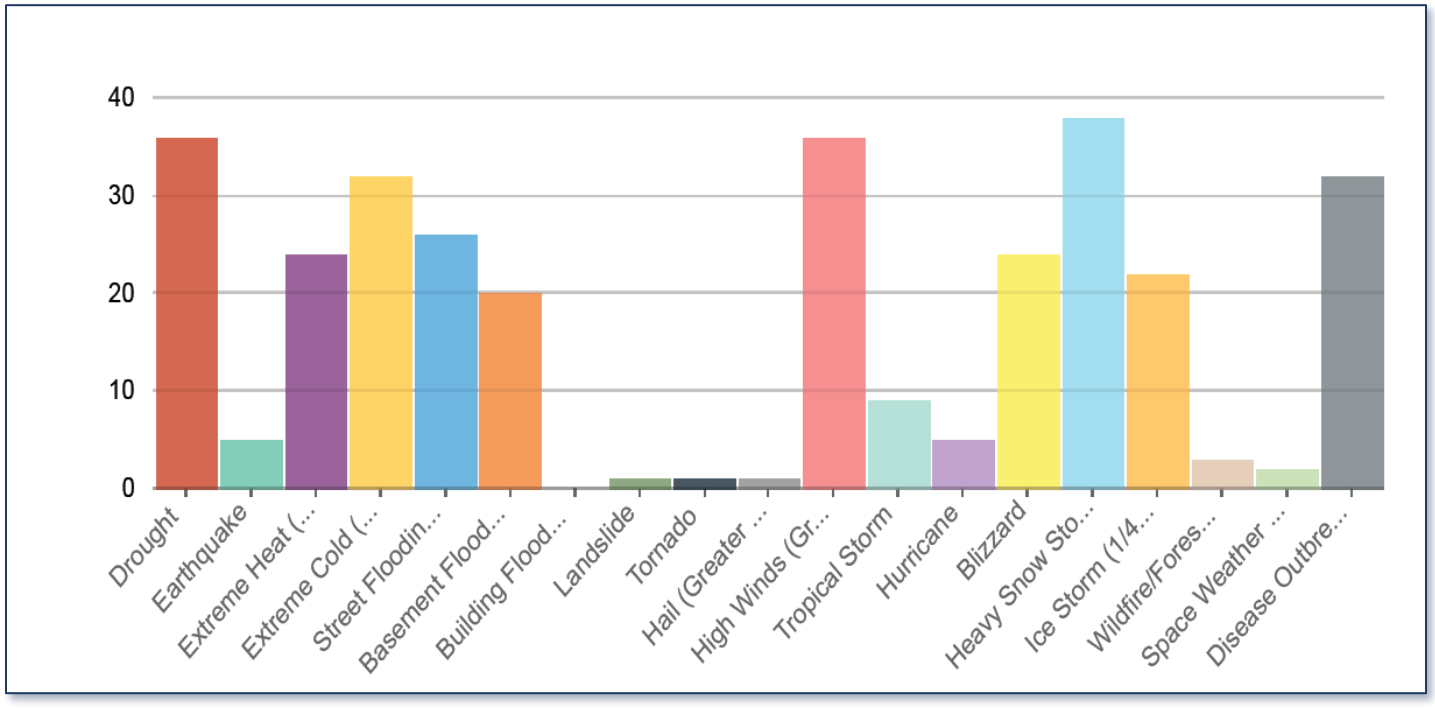
Local & Regional Agencies involved in hazard mitigation activities. The notification was sent to city administrators, city, and town managers, as well as department heads that align with community sectors, this includes agencies with the authority to regulate development, refer to Figure 5.

SECTORS & SUPPORTING/COORDINATING AGENCIES														
	Auburn	Durham	Greene	Leeds	Lewiston	Lisbon	Livermore	Livermore Falls	Mechanic Falls	Minot	Poland	Sabattus	Turner	Wales	
SECTORS															**REGIONAL & STATE SUPPORTING AGENCIES**
Emergency Management															
Local Emergency Manager															MEMA, ME FOREST SERVICE
Police															
Fire/EMS															
Economic Development															
Economic Development Director															AVCOG, AUBURN BUSINESS & COMMUNITY DEVELOPMENT
Town Manager															
Land Use and Development															
Code Enforcement															ME DACF & ME USDA
Comprehensive Planning															
Assessing															
Housing															
General Assistance															LEWISTON HOUSING
Housing Authority															
Health and Social Services															
General Assistance															ME CDC, MEMA, COMMUNITY CONCEPTS
Transportation															
Infrastructure															
Town Water															ME RURAL WATER ASSOCIATION, MEMA
Sewer/Waste Water															
Transfer Station															
Municipal Waste Collection															
Public Works/Road Commissioner															
Public Transportation															
Natural and Cultural Resources															
Parks & Recreation															MME HISTORIC PRESERVATION COMMISSION, UMAINE CO-OP, ME WATER & SOIL CONSERVATION, ME FOREST RANGERS
Library															
Conservation Committee															
Historical Society															

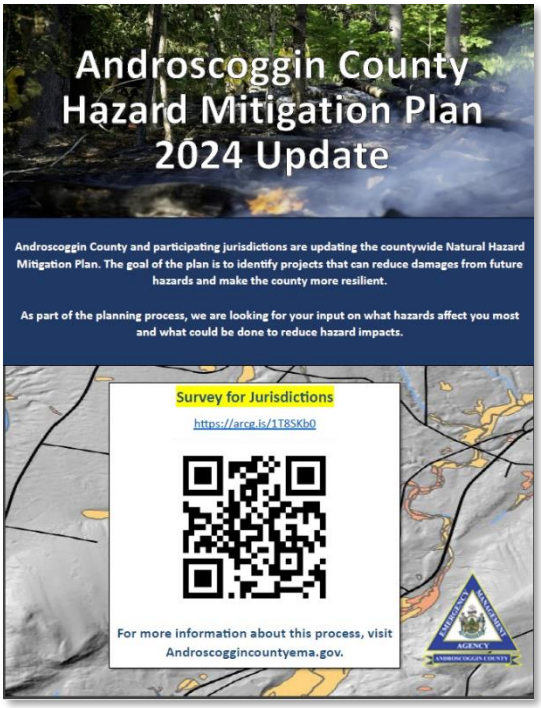
Figure 5: The Androscoggin County Natural Hazard Mitigation Community Sector Matrix.

Public Survey. ACEMA received a total of 58 responses from the Natural Hazard Mitigation Public Survey. The culmination of the Public Survey responses, Hazard Identification and Risk analysis, review of all available resources assisted with the selection of the hazards for inclusion of this Hazard Mitigation Plan. Those hazards are Flooding, Severe Summer Weather, Wildfire, Drought, and Severe Winter Weather. Participants were asked to answer questions regarding insurance programs and preparedness, to suggest potential mitigation actions and to identify vulnerabilities. The complete survey and response summary is located in Appendix B.

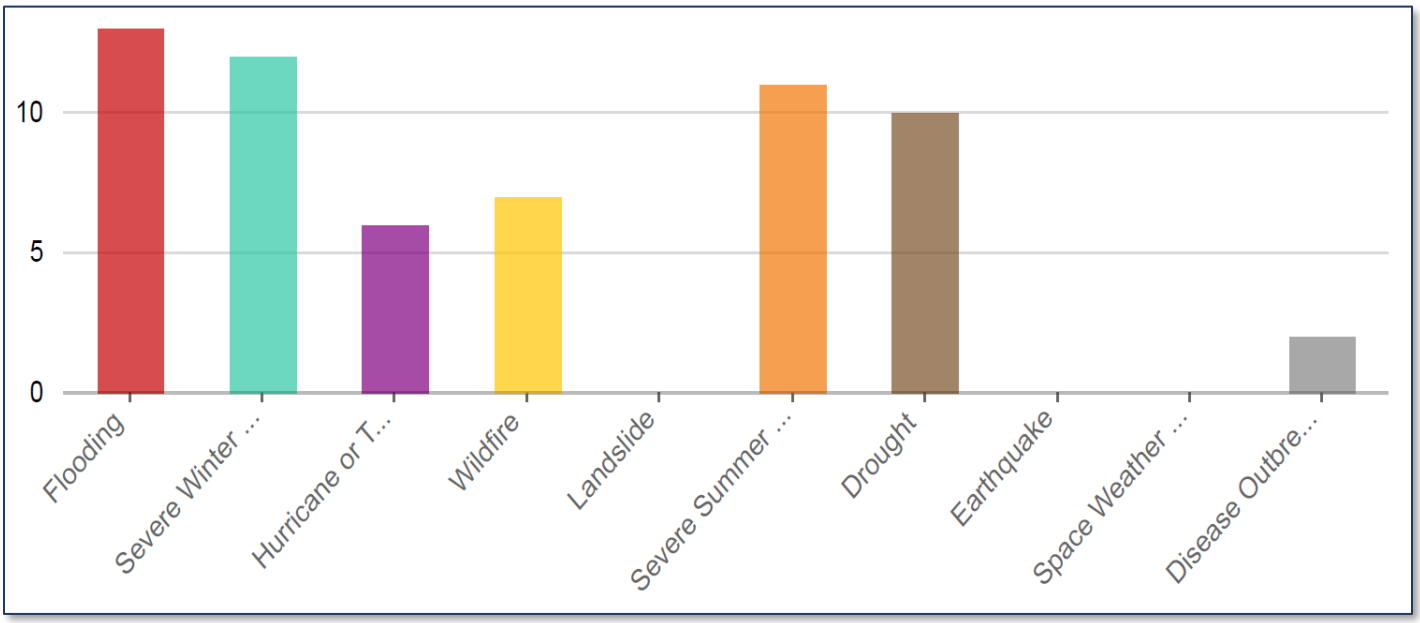
Since 2012 have you experienced any of the following hazards since living in Androscoggin County?		
Answers	**Count**	**Percentage**
Drought	36	62.07%
Earthquake	5	8.62%
Extreme Heat	24	41.38%
Extreme Cold	32	55.17%
Street Flooding	26	44.83%
Basement Flooding	20	34.48%
Building Flooding (at or above 1st floor	0	0%
Landslide	1	1.72%
Tornado	1	1.72%
Hail (Greater than 1" in diameter)	1	1.72%
High Winds (Greater than 50 MPH)	36	62.07%
Tropical Storm	9	15.52%
Hurricane	5	8.62%
Blizzard	24	41.38%
Heavy Snowstorm (15" or more in 24 hours)	38	65.52%
Ice Storm (1/4" or more of ice)	22	37.93%
Wildfire/Forest Fire	3	5.17%
Space Weather (Radio Blackout, etc.)	2	3.45%
Disease Outbreak	32	55.17%



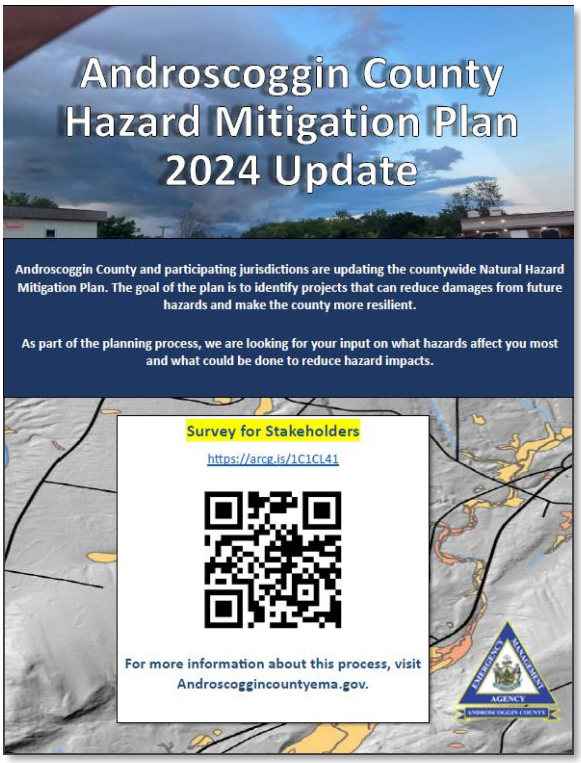
Jurisdiction Survey. ACEMA received a total of 14 responses from the Natural Hazard Mitigation Jurisdiction Survey. The culmination of the survey responses, Hazard Identification and Risk analysis, review of all available resources assisted with the selection of the hazards for inclusion of this Hazard Mitigation Plan. Those hazards are Flooding, Severe Summer Weather, Wildfire, Drought, and Severe Winter Weather. Participants were asked questions covering previous events, future concerns, vulnerabilities, insurance programs, preparedness. Jurisdictions updated the status of the projects submitted for inclusion in the 2017 Androscoggin County Hazard Mitigation Plan. The survey addressed outreach and education delivery methods, development in hazard prone areas, land use and development considerations for economic growth and development, impacts the economy and transportation, as part of critical infrastructure. The complete survey and response summary is located in Appendix B.



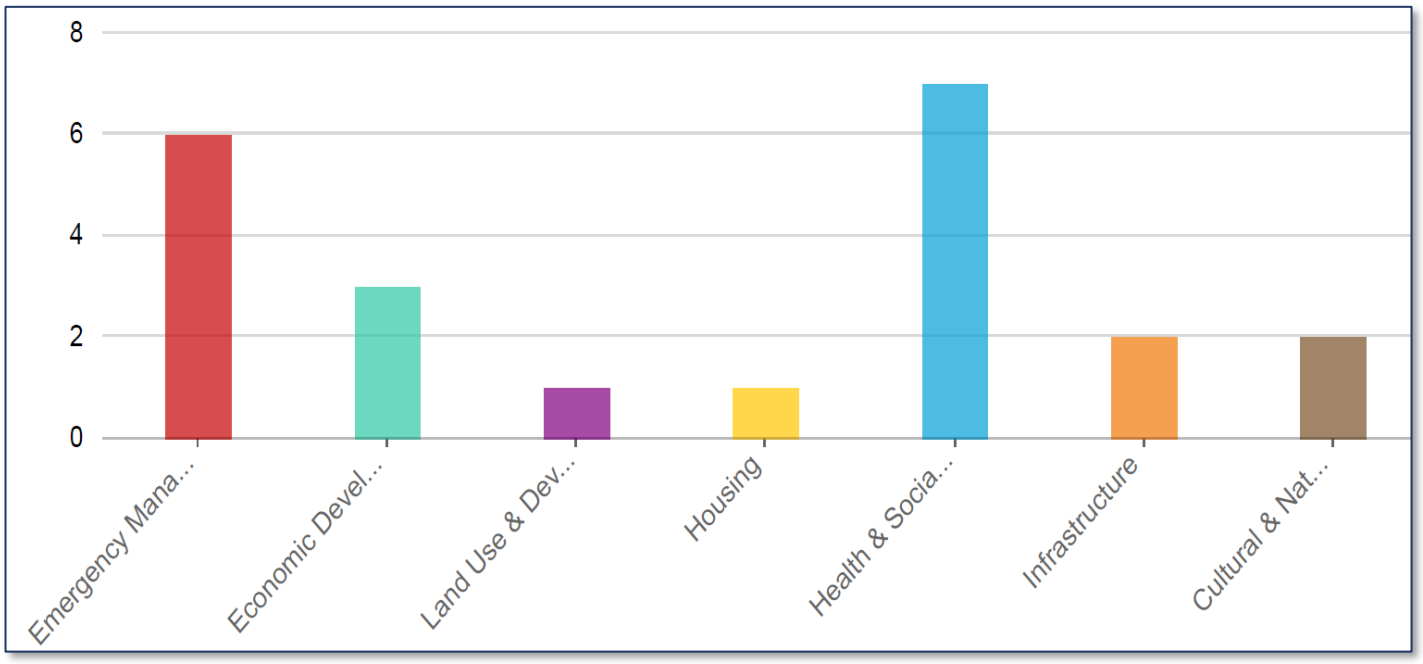
Identify the 5 hazards you are most concerned about causing future impacts.		
Answers	**Count**	**Percentage**
Flooding	13	92.86%
Severe Winter Weather (Heavy Snow, Extreme Cold, etc.)	12	85.71%
Hurricane or Tropical Storm	6	42.86%
Wildfire	7	50.00%
Landslide	0	0.00%
Severe Summer Weather (Tornado, Extreme Heat, etc.)	11	78.57%
Drought	10	71.43%
Earthquake	0	0.00%
Space Weather (Radio Blackout, etc.)	0	0.00%
Disease Outbreak	2	14.29%



Stakeholder Survey. ACEMA received a total of 22 responses from the Natural Hazard Mitigation Stakeholder Survey. The culmination of the survey responses, Hazard Identification and Risk analysis, review of all available resources assisted with the selection of the hazards for inclusion of this Natural Hazard Mitigation Plan. Those hazards are Flooding, Severe Summer Weather, Wildfire, Drought, and Severe Winter Weather. Participants were asked questions covering previous events, future concerns, identification of vulnerable infrastructure, socially vulnerable populations, insurance coverage, to identify potential mitigation actions in or near their operations located within Androscoggin County. The survey addressed outreach and education delivery methods, development in hazard prone areas, land use and development considerations for economic growth and development, impacts to the economy and transportation, as part of critical infrastructure. The complete survey and response overview is located in Appendix B.



What Community Sector category best describes your operation or service?		
Answers	**Count**	**Percentage**
Emergency Management	6	27.27%
Economic Development	3	13.64%
Land Use & Development	1	4.55%
Housing	1	4.55%
Health & Social Services	7	31.82%
Infrastructure	2	9.09%
Cultural & Natural Resources	2	9.09%



Neighboring Communities. The stakeholder and public surveys were sent to all 14 jurisdictions in Androscoggin County as well as the five contiguous county Emergency Management Agencies for dissemination, resulting in all adjacent communities to Androscoggin County being notified.

Representatives of Business, Academia, and other Private Organizations. The stakeholder and public surveys were sent to over 200 businesses located or doing business in Androscoggin County, all public, private, and parochial academic institutions located in Androscoggin County as well as non-profit organizations that are located in and/or serve Androscoggin County, this includes community-based organizations that work directly with and/or provide support to underserved communities and socially vulnerable populations. Responses to the stakeholder and public surveys, as well as a complete listing of recipients, can be found in Appendix D.

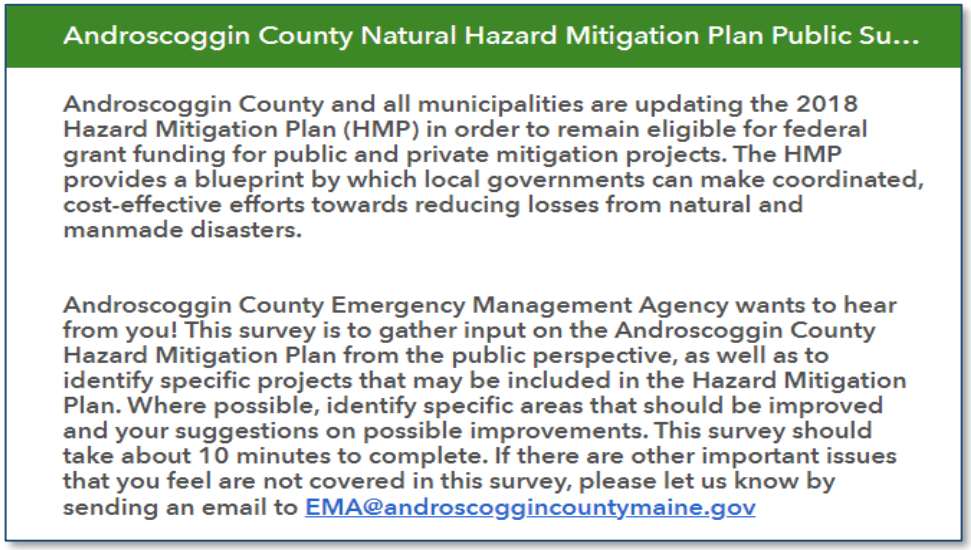


Figure 6: Snapshot of the Androscoggin County Natural Hazard Mitigation Public Survey.

Element A Requirements
A4. Does the plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement 44 CFR § 201.6(b)(3))
A4-a. Does the plan document what existing plans, studies, reports, and technical information were reviewed for the development of the plan, as well as how they were incorporated into the document?

Plan Review and Incorporation

The Androscoggin County Hazard Mitigation Planning Team reviewed the 2017 Androscoggin County Hazard Mitigation Plan, the 2023 State Hazard Mitigation Plan, and other county and local plans as part of the plan update process, components of these plans were incorporated as appropriate. The 2023 plan update builds from previous plans, incorporating results of the 2022 Risk Assessment, hazard location mapping, new data sets and studies, current concerns and future trends, vulnerabilities, and potential impacts from natural hazards to Androscoggin County. Results of the review and incorporation process are detailed in Elements B and C.

Table 15: Plan Incorporation & Review
Existing Plans, Studies, Reports and Technical Information*
2010 & 2017 Androscoggin County Natural Hazard Mitigation Plan
2023 State of Maine Natural Hazard Mitigation Plan
2020 Maine Climate Council Maine Won't Wait climate report and annual progress reports
NFIP Community Status Book & 2013 Flood Insurance Study & Effective FIRM database
Data sets, comprehensive plans, code & ordinances, Land Use plans, EOPs, EAPs

**Many other sources are referenced throughout this plan, also provided in detail, see Element B & Appendix C*

TABLE OF CONTENTS – ELEMENT B

Element B - Risk Assessment

Element B Requirements
B1. Does the plan include a description of the type, location, and extent of all natural hazards that can affect the jurisdiction? Does the plan also include information on previous occurrences of hazard events and on the probability of future hazard events? (Requirement 44 CFR § 201.6(c)(2)(i))
B1-a. Does the plan describe all natural hazards that can affect the jurisdiction(s) in the planning area, and does it provide the rationale if omitting any natural hazards that are commonly recognized to affect the jurisdiction(s) in the planning area?
B1-b. Does the plan include information on the location of each identified hazard?
B1-c. Does the plan describe the extent for each identified hazard?
B1-d. Does the plan include the history of previous hazard events for each identified hazard?
B1-e. Does the plan include the probability of future events for each identified hazard? Does the plan describe the effects of future conditions, including climate change (e.g., long-term weather patterns, average temperature, and sea levels), on the type, location, and range of anticipated intensities of identified hazards?
B1-f. For participating jurisdictions in a multi-jurisdictional plan, does the plan describe any hazards that are unique to and/or vary from those affecting the overall planning area?

Identification of Hazards

Androscoggin County Emergency Management Agency conducted an All-Hazards Risk Assessment in 2022, all 14 jurisdictions participated. As teams comprised of administration and department heads, jurisdictions rated the impact that each hazard would have on their community using the information provided by Androscoggin County EMA through presentations from SME, Donny Dumont, NWS and Linsdey Spigel and Henry Berry, ME-Geological Survey, hazard reports containing hazard definitions, county context and general consequence analysis. As each jurisdiction in Androscoggin County varies greatly in personnel, resources and geography, each jurisdiction ranked according to their specific community. The county's overall ranking of natural hazards is shown in Figure 7 below and Appendix A in addition to the individual jurisdiction ranking.

Androscoggin County Natural Hazards Identification and Risk Assessment

#	RATING	Likelihood	Impact/Vulnerability
3	Likelihood/ Permanent Impact	Highly Likely (within 3 years)	Permanent Disruption, Permanent damage; Mass Injuries & Fatalities
2	Likelihood/ Significant Impact	Likely (within 5 years)	Significant disruption, damage; Multiple injuries, fatalities
1	Likelihood/ Low Impact	Somewhat likely (within 6-10 years)	Low impact, damage; Some injuries or fatalities
0	Likelihood/ No impact	Unlikely (within the next 10 years)	No impact, disruption, injuries or fatalities

Hazard	Likelihood	Vulnerability						Total Score
		Continuity of Operations	People	Property/ Infrastructure	Economy	Environment	Composite Score	
	Likelihood of one incident within a define period of time	Total Score	Total Score	Total Score	Total Score	Total Score		
Severe Fall/Winter Weather	2.3	1.7	1.1	1.1	0.9	0.8	1.1	3.4
Severe Summer Weather	1.7	1.2	1.1	1.1	0.9	1.1	1.1	2.8
Disease Outbreak	1.9	1.9	2.0	0.4	1.9	0.4	1.3	3.3
Drought	1.6	0.9	0.8	0.9	1.1	1.6	1.1	2.6
Wildfire	1.1	1.2	0.8	1.2	0.9	1.4	1.1	2.2
Landslide/Mass Wasting	0.6	0.5	0.6	0.6	0.4	0.7	0.6	1.1
Flooding	1.4	1.1	0.7	1.5	1.1	1.0	1.1	2.5
Hurricane/Tropical Cyclone	0.8	1.2	0.9	1.4	1.1	1.0	1.1	1.9
Earthquake	0.4	0.8	0.6	1.0	0.6	0.8	0.8	1.1
Space Weather	0.4	0.9	0.5	0.9	1.0	0.4	0.7	1.1

Figure 7: Androscoggin County Natural Hazards Identification and Risk Assessment

Table 16: Natural Hazards Inclusion Summary					
Hazard	Locations	Determining Factors			
		Extent	Occurrences	Future Probability	Source
Flooding					
Inland	Throughout Androscoggin County, see Figure 8.	100–500-year floods	High Frequency	High due to climate change	FEMA FRIM database, NWS hydrological database
Dam Breach	Four high hazard dams and two significant hazard dams, see Element G.	Predicted Maximum Flood (PMF)	Low frequency	Medium due to age of infrastructure	USGS, engineering models.
Severe Summer Weather					
Wind	Throughout Androscoggin County, see Figure 14.	Damaging 55 mph or greater wind gusts	High Frequency	High due to climate change	NWS database
Hurricane/Tropical Storm	Throughout Androscoggin County, see Figure 25 & 26.	Category 1 Hurricane	Medium Frequency	High due to climate change	NWS database
Extreme Heat	Throughout Androscoggin County, see Table 25.	100°F+ over 3-days including heat index	Medium Frequency	High due to climate change	NWS database, Climate modeling
Wildfire					
Wildfire	Throughout Androscoggin County, see Figure 23.	1+ acre burned	High Frequency	High due to climate change	US Forest Service records, archived periodicals
Drought					
Drought	Throughout Androscoggin County, see Figure 28.	NWS drought criteria	Medium Frequency	High due to climate change	USGS database, USDA database, Climate modeling
Severe Winter Weather					
Blizzard	Throughout Androscoggin County, see Table 28 & 29.	NWS Blizzard criteria	Medium Frequency	High due to climate change	NWS database, archived periodicals
Ice Storm	Throughout Androscoggin County, see Table 28 & 29.	NWS Ice storm criteria	Medium Frequency	High due to climate change	NWS database, archived periodicals
Extreme Cold	Throughout Androscoggin County, see Table 28 & 29.	Below 0°F over 3 days, with wind chill	Medium Frequency	High due to climate change	NWS database, archived periodicals, Climate modeling
Heavy Snow	Throughout Androscoggin County, see Table 28 & 29.	NWS Winter Storm criteria	High Frequency	High due to climate change	NWS database, archived periodicals

Natural Hazards Selection

Resulting from the Natural Hazard Identification and Risk Assessment, a review of all available resources, and ranking by the jurisdictions the following hazards have been selected for this Natural Hazard Mitigation Plan, Flooding, Severe Summer Weather, Wildfire, Drought, and Severe Winter Weather, refer to Tables 16 and Table 17 for a detailed reasoning for inclusion and non-inclusion.

Table 17: Natural Hazards Non-Inclusion Summary					
Hazard	Locations	Extent	Occurrences	Future Probability	Source
Earthquake					
Earthquake	See Appendix C	Magnitude: 1.5-3.5	Low Frequency 6 events since 1995	Insufficient data to calculate future changes in probability	USGS Earthquake Hazard Assessment, Appendix C
Landslide					
Landslide	See Appendix C	Range: 0.07-10.69 acres	Low Frequency All events prehistoric	Insufficient data to calculate probability	Maine Geological Survey record of historic inland landslides, Appendix C
Pandemic					
Pandemic	See Appendix C	Androscoggin County EMA has a separate pandemic plan.			
Space Weather					
Space Weather	See Appendix C	See Appendix C	Medium Frequency	Insufficient data to calculate probability of high impact events.	SHMP 2023-Hazards Not Profiled, Appendix C
Hazard Mechanisms					
Blight/Infestation	Throughout Androscoggin County, see Drought.	There is insufficient data to calculate the recurrence interval and impacts/losses to jurisdictional assets caused by blight and infestation. Negative impacts are expected for agriculture, inland tourism, and health impacts.			
Air Quality	Throughout Androscoggin County, see Wildfire.	There is insufficient data to calculate the recurrence interval and impacts/losses to jurisdictional assets caused by air quality. Negative impacts are expected for Androscoggin County, particularly urban centers, if a poor air quality event were to occur.			

Flooding

The Androscoggin River is the primary waterway in Androscoggin County, with major tributaries including the Nezinscot River, Dead River, Martin Stream, Sabattus River, and the Little Androscoggin River. Major lakes/ponds in Androscoggin County include Lake Auburn, Sabattus Pond and the Range Ponds (Upper, Middle, and Lower). The majority of the flooding in the county is caused by winter snowmelt runoff and/or severe rain events which undercut and washout roads. River flooding is likely especially during the spring due to snowmelt and the possibility of ice jams. Low lying areas may be subject to flooding due to their limited ability to drain water. Urban areas and/or any area with significant impermeable surface cover such as roads may be subject to flooding due to poor drainage. The Table 18 lists the major rivers in Androscoggin County and the municipalities that their flooding would affect.

Table 18: Rivers and Potentially Impacted Communities in Androscoggin County

River Name	Potentially Impacted Jurisdictions
Androscoggin River	Auburn, Durham, Greene, Leeds, Lewiston, Lisbon, Livermore, Livermore Falls, Turner
Little Androscoggin River	Auburn, Mechanic Falls, Minot, Poland
Nezinscot River	Turner
Dead River	Leeds
Martin Stream	Livermore, Turner
Sabattus River	Lisbon, Sabattus
Bog Brook	Minot
Jock Stream	Wales

General Definition of Flooding. As defined by the National Weather Service is "An overflow of water onto normally dry land. The inundation of a normally dry area caused by rising water in an existing waterway, such as a river, stream, or drainage ditch. Ponding of water at or near the point where the rain fell."

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

- **Beaver Dam Flooding**: Flooding resulting from back-up and overflow of water resulting from the construction of beaver dams.
- **Dam failure:** The sudden release of water resulting from structural collapse or improper operation of the impounding structure. Dam failure can cause rapid downstream flooding, loss of life, damage to property, and the forced evacuation of people.
- **Flash flood:** A sudden and dangerous rise in water along a stream, river, wash or over a normally dry land area. Flash floods result from heavy rainfall, river ice jams, dam, or levee failures. Flash floods can occur within a few minutes or hours and can move at surprisingly high speeds.
- **Ice jam**: A buildup of floating ice fragments that blocks the normal flow of a river. During a thaw or rainstorm, the increased discharge from snowmelt and/or rainfall can lift and break up a thick ice cover and carry it downstream as an ice run. Ice runs can jam in river bends or against the sheet ice covering flatter reaches. The resulting ice jams can block enough river flow that serious flooding may result within an hour of their formation. Failure of an ice jam suddenly releases water downstream. Damages from ice jam flooding usually exceed those of clear water flooding because of higher than predicted flood elevations, rapid increase in water levels upstream and downstream, and physical damage caused by ice chunks. Moving ice masses can shear off trees and destroy buildings and bridges above the level of the flood waters.

- **Lacustrine (Lake Flooding)**: occurs when the outlet for the lake cannot discharge water fast enough to maintain the normal pool elevation of the lake. During a base flood event, normal increases in water surface elevations on most Maine lakes and ponds range from 1 to 5 feet. While this can impact individual dwellings built near the water's edge, there are no records of major damages so this type of flood will not be further addressed in the plan.
- **Riverine/riparian:** Periodic overflow of rivers and streams, usually the result of spring runoff, but can also be caused by major rainstorms.
- **Urban:** Overflow of storm sewer systems, usually due to poor drainage, following heavy rain or rapid snow melt. The combined sanitary and storm water systems that some urban areas installed years ago can cause flooding of sanitary sewerage when riparian floods occur. Runoff is increased due to the number of impervious surfaces such as roof tops, sidewalks, and paved streets. This along with riverine flooding are the most common types of flooding seen in Androscoggin County.

Location of Flooding Hazards. All jurisdictions in Androscoggin County are subject to flooding in one form or another. Androscoggin County's susceptibility to flooding is exacerbated by its wide range of weather conditions. Due to seasonal factors such as heavy rains, melting snowpack and/or ice jams, major flooding most frequently occurs between December and May. Based on data from the National Weather Service, the most flood-prone months are March, April, and May, respectively. Floods can also be caused by hurricanes or tropical storms. Based on the 2013 Flood Insurance Study (FIS) the areas subject to a 100-year flooding event and 500-year flooding event are depicted on FEMA floodplain maps, refer to Figure 8. Local officials have identified additional locations that are subject to flooding and/or that have had repeated flood damages in specific jurisdictions, as identified later in Element B, Hazard Mitigation Projects in Element C, and the Androscoggin County Natural Hazard Mitigation Survey for Jurisdictions 2023, included in Appendix B.

Extent/Severity of the Hazard. Flooding can cause loss of life, property damage, disruption of communications, transportation, utility service and community services, crop and livestock damage, health issues from contaminated water supplies, and loss and interruption of business. Maine overall receives over 42 inches a year of precipitation which contributes significantly to flood potential. A strong low-pressure system over the east coast of the United States or the tendency of some storms to follow one another in rapid succession provide heavy, combined moisture. Water abundance is one of the state's most valuable natural resources and its primary hazard. Although the Maine State Hazard Mitigation Plan highlights 1987 as the worst flood of record in Maine on the Kennebec and Piscataquis Rivers, the floods of record for Androscoggin County are 1936 as noted in Table 19, which took houses down river, as well as the Flood of 1987. (USGS Maine Flood of 1987 Report)

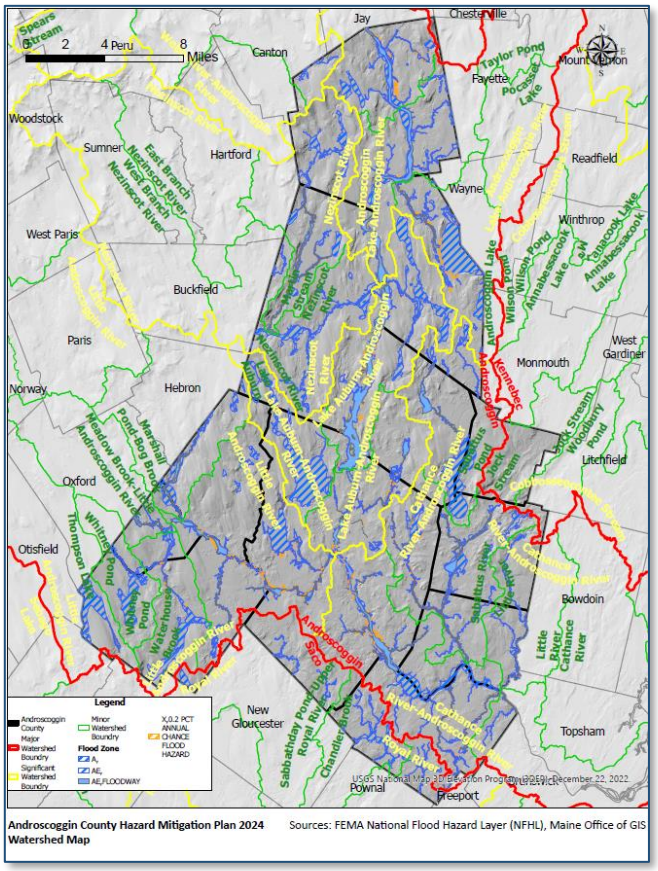


Figure 8: Androscoggin County Flood Hazard and Watershed map, see Appendix A for full size map.

Table 19: Androscoggin River gage at Auburn			
Date	Gage Height (Feet)	Flow (Cubic Feet per Second)	NWS Flood Stage
March 30, 1936	27.57	135,000	Major
April 2, 1987	23.71	99,600	Major
March 28. 1953	22.84	94,100	Major
March 1, 1896	17.80	65,000 (Estimate)	Moderate
May 13, 1989	17.42	61,900	Moderate
April 7. 1984	17.27	59,100	Moderate
December 22, 1973	16.78	51,900	Moderate
June 4, 2012	16.76	58,400	Moderate

Source: USGS National Water Information System

Table 20: Nezinscot River gage at Turner Center			
Date	Gage Height (Feet)	Flow (Cubic Feet per Second)	NWS Flood Stage[1]
March 27, 1953	11.18	13,900	N/A
April 1, 1987	10.20	11,600	N/A
April 4, 2005	8.72	8,630	N/A
March 15, 1977	8.69	8,530	N/A
June 4, 2012	8.42	8,010	N/A
April 6, 1984	8.30	7,790	N/A
April 17, 2007	8.23	7,630	N/A
April 4, 1951	7.70	6,920	N/A

Source: USGS National Water Information System

[1]*The National Weather Service does not currently have a flood stage set for the Nezinscot River gauge.*

Figure 9: The US Route 202 Bridge between Lewiston and Auburn during the Flood of 1987. Source: Lewiston Sun Journal

Previous Occurrences. While minor flooding usually occurs every year in Androscoggin County, some of the most significant flooding events since 1896 are shown in the table below.

Table 21: Historical Summary of Flooding Events in Androscoggin County		
Date(s)	Description	Presidential Disaster Declaration
March 2, 1896	Severe Storms, Flooding	-
March 11-23, 1936	Severe Storms, Flooding	-
March 27-30, 1953	Severe Storms, Flooding	-
February 27, 1970	Severe Storms, Ice Jams and Flooding	FEMA-284-DR-ME
January 18, 1974	Severe Storms, Flooding	FEMA-410-DR-ME
March 20, 1977	Severe Storms, Flooding	-
May 31 to June 6, 1984	Severe Storms, Flooding	-
January 27-29, 1986	Severe Storms, Flooding	-
April 1, 1987	Severe Storms, Flooding (April Fool's Storm)	FEMA-788-DR-ME
May 12 to July 27, 1989	Severe Storms, Flooding	FEMA-830-DR-ME
March 27, 1992	Flooding, Heavy Rain, Ice Jams	FEMA-940-DR-ME
April 9-15, 1993	Heavy Rain, Flooding, Ice Jams, Snowmelts (Easter Storm)	FEMA-988-DR-ME
January 19 to February 6, 1996	Severe Storms/Flooding	FEMA-1106-DR-ME
April 16-17, 1996	Flooding and Mudslides	FEMA-1114-DR-ME
June 12-21, 1998	Severe Storms and Flooding	FEMA-1232-DR-ME
March 28 to April 26, 2000	Severe Storms and Flooding	FEMA-1326-DR-ME
December 17, 2002 to June 1, 2003	Extreme Winter Weather	FEMA-1468-DR-ME
March 28, to May 3, 2005	Severe Storms, Flooding, Snow Melts, and Ice Jams	FEMA-1591-DR-ME
April 15-23, 2007	Severe Storms, Inland and Coastal Flooding (Patriot's Day Storm)	FEMA-1693-DR-ME
July 18 to August 16, 2008	Severe Storms, Flooding and Tornadoes	FEMA-1788-DR-ME
December 11-27, 2008	Severe Winter Storm and Flooding	FEMA-1815-DR-ME
June 4, 2012	Severe Storms and Flooding	-
April 16, 2014	Severe Storms and Flooding	-
October 31, 2017	Severe Storms and Flooding	-
April 22, 2019	Severe Storms and Flooding	-
May 1, 2023	Severe Storms and Flooding (May Day Storm)	FEMA-4719-DR-ME*

Source FEMA Disaster Declarations

**Androscoggin County was impacted by but did not meet the damage threshold to be included in the May Day Storm declaration.*

- Denotes the event did not result in a disaster declaration.

Table 22: Flood Losses in Dollars per jurisdiction for Federal Disaster Declarations Since 1987 (dollar values are accurate to the year of each disaster declaration)						
Jurisdiction	DR 788 April 1987	DR-1114 April 1996	DR-1326 March/April 2000	DR 1591 March-May 2005	DR-1693 April 2007	DR-1815 December 2008
Androscoggin County	$8,726	$0	$0	$2,379	$1,716	$0
Auburn	$126,948	$12,223	$0	$15,603	$33,300	$281,110
Durham	$6,854	$44,313	$0	$46,257	$24,605	$26,623
Greene	$10,918	$6,700	$0	$77,259	$97,174	$68,154
Leeds	$11,324	$9,872	$0	$71,870	$33,741	$45,155
Lewiston	$31,366	$19,528	$296,956	$28,117	$120,999	$234,045
Lisbon	$77,882	$6,771	$0	$13,607	$8,392	$21,442
Livermore	$26,996	$4,391	$5,449	$15,636	$70,817	$39,046
Livermore Falls	$43,382	$1,972	$0	$10,666	$33,043	$30,675
Mechanic Falls	$5,102	$30,877	$6,142	$16,324	$29,599	$38,428
Minot	$6,644	$138,968	$13,255	$24,604	$42,873	$59,477
Poland	$9,383	$14,501	$0	$65,347	$120,385	$54,057
Sabattus	$6,614	$0	$0	$7,209	$11,637	$30,691
Turner	$9,730	$31,582	$0	$68,196	$35,214	$58,489
Wales	$4,470	$1,732	$0	$5,889	$1,467	$0
Other	$66,002[1] & $4,223[2]	$7,159[1]	$0	$34,469[3]	$8,9631	$0
Total	$456,564	$354,261	$321,802	$507,432	$673,925	$987,392

[1]*Auburn Water District*

[2]*Lewiston Auburn Water Pollution Control Authority (LAWPCA)*

[3]*Lewiston/Auburn Municipal Airport*

Figure 10: Nezinscot Dam, Turner ME Source: Mapio

Probability of Future Occurrence. Floods are described in local flood hazard studies in terms of their extent, including the horizontal area affected, and the related probability of occurrence. Flood studies use historical records to determine the probability of occurrence for different extents of flooding. The most widely adopted design and regulatory standard for floods in the United States is the 1-percent annual chance flood and this is the standard formally adopted by FEMA. The 1-percent annual flood, also known as the base flood, has a 1 percent chance of happening in any particular year. It is also referred to as the "100-year flood." The probability of flooding of homes, commercial and governmental buildings and critical facilities located in flood-prone areas is 1% in any given year. It is possible that flooding will increase due to climate change, as described in the Climate Change section of Element B, which suggest that more high impact rainfall events will occur in the state of Maine in the coming years.

Vulnerabilities to Flooding

Assessing Vulnerability to Flooding. In 2021 in preparation for the All-Hazards Risk Assessment, Androscoggin County Emergency Management Agency worked with the North-East States Emergency Consortium (NESEC) to develop quantitative reports usings HAZUS version 4.2 to estimate the potential impacts of a 500-year flood in Androscoggin County. Based on the report, there would be an estimated $365,622,000 in damage to general building stock, $767,490 in damage to utilities and $6,000 in damage to transportation systems. A snapshot of the losses to general building stock is included below in Figure 11. The complete HAZUS flood impact report is included in Appendix C.

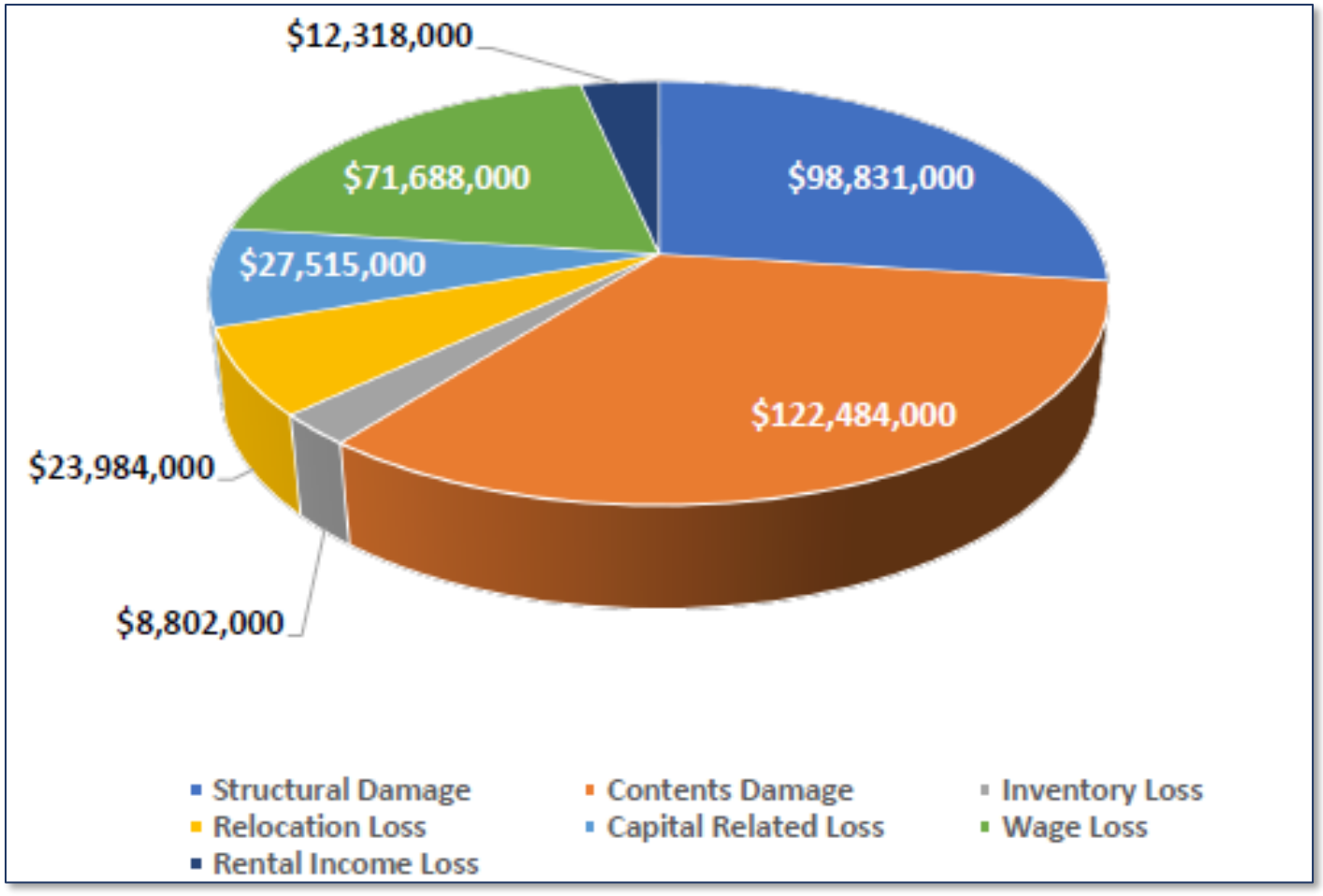


Figure 11: Androscoggin County HAZUS Flood Damage Economic Loss for Buildings by Type

Specific Locations Vulnerable to Flooding. Androscoggin County Emergency Management Agency, through the three specific Natural Hazard Surveys asked jurisdictions, stakeholders, and the public to identify locations within Androscoggin County that are most vulnerable to natural hazards. Additional information was gathered through past occurrences and data provided by subject matter experts, such as the National Weather Service. Table 23 below lists specific locations, including critical facilities in each jurisdiction that are vulnerable to flooding and the mechanism related to the vulnerability. Flood waters can contain a variety of hazards including building debris, hazardous chemicals, wastewater effluent[1]. Once floodwaters recede these materials can be deposited on land, causing contamination of agricultural land or residential properties, which can require extensive cleanup efforts lasting long after the flood is over. Flood hazard impacts community sectors, identified as emergency management, economic development, land use and development, housing, health and social services, infrastructure, and natural and cultural resources as outlined later in Element B.

[1] US CDC Hazards of Floodwaters

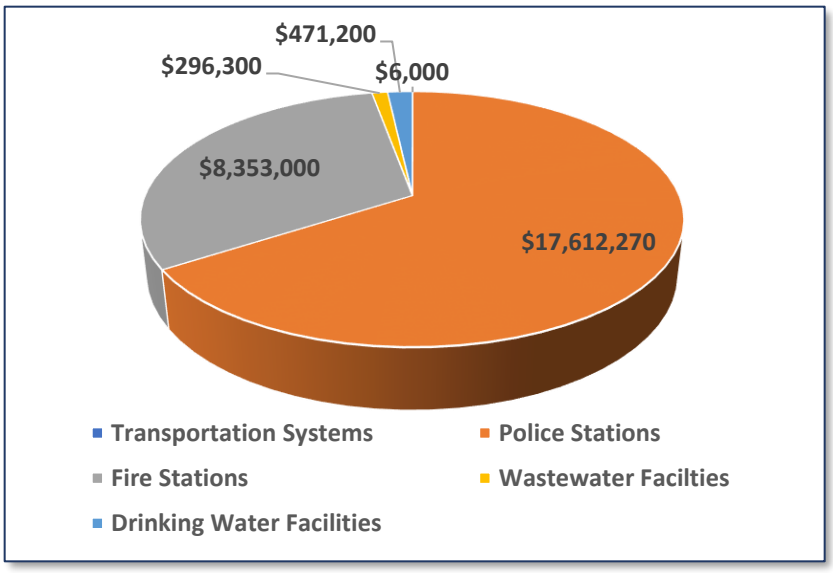


Figure 12: Androscoggin County HAZUS Flood Damage to community lifelines

Table 23: Specific locations vulnerable to Flooding

Jurisdiction	Location 1 & Mechanism	Location 2 & Mechanism
Auburn	North River Road, River flooding	Main Street, Urban flooding
Durham	Newell Brook Road, Flash flooding	Swamp Road, Flash flooding
Greene	Coburn Road, Flash flooding	Hills Ridge Road, Flash flooding
Leeds	Quaker Ridge Road, Flash flooding	River Road, River flooding
Lewiston	Adams Avenue, Urban flooding	Main Street, Urban flooding
Lisbon	Ferry Road, River flooding	Main Street/Route 125, Flash flooding
Livermore	Norton Road, Flash flooding	Goding Road, Flash flooding
Livermore Falls	Moose Hill Road, Flash flooding	Strickland Loop Road (Norris Bridge) , Flash flooding
Mechanic Falls	Riverside Drive, River flooding	Libby Road, Flash flooding
Minot	Bucknam Bridge Road, River flooding	West Minot Road, River flooding
Poland	Cobb Road, Flash flooding	Jackson Road, Flash flooding
Sabattus	Maxwell Road, Flash flooding	Marsh Road, Flash flooding
Turner	School House Hill Road, River flooding	Orchard Way, Flash flooding
Wales	Avenue Road, River flooding	East Road, River flooding

Community Sector Risks from Flooding.

Emergency Management: Firefighting efforts can be impacted by flooding, due to damage to or contamination of water supply systems. First Responders may have difficulty responding to incidents due to washed out or impassable roads. No public safety facilities in Androscoggin County are currently located in a FEMA designated floodplain, as shown in Figure 13.

Economic Development: Flooding can cause property damage to both residential, commercial, and industrial properties, resulting in significant economic impact, in the form of lost jobs and closed businesses.

Land Use and Development: Jurisdictions have limited development in floodplains through the adoption of the National Flood Insurance Program and the enactment of local floodplain ordinances. Because all 14 jurisdictions have adopted a floodplain management ordinance, there has been very little development within the floodplain in the last 5 years across Androscoggin County.

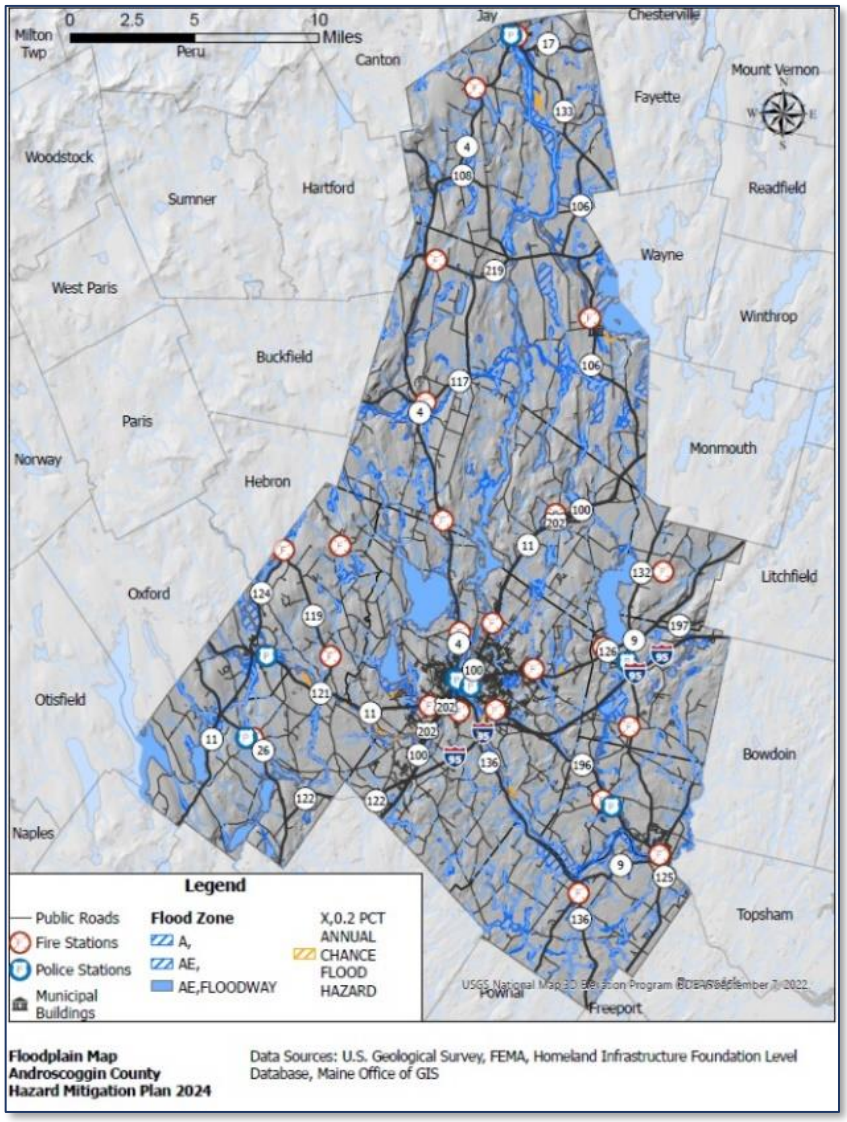
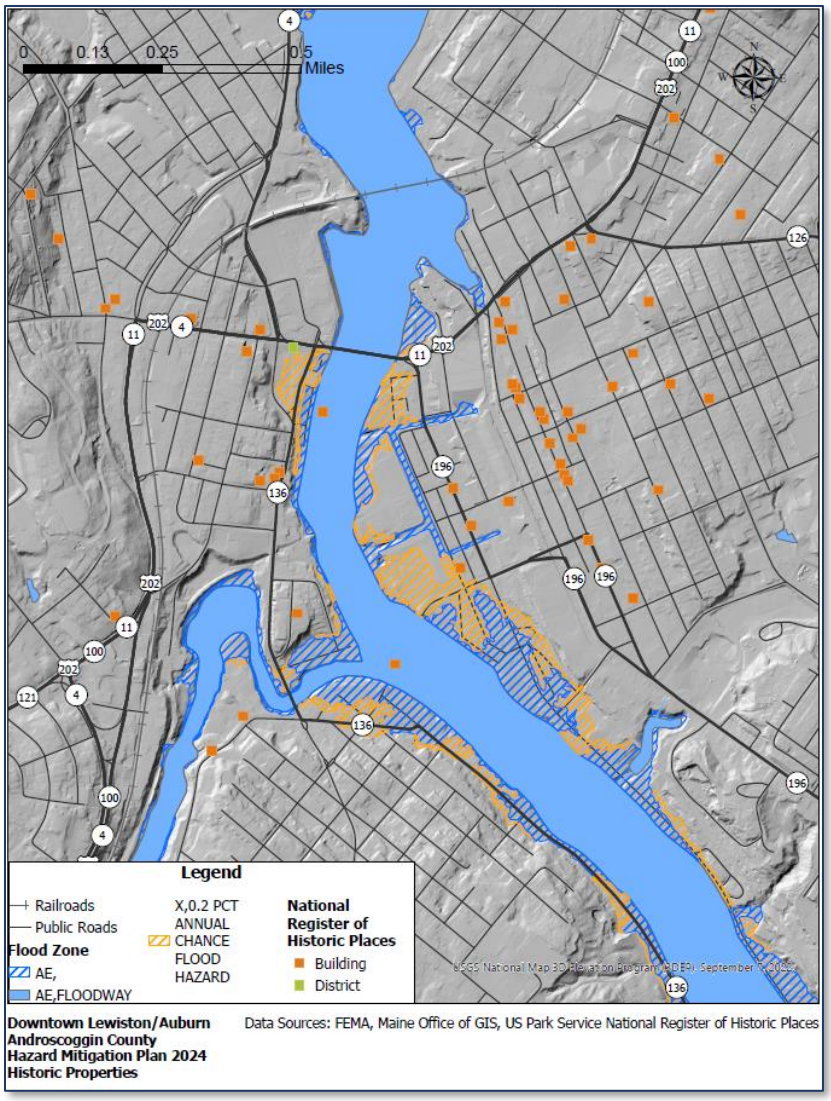


Figure 13: FEMA identified flood zones and Public Safety facilities in Androscoggin County, a full-sized map is included in Appendix A

Housing: Flooding may cause damage to residential units that are not properly floodproofed, causing molds and mildew to develop within structural components of residences. Many residential owners do not carry flood insurance, leading to some homeowners being unable to recoup losses from flood impacts. As noted in the Androscoggin County Natural Hazard Mitigation Public Survey, the majority of survey participants indicted that they do not carry flood insurance, either because it is too expensive, the property owner believes that their property will not flood, or the property was inherited. A majority of residential units in Androscoggin County source drinking water from wells, its very likely wells exposed to flood waters may require disinfection after flood waters recede, as flood waters contain numerous contaminants such as chemicals, debris, and wastewater effluent[1]. Refer to the full-size flood zone map located in Appendix A.

[1] US EPA Flooded Homes Cleanup Guidance



Health & Social Services: Flooding may cause health issues from contaminated water supplies. No hospitals or Long-Term Healthcare Facilities (LTHCF) are located in a FEMA designated floodplain. Socially vulnerable (SV) populations, such as those in poverty or the elderly may have trouble evacuating, reason being is the lack of owning a personal vehicle or relying on public transportation, which may be impacted during a flooding event. The same SV population likely suffer from lack of a savings and a low credit score making it difficult to near impossible to qualify for a recovery loan. If the property damage is severe enough the inhabitants have to relocate at their expense, the whole ordeal may cause a stress and lack of sleep, impacting the immune system creating a perfect scenario for illness from the floodwaters. Floodwaters can carry numerous hazards in the form of chemicals, debris, and wastewater effluent, which can contaminate food and water supplies impacted by flooding as noted by the American Lung Association[1].

Figure 14: Historic properties located in the flood zone of downtown Lewiston and Auburn, full sized maps are inlcuded in Appendix A

Infrastructure: Floods can damage transportation infrastructure including roads and bridges causing interruptions to commodity distribution such as medical supplies, food and fuel and delivery of critical services like electrical power, drinking water and emergency medical transport. Most road washouts are quickly repaired, but some are not mitigated. As a result, replacement culverts, ditching and fill can be just as susceptible to future flood damages. The majority of critical infrastructure facilities in Androscoggin County are located outside of FEMA designated floodplains, with the notable exception being three of the five wastewater treatment plants, due to the requirement of their design placing then in proximity to a body of water, specifically Lewiston, Livermore Falls and Lisbon, refer to Appendix A.

Natural & Cultural Resources: Vegetation may be washed away by floodwaters and soil may be scoured away in some areas and redeposited in others by flooding. Two historic structures, the Roak Block located on Main Street in the City of Auburn, refer to the Auburn Jurisdictional Profile for a full-size map and the Nathaniel Osgood House on Royalsborough Road in Durham are located in a FEMA designated flood zone.

[1] *American Lung Association Floods and Water Damage*

Severe Summer Weather

Androscoggin County experiences at least one severe summer event each year, typically a severe thunderstorm. Numerous less impactful systems can occur; microbursts cause tree and property damage resulting in power outages countywide, while tornadoes and hurricanes happen less frequently, these events are no less impactful, the county also experiences 2-3 extreme heat events per year, putting a strain on the power grid and can lead to significant heat related illnesses in vulnerable populations.

General Definition. Based on the interconnectedness, historical records and the 2017 Natural Hazard Mitigation plan the Androscoggin County Planning team grouped the following hazards in the category that is Severe Summer Weather: Hurricane, Tornado, Severe Thunderstorm, Microburst and Extreme heat.

Types of Severe Summer Weather. A single summer storm may contain one or more of the following:

- **Hurricane:** Tropical storms with wind speeds reaching upwards of 74 miles per hour, accompanied by heavy rain. Hurricanes are categorized on a Saffir-Simpson Scale, in Table 24.
- **Tornado:** A tornado is a rapidly rotating column of air created by a thunderstorm during periods of substantial atmospheric instability. A funnel cloud is a tornado that has not reached the ground.
- **Severe Thunderstorm:** A severe thunderstorm is defined by the National Weather Service (NWS) as a storm capable of producing a tornado, 1" or greater hail and/or wind gusts of 57 MPH or more. It should be noted that rainfall and lightning are important components of a thunderstorm, but do not make a storm severe. The most common would-be severe thunderstorms, which can occur as single "cell" storms, multi-cell storms or in a line of cells known as a squall line.
- **Microburst:** A microburst is when atmospheric processes in a thunderstorm cause wind to rush down and spread out in all directions once it hits the ground. A microburst can produce winds and damage similar to a tornado Microbursts usually affect an area less than 2.5 miles in diameter.
- **Extreme Heat:** Air temperatures in the upper 90's and heat index over 100 degrees. The Heat Index is a measure of how hot it feels like based on a combination of the air temperature and the dew point, which is a measure of the amount of moisture in the air.

Location of Severe Summer Hazards. All of Androscoggin County is subject to severe summer storm events. Some areas have recently experienced microbursts which has caused substantial tree and property damage, but no loss of life. According to the National Hurricane Center, the Atlantic Hurricane season is from July 1 to November 30 of each year. According to the National Weather Service Storm Prediction Center (SPC) the State of Maine averages 1-2 tornadoes each year, usually in the month of July[1]. [1]NWS Storm Prediction Center 25 Year Average of Tornadoes per State by Month

Table 23: Tornado Rating Scales

Fujita Category	Sustained Wind Speed	Enhanced Fujita Category	Winds Speeds *3 second wind gusts
F0	Less than 73 MPH	EF0	65-85 MPH
F1	73-112 MPH	EF1	86-110 MPH
F2	113-157 MPH	EF2	111-135 MPH
F3	158-206 MPH	EF3	136-165 MPH
F4	207-260 MPH	EF4	166-200 MPH
F5	261-318 MPH	EF5	Greater than 200 MPH

Source: National Weather Service

Extent/Severity of the Hazard. The majority of severe summer weather types in Androscoggin County such as tornados, microbursts or severe thunderstorms have localized impacts. Historically, the State of Maine has experienced tornadoes rated up to EF2 and hail up to 3 inches in diameter. Severe thunderstorm wind gusts can snap tree branches and uproot trees, while heavy rainfall from thunderstorms can produce localized urban or poor drainage flooding. Hurricanes generally weaken to become either a tropical storm or tropical depression by the time they reach Androscoggin County. However, even in a weakened state, it is likely that any tropical system would affect the entire county and could cause extensive tree damage as well as damage to structures. Table 23 on the previous page provides information on various categories of tornados and table 24, below provides information on hurricanes.

Figure 15 Illustrates the location of National Weather Service Severe storm reports including tornadoes, hail, and severe thunderstorm wind from 1950 to 2021. See Appendix A for full size map.

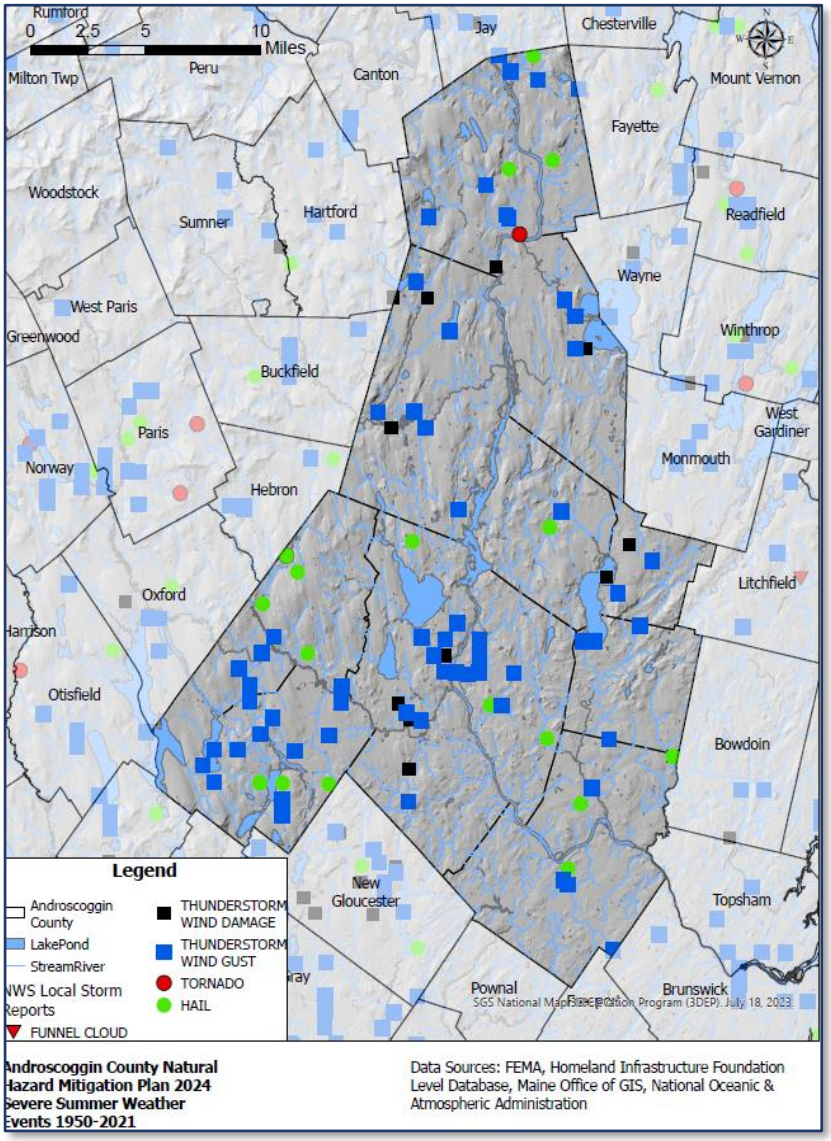


Table 24: Saffir-Simpson Hurricane Scale		
Category	Sustained Wind Speed	Effects
Tropical Depression	Less than 39 MPH	Minor damage may occur in older mobile homes
Tropical Storm	39 – 73 MPH	Sustained winds capable of causing structural damage
Category 1 Hurricane	74 – 95 MPH	Very dangerous winds will produce some damage
Category 2 Hurricane	96 – 110 MPH	Extremely dangerous winds will cause extensive damage
Category 3 Hurricane	111 -129 MPH	Devastating damage will occur
Category 4 Hurricane	130 – 156 MPH	Catastrophic damage will occur
Category 5 Hurricane	Greater than 157 MPH	Catastrophic damage will occur

Source: National Hurricane Center Saffir-Simpson Scale

Previous Occurrences. While severe summer storms usually occur every year in Androscoggin County, some of the most significant severe summer events since 1858 are shown in the table below.

Table 25: Historical Summary of Severe Summer Weather Events in Androscoggin County

Date(s)	Description	Location	Presidential Disaster Declaration
September 17, 1858	Hurricane Three	Countywide	-
September 9, 1860	Hurricane Six	Countywide	-
November 3, 1861	Hurricane Eight	Countywide	-
September 30, 1874	Hurricane Six	Countywide	-
October 9, 1894	Hurricane Five	Countywide	-
August 26, 1933	Hurricane Six	Countywide	-
September 9, 1934	Hurricane Seven	Countywide	-
September 21, 1938	Hurricane Six ("The Long Island Express")	Countywide	-
September 2, 1952	Hurricane Able	Countywide	-
July 31, 1960	Tropical Storm Brenda	Countywide	-
September 13, 1960	Hurricane Donna	Countywide	-
September 15, 1961	Tropical Storm Six	Countywide	-
July 31, 1971	F2 Tornado	Livermore, Livermore Falls	-
July 14, 1975	F1 Tornado	Minot	-
September 17, 1985	Hurricane Gloria	Countywide	-
July 14, 1988	F1 Tornado	Tuner	-
August 19, 1991	Hurricane Bob	Countywide	FEMA-DR-915-ME
July 8, 1996	Severe Thunderstorm, 1"Hail	Livermore Falls	-
September 16-19, 1999	Hurricane Floyd	Countywide	FEMA-DR-1308-ME
June 20, 2006	Severe Thunderstorm, 1"Hail	Auburn	-
July 18, 2006	Severe Thunderstorm	Leeds, Mechanic Falls	-
July 24, 2008	Severe Thunderstorm	Mechanic Falls, Turner	-
September 9, 2008	Severe storms, flooding & tornadoes	Countywide	FEMA-DR-1788-ME
May 21, 2011	Severe Thunderstorm	Greene, Leeds	-
June 1, 2011	Severe Thunderstorm	Lewiston, Livermore Falls, Minot, Poland	-
August - September, 2011	Tropical Storm Irene	Countywide	FEMA-DR-4032-ME*
June 22, 2012	Severe Thunderstorm	Mechanic Falls, Minot, Poland	-
August 5, 2014	Severe Thunderstorm	Mechanic Falls, Minot, Poland	-
July 28, 2015	Microburst, 1" Hail	Durham, Lisbon, Sabattus, Wales	-

Table 25 continues to the next page.

- Denotes the event did not result in a disaster declaration.

Table 25 Continued: Historical Summary of Severe Summer Weather Events in Androscoggin County			
Date(s)	Description	Location	Presidential Disaster Declaration
March 17, 2016	Severe Thunderstorm, 1-2" Hail	Leeds, Lewiston, Lisbon, Minot, Poland	-
June 12, 2016	Severe Thunderstorm	Minot, Poland	-
September 5, 2017	Severe Thunderstorm	Auburn	-
September 6, 2018	Severe Thunderstorm	Durham, Lisbon, Poland	-
June 27, 2019	Severe Thunderstorm, 1" Hail	Livermore Falls	-
August 5, 2020	Tropical Storm Isaias	Countywide	-
August 24, 2020	Severe Thunderstorm, 1" Hail	Livermore Falls, Poland	-
August 11 – 13, 2021	Extreme Heat	Countywide	-
September 6, 2021	Microburst	Sabattus, Wales	-
May 22, 2022	Severe Thunderstorm	Livermore	-
July 25, 2023	Urban Flash Flooding	Lewiston & Auburn	-

Sources FEMA Disaster Declarations *and* ***NWS Storm Events Database*** **Androscoggin County was impacted by but did not meet the damage threshold to be included in the Tropical Storm Irene disaster declaration.*

Figure 16: Worumbo Hydroelectric Dam in Lisbon Source: Eagle Creek Hydroelectric

Table 26: Severe Summer Losses in Dollars per jurisdiction for Federal Disaster Declarations Since 1987 (dollar values are accurate to the year of each disaster declaration)			
Jurisdiction	FEMA-DR-915-ME Hurricane Bob August 1991	FEMA-DR-1308-ME Hurricane Floyd September 1999	FEMA-DR-1788-ME Flooding July – August 2008
Androscoggin County	$0	$0	$0
Auburn	$189,481	$151,628	$40,830
Durham	$49,798	$30,219	$0
Greene	$17,206	$2,124	$0
Leeds	$0	$0	$0
Lewiston	$143,920	$123,712	$0
Lisbon	$168,805	$0	$0
Livermore	$0	$0	$10,968
Livermore Falls	$3,253	$0	$52,647
Mechanic Falls	$12,663	$0	$0
Minot	$0	$11,518	$92,789
Poland	$6,283	$0	$7,154
Sabattus	$155,159	$27,405	$0
Turner	$4,420	$0	$0
Wales	$2,696	$0	$0
Other	$4,787[1], $515[2] & $3,128[3]	$22,940[4] &$11,588[5]	$0
Total	$762,114	$381,134	$204,388

[1] *Lewiston Auburn Water Pollution Control Authority (LAWPCA)*
[2] *Agassiz Village Inc*
[3] *Lisbon Village Library*
[4] *Auburn Water District*
[5] *Auburn School Department*

Figure 17: Low flow conditions at the Great Falls on the Androscoggin River, Lewiston, ME Source: Jimmy Emerson

Probability of Future Occurrence. While there are no probability studies for severe summer storms overall, given Maine's geographic location, and climatology it is reasonable to expect at least one severe storm per summer season. Based on available research, the area around Portland, Maine, and by extension Androscoggin County is forecast to be impacted by a tropical storm approximately every 12 years[1].

[1] Spatiotemporal Patterns and Return Periods of Tropical Storm and Hurricane Strikes from Texas to Maine

Vulnerabilities to Severe Summer Weather

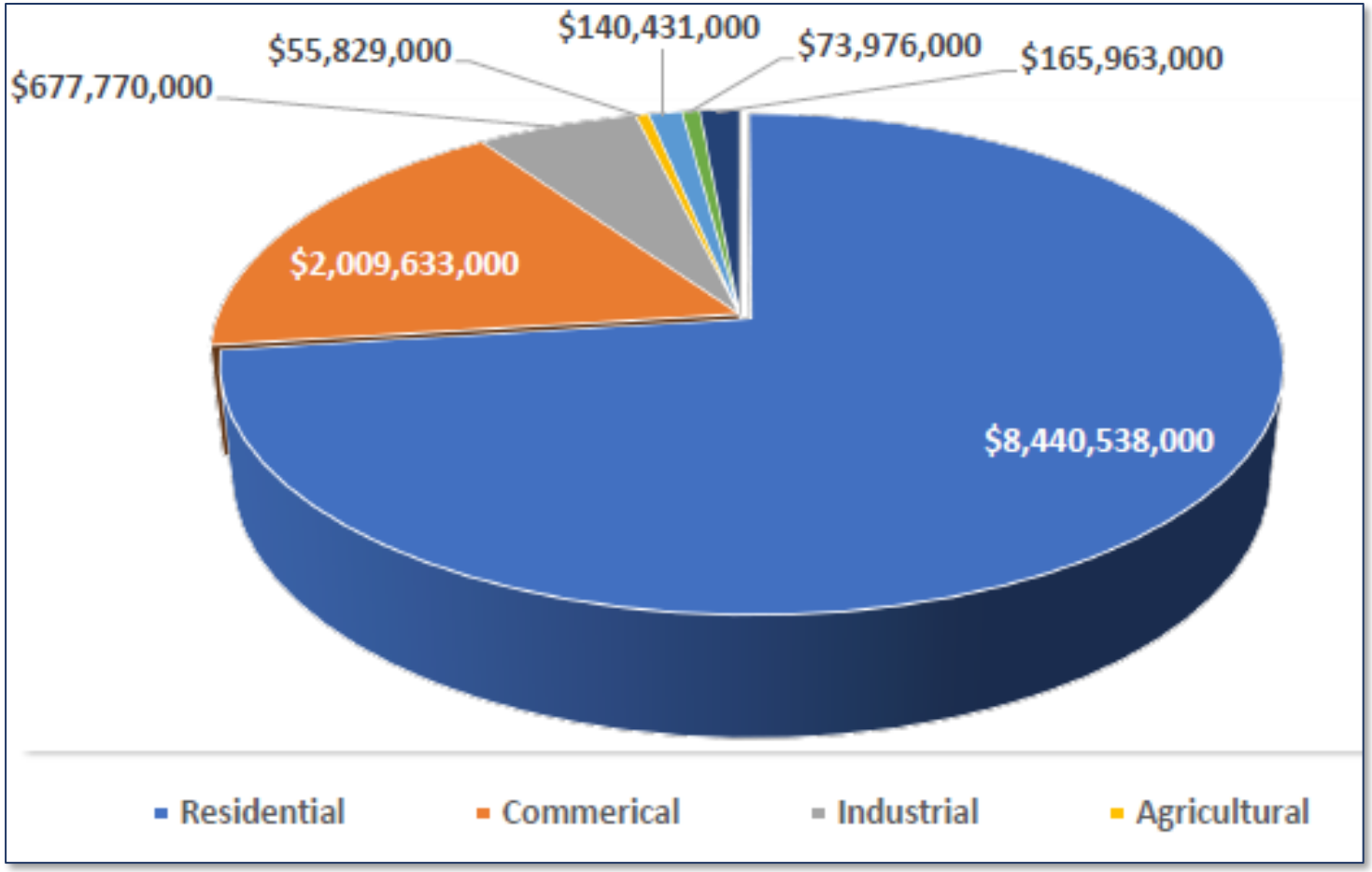
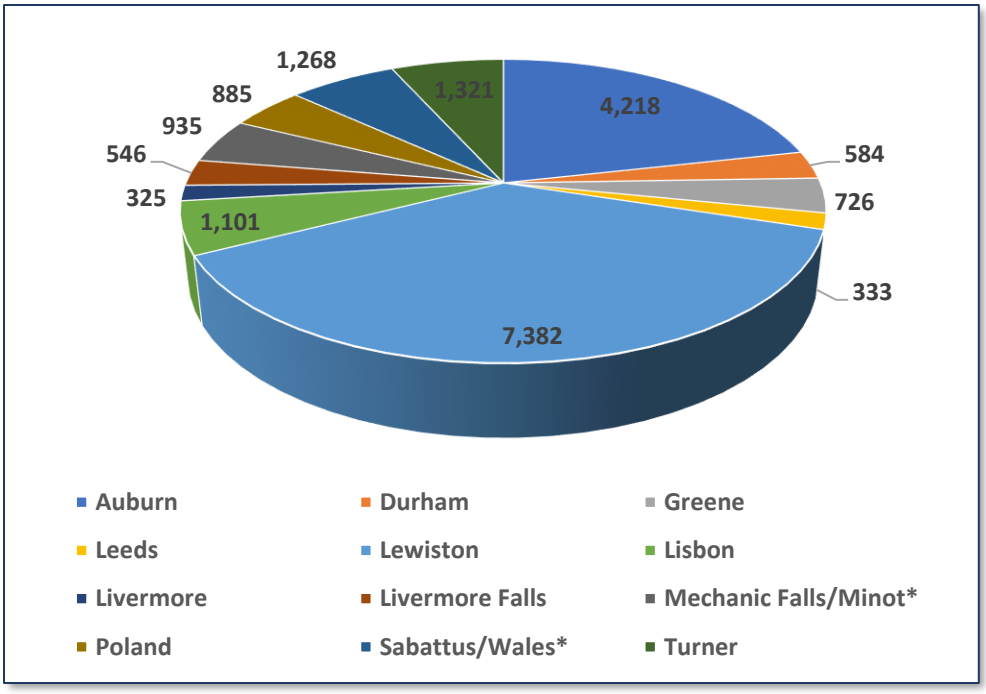


Figure 18: Androscoggin County HAZUS Hurricane Estimated Building Losses by Type

Assessing Vulnerability to Severe Summer Weather. In 2021, in preparation for the All-Hazards Risk Assessment, Androscoggin County Emergency Management Agency worked with the North-East States Emergency Consortium (NESEC) to develop quantitative reports usings HAZUS version 4.2 to estimate the potential impacts of the worst-case scenario hurricane, a 1 in 1000-year event, which would be a high-end Category 1 hurricane directly impacting Androscoggin County. Based on the report, there would be an estimated $11,564,140,000 in damage to building stock, with 72.99% of that being to residential structures. Figure 18, Illustrates the potential loses by building type. The complete HAZUS Hurricane impact report is included in Appendix C.

Specific Locations Vulnerable to Severe Summer Weather. Androscoggin County Emergency Management Agency, through three specific Natural Hazard Surveys asked jurisdictions, stakeholders, and the public to identify locations within Androscoggin County that are most vulnerable to natural hazards. Additional information was provided through past occurrences and data provided by subject matter experts, such as the National Weather Service. Table 27 below lists specific locations, including critical facilities in each jurisdiction that are vulnerable to severe summer weather and the mechanism related to the vulnerability. According to the US CDC, the elderly are more prone to heat related health concerns[1]. This is a concern in Androscoggin County as heat stress is compounded in urban areas such as Lewiston and Auburn, as noted in Figure 19. The Energy Information Administration (EIA) notes that only 70% of residences in Maine use air conditioning compared to 89% for the United States as a whole[2].



[1]US CDC Older Adults and Extreme Heat [2] EIA Residential Energy Consumption Survey (RECS) Dashboard

*Figure 19: Population age 65 and older by jurisdiction*This is based on census tract level data, Mechanic Falls and Minot share one census tract, Sabattus and Wales share another.*

Table 27: Specific locations vulnerable to Severe Summer Weather		
Jurisdiction	Location 1 & Mechanism	Location 2 & Mechanism
Auburn	Downtown area, Extreme Heat	Minot Avenue (Fire Station)
Durham	Stackpole Road, Microburst	Swamp Road, Microburst
Greene	North River Road, Severe Thunderstorm	Lane Road, Severe Thunderstorm
Leeds	Lake Shore Drive, Severe Thunderstorm	Campbell Road, Severe Thunderstorm
Lewiston	Downtown area, Extreme Heat	Oak Street (Lewiston Fire/County EOC), Severe Thunderstorm
Lisbon	Downtown area, Extreme Heat	Ferry Road, Microburst
Livermore	Norton Road, Severe Thunderstorm	Goding Road, Severe Thunderstorm
Livermore Falls	Downtown area, Extreme Heat	Depot Street, Severe Thunderstorm
Mechanic Falls	North Street, Severe Thunderstorm	Elm Street, Severe Thunderstorm
Minot	Jackass Annie Road, Severe Thunderstorm	Woodman Hill Road (Town Office/Fire Station), Severe Thunderstorm
Poland	Brown Road, Severe Thunderstorm	Cobb Road, Severe Thunderstorm
Sabattus	Maxwell Road, Microburst	Marsh Road, Microburst
Turner	Upper Street/Lower Street, Severe Thunderstorm	General Turner Hill Road (Fire Station), Severe Thunderstorm
Wales	Ridge Road, Microburst	Pond Road, Microburst

Community Sector Risks from Severe Summer Weather.

Emergency Management: Members of public safety departments are more likely to suffer from heat related illnesses during periods of high temperatures, due to heat retention of Personal Protective Equipment (PPE) if not adequately hydrated. Public safety facilities may be damaged by severe summer weather events, limiting the capabilities of these agencies. Tornadoes, severe thunderstorms, and hurricanes may limit the capability of public safety to respond to incidents due to trees blocking roads and damaged critical infrastructure facilities.

Economic Development: Extreme heat events will increase the costs to keep office buildings cool. Tornadoes, severe thunderstorms, and hurricanes may cause damage to residential, commercial, and industrial buildings, leading to economic losses, in the form of lost jobs and closed businesses.

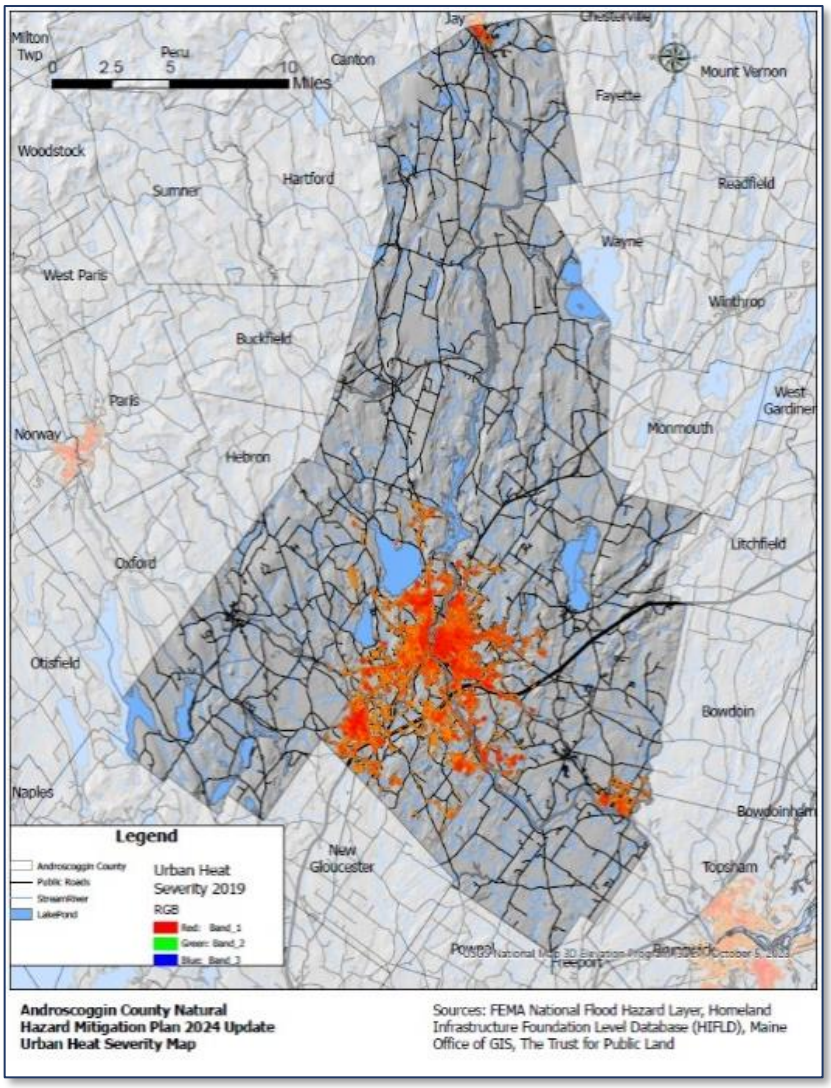


Figure 20: Illustrates urban areas, like Lewiston and Auburn are more likely to be experience extreme heat events, due to the urban heat island effect.

Land Use and Development: Building codes can require that new structures be built to withstand a degree of impact from severe summer storms. Jurisdictions can also require older structures to be retrofitted to meet newer building standards and codes. As noted in Element E - Changes in Development, the majority of development in Androscoggin County has occurred in more rural areas in the last 5 years. Buildings constructed in these areas are likely more vulnerable to severe summer storms knocking down trees and branches if the defensible space between the structure and the tree line hasn't been maintained. These rural areas are less susceptible to extreme heat events, unlike the urban areas shown in Figure 20.

Housing: Tornadoes, severe thunderstorms, and hurricanes may cause loss of power and structural damage to residential properties. This is especially a concern in areas with structures surrounded by trees, which severe summer storms could knock onto the residential units. Some owners may not carry insurance for their property, either because they believe their home will not be damaged by a severe summer storm or because it is too expensive, as mentioned previously. For example, newly constructed residences are required to conform to MUBEC standards which requires so called "Hurricane Straps" or "Hurricane Clips" to be installed to improve the strength of the roof to resist strong winds.[1] *MUBEC International Residential Code 2015*

Health & Social Services: Extreme heat events would increase the number of cases of heat related illness, especially the Socially Vulnerable (SV) and unhoused populations with limited access to cooling facilities. This in turn puts a strain on the already understaffed health and social services agencies. Socially vulnerable (SV) populations may experience difficulties evacuating, due to lack of owning a personal vehicle or relying on public transportation, which may be impacted during extreme summer weather events, like flash flooding, or microburst.

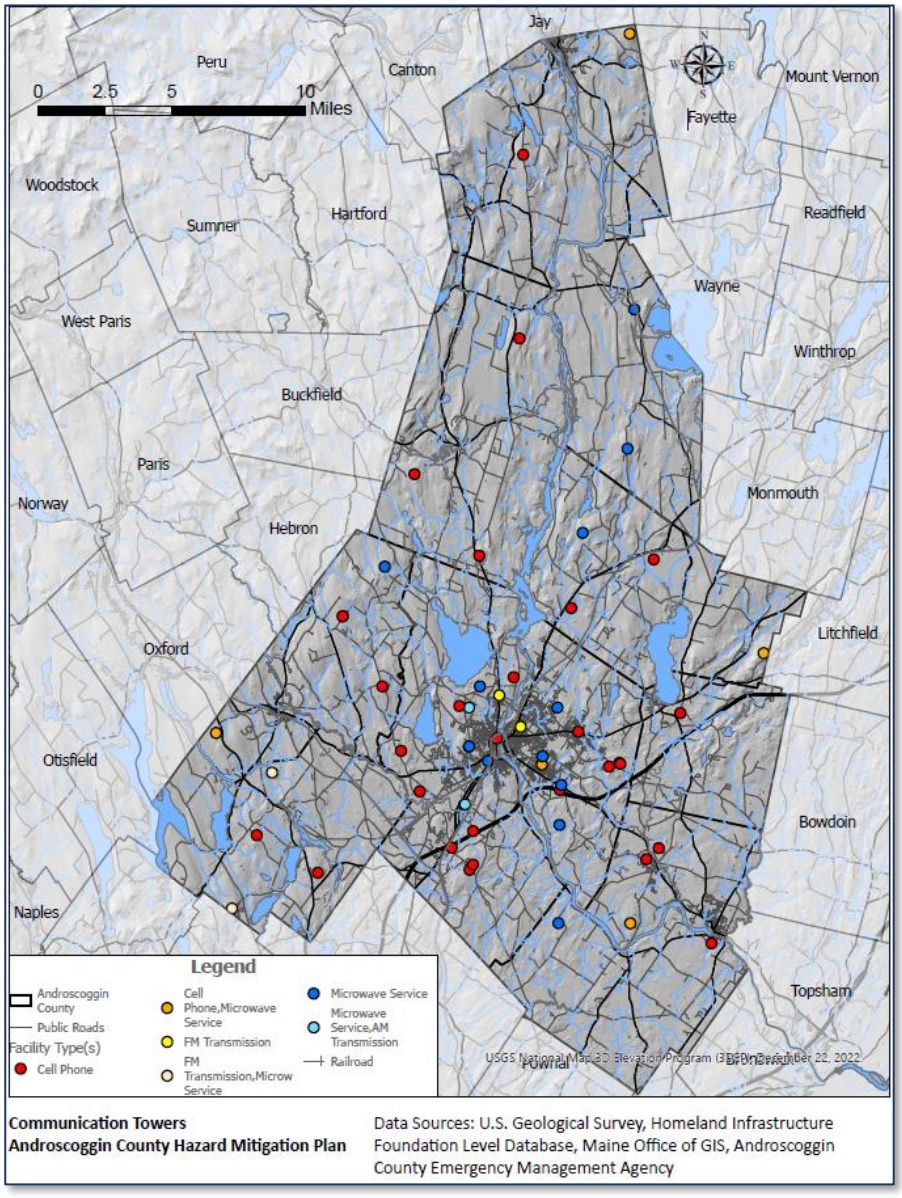


Figure 21: Communications tower locations in Androscoggin County.

Infrastructure: During extreme heat events power lines will sag due to increased electrical resistance, this can cause a short circuit to occur resulting in a power outage. Severe summer storms can damage transportation infrastructure including roads and bridges disrupting delivery of commodities such as medical supplies, food, and fuel, and. delivery of services like electrical power and drinking water. Communication towers can be knocked down by the strong winds of microbursts, tornadoes, severe thunderstorms or hurriances[1] [1] Tower Engineering Company: 4 Common causes for tower failure

Natural & Cultural Resources: Tornadoes, severe thunderstorms and hurricanes can cause extensive damage to vegetation, uprooting trees, or breaking branches. Extreme heat events can cause vegetation to die due to lack of moisture, including crops. This damaged or dead vegetation can lead to an accumulation of fuel for wildfires[2]. Historic properties may be damaged by severe summer storms, either due to direct impacts from wind or hail, or by branches and/or fallen trees landing on the structure. Historic properties may be damaged by extreme heat events, which can allow high moisture to accumulate, which can over time damage the structure. Historic properties are likely more vulnerable to severe summer storms knocking down trees and branches if the defensible space between the structure and the tree line hasn't been maintained. [2] Journal Storage: Fire in the forests of Maine and New Hampshire

Severe Winter Weather

All of Androscoggin County is subject to severe winter storm events. One of the worst storms in Androscoggin County was the ice storm of 1998, this event severely damaged the electrical transmission system, and caused major tree damage, blocked numerous roadways with debris and ice, and caused some limited building damages. However, the most damaging winter storms in Androscoggin County are blizzards and Nor'easters, which overwhelm snow removal operations and can cause widespread power outages. Maintaining critical infrastructure, properly insulating pipes and mitigating water runoff are just a few of the things that are being done to reduce the effects of some of these storms.

General Definition. Based on the interconnectedness, historical records and the 2017 Natural Hazard Mitigation plan the Androscoggin County Planning team grouped the following hazards in the category that is Severe Winter Weather: Blizzard, Heavy Snowstorm, Ice Storms, Nor'easter, Sleet Storm and Extreme Cold.

Types of Severe Winter Weather in Androscoggin County. A single winter weather event may include one or more of the following:

- **Blizzard:** A combination of heavy snow and high winds. Sustained winds or frequent gusts of 35 miles per hour or more with heavy falling or blowing snow limiting visibility to a quarter mile or less that persists for three or more hours. The combination of conditions along with subfreezing temperatures brings potentially life-threatening traveling conditions.
- **Heavy Snowstorm:** A snowfall of 6 inches or more within 24 hours which disrupts or slows transportation systems and public safety departments' response capability.
- **Ice Storms:** Freezing rain is liquid water precipitation that freezes upon impact with the subfreezing surface. Any amount of freezing rain can be dangerous for travel conditions on untreated roads. An ice storm is used to describe occasions when damaging accumulations of ice are expected during freezing rain situations. Mean radial ice coating at least one fourth inch in thickness is heavy enough to begin to damage tree branches, overhead wires, and similar objects. A mean radial ice coating of one-half inch is heavy enough to produce destructive widespread power outages.
- **Nor'easter:** Nor'easters are extra-tropical coastal storms that can produce tremendous amounts of precipitation and strong winds. When the precipitation is in the form of snow, sleet, or freezing rain, it can damage overhead utility lines and become a highway driving hazard.
- **Sleet Storm:** Sleet is defined as pellets of ice composed of frozen or mostly frozen raindrops of refrozen or partially melted snowflakes. These pellets of ice usually bounce after hitting the ground or other hard surfaces. Heavy sleet is a relatively rare event defined as an accumulation of ice pellets covering the ground to a depth of one-half inch or more. Sleet can be extremely slick and hazardous to drive on compared to snow, but it doesn't drift or cause low visibilities.
- **Extreme Cold:** Air temperatures and/or Wind Chill values below -20 degrees. Wind Chill is a measure of how cold it feels like based on a combination of the air temperature and wind speed. Higher wind speeds will make it feel much colder than the actual air temperature.

Location of Severe Winter Hazards. All of Androscoggin County is subject to severe winter storm events. Severe winter storms can have one or more features which cause significant impact on local communities. Northern portions of the county generally receive more snowfall each year than southern portions as shown below in Figure 20. However, during Nor'easters and other coastal storms it is not uncommon for the southern portions of the county to receive more snow than the north from individual storms.

Extent/Severity of the Hazard. The most potentially damaging types of winter storm in Androscoggin County would be an ice storm similar to the Ice Storm of 1998 or a Nor'easter extending over several days. Both of these events would likely cause significant damage to the electrical grid and increase the amount of time required to clear roads for travel. However, while there is not a widely used standard to classify the intensity of snowstorms, as the degree of associated damage cannot be determined solely by the amount of snowfall. One approach is the Northeast Snowfall Index Scale (NESIS) which was created by to isolate the impacts of snowfall and was developed by Paul Kocin and Louis Uccellini of the National Weather Service. Table 28 provides information used to rate snowstorm severity, and occurrences in Androscoggin County.

Table 28 : Northeast Snowfall Index Scale		
Category / Description	NESIS Value[1]	Occurrences in Androscoggin County
1: Notable	1 – 2.49	25
2: Significant	2.5 – 3.99	19
3: Major	4 – 5.99	19
4: Crippling	6 – 9.99	8
5: Extreme	10+	1

Source: National Center for Environmental Information

[1] *NESIS Values are based on total snowfall over an area and the total population within that area.*

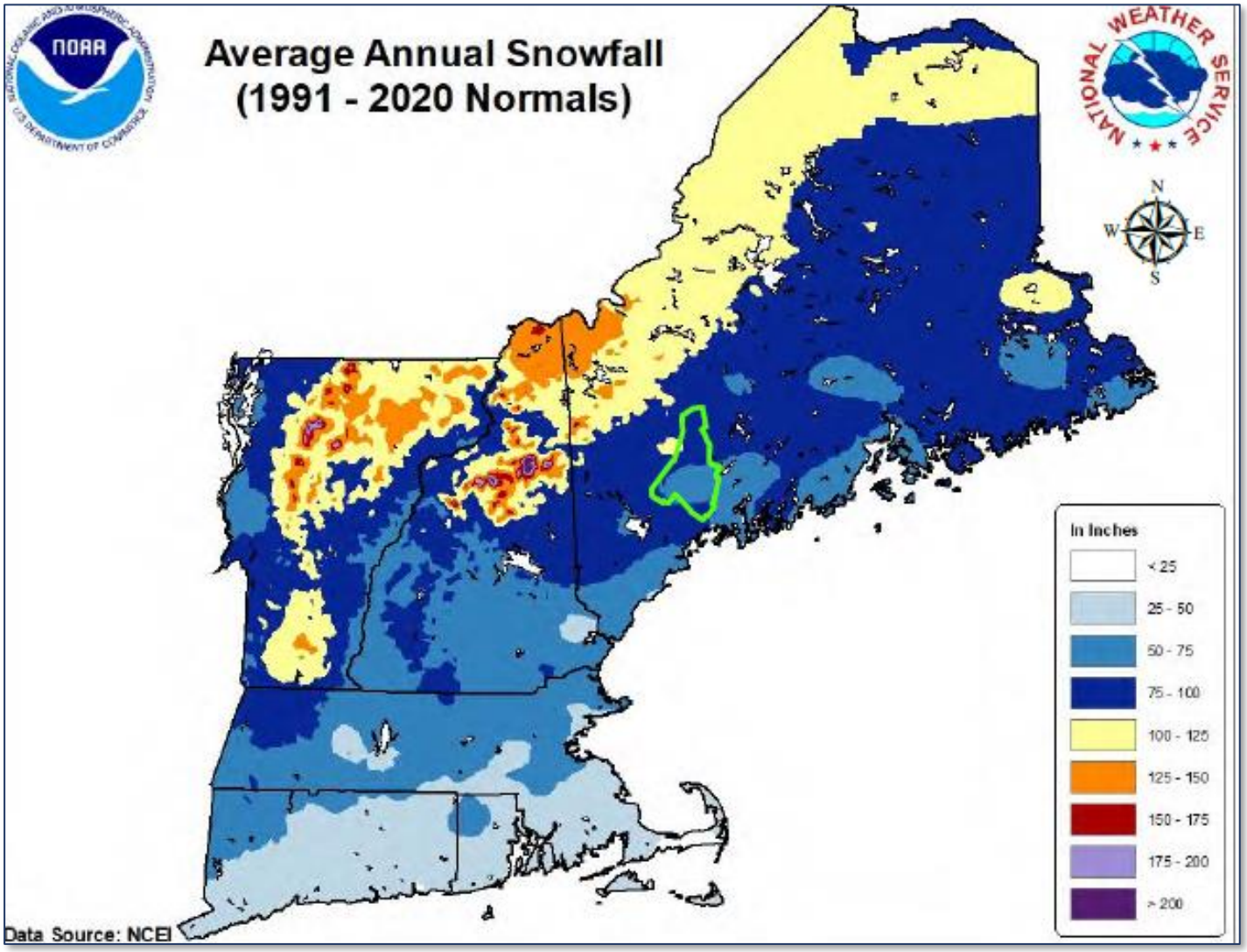


Figure 22: New England, average annual snowfall in, with Androscoggin County highlighted in Green.

Previous Occurrences: While severe winter storms usually occur every year in Androscoggin County, some of the most significant severe winter events since 1969 are shown in the table below.

Table 29: Historical Summary of Severe Winter Weather Events in Androscoggin County		
Date(s)	Description	Presidential Disaster Declaration
February 8 – 10, 1969	Severe Winter Storm	-
December 25 – 28, 1969	Severe Winter Storm	-
February 18 – 20, 1972	Severe Winter Storm	-
January 19 – 21, 1978	Severe Winter Storm	-
April 6 – 7, 1982	Severe Winter Storm	-
March 13-14, 1993	Blizzard with severe winds and snowfall	FEMA-3099-EM-ME
January 9-23, 1998	Ice Storm (Ice Storm of '98)	FEMA-1198-DR-ME
March 5-31, 2001	Severe winter storm (Blizzard)	FEMA-3164-EM-ME
December 17, 2002 to June 1, 2003	Extreme Winter Weather, Severe Cold	FEMA-1468-DR-ME
February 10-11, 2005	Severe winter storms	FEMA-3206-EM-ME
March 9, 2005	Severe winter storm	FEMA-3209-EM-ME
March 11-12, 2005	Record Snow	FEMA-3210-EM-ME
February 8-9, 2013	Severe winter storm (Blizzard)	FEMA-4108-DR-ME
December 21-26, 2013	Severe ice storm, sub-freezing temperatures	None (Denied)
January 26-28, 2015	Severe winter storm (Blizzard)	FEMA-4208-DR-ME
February 13, 2017	State offices closed due to severe winter storm (Blizzard)	-
January 29, 2022	Severe winter storm (Blizzard)	-
December 24-25, 2023	Severe winter storm (Winter Storm Elliot)	-

Source FEMA Disaster Declarations

- *Denotes the event did not result in a disaster declaration.*

Figure 23: Bates College, Lewiston, ME Ice Storm 1998 Source: Bates College Phyllis Graber Jensen

Table 30: Severe Summer Losses in Dollars per jurisdiction for Federal Disaster Declarations Since 1987 (dollar values are accurate to the year of each disaster declaration)										
Jurisdiction	FEMA-3099-EM-ME Blizzard March 1993	FEMA-1198-DR-ME Ice Storm January 1998	FEMA-1364-EM-ME Blizzard March/April 2001	FEMA-1468-DR-ME Severe Winter Storm December 2003	FEMA 3190-EM ME Heavy Snow December 2004	FEMA-3206-EM-ME Snowstorm February 2005	FEMA-3209-EM-ME Snowstorm March 2005	FEMA-3210-EM-ME Snowstorm March 2005	FEMA-4108-DR-ME Severe Winter Storm February 2013	FEMA-4208-DR-ME Severe Winter Storm January 2015
Androscoggin County	$0	$8,119	$1,775	$0	$2,974	$0	$0	$1,870	$3,613	$3,148
Auburn	$13,599	$845,127	$79,454	$0	$57,634	$55,889	$53,155	$68,554	$108,815	$78,877
Durham	$0	$134,190	$4,726	$0	$9,903	$8,492	$42,376	$14,180	$1,540	$24,226
Greene	$2,321	$129,513	$14,853	$0	$12,034	$10,286	$17,824	$11,051	$27,268	$14,754
Leeds	$2,255	$202,496	$12,732	$0	$10,909	$13,543	$16,848	$11,333	$14,816	$13,035
Lewiston	$15,125	$538,308	$105,920	$145,517	$108,492	$81,643	$88,722	$91,170	$44,592	$72,046
Lisbon	$3,992	$209,545	$24,809	$17,899	$11,407	$21,220	$17,455	$24,001	$31,396	$21,117
Livermore	$1,534	$217,051	$8,925	$1,125	$6,842	$13,089	$20,404	$10,429	$12,725	$10,039
Livermore Falls	$1,809	$50,679	$12,598	$15,117	$10,690	$7,361	$12,764	$11,688	$19,819	$15,084
Mechanic Falls	$806	$88,433	$11,055	$3,414	$6,029	$14,275	$16,939	$10,287	$12,908	$10,156
Minot	$2,949	$125,147	$16,978	$0	$14,401	$13,971	$12,324	$8,055	$23,996	$14,245
Poland	$2,869	$212,636	$25,356	$0	$14,318	$19,133	$21,986	$23,861	$31,474	$19,611
Sabattus	$1,915	$116,779	$17,402	$8,837	$10,605	$15,297	$16,782	$16,903	$20,691	$11,903
Turner	$3,656	$143,273	$12,521	$1,838	$8,150	$19,178	$21,749	$10,322	$31,070	$18,756
Wales	$0	$35,938	$0	$0	$1,885	$0	$0	$0	$0	$0
Other	$0	$20,182[1], $191,641[2], $24,942[3]	$7,199[4] & $8,168[3]	$101,842[1]	$4,561[4] & $3,198[5]	$5,705[4], $3,048[6], $2,047[5], $4,062[7,] $22,125[8]	$6,311[4], $2,618[6], $4,353[5], $3,479[7], $15,633[8], $1,509[9]	$5,331[4], $2,804[6], $1,945[5], $5,305[7], $22,151[8], $1,495[9]	$0	$6,335[1], $10,250[4], $10,713[3], $1,320[10], $46,226[8]
Total	$52,830	$381,134	$364,471	$295,589	$294,032	$330,364	$393,231	$352,735	$384,722	$401,842

[1]Auburn Water District [2]Private Non-Profits (PNP's) [3]Auburn School Department [4] Lewiston Auburn Municipal Airport [5] Auburn Housing Authority
[6]Central Maine Medical Center [7]Lewiston Housing Authority [8]Lewiston School District [9] St. Dominic's Regional High School
[10] MSAD 36/RSU 73 Livermore & Livermore Falls

Probability of Future Occurrence. Based on Androscoggin County's geographic location and climatology it is reasonable to assume that at least one severe winter storm is likely to occur in the county each year. As noted in the 2020 report from the Maine Climate Council, there has been a trend of shorter winters with more intense precipitation, suggesting that the county more receive fewer but more intense winter storms.

Vulnerabilities to Severe Winter Weather

Assessing Vulnerability to Severe Winter Weather: This plan uses the worst-case, real-life damages to calculate potential winter storm damages, and assumes that historic patterns will hold for the future. For Androscoggin County, the worst winter storm on record is the ice storm of 1998, which resulted in a statewide Presidential Disaster Declaration of with $47,748,466 in damages. The damages in Androscoggin County totaled $3,221,999 which would be $5,785,761.39 in 2022 dollars. The methodology for calculating potential losses in Androscoggin County is to use actual damages updated using the Consumer Price Index.

Table 31: US Consumer Price Index (1982-1984 = 100)				
1947 = 22.3	1988 = 118.3	1997 = 160.5	2006 = 201.6	2015 = 237.0
1980 = 82.4	1989 = 124.0	1998 = 163.0	2007 = 207.3	2016 = 240.0
1981 = 90.9	1990 =130.7	1999 = 166.6	2008 = 215.3	2017 = 245.1
1982 = 96.5	1991 = 136.2	2000 = 172.2	2009 = 214.5	2018 = 251.1
1983 = 99.6	1992 = 140.3	2001 = 177.1	2010 = 218.1	2019 = 255.7
1984 =103.9	1993 = 144.5	2002 = 179.9	2011 = 224.9	2020 = 258.8
1985 = 107.6	1994 = 148.2	2003 = 184.0	2012 = 229.6	2021 = 271.0
1986 = 109.6	1995 = 152.4	2004 = 188.9	2013 = 233.0	2022 = 292.7
1987 = 113.6	1996 = 156.9	2005 = 195.3	2014 = 236.7	N/A

Source: US Bureau of Labor Statistics

Table 32: Potential Winter Storm Damages in Androscoggin County		
Jurisdiction	Actual Damages From the 1998 Ice Storm	Updated Ice Storm Losses using Consumer Price Index
Androscoggin County	$8,119	$14,579.33
Auburn	$845,127	$1,517,599.22
Durham	$134,190	$240,965.72
Greene	$129,513	$232,567.21
Leeds	$202,496	$363,623.19
Lewiston	$538,308	$966,642.65
Lisbon	$209,545	$376,281.11
Livermore	$217,051	$389,759.68
Livermore Falls	$50,679	$91,004.56
Mechanic Falls	$88,433	$158,799.63
Minot	$125,147	$224,727.16
Poland	$212,636	$381,831.64
Sabattus	$116,779	$209,700.70
Turner	$143,273	$257,276.12
Wales	$35,938	$64,534.07
Other	$20,182[1], $119,641[2], $24,942[3]	$36240.93[1], $214,840[2], $44,788.49[3]
Total	$3,221,999	$5,785,761.39

[1]Auburn Water District [2]Private Non-Profits (PNP's) [3]Auburn School Department

Specific Locations Vulnerable to Severe Winter Weather. Androscoggin County Emergency Management Agency, through the three Natural Hazard Surveys asked jurisdictions, stakeholders, and the public to identify locations within Androscoggin County that are most vulnerable to natural hazards. Additional information was provided through past occurrences and data provided by subject matter experts, such as the National Weather Service. Table 33 below lists specific locations, including critical facilities in each jurisdiction that are vulnerable to severe winter weather and the mechanism related to the vulnerability. Many residential units in Androscoggin County were built prior to the statewide adoption of the Maine Uniform Building and Energy Code (MUBEC), which means that these buildings are likely to have limited insulation, making occupants vulnerable to extreme cold events. Older buildings may also not be constructed to withstand heavy snow and ice loads that build up during long duration winter weather events.

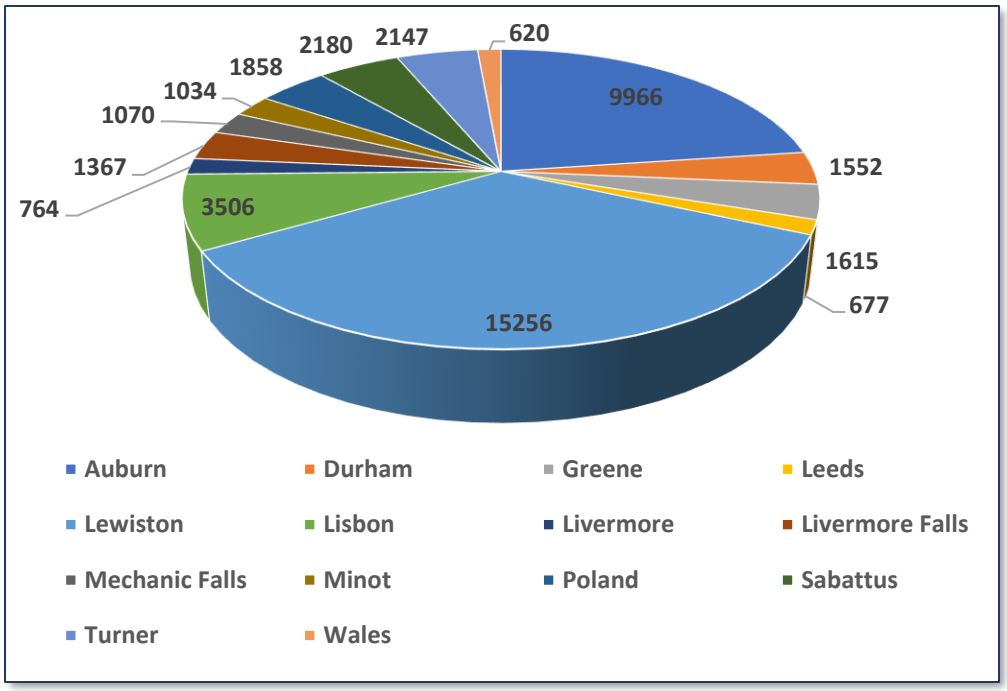


Figure 24: Housing units built in Androscoggin County prior to the adoption of MUBEC in 2010.

Table 33: Specific locations vulnerable to Severe Winter Weather

Jurisdiction	Location 1 & Mechanism	Location 2 & Mechanism
Auburn	Beech Hill Road, Nor'easter	Minot Avenue, Nor'easter
Durham	Stackpole Road, Nor'easter	Royalsborough Road, Nor'easter
Greene	College Road, Nor'easter	North River Road, Nor'easter
Leeds	Lake Shore Drive, Nor'easter	Quaker Ridge Road, Nor'easter
Lewiston	River Road, Blizzard	Dyer Road, Blizzard
Lisbon	Pinewoods Road, Nor'easter	Moody Road (Water Treatment Plant), Nor'easter
Livermore	Goding Road, Nor'easter	Norton Road, Nor'easter
Livermore Falls	Moose Hill Road, Nor'easter	Fayette Road (Drinking Water Source), Nor'easter
Mechanic Falls	Elm Street, Nor'easter	North Street, Nor'easter
Minot	Jackass Annie Road, Nor'easter	Woodman Hill Road (Town Office) , Nor'easter
Poland	Brown Road, Blizzard	Tiger Hill Road, Blizzard
Sabattus	Lake Street, Nor'easter	Maxwell Road, Nor'easter
Turner	Upper Street, Nor'easter	Snell Hill Road, Nor'easter
Wales	Pond Road, Nor'easter	Centre Road (Wales Town Office/Fire Station), Extreme Cold

Community Sector Risks from Severe Winter Weather.

Emergency Management: Public safety members may have difficulty responding to events during severe winter weather events, due to hazardous road conditions and the possibility of downed trees or powerlines blocking roads. Extreme cold temperatures would also limit public safety's ability to respond to incidents without specific PPE. Extreme cold can also cause water pumps and fire hoses to freeze and can quickly drain the batteries of electronic equipment.

Economic Development: Severe winter storms may cause damage to residential, commercial, or industrial properties, leading to economic losses, in the form of lost jobs and closed businesses. Extreme cold events would increase the costs to heat office buildings. The National Weather Service notes that power outages caused by severe winter storms can force businesses to close during the event, combined with snow removal and damage repair costs can lead to economic losses[1]. Business that remain open during a storm will likely receive reduced business as customers are more likely to stay home during the event[1]. [1]National Weather Service: The Varying Types of Winter Weather

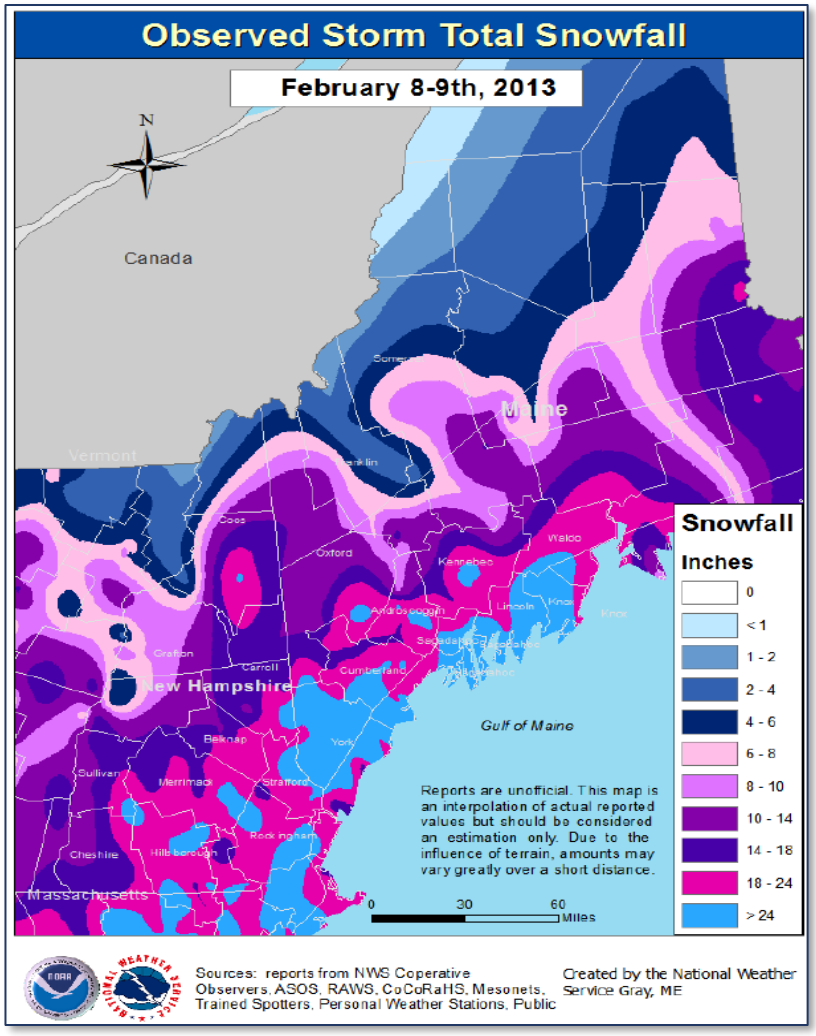
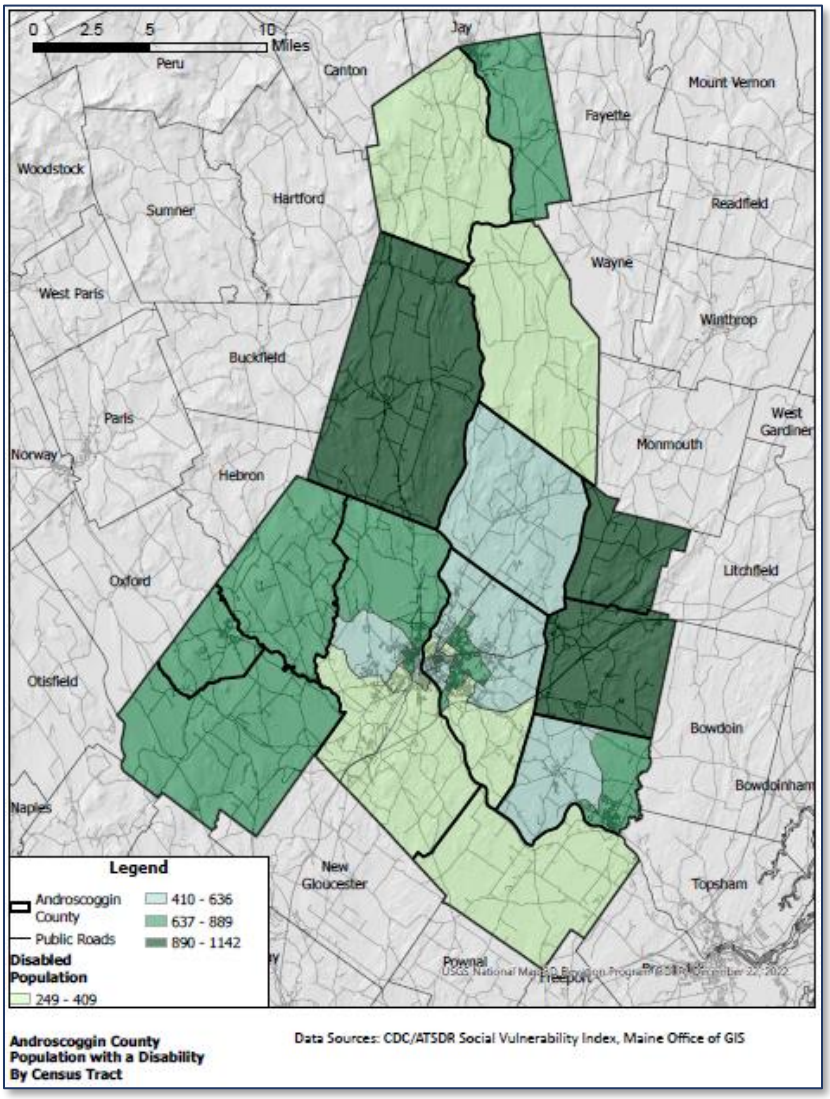


Figure 25: Snowfall from the February 8-9, 2013.Blizzard in Maine.

Land Use and Development: Building codes can require that new structures be built to withstand a degree of impact from severe summer storms. Jurisdictions can also require older structures to be retrofitted to meet newer building standards and codes. As noted in Element E - Changes in Development, the majority of development in Androscoggin County has occurred in more rural areas in the last 5 years. Buildings constructed in these areas are likely more vulnerable to severe winter storms knocking down trees and branches if there isn't enough defensible space between the structure and the tree line.

Housing: Housing in Androscoggin County is generally designed to withstand winter weather conditions. However severe winter storms may still cause damage to buildings. Extreme cold events may overwhelm heating systems in some residential buildings, especially if they are poorly insulated. Buildings kept below 55°F are likely to suffer from frozen water pipes. These pipes can burst causing extensive water damage to structures. While some single-family residences in Androscoggin County have backup generators, the majority of multi-family residential units lack generators. According to the 2020 US Census, 62% of housing units in Androscoggin County use Oil for heat[2]. A long duration extreme cold event can strain fuel supplies, increasing the cost to heat buildings. [2] 2020 US Census Housing Unit Heating Fuel Data



Health & Social Services: Snow and ice accumulation can cause downed powerlines, leading to a loss of electricity and heat from homes and businesses. The Socially Vulnerable (SV) populations namely the young and elderly are especially susceptible to a loss of home heating for an extended period of time[1]. An extreme cold event will also lead to more cases of cold related illnesses such as hypothermia, more likely to occur in the unhoused populations. The uptick in emergency room visits in turn puts a strain on the already understaffed health and social services agencies. [1] *National Institute of Health The experience of potentially vulnerable people during cold weather*

Figure 26: Socially vulnerable population with a disability in Androscoggin County

Infrastructure: Wind, snow, and ice accumulation from severe winter storms can knock down trees, and power lines, blocking the delivery of commodities such as medical supplies, food, and fuel. Damage to transmission infrastructure from severe winter storms can also cause interruptions in the delivery of utilities such as electricity, internet and drinking water. Communication towers can accumulate ice during severe winter weather, which may cause the tower to collapse. Alternatively, the ice can be knocked off by strong winds, causing damage to anything on the ground impacted by the ice[2]. [2] *Tower Engineering Company: 4 Common causes for tower failure*

Natural & Cultural Resources: Heavy snow and ice accumulation can weigh down and damage vegetation which can lead to an accumulation of fuel for wildfires[3] with the largest scale occurrence in Maine being the 1998 Ice Storm. The towns of Durham, Leeds, Minot, and Wales have numerous farms that can be impacted by severe winter weather, causing crop loss, loss of power and generator failure may put livestock at risk. Historic properties are likely more vulnerable to severe winter storms knocking down trees and branches if the defensible space between the structure and the tree line haven't been maintained. Severe winter weather events resulting in broken limbs and fallen trees have the potential to cause damages to wildlands, resulting in potential loss of habitat. [3] *Journal Storage: Fire in the forests of Maine and New Hampshire*

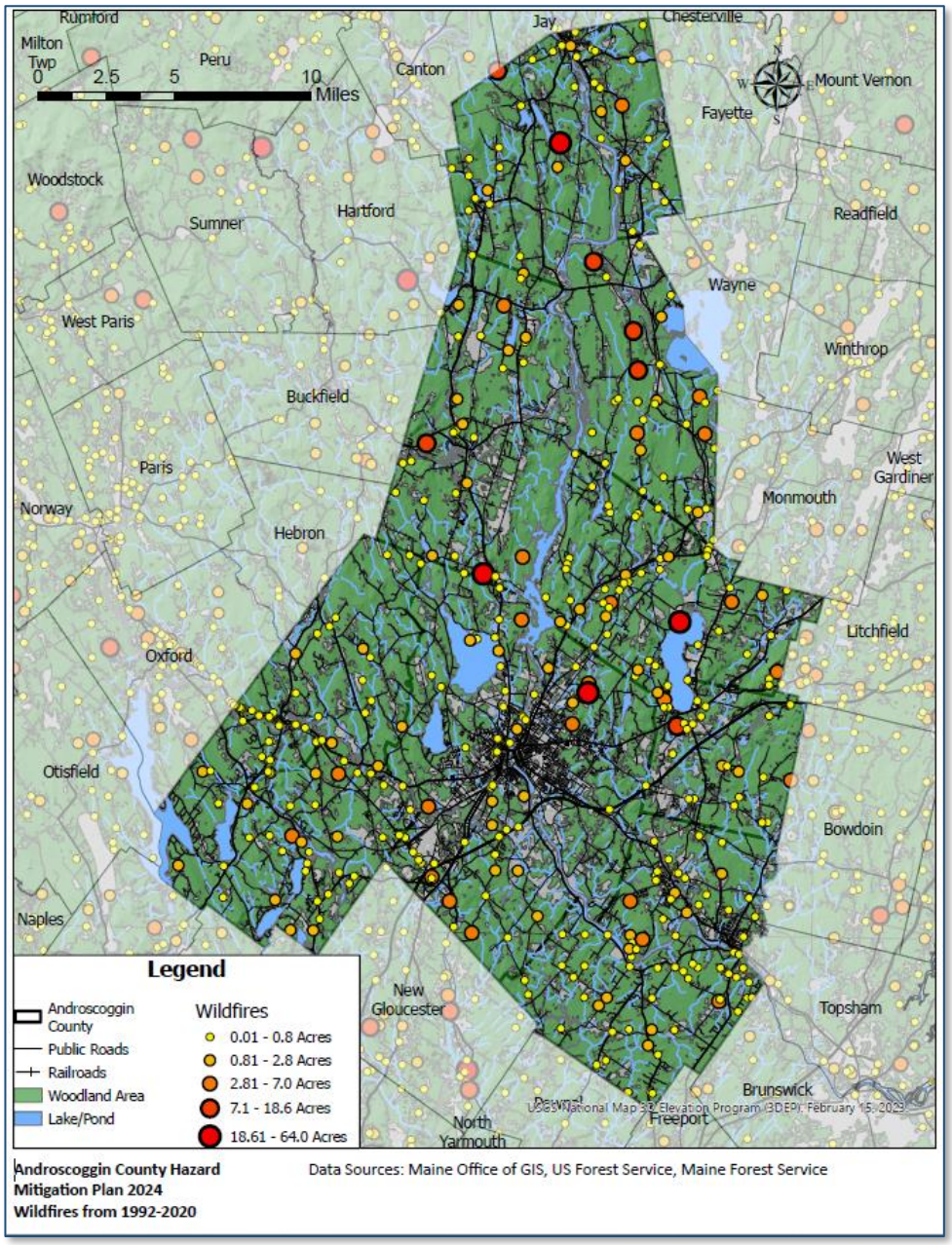
Wildfire

Androscoggin County is impacted annually by small woods and brushfires, but occasionally these fires will cause damage to property.

General Definition. As defined by the National Wildfire Coordination Group a wildfire is an unplanned, unwanted wildland fire including unauthorized human-caused fires, escaped wildland fire use events, escaped prescribed fire projects, and all other wildland fires where the objective is to put the fire out.

Types of Wildfires in Androscoggin County. There are two main types of wildfires as defined by the US Forest Service

- **Wildland fire:** Any non-structure fire, except prescribed fires that occur in a wildland.
- **Wildland-Urban Interface (WUI) Fire:** A fire that occurs in an area that has structures located in an otherwise undeveloped wildland.



Location of Wildfire Hazards: Maine's forests are not as susceptible to fire as some areas of the country that have been impacted by extreme wildfires in recent years. Due to the amount of rainfall Androscoggin County normally receives each year, wildfire risk is somewhat lower than other parts of the United States. The species of trees in Maine's forests are not as susceptible to ignite through lightning or carelessly disposed smoking and cooking debris. Most of Androscoggin County can be susceptible to wildfire because of its proximity to wooded and grassland areas as well as railroad tracks. Fires tend to occur during the spring months, as the snow melts and allows for wildfire fuels to dry out.

Figure 27: Androscoggin County Wildfires from 1992 - 2020

Extent/Severity of the Hazard. The largest fires on record in Androscoggin County occurred in October 1947, which burned a combined total of 1,430 acres of land in Auburn, Durham, and Livermore Falls. These fires were part of a larger statewide series of fires caused by extensive amounts of tree debris left in the woods from the 1938 hurricane, combined with forestry activities during and following World War II. Droughts can also exacerbate conditions for potential wildfires, while limiting access to water to extinguish them. Wildfires will also produce large amounts of smoke and ash, causing poor air quality in surrounding areas. Large wildfires can have air quality impacts hundreds of miles from the fire's location. The Maine Forest Service (MFS) reports from 2009-2016 fifteen structures were destroyed by wildfires in Androscoggin County. The damage costs listed below in Table 34 are estimates given to the Maine Forest Service; this data does not include actual costs and does not include the type of structure destroyed. For actual damage cost insurance agents should be contacted.

Table 34: Androscoggin County Structures Destroyed by Wildfire

Year of Fire	Jurisdiction	# of Structures Destroyed	Property Damage Value (2017 Dollars)
2010	Poland	2	$10,000
	Sabattus	1	$100
2012	Livermore Falls	1	$200
2013	Lewiston	1	$52,130
2015	Durham	1	$1,000
	Mechanic Falls	2	$1,200
2016	Greene	3	$20,100
	Livermore	4	$251,000

Source: Maine Forest Service

Figure 28: Woods fire, Auburn, ME May 18, 2022. Source: Lewiston Sun Journal

Previous Occurrences. The table below illustrates the impacts of fires in Androscoggin County from 2010 to 2022.

Table 35: Historical Summary of Wildfire Events in Androscoggin County			
Year	Jurisdiction(s) Impacted	# of Fires	Acres Burned
2005	Auburn, Greene, Leeds, Livermore Falls	11	14.9
2006	Auburn, Durham, Leeds, Livermore, Livermore Falls, Sabattus, Turner	9	62.85
2007	Auburn, Durham, Leeds	4	7.95
2008	Durham, Leeds, Poland, Sabattus	6	6.95
2009	Auburn, Durham, Livermore Falls, Mechanic Falls, Poland, Sabattus, Turner, Wales	10	10.35
2010	Auburn, Leeds, Livermore, Sabattus	4	0.56
2011	Auburn, Greene, Leeds, Lisbon, Poland	11	2.04
2012	Durham, Lewiston, Lisbon, Livermore, Livermore Falls, Turner, Wales	11	7.3
2013	Leeds, Lewiston, Livermore Falls, Mechanic Falls, Turner	8	37.9
2014	Auburn, Lewiston, Lisbon	7	3.3
2015	Auburn, Durham, Greene, Lewiston, Lisbon, Livermore, Mechanic Falls, Sabattus	13	2.56
2016	Auburn, Greene, Leeds, Lewiston, Lisbon, Livermore, Livermore Falls, Mechanic Falls, Minot, Poland, Turner, Wales	24	14.42
2017	Auburn, Greene, Leeds, Lewiston, Lisbon, Livermore, Livermore Falls, Mechanic Falls, Minot, Poland, Sabattus, Wales	32	10.9
2018	Auburn, Durham, Greene, Leeds, Lisbon, Livermore Falls, Mechanic Falls, Poland, Sabattus, Turner, Wales	24	10.9
2019	Auburn, Durham, Greene, Mechanic Falls, Poland, Wales	12	3.1
2020	Auburn, Durham, Greene, Leeds, Lisbon, Livermore Falls, Mechanic Falls, Minot, Poland, Sabattus, Turner, Wales	61	30.8
2021	Auburn, Durham, Greene, Leeds, Lewiston, Livermore, Livermore Falls, Mechanic Falls, Minot, Poland, Sabattus, Turner, Wales	23	10.0
2022	Auburn, Durham, Greene, Leeds, Lewiston, Lisbon, Livermore Falls, Mechanic Falls, Minot, Poland, Sabattus, Turner	31	4.5

Source: US Forest Service Spatial Wildfire Occurrence for the United States

Probability of Future Occurrence: There are no probability studies that have been conducted for the future occurrence of wildfires in Androscoggin County specifically. Androscoggin County is generally impacted by ten to twenty fires each year, most of which are less than 1 acre in size. According to data from the Maine Forest Service "Debris burning" and "Children" are the primary causes of fire, which makes it difficult to predict the locations of these events, compared to those cause by other sources such as railroads.

Vulnerabilities to Wildfire

Assessing Vulnerability to Wildfire. This plan uses worst-case, real-life damages to calculate potential wildfire losses, and assumes that historic patterns will hold for the future. The 1947 fires were the worst on record, this series of wildfires that flared over Eastern and Southern Maine cause an estimated $30,000,000 in damages, primarily to Cumberland, Hancock, Oxford, and York Counties. The damage in 2022 dollars would be about $393 million using the US Consumer Price Index. While there is significantly more development in each of these counties today than there was in 1947, fire-fighting capabilities have also increased substantially since that time so there may be no need to further increase the damage estimate. The methodology for calculating potential wildfire losses in Androscoggin County is based on the damages that occurred in the 1947 fire in Cumberland, Hancock, Oxford, and York Counties. The 2020 population of the four counties is 628,296. Divide $393 million (the 1947 fire in 2022 dollars) by 628,296 to get a per capita cost of $625. Multiply each town's 2020 population by $625 to get potential wildfire damages.

Table 36: US Consumer Price Index (1982-1984 = 100)				
1947 = 22.3	1988 = 118.3	1997 = 160.5	2006 = 201.6	2015 = 237.0
1980 = 82.4	1989 = 124.0	1998 = 163.0	2007 = 207.3	2016 =240.0
1981 = 90.9	1990 =130.7	1999 = 166.6	2008 = 215.3	2017 =245.1
1982 = 96.5	1991 = 136.2	2000 = 172.2	2009 = 214.5	2018 =251.1
1983 = 99.6	1992 = 140.3	2001 = 177.1	2010 = 218.1	2019 =255.7
1984 =103.9	1993 = 144.5	2002 = 179.9	2011 = 224.9	2020 =258.8
1985 = 107.6	1994 = 148.2	2003 = 184.0	2012 = 229.6	2021 =271.0
1986 = 109.6	1995 = 152.4	2004 = 188.9	2013 = 233.0	2022 = 292.7
1987 = 113.6	1996 = 156.9	2005 = 195.3	2014 = 236.7	N/A

Source: US Bureau of Labor Statistics

Table 37: Potential Wildfire in Androscoggin County		
Jurisdiction	2020 Year-Round Population	Potential Wildfire Damages (2022 Dollars
Androscoggin County	23,055	$14,409,375
Auburn	3,848	$2,405,000
Durham	4,350	$2,718,750
Greene	2,326	$145,3750
Leeds	36,592	$22,870,000
Lewiston	9,009	$5,630,625
Lisbon	2,095	$1,309,375
Livermore	3,187	$1,991,875
Livermore Falls	3,031	$1,894,375
Mechanic Falls	2,607	$1,629,375
Minot	5,376	$3,360,000
Poland	4,876	$3,047,500
Sabattus	5,734	$3,583,750
Turner	1,616	$1,010,000
Wales	23,055	$14,409,375
Total	111,139	$69,461,875

Specific Locations Vulnerable to Wildfire. Androscoggin County Emergency Management Agency, through the three specific Natural Hazard Surveys asked jurisdictions, stakeholders, and the public to identify locations within Androscoggin County that are most vulnerable to natural hazards. Additional information was provided through past occurrences and data provided by subject matter experts, such as the Maine Forest Service. Table 38 below lists specific locations, including critical facilities in each jurisdiction that are vulnerable to wildfire and the mechanism related to the vulnerability. Past severe weather events such as the Ice Storm of 1998 and windstorm of October 2017 caused large amounts of tree damage in the forests of Androscoggin County. As the majority of this debris is on undeveloped land, it is left to accumulate over the years. This debris could provide plenty of fuel for future wildfires, especially in the event of a drought. Construction in the Wildland-Urban Interface increases exposure to the impacts of wildfires. The US CDC notes that vulnerable populations including the elderly, children and those with pre-existing health conditions are at greatest risk from the effects wildfire smoke[1]. This includes individuals with disabilities, as illustrated in Figure 29.[1]US CDC Wildfire Smoke Impacts

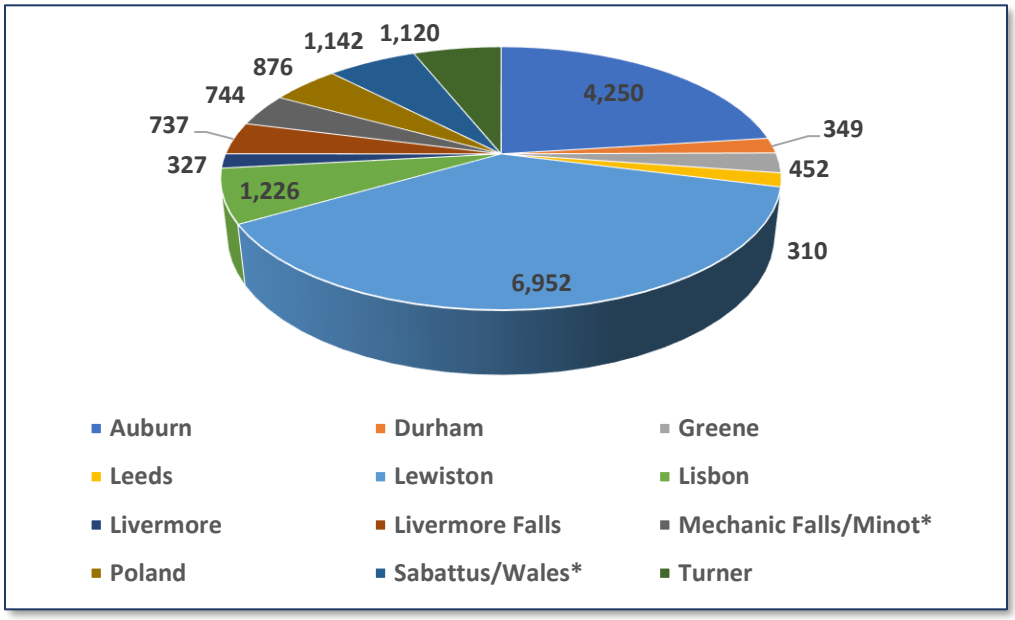


*Figure 29: Socially vulnerable population with a disability by jurisdiction*This is based on census tract level data, Mechanic Falls and Minot share one census tract, Sabattus and Wales share another.*

Table 38: Specific locations vulnerable to Wildfire

Jurisdiction	Location 1 & Mechanism	Location 2 & Mechanism
Auburn	Washington Street, railroad tracks	Interstate 95, vehicle operation
Durham	Old Brunswick Road, WUI	Pinkham Brook Road, WUI
Greene	US Route 202, railroad tracks	Allen Pond Road, WUI
Leeds	Route 106, railroad tracks	Quaker Ridge Road, WUI
Lewiston	Old Greene Road, WUI	College Street, railroad tracks
Lisbon	Pinewoods Road, WUI	Ridge Road, WUI
Livermore	Canton Road, WUI	Fish Meadow Road, WUI
Livermore Falls	Park Street, railroad tracks	Hunton Brook Road, WUI
Mechanic Falls	Pleasant Street, railroad tracks	Brown Road, WUI
Minot	West Minot Road, WUI	Center Minot Hill Road, WUI
Poland	Johnson Hill Road, WUI	Hackett Mills Road, railroad tracks
Sabattus	Greene Road, WUI	Sutherland Pond Road, WUI
Turner	Buckfield Road, WUI	Conant Road, WUI
Wales	Leeds Junction Road, railroad tracks	Cedar Lane, WUI

Community Sector Risks from Wildfire.

Emergency Management: Public safety may have difficulty responding to other incidents due to the manpower and equipment required to contain a large wildfire. Due to the rural nature of much of the county, some public safety buildings are located in the Wildland-Urban Interface (WUI) and may be vulnerable to wildfires. Better wildfire management practices have reduced the overall impact of wildfires. However, as there has been a nationwide shortage of firefighters in recent years, any wildfire will put a strain on departments ability to respond.

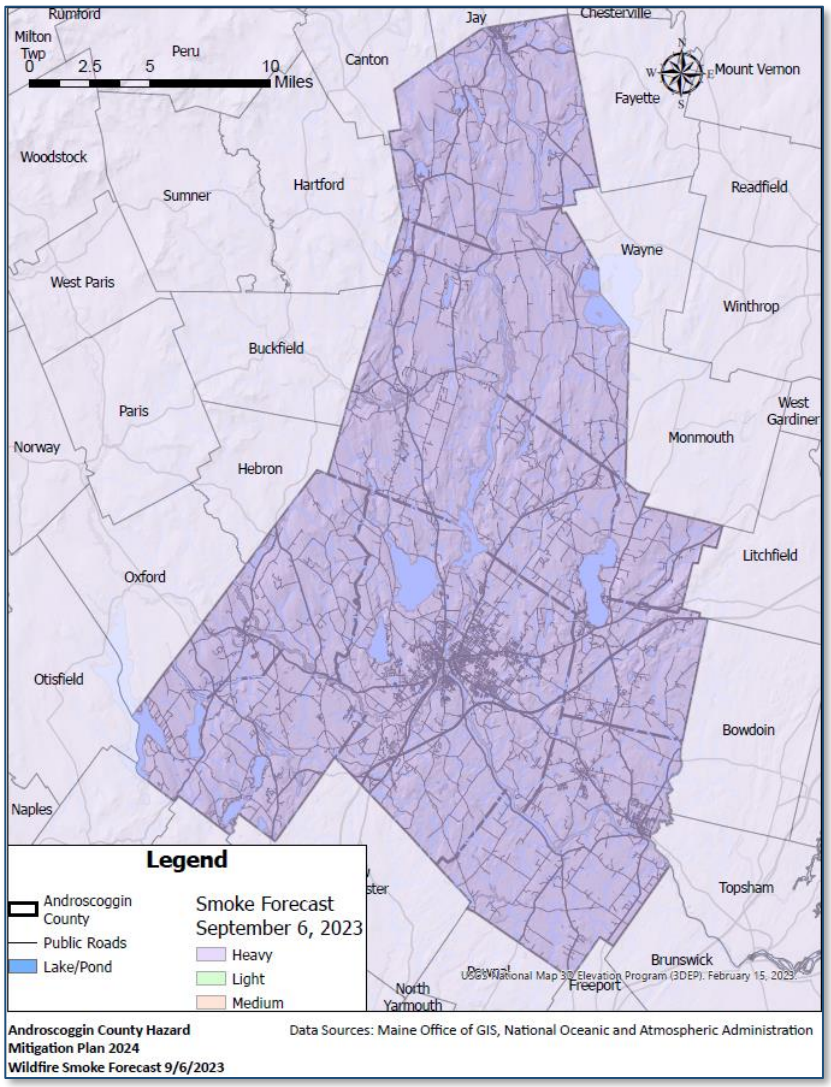
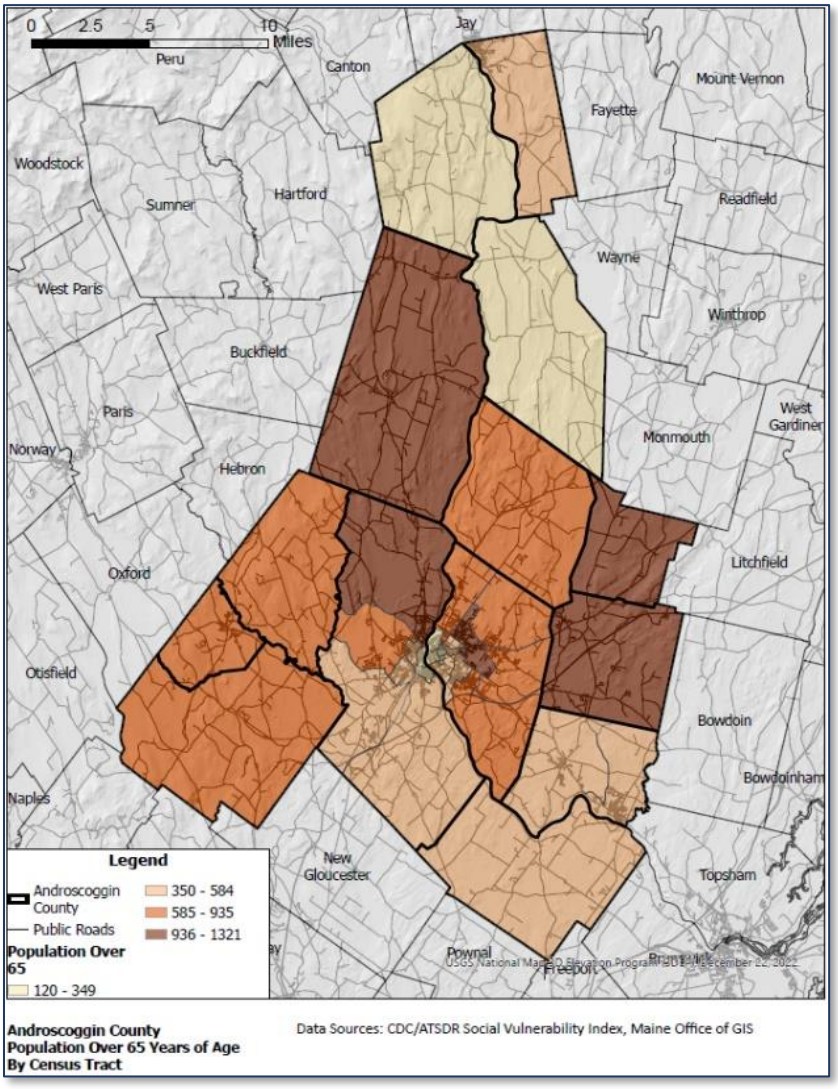


Figure 30: Air Quality in Androscoggin County during the wildfire smoke event, western Canada, September 6, 2023

Economic Development: Wildfires can damage residential, commercial, and industrial buildings, leading to economic losses, in the form of lost jobs and closed businesses. Wildfires can also damage or destroy crops, leading to agricultural losses. Almost all of the farms in Androscoggin County are located in rural areas, which are part of WUI areas, making these farms vulnerable to wildfire.

Land Use and Development: Building and land use codes can require that structures built in the Wildland-Urban Interface have defensible space and use flame resistant construction materials. Jurisdictions can adopt Community Wildfire Protection Plans to develop strategies and implement these protective measures[1]. Due to most of Androscoggin County being part of the Wildland Urban Interface (WUI), the majority of recent construction has occurred within this area, increasing the likelihood of wildfires to occur and impact as noted in Element E - Changes in Development. The National Fire Protection Association (NFPA) recommends removing trees within 5 feet of a structure and limiting the space between trees up to 100 feet from the structure to create a defensible space and reduce the impact of wildfire.[2] [1] *US Forest Service Community Wildfire Defense Grant Program* [2] *National Fire Protection Association Preparing Homes for Wildfire*

Housing: Due to the relatively rural nature of most of Androscoggin County, many residential units are built in the Wildland-Urban Interface (WUI). This makes these homes susceptible to being damaged or destroyed in a wildfire. Creating defensible space between the building would reduce the likelihood of impacts from wildfire.



Health & Social Services: Socially vulnerable populations especially the elderly or those in poverty may have trouble evacuating and recovering from the impacts of a wildfire. Socially Vulnerable (SV) populations exposure to wildfire smoke can cause breathing issues and exacerbate health issues in those with existing breathing problems[1]. As shown on the previous page in Figure 30, wildfire smoke can affect areas hundreds if not thousands of miles away from where the fire occurred. Some healthcare facilities, such as the DFD Russell Medical Center clinics in Leeds and Turner are located in a WUI and could be vulnerable to wildfire.

[1] *National Institute of Health Socially Vulnerability of the people exposed to wildfires in US. West Coast States*

Figure 31: Population 65 years of age and older in Androscoggin County

Infrastructure: The delivery of commodities such as medical supplies, food and fuel may be interrupted due to a wildfire causing road closures or damaging businesses. Damage to transmission infrastructure from wildfires can also cause interruptions in the delivery of utilities such as electricity, internet and drinking water. Due to the rural nature of much of the county, numerous critical infrastructure facilities, such as power substations and communication towers are built in or near the Wildland-Urban Interface. Since communications towers are generally built in remote areas on top of hills or mountains, it can be more difficult for fire departments to access the site in the event of a wildfire.

Natural & Cultural Resources: Wildfires cause significant damage or destruction to vegetation. The National Weather Service states that land that has been damaged by a wildfire can be susceptible to landslides or mudslides if exposed to heavy rain[2]. Historic properties, which are irreplaceable and contribute to community identity, may be damaged, or destroyed by wildfire and those that are located in WUI area are especially vulnerable. Properties such as the Poland Spring Museum in Poland, and the Shiloh Chapel in Durham are located in WUI areas. The Norlands historic property in Livermore is also located in a WUI area, however since the property is actively farmed, there is some defensible space separating it from the surrounding tree line.

[2] *National Weather Service Flood After Fire*

Drought

Androscoggin County normally receives about 42 inches of rain each year, any lower amount would be considered the beginning of a drought.

General Definition. According to the National Drought Mitigation Center a drought is a protracted period of deficient precipitation resulting in extensive damage to crops, and a consequential loss of yield.

Types of Droughts in Androscoggin County. A single drought event may include one or more of the following:

- **Meteorological Drought:** Meteorological Droughts are based on the degree of dryness or precipitation deficit and the length of the dry period.
- **Hydrological Drought:** Hydrological Droughts is based on the impact of precipitation deficits on the water supply such as stream flow, reservoir and lake levels, and ground water table decline.
- **Agricultural Drought:** An Agricultural Drought refers to soil moisture deficits, and subsequent impact to plants and agriculture, resulting from precipitation deficits and/or above-normal temperatures and wind that cause evaporative losses. Agricultural drought can increase the need for crop irrigation.
- **Socioeconomic Drought:** A Socioeconomic Drought considers the impact of drought conditions (meteorological, agricultural, or hydrological drought) on supply and demand of some economic goods such as fruits, vegetables, grains, and meat. Socioeconomic drought occurs when the demand for an economic good exceeds supply as a result of a weather-related deficit in water supply.

Location of Drought Hazards. All of Androscoggin County can be affected by drought since drought classification is generally longer term (weekly, monthly, seasonal) and based on large scale precipitation trends, surface and groundwater levels, soil moisture content, and other dryness indicators.

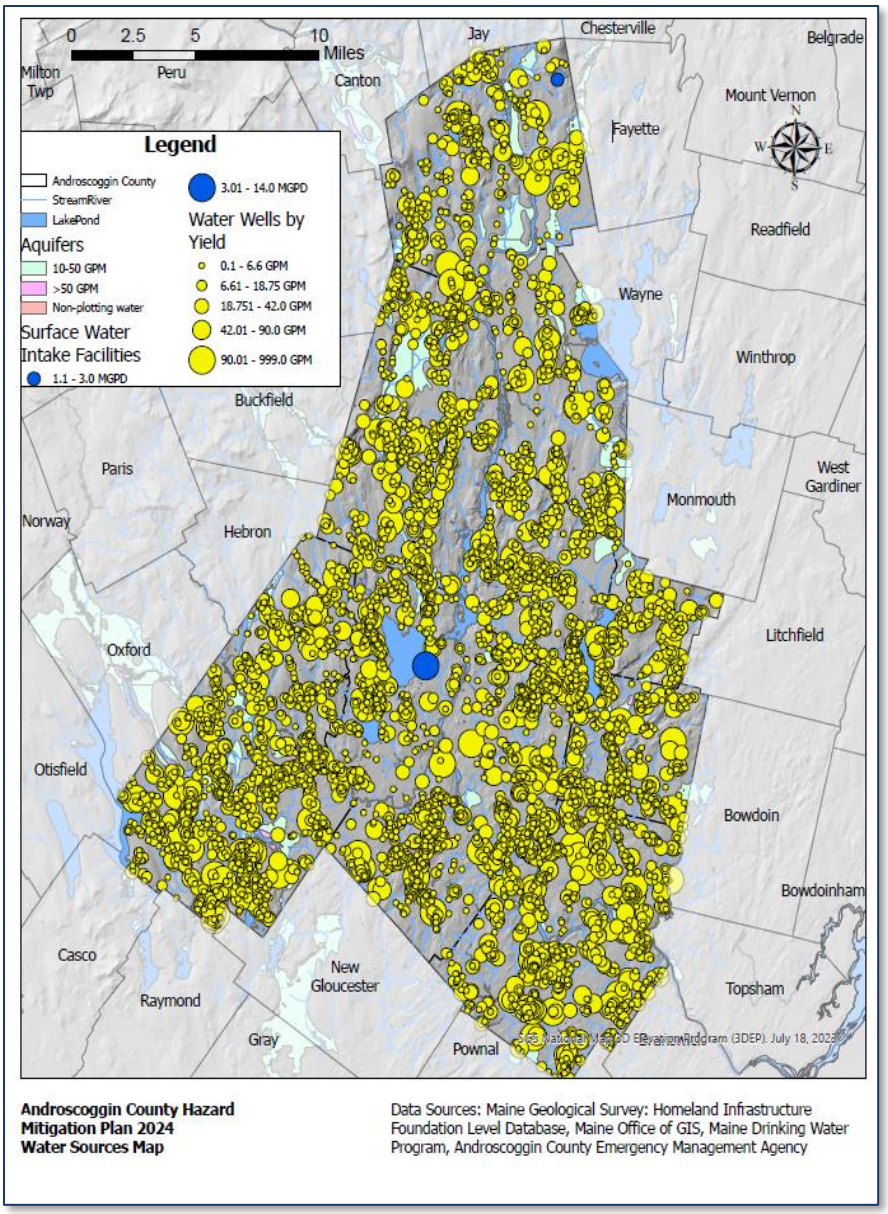


Figure 32: Androscoggin County Map of Aquifers, Wells and Surface Water Intake Sources

Extent/Severity of the Hazard. Historically droughts have affected most if not all of Androscoggin County at the same time, while there may be the duration of drought events have varied from several months to several years. The effects of drought can be compounded by the presence of invasive species of insects and various plant blights/diseases. Low water levels will stress or kill vegetation, the ones that survive will be more vulnerable to being killed off by the insects and diseases. Since 2012 the US Department of Agriculture (USDA) has included Androscoggin County in 9 disaster designations for drought. Of these Androscoggin County was designated as the primary county in 2 and as a contiguous county in 7 of the disaster designations. Table 40 illustrates the USDA disaster designations in Androscoggin County.

Table 39: Drought Impacts in Maine

Drought Category	Drought Impacts	Plamer Drought Severity Index
D0: Abnormally Dry	Crop growth stunted; elevated fire danger; surface water levels decline	-1 to -1.9
D1: Moderate Drought	Hay and grain yields below normal; honey production declines; wildfire danger increases; lake and reservoir levels below normal capacity	-2 to -2.9
D2: Severe Drought	Specialty crop yields below normal; fire danger warnings issued; trees brittle and susceptible to insects; fish kills occur; groundwater declines	-3 to -3.9
D3: Extreme Drought	Widespread crop loss; some wells go dry; wildlife disease outbreaks occur; river levels extremely low	-4 to -4.9
D4: Exceptional Drought[1]	Extreme crop loss; many wells go dry; lakes, rivers and reservoirs at extremely low levels	-5 or less

Source: NWS Maine Drought Impacts [1] Maine has not received a D4: Exceptional Drought designation since the system's implementation in 2000, thus unlike the other categories these impacts are not specific to Maine.

Table 40: USDA Disaster Designations in Androscoggin County

Date of Designation	Designation Number	Primary or Contiguous designation
September 30, 2015	S3906	Contiguous
September 28, 2016	S4057	Contiguous
October 5, 2016	S4064	Primary
October 15, 2020	S4820	Contiguous
October 16, 2020	S4828	Contiguous
October 20, 2020	S4837	Contiguous
August 18, 2021	S5045	Contiguous
August 25, 2021	S5056	Contiguous
September 26, 2022	S5295	Primary

Source: US Department of Agriculture Disaster Designation Archive

Previous Occurrences. Table 38 below shows drought occurrences in Androscoggin County since 1899, when records first began.

Table 41: Historical Drought Occurrences in Androscoggin County		
Overall Duration	Highest Drought Category[3]	Duration of Highest Drought Category
April 1899 – February 1900	D4: Exceptional Drought	November 1899 – January 1900
December 1904 – June 1906	D4: Exceptional Drought	April 1905 – July 1905
October 1909 – December 1912	D4: Exceptional Drought	April 1911 – June 1911
December 1940 – June 1942	D4: Exceptional Drought	March 1941 – March 1942
April 1947 - February 1951	D4: Exceptional Drought	January 1948 - June 1948
July 1952 – March 1953	D3: Extreme Drought	October 1952 – December 1952
October 1956 – January 1958	D4: Exceptional Drought	July 1957 -November 1957
July 1965 – November 1966	D4: Exceptional Drought	April 1965 -February 1966
August 1978 – March 1979	D4: Exceptional Drought	October 1978 – January 1979
January 1980 – September 1981	D4: Exceptional Drought	December 1980 – February 1981
January 1985 – January 1986	D4: Exceptional Drought	February 1985 – August 1985
October 1994 – November 1995	D4: Exceptional Drought	August 1995 – October 1995
June 2001 – November 2002	D3: Extreme Drought	December 2001 – April -2002
May 2016 – March 2017	D3: Extreme Drought	September 2016 – January 2017
June 2020 – December 2020	D2: Severe Drought	September 2020 – December 2020
April 2021 – November 2021	D1: Moderate Drought	June 2021 – July 2021

Source: National Integrated Drought Information System Data for Androscoggin County 1895-Present

[3] Drought categories from 1895-2000 are assumed based on available data.

Probability of Future Occurrence. Similar to the recurrence of floods, hydrologists and meteorologists define the extent of a drought by its probability of occurrence. A droughts extent, intensity and duration are factors that make droughts difficult to predict. Based on available studies there are estimated recurrence intervals for historical droughts in Maine. Table 39 below shows these recurrence intervals. According to research done by the Maine Climate Council, there has not been an observed increase in meteorological drought, but it is uncertain if drought will be more common in Maine due to climate change[1].

[1] Maine Climate Council Assessment of Climate Change and its effects in Maine

Table 42: Historical Droughts Affecting Androscoggin County Recurrence Intervals		
Overall Drought Period	Years of Surface Water Drought	Average Recurrence interval
1947 – 1950	1947 – 1949	45 Years
1952 – 1953	1952 – 1953	25 Years
1955 – 1959	1957 and 1959	20 Years
1963 – 1969	1965 – 1966 and 1968	25 Years
1978	1978	15 Years
1984 - 1988	1985 and 1987	20 Years
1995	1995	40 Years
1999 – 2002	1999 and 2001 - 2002	60 Years

Source: USGS Drought Conditions in Maine 1999-2002: A Historical Retrospective

Vulnerabilities to Drought

Assessing Vulnerability to Drought. This plan uses the worst-case, real-life damages to calculate potential drought damages, and assumes that historic patterns will hold for the future. For Androscoggin County, the worst drought was the 1999 to 2002 drought, which resulted in farmers statewide losing more than $32,000,000 in crops between 2001 and 2002. According to the Maine Department of Agriculture Water Use Survey 111 farms in Androscoggin County and neighboring Sagadahoc County lost a total of $1,730,050 between 2001 and 2002[1]. [1]*Sustainable Agriculture Water Source & Use Policy & Action Plan March 2003*

The methodology for calculating potential losses in Androscoggin County is to use actual damages updated using the Consumer Price Index

- Average Loss Per Farm in 2001 dollars equals $ 13,989, which is $23,120.15 in 2022 Dollars.
- Average Loss Per Farm in 2002 dollars equals $ 17,154, which is $ 27,909.81 in 2022 Dollars.
- Multiply by the number of farm operations in each jurisdiction.

Table 43: US Consumer Price Index (1982-1984 = 100)				
1947 = 22.3	1988 = 118.3	1997 = 160.5	2006 = 201.6	2015 = 237.0
1980 = 82.4	1989 = 124.0	1998 = 163.0	2007 = 207.3	2016 = 240.0
1981 = 90.9	1990 =130.7	1999 = 166.6	2008 = 215.3	2017 = 245.1
1982 = 96.5	1991 = 136.2	2000 = 172.2	2009 = 214.5	2018 = 251.1
1983 = 99.6	1992 = 140.3	2001 = 177.1	2010 = 218.1	2019 = 255.7
1984 =103.9	1993 = 144.5	2002 = 179.9	2011 = 224.9	2020 = 258.8
1985 = 107.6	1994 = 148.2	2003 = 184.0	2012 = 229.6	2021 = 271.0
1986 = 109.6	1995 = 152.4	2004 = 188.9	2013 = 233.0	2022 = 292.7
1987 = 113.6	1996 = 156.9	2005 = 195.3	2014 = 236.7	N/A

Source: US Bureau of Labor Statistics

Table 44: Potential Drought Damages in Androscoggin County			
Jurisdiction	Number of Farm Operations[1]	Potential Drought Damages (2001 Scenario)	Potential Drought Damages (2002 Scenario)
Auburn	48	$1,109,767.20	$1,339,670.88
Durham	36	$832,325.40	$1,004,753.16
Greene	14	$323,682.10	$390,737.34
Leeds	30	$693,604.50	$837,294.30
Lewiston	136	$3,144,340.40	$3,795,734.16
Lisbon	24	$554,883.60	$669,835.44
Livermore	30	$693,604.50	$837,294.30
Livermore Falls	25	$578,003.75	$697,745.25
Mechanic Falls	18	$416,162.70	$502,376.58
Minot	21	$485,523.15	$586,106.01
Poland	23	$531,763.45	$641,925.63
Sabattus/Wales[2]	62	$1,433,449.30	$1,730,408.22
Turner	30	$693,604.50	$837,294.30
Total	496	$11,467,594.40	$13,843,265.76

[1] *USDA National Agricultural Statistics Service 2017 Census*

[2] *USDA Data is based on Zip Code, Sabattus and Wales share the 04280 zip code.*

Specific Locations Vulnerable to Drought. ACEMA, through the three Natural Hazard Surveys asked jurisdictions, stakeholders, and the public to identify locations within Androscoggin County that are most vulnerable to natural hazards. Additional information was provided through past occurrences and data provided by subject matter experts, such as the NWS Gray. Table 45 below lists locations, including critical facilities in each jurisdiction that are vulnerable to drought and the mechanism related to the vulnerability.

More than 50% of the homes in Androscoggin County receive their drinking water from wells. Many of these wells are hand dug which can be especially vulnerable to drought conditions. Drilled bedrock wells tend to be more resistant to drought and tend have lower water flow rates than dug wells[1]. Drought conditions can cause harmful algal blooms (HAB's) to occur on bodies of water, lowering water quality and potentially impacting drinking water supplies[2].

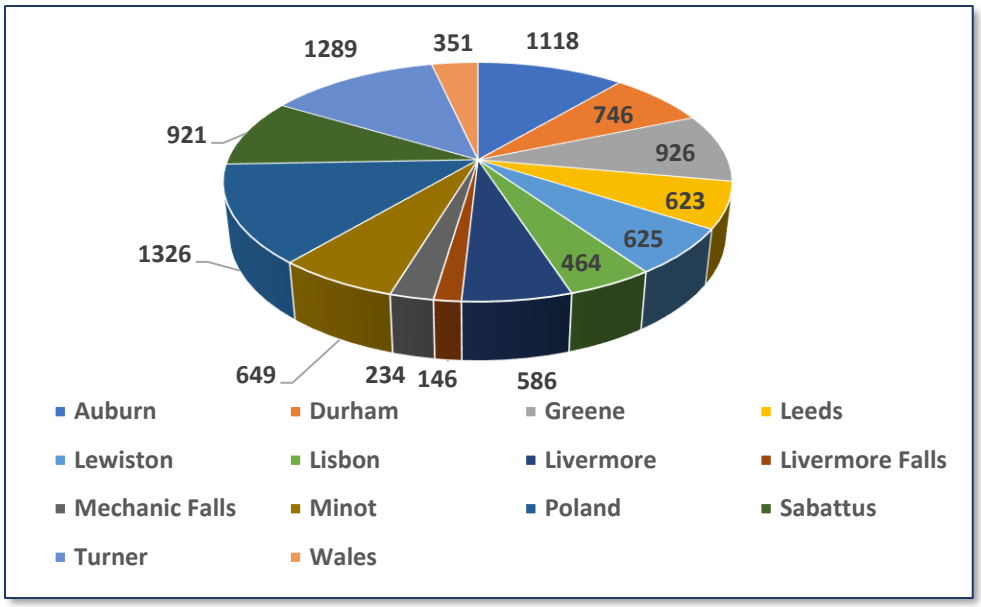


Figure 33: Drinking water wells per jurisdiction

[1] Maine Drinking Water Program Facts for Private Well Owners

[2] MaineDEP Harmful Alagal Blooms in Maine Lakes

Table 45: Specific locations vulnerable to Drought and mechanism

Jurisdiction	Location 1 & Mechanism	Location 2 & Mechanism
Auburn	Lake Auburn Area, Harmful Algal Blooms	Taylor Pond Area, Harmful Algal Blooms
Durham	Bowie Hill Road, Agricultural impacts	Davis Road, Agricultural impacts
Greene	Around Sabattus Pond, Harmful Algal Blooms	North River Road, well water impacts
Leeds	Quaker Ridge Road, well water impacts	Lake Shore Drive, Harmful Algal Blooms
Lewiston	No Name Pond Area, Harmful Algal Blooms	Pinewoods Road, well water impacts
Lisbon	Upland Road, Agricultural impacts	Upland Road, Agricultural impacts
Livermore	Boothby Road, Agricultural impacts	Long Pond Area, Harmful Algal Blooms
Livermore Falls	Pine Ridge Loop, well water impacts	Lower Park Street, well water impacts
Mechanic Falls	Jordan Road, well water impacts	North Street, well water impacts
Minot	Woodman Hill Road, Agricultural impacts	Center Minot Hill Road, Agricultural impacts
Poland	Tripp Pond Area, Harmful Algal Blooms	Range Ponds Area, Harmful Algal Blooms
Sabattus	Sabattus Pond Area, Harmful Algal Blooms	Bowdoinham Road Middle Road
Turner	Upper Street/Lower Street; Agricultural impacts	North Parish Road, Agricultural impacts
Wales	Sabattus Pond Area, Harmful Algal Blooms	Leeds Junction Road, Agricultural impacts

Community Sector Risks from Drought.

Emergency Management: Firefighters may have to respond to more wildfires due to dry vegetation caused by a drought. Firefighters may also have difficulty finding adequate water sources for firefighting. As there has been a nationwide shortage of firefighters in recent years and any fire during a drought would require additional manpower to supply water to fight the fire, this would put a strain on most fire department's ability to respond.

Economic Development: A drought will cause significant economic losses on any agriculture-based businesses, in the form of lost jobs and closed businesses. Any businesses that are reliant on agricultural products such as food distributors and restaurants will also likely face increased operating costs. According to the USDA, Hay is the primary crop grown in Androscoggin County, along with apples, Christmas trees and maple trees for syrup production[1]. All farms would suffer from reduced crop yields during a drought. Farms that raise livestock would have reduced hay and grain supplies available increasing the cost of feed the animals. [1] USDA Agriculture Census 2017 for Androscoggin County

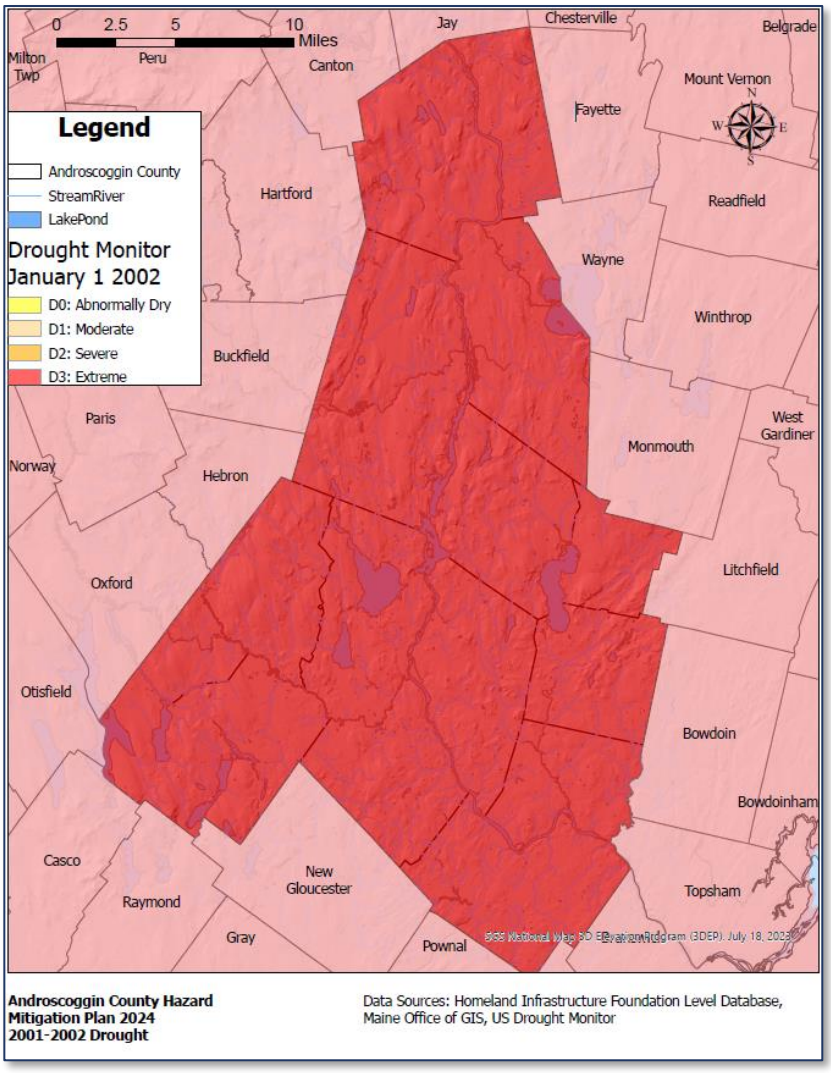
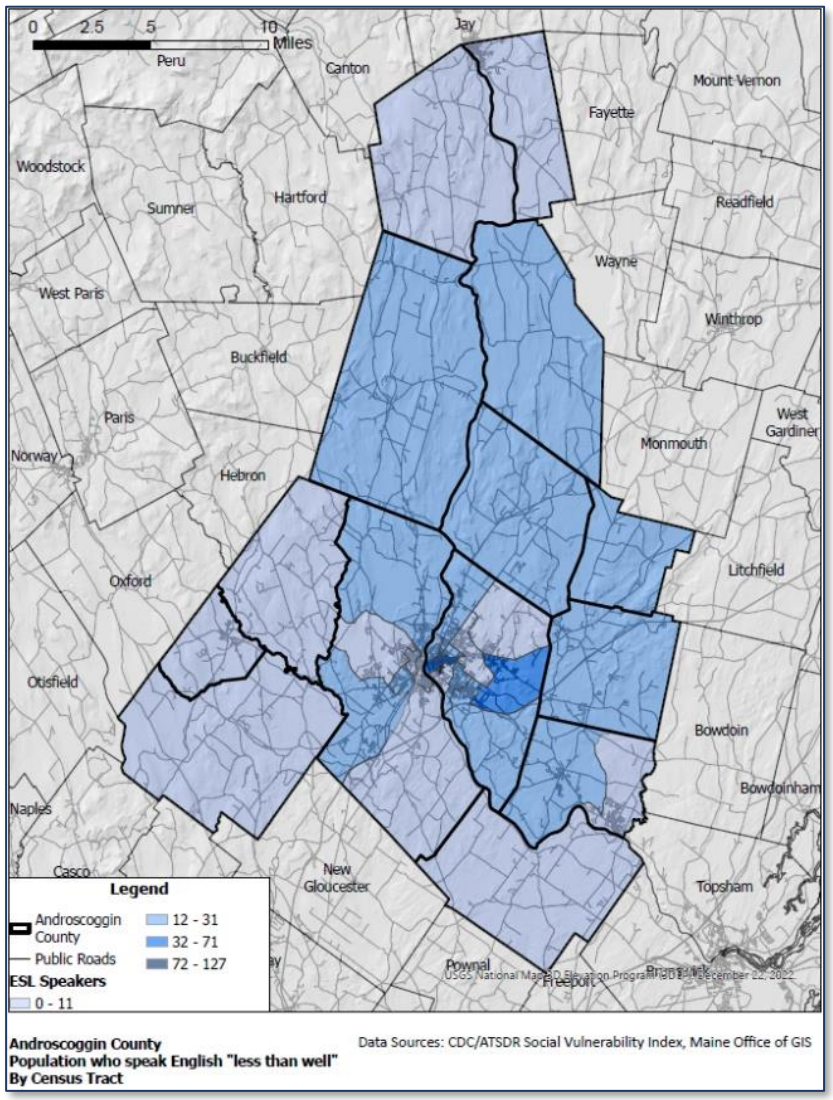


Figure 34: Androscoggin County during the peak of the 2001-2002 drought in January 2002

Land Use and Development: Land use policies can be used to encourage the use of more drought resistant water sources, and planting of drought resistant vegetation and crops. As noted in Element E - Changes in Development, the majority of development in Androscoggin County has occurred in more rural areas in the last 5 years. Increased development in areas reliant on wells will put more demand on aquifers. This could cause increased impacts in the event of a drought.

Housing: Since the about half of the residential properties in Androscoggin County, and Maine as a whole use a well for their water supply. A drought can cause significant impacts to residences that do not have an appropriately designed well. According to the Maine Drinking Water Program (DWP) there are 4,870 wells in Androscoggin County, of which only 22% are drilled. The other 78% are mainly dug wells, which are shallower and more susceptible to drought impacts than drilled bedrock wells[2]. This would increase the likelihood of more wells going dry during a drought. Low water levels in wells are also more likely to allow wells to become contaminated with toxic metals such as arsenic, bacteria and other pathogens.[2] Maine Drinking Water Program Facts for Private Well Owners



Health & Social Services: Limited water availability may increase cases of dehydration and/or heat related illnesses especially in Socially Vulnerable (SV) populations such as those in poverty or the elderly. The same SV populations likely suffer from a lack of a savings and a low credit score making it difficult to near impossible to afford to either buy bottled water for an extended period or to have a new well drilled if the existing one goes dry. Healthcare facilities that rely on well will be unable to function without water delivery if their wells run dry. Rural clinics such as the DFD Russell Medical Centers in Leeds and Turner rely on well water.

Figure 35: Socially Vulnerable population with Limited English Proficiency in Androscoggin County

Infrastructure: A drought can reduce the available supply for municipal water systems, Municipal water systems relying on well water including Lisbon, Mechanic Falls and Sabattus would face reduced aquifer capacity and increased possibility of contamination. Municipal water systems relying on surface water intake including Auburn, Lewiston and Livermore Falls would also face less supply and more risk of contamination. A drought can also cause the interruption of the delivery of critical services such as food and water delivery, either due to lower local availability or having to ship products in from further away. A drought would limit the ability of water bottling facilities to meet product demands as they are reliant on aquifers or springs, these facilities in located in the towns of Greene, Livermore, and Poland. Dams generating hydroelectric power would have lower flows during a drought, reducing the amount of electricity generated, thus forcing other power plants using fossil fuels or renewable energy to make up the difference.

Natural & Cultural Resources: The amount of vegetation including crops that would be impacted by a drought would depend on its severity, but even an abnormally dry period would have some impact. Vermin such as insects and rats are more likely to cause problems during a drought as they must search more area for food, killing already weakened vegetation and crops as noted by the University of Illinois Extension[1]. Historical properties may be impacted by drought if they rely on having water available for fire protection. [1] *University of Illinois Extension How Does Drought Stress Influence Plant & Insect Interactions?*

Element B Requirements
B2. Does the plan include a summary of the jurisdiction's vulnerability and the impacts on the community from the identified hazards? Does this summary also address NFIP-insured structures that have been repetitively damaged by floods? (Requirement 44 CFR § 201.6(c)(2)(ii))
B2-a. Does the plan provide an overall summary of each jurisdiction's vulnerability to the identified hazards?
B2-b. For each participating jurisdiction, does the plan describe the potential impacts of each of the identified hazards on each participating jurisdiction?
B2-c. Does the plan address NFIP-insured structures within each jurisdiction that have been repetitively damaged by floods?

Climate

The entire state of Maine is classified as a Warm summer, Humid Continental climate under the Köppen-Gieger climate classification[1]. The majority of Androscoggin County is then subdivided by the Climate Prediction Center (CPC) as part of the Southern Interior climate subdivision, with a southern portion of the county as part of the Coastal climate subdivision. July is the warmest month in Maine with a statewide average of 65.4 degrees and January being the coldest month, with a statewide average of 13.5 degrees. Maine averages 42.6 inches of precipitation each year, based on records back to 1895. Prevailing winds vary with season a location, data from the weather station at Lewiston-Auburn Municipal Airport indicate winds tend to be out of the North or Northwest[2].

[1] *Climate.gov*

[2] *Lewiston Auburn Airport Weather Station Data*

Figure 36: Hackett Mills Dam, Little Androscoggin River, Minot, ME. Source: Eagle Creek Renewable.

Climate Change

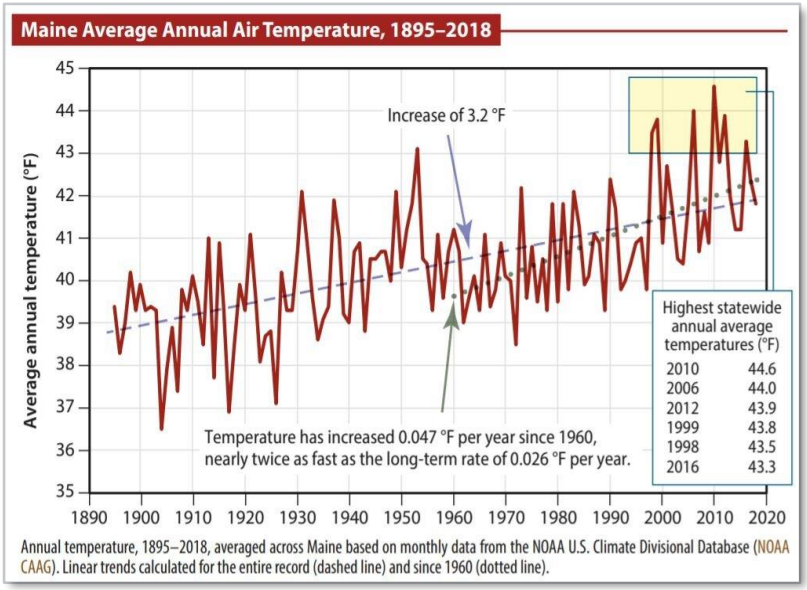
While a detailed evaluation of climate change is beyond the scope of this plan, long term global climate trends, which include changes in temperature and precipitation, may affect the State of Maine and Androscoggin County. The excerpt below, which are statewide in nature, are expected to reflect climate changes in Androscoggin County. As stated in the Maine State Hazard Mitigation Plan 2023 Update, 'the National Aeronautics and Space administration (NASA) uses the following definitions to describe climate and weather:

- **Climate:** The description of the long-term pattern of weather in a particular area.
- **Weather:** The description of the way the atmosphere is behaving in the short term, from minute to minute, hour to hour, day to day, and season to season.'

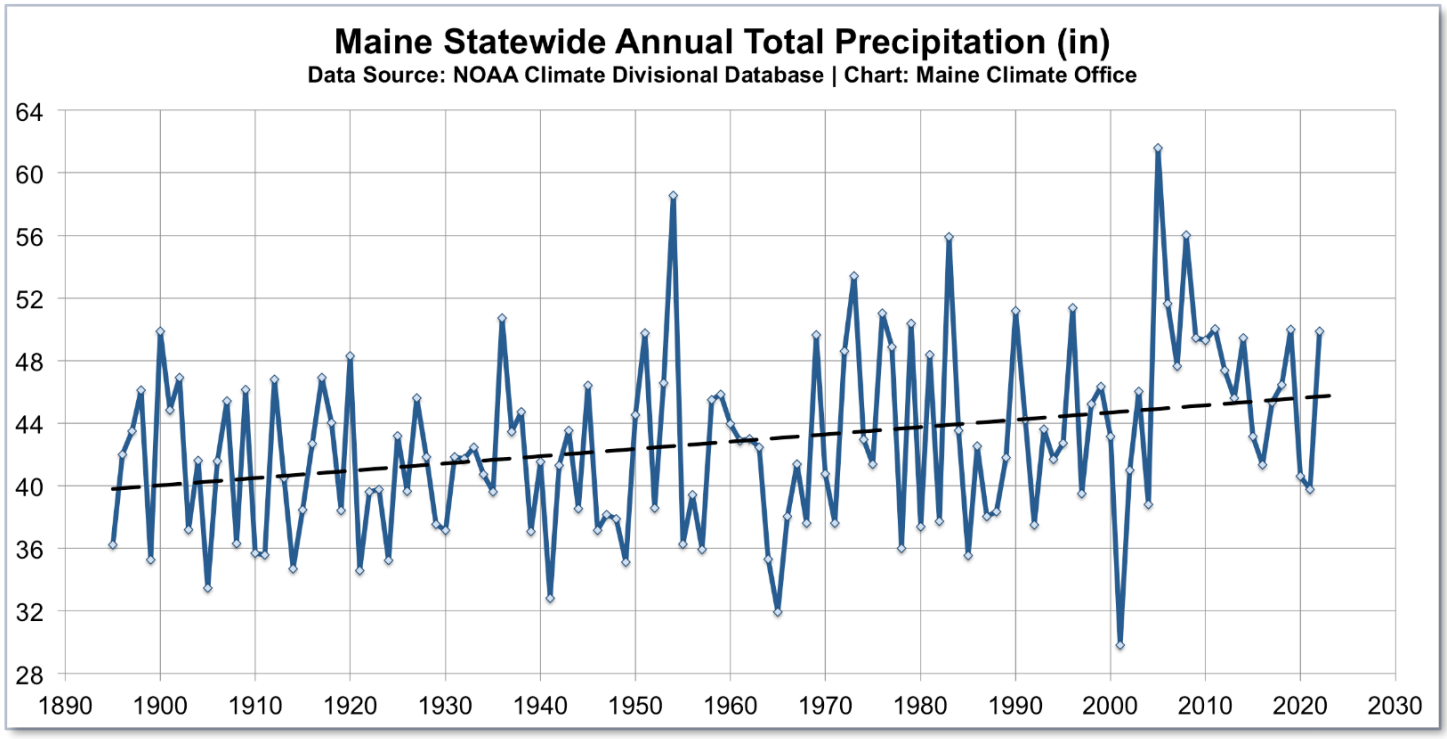
As Mainers are aware, the state has long had a highly variable climate, characterized by abrupt weather variations day-to-day, month-to-month, and year to year. The report, "Maine's Climate Future, 2020 Update[1]," prepared by the University of Maine, states that "Rapid warming in the Arctic can affect the weather we experience in Maine and conditions in the Gulf of Maine (Schmitt 2007). As arctic air warms, there is less of a temperature difference between the North Pole and the continental United State, leading to weaker westerly winds. Recent studies have suggested that weakened westerlies may lead to a more wavy Jet Stream, so called "blocking" storm patterns, and Polar Vortex dips that allow Artic air, still very cold, to plunge into Maine during winter page 14)."

"Changes in the distribution of winds and sea-surface temperature across the North Atlantic, and Gulf Stream position, are likely amplifying regional warming and precipitation cycles, and have the potential to further affect seasonal shifts in the environment over the coming decades (Saba et.al. 2016, Thomas et.al.2017) (page 14)." However, county-wide, or town-specific data does not exist on the extent to which increasing temperatures or precipitation will affect flooding, summer storm, winter storms, or wildfires. [1] Maine's Climate Future 2020 Update

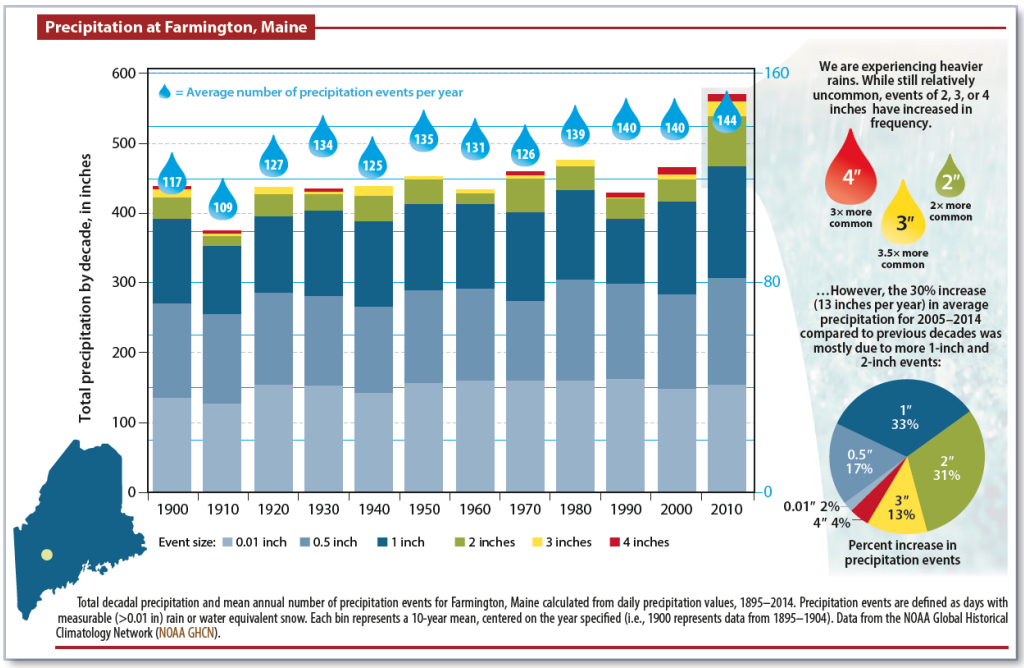
Temperature Changes. Excerpts from the report "Maine's Climate Future, 2020 Update," prepared by the University of Maine, include the following, "Temperatures are increasing statewide. Average annual temperature has increased 3.2 degrees Fahrenheit in the last 124 years, and the rate of warming has increased most notably since 1960. The six warmest years on record have occurred since 1998. Indeed, the Northeast is warming faster than any other region in the U.S. and is projected to warm 5.4 degrees Fahrenheit when the rest of the world reaches 3.6 degrees Fahrenheit (page 3)…The growing season (the period between the last frost and first frost) is more than two weeks longer than it was in 1950, mostly due to later frosts in the fall (page 4)." The above chart, taken from "Maine's Climate Future, 2020 Update," demonstrates year to year variations in Maine's annual temperature with periods of relative cold and relative warmth, but an overall upward trend in annual average temperatures.



Precipitation Changes in Maine. Maine's Climate Future, 2020 Update, reports that, "Average annual precipitation has increased 15 percent (5.8 inches) since 1895, and the increase has come in the form of more rain and less snow. As illustrated in the chart immediately below, since 1895, depth of annual snowfall has decreased 20 percent (2.3 inches). As with temperature, the rate of increase has accelerated in recent decades (page 5). "Communities across the state are experiencing more heavy or "intense" precipitation events (Fernandez et. al. 2015)…Increased precipitation means increased volume of runoff to local streams, rivers, and ultimately the Gulf of Maine (Vincent et. al. 2015, Huntington et. al. 2016). These higher floods and flows can…damage roads, bridges, and properties (page 6)."



The following chart shows how precipitation has increased in the town of Farmington, Maine, which is located approximately 14 miles north of the Androscoggin County border, 41 miles from the city center of Lewiston, Maine, 50 miles from the center of the Town of Durham, Maine and 39 miles from the center of the Town of Minot.



Social Vulnerabilities

The US CDC defines social vulnerability as potential negative effects on communities caused by external stresses on human health. Such stresses include natural or human-caused disasters, or disease outbreaks. Reducing social vulnerability can decrease both human suffering and economic loss. As part of this plan, Androscoggin County EMA used data from the CDC Social Vulnerability Index (SVI) from 2020 to assist with determining the vulnerability of jurisdictions in Androscoggin County to natural hazards. While Androscoggin County as a whole is considered a Medium-High vulnerability under the SVI, portions of the cities of Lewiston and Auburn as well as the town of Livermore Falls are considered to have High social vulnerability under the SVI. Table 46 illustrates 5 of the 16 variables from the US Census that the CDC uses to calculate social vulnerability in communities.

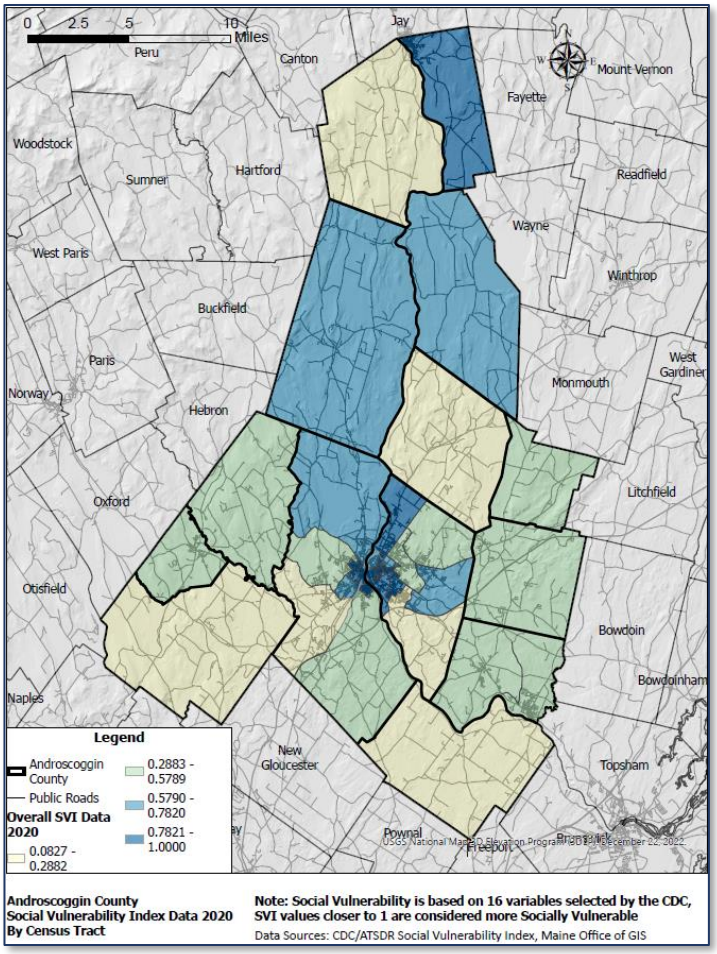


Figure 37: Overall Social Vulnerability in Androscoggin County by Census Tract

Table 46: Social Vulnerabilities in Androscoggin County

Jurisdiction	Population Under 17	Population Over 65	Disabled Population	Population with Limited English Proficiency	Population 150% below poverty level
Auburn	5,062	4,218	4,250	89	5,443
Durham	906	584	349	0	195
Greene	973	726	452	13	320
Leeds	768	333	310	17	785
Lewiston	7,306	7,382	6,952	461	10,313
Lisbon	2,104	1,101	1,226	36	1,548
Livermore	483	325	327	0	260
Livermore Falls	837	546	737	0	1,072
Mechanic Falls/Minot*	1,477	935	744	0	740
Poland	1,107	885	876	0	394
Sabattus/Wales*	1,222	1,268	1,142	19	800
Turner	1,143	1,321	1,120	20	756

Source: CDC/ATSDR Social Vulnerability Index

**SVI data is based on census tract level data, Mechanic Falls and Minot share one census tract and Sabattus and Wales share another.*

TABLE OF CONTENTS – ELEMENT C

Element C – Mitigation Strategies

Element C Requirements
C1. Does the plan document each participant's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement 44 CFR § 201.6(c)(3))
C1-a. Does the plan describe how the existing capabilities of each participant are available to support the mitigation strategy? Does this include a discussion of the existing building codes and land use and development ordinances or regulations?
C1-b. Does the plan describe each participant's ability to expand and improve the identified capabilities to achieve mitigation?

Existing Capabilities: Authorities, Policies, Programs, and Resources

Summarized below is brief overview of existing authorities and resources for jurisdictions in Androscoggin County available to accomplish hazard mitigation efforts. Refer to Table 47 for specifics.

- **County**: County government in Maine has a limited role. Maine operates under a "home rule" statute which provides its municipalities with a great deal of local autonomy. In Androscoggin County there are seven county commissioners who oversee the operations of county government, which include courts, sheriff, corrections, probate, registry of deeds and emergency management.
- **Cities**: There are two cities in Androscoggin County, Auburn, and Lewiston. All cities in Maine have local charters granted by the Maine Legislature that provide for a representative form of government meaning, a city council that serves as the legislative body. The city council is elected by and answerable to the citizens. In Lewiston and Auburn, the mayors are elected by the vote of the people. Lewiston and Auburn operate under a mayor/city council form of government.

Figure 36: Campbell Road, Leeds, ME. May Day Storm 2023 Source: Leeds Public Works, Jake Rodrigue

- **Towns:** There are twelve incorporated towns in Androscoggin County. A Maine community becomes a town when it is incorporated by a special act of the legislature. 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. All of the county's towns operate with a town meeting; 10 of the towns have a selectboard, while Lisbon and Mechanic Falls have a town council.
- **City Manager/City Administrator/Town Manager/Administrative Assistant**: The City of Lewiston has a city administrator, while Auburn has a city manager. Nine towns maintain town managers, while Leeds, Livermore and Wales have administrative assistants to serve the selectboard. The role of city administrator, city manager/town manager varies greatly, for example, a town manager may also have the roles and responsibilities of the Road Commissioner or EMA director.
- **Code Enforcement Officer:** All jurisdictions in Androscoggin County have a code enforcement officer as required, whose role is to ensure that all state laws and municipal codes and ordinances that support hazard mitigation, such as standards of public health, safety, public works, building codes and more are adhered to.
- **Public Works or Road Commissioner**: All jurisdictions in Androscoggin County have a public works department, a few have road commissioners, but most have public works director (PWD). In three jurisdictions the town manager or board of selectmen serve as the Road Commissioner (RC) and maintain a Road Foreman (RF).
- **Resources, Staff:** There are no jurisdictions in Androscoggin County with staff resources devoted exclusively to hazard mitigation. However, all jurisdictions have a planning board (PB), Lewiston and Auburn have Engineering Departments, and GIS specialists. Three jurisdictions have an Economic and Community Development Department, all of the aforementioned can support hazard mitigation efforts.

Table 47: Summary of Capabilities – Authorities and Resources

Jurisdiction	Management Type	Code Enforcement	Public Works	EMA Director	Planning	Form of Government
Auburn	City Manager	X	PWD	X	ECD & PB	Council
Durham	Town Manager	X	RC	X	PB	Selectboard
Greene	Town Manager	X	RF	X	PB	Selectboard
Leeds	Administrative Assistant	X	PWD	X	PB	Selectboard
Lewiston	City Administrator	X	PWD	X	ECD &PB	Council
Lisbon	Town Manager	X	PWD	X	ECD & PB	Council
Livermore	Administrative Assistant	X	RC & RF	X	PB	Selectboard
Livermore Falls	Town Manager	X	PWD	X	PB	Selectboard
Mechanic Falls	Town Manager	X	PWD	X	PB	Council
Minot	Town Manager	X	PWD	X	PB	Selectboard
Poland	Town Manager	X	PWD	X	PB	Selectboard
Sabattus	Town Manager	X	RC & RF	X	PB	Selectboard
Turner	Town Manager	X	PWD	X	PB	Selectboard
Wales	Administrative Assistant	X	PWD	X	PB	Selectboard

- **Flood Hazard Ordinance:** All Androscoggin County jurisdictions are in the National Flood Insurance Program (NFIP), in accordance with NFIP, those jurisdictions have a flood hazard ordinance in effect.
- **Shoreland Zoning Ordinance:** All Androscoggin County jurisdictions are required to have a shoreland zoning ordinance, in accordance with MRSA Title 3 Article 2-b.
- **Building Code**: The Maine Uniform Building and Energy Code (MUBEC) applies to all towns within the State of Maine. Enforcement of MUBEC is required for municipalities with populations meeting or exceeding 4,000 residents based on the U.S. Census Bureau's most recent decennial census. Municipalities with populations below this threshold may also adopt (and are encouraged to adopt) MUBEC. MUBEC is made up of the following codes and standards: 2015 International Residential Code (IRC), International Building Code (IBC), International Existing Building Code (IEBC), International Energy Conservation Code (IECC) https://www.maine.gov/dps/fmo/building-codes

Codes, Ordinances, Plans, Resources, and Requirements

Building Codes			
Adopted, if yes when?			Have aspects if the HMP been incorporated into the jurisdiction's codes/ordinances/requirements?
YES	NO	DATE	If yes, describe how in comments.
X		12/28/2021	If no, add Mitigation project # if applicable.

Comments
- Maine Uniform Building and Energy Code (MUBEC) was established in 2010 for all municipalities with more than 4,000 residents.
- Building Codes are specified in the City Code of Ordinances Chapter 18

Town Zoning Ordinances			
Adopted, if yes when?			Have aspects if the HMP been incorporated into the jurisdiction's codes/ordinances/requirements?
YES	NO	DATE	If yes, describe how in comments.
X		1/9/1988	If no, add Mitigation project # if applicable.

Comments
- Maine municipalities can adopt ordinances under MSRA 30-A Chapter 141
- Zoning and Land Use codes are included in City Code of Ordinances Appendix A Zoning & Land Use Code Articles I – XVII

Local Subdivision Regulations			
Adopted, if yes when?			Have aspects if the HMP been incorporated into the jurisdiction's codes/ordinances/requirements?
YES	NO	DATE	If yes, describe how in comments.
X		1/9/1988	If no, add Mitigation project # if applicable.

Comments
- Maine Subdivision law is described in MSRA 30-A Chapter 187 Subchapter 4
- Subdivision regulations are included in multiple parts of City Ordinances Appendix A Zoning & Land Use Code Articles I – XVII

Stormwater Management			
Adopted, if yes when?			Have aspects if the HMP been incorporated into the jurisdiction's codes/ordinances/requirements?
YES	NO	DATE	If yes, describe how in comments.
X		7/27/2006	If no, add Mitigation project # if applicable.

Comments
- Stormwater Management is required under MSRA 30-A Chapter 161 for sewers and MSRA 38 Section 420-D for certain construction projects.
- Stormwater management is specified in the City Code of Ordinances Chapter 74 Article IV
- The city has a Municipal Separate Storm Sewer System Permit (MS4) Stormwater Management Plan

- **Tree Care and electricity transmission/distribution lines:** Central Maine Power implements tree pruning and removals within the rights of ways to reduce potential service interruptions during and after severe summer or winter storms.
- **Culvert Sizing Design Guidance:** approved by the Maine Department of Transportation Environmental Office in 2015, this guidance replaces older practices to ensure new culverts withstand larger peak flows currently experienced in stream and rivers. This design guidance is implemented for state/public roads and strongly encouraged for county and municipal roads.
- **Other State-level laws that impact zoning/land use**: Other state laws exist that support community efforts for mitigation actions in their jurisdiction or authorize municipalities with the right to adopt their own ordinances. A reference guide to these laws and how they may be enforced is provided here: https://legislature.maine.gov/doc/7182
- **Resources:** In addition to staffing or other expertise, funding resources are from local taxes and/or grants. Local tax dollars may in include general fund money, capital improvement funds or bonded funds or funds derived from a tax increment financing district.

  Community Action Partnerships: Community Action Partnership is a national, 501(c)3 nonprofit membership organization that provides technical assistance, training, and other resources to Community Action Agencies, nonprofit and public groups funded by the Community Services Block Grant (CSBG), a

federal program that allocates funding to states to connect Americans to greater opportunity. The Maine Community Action Partnership (MeCAP) is the statewide organization dedicated to improving the quality of life of Maine people by advocating for, promoting, and supporting the work of the 10 regional Maine community action agencies. The mission of MeCAP and partner agencies align with the mitigation goals of this Plan by reducing the overall vulnerability of disadvantaged communities through use of whole community approaches https://mecap.org/our-network

Other Regional Planning Capabilities: Androscoggin Valley Council of Governments (AVCOG) provides regional planning support serving the Western Maine communities of Androscoggin, Franklin, and Oxford Counties. AVCOG provides technical assistance to support local economic development, land-use planning, transportation planning, and environmental management.

- **Expansion/Improvements:** All jurisdictions in Androscoggin County could expand and improve their existing capabilities through planning efforts by issuing economic development plans, comprehensive plan updates, risk-informed zoning ordinances, building code enforcement, public health plans, participate in Community Rating System, etc., or if additional funds, beyond their existing tax bases, became available to address the hazard mitigation projects listed in this plan, Element C.

Figure 37, Tall Pines Drive, Lewiston, ME. October 14, 2022, Tree damage. Source: Lewiston Sun Journal

Capability Assessment. As part of the Risk and Capability Assessment the jurisdictional teams completed the Project Worksheets, resulting in the identification of vulnerabilities and capabilities, the sheets aided the development of mitigation strategies for the plan update. The Project Worksheet-Codes, Ordinances, Plans Resources and Requirements, used to capture capabilities like, codes, ordinances, plans, resources, and requirements, is embedded on page C-3. Worksheets completed by the jurisdictions are located in Appendix A. Table 48, presented below, summarizes the capabilities for jurisdictions in Androscoggin County.

Table 48: Summary of Capabilities - Plans, Codes, Ordinances & Resources

Jurisdiction	Building Code	Shoreland Zoning Ordinance	Flood Hazard Ordinance*	Sub division Ordinance	Stormwater Management	Comprehensive Plan	Economic Development Plan	Emergency Operations Plan	Public Health Plan	Debris Management Plan
Auburn	MUBEC	X	X	X	X	X	X	X	X	X
Durham	MUBEC	X	X	X	X	X	-	X	-	X
Greene	MUBEC	X	X	X	X	X	-	X	-	X
Leeds	MUBEC	X	X	X	X	X	-	X	-	X
Lewiston	MUBEC	X	X	X	X	X	X	X	X	X
Lisbon	MUBEC	X	X	X	X	X	X	X	-	X
Livermore	MUBEC	X	X	X	X	X	-	X	-	X
Livermore Falls	MUBEC	X	X	X	X	X	-	X	-	X
Mechanic Falls	MUBEC	X	X	X	X	X	-	X	-	X
Minot	MUBEC	X	X	X	X	X	-	X	-	X
Poland	MUBEC	X	X	X	X	X	-	X	-	X
Sabattus	MUBEC	X	X	X	X	X	-	X	-	X
Turner	MUBEC	X	X	X	X	X	-	X	-	X
Wales	MUBEC	X	X	X	X	X	-	X	-	X

** All Androscoggin County jurisdictions are in the National Flood Insurance Program (NFIP), in accordance with NFIP, those jurisdictions have a flood hazard ordinance in effect.*

- Denotes the nonexistence of the referenced plan.

Element C Requirements
C2. Does the plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement 44 CFR § 201.6(c)(3)(ii))
C2-a. Does the plan contain a narrative description or a table/list of their participation activities?

National Flood Insurance Program (NFIP)

FEMA states, the National Flood Insurance Program (NFIP) enables property owners to purchase flood insurance. In return, communities agree to adopt and implement local floodplain management regulations that contribute to protecting lives and reducing the risk of new construction and substantial improvements from future flooding. The State of Maine requires that all municipalities have a code enforcement officer and further, that all code enforcement officers undergo training and certification at the state level. Proper administration and enforcement of floodplain management ordinance is part of the training program.

NFIP Compliance Maintained by All 14 Jurisdictions. As shown in the table below, all jurisdictions in Androscoggin County participate in the National Flood Insurance Program (NFIP). And as a condition of participation in the program, have enacted floodplain management ordinances that limit new development in floodplain areas. The City of Lewiston and the City of Auburn go beyond the NFIP's minimum standards for floodplain management and participate in the Community Rating System (CRS). Discounts may be available on flood insurance premiums for Lewiston and Auburn resident policy holders.

- Adoption of NFIP minimum floodplain management criteria via local regulation, see Table 50
- Adoption of the latest effective flood insurance rate map (FIRM), if applicable, see Table 50
- Implementation and enforcement of local floodplain management regulations to regulate and permit development of Special Flood Hazard Areas (SFHAs) any location within the 100-year flood and 500-year flood zones.
- The Floodplain Administrator, as identified in Appendix A is responsible for making determinations of substantial improvement and substantial damage. These determinations are made for all development in a special flood hazard area that proposes to improve an existing structure including alterations, movement, enlargement, replacement, repair, additions, rehabilitations, renovations, repairs of damage from any origin (such as, but not limited to flood, fire, wind, or snow) and any other improvement of or work on such structure including within its existing footprint. The Floodplain Administrator, in coordination with any other applicable community official(s), shall be responsible for the following:
    - Determine if a substantial damage (SD) determination needs to be made and communicate SD and permit requirements to property owners.
    - Verify the cost of repairs to the structure.
    - Verify the market value of the structure.
    - Make the SD determination and issue it to the property owner.
    - Permit development/ensure compliance with community ordinance.
    - Inspect development and maintain as-built compliance documentation post construction.
- Appointment of a designee or agency to implement the addressed commitments and requirements of the NFIP. The code enforcement officer is the designated entity for addressing the commitment of the NFIP. Depending on the local ordinance, additional approvals (e.g., local planning board) may also be required.
- Since only FEMA has the authority to implement Flood Insurance Rate Map (FIRM) changes, the communities and the county will identify updates, errors, or omissions and recommend needed changes based on continued sea level rise and changes in the county

Table 49: National Flood Insurance Program (NFIP) Repetitive Loss Properties				
Jurisdiction	Residential Structures		Non-Residential Structures	
	# of Properties	# of Losses	# of Properties	# of Losses
Greene	1	2	None	N/A
Mechanic Falls	1	3	None	N/A
Wales	1	2	None	N/A

Source: Maine Floodplain Management Program (FEMA PIVOT Database May 25,2023)

Androscoggin County Flood Insurance Info as of May 24, 2023

- Number of Policies: 133
- Total Coverage: $28,736,000
- Total Premium: $139,463
- Claims since 1978: 131
- Total Paid since 1978: $815,793

Source: Maine Floodplain Management Program (FEMA CIS database May 24, 2023)

Table 50: Androscoggin County Communities Participating in the NFIP								
Jurisdiction	Initial FHBM	Initial FIRM	Current Effective Map Date	Date Community Joined the NFIP	Adoption & Enforcement	Community Rating System Entry Date	Current Effective CRS Date	CRS Class
Auburn	5/31/1974	2/4/1981	7/8/2013	2/4/1981	X	10/1/1992	10/1/1992	9
Durham	3/15/1974	5/4/1988	7/8/2013	5/4/1988	X	N/A	N/A	N/A
Greene	4/1/1975	5/3/1990	7/8/2013	5/3/1990	X	N/A	N/A	N/A
Leeds	6/21/1974	7/16/1990	7/8/2013	7/16/1990	X	N/A	N/A	N/A
Lewiston	4/5/1974	9/28/1979	7/8/2013	9/28/1979	X	10/1/1993	5/1/1997	8
Lisbon	2/15/1974	3/4/1985	7/8/2013	3/4/1985	X	N/A	N/A	N/A
Livermore	11/8/1974	5/3/1990	7/8/2013	5/3/1990	X	N/A	N/A	N/A
Livermore Falls	2/15/1974	8/5/1991	7/8/2013	8/5/1991	X	N/A	N/A	N/A
Mechanic Falls	2/15/1974	5/17/1990	7/8/2013	5/17/1990	X	N/A	N/A	N/A
Minot	2/1/1974	5/17/1990	7/8/2013	5/17/1990	X	N/A	N/A	N/A
Poland	2/24/1974	6/5/1985	7/8/2013	6/5/1985	X	N/A	N/A	N/A
Sabattus	5/31/1974	2/15/1980	7/8/2013	2/15/1980	X	N/A	N/A	N/A
Turner	7/26/1974	6/19/1985	7/8/2013	6/19/1985	X	N/A	N/A	N/A
Wales	2/15/1974	8/1/2008	7/8/2013	8/1/2008	X	N/A	N/A	N/A

Source: FEMA Community Status Book as of October, 2023

Element C Requirements
C3. Does the plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement 44 CFR § 201.6(c)(3)(i))
C3-a. Does the plan include goals to reduce the risk from the hazards identified in the plan?

Goals and Objectives – Androscoggin County

FEMA defines Goals as general guidelines that explain what should be achieved and defines Objectives as strategies or implementation steps to attain mitigation goals. Unlike goals, objectives are specific and measurable, where feasible. FEMA defines Mitigation Actions as specific actions that help to achieve the mitigation goals and objectives. Combined, goals, objectives and actions provide direction for Androscoggin County and all jurisdictions to reduce risks from identified hazards and improve resilience.

Goals	Objectives
1) Minimize loss and disruption of life, property, & the environment	1.1: Develop, enhance, and promote early warning & emergency communications systems
	1.2: Encourage use of capabilities & gap analysis to identify needs for special equipment, training & exercises to enhance response and recovery capabilities for natural hazards.
	1.3: Promote jurisdictions to identify critical infrastructure, transportation routes and vulnerable populations in hazard prone areas
	1.4 Update County resource manual, inclusion of NIMS typing and FEMA cost codes
2) Encourage Continuity of Operations pre, during & post hazard events	2.1: Encourage local governments to develop, adopt & implement Continuity of Operations Plans
	2.2: Encourage local government & stakeholders to implement risk reduction measures and install redundant energy sources
	2.3: Encourage design, development, and adoption of local recovery plan
	2.4 Encourage continuity of operations of non-government, commerce, private sector, academia, and infrastructure
3) Enhance Mitigation Capabilities	3.1: Assist with local Hazard Mitigation Planning
	3.2: Promote whole community hazard mitigation planning at local levels to identify, introduce, and implement cost effective hazard mitigation measures
	3.3: Support integration and adoption of effective code, zoning, development regulation and comprehensive planning
	3.4 Identify & maintain detailed data on critical infrastructure, high hazard dams & community lifelines for future mitigation actions
4) Increase Public Awareness and Support for Hazard Mitigation	4.1: Provide user friendly hazard data to the public for mitigation & recovery planning & improve accessibility
	4.2: Strengthen understanding of, and adaption to a changing climate
	4.3: Community involvement through promotion of CERT programs
	4.4 Provide to local governments, stakeholder education and training in Hazard Mitigation Program & Funding opportunities
5) Increase Resilience of Economy & Local Resources	5.1: Encourage participation in the National Flood Insurance Program Community Rating system to reduce insurance premiums
	5.2: Improve data collection and sharing; increase data availability and accessibility to reduce impacts of natural hazards
	5.3: Promote the protection, restoration and enhancement of environmental resources that serve a natural hazard mitigation function
	5.4 Incorporate mitigation concepts into local planning for agricultural, conservation & historic properties, identify locations for prioritization for future mitigation funding opportunities

Element C Requirements
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? (Requirement 44 CFR § 201.6(c)(3)(ii))
C4-a. Does the plan include an analysis of a comprehensive range of actions/projects that each jurisdiction considered to reduce the impacts of hazards identified in the risk assessment?
C4-b. Does the plan include one or more action(s) per jurisdiction for each of the hazards as identified within the plan's risk assessment?

C5. Does the plan contain an action plan that describes how the actions identified will be prioritized (including a cost-benefit review), implemented, and administered by each jurisdiction? (Requirement 44 CFR § 201.6(c)(3)(iv)); (Requirement §201.6(c)(3)(iii))
C5-a. Does the plan describe the criteria used for prioritizing actions?
C5-b. Does the plan provide the position, office, department, or agency responsible for implementing/administrating the identified mitigation actions, as well as potential funding sources and expected time frame?

Local Mitigation Projects

Project Development. Jurisdictions, by completing the project development worksheets for each action, identified the risk/vulnerability being addressed, described the problem and solution in detail, created a plan for implementation, indicating timeframe, prioritization, responsible organization, planning mechanisms and funding source(s) to be utilized and considerations to three alternatives. Refer to the Project Development Worksheet for details, located Appendix A. The combined effort of all jurisdictions resulted in the inclusion of at least one action/project for each of the top 5 ranked hazards as identified in Element B.

Project Worksheet- Project Development			
Project Name:			
Project Number:			
Risk / Vulnerability			
Hazard(s) of Concern:			
Description of the Problem:			
Action or Project Intended for Implementation			
Description of the Solution:			
Is this project related to a Critical Facility?	Yes		No
Level of Protection:		Estimated Benefits (losses avoided):	
Useful Life:		Goal(s) Met:	
Estimated Cost:		Mitigation Action Type:	
Plan for Implementation			
Prioritization:		Desired Timeframe for Implementation:	
Est. Time Required for Project Implementation:		Potential Funding Sources:	
Responsible Organization:		Local Planning Mechanisms to be Used in Implementation:	
Three Alternatives Considered (including No Action)			
Alternatives:	Action	Estimated Cost	Evaluation

Criteria for prioritization. Jurisdictions listed alphabetically, developed projects using the project development worksheet separately and thereafter in consultation with ACEMA and the MEMA Hazard Mitigation staff during the Project Planning Workshops, and in subsequent emails, and phone calls. Jurisdictions ranked actions/projects using defined criteria listed in the project prioritization worksheets and local knowledge, benefits, risk and capabilities analysis, updated data, and reports for plan inclusion. Refer to project prioritization worksheet for details on page 11.

Project Worksheet - Prioritization			
Project Name:			
Project Number:			
Criteria	Numeric Rank (-1, 0, 1)	Provide brief rationale for numeric rank when appropriate	
Life Safety			
Property Protection			
Cost-Effectiveness			
Technical			
Political			
Legal			
Fiscal			
Environmental			
Social			
Administrative			
Multi-Hazard			
Timeline			
Agency Champion			
Community Objectives			
Total		Priority (High/Med/Low)	

Cost-benefit analysis. Many jurisdictions included in this plan are small, with limited staff, resources, and/ or funding to prepare cost-benefit analyses for projects included in this plan. With that said, a very rigorous, line-by-line analysis of cost effectiveness will be conducted during the budget review process and subsequent public discussion through regular and special meetings in those cases involving expenditure of local funds for implementation. This review is at least equal to a formal benefit-cost calculation, as each expenditure line will be carefully scrutinized versus the use of a formula. As required, a formal cost benefit analysis will be prepared in the event that mitigation funding is pursued.

Status of completed, deleted, or deferred projects. The list of local projects, starting on page 12, contains a status column identifying projects as completed, deleted, or deferred. Deferred projects, lists the reason(s) that no changes occurred, most commonly, the lack of available funding. Projects included in the 2017 plan are highlighted in gray.

Funding Sources. Jurisdictions were given a list of funding opportunities provided by the Maine Emergency Management Agency, as well as hazard mitigation funding opportunity factsheets during meetings, workshops, and subsequent emails. Potential funding sources for local projects include, but are not limited to:

- FEMA Hazard Mitigation Assistance (HMA) grant funds
- MEMA Pre-Disaster Mitigation (PDM) grant funds/Hazard Mitigation Grant Program
- (HMGP) funds/Flood Mitigation Assistance (FMA) grant funds
- Maine DOT local road assistance funds
- Maine Department of Environmental Protection (DEP) culvert grants
- Community Development Block Grant (CDBG) funds

Timeframe. It is anticipated that all mitigation actions will be implemented, administered, and completed by local officials within the specific amount of time listed under the column "TIMEFRAME" within the current 5-year planning cycle unless funds are unavailable.

Figure 38: Livermore Dam, Livermore, ME. Source: Eagle Creek.

Countywide Mitigation Actions								
Jurisdiction	Project Number	Project Description	Cost Estimate**	Timeframe	Responsible Agency	Goal(s) Met	Hazard(s) Addressed	Status
Androscoggin County	2024-ACEMA-01	Conduct the Androscoggin County All Hazards Risk Assessment to assist the participating jurisdictions understand the mechanisms of hazards and inform future mitigation actions.	$60,000	2 years	Androscoggin County EMA & participating jurisdictions	1	All Hazards*	New Project
	2024-ACEMA-02	Assist participating jurisdictions to develop, adopt and implement mitigation measures and secure funding to address long term vulnerability reduction.	$40,000	1 years	Androscoggin County EMA & participating jurisdictions	2	All Hazards*	New Project
	2024-ACEMA-03	Utilize GIS to develop a comprehensive vulnerability analysis to identify critical infrastructure in hazard prone areas to inform future mitigation actions benefiting participating jurisdictions.	$40,000	3 years	Androscoggin County EMA & participating jurisdictions	3	All Hazards*	New Project
	2024-ACEMA-04	Provide workshops, seminars, trainings & webinars to strengthen understanding of and adaption to a changing climate, hazard mitigation programs and funding opportunities for participating jurisdictions.	$20,000	1 year	Androscoggin County EMA & participating jurisdictions	4	All Hazards*	New Project
	2024-ACEMA-05	Assist jurisdictions to implement hazard mitigation planning and actions with comprehensive planning, to develop risk-informed zoning ordinances, building code modeling education and increase Community Rating System participation to enhance economic resilience and mitigation.	$60,000	1 year	Androscoggin County EMA & participating jurisdictions	5	All Hazards*	New Project

**All Hazards include those which were identified in this Natural Hazard Mitigation Plan, see Element B for details.*

***Funding source (s) for all actions are indicated in the project development worksheets, located in Appendix A.*

Local Mitigation Projects								
Jurisdiction	Project Number	Project Description	Cost Estimate**	Timeframe	Responsible Agency	Goal(s) Met	Hazard(s) Addressed	Status
Auburn	2005-Auburn-01	Jordan School Road: rehabilitate the culvert headwall and wing-wall to reduce erosion.	$60,000	3 weeks	Director of Public Works	1	Flooding, Severe Summer Weather, Severe Winter Weather	Deferred due to lack of funding
	2005-Auburn-02	Woodbury Hill Road: Improve, and add 4,000' of ditches, line and add check dams as needed.	$42,000	5 weeks	Director of Public Works	1	Flooding, Severe Summer Weather, Severe Winter Weather	Deferred due to lack of funding
	2005-Auburn-04	Steele Road: Remove ledge in ditch line 500’ add 3,300 of ditches, add (3) 36'' x 40' cross culverts.	$56,000	5 weeks	Director of Public Works	1	Flooding, Severe Summer Weather, Severe Winter Weather	Not completed. Ditching completed, blasting needed
	2005-Auburn-06	Beaver Road: Add 2,400' of ditches, line and add check dams as needed, and relay driveway culverts as needed.	$28,000	4 weeks	Director of Public Works	1	Flooding, Severe Summer Weather, Severe Winter Weather	Deferred due to lack of funding
	2005-Auburn-07	Blanchard Road: Reclaim road base and pave, add 1,800' of ditches, line and add check dams as needed.	$72,000	4 weeks	Director of Public Works	1	Flooding, Severe Summer Weather, Severe Winter Weather	Deferred due to lack of funding

Jurisdiction	Project Number	Project Description	Cost Estimate**	Timeframe	Responsible Agency	Goal(s) Met	Hazard(s) Addressed	Status
Auburn	2005-Auburn-08	Jordan School Road: Improve, and add 5,000' of ditches, line and add check dams as needed, add (5) 36'' x 40' cross culverts and relay (10) driveway culverts.	$1,000,000	6 weeks	Director of Public Works	1	Flooding, Severe Summer Weather, Severe Winter Weather	Project lengthy; partially done by State still needs some work
	2005-Auburn-19	Fickett Road: Add ditches and upsize culverts.	$30,000	4 weeks	Director of Public Works	1	Flooding, Severe Summer Weather, Severe Winter Weather	Project done with city funds. 2005-6, Needs Ditching
	2010-Auburn-01	Royal River Road: Improve, and add 2,300' of ditches, line and add check dams as needed. Blasting necessary.	$40,000	4 weeks	Director of Public Works	1	Flooding, Severe Summer Weather, Severe Winter Weather	Deferred due to lack of funding
	2024-Auburn-01	Dry Hydrant Assessment & Installation to inform mitigation planning and reduction of wildfire vulnerabilities	$50,000	1 Year	Fire Chief	1	Wildfire, Drought	New Project
	2024-Auburn-02	Utilize GIS to inform mitigation Planning to identify most vulnerable areas & critical infrastructure	$25,000	6 Months	Fire Chief	2, 5	All Hazards	New Project

**All Hazards include those which were identified in this Natural Hazard Mitigation Plan, see Element B for details.*

***Funding source (s) for all actions are indicated in the project development worksheets, located in Appendix A*

Jurisdiction	Project Number	Project Description	Cost Estimate**	Timeframe	Responsible Agency	Goal(s) Met	Hazard(s) Addressed	Status
Durham	2005-Durham-01	Improve drainage on Swamp Road near Meadow Brook.	$7,000	2 weeks	Road Commissioner	1	Flooding, Severe Summer Weather, Severe Winter Weather	Engineering Studies complete, begun drainage work
	2005-Durham-02	Protect Cedar Pond Road from erosion (Option 2): improved ditching, new culverts, rip rap, grading and elevating the road.	$50,000	4 months	Selectmen and Road Commissioner	1	Flooding, Severe Summer Weather, Severe Winter Weather	Improved Ditching & Upgraded culverts
	2005-Durham-03	Reconstruct Runaround Pond Dam. Dam has been patched needs to be strengthened and repaired to prevent failure.	$200,000	12 weeks	Selectmen and Road Commissioner	1	Flooding	Deferred due to lack of funding
	2005-Durham-04	Improve and armor ditches on Brickyard Hill and Shiloh Roads where steep slopes create problems.	$15,000	2 weeks	Road Commissioner	1	Flooding, Severe Summer Weather, Severe Winter Weather	Paved Brickyard Hill Road, and applied rip rap to Shiloh Road
	2010-Durham-01	Swamp Road: Upsize existing multiple culverts with 8' x 4' x 40' bottomless box culvert with integrated headwalls. Flooded causing a road closure 3 times between January 1, and May10, 2010. Dig and repave.	$123,000	3 weeks	Road Commissioner	1	Flooding, Severe Summer Weather, Severe Winter Weather	Funding Received from Maine DEP Stream Crossing Infrastructure Grant, pending construction

***Funding source (s) for all actions are indicated in the project development worksheets, located in Appendix A*

Jurisdiction	Project Number	Project Description	Cost Estimate**	Timeframe	Responsible Agency	Goal(s) Met	Hazard(s) Addressed	Status
Durham	2010-Durham-02	Soper Road: Upsize existing culvert with 6' x 4' x 40' bottomless box culvert with integrated headwalls. Floods at least annually causing a road closure.	$97,000	2 weeks	Road Commissioner	1	Flooding, Severe Summer Weather, Severe Winter Weather	Replaced damaged culvert with larger PVC culvert in 2023
	2010-Durham-02	Cedar Pond Road (option1): Move 250' x 20' of road, repave, and add ditches 250'	$189,000	6 weeks	Selectmen and Road Commissioner	1	Flooding, Severe Summer Weather, Severe Winter Weather	Completed project 2005-Durham-03 instead
	2010-Durham-03	Add culvert, protect inlet/outlet and improve drainage on Auburn-Pownal Road where Twin Brooks flow into Runaround Pond. Even with the increased culvert size it floods at least annually causing a road closure.	$194,000	1 week	Road Commissioner	1	Flooding, Severe Summer Weather, Severe Winter Weather	Installed bottomless box culvert, using Maine DEP Stream Crossing Grant 2017
	2010-Durham-04	Brickyard Hill and Shiloh Road: Remove ledge as needed and stabilize slope 5' x 400' and ditch 400'.	$15,700	3 weeks	Road Commissioner	1	Flooding, Severe Summer Weather, Severe Winter Weather	Added granite to control water flow & runoff

***Funding source (s) for all actions are indicated in the project development worksheets, located in Appendix A*

Jurisdiction	Project Number	Project Description	Cost Estimate**	Timeframe	Responsible Agency	Goal(s) Met	Hazard(s) Addressed	Status
Durham	2010-Durham-05	Meadow Road. Elevate 5,000' x 21' x 2', stabilize shoulders upsize (13) 15'' x 40' culverts with 18'' x 40' HDPE culverts.	$1,100,000	6 weeks	Road Commissioner	1	Flooding, Severe Summer Weather, Severe Winter Weather	Elevated 5,000 feet of road 12 inches, stabilized shoulders, no new culverts yet
	2017-Durham-01	Replace Mill Pond Bridge	$128,000	4 weeks	Road Commissioner	1	Flooding, Severe Summer Weather, Severe Winter Weather	Project Completed with town funds in 2015
	2017-Durham-02	Brickyard Hill install catch basin and widen. Problems with erosion.	$790,000	4 weeks	Road Commissioner	1	Flooding, Severe Summer Weather, Severe Winter Weather	Widened road in 2023
	2024-Durham-01	Install new generator to replace non-working generator at town hall to ensure continuity of services	$25,000	1 Year	Selectmen and Road Commissioner	1, 2	Severe Summer Weather, Severe Winter Weather	New Project
	2024-Durham-02	Construct Fuel Depot for all town vehicles, mitigation efforts against loss from severe winter and summer weather.	$20,000	2 Years	Road Commissioner	1	Flooding, Severe Summer Weather, Severe Winter Weather	New Project

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Jurisdiction	Project Number	Project Description	Cost Estimate**	Timeframe	Responsible Agency	Goal(s) Met	Hazard(s) Addressed	Status
Greene	2010-Greene-05	North Mountain Road: Ditch and line 800', upsize (6) 12'' x 40' with 24'' x 40' HDPE culverts.	$16,000	3 weeks	Road Commissioner	1	Flooding, Severe Summer Weather, Severe Winter Weather	Deferred due to lack of funding
	2010-Greene-06	Old Greene Road: Improve drainage. Reclaiming road on existing asphalt, cross culvert, bring in gravel and re- gravel, 2" modified binder asphalt. On town line, raise dip and lower the rise.	$50,000 Town Funds	3 weeks	Road Commissioner	1	Flooding, Severe Summer Weather, Severe Winter Weather	Deferred due to lack of funding
	2010-Greene-07	River Road: Elevate causeway 200' x 21' x 24'' and stabilize shoulders, ditch 1,500' and add (9) 24'' x 40' culverts. Florida Power and Light (FPL) is working near causeway at Cherry Pond doing road upgrades.	FPL $60,000	6 weeks	Road Commissioner	1	Flooding, Severe Summer Weather, Severe Winter Weather	Deferred due to lack of funding
	2024-Greene-01	Upsize culvert on Dagget Hill Road near Route 202 to reduce loss due to flooding, flash flooding.	None to Town	6 Months	Maine DOT	1	Flooding, Severe Summer Weather, Severe Winter Weather	New Project
	2024-Greene-02	Provide Wildfire education to residents on defensible space for wildfire & wildland fire reduction.	None to Town	6 Months	Fire Department	2, 4	Wildfire	New Project
	2024-Greene-03	Provide Severe Weather education to residents, develop community wood bank for residents	$75,000	6 Months	Town Manager	1, 4	Severe Summer Weather, Severe Winter Weather	New Project
	2024-Greene-04	Assist Sabattus & Wales to repair Sabattus Pond (Sleeper) Dam to reduce impact from flooding	$500,000	6 Months	Sabattus Dam Association	1	Flooding	New Project

Jurisdiction	Project Number	Project Description	Cost Estimate**	Timeframe	Responsible Agency	Goal(s) Met	Hazard(s) Addressed	Status
Leeds	2010-Leeds-08	Bernie Hartford Road: Install geotextile and elevate 2,500, 22' x 36'' stabilize shoulders and add (5) 24'' x 40' culverts.	$45,000	5 weeks	Public Works Director	1	Flooding, Severe Summer Weather, Severe Winter Weather	No complete. 2016 raised road, smaller culverts installed
	2010-Leeds-09	South end of Bishop Hill Road 300' of ditching	$32,000	2 weeks	Public Works Director	1	Flooding, Severe Summer Weather, Severe Winter Weather	Completed
	2024-Leeds-01	Expand ditches and repave all of Quaker Ridge Road except 1,000 feet of southern end to reduce impacts from flash flooding.	$3,400,000	5 Years	Public Works Director	1	Flooding, Severe Summer Weather, Severe Winter Weather	New Project
	2024-Leeds-02	Upsize culvert near 39 River Road, mitigation efforts against potential road washout from nearby pond overflow during severe summer and winter weather events.	$30,000	6 weeks	Public Works Director	1	Flooding, Severe Summer Weather, Severe Winter Weather	New Project

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Jurisdiction	Project Number	Project Description	Cost Estimate**	Timeframe	Responsible Agency	Goal(s) Met	Hazard(s) Addressed	Status
Lewiston	2005-Lewiston-02	Main Street by Switzerland Road and sewer upstream. Manhole cover gets blown off due to undersized sewer pipe.	$65,000	2 Weeks	Public Works Director	1	Flooding, Severe Summer Weather	Upstream separation complete
	2005-Lewiston-04	Pettingill Street	$348,990	2 Months	Public Works Director	1	Flooding, Severe Summer Weather	Sanitary Sewer replaced in 2020, storm drain improvements needed for Jepson Brook
	2017-Lewiston-01	Bartlett Street: Add 48" storm drain inlet	$50,000	2 Months	Public Works Director	1	Flooding, Severe Summer Weather	Inlet regraded and brush trimmed back
	2024-Lewiston-01	Improve stormwater drainage on Jepson Brook for long term vulnerability reduction	$1,100,000	3 Years	Public Works Director	1	Flooding, Severe Summer Weather, Severe Winter Weather	New Project
	2024-Lewiston-02	Improve stormwater drainage on Gully Brook for long term vulnerability reduction	$500,000	2 Years	Public Works Director	1	Flooding, Severe Summer Weather, Severe Winter Weather	New Project
	2024-Lewiston-03	Increase capacity of Randall Road Wastewater Pump Station for long term vulnerability reduction	$200,000	2 Years	Public Works Director	1	Flooding, Severe Summer Weather, Severe Winter Weather	New Project
	2024-Lewiston-04	Protect and maintain operations at Main Street Drinking Water Pump Station from flooding conditions.	$200,000	2 Years	Public Works Director	1	Flooding, Severe Summer Weather, Severe Winter Weather	New Project

Jurisdiction	Project Number	Project Description	Cost Estimate**	Timeframe	Responsible Agency	Goal(s) Met	Hazard(s) Addressed	Status
Lewiston	2024-Lewiston-05	Protect and maintain operations at Tall Pines Wastewater Pump Station and sewer interceptor from flooding conditions.	$200,000	2 Years	Public Works Director	1	Flooding, Severe Summer Weather, Severe Winter Weather	New Project
	2024-Lewiston-06	Design and build a drinking water filtration system and install erosion protection in the watershed	$60,000,000	3 Years	Public Works Director, Auburn Water District	1	Flooding, Severe Summer Weather, Severe Winter Weather	New Project
	2024-Lewiston-07	Improve stormwater capacity of Main Street in the area of CSX railroad bridge.	$250,000	1-2 Years	Public Works Director	1	Flooding, Severe Summer Weather, Severe Winter Weather	New Project
	2024-Lewiston-08	Improve stormwater capacity of Oak Street in the area of Central Fire Station/EOC	$250,000	1-2 Years	Public Works Director	1	Flooding, Severe Summer Weather, Severe Winter Weather	New Project
	2024-Lewiston-09	Purchase a flood mitigation boat to provide inspection, remediation, and recovery response on the Androscoggin River	$100,000	1 Year	Public Works Director	1	Flooding, Severe Summer Weather, Severe Winter Weather	New Project
	2024-Lewiston-10	Assess and build/relocate Lewiston Public Works to protect from flooding	$15,000,000	3 Years	Public Works Director	1	Flooding, Severe Summer Weather, Severe Winter Weather	New Project

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Jurisdiction	Project Number	Project Description	Cost Estimate**	Timeframe	Responsible Agency	Goal(s) Met	Hazard(s) Addressed	Status
Lisbon	2005-Lisbon-01	Improve drainage on Ferry Road near Clay Corner to minimize erosion; enlarge culvert also, investigate drainage problems on Ferry Road between Marshall and Nason Streets	$100,000	2 Months	Public Works Director	1	Flooding, Severe Summer Weather, Severe Winter Weather	Not complete. Work done by town in 2023, still needs work.
	2017-Lisbon-03	Ferry Road: Culvert upgrade adjacent to 73 Ferry Road	$150,000	1 month	Public Works Director	1	Flooding, Severe Summer Weather, Severe Winter Weather	Deferred due to lack of funding
	2017-Lisbon-04	Pump Station Generators: 7 single-phase generators 2 3-phase generators	$8,000 each $12,000 each	1 Year	Public Works Director	1, 2	Severe Summer Weather, Severe Winter Weather	Not complete. Some but not all generators purchased
	2017-Lisbon-05	Treatment Plant Generator	$150,000	1 Month	Public Works Director	1, 2	Severe Summer Weather, Severe Winter Weather	Completed. Installed in 2023
	2024-Lisbon-01	Install a generator at the MTM Center to support a secondary shelter as alternate to shelter at school	$250,000	1 year	Public Works Director	1, 2	Severe Summer Weather, Severe Winter Weather	New Project
	2024-Lisbon-02	Install a water pump station at the river to allow for farmers to receive water during drought.	$75,000	6 Months	Public Works Director	1, 5	Drought, Wildfire	New Project
	2024-Lisbon-03	Install a generator at town repeater tower to allow for uninterrupted communications to ensure continuity of operations.	$20,000	1 year	Public Works Director	1, 2	Severe Summer Weather, Severe Winter Weather	New Project

Jurisdiction	Project Number	Project Description	Cost Estimate**	Timeframe	Responsible Agency	Goal(s) Met	Hazard(s) Addressed	Status
Livermore	2010-Livermore-03	River Road: Mitigate flooding to a 50-year event standard by elevating approximately 600' of 21'-wide road (4' elevation suggested), and upsize existing galvanized culvert from 36'' to 4' HDPE, stabilize shoulders and repave	$50,000	4 weeks	Town Administrator, Highway Foreman & Road Committee	1	Flooding, Severe Summer Weather, Severe Winter Weather	Project Completed in 2023
	2024-Livermore-01	Upsize culverts and raise Goding Road reduce impacts from flooding	$30,000	1 Year	Highway Foreman	1	Flooding, Severe Summer Weather, Severe Winter Weather	New Project
	2024-Livermore-02	Upsize culverts and raise Norton Road at Ford Brook crossing reduce impacts from flooding	$300,000	18 Months	Highway Foreman	1	Flooding, Severe Summer Weather, Severe Winter Weather	New Project

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Jurisdiction	Project Number	Project Description	Cost Estimate**	Timeframe	Responsible Agency	Goal(s)Met	Hazard(s) Addressed	Status
Livermore Falls	2010-Livermore Falls-03	Cargill Street: Slip line existing underground drainage	$15,000	1 week	Road Commissioner	1	Flooding, Severe Summer Weather, Severe Winter Weather	Deferred due to lack of funding
	2010-Livermore Falls-05	Baldwin Street: Add a couple catch basins and improve drainage.	$15,000	3 weeks	Road Commissioner	1	Flooding, Severe Summer Weather, Severe Winter Weather	Deferred due to lack of funding
	2024-Livermore Falls-01	Install ditching and riprap on Moose Hill Rd between bottom of the hill and Philip Smith Road reduce impacts from flooding	$70,000	6 Months	Public Works Director	1	Flooding, Severe Summer Weather, Severe Winter Weather	New Project
	2024-Livermore Falls-02	Develop a community shelter with backup generator for long term vulnerability reduction	$1,000,000	1 Year	Town Manager	1, 2	Flooding, Severe Summer Weather, Severe Winter Weather	New Project
	2024-Livermore Falls-03	Install a larger box culvert under Route 17 next to Livermore Falls Water Treatment Plant to protect against flooding	$600,000	6 Months	Maine DOT	1	Flooding, Severe Summer Weather, Severe Winter Weather	New Project
	2024-Livermore Falls-04	Install new sump and drain area at Water District Treatment Plant to protect against flooding	$30,000	6 Months	Livermore Falls Water District	1, 2	Flooding, Severe Summer Weather, Severe Winter Weather	New Project
	2024-Livermore Falls-05	Repair the dam at the Livermore Falls Water treatment plant reduce impacts from flooding	$75,000	6 Months	Livermore Falls Water District	1, 3	Flooding, Severe Summer Weather, Severe Winter Weather	New Project

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Jurisdiction	Project Number	Project Description	Cost Estimate**	Timeframe	Responsible Agency	Goal(s)Met	Hazard(s) Addressed	Status
Livermore Falls	2024-Livermore Falls-06	Install backup generator at Redwater Brook Sewer Pump Station prevent water contamination	$60,000	8 Months	Livermore Falls Sewer District	1, 2	Severe Summer Weather, Severe Winter Weather	New Project
	2024-Livermore Falls-07	Install backup generator at Poland Meadow Sewer Pump Station prevent water contamination.	$60,000	8 Months	Livermore Falls Sewer District	1, 2	Severe Summer Weather, Severe Winter Weather	New Project
	2024-Livermore Falls-08	Install backup generator at Shuy Corner Sewer Pump Station prevent water contamination.	$60,000	8 Months	Livermore Falls Sewer District	1, 2	Severe Summer Weather, Severe Winter Weather	New Project
	2024-Livermore Falls-09	Expand Norris Bridge on Strickland Loop Rd replacing granite wing walls with concrete wing walls reduce impacts from flooding .	$900,000	1 year	Public Works Director	1	Flooding, Severe Summer Weather, Severe Winter Weather	New Project
	2024-Livermore Falls-10	Install a backup generator at public works garage to power garage and diesel fuel pumps.	$25,000	1 Year	Public Works Director	1, 2	Severe Summer Weather, Severe Winter Weather	New Project
	2024-Livermore Falls-11	Upsize storm drain lines and add more catch basins to Baldwin Road reduce impacts from flooding	$250,000	1 Year	Public Works Director	1	Flooding, Severe Summer Weather, Severe Winter Weather	New Project
	2024-Livermore Falls-12	Upsize storm drain lines and add more catch basins to Munsey Avenue reduce impacts from flooding	$250,000	1 Year	Public Works Director	1	Flooding, Severe Summer Weather, Severe Winter Weather	New Project

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Jurisdiction	Project Number	Project Description	Cost Estimate**	Timeframe	Responsible Agency	Goal(s)Met	Hazard(s) Addressed	Status
Livermore Falls	2024-Livermore Falls-13	Install storm drain lines & catch basins to Depot Street, Park St to reduce impacts from flooding	$250,000	1 Year	Public Works Director	1	Flooding, Severe Summer Weather, Severe Winter Weather	New Project
	2024-Livermore Falls-14	Install a backup generator at Treat Memorial Library for long term vulnerability reduction.	$6,000	6 Months	Library Director	1, 2	Severe Summer Weather, Severe Winter Weather	New Project
	2024-Livermore Falls-15	Develop a safety plan and perform a structural assessment of Treat Memorial Library for long term vulnerability reduction.	$7,000	1 Year	Library Director	2, 3	All Hazards*	New Project
	2024-Livermore Falls-16	Install an air purifier at the Treat Memorial Library to improve air quality for long term vulnerability reduction.	$1,500	6 Months	Library Director	1	Wildfire, Drought	New Project
	2024-Livermore Falls-17	Install backup generator at Livermore Falls Fire Station for long term vulnerability reduction.	$60,000	8 Months	Livermore Falls Fire Department	1, 2	Severe Summer Weather, Severe Winter Weather,	New Project

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Jurisdiction	Project Number	Project Description	Cost Estimate**	Timeframe	Responsible Agency	Goal(s)Met	Hazard(s) Addressed	Status
Mechanic Falls	2010-Mechanic Falls-04	Elm Street: Rebuild roadbed and ditch 5,000'.	$1,000,000	6 weeks	Road Commissioner	1	Flooding, Severe Summer Weather, Severe Winter Weather	Deferred due to lack of funding
	2010-Mechanic Falls-05	Libby Road: Add 18'' x 40' HDPE and repave.	$2,500	3 weeks	Road Commissioner	1	Flooding, Severe Summer Weather, Severe Winter Weather	Repaving Completed
	2024-Mechanic Falls-01	Stabilize riverbank behind town complex at 108 Lewiston Street reduce impacts from flooding	$15,000	2 Weeks	Public Works Director	1	Flooding	New Project
	2024-Mechanic Falls-02	Install concrete box culvert on Winterbrook Road reduce impacts from flooding	$150,000	1 Week	Public Works Director	1	Flooding, Severe Summer Weather, Severe Winter Weather	New Project
	2024-Mechanic Falls-03	Install larger culvert on Libby Road reduce impacts from flooding	$10,000	1 week	Public Works Director	1	Flooding, Severe Summer Weather, Severe Winter Weather	New Project
	2024-Mechanic Falls-04	Install new and larger generator to provide backup power to town complex ensure continuity of services	$106,500	2 weeks	Town Manager	1, 2	Severe Summer Weather, Severe Winter Weather	New Project

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Jurisdiction	Project Number	Project Description	Cost Estimate**	Timeframe	Responsible Agency	Goal(s)Met	Hazard(s) Addressed	Status
Minot	2010-Minot-02	Bucknam Bridge Road: Elevate 1,000' x 4' x 21 stabilize shoulders and repave. Install (2) 24" cross culverts.	$87,000	6 weeks	Road Commissioner	1	Flooding, Severe Summer Weather, Severe Winter Weather	Deferred due to lack of funding
	2017-Minot-01	Death Valley Road: Stream crossing, upsize culverts, install wing walls, lift road	$35,000	2 weeks	Town Administrator	1	Flooding, Severe Summer Weather, Severe Winter Weather	Project Completed
	2024-Minot-01	Update town comprehensive plan implementation of hazard mitigation	$25,000	2 Years	Town Administrator	2, 5	All Hazards*	New Project
	2024-Minot-02	Develop a Continuity of Operations Plan for the town	$50,000	3 Months	Town Administrator	2, 3	All Hazards*	New Project
	2024-Minot-03	Construct a community shelter with generator back up that would be used to shelter residents in the immediate area from extreme weather conditions	$500,000	12 Months	Town Administrator	1, 2, 3	All Hazards*	New Project
	2024-Minot-04	Improve site drainage and construct a sand-salt shed that would shield supplies from the elements.	$1.500,000	12 Months	Road Commissioner	1	Severe Summer Weather, Severe Winter Weather	New Project

**All Hazards include those which were identified in this Natural Hazard Mitigation Plan, see Element B for details.*

***Funding source (s) for all actions are indicated in the project development worksheets, located in Appendix A*

Jurisdiction	Project Number	Project Description	Cost Estimate**	Timeframe	Responsible Agency	Goal(s)Met	Hazard(s) Addressed	Status
Minot	2024-Minot-05	Phase 1: complete an assessment of available water sources and their conditions to determine risk. Phase 2: Develop a mitigation plan to establish defensible space for additional water resources	$150,000	24 Months	Town Administrator	1, 3, 5	Wildfire, Drought	New Project
	2024-Minot-06	Conduct a risk assessment for drought and severe weather conditionals and develop a mitigation plan to promote resiliency and sustainability for the agricultural community.	$25,000	24 Months	Town Administrator	1, 2, 3, 4, 5	Severe Summer Weather, Severe Winter Weather, Drought	New Project
	2024-Minot-07	Complete a risk assessment for hazard mitigation and drainage improvement that addresses changes in storm water patterns.	$50,000	4 Years	Road Commissioner	1, 3, 5	All Hazards*	New Project

**All Hazards include those which were identified in this Natural Hazard Mitigation Plan, see Element B for details.*

***Funding source (s) for all actions are indicated in the project development worksheets, located in Appendix A*

Jurisdiction	Project Number	Project Description	Cost Estimate**	Timeframe	Responsible Agency	Goal(s) Met	Hazard(s) Addressed	Status
Poland	2010-Poland-01	North Raymond Road: Elevate roadways 36"; add geotextiles; re- pave; stabilize shoulders; add (4) cross culverts (40' each). Section a, about 1/4 miles from Rte. 11 1800'x20' and section b, No. Raymond Rd. Extension 2500'x20'.	$190,000	6 weeks	Road Commissioner	1	Flooding, Severe Summer Weather, Severe Winter Weather	Project Completed
	2010-Poland-02	Johnson Hill Road: Blast ledge, ditches; 2 sections 1250' each. Armor and stabilize ditches; check dams; add (4) cross culverts (40' each). Section a between Heath Rd and Abrams Ln 1250'x20'and section b Johnson Hill to Casco Town Line 1250'x20'.	$75,000	4 weeks	Road Commissioner	1	Flooding, Severe Summer Weather, Severe Winter Weather	Not complete. Riprap and culverts installed, repaved road, no blasting
	2010-Poland-03	Hardscrabble Road: Elevate two sections of road 500’ x 20' x 24'' and stabilize shoulders.	$20,000	4 weeks	Road Commissioner	1	Flooding, Severe Summer Weather, Severe Winter Weather	Project Completed
	2024-Poland-01	Right size the 3 under road culverts on Cobb Road reduce impacts from flooding	$4,000	1 Year	Road Commissioner	1	Flooding, Severe Summer Weather, Severe Winter Weather	New Project
	2024-Poland-02	Right size 3 under road culverts on Jackson Road reduce impacts from flooding	$6,000	1 Year	Road Commissioner	1	Flooding, Severe Summer Weather, Severe Winter Weather	New Project

Jurisdiction	Project Number	Project Description	Cost Estimate**	Timeframe	Responsible Agency	Goal(s) Met	Hazard(s) Addressed	Status
Poland	2024-Poland-03	Install Dry Hydrant at Potash Brook to reduce impacts from wildfire	$7,000	1 year	Road Commissioner, Fire Chief	1, 3	Wildfire, Drought	New Project
	2024-Poland-04	Right size 3 under road culverts on Westview Drive reduce impacts from flooding	$6,000	1 Year	Road Commissioner	1	Flooding, Severe Summer Weather, Severe Winter Weather	New Project
	2024-Poland-05	Trim overgrown tree limbs on Birch Drive reduce impacts from severe summer and winter events to maintain power and communications services	$3,500	2 Weeks	Road Commissioner	1	Severe Summer Weather, Severe Winter Weather, Wildfire	New Project

***Funding source (s) for all actions are indicated in the project development worksheets, located in Appendix A*

Jurisdiction	Project Number	Project Description	Cost Estimate**	Timeframe	Responsible Agency	Goal(s) Met	Hazard(s) Addressed	Status
Sabattus	2010-Sabattus-01	Long Beach Road: Retrofit pump station by raising or replacing with submersible pump.	$12,000	2 Weeks	Road Commissioner	1	Flooding, Severe Summer Weather	Deferred due to lack of funding
	2010-Sabattus-02	Marsh Road #1(from the intersection of Route 126 and Marsh Road at .15ths): Upsize stone culvert with 4' x 6' x 50' bottomless box culvert, elevate 300' x 2' x 24' repave and stabilize shoulders.	$37,000	4 Weeks	Road Commissioner	1	Flooding, Severe Summer Weather, Severe Winter Weather	Completed in 2021 with Maine DEP Stream Crossing Infrastructure Grant
	2010-Sabattus-03	Marsh Road #2 (from the intersection of Route 126 and Marsh Road at .4 to .6ths): Upsize stone culvert with 4' x 6' x 50' bottomless box culvert, elevate 600’ x 2' x 24' repave and stabilize shoulders.	$150,000	4 Weeks	Road Commissioner	1	Flooding, Severe Summer Weather, Severe Winter Weather	Completed in 2021 with Maine DEP Stream Crossing Infrastructure Grant
	2010-Sabattus-04	Marsh Road #3 (from the intersection of Route 126 and Marsh Road at 2.4 miles): Upsize stone culvert with 4' x 6' x 50' bottomless box culvert, elevate 600’ x 2' x 24' repave and stabilize shoulders.	$127,000	4 Weeks	Road Commissioner	1	Flooding, Severe Summer Weather, Severe Winter Weather	Completed in 2021 with Maine DEP Stream Crossing Infrastructure Grant
	2010-Sabattus-05	Maxwell Road (extension of Marsh Road) (from the intersection of Route 126 and Marsh Road at 3.0 miles): Upsize existing culverts with 4' x 5' x 50' bottomless box culvert, elevate 500' x 2' x 24' repave and stabilize shoulders.	$110,000	3 Weeks	Road Commissioner	1	Flooding, Severe Summer Weather, Severe Winter Weather	Deferred due to lack of funding

***Funding source (s) for all actions are indicated in the project development worksheets, located in Appendix A*

Jurisdiction	Project Number	Project Description	Cost Estimate**	Timeframe	Responsible Agency	Goal(s) Met	Hazard(s) Addressed	Status
Sabattus	2010-Sabattus-06	Webster Corner Road: Improve drainage by upsizing existing (5) 15'' x 20' culverts with 18'' x 20' HDPEs, Ditch and line 2,000' remove ledge as needed and add check dams.	$22,000	3 Weeks	Road Commissioner	1	Flooding, Severe Summer Weather, Severe Winter Weather	Deferred due to lack of funding
	2010-Sabattus-07	Dube Drive (intersection at Crowley Road): Upsize existing culvert with 4'x5'x50' bottomless box culvert, elevate 200' x 2'x24' repave, ditch along Crowley Road 750'.	$30,000	4 Weeks	Road Commissioner	1	Flooding, Severe Summer Weather, Severe Winter Weather	Culvert Replaced with HDPE culvert after washout in 2023, Town Funds
	2024-Sabattus-01	Upsize existing culverts with bottomless box culverts on Maxwell Road reduce impacts from flooding	$450,000	3 Months	Road Commissioner	1	Flooding, Severe Summer Weather, Severe Winter Weather	New Project
	2024-Sabattus-02	Improve drainage on Webster Corner Road reduce impacts from flooding	$20,000	3 Weeks	Road Commissioner	1	Flooding, Severe Summer Weather, Severe Winter Weather	New Project
	2024-Sabattus-03	Shim and repave first 2,100 ft of Keay Road reduce impacts from flooding	$120,000	6 Months	Road Commissioner	1	Flooding, Severe Summer Weather, Severe Winter Weather	New Project
	2024-Sabattus-04	Shim and pave first 275 ft of Maxwell Road and complete erosion control measures reduce impacts from flooding	$63,000	6 Months	Road Commissioner	1	Flooding, Severe Summer Weather, Severe Winter Weather	New Project, In progress

***Funding source (s) for all actions are indicated in the project development worksheets, located in Appendix A*

Jurisdiction	Project Number	Project Description	Cost Estimate**	Timeframe	Responsible Agency	Goal(s) Met	Hazard(s) Addressed	Status
Sabattus	2024-Sabattus-05	New topcoat of asphalt to Marsh Road reduce impacts from flooding	$124,000	6 Months	Road Commissioner	1	Flooding, Severe Summer Weather, Severe Winter Weather	New Project, In progress
	2024-Sabattus-06	Purchase a radio tower with back-up power to provide redundant emergency communications, ensure continuity of services. .	$500,000	1 Year	Road Commissioner	1, 2	Severe Summer Weather, Severe Winter Weather	New Project
	2024-Sabattus-07	Replace or reconstruct Sabattus Pond (Sleeper) Dam reduce impacts from flooding	$1,200,000	5 Months	Sabattus Lake Dam Association	1, 3	Flooding	New Project

***Funding source (s) for all actions are indicated in the project development worksheets, located in Appendix A*

Jurisdiction	Project Number	Project Description	Cost Estimate**	Timeframe	Responsible Agency	Goal(s) Met	Hazard(s) Addressed	Status
Turner	2010-Turner-02	Tidswell Road: Upsize existing 14' x 50' culvert with 14' x 8' x 40' bottomless box culvert and with integrated headwalls and upsize (2) 18'' x 30' culverts with 24'' x 40' HDPE'S and repave.	$65,000	4 weeks	Road Commissioner	1	Flooding, Severe Summer Weather, Severe Winter Weather	Project Completed with Maine DEP Stream Crossing Grant 2019
	2010-Turner-03	Allen Road: Elevate and repave 100' x 21' x 3' and stabilize shoulders.	$22,000	4 weeks	Road Commissioner	1	Flooding, Severe Summer Weather, Severe Winter Weather	Project Completed with town funds
	2010-Turner-06	Snell Hill Road: Upsize (4) culverts with 15'' x 40' HDPE'S and elevate (2) sections of road 100' and elevate two sections of road 100' and 400' x 21' x 2' and repave.	$31,000	4 weeks	Road Commissioner	1	Flooding, Severe Summer Weather, Severe Winter Weather	Project Completed with town funds
	2017-Turner-01	River Road: Elevate road 1000' x 24' x 3-4' and stabilize shoulder.	$135,000	4 weeks	Director of Public Works	1	Flooding, Severe Summer Weather, Severe Winter Weather	Completed. Town Funds 2012
	2024-Turner-01	Elevate School House Hill Road above the 100-year flood plain	$175,000	2 Years	Director of Public Works	1	Flooding, Severe Summer Weather, Severe Winter Weather	New Project
	2024-Turner-02	Rehabilitate Nezinscot River Dam reduce impacts from flooding	$400,000	3 Years	Director of Public Works	1	Flooding	New Project
	2024-Turner-03	Install additional dry hydrants across the town reduce impacts from wildfire	$40,000	1 Year	Fire Chief	1, 3	Wildfire, Drought	New Project

***Funding source (s) for all actions are indicated in the project development worksheets, located in Appendix A*

Jurisdiction	Project Number	Project Description	Cost Estimate**	Timeframe	Responsible Agency	Goal(s) Met	Hazard(s) Addressed	Status
Wales	2010-Wales-01	Avenue Road: upsize bridge at jock stream and add "beaver deceiver" elevate intersection 450' x 21' x 12'' and repave.	$30,000	6 weeks	Road Commissioner	1	Flooding, Severe Summer Weather, Severe Winter Weather	Project Completed
	2010-Wales-02	Bull Run Road: Install additional 15'' x 40' cross culvert and repave.	$2,500	3 weeks	Road Commissioner	1	Flooding, Severe Summer Weather, Severe Winter Weather	Project Completed
	2024-Wales-01	Assess the needs to replace the bridge on Avenue Road over Jock Stream.	$75,000	1 Year	Road Commissioner	1, 3	Flooding, Severe Summer Weather, Severe Winter Weather	New Project
	2024-Wales-02	Replace existing aboveground propane tanks with underground propane tanks at municipal complex to lessen impacts from extreme temps.	$40,000	6 Months	Road Commissioner	1, 2	Severe Winter Weather	New Project
	2024-Wales-03	Assess the feasibility of installing additional dry hydrants, cisterns and/or retention ponds for fire protection.	$25,000 Per Site	1 Year	Fire Chief	1, 3	Wildfire, Drought	New Project
	2024-Wales-04	Replace the existing bridge or add an additional culvert to Avenue Rd reduce impacts from flooding.	$750,000	2 Years	Road Commissioner	1, 3,	Flooding, Severe Summer Weather, Severe Winter Weather	New Project
	2024-Wales-05	Remove the bridge on East Road at Jock Stream reduce impacts from flooding.	$50,000	2 Months	Road Commissioner	1, 5	Flooding, Severe Summer Weather, Severe Winter Weather	New Project
	2024-Wales-06	Assist the Greene and Sabattus with fixing Sabattus Pond (Sleeper) Dam reduce impacts from flooding.	$1,200,000	6 Months	Sabattus Lake Dam Association	1, 5	Flooding	New Project

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Element D – Plan Maintenance

Element D Requirements
D1. Is there discussion of how each community will continue public participation in the plan maintenance process? (Requirement 44 CFR § 201.6(c)(4)(iii))
D1-a. Does the plan describe how communities will continue to seek future public participation after the plan has been approved?

Public Participation

The Androscoggin County Emergency Management Agency leads the effort to adapt and update the Multi-Jurisdictional Hazard Mitigation Plan. ACEMA is determined to continue and improve public involvement in the hazard mitigation plan maintenance process. The Jurisdictional teams, comprised of department heads, by extension represent the public, and as such will continue to inform the process on behalf of the public. Furthermore, ACEMA will continue to provide opportunities for public engagement, allowing for public comment and valued input regarding the plan. Opportunities include,

- Plan distribution to all 14 jurisdictions, allowing for public accessibility at the city halls and town offices.
- Plan promotion, discussions pertaining to mitigation, and plan implementation during public meetings.
- Solicitation for public comment, the plan will be posted to the ACEMA website for such opportunities.
- ACEMA contact information is presented in plan, reasons being accessibility and public comment tracking.

Element D Requirements
D2. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating, and updating the mitigation plan within a five-year cycle)? (Requirement 44 CFR § 201.6(c)(4)(i))
D2-a. Does the plan describe the process that will be followed to track the progress/status of the mitigation actions identified within the Mitigation Strategy, along with when this process will occur and who will be responsible for the process?
D2-b. Does the plan describe the process that will be followed to evaluate the plan for effectiveness? This process must identify the criteria that will be used to evaluate the information in the plan, along with when this process will occur and who will be responsible.
D2-c. Does the plan describe the process that will be followed to update the plan, along with when this process will occur and who will be responsible for the process?

Plan Maintenance Procedures

Monitoring the Plan. Plan progress will be monitored through cyclical meetings with MEMA and/or local jurisdictions, as well as following federally declared disasters in Androscoggin County. ACEMA developed a worksheet for plan maintenance to ensure annual review and update of the Hazard Mitigation Plan occurs, see Figure 39. There, the Jurisdictional Team can track the project status and implementation, before each budget cycle, following each major event and federally declared disaster. The Hazard mitigation planning team is responsible for contact, coordination, and facilitation of the formal review process, beginning every three years of the five-year plan cycle. The County EMA also intends to work with MEMA officials, jurisdictional teams and stakeholders representing businesses, academia, and nonprofit organizations in periods following disasters to determine the best course for the region to mitigate future damages to roads, critical facilities, residential structures, and businesses. The attendees will be briefed on the mitigation plan and project application process

at each federal disaster declaration kick-off meeting. The mitigation plan and funding project application process will be address and will be reinforced via email announcements for workshops, funding opportunities and grant application deadlines.

Evaluating the Plan. Annually and following disaster declarations, ACEMA will review the hazards in the risk assessment in Element B and mitigation strategies in Element C to determine relevancy to variable conditions including land development in the county, as well as changes in state or federal policy to ensure that Elements B and C reflect current and expected conditions.

Project Worksheet - Maintenance	
Status Report (for plan maintenance) Year 1	
Date of Status Report:	
Project Status:	
Update Evaluation of the Problem:	
Update Evaluation of the Solution:	
Status Report (for plan maintenance) Year 2	
Date of Status Report:	
Project Status:	
Update Evaluation of the Problem:	
Update Evaluation of the Solution:	
Status Report (for plan maintenance) Year 3	
Date of Status Report:	
Project Status:	
Update Evaluation of the Problem:	
Update Evaluation of the Solution:	
Status Report (for plan maintenance) Year 4	
Date of Status Report:	
Project Status:	
Update Evaluation of the Problem:	
Update Evaluation of the Solution:	
Status Report (for plan maintenance) Year 5	
Date of Status Report:	
Project Status:	
Update Evaluation of the Problem:	
Update Evaluation of the Solution:	

Figure 39, Project worksheet for plan maintenance.

Updating the Plan. At year three of the five-year period covered by this plan, the Hazard Mitigation Planning Team will conduct a hazard analysis and risk and capabilities assessment. In collaboration with the jurisdictions, the status of current projects will be updated and add new projects as determined. The process will come to fruition through a series of compounding meetings, the kickoff meeting, the seminar, and project planning meetings, including emails, surveys, and the website, as described in Element A. Once all hazards, projects, maps, and all pertinent data have been updated, and public input recorded, the Androscoggin County Hazard Mitigation Plan draft will be submitted to MEMA for review and recommendations before the final draft is forwarded to FEMA for review and approval pending adoption (APA). After APA, the jurisdictions will adopt the plan for final approval and start another five-year plan cycle.

Figure 40: Minot Ave, Auburn, ME July 25, 2023, Flash Flood. Source: News Center Maine

Element D Requirements
D3. Does the plan describe a process by which each community will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement 44 CFR § 201.6(c)(4)(ii))
D3-a. Does the plan describe the process the community will follow to integrate the ideas, information, and strategy of the mitigation plan into other planning mechanisms?
D3-b. Does the plan identify the planning mechanisms for each plan participant into which the ideas, information and strategy from the mitigation plan may be integrated?
D3-c. For multi-jurisdictional plans, does the plan describe each participant's individual process for integrating information from the mitigation strategy into their identified planning mechanisms?

Integration

County government is very limited in scope and authority in the State of Maine and does not guide and control planning or development within its borders. Within Maine, most government authority is with state statutes and rules and with municipal "Home Rule" ordinances. Jurisdictions in Androscoggin County have already incorporated strategies recommended by or consistent with this Plan into local planning mechanisms as discussed below. By adopting this plan, each community, including Androscoggin County, is agreeing to continue implementation of strategies aimed at mitigating hazards identified in this Plan. Participating jurisdictions have a variety of planning and regulatory mechanisms for managing land use at the local level, thereby minimizing the exposure of future development to natural hazards.

In total, there are 14 jurisdictions in Androscoggin County. Available planning mechanisms at the municipal level include:

- **Local flood plain management ordinances.** As documented in Element C, all 14 jurisdictions have joined the Flood Insurance Program and have adopted floodplain management ordinances.
- **Shoreland zoning ordinances.** All of the municipalities in Androscoggin County are required to have a shoreland zoning ordinance. Shoreland zoning ordinances contain requirements for locating structures outside of known flood hazard areas and/or for complying with the requirements of municipal flood plain management ordinances.
- **Subdivision review requirements.** Maine state law contains criteria that local officials must use in conducting subdivision reviews. One of the criteria contains a specific reference to FEMA's Flood Boundary and Floodway Maps and Flood Insurance Rate Maps, and requires elevation above the 100-year flood plain:
- **Local comprehensive plans.** All 14 jurisdictions maintain comprehensive plans, which are policy document that address a wide range of issues affecting the future of the community, and those relating to public safety and environmental protection would be consistent with the strategies contained in this plan. In general, local comprehensive plans do not include recommendations on specific projects, although they may contain more general recommendations that roads and their associated infrastructure be upgraded as funds become available.
- **Capital improvement plans.** Most municipalities have capital improvement plans; most of the smaller ones do not, but they do have local budgeting processes which are used to examine potential expenditures in detail and establish overall spending priorities. In either case, the budget review process is used to evaluate and recommend a course of action for actions contained in the hazard mitigation plan.

- **Local Budgeting Processes.** These processes are used to examine potential expenditures in detail and establish overall spending priorities. The budget review process is used to evaluate and recommend a course of action for actions contained in the hazard mitigation plan; this can include road maintenance planning efforts.
- **Emergency management and mitigation planning.** Androscoggin County EMA is the catalyst for helping all jurisdictions focus on hazard mitigation planning including the consideration and refinement of information on hazards contained in this plan and mitigation projects.
- **Fire prevention planning and coordination.** Including participation in mutual aid agreements, training, and exercises.
- **Grant writing.** Most of the County's municipalities have been active in applying for grants to address municipal priorities which might include funding for one or more of the projects contained in this plan.

In addition to the planning mechanisms detailed in Appendix A and outlined above, twelve jurisdictions of hold town meetings and two hold council meetings, both offer a public comment period, an opportunity to communicate concerns, opinions and offer solutions regarding the state of affairs. It is during such meetings, hazard mitigation activities are discussed, such as road maintenance, zoning ordinances, permitting, budgeting effort to support such activities. ACEMA will continuously encourage jurisdictions to integrate the plan requirements into existing planning mechanisms, inform the jurisdictions and the public of hazard mitigation funding opportunity workshops, maintain a copy of the 2024 Hazard Mitigation report on the ACEMA website which contains hazard mitigation resources, an overview of the hazard mitigation program and funding opportunities. ACEMA will continue to assist municipalities with the completion of FEMA Pre-Disaster and Hazard Mitigation Grant applications, project implementation, maintenance, and plan updates.

Figure 41: Woodland fire, Lewiston, ME June 6, 2022. Source: Lewiston Fire.

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Element E – Plan Update

Element E Requirements
E1. Was the plan revised to reflect changes in development? (Requirement 44 CFR § 201.6(d)(3))
E1-a. Does the plan describe the changes in development that have occurred in hazard-prone areas that have increased or decreased each community's vulnerability since the previous plan was approved?

Assessing Changes in Development

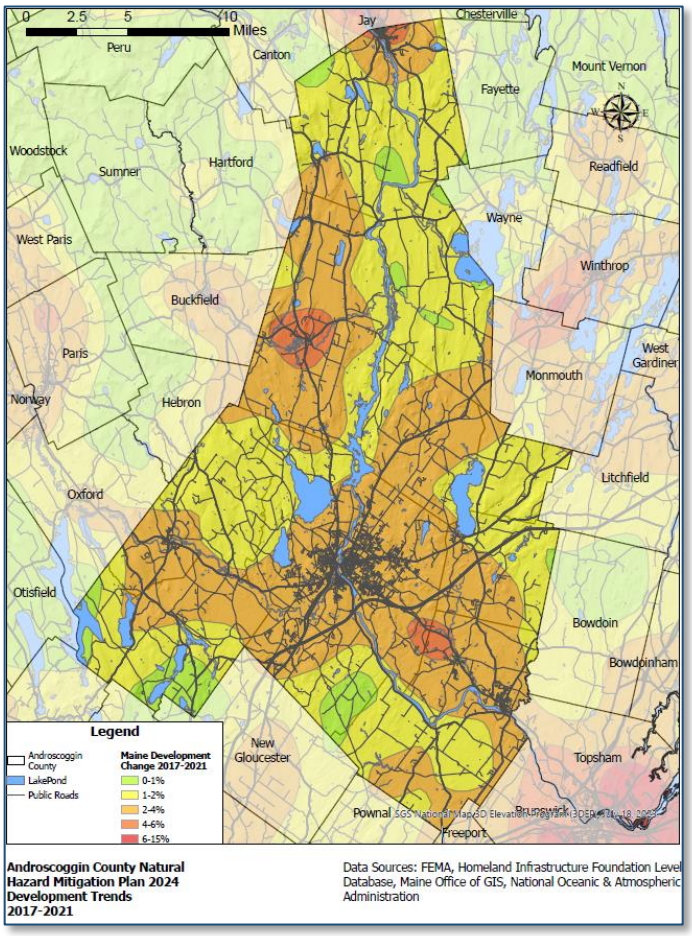
There have been no known development changes in hazard-prone areas that have affected any jurisdiction's overall vulnerability. However, there are multiple programs to mitigate against unchecked development in hazard prone areas, such as community participation in NFIP through enforcement of Flood Insurance Rate Maps in local Floodplain Ordinances, development of local comprehensive plans, shoreland zoning ordinances and land use ordinances, as described in Element C of this Plan.

Changes in Population and Housing. Land uses in Androscoggin County range from densely populated urban areas to suburban residential areas to rural, farm areas, and forest land. Between 2010 and 2020, the County's population grew from 107,702 to 111,139, for an increase of 3,437 or 3.2%. However, some communities experienced growth rates as high as 22.1%, while the towns of Leeds, Livermore Falls and Wales lost population. In a similar trend, housing units have increased in most jurisdictions. Between 2010 and 2020 housing units in Androscoggin County increased from 48,851 to 49,837. Housing units have increased in most jurisdictions in Androscoggin County, especially Leeds and Sabattus. Development has encroached on the wildland-urban interface, at the same time, development has not spilled into FEMA identified flood zones. A clear trend in the County is that nearly all of the population growth is occurring in the urban, suburban, and most rural communities. Although on-going changes are occurring in Androscoggin County, growth has been monitored in a manner that protects the hazard prone areas from further development which could affect the vulnerability of the community. Table 51 illustrates the changes in population and housing units for Androscoggin County.

Table 51: Change in Population in Androscoggin County between 2010 and 2020

Jurisdiction	2010 Population	2020 Population	Change in Population	2010 Housing Units	2020 Housing Units	Change in Housing Units
Auburn	23,055	24,061	4.4%	11,260	11,000	-2.3%
Durham	3,848	4,173	8.4%	1,498	1,660	10.8%
Greene	4,350	4,376	0.6%	1,759	1,958	11.3%
Leeds	2,326	2,262	-2.8%	889	1,053	18.4%
Lewiston	36,592	37,121	1.4%	16,355	16,579	1.3%
Lisbon	9,009	9,711	7.8%	4,108	4,179	1.7%
Livermore	2,095	2,127	1.5%	1,088	1,151	5.7%
Livermore Falls	3,187	3,060	-4.0%	1,661	1,494	-10.1%
Mechanic Falls	3,031	3,107	2.5%	1,425	1,341	-5.9%
Minot	2,607	2,766	6.1%	1,017	1,114	9.5%
Poland	5,376	5,906	9.9%	2,681	2,852	6.3%
Sabattus	4,876	5,044	3.4%	1,837	2,244	22.1%
Turner	5,734	5,817	1.4%	2,592	2,544	-1.8%
Wales	1,616	1,608	-0.5%	681	668	-1.9%

Source: US Census



Sentinel 2 Data Assessment. One other way used to assess changes in development pursued in this plan was the use of remote sensing data to estimate trends in land use changes and identify where these changes may intersect with hazard prone areas. Sentinel satellite imagery used to categorize land cover/land use type provide for change detection in global development at a 30-meter resolution over multiple years. This analysis can be replicated for any location on earth from 2017-2021. Based on this analysis as shown in Figure 42, there have been relatively large amounts of changes in development in parts of Lisbon, Livermore Falls and Turner, conversly according to the Sentinel 2 data Durham and Poland show little to no development in the last 5 years. Full size Sentinel 2 Data maps are located in the Jurisdictional Profiles for Lisbon, Livermore Falls, Turner, Durham and Poland, refer to Appendix A.

Figure 42: Changes in Development 2017-2021 using Sentinel 2 satellite data.

Figure 43: Androscoggin River at Great Falls, Lewiston, ME, May Day Flood 2023. Source: Bangor Daily News

Element E Requirements
E2. Was the plan revised to reflect changes in priorities and progress in local mitigation efforts? (Requirement 44 CFR § 201.6(d)(3))
E2-a. Does the plan describe how it was revised due to changes in community priorities?
E2-b. Does the plan include a status update for all mitigation actions identified in the previous mitigation plan?
E2-c. Does the plan describe how jurisdictions integrated the mitigation plan, when appropriate, into other planning mechanisms?

Changes in Priorities

Androscoggin County EMA requested each municipality review submitted projects as well as, to indicate If their actions have changed in priority, either by the addition of new actions and/or by changes in existing, uncompleted actions. Changes are indicated in the table of actions for each jurisdiction in Element C.

Status of Mitigation Projects. As part of Element C - Mitigation Strategy, there is a "Status" column in the table of local mitigation projects that describes the status of each strategy. All actions that are new are identified as such. Actions that have not been completed are included in the updated plan are identified by the phrase "Deferred, lack of funds." Actions that have been completed are also included in the table, with completion information in the status column and highlighted in gray. The following planning mechanisms may be used by jurisdictions to achieve the goals, actions and projects as described in Element C.

- **Completed projects**: Information on municipal projects that have been completed or are underway have been integrated into other planning mechanisms. These projects were incorporated into municipal warrant items, budgets, municipal appropriations, bid documents and contracts for work.
- **Floodplain Management Ordinances**: As documented in Element C, all of Androscoggin County's municipalities have joined the National Flood Insurance Program and the cities of Lewiston and Auburn have gone beyond the minimum standards to participate in the Community Rating System. These ordinances have already incorporated the general goals contained in this plan of minimizing loss and disruption of life, property, & the environment.
- **Shoreland zoning ordinances:** All jurisdictions in Androscoggin County have shoreland zoning ordinances as required by state law. Shoreland zoning ordinances contain requirements for locating structures outside of known flood hazard areas. As such, all of the jurisdictions in Androscoggin County have already incorporated into their shoreland zoning ordinances the general goals contained in this plan of minimizing loss and disruption of life, property, & the environment.
- **Subdivision review requirements:** Maine state law contains criteria that local officials must use in conducting subdivision reviews. One of the criteria contains a specific reference to FEMA's Flood Boundary and Floodway Maps and Flood Insurance Rate Maps and requires elevation above the 100-year flood plain, this statutory requirement already incorporates floodplain management goals contained in the plan into the local subdivision review process.
- **Capital improvement plans:** Most municipalities have capital improvement plans; most of the smaller ones do not, but they do have local budgeting processes which are used to examine potential expenditures in detail and establish overall spending priorities. In either case, the budget review process is used to evaluate and recommend a course of action for projects contained in the hazard mitigation plan.

- **Local budgeting processes:** These processes are used to examine potential expenditures in detail and establish overall spending priorities. The budget review process is used to evaluate and recommend a course of action for actions contained in the hazard mitigation plan; this can include road maintenance planning efforts.

Figure 44: Miller Alley, Auburn, ME July 25, 2023. Source: City of Auburn.

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Element F – Plan Adoption

Element F Requirements
F2. For multi-jurisdictional plans, has the governing body of each jurisdiction officially adopted the plan to be eligible for certain FEMA assistance? (Requirement 44 CFR § 201.6(c)(5))
F2-a. Did each participant adopt the plan and provide documentation of that adoption?

Participation

This plan is a multi-jurisdiction plan. Municipalities that participated in the preparation of this plan include the following:

Municipalities	
Auburn, City of	Livermore Falls, Town of
Durham, Town of	Mechanic Falls, Town of
Greene, Town of	Minot, Town of
Leeds, Town of	Poland, Town of
Lewiston, City of	Sabattus, Town of
Lisbon, Town of	Turner, Town of
Livermore, Town of	Wales, Town of

FEMA defines Goals as general guidelines that explain what should be achieved and defines Objectives as strategies or implementation steps to attain mitigation goals, and mitigation actions as specific actions that help to achieve the mitigation goals and objectives. This plan combines goals, objectives, and actions to provide direction for Androscoggin County and all jurisdictions to reduce risks from identified hazards and improve resilience. All 14 jurisdictions participated; each action/project submitted for inclusion in this plan contributes to the county-wide mitigation strategy. The local mitigation actions/projects paint a picture, illustrating what each community prioritizes and their commitment to hazard mitigation and resilience.

By adopting this plan, each community is agreeing to continue implementation of strategies aimed at mitigating hazards identified in this Plan. Participating jurisdictions will apply the Androscoggin County Natural Hazard Mitigation Plan – Resolution of Adoption template to that jurisdictions letterhead and submit a completed copy for inclusion to this Plan. The Resolution of Adoption template to completed by each participating jurisdiction is shown on the following page.

Figure 45: Androscoggin River at Veterans Park, Lewiston, ME December 18, 2023. Source: Lewiston Sun Journal

Resolution

ANDROSCOGGIN COUNTY NATURAL HAZARD MITIGATION PLAN

RESOLUTION OF ADOPTION 2024

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 Androscoggin 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, the 2 Cities, 12 Towns in Androscoggin County, as well as Androscoggin County are committed to the mitigation goals and measures as presented in this plan;

Therefore, the Androscoggin County Commissioners, or the Boards of Selectmen or City Councilors of the 14 municipalities hereby ADOPT the Androscoggin County Natural Hazard Mitigation Plan 2024 Update.

AUTHORIZING SIGNATURES - (County of/City of/ Town of Jurisdiction)

(Name typed)	(Title & Signature above)	Date
(Name typed)	(Title & Signature above)	Date
(Name typed)	(Title & Signature above)	Date
(Name typed)	(Title & Signature above)	Date
(Name typed)	(Title & Signature above)	Date
(Name typed)	(Title & Signature above)	Date
(Name typed)	(Title & Signature above)	Date

TABLE OF CONTENTS – ELEMENT G

Element G – High Hazard Potential Dams

Element G Requirements
HHPD1. Did the plan describe the incorporation of existing plans, studies, reports, and technical information for HHPDs?
HHPD1-a. Does the plan describe how the local government worked with local dam owners and/or the state dam safety agency?
HHPD1-b. Does the plan incorporate information shared by the state and/or local dam owners?

High and Significant Hazard Dams in Androscoggin County

Maine dams were constructed incrementally over a period of 300 years, with the oldest in Androscoggin County being the Sleeper dam in Sabattus which was built in 1850. During the Industrial Revolution businesses harnessed the abundant fast flowing rivers and their steep drops for the development of energy and transportation. Many dams throughout the country are now aged, and in Maine many of these structures are nearly 100 years old and beyond the normal design life of such structures. Many are low head dams constructed using local materials of stone, timber, and earth. Dam failure is not a frequent occurrence, but it can and does occur. Maine law MSRA 37-B Chapter 24, consistent with federal law, classifies the hazard potential of dams as High, Significant or Low. If they fail, High Hazard dams could cause loss of life; Significant Hazard dams could cause significant property damage and Low Hazard dams would generally cause damage only to the owner's property. Therefore, it's possible that a small (low head) dam located above a large community could be rated High Hazard, while a structurally larger dam sited in an unpopulated area could be a Low Hazard potential. The Maine Dam Safety program is required to inspect all High Hazard dams at least every 2 years and all significant hazard dams at least every 4 years. Androscoggin County EMA receives copies of the inspection reports from the Maine Dam Safety Program for dams located in Androscoggin County. ACEMA also receives annual updates on Emergency Action Plans and notification charts from dams owned by Brookfield Hydroelectric and Eagle Creek Hydroelectric. ACEMA also works with other dam owners including the Lake Auburn Watershed Protection Commission and municipalities including the towns of Poland, Sabattus and Turner. All dam owners were asked to complete the Stakeholder Survey described in Element A, however no responses were received.

General Definition of Dam Breach. A dam breaching event can occur with little time to warn persons and communities down river. With the continued interest in dam safety and the enactment of Maine Dam Safety inspections to detect structural problems in 1997, warning times have increased significantly. High and significant hazard rated dams are inspected every six years. According to Maine law, dams having a high and significant hazard rating classification are required to have an Emergency Action Plan (EAP) that includes notification procedures for warning downstream communities and populations of impending flash flooding. According to the Maine Dam Safety Program records, there are six EAPs in Androscoggin County that must be updated every two years to remain compliant. Each EAP is created and updated by the dam owner and provided to both the Maine Dam Safety Program and Androscoggin County EMA to assist with planning efforts. Based on the EAP for Gulf Island Dam, a breach of this dam could impact parts of Lewiston, Auburn, Lisbon, and Durham in Androscoggin County. Dam owners must share copies of the EAP's with Emergency Management and public safety agencies in areas surrounding their dams. Dam breach scenarios are most likely to occur due to extreme flood events, which overwhelm the maximum flow the dam is designed for. However, events such as a large earthquake, mechanical failure in one of the dam's systems or an adversarial threat could impact the dam. Any damage to a dam would have to be assessed by qualified engineers before repairs could be completed.

Table 49: High and Significant Hazard Dams in Androscoggin County					
FERC ID	Hazard Level	Dam Name	Dam Owner	Jurisdiction(s)	Water Body/River
ME00007	High	Gulf Island Pond	Brookfield Hydroelectric	Auburn, Lewiston	Androscoggin River
ME00019	High	East Auburn	Lake Auburn Watershed Protection Commission	Auburn	Lake Auburn / Bobbin Brook
ME00255	High	North Auburn	Lake Auburn Watershed Protection Commission	Auburn	The Basin / Lake Auburn
ME00377	High	Estes Bog #5	Town of Poland	Poland	Estes Bog
ME00020	Significant	Nezinscot	Town of Turner	Turner	Nezinscot River
ME00014	Significant	Sleeper	Town of Sabattus	Sabattus	Sabattus Lake / Sabattus River

Source: USACE National Inventory of Dams and Maine Dam Safety Program

High Hazard Dam Breach Maps. The following pages include inundation maps for the four high hazard dams in Androscoggin County. Modeling for the North Auburn Dam and East Auburn Dam was completed by Wright-Pierce Engineers for the Lake Auburn Watershed Protection Commission in November of 2014. North Auburn Dam has no expected impact on buildings as there are none in the modeled flood zone. However, floodwaters are likely to overtop two road bridges, potentially endangering motorists as shown in Figure 56. East Auburn Dam would impact four buildings in a PMF scenario, as shown in Figure 57. Two buildings at 1097 Center Street in Auburn, W.D. Matthews Machinery at 901 Center Street and 136 Stetson Road in Auburn. These buildings have a combined assessed value of $3,494,900. Estes Bog #5 impacts was estimated by Poland Public Works department. Estes Bog is expected to impact a single-family home at 379 Schellinger Road, Poland, with an assessed value of $41,000. Gulf Island Pond was modeled in house by Brookfield Hydroelectric. A failure at Gulf Island Pond in what is referred to a Sunny Day scenario, would impact an estimated 350 structures in Auburn, Durham, Lewiston and Lisbon, as well as additional properties in jurisdictions downstream of Androscoggin County. In a Probable Maximum Flood (PMF) scenario, an additional 919 structures would be impacted. Figures 47 through 54 show areas and structures that would be impacted by a dam breach of Gulf Island Pond. Structures that would be impacted by both scenarios are shown in yellow, while structures impacted only by a PMF scenario are shown in orange.

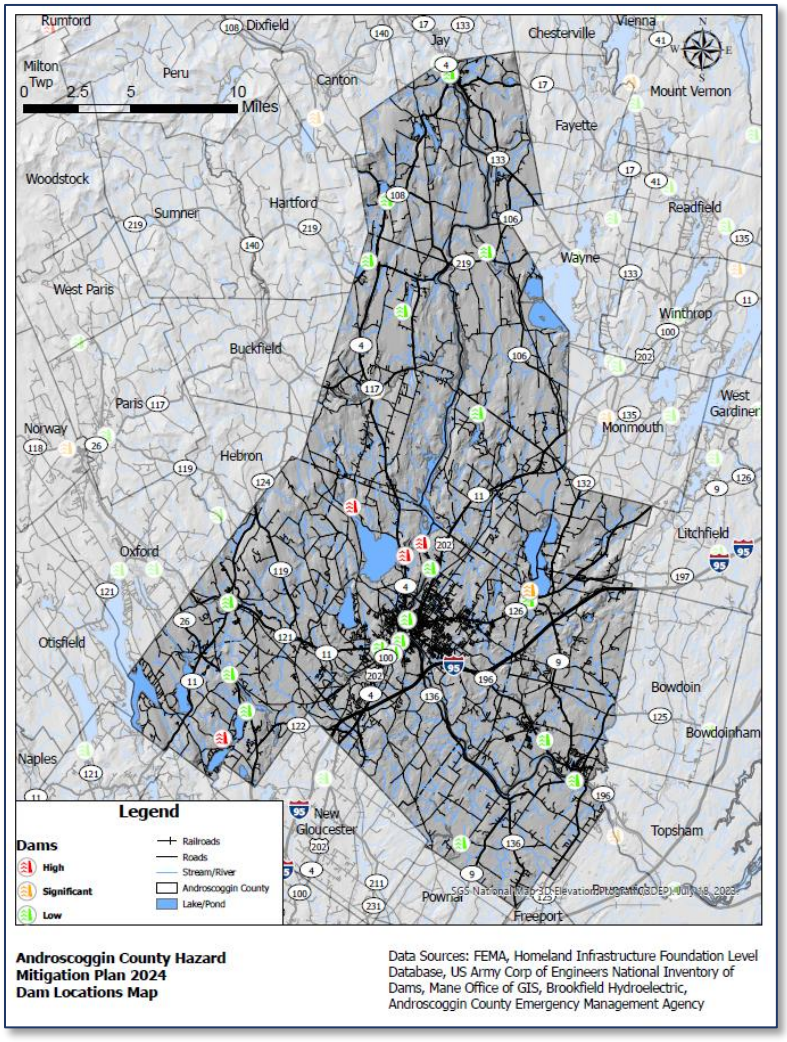

Figure 46: Hazard level of dams in and around Androscoggin County

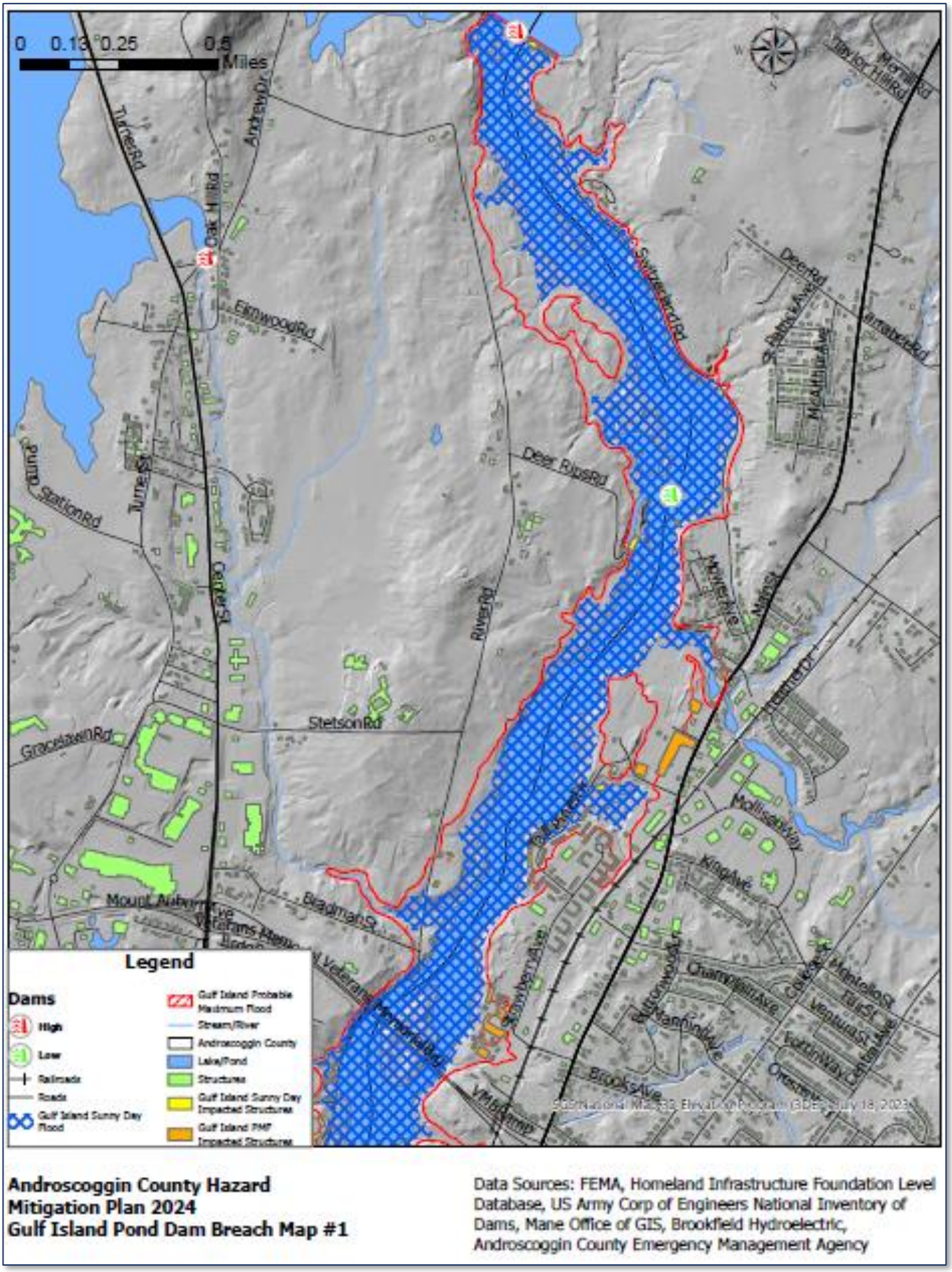

Figure 47: Gulf Island Pond Inundation Map Part 1 of 8

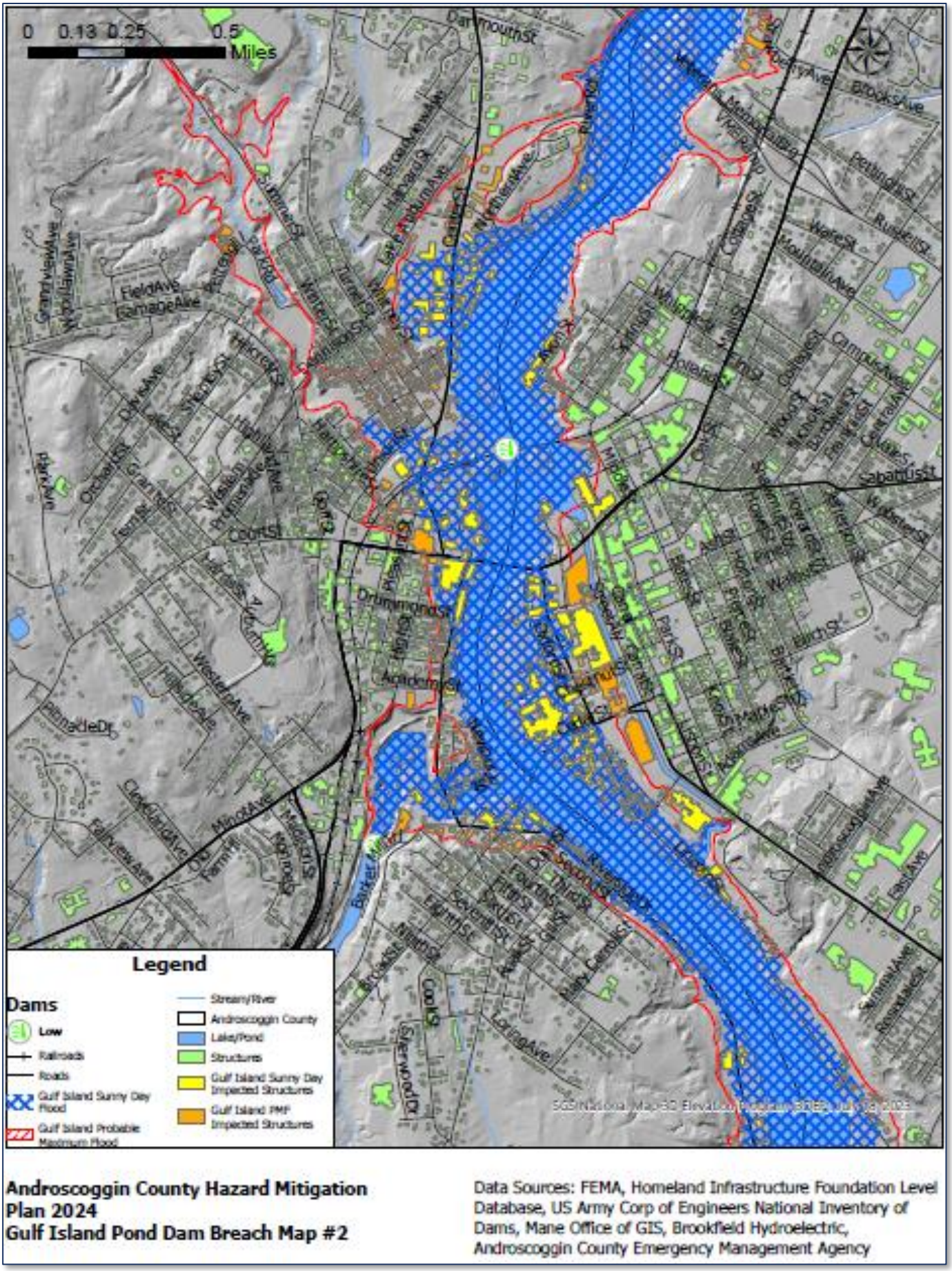

Figure 48: Gulf Island Pond Inundation Map Part 2 of 8

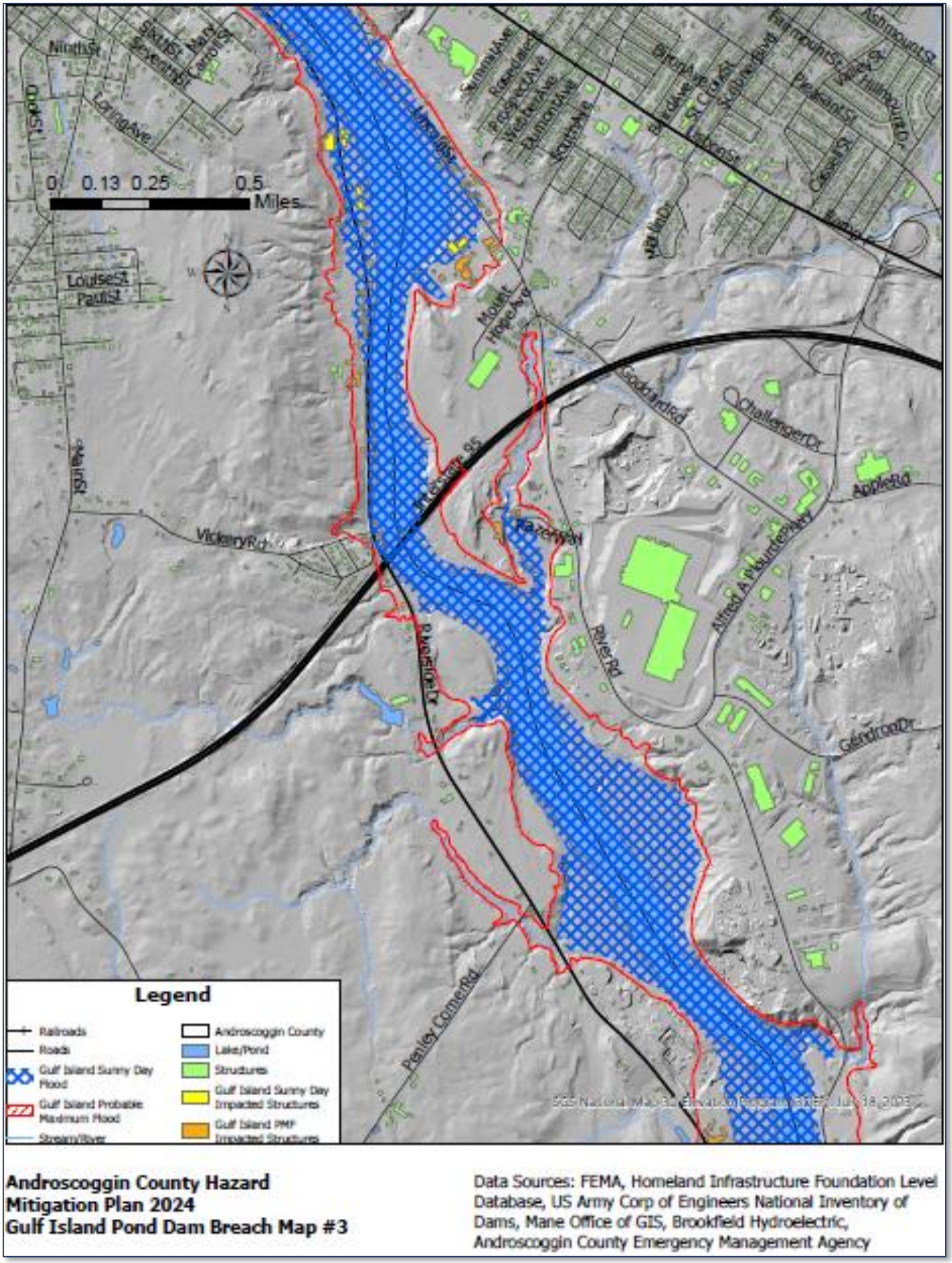

Figure 49: Gulf Island Pond Inundation Map Part 3 of 8

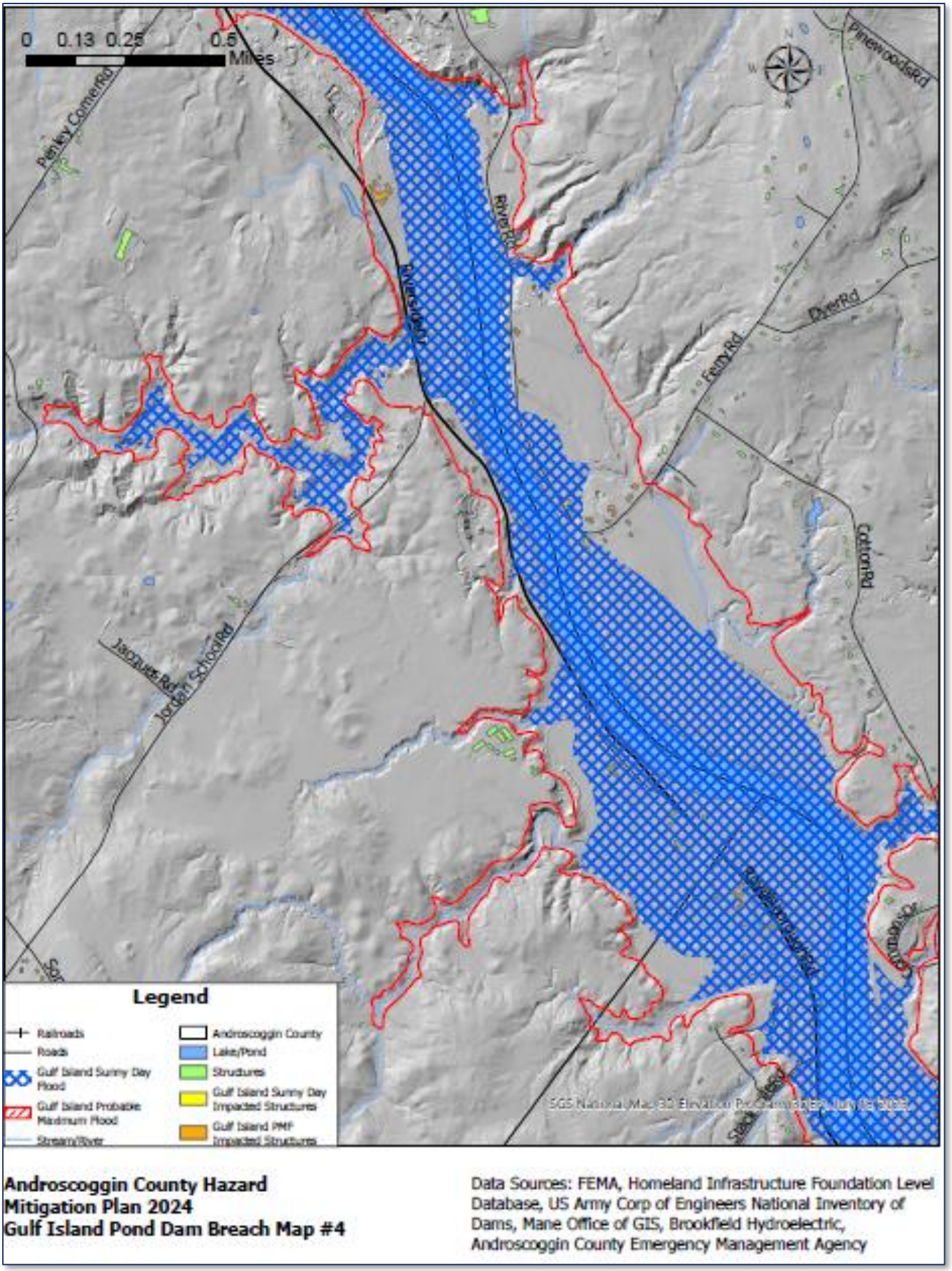

Figure 50: Gulf Island Pond Inundation Map Part 4 of 8

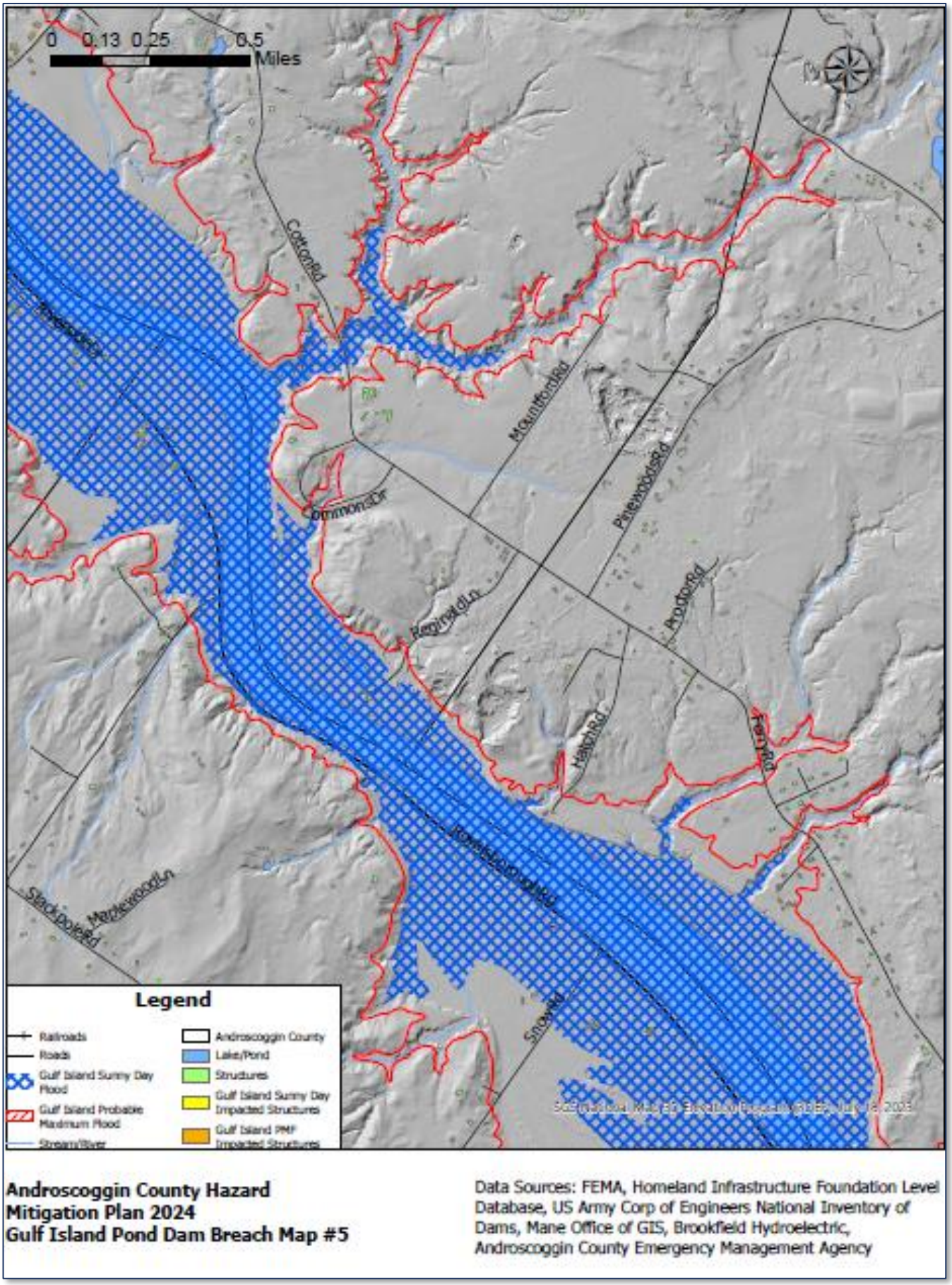

Figure 51: Gulf Island Pond Inundation Map Part 5 of 8

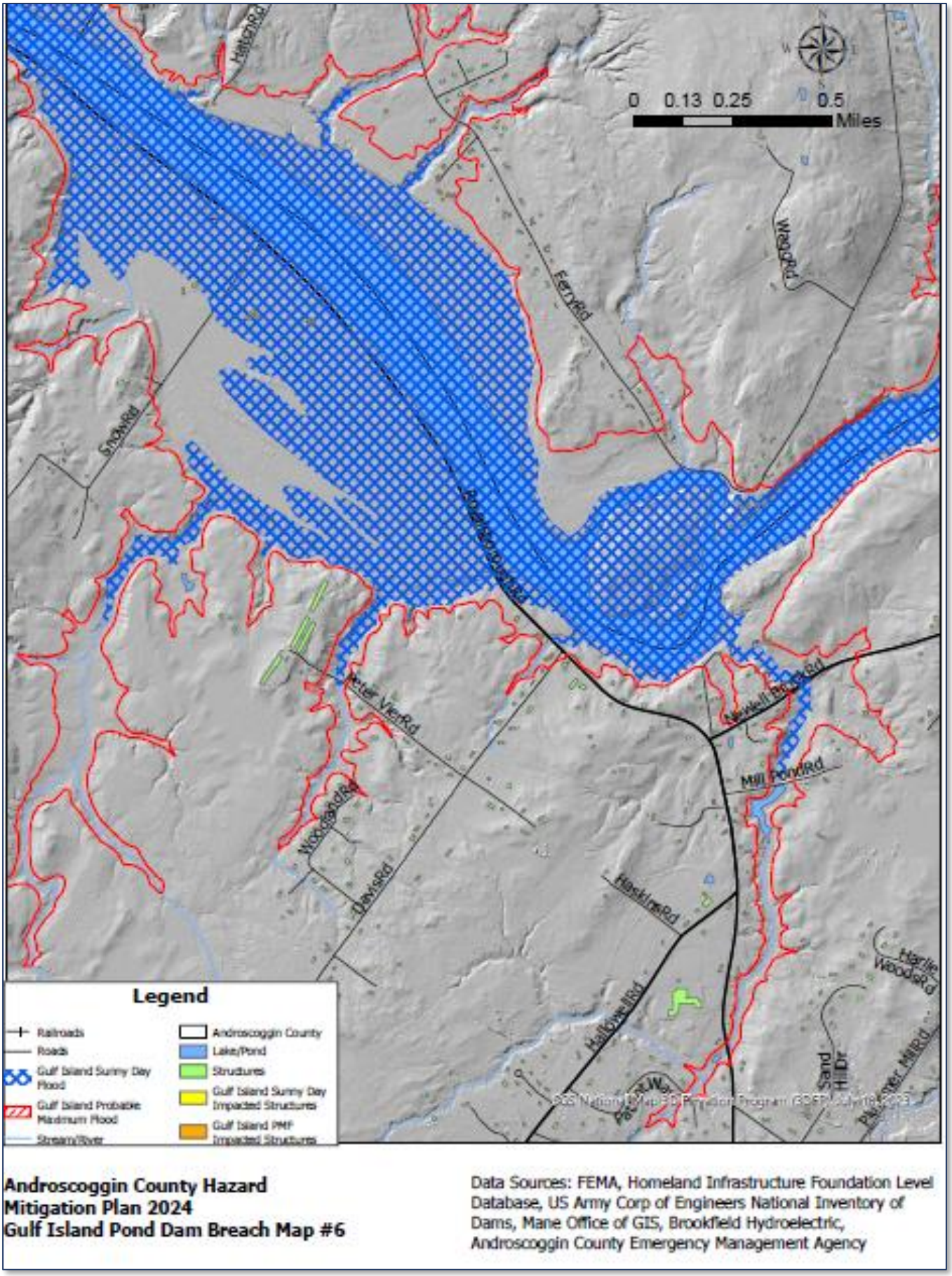

Figure 52: Gulf Island Pond Inundation Map Part 6 of 8

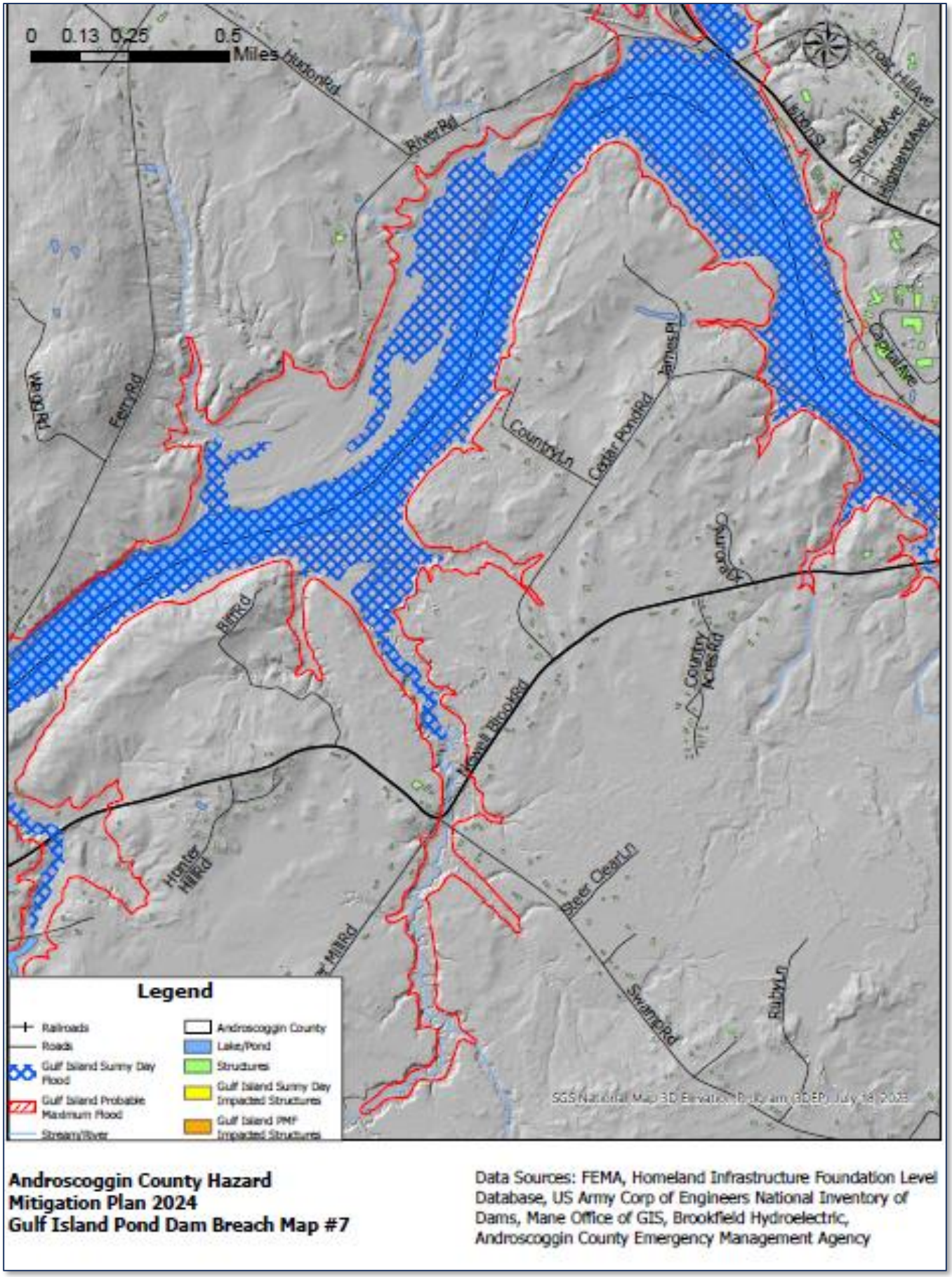

Figure 53: Gulf Island Pond Inundation Map Part 7 of 8

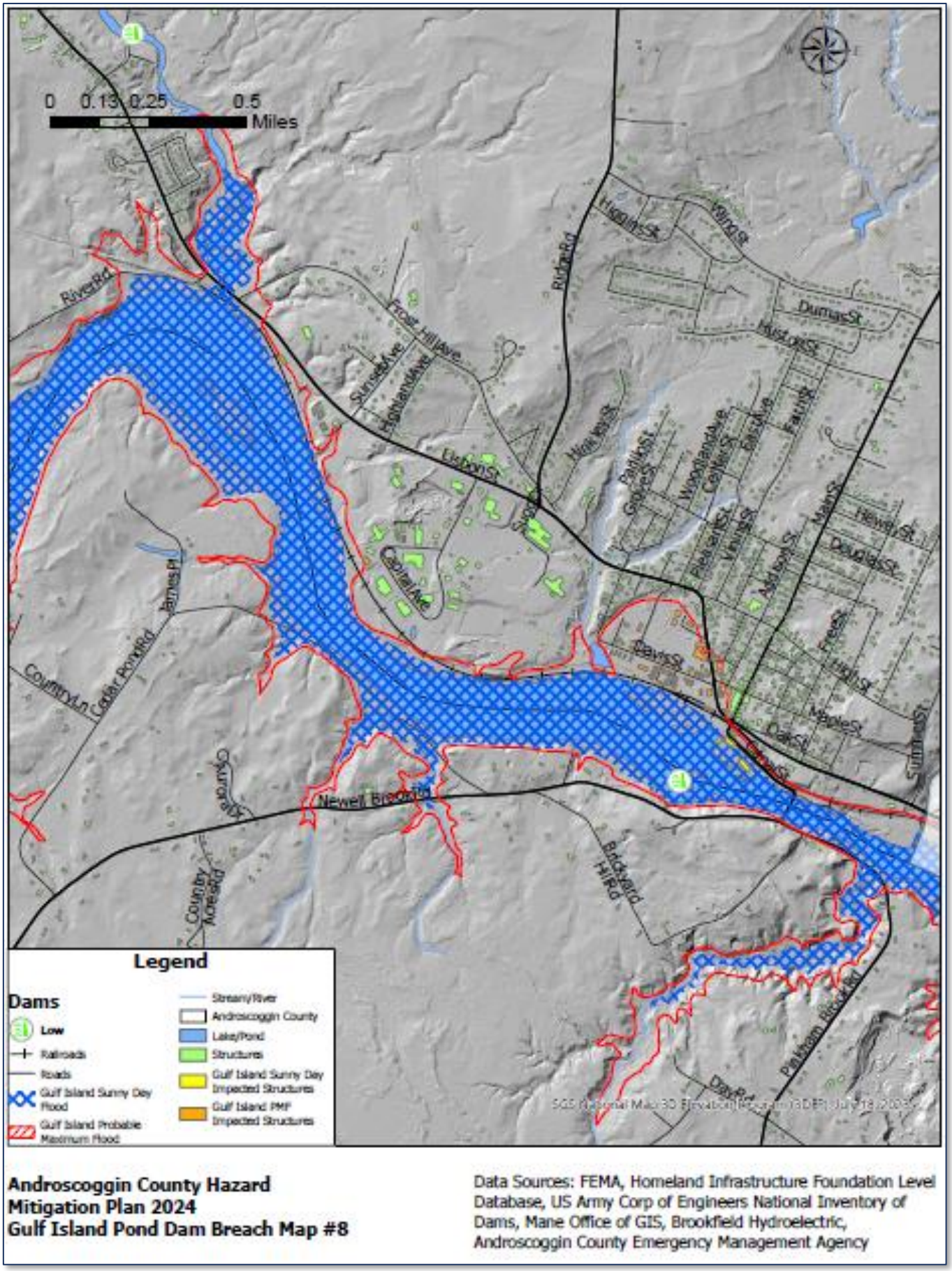

Figure 54: Gulf Island Pond Inundation Map Part 8 of 8

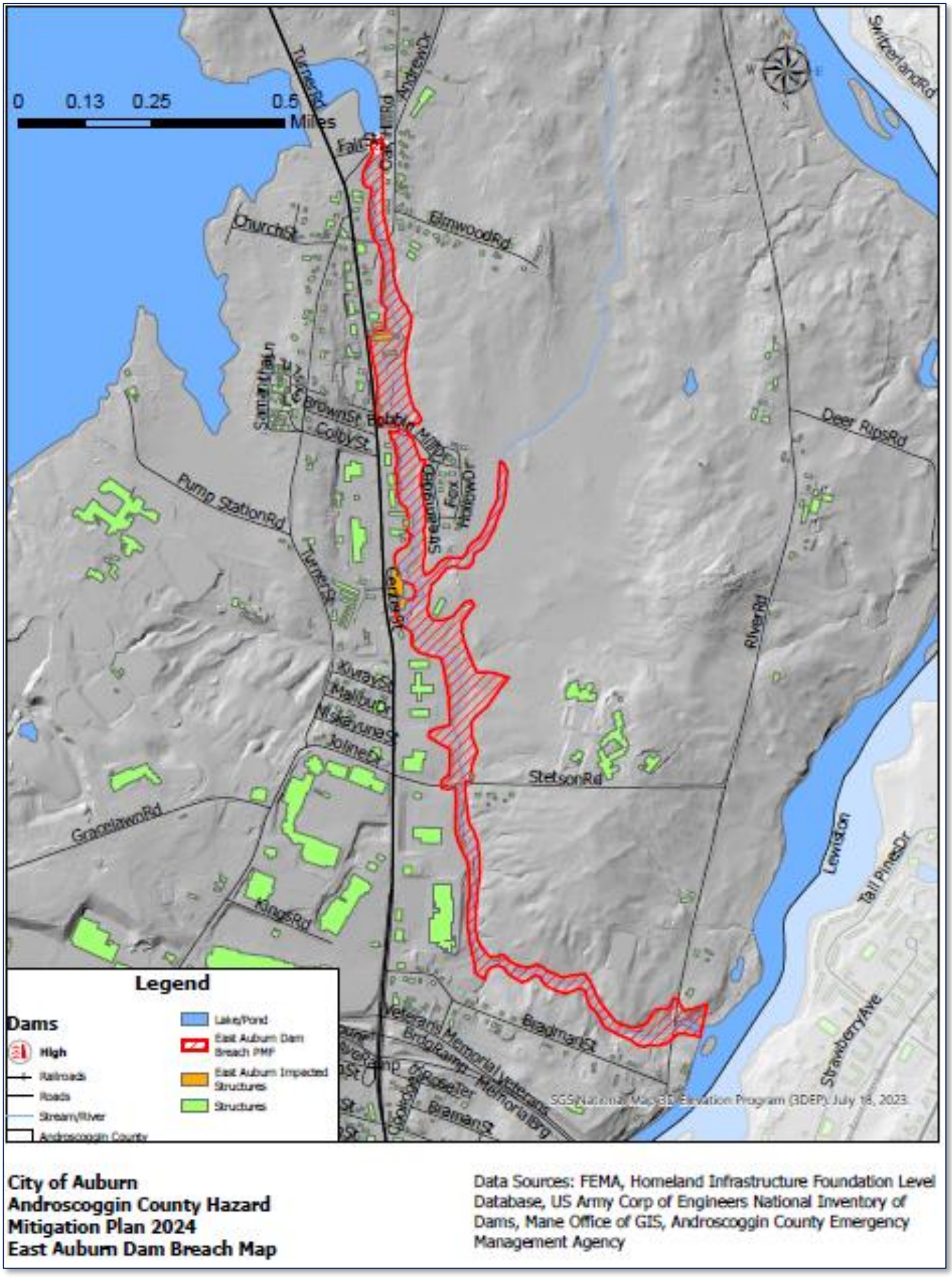

Figure 55: East Auburn Dam Inundation Map

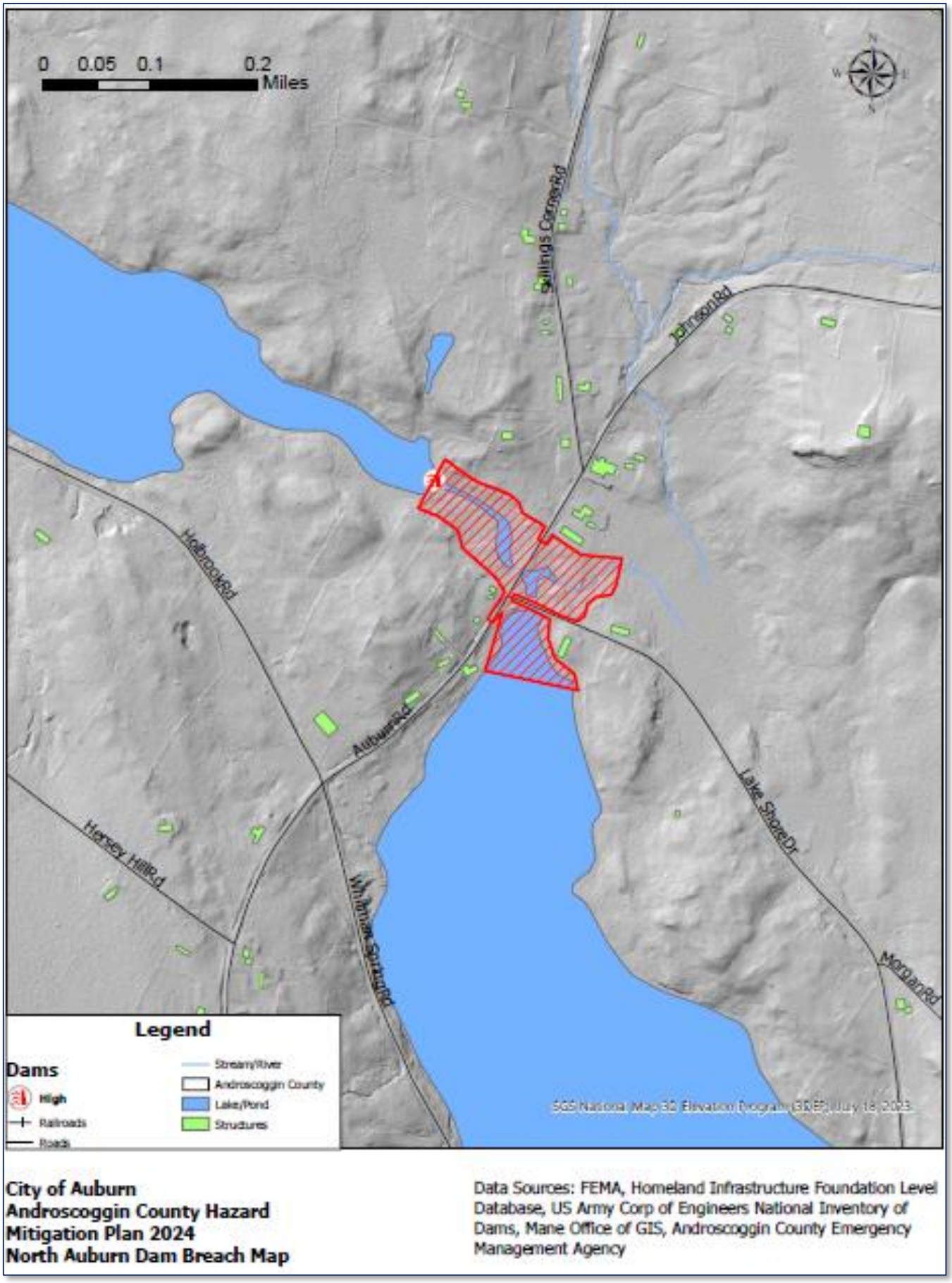

Figure 56: North Auburn Dam Inundation Map

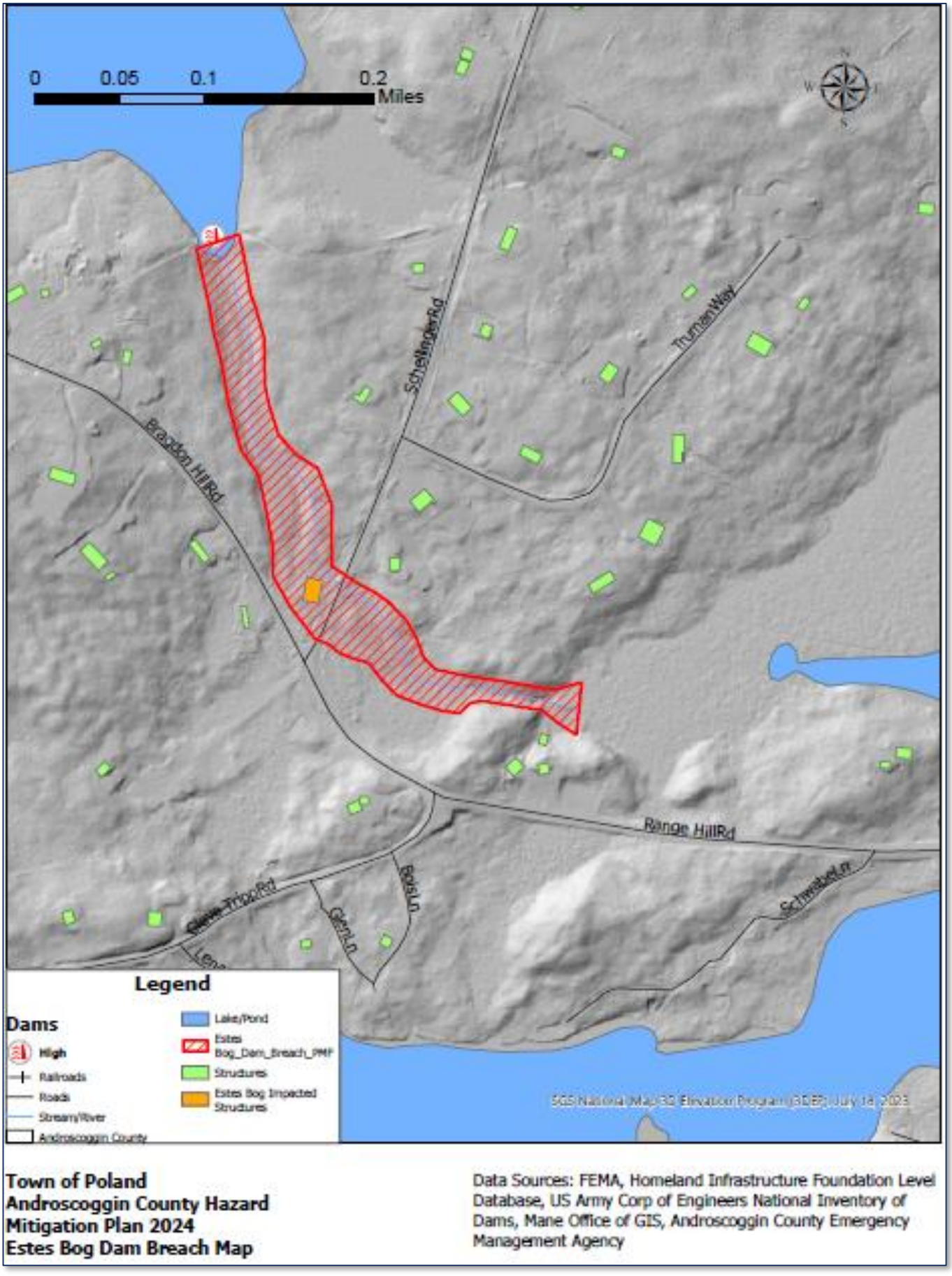

Figure 57: Estes Bog #5 Dam Inundation Map

Element G Requirements
HHPD2. Did the plan address HHPDs in the risk assessment?
HHPD2-a. Does the plan describe the risks and vulnerabilities to and from HHPDs?
HHPD2-b. Does the plan document the limitations and describe how to address deficiencies?

Dam Failure Risk Assessment

Dam failures are a relatively rare but potentially catastrophic occurrence. There have been ten recorded dam failures in Maine, only one of which occurred in Androscoggin County. The only recorded dam failure in Androscoggin County was the failure of the Keen's Mill Dam in the Town of Turner in 1806[1]. The dam was destroyed by a large flood of spring meltwater or feshet as it was called. This dam was located on the Nezinscot River, which at that time was known at the Twenty Mile River. The dam was probably located off Cobb Road. It is unknown what type of material was used in the creation of the dam, or the amount of water in the flood that caused it to fail. It should be noted that there have been at least 2 partial dam failures in Androscoggin County. In the 1990's the Pleasant Pond Dam in Turner was damaged by flooding. In June of 2012 the Upper Dam on the Sabattus River in the Town of Lisbon partially failed due to a heavy rainstorm. This partial failure caused the dam's pond capacity to drop until the dam was completely removed in June of 2022. Both of these dams are rated as low hazard, but it should be noted as any dam failure would have some degree of impact on the jurisdiction. Androscoggin County has a total of 27 dams registered with the US Army Corp of Engineers National Inventory of Dams (USACE NID). Riverfront areas of Lisbon, Livermore Falls, Poland, Sabattus and Turner could expect infrastructure damages, especially to downstream roads and bridges if their dams were to breach. Androscoggin County EMA used dam breach modeling data from the owners of the 4 High Hazard dams. All four dams were modeled to show the worst-case scenario event, a Probable Maximum Flood (PMF) event. Brookfield Hydroelectric also provided a less severe sunny day breach scenario for the potential failure of Gulf Island Pond. It should also be noted that as part of the model for Gulf Island Pond, it assumes that the downstream low hazard Deer Rips dam also fails.

Figure 58: Deer Rips Dam, Lewiston/ Auburn, ME. Source: Brookfield Hydro

[1] History of the Town of Turner from Settlement to 1886, US Archives

Limitations of Dam Breach Mitigation. There are primary potential limitation to dam breach mitigation in Androscoggin County would be limited funding available to maintain, repair or remove dams. While privately owned dams such as those owned by Brookfield Hydroelectric or Eagle Creek Hydroelectric may have more funds available to maintain and repair any damage that may occur to the dam, those owned by municipal or quasi-municipal entities are less likely to have the money on hand necessary to fund a large dam repair project. Most jurisdictions do not have a certified engineer on staff who would be able to design any necessary repairs to a dam. This means that these jurisdictions would have to contract out to an engineering firm to do the design work. However, since dam owners in Androscoggin County are aware of the potential damage a dam failure event would inflict, they would likely take any available opportunities to be able to work with stakeholders to ensure that the dams would remain in good condition. These issues can be addressed through the implementation of the five goals described in Element C – Mitigation Strategy.

Element G Requirements
HHPD3. Did the plan include mitigation goals to reduce long-term vulnerabilities from HHPDs?
HHPD3-a. Does the plan address how to reduce vulnerabilities to and from HHPDs as part of its own goals or with other long-term strategies?
HHPD3-b. Does the plan link proposed actions to reducing long-term vulnerabilities that are consistent with its goals?

Dam Failure Mitigation Goals

The five goals of the Androscoggin County Natural Hazard Mitigation Plan, as described in Element C- Mitigation Strategy are all relevant to reducing vulnerabilities to High Hazard Dams in in Androscoggin County. These goals can work in conjunction with one of the goals of the Maine State Hazard Mitigation Plan 2023. The state hazard mitigation plan lists Goal 1.8 as **“**Maine's dam infrastructure is aging and the Dam Safety Program is currently understaffed, facing significant challenges with implementing dam risk reduction” and includes seven mitigation actions to achieve this goal. Through the implementation of both the goals outlined in the Androscoggin County Natural Hazard Mitigation Plan and the Maine State Hazard Mitigation Plan, Androscoggin County, and the state of Maine as a whole will be able to reduce long term vulnerability to high hazard dams.

Figure 59: 1987 Flood, North River Rd., Auburn, ME. Source: Lewiston Sun Journal

Element G Requirements
HHPD4-a. Did the plan include actions that address HHPDs and prioritize mitigation actions to reduce vulnerabilities from HHPDs?
HHPD4-a. Does the plan describe specific actions to address HHPDs?
HHPD4-b. Does the plan describe the criteria used to prioritize actions related to HHPDs?
HHPD4-c. Does the plan identify the position, office, department, or agency responsible for implementing and administering the action to mitigate hazards to or from HHPDs?

Dam Failure Mitigation Actions

As described in Element C – Mitigation Strategy, all 14 jurisdictions in Androscoggin County submitted local mitigation actions/projects to address natural hazards outlined in this plan. Four towns submitted projects for inclusion in this plan that were related to the rehabilitation of significant hazard dams. The Towns of Greene, Sabattus and Wales submitted projects for the Sabattus Pond (Sleeper) dam which is owned by the Sabattus Dam Commission. All three towns are part of the commission as the dam regulates the water level of Sabattus Pond and allows for recreational use of the lake. The Town of Turner submitted a project to assess and rehabilitate the Nezinscot Dam, which is owned by the Town. In the case of high hazard potential dams, these prioritization criteria all apply, with the addition of the Maine State Dam Safety Inspector's designation of hazard level to prioritize high hazard dams. Additional information related to these projects is included in Element C and Appendix A. However, as none of the 14 jurisdictions submitted projects related to high hazard dams, this element does not meet the requirements of qualify for the HHPD program. This document can still serve as guidance for inclusion in future Natural Hazard Mitigation Plans.

Figure 60: 1896 Flood, Turner, ME. Source: Leavitt Port Co.