ELK COUNTY HAZARD MITIGATION

Clarion River, Ridgway PA

Elk County Office of Emergency Services
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Michael McAllister, Director

2017 Plan Update

County officials began developing the county's first Hazard Mitigation Plan (HMP) in 2006 and worked closely with Carolyn Benish of FEMA throughout the process. In late 2010 PEMA hired the consultant Michael Baker Jr., Inc. to assist Elk County in completing the plan. Elk County's Hazard Mitigation Plan was formally adopted in 2011.

Local Mitigation Plans must be updated at least once every five years in order to continue to be eligible for FEMA hazard mitigation project grant funding. Specifically, the regulation at 44 CFR 201.6(d) (3) reads:

A local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval within five (5) years in order to continue to be eligible for mitigation funding. (Local Mitigation Plan Review Guide 2011)

The Planning Process

The Elk County Planning Department in cooperation with Elk County Emergency Management put together a Hazard Mitigation Planning Team (HMPT) in 2016 in order to prepare this update which included municipal officials and other stakeholders such as the Elk County Sheriff, local police force representatives and others. The HMPT assembled to review the plan in order to identify if there were any new hazards that affect the County, assess potential damages from those hazard events, select actions to address the County's vulnerability to such hazards, and develop an implementation-strategy action plan in order to mitigate potential losses.

Thank You

The Planning Department and Emergency Management would like to thank Michael Baker Jr., for generously allowing us to utilize the content of their original plan. Most of the original data remains unchanged however in order to incorporate updates to the plan, formatting changes needed to be made. A copy of Michael Baker Jr.'s original Hazard Mitigation Plan is available upon request.

We would also like to thank everyone that participated in the project by attending meetings or by providing updated data and pictures. Your input is much appreciated.

Mike McAllister, Director
Elk County Emergency Services

Jodi Foster, Director
Elk County Planning Department

EXECUTIVE SUMMARY

Overview

Hazard mitigation is any sustained action taken to reduce or eliminate long-term risk to life, property, and the environment resulting from natural and human-made hazards. The Elk County Hazard Mitigation Plan (HMP) was developed to identify the vulnerabilities and risks associated with hazards and to define a mitigation strategy to reduce these vulnerabilities. The Elk County HMP was adopted by the Elk County Board of Commissioners on May 14, 2018. The adopted and FEMA approved Elk County 2017 HMP can be accessed online here: www.co.elk.pa.us.

FEMA requires that all jurisdictions have an approved HMP every five years in order to maintain access to Hazard Mitigation Assistance grants. There are many activities that jurisdictions should take to socialize the plan, maintain the plan, implement mitigation actions from the plan, and to integrate the risk assessment and mitigation strategy from the plan into other community documents over the five years between plan updates. The Five-Year Planning Cycle outlines a planning process, including the conduct of annual HMP review meetings, which will ensure that Elk County concentrates on hazard mitigation throughout the five years to ensure the effectiveness of the HMP and to increase the efficiency in the next HMP update. Elk County will use the guidance and forms in the *Local Mitigation Planning Handbook* to guide the annual plan reviews and future update meetings: https://www.fema.gov/media-library/assets/documents/31598.

Figure 1: Five-Year HMP Planning Cycle

This Executive Summary and Integration Tool summarizes information from the HMP related to the planning process to create the HMP, as well as the risk assessment and mitigation strategy from the HMP, to enable better identification of information that can be integrated into other community plans to reduce risk in Elk County. By integrating risk assessment information into other plans, the community can ensure that there are no conflicting policies, especially related to project implementation or land use or development. Additionally, the Elk County Planning Department and Emergency Management Agency can enhance efficiency in project implementation by identifying potential redundant efforts or by identifying other resources for implementation. Guidance and information about plan integration is included in the *Plan Integration: Linking Local Planning Efforts*: https://www.fema.gov/media-library/assets/documents/108893.

All progress made on plan integration must be tracked and reported at annual meetings to include in the HMP update and to identify further areas for integration.

Hazard Mitigation Planning Process

Elk County developed an HMP in 2011 and this is the first update of the HMP since it was adopted. The Elk County Planning Department led a comprehensive update of the HMP beginning in 2016. The following agencies and organizations took part in the HMP update.

Planning Partners	
Elk County Emergency Management Agency	Elk County IT/GIS
Elk County Sheriff's Department	St. Marys Police Department
Elk County Housing Specialist	Benezette Township
Johnsonburg Borough	Ridgway Township
Pennsylvania Emergency Management Agency	Elk County Emergency Services

There were numerous changes made during the update process that were not reflected in the original plan. The update includes much more local information on past instances of hazardous events that impacted the county. It also includes more localized data that is relevant to Elk County such as: demographics, social characteristics, income, housing, etc. This was done in an effort to get a clearer picture of how local neighborhoods would be impacted during a hazardous event and what the economic losses would be as a result of a major incident.

The plan update doesn't reflect any significant increases or decreases in vulnerability to the hazards outlined in the plan except for flooding. Historic data does show an increase in the *frequency* of flooding events over the past twenty years. However, the severity of flooding, although still significant in some cases, is much less than decades ago. The implementation of flood control projects has helped to eliminate some of the worst flooding the county had seen in the past.

Risk Assessment

The HMP identifies twelve hazards that have the potential to impact Elk County. These hazards were ranked in order to identify the overall risk they pose. The PA STEEL methodology was used to determine ranking. PA STEEL weighs several criteria to determine ranking. The criteria include: Political, Administrative, Social, Technical, Economic, Environmental, & Legal. Table 6-4 on pages 148-151 summarizes the findings.

Mitigation Strategy

The plan update recognizes mitigation actions that have been completed during the previous five years since the original plan was written. New mitigation actions have been added and will be updated annually as projects are completed.

In order to develop the Mitigation Strategy, the planning team identified their goals and objectives for reducing risk in Elk County and then identified mitigation actions to implement between plan updates to meet these goals and objectives.

Goals and Objectives

A list of Goals and Objectives can be found on page 135 in Table 6-1. These will be updated annually as projects are completed.

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1. Introduction

1.1 Background

Across the United States, natural and human-caused disasters have led to increasing levels of deaths, injuries, property damage, and interruption of business and government services. The time, money, and efforts to recover from these disasters exhaust resources, diverting attention from important public programs and private agendas. The emergency management community, citizens, elected officials and other stakeholders in Elk County, Pennsylvania recognize the impact of disasters on their community and support proactive efforts needed to reduce the impact of natural and human-caused hazards.

Hazard mitigation describes sustained actions taken to prevent or minimize long-term risks to l i f e and property from hazards and create successive benefits over time. Pre-disaster mitigation actions are taken in advance of a hazard event and are essential to breaking the disaster cycle of damage, reconstruction, and repeated damage. With careful selection, successful mitigation actions are cost-effective means of reducing risk of loss over the long-term.

Accordingly, the Elk County Hazard Mitigation Planning Team (HMPT) in cooperation with elected officials of the County and its municipalities prepared a Hazard Mitigation Plan (HMP). The Plan is the result of work by citizens of the County to develop a pre-disaster multi- hazard mitigation plan that will not only guide the County towards greater disaster resistance, but will also respect the character and needs of the community.

PEMA/FEMA requires that the plan be updated every five (5) years in order to keep the plan relevant by eliminating mitigation strategies that have been fulfilled and adding new strategies as events warrant. As was true with development of the initial plan, a core group of officials from the County, its municipalities, and emergency services personnel have worked together to provide this updated version of the Hazard Mitigation Plan.

1.2 Purpose

This Hazard Mitigation Plan Update was developed for the purpose of:

- Providing a blueprint for reducing property damage and saving lives from the effects of future natural and man-made disasters in Elk County;
- Qualifying the County for pre-disaster and post-disaster grant funding;
- Complying with state and federal legislative requirements related to local hazard mitigation planning;
- Demonstrating a firm local commitment to hazard mitigation principles; and
- Improving community resiliency following a disaster event.

The Disaster Mitigation Act of 2000 (DMA 2000), Section 322 requires that local governments (communities/counties), as a condition of receiving federal disaster mitigation funds, have a mitigation plan that describes the process for identifying hazards, creating a risk assessment and vulnerability analysis, identifying and prioritizing mitigation strategies, and developing and

implementation schedule for the County and each of the municipalities.

Congress authorized the establishment of a Federal grant program to provide financial assistance to States and communities for flood mitigation planning and activities. The Federal Emergency Management Agency (FEMA) has designated this Flood Mitigation Assistance (FMA).

1.3 Scope

The Elk County 2017 HMP update has been prepared to meet requirements set forth by the FEMA and (PEMA) to maintain and continually address both natural and human-made hazards determined to be of significant risk to the County and/or its local municipalities. Updates will take place following significant disasters or at a minimum, once a year.

1.4 Authority and References

Authority for this plan originates from the following federal sources:

- Robert T. Stafford Disaster Relief and Emergency Assistance Act, 42 U.S.C., Section 322, as amended;
- Code of Federal Regulations (CFR), Title 44, Parts 201 and 206; and
- Disaster Mitigation Act of 2000, Public Law 106-390, as amended.
- National Flood Insurance Act of 1968, as amended, 42 U.S.C. 4001 et seq.

Authority for this plan originates from the following Commonwealth of Pennsylvania sources:

- Pennsylvania Emergency Management Services Code. Title 35, Pa C.S. Section 101.
- Pennsylvania Municipalities Planning Code of 1968, Act 247 as reenacted and amended by Act 170 of 1988.
- Pennsylvania Stormwater Management Act of October 4, 1978. P.L. 864, No. 167.

The following Federal Emergency Management Agency (FEMA) guides and reference documents were used to prepare this document:

- FEMA 386-1: Getting Started. September 2002.
- FEMA 386-2: Understanding Your Risks: Identifying Hazards and Estimating Losses. August 2001.
- FEMA 386-3: Developing the Mitigation Plan. April 2003.
- FEMA 386-4: Bringing the Plan to Life. August 2003.
- FEMA 386-5: Using Benefit-Cost Review in Mitigation Planning. May 2007.
- FEMA 386-6: Integrating Historic Property and Cultural Resource Considerations into Hazard Mitigation Planning. May 2005.
- FEMA 386-7: Integrating Manmade Hazards into Mitigation Planning. September 2003.
- FEMA 386-8: Multijurisdictional Mitigation Planning. August 2006.
- FEMA 386-9: Using the Hazard Mitigation Plan to Prepare Successful Mitigation

Projects. August 2008.

- FEMA Local Multi-Hazard Mitigation Planning Guidance. July 1, 2008.

FEMA National Fire Incident Reporting System 5.0: Complete Reference Guide.

- January, 2008.

The following Pennsylvania Emergency Management Agency (PEMA) guides and reference documents were used prepare this document:

- PEMA: Hazard Mitigation Planning Made Easy!
- PEMA Mitigation Ideas: Potential Mitigation Measures by Hazard Type; A Mitigation Planning Tool for Communities. March 6, 2009.
- PEMA: Draft Standard Operating Guide. October 9, 2009.

The following additional guidance document produced by the National Fire Protection Association (NFPA) was used to create this plan:

NFPA 1600: Standard on Disaster/Emergency Management and Business Continuity Programs. 2007.

2. Community Profile

2.1 Geography and Environment

Elk County is an approximately 830 square mile county located in north central Pennsylvania (Figure 2-1). It shares borders with Clearfield and Jefferson Counties to the south, Forest County to the west, McKean County to the north, and Cameron County to the east.

Elk County is a predominantly rural county which lies in the Allegheny Mountain section of the Appalachian Plateaus Physiographic Province. The County contains the Eastern Continental Divide. The County's topography is classified by steep valleys and flat plateaus at higher elevations. The landscape is generally rugged and heavily wooded.

Elk County contains two major watersheds (the Clarion River and Sinnemahoning Creek watersheds) and one watershed complex (the West Creek/Elk Creek/Little Toby Creek watershed complex). The watersheds of Elk County are displayed in Figure 2-2.

2.2 Community Facts

Elk County was formed in 1843 out of lands of Jefferson, Clearfield, and McKean Counties. Elk County is named for the herd of elk that inhabits the County. The herd is one of the two only wild elk herds east of the Mississippi (General Engineering, Inc., 1999). The elk herd in Elk and Cameron Counties numbers approximately 1,000 animals (Elk Country Visitor's Center 2016)

The first inhabitants of the land area that is now Elk County were presumed to be the Seneca or Cornplanter Indians. The area was settled as early as 1787 by immigrants from Baltimore and Philadelphia. The immigrants established farms however, it was apparent that County would not be able to prosper agriculturally and they began lumber and logging the resources of the County's vast forest. Elk County's economy evolved from logging and lumber to coal mining and the tanning business. Today, the County's economy thrives on carbon graphite and powdered metals manufacturing and the County is renowned for its powdered metal plants.

Elk County is also a producer of fine hardwood. Forest resources are significant for timbering, tourism, and aesthetics, recreation, and conservation. The lumber and wood product industry and paper mills and product industries are large employers in the County.

Elk County lies on the edge of Pennsylvania's main bituminous coal field and has several bituminous coal seams running throughout the County which have been mined primarily in surface mining operations. The discovery of deep deposits of natural gas in the Marcellus and Utica Shale formations produce moderate amounts of natural gas in the County. Small amounts of stone are quarried as well.

NATIONAL MITIGATION FRAMEWORK

Seven Core Capabilities:

- Threats and Hazard Identification
- Risk and Disaster Resilience Assessment
- Planning
- Community Resilience
- Public Information and Warning
- Long-Term Vulnerability Reduction
- Operational Coordination

Hazard Mitigation is the only phase of emergency management specifically dedicated to breaking the cycle of damage, reconstruction, and repeated damage.

FEMA's Hazard Mitigation Assistance Guidance

Figure 2-1: Base map of Elk County (Elk County GIS Department, 2010; ESRI, 1997, 2003)

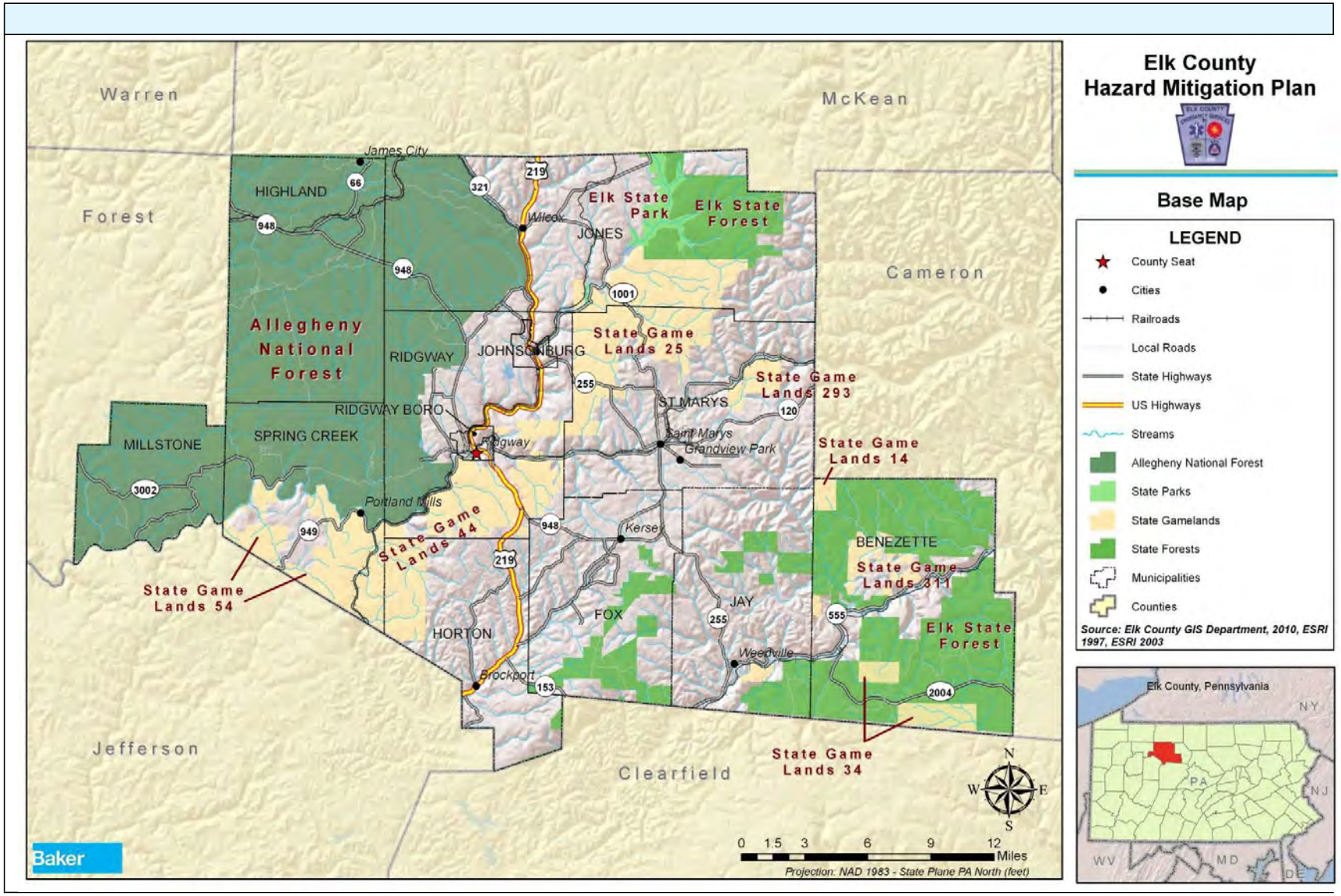
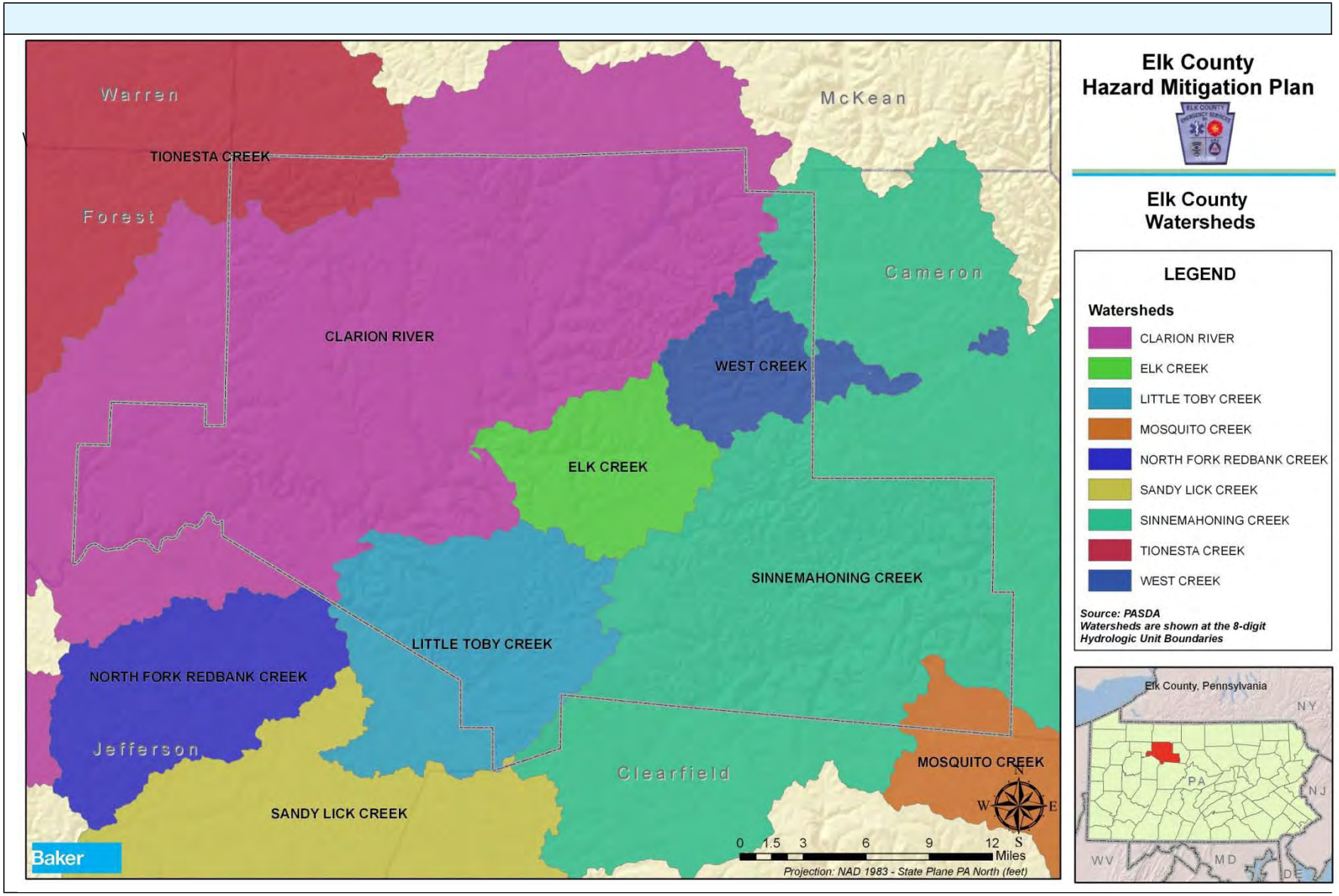


Figure 2-2: Watersheds of Elk County (PASDA, 2010).



2.3 Population and Demographics

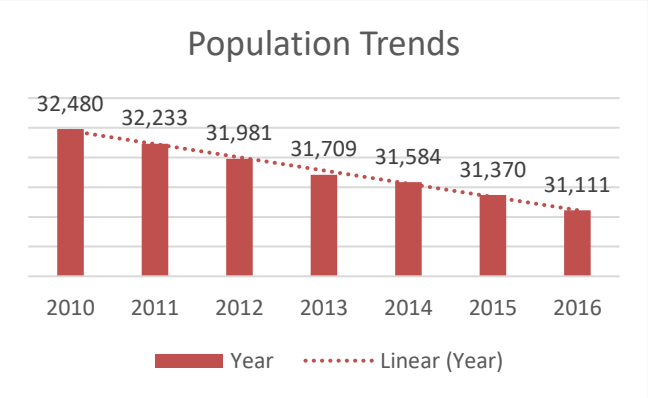
According to the 2010 Census, the population of Elk County is 31,946. The Census estimates that in 2016, Elk County's population decreased to 31,111 people. Population density is highest in Ridgway Borough with a 2010 Census population density of 1,568 people per square mile. Table 2-1 provides a distribution of County population per municipality obtained from the U.S. Census Bureau, Population Estimates Program. Note that 2016 populations are estimated projections based on 2010 Census results. The Census results for small rural areas have a high margin of error which should be considered when reviewing the data.

Table 2-1: List of municipalities in Elk County and associated populations (U.S. Census, 2010, 2016).

MUNICIPALITY	2010 POPULATION	2016 ESTIMATED POPULATION	MARGIN OF ERROR (+ or -)	PERCENT CHANGE (%)
Benezette Township	207	231	**61**	**+11.59%**
Fox Township	3630	3542	**27**	**-2.42%**
Highland Township	492	441	**81**	**-10.37%**
Horton Township	1452	1502	**180**	**+3.44%**
Jay Township	2072	2090	**213**	**+0.87%**
Johnsonburg Borough	2483	2469	**221**	**+0.56%**
Jones Township	1624	1494	**132**	**-8.00%**
Millstone Township	82	71	**25**	**-13.41%**
Ridgway Borough	4078	3926	**37**	**-3.73%**
Ridgway Township	2523	2447	**136**	**-3.01%**
Spring Creek Township	233	150	**34**	**-35.62%**
City of St. Mary's	13070	12748	**20**	**-2.46%**
TOTAL	31946	31111	*******	**-2.61%**

Elk County's population had been steadily decreasing for the last decade. The decrease is predicted to continue in the future. This trend could be attributed to the migration of the younger generation out of the area, a negative birth/death ratio, and the aging population.

Figure 2-3 Population Trends according to the American Community Survey.



According to the U.S. Census Bureau, Pennsylvania's population increased 0.8% between 2010 and 2017.

There is a slightly larger female population than male. Females number 16,003 or 50.3% while males number 15,796 or 49.7%. The median age of the County population is 45.6 years with eighty-one percent of the population over 18 years of age and approximately nineteen percent 65 years or older. There are an estimated 17,576 housing units. (U.S. Census ACS, 2014 5-Year Estimate) The median value of an owner occupied home in the County is $92,100, well below the state average of $174,100.

2.3.1 Social Characteristics

There are 13,212 total households in the county. As of the 2010 Census, 9,048 were families with children less than 18 years of age. 7,142 are married couple families. There are approximately 663 or 5% that are male headed households, with no wife present. The number of female householders, with no husband present is 1,223. The average family size is 2.92 which is slightly higher than the state and national average of 2.49 and 2.64 respectively.

Elk County has historically lacked diversity in population in terms of race, ethnicity, and national origin. The county is predominantly white at 98.4%, which is 21% higher than the state's overall white population of 77% and although the majority of citizens recognize their ancestry as German, Italian, and Irish, 98.6% were born in the United States. (2010 US Census) The remainder of the population is identified as Black or African American alone, Asian alone, American Indian or Alaskan Native alone totaling 1.6%. There is also a small population of Latino or Hispanic citizens which the US Census Bureau defines as an ethnicity, not a race.

2.3.2 Disability

The U.S. Census Bureau estimates there are 4,774 persons with disabilities in Elk County. The disability can be classified as one or more of the following: hearing difficulty, vision difficulty, cognitive difficulty, ambulatory difficulty, self-care difficulty, or an independent living difficulty. There are an almost even number of males as there are females with disabilities. Males number 2,398 while females with a disability total 2,376. Minorities with disabilities are as follows: Black or African American alone, 42; Asian alone, 50; Two or more races, 10 and Hispanic or Latino (of any race), 54.

2.3.3 Income

The median income of households in Elk County is $45,767. This is more than $9,127 less than the state median household income of $54,895 and $6,000 less than the national median income. (U.S. Census ACS, 2012-2013). Approximately ten percent of the County population lives in poverty, slightly lower than the state poverty rate of 12.9%.

2.3.4 Education

50.8% of the residents in Elk County have graduated from high school. 2,483 or 10.7% have an Associate's Degree; 2,640 or 11.4% have a Bachelor's Degree; and 1,603 or 4.6% have a Graduate or professional degree. 9.1% or 2,118 have no high school diploma.

2.4 Land Use and Development

Over ninety-three percent of Elk County is forested (Figure 2-5). Large tracts of this forest land are owned by state and private landowners. More than 50% of the County's land area is publically owned. Because of the County's steep slopes and large percentage of publically-held land, the County has limited availability for development.

In addition, farming is limited, with only 23,488 acres of the County's land area as agricultural land. According to the USDA's Agricultural Census, in 2012 Elk County had 271 farms, with the average size being 87 acres. That number is down 28% from the 2007 count of 376 farms. The market value of products sold is $4,229,000. The largest commodity by value of sales is milk from cows followed by other crops and hay. (US Dept. of Ag, 2016)

Transportation facilities within Elk County include highway, rail, and air facilities. U.S. Route 219 is the major north-south highway and U.S. Route 120 is the major east-west highway. U.S. Route 219 is a two-lane highway with significant logging, coal, and other truck traffic (DCED, 2005). In addition, State Route 255 connects St. Mary's to Dubois and connects to I-80. Elk County has only one commercial airport, the Dubois Regional Airport. Rail services are provided predominantly by Conrail and the Baltimore and Ohio System.

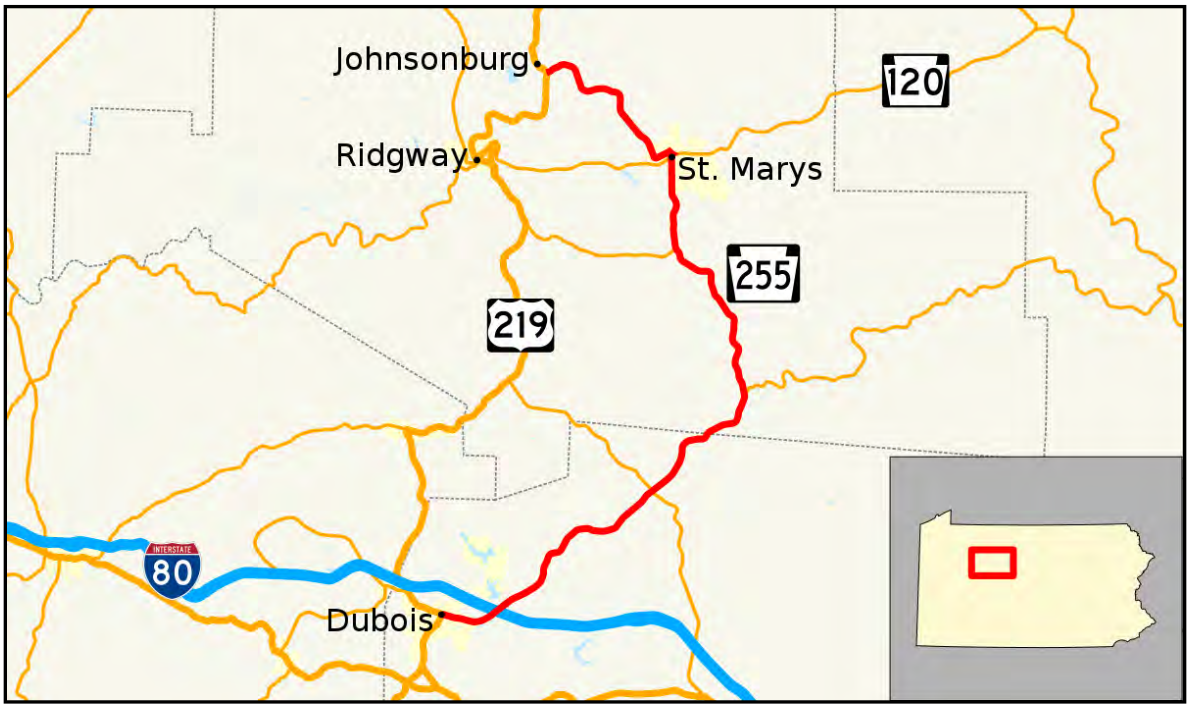


Figure 2-4 Major highways in Elk County

Figure 2-5: Elk County land cover (MRCL Consortium, 2001).

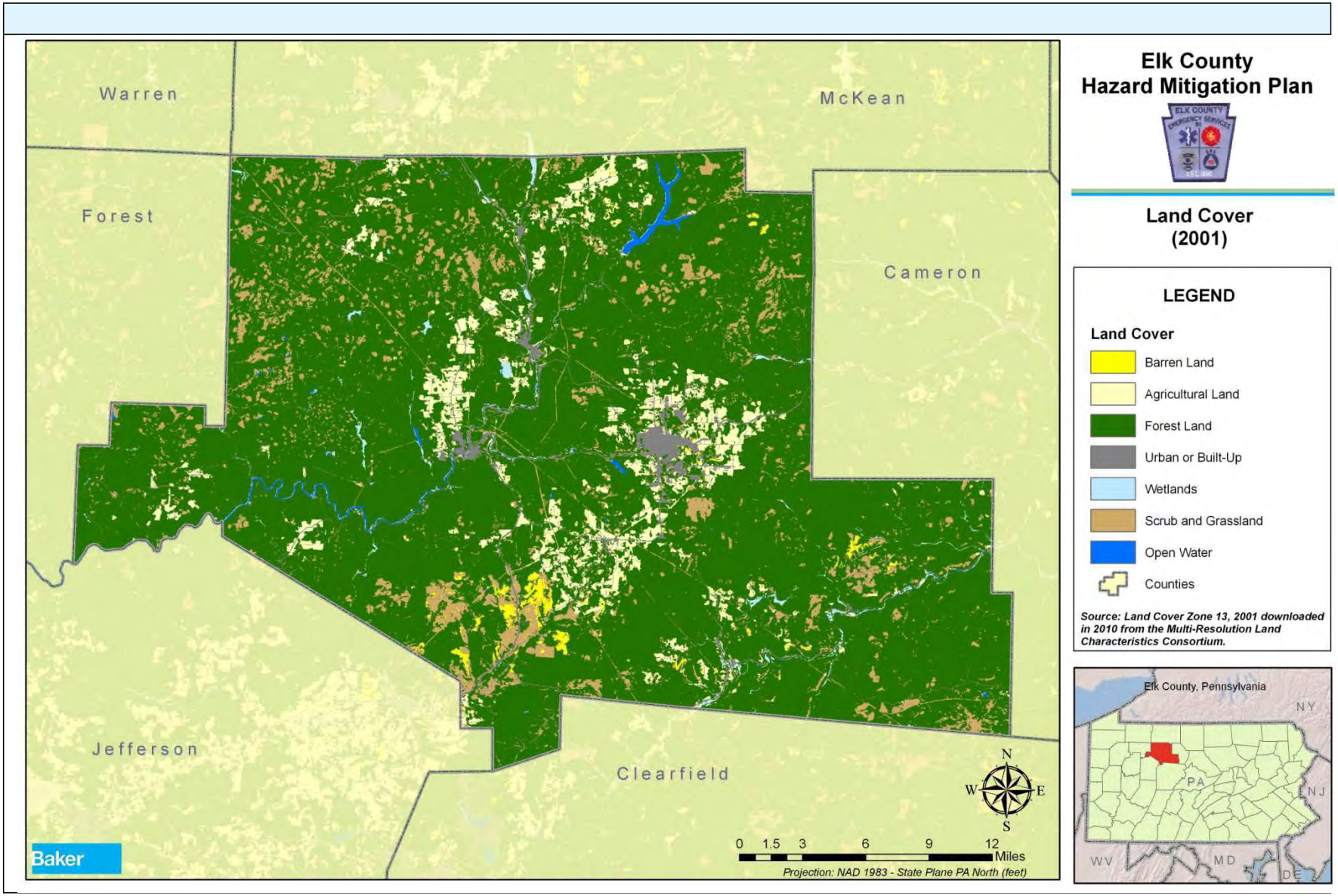
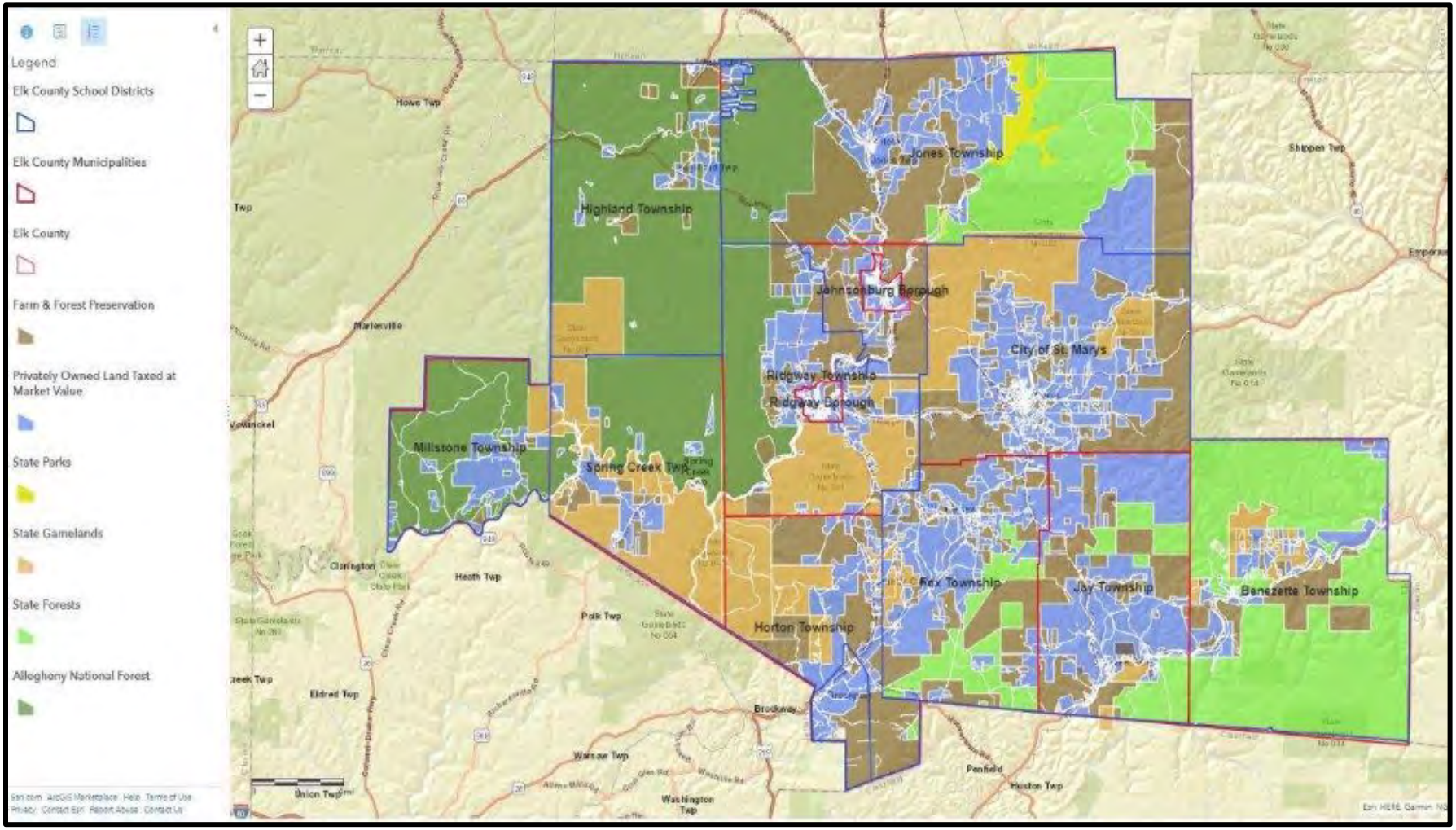


Figure 2-6: Land coverage map depicting public vs. private lands. Interactive map can be found on Elk County's website by visiting: www.co.elk.pa.us.



2.5 Data Sources and Limitations

In order to assess the vulnerability of different jurisdictions to the hazards, data on past occurrences of damaging hazard events was gathered. For a number of historic natural-hazard events, the National Climatic Data Center (NCDC) database was utilized. NCDC is a division of the US Department of Commerce's National Oceanic and Atmospheric Administration (NOAA). Information on hazard events is compiled by NCDC from data gathered by the National Weather Service (NWS), another division of NOAA. NCDC then presents it on their website in various formats. The data used for this plan came the US Storm Events database, which "documents the occurrence of storms and other significant weather phenomena having sufficient intensity to cause loss of life, injuries, significant property damage, and/or disruption to commerce" (NOAA, 2016).

Additional information used to complete the risk assessment for this plan was taken from various government agency and non-government agency sources. Those sources are cited where appropriate throughout the plan with full references listed in **Appendix A – Bibliography**. It should be noted that numerous GIS datasets were obtained from the Pennsylvania Spatial Data Access (PASDA) website (http://www.pasda.psu.edu/). PASDA is the official public access geospatial information clearinghouse for the Commonwealth of Pennsylvania. PASDA was developed by the Pennsylvania State University as a service to the citizens, governments, and businesses of the Commonwealth. PASDA is a cooperative project of the Governor's Office of Administration, Office for Information Technology, Geospatial Technologies Office and the Penn State Institutes of Energy and the Environment of the Pennsylvania State University.

The Elk County Tax Assessment dataset was used as an inventory of structures throughout the County. The data set distinguishes between commercial, residential, and rental properties. (Elk County Tax Claim Bureau, 2016)

The flood hazard area data used in this plan is the countywide Digital Flood Insurance Rate Map (DFIRM), released January 18, 2012. This data provides flood frequency and elevation information used in the flood hazard risk assessment. Other GIS datasets including *streams, street centerlines, watersheds,* and *state- and nationally-owned lands* were provided by the Elk County GIS Department. Population data from the 2010 Census and 2014 estimated populations were obtained from the U.S. Census Bureau in 2016. The County is not confident in the precision of the 2014 population values. The US Census Bureau recognizes that the small rural populations are difficult to estimate accurately because of an inadequate sample size.

HAZUS-MH is a powerful risk assessment methodology for analyzing potential losses from floods, hurricane winds and earthquakes. In HAZUS-MH, current scientific and engineering knowledge is coupled with the latest GIS technology to produce estimates of hazard-related damage before, or after, a disaster occurs. This software was used to estimate losses for floods in Elk County.

This HMP evaluates the vulnerability of the County's critical facilities. For the purposes of this plan, critical facilities are those entities that are essential to the health and welfare of the community. The list of critical facilities was largely extracted from the list of State Critical Facilities identified during the creation of the Commonwealth of Pennsylvania 2010 All-Hazard Mitigation Plan and was finalized in consultation with the Elk County Office of Emergency Management. This includes law enforcement, emergency response, medical services, and schools. For a complete listing of critical facilities, please see **Appendix C**.

3. Planning Process

3.1 Planning Process and Participation Summary

Beginning in early 2016, a group of stakeholders from Elk and McKean Counties were requested to meet with PEMA to discuss updating their Hazard Mitigation Plans. During the course of the meeting it was determined that because both counties' plans were due to be updated at the same time, we could collaborate and help each other through the process. Unfortunately, McKean County encountered difficulties when key personnel retired and their schedule no longer kept pace with Elk County. In order to continue progress, the Elk County Planning Department in cooperation with Elk County Emergency Management put together a Hazard Mitigation Planning Team in 2016 in order to prepare this update which included municipal officials and other stakeholders such as the Elk County Sheriff, local police force representatives, fire and ambulance personnel and others. The HMPT assembled to review the plan in order to identify if there were any new hazards that affect the County, assess potential damages from those hazard events, select actions to address the County's vulnerability to such hazards, and develop an implementation-strategy action plan in order to mitigate potential losses. All available meeting and participation documentation can be found in **Appendix E.**

In order to obtain information from municipalities and other stakeholders, forms and surveys were distributed and collected throughout the planning process. Table 3-1 lists each municipality along with their specific participation and contributions to the planning process.

Table 3-1: Summary of participation from local municipalities during the Hazard Mitigation Planning Process.

MUNICIPALITY	WORKSHEETS/SURVEYS/FORMS		MEETINGS	
	RECEIVED CAPABILITY ASSESSMENT SURVEY	RECEIVED HAZARD RISK ASSESSMENT QUESTIONNAIRE	ATTENDED FIRST MEETING	ATTENDED FINAL MEETING
Benezette Township	✓	✓	✓	
Fox Township	✓	✓	✓	
Highland Township	✓	✓		
Horton Township	✓	✓		✓
Jay Township	✓	✓		✓

Johnsonburg Borough	✓	✓	✓	✓
Jones Township	✓	✓	✓	
Millstone Township	✓	✓		
Ridgway Borough	✓	✓		
Ridgway Township	✓	✓	✓	✓
City of St. Marys	✓	✓	✓	✓
Spring Creek Township	✓	✓	✓	

3.2 The Planning Team

The Hazard Mitigation Planning Team for the 2017 HMP Update included:

1. Michael McAllister, Director, Elk County Office of Emergency Management
2. Jodi Foster, Elk County Planning Department
3. Richard Gavazzi, Elk County Housing Specialist
4. Todd Calteragone, Elk County Sheriff
5. Ray Imhoff, Elk County Emergency Services
6. Jim Abbey, Elk County IT/GIS

3.3 Meetings and Documentation

- **March 3, 2016- Notice Plan Update Due**
- **May 25, 2016 – Initial HM Update Planning Team Meeting**
- **November 16, 2016-Initial Stakeholders Meeting**
  Meeting attendees were introduced to the Planning Team and informed of the update process. Surveys were distributed to those in attendance.
- **June 16, 2017- Elk County Commissioners Meeting**
  Public meeting to discuss the Hazard Mitigation Plan and to encourage citizen's participation via the survey available on the county's website
- **Feb – March 2017- Local Fire Departments** Numerous meetings were held with the Chiefs of the local fire departments to discuss Hazard Mitigation and Wildfire Protection.
- **May 24, 2017 – Ambulance Directors-**Phone interviews conducted with two of the larger ambulance providers in Elk County to determine their hazard mitigation readiness.
- **May 24, 2017-Hospital Personnel-**Phone interview with Director of Maintenance in charge of emergency operations.
- **October 2, 2017-Red Cross-**Phone interview with Executive Director to determine shelter location and readiness for the area.
- **October 25, 2017-Draft plan Published-** A draft of the plan was published on Elk County's website. The comment period ended on December 1, 2017. No comments were received. See Appendix J.
- **October 26, 2017 – Final Stakeholders & Public meeting**
  Meeting to review the draft plan.

The meeting was advertised in local newspapers. The meeting invitations in **Appendix E** reflect the meeting date and the results of the public participation.

3.4 Public and Stakeholder Participation

Each municipality was given the opportunity to participate in the HMP process through invitation meetings, review of risk assessment results and mitigation actions, and an opportunity to comment on a final draft of the HMP. The tools listed below were distributed to solicit information, and comments from local municipalities in Elk County. Responses to these worksheets and surveys are included in **Appendix G**:

1) ***Capability Assessment Survey***: Collects information on local planning, regulatory, administrative, technical, fiscal, political, and resiliency capabilities that can be included in the countywide mitigation strategy.

2) ***Hazard Risk Assessment Questionnaire:*** Provides stakeholders the opportunity to identify hazards, comment on mitigation goals and objectives and identify mitigation actions that they would like to implement over the next five years.

The stakeholders listed in Table 3-2 served on the 2017 countywide HMPT and actively participated in the planning process through attendance at meetings, completion of assessment surveys, or submission of comments.

Table 3-2: Stakeholders who participated in the planning process.

MUNICIPALITY/ORGANIZATION	PARTICIPANT/TITLE
Benezette Township	Doug Ruffo, Supervisor
Fox Township	Scott Surra, Fire Chief
Highland Township	Bill Edinger, Fire Chief
Johnsonburg Borough	Jack Fowler, EMC
Jones Township	Laurie Storrar, Township Supervisor and Secretary
Ridgway Borough	Raymond Imhof/EMA Coordinator
Ridgway Township	Michelle Bogacki & Milly Bowers
St. Marys City	Tom Nicklas, Chief of Police
Elk County Planning	Richard Gavazzi, Housing Specialist
Elk County Sheriff	Todd Caltagarone, Sheriff
Elk County IT/GIS	Jim Abbey, IT/GIS Director
Elk County Prison	Greg Gebauer, Elk County Prison Warden

Updates on the HMP development process were given at the Elk County Commissioner's meetings. The Elk County Planning Director provided information to the Board and allowed for questions and comments.

Community participation and comment was encouraged throughout the planning process. A newspaper notice was published in the Ridgway Record and the Daily Press to notify the citizens of Elk County that a survey was available on the Elk County Planning Department's website (www.co.elk.pa.us). Citizens were encouraged to complete the survey and return it to the Planning Department. There were 1,292 hits on the link but only one (1) citizen actually submitted the survey. A copy of the survey and the results can be found in **Appendix H**.

3.5 Multi-Jurisdictional Planning

The original HMP, written by Michael Baker, Jr. was developed using a multi-jurisdictional approach. With funding support from PEMA, County level departments had resources such as technical expertise and data which local jurisdictions lacked. Involvement from local municipalities was critical to the collection of local knowledge related to hazard events. Local municipalities also have the legal authority to enforce compliance with land use planning and development issues. Effort was made to involve all 12 municipalities in the planning process. Table 3-1 lists jurisdictional participation in the **2016 HMP Update**.

Each municipality was emailed an invitation to the final public meeting. Surveys and forms were mailed or emailed to jurisdictions along with letters requesting that local information be provided. Ten of the 12 municipalities in the County participated in the planning process by attending meetings and/or providing information.

A similar approach was used during the HMP **Update** however, because many hazards were already identified and the risk unchanged, the planning process was not quite as rigorous as initial plan development. During the update process, eight (8) of the 12 municipalities participated. See Table 3-21 for list of participants.

3.6 Existing Planning Mechanisms

There are numerous existing regulatory and planning mechanisms in place at the state, County, and municipal level of government which support hazard mitigation planning efforts. These tools include the Commonwealth of Pennsylvania Standard All-Hazard Mitigation Plan, local floodplain management ordinances, the Elk County Comprehensive Plan, Elk County Emergency Operations Plan, Elk County Hazard Vulnerability Analysis, the Elk County Act 167 Storm Water Management Plan, Elk County Flood Mitigation Plan, a Community Wildfire Protection Plan, local Emergency Operation Plans, local zoning ordinances, local subdivision and land development ordinances, local Source Water Protection Plans and local comprehensive plans. These mechanisms are described in Section 5 and information from several of these documents has been incorporated into this plan.

Information on identified development constraints and potential future growth areas was incorporated from the Elk County Comprehensive Plan and information from county officials so that vulnerability pertaining to future development could be established. The County Hazard Vulnerability Analysis provided direction for hazard identification as well as information on past

occurrences including anecdotal information. Floodplain management ordinance information was used to aid in the establishment of local capabilities in addition to participation in the NFIP.

4. Risk Assessment

4.1 Process Summary

This risk assessment provides a factual basis for activities proposed by the County in their mitigation strategy. Hazards that may affect Elk County are identified and defined in terms of location and geographic extent, magnitude of impact, previous events and likelihood of future occurrence.

The Hazard Mitigation Steering Committee (HMSC) identified natural and human-made hazards, during creation of the original HMP, which have the potential to impact Elk County. The occurrence of a past hazard event in the County provided an indication of future possible incidence, but the fact that a hazard event has not previously occurred did not exclude the hazard from further investigation. Similarly, limited past occurrences of hazard events did not solely warrant a hazard's inclusion in the plan. The hazards considered to be the most significant hazards for Elk County included: Flood, Flash Flood, and Ice Jam, Winter Storm, Wildfire, Drought, Landslide, Tornado and Windstorm, Transportation Accidents, Hazardous Materials, Dam Failure, Urban Fire and Explosion, Fuel Shortages, and Terrorism. Hazard profiles were then developed in order to define the characteristics of each hazard as it applies to the County.

Following hazard identification and profiling, a vulnerability assessment was performed to identify the impact of natural or human-caused hazard events on people, buildings, infrastructure and the community. Each natural and human-made hazard is discussed in terms of its potential impact on individual communities in Elk County, including the types of structures and infrastructure that may be at risk. The assessment allows the County and its municipalities to focus mitigation efforts on areas most likely to be damaged or most likely to require early response to a hazard event. A vulnerability analysis was performed which identifies structures, critical facilities or people that may be impacted by hazard events and describes what those events can do to physical, social and economic assets. Depending upon the type of hazard and the data available, assessment results consist of an inventory of vulnerable structures or populations. For more information on data sources and limitations, please see Section 2. This information was not expected to change during the HM Update process.

Section 4 provides a summary of previous disaster declarations affecting Elk County as well as a review of hazards identified as having the potential to impact the County in 2017. These hazards have not changed since the plan was originally written so these statistics are still relevant for the updated plan. Only the most current and credible sources were used to complete the hazard profiles included in Section 4; see citations and **Appendix A- Bibliography** for source details.

4.2 Hazard Identification

4.2.1 Table of Presidential Disaster Declarations

Presidential Disaster and Emergency Declarations are issued when it has been determined that state and local governments need assistance in responding to a disaster event. Table 4-1 identifies Presidential Disaster and Emergency Declarations issued between 1955 through 2016 that have affected Elk County.

In addition to these Presidentially-declared events, twelve events warranted Gubernatorial Disaster Declarations or Proclamations. *Ten additional disaster declarations were added beginning in 2010 as part of the update process.* Table 4-2 lists Gubernatorial Disaster Declarations or Proclamations that have been issued for Elk County between 1963 and 2016 with the most current listed first.

Table 4-1: Presidential Disaster and Emergency Declarations affecting Elk County. (PEMA, 2017)

DECLARATION NUMBER	DATE	EVENT
3356	October 2012	Emergency declaration-Hurricane Sandy
3235	September, 2005	Proclamation of Emergency – Hurricane Katrina
1557	September, 2004	Tropical Depression Ivan
1497	September, 2003	Hurricane Isabel/Henri
1294	September, 1999	Hurricane Floyd
1085	January, 1996	Severe Winter Storms
1093	January, 1996	Flooding
1015	January, 1994	Severe Winter Storms
3105	March, 1993	Blizzard
340	June, 1972	Flood (Agnes)

Table 4-2: Gubernatorial Disaster Declarations or Proclamations affecting Elk County. (PEMA, 2017)

DATE	EVENT
January, 2016	Winter Storm
June, 2015	Severe Weather
January, 2015	Winter Storm
February, 2014	Winter Storm
January, 2014	Extended Prolonged Cold
June, 2013	Severe Weather
October, 2012	Hurricane Sandy
April 2012	Spring Storm
August-November 2011	Hurricane Irene
January, 2011	Winter Storm
February, 2010	Winter Storm
April, 2007	Proclamation of Emergency - Severe Winter Storm
February, 2007	Proclamation of Emergency - Regulations

February, 2007	Proclamation of Emergency - Severe Winter Storm
September, 2006	Proclamation of Emergency - Tropical Depression Ernesto
September, 2005	Proclamation of Emergency - Hurricane Katrina
December, 1998	Drought
February, 1978	Blizzard
January, 1978	Heavy Snow
February, 1974	Truckers Strike
February, 1972	Heavy Snow
January, 1966	Heavy Snow
September, 1963	Drought

Elk County has also received Small Business Administration Disaster Assistance for a number of disaster events. A Small Business Administration Disaster Declaration qualifies communities for access to affordable, timely, and accessible financial assistance. Table 4-3 illustrates Small Business Administration Disaster Declarations issued for Elk County between 1954 and 2016. *The May 2014 event is the only declaration as of 2016.*

Table 4-3: Small Business Administration Disaster Declarations affecting Elk County. (SBA, 2017)

DATE	EVENT
May, 2014	Flooding
April, 2003	Fire
March, 2003	Fire

Since 1955, declarations have been issued for various hazard events including hurricanes or tropical storms, severe winter storms, and flooding. A unique Presidential Emergency Declaration was issued in September, 2005. Through Emergency Declaration 3235, President George W. Bush declared that a state of emergency existed in the Commonwealth of Pennsylvania and ordered federal aid to supplement Commonwealth and local response efforts to help people evacuated from their homes due to Hurricane Katrina. All counties within the Commonwealth, including Elk County, were indirectly affected by Hurricane Katrina as a result of evacuee assistance.

4.2.2 Summary of Hazards

Hazards were considered, identified and profiled initially in 2006 by the HMSC with assistance from FEMA and PEMA. In order to format and finalize the HMP the identified hazards were updated using Pennsylvania's standard list of hazards. This list was obtained primarily from the 2007 Edition of the National Fire Protection Association's NFPA 1600: Standard on Disaster/Emergency Management and Business Continuity Programs (NFPA, 2007). Twelve hazards were identified as the most significant to Elk County and risk was assessed for each.

Table 4-4 contains a complete list and description of the twelve hazards which have the potential to affect Elk County as identified through previous occurrences, expected future

significance and input from those that participated in the 2011 planning process. Hazard profiles are included for each of these hazards.

Table 4-4: List and description of natural and human-made hazards profiled in the 2011 HMP.

Natural Hazards

Drought

Drought is a natural climatic condition which occurs in virtually all climates, the consequence of a natural reduction in the amount of precipitation experienced over a long period of time, usually a season or more in length. High temperatures, prolonged winds, and low relative humidity can exacerbate the severity of drought. This hazard is of particular concern in Pennsylvania due to the presence of farms as well as water-dependent industries and recreation areas across the Commonwealth. A prolonged drought could severely impact these sectors of the local economy, as well as residents who depend on wells for drinking water and other personal uses (National Drought Mitigation Center, 2006).

Flood, Flash Flood, & Ice Jam

Flooding is the temporary condition of partial or complete inundation on normally dry land and it is the most frequent and costly of all hazards in Pennsylvania. Flooding events are generally the result of excessive precipitation. General flooding is typically experienced when precipitation occurs over a given river basin for an extended period of time. Flash flooding is usually a result of heavy localized precipitation falling in a short time period over a given location, often along mountain streams and in urban areas where much of the ground is covered by impervious surfaces. The severity of a flood event is dependent upon a combination of stream and river basin topography and physiography, hydrology, precipitation and weather patterns, present soil moisture conditions, the degree of vegetative clearing as well as the presence of impervious surfaces in and around flood-prone areas. Winter flooding can include ice jams which occur when warm temperatures and heavy rain cause snow to melt rapidly. Snow melt combined with heavy rains can cause frozen rivers to swell, which breaks the ice layer on top of a river. The ice layer often breaks into large chunks, which float downstream, piling up in narrow passages and near other obstructions such as bridges and dams. All forms of flooding can damage infrastructure (USACE, 2007).

Landslide

A landslide is the downward and outward movement of slope-forming soil, rock and vegetation reacting to the force of gravity. Landslides may be t triggered by both natural and human-caused changes in the environment, including heavy rain, rapid snow melt, steepening of slopes due to construction or erosion, earthquakes and changes in groundwater levels. Mudflows, mudslides, rockfalls, rockslides and rock topples are all forms of a landslide. Areas that are generally prone to landslide hazards include previous landslide areas, the bases of steep slopes, the bases of drainage channels, developed hillsides and areas recently burned by forest and brush fires.

Tornado and Wind Storm

A wind storm can occur during severe thunderstorms, winter storms, coastal storms, or tornadoes. Straight-line winds such as a downburst have the potential to cause wind gusts that exceed 100 miles per hour. Based on 40 y ears of tornado history and over 100 years of hurricane history, FEMA identifies western and central Pennsylvania as being more susceptible to higher winds than eastern Pennsylvania. (FEMA, 1997). A tornado is a violent windstorm characterized by a twisting, funnel-shaped cloud extending to the ground. Tornadoes are most often generated by thunderstorm activity (but sometimes result from hurricanes or tropical storms) when cool, dry air intersects and overrides a layer of warm, moist air forcing the warm air to rise rapidly. The damage caused by a tornado is a result of high wind velocities and wind-blown debris. According to the National Weather Service, tornado wind speeds can range between 30 to more than 300 miles per hour. They are more likely to occur during the spring and early summer months of March through June and are most likely to form in the late afternoon and early evening. Most tornadoes are a few dozen yards wide and touch down briefly, but even small, short-lived tornadoes can inflict tremendous damage. Destruction ranges from minor to catastrophic depending on the intensity, size, and duration of the storm. Structures made of light materials such as mobile homes are most susceptible to damage. Waterspouts are weak tornadoes that form over warm water and are relatively uncommon in Pennsylvania. Each year, an average of over 800 tornadoes is reported nationwide, resulting in an average of 80 deaths and 1,500 injuries (NOAA, 2002). Based on NOAA Storm Prediction Center Statistics, the number of recorded F3, F4, & F5 tornadoes between 1950-1998 ranges from <1 to 15 per 3,700 square mile area across Pennsylvania (FEMA, 2009). A water spout is a tornado over a body of water (American Meteorological Society, 2009).

Wildfire

A wildfire is a raging, uncontrolled fire that spreads rapidly through vegetative fuels, exposing and possibly consuming

structures. Wildfires often begin unnoticed and can spread quickly, creating dense smoke that can be seen for miles. Wildfires can occur at any time of the year, but mostly occur during long, dry hot spells. Any small fire in a wooded area, if not quickly detected and suppressed, can get out of control. Most wildfires are caused by human carelessness, negligence and ignorance. However, some are precipitated by lightning strikes and in rare instances, spontaneous combustion. Wildfires in Pennsylvania can occur in fields, grass, brush and forests. 98% of wildfires in Pennsylvania are a direct result of people, often caused by debris burns (DCNR, 2009).

Winter Storm

Winter storms may include snow, sleet, freezing rain, or a mix of these wintry forms of precipitation. A winter storm can range from a moderate snowfall or ice event over a period of a few hours to blizzard conditions with wind-driven snow that lasts for several days. Many winter storms are accompanied by low temperatures and heavy and/or blowing snow, which can severely impair visibility and disrupt transportation. The Commonwealth of Pennsylvania has a long history of severe winter weather.

Technological and Human-made Hazards

Dam Failure

A dam is a barrier across flowing water that obstructs, directs, or slows down water flow. Dams provide benefits such as flood protection, power generation, drinking water, irrigation and recreation. Failure of these structures results in an uncontrolled release of impounded water. Failures are relatively rare, but immense damage and loss of life is possible in downstream communities when such events occur. Aging infrastructure, hydrologic, hydraulic and geologic characteristics, population growth and design and maintenance practices should be considered when assessing dam failure hazards. The failure of the South Fork Dam, located in Johnstown, PA, was the deadliest dam failure ever experienced in the United States. It took place in 1889 and resulted in the Johnstown Flood which claimed 2,209 lives (FEMA, 1997). Today there are approximately 3,200 dams and reservoirs throughout Pennsylvania (PADEP, 2008).

Fuel Shortages

Fuel shortages result from supply chain breaks or secondary to other hazard events, for example (Mercer County, PA, 2005).

Hazardous Materials

Hazardous material releases occur at fixed facilities or as such materials are in transit and including toxic chemicals, infectious substances, bio hazardous waste, and any materials that are explosive, corrosive, flammable, or radioactive (PL 1990-165, § 207(e)).

Terrorism

Terrorism is use of force or violence against persons or property with the intent to intimidate or coerce. Acts of terrorism include threats of terrorism; assassinations; kidnappings; hijackings; bomb scares and bombings; cyber-attacks (computer- based); and the use of chemical, biological, nuclear and radiological weapons. (FEMA, 2009).

Transportation Accidents

Transportation accidents can result from any form of air, rail, water, or road travel. It is unlikely that small accidents would significantly impact the larger community. However, certain accidents could have secondary regional impacts such as a hazardous materials release or disruption in critical supply/access routes, especially if vital transportation corridors or junctions are present.

Urban Fire and Explosion

An urban fire involves a structure or property within an urban or developed area. For hazard mitigation purposes, major urban fires involving large buildings and/or multiple properties are of primary concern. The effects of a major urban fire include minor to significant property damage, loss of life, and residential or business displacement. Explosions are extremely rapid releases of energy that usually generate high temperatures and often lead to fires. The risk of severe explosions can be reduced through careful management of flammable and explosive hazardous materials. (FEMA, 1997).

4.3 Hazard Profiles and Vulnerability Analysis

Natural Hazards

4.3.1 Drought

4.3.3.1 Location and Extent

Droughts are regional climatic events, so when these events occur in Elk County, impacts are felt across the entire County as well as areas outside County boundaries. The spatial extent for areas of impact can range from areas of Pennsylvania to the entire mid-Atlantic region. Areas with extensive agricultural land use are most vulnerable to drought. While Figure 4-1 shows that all of Elk County has an equal occurrence of severe or extreme drought, the agricultural industry is often hardest hit.

4.3.1.2 Range of Magnitude

Hydrologic drought events result in a reduction of stream flows, reduction of lake/reservoir storage, and a lowering of groundwater levels. These events have adverse impacts on public water supplies for human consumption, rural water supplies for livestock consumption and agricultural operations, water quality, natural soil water or irrigation water for agriculture, soil moisture, conditions conducive to wildfire events, and water for navigation and recreation.

The Commonwealth uses five parameters to assess drought conditions:

1) Stream flows (compared to benchmark records)
2) Precipitation (measured as the departure from normal, 30 year average precipitation)
3) Reservoir storage levels in a variety of locations (especially three New York City reservoirs in upper Delaware River Basin)
4) Groundwater elevations in a number of counties (comparing to past month, past year and historic record)
5) The Palmer Drought Severity Index – a soil moisture algorithm calibrated for relatively homogeneous regions which measures dryness based on recent precipitation and temperature. (See Table 4-5 below).

Table 4-5: Palmer Drought Severity Index (PSDI) classifications (NDMC, 2009).

SEVERITY CATEGORY	PSDI VALUE
Extremely wet	4.0 or more
Very wet	3.0 to 3.99
Moderately wet	2.0 to 2.99
Slightly wet	1.0 to 1.99
Incipient wet spell	0.5 to 0.99
Near normal	0.49 to -0.49
Incipient dry spell	-0.5 to -0.99
Mild drought	-1.0 to -1.99
Moderate drought	-2.0 to -2.99
Severe drought	-3.0 to -3.99
Extreme drought	-4.0 or less

4.3.1.3 Phases of drought preparedness in Pennsylvania in order of increasing severity are:

- Drought Watch: A period to alert government agencies, public water suppliers, water users and the public regarding the potential for future drought-related problems. The focus is on increased monitoring, awareness and preparation for response if conditions worsen. A request for voluntary water conservation is made. The objective of voluntary water conservation measures during a drought watch is to reduce water uses by 5 percent in the affected areas. Due to varying conditions, individual water suppliers or municipalities may be asking for more stringent conservation actions.
- Drought Warning: This phase involves a coordinated response to imminent drought conditions and potential water supply shortages through concerted voluntary conservation measures to avoid or reduce shortages, relieve stressed sources, develop new sources, and if possible forestall the need to impose mandatory water use restrictions. The objective of voluntary water conservation measures during a drought warning is to reduce overall water uses by 10-15 percent in the affected areas. Due to varying conditions, individual water suppliers or municipalities may be asking for more stringent conservation actions.
- Drought Emergency: This stage is a phase of concerted management operations to marshal all available resources to respond to actual emergency conditions, to avoid depletion of water sources, to assure at least minimum water supplies to protect public health and safety, to support essential and high priority water uses and to avoid unnecessary economic dislocations. It is possible during this phase to impose mandatory restrictions on non-essential water uses that are provided in the Pennsylvania Code (Chapter 119), if deemed necessary and if ordered by the Governor of Pennsylvania. The objective of water use restrictions (mandatory or voluntary) and other conservation measures during this phase is to reduce consumptive water use in the affected area by fifteen percent, and to reduce total use to the extent necessary to preserve public water system supplies, to avoid or mitigate local or area shortages, and to assure equitable sharing of limited supplies.
- Local Water Rationing: Although not a drought phase, local municipalities may, with the approval of the PA Emergency Management Council, implement local water rationing to share a rapidly dwindling or severely depleted water supply in designated water supply service areas. These individual water rationing plans, authorized through provisions of the Pennsylvania Code (Chapter 120), will require specific limits on individual water consumption to achieve significant reductions in use. Under both mandatory restrictions imposed by the Commonwealth and local water rationing, procedures are provided for granting of variances to consider individual hardships and economic dislocations.

Environmental impacts of drought include:

- Hydrologic effects – lower water levels in reservoirs, lakes, and ponds; reduced streamflow; loss of wetlands; estuarine impacts; groundwater depletion and land subsidence; effects on water quality such as increases in salt concentration and water temperature
- Damage to animal species – lack of feed and drinking water; disease; loss of biodiversity; migration or concentration; and reduction and degradation of fish and wildlife habitat
- Damage to plant communities – loss of biodiversity; loss of trees from urban landscapes and wooded conservation areas
- Increased number and severity of fires

- Reduced soil quality
- Air quality effects – dust and pollutants
- Loss of quality in landscape

Three Drought Emergencies have been declared in Elk County since 1980. A worst case scenario for droughts occurred in 1998. The Governor declared a State of Drought Emergency from December until March of 1999 in fifteen northcentral Pennsylvania counties, including Elk.

4.3.1.4 Past Occurrence

Declared drought status for Elk County from 1980 to 2017 is shown in Table 4-6. The Department of Environmental Protection is the agency responsible for collecting drought information. Data for all counties in the Commonwealth is available for the years 1980 through 2017.

Table 4-6: Elk County Declared Drought Status from 1980 to 2016 (PADEP, 2017).

DATE	DROUGHT STATUS	DATE	DROUGHT STATUS
Nov 18, 1980 - Apr 20, 1982	Emergency (Eastern portion only)	Sept 1, 1995 - Dec 18, 1995	Watch
Apr 26, 1985 - Oct 22, 1985	Watch (Eastern portion only)	Dec 3, 1998 - Dec 8, 1998	Watch
Oct 22, 1985 - Dec 19, 1985	Watch	Dec 9, 1998 - Dec 16, 1998	Warning
Jul 7, 1988 - Aug 24, 1988	Watch	Dec 16, 1998 - Mar 15, 1999	Emergency
Aug 24, 1988 - Dec 12, 1988	Warning	Mar 15, 1999 - Sept 30, 1999	Watch
Mar 3, 1989 - May 15, 1989	Watch	Sept 30, 1999 - Feb 25, 2000	Warning
June 28, 1991 - Jul 24, 1991	Watch	Feb 25, 2000 - May 5, 2000	Watch
Jul 24, 1991 - Aug 16, 1991	Warning	Aug 24, 2001 - May 13, 2002	Watch
Aug 16, 1991 - Apr 20, 1992	Emergency	Apr 11, 2006 - June 30, 2006	Watch
Apr 20, 1992 - June 23, 1992	Warning	Aug 8, 2007 - Feb 15, 2008	Watch
June 23, 1992 - Sept 11, 1992	Watch	Nov 7, 2008 - Jan 26, 2009	Watch
Sept 16, 2010 – Nov 10, 2010	Watch	Nov 10, 2010 – Dec 17, 2010	Watch
Aug 5, 2011 – Sept 2, 2011	Warning	Sept 2, 2011 – Oct 13, 2011	Warning

Elk County also has record of a drought event prior to 1980. In 1963 a Gubernatorial Proclamation was issued for numerous communities in the Commonwealth in response to drought.

Table 4-2 shows that since 1955, there has been two Gubernatorial Proclamations in response to drought conditions within the County.

4.3.1.5 Future Occurrence

It is difficult to forecast the severity and frequency of future drought events in Elk County. Based on the most current data from NOAA (see Figure 4-1) the current drought situation is

normal or near normal. However, Elk County has a history of drought watches and warnings with the latest warning being declared in 2011. Therefore, the future occurrence of drought can be considered *possible* as defined by the Risk Factor Methodology probability criteria (see Table 4-36).

4.3.1.6 Vulnerability Assessment

The most significant losses resulting from drought events are typically found in the agriculture sector. Therefore, drought events can severely impair the local economy with prolonged drought negatively impacting the livelihood of residents within agricultural communities particularly.

However, Elk County is not a major agricultural community; the County ranks 63rd out of the 67 Commonwealth counties in agricultural production, with a total market value of all agricultural products exceeding $4.2 million (USDA, 2012). As a result, Elk County's vulnerability to drought is comparatively lower to other areas of the Commonwealth where agriculture is a prime driver of local economies. In Elk County, the majority of agricultural sales came from the sale of livestock, poultry, and their products, with sales totaling $2.3 million (62% of all sales) in 2007. Crop sales make up the other 38% of sales.

Elk County residents that use private domestic wells are more vulnerable to droughts because their wells can dry up. Table 4-7 shows the number of domestic wells per municipality as collected by the Pennsylvania Groundwater Information System (PAGWIS). According to this dataset, residents in the City of St. Marys are the most vulnerable to the water supply issues related to droughts. It is important to note, however, that the well data collected by PAGWIS relies on voluntary submissions of well record data by well drillers; therefore, it is not a complete database of all domestic wells in the County.

Average Cost to Drill a Well

In Pennsylvania, the average cost to drill a domestic water well is approximately $4,000-$7,000 depending on the depth needed to reach water. This estimate doesn't include additional costs that may be needed to treat the water due to high iron content or other water quality issues.

In addition, public water suppliers are also vulnerable during periods of drought, particularly because in Elk County, most public and domestic water use is met by ground water sources. However, each municipal authority has an emergency plan in place and work cooperatively together to ensure an emergency supply is available if needed. There are twelve public water suppliers and one private that operate in the County. These include: Brockway Borough Municipal Authority, Horton Township Municipal Authority, Elbon Home Owners Association, Joy Gardens Mobile Home Park Authority, Jones Township Municipal Authority, St. Marys Area Joint Water Authority, Ridgway Township Municipal Authority, Johnsonburg Municipal Authority, Ridgway Borough Water Works, Fox Township Municipal Authority, Jay Township Water Authority, and the Highland Township Municipal Authority. The village of Daguscahonda, located in Ridgway Township, has its own private water supply. It is currently unregulated and has been subject to review by DEP on numerous occasions.

Figure 4-1: Drought Severity Index Map. Elk County's location is depicted by the red arrow indicating the county is near normal. NOAA, 2018

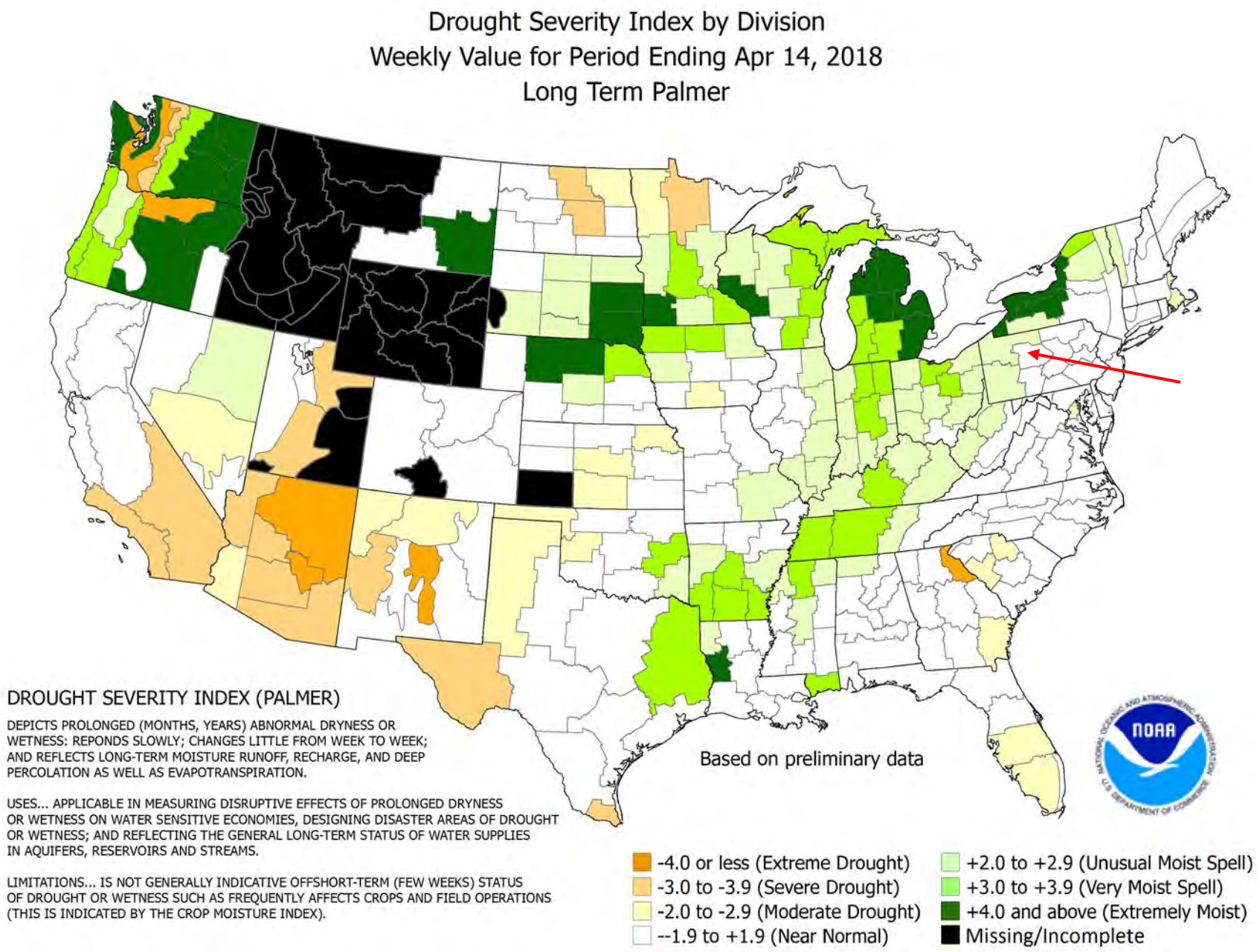


Table 4.-7: Number of domestic wells per municipality in Elk County (PAGWIS, 2017).

MUNICIPALITY	DOMESTIC WELLS
Benezette Township	**92**
Fox Township	**54**
Highland Township	**18**
Horton Township	**52**
Jay Township	**48**
Johnsonburg	**1**
Jones Township	**98**
Millstone Township	**27**
Ridgway Borough	**0**
Ridgway Township	**59**
Spring Creek Township	**39**
City of St. Marys	**126**
Unknown	**19**
TOTAL	633

4.3.2 Flood Protection Measures

4.3.2.1 Dam Failure

Dam failures most often occur during or after a massive rainfall, flooding, or spring thaws, sometimes with little to no warning. Depending on the size of the water body where the dam is constructed, water contributions may come from distant upstream locations. There are approximately 22 dams located in Elk County that are both publically and privately owned. These dams are shown in Figure 4-2. Four of these dams are Category 1 dams which if breached, could cause substantial losses of life and excessive Economic losses. These dams include the H.B. Norton Dam, the Riley Run Dam, the Clarion River Reservoir Dam (East Branch Dam), and the Laurel Run Dam.

4.3.2.2 Range of Magnitude

Dam failures can pose a serious threat to communities located downstream from major dams. The impact of a dam failure is dependent on the volume of water impounded by the dam and the amount of population or assets located downstream. Catastrophic failures are characterized by the sudden, rapid, and uncontrolled release of impounded water or any other fluid or semi- fluid from a dammed impoundment or water body. The DEP defines a *high hazard dam* as “any dam so located as to endanger populated areas downstream by its failure” [Def. added May 16, 1985, P.L.32, No. 15]. High hazard dams receive two inspections each year – once by a professional engineer on behalf of the owner and once by a DEP inspector (PADEP, 2008).

Dam failures may or may not leave enough time for evacuation of people and property, depending on their abruptness. Seepages in earth dams usually develop gradually, and, if the embankment damage is detected early, downhill residents have at least a few hours or days to evacuate. Failures of concrete or masonry dams tend to occur suddenly, sending a wall of water

and debris down the valley at more than 100 mph. Survival would be a matter of having the good fortune not to be in the flood path at the time of the break. Dam failures due to the overtopping of a dam normally give sufficient lead time for evacuation.

The worst dam failure in Pennsylvania was the Johnstown Flood of 1889. The worst case scenario for a dam failure event in Elk County would be if a dam failure occurred at the Clarion River Reservoir Dam, an A-1 dam. In this case, a substantial loss of life and excessive economic loss would be expected according to the federal dam hazard potential classifications. Municipalities in Elk County with the highest vulnerability to this dam if it would fail are Johnsonburg Borough, Ridgway Township and Borough, and parts of St. Marys.

4.3.2.3 Past Occurrence

There have been two significant dam failures in Pennsylvania. As stated above, the worst dam failure to occur in the U.S. took place in Johnstown, PA in 1889 which claimed 2,209 lives. Another dam failure took place in Austin, PA (Potter County) in 1911 which claimed 78 lives. No significant dam failures have occurred in Elk County. According to PEMA, minor dam failures occur annually, but the impact of these events is minimal.

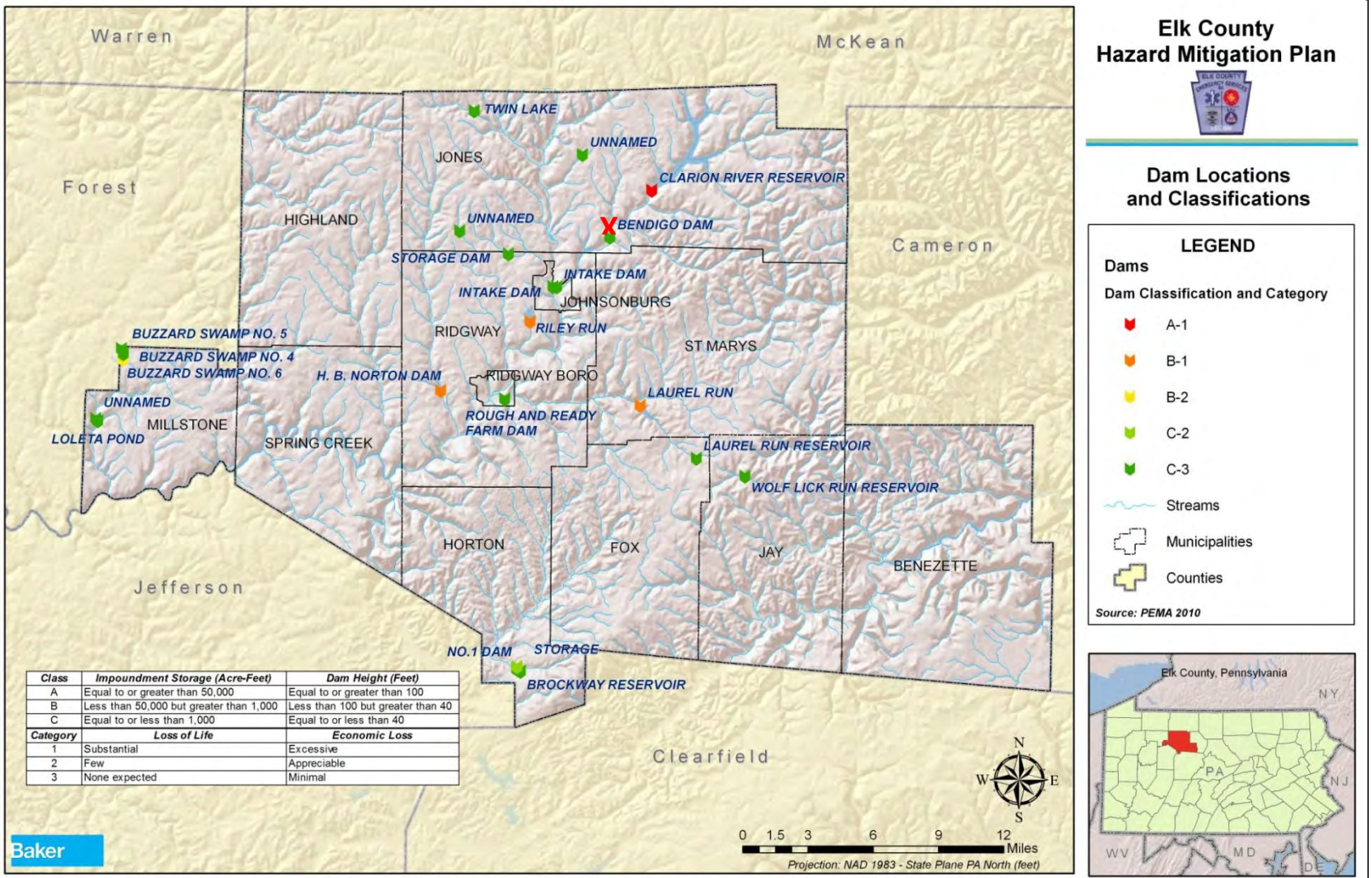
4.3.2.4 Future Occurrence

Provided that adequate engineering and maintenance measures are in place, high-hazard dam failures are *unlikely* in Elk County as defined by the Risk Factor Methodology probability criteria (see Table 4-36). The DEP inventories and regulates all dams that meet or exceed the following criteria (PADEP, 2008):

- Impound water from a drainage area of greater than 100 acres;
- Have a maximum water depth greater than 15 feet;
- Have a maximum storage capacity of 50 acre-feet or greater.

The construction, operation, maintenance, modification and abandonment of dams is reviewed and monitored by the Department's Division of Dam Safety. Dams are evaluated based on categories such as slope stability, undermining seepage and spillway adequacy. The presence of structural integrity and inspection programs significantly reduces the potential for major dam failure events to occur.

Figure 4-2: Dam Locations and Classifications in Elk County (PEMA, 2010). Note: X depicts Bendigo Dam that was removed in 2014



Class	Impoundment Storage (Acre-Feet)	Dam Height (Feet)
A	Equal to or greater than 50,000	Equal to or greater than 100
B	Less than 50,000 but greater than 1,000	Less than 100 but greater than 40
C	Equal to or less than 1,000	Equal to or less than 40
Category	**Loss of Life**	**Economic Loss**
1	Substantial	Excessive
2	Few	Appreciable
3	None expected	Minimal

4.3.2.5 Vulnerability Assessment

Property and populations located downstream from any dam are vulnerable to dam failure. The Pennsylvania Code (*§ 105.91 Classification of dams and reservoirs*) classifies both dams by size and the amount of loss of life and economic loss expected in a failure event. Table 4-8 displays the dam classification; although the size of a dam may result in varying impacts, the hazard potential classification of Category 1 dams are most important, since they will cause substantial loss of life and excessive economic loss.

Table 4-8: Dam Classification (The Pennsylvania Code, 2010).

Dam Size Classification		
CLASS	**IMPOUNDMENT STORAGE (acre feet)**	**DAM HEIGHT (feet)**
A	Equal to or greater than 50,000	Equal to or greater than 100
B	Less than 50,000 but greater than 1000	Less than 100 but greater than 40
C	Equal to or less than 1000	Equal to or less than 40
Dam Damage Classification		
CATEGORY	**LOSS OF LIFE**	**ECONOMIC LOSS**
1	Substantial	Excessive
2	Few	Appreciable
3	None Expected	Minimal

Communities downstream of Category 1 and other high-hazard dams should pay particular attention to inspection and maintenance activities that keep their communities safe. With these activities and oversight from the DEP, vulnerability decreases significantly. In addition, the County should remain aware of changes that may take place regarding dams outside and upstream of Elk County (mapped in Figure 4-6).

4.3.3 East Branch Dam Repair Project

Since June 1952, the USACE has operated and maintained the East Branch Dam and Reservoir on East Branch Clarion River. The dam controls a drainage area of 72.4 square miles and is located 7.35 miles upstream of the mouth of the East Branch Clarion River (Reference 5). The flood control project reduces major floods on the Clarion River at Ridgeway by an average of 2 feet.

East Branch Dam is owned and operated by the Pittsburgh District, U.S. Army Corps of Engineers. As part of a risk management approach to improving public safety, the Corps has classified East Branch Dam as Dam Safety Action Class (DSAC) II. East Branch Dam is considered to have confirmed (potentially unsafe) issues which merit further study and analysis, largely because it has a history of seepage related problems.

A void in the dam was detected in 1957 after muddy flows were observed downstream of the dam. Engineers at the time investigated the situation as it could have been an indication of internal erosion and a serious condition that could lead to dam failure if unaddressed. A 'bus-sized void" was detected at the time and an aggressive grouting effort was undertaken to fill the void and address any other areas in question.

Based upon on a risk assessment in 2009, USACE determined this dam to be a high risk dam primarily due to the risks associated with re-initiation of internal erosion at or near an embankment void grouted during the 1957 internal erosion event. It was determined that the unknown condition of that repair and the potential for similar seepage events required the implementation of a dam safety initiative that in part required additional grouting and the installation of a cutoff wall through the earthen dam. Project completion date is estimated between 2019 and 2020. (U.S. Army Corps of Engineers, 2017)

Figure 4-3: Work on the East Branch Dam Repair Project

4.3.3.1 Emergency Planning

To be most cautious in emergency planning in case of a dam failure, the USACE determined the rate at which communities located below the dam would be affected. They based their calculations on the worst case scenario of the lake being completely filled and a rapidly occurring breach in the dam. ***In reality, conditions are very unlikely to be so extreme.*** In over fifty years of operation, the East Branch Lake has yet to be filled to capacity. Even during the record Hurricane Agnes event in 1972 the lake level was over 12 feet below maximum pool and twenty-one feet below the top of the dam. In addition, the dam is inspected and monitored closely for advance indications of developing problems. During the seepage-related incident in 1957, observation of unusual seepage conditions allowed ample time to take action to prevent a failure.

Based on this emergency action plan reflecting the worst case scenario, Johnsonburg, seven miles downstream of the dam, would see the first flood water arrive ***two hours*** after a breach. The peak flood would occur ***30 minutes later***. At Ridgway, 15 miles downstream of the dam, the first flood water would arrive ***three hours*** after a breach, and the peak flood would occur in three hours and 30 minutes. The town of Wilcox is not in the path of flooding because it is located well upstream in the valley of the West Branch, a different fork of the Clarion River. (US Army Corp of Engineers)

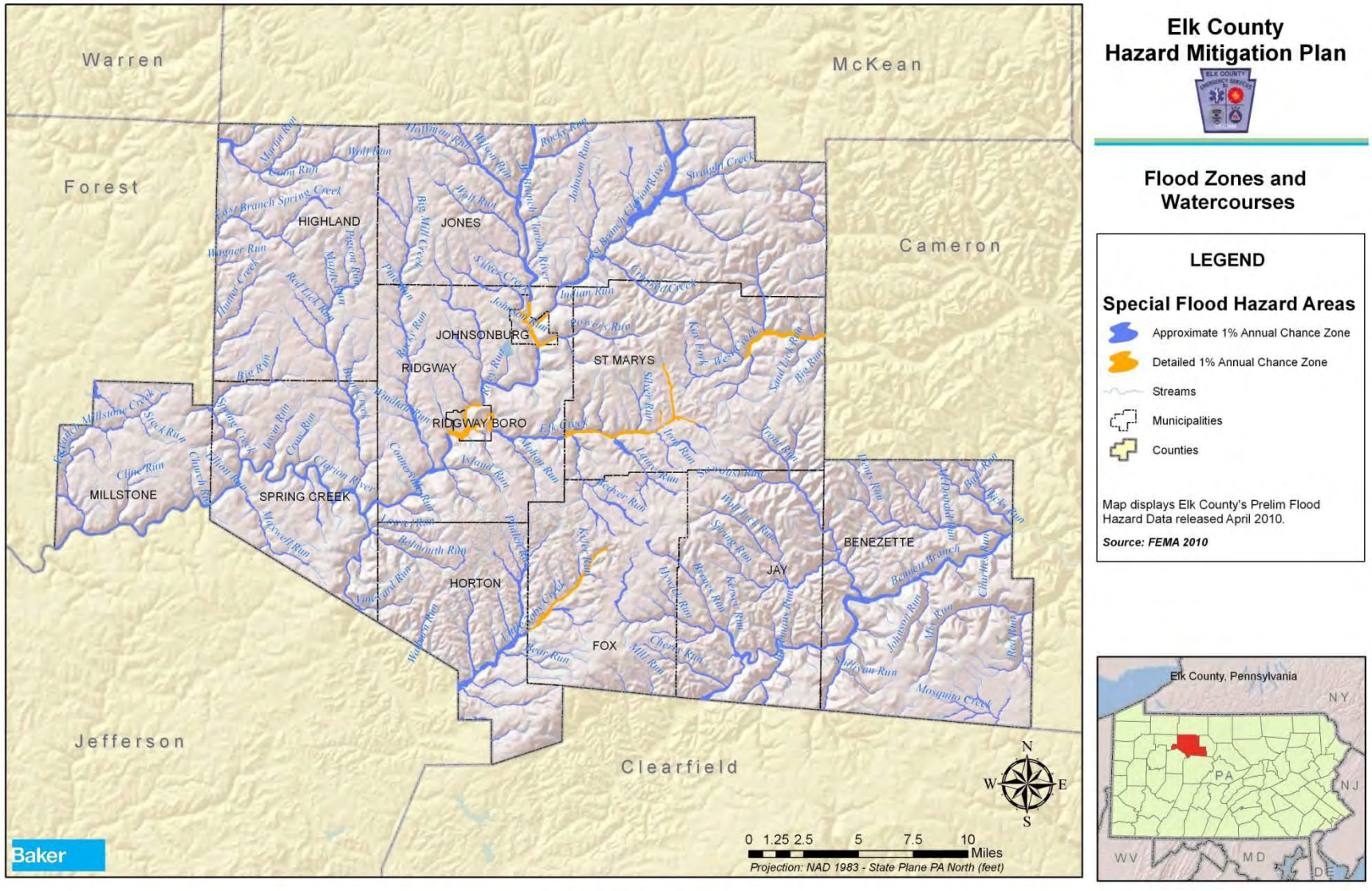
Figure 4-4: Drilling into the East Branch dam wall. Photo courtesy of the US Army Corp of Engineers

4.3.3.2 Swift 911 Emergency Response System

In 2016 The Elk County Board of Commissioners was approached by the Elk County Emergency Management Agency to implement a Swift 911 Warning System. SwiftReach is a mass warning system that provides a user friendly interface, backed by a fault-tolerant network which delivers 2-way messages via voice, text, email, fax, RSS and social media to a large number of people in a short time span. This system would be activated in case of an emergency situation with the East Branch Dam but could be utilized for any number of emergency situations.

Figure 4-5: East Branch Dam. Courtesy of the US Army Corp of Engineers, Pittsburg District

Figure 4-6: Map showing the location of watercourses and flood zones throughout Elk County.

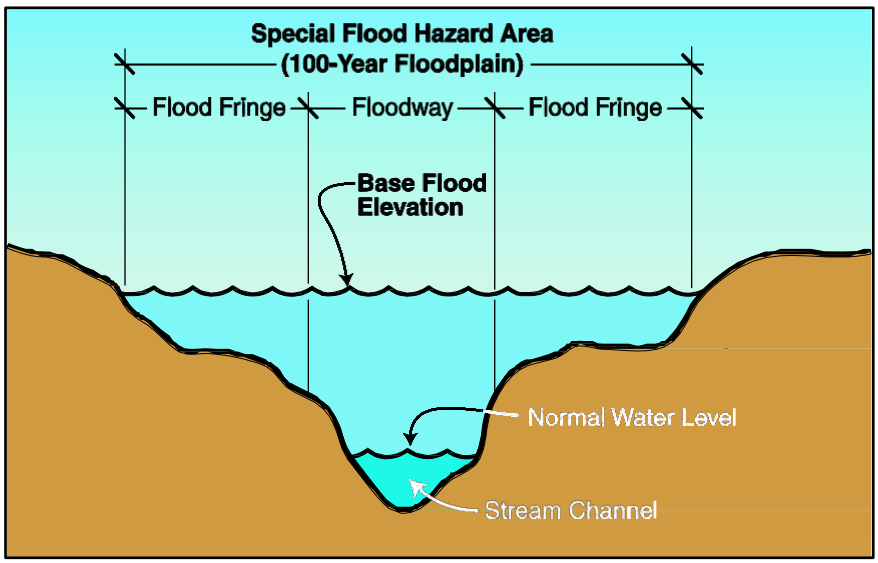


4.3.4 Flood, Flash Flood, Ice Jam

4.3.4.1 Location and Extent

Elk County is located in the Ohio River Basin. This area, like many others in Pennsylvania, is flood prone because of the mountainous terrain and because most of the communities are located along streams and rivers valleys. In addition, community development of the floodplain has resulted in frequent flooding. For inland areas, excess water from snowmelt or rainfall accumulates and overflows onto stream banks and adjacent floodplains. Floodplains are lowlands adjacent to rivers, streams and creeks that are subject to recurring floods. The size of the floodplain is described by the recurrence interval of a given flood. However, in assessing the potential spatial extent of flooding it is important to know that a floodplain associated with a flood that has a 10 percent chance of occurring in a given year is smaller than the floodplain associated with a flood that has a 0.2% annual chance of occurring. The National Flood Insurance Program (NFIP), for which Flood Insurance Rate Maps (FIRM) are published, identifies the 1% annual chance flood. This 1% annual chance flood event is used to delineate the *Special Flood Hazard Area* and identify *Base Flood Elevations*. Figure 4-7 illustrates these terms. The Special Flood Hazard Area serves as the primary regulatory boundary used by FEMA, the Commonwealth of Pennsylvania and Elk County local governments.

Figure 4-7: Diagram identifying *Special Flood Hazard Area*, *1% annual chance (100-Year) floodplain*, *floodway* and *flood fringe*.



Countywide Digital Flood Insurance Rate Maps (DFIRMs) were released for Elk County on January 18, 2012. All communities within the County will now be shown on a single set of countywide FIRMs. Previous FIRMs and Flood Boundary and Floodway Maps (FBFM) were digitized to produce a DFIRM that is compatible with GIS. Prior to the publication of this digital data, flood hazard information from FEMA was available through paper FIRMs and Q3 data.

Once the final FIRMs for the entire county become effective, they can be obtained from the FEMA Map Service Center (http://www.fema.gov). These maps can be used to identify the expected spatial extent and elevation of flooding from a 1% and 0.2% annual chance event. All of the

municipalities in the County were determined to have special flood hazard areas (SFHA).

Flood sources identified in the most recent mapping project include: Alysworth Run, Brewery Run, Clarion River, East Branch Clarion River, Elk Creek, Gallagher Run, Little Toby Creek, North Branch Elk Creek, Powers Run, Silver Creek, West Branch Clarion River, and West Creek. Figure 4-6 shows the location of watercourses and flood zones in Elk County. The location of approximate and detailed (including Base Flood Elevations) Special Flood Hazard Areas (1% annual chance zones) are shown.

4.3.4.2 Range of Magnitude

Floods are considered hazards when people and property are affected. Most injuries and deaths from flooding happen when people are swept away by flood currents and most property damage results from inundation by sediment-filled water. A large amount of rainfall over a short time span can result in flash flood conditions. Small amounts of rain can result in floods in locations where the soil is frozen or saturated from a previous wet period or if the rain is concentrated in an area of impermeable surfaces such as large parking lots, paved roadways, o r other impervious developed areas.

Several factors determine the severity of floods, including rainfall intensity and duration, topography, ground cover and rate of snowmelt. Water runoff is greater in areas with steep slopes and little to no vegetative ground cover. Since the County has mountainous terrain, this can contribute to more severe floods as runoff reaches receiving water bodies more rapidly over steep terrain. Also, urbanization typically results in the replacement of vegetative ground cover with asphalt and concrete, increasing the volume of surface runoff and stormwater, particularly in areas with poorly planned stormwater drainage systems.

In Elk County there are seasonal differences in how floods are caused. In the winter and early spring (February to April), major flooding has occurred as a result of heavy rainfall on dense snowpack throughout contributing watersheds. Winter floods also have resulted from runoff of intense rainfall on frozen ground, and, on rare occasions, local flooding has been exacerbated by ice jams in rivers. Ice jam floods occur on rivers that are totally or partially frozen. A rise in stream stage will break up a totally frozen river and create ice flows that can pile up on channel obstructions such as shallow riffles, log jams, or bridge piers. The jammed ice creates a dam across the channel over which the water and ice mixture continues to flow, allowing for more jamming to occur. Although specific data on ice jam incidents in the County is not available from the County Office of Emergency Management or the National Climatic Data Center, anecdotal evidence suggests that ice jams have occurred in the past in parts of the County.

Summer floods have occurred from intense rainfall on previously saturated soils. Summer thunderstorms deposit large quantities of rainfall over a short period of time that can result in flash flood events. In addition, the County occasionally experiences intense rainfall from tropical storms in late summer and early fall. A summer flood caused a worst case scenario flood on July 19, 1942 when the Elk Creek and Clarion River flooded. It was a >500 year flood event for the Clarion River.

This flood event resulted from an intense thunderstorm and was the worst disaster in Johnsonburg Borough history. Sections of the Route 219 Bridge and the Pennsylvania Railroad Bridge were washed away along with many homes and approximately twenty railroad cars. Utilities including water and electricity incurred significant damage. Losses from this event were estimated to be approximately one million dollars. (FEMA 1978).

Although floods can cause damage to property and loss of life, floods are naturally occurring events that benefit riparian systems which have not been disrupted by human actions. Such benefits include groundwater recharge and the introduction of nutrient rich sediment improving soil fertility. However, the destruction of riparian buffers, changes to land use and land cover throughout a watershed, and the introduction of chemical or biological contaminants which often accompany human presence cause environmental harm when floods occur (see photos below). Hazardous material facilities are potential sources of contamination during flood events. Other negative environmental impacts of flooding include: water-borne diseases, heavy siltation, damage or loss of crops, and drowning of both humans and animals.

Figure 4-8: Series of photos depicting flood debris along the Clarion River after the 2014 flood event. Photos courtesy of the Elk County Conservation District.

4.3.4.3 Past Occurrence

Elk County has a long history of flooding events. Flash flooding is the most common type of flooding that occurs in the County. Two of the nine Presidential Disaster and Emergency Declarations affecting Elk County have been in response to hazard events related to flooding. Table 4-9 lists flood event information from 1993 to 2017 obtained from the NCDC. Estimated property damage was not available for most flooding events. Table 4-10 lists historic flood events.

4.3.4.4 Recent Events

Wednesday May 21, 2014 -Elk County received approximately 4 inches of rain in a very short amount of time. The volume of rainfall led to significant flash flooding throughout the county. The water level rose so swiftly that many residents and business owners were caught in the flooding and had to be rescued. There is no record of estimated property damage although numerous homes and businesses were inundated. On June 15, 2014 Governor Corbett declared Elk County a disaster area and authorized the SBA to offer disaster assistance loans of up to $200,000 for residents that suffered property damage.

Figure 4-9: This photo submitted to The Bradford Era shows an overhead view of the extent of flooding from Elk Creek extending to the Clarion River in Ridgway, PA. Retrieved at Google.com. Photographer unknown. Sheetz Convenience store located to the left of the photo suffered extensive damage and was closed for weeks. No estimate of damage or lost sales was available.

Figure 4-10: Clarion River....still rising. Photos courtesy of Steve Putt.

Bottom photo: Clarion River at normal levels. Date unknown.

ECONOMIC IMPACT

According to Owner Steve Putt, County Squirrel Outfitters suffered approximately $30,000 in damages and was closed for one week. Estimated lost sales were approximately $5,000.

Figure 4-11: Country Squirrel Outfitters, Ridgway, PA

Figure 4-12: Lumberjacks Restaurant and Rite Aid, Ridgway, PA

Note the "before" picture of Lumberjack Restaurant below.

Rite-Aid, located in the background of Figure 4-12, had approximately three feet of water flood the interior of the building. An extensive re-model followed the flooding, closing the business for several months. No estimate of damage or revenue loss is available.

Figure 4-13: 2014 Main Street, Ridgway, PA

Figure 4-14: 2014 Flood, Ridgway, PA

4.3.4.4-1 Woman Drowns While Canoeing on the Clarion

Saturday May 24, 2014- Two days after a major flood event occurred, a young woman drowned in the Clarion River in Elk County near Portland Mills while canoeing. A woman was trapped under the water, and a man was pinned with his head above water. The Clarion River was running higher than normal at 7.1 feet and according to Ridgway Fire Chief Scott Pontious in an article in the DuBois Courier Express, “the river was swift.” Although her death was not attributed directly to the flooding, high levels and velocity of the water in the wake of such severe flooding made conditions challenging for recreational activities.

4.3.4.4-2 Jay Township Flooding

Jay Township received significant flooding during the May 21, 2014 flood as well. The Jay Township Volunteer Fire Department became a victim when their station was inundated with floodwater from Kersey Run. The following series of photos submitted by Rick Krulia, Jay Township Fire Chief depicts flooding in and around the fire station. There are also several reclaimed coal mines in the vicinity of the flooding. Although not directly attributed to the flooding, water run-off from the mines was excessive during this event.

Figure 4-15: Debris being carried downstream during the flood on Kersey Run.

Figure 4-16: Kersey Run could be classified as a small stream typically however, note the velocity of the water creating large swells during the worst of the flooding.

Figure 4-17: Jay Twp. VFD is surrounded by flood water. Pictured is the rear of the fire station. Luckily, the fire department's loss was limited to clean up costs only. The Jay Township Fire Department is located in Flood Zone A according to FEMA Flood Rate Map.

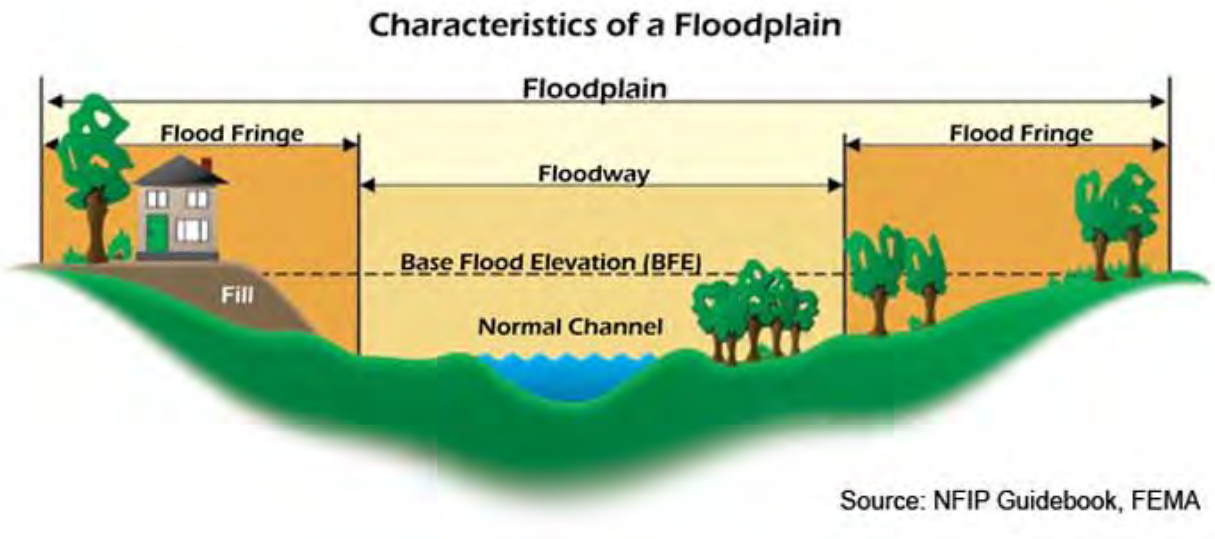


Figure 4-18: This basic graphic from FEMA shows the different characteristics of a typical floodplain.

Table 4-9: Flood and flash flood events impacting Elk County from 1993-2017		
DATE	**LOCATION & DESCRIPTION**	**ESTIMATED PROPERTY DAMAGE ($)**
3/29/1993	Multiple Counties. Flood – Flooding occurred in four Pennsylvania counties resulting in the closure of many secondary roads and various schools.	NP
8/14/1994	St. Marys. Flood/Flash Flood – Several roads and basements in the County were flooded.	$50,000
8/14/1994	Ridgway. Flood – The Clarion River at Ridgway crested just above its 16-foot flood stage.	NP
8/27/1994	Countywide. Flood/Flash Flood – Small stream flooding was reported countywide and basement flooding was observed at St. Marys.	NP
1/19/1996	Multiple Counties. Flash Flood/Flash Flood.	NP
5/11/1996	Ridgway. Flash Flood – Heavy rains caused flooding of small streams and drainage areas.	NP
8/28/1996	Kersey. Flash Flood.	NP
6/23/1998	West Central Portion of Elk County. Flash Flood – Rains cased small stream and poor drainage flooding in rural areas west of Ridgway.	NP
8/14/1998	Northern Portion of Elk County. Flash Flood – Heavy rains caused flooding of small streams and basements.	NP
7/12/2004	St. Marys. Flash Flood – Heavy rain caused flooding in the Johnsonburg and St. Mary's area resulting in the closing of numerous roads and flooding of basements.	NP
9/9/2004	Countywide. Flood.	NP
9/17/2004	Multiple Counties. Flood – Remnants of Hurricane Ivan caused heavy rain and flooding in many Pennsylvania counties.	$50,000,000
9/18/2004	Countywide. Flood – Heavy rain caused the Clarion River to rise above its flood stage.	NP
1/25/2010	Ridgway. Flood-Heavy rainfall between 1 and 4 inches caused localized area flooding which closed portions of Rte. 949 southwest of Ridgway. Additionally many basements were reported flooded throughout the county.	NP
12/01/2010	Johnsonburg and Ridgway Boroughs. Flood. 2-4 inches of rain produced extensive flooding. Clarion River crested at 19.21 feet. Several basements were flooded up to 5 feet.	$200,000
5/21/2014	Multiple Municipalities. Flood-Heavy rain caused significant life-threatening flash flooding focused on Ridgway Borough. Major flooding occurred on the Clarion River at Ridgway where the river crested at 21.67 feet-second highest crest on record. Several water rescues and evacuations occurred. Elk County was declared a disaster area due to significant damage to homes and businesses. Other areas impacted by flooding included St. Marys, Johnsonburg, Byrnedale, James City, Wilcox, Weedville, Kersey, and Elbon.	NP

Table 4-10 provides further past occurrences of historical flooding events listed in the County's

Hazard Vulnerability Assessment. No loss estimates were available for these events with the exception of the July 1942 event.

When comparing tables 4-9 and 4-10, it is obvious that, although the severity of flooding is not as significant due to various flood control projects (specifically the building of the East Branch Dam), the frequency has increased in the last 20 years. The year 2004 had four flood events significant enough to cause property damage. There has been no significant flooding since 2014. Although the county has experienced heavy rain events, none has led to the type of flooding seen during that event.

Table 4-10: Elk County historic flooding events (L. Robert Kimball & Associates, Inc., 2009).

DATE	LOCATION AND/OR DESCRIPTION
September 1861	Clarion River flooding. >500-year event.
June 1889	Clarion River flooding. <50-year event.
1905	Elk Creek flooding.
March 1913	Clarion River flooding.
March 1936	Elk Creek and Clarion River flooding. Clarion River <500-year event.
July 1942	Elk Creek and Clarion River flooding. Clarion River >500-year event.
May 1943	Clarion River flooding. > 10-year event.
May 1946	Clarion River flooding. Just under 50-year event.
November 1950	Clarion River flooding. Just under 50-year event. Highest flood of record for Elk Creek.
January 1952	Clarion River flooding. Just under 10-year event.
March 1956	Clarion River flooding. Just under 10-year event.
January 1959	Clarion River flooding. Just under 10-year event.
September 1967	Clarion River flooding. >10-year event.
June 1972	Elk Creek and Clarion River flooding. Clarion River just under 100-year event.

In addition to the aforementioned past flood events, the National Flood Insurance Program identifies properties that frequently experience flooding. *Repetitive loss properties* are structures insured under the NFIP which have had at least two paid flood losses of more than $1,000 over any ten year period since 1978. A property is considered a *severe repetitive loss property* either when there are at least four losses each exceeding $5,000 or when there are two or more losses where the building payments exceed the property value. In order to prove eligibility, the Hazard Mitigation Assistance grant funding defines a repetitive loss property as “A structure covered by a contract for flood insurance made available under the NFIP that:

1. Has incurred flood-related damage on two occasions, in which the cost of the repair, on the average, equaled or exceeded 25 percent of the market value of the structure at the time of each such flood event; and

2. At the time of the second incidence of flood-related damage, the contract for flood insurance contains increased cost of compliance coverage."

As of March 4, 2016, there were ten repetitive loss properties in Elk County, six of which were insured (FEMA CIS, 2016). These repetitive loss properties are located in Jay Township, Ridgway Township, Ridgway Borough, and the City of Saint Mary's. Table 4-11 shows the number of repetitive loss properties by municipality. There are no severe repetitive loss properties in Elk County. Table 4-11 below lists the repetitive loss properties by municipality:

Table 4-11: Summary of the number and type of Repetitive Loss properties by municipality (FEMA CIS, 2016).

MUNICIPALITY	TYPE		SUM OF REPETITIVE LOSS PROPERTIES
	NON-RESIDENTIAL	SINGLE FAMILY	
Benezette Township	0	0	0
Fox Township	0	0	0
Highland Township	0	0	0
Horton Township	0	0	0
Jay Township	**2**	**0**	**2**
Johnsonburg Borough	0	0	0
Jones Township	0	0	0
Millstone Township	0	0	0
Ridgway Borough	**0**	**3**	**3**
Ridgway Township	**0**	**3**	**0**
Spring Creek Township	0	0	0
City of St. Mary's	**1**	**1**	**2**
TOTAL	**3**	**7**	**10**

Floods are the most common and costly natural catastrophe in the United States. In terms of economic disruption, property damage, and loss of life, floods are "nature's number-one disaster." For that reason, flood insurance is almost never available under industry-standard homeowner's and renter's policies. The best way for citizens to protect their property against flood losses is to purchase flood insurance through the NFIP.

Congress established the NFIP in 1968 to help control the growing cost of federal disaster relief. The NFIP is administered by the Federal Emergency Management Agency (FEMA), part of the Department of

Homeland Security. The NFIP offers federally-backed flood insurance in communities that adopt and enforce effective floodplain management ordinances to reduce future flood losses.

Since 1983, the chief means of providing flood insurance coverage has been a cooperative venture of FEMA and the private insurance industry known as the Write Your Own (WYO) Program. This partnership allows qualified property and casualty insurance companies to "write" (that is, issue) and service the NFIP's Standard Flood Insurance Policy (SFIP) under their own names.

4.3.4.4-3 Flood Mitigation Assistance Plan (FMAP)

National Flood Insurance is available only in communities that apply for participation in the NFIP and agree to implement prescribed flood mitigation measures. One such requirement is to prepare a flood mitigation plan. The Flood Mitigation Assistance Program (FMAP) is a pre-disaster mitigation program. FMAP funding comes from the National Flood Insurance Program (NFIP). Only NFIP-insured homes and businesses are eligible for mitigation in this program.

Elk County prepared an FMAP Plan which was approved by PEMA/FEMA in 2009. All of the municipalities in Elk County adopted the FMAP ordinance shortly thereafter.

Newly participating communities are admitted to the NFIP's Emergency Program. Most of these communities quickly earn "promotion" to the Regular Program.

The Emergency Program is the initial phase of a community's participation in the NFIP. In return for the local government's agreeing to adopt basic floodplain management standards, the NFIP allows local property owners to buy modest amounts of flood insurance coverage.

By agreeing to adopt more comprehensive floodplain management measures, an Emergency Program community can be "promoted" to the Regular Program. Local policyholders immediately become eligible to buy greater amounts of flood insurance coverage. All participating municipalities in Elk County are in the Regular Program.

The minimum floodplain management requirements include:

- Review and permit all development in the SFHA;
- Elevate new and substantially improved residential structures above the Base Flood Elevation;
- Elevate or dry flood proof new and substantially improved non-residential structures;
- Limit development in floodways;
- Locate or construct all public utilities and facilities so as to minimize or eliminate flood damage; and
- Anchor foundation or structure to resist floatation, collapse, or lateral movement.

In addition, Regular Program communities are eligible to participate in the NFIP's Community Rating

System (CRS). Under the CRS, policyholders can receive premium discounts of 5 to 45 percent as their cities and towns adopt more comprehensive flood mitigation measures.
Currently, no municipalities in Elk County participate in CRS.

Table 4-12: Elk County Municipal Participation in the National Flood Insurance Program (FEMA Community Status Book, 2016*)

COMMUNITY	PARTICIPATION STATUS	CID	INITIAL FIRM IDENTIFIED	CURRENT EFFECTIVE MAP DATE
Benezette Township	P	422612	06/01/1987	01/18/2012 (M)**
Fox Township	P	421608	11/02/1990	01/18/2012
Highland Township	P	421609	12/01/1986	01/18/2012 (M)
Horton Township	P	421610	12/01/1986	01/18/2012 (M)
Jay Township	P	421611	12/01/1986	01/18/2012 (M)
Johnsonburg Borough	P	420443	09/29/1978	01/18/2012
Jones Township	P	421612	12/01/1986	01/18/2012 (M)
Millstone Township	P	421613	12/01/1986	01/18/2012 (M)
Ridgway Borough	P	420444	02/15/1980	01/18/2012
Ridgway Township	P	420445	09/29/1978	01/18/2012
Spring Creek Township	P	421614	12/01/1986	01/18/2012 (M)
City of St. Mary's	P	420446	08/15/1980	01/18/2012

The following table lists the Elk County municipalities participating in the NFIP. Note that all municipalities in the County participate in the program.

**Community Status Book Updated 08/23/16-FEMA.gov*
*** (M)-Indicates No elevation determined. All Zones A, C, and X*

4.3.4.4 Future Occurrence

In Elk County, flooding occurs commonly and can occur during any season of the year. Therefore the future occurrence of floods in Elk County can be characterized as *highly likely* as defined by the Risk Factor Methodology probability criteria (see Table 4-36). Floods are described in terms of their extent (including the horizontal area affected and the vertical depth of floodwaters) and the related probability of occurrence. The NFIP uses historical records to determine the probability of occurrence for different extents of flooding. The probability of occurrence is expressed in percentages as the chance of a flood of a specific extent occurring in any given year.

The NFIP recognizes the 1 percent -annual-chance flood, also known as the *base flood*, as the standard for identifying properties subject to federal flood insurance purchase requirements. A 1% annual chance flood is a flood which has a 1 percent chance of occurring over a given year. The DFIRMs will be able to be used to identify areas subject to the 1- and 0.2 percent-annual-chance

flooding. Areas subject to 2% and 10% annual chance events are not shown on maps; however, water surface elevations associated with these events are included in the flood source profiles contained in the Flood Insurance Study Report.

Table 4-13 shows a range of flood recurrence intervals and associated probabilities of occurrence.

Table 4-13: Recurrence intervals and associated probabilities of occurrence (FEMA, 2001).

RECURRENCE INTERVAL	CHANCE OF OCCURRENCE IN ANY GIVEN YEAR (%)
10 year	10
50 year	2
100 year	1
500 year	0.2

4.3.4.5 Vulnerability Assessment

Elk County is vulnerable to flooding that causes loss of lives, property damage, and road closures. For purposes of assessing vulnerability, the County focused on community assets that are located in the 1%-annual-chance floodplain. While greater and smaller floods are possible, information about the extent and depths for this floodplain is available for all municipalities countywide, thus providing a consistent basis for analysis. Flood vulnerability maps for each applicable local municipality, showing the 1%-annual-chance flood hazard area and addressable structures, critical facilities and transportation routes within it, are included in **Appendix D**. These maps were created using FEMA Countywide digital data.

Table 4-14 displays the number of addressable structures per municipality and the number of critical facilities intersecting the SFHA along with the total number of addressable structures, critical facilities and the number of NFIPs in force for each municipality. In Elk County, the addressable structures analyzed are the primary addressable structures in the municipality – single-address structures, multiple-address structures, and utility structures. It does not include structures identified as non-addressable, such as sheds and other outbuildings. These structure categories stem from 911 addressing, and thus are geared towards 911 response rather than vulnerability analysis. There is no assessed value associated with individual structure data points.

Ridgway Borough, Benezette Township, and Johnsonburg Borough each have over 100 structures located in the SFHA. Proportionally, Benezette Township has by far the highest percentage of structures in the SFHA; nearly 15% of all structures in the municipality are located in the SFHA. However, only 13% have an active flood insurance policy in force. That means 87% of all property at risk of flooding is unprotected. Johnsonburg Borough is slightly worse in terms of NFIP policies; 90% of at risk properties have no flood insurance in place.

Similarly, Horton and Millstone Townships and Ridgway Borough each have between 8-9% of all structures located in the SFHA. On the other end of the spectrum, Highland Township has no

addressable structures located in the 1%-annual-chance flood hazard area even though it has identified SFHAs, so it is likely the municipality least vulnerable to flood, flash flood, and ice jam hazards. Other municipalities with proportionally lower risk include Fox Township with 10 vulnerable structures (of 1,871), City of St. Marys with 100 vulnerable structures (of 6,160), and Ridgway Township with 42 vulnerable structures (of 1,349).

Table 4-14: Structure and critical facility vulnerability summary for Flood Hazards.					
MUNICIPALITY	**NUMBER OF ADDRESSABLE STRUCTURES IN SFHA**	**TOTAL # ADDRESSABLE STRUCTURES IN MUNICIPALITY**	**CRITICAL FACILITIES IN SFHA**	**TOTAL CRITICAL FACILITIES**	**NUMBER OF FLOOD INSURANCE POLICIES IN PLACE**
Benezette Township	144	976	0	0	19
Fox Township	10	1871	0	4	4
Highland Township	0	673	0	1	0
Horton Township	69	793	0	1	23
Jay Township	51	1360	0	2	17
Johnsonburg Borough	124	1304	0	4	12
Jones Township	90	1306	0	1	10
Millstone Township	32	396	0	0	5
Ridgway Borough	167	1951	1	5	55
Ridgway Township	42	1369	0	4	11
Spring Creek Township	35	661	0	0	0
City of St. Marys	100	6160	0	9	31
TOTAL	**864**	**18820**	**1**	**31**	**187**

Additional information on flood vulnerability and losses in Elk County, including the 1%-annual-chance flood event results from HAZUS, is provided in the Potential Loss Estimates section.

4.3.4.6 Additional Flood Mitigation Plans & Activities

4.3.4.6-1 Act 167 Stormwater Management Plan

Pennsylvania's Storm Water Management Act (Act 167)

Pennsylvania's Storm Water Management Act (Act 167) was enacted in 1978. This Act was in response to the impacts of accelerated stormwater runoff resulting from land development in the state. It requires counties to prepare and adopt watershed based stormwater management plans. It also requires municipalities to adopt and implement ordinances to regulate development consistent with these plans.

In 2009 Elk County began Phase II of their Act 167 Stormwater Management Plan and completed it in 2010. Unfortunately, funding was cut by DEP approximately half way through the planning process and the program had to be completed without the benefit of stormwater modeling. However, the plan was

completed in accordance with DEP's guidelines and all of the municipalities in Elk County passed the ordinance. The plan is listed on Elk County's website at www.co.elk.pa.us.

4.3.4.6-2 Annual Educational Public Outreach- Rain Barrel Workshop

A requirement of Act 167 Stormwater Management Plan is on-going public education. The Elk County Planning Department partners with the Elk County Conservation District to host an annual rain barrel workshop in order to educate the public about the importance of controlling stormwater run-off. Each year a different theme is chosen to entice a more diverse group of residents to attend. Each event talks about the importance of managing stormwater runoff, no matter what the theme is. The workshop is now in its fifth year and over 150 rain barrels have been distributed to residents of the county.

2016 Rain Barrel Workshop Announcement

4.3.4.6-3 Source Water Protection Plan (SWP)

In 2011 Elk County worked cooperatively with the Department of Environmental Protection to participate in the Source Water Protection Technical Assistance Program (SWPTAP). This is a voluntary effort undertaken by municipal water authorities to assess their raw sources of drinking water (both surface and ground water). Potential sources of contamination to the drinking water are then identified. Mitigation measures are developed based on how long a potential contaminant would take to reach that water supply. Seven out of ten municipal authorities prepared a plan. The City of St. Marys (Elk County's largest water supplier) opted out due to already having an older version of a SWP in place. SWPs are not a tool to mitigate flooding. However, they are important to hazard mitigation because of the potential contamination events to water supplies that can occur from a flood event.

4.3.5 Landslide

4.3.5.1 Location and Extent

Rockfalls, rockslides, block glide, debris slide, earth flow, mud flow, and other slope failures usually occur in areas of Elk County with moderate to steep slopes and high precipitation. Many slope failures are associated with precipitation events – periods of sustained above-average precipitation, specific rainstorms, or snowmelt events. Areas experiencing erosion, decline in vegetation cover, and earthquakes are also susceptible to landslides. Human activities that contribute to slope failure include altering the natural slope gradient, increasing soil water content, and removing vegetation cover.

The USGS identifies Elk County as falling into three distinct zones of landslide susceptibility and incidence. Figure 4-19 shows areas of low, moderate, and high landslide susceptibility as determined by the U.S. Geological Survey. The majority of Elk County has a *Combo-High* susceptibility to landslides, meaning these areas have a high susceptibility to landslides with moderate incidence of occurrence. However, the northwestern portion of the county has a *Sus-High* susceptibility, meaning these areas have a high susceptibility to landslides with low incidence of occurrence.

Over 73% of the total land area of the County is classified as Combo- High susceptibility and include all or a portion of the jurisdictions listed in Table 4-15.

Table 4-15: Municipalities located partially or completely in Combo-High Landslide Zones (USGS, 2001).

Benezette Township	Johnsonburg Borough	**Ridgway Township**
Fox Township	Jones Township	**Spring Creek Township**
Horton Township	Millstone Township	**St. Mary's Township**
Jay Township	**Ridgway Borough**	

4.3.5.2 Range of Magnitude

Landslides cause damage to transportation routes, utilities, and buildings and create travel delays and other side effects. Fortunately, deaths and injuries due to landslides are rare in Pennsylvania. Almost all of the known deaths due to landslides have occurred when rockfalls or other slides along highways have involved vehicles. Storm-induced debris flows are the only other type of landslide likely to cause death and injury. As residential and recreational development increases on and near steep mountain slopes, the hazard from these rapid events will also increase. Most Pennsylvania landslides are moderate to slow moving and damage property rather than people.

The Pennsylvania Department of Transportation and large municipalities incur substantial costs due to landslide damage and to extra construction costs for new roads in known landslide-prone areas. A 1991 estimate showed an average of $10 million per year is spent on landslide repair contracts across the Commonwealth and a similar amount is spent on mitigation costs for grading projects (DCNR, 2010).

There are no officially recorded landslides in Elk County. However, there are numerous mountains throughout the county which could pose a threat and produce landslides that result in injury, death or substantial property. Minor landslides could cause property damage to vehicles, damage to roads resulting in temporary road closures, and minor personal injury. A possible worst-case scenario could occur in Elk County if there was a large landslide in the extreme southern tip of the county. The total population at risk in this area is approximately 1,577.

4.3.5.3 Past Occurrence

No comprehensive list of landslide incidents is available at this time, as there is no formal reporting system in place in the county or the Commonwealth. Based on anecdotal information from the County,

minor landslides have occurred occasionally in construction sites causing minor problems but no serious injury.

4.3.5.4 Future Occurrence

Based on historical events, landslide events resulting in loss of life and property damage are unlikely in Elk County. However, with mixed susceptibility to landslides, the probability of landslides occurring in the county is *possible* as defined by the Risk Factor Methodology probability criteria (see Table 4-36). Mismanaged intense development in steeply sloped areas could increase the frequency of occurrence. In addition, the many roadcuts throughout the county pose a threat and increase the probability of a slide at any one of the areas at any time.

4.3.5.5 Vulnerability Assessment

With the exception of the areas such as those mentioned previously, communities in Elk County are not particularly vulnerable to landslides. However, transportation routes throughout the County located at the base or crest of cliffs should be considered vulnerable to this hazard. An inventory of these areas is not available.

Table 4-16 displays the total number of primary addressable structures intersecting the landslide combo-high zone, which is the zone of highest risk in Elk County. Over 90% of the County's addressable structures intersect with the landslide combo-high zone. In terms of jurisdictional vulnerability, the City of St. Marys has by far the most vulnerable addressable structures; it has over three times more potentially vulnerable structures than Ridgway Borough, the next highest jurisdiction. In fact, over half of the municipalities in the County have over 1,000 parcels potentially vulnerable to landslide hazards. Only Highland Township has no structures vulnerable to landslide hazards as the Township is located entirely outside the combo-high z o n e .

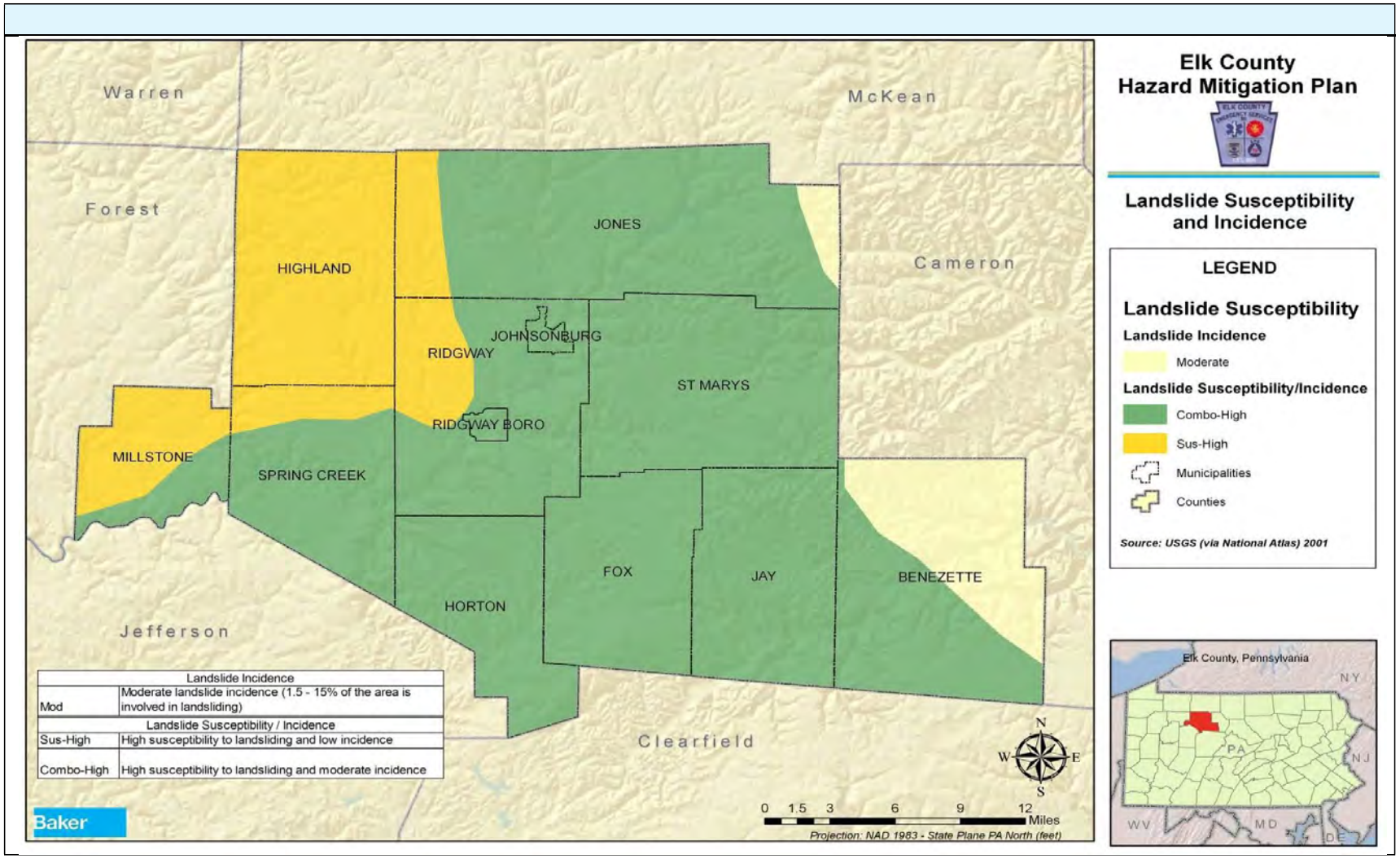
Table 4-16 also displays the number of critical facilities that are located in the landslide combo-high zone by jurisdiction. Nearly all of Elk County's critical facilities are located in the landslide combo-high zone; only the critical facility located in Highland Township is not located in the landslide combo-high zone. The vulnerable critical facilities are located across eight of the 12 municipalities in the County. The City of St. Marys has the most vulnerable critical facilities with nine, followed by Ridgway Borough, which hosts five critical facilities. For a complete list of critical facilities and their vulnerability to landslide hazards, please see **Appendix C**. It is important to note that the vulnerability of each individual structure and critical facility will depend on a number of factors including slope, topography, and underlying geology and soil. For more information on the data sources, limitations, and methodology employed in estimating losses, please see Section 2.

Table 4 -16: Structure and critical facility vulnerability summary for Landslide Hazards.

MUNICIPALITY	NUMBER OF ADDRESSABLE STRUCTURE	TOTAL # ADDRESSABLE STRUCTURES IN MUNICIPALITY	CRITICAL FACILITIES IN LANDSLIDE COMBO-	TOTAL CRITICAL FACILITIES
Benezette Township	481	976	0	**0**
Fox Township	1871	1871	4	**4**
Highland Township	0	673	0	**1**
Horton Township	791	793	1	**1**
Jay Township	1360	1360	2	**2**
Johnsonburg Borough	1304	1304	4	**4**
Jones Township	1234	1306	1	**1**
Millstone Township	273	396	0	**0**
Ridgway Borough	1951	1951	5	**5**
Ridgway Township	1085	1369	4	**4**
Spring Creek Township	656	661	0	**0**
City of St. Marys	6160	6160	9	**9**
TOTAL	**171**	**18820**	**30**	**31**

Figure 4-19: Photo shows an example of a rock/land slide most often experienced in this region. Photo courtesy of WTAE TV.

Figure 4-20: Map of general landslide hazard areas and municipalities in Elk County (USGS, 2001).



4.3.6 Tornado, Windstorm

4.3.6.1 Location and Extent

Tornadoes and wind storms can occur throughout Elk County though events are usually localized. However, severe thunderstorms may result in conditions favorable to the formation of numerous or long-lived tornadoes. Tornadoes can occur at any time during the day or night, but are most frequent during late afternoon into early evening, the warmest hours of the day, and most likely to occur during the spring and early summer months of March through June. Tornado movement is characterized in two ways: direction and speed of spinning winds, and forward movement of the tornado, also known as the storm track. The forward motion of the tornado path can be a few hundred yards or several hundred miles in length. The width of tornadoes can vary greatly, but generally range in size from less than 100 feet to over a mile in width. Some tornadoes never touch the ground and are short-lived, while others may touch the ground several times.

Straight-line winds and windstorms are experienced on a more region-wide scale. While such winds usually accompany tornadoes, straight-lined winds are caused by the movement of air from areas of higher pressure to areas of lower pressure. Stronger winds are the result of greater differences in pressure. Windstorms are generally defined with sustained wind speeds of 40 mph or greater lasting for one hour or longer, or winds of 58 mph or greater for any duration.

Figure 4-22 shows that the eastern portion of the county is located in the Zone III wind zone and the western portion of the county in the Zone IV wind zone. However, Figure 4-26 depicts that tornado activity has occurred throughout the entire county.

4.3.6.2 Range of Magnitude

Each year, tornadoes account for $1.1 billion in damages and cause over 80 deaths nationally (NCAR, 2001). While the extent of tornado damage is usually localized, the vortex of extreme wind associated with a tornado can result in some of the most destructive forces on Earth. Rotational wind speeds can range from 100 mph to more than 250 mph. In addition, the speed of forward motion can range from 0 to 50 mph. Therefore, some estimates place the maximum velocity (combination of ground speed, wind speed, and upper winds) of tornadoes at about 300 mph. The damage caused by a tornado is a result of the high wind velocity and wind-blown debris, also accompanied by lightning or large hail. The most violent tornadoes have rotating winds of 250 miles per hour or more and are capable of causing extreme destruction and turning normally harmless objects into deadly missiles.

Damages and deaths can be especially significant when tornadoes move through populated, developed areas. The destruction caused by tornadoes ranges from minor to extreme depending on the intensity, size and duration of the storm as described below. Typically, tornadoes cause the greatest damages to structures of light construction such as mobile homes. The Enhanced Fujita Scale, also known as the “EF-Scale,” measures tornado strength

and associated damages. The EF-Scale is an update to the earlier Fujita Scale, also known as the "F-Scale," that was published in 1971. It classifies United States tornadoes into six intensity categories, as shown in Table 4-20, based upon the estimated maximum winds occurring within the wind vortex. Since its implementation by the National Weather Service in 2007, the EF-Scale has become the definitive metric for estimating wind speeds within tornadoes based upon damage to buildings and structures. F-Scale categories with corresponding EF-Scale wind speeds are provided in Table 4-20 since the magnitude of previous tornado occurrences is based on the F-Scale.

Table 4-17: Enhanced Fujita Scale (EF-Scale) categories with associated wind speeds and description of damages.

EF-SCALE NUMBER	WIND SPEED (mph)	F-SCALE NUMBER	TYPE OF DAMAGE POSSIBLE
EF0	65–85	F0-F1	**Minor damage**: Peels surface off some roofs; some damage to gutters or siding; branches broken off trees; shallow-rooted trees pushed over. Confirmed tornadoes with no reported damage (i.e., those that remain in open fields) are always rated EF0.
EF1	86-110	F1	**Moderate damage**: Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
EF2	111–135	F1-F2	**Considerable damage**: Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes completely destroyed; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
EF3	136–165	F2-F3	**Severe damage**: Entire stories of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some distance.
EF4	166–200	F3	**Devastating damage**: Well-constructed houses and whole frame houses completely leveled; cars thrown and small missiles generated.
EF5	>200	F3-F6	**Extreme damage**: Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 m (300 ft); steel reinforced concrete structure badly damaged; high-rise buildings have significant structural deformation.

Figure 4-22 shows wind speed zones developed by the American Society of Civil Engineers based on information including 40 years of tornado history and over 100 years of hurricane history. It identifies wind speeds that could occur across the United States to be used as the basis for design and evaluation of the structural integrity of shelters and critical facilities.

Elk County falls within Zones III and IV, meaning design wind speeds for shelters and critical facilities should be able to withstand a 3-second gust of up to 200 or 250 mph (depending on

location in the county), regardless of whether the gust is the result of a tornado, hurricane, tropical storm, or windstorm event. Therefore, these structures should be able to withstand speeds experienced in an EF4 or EF5 tornado. Nevertheless, tornados have still occurred in Elk County, causing injury and property damage. A worst case scenario for tornados occurred in 1963 when an F3 tornado touched down in the county. It caused 20 injuries and $2.5 million in property damage.

Hazardous material facilities should meet design requirements for the wind zones identified in Figure 4-22 in order to prevent release of hazardous materials into the environment.

The Federal Emergency Management Agency (FEMA) has a free publication that can be accessed on their website titled, “How to Prepare for a Tornado”. Inside you will find information about what a tornado is, how one forms and lifesaving tips about things you can do to stay safe during a tornado. The chart below lists possible weather conditions that indicate a tornado is approaching.

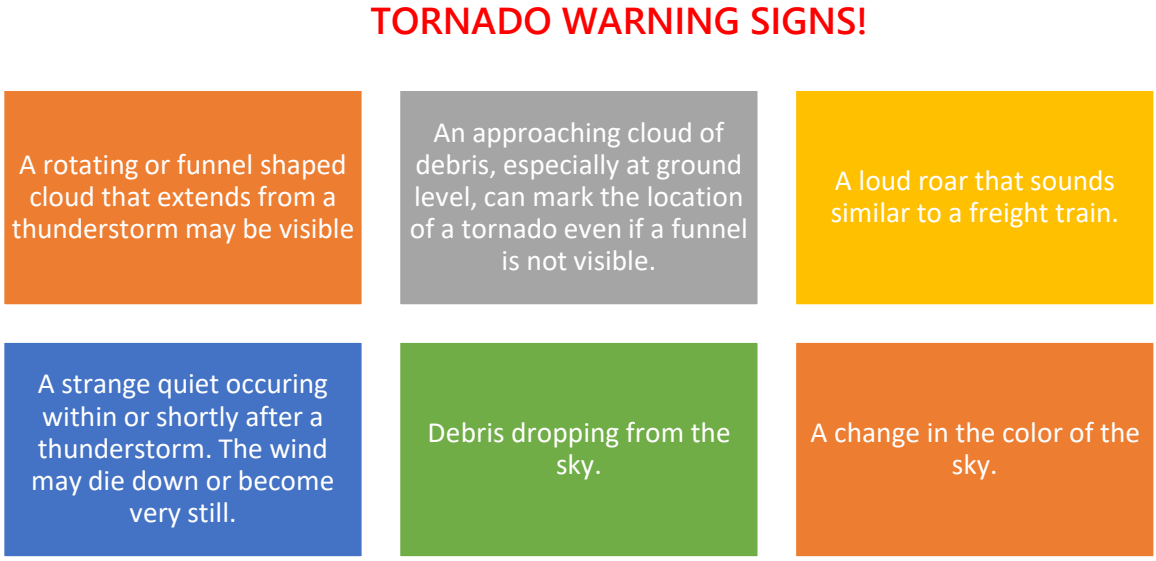
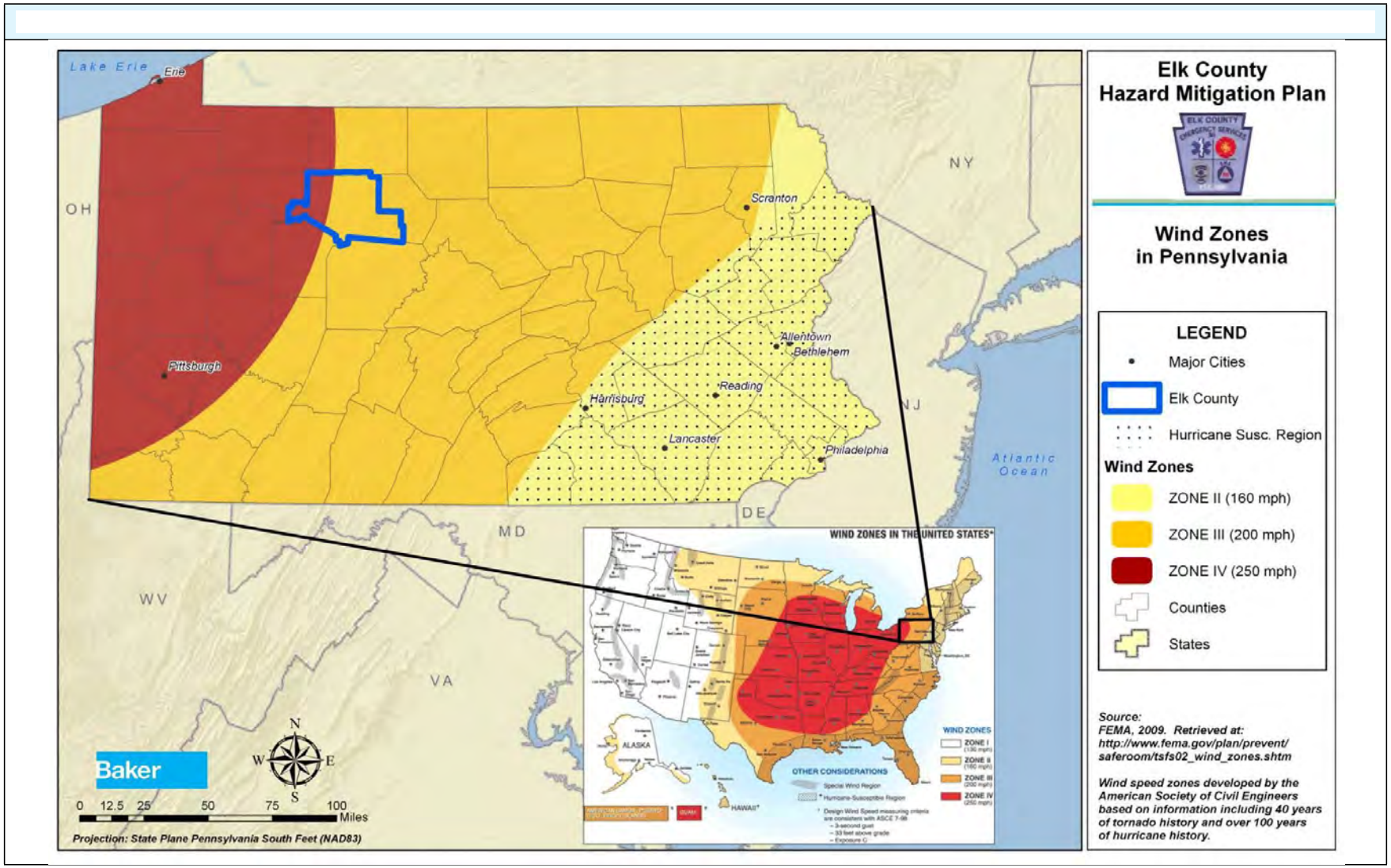


Figure 21: How to Prepare for a Tornado. FEMA.gov.

Figure 4-22: Design wind speeds for community shelters across the United States (FEMA, 2009).



4.3.6.3 Past Occurrence

Tornadoes have occurred in all seasons and all regions of Pennsylvania, but the northern, western, and southeastern portions of the Commonwealth have been struck more frequently. One of the deadliest tornadoes in the Commonwealth occurred during a May, 1985 storm which killed six people, injured sixty, and destroyed campers, mobile homes, and businesses across Lycoming, Union, and Northumberland Counties. Two tornadoes touched down in Elk County during this storm. A list of tornado events that have occurred in Elk County between 1950 and 2017 is shown in Table 4-18 with an associated Fujita Tornado Scale magnitude. A map showing the approximate location of previous events is included in Figure 4-26.

Table 4-18: Previous tornado events between 1950 and 2017 in Elk County (NCDC, 2017).

LOCATION	DATE	ESTIMATED LENGTH	ESTIMATED WIDTH	MAGNITUDE	ESTIMATED PROPERTY DAMAGE ($)
Elk County	9/03/63	8.40 mile	100 yards	F3	2,500,000
Elk County	5/31/85	10.5 miles	300 yards	F2	0
Elk County	5/31/85	11.5 miles	1000 Yards	F4	0
Johnsonburg Borough	5/31/98	3 miles	100 yards	F1	0
Ridgway Borough	5/31/98	0.5 miles	100 yards	F0	0
Brockport	6/20/01	3 miles	60 yards	F1	10,000
Highland Corners	8/19/01	2 miles	100 yards	F1	0
Ketner	7/26/09	1 miles	30 yards	F1	5,000
Force	8/09/09	NP	NP	F1	0
Dahoga/Twin Lakes	**5/01/17**	**NP**	**NP**	**EF1**	**0**

Since tornado events are typically localized, environmental impacts are rarely widespread. However, where these events occur, severe damage to plant species is likely. This includes loss of trees and an increased threat of wildfire in areas where dead trees are not removed. The EF1 tornado that occurred on May 1, 2017 highlights these types of impacts.

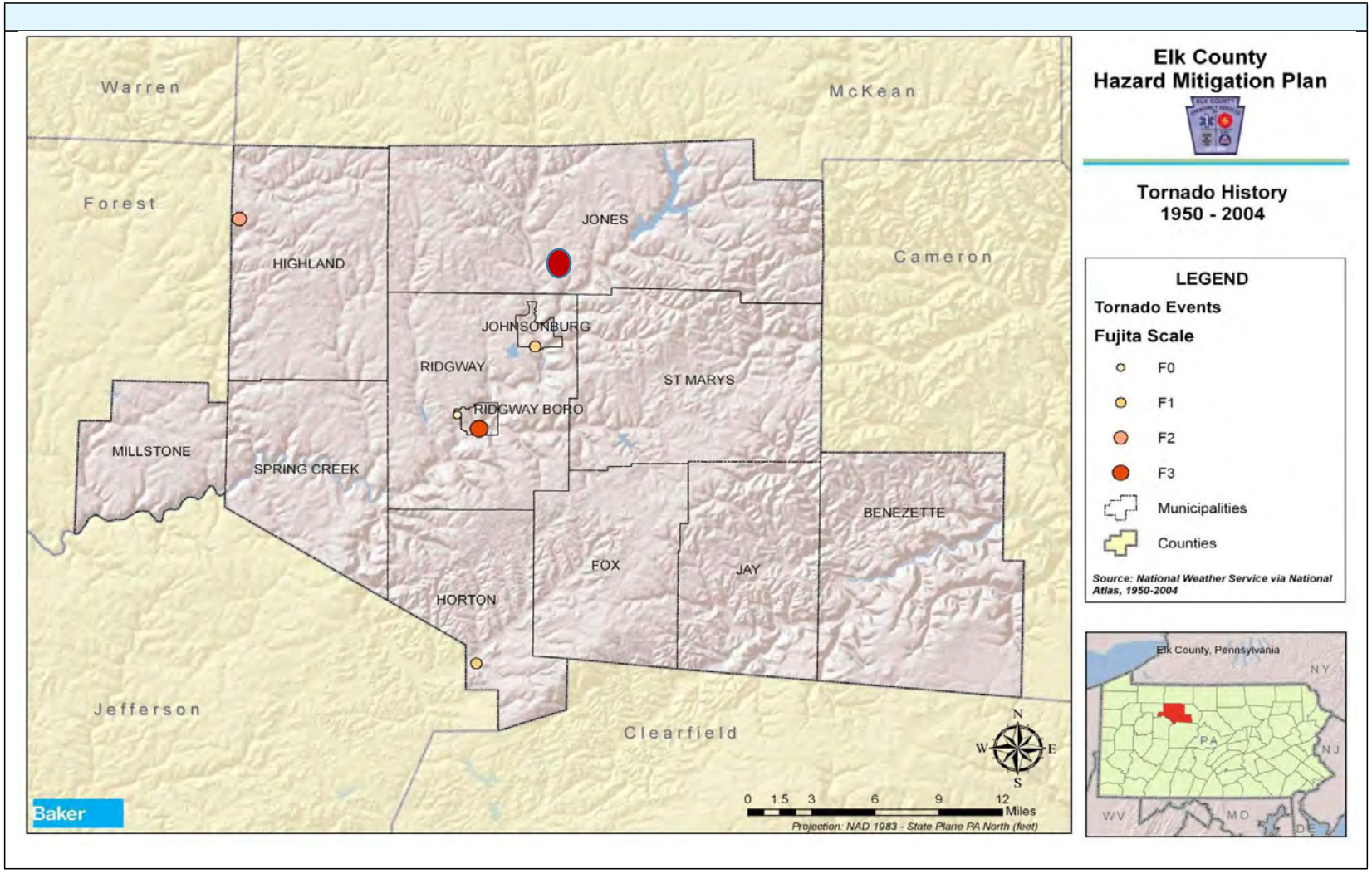
Two confirmed tornadoes touched down in Elk County on May 1, 2017. They were located in the Dahoga and Twin Lakes area between Wilcox and Kane. Two distinct tracts fairly close to each other caused extensive tree damage on the Allegheny National Forest. The largest tract was estimated to be three miles long and 100 yards wide. Estimated wind speeds were between 90 and 110 miles per hour. Although it is difficult to show the tornado's path from the ground, the following photos highlight the tree damage and debris that was left in the storm's path in the ANF:

Figure 23: Tree Damage on the ANF- Large amounts of debris create a secondary hazard. The sheer volume of brush left behind can significantly increase the threat of wild fire.

Figure 24: EF1 Tornado Damage-It is difficult to see the actual tract of the tornado from ground level.

Figure 25: Tornado Clean-Up-The instability of this type of damage creates hazardous conditions for those tasked with the clean-up.

Figure 4-26: Tornadoes that have touched down in Elk County between 1950 and 2017 (NWS via National Atlas, 1950-2017). The red dot indicates approximate location of most recent EF1 tornado that occurred in 2017.



Windstorm events may be the result of thunderstorms, hurricanes, tropical storms, winter storms, or nor'easters. There are over 100 high wind events recorded in Elk County since 1950. In 2002 the County experienced high winds from a thunderstorm in excess of 85 mph. This storm caused over 100 trees to be knocked down in St. Marys and is the highest recorded wind speed in the County to date. A list of events greater than 50 knots that have occurred since 1997 is shown in Table 4-19.

Table 4-19: Previous windstorm events greater than 50 knots in Elk County between 1997 and 2017 (NCDC, 2017).

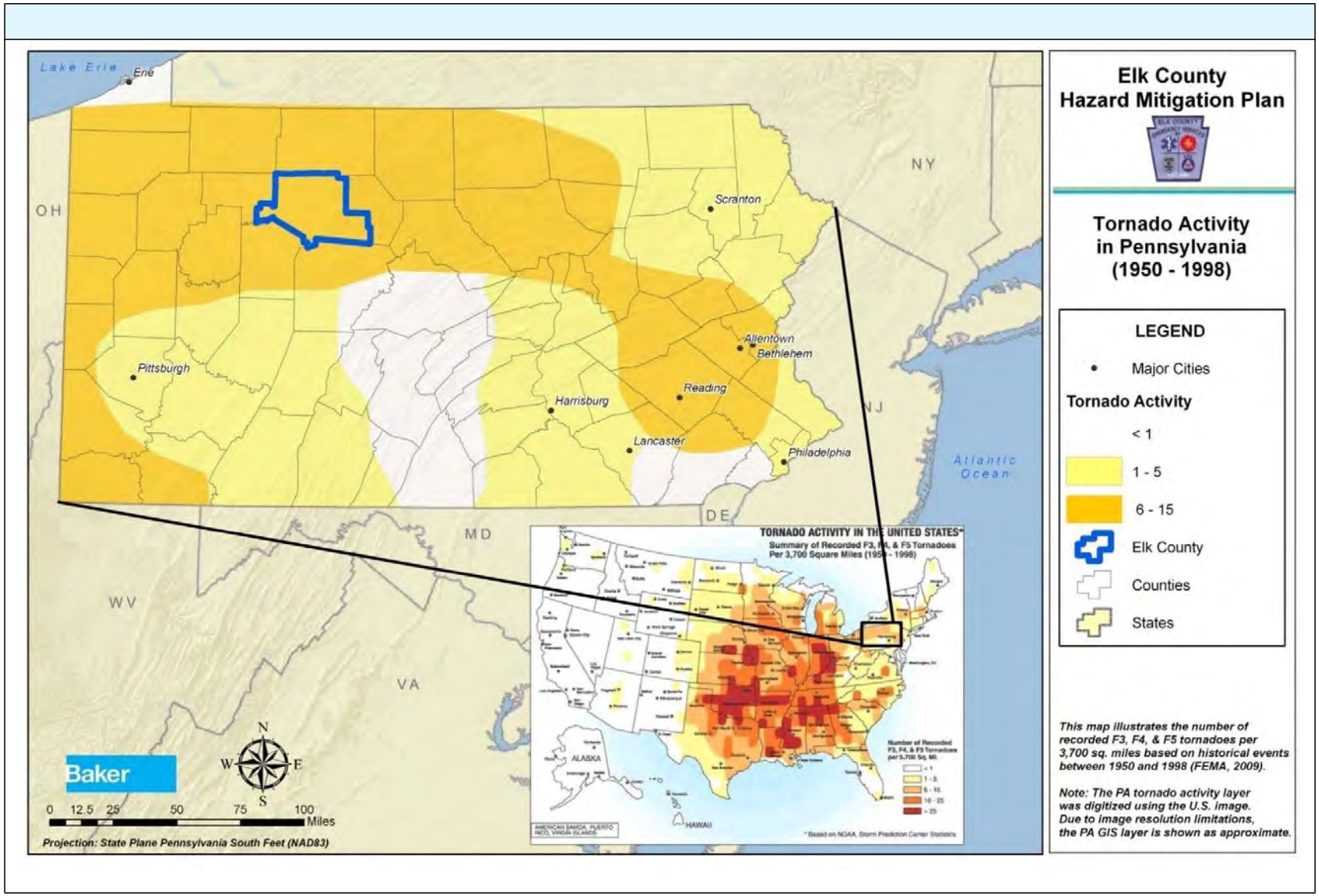
LOCATION	DATE	ESTIMATED WIND SPEED (knots)	ESTIMATED PROPERTY
St. Mary's	5/03/1997	51	**NP**
Glen Hazel	6/25/1997	51	**NP**
St. Mary's	7/15/1997	51	**5,000**
Russell City	8/16/1997	51	**NP**
Johnsonburg	8/16/1997	51	**NP**
Boot Jack	6/23/1998	51	**NP**
Ridgway	8/24/1998	51	**NP**
Brockport	8/24/1998	51	**NP**
Ridgway	9/07/1998	51	**NP**
Countywide	11/10/1998	51	**NP**
Countywide	9/29/1999	60	**100,000**
St. Mary's	6/27/2002	75	**NP**
Countywide	12/01/2004	60	**NP**
Countywide	2/17/2006	53	**20,000**
Weedville	4/16/2017	52	**2,000**
Ridgway	**4/20/2017**	**52**	**7,000**

4.3.6.4 Future Occurrence

According to the National Weather Service, the Commonwealth of Pennsylvania has an annual average of ten tornadoes with two related deaths. While the chance of being hit by a tornado is small, the damage that results when the tornado arrives is devastating. An F4 tornado, with a 0.019 percent annual probability of occurring, can carry wind velocities of 200 mph, resulting in a force of more than 100 pounds per square foot of surface area. This is a "wind load" that exceeds the design limits of most buildings.

Based on tornado activity information for Pennsylvania between 1950 and 1998, Elk County lies within an area that has experienced 6 to 15 F3, F4, or F5 tornadoes per 3,700 square miles (see Figure 4-27). This equals a 12 percent to 31 percent chance that the planning area will be affected by a Category F3, F4, or F5 tornado each year. The probability of tornados in Elk County can be considered *likely* as defined by the Risk Factor Methodology probability criteria (see Table 4-36).

Figure 4-27: Number of recorded F3, F4, & F5 Tornadoes per 3,700 sq. miles based on historical events between 1950 and 2017 (FEMA, 2009).



4.3.6.5 Vulnerability Assessment

While the frequency of windstorms and minor tornadoes is expected to remain relatively constant, vulnerability increases in more densely developed areas. Since high wind events may affect the entire County, it is important to identify specific critical facilities and assets that are most vulnerable to the hazard. Communities located in the central and western portion of the County are most likely to experience tornados while communities in the eastern portion of the County have had no recorded tornados in the last 50 years.

4.3.6.5-1 Utilities

Elk County has approximately 900 miles of electric utility lines that may be affected during a natural disaster. When power goes out or lines go down, there is a process that involves damage assessment and logistics to arrange for field personnel to inspect and restore the power lines. Depending on the size of the area affected this can take hours or days before service is restored. Higher priority is given to hospitals, fire stations, water treatment plants and other essential facilities. Once those areas are restored, the goal is to restore customers starting with the largest blocks of outages. Residents that rely on life saving equipment such as oxygen need to have a plan in place for these types of incidents. The electric company does not prioritize individual residences in cases of widespread power outages.

Residents in the most rural areas are aware of the difficulties they face when a wide-spread power outage occurs. They have adapted to become self -sufficient when this happens because of the length of time it may take to have power restored. Many residents have portable, gas- powered generators that they utilize in the event of a long-term outage.

Figure 28-West Penn Power responding to lines down in Jones Township after tornado blew through the area in May of 2017.

Communications are a challenge as well but with the advent of cellular phones, the loss of land-line telephones that occur when lines come down is not as critical as it once was.

One primary concern in severe wind-related hazards is manufactured housing and mobile homes. Due to their light-weight and often unanchored design, manufactured housing is extremely vulnerable to high winds and will generally sustain the most damage. Table 4-20 shows the number of mobile homes located in the county according to the Elk County Tax Assessment Office.

Table 4-20: Manufactured Housing. Elk County Tax Assessment, 2017

Municipality	Local	Seasonal	Total
Benezette Township	10	121	131
City of St. Marys	90	17	107
Fox Township	84	14	98
Highland Township	16	72	88
Horton Township	57	25	82
Jay Township	76	64	140
Johnsonburg Borough	5	0	5
Jones Township	31	92	123
Ridgway Borough	0	0	0
Ridgway Township	31	26	57
Millstone Township	5	94	99
Spring Creek Township	12	126	138
Totals	**417**	**651**	**1068**

Mobile Homes are an affordable alternative to brick and mortar structures and Elk County has a fairly large number of residents that live in this type of housing. Some are located in trailer parks and others are scattered throughout the county on single lots. Unfortunately, these types of structures can be vulnerable to natural and man-made disasters, especially fire and wind and can quickly be destroyed under the right circumstances. They are also more prone to flood damage with as little as six (6) inches of water causing substantial damage.

Figure 4-29: Mobile home or "trailer". Note the hitch attached to the front for towing.

Figure 4-30: Manufactured home. No hitch attached but note the skirting around the bottom. This is typical in order to hide where the wheels are located.

Figure 4-31: Mobile Homes are notorious for the rapid rate they can burn. Photo courtesy of Jay Township Fire Dept.

4.3.6.5-2 Mobile Homes vs. Manufactured Homes

The terms mobile home and manufactured home are often used interchangeably which can lead to confusion. Not long after the automobile became accessible to more people, trailers were developed. They were called “trailers” because they trailed behind a vehicle and became a popular use for camping. As time went on they became larger and more elaborate so people began using them as a permanent residence. However, they often retained their wheels and were not permanently attached to a property so they were called “mobile homes”. Once people began living in these types of “homes” permanently, it was determined around 1976 that higher standards were required to make them safer. So, if the structure was manufactured before 1976 it can be correctly called a mobile home. Structures built after that (with stricter building codes) are called manufactured homes. Regardless of the name chosen, they are both equally vulnerable to a high wind event. Mobile homes are also notorious for the rapid rate they can burn. Some accounts have them fully engulfed in as little as three minutes. The small windows in older models make escape difficult if a door is blocked.

Mobile homes can be a significant factor in contributing to slum and blight, especially pre-1976 models. Mobile homes deteriorate at a faster pace than a traditionally built home. They depreciate in value similar to a motor vehicle so it becomes difficult to justify the additional expense needed for repairs. Therefore, people have a tendency to abandon them when they’ve reached a certain level of decay. Mobile homes are also similar to a motor vehicle because they are “titled” by the Department of Motor Vehicles. They can be easily moved from one location to another. Therefore, when one is abandoned, the local municipality has no way to identify it properly without the title, which is often lost or taken by the original owner. Mobile homes placed in repository due to failure to pay taxes often linger for years because of the uncertainty of its true identity.

4.3.7 Wildfire

4.3.7.1 Location and Extent

Wildfires take place in less developed or completely undeveloped areas, spreading rapidly through vegetative fuels. They can occur any time of the year, but mostly occur during long, d r y , hot spells. Any small fire, if not quickly detected and suppressed, can get out of control. Most wildfires are caused by human carelessness, negligence, and ignorance. However, some are precipitated by lightning strikes and in rare instances, spontaneous combustion. Wildfires in Pennsylvania can occur in open fields, grass, dense brush, and forests.

Because more than 93 percent of Elk County's land cover is forest, (see Figure 2-5 for land cover illustration), the potential geographic extent of wildfires is quite large. Under dry conditions or droughts, wildfires have the potential to burn forests as well as croplands. The greatest potential for wildfires is in the spring months of March, April, and May, and the autumn months of October and November; 83% of all Pennsylvania wildfires occur in these two time periods. In the spring, bare trees allow sunlight to reach the forest floor, drying fallen leaves and other ground debris. In the fall, dried leaves are also fuel for fires. The number one cause of wildfires in Elk County is due to debris burning. Incendiary devices are the second leading cause. However, some are precipitated by lightning strikes and, in rare instances, spontaneous combustion.

4.3.7.2 Range of Magnitude

Wildfire events can range from small fires that can be managed by local firefighters to large fires impacting many acres of land. Large events may require evacuation from one or more communities and necessitate regional or national firefighting support. The impact of a severe wildfire can be devastating. A wildfire has the potential to kill people, livestock, fish and wildlife. They often destroy property, valuable timber, forage and recreational and scenic values. A worst case scenario for wildfires occurred in Elk County in 2016 when a wildfire burned over 100 acres of land in Ridgway Township.

In addition to the risk wildfires pose to the general public and property owners, the safety of firefighters is also a concern. Although loss of life among firefighters does not occur often in Pennsylvania, it is always a risk. More common firefighting injuries include falls, sprains, abrasions or heat-related injuries such as dehydration. Response to wildfires also exposes emergency responders to the risk of motor vehicle accidents and can place them in remote areas away from the communities that they are chartered to protect.

The most significant environmental impact is the potential for severe erosion, silting of stream beds and reservoirs, and flooding due to ground-cover loss following a fire event.
Wildfire can also have a positive environmental impact in that they burn dead trees, leaves, and grasses to allow more open spaces for new vegetation to grow and receive sunlight. Another positive effect is that it stimulates the growth of new shoots on trees and shrubs and its heat can open pine cones and other seed pods.

4.3.7.3 Past Occurrence

The Department of Conservation and Natural Resources (DCNR), Bureau of Forestry (BOF) have two districts located in Elk County (see Figure 4-31). District 13 is completely within the county while District 9 covers only a small portion of the southeast corner (Moshannon State Forest). There have been 44 wildfire events reported to the Pennsylvania Department of Conservation and Natural Resources Bureau of Forestry from 2009-2016 in District 13 (see Table 4-21). The year 2009 saw the most reported wildfire events at 10 in District 13, but the largest number of acres burned in 2013, when over 300 acres were scorched.

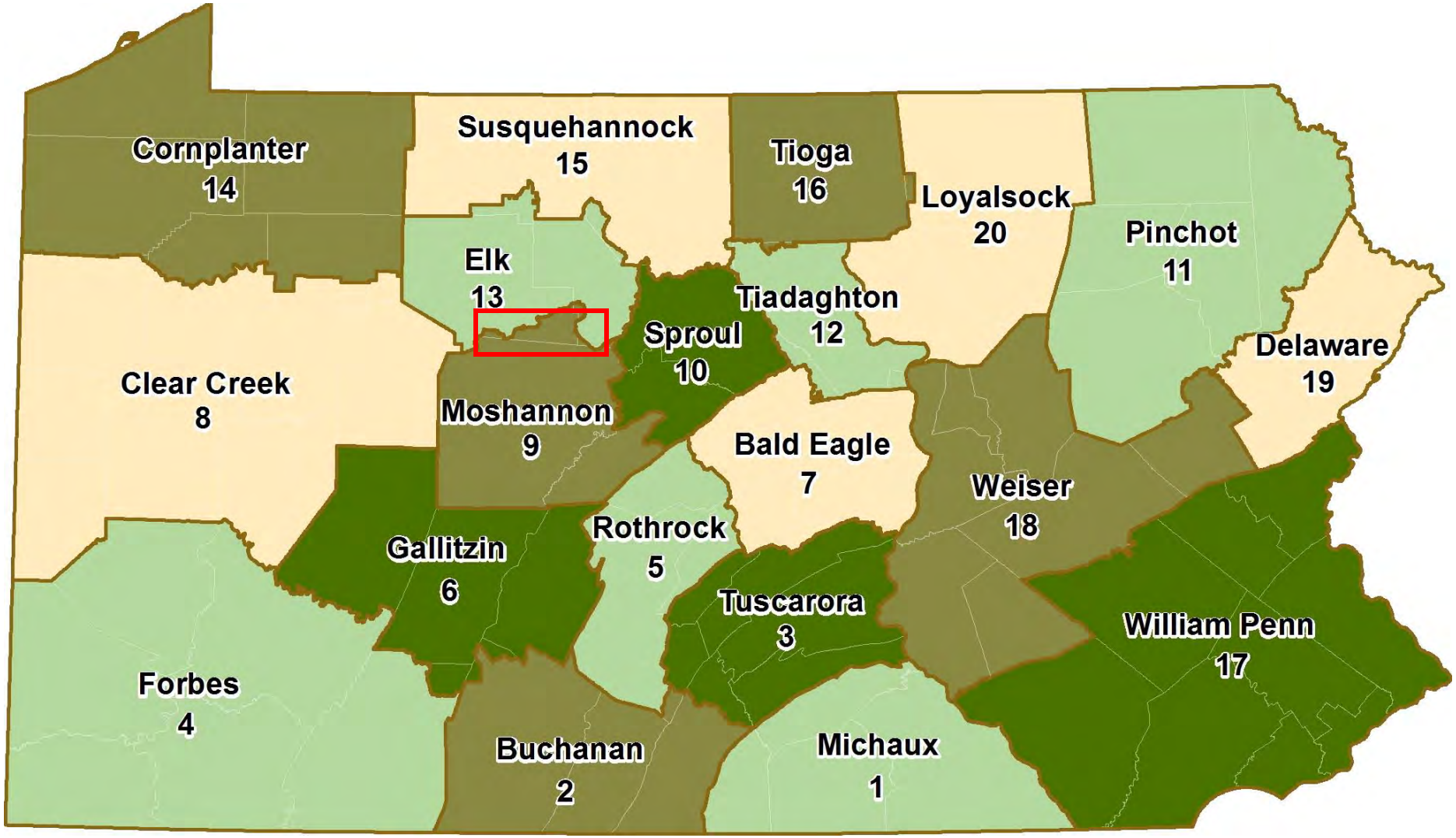
Table 4-21: District 13 Wildfires

	PA Bureau of Forestry District 13			
Year	**Spring # of Fires**	**Total Acreage**	**Fall # of Fires**	**Total Acreage**
2009	10	281.3	0	0
2010	6	8.5	1	10.2
2011	0	0	0	0
2012	8	252	0	0
2013	7	389.9	0	0
2014	5	124	0	0
2015	2	45	1	0
2016	2	1	2	101
Totals	**40**	**1101.7**	**4**	**111.2**

Proper forest management can reduce the number of wildfires that occur in any given year. Elk State Forest (District 13) conducts prescribed fire burns annually to eliminate areas considered at risk for a wildfire. Their 2017 Forest Management Activity Report (DCNR, 2017) lists the following planned prescribed fires:

- 2 fires totaling approximately 175 acres off of McDonald Draft Road, Elk County.
- 58 acre fire off of Ridge Road, Cameron County in the Johnson Run area.
- 2 fires totaling 55 acres off of Montour Road, Cameron County in the Arksill fences.
- 20 acre fire off of Ridge Road, Cameron County in the Laurel Ridge area.

Figure 4-32: DCNR-BOF District Map, 2017. District 13 and the portion of District 9 (highlighted in red box) are located in Elk County



Wildfires in District 9 are a little bit more difficult to track. The BOF doesn't break down fires by location as they have in the past so every fire in that district is listed in Table 4-23. It is safe to assume that given the forested nature of the area, several of the reported fires occurred in Elk County.

These lists don't include wildfires that were not reported to DCNR or that were controlled solely by the volunteer fire departments in the County. Local fire departments were contacted in an effort to obtain more accurate statistics but the information was not forthcoming.

Table 4-22: District 9 Wildfires

	PA Bureau of Forestry District 09			
Year	**Spring # of Fires**	**Total Acreage**	**Fall # of Fires**	**Total Acreage**
2009	84	326.6	9	14.1
2010	59	97.1	31	17.3
2011	22	51.6	12	1.1
2012	53	93	19	11.2
2013	7	380.9	0	0
2014	64	194	6	24
2015	41	88	10	10
2016	49	156	19	29
Totals	**379**	**1387.20**	**106**	**106.7**

The Allegheny National Forest

Portions of the Allegheny National Forest are located in Elk County. The district office is located in Marienville, PA in Jefferson County. The ANF reports 60 wildfires occurred on the ANF between 2009 and 2017. Unfortunately, they do not track fires by county so it is difficult to know how many of the fires occurred in here.

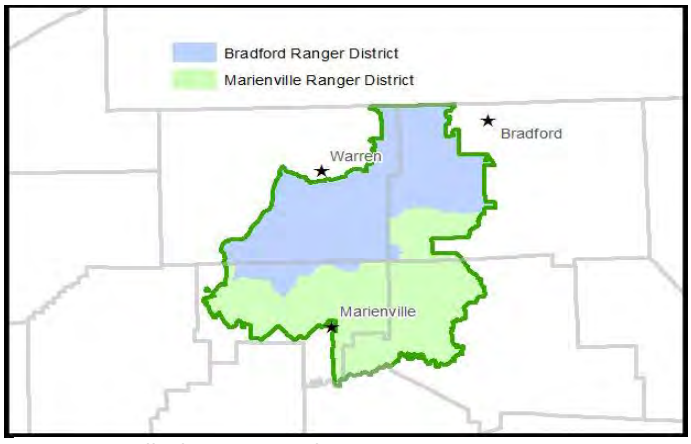


Figure 4-33 Allegheny National Forest Map

In addition, Elk County has record of several other wildfire events prior to 2002. They are depicted in Table 4-24 below.

Table 4-23: Wildfire events in Elk County prior to 2002 (Elk County OEM, 2003).

DATE	RANGER DISTRICT	AREA (acres)
4/26/1997	Ridgway	<1
3/28/1998	Ridgway	3
8/3/1998	Ridgway	3
5/04/1999	Jones Township	3
04/29/2000	Highland	1.5
8/26/2000	Spring Creek	<1
4/14/2001	Spring Creek	4
4/26/2001	Highland	4
4/26/2001	Highland	1
8/12/2001	Millstone	1.3
11/19/2001	Spring Creek	5.6

4.3.7.4 Future Occurrence

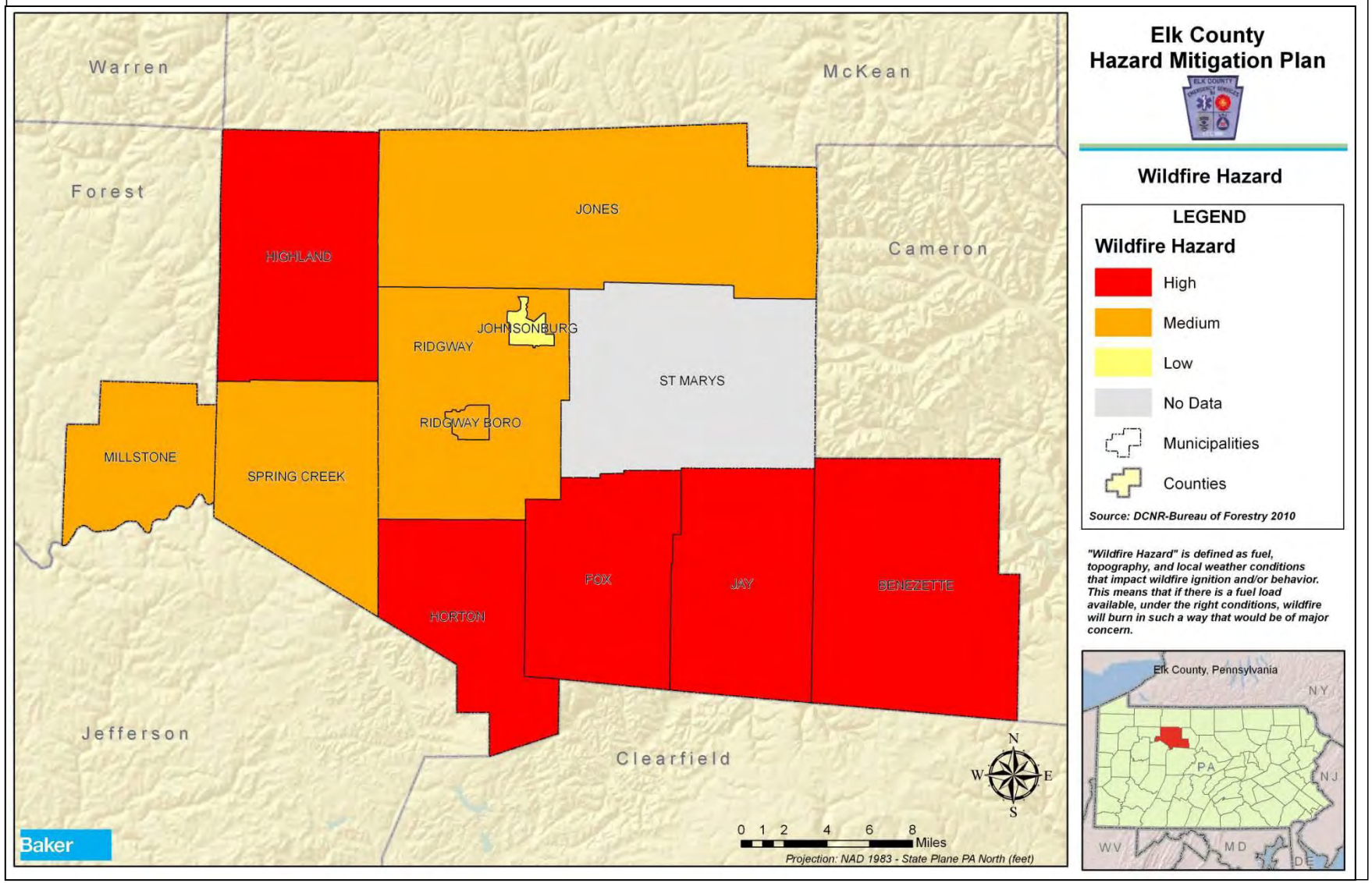
Previous events indicate that wildfires will continue to occur yearly. Weather conditions like drought can increase the likelihood of wildfires occurring. Any fire, without the quick response or attention of fire- fighters, forestry personnel, or visitors to the forest, has the potential to become a wildfire.

The probability of a wildfire occurring each year in Elk County is *highly likely* as defined by the Risk Factor Methodology probability criteria (see Table 4-36). However, the likelihood of one of those fires attaining significant size and intensity is unpredictable and highly dependent on environmental conditions and firefighting response.

4.3.7.5 Vulnerability Assessment

The Pennsylvania Bureau of Forestry has conducted an independent wildfire hazard risk assessment for the various municipalities across Elk County. Results of that assessment are shown in Figure 4-33. *Wildfire hazard* is defined based on conditions that affect wildfire ignition and/or behavior such as fuel, topography and local weather. Based on this assessment, five of the twelve municipalities within Elk County have a *high wildfire hazard potential:* Highland, Horton, Fox, Jay, and Benezette Townships. Ridgway Borough, and Ridgway, Jones, Millstone, and Spring Creek Townships are considered to have *medium wildfire hazard potential*. Only Johnsonburg Borough is considered to have *low wildfire hazard potential*. No wildfire hazard calculation is available for the City of St. Marys.

Figure 4-34: Wildfire hazard potential per municipality in Elk County (DCNR-BOF, 2010).



The vulnerability assessment for wildfires is based on the aforementioned wildfire hazard classification. For this assessment, all primary addressable structures and critical facilities that are located within the jurisdictions identified by DCNR-Bureau of Forestry as being "High- Hazard" are considered most vulnerable to wildfire events. Table 4-25 illustrates the vulnerable structures by municipality. Fox Township has the largest number of vulnerable structures with 1,871 parcels located in the wildfire high-hazard area. Each of the jurisdictions with vulnerable addressable structures has over 600 structures located in the wildfire high- hazard area, but of the vulnerable jurisdictions Highland Township has the fewest vulnerable structures.

Approximately 25% of all critical facilities are located in areas that are considered most vulnerable to wildfire hazards. Fox Township has the highest concentration of vulnerable critical facilities with four. Of the municipalities with vulnerable critical facilities, Highland and Horton Townships have the fewest with only one each that are vulnerable to wildfires. For a complete list of critical facilities and their vulnerability to wildfire hazards, please see **Appendix C**.

Table 4-24: Structure and critical facility vulnerability summary for Wildfire Hazards.

MUNICIPALITY	NUMBER OF ADDRESSABLE STRUCTURES IN WILDFIRE HIGH-HAZARD AREAS	TOTAL # ADDRESSABLE STRUCTURES IN MUNICIPALITY	CRITICAL FACILITIES IN WILDFIRE HIGH-HAZARD AREAS	TOTAL CRITICAL FACILITIES
Benezette Township	976	976	0	0
Fox Township	1871	1871	4	4
Highland Township	673	673	1	1
Horton Township	793	793	1	1
Jay Township	1360	1360	2	2
Johnsonburg Borough	0	1304	0	4
Jones Township	0	1306	0	1
Millstone Township	0	396	0	0
Ridgway Borough	0	1951	0	5
Ridgway Township	0	1369	0	4
Spring Creek Township	0	661	0	0
City of St. Marys	0	6160	0	9
TOTAL	**5673**	**18820**	**8**	**31**

4.3.7.6 Additional Vulnerabilities

There are numerous inherent difficulties to face when fighting wildfires in some of the most remote areas of Elk County that increases vulnerability to firefighters and structures located next to a forested area. The following examples highlight a few of the challenges:

4.3.7.6-1 Water Supply

Water supplies can be difficult, if not impossible to find when fighting a wildfire. In most instances firefighters are required to utilize tanker trucks and jerry cans to carry water to the scene of a wildfire.

4.3.7.6-2 Time of Travel

Firemen often need to travel a long distance in order to reach the scene of a wildfire. This can slow response time which gives the fire time to spread. Roadways can be narrow or non-existent making access to the fire extremely difficult as well. Small fires can rapidly intensify if conditions are favorable (low humidity, high wind) which makes it even more critical to reach the fire as quickly as possible.

4.3.7.6-3 Evacuations

Some of the more remote municipalities in Elk County have only one route to exit the area. In the event of a large wildfire, this could lead to injury or loss of life.

4.3.7.6-4 Lack of Manpower

Elk County has eight fire departments, all volunteer based. It has become increasingly difficult to maintain enough manpower to respond to a fire. An aging force and a lack volunteer recruits are cited as a future challenge. Additional training requirements and the amount of time it takes to train as a fireman makes it difficult for some to invest the time needed to volunteer. Employers in the area are also becoming more reluctant to allow firemen to leave in the event a fire occurs during work hours. These, as well as other factors, means an outbreak of any type of fire creates a more hazardous situation in rural areas. This danger increases dramatically when a structure located in a Wildland Urban Interface (WUI) ignites.

4.3.7.6-5 Highland Hotel Fire

On January 3, 2016 a structure located in the Allegheny National Forest in Highland Township caught fire. The Highland Hotel was a well-known historic structure that accidentally caught fire during the early morning hours. Fourteen different fire companies responded to the fire, many bringing tanker trucks to supply water. The building was a total loss. The situation could've been much worse if the fire had occurred during the spring months when wildfire conditions are most dangerous. The area nearby is heavily forested and sparks could have triggered brush fires or spread to other homes.

Figure 4-35: Highland Hotel Historic Image

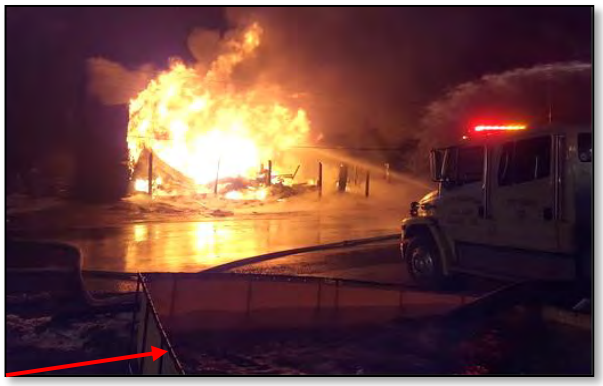


Figure 4-35: Fighting the fire. Notice the portable pond being used as a source of water.

Figure 4-36: Battling the Highland Hotel

4.3.7.7 Future Planning

4.3.7.7-1 Community Wildfire Protection Plan (CWPP)

Elk County was approached in 2016 by a representative from the Allegheny National Forest and asked to participate in preparing a Community Wildfire Protection Plan. This plan will assess the fire conditions in the county as well as identify the number of structures located within the Wildland Urban Interface. The PA Bureau of Forestry was included in the study as well in order to assess state forests and game lands. Educational information about DCNR's Firewise program is an integral part of the plan.

These efforts are being undertaken in order to educate residents located in a (Wildland Urban Interface) WUI in ways they can reduce the vulnerability of their structure in the event a wildfire or brush fire occurs near their property. It will also look for weaknesses in the county's ability to fight fires (as some examples show above) and offer suggestions on how to overcome these challenges. The plan was finalized in the fall of 2017 and is available on Elk County's website at: www.co.elk.pa.us.

4.3.8 Winter Storm

4.3.8.1 Location and Extent

Winter storms are regional events. Every county in the Commonwealth is subject to severe winter storms including Elk. Within Elk County there are slight variations in the average amount of snowfall that is received throughout different parts of the County because of terrain differences. Generally, the average annual snowfall in the county increases from south to north (see Figure 4-37).

4.3.8.2 Range of Magnitude

Winter storms consist of cold temperatures, heavy snow or ice and sometimes strong winds. They begin as low-pressure systems that move through Pennsylvania either following the jet stream or developing as extra-tropical cyclonic weather systems over the Atlantic Ocean called nor'easters. Due to their regular occurrence, these storms are considered hazards only when they result in

damage to specific structures or cause disruption to traffic, communications, electric power, or other utilities.

A winter storm can adversely affect roadways, utilities, business activities, and can cause frostbite or loss of life. These storms may include one or more of the following weather events:

- **Heavy Snowstorm:** Accumulations of four inches or more in a six-hour period, or six inches or more in a twelve-hour period.
- **Sleet Storm:** Significant accumulations of solid pellets which form from the freezing of raindrops or partially melted snowflakes causing slippery surfaces posing hazards to pedestrians and motorists.
- **Ice Storm:** Significant accumulations of rain or drizzle freezing on objects (trees, power lines, roadways, etc.) as it strikes them, causing slippery surfaces and damage from the sheer weight of ice accumulation.
- **Blizzard:** Wind velocity of 35 miles per hour or more, temperatures below freezing, considerable blowing snow with visibility frequently below one-quarter mile prevailing over an extended period of time.
- **Severe Blizzard:** Wind velocity of 45 miles per hour, temperatures of 10 degrees Fahrenheit or lower, a high density of blowing snow with visibility frequently measured in feet prevailing over an extended period time.

Any of the above events can result in the closing of major or secondary roads, particularly in rural locations, stranded motorists, transportation accidents, loss of utility services, and depletion of oil heating supplies. Environmental impacts often include damage to shrubbery and trees due to heavy snow loading, ice build-up and/or high winds which can break limbs or even bring down large trees. Gradual melting of snow and ice provides excellent groundwater recharge. However, high temperatures following a heavy snowfall can cause rapid surface water runoff and severe flooding.

Figure 4-38 shows mean annual snowfall in Elk County to be between 50 and 80 inches. Three of the eight Presidential Disaster and Emergency Declarations affecting Elk have been in response to hazard events related to winter storms (see Table 4-1). In addition to the events described above, other winter storm events, including those associated with Disaster Declarations, are listed in Table 4-26. The worst case scenario of a winter storm in Elk County occurred in 1978 which affected all 67 counties. An estimated $121,148 was spent for snow removal in Elk County.

4.3.8.3 Past Occurrence

Elk County and the Commonwealth of Pennsylvania have a long history of severe winter weather. Significant winter storm events that have affected Elk County since 2010 are listed in Table 4-25. The National Climactic Data Center (NCDC) data on past occurrence for winter storm events since 1993 is the only comprehensive list of data available for the county aside from information from past disaster declarations. Prior to 1993, the County experienced significant winter storms in 1972, 1977, and 1978 (Elk County OEM, 2003).

In the winter of 1993-1994, the state was hit by a series of protracted winter storms. The severity and nature of these storms combined with accompanying record-breaking frigid temperatures posed a major threat to the lives, safety and well-being of Commonwealth residents and caused major disruptions to the activities of schools, businesses, hospitals and nursing homes.

One of these devastating winter storms occurred in early January 1994 with record snowfall depths in many areas of the Commonwealth, strong winds, and sleet/freezing rains. Numerous storm-related power outages were reported and as many as 600,000 residents were without electricity, in some cases for several days at a time. A ravaging ice storm followed which closed major arterial roads and downed trees and power lines. Utility crews from a five-state area were called to assist in power restoration repairs. Officials from PPL Corporation stated that this was the worst winter storm in the history of the company; related damage-repair costs exceeded
$5,000,000.
Serious power supply shortages continued through mid-January because of record cold temperatures at many places, causing sporadic power generation outages across the Commonwealth. The entire Pennsylvania-New Jersey-Maryland grid and its partners in the District of Columbia, New York and Virginia experienced 15-30 minute rolling blackouts, threatening the lives of people and the safety of the facilities in which they resided. Power and fuel shortages affecting Pennsylvania and the East Coast power grid system required the Governor to recommend power conservation measures be taken by all commercial, residential and industrial power consumers.

The record cold conditions resulted in numerous water-main breaks and interruptions of service to thousands of municipal and city water customers throughout the Commonwealth.
Additionally, the extreme cold in conjunction with accumulations of frozen precipitation resulted in acute shortages of road salt. As a result, trucks were dispatched to haul salt from New York to expedite deliveries to Pennsylvania Department of Transportation storage sites.

Table 4.-25: Winter Storm Events, NCDC 2017

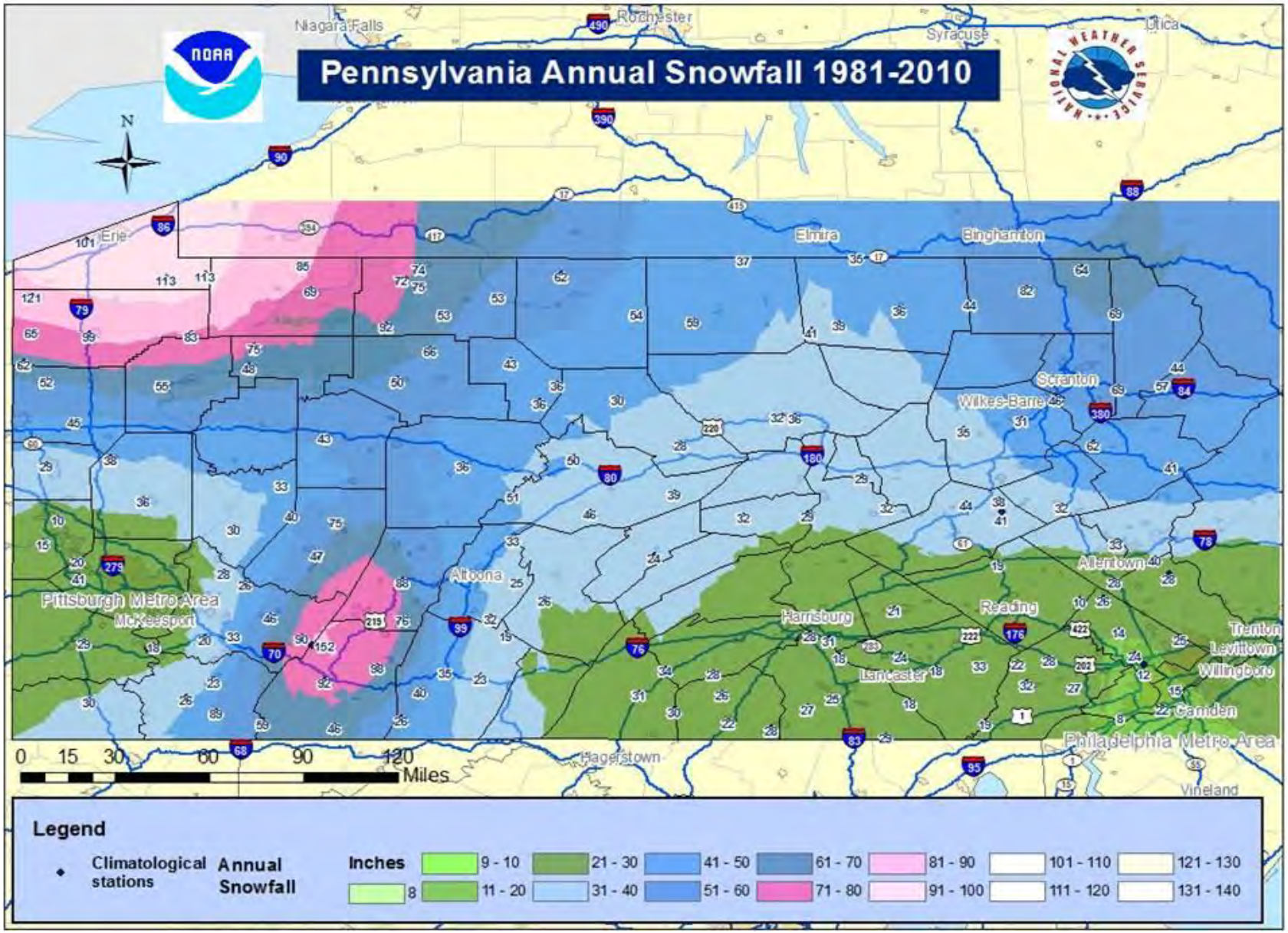
Location	Date	Type
Multiple Counties	02/01/2011	Snow, Sleet, Freezing Rain
Multiple Counties	02/20/2011	Heavy Snow
Multiple Counties	04/22/2012	Heavy Snow
Multiple Counties	12/26/2012	Heavy Snow
Multiple Counties	11/26/2013	Snow, Sleet, Freezing Rain
Multiple Counties	12/14/2013	Heavy Snow
Multiple Counties	02/04/2014	Winter Storm
Multiple Counties	02/01/2015	Winter Storm
Multiple Counties	02/15/2016	Snow, Sleet, Freezing Rain

Additionally, there were six Gubernatorial Declarations for Winter Storms from 2010 to 2016. Table 4-26 lists these events.

Table 4-26: Gubernatorial winter storm declarations.

Date	Type
February 2010	Winter Storm
January 2011	Winter Storm
January 2014	Winter Storm
February 2014	Winter Storm
January 2015	Winter Storm
January 2016	Winter Storm

Figure 4-38: Annual Snowfall for Pennsylvania. National Weather Service-NOAA 2017.



4.3.8.4 Future Occurrence

Winter storms are a regular, annual occurrence in Elk County and should be considered *highly likely* as defined by the Risk Factor Methodology probability criteria (see Table 4-36).
Approximately thirty-five winter storm events occur across Pennsylvania and about three to five in Elk County annually. Table 4-27 shows the probability of receiving measureable snowfall by month in Elk County. These probabilities are based on data collected over a minimum of 17 years.

Table 4-27: Probability of Measurable Snowfall in Elk County by Snow Station (NCDC, 2007).

MONTH	PROBABILITY (%)		
	Glen Hazel NE Dam	Medix Run	Ridgway
January	100	100	99
February	100	100	100
March	100	100	95.8
April	81	63.2	60.6
May	5.4	5.3	6
June	0	0	0
July	0	0	0
August	0	0	0
September	0	0	0
October	22.4	10.5	13.3
November	84.7	83.3	89.4
December	100	100	100

4.3.8.5 Vulnerability

Based on the information available, all communities in Elk County are essentially equally vulnerable to the direct impacts of winter storms. Residents of the mountainous areas of the County may be more susceptible, especially when emergency medical assistance is required. In addition, some rural areas of the County are susceptible to isolation caused by winter storms including: Highland, Millstone, Spring Creek, and Benezette Townships. These townships are heavily wooded which make emergency response to the areas difficult when roadways are blocked by downed trees and wires.

These remote areas of Elk County also struggle with communications. Local road crews tasked with keeping roads clear are often in isolated areas. Numerous times drivers have become stuck or their vehicles have become disabled with no way of contacting anyone for help. No access to cell phone service and limited distance of portable radios creates an additional hazard for workers during a winter storm.

Vulnerability to the effects of winter storms on buildings is also dependent on the age of the building type, construction material used and condition of the structure. Table 4-28 below shows that most

structures in Elk County were built since 1940. Additional information on construction type and building codes enforced at time of construction would allow a more thorough assessment of the vulnerability of structures to winter storm impacts such as severe wind and heavy snow loading. Building codes for snow loads were only beginning to be addressed in the 1970s and 1980s. Therefore, any structure built before 1970 may have roofs that do not meet snow load codes in place today putting them at risk of roof collapse during a heavy snow event. Typically for Northwest and North central PA, snow loads run between 30 and 35 pounds per square foot.

Table 4-28: Age of Housing Units in Elk County (American Community Survey, 2015).

Municipality	Number of Housing Units Built Prior to 1940	Percent of Total Housing Units
Benezette Township	231	33%
Fox Township	281	18%
Highland Township	187	36%
Horton Township	195	25%
Jay Township	375	29%
Johnsonburg Borough	642	50%
Jones Township	341	28%
Millstone Township	92	29%
Ridgway Borough	1103	55%
Ridgway Township	268	22%
Spring Creek Township	123	21%
City of St. Marys	1479	25%

Because of the frequency of winter storms, strategies have been developed to respond to these events. Snow removal and utility repair equipment is present to respond to typical events. The use of auxiliary heat and electricity supplies such as wood burning stoves, kerosene heaters and gasoline power generators reduces the vulnerability of humans to extreme cold temperatures commonly associated with winter storms. People residing in structures lacking adequate equipment to protect against cold temperatures or significant snow and ice are more vulnerable to winter storm events. Even for communities that are prepared to respond to winter storms, severe events involving snow accumulations that exceed six or more inches in a twelve hour period can cause a large number of traffic accidents, strand motorists due to snow drifts, interrupt power supply and communications, and cause the failure of inadequately designed and/or maintained roof systems.

Human-Made Hazards

4.3.9 Fuel Shortages

4.3.9.1 Location and Extent

A fuel shortage occurs when the supply of energy resources does not meet the demand. Fuel shortages may be caused by nationwide shortages of more localized imbalances of supply due to weather, strikes

or an oil embargo. Such energy emergencies have been experienced in the United States including the problems caused by rapid price increases, which also have the effect of leaving homes and industry without the needed fuels.

4.3.9.2 Range and Magnitude

Most fuel shortages are regional or national events. A fuel shortage can have numerous impacts including increases in the cost of fuel putting an economic burden on families and businesses, long lines at gas stations due to fuel rationing, disruptions in freight traffic, incidents of violence, truck driver strikes, and a shortage of heating fuels.

A worst case scenario for fuel shortage in Elk County would be if there was a shortage of gasoline in Elk County in the winter months which may leave many homes without a source of heat.

4.3.9.3 Past Occurrence

Elk County, like most of Pennsylvania, experienced long lines at gasoline pumps and shortages of fuel in 1973 as a result of the OPEC oil embargo. Government actions were taken to assure that fuels and power were available for emergency and priority users. In the late 1970's, drastic increases in prices presented hardships for low-income consumers in particular. Artificial shortages developed as suppliers held out for higher prices.

Gas prices have become more volatile in recent years with the highest prices recorded in 2008. Numerous factors such as low supply and a surge in demand drove the price of oil up to $140 a barrel. This in turn increased gas prices. Although prices have stabilized, the inelasticity of supply and demand curves will most surely keep price volatility a concern for the future. A chart from Gas Buddy (see Figure 4-38) shows the historic price fluctuations over a ten year period. (Gas Buddy, 2017)

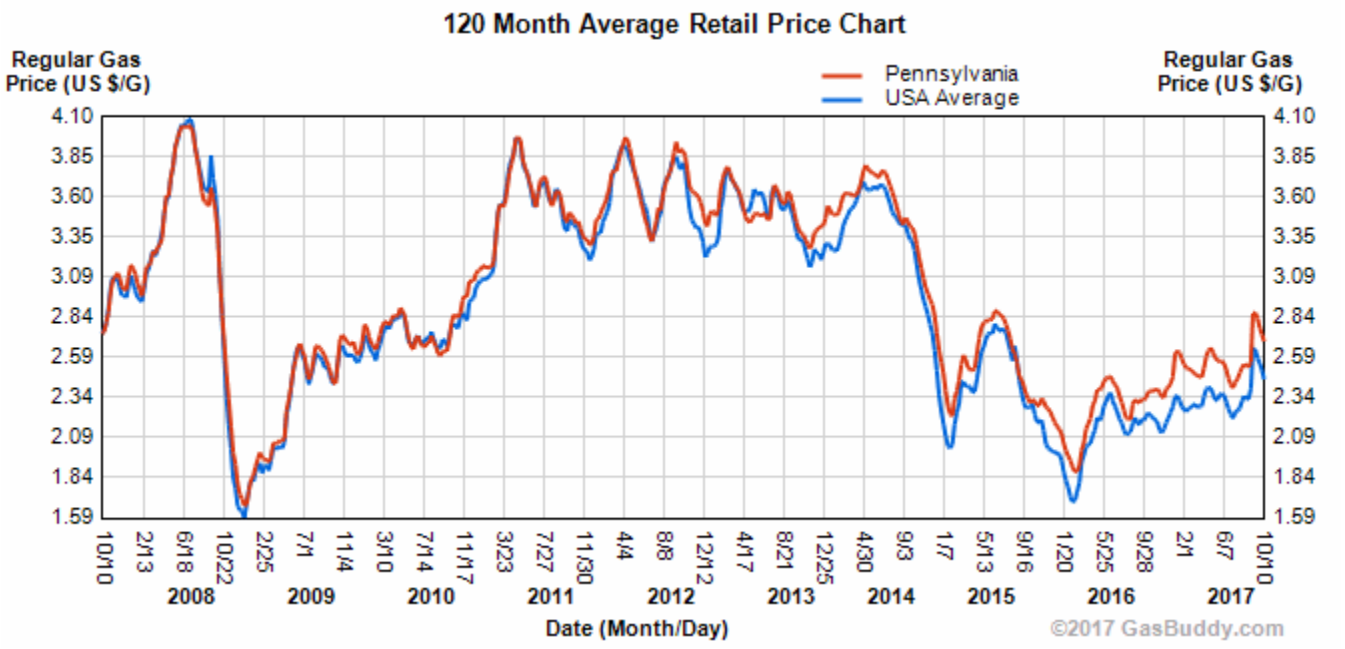


Figure 4-39: Historic Gas Prices

4.3.9.4 Future Occurrence

A major fuel crisis could develop in the future depending on international relationship and tensions. However, significant changes seem to have reduced both the likelihood of another major oil embargo and/or drastic price increases. Alternative sources of energy, especially natural gas, conservation and significant increases in efficiency through technological advances have reduced the growth in demand for oil thus reducing the probability of another 1973 type of crisis will occur. However the possibility must not be totally discounted. Localized problems are likely to continue. Therefore the future occurrence of fuel shortages in Elk County should be considered *unlikely* as defined by the Risk Factor Methodology probability criteria (see Table 4-35).

4.3.9.5 Vulnerability Assessment

Conservation and improved technology for more efficient uses of fuel have reduced the rate of increase of demand for energy for many purposes. The capability of substitution of fuel, should a shortage of one fuel develop, have also increased in Elk County. The vulnerability to shortages seems to have decreased as a result of these changes and adjustments. During cold weather conditions, increased demand for natural gas requires some users to switch to oil, coal, wood burners or other sources of energy.

Emergency medical facilities, including retirement homes and senior centers, are particularly vulnerable to fuel shortages as elderly populations are particularly vulnerable to cold temperatures. In addition, as a result of escalating fuel prices, in the late 70's low-income households in particular have become more vulnerable to utility shutoffs and more frequent depletion of fuel supplies. Pennsylvania offers a heating assistance program called LIHEAP-Low Income Energy Assistance Program. LIHEAP is a grant that offers assistance to low income families unable to pay their heating bills. It can be a cash grant that is sent directly to the utility company or a crisis grant can be awarded for households in immediate danger of losing their heat. Although state budgeting concerns are often an issue, LIHEAP continues to be funded by the state legislature.

4.3.10 Hazardous Materials

4.3.10.1 Location and Extent

Hazardous material releases can occur wherever hazardous materials are manufactured, used, stored, or transported. Hazardous material releases can create direct injuries and death and can contaminate air, water, and soils. They can occur as a result of human carelessness, intentional acts, or natural hazards. When caused by natural hazards, these incidents are known as secondary hazards. Hazardous materials can include toxic chemicals, radioactive materials, infectious substances, and hazardous wastes. Such releases usually occur at fixed site facilities or along transportation routes. The high volume of traffic using U.S. Route 219 creates great potential for accidents involving hazardous material, especially in Ridgway in the area of Boot Jack Hill and Route 255 at Byrnedale Hill and Downtown St. Marys. The county's major routes are: US Route 219 and State Routes 255, 120, 948, 949, 555, and 153. There are several points where these transportation routes cross streams within the watershed that serves as a part of the County's domestic water

supply. In addition, the rail lines in the County pass through the boroughs where a large number of people could be vulnerable if an accident were to occur.

Transportation of hazardous materials on highways involves tanker trucks or trailers. Unsurprisingly, large trucks are responsible for the greatest number of hazard material release incidents. Hazardous material releases from rail transport are also of concern due to collisions and derailments that could result in large spills.

Facilities that use, manufacture, or store hazardous materials in Pennsylvania must comply with both Title III of the federal Superfund Amendments and Reauthorization Act (SARA), also known as the Emergency Planning and Community Right-to-Know Act (EPCRA), and the Commonwealth's reporting requirements under the Hazardous Materials Emergency Planning and Response Act (1990-165), as amended. The community right-to-know reporting requirements keep communities abreast of the presence and release of chemicals at individual facilities. There are 17 SARA Title III facilities in Elk County (PEMA, Western Office, 2017).

Key information about the chemicals handled by manufacturing or processing facilities is contained in the U.S. Environmental Protection Agency's (EPA) Toxic Release Inventory (TRI) database. TRI tracks the management of certain toxic chemicals that may pose a threat to human health and the environment. U.S. facilities in different industry sectors must report annually how much of each chemical is released to the environment and/or managed through recycling, energy recovery and treatment. (A "release" of a chemical means that it is emitted to the air or water, or placed in some type of land disposal.)

In general, chemicals covered by the TRI Program are those that cause:

- Cancer or other chronic human health effects
- Significant adverse acute human health effects
- Significant adverse environmental effects

Facilities which employ ten or more full-time employees and which manufacture or process 25,000 pounds or more, or otherwise use 10,000 pounds or more, of any SARA Section 313-listed toxic chemical in the course of a calendar year are required to report TRI information to the USEPA, the federal enforcement agency for SARA Title III, and PEMA.

Elk County has 26 TRI facilities. According to the TRI report from 2015 (updated November 29, 2016) there were 11.8 million pounds of total production related waste managed. Table 4-29 lists the top 5 TRI facilities along with the total and manner of disposal of production waste:

Table 4-29: Top 5 TRI Facilities.

Elk County's Top 5 TRI Facilities by Total Disposal or Other Releases (measured in pounds)				
Domtar	**Air** 243,199	**Water** 58,577	**Land** 26,959	**Off-site disposal or other releases** 107,532
ECarbon	12,806	5,435		
Metal Powder Products, Washington Street				15,117
Mersen, USA				4,670
St. Marys Carbon	3,300			

A number of EPA programs collect chemical release and waste management information. Each of these programs has different requirements for who must report, what information must be reported and how often they must report. There is, however, some overlap between the facilities regulated by these programs and the facilities that report to TRI.

Users who want to find information that is not available in TRI can check the databases associated with these other programs. For example, the National Emissions Inventory (NEI) can be used to find estimates of air releases for facilities that do not report to TRI or for mobile sources such as cars, which are not covered by TRI. These databases include:

- RCRA Info – contains hazardous waste management information;
- PCS and ICIS-NPDES – contains monthly measurements of chemicals released to water at facilities with discharge permits;
- National Emissions Inventory (NEI) – contains air release estimates for stationary and mobile sources;
- Risk Management Plan (RMP) – contains risk management plans that state the amount of chemicals facilities have in on-site processes.

4.3.10.2 Range of Magnitude

Hazardous material releases can contaminate air, water and soils, possibly resulting in death and/or injuries. Dispersion can take place rapidly when transported by water and wind. While often accidental, releases can occur as a result of human carelessness, intentional acts, or natural hazards. When caused by natural hazards, these incidents are known as secondary events. Hazardous materials can include toxic chemicals, radioactive materials, infectious substances and hazardous wastes. Such releases can affect nearby populations and contaminate critical or sensitive environmental areas.

With a hazardous material release, whether accidental or intentional, there are several potentially

exacerbating or mitigating circumstances that will affect its severity or impact. Mitigating conditions are precautionary measures taken in advance to reduce the impact of a release on the surrounding environment. Primary and secondary containment or shielding by sheltering-in-place protects people and property from the harmful effects of a hazardous material release.

Exacerbating conditions, characteristics that can enhance or magnify the effects of a hazardous material release include:

- Weather conditions: Affects how the hazard occurs and develops
- Micro-meteorological effects of buildings and terrain: Alters dispersion of hazardous materials
- Non-compliance with applicable codes (e.g. building or fire codes) and maintenance failures (e.g. fire protection and containment features): Can substantially increase the damage to the facility itself and to surrounding buildings.

The severity of the incident is dependent not only on the circumstances described above, but also with the type of material released and the distance and related response time for emergency response teams. The areas within closest proximity to the releases are generally at greatest risk, yet depending on the agent, a release can travel great distances or remain present in the environment for a long period of time (e.g. centuries to millennia for radioactive materials), resulting in extensive impacts on people and the environment.

Figure 4-40: Site of the Norfolk Southern train derailment. 42,000 gallons of caustic lye was spilled polluting the Sinnemahoning. Photo courtesy of PA Attorney General.

A worst case scenario for a hazardous material release occurred on June 30, 2006 when a Norfolk Southern train derailed near Gardeau, Norwich Township, McKean County, and wiped out fish and aquatic life in Big Fill Hollow and an 11-mile segment of Sinnemahoning-Portage Creek. Approximately 42,000 gallons of lye, also called liquid sodium hydroxide or caustic soda, spilled during the derailment. It also affected the fisheries in the Driftwood Branch of Sinnemahoning Creek as far as 30 miles downstream from the derailment site. A portion of the contamination on the Driftwood Branch was located in Elk County.

As a result of the spill, a large settlement was reached between Northfolk Southern and DEP to pay for the clean-up of the site and to cover environmental damages. A portion of the money was awarded to support projects in the Sinnemahoning Portage Creek Watershed, and the Driftwood Branch of the Sinnemahoning Creek Watershed.

4.3.10.3 Past Occurrence

Since the passage of SARA, Title III facilities which produce, use, or store hazardous chemicals must notify the public through the county emergency dispatch center and PEMA if an accidental release of a hazardous substance meets or exceeds a designated reportable quantity, and affects or has the potential to affect persons and/or the environment outside the plant. SARA, Title III and Pennsylvania Act 165 also require a written follow-up report to PEMA and the County. These written follow-up reports include any known or anticipated health risks associated with the release and actions to be taken to mitigate potential future incidents. In addition, Section 204(a) (10) of Act 165 requires PEMA to staff and operate a 24-hour State Emergency Operations Center (SEOC) to provide effective emergency response coordination. There were 9 hazardous material release incidents in Elk County reported to the SEOC in 2008 and no deaths reported as a result of these incidents (PEMA, 2008).

Figure 4-41: In 2010, The Western Pennsylvania Conservancy began a detailed visual assessment of Portage Creek after the Norfolk derailment. The project was paid for from the Sinnemahoning Endowment grant that was implemented utilizing Norfolk Settlement funds. Photo of Fourmile Run at Portage Creek courtesy of the WPC.

Since 2010, across the Commonwealth, there were 5,243 highway related hazardous material incidents and 194 railway related incidents. (PHMSA, 2017). Other information relating to the means of hazardous material releases (for example air freight) can also be found, however it is only at the state level and not per county. The top two types of hazardous materials released were combustible fuels and corrosive materials.

Historical records in Elk County document that there were two truck accidents involving hazardous materials and seven rail hazardous material incidents during the period of 1977- 1983. The rail accidents involved hazardous materials in thirty derailed cars, six of which were leaking.

4.3.10.4 Future Occurrence

While many hazardous material release incidents have occurred in Elk County in the past, they are generally considered difficult to predict. An occurrence is largely dependent upon the accidental or intentional actions of a person or group. Intentional acts are addressed under Terrorism. The recent trend of increased number of accidents involving hazardous materials in Elk County is expected to continue for several reasons.

Natural gas drilling (both conventional and unconventional) have resulted in hazardous materials spills in Elk County and are expected to continue in the future. A major gas company with numerous land holdings in Elk County was recently fined $375,000 by DEP. A discharge of an estimated 70 to 100 barrels of crude oil which flowed across land then into a tributary in McKean County and a discharge of an estimated 500 barrels of flowback fluid generated from a valve failure to the ground and surrounding wetlands in Forest County were some of the violations they were fined for. Although these incidents were not specific to Elk County, similar types of violations can and do occur here.

The introduction of more new products and by-products classified as hazardous each year will increase the number of products which will be of concern. Therefore future occurrence for hazardous material release can be determined to be *likely* as defined by the Risk Factor Methodology probability criteria (see Table 4-35).

4.3.10.5 Vulnerability Assessment

Transportation carriers must have response plans in place to address accidents, otherwise an emergency response team will step in to secure and restore the area.

4.3.10.5-1 Emergency Response

Elk County no longer has a volunteer emergency response team. In 2017 it was decided to outsource to a third party due to the cost involved to maintain state haz-mat certification. Quick response minimizes the volume and concentration of hazardous materials that disperse through air, water and soil. The new hazardous material response team guarantees response within two hours and can also initiate environmental clean-up.

4.3.10.5-2 Water Resources

In terms of vulnerable water sources, there are nine water supply facilities in the County. The local Source Water Protection Plans that have been completed can identify which facilities would be impacted by a given spill and information is available on the streams from which these facilities withdraw water.

4.3.10.5-3 Addressable Structures- Roadways

Because the primary concern of the County is the issue of hazardous materials incidents that occur in transit, the County's vulnerability to hazardous materials incidents is defined as primary addressable structures and critical facilities located within ¼ mile of major roads and primary addressable structures and critical facilities located within ¼ mile of the County's rail lines. This vulnerability is summarized in Table 4-30.

Approximately 73% of all primary addressable structures are located within ¼ mile of major roads, and 29 of the 31 critical facilities in the County are within ¼ mile of major roads. In examining jurisdictional vulnerability, Ridgway Borough has the most addressable structures in the area vulnerable to hazardous materials incidents on major roads; over 94% of all the municipality's primary addressable structures are located in that hazard area. Ridgway Township, Johnsonburg Borough, the City of St. Marys, and Fox Township are also comparatively more vulnerable with over 1,000 vulnerable addressable structures each. Highland Township has the smallest number of vulnerable structures with only 215, but even this is one-third of the total primary addressable

structures in the County.

4.3.10.5-4 Addressable Structures-Rail

The rail right-of-ways in Elk County are much more limited than the highway system, so it is unsurprising that fewer addressable structures and critical facilities are considered vulnerable to hazardous materials incidents originating from rail transportation. Approximately 25% of all primary addressable structures in the County are located within ¼ mile from the County's railroads. The commercial and population centers of the county located in Ridgway and Johnsonburg Boroughs and the City of St. Marys have the highest numbers of addressable structures within ¼ mile of rail lines.

Johnsonburg in particular, has approximately two-thirds of all primary addressable structures in the county which are located in the defined hazard area. Fox, Horton, and Millstone Townships have no addressable structures located in hazard areas because they have no rail lines running through them. There are 16 critical facilities vulnerable to hazardous materials incidents that occur on rail, including all five of the critical facilities located in Johnsonburg and Ridgway Boroughs. Half of the critical facilities in both Ridgway Township and the City of St. Marys are also vulnerable to these incidents. The following series of photos highlights the location of the railroad tracks and their proximity to residential and commercial areas in Johnsonburg, Ridgway, and St. Marys, PA.

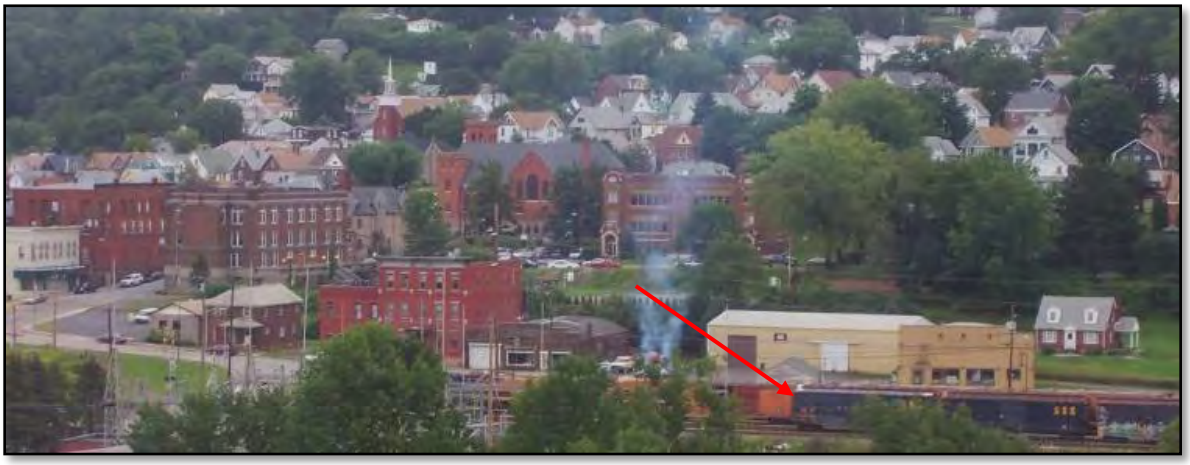


Figure 4-42: Train rail yard in Johnsonburg. Red arrow depicts location of the train in the foreground. Note the numerous residential properties in the background.

BEFORE A HAZARDOUS MATERIALS INCIDENT

The following are things you can do to protect yourself, your family and your property from the effects of a hazardous materials incident:

- ✓ Build an Emergency Supply Kit with the addition of plastic sheeting and duct tape.
- ✓ Make a Family Emergency Plan.
- ✓ Know how to operate your home's ventilation system.
- ✓ Identify an above-ground shelter room with as few openings as possible.
- ✓ Read more about Sheltering In Place.

Ready.gov

The Johnsonburg Paper Mill (Domtar) was founded in 1888 and even after several changes in ownership, continues to operate almost 120 years later.

Today it is considered a state of the art facility with the most sophisticated equipment available for manufacturing paper and other products.

Domtar is a major employer in Elk County. With over 300 people working there, any type of failure due to accident or natural disaster could lead to major losses, both human and economic.

Haz-Mat Vulnerability

The red circle on the photo to the right depicts the general location of the Domtar Paper Mill which utilizes rail as part of its supply chain. The red arrows depict the rail location in reference to the town.

Johnsonburg Borough's Population Density is 852 people per square mile. A hazardous material spill from the railroad that requires evacuation could be problematic with so many people within a short distance of the line.

Domtar is number one on the SARA Title III list of TRI facilities in Elk County.

Figure 4-43: Approximate Location of Domtar Paper Mill. Google Earth, 2017. Domtar employs over 300 people, the majority of which live and work in Elk County. Any disruption to their operations would be detrimental to their business and to Elk County's unemployment rate and economy. It is imperative to support the industry, not only for their good, but for the good of the county.

Figure 4-44: Railroad track running through the center of the Diamond in downtown St. Marys. The railroad crossing gate is to the left in the photo. Another crossing is located at the far end of the photo towards the left/center but there is no gate.

Figure 4-45: This photo shows the proximity of a housing complex that abuts the railroad track in St. Marys, PA. The complex also houses a Senior Center and the PA Career Link office.

Figure 4-46: Railroad tracks located at the base of Montmorenci Road on the West End of Ridgway, PA. Residential and Commercial buildings are located nearby.

Figure 4-47: Front Street, Ridgway PA. Section of railroad track in foreground shows proximity to homes.

Table 4-30: Structure and critical facility vulnerability summary for Hazardous Materials events.

MUNICIPALITY	NUMBER OF ADDRESSABLE STRUCTURES WITHIN 1/4 MI OF MAJOR ROADS	NUMBER OF ADDRESSABLE STRUCTURES WITHIN 1/4 MI OF RAILROADS	TOTAL # ADDRESSABLE STRUCTURES IN MUNICIPALITY	CRITICAL FACILITIES WITHIN 1/4 MI OF MAJOR ROADS	CRITICAL FACILITIES WITHIN 1/4 MI OF RAILROADS	TOTAL CRITICAL FACILITIES
Benezette Township	479	237	976	0	0	0
Fox Township	1450	0	1871	4	0	4
Highland Township	215	94	673	1	0	1
Horton Township	613	0	793	1	0	1
Jay Township	848	295	1360	1	0	2
Johnsonburg Borough	1089	756	1304	4	4	4
Jones Township	895	319	1306	1	0	1
Millstone Township	290	0	396	0	0	0
Ridgway Borough	1841	1004	1951	5	5	5
Ridgway Township	1141	416	1369	4	2	4
Spring Creek Township	327	6	661	0	0	0
St. Marys City	4495	1651	6160	8	5	9
TOTAL	**13683**	**4778**	**18820**	**29**	**16**	**31**

4.3.11 Terrorism

4.3.11.1 Location and Extent

An important consideration in evaluating terrorism hazards is the existence of facilities, landmarks, or other buildings of international, national, or regional importance. While Elk County has many notable landmarks from a local historic perspective, there are no sites which are considered significant landmarks in terms of national or international importance.

Nonetheless, terrorism can take many forms and terrorists have a wide range of personal, political, or cultural agendas. Therefore, there is no location that is not a potential terrorist target. Three types of terrorist activity are particularly relevant to Elk County: agriterrorism and intentional hazardous material releases and computer attacks. Agriterrorism is the direct, intentional, generally covert contamination of food supplies or introduction of pests and/or disease agents to crops and livestock. Elk County is semi-rural with about 3.6% of its land area dedicated to agriculture.

There are also a number of SARA Title III facilities and major transportation routes that traverse the County; making intentional hazard material releases a potential threat to citizens and the environment. Critical facilities including police stations, hospitals, fire stations, schools, wastewater treatment plants, water supply facilities, may be potential terrorist targets. A complete list of these facilities is included in **Appendix C**.

Computer attacks which can include viruses or malware are ways internet "hackers" can disrupt or deny service to any organization that relies on computers to conduct business. One type of attack is called "Ransomware" which is a malicious software designed to block access to a computer until a sum of money (ransom) is paid. Although not as serious as a cyber-attack, it still has the potential to disrupt services and could cause harm if a particular type of facility is hacked. There have been several such attacks in Elk County recently. One local municipal water authority was forced to purchase new computers and re-install all of their data rather than pay the ransom that was demanded.

In addition, all bridges and railways across the County are considered potential targets.

Cyber Security

President Obama stated in 2016 that cyber security is one of the greatest challenges we face as a nation. He requested the formation of a group to assess the current state of cybersecurity in our country and recommended bold, actionable steps that the government, private sector, and the nation as a whole can take to bolster cybersecurity in today's digital world.

The Commission on Enhancing National Cybersecurity's report led to Cybersecurity National Action Plan that highlights three priorities:

1. Raising the level of cybersecurity defenses in the public and private sectors;
2.Deterring and disrupting malicious cyber activity aimed at the United States or its allies; and
3. Effectively responding to and recovering from cybersecurity incidents when they occur.

Ransomware

A news article released by The National Association of Counties (NACo) discusses the prevalence of Ransomware in 2017. According to the FBI, "Ransomware is a very big problem and it has not abated as yet," said Ron Yearwood, section chief for the FBI's Cyber Operations, headquartered in New York." The article goes on to state that, "if your county has not experienced a ransomware attack, consider yourself lucky."

Figure 4-48: Presidential Declaration

4.3.11.2 Range of Magnitude

The term "terrorism" refers to intentional, criminal, malicious acts, but the functional definition of terrorism can be interpreted in many ways. Officially, terrorism is defined in the Code of Federal Regulations as "…the unlawful use of force and violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in f u r t h e r a n c e of political or social objectives" (28 CFR §0.85).

Terrorist attacks can take many forms, including agriterrorism, arson/incendiary attack, armed attack, biological agent, chemical agent, cyberterrorism, conventional bomb, intentional hazardous material release, nuclear bomb and radiological agent. The severity of terrorist incidents depends upon the method of attack, the proximity of the attack to people, animals, or other assets and the duration of exposure to the incident or attack device. For example, chemical agents are poisonous gases, liquids or solids that have toxic effects on people, animals, or plants. Many chemical agents can cause serious injuries or death. In this case, severity of injuries depends on the type and amount of the chemical agent used and the duration of exposure. A worst case scenario for terrorism in Elk County would be if a bomb was set off at the County courthouse in Ridgway Borough; injuring many people and destroying structures.

Biological agents are organisms or toxins that have illness-producing effects on people, livestock and crops. Some biological agents cannot be easily detected and may take time to develop. Therefore, it can be difficult to know that a biological attack has occurred until victim display symptoms. In other cases, the effects are immediate. Those affected by a biological agent require the immediate attention of professional medical personnel. Some agents are contagious which may result in the need for victims to be quarantined.

4.3.11.3 Past Occurrence

Elk County has experienced terrorist incidents in the past. In 2008, one terrorist incident was reported to PEMA (PEMA, 2008). Specific details regarding the incident are not available. Additional incident information for years prior to 2008 may be obtained from annual reports submitted to PEMA. Elk County's Office of Emergency Management does not have information regarding the specifics of terrorist incidents but bomb threats are often the most common terrorist threat.

4.3.11.3-1 Recent Events

On November 28, 2014 the Walmart store located in Fox Township, Elk County was evacuated due to a bomb threat. The local fire marshal confirmed bomb sniffing dogs were brought to the scene and a criminal investigation was conducted. No bomb was found.

4.3.11.4 Future Occurrence

An important consideration in estimating the likelihood of a terrorist incident is the existence of facilities, landmarks, or other buildings of national importance. While Elk County has many notable landmarks from a local historic perspective, it does not contain any sites with national symbolism (i.e. the Statue of Liberty); therefore the likelihood of a terrorist attack (from a national standpoint) is *unlikely* as defined by the Risk Factor Methodology probability criteria (see Table 4-35). However, terrorism takes many forms, and terrorists have a wide range of local, state, and national political interests or personal agenda, making the identification of potential targets especially difficult.

4.3.11.5 Vulnerability Assessment

Since the probability of terrorism occurring cannot be quantified in the same way as that of many natural hazards, it is not possible to assess vulnerability in terms of likelihood of occurrence. Instead, vulnerability is assessed in terms of specific assets. By identifying potentially at-risk terrorist targets in a community, planning efforts can be put in place to reduce the risk of attack. All communities in Elk County are vulnerable on some level, directly or indirectly, to a terrorist attack. However, communities where the previously mentioned potential targets are located should be considered more vulnerable. Site-specific assessments should be based on the relative importance of a particular site to the surrounding community or population, threats that are known to exist and vulnerabilities including:

- Inherent vulnerability:
- Visibility – How aware is the public of the existence of the facility?
- Utility – How valuable might the place be in meeting the objectives of a potential terrorist?
- Accessibility – How accessible is the place to the public?
- Asset mobility – is the asset's location fixed or mobile?
- Presence of hazardous materials – Are flammable, explosive, biological, chemical and/or radiological materials present on site? If so, are they well secured?
- Potential for collateral damage – What are the potential consequences for the surrounding area if the asset is attacked or damaged?
- Occupancy – What is the potential for mass casualties based on the maximum number of individuals on site at a given time?

- Tactical vulnerability:

Site Perimeter

- Site planning and Landscape Design – Is the facility designed with security in mind – both site-specific and with regard to adjacent land uses?
- Parking Security – Are vehicle access and parking managed in a way that separates vehicles and structures?

Building Envelope

- Structural Engineering – Is the building's envelope designed to be blast-resistant? Does it provide collective protection against chemical, biological and radiological contaminants?

Facility Interior

- Architectural and Interior Space Planning – Does security screening cover all public and private areas?
- Mechanical Engineering – Are utilities and HVAC systems protected and/or backed up with redundant systems?
- Electrical Engineering – Are emergency power and telecommunications available? Are alarm systems operational? Is lightning sufficient?
- Fire Protection Engineering – Are the building's water supply and fire suppression systems adequate, code-compliant and protected? Are on-site personnel trained appropriately? Are local first responders aware of the nature of the operations at the facility?
- Electronic and Organized Security – Are systems and personnel in place to monitor and protect the facility?

4.3.12 Transportation Accident

4.3.12.1 Location and Extent

For the purposes of this plan, transportation accidents are defined as incidents involving highway, air and rail travel. Within Elk County, there are over 456 miles of state and federal highway, 373 miles of local municipal roads, 122 miles of rail line, and 116 bridges in the County (PennDOT, 2009; FHA, 2009). The major transportation networks in Elk County include US Route 219 and State Routes 255, 120, 948, 949, 555, and 153 and are important for the movement of goods and people (Figure 4-50). Figure 4-51 illustrates the average annual daily traffic for Elk County roads.

There is no passenger rail service in the County but the County also has an extensive freight rail service network of Conrail and the Baltimore and Ohio railroad. There is potential for major accidents on any of these railways.

Elk County has no commercial airports but one private airport near St. Marys, a privately owned heliport located at the St. Marys Hospital, and a private Elkview heliport in Benezette Township. A five-mile radius around each airport or heliport can be considered a high-risk area since most aviation incidents occur near landing or take-off sites.

4.3.12.2 Range of Magnitude

Significant transportation accidents can result in death or serious injury or extensive property loss or damage. Road and railway accidents in particular have the potential to result in hazardous materials release as well if the accident involves a vehicle carrying hazardous materials.

Transportation accidents occur each year in the county resulting in crashes and traffic deaths. 2016 was a particularly bad year with ***11 fatal crashes***.

4.3.12.3 Past Occurrence

The most common transportation accidents in the County involve highway incidents involving motor vehicles. The County's most serious transportation concerns involve US Route 219 and State Routes 255 and 120 which have the highest average annual daily traffic. Table 4-31 below summarizes ten

(10) year vehicular crash data from 2006-2016 for Elk County.

Single vehicle run-off-the road crashes are consistently the highest type of accident annually. Approximately 1/3 of all crashes involve elderly drivers aged 65 and up.

Table 4-31: Six-Year Accident Totals. PA Dept. of Transportation Crash Information Tool (Web August 2017*)*

Elk County Crash Statistics	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
Total Crashes	349	359	342	286	292	304	302	325	327	293	322
Unrestrained Crashes (Pass. Cars, Lt Trks, Hvy Trks, Vans, SUVs)	85	53	50	43	44	47	41	73	44	37	55
Pedestrian Crashes	5	8	3	4	4	4	4	6	2	6	6
Motorcyclist Crashes	11	14	12	10	18	13	15	4	11	11	12
Bicyclist Crashes	2	2	5	3	1	1	2	2	2	3	1
Alcohol-Related Crashes	53	44	44	33	33	37	42	42	36	28	43
Drinking Driver Crashes	52	44	44	33	32	37	41	41	36	28	42
Impaired Driver Crashes	54	47	50	37	35	43	42	47	39	31	52
Speeding Crashes	16	7	8	11	10	6	8	11	11	7	15
Distracted Driver Crashes	35	28	28	30	25	21	25	27	30	30	33
Heavy Truck Crashes	25	30	22	19	19	27	19	21	17	26	23
Aggressive Driving Crashes	12	9	10	10	11	3	18	17	19	12	16
Single Vehicle Run-Off-the-Road Crashes	198	212	205	158	146	189	163	193	189	160	194
Hit Fixed Object Crashes	169	180	175	136	125	158	144	176	163	137	166
Hit Tree Crashes	66	49	58	59	41	50	45	49	45	31	37
Hit Utility Pole Crashes	27	26	19	24	15	23	20	26	28	18	27
Hit Guiderail Crashes	13	30	25	16	18	25	18	24	29	27	36
Head-on / Opposite Direction Side Swipe Crashes	17	23	22	12	19	15	19	18	11	13	10
Intersection Crashes	86	73	75	66	87	51	69	77	73	71	67
Signalized Intersection Crashes	15	21	19	21	23	13	15	19	21	16	20
Stop Controlled Intersection Crashes	39	32	33	26	32	20	23	24	23	27	27
Running Red Light Crashes (any factor)	5	3	8	6	2	4	4	5	5	5	8
Crashes Involving a 65+ Year Old Driver	52	46	34	47	47	31	43	41	52	52	54
Crashes Involving a 65-74 Year Old Driver	27	24	19	28	27	18	23	23	33	33	40

Crashes Involving a 75+ Year Old Driver	27	24	15	20	22	15	21	18	21	20	17
Local Road (only) Crashes	54	56	49	52	46	39	57	43	40	45	43
Work Zone Crashes	3	2	4	1	3	3	1	10	5	5	0
Winter Condition Crashes	49	108	98	68	60	80	49	101	87	61	55
Crashes Involving a 16-17 Year Old Driver	31	44	34	26	28	27	28	22	20	20	23
Crashes Involving a 16 Year Old Driver	12	14	11	7	8	6	8	4	10	5	10
Crashes Involving a 17 Year Old Driver	20	30	24	19	20	23	21	18	10	15	13
Drowsy/Asleep Driver Crashes	10	9	12	10	7	10	9	6	12	11	6
Train/Trolley with Motor Vehicle Crashes	0	0	0	0	0	0	0	0	0	0	0
Vehicle Failure Related Crashes (any factor)	24	21	15	10	17	11	18	17	15	11	13

There have been no deaths or injuries due to railroad incidents.

4.3.12.4 Future Occurrence

Considering the transportation network within the county and the steady increase in local and tourist traffic especially during the peak travel season (June-October) it can be assumed that unless the highways are improved or controlled to coincide with the traffic volumes, the number of accidents and fatalities are expected to continue or increase.

4.3.12.4-1 Travel and Tourism

The municipalities of Benezette and Jay Township are particularly vulnerable to an increase in traffic accidents due to tourism. The Elk Country Visitor's Center is a multi-million dollar facility that was opened in 2010 in an effort to give visitors to the area a structured environment in which to learn about (and sometimes view) the elk herd located there. It has been reported that as many as 400,000 people a year have visited the center and the surrounding areas. Traffic becomes extremely congested during peak viewing season (Aug.-Oct.) making it difficult for emergency services to get through the area when needed, increasing the risk of fatalities due to delayed response time.

The Elk herd is free-roaming which means they can be seen anywhere in the natural environment. This creates another hazardous situation because they are frequently seen in a local resident's yard or a large open field. Tourists will unexpectedly stop along the roadway to view one of these majestic animals without any thought of the danger of approaching traffic.

Figure 4-49: Elk grazing on Winslow Hill in Benezette, PA. Photo courtesy of Doug Foster

The animals' behavior is unpredictable. One minute they may walking beside a road and then suddenly decide to dart across it. They can be difficult to see as they are exiting the forest. Their coats often blend in with the natural surroundings, camouflaging them until it's too late. Even local residents familiar with the area can be vulnerable to an accident. A local motorcyclist was killed in 2013 when he struck an elk while travelling on Route 555. He was ejected from his bike due to the impact with the large animal. There have been *11* Elk hit by vehicles as of October of 2017.

Figure 4-50: Bull Elk. Note the vehicle stopped on the road in the background. Photo courtesy of Doug Foster

Whitetail deer, which are known to graze with the elk on occasion are also a hazard to drivers in the area. There were *89* deer related vehicle accidents county-wide in a five year period, *19* in which there were injuries reported. Visitors to the area that are unfamiliar with wildlife behavior are more susceptible to these types of accidents.

In 2017 the Benezette Township Supervisors, working cooperatively with PennDot, the Elk County Planning Department, and the North Central PA Regional Planning and Development Commission hired the consulting firm of Michael Baker Jr. to conduct a traffic feasibility study to examine the on-going safety issues. The study is expected to offer viable solutions that can be implemented and should be completed by 2018.

Transportation Accidents Continued….

Update

4.3.12.4-2 Roadways and Bridges

Since the writing of Elk County's 2011 Hazard Mitigation Plan, several state routes have undergone reconstruction and/or maintenance. Route 120 and Route 255 received extensive work which included replacing aging stormwater structures and correcting hazardous intersections.

The state has also instituted the Rapid Bridge Replacement program. The state hired an outside contractor to replace structurally deficient bridges over 20 feet throughout the Commonwealth. Elk County has had two such structures being replaced as part of the program; one in Johnsonburg and one in St. Marys.

PennDot also replaced a structurally deficient bridge on Route 219 in Ridgway Borough (known as the Pennsy Bridge) in 2015. Unfortunately, during construction a portion of the bridge collapsed, injuring three people. After an extensive investigation into the cause of the collapse the project was successfully completed.

Figure 4-51: Pennsy Bridge before collapse.

Figure 4-52: Below- The Pennsy Bridge on Route 219 after a partial collapse. ***A Clarion PA company was fined for serious violations***

Transportation incidents may increase slightly over the next five years without proper mitigation strategies in place. Therefore, based on this and past occurrences, the probability of transportation accidents is characterized as *highly likely* as defined by the Risk Factor Methodology probability criteria (see Table 4-35).

Figure 4-53: Elk County transportation system (PEMA, 2010; ESRI, 2010; Elk County GIS Department, 2010).

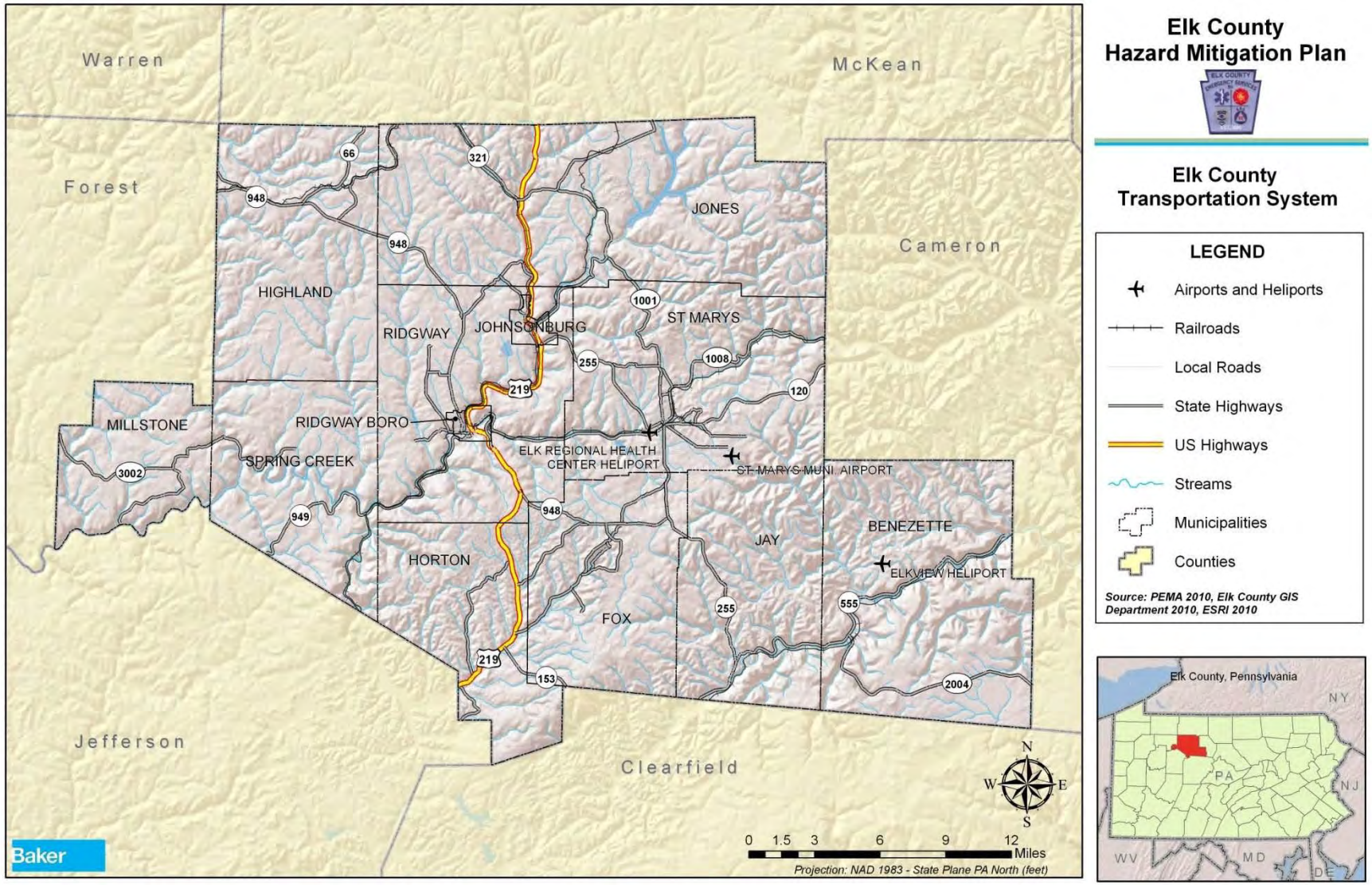
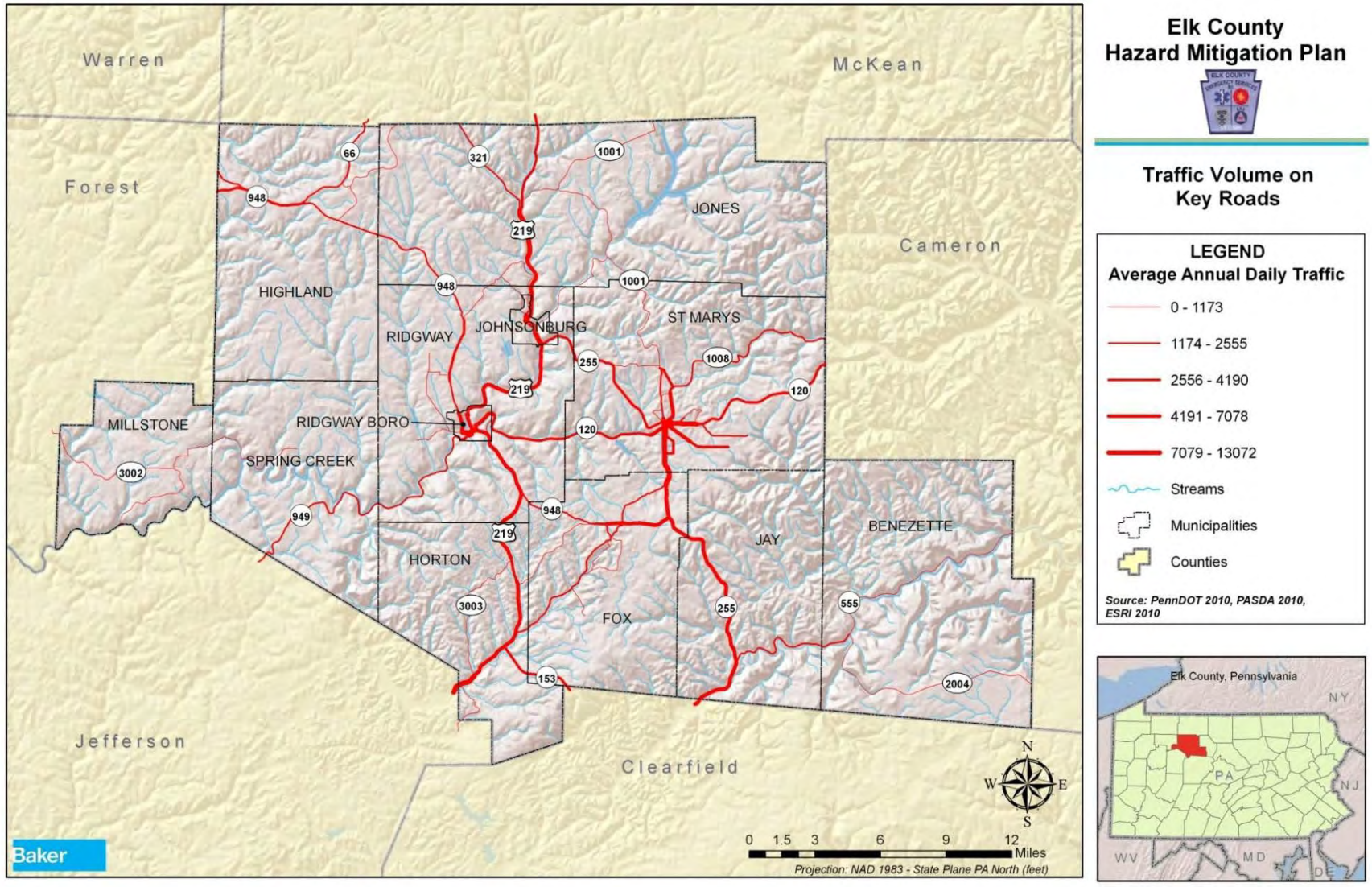


Figure 4-54: Average annual daily traffic on key roadways in Elk County (PennDOT, 2010; PASDA, 2010, ESRI, 2010).



4.3.12.5 Vulnerability Assessment

A transportation related accident can occur on any stretch of road or railway in Elk County. However, severe accidents are more likely to occur along the County's several major highways which are heavy traffic carriers of all types of vehicles and a wide variety of freight. Although the county has not experienced any major highway accidents during the past ten years, the potential does exists. According to the Elk County Vulnerability Assessment, Routes 219 and 255 are of concern for major highway accidents.

The potential for a major railroad accident in Elk County exists but accidents are not expected to go beyond the rail right-of-way, unless hazardous materials are involved.

4.3.12.5-1 Aviation Accidents

The average rate of aviation accidents nation-wide is 8.47 accidents per 100,000 flight hours. Therefore, the likelihood of an aviation incident in the County is considered low.

There are approximately 14,845 people located beneath routine flight paths of the airport and heliports in the County. Table 4-32 displays populations located within 5-miles of airport and heliports located within Elk County. However, note that since the airport/heliports are located close to one another within the County, there is a lot of overlap of the vulnerable population and therefore the values in the table don't add up to the 14,845 total population located within 5 miles of the air transport facilities.

Table 4-32: Population within 5-miles of airports and heliports located in Elk County.

AIRPORT	2000 POPULATION
St. Marys Regional Airport	8,342
Elkview Heliport	1,045
Elk Regional Medical Center Heliport	12,461

There have been four (4) fatal aviation accidents at the St. Marys Municipal Airport since 1965 with at least six deaths. All of the reported crashes were located at, or in close proximity to the airport and didn't threaten any residential structures. (http://planecrashmap.com/list/pa/, 2017)

There has also been numerous non-fatal aviation accidents; four (4) in the last two years alone. On March 13, 2015 a bi-plane was flipped over when it was hit by a cross-wind as it was landing. On April 29, 2015 an airplane's landing gear malfunctioned resulting in a crash and on May 3, 2015 a pilot lost control of his aircraft and it crashed into the airport's administration building. Finally, a Bell helicopter crash occurred in 2017. (See below for further details).

4.3.12.5-2 Aircraft hits administration building at St. Marys Airport

On Sunday May 3, 2015 a pilot flying a private airplane lost control while trying to start the plane's engine.

Officials stated the pilot, upon noticing an issue with the plane's propeller, exited the aircraft and attempted to start the propeller manually when it unexpectedly kicked on. The airplane spun around and travelled, unattended until it crashed into the airport's administration building. The pilot was reportedly struck in the head by the propeller but otherwise received minor injuries.

The impact broke the windows at the ground level and damaged a post to a deck owned by the West Wind Restaurant situated above.

A group of children were standing on the deck and approximately 30 people were inside the restaurant at the time of the incident. No one was injured.

Figure 4-55: Airplane Crash. Photo Courtesy of the Bradford Era published on May 4, 2015. The top arrow depicts the deck where children were located.

On August 20, 2017 a Bell 47 helicopter crashed just off of Route 255 in St. Marys. The pilot reported that the aircraft suffered engine failure at approximately 1,000 feet but he was able to control a hard landing. He was uninjured.

The accident happened in very close proximity to the highway and could've been significantly worse if it had crashed directly on 255, one of the more heavily traveled roads in the county.

Figure 4-56: Bell Helicopter Stock Photo.

Figure 4-57: St. Marys Airport and proximity to trailer court.

Trailer Court on Robin Rd. St. Marys, PA. Note the actual location in reference to the airport on Google Earth map to the right. The approximate distance is ½ of a mile.

St. Marys Municipal Airport. Red arrow depicts location of restaurant hit by airplane. Runway is in the foreground.

4.3.13 Urban Fire and Explosion

4.3.13.1 Location and Extent

Significant urban fires are limited to more densely populated areas that contain large and/or multiple buildings. Such fires may start in single structure, but spread to nearby buildings or throughout a large building if adequate fire control measures are not in place.

4.3.13.2 Range of Magnitude

Severe urban fires result in extensive damage to residential, commercial and/or pubic property. Lives may be lost and people are often displaced for several months to years depending on the magnitude of the event.

4.3.13.3 Past Occurrence

Elk County experiences a number of urban fires every year, most of which are small and affect one to a few structures. However, a list of all previous fires in the past five years, the amount and type are listed in Table 4-33.

Ridgway Borough seems to be particularly vulnerable to commercial fires. The size, age and close proximity of the structures located on Main Street are perfect examples of how these types of fires can spread rapidly. The following series of photographs depict a few of the fires that have occurred on Main Street in the past six years.

Figure 4-58: Cliffe's Pharmacy, 223 Main Street, Ridgway, PA Facade fire on September 2, 2016. Photo by Richie Lecker

Figure 4-59:201 Main Street, Ridgway PA. March 19, 2011. Photo Courtesy of the Johnsonburg Fire Department

Ridgway Borough, Johnsonburg Borough and downtown St. Marys (formally known as St. Marys Borough) are most vulnerable to residential-urban fires due to their dense population. It is essential that these types of fires be extinguished quickly so that they don't spread to neighboring properties. Residential fires are the most numerous type of fire listed in Table 4-33 followed closely by Commercial/Industrial fires. (Elk County EMA, 911 Call Log)

Figure 4-60: Main Street Tavern downtown Ridgway PA, February 7, 2017
The structure was a total loss. Photo Courtesy of WJAC TV

Table 4-33: Number & Type of Fires in Elk County for the past six years. (Elk County EMA, 2017)

Year	High Life Hazard	Mobile Home	Commercial Industrial	Apartment	Residential Single	Chimney	All Others	Total
2012	2	2	13	4	48	3	26	98
2013	1	0	22	6	29	4	23	85
2014	4	1	8	7	39	7	23	89
2015	4	0	11	2	32	1	16	66
2016	2	0	15	5	17	3	20	62
2017	0	2	6	1	20	2	12	43
Totals	**13**	**5**	**75**	**25**	**185**	**20**	**120**	**443**

4.3.13.4 Future Occurrence

Although Elk County has experienced no major fire disasters in the past decade, the threat of fire in Elk County increases yearly as existing housing stock and commercial structures grow older, communities become more densely populated, and more home-owners depend on wood burners and portable heaters. Therefore the occurrence of urban fire can be considered *possible* as defined by the Risk Factor Methodology probability criteria (see Table 4-35)

4.3.13.5 Vulnerability Assessment

4.3.13.5-1 Fire Fighting Capability

Elk County has eight (8) volunteer fire companies with varying types of apparatus. (See **Appendix J** for a complete list.) Every department has stated volunteer recruitment is an area of concern for continued operations. Current members are aging and new recruits are difficult to find due to the amount of training now required to become a member.

Employers in the area are also less likely to allow fire fighters to leave work when a fire occurs. These concerns alone can limit the available manpower and can put fire fighters and structures at risk when the call for a fire goes out increasing the county's vulnerability to large urban fires.

Figure 4-61: Crystal Fire Department, Station #1. St. Marys, PA

Areas where large buildings are located or development is densely spaced should be considered more vulnerable to urban fire events. The following factors contribute to Elk County's vulnerability to urban fires: 36.5 percent of the county's housing stock was constructed before 1939 and approximately 5 percent of the county housing units use fireplaces, stoves, or portable wood heaters (U.S. Census, 2000). On January 8, 2016 two people were killed in a house fire in Kersey, PA. The cause of the fire was determined to be an improperly installed wood burning stove.

However, in order to adequately assess vulnerability to urban fires, detailed information on the design specifications, specifically fires codes, used for construction of individual buildings is required. All municipalities in Elk County have adopted the Uniform Construction Code which assures buildings are designed to address structure fire hazards. However, these regulations will only affect new construction, as well as additions and renovations to existing structures. Older buildings that do not meet the criteria established in modern fire codes continue to remain vulnerable.

4.4 Hazard Vulnerability Summary

4.4.1 Methodology

Ranking hazards helps communities set goals and priorities for mitigation based on their vulnerabilities. A Risk Factor (RF) is a tool used to measure the degree of risk for identified hazards in a particular planning area. The RF can also be used to assist local community officials in ranking and prioritizing those hazards that pose the most significant threat to their area based on a variety

of factors deemed important by the planning team and other stakeholders involved in the hazard mitigation planning process. The RF system relies mainly on historical data, local knowledge, general consensus opinions from the planning team and information collected through development of the hazard profiles. The RF approach produces numerical values that allow identified hazards to be ranked against one another; the higher the RF value, the greater the hazard risk.

RF values were obtained by assigning varying degrees of risk to five categories for each of the eleven hazards profiled in the 2011 HMP. Those categories include: *probability*, *impact*, *spatial extent*, *warning time* and *duration*. Each degree of risk was assigned a value ranging from 1 to 4. The weighting factor agreed upon by the planning team is shown in Table 4-34. To calculate the RF value for a given hazard, the assigned risk value for each category was multiplied by the weighting factor. The sum of all five categories equals the final RF value, as demonstrated in the example equation:

Risk Factor Value = [(Probability x .30) + (Impact x .30) + (Spatial Extent x .20) + (Warning Time x .10) + (Duration x .10)]

Table 4-35 summarizes each of the five categories used for calculating a RF for each hazard. According to the weighting scheme applied, the highest possible RF value is 4.0.

Table 4-34: Summary of Risk Factor approach used to rank hazard risk.

RISK ASSESSMENT CATEGORY	DEGREE OF RISK			WEIGHT VALUE
	LEVEL	CRITERIA	INDEX	
PROBABILITY *What is the likelihood of a hazard event occurring in a given year?*	**UNLIKELY**	LESS THAN 1% ANNUAL PROBABILITY	1	30%
	POSSIBLE	BETWEEN 1 & 10% ANNUAL PROBABILITY	2	
	LIKELY	BETWEEN 10 &100% ANNUAL PROBABILITY	3	
	HIGHLY LIKELY	100% ANNUAL PROBABILTY	4	
IMPACT *In terms of injuries, damage, or death, would you anticipate impacts to be minor, limited, critical, or catastrophic when a significant hazard event occurs?*	**MINOR**	VERY FEW INJURIES, IF ANY. ONLY MINOR PROPERTY DAMAGE & MINIMAL DISRUPTION ON QUALITY OF LIFE. TEMPORARY SHUTDOWN OF CRITICAL FACILITIES.	1	30%
	LIMITED	MINOR INJURIES ONLY. MORE THAN 10% OF PROPERTY IN AFFECTED AREA DAMAGED OR DESTROYED. COMPLETE SHUTDOWN OF CRITICAL FACILITIES FOR MORE THAN ONE DAY.	2	
	CRITICAL	MULTIPLE DEATHS/INJURIES POSSIBLE. MORE THAN 25% OF PROPERTY IN AFFECTED AREA DAMAGED OR DESTROYED. COMPLETE SHUTDOWN OF CRITICAL FACILITIES FOR MORE THAN ONE WEEK.	3	
	CATASTROPHIC	HIGH NUMBER OF DEATHS/INJURIES POSSIBLE. MORE THAN 50% OF PROPERTY IN AFFECTED AREA DAMAGED OR DESTROYED. COMPLETE SHUTDOWN OF CRITICAL FACILITIES FOR 30 DAYS OR MORE.	4	

SPATIAL EXTENT *How large of an area could be impacted by a hazard event? Are impacts localized or regional?*	**NEGLIGIBLE**	LESS THAN 1% OF AREA AFFECTED	**1**	**20%**
	SMALL	BETWEEN 1 & 10% OF AREA AFFECTED	**2**	
	MODERATE	BETWEEN 10 & 50% OF AREA AFFECTED	**3**	
	LARGE	BETWEEN 50 & 100% OF AREA AFFECTED	**4**	
WARNING TIME *Is there usually some lead time associated with the hazard event? Have warning measures been implemented?*	**MORE THAN 24 HRS**	SELF-DEFINED	**1**	**10%**
	12 TO 24 HRS	SELF-DEFINED	**2**	
	6 TO 12 HRS	SELF-DEFINED	**3**	
	LESS THAN 6 HRS	SELF-DEFINED	**4**	
DURATION *How long does the hazard event usually last?*	**LESS THAN 6 HRS**	SELF-DEFINED	**1**	**10%**
	LESS THAN 24 HRS	SELF-DEFINED	**2**	
	LESS THAN 1 WEEK	SELF-DEFINED	**3**	
	MORE THAN 1 WEEK	SELF-DEFINED	**4**	

(NOTE: Levels of warning time and criteria that define them may be adjusted based on hazard addressed.)

(NOTE: Levels of warning time and criteria that define them may be adjusted based on hazard addressed.)

4.4.2 Ranking Results

Using the methodology described, Table 4-35 lists the Risk Factor calculated for each of the nineteen potential hazards identified in the 2011 HMP. Hazards identified as *high* risk have risk factors greater than or equal to 2.5. Risk Factors ranging from 2.0 to 2.4 were deemed *moderate* risk hazards. Hazards with Risk Factors less than 2.0 are considered *low* risk.

Table 4-35: Ranking of hazard types based on Risk Factor methodology.

HAZARD RISK	HAZARD NATURAL (N) or MAN-MADE (M)	RISK ASSESSMENT CATEGORY					RISK FACTOR
		PROBABILITY	IMPACT	SPATIAL EXTENT	WARNING TIME	DURATION	
HIGH	Winter Storm (N)	4	2	4	1	3	3.0
	Flood, Flash Flood, Ice Jam (N)	4	2	3	3	2	2.9
	Wildfire (N)	4	1	3	3	2	2.6
MODERATE	Hazardous Materials (M)	3	2	2	4	2	2.5
	Tornado and Windstorm (N)	3	2	2	4	1	2.4
	Dam Failure (M)	1	3	2	4	3	2.3
	Drought (N)	2	1	4	1	4	2.2
	Transportation Accident (M)	4	1	1	4	1	2.2
	Urban Fire and Explosion (M)	2	2	3	1	2	2.1
LOW	Fuel Shortages (M)	1	1	4	1	4	1.9
	Terrorism (M)	1	2	2	4	2	1.9
	Landslide (N)	2	1	1	4	1	1.6

Based on these results, there are three *high* risk hazards, six *moderate* risk hazards and three *low* risk hazards in Elk County. Mitigation actions were developed for all high, moderate, and low risk hazards (see Section 6). The threat posed to life and property for moderate and high risk hazards is considered significant enough to warrant the need for establishing hazard- specific mitigation actions. Mitigation actions related to future public outreach and emergency service activities are identified to address low risk hazard events (i.e. disorientation and landslide).

4.4.3 Potential Loss Estimates

Based on available data, general potential loss estimates were established for drought, flood, tornado and windstorm, and winter storm hazards. Loss estimates were not able to be determined for landslide, wildfire, dam failure, hazardous materials incidents, terrorism, transportation accidents, urban fire and explosion, and utility interruption. Estimates provided in this section are based on HAZUS-MH, version MR4 and historical loss estimates from the NCDC. Estimates are considered *potential* in that they generally represent losses that could occur in a countywide hazard scenario. In events that are localized, losses may be lower, while regional events could yield higher losses. Potential loss estimates have four basic components, including:

- Replacement Value: Current cost of returning an asset to its pre-damaged condition, using present-day cost of labor and materials.
- Content Loss: Value of building's contents, typically measured as a percentage of the building replacement value.
- Functional Loss: The value of a building's use or function that would be lost if it were damaged or closed.
- Displacement Cost: The dollar amount required for relocation of the function (business or service) to another structure following a hazard event.

The flood hazard loss estimates incorporate all four of these components, but the loss estimates for tornado and windstorm and winter storm events incorporate only historical reported property damage. Loss estimates for drought are based on the primary target of droughts – agricultural products.

The full suite of potential losses was able to be calculated for flood events using HAZUS-MH MR4, a standardized loss estimation software package available from FEMA. These studies provided estimates of total economic loss, building damage, content damage, and other economic impacts that can be used in local flood response and mitigation planning activity.

Using HAZUS-MH, total building-related losses for the 1% annual-chance flood event were estimated to be $138.12 million. HAZUS estimated that about 182 buildings will be at least moderately damaged; of these, 180 of the buildings were residential occupancies while the other buildings with expected damage were industrial and commercial. Figure 4-59 shows the spatial distribution of total losses at the Census block level. Some of the highest economic losses are expected in Ridgway and Johnsonburg Boroughs; these jurisdictions have some of the highest population densities in the County, and the Clarion River flows through the center of these Boroughs. Total economic loss,

including replacement value, content loss, functional loss, and displacement cost was estimated at $139.47 million for the entire County. The full HAZUS results report can be found in **Appendix F**.

Another way to look at potential loss is by looking at the assessed value and fair market value of the properties in Elk County. The assessed value of a property is a figure local governments use to determine a homeowner's annual property tax. It is always a percentage of the property's Fair Market Value (FMV), but the percentage varies from state to state. Most states calculate assessed value at 80 percent to 90 percent of FMV, and then impose a 1 percent to 2 percent annual property tax on the assessed value. Elk County's assessed value is 2.31 %. Table 4-36 below shows the total assessed value versus total fair market value for all taxable property in Elk County by municipality. Even though this doesn't give an estimate for losses based on individual incidents, it does show what a total loss would be if a municipality suffered a catastrophic event. **Appendix I** lists each individual municipality and the specific types of structures located there.

Table 4-36: Assessed value fair market value for taxable structures per municipality. Elk County Tax Assessment, 2017

Municipality	Number of Taxable Properties	Total Assessed Value	Total Fair Market Value in Dollars
City of St. Marys	6,104	216,061,600	$ 499,862,986
Benezette Township	993	9,355,300	$ 21,571,921
Fox Township	1896	52,372,360	$ 120,980,152
Highland Township	727	7,494,090	$ 17,311,348
Horton Township	795	16,048,600	$ 37,072,267
Jay Township	1331	23,973,000	$ 55,377,630
Johnsonburg	1,303	31,995,660	$ 73,909,975
Jones Township	1367	23,167,300	$ 53,516,464
Ridgway Borough	1932	51,683,555	$ 119,389,013
Ridgway Township	1409	40,707,950	$ 94,035,365
Spring Creek Township	654	5,107,400	$ 11,798,094
Millstone Township	385	3,125,900	$ 7,220,830
Totals	**18,896**	**481,092,715**	**$ 1,112,046,044**

Table 4-37 depicts the building types located throughout the county and their fair market value. Residential homes are the most prevalent type of structure.

Table 4-37: Building types and their assessed and fair market values. Elk County Tax Assessment, 2017

Building Type	Number	Total Assessed Value	Total Fair Market Value in Dollars
Commercial	883	47,652,110	$110,076,374
Community Service	525	43,465,600	$100,405,536
Industrial	204	39,773,100	$91,875,86
Residential	10,810	273,919,400	$622,753,814
Rental	1,581	26,971,525	$62,304,223
Seasonal	2,982	25,861,950	$59,741,105
Mobile Homes	1,068	6,948,400	$16,050,804

HAZARD IDENTIFICATION AND RISK ASSESSMENT

Hazard identification and risk assessment provides the factual basis for activities proposed in the strategy portion of a hazard mitigation plan. An effective risk assessment informs proposed actions by focusing attention and resources on the greatest risks. The four basic components of a risk assessment are:

1) Hazard identification

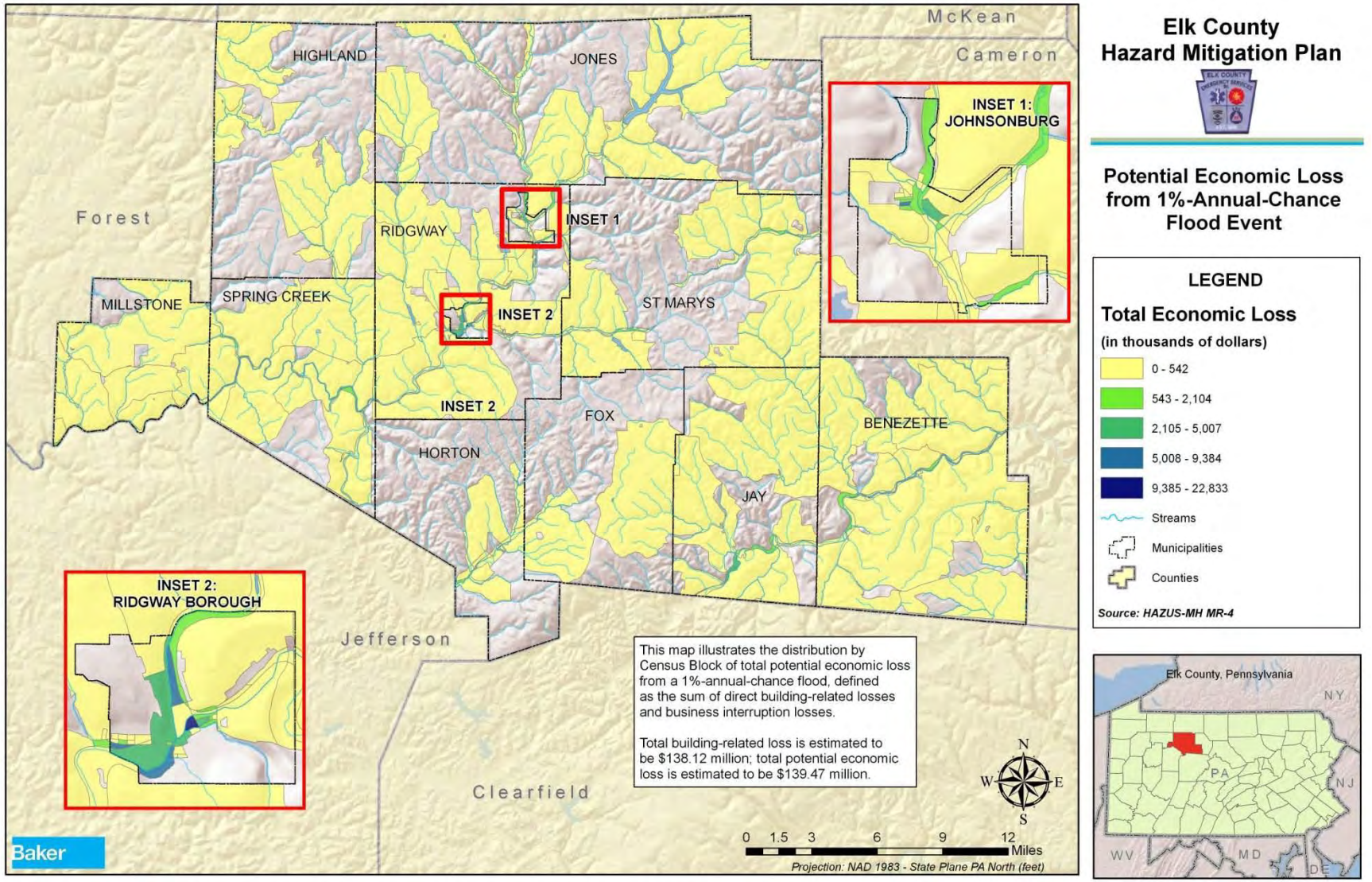
2) Profiling of hazard events

3) Inventory of assets

4) Estimation of potential human and economic losses based on the exposure and vulnerability of people, buildings, and infrastructure.

FEMA

Figure 4-62: Distribution by Census block of the potential total economic loss expected from a 1% annual-chance flood event in Elk County (HAZUS-MH MR-4).



For the remaining hazards where loss estimates could be determined, loss estimates are generalized based on the historical impact of the hazard. It is important to note that loss estimates are not reported for many of the previous events recorded in the NCDC Storm Events Database, which reports events from 1950-2010. As a result, all potential losses listed can be considered a minimum estimate of historical losses. In the case of tornadoes and windstorms, the past occurrences yielded property damage of $2.63 million and 20 injuries, all of which occurred during tornados. Only eight of the 59 winter storm events reported to NCDC have reported loses; those events resulted in one death, 248 injuries, and $61.21 million in property damage. In the case of droughts, there are no historical losses recorded in the NCDC, but usually drought losses are largely agricultural; as a result, losses are expected to be some portion of Elk County's $3.7 million in agricultural production, depending on the magnitude of the event.

4.4.4 Future Development and Vulnerability

Risk and vulnerability to natural and human-made hazard events are not static. Risk will increase or decrease as counties, and municipalities see changes in land use and development as well as changes in population. Elk County is expected to experience a variety of factors that will, in some areas, increase vulnerability to hazards while in other areas, vulnerability may stay static or even be reduced.

In its 1999 Comprehensive Plan, the Elk County Planning Department expected that future development would be highly concentrated in the County's existing downtowns, like Ridgway, Johnsonburg, St. Marys, Brockport (southwest Horton Township), and Dagus Mines (northeast Fox Township). These are not designated "growth areas;" rather, they are areas with existing downtown and residential character, and the County's desire to curb sprawl will encourage growth in existing developed areas. At the same time, the Comprehensive Plan states, "The vast majority of land area should remain in rural conservation and low-density residential uses." Based on this document, risk and vulnerability are expected to remain constant or increase in the downtown areas and remain constant in the rest of the County. Additionally, about half of all County land held is publicly held in state forests, state parks, and state gamelands; the County does not believe this will change in the future, so it is unlikely that there will be growth in these areas, thus stabilizing risk in the County.

Update

4.4.4.1 Land Use and Development

One way of tracking future development is to review the amount and type of subdivisions the county processes throughout the year. Elk County has two duties in this regard. For municipalities that have their own Subdivision and Land Development Ordinance (SALDO), the county planning department reviews the subdivision and provides comments if warranted, but has no approval rights. For municipalities that have no such ordinance, the county's SALDO is utilized. In these cases, the county has the right to approve or deny a subdivision and the local municipality reviews and comments, giving up their approval rights. Therefore, the county is aware of every instance when a property is altered by subdivision. See Table 4-38 for a list of subdivisions that have occurred between 2012 and 2017.

Municipality	2012	2013	2014	2015	2016	2017	Totals
Benezette	2	3	1	2	0	2	10
Fox	9	7	4	8	9	8	45
Highland	0	0	0	0	0	1	1
Horton	2	2	1	2	3	1	11
Jay	2	2	1	3	8	2	18
Johnsonburg	1	0	0	0	1	0	2
Jones	3	3	5	2	2	7	22
Millstone	1	0	1	0	1	1	4
Ridgway Borough	3	0	1	1	1	0	6
Ridgway Township	10	4	7	2	7	5	35
Spring Creek	2	0	1	1	2	0	6
St. Marys	9	11	11	18	14	17	80
Totals	44	32	33	39	48	44	240

Table 4-38: Elk County Subdivisions by municipality.

The most common forms of subdivisions the county reviews are: residential, commercial, industrial, recreation and other. Residential subdivisions most often are for either creation of new building lots or for an addition to an existing lot. In the six year period between 2012 and 2017 there were 209 residential subdivisions. One-hundred and forty new lots were created and ninety-four were side-lot additions to an existing property. In the same time frame there were also twenty-four non-building waivers applied for which indicates there are no future plans to develop the lot. This means there is the potential for 116 new residential buildings to be constructed throughout the county. Not every lot that is created is sold and developed but the numbers give a fair representation of the possibilities.

Commercial property subdivisions totaled twenty-one in the time frame mentioned. Most were creation of lots or lot additions. There was only one known new business developed. Industrial subdivisions numbered six with all of them being attributed to existing businesses; no new development was noted.

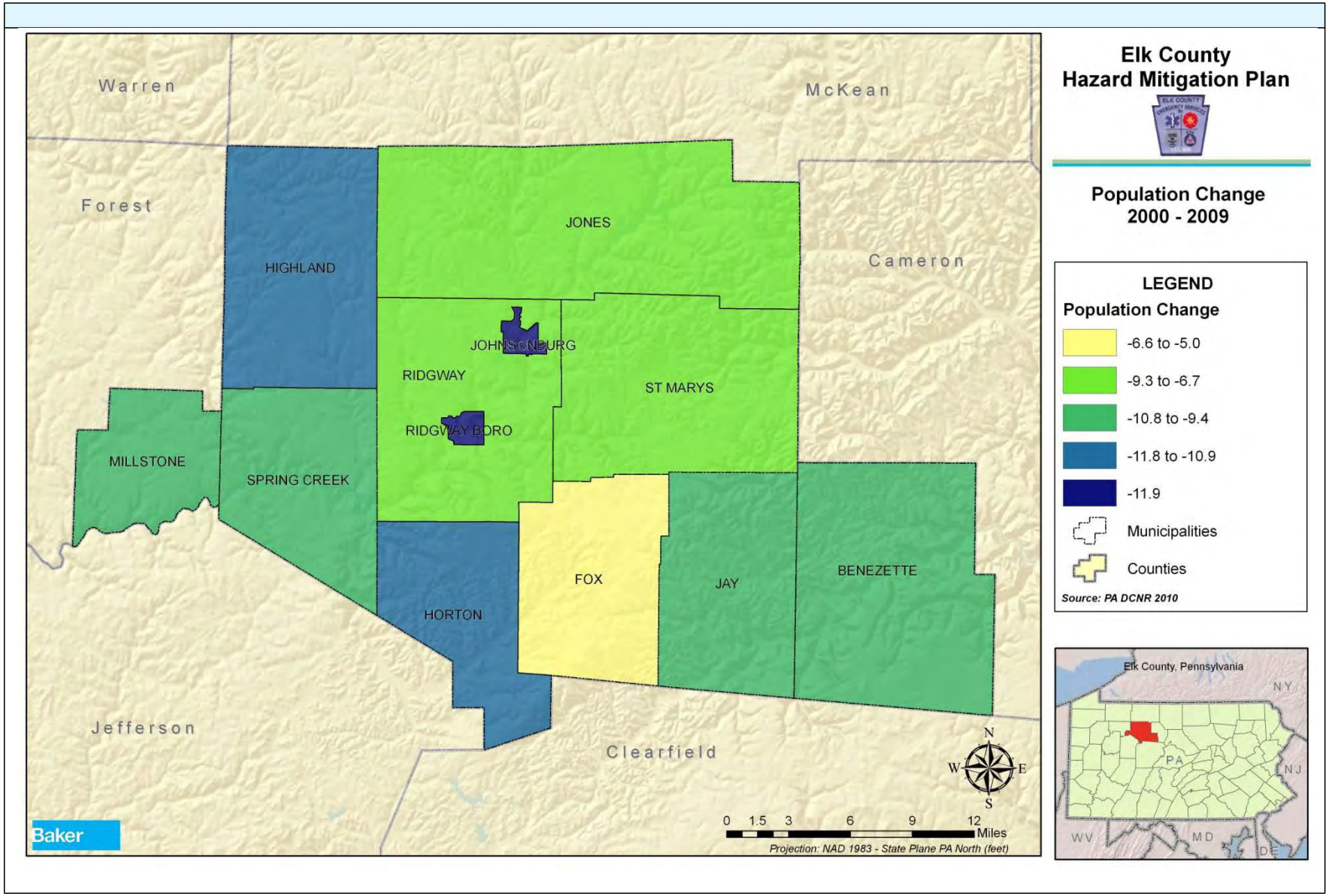
It is still true that almost half of all county land is held publicly but according to the Elk County Tax Assessment office, there is approximately 156,000 acres or 247 square miles of undeveloped privately owned land. Therefore, new development does continue but mainly in the form of residential building.

4.4.4.2 Population Change

Population change is another significant indicator of changes in vulnerability in the future. As discussed in Section 2, the total population of Elk County has shrunk by 1.13% from 2010-2014. This decline in population has not been evenly distributed in the County, though. Table 2-1 on page 7 shows the 2010-2014 percent change in population by municipality in Elk County. Johnsonburg and

Ridgway Boroughs have the highest population densities in the County, meaning that hazard vulnerability and loss estimates will most likely be relatively higher in those two jurisdictions. These losses, coupled with physical development constraints like rugged terrain and steep slopes across the county, are likely to cause risk to remain constant or decrease in the County.

Figure 4-63: Population change in Elk County from 2000-2009 (US Census, 2010).



5. Capability Assessment

5.1 Process Summary

Elk County has a number of resources it can access to implement hazard mitigation initiatives including emergency response measures, local planning and regulatory tools, administrative assistance and technical expertise, fiscal capabilities, and participation in local, regional, state, and federal programs. The presence of these resources enables community resiliency through actions taken before, during, and after a hazard event.

During the HMP process, local plans, ordinances, and codes were identified for each municipality. Through responses to the *Capability Assessment Survey* distributed to all of the County's municipalities and input from the HMSC and the HMPT, the HMP provides an inventory of the most critical local planning tools available within each municipality and a summary of the fiscal and technical capabilities available through programs and organizations outside of the County. It also identifies emergency management capabilities and the processes used for implementation of the National Flood Insurance Program.

While the capability assessment serves as a good instrument for identifying local capabilities for, it also provides a means for recognizing gaps and weaknesses that can be resolved through future mitigation actions. The results of this assessment lend critical information for developing an effective mitigation strategy.

5.2 Capability Assessment Findings

5.2.1 Emergency Management

The Elk County Office of Emergency Management coordinates countywide emergency management efforts. Each municipality has a designated local emergency management coordinator who possesses a unique knowledge of the impact hazard events have on their community. A significant amount of information used to develop this plan was obtained from the emergency management coordinators. The Emergency Management Services Code (PA Title 35) requires that all municipalities in the Commonwealth have a Local Emergency Operations Plan (EOP) which is updated every two years. The majority of municipalities in Elk County have or are in the process of updating their local EOP. A countywide EOP also exists. Municipalities are not required to sign on to the County EOP, because County staff prefers to keep municipal emergency management coordinators actively engaged at a more local level.

5.2.2 Emergency Services

Elk County has five ambulance companies available to respond to a citizen in need of medical assistance. They are: St. Marys Ambulance, Fox Township, Ridgway, Bennetts Valley and Jones Township. Figure 5-4 on page 125 is a map that depicts the service area for each company. For example: According to the map, Ridgway Ambulance service covers Ridgway Township, Ridgway Borough, Spring Creek and Millstone Townships and a portion of Horton Township. The St. Marys Ambulance Service has an agreement with Johnsonburg Borough to cover that municipality as well as all of St. Marys and a portion of Bennetts Valley. St. Marys has the largest amount of ambulances

with five (5) in their fleet. Elk County Ambulance Transport Service is a new service that provides transports only.

5.2.3 Hospitals & Nursing Homes

Elk County has one hospital located in St. Marys, Penn Highlands Elk (PHE). PHE has a helicopter landing pad for medical evacuations by air if needed.
Table 5-21 lists the nursing homes and assisted living facilities in Elk County along with the number of beds available for each. This information is critical in order to be prepared when a disaster strikes. These residents are part of our most vulnerable population and will need the most assistance in evacuating.

Pennsylvania State law requires that in order to obtain a license to operate this type of facility, an emergency plan must be in place in case of a disaster.

Table 5-1: Nursing Homes and Assisted Living Facilities

Name	Location	Type of Facility	Available Beds/Units
Pine Crest Manor	St. Marys	Nursing Home	138 Beds
Elk Haven Nursing Home	St. Marys	Nursing Home	120 Beds
Silver Creek Terrace	St. Marys	Assisted Living	56 Units
Ridgemont Assisted Living	Ridgway	Assisted Living	40 Units
Total			**354**

The Pennsylvania Department of Health goes one step further. The Health Care Coalition (HCC) Preparedness is defined as, "A formal collaboration among healthcare organizations and public and private partners that is organized to prepare for, respond to, and recover from an emergency, mass casualty or catastrophic event." The coalition is divided into regions. Each region is assigned a hospital association representative and a public health preparedness coordinator. Elk County falls in the Northwest Central Emergency Response Group. Tom Kerchinski is the local hospital association representative.

5.2.4 Elderly Housing

Name	Type	Number of Units	Location
Elco Glen	Elderly/Disabled	32	St. Marys
St. Joseph's Terrace	Elderly	22	Weedville
Fox Manor	Elderly	17	Kersey
Elk Towers	Elderly	102	St. Marys
Ridgmont Senior Cottages	Elderly	20	Ridgway
Marienstadt Place	Elderly	24	St. Marys
St. Marys Apartments	General*	26	St. Marys
Total		**571**	

Table 5-2: Elderly Housing

Elk County also has numerous senior housing facilities depicted in Table 5.2.4. These housing facilities are also in need of special attention in times of disaster and should be included in any emergency disaster plan.

5.2.5 Disaster Preparation

Interviews conducted with the various emergency services organizations in preparing the HMP Update revealed there is a coordinated effort in Elk County in order to be prepared for a disaster response of all types.

Figure 5-1: DCNR staff, 911 Coordinators and EMA directors discuss wildland fire training. September 27, 2017. Photo courtesy of Elk County Emergency Management Agency

Penn Highlands Elk has a disaster plan in place that is updated annually to address any changes. Their plan includes preparations for a triage unit for mass casualties, an Evacuation Plan, as well as a Continuity of Operations Plan in case the hospital itself is affected by the disaster. PHE works with the ambulance and fire departments to conduct drills on a regular basis to ensure everyone knows their role during a disaster.

The local ambulance services and the fire departments also conduct drills to prepare for a countywide disaster. There are simulations once a year (for example: an airplane crash at the local airport) which enable these organizations the opportunity to practice in the event of a real emergency. The fire departments also work cooperatively with the local schools and nursing homes to conduct fire drills annually.

Due to the rural nature of Elk County, there is a heavy reliance on air ambulances to transport patients to a critical care facility when needed. There are numerous pre-designated landing zones for medical helicopters located all through-out the county in order to be able to reach a critically injured patient as close to the scene of the accident as possible.

Figure 5-2: Stat MedEvac landing at the Jay Township Ball field.

Patients can be air-lifted to hospitals located over one-hundred miles away or more in a relatively short amount of time. Hospital facilities in Altoona, State College, Pittsburgh and Erie, PA are utilized depending on the type and extent of a patient's injuries. This type of service is dependent on the weather at the time of the accident and are sometimes not available if conditions aren't favorable

for safe flying. In those cases, ambulances must be utilized for transportation and the travel time becomes much longer.

In addition to disaster simulations, there are regularly scheduled exercises and meetings conducted to ensure readiness in the event of a disaster. The following lists highlights a few of the trainings and meetings:

- Weather Exercise annually in March
- Winter Weather Exercise annually in January
- EMA Alert Warning Notification Exercise conducted numerous times throughout the year
- EMS, Police, and Fire quarterly meeting for response notification
- Police Chiefs conduct monthly meeting with the DA to discuss operations
- Fire Chiefs meet quarterly for planning
- Multi County Regional Task Force meets monthly to discuss operations and planning
- 911 Directors monthly meeting
- Local Emergency Planning Committee (LEPC) meet quarterly for Community Hazardous Material Preparation

5.2.6 The Red Cross, EMMCO East, and Emergency Shelters

The local chapter of the American Red Cross is led by Jason Bange, the Executive Director. According to Jason, there are 135 disaster volunteers ready to respond to an incident in Elk County. If a large event occurs a regional response is called for with an additional 1900 volunteers available. Jason also states that the Red Cross attempts to have a representative on the scene within two hours. If shelters are needed their goal is to be ready within four hours. (Telephone Interview, 10/02/17)

Elk County has four (4) designated emergency (fixed) shelters. (See Table 5-3) However, by law, schools can automatically be taken to be used for shelters if needed. The Red Cross also has a trailer capable of sheltering 100 people that is equipped with cots and blankets.

Name	Address	Capacity
Johnsonburg High School	315 High School Road	356/178
Ridgway Fire Hall	30 North Broad Street	100/50
Saint Joseph Church Social Hall	17727 Bennetts Valley Hwy.	50/25
Weedville Wesleyan Church	18945 Bennetts Valley Hwy.	150/75

Table 5-3: Elk County designated Red Cross Shelters.

For a full list of emergency service contacts see **Appendix J.**

Figure 5-3: EMS West (formerly Emmco East) located in Fox Township, PA.

EMMCO East (now known as EMS West) can respond to an emergency when needed. According to Mike McAllister, EMA Director, EMS West is not a "first responder" agency. EMS is typically utilized for incidents that may involve mass casualties. They have the ability to set up a mobile field hospital, erect portable shelters and provide cots and tents.

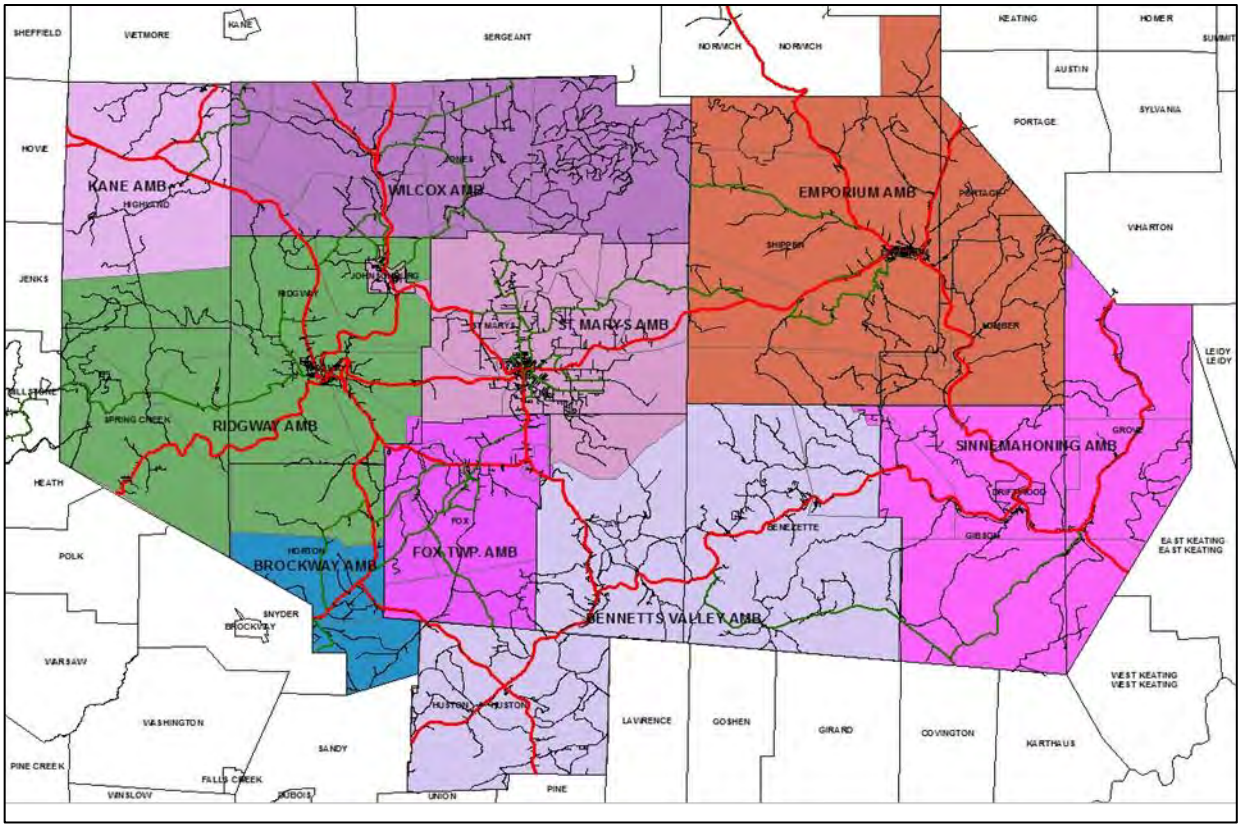


Figure 5-4: Elk County Ambulance Service Areas. Service area is color coded to represent areas where each ambulance responds.

5.3 Participation in the National Flood Insurance Program (NFIP)

All 12 municipalities in Elk County are participants in the NFIP (see Table 5-4). The program i s managed by local municipalities participating in the program through ordinance adoption and floodplain regulation while the Elk County Office of Planning and Development provides an oversight and coordination role. Similarly, permitting processes needed for building construction and development in the floodplain are implemented at the municipal level through various ordinances (e.g. zoning, subdivision/land development and floodplain ordinances).

FEMA Region III makes available to communities, an ordinance review checklist which lists required provisions for floodplain management ordinances. This checklist helps communities develop an effective floodplain management ordinance that meets federal requirements for participation in the NFIP.

The Pennsylvania Department of Community and Economic Development (DCED) provides communities, based on their CFR, Title 44, Section 60.3 level of regulations, with a suggested ordinance document to assist municipalities in meeting the minimum requirements of the NFIP along with the Pennsylvania Flood Plain Management Act (Act 166). These suggested or model ordinances contain provisions that are more restrictive than state and federal requirements.

Act 166 mandates municipal participation in and compliance with the NFIP. It also establishes higher regulatory standards for hazardous materials and high risk land uses. As new Digital Flood Insurance Rate Maps (DFIRMs) are published, the Pennsylvania State NFIP Coordinator housed at DCED, works with communities to ensure the timely and successful adoption of an updated floodplain management ordinance by reviewing and providing feedback on existing and draft ordinances. In addition, DCED provides guidance and technical support through Community Assistance Contacts (CAC) and Community Assistance Visits (CAV).

Countywide Digital Flood Insurance Rate Maps (DFIRMs) were released for Elk County on **January 18, 2012**. The digital maps will greatly enhance mitigation capabilities as they relate to identifying flood hazards and is a significant improvement to the previously effective paper Flood Insurance Rate Maps. Residents and municipal officials are provided with mapping assistance from the Elk County Planning Department upon request. Maps can be viewed at 300 Center Street, Ridgway, Pennsylvania. Residents can also log onto: www.pafloodmaps.com to obtain a flood map.

There are no communities in Elk County currently participating in the NFIP Community Rating System (FEMA CIS, 2017).

5.4 Planning and Regulatory Capability

Some of the most important planning and regulatory capabilities that can be utilized for hazard mitigation include comprehensive plans, building codes, floodplain ordinances, subdivision and land development ordinances, and zoning ordinances. These tools provide mechanisms for the implementation of adopted mitigation strategies. Table 5-4 summarizes their presence within each municipality.

Comprehensive Plans promote sound land use and regional cooperation among local governments to address planning issues. These plans serve as the official policy guide for influencing the location, type and extent of future development by establishing the basis for decision-making and review processes on zoning matters, subdivision and land development, land uses, public facilities and housing needs over time. The existing countywide Comprehensive Plan for Elk County was last amended in 1999. County governments are required by law to adopt a comprehensive plan, while local municipalities may do so at their option. Future comprehensive plan updates and improvements will be included in the 2017 HMP findings.

Building codes regulate construction standards for new construction and substantially renovated buildings. Standards can be adopted that require resistant or resilient building design practices to address hazard impacts common to a given community. In 2003, the Commonwealth of Pennsylvania implemented Act 45 of 1999, the Uniform Construction Code (UCC), a comprehensive building code that establishes minimum regulations for most new construction, including additions and renovations to existing structures. All 12 municipalities in Elk County are required to adhere to the UCC. On December 10, 2009 the Commonwealth adopted regulations of the 2009 International Code Council's codes. The effective date of the regulations is December 31, 2009. Since all municipalities in Elk County are required to abide by the UCC they will are required to enforce the 2009 building code regulations for all building permits submitted after December 31, 2009. If a design or construction contract for proposed work was signed between December 31, 2006 and December 30, 2009 then the 2006 International Codes must be abided.

Through administration of floodplain ordinances, municipalities can ensure that all new construction or substantial improvements to existing structures located in the floodplain are flood-proofed, dry-proofed, or built above anticipated flood elevations. Floodplain ordinances may also prohibit development in certain areas altogether. The NFIP establishes minimum ordinance requirements which must be met in order for that community to participate in the program. However, a community is permitted and in fact, encouraged, to adopt standards which exceed NFIP requirements. Through participation in the NFIP, all municipalities within the County have floodplain regulations in place.

Subdivision and land development ordinances are intended to regulate the development of housing, commercial, industrial or other uses, including associated public infrastructure, as land is subdivided into buildable lots for sale or future development. Within these ordinances, guidelines on how land will be divided, the placement and size of roads and the location of

infrastructure can reduce exposure of development to hazard events. Seven jurisdictions within Elk County have adopted and enforce a subdivision and land development ordinance.

Zoning ordinances allow for local communities to direct the development of land in order to protect the interest and safety of the general public. Zoning ordinances can be designed to address unique conditions or concerns within a given community. They may be used to create buffers between structures and high-risk areas, limit the type or density of development and/or require land development to consider specific hazard vulnerabilities. Five jurisdictions within Elk County have adopted and enforce a zoning ordinance. Of the remaining seven, two have expressed an interest in a county zoning ordinance. The remaining five are adamantly opposed to any type of zoning. The county has no jurisdiction or ability to require the municipalities to adopt zoning.

5.5 Administrative and Technical Capability

Administrative capability is described by an adequacy of departmental and personnel resources for the implementation of mitigation-related activities. Technical capability relates to an adequacy of knowledge and technical expertise of local government employees or the ability to contract outside resources for this expertise in order to effectively execute mitigation activities. Common examples of skill sets and technical personnel needed for hazard mitigation include: planners with knowledge of land development/management practices, engineers or professionals trained in construction practices related to buildings and/or infrastructure (e.g. building inspectors), planners or engineers with an understanding of natural and/or human caused hazards, emergency managers, floodplain managers, land surveyors, scientists familiar with hazards in the community, staff with the education or expertise to assess community vulnerability to hazards, personnel skilled in geographic information systems, resource development staff or grant writers, fiscal staff to handle complex grant application processes.

Based on assessment results, municipalities in Elk County have moderate administrative and technical staff needed to conduct hazard mitigation-activities. There seems to be sufficient emergency management staff across the County and several municipalities have grant writing capabilities. However, there seems to be a common lack of personnel for land surveying and scientific work related to community hazards. This result is not necessarily surprising since these tasks are typically contracted to outside providers. Many communities do not have their own personnel skilled in geographic information systems but have identified that the County GIS Department is able to provide these services. Approximately 75 percent of the municipalities have an identified emergency management coordinator.

Other local organizations that could act as partners include the Elk County Conservation District, the Penn State Cooperative Extension, the Tri-County Fireman's Association, business development organizations such as Chambers of Commerce, and the North Central PA Regional Planning and Development Commission.

Table 5-4: Summary of planning tools adopted by each municipality in Elk County (HMP Capability Assessment Surveys, 2010; Elk County Planning Department, 2017)								
COMMUNITY	**COMP PLAN**	**BUILDING CODE**	**FLOODPLAIN ORDINANCE - NFIP PARTICIPANT**	**SUBDIVISION & LAND DEVELOPMENT ORDINANCE**	**ZONING ORDINANCE**	**Act 167 Stormwater Management Plan**	**Flood Mitigation Assistance Plan (FMAP)**	**North Central Greenways Plan**
County of Elk	Yes	No	No	Yes	No	Yes	Yes	Yes
Benezette Township	No	Yes	Yes	No	No	Yes	Yes	No
Fox Township	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Highland Township	No	Yes	Yes	No	No	Yes	Yes	No
Horton Township	Yes	Yes	Yes	No	No	Yes	Yes	No
Jay Township	No	Yes	Yes	Yes	No	Yes	Yes	No
Johnsonburg Borough	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Jones Township	No	Yes	Yes	Yes	No	Yes	Yes	No
Millstone Township	No	Yes	Yes	No	No	Yes	Yes	No
Ridgway Borough	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Ridgway Township	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Spring Creek Township	No	Yes	Yes	No	No	Yes	Yes	No
City of St. Mary's	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No

State agencies agency which can provide technical assistance for mitigation activities include, but are not limited:

- Pennsylvania Department of Community and Economic Development
- Pennsylvania Department of Conservation and Natural Resources
- Pennsylvania Department of Environmental Protection
- Pennsylvania Emergency Management Agency (PEMA)
- PA Bureau of Forestry

Federal agencies which can provide technical assistance for mitigation activities include, but are not limited to:

- Army Corp of Engineers
- Department of Housing and Urban Development
- Department of Agriculture
- Economic Development Administration
- Emergency Management Institute
- Environmental Protection Agency
- FEMA
- Small Business Administration
- United States Department of Agriculture (USDA)
- Allegheny National Forest (ANF)

5.6 Fiscal Capability

The decision and capacity to implement mitigation-related activities is often strongly dependent on the presence of local financial resources. While some mitigation actions are less costly than others, it is important that money is available locally to implement policies and projects. Financial resources are particularly important if communities are trying to take advantage of state or federal mitigation grant funding opportunities that require local-match contributions. Based on survey results, most municipalities within the County perceive fiscal capability to be moderate to low.

State programs which may provide financial support for mitigation activities include, but are not limited to:

- DCNR Community Conservation Partnerships Program
- DCED Community Revitalization Program
- Floodplain Land Use Assistance Program
- DEP Growing Greener Program
- Keystone Communities Grant Program
- Land Use Planning and Technical Assistance Program
- Headwaters, RC&D
- Local charitable foundations

- Shared Municipal Services
- Technical Assistance Program
- Act 13 Marcellus Legacy Grants
- DEP Flood Protection Program
- DEP Stream Improvement Program

Federal programs which may provide financial support for mitigation activities include, but are not limited to:

- Community Development Block Grants Disaster Recover (CDBG-DR)
- Disaster Housing Program
- Emergency Conservation Program
- Emergency Management Performance Grants (EMPG)
- Emergency Watershed Protection Program
- Hazard Mitigation Grant Program (HMGP)
- Flood Mitigation Assistance Program
- Non-insured Crop Disaster Assistance Program
- Pre-Disaster Mitigation Program
- Section 108 Loan Guarantee Programs
- Severe Repetitive Loss Grant Program (SRL)
- Weatherization Assistance Program
- Appalachian Regional Commission (ARC)

5.7 Political Capability

One of the most difficult capabilities to evaluate involves the political will of a jurisdiction to enact meaningful policies and projects designed to mitigate hazard events. The adoption of hazard mitigation measures may be seen as an impediment to growth and economic development. In many cases, mitigation may not generate interest among local officials when compared with competing priorities. Therefore, the local political climate must be considered when designing mitigation strategies, as it could be the most difficult hurdle to overcome in accomplishing the adoption or implementation of specific actions.

The *Capability Assessment Survey* was used to capture information on each jurisdiction's political capability. Survey respondents were asked to identify examples of political capability, such as guiding development away from hazard areas, restricting public investments or capital improvements within hazard areas, or enforcing local development standards that go beyond minimum state or federal requirements (i.e. building codes, floodplain management ordinances, etc…). These examples were used to guide respondents in scoring their community on a scale of "unwilling" (0) to "very willing" (5) to adopt policies and programs that reduce hazard vulnerabilities. Of the nine municipalities that responded, scores ranged from 0-5 with an average score of 2.94.

5.8 Self-Assessment

In addition to the inventory and analysis of specific local capabilities, the *Capability Assessment Survey* required each local jurisdiction to conduct its own self-assessment of its capability to effectively implement hazard mitigation activities. As part of this process, county and municipal officials were encouraged to consider the barriers to implementing proposed mitigation strategies in addition to the mechanisms that could enhance or further such strategies. In response to the survey questionnaire, local officials classified each of the capabilities as either "limited," "moderate" or "high." Table 5-5 summarizes the results of the self-assessment survey as a percentage of responses received. For example, 50% of communities who responded indicated their community had moderate fiscal capabilities related to hazard mitigation activities that reduce hazard vulnerabilities.

Table 5-5: Summary of self-assessment capability responses expressed as a percentage (%) of responses received.

CAPABILITY CATEGORY	LIMITED	MODERATE	HIGH
Planning & Regulatory	25	62	13
Administrative & Technical	37	50	13
Fiscal	50	50	0
Political	38	62	0
Community Resiliency	38	62	0

5.9 Existing Limitations

As mentioned, there are no communities in Elk County participating in the NFIP Community Rating System (CRS). However, all 12 municipalities in the County have been designated as flood prone. Community participation in this program can provide premium reductions for properties located outside of Special Flood Hazard Areas of up to 10 percent and reductions for properties located in Special Flood Hazard Areas of up to 45 percent. These discounts can be obtained by undertaking public information, mapping and regulations, flood damage reduction and flood preparedness activities (FEMA, 2009).

Based on the capability assessment results, all 12 municipalities in the County have an adopted stormwater management ordinance. A stormwater management plan is designed to address flooding associated with stormwater runoff. These plans typically focus on design and construction measures that are intended to reduce the impact of more frequently occurring minor urban flooding. The presence of a stormwater management plan greatly enhances mitigation capabilities needed to address flood and transportation hazards. All structures existing before the completion of the plan are "grandfathered" however, making it very difficult to address some of the most problematic issues.

Numerous roads and intersections exist in the County where flooding issues repeatedly occur.

Some of these roads and intersections are state routes. The County and local municipalities face challenges in mitigating flood events on state routes since these roads are owned and maintained by the Commonwealth of Pennsylvania. Local municipalities do not have the authority to independently carry out a mitigation project. In these situations, the Pennsylvania Department of Transportation must decide to undertake the project. Since the Department of Transportation is often most concerned with larger, critical transportation routes, smaller state roads and intersections which significantly affect a local community may not get the attention they need for the Commonwealth to take on a mitigation project.

6. Mitigation Strategy

6.1 Process Summary

Mitigation *goals* are general guidelines that explain what the County wants to achieve. Goals are usually expressed as broad policy statements representing desired long-term results. Mitigation *objectives* describe strategies or implementation steps to attain the identified goals while mitigation *actions* and mitigation *projects* are very specific and measurable. Five goals and nine objectives were identified during the HMP development process.

The HMSC developed goals and objectives for county hazard mitigation efforts in 2006. A Hazard-Risk Assessment Questionnaire was provided to the HMPT in 2010 which asked for mitigation goal and objective feedback and community specific mitigation actions.

The final list of goals and objectives is available in Table 6-1. The Mitigation Action Plan, provided in Table 6-3, contains at least one action and/or project for each jurisdiction in the planning area. The completed *Hazard-Risk Assessment Questionnaires* are available in **Appendix G**.

Mitigation actions and projects were evaluated using PA STEEL. Table 6.4-2 contains this evaluation. The final list of actions and projects is contained in the Mitigation Action Plan in Table 6.4-1.

6.2 Mitigation Goals and Objectives

Table 6-1 details the mitigation goals and objectives established for the 2018 HMP based on HMSC and HMPT guidance.

Table 6-1: List of Mitigation Strategy Goals and Objectives.	
GOAL 1	Local Plans and Regulations
Objective 1A	Utilize radio spots, newspaper articles, and public service announcements.
Objective 1B	Make available to the public an assortment of disaster preparedness brochures
GOAL 2	Improve and update countywide datasets and update general municipal maps accordingly.
Objective 2A	Create a committee to improve and update maps of each municipality.
Objective 2B	Incorporate updated Flood Insurance Rate Maps (FIRMs) into county processes.
GOAL 3	Improve public and public officials' participation in the mitigation implementation process.
Objective 3A	Use public service announcements to inform the public and officials of the importance of hazard mitigation in order to get more people interested in the mitigation process
GOAL 4	Rank all the mitigation opportunity forms
Objective 4A	Review all of the submitted Hazard Mitigation Opportunity forms submitted by the 12 municipalities of Elk County and rank them according to a viable ranking system in order
GOAL 5	Facilitate the protection life and property from natural and man-made disasters
Objective 5A	Reduce wildfire potential through planning and outreach.
Objective 5B	Implement structural projects to reduce the impacts from flooding including acquisition, elevation and relocation.
Objective 5C	Improve coordination and communication disaster response organizations, emergency management entities, and local and county governments.

6.3 Identification and Analysis of Mitigation Techniques

Appendix 7 of the SOG developed by PEMA provides a comprehensive list of hazard mitigation ideas. Elk County used this guide to identify mitigation techniques and develop mitigation actions. There are four categories of mitigation actions which Elk County considered in developing its Mitigation Action Plan. Those categories include:

- **Local Plans and Regulations:** Government administrative or regulatory actions or processes that influence the way land and buildings are developed and built. These actions also include public activities to reduce hazard losses. Examples include planning, zoning, building codes, subdivision regulations, hazard specific regulations (such as floodplain regulations), capital improvement

programs, and open-space preservation and stormwater regulations.

- **Structure and Infrastructure:** Actions that involve modifying or removing existing buildings or infrastructure to protect them from a hazard. Examples include the acquisition, elevation and relocation of structures, structural retrofits, flood-proofing, storm shutters, and shatter- resistant glass. Most of these property protection techniques are considered to involve "sticks and bricks;" however, this category also includes insurance. Mitigation projects intended to lessen the impact of a hazard by using structures to modify the environment. Structures include stormwater controls (culverts); dams, dikes, and levees; and safe rooms.

- **Public Education and Awareness:** Actions to inform and educate citizens, elected officials, and property owners about potential risks from hazards and potential ways to mitigate them. Such actions include hazard mapping, outreach projects, library materials dissemination, real estate disclosures, the creation of hazard information centers, and school age / adult education programs.

- **Natural Systems Protection:** Actions that, in addition to minimizing hazard losses also preserve or restore the functions of natural systems. These actions include sediment and erosion control, stream corridor restoration, forest and vegetation management, wetlands restoration or preservation, slope stabilization, and historic property and archeological site preservation.

Table 6-2 provides a matrix identifying the mitigation techniques used for the moderate and high risk hazards in the County. The specific actions associated with these techniques are included in Table 6-3.

Table 6-2: Mitigation techniques used for moderate and high risk hazards in Elk County.

HAZARD	MITIGATION TECHNIQUE					
	PREVENTION	PROPERTY PROTECTION	PUBLIC EDUCATION AND AWARENESS	NATURAL RESOURCE PROTECTION	STRUCTURAL PROJECT IMPLEMENTATION	EMERGENCY SERVICES
Drought	✓		✓	✓		✓
Flood, Flash Flood, Ice Jam	✓	✓	✓	✓	✓	✓
Landslide	✓		✓		✓	✓
Tornado and Windstorm	✓	✓	✓			✓
Wildfire	✓		✓			✓
Winter Storm	✓		✓			✓
Dam Failure	✓		✓			✓
Fuel Shortage	✓		✓			✓

Hazardous Materials	✓		✓			✓
Terrorism	✓		✓			✓
Transportation Accident	✓		✓		✓	✓
Urban Fire and Explosion	✓		✓			✓

6.4 Mitigation Action Plan

Potential mitigation actions were submitted via the *Hazard-Risk Assessment Questionnaire* and reviewed by the HMSC. Table 6-3 contains the final list of 21 actions which were developed during the planning process based on identified needs and vulnerability analysis. At least one mitigation action was established for each moderate and high risk hazard in Elk County. More than one action is identified for several hazards. Every participating jurisdiction has at least one mitigation action. Each mitigation action is intended to address one or more of the goals and objectives identified in Section 6. As a part of the HM Plan Update, Table 6-3 now includes the status of each action chosen previously and includes new actions to be addressed in the next five years. A Comment section has also been added to clarify the status of the actions as well.

Table 6-3: Elk County Mitigation Action Plan.	
COMMUNITY: Elk County; Benezette Township; Fox Township, Highland Township; Jay Township, Johnsonburg Borough; Jones Township; Millstone Township; Ridgway Borough; Ridgway Township; City of St. Marys	**ACTION:** Hold public forum to educate public about types of hazard mitigation that can be done on an individual basis.
ACTION NO: 1	
Category:	Public Education and Awareness
Hazard(s) Addressed:	Drought; Flood, Flash Flood, Ice Jam; Landslide; Tornado and Windstorm; Wildfire; Winter Storm; Dam Failure; Fuel Shortages; Hazardous Materials; Terrorism; Transportation Accident; Urban Fire and Explosion
Lead Agency/Department:	Elk County OEM ON-GOING
Implementation Schedule:	1 year
Funding Source:	FEMA/HMGP; PEMA, County
New Action:	Continue to engage the public using various means of communication. Elk County has a new re-designed website that is more interactive and has been well received by the public. Articles and news information concerning hazard mitigation can now be posted regularly.

Comments:	May 2017: A Public Survey was posted on Elk County's website. 1,248 people clicked on the article but only one completed the survey. It was advertised in the local newspaper, announced at a Commissioner's meeting and posted on Facebook as part of the outreach as well.
COMMUNITY: Elk County; Benezette Township; Fox Township, Highland Township; Jay Township, Johnsonburg Borough; Jones Township; Millstone Township; Ridgway Borough; Ridgway Township; City of St. Marys	**ACTION:** Increase awareness of and participation in FEMA's Community Rating System (CRS) Program.
ACTION NO: 2	
Category:	Prevention - National Flood Insurance Program
Hazard(s) Addressed:	Flood, Flash Flood, & Ice Jam
Lead Agency/Department:	Municipalities ON-GOING
Implementation Schedule:	Begin review of CRS requirements in 2011. Adopt measures when appropriate to attain CRS credit through 2016.
Funding Source:	Municipalities, County staff time
New Action:	North Central PA Regional Planning & Development Commission has hired a new position. The new employee will actively raise awareness of the short and long term public and private impacts of the Flood Insurance Reform. North Central plans to develop and implement a self-help flood resiliency protocol for a selected pilot community. This tool will allow municipal governments to complete flood mitigation assessments, including flood proofing, structure elevation, structure relocation, and municipal boundary expansions. The self-analysis will allow for municipalities to implement mitigation measures utilizing existing available state and federal funding. Another anticipated outcome of the project will be to develop an Elevation Certificate Program for the region. North Central will develop a model RFP to solicit professional surveyor or engineering services to prepare and issue FEMA Elevation Certificates for interested homeowners within the 100-year floodplain (Zone AE). The intent of this program is to create savings in the community for each participating property owner.
Comments:	The CRS program continues to be an option for flood-prone municipalities. Limited staff and resources makes it difficult to meet the demands of the program however, with help from North Central the program may become more accessible for those that choose to implement it.
COMMUNITY: Elk County; Benezette Township; Fox Township, Highland Township; Jay Township, Johnsonburg Borough; Jones Township; Millstone Township; Ridgway Borough; Ridgway Township; City of St. Marys	ON-GOING **ACTION:** Identify mitigation projects within the County that would reduce flood vulnerability of critical facilities.

ACTION NO: 3	
Category:	Prevention; Property Protection – National Flood Insurance Program
Hazard(s) Addressed:	Flood, Flash Flood, & Ice Jam; Tornado and Windstorm
Lead Agency/Department:	Elk County OEM
Implementation Schedule:	Ongoing; 1 year
Funding Source:	Municipal and County staff time
New Action:	County and local municipal authorities will work together to share information on new funding sources and/or programs as they become available.
Comments:	Municipalities with flood-prone areas continue to address these issues. Stormwater mitigation and roadway work has been the most successful remediation to date.
COMMUNITY: Elk County; Benezette Township; Fox Township, Highland Township; Jay Township, Johnsonburg Borough; Jones Township; Millstone Township; Ridgway Borough; Ridgway Township; City of St. Marys	**ACTION:** Adopt Firewise program. COMPLETE
ACTION NO: 4	
Category:	Prevention
Hazard(s) Addressed:	Wildfire
Lead Agency/Department:	DCNR; County
Implementation Schedule:	5 year rotation for hazard fuel mitigation projects; Annually for public education projects and training; Three years for updates on Emergency Action Plans
Funding Source:	U.S. Forest Service; DCNR
New Action:	Widespread dissemination of the new Community Wildfire Protection Plan to local municipal officials and fire departments. Mitigation programs and educational programs will be implemented according to the plan.
Comments:	The Elk County Planning Department in cooperation with the Allegheny National Forest is preparing a Community Wildfire Protection Plan; the federal version of the state Firewise Program. The plan incorporates Firewise components as well as CWPP requirements. Plan adoption is expected by the end of 2017.
COMMUNITY: Elk County	**ACTION:** Identify means of managing stranded travelers during winter storms. INCOMPLETE
ACTION NO: 5	
Category:	Emergency Services

Hazard(s) Addressed:	Winter Storm
Lead Agency/Department:	Elk County OEM
Implementation Schedule:	1 year
Funding Source:	NA
New Action:	County personnel will work cooperatively with emergency services, local municipal officials and PennDot to develop an action plan within the next five years.
Comments:	Most of the stranded travelers in Elk County have been snow-plow drivers located in remote areas with no cell phone service and limited radio contact. Hand-held radios are updated occasionally to try to remedy the problem.
COMMUNITY: Elk County; Benezette Township; Fox Township, Highland Township; Jay Township, Johnsonburg Borough; Jones Township; Millstone Township; Ridgway Borough; Ridgway Township; City of St. Marys	**ACTION:** Identify and resurface portions of various problem streets and intersections. ON-GOING
ACTION NO: 6	
Category:	Structural Project Implementation
Hazard(s) Addressed:	Transportation Accidents
Lead Agency/Department:	Elk County; PennDOT
Implementation Schedule:	5 years
Funding Source:	Municipalities; County; PennDOT
New Action:	The Elk County Planning Department will outreach to local municipalities in order to educate them about the potential use of CDBG funds for these types of projects as well as coordinate with North Central PA Regional Planning and Development Corporation's local Rural Planning Organization to offer solutions.
Comments:	Numerous problem roadways have been updated in the past five years. PennDot is working on an Extreme Weather Vulnerability Study which Elk County hopes to incorporate into this plan when complete.
COMMUNITY: Benezette & Jay Townships	**ACTION:** Remove excess gravel annually from beneath bridges previously identified as debris jam prone. ON-GOING
ACTION NO: 7	
Category:	Structural Project Implementation; Natural Resource Protection
Hazard(s) Addressed:	Flood, Flash Flood, Ice Jam
Lead Agency/Department:	Benzette Township

Implementation Schedule:	Annually or as needed
Funding Source:	Benzette Township
New Action:	Elk County will partner with the local conservation district, DEP, and the Western Pennsylvania Conservancy Watershed Manager to work cooperatively together to clear local streams excess gravel annually.
Comments:	This program has had limited success and has become more difficult due to DEP restrictions on entering/altering a stream. This type of project is unlikely to be funded by FEMA since it is considered maintenance.
COMMUNITY: Jay Township; Ridgway Township; Horton Township	**ACTION:** Remove debris from local waterways as needed.
ACTION NO: 8	
Category:	Structural Project Implementation; Natural Resource Protection
Hazard(s) Addressed:	Flood, Flash Flood, Ice Jam
Lead Agency/Department:	Townships
Implementation Schedule:	Annually or as needed ON-GOING
Funding Source:	Local Townships, Elk County Conservation, WPC, DEP
New Action:	Elk County will partner with the local conservation district, DEP, and the Western Pennsylvania Conservancy Watershed Manager to work cooperatively together to clear local streams of debris annually.
Comments:	This program has limited success because of DEP restrictions. Debris removal is only allowed after flooding and only if it is done from the stream bank. That can be difficult if the debris is large or the water is still high. Local watershed groups and the conservation district do on-going river clean-ups in various locations throughout the county but debris removal (such as trees) by local municipal crews is discouraged. FEMA also considers these actions as maintenance and are unlikely to provide funding.
COMMUNITY: Jones Township; City of St. Marys	**ACTION:** Identify and prioritize areas needing improved stormwater infrastructure.
ACTION NO: 9	
Category:	Prevention; Structural Project Implementation
Hazard(s) Addressed:	Flood, Flash Flood, Ice Jam; Landslide
Lead Agency/Department:	Municipalities, County, DEP ON-GOING
Implementation Schedule:	5 years
Funding Source:	FEMA/HMGP; DEP; EPA

New Action:	Although Jones Township is complete, the City of St. Marys has a much larger area to oversee. The County will continue to share information and work cooperatively with the city to help them implement their stormwater projects.
Comments:	Elk County's CDBG program did an extensive update to Jones Township's stormwater infrastructure beginning in 2013 and ending in 2016. Over $250,000 was invested. St. Marys is currently working on a potential flood control project for the Elk Creek Watershed.
COMMUNITY: Jones Township	**ACTION:** Identify methods for improving radio communications between local agencies and County (i.e. Township crews, fire department, county control).
ACTION NO: 10	
Category:	Prevention; Emergency Services
Hazard(s) Addressed:	Flood, Flash Flood, Ice Jam; Landslide; Tornado and Windstorm; Wildfire; Winter Storm; Dam Failure; Hazardous Materials; Terrorism; Transportation Accident; Urban Fire and Explosion
Lead Agency/Department:	Jones Township
Implementation Schedule:	2 years ON-GOING
Funding Source:	Jones Township; County
New Action:	Elk County Emergency Management will continue to update equipment as new technology becomes available.
Comments:	Communications throughout the county continue to be a challenge for all municipalities. Radios have just recently been updated and a new tower was installed in the Jones Township area which has alleviated some of the problems. As technology evolves it will be implemented as soon as possible.
COMMUNITY: Ridgway Borough	**ACTION:** Identify method and funding source for improving early warning systems especially in response to flooding.
ACTION NO: 11	
Category:	Emergency Services
Hazard(s) Addressed:	Drought; Flood, Flash Flood, Ice Jam; Landslide; Tornado and Windstorm; Wildfire; Winter Storm; Dam Failure; Fuel Shortages; Hazardous Materials; Terrorism; Transportation Accident; Urban Fire and Explosion
Lead Agency/Department:	Ridgway Borough COMPLETE
Implementation Schedule:	1 year
Funding Source:	Ridgway Borough; FEMA/HMGP
New Action:	None at this time however if new/improved technology becomes available to replace SWIFT County OES will investigate it.
Comments:	Elk County OES has implemented SWIFT and can now notify residents via emergency notifications.

COMMUNITY: Ridgway Borough **ACTION NO:** 12	**ACTION:** Improve radio communication with 911 Dispatch Center (currently municipal government cannot communicate with the 911 center on its own frequency)
Category:	Prevention; Emergency Services
Hazard(s) Addressed:	Drought; Flood, Flash Flood, Ice Jam; Landslide; Tornado and Windstorm; Wildfire; Winter Storm; Dam Failure; Fuel Shortages; Hazardous Materials; Terrorism; Transportation Accident; Urban Fire and Explosion
Lead Agency/Department:	Ridgway Borough COMPLETE
Implementation Schedule:	2 years
Funding Source:	Ridgway Borough; FEMA/HMGP
New Action:	Elk County OES will continue to address communication issues as they arise.
Comments:	Same comment as Action No. 10
COMMUNITY: Elk County **ACTION NO:** 13	**ACTION:** Contact DEP and discuss opportunity and potential funding for developing a drought contingency plan.
Category:	Prevention; Natural Resource Protection
Hazard(s) Addressed:	Drought; Wildfire ON-GOING
Lead Agency/Department:	Elk County OEM
Implementation Schedule:	6 months
Funding Source:	NA
New Action:	The Elk County Planning Department will contact DEP and determine whether or not a drought contingency plan is needed. If so, planning department staff will pursue the project within the next five years.
Comments:	Although not specifically intended as a drought contingency plan, local Source Water Protection Plans do identify alternate sources of water supplies in the event of a contamination or drought.
COMMUNITY: Johnsonburg Borough; Ridgway Borough, Jay Township **ACTION NO:** 14	**ACTION:** Evaluate the inclusion of more restrictive floodplain management requirements in floodplain management ordinances in those communities with highest population densities.
Category:	Prevention; National Flood Insurance Program (New buildings/infrastructure)
Hazard(s) Addressed:	Flood, Flash Flood, & Ice Jam
Lead Agency/Department:	Boroughs INCOMPLETE
Implementation Schedule:	Ongoing
Funding Source:	Municipal staff time

New Action:	Encourage residents with repetitive losses to participate in the buy-out program. Assist in locating funding to pay for flood mitigation actions.
Comments:	New development is limited in these areas due to the population density so new restrictions are not effective. Most ordinances would "grandfather" existing properties.
COMMUNITY: Countywide **ACTION NO:** 15	**ACTION:** Require or encourage wind engineering measures and construction techniques that may include structural bracing, straps and clips, anchor bolts, laminated or impact-resistant glass, reinforced pedestrian and garage doors, window shutters, waterproof adhesive sealing strips, or interlocking roof shingles.
Category:	Prevention
Hazard(s) Addressed:	Tornado and Windstorm
Lead Agency/Department:	Elk County
Implementation Schedule:	5 years ON-GOING
Funding Source:	County and municipal staff time
New Action:	Elk County and Emergency Management will work with local municipalities to educate the citizens about options to improve the structural integrity of their homes.
Comments:	These types of measures will be discussed as part of the public outreach for the Community Wildfire Protection Plan, which also calls for fire-resistant roofing materials and debris clean-up bordering properties.
COMMUNITY: Benezette Township, Fox Township, Highland Township, Horton Township, Jay Township, Millstone Township, Ridgway Township, Spring Creek Township **ACTION NO:** 16	**ACTION:** Identify shelters and determine feasibility of warning system for municipalities with large number of manufactured homes.
Category:	Prevention, Emergency Services
Hazard(s) Addressed:	Tornado and Windstorm,
Lead Agency/Department:	Elk County, Municipalities ON-GOING
Implementation Schedule:	3 years
Funding Source:	FEMA/HMGP, Elk County, Municipality
New Action:	Encourage manufactured and mobile home owners to prepare an emergency plan in case of these types of emergencies utilizing public education materials. They will be posted on local web sites and placed in local newspapers. This will be done annually at the start of the spring season to remind residents to take cover.

Comments:	Shelters have been identified but the feasibility of warning systems for manufactured homes is more difficult to achieve. There are several trailer parks located in Elk County which could be directed to shelters but there are also mobile homes located randomly throughout in some very remote areas. Tornados can happen quickly limiting the amount of time residents in remote areas have to evacuate to a shelter. Directing them to do so without ensuring enough time could put them at further risk.
COMMUNITY: Benezette Township, Fox Township, Highland Township, Horton Township, Jay Township, Johnsonburg Borough, Jones Township, Millstone Township, Ridgway Borough, Ridgway Township, Spring Creek Township **ACTION NO:** 17	**ACTION:** Reduce risk from flooding in Ridgway Borough by conducting acquisition and demolition of at risk houses along the Clarion River between Main and Depot Street and the West End.
Category:	Property Protection
Hazard(s) Addressed:	Flood, Flash Flood, Ice Jam
Lead Agency/Department:	Elk ON-GOING
Implementation Schedule:	5 years
Funding Source:	FEMA/HMGP, Elk County, Municipal
New Action:	Explore the feasibility of properties eligible for funding in order to demolish and reconstruct houses in the flood zone.
Comments:	Ridgway Borough has successfully completed on buy-out project for a repetitive loss property. $182,000 has been awarded in order to buy-out the homeowner and remove the structure.
COMMUNITY: Benezette Township, Fox Township, Highland Township, Horton Township, Jay Township, Johnsonburg Borough, Jones Township, Millstone Township, Ridgway Borough, Ridgway Township, Spring Creek Township **ACTION NO:** 18	**ACTION**: Adopt the Elk County Act 167 Stormwater Management Plan. COMPLETE
Category:	Prevention
Hazard(s) Addressed:	Flood, Flash Flood, Ice Jam
Lead Agency/Department:	Municipalities
Implementation Schedule:	1 year
Funding Source:	Staff time

New Action:	Elk County will continue to encourage local municipalities to utilize the stormwater management plan. Elk County would like to update the plan to include stormwater modeling if new funding becomes available.
Comments:	The plan is not as comprehensive as it would've been had DEP funding not been cut but it does cover the basics of storm water management. Local municipalities have all adopted the plan.
COMMUNITY: Ridgway Borough	**ACTION:** Work with PA DEP to develop a flood protection plan for the riverfront project.
ACTION NO: 19	
Category:	Property Protection
Hazard(s) Addressed:	Flood, Flash Flood, Ice Jam INCOMPLETE
Lead Agency/Department:	Ridgway Borough, PA DEP
Implementation Schedule:	3 years
Funding Source:	DEP, FEMA/HMGP, Municipality
New Action:	Variations of the plan have been discussed. Elk County Planning will keep in touch with Ridgway Borough to discuss future plans.
Comments:	The Riverfront Project has not had any serious implementation plans since its writing.
COMMUNITY: Ridgway Borough, City of St. Marys, Jay Township	**ACTION:** Identify and implement flood mitigation projects on the Elk Creek Watershed in St. Marys and Ridgway and Kersey Run in Jay Township.
ACTION NO: 20	
Category:	Property Protection, Flood Control
Hazard(s) Addressed:	Flood, Flash Flood, Ice Jam NEW
Lead Agency/Department:	Ridgway Borough, City of St. Marys, Jay Township, US Army Corp
Implementation Schedule:	3 years
Funding Source:	DEP, FEMA/HMGP, Municipality
New Action:	Projects are scheduled for Elk Creek in Ridgway by the US Army Corp. St. Marys projects are in the planning phase and Kersey Run's issues have not been identified. A feasibility study has been discussed but funding is an issue.
Comments:	Some projects in St. Marys and Ridgway have been identified. Kersey Run has not.
COMMUNITY: All	**ACTION:** Identify and coordinate evacuation plan for elderly and disabled living alone. NEW
ACTION NO: 21	
Category:	Prevention, Emergency Services

Hazard(s) Addressed:	Flood, Flash Flood, High Wind Events, Tornadoes, Wildfire
Lead Agency/Department:	Elk County EMA, Area Transportation Authority, LIFT
Implementation Schedule:	3 years
Funding Source:	FEMA, Act 13
New Action:	Create a database or emergency call list of residents that are elderly or disabled and have no means to evacuate on their own if necessary in order to expedite removal in case of evacuation.
Comments:	The three agencies leading this effort already share some information but it is not cohesive and no one is in charge of keeping it up to date. HIPA laws make it difficult to identify all at risk citizens but a registry could be created encouraging residents that need assistance to call.

Table 6-3 lists twenty-one mitigation actions that were recommended during development of the 2011 plan. Two new actions has been added for the HMP Update. Comments have been inserted below each action to update where they stand. Of the twenty-one (21) proposed projects, two (2) are new; four (4) have been completed; eleven (12) are on-going and four (4) are incomplete. The on-going projects are the types of projects that really have no ending time-frame and will continue to be pursued in the coming years. The incomplete projects will be evaluated to determine their feasibility.

Mitigation actions were evaluated using the seven criteria which frame the *PASTEEL* method. These feasibility criteria include:

- **Political:** Does the action have public and political support?
- **Administrative:** Is there adequate staffing and funding available to implement the action in a timely manner?
- **Social:** Will the action be acceptable by the community or will it cause any one segment of the population to be treated unfairly?
- **Technical:** How effective will the action be in avoiding or reducing future losses?
- **Economic:** What are the costs and benefits of the action and does it contribute to community economic goals?
- **Environmental:** Will the action provide environmental benefits and will it comply with local, state and federal environmental regulations?
- **Legal:** Does the community have the authority to implement the proposed measure?

The *PASTEEL* method use political, administrative, social, technical, economic, environmental and legal considerations as a basis means of evaluating which of the identified actions should be considered most critical. Economic considerations are particularly important in weighing the costs versus benefits of implementing one action prior to another.

FEMA mitigation planning requirements indicate that any prioritization system used shall include a special emphasis on the extent to which benefits are maximized according to a cost-benefit review of the proposed projects. To do this in an efficient manner that is consistent with FEMA's guidance on using cost-benefit review in mitigation planning, the *PASTEEL* method was adapted to include a higher weighting for two elements of the *economic* feasibility factor – Benefits of Action and Costs of Action. This method incorporates concepts similar to those described in Method C of FEMA 386-5: Using Benefit Cost Review in Mitigation Planning (FEMA, 2007).

Those participating in the 2011 HMP process provided comments which allowed for the prioritization of the mitigation actions listed in Table 6-3 using the seven *PASTEEL* criteria. In order to evaluate and prioritize the mitigation actions, *favorable* and *less favorable* factors were identified for each action. Table 6-4 summarizes the evaluation methodology and provides the results of this evaluation for all nineteen mitigation actions. The first results column includes a summary of the feasibility factors, placing equal weight on all factors. The second results column reflects feasibility scores with benefits and costs weighted more heavily; and therefore, given greater priority. A weighting factor of three was used for each benefit and cost element. Therefore, a "+" benefit factor rating equals three pluses and a "-" benefit factor rating equals three minuses in the total prioritization score Using cost-benefit weighted prioritization, all nineteen actions received more favorable than unfavorable ratings. The two highest rated actions involved exploring the opportunity to develop a drought contingency plan and educating local officials about FEMA's CRS. The least favorably rated action involved stream dredging.

Table 6-4: Summary of Mitigation Actions using PASTEEL methodology.

MITIGATION ACTIONS		*PA STEEL* CRITERIA CONSIDERATIONS (+) *Favorable* (-) *Less favorable* (N) *Not Applicable*																							
		P Political			A Administrative			S Social		T Technical			E Economic				E Environmental						L Legal				
NO.	NAME	Political Support	Local Champion	Public Support	Staffing	Funding Allocation	Maintenance / Operations	Community Acceptance	Effect on Segment of Population	Technically Feasible	Long-Term Solution	Secondary Impacts	**Benefit of Action (x3)**	**Cost of Action (x3)**	Contributes to Economic Goals	Outside Funding Required	Effect on Land / Water	Effect on Endangered Species	Effect on HAZMAT / Waste Site	Consistent w/ Community Environmental Goals	Consistent w/ Federal Laws	State Authority	Existing Local Authority	Potential Legal Challenge	**SUMMARY (EQUAL WEIGHTING)**	**SUMMARY (BENEFITS & COSTS PRIORITIZED)**
1	Hold public forum to educate public about types of hazard mitigation that can be done on an individual basis.	+	-	+	-	+	+	+	+	+	+	+	+	+	N	-	N	N	N	+	+	N	+	N	14 (+) 3 (-) 6(N)	18 (+) 3(-) 5(N)
2	Increase awareness of and participation in FEMA's Community Rating System (CRS) Program.	+	+	-	+	+	+	+	+	+	+	+	+	+	+	N	N	N	N	+	+	+	+	+	+	19 (+) 1 (-) 3 (N)	23(+) 1 (-) 3(N)
3	Identify mitigation projects within the County that would reduce flood vulnerability of critical facilities.	+	-	+	-	-	+	+	+	+	+	+	+	-	+	-	+	N	+	+	+	+	+	+	+	17 (+) 5 (-) 1(N)	19(+) 7 (-) 1 (N)
4	Identify means of managing stranded travelers during winter storms.	+	-	+	-	-	-	+	+	+	+	N	+	-	N	-	N	N	N	N	N	N	+	+	+	10(+) 6(-) 7(N)	12(+) 8(-) 7(N)
5	Identify and resurface portions of various problem	+	-	+	-	-	-	+	+	+	N	+	+	-	+	-	N	N	N	N	N	N	+	+	+	11(+) 6(-) 6(N)	13(+) 8(-) 14 (N)

Table 6-4: Summary of mitigation action prioritization using *PASTEEL* methodology.

MITIGATION ACTIONS		***PA STEEL* CRITERIA CONSIDERATIONS** (+) *Favorable* (-) *Less favorable* (N) *Not Applicable*																							
		P Political			**A** Administrative			**S** Social		**T** Technical			**E** Economic				**E** Environmental					**L** Legal			**SUMMARY (EQUAL WEIGHTING)**	**SUMMARY (BENEFITS & COSTS PRIORITIZED)**
NO.	**NAME**	Political Support	Local Champion	Public Support	Staffing	Funding Allocation	Maintenance / Operations	Community Acceptance	Effect on Segment of Population	Technically Feasible	Long-Term Solution	Secondary Impacts	**Benefit of Action (x3)**	**Cost of Action (x3)**	Contributes to Economic Goals	Outside Funding Required	Effect on Land / Water	Effect on Endangered Species	Effect on HAZMAT / Waste Site	Consistent w/ Community Environmental Goals	Consistent w/ Federal Laws	State Authority	Existing Local Authority	Potential Legal Challenge		
	Streets and intersections.																									
6	Remove excess gravel annually from beneath bridges previously identified as debris jam prone.	+	+	+	-	-	-	+	N	+	-	-	+	-	+	-	+	N	N	N	+	-	-	+	10 (+) 9 (-) 4(N)	12 (+) 11(-) 4(N)
7	Remove debris from local waterways as needed.	+	+	+	-	-	-	+	+	+	-	+	+	+	+	+	+	N	N	+	N	+	+	N	15 (+) 4 (-) 3(N)	19(+) 4 (-) 3 (N)
8	Identify and prioritize areas needing improved stormwater infrastructure.	+	-	+	-	-	-	+	+	+	+	+	+	+	+	-	+	N	N	+	+	-	+	-	14 (+) 7 (-) 2(N)	18(+) 7(-) 2(N)
9	Identify methods for improving radio communications between local agencies and County (i.e. Township crews, fire department, county control).	+	+	+	-	+	-	+	+	+	+	+	+	+	+	+	N	N	N	N	+	N	+	-	15(+) 3(-) 5(N)	19(+) 3(-) 5(N)
10	Identify method and funding source for improving early warning systems especially in	+	+	+	+	-	-	+	+	+	+	+	+	+	+	-	+	N	+	N	+	N	+	+	17(+) 3(-) 3(N)	19(+) 3(-) 3(N)

Table 6-4: Summary of mitigation action prioritization using *PASTEEL* methodology.

MITIGATION ACTIONS		***PA STEEL* CRITERIA CONSIDERATIONS** (+) *Favorable* (-) *Less favorable* (N) *Not Applicable*																							
		P Political			**A** Administrative			**S** Social		**T** Technical			**E** Economic				**E** Environmental					**L** Legal				
NO.	**NAME**	Political Support	Local Champion	Public Support	Staffing	Funding Allocation	Maintenance / Operations	Community Acceptance	Effect on Segment of Population	Technically Feasible	Long-Term Solution	Secondary Impacts	**Benefit of Action (x3)**	**Cost of Action (x3)**	Contributes to Economic Goals	Outside Funding Required	Effect on Land / Water	Effect on Endangered Species	Effect on HAZMAT / Waste Site	Consistent w/ Community Environmental Goals	Consistent w/ Federal Laws	State Authority	Existing Local Authority	Potential Legal Challenge	**SUMMARY (EQUAL WEIGHTING)**	**SUMMARY (BENEFITS & COSTS PRIORITIZED)**
	Response to flooding.																									
11	Improve radio communication with 911 Dispatch Center (currently municipal government cannot communicate with the 911 center on its own frequency)	+	+	+	-	+	-	+	+	+	+	+	+	+	+	+	N	N	N	N	+	N	+	-	15(+) 3(-) 5(N)	19(+) 3(-) 5(N)
12	Contact DEP and discuss opportunity and potential funding for developing a drought contingency plan.	-	-	+	-	+	+	+	+	+	+	+	+	+	+	+	+	N	N	+	+	N	+	+	17 (+) 3 (-) 3(N)	21 (+) 3(-) 3(N)
13	Evaluate the inclusion of more restrictive floodplain management requirements in floodplain management ordinances in those communities with highest population densities.	-	-	-	-	+	+	-	+	+	+	+	+	+	+	+	+	N	+	+	+	N	+	-	15 (+) 6 (-) 2(N)	19 (+) 6(-) 2(N)
14	Require or encourage wind engineering measures and	-	-	-	-	-	-	-	+	+	+	+	+	-	+	-	+	N	N	+	+	-	-	-	9 (+) 12(-) 2(N)	11 (+) 14(-) 2(N)

Table 6-4: Summary of mitigation action prioritization using *PASTEEL* methodology.

MITIGATION ACTIONS		***PA STEEL* CRITERIA CONSIDERATIONS** (+) *Favorable* (-) *Less favorable* (N) *Not Applicable*																						
		P Political			**A** Administrative			**S** Social		**T** Technical			**E** Economic				**E** Environmental					**L** Legal				
NO.	**NAME**	Political Support	Local Champion	Public Support	Staffing	Funding Allocation	Maintenance / Operations	Community Acceptance	Effect on Segment of Population	Technically Feasible	Long-Term Solution	Secondary Impacts	**Benefit of Action (x3)**	**Cost of Action (x3)**	Contributes to Economic Goals	Outside Funding Required	Effect on Land / Water	Effect on Endangered Species	Effect on HAZMAT / Waste Site	Consistent w/ Community Environmental Goals	Consistent w/ Federal Laws	State Authority	Existing Local Authority	Potential Legal Challenge	**SUMMARY (EQUAL WEIGHTING)**	**SUMMARY (BENEFITS & COSTS PRIORITIZED)**
	Construction techniques.																									
15	Identify shelters and determine feasibility of warning system for municipalities with large number of manufactured homes.	+	-	+	-	-	-	+	+	+	+	+	+	+	+	-	N	N	N	N	+	+	+	+	14 (+) 5 (-) 4(N)	18 (+) 5 (-) 4(N)
16	Implement structural and property protection projects such as elevation, acquisition and relocation of properties in identified problem areas.	+	-	-	-	-	+	-	+	+	+	+	+	+	+	-	+	N	+	+	+	-	+	+	15 (+) 7 (-) 1(N)	19 (+) 7 (-) 1(N)
17	Adopt the Elk County Act 167 Stormwater Management Plan.	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	+	N	+	+	+	22 (+) 0 (-) 1(N)	26 (+) 0 (-) 1(N)
18	Work with PA DEP to develop a flood protection plan for the riverfront project.	+	+	+	-	-	+	+	+	+	+	+	+	+	+	-	+	N	N	N	N	-	+	+	15 (+) 4 (-) 4(N)	19 (+) 4 (-) 4(N)

7. Plan Maintenance

7.1 Process Summary

Monitoring, evaluating and updating this plan, is critical to maintaining its value and success in Elk County's hazard mitigation efforts. Ensuring effective implementation of mitigation activities paves the way for continued momentum in the planning process and gives direction for the future. This section explains who will be responsible for maintenance activities and what those responsibilities entail. It also provides a methodology and schedule of maintenance activities including a description of how the public will be involved on a continued basis.

7.2 Monitoring, Evaluating and Updating the Plan

The HMSC established for the 2017 HMP Update is designated to administer the plan maintenance processes of monitoring, evaluation and updating with support and representation from participating municipalities. Michael McAllister, Director of the Elk County Office of Emergency Management, and Jodi Foster, Director of the Elk County Planning Department will share responsibility for the HMSC in all associated plan maintenance requirements including annual reviews. The HMSC will coordinate maintenance efforts, but the input needed for effective periodic evaluations will come from community representatives, local emergency management coordinators and planners, the general public and other important stakeholders. The HMSC will oversee the progress made on the implementation of action items identified in the 2017 HMP Update and modify actions, as needed, to reflect changing conditions. The HMSC will meet annually each May to discuss specific coordination efforts that may be needed with other stakeholders. Should a significant disaster occur within the County, the HMSC will reconvene within 30 days of the disaster to review and update the plan.

Each municipality will designate a community representative to monitor mitigation activities and hazard events within their respective communities. The local emergency management coordinator would be suitable for this role. This individual will be asked to work with the HMSC to provide updates on applicable mitigation actions and feedback on changing hazard vulnerabilities within their community.

Upon each HMP evaluation, the HMSC will consider whether applications should be submitted for existing mitigation grant programs. A decision to apply for funding will be based on appropriate eligibility and financial need requirements. The HMSC will also support local and county officials in applying for post-disaster mitigation funds when they are available. All state and federal mitigation funding provided to the County or local municipalities will be reported in subsequent plan updates. In addition, new plans and programs being developed within the County will be evaluated as to the ability and necessity to incorporate the 2017 HMP Update into them.

The 2017 HMP Update will be re-evaluated again in five years, as required by the Disaster Mitigation Act of 2000, or following a disaster event. Future plan updates will account for any new hazard vulnerabilities, special circumstances, or new information that becomes available. During the five-year review process, the following questions will be considered as criteria for

assessing the effectiveness the Elk County HMP.

- Has the nature or magnitude of hazards affecting the County changed?
- Are there new hazards that have the potential to impact the County?
- Do the identified goals and actions address current and expected conditions?
- Have mitigation actions been implemented or completed?
- Has the implementation of identified mitigation actions resulted in expected outcomes?
- Are current resources adequate to implement the Plan?
- Should additional local resources be committed to address identified hazards?

Issues that arise during monitoring and evaluation which require changes to the risk assessment, mitigation strategy and other components of the plan will be incorporated during future updates.

7.3 Incorporation into Other Planning Mechanisms

Based on the comprehensive nature of this plan, the HMPT believes that this document will be highly useful when updating and developing other planning mechanisms in the County. Specific documents that the HMPT will actively incorporate information from the 2017 HMP Update into include:

- Elk County Comprehensive Plan: Section 4.4.4, Future Development and Vulnerability, will provide information for the development of the next County Comprehensive Plan by making available specific risk and vulnerability information for the entire county but more specifically the potential areas of growth.
- Elk County Emergency Operations Plan: The 2017 HMP Update will provide information on risk and vulnerability that will be extremely important to consider and incorporate into the next County EOP. Probability and vulnerability can direct emergency management efforts and response.

Elk County Hazard Vulnerability Analysis: The County EMA's HVA and the County HMP are mutually beneficial plans that are used together to better understand risk and vulnerability. Just as the existing County HVA was used to supplement the development of this plan, the 2017 HMP Update will be used to aid in goal and objective development, hazard identification, and risk assessment in the next County HVA.

7.4 Continued Public Involvement

As was done during the development of the 2011 HMP, the HMSC will involve the public during the evaluation and update of the HMP through various workshops and meetings. The public will have access to the current HMP through their local municipal office, the Elk County Planning Department or the Elk County Office of Emergency Management. Information on upcoming events related to the HMP or solicitation for comments will be announced via newsletters, newspapers, mailings, and on the County website (http://www.co.elk.pa.us). The HMSC will incorporate all relevant comments during the next update of the HMP.

8. Plan Adoption

The Plan was submitted to the Pennsylvania State Hazard Mitigation Officer on January 22, 2018. It was forwarded to FEMA for final review and approval-pending-adoption February 5, 2018. FEMA granted approval-pending-adoption on _____ Full approval from FEMA was received on <*Month Day, Year*>. (To be revised when known.)

This section of the plan includes copies of the local adoption resolutions passed by Elk County and its municipal governments as well as a completed Local Mitigation Plan Review Crosswalk. Adoption resolution templates are provided to assist the County and municipal governments with recommended language for future adoption of the HMP.

8.1 County Resolution

Elk County 2017 Hazard Mitigation Plan Update

County Adoption Resolution
Resolution No.
Elk County, Pennsylvania

WHEREAS, the municipalities of Elk County, Pennsylvania are most vulnerable to natural and human-made hazards which may result in loss of life and property, economic hardship, and threats to public health and safety, and

WHEREAS, Section 322 of the Disaster Mitigation Act of 2000 (DMA 2000) requires state and local governments to develop and submit for approval to the President a mitigation plan that outlines processes for identifying their respective natural hazards, risks, and vulnerabilities, and

WHEREAS, Elk County acknowledges the requirements of Section 322 of DMA 2000 to have an approved Hazard Mitigation Plan as a prerequisite to receiving post-disaster Hazard Mitigation Grant Program funds, and

WHEREAS, the Elk County 2017 Hazard Mitigation Plan Update has been developed by the Elk County Planning Department and the Elk County Office of Emergency Management in cooperation with other county departments, local municipal officials, and the citizens of Elk County, and

WHEREAS, a public involvement process consistent with the requirements of DMA 2000 was conducted to develop the Elk County 2017 Hazard Mitigation Plan Update, and

WHEREAS, the Elk County 2017 Hazard Mitigation Plan Update recommends mitigation activities that will reduce losses to life and property affected by both natural and human-made hazards that face the County and its municipal governments,

NOW THEREFORE BE IT RESOLVED by the governing body for the County of Elk that:

- The Elk County 2017 Hazard Mitigation Plan Update is hereby adopted as the official Hazard Mitigation Plan of the County, and
- The respective officials and agencies identified in the implementation strategy of the Elk County 2017 Hazard Mitigation Plan Update are hereby directed to implement the recommended activities assigned to them.

ADOPTED, this Day of , 2017

ATTEST:
ELK COUNTY
COMMISSIONERS

By _____

By _____

By _____

8.2 Municipal Resolution

Elk County 2017 Hazard Mitigation Plan Update

Municipal Adoption Resolution

Resolution No.

<Borough/Township of Municipality Name>, Elk County, Pennsylvania

WHEREAS, the *<Borough/Township of Municipality Name>*, Elk County, Pennsylvania is most vulnerable to natural and human-made hazards which may result in loss of life and property, economic hardship, and threats to public health and safety, and

WHEREAS, Section 322 of the Disaster Mitigation Act of 2000 (DMA 2000) requires state and local governments to develop and submit for approval to the President a mitigation plan that outlines processes for identifying their respective natural hazards, risks, and vulnerabilities, and

WHEREAS, the *<Borough/Township of Municipality Name>* acknowledges the requirements of Section 322 of DMA 2000 to have an approved Hazard Mitigation Plan as a prerequisite to receiving post-disaster Hazard Mitigation Grant Program funds, and

WHEREAS, the Elk County 2017 Hazard Mitigation Plan Update has been developed by the Elk County Planning Department and the Elk County Office of Emergency Management in cooperation with other county departments, and officials and citizens of *<Borough/Township of Municipality Name>*, and

WHEREAS, a public involvement process consistent with the requirements of DMA 2000 was conducted to develop the Elk County 2017 Hazard Mitigation Plan Update, and

WHEREAS, the Elk County 2017 Hazard Mitigation Plan Update recommends mitigation activities that will reduce losses to life and property affected by both natural and human-made hazards that face the County and its municipal governments,

NOW THEREFORE BE IT RESOLVED by the governing body for the *<Borough/Township of Municipality Name>*:

- The Elk County 2017 Hazard Mitigation Plan Update is hereby adopted as the official Hazard Mitigation Plan of the *<Borough/Township>*, and
- The respective officials and agencies identified in the implementation strategy of the Elk County 2017 Hazard Mitigation Plan Update are hereby directed to implement the recommended activities assigned to them.

ADOPTED, this Day of , 2017

ATTEST: ***<BOROUGH/TOWNSHIP OF MUNICIPALITY NAME>***

By

_____

By

By

9. Appendices

Appendix A– Bibliography & Works Cited

Appendix B– Local Mitigation Plan Review Crosswalk

Appendix C– Critical Facilities

Appendix D– Local Municipality Flood Vulnerability Maps

Appendix E– Meeting and Agendas

Appendix F– HAZUS Reports

Appendix G- Municipal Surveys

Appendix H- Public Survey

Appendix I- Tax Assessment Information per Municipality

Appendix J- Final Public Meeting Notice and Invitation to Review and Comment

APPENDIX A
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APPENDIX B-LOCAL MITIGATION PLAN REVIEW CROSSWALK

Jurisdiction: Elk County, Pennsylvania	**Title of Plan:** Elk County 2017 Hazard Mitigation Plan Update	**Date of Plan:** Submitted 01/12/2018 for PEMA and FEMA review
Local Point of Contact: Jodi Foster **Title:** Director **Agency:** Elk County Planning Department	**Address:** Elk County Planning Department 300 Center Street Ridgway, PA 15853	
Phone Number: 814-776-5304	**E-Mail:** jfoster@countyofelkpa.com	

State Reviewer: Ernie Szabo	**Title:** Emergency Management Specialist	**Date:**

FEMA Reviewer:	**Title:**	**Date:**
Date Received in FEMA Region (insert #)		
Plan Not Approved		
Plan Approvable Pending Adoption		
Plan Approved		

Section 1:
Regulation Checklist

INSTRUCTIONS: The Regulation Checklist must be completed by FEMA. The purpose of the Checklist is to identify the location of relevant or applicable content in the Plan by Element/sub-element and to determine if each requirement has been 'Met' or 'Not Met'. The 'Required Revisions' summary at the bottom of each Element must be completed by FEMA to provide a clear explanation of the revisions that are required for plan approval. Required revisions must be explained for each plan sub-element that is 'Not Met.' Sub-elements should be referenced in each summary by using the appropriate numbers (A1, B3, etc.), where applicable. Requirements for each Element and sub-element are described in detail in this *Plan Review Guide* in Section 4, Regulation Checklist.

1. REGULATION CHECKLIST Regulation (44 CFR 201.6 Local Mitigation Plans)	Location in Plan (section and/or page number)	Met	Not Met
ELEMENT A. PLANNING PROCESS			
A1. Does the Plan document the planning process, including how it was prepared and who was involved in the process for each jurisdiction? (Requirement 201.6 (c)(1))	**Section 3.1: Planning Process** Pages 12-14	x	
A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interest to be involved in the planning process? (Requirement 201.6 (b)(2))	**Section 3.1: Participation of Local Municipalities** Table 3-1, Page 12	x	
A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement 201.6 (b)(1))	**Section 3: Public Participation** Pages 13-14; Table 3-2 Stakeholders	x	
A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement 201.6 ©(4)(i))	**Section 3.4: Multi-Jurisdictional Planning** Page 15; 49-50; 115-116	x	
A5. Is there discussion of how the community (ies) will continue public participation in the plan maintenance process? (Requirement 201.6 ©(4)(i))	**Section 7.4: Continued Public Involvement** Page 151-152	x	
ELEMENT A. REQUIRED REVISIONS			

1. REGULATION CHECKLIST Regulation (44 CFR 201.6 Local Mitigation Plans)	Location in Plan (section and/or page number)	Met	Not Met
ELEMENT B. HAZARD IDENTIFICATION AND RISK ASSESSMENT			
B1. Does the Plan include a description of the type, location, and extent of all natural hazards that can affect each jurisdiction (s)? (Requirement 201.6 (c)(2)(i))	**Section 4: Natural Hazards Profile; Table 4-4** Pages 19 & 20	X	
B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement 201.6 (c)(2)(i))	**Section 4: Past & Future Occurrence for Each Hazard** Pages 16-116	X	
B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement 201.6 ©(2)(ii)	**Section 4: Hazard Profiles & Vulnerabilities** Pages 16-116	X	
B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement 201.6 (c)(2)(ii))	**Section 4: Repetitive Loss Structures Table 4-11 Page 45**	X	
ELEMENT A. REQUIRED REVISIONS			
ELEMENT C. MITIGATION STRATEGY			
C1. Does the plan document each jurisdiction's existing authorities, policies, programs and resources and its ability to expand on and improve these existing policies and programs? (Requirement 201.6 (c)(3))	**Section 5.5; Table 5-4** Page 128	X	
C2. Does the Plan address each jurisdiction's participation in the NFIP and continued compliance with NFIP requirements, as appropriate? (Requirement 201.6 (c)(3)(ii))	**Section 5.3** Page 125; **Table 5-4** Page 128	X	
C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement 201.6 (c)(3)(ii)	**Section 6.2** Page 133; **Table 6-1** Pages 133-34	X	
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 201.6 (c)(3)(ii))	**Section 6.4** Page 136; **Table 6-3** Pages 136-145	X	
C5. Does the Plan contain an action plan that describes how the actions identified will be prioritized (including cost benefit review), implemented, and administered by each jurisdiction? (Requirement 201.6 (c)(3)(iv)); (Requirement 201.6 (c)(3)(iii))	**Section 6.4** Page 136; **Table 6-3** Pages 136-145	X	
C6. Does the Plan describe a process by which local government will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement 201.6 (C)(4)(ii))	**Section 5.4** Pages 126-27; Section **5.5** Page 127; Section **7.3** Page 153	X	
ELEMENT C: REQUIRED REVISIONS			

1. REGULATION CHECKLIST Regulation (44 CFR 201.6 Local Mitigation Plans)	Location in Plan (section and/or page number)	Met	Not Met
ELEMENT D: PLAN REVIEW, EVALUATION, AND IMPLEMENTATION (applicable to plan updates only)			
D1. Was the plan revised to reflect changes in development? (Requirement 201.6 (d)(3))	**4.4.4.1** Pages 116-118	X	
D2. Was the plan revised to reflect progress in local mitigation? (Requirement 201.6 (d)(3))	**Section 6: Table 6-4** Pages 136-145	X	
D3. Was the plan revised to reflect changes in priorities? (Requirement 201.6 (d)(3))	**Section 6 Figure 6-4** PASTEEL Pages 148-151	X	
ELEMENT A. REQUIRED REVISIONS			

1. REGULATION CHECKLIST Regulation (44 CFR 201.6 Local Mitigation Plans)	Location in Plan (section and/or page number)	Met	Not Met
ELEMENT F. ADDITIONAL STATE REQUIREMENTS (OPTIONAL FOR STATE REVIEWERS ONLY; NOT TO BE COMPLETED BY FEMA)			
F1.			
F2.			
ELEMENT F: REQUIRED REVISIONS			

APPENDIX C- CRITICAL FACILITIES

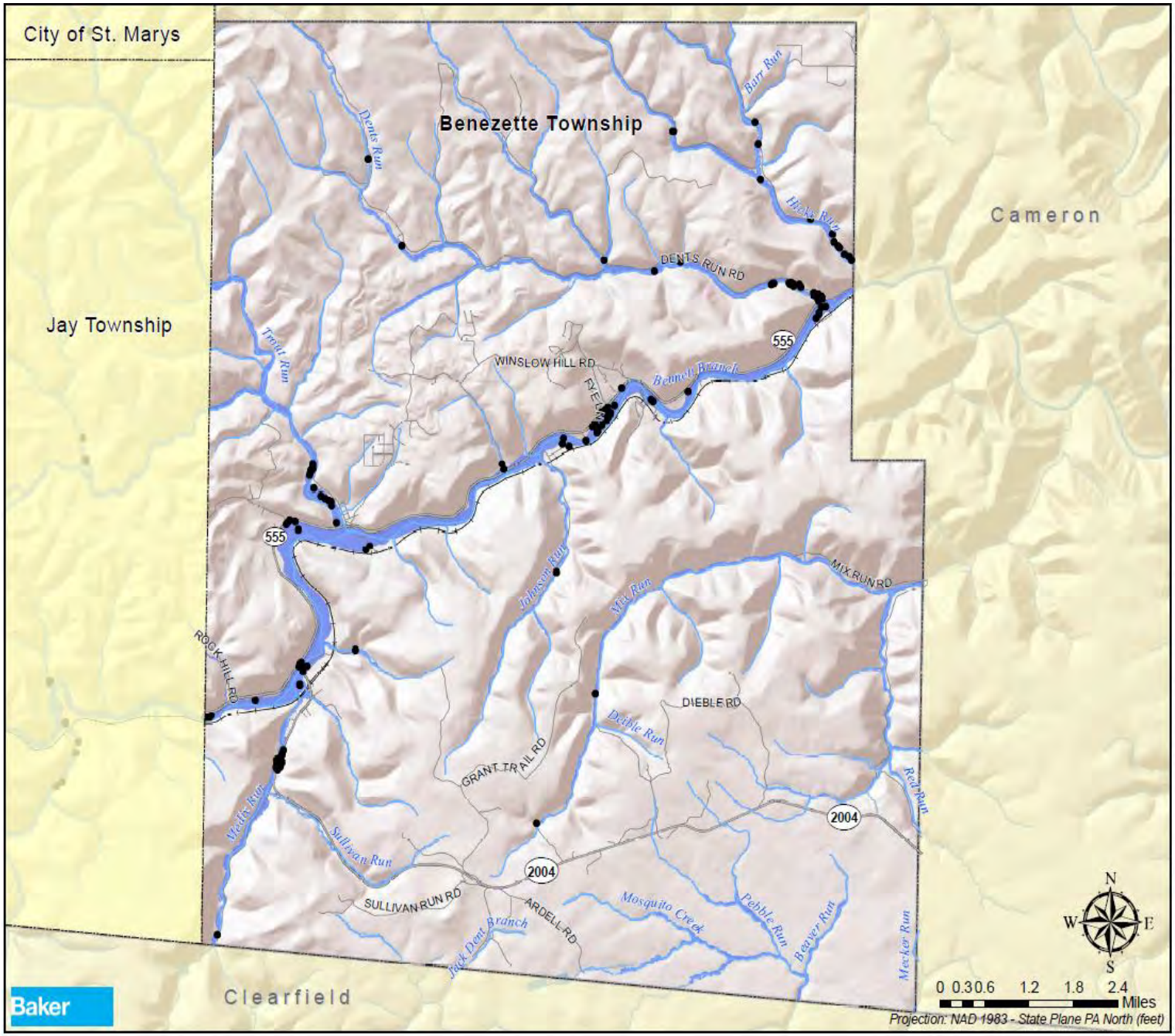
FACILITY NAME	ADDRESS	MUNICIPALITY	WITHIN THE 1% ANNUAL CHANCE FLOOD ZONE	WITHIN COMBO-HIGH LANDSLIDE ZONE*	WITHIN HIGH WILDFIRE ZONE	WITHIN ¼ MILE OF MAJOR ROAD (HAZMAT INCIDENTS)	WITHIN ¼ MILE OF RAIL (HAZMAT INCIDENTS)
911 AND EMERGENCY SERVICES							
Elk County 911 Center	Court House P.O. Box 448	Ridgway Township		X		X	
FIRE DEPARTMENT							
Horton Township Volunteer Fire Department	PO Box 17	Horton Township		X	X	X	
Jay Township Volunteer Fire Company	3161 Cleveland Street	Jay Township		X	X		
Fox Township Volunteer Fire Department	PO Box 229	Fox Township		X	X	X	
Ridgway Fire Department Inc.	PO Box 391	Ridgway Borough		X		X	X
Crystal Fire Department	PO Box C	City of St. Marys		X		X	X
Johnsonburg Fire Department	PO Box 355	Johnsonburg Borough		X		X	X
Wilcox Volunteer Fire Department	PO Box 117	Jones Township		X		X	
Highland Township Volunteer Fire Department	PO Box 111	Highland Township			X	X	
HOSPITAL							
Elk Regional Health Center	763 Johnsonburg Road	Ridgway Township		X		X	X

FACILITY NAME	ADDRESS	MUNICIPALITY	WITHIN THE 1% ANNUAL CHANCE FLOOD ZONE	WITHIN COMBO-HIGH LANDSLIDE ZONE	WITHIN HIGH WILDFIRE ZONE	WITHIN ¼ MILE OF MAJOR ROAD (HAZMAT INCIDENTS)	WITHIN ¼ MILE OF RAIL (HAZMAT INCIDENTS)
POLICE DEPARTMENT							
Ridgway Boro Police Department	108 Main St	Ridgway Borough	X	X		X	X
City Of St Marys Police Dept	319 Erie Avenue	City of St. Marys				X	X
Johnsonburg Boro Police Dept	516 Market Street	Johnsonburg Borough		X		X	X
SCHOOL							
Bennett's Valley Elementary School	Route 255, Weedville, PA	Jay Township		X	X	X	
Fox Township Elementary School	367 Main Street, Kersey, PA	Fox Township		X	X	X	
St. Boniface School	359 Main Street, Kersey, PA	Fox Township		X	X	X	
Saint Marys Area Middle School	979 S. Saint Mary's Road	City of St. Marys		X		X	
Saint Marys Area High School	977 St. Mary's Road	City of St. Marys		X			
Francis S. Grandinetti Elementary School	62 School Drive	Ridgway Township		X		X	
Saint Marys Catholic Elementary School	14 Queens Road	City of St. Marys		X		X	
South Saint Marys Street Elementary School	307 S. Saint Mary's Street	City of St. Marys		X		X	X
Saint Leo's School	117 Depot Street	Ridgway Borough		X		X	X
Elk County Catholic High School	600 Maurus Street	City of St. Marys		X		X	X

FACILITY NAME	ADDRESS	MUNICIPALITY	WITHIN THE 1% ANNUAL CHANCE FLOOD ZONE	WITHIN COMBO-HIGH LANDSLIDE ZONE	WITHIN HIGH WILDFIRE ZONE	WITHIN ¼ MILE OF MAJOR ROAD (HAZMAT INCIDENTS)	WITHIN ¼ MILE OF RAIL (HAZMAT INCIDENTS)
Sacred Heart School	337 Center Street	City of St. Marys		X		X	X
Elk County Catholic Middle School	325 Church Street	City of St. Marys		X		X	
Ridgway Area Middle School	1403 Hill Street, P.O. Box 447	Ridgway Borough		X		X	X
Ridgway Area High School	1403 Hill Street, P.O. Box 447	Ridgway Borough		X		X	X
Holy Rosary School	605 Market Street	Johnsonburg Borough		X		X	X
Johnsonburg Area Junior Senior High School	315 High School Road	Johnsonburg Borough		X		X	X
Johnsonburg Area Elementary School	1356 Wilcox Road	Ridgway Township		X		X	X
WAL-MART							
Wal-Mart Supercenter	1102 Million Dollar Highway	Fox Township		X	X	X	

*Although most of the structures listed are within the Combo-High Landslide Zone Geologic Map, risk of landslides for most of these facilities is very low due to their location.

APPENDIX D- FLOOD HAZARD VULNERABILITY MAPS



Elk County Hazard Mitigation Plan

Benezette Township Flood Vulnerability

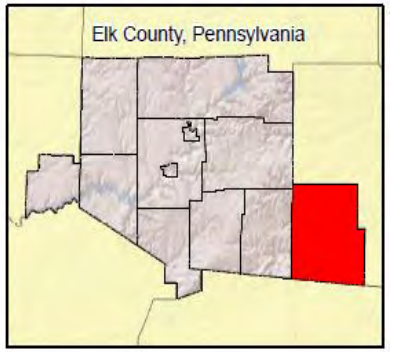
LEGEND

- Streams
- Local Roads
- State Routes
- Railroad
- Municipalities
- Counties
- Addressable Structures in Flood Zones

Flood Hazard Areas

- Approximate 1% Annual Chance Zone
- Detailed 1% Annual Chance Zone

Source: Elk County GIS Department 2010, PEMA 2010, ESRI 1997



Elk County Hazard Mitigation Plan

Fox Township Flood Vulnerability

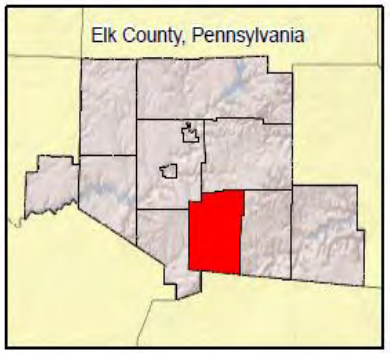
LEGEND

- Fire Department
- School
- Wal-Mart
- Municipalities
- Counties
- Addressable Structures in Flood Zones
- Streams
- Local Roads
- State Routes

Flood Hazard Areas

- Approximate 1% Annual Chance Zone
- Detailed 1% Annual Chance Zone

Source: Elk County GIS Department 2010, PEMA 2010, ESRI 1997



Elk County Hazard Mitigation Plan

Highland Township Flood Vulnerability

LEGEND

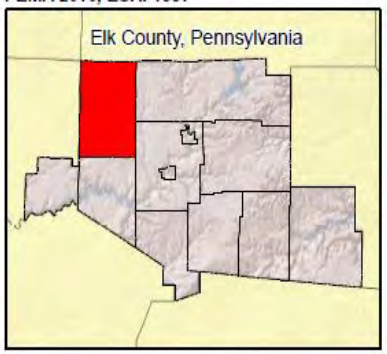
- Fire Department
- Streams
- Local Roads
- State Routes
- Railroad
- Municipalities
- Counties

Flood Hazard Areas

- Approximate 1% Annual Chance Zone
- Detailed 1% Annual Chance Zone

Highland Township does not have any addressable structures located within the Special Flood Hazard Area.

Source: Elk County GIS Department 2010, PEMA 2010, ESRI 1997



Elk County Hazard Mitigation Plan

Horton Township Flood Vulnerability

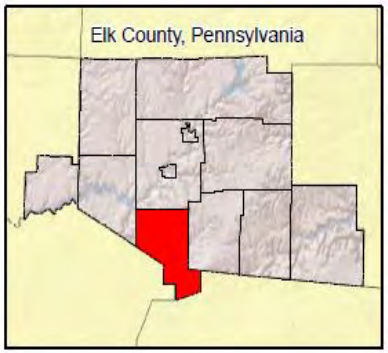
LEGEND

- Fire Department
- Local Roads
- State Routes
- US Routes
- Railroad
- Streams
- Counties
- Municipalities
- Addressable Structures in Flood Zones

Flood Hazard Areas

- Approximate 1% Annual Chance Zone
- Detailed 1% Annual Chance Zone

Source: Elk County GIS Department 2010, PEMA 2010, ESRI 1997



Elk County Hazard Mitigation Plan

Jay Township Flood Vulnerability

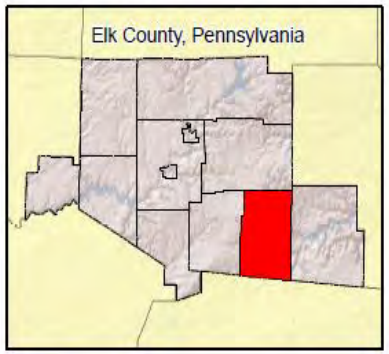
LEGEND

- Fire Department
- School
- Streams
- Local Roads
- State Routes
- Railroad
- Municipalities
- Counties
- Addressable Structures in Flood Zones

Flood Hazard Areas

- Approximate 1% Annual Chance Zone
- Detailed 1% Annual Chance Zone

Source: Elk County GIS Department 2010, PEMA 2010, ESRI 1997



Elk County Hazard Mitigation Plan

Johnsonburg Borough Flood Vulnerability

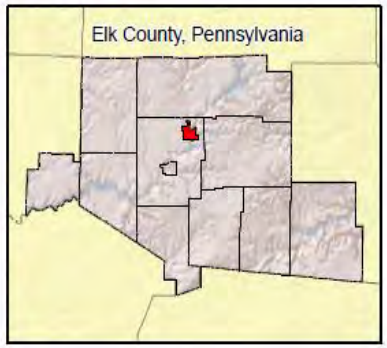
LEGEND

- Police Department
- Fire Department
- School
- Streams
- Railroad
- Local Roads
- State Routes
- US Routes
- Municipalities
- Counties
- Addressable Structures in Flood Zones

Flood Hazard Areas

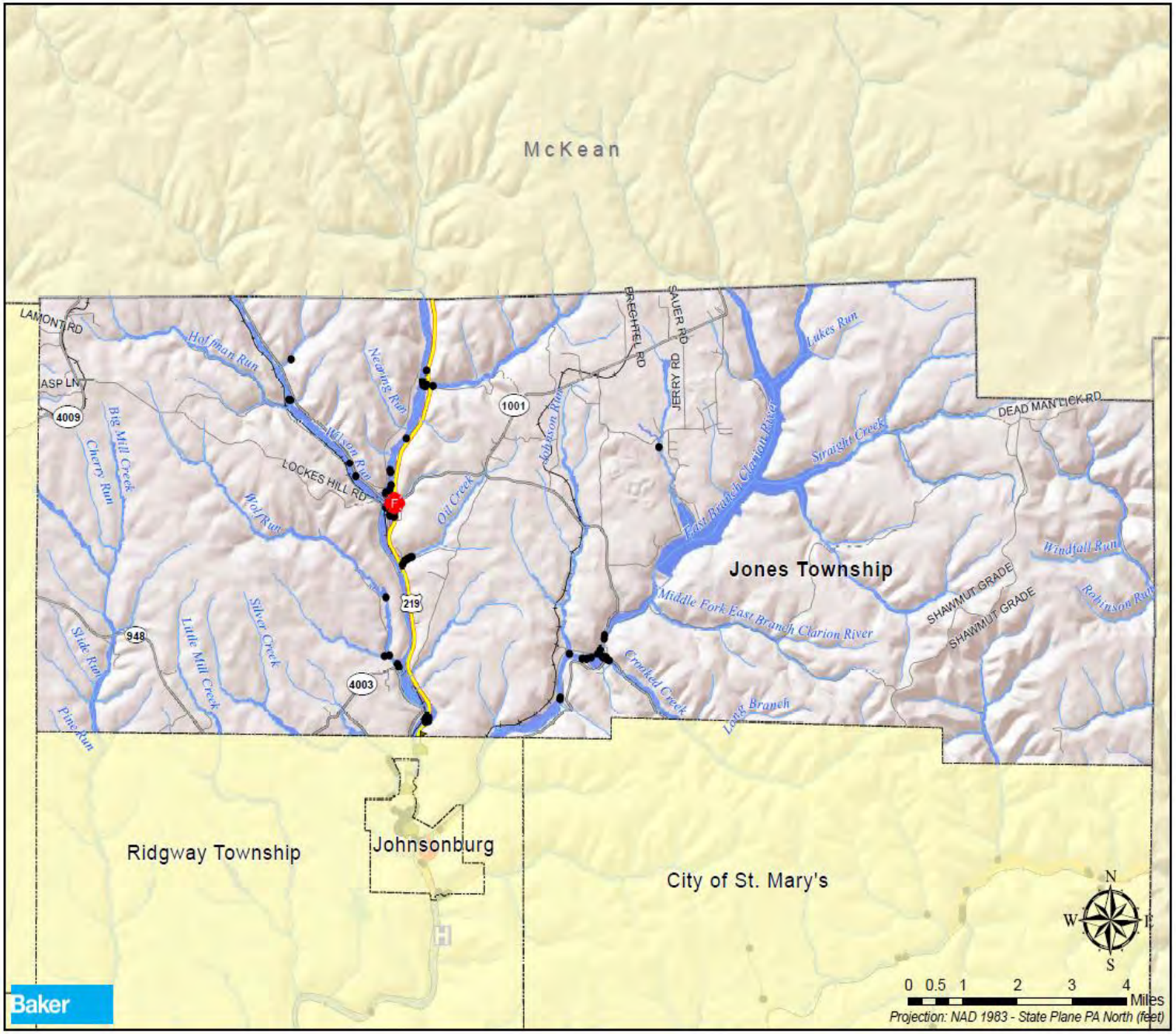
- Approximate 1% Annual Chance Zone
- Detailed 1% Annual Chance Zone

Source: Elk County GIS Department 2010, PEMA 2010, ESRI 1997



Elk County Hazard Mitigation Plan

Jones Township Flood Vulnerability



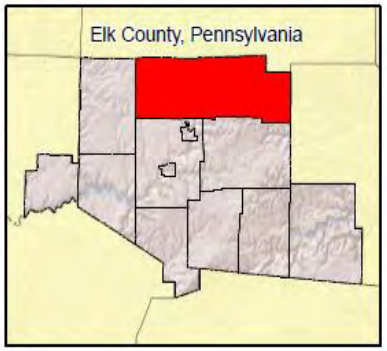
LEGEND

- Fire Department
- Streams
- Local Roads
- State Routes
- US Routes
- Railroad
- Municipalities
- Counties
- Addressable Structures in Flood Zones

Flood Hazard Areas

- Approximate 1% Annual Chance Zone
- Detailed 1% Annual Chance Zone

Source: Elk County GIS Department 2010, PEMA 2010, ESRI 1997



Elk County Hazard Mitigation Plan

Millstone Township Flood Vulnerability

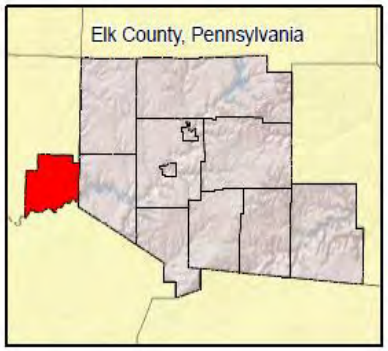
LEGEND

- Streams
- Local Roads
- State Routes
- Municipalities
- Counties
- Addressable Structures in Flood Zones

Flood Hazard Areas

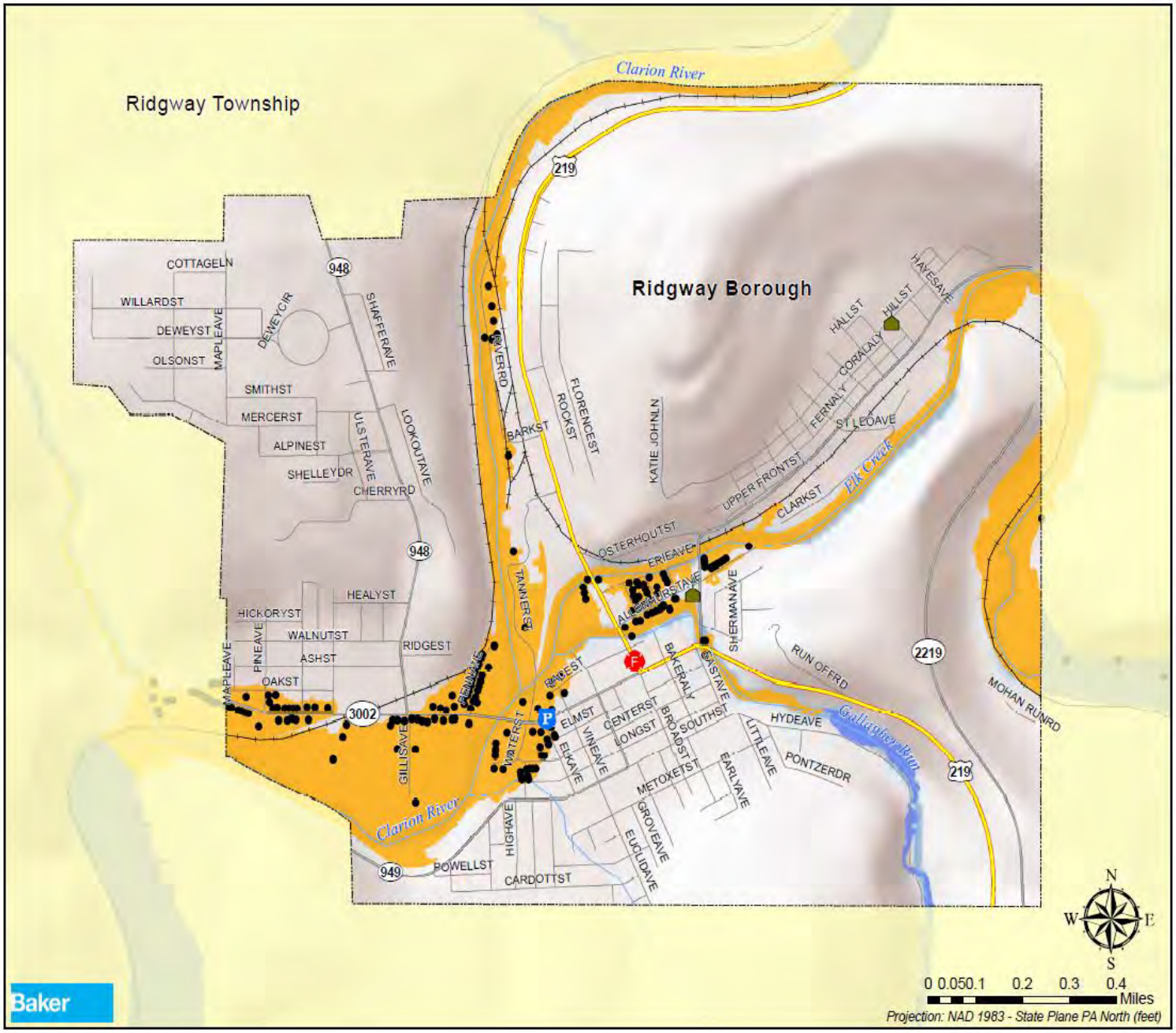
- Approximate 1% Annual Chance Zone
- Detailed 1% Annual Chance Zone

Source: Elk County GIS Department 2010, PEMA 2010, ESRI 1997



Elk County Hazard Mitigation Plan

Ridgway Borough Flood Vulnerability



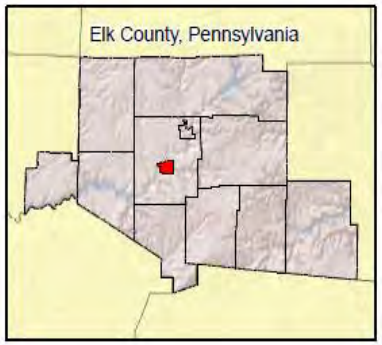
LEGEND

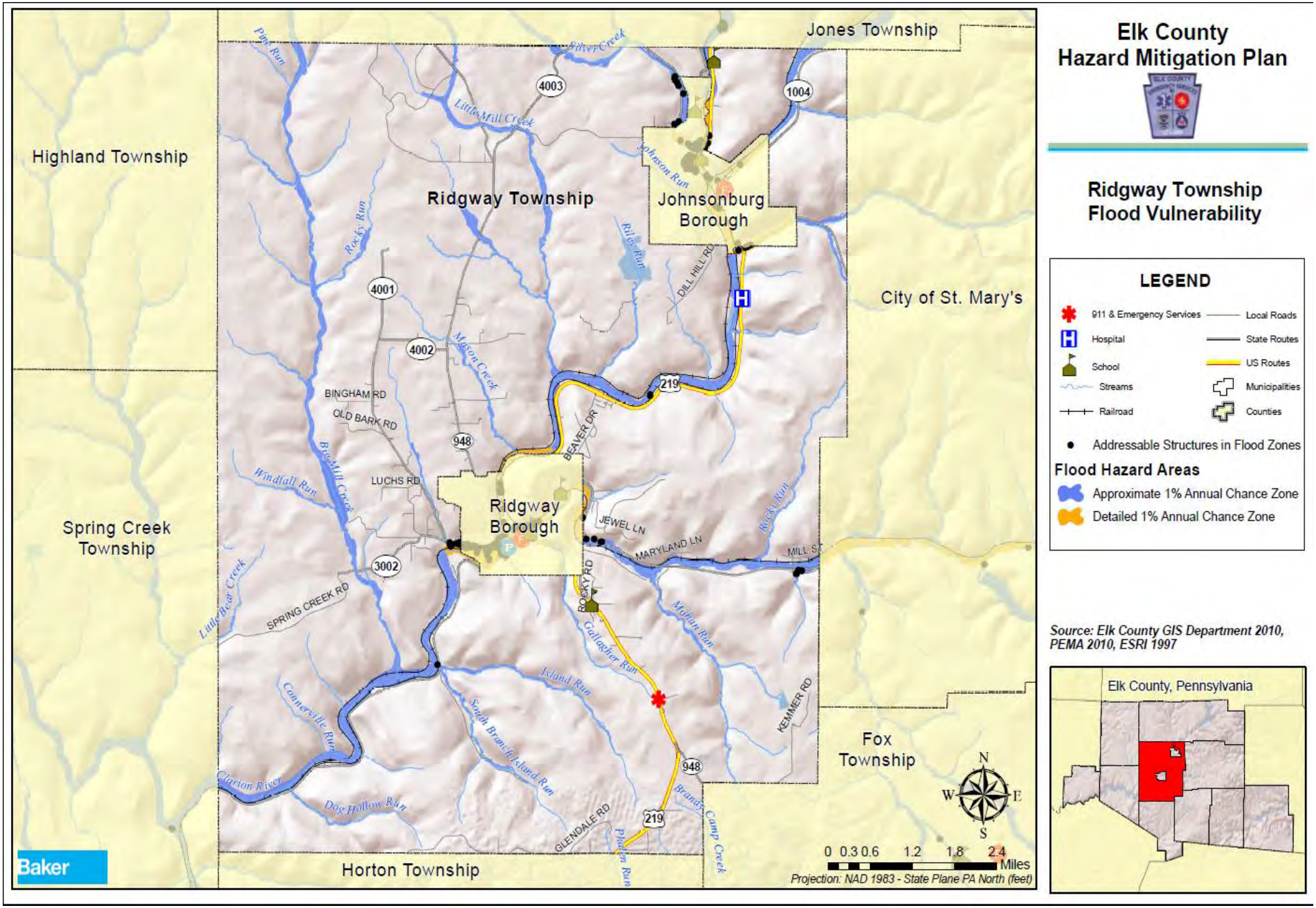
- Police Department
- Fire Department
- School
- Streams
- Railroad
- Local Roads
- State Routes
- US Routes
- Municipalities
- Counties
- Addressable Structures in Flood Zones

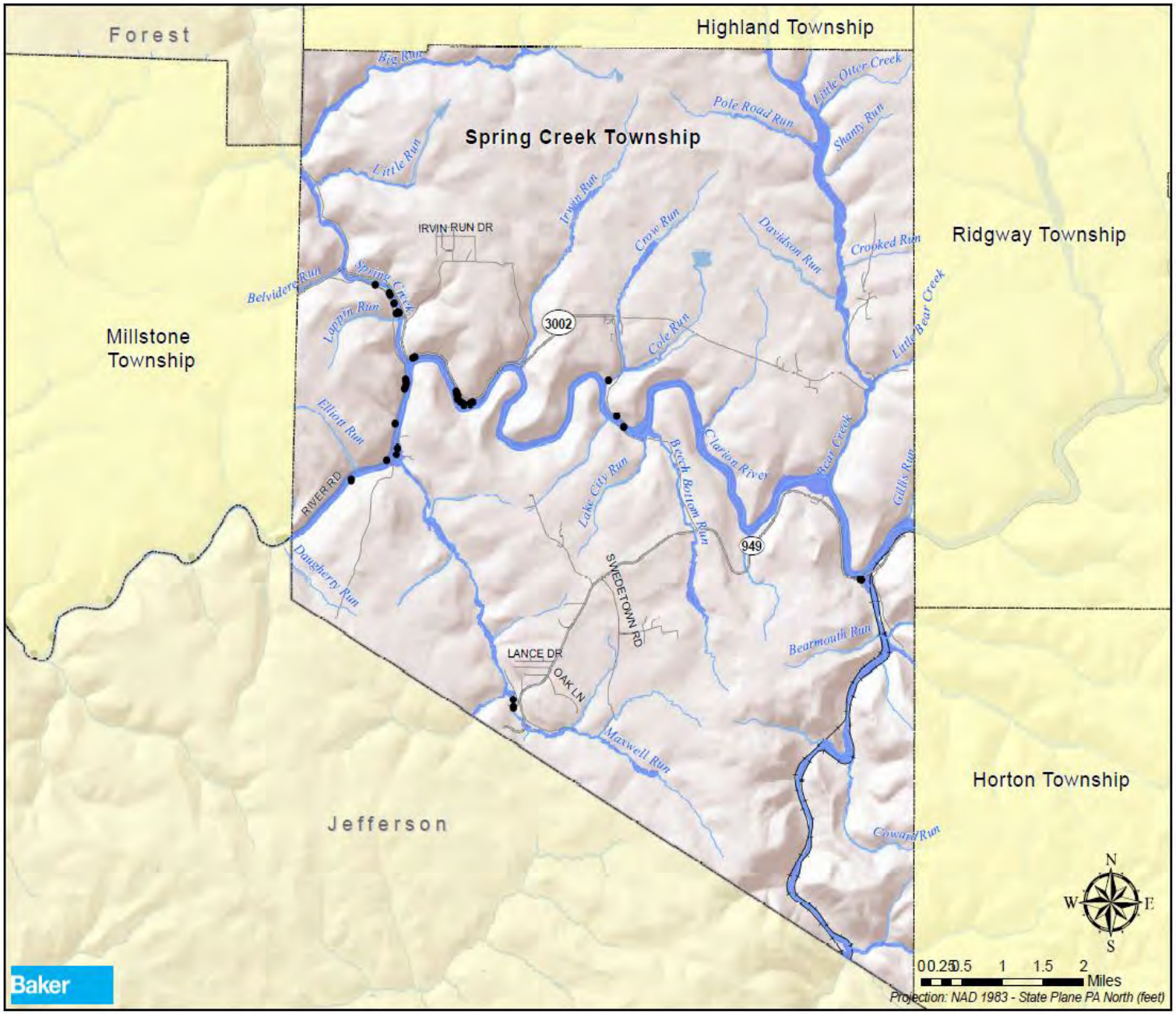
Flood Hazard Areas

- Approximate 1% Annual Chance Zone
- Detailed 1% Annual Chance Zone

Source: Elk County GIS Department 2010, PEMA 2010, ESRI 1997




Elk County
Hazard Mitigation Plan
Ridgway Township
Flood Vulnerability
LEGEND
911 & Emergency Services
Hospital
School
Streams
Railroad
Local Roads
State Routes
US Routes
Municipalities
Counties
Addressable Structures in Flood Zones
Flood Hazard Areas
Approximate 1% Annual Chance Zone
Detailed 1% Annual Chance Zone
Source: Elk County GIS Department 2010, PEMA 2010, ESRI 1997
Elk County, Pennsylvania
Highland Township
Jones Township
City of St. Mary's
Spring Creek Township
Fox Township
Horton Township
Ridgway Township
Johnsonburg Borough
Ridgway Borough
Pine Run
River Creek
Little Mill Creek
Johnson Run
Rocky Run
Rilen Run
Mason Creek
Bissell Hill Creek
Windfall Run
Little Bear Creek
Clarion River
Connersville Run
South Branch Island Run
Island Run
Dog Hollow Run
Gallagher Run
Mahan Run
Rocky Run
Brandy Camp Creek
Pleasant Run
4003
1004
4001
4002
219
948
3002
BINGHAM RD
OLD BARK RD
LUCHS RD
BEAVER DR
DILL HILL RD
JEWEL LN
MARYLAND LN
MILL ST
ROCKY RD
SPRING CREEK RD
KEMMER RD
GLENDALE RD
N
W
E
S
0 0.3 0.6 1.2 1.8 2.4
Miles
Projection: NAD 1983 - State Plane PA North (feet)
Baker



Elk County Hazard Mitigation Plan

Spring Creek Township Flood Vulnerability

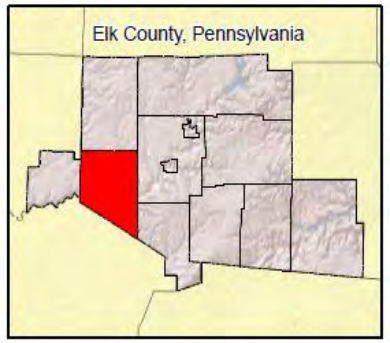
LEGEND

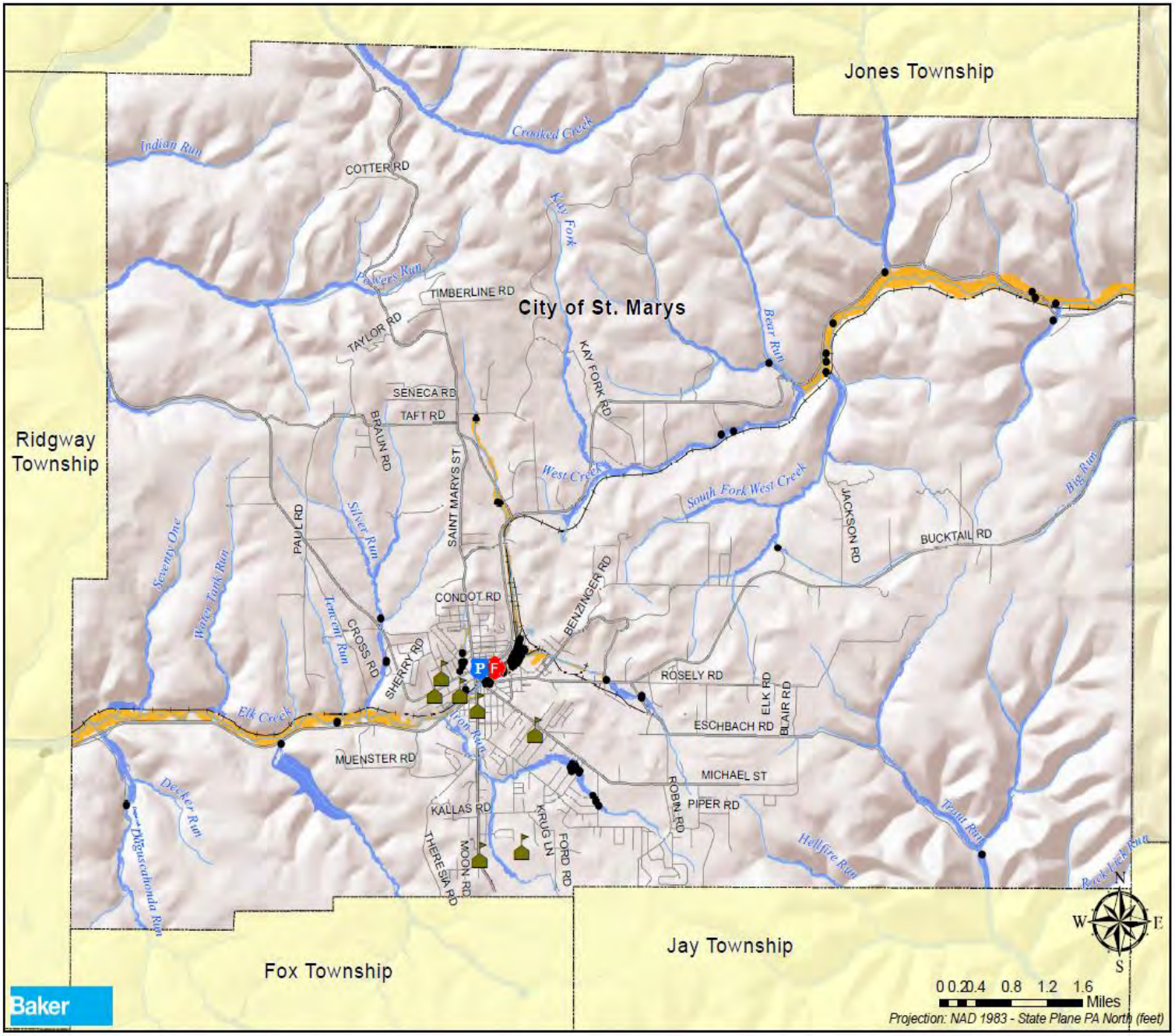
- Streams
- Local Roads
- State Routes
- Railroad
- Municipalities
- Counties
- Addressable Structures in Flood Zones

Flood Hazard Areas

- Approximate 1% Annual Chance Zone
- Detailed 1% Annual Chance Zone

Source: Elk County GIS Department 2010, PEMA 2010, ESRI 1997





Elk County Hazard Mitigation Plan

City of St. Marys Flood Vulnerability

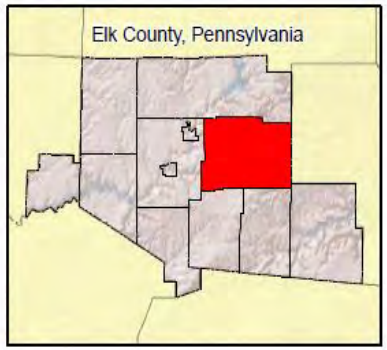
LEGEND

- Police Department
- Fire Department
- School
- Streams
- Municipalities
- Local Roads
- State Routes
- US Routes
- Railroad
- Counties
- Addressable Structures in Flood Zones

Flood Hazard Areas

- Approximate 1% Annual Chance Zone
- Detailed 1% Annual Chance Zone

Source: Elk County GIS Department 2010, PEMA 2010, ESRI 1997



APPENDIX E- MEETINGS AND AGENDAS

Hazard Mitigation Plan Update Meeting Agenda

Wednesday, May 25, 2016

Courthouse Annex

10:00 AM

1. **Introductions**

2. **Explanation of Hazard Mitigation Plan**
   Discussion concerning the history of the plan and why it is needed. PEMA and FEMA's role in development of the plan.

3. **Review of Scope of Work**
   Quick review of the old plan and discussion about data collection, mapping needs, research.

4. **Identification of Stakeholders**
   Identify other agencies that need to be included in the group and who will reach out to them.

5. **Review Next Steps**
   Action items needed for next meeting.

6. **Next Meeting Date**

Hazard Mitigation Plan Update Meeting

Wednesday, May 25, 2016

Courthouse Annex

10:00 AM

Name	Agency	Contact Info.
Jodi Foster	Elk Co. Planning	jfoster@countyofelkpa.com
Richard Gnazzi	Elk Co. Planning	rgnazzi@countyofelkpa.com
Jim Abbey	Elk Co. IT/GIS	jabbey@countyofelkpa.com
Mike McAllister	Elk Co. OES	mmcallister@elkoes.com
Todd Caltagarone	SHERIFF	tcaltagarone@countyofelkpa.com
Ray Imhoff	Ridgway Borough	RIDGWAYRAY@windstream.net

AGENDA

Elk County Hazard Mitigation Plan Update

Wednesday, November 16, 2016

Elk County Courthouse Annex

1:00 PM

I. Welcome and Introductions

II. Purpose of the meeting

III. Ernie Szabo, PEMA Presentation

IV. Next Steps

V. Open Discussion

VI. Next Meeting Date

VII. Adjourn

Sign-in

Elk County Hazard Mitigation Plan Update

Wednesday, November 16, 2016

Elk County Courthouse Annex

1:00 PM

Name	Organization	Email	Phone
Jodi Foster	Planning	jfoster@countyofelkpa.com	—
Jack Fowler	Johnsonbury	Jbgpress@windstream.net	965-2366
Doug Ruffo	Benezette Twp	ruffodoug@yahoo.com	787-8811
Todd Caltagarone	Elk County Sheriff	tcaltagarone@countyofelkpa.com	776 5353
Tom Nicklas	City of St. Marys PD	tnicklas@stmaryspa.gov	781-1315
Scott Surra	Fox Twp	scotts@stmarysinsurance.org	594-5760
Richard Gaudi	Elk County	rgaudi@countyofelkpa.com	776-5335
Milly Bowers	Ridgway Twp	rwyTwp@windstream.net mhbbrc@comcast.net	773-5625 776-2587
Ernest Szabo	PEMA	eszabo@pa.gov	717 651 2159
Laurie Storrar	Jones Twp	Lstorrar@centralcom.com	929 5138
Jim Abbey	Elk Co. IT/GIS	jabbey@countyofelkpa.com	776-5378
Ted Bullers	Spring Creek Twp	PTBullers@yahoo.com	7766348

AGENDA

Elk County Hazard Mitigation Plan Update

Thursday, October 26, 2017
Elk County EMS Building
6:00 PM

I. Welcome and Introductions

II. Purpose of the meeting

III. Plan Review

IV. Next Steps

V. Open Discussion

VI. Adjourn

Public info provided by Army Corp of Engineers.

Water Treatment Plants are downstream. Causing Plants to overflow.

Highlight - info. is real updated data.

Sign-in

Elk County Hazard Mitigation Plan Update

Thursday, October 26, 2017

Elk County EMS Building

6:00 PM

Name	Organization	Email	Phone
Jodi Foster	Elk Co. Planning		776-5304
Richard A. Krenitz Sr.	Jay Twp. Fire Chief Jay Twp. Supervisor		787-8944
Ernest Szabo	PEMA	erszabo@pa.gov	717 651 2259
Joyce Fowler	Johnsonburg Boro	Jbgpress@windstream.net	965-2366
Tom Nicklas	St. Marys Police	tnicklas@stmaryspa.gov	781-1315
Michelle Boback	Ridgway Twp	rwytwp@Windstream.net	7735625
Milly Bowers	Ridgway Twp	mhbbrc@Comcast.net	7762587
Kathy Carr	Horton Twp.	HORTONTOWNSHIP@ROCKWAY.TV.com	365-1622

APPENDIX F- HAZUS RESULTS REPORT

HAZUS-MH: Flood Event Report

Region Name: Elk_County_HMP

Flood Scenario: ElkCounty_100yr

Print Date: Monday, November 29, 2010

Disclaimer:

Totals only reflect data for those census tracts/blocks included in the user's study region.

The estimates of social and economic impacts contained in this report were produced using HAZUS loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social

General Description of the Region

HAZUS is a regional multi-hazard loss estimation model that was developed by the Federal Emergency Management Agency (FEMA) and the National Institute of Building Sciences (NIBS). The primary purpose of HAZUS is to provide a methodology and software application to develop multi-hazard losses at a regional scale. These loss estimates would be used primarily by local, state and regional officials to plan and stimulate efforts to reduce risks from multi-hazards and to prepare for emergency response and recovery.

The flood loss estimates provided in this report were based on a region that included 1 county (ies) from the following state(s):

- **Pennsylvania**

Note:
Appendix A contains a complete listing of the counties contained in the region.

The geographical size of the region is 829 square miles and contains 1,613 census blocks. The region contains over 14 thousand households and has a total population of 35,112 people (2000 Census Bureau data). The distribution of population by State and County for the study region is provided in Appendix B.

There are an estimated 17,614 buildings in the region with a total building replacement value (excluding contents) of 2,944 million dollars (2006 dollars). Approximately 92.98% of the buildings (and 68.55% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

HAZUS estimates that there are 17,614 buildings in the region which have an aggregate total replacement value of 2,944 million (2006 dollars). Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure ($1000)	Percent of Total
Residential	2,017,884	68.5%
Commercial	370,970	12.6%
Industrial	461,148	15.7%
Agricultural	6,912	0.2%
Religion	40,982	1.4%
Government	24,913	0.8%
Education	20,892	0.7%
Total	**2,943,701**	**100.00%**

Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure ($1000)	Percent of Total
Residential	574,805	74.4%
Commercial	81,099	10.5%
Industrial	88,086	11.4%
Agricultural	1,484	0.2%
Religion	8,392	1.1%
Government	13,543	1.8%
Education	5,565	0.7%
Total	**772,974**	**100.00%**

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 236 beds. There are 15 schools, 9 fire stations, 4 police stations and no emergency operation centers.

Flood Scenario Parameters

HAZUS used the following set of information to define the flood parameters for the flood loss estimate provided in this report.

Study Region Name:	Elk_County_HMP
Scenario Name:	ElkCounty_100yr
Return Period Analyzed:	100
Analysis Options Analyzed:	No What-Ifs

Building Damage

HAZUS estimates that about 182 buildings will be at least moderately damaged. This is over 4% of the total number of buildings in the scenario. There are an estimated 77 buildings that will be completely destroyed. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the HAZUS Flood technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		Substantially	
Occupancy	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Agriculture	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	0	0.00	1	100.00	0	0.00	0	0.00	0	0.00	0	0.00
Education	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Government	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	0	0.00	0	0.00	0	0.00	0	0.00	1	100.00	0	0.00
Religion	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
Residential	0	0.00	3	1.67	9	5.00	38	21.11	53	29.44	77	42.78
Total	**0**		**4**		**9**		**38**		**54**		**77**	

Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		Substantially	
	Count	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**	**Count**	**(%)**
Concrete	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00
ManufHousing	0	0.00	0	0.00	0	0.00	0	0.00	0	0.00	7	100.00
Masonry	0	0.00	1	2.33	1	2.33	10	23.26	12	27.91	19	44.19
Steel	0	0.00	1	50.00	0	0.00	0	0.00	1	50.00	0	0.00
Wood	0	0.00	1	0.78	8	6.20	28	21.71	41	31.78	51	39.53

Essential Facility Damage

Before the flood analyzed in this scenario, the region had hospital beds available for use. On the day of the scenario flood event, the model estimates that hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

		# Facilities		
Classification	Total	At Least Moderate	At Least Substantial	Loss of Use
Fire Stations	9	0	0	0
Hospitals	1	0	0	0
Police Stations	4	0	0	0
Schools	15	0	0	0

If this report displays all zeros or is blank, two possibilities can explain this.

(1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.

(2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

HAZUS estimates the amount of debris that will be generated by the flood. The model breaks debris into three general categories: 1) Finishes (dry wall, insulation, etc.), 2) Structural (wood, brick, etc.) and 3) Foundations (concrete slab, concrete block, rebar, etc.). This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 13,730 tons of debris will be generated. Of the total amount, Finishes comprises 37% of the total, Structure comprises 36% of the total. If the debris tonnage is converted into an estimated number of truckloads, it will require 549 truckloads (@25 tons/truck) to remove the debris generated by the flood.

Social Impact

Shelter Requirements

HAZUS estimates the number of households that are expected to be displaced from their homes due to the flood and the associated potential evacuation. HAZUS also estimates those displaced people that will require accommodations in temporary public shelters. The model estimates 561 households will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 962 people (out of total population of 35,112) will seek temporary shelter in public shelters.

Economic Loss

The total economic loss estimated for the flood is 139.47 million dollars, which represents 18.04 % of the total replacement value of the scenario buildings.

Building-Related Losses

The building losses are broken into two categories: direct building losses and business interruption losses. The direct building losses are the estimated costs to repair or replace the damage caused to the building and its contents. The business interruption losses are the losses associated with inability to operate a business because of the damage sustained during the flood. Business interruption losses also include the temporary living expenses for those people displaced from their homes because of the flood.

The total building-related losses were 138.12 million dollars. 1% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 35.26% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss						
	Building	32.04	7.63	15.27	1.78	56.71
	Content	17.08	21.97	30.50	7.62	77.18
	Inventory	0.00	0.79	3.38	0.07	4.23
	Subtotal	**49.11**	**30.39**	**49.15**	**9.46**	**138.12**
Business Interruption						
	Income	0.00	0.10	0.03	0.02	0.15
	Relocation	0.06	0.04	0.02	0.00	0.11
	Rental Income	0.01	0.02	0.01	0.00	0.04
	Wage	0.00	0.13	0.02	0.91	1.06
	Subtotal	**0.07**	**0.29**	**0.07**	**0.93**	**1.35**
ALL	**Total**	**49.18**	**30.68**	**49.22**	**10.39**	**139.47**

Appendix A: County Listing for the Region

Pennsylvania

- Elk

Appendix B: Regional Population and Building Value Data

	Population	Residential	Non-Residential	Total
Pennsylvania				
Elk	35,112	2,017,884	925,817	2,943,701
Total	**35,112**	**2,017,884**	**925,817**	**2,943,701**
Total Study Region	**35,112**	**2,017,884**	**925,817**	**2,943,701**

Building Value (thousands of dollars)

APPENDIX G-MUNICIPAL SURVEYS

Appendix 3. Capability Assessment Survey

Jurisdiction: Fox Township *Point of Contact/Title:* _____
Phone: _____ *E-mail:* _____

1. Planning and Regulatory Capability: Please indicate whether the following planning or regulatory tools and programs are currently in place or under development for your jurisdiction by placing an "X" in the appropriate box, followed by the date of adoption/update. Then, for each particular item in place, identify the department or agency responsible for its implementation and indicate its estimated or anticipated effect on hazard loss reduction (Supports, Neutral or Hinders) with the appropriate symbol and also indicate if there has been a change in the ability of the tool/program to result in loss reduction. Finally, please provide additional comments or explanations in the space provided.

Tool/Program	Status			Dept. / Agency Responsible	Comments:
	In Place	Date Adopted or Updated	Under Development		
EXAMPLE: Hazard Mitigation Plan	X	1/1/2006		Hazard County EMA	Interim update in 2008 revised mitigation strategy; completed one action.
Hazard Mitigation Plan					
Emergency Operations Plan	X	4/2014		Fox Twp EMA director (S)	updated regularly
Disaster Recovery Plan					
Evacuation Plan					
Continuity of Operations Plan					
NFIP					
NFIP-CRS					
Floodplain Regulations	X	1/2012		Fox Twp Code Enforcement (S)	
Floodplain Management Plan	X	1/2012		" " (S)	
Zoning Regulations	X	10/2005		" " (N)	
Subdivision Regulations	X	6/1997		" " (N)	
Comprehensive Land Use Plan (or General, Master or Growth Mgmt. Plan)					
Open Space Management Plan (or Parks/Rec or Greenways Plan)					
Stormwater Management Plan / Ordinance	X	6/2001		Fox Code Enf. Elk Co. Cons. Dist. (S)	
Natural Resource Protection Plan					

Capital Improvement Plan					
Economic Development Plan					
Historic Preservation Plan					
Farmland Preservation					
Building Code (UCC)	X	2005		Fox Twp. Code Enf. (S)	
Fire Code					
Firewise					
Storm Ready					
Other					

Appendix 3. Capability Assessment Survey

Jurisdiction: Jones Township *Point of Contact/Title:* LAURIE STORRAR, SUPERVISOR
Phone: 814 929 5138 *E-mail:* Lstorrar@ncentral.com

1. Planning and Regulatory Capability: Please indicate whether the following planning or regulatory tools and programs are currently in place or under development for your jurisdiction by placing an "X" in the appropriate box, followed by the date of adoption/update. Then, for each particular item in place, identify the department or agency responsible for its implementation and indicate its estimated or anticipated effect on hazard loss reduction (Supports, Neutral or Hinders) with the appropriate symbol and also indicate if there has been a change in the ability of the tool/program to result in loss reduction. Finally, please provide additional comments or explanations in the space provided.

Tool/Program	Status			Dept. / Agency Respon-sible	Comments:
	In Place	Date Adopted or Updated	Under Develop-ment		
EXAMPLE: Hazard Mitigation Plan	X	1/1/2006		Hazard County EMA	Interim update in 2008 revised mitigation strategy; completed one action.
Hazard Mitigation Plan	X	2011		County EMA	
Emergency Operations Plan					
Disaster Recovery Plan					
Evacuation Plan					
Continuity of Operations Plan					
NFIP	X				
NFIP-CRS					
Floodplain Regulations	X	1-18-12		Jones Township	
Floodplain Management Plan	X	1-18-12		Jones Township	
Zoning Regulations					
Subdivision Regulations	X	12-18-2001		Jones Township	
Comprehensive Land Use Plan (or General, Master or Growth Mgmt. Plan)					Covered under County plan
Open Space Management Plan (or Parks/Rec or Greenways Plan)					
Stormwater Management Plan / Ordinance	X	4-11-11		Jones Township	
Natural Resource Protection Plan					

Capital Improvement Plan					
Economic Development Plan					
Historic Preservation Plan					
Farmland Preservation					
Building Code	X	2004		Jones Township	
Fire Code					
Firewise					
Storm Ready					
Other					

do you have capability assessing w/o outside help.

Appendix 4. Capability Self-Assessment Matrix

Purpose: To record the results from the *Capability Assessment Survey, Section 5, Self Assessment* in **Appendix 3**, completed by each jurisdiction.

Instructions: Complete the table below by first listing all communities. Then enter the degree of capability (limited, moderate, high) for each capability category that was recorded on each community's *Capability Assessment Survey, Section 5, Self Assessment.*

Community Name	Capability Category				
	Planning and Regulatory Capability	Administrative and Technical Capability	Fiscal Capability	Community Political Capability	Community Resiliency Capability
EXAMPLE: Hazardtown	*Moderate*	*Moderate*	*Limited*	*High*	*Moderate*
Wilcox	Moderate	Limited	Limited	Moderate	Moderate
Rasselas	Limited	Limited	Limited	Moderate	Limited
Glen Hazel	Limited	Limited	Limited	Moderate	Moderate
Lamont	Limited	Limited	Limited	Moderate	Moderate

Appendix 5. Hazard Identification and Risk Evaluation Worksheet

Name: LAURIE STORRAR *Title:* SUPERVISOR/SECRETARY

Jurisdiction: JONES TOWNSHIP

PART 1

Identified Hazards 2XXX HMP	*How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community?* NC=No Change, I=Increase, D=Decrease *(Please provide an explanation for any hazards marked I or D in the "Additional Comments" column)*	*Additional Comments*
Natural Hazards		
Flooding	I	flood maps now show more areas within floodplain
WILD FIRES	NC	
Human-made Hazards		
Levee Failure	NC	
Power Outages	NC	
Train Derailments	NC	
Marcellus Activities	I	most Marcellus activity is in remote area of TWP

Appendix 5. Hazard Identification and Risk Evaluation Worksheet

PART II

Other Hazards:
Do any of these hazards, not previously profiled in the County's hazard mitigation plan, have the potential to affect your municipality significantly? *(If so, check box)*

Natural

- ☐ *Avalanche/Glacier*
- ☐ *Coastal Erosion*
- ☐ *Dust, Sand Storm*
- ☐ *Expansive Soils*
- ☐ *Extreme Temperature*
- ☐ *Hailstorm*
- ☐ *Hurricane, Tropical Storm, Nor'easter*
- ☐ *Invasive Species*
- ☐ *Landslide*
- ☐ *Lightning Strike*
- ☐ *Pandemic*
- ☐ *Radon Exposure*
- ☐ *Subsidence, Sinkhole*
- ☐ *Tsunami*
- ☐ *Volcano*

Human-made

- ☐ *Building or Structure Collapse*
- ☐ *Civil Disturbance*
- ☐ *Disorientation*
- ☑ *Drowning* (DAm)
- ☑ *Levee Failure*
- ☐ *War and Criminal Activity*

Other Comments

Appendix 3. Capability Assessment Survey

Jurisdiction: ELK CO. PRISON *Point of Contact/Title:* Gregory J. Gebauer - Warden
Phone: 814-776-5318 *E-mail:* G.Gebauer@COUNTYOFELK.COM

1. Planning and Regulatory Capability: Please indicate whether the following planning or regulatory tools and programs are currently in place or under development for your jurisdiction by placing an "X" in the appropriate box, followed by the date of adoption/update. Then, for each particular item in place, identify the department or agency responsible for its implementation and indicate its estimated or anticipated effect on hazard loss reduction (Supports, Neutral or Hinders) with the appropriate symbol and also indicate if there has been a change in the ability of the tool/program to result in loss reduction. Finally, please provide additional comments or explanations in the space provided.

Tool/Program	Status			Dept. / Agency Respon-sible	Comments:
	In Place	Date Adopted or Updated	Under Develop-ment		
EXAMPLE: Hazard Mitigation Plan	X	1/1/2006		Hazard County EMA	Interim update in 2008 revised mitigation strategy; completed one action.
Hazard Mitigation Plan					
Emergency Operations Plan	X	2009		PRISON	
Disaster Recovery Plan					
Evacuation Plan	X	3-2008		PRISON	
Continuity of Operations Plan					
NFIP					
NFIP-CRS					
Floodplain Regulations					
Floodplain Management Plan					
Zoning Regulations					
Subdivision Regulations					
Comprehensive Land Use Plan (or General, Master or Growth Mgmt. Plan)					
Open Space Management Plan (or Parks/Rec or Greenways Plan)					
Stormwater Management Plan / Ordinance					
Natural Resource Protection Plan					

PART II

Other Hazards:
Do any of these hazards, not previously profiled in the County's hazard mitigation plan, have the potential to affect your municipality significantly? *(If so, check box)*

Natural

- ☐ *Avalanche/Glacier*
- ☐ *Coastal Erosion*
- ☐ *Dust, Sand Storm*
- ☐ *Expansive Soils*
- ☐ *Extreme Temperature*
- ☐ *Hailstorm*
- ☒ *Hurricane, Tropical Storm, Nor'easter*
- ☐ *Invasive Species*
- ☐ *Landslide*
- ☒ *Lightning Strike*
- ☐ *Pandemic*
- ☐ *Radon Exposure*
- ☐ *Subsidence, Sinkhole*
- ☐ *Tsunami*
- ☐ *Volcano*

Human-made

- ☒ *Building or Structure Collapse*
- ☒ *Civil Disturbance*
- ☐ *Disorientation*
- ☐ *Drowning*
- ☐ *Levee Failure*
- ☒ *War and Criminal Activity*

Other Comments

Appendix 3. Capability Assessment Survey

Jurisdiction: CITY OF ST. MARYS *Point of Contact/Title:* THOMAS J. NICKLAS, CHIEF OF POLICE
Phone: 814-781-1315 *E-mail:* tnicklas@stmarysPA.gov

1. Planning and Regulatory Capability: Please indicate whether the following planning or regulatory tools and programs are currently in place or under development for your jurisdiction by placing an "X" in the appropriate box, followed by the date of adoption/update. Then, for each particular item in place, identify the department or agency responsible for its implementation and indicate its estimated or anticipated effect on hazard loss reduction (Supports, Neutral or Hinders) with the appropriate symbol and also indicate if there has been a change in the ability of the tool/program to result in loss reduction. Finally, please provide additional comments or explanations in the space provided.

Tool/Program	Status			Dept. / Agency Respon-sible	Comments:
	In Place	Date Adopted or Updated	Under Develop-ment		
EXAMPLE: Hazard Mitigation Plan	X	1/1/2006		Hazard County EMA	Interim update in 2008 revised mitigation strategy; completed on action.
Hazard Mitigation Plan					
Emergency Operations Plan	✓	1/29/03		CITY EMA COMMITTEE	REVISIONS IN PROGRESS
Disaster Recovery Plan					REFERENCED IN EOP NO PLAN
Evacuation Plan	✓	1/29/03		CITY EMA COMMITTEE	INCORPORATED WITHIN EMERG. OPS. PLAN
Continuity of Operations Plan					REFERENCED IN EOP NO PLAN
NFIP	✓	11/7/07		ZONING	ORDINANCE #268
NFIP-CRS					
Floodplain Regulations	✓	12/18/06		ZONING	ORDINANCE #227
Floodplain Management Plan	✓	12/18/06		ZONING	ORDINANCE #227
Zoning Regulations	✓	12/18/06		ZONING	ORDINANCE #227
Subdivision Regulations	✓	3/3/03		ZONING	ORDINANCE #173
Comprehensive Land Use Plan (or General, Master or Growth Mgmt. Plan)					
Open Space Management Plan (or Parks/Rec or Greenways Plan)					
Stormwater Management Plan / Ordinance	✓	8/18/14		CODE ENFORCEMENT	ORDINANCE #291
Natural Resource Protection Plan					

Capital Improvement Plan	✓				ONGOING
Economic Development Plan					
Historic Preservation Plan					
Farmland Preservation					
Building Code	✓	5/17/04		CODE ENFORCEMENT	ORDINANCE # 185 *
Fire Code	✓	5/17/04		CODE ENFORCEMENT	ORDINANCE # 185 *
Firewise					
Storm Ready					
Other					

* PA CONSTRUCTION CODE ACT 45 OF 1999

Appendix 5. Hazard Identification and Risk Evaluation Worksheet

Name: THOMAS J. NICKLAS *Title:* CHIEF OF POLICE

Jurisdiction: CITY OF ST. MARYS

PART 1

Identified Hazards 2XXX HMP	*How has the frequency of occurrence, magnitude of impact, and/or geographic extent changed in your community?* **NC**=No Change, **I**=Increase, **D**=Decrease *(Please provide an explanation for any hazards marked **I** or **D** in the "Additional Comments" column)*	*Additional Comments*
Natural Hazards		
DROUGHT	NC	
FLOOD, FLASH FLOOD, ICE JAM	NC	
LANDSLIDE	NC	
TORNADO AND WIND STORM	NC	
WILD FIRE	NC	
WINTER STORM	NC	
Human-made Hazards		
DAM FAILURE	NC	
FUEL SHORTAGES	NC	
HAZARDOUS MATERIALS	NC	
TERRORISM	NC	
TRANSPORTATION ACCIDENTS	NC	
URBAN FIRE AND EXPLOSION	NC	

CITY OF ST. MARYS

Appendix 5. Hazard Identification and Risk Evaluation Worksheet

PART II

Other Hazards:

Do any of these hazards, not previously profiled in the County's hazard mitigation plan, have the potential to affect your municipality significantly? *(If so, check box)*

Natural

- ☐ *Avalanche/Glacier*
- ☐ *Coastal Erosion*
- ☐ *Dust, Sand Storm*
- ☐ *Expansive Soils*
- ☑ *Extreme Temperature*
- ☐ *Hailstorm*
- ☑ *Hurricane, Tropical Storm, Nor'easter*
- ☐ *Invasive Species*
- ☐ *Landslide*
- ☐ *Lightning Strike*
- ☐ *Pandemic*
- ☐ *Radon Exposure*
- ☐ *Subsidence, Sinkhole*
- ☐ *Tsunami*
- ☐ *Volcano*

Human-made

- ☐ *Building or Structure Collapse*
- ☐ *Civil Disturbance*
- ☐ *Disorientation*
- ☐ *Drowning*
- ☐ *Levee Failure*
- ☐ *War and Criminal Activity*

Other Comments

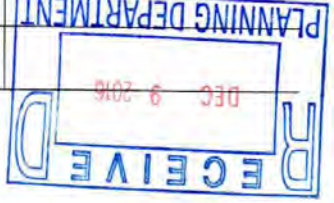
- EXTREME COLD WEATHER IS A POSSIBILITY IN OUR GEOGRAPICAL REGION
- INLAND TRACKS OF HURRICANES, TROPICAL STORMS OR NOR'EASTERS HAVE SIGNIFICANTLY IMPACTED THE AREA IN THE PAST.

Appendix 3. Capability Assessment Survey

Jurisdiction: RIDGWAY TOWNSHIP *Point of Contact/Title:* MICHELLE BOARDMAN - SEC
Phone: 814-773-5625 *E-mail:* TWPTWP@WINDSTREAM.NET

1. Planning and Regulatory Capability: Please indicate whether the following planning or regulatory tools and programs are currently in place or under development for your jurisdiction by placing an "X" in the appropriate box, followed by the date of adoption/update. Then, for each particular item in place, identify the department or agency responsible for its implementation and indicate its estimated or anticipated effect on hazard loss reduction (Supports, Neutral or Hinders) with the appropriate symbol and also indicate if there has been a change in the ability of the tool/program to result in loss reduction. Finally, please provide additional comments or explanations in the space provided.

Tool/Program	Status			Dept. / Agency Respon-sible	Comments:
	In Place	Date Adopted or Updated	Under Develop-ment		
EXAMPLE: Hazard Mitigation Plan	X	1/1/2006		Hazard County EMA	Interim update in 2008 revised mitigation strategy; completed one action.
Hazard Mitigation Plan	X	3/20/2012		COUNTY	
Emergency Operations Plan	X	6/2016		TWP/COUNTY	
Disaster Recovery Plan					
Evacuation Plan	X	11/5/2009		TWP/COUNTY	
Continuity of Operations Plan	X	11/5/2009		TWP/COUNTY	
NFIP	X	12/2/1972		TWP	
NFIP-CRS					
Floodplain Regulations	X	ORD 100 12/20/2011		TWP/COUNTY	NEW MAPS 4-16-2010
Floodplain Management Plan			?	TWP/COUNTY	
Zoning Regulations	X	ORD 43 10/5/1981 +AMENDED	X	TWP	CONTRACTED EADS
Subdivision Regulations	X	ORD 40 8/13/1979		TWP	
Comprehensive Land Use Plan (or General, Master or Growth Mgmt. Plan)	X	4/10/1978	X	TWP	CONTRACTED EADS
Open Space Management Plan (or Parks/Rec or Greenways Plan)					
Stormwater Management Plan / Ordinance	X	ORD'S 101+106 2/1/2012		TWP	
Natural Resource Protection Plan					



Appendix 4. Capability Self-Assessment Matrix

Purpose: To record the results from the *Capability Assessment Survey, Section 5, Self Assessment* in **Appendix 3**, completed by each jurisdiction.

Instructions: Complete the table below by first listing all communities. Then enter the degree of capability (limited, moderate, high) for each capability category that was recorded on each community's *Capability Assessment Survey, Section 5, Self Assessment.*

Community Name	Capability Category				
	Planning and Regulatory Capability	Administrative and Technical Capability	Fiscal Capability	Community Political Capability	Community Resilience Capability
EXAMPLE: Hazardtown	*Moderate*	*Moderate*	*Limited*	*High*	*Moderate*
RIDGWAY TWP	HIGH	HIGH	LIMITED	MODERATE	HIGH

Appendix 5. Hazard Identification and Risk Evaluation Worksheet

PART II

Other Hazards:
Do any of these hazards, not previously profiled in the County's hazard mitigation plan, have the potential to affect your municipality significantly? *(If so, check box)*

Natural

- ☐ *Avalanche/Glacier*
- ☐ *Dust, Sand Storm*
- ☐ *Extreme Temperature*
- ☒ *Hurricane, Tropical Storm, Nor'easter*
- ☐ *Landslide*
- ☒ *Pandemic* ANIMAL
- ☐ *Subsidence, Sinkhole*
- ☐ *Volcano*
- ☐ *Coastal Erosion*
- ☐ *Expansive Soils*
- ☐ *Hailstorm*
- ☒ *Invasive Species*
- ☒ *Lightning Strike*
- ☐ *Radon Exposure*
- ☐ *Tsunami*

Human-made

- ☐ *Building or Structure Collapse*
- ☐ *Disorientation*
- ☐ *Levee Failure*
- ☐ *Civil Disturbance*
- ☐ *Drowning*
- ☐ *War and Criminal Activity*

Other Comments

CYBER ATTACK

Received
11/30/16

Appendix 3. Capability Assessment Survey

Jurisdiction: ELK COUNTY COURTHOUSE Point of Contact/Title: TODD CALTAGARONE / SHERIFF
Phone: 814.776.5353 E-mail: tcaltagarone@countyofelkpa.com

1. Planning and Regulatory Capability: Please indicate whether the following planning or regulatory tools and programs are currently in place or under development for your jurisdiction by placing an "X" in the appropriate box, followed by the date of adoption/update. Then, for each particular item in place, identify the department or agency responsible for its implementation and indicate its estimated or anticipated effect on hazard loss reduction (Supports, Neutral or Hinders) with the appropriate symbol and also indicate if there has been a change in the ability of the tool/program to result in loss reduction. Finally, please provide additional comments or explanations in the space provided.

Tool/Program	Status			Dept. / Agency Respon-sible	Comments:
	In Place	Date Adopted or Updated	Under Develop-ment		
EXAMPLE: Hazard Mitigation Plan	X	1/1/2006		Hazard County EMA	Interim update in 2008 revised mitigation strategy; completed one action.
Hazard Mitigation Plan					
Emergency Operations Plan					
Disaster Recovery Plan					
Evacuation Plan					
Continuity of Operations Plan					
NFIP					
NFIP-CRS					
Floodplain Regulations					
Floodplain Management Plan					
Zoning Regulations					
Subdivision Regulations					
Comprehensive Land Use Plan (or General, Master or Growth Mgmt. Plan)					
Open Space Management Plan (or Parks/Rec or Greenways Plan)					
Stormwater Management Plan / Ordinance					
Natural Resource Protection Plan					
HOSTILE EVENT / ACTIVE SHOOTER EAP			✓	COURTHOUSE SECURITY CMTE / SUB CMTE	
2013 SECURITY ASSESSMENT COURTHOUSE / ANNEX		2013		COURTHOUSE SECURITY CMTE JUDGE MASSON PRESIDES	SOME RECOMENDATIONS COMPLETED / SOME PENDING (BUDGETARY CONSTRAINTS)

APPENDIX H- HAZARD MITIGATION PUBLIC SURVEY

ELK COUNTY HAZARD MITIGATION PLAN
CITIZEN'S PARTICIPATION SURVEY

FEMA, the Federal Emergency Management Agency defines Hazard Mitigation Planning as the process of figuring out how to reduce or eliminate the loss of life and property damage resulting from ***natural hazards*** such as floods, earthquakes, tornadoes, landslides, wildfires and more. Mitigation planning involves risk assessment, estimating losses in the event of a natural disaster and determining how to reduce that risk by putting measures in place before a natural disaster occurs.

The Elk County Emergency Management Agency created a hazard mitigation plan in 2011. FEMA requires that the plan be updated every five (5) years. Elk County EMA has been working in cooperation with The Elk County Planning Department on this update. The update will include any new hazards identified, as well as hazards that may have occurred after adoption of the 2011 plan. We will also be looking for information on any pre-disaster hazard mitigation projects that may have been recommended in the initial plan and have been started and/or completed.

As citizens of Elk County, your input is important. We would like information about your needs for disaster preparedness that will help improve public response and identify risk reduction activities. Please take a moment to complete the attached survey so that we can better gauge your knowledge of hazard mitigation and determine what you feel are the biggest priorities for future hazard mitigation planning in Elk County.

The following list of hazards has been identified as having the *potential* to affect Elk County. Keep these in mind as you answer the survey questions. They are listed in no significant order although some hazards are more frequent than others:

Drought **Flood, Flash Flood & Ice Jam** **Landslide** **Tornado & Wind Storm**

Wildfire **Winter Storm** **Dam Failure** **Fuel Shortages** **Hazardous Materials**

Terrorism **Transportation Accidents** **Urban Fire & Explosion**

QUESTIONNAIRE
NATURAL HAZARDS PREPAREDNESS

NATURAL HAZARD INFORMATION

1. In the past five years have you or someone you know experienced a natural disaster such as a severe windstorm, flood, wildfire, or other type of natural disaster?

☐ Yes ☐ No ***(IF NO Skip to Question 2)***

1.1. If ("YES") which of these natural disasters have you or someone you know experienced? Check all that pertain:

☐ Drought ☐ Household Fire ☐ Landslide
☐ Wind Storm ☐ Winter Storm ☐ Wildfire ☐ Other (Please list)

2. How concerned are you personally about the following natural disasters effecting Elk County**? (Check the corresponding number for each hazard)**

Natural Disaster	Extremely Concerned	Very Concerned	Concerned	Somewhat Concerned	Not Concerned
Drought	☐	☐	☐	☐	☐
Earthquake	☐	☐	☐	☐	☐
Flood	☐	☐	☐	☐	☐
Landslide	☐	☐	☐	☐	☐
Wildfire	☐	☐	☐	☐	☐
Household Fire	☐	☐	☐	☐	☐
Windstorm/Tornado	☐	☐	☐	☐	☐
Winter Storm	☐	☐	☐	☐	☐
Other _____	☐	☐	☐	☐	☐

3. Have you ever received information about how to make your family home safer from natural disasters?
   ☐ Yes ☐ No
4. Who would you most trust to provide you with information about how to make your family and home safer from natural disasters? ***(Please check all that apply)***

☐ **News media** ☐ **University or research institution** ☐ **Government Agency** ☐ **Insurance Company/Agent**
☐ **American Red Cross** ☐ **Other Non-Profit** ☐ **Not Sure** **Other**_____

5. What is the most effective way for you to receive information about how to make your family home safer from natural disasters? (***Please check all that apply)***

☐ **Newspaper stories/ads** ☐ **Schools** ☐ **Books** ☐ **Mail** ☐ **Fire Department** ☐ **Internet**
☐ **Television news/ads** ☐ **Fact Sheet** ☐ **Brochure** ☐ **Magazine** ☐ **Public workshops/meetings**
☐ **Radio news/ads** **Other** _____

6. Do you feel preparedness activities for disaster events are important to the safety and well-being of your family?

   ☐ Yes ☐ No

7. **In your household,** have you or someone: ***(Check all that apply)***

Preparedness Activity	**Have Done**	**Plan To Do**	**Not Done**	**Unable To Do**
A. **Talked with members in your household about what to do in the case of a natural disaster or emergency?**				
B. **Developed a "Household/Family Emergency Plan" in order to decide what everyone would do in the event of a household emergency?**				
C. **Prepared a "Disaster Supply Kit" (Stored extra food, water, batteries or other emergency supplies?)**				

8. Do you feel emergency services (fire, ambulance, police, hospital,) are adequately prepared to deal with a natural disaster in your municipality? (***If no, please give a brief explanation why)***

☐ Yes ☐ No ☐ Not Sure

9. Do you have an estimate of the value of your property and personal items for insurance purposes in the event of a loss due to a natural disaster?

☐ Yes ☐ No

10. Are you confident you are adequately insured in the event of a major loss?

☐ Yes ☐ No

11. Do you believe there are government programs (either grants or low-interest loans) to help you recover from losses due to a natural disaster that may not covered by traditional insurance?

☐ Yes ☐ No ☐ Not Sure

12. Would you be willing to incur additional costs to make your home safe from certain types of natural disasters, i.e. roof tie downs, reinforced concrete walls, water-proof concrete or a safe room?

☐ Yes ☐ No

13. Do you feel the expense involved in safety measures would outweigh the benefit?

☐ Yes ☐ No

14. Overall, do you feel prepared in the event a natural disaster should strike?

☐ Yes ☐ No

15. What, in your opinion, would help make Elk County more resilient in the event of a natural disaster?

Thank you for participating!

Please return surveys by email to:
jfoster@countyofelkpa.com
or mail to:
Jodi Foster
Elk County Courthouse Annex
300 Center St., PO Box 448
Ridgway, PA 15853

Public survey results

ELK COUNTY HAZARD MITIGATION PLAN
CITIZEN'S PARTICIPATION SURVEY

FEMA, the Federal Emergency Management Agency defines Hazard Mitigation Planning as the process of figuring out how to reduce or eliminate the loss of life and property damage resulting from ***natural hazards*** such as floods, earthquakes, tornadoes, landslides, wildfires and more. Mitigation planning involves risk assessment, estimating losses in the event of a natural disaster and determining how to reduce that risk by putting measures in place before a natural disaster occurs.

The Elk County Emergency Management Agency created a hazard mitigation plan in 2011. FEMA requires that the plan be updated every five (5) years. Elk County EMA has been working in cooperation with The Elk County Planning Department on this update. The update will include any new hazards identified, as well as hazards that may have occurred after adoption of the 2011 plan. We will also be looking for information on any pre-disaster hazard mitigation projects that may have been recommended in the initial plan and have been started and/or completed.

As citizens of Elk County, your input is important. We would like information about your needs for disaster preparedness that will help improve public response and identify risk reduction activities. Please take a moment to complete the attached survey so that we can better gauge your knowledge of hazard mitigation and determine what you feel are the biggest priorities for future hazard mitigation planning in Elk County.

The following list of hazards has been identified as having the *potential* to affect Elk County. Keep these in mind as you answer the survey questions. They are listed in no significant order although some hazards are more frequent than others:

Drought **Flood, Flash Flood & Ice Jam** **Landslide** **Tornado & Wind Storm**

Wildfire **Winter Storm** **Dam Failure** **Fuel Shortages** **Hazardous Materials**

Terrorism **Transportation Accidents** **Urban Fire & Explosion**

RECEIVED
JUN – 7 2017
PLANNING DEPARTMENT

QUESTIONNAIRE
NATURAL HAZARDS PREPAREDNESS

NATURAL HAZARD INFORMATION

1. In the past five years have you or someone you know experienced a natural disaster such as a severe windstorm, flood, wildfire, or other type of natural disaster?

   ☒ Yes ☐ No ***(IF NO Skip to Question 2)***

   1.1. If ("YES") which of these natural disasters have you or someone you know experienced? Circle all that pertain:

   ☐ Drought ☐ Household Fire ☐ Landslide FLOOD
   ☒ Wind Storm ☐ Winter Storm ☐ Wildfire ☒ Other (Please list)

   FIRES DOWNTOWN IN OLD STRUCTURES ON MAIN ST.

2. How concerned are you personally about the following natural disasters effecting Elk County? **(/ ÙgÊ the corresponding number for each hazard)**

Natural Disaster	Extremely Concerned	Very Concerned	Concerned	Somewhat Concerned	Not Concerned
Drought	☐	☐	☑	☐	☐
Earthquake	☐	☐	☐	☐	☑
Flood	☑	☐	☐	☐	☐
Landslide	☐	☐	☐	☐	☑
Wildfire	☐	☐	☐	☐	☑
Household Fire	☐	☐	☑	☐	☐
Windstorm/Tornado	☐	☐	☑	☐	☐
Winter Storm	☐	☐	☑	☐	☐
Other _____	☐	☐	☐	☐	☐

3. Have you ever received information about how to make your family home safer from natural disasters?
   ☑ Yes ☐ No
4. Who would you most trust to provide you with information about how to make your family and home safer from natural disasters? ***(Please check all that apply)***

☐ **News media** ☐ **University or research institution** ☐ **Government Agency** ☐ **Insurance Company/Agent**
☑ **American Red Cross** ☐ **Other Non-Profit** ☐ **Not Sure** **Other**_____

5. What is the most effective way for you to receive information about how to make your family home safer from natural disasters? (***Please check all that apply)***

☑ **Newspaper stories/ads** ☐ **Schools** ☐ **Books** ☐ **Mail** ☑ **Fire Department** ☑ **Internet**
☑ **Television news/ads** ☐ **Fact Sheet** ☑ **Brochure** ☐ **Magazine** ☐ **Public workshops/meetings**
☐ **Radio news/ads** **Other** _____

6. Do you feel preparedness activities for disaster events are important to the safety and well-being of your family?
   ☑ Yes ☐ No

7. **In your household,** have you or someone: ***(Check all that apply)***

Preparedness Activity	**Have Done**	**Plan To Do**	**Not Done**	**Unable To Do**
A. **Talked with members in your household about what to do in the case of a natural disaster or emergency?**	☑			
B. **Developed a "Household/Family Emergency Plan" in order to decide what everyone would do in the event of a household emergency?**	☐	☐	☑	☐
C. **Prepared a "Disaster Supply Kit" (Stored extra food, water, batteries or other emergency supplies?)**	☑			

8. Do you feel emergency services (fire, ambulance, police, hospital,) are adequately prepared to deal with a natural disaster in your municipality? ***(If no, please give a brief explanation why)***

☐ Yes ☒ No ☐ Not Sure

RIDGWAY BOROUGH IS REACTIONARY NOT PROACTIVE TO COMMUNITY FLOODING. THEY CONTINUE TO ASSUME IT'S TOO BIG AN ISSUE TO ADDRESS. IT HOLDS THE TOWN BACK FROM DEVELOPING THE RIVER FRONT AND REHAB OF BUEHLER LUMBER PROPERTY

9. Do you have an estimate of the value of your property and personal items for insurance purposes in the event of a loss due to a natural disaster?

☒ Yes ☐ No

10. Are you confident you are adequately insured in the event of a major loss?

☒ Yes ☐ No

11. Do you believe there are government programs (either grants or low-interest loans) to help you recover from losses due to a natural disaster that may not covered by traditional insurance?

☐ Yes ☒ No ☐ Not Sure

12. Would you be willing to incur additional costs to make your home safe from certain types of natural disasters, i.e. roof tie downs, reinforced concrete walls, water-proof concrete or a safe room?

☐ Yes ☒ No OUR HOME IS ALREADY SECURE

13. Do you feel the expense involved in safety measures would outweigh the benefit?

☐ Yes ☒ No

14. Overall, do you feel prepared in the event a natural disaster should strike?

☒ Yes ☐ No

15. What, in your opinion, would help make Elk County more resilient in the event of a natural disaster?

PREVENTION! START TO BUY / CONDEMN HOMES IN THE FLOOD PLANE. WORK WITH ARMY CORP OF ENGINEERS

TO MINIMIZE DOWNTOWN FLOODING, PROMOTE UPSTREAM WATER CONTROL, NOT JUST IN RIDGWAY

Thank you for participating!

Please return surveys by email to:
jfoster@countyofelkpa.com
or mail to:
Jodi Foster
Elk County Courthouse Annex
300 Center St., PO Box 448
Ridgway, PA 15853

APPENDIX I- TAX ASSESSMENT INFORMATION BY MUNICIPALITY

Benezette

Property Type	Number	Assessed Value	Estimated Cash Value
Agriculture	1	21,900	50,589
Commercial	17	472,150	1,090,667
Community Services	0		
Industrial	0		
Public Services	0		
Residential	88	1,929,950	4,458,185
MOHO Res. Land*	6	66,400	153,384
MOHO Res. Lease*	4	27,500	63,525
Rental Property	9	171,350	395,819
Misc. Building	7	22,850	52,784
Church Parsonage	0		
Seasonal Home	695	5,546,500	12,812,415
MOHO Land Season*	88	359,650	830,792
MOHO Lease Season*	33	96,800	223,608
Veteran's Preference	0		
Tax Exempt			
Community Services	12	58,550	135,251
Elk County Repository	2	3,850	8,894
Public Services	0		
Public Util	2	56,300	130,053
Rental Property	1	11,900	27,489
Seasonal Home	2	16,050	37,076
PA State Game Lands	21	4,150	9,587
PA Forest Dept.	4	14,950	34,535
Govt. Land State	1	474,500	1,096,095
Veteran's Preference	0		
Totals	**993**	**9,355,300**	**$21,610,748**

Fox Township

Property Type	Number	Assessed Value	Estimated Cash Value
Agriculture	22	609,150	1,407,136.50
Commercial	73	7,558,750	17,460,712.50
Community Services	2	29,100	67,221
Industrial	19	3,394,150	7,840,486.50
Public Services	1	30,750	71,032.50
Residential	1262	34,322,750	79,285,552.50
MOHO Land Resident	54	643,950	1,487,524.50
MOHO Lease Resident	30	297,500	687,225
Rental Property	127	2,010,850	4,645,063.50
Miscellaneous	53	374,110	864,194.10
Church Parsonage	1	46,300	106,953
Seasonal Home	147	1,391,900	3,215,289
Tax Exempt			
MOHO Land Seasonal	13	22,700	52,437
MOHO Lease Seasonal	1	6,900	15,939
Veteran's Preference	1	6,400	14,784
Tax Exempt			
Community Services	65	1,292,600	2,985,906
Elk County Repository	2	2,150	4,966.50
Public Services	8	150,550	347,770.50
Public Util	9	24,900	57,519
Residential	1	13,600	31,416
Veteran's Preference	5	143,300	331,023
Totals	**1896**	**52,372,360**	**$120,980,152**

Highland Township

Property	Number	Assessed Value	Estimated Cash Value
Agriculture	3	78,450	181,219.50
Commercial	26	433,100	1,000,461
Industrial	6	73,300	169,323
Residential	163	3,299,190	7,621,128.90
MOHO Land Resident	12	131,200	303,072
MOHO Lease Resident	4	25,000	57,750
Rental	24	286,400	661,584
Miscellaneous	11	47,800	110,418
Seasonal	373	2,656,750	6,137,092.50
MOHO Land Seasonal	44	228,500	527,835
MOHO Lease Seasonal	27	54,350	125,548.50
Tax Exempt			
Commercial	2	100	231
Community Services	21	63,350	146,338.50
Public Services	1	57,700	133,287
Public Util	5	20,200	46,662
Seasonal	1	6,650	15,361.50
MOHO Lease Seasonal	1	5,000	11,550
Elk County Repository	1	950	2,195
Veteran's Preference	2	26,100	60,291
Total	**727**	**7,494,090**	**$17,311,348**

Horton
Township 051

Property Type	Number	Assessed Value	Estimated Cash Value
Agriculture	4	76,600	176,946.00
Commercial	14	777,300	1,795,563.00
Recreation/Entertain	1	1,500	3,465.00
Community Services	3	77,050	177,985.50
Residential	282	7,472,300	17,261,013.00
MOHO Land Resident	14	209,500	483,945.00
MOHO Lease Resident	11	95,000	219,450.00
Rental Property	30	489,550	1,130,860.50
Miscellaneous	6	33,800	78,078.00
Church Parsonage	1	29,950	69,184.50
Seasonal	29	301,100	695,541.00
MOHO Land Seasonal	11	80,250	185,377.50
Vacant Land* **	0	2,750	6,352.50
MOHO Lease Seasonal	1	6,550	15,130.50
Tax Exempt			
Community Services	17	45,150	104,296.50
Public Util	2	2,650	6,121.50
Veteran's Preference	2	43,850	101,293.50
Totals	**428**	**9,744,850**	**$22,510,604**

Horton Township
055

Property Type	Number	Assessed Value	Estimated Cash Value
Agriculture	4	62,650	144,721.50
Commercial	16	433,500	1,001,385
Community Services	0		
Industrial	4	63,600	146,916
Miscellaneous	15	35,500	82,005
Rental Property	28	347,150	801,916.50
Residential	195	4,050,550	9,356,770.50
MOHO Land Residential	20	155,550	359,320.50
MOHO Lease Residential	12	85,700	197,967
Seasonal	44	883,700	2,041,347
MOHO Land Seasonal	11	72,150	166,666.50
MOHO Lease Seasonal	1	5,600	12,936
Vacant land	0	800	1,848
Tax Exempt			
Community Services	14	96,500	222,915
MOHO Lease Residential	1	2,600	6,006
Veteran's Preference	1	8,200	18,942
Totals	**366**	**6,303,750**	**$14,561,663**

Jay Township

Property Type	Number	Assessed Value	Estimated Cash Value
Agriculture	7	177,550	410,140.50
Commercial	51	1,603,750	3,704,662.50
Community Service	1	30,850	71,263.50
Recreation/Entertain	1	4,300	9,933
Industrial	2	100,200	231,462
Residential	669	15,594,150	36,022,486.50
MOHO Land Resident	39	375,100	866,481
MOHO Lease Resident	37	406,300	938,553
Rental	105	1,429,250	3,301,567.50
Miscellaneous	24	111,550	257,680.50
Church Parsonage	3	78,000	180,180
Seasonal	266	2,176,300	5,027,253
MOHO Land Seasonal	55	280,700	648,417
MOHO Lease Seasonal	9	17,850	41,233.50
Tax Exempt			
Community Service	45	1,354,550	3,129,010.50
Elk County Repository	4	2,700	6,237
Public Service	3	29,850	68,953.50
Public Util	3	81,950	189,304.50
Rental	1	6,150	14,206.50
Veteran's Preference	5	110,500	255,255
Government Land US	1	1,450	3,349.50
Totals	**1331**	**23,973,000**	**$55,377,630**

Johnsonburg Borough

Property Type	Number	Assessed Value	Estimated Cash Value
Commercial	61	2,017,860	4,661,256.60
Community Service	3	86,450	199,699.50
Industrial	11	5,251,550	12,131,080.50
Elk County Repository	3	400	924.00
Residential	876	16,732,200	38,651,382.00
MOHO Land Resident	5	59,650	137,791.50
Rental	199	3,114,100	7,193,571.00
Miscellaneous	48	106,950	247,054.50
Church Parsonage	3	91,650	211,711.50
Seasonal	2	400	924.00
Tax Exempt			
Commercial	3	40,150	92,746.50
Community Service	54	3,299,950	7,622,884.50
Public Service	10	1,122,750	2,593,552.50
Public Util	15	42,900	99,099.00
Residential	4	8,200	18,942.00
Rental	5	8,950	20,674.50
Veteran's Preference	1	11,550	26,680.50
Totals	**1303**	**31,995,660**	**$73,909,974.60**

Jones Township 072

Property Type	Number	Assessed Value	Estimated Cash Value
Agriculture	19	424,600	980,826.00
Commercial	40	748,850	1,729,843.50
Industrial	7	702,700	1,623,237
Rec./Entertainment	2	38,050	87,895.50
Residential	522	13,229,950	30,561,184.50
MOHO Land Resident	20	331,800	766,458
MOHO Lease Resident	10	78,000	180,180
Rental	67	931,300	2,151,303
Miscellaneous	28	241,650	558,211.50
Church Parsonage	1	56,450	130,399.50
Seasonal	450	3,940,450	9,102,439.50
MOHO Land Seasonal	84	403,850	932,893.50
MOHO Lease Seasonal	6	41,050	94,825.50
Tax Exempt			
Commercial	2	37,600	86,856
Community Service	24	444,750	1,027,372.50
Elk County Repository	4	19,900	45,969
Public Service	2	33,750	77,962.50
Public Util	8	32,100	74,151
Residential	1	20,550	47,470.50
MOHO Lease Resident	1	7,800	18,018
Veteran's Preference	1	21,600	49,896
Government Land US	4	40,000	92,400
Totals	**1303**	**21,826,750**	**$50,419,793**

Jones Township
073

Property Type	Number	Assessed Value	Estimated Cash Value
Agriculture	7	157500	363,825.00
Commercial	5	110,750	255,832.50
Residential	30	831,400	1,920,534.00
MOHO Land Resident	1	6,850	15,823.50
Rental	1	20,000	46,200.00
Miscellaneous	2	3,800	8,778.00
MOHO Land Seasonal	1	1,400	3,234.00
Seasonal	15	128,100	295,911.00
Tax Exempt			
Community Service	1	9,700	22,407.00
Public Util	1	71,050	164,125.50
Totals	**64**	**1340550**	**$3,096,670.50**

Millstone Township

Property Type	Number	Assessed Value	Estimated Cash Value
Agriculture	4	71,750	165,742.50
Commercial	1	1,550	3,580.50
Residential	27	519,100	1,199,121
MOHO Land Resident	3	25,200	58,212
MOHO Lease Resident	2	22,200	51,282
Rental Property	1	13,750	31,762.50
Miscellaneous Building	3	6,350	14,668.50
Seasonal Home	246	2,100,150	4,851,346.50
MOHO Land Seasonal	57	219,850	507,854
MOHO Lease Seasonal	36	101,650	234,811.50
Tax Exempt			
Community Services	4	41,800	96,558
MOHO Lease Seasonal	1	2,550	5,891
Totals	**385**	**3,125,900**	**$7,220,830**

Ridgway Borough

Property Type	Number	Assessed Value	Estimated Cash Value
Agriculture	1	19,600	45,276
Commercial	128	5,203,650	12,020,431.50
Community Service	2	78,350	180,988.50
Industrial	18	2,356,700	5,443,977
Public Service	2	340,300	786,093
Recreation/Entertain	3	115,100	265,881
Residential	1325	28,485,025	65,800,407.75
Rental	296	5,053,575	11,673,758.25
Miscellaneous	19	83,650	193,231.50
Church Parsonage	9	288,200	665,742
Seasonal	6	249,850	577,153.50
Tax Exempt			
Commercial	2	475,600	1,098,636
Community Service	71	5,251,600	12,131,196
Elk County Repository	10	20	46.20
Public Service	17	2,742,150	6,334,366.50
Public Util Exemp	2	9,200	21,252
Public Util	13	509,450	1,176,829.50
Residential	9	40,085	92,596.35
Rental	1	50	115.50
Government Land US	1	235,650	544,351.50
Veteran's Preference	8	145,750	336,682.50
Totals	**1943**	**51,683,555**	**$119,389,012**

Ridgway
Township 092

Property Type	Number	Assessed Value	Estimated Cash Value
Agriculture	5	110,950	256,294.50
Commercial	15	700,050	1,617,115.50
Industrial	1	51,850	119,773.50
Recreation/Entertain	1	17,450	40,309.50
Residential	192	4,942,250	11,416,598
MOHO Land Resident	4	26,100	60,291
MOHO Lease Resident	1	4,400	10,164
Rental	9	129,100	298,221
Miscellaneous	7	24,300	56,133
Seasonal	14	128,050	295,795.50
MOHO Land Seasonal	2	19,850	45,853.50
Tax Exempt			
Community Service	6	1,072,650	2,477,822
Public Service	2	1,382,400	3,193,344
Veteran's Preference	1	17,050	39,385.50
Totals	**260**	**8,626,450**	**$19,927,100**

Ridgway Township 095

Property Type	Number	Assessed Value	Estimated Cash Value
Agriculture	11	312,650.00	722,221.50
Commercial	72	2,847,500	6,577,725
Community Service	3	37,350	86,278.50
Industrial	24	4,611,100	10,651,641
Recreation/Entertain	1	38,600	89,166
Residential	693	19,289,950	44,559,785
MOHO Land Resident	17	212,550	490,990.50
MOHO Land Lease	9	46,750	107,992.50
Rental	53	962,250	2,222,797.50
Miscellaneous	48	233,450	539,269.50
Church Parsonage	1	62,550	144,491
Seasonal Home	135	1,404,450	3,244,279.50
MOHO Land Seasonal	20	87,300	201,663
MOHO Lease Seasonal	4	13,650	31,531.50
Veteran's Preference	1	13,400	30,954
Tax Exempt			
Commercial	2	41,500	95,865
Community Service	36	1,660,800	3,836,448
Elk County Repository	1	2,700	6,237
Public Util Taxable	7	20,800	48,048
Public Service	2	75,600	174,636
Veteran's Preference	2	24,100	55,671
PA State Game Lands	4	60,600	139,986
Govt. Land State	3	21,900	50,589
Totals	**1149**	**32,081,500**	**$74,108,265**

Spring Creek Township

Property Type	Number	Assessed Value	Estimated Cash Value
Agriculture	5	138,250	319,357.50
Commercial	3	53,550	123,700.50
Residential	82	1,481,150	3,421,456.50
MOHO Land Resident	12	105,250	243,128
Rental	4	39,600	91,476
Miscellaneous	9	32,000	73,920
Seasonal	382	2,734,100	6,315,771
MOHO Land Seasonal	78	308,900	713,559
MOHO Lease Seasonal	46	105,250	243,127.50
Tax Exempt			
Community Service	8	59,150	136,636.50
Elk County Repository	1	350	808.50
Public Utility	2	1,100	2,541
MOHO Lease Seasonal	2	2,650	6,121.50
Veteran's Preference	1	3,550	8,200.50
Pa State Game Land	17	38,100	88,011
Govt. Land State	1	2,500	5,775
Govt. Land US	1	1,950	4,504.50
Totals	**654**	**5,107,400**	**$11,798,094**

City of St. Marys

Property Type	Number	Assessed Value	Estimated Cash Value
Agriculture	45	1,211,650	2,798,912
Commercial	342	23,773,750	54,917,363
Community Services	2	185,350	428,159
Industrial	108	22,644,050	52,307,756
Rec./Entertainment	9	425,800	983,598
Residential	4,389	121,660,050	281,797,016
MOHO Res. Land	46	599,250	1,384,268
MOHO Res. Lease	44	365,750	844,883
Rental	619	12,128,650	28,017,182
Miscellaneous	85	460,950	1,064,795
Church Parsonage	3	138,800	320,628
Seasonal	175	2,197,450	5,076,110
MOHO Seasonal Land	9	63,150	145,877
MOHO Seasonal Lease	5	22,000	50,820
Tax Exempt			
Commercial	8	321,100	741,510
Community Services	131	23,024,900	53,187,519
Industrial	4	523,900	1,210,209
Miscellaneous	1	400	924
Public Service	25	4,404,800	10,175,088
Public Util	29	712,500	1,645,875
Rec./Entertainment	1	10,850	25,064
MOHO Res. Lease	1	10,400	24,024
Rental	1	12,700	29,337
Veteran's Preference	17	497,850	1,150,034
KOZ	1	52,350	120,929
Gov. Land US	3	600,800	1,387,848
Totals	**6104**	**216,061,000**	**$499,862,986**

APPENDIX J- EMERGENCY SERVICE CONTACTS

Elk County Fire Departments

Crystal Fire Department
PO Box C
St. Marys, PA 15857
781-1717

Johnsonburg Fire Department
99 Clarion Road
Johnsonburg, PA 15845
965-4276

Fox Township Fire Department
PO Box 229
Kersey, PA 15846
Club Side: 885-8000
Truck Side: 885-8397

Ridgway Fire Department
PO Box 391
Ridgway, PA 15853
772-8085

Jay Township Fire Department
Box 146
Byrnedale, PA 15827
787-5298

Jones Township Fire Department
PO Box 117
Wilcox, PA 929-5550

Horton Township Fire Department
Box 17
Brockport, PA 265-8971

Highland Township Fire Department
PO Box 111
James City, PA 16734
837-6401

Elkland Search and Rescue
1230 Brussells Street
St. Marys, PA 15857
781-1799

Elk County Ambulance Services

St. Marys Area Ambulance Service
773 Johnsonburg Road
St. Marys, PA 15857

Bennetts Valley Ambulance Service
12479 Bennetts Valley Hwy.
Penfield, PA 15849
637-5725

Ridgway Ambulance Corporation
120 North Broad St.
Ridgway, PA 15853
773-3633

Fox Township Ambulance Service
432 Main St.
Kersey, PA 15846
885-8166

Elk County Ambulance Transport Service
422 West Mill St.
St. Marys, Pa 15857
594-7527

Disaster Assistance

EMS West
1141 Million Dollar Highway
Kersey, PA 15846
834-9212

American Red Cross
808 S. Michael Road
St. Marys, PA 15857
834-2915

Elk County Office of Emergency Services
131 Ridgmont Drive
Ridgway, PA 15853
776-4606

APPENDIX K- PUBLIC OUTREACH

NO. 4, 1-2

PROOF OF PUBLICATION OF NOTICE IN THE RIDGWAY RECORD

STATE OF PENNSYLVANIA, } SS:
COUNTY OF ELK }

Christie Gardner Of The Ridgway Record, of the County and State aforesaid, being duly sworn, deposes and says that The Ridgway Record, a daily newspaper published in Ridgway, County and State aforesaid, was established December 1, 1903, and since which date The Ridgway Record has been regularly issued in said County, and that the printed notice or publication attached hereto is exactly the same as was printed and published in the regular editions and issues of the said The Ridgway Record on the following dates, viz: 10/11, 19/2017

Affiant further deposes that he, she is the Publisher of The Ridgway Record, a daily newspaper of general circulation, to verify the foregoing statement under oath, and that neither the affiant nor The Ridgway Record is interested in the subject matter at the aforesaid notice or advertisement and that all allegations in the foregoing statements as to time, place and character of publication are true.

Copy of Notice or Publication

Christie Gardner

Public Notices 100 Public Notices 100

NOTICE OF PUBLIC MEETING

NOTICE IS hereby given that the Elk County Office of Emergency Management is in the process of updating the Elk County Hazard Mitigation Plan. The final public meeting for the plan is scheduled for 6:00 p.m. on Thursday, October 26, 2017, located at the Elk County Emergency Management Agency building at 131 Ridgemont Drive, Ridgway, Pennsylvania 15853. For questions, please contact Jodi Foster via telephone at (814) 776-5304 or email at: jfoster@countyofelkpa.com

Oct. 11, 19, adv.

Sworn to and subscribed before me this 31

day of October A.D., 2017

My Commission expires:

COMMONWEALTH OF PENNSYLVANIA
NOTARIAL SEAL
Lisa Challingsworth, Notary Public
City of St. Marys, Elk County
My Commission Expires June 14, 2021
MEMBER, PENNSYLVANIA ASSOCIATION OF NOTARIES

STATEMENT OF ADVERTISING COSTS

Elk County Emergency Services
131 Ridgemont Dr. Ridgway PA 15853

Ridgway Record Dr.

For publishing the notice or publication attached hereto on the above dates _____ $ 91.80
Probating same: _____ $ 5.00

Total: _____ $ 96.80

Publisher's Receipt for Advertising Costs:

_____ hereby acknowledges receipt of the aforesaid notice and publication costs and certifies that the same have been duly paid.

By

Lisa Challingsworth

NO. 4, 1-2

PROOF OF PUBLICATION OF NOTICE IN THE RIDGWAY RECORD

STATE OF PENNSYLVANIA, } SS:
COUNTY OF ELK

Christi Gardner Of The Ridgway Record, of the County and State aforesaid, being duly sworn, deposes and says that The Ridgway Record, a daily newspaper published in Ridgway, County and State aforesaid, was established December 1, 1903, and since which date The Ridgway Record has been regularly issued in said County, and that the printed notice or publication attached hereto is exactly the same as was printed and published in the regular editions and issues of the said The Ridgway Record on the following dates, viz: 10/26/17

Affiant further deposes that he, she is the Publisher of The Ridgway Record, a daily newspaper of general circulation, to verify the foregoing statement under oath, and that neither ~~the affiant nor The Ridgway Record is interested in the subject matter at the aforesaid notice or~~ advertisement and that all allegations in the foregoing statements as to time, place and character of publication are true.

Christi Gardner

Copy of Notice or Publication

Public Notices 100 Public Notices 100

PUBLIC NOTICE

Notice is hereby given that the Elk County Department of Emergency Services is in the process of updating the Elk County Hazard Mitigation Plan. The Plan was first developed in 2011 and is considered a blueprint for reducing property damage and saving lives from the effects of future natural disasters in Elk County. Interested persons may download and review an electronic copy of the draft Plan Update at: www.co.elk.pa.us beginning on Monday October 30, 2017. A paper copy of the draft Plan Update will also be available for review at the same time at the Elk County Courthouse Annex in the Planning Department, 300 Center St., Room 107 Ridgway, Pennsylvania 15853. All comments on the draft Plan Update should be submitted in writing no later than November 30, 2017 to Jodi Foster, Elk County Planning Department at: jfoster@countyofelkpa.com or Elk County Courthouse, P.O. Box 448, Ridgway Pennsylvania 15853.

Oct. 26, adv.

Sworn to and subscribed before me this 31

day of October A.D., 2017

My Commission expires:

COMMONWEALTH OF PENNSYLVANIA
NOTARIAL SEAL
Lisa Challingsworth, Notary Public
City of St. Marys, Elk County
My Commission Expires June 14, 2021
MEMBER, PENNSYLVANIA ASSOCIATION OF NOTARIES

STATEMENT OF ADVERTISING COSTS

Elk Co. Emergency Serv. Cert
131 Ridgemont Dr., Ridgway, PA 15853

Ridgway Record. Dr.

ation attached hereto on the above dates _____ $ 71.40

_____ $ 5.00

Total: _____ $ 76.40

Publisher's Receipt for Advertising Costs:

_____ hereby acknowledges receipt of the aforesaid notice and publication costs and certifies that the same have been duly paid.

By

Lisa Challingsworth

Posted on Elk County Website

Elk County Hazard Mitigation Plan Update

- 
- 

Category: Uncategorised

Published: Wednesday, 25 October 2017

Elk County Hazard Mitigation Plan Update Now Available for Review

The Elk County Planning Department in cooperation with the Elk County Emergency Management Agency has prepared an update to the Elk County Hazard Mitigation Plan.

County officials began developing the county's first Hazard Mitigation Plan (HMP) in 2006. The Plan was approved by FEMA and adopted in 2011. However, local Mitigation Plans must be updated at least once every five years in order to continue to be eligible for FEMA hazard mitigation project grant funding. In order to meet FEMA's requirement, the Updated HMP was prepared.

Any person interested in reviewing the Draft of the plan can do so by clicking the link below. If you have any questions or comments, please direct them to:

Elk County Hazard Mitigation Plan Update - Pages 1 to 150

Elk County Hazard Mitigation Plan Update - Pages 151 to 217

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Comments must be received by Friday, December 1, 2017 by close of business at 4 PM in order to be incorporated into the final plan.

Elk County residents asked to assist in hazard mitigation planning

The Elk County Planning Department in cooperation with the Elk County Emergency Management Agency, is currently in the process of updating the Elk County Hazard Mitigation Plan.

The original plan was prepared and adopted by the Elk County Board of Commissioners in 2011 and is required to be updated every five years.

Hazard mitigation is defined by the Federal Emergency Management Agency (FEMA), as "the effort to reduce loss of life and property by lessening the impact of disasters. This is achieved through risk analysis, which results in information that provides a foundation for mitigation activities that reduce risk..." Counties that have a Hazard Mitigation Plan in place are eligible for emergency disaster funds through the state and federal government in the event of a major disaster.

Risk analysis is identifying the vulnerability of locations to certain types of hazards. For Elk County, a list of natural and human-made disasters was profiled by the consulting firm of Michael Baker Jr., Inc. during development of the original plan. Natural hazards identified include: drought, flood, flash flood, and ice jams; landslides, tornado and windstorms; wildfires, and winter storms. Technological and human-made hazards include: dam failure, fuel shortages, hazardous materials, terrorism, transportation accidents and urban fire and explosions.

The identification of these hazards in the 2011 plan led to mitigation strategies that were implemented in the last five years which included: adoption of Elk County's Act 167 Stormwater Management Plan, an extensive stormwater project, structural improvements to various problem streets and intersections, and many others too numerous to mention.

Jodi Foster, Director of the Elk County Planning Department states, "One of the most important aspects of hazard mitigation planning is participation by the local citizens. Elk County residents can assist in this effort by completing

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a hazard mitigation survey that has been posted on Elk County's website. The survey is designed to determine how prepared residents of the county are in the event of a disaster and determine the types of hazards they feel most threatened by. Residents can also assist by helping to identify local hazards and to prioritize projects they feel are important to implement."

The information received will be reviewed by the hazard mitigation team and incorporated into the final Hazard Mitigation Plan Update.

According to Foster, "Flooding is the most recurrent and significant hazard Elk County faces. It is also the most difficult to mitigate because of the size and scope of the problem."

"Efforts are ongoing behind the scenes to study and address flooding issues. Municipal, county, and state officials are continually looking for ways to find and fund projects that will lessen flooding impacts during heavy rain events. It is definitely a challenge and one that we all recognize."

However, flooding is not the only hazard county residents should be concerned about. Damage from high winds and the occasional tornado remind everyone that Mother Nature can be unpredictable.

Foster goes on to state that, "We all have a tendency to become complacent and a bit too comfortable when no significant events occur over a period of time. However, the recent EF-1 tornado that just occurred on May 5 of this year on Allegheny National Forest property was perilously close to Twin Lakes and the village of Wilcox. There could've been significant property damage and potential loss of life during that storm, which should be a reminder to everyone how important it is to be prepared for just such an event."

Residents that wish to complete the survey can do so by logging on to the county's website at co.elk.pa.us and clicking on the link for the Elk County Hazard Mitigation Survey. This will take you to the survey which is a fillable document that most can complete on their computer. The completed survey can then be emailed to jfoster@countyofelkpa.com. Residents that would like a paper copy to complete can request one by calling the Elk County Planning Department at 776-5335.