Mitigation Plan for Natural Disasters

Ashland County, Ohio

Contents

Section One: Introduction

Overview – Disaster Mitigation Act of 2000

The Disaster Mitigation Act of 2000 (DMA2K) was enacted by the Federal government for the purpose of reducing or eliminating the long-term risk to human life and property from natural disasters. This legislation provides local communities with the guidance necessary to appropriately assess the natural disasters impacting these communities and to establish and implement mitigation activities that will result in reducing or eliminating these risks. The Act emphasizes cooperative efforts among all public sectors including local citizens; city, village, township, and county officials; and State and Federal governmental agencies. It is to this end that the Ashland County Mitigation Plan for Natural Disasters is established.

Planning Committee Mission

It is the mission of the Ashland County Mitigation Planning Committee to develop and implement a Mitigation Plan for Ashland County, Ohio that is directed specifically to natural disasters. The plan is designed to minimize the adverse effects of natural disasters on the lives and properties of citizens of Ashland County.

Plan Design

The Ashland County Mitigation Plan for Natural Disasters is designed, through its goals and action plans, for a five-year implementation period. It is considered a multi-jurisdictional plan. Multi-jurisdictional plans address issues specific to individual incorporated areas (the county, the City of Ashland, and the villages of Bailey Lakes, Hayesville, Jeromesville, Loudonville, Mifflin, Perrysville, Polk, and Savannah) and the 15 unincorporated areas (townships). The plan describes the methods and procedures utilized in its development; provides the results of community assessments; identifies the mitigation activities determined to be most important to the citizens of Ashland County; and sets timelines for the implementation of those activities. This plan will continue to be a working document. The Ashland County Mitigation Plan functions as a means to address community issues and concerns as they relate to the mitigation of natural disasters, for it is toward their protection and the protection of their properties that this Mitigation Plan is directed.

Ashland County Hazard Identification and Risk Assessment Rankings

The findings from the planning team's Hazard Identification and Risk Assessment are outlined in the chart below:

Hazard	Probability	Severity Magnitude & Mitigation	Magnitude			Speed of Onset	Duration	Vulnerability (Severity and Probability)
			Human Impact	Property Impact	Business Impact			
Flood/Flash Flood	3	13	1	3	2	2	4	72%
Thunderstorm	3	12	1	2	2	3	2	67%
Epidemic/Pandemic	2	14	3	1	3	1	1	52%
Tornado	2	12	1	2	2	4	4	44%
Windstorm	2	11	1	2	1	1	2	41%
Winterstorm	2	11	1	2	1	1	2	41%
Hail	2	10	1	1	1	1	2	37%
Extreme Temperatures	1	10	1	1	1	1	1	19%
Drought	1	9.5	.5	1	1	1	1	18%
Lightning	1	9.5	.5	1	1	4	4	18%
Dam Failure	.5	9.5	.5	1	1	4	2	9%
Earthquake	.5	9.5	.5	1	1	4	4	9%
Landslide	.5	9.5	.5	1	1	4	4	9%

Based on the 2020 HIRA, Ashland County's top five hazards include: flood, thunderstorm, epidemic/pandemic, tornado, and windstorm.

Section Two: Community Profile

Community Overview

Ashland County is located in the northeast region of Ohio and is bordered by seven counties including: Richland County on the west; Huron County on the north and west; Lorain County to the north; Medina County on the north and east; Wayne County on the east; Holmes County on the south and east; and Knox to the south. Ashland County is comprised of 24 political subdivisions which include: the City of Ashland; the villages of Bailey Lakes, Hayesville, Jeromesville, Loudonville, Mifflin, Perrysville, Polk, and Savannah; and the townships of Clear Creek, Green, Hanover, Jackson, Lake, Mifflin, Milton, Mohican, Montgomery, Orange, Perry, Ruggles, Sullivan, Troy, and Vermillion.

Ashland County was established on February 24, 1846, and encompasses 424.4 square miles. According to the State of Ohio's Office of Research 2020 edition Ashland County Profile, the county's land usage consists of approximately 36% cultivated crops, 33% forest, 21% pasture, and the remaining 10% comprising of wetlands, open water or lower intensity development.

Demographics

Ashland County's population at the 2010 census was 53,139 and projects that the population will increase to 53,980 for 2020 (see the table below for a breakdown of demographics by jurisdictions). Ashland County's population is primarily White at 96.6% with a 3.4 % minority population. The median age for Ashland County residents is 40.3 years. At present, approximately 5.7% of the population is less than 5 years of age (3,062) and 15.9% of the population are 65 years or more (9,580). These are the two age groups that often need special consideration during disaster events.

Ashland County Jurisdictions	2010 Census
City of Ashland	20,362
Jackson Township	3,551
Montgomery Township	2,700
Village of Loudonville	2,587
Orange Township	2,523
Sullivan Township	2,513
Milton Township	2,383
Vermillion Township	2,170
Perry Township	1,990
Green Township	1,808
Clear Creek Township	1,492

Mohican Township	1,471
Troy Township	1,132
Mifflin Township	989
Ruggles Township	905
Hanover Township	871
Village of Perrysville	735
Lake Township	690
Village of Jeromesville	562
Village of Hayesville	448
Village of Savannah	413
Village of Bailey Lakes	371
Village of Polk	336
Village of Mifflin	137

Table: Population by Race Table

Population by Race	Number	Percent
Total Population	53,477	100%
White	51,672	96.6%
African-American	436	0.8%
Native American	3	0.0%
Asian	396	0.7%
Pacific Islander	0	0.0%
Other	230	0.4%
Two or More Races	740	1.4%
Hispanic (may be of any race)	713	1.3%
Total Minority	**2,311**	**4.3%**

Table: Population by Age

Age	Number	Percentage
Under 5 years	3,062	5.7%
5 to 17 years	9,107	17.0%
18 to 24 years	5,889	11.0%
25 to 44 years	11,458	21.4%
45 to 64 years	14,381	26.9%
65 years and more	9,580	17.9%
Total	53,477	100.0%
Median Age	**40.3**	

Economy

Crucial components to Ashland County's economy include agriculture, manufacturing, trade, transportation, utilities, education and health services, and local government. In the last five year's Ashland County's farmland increased to 160,698 acres (+12,000 acres), with 1,122 farms (+72) that generate a total of $113,750,000 annually, an increase of ($ 21,694,000). Employment in the county saw minor cut in financial services jobs (9.4%) and natural resources and mining jobs (4.2%) since 2013 (see table below); however, unemployment rates have declined from 5.1% in 2016 to 4.2 in 2019.

Table: Establishments, Employment, and Wages by Sector

Industrial Sector	Number of Establishments (Change Since 2013)	Average Employment (Change Since 2013)	Total Wages (Change Since 2013)
Private Sector	1,034 (5.6%)	16,342 (8.5%)	$ 620,779,941 (22.1%)
Goods-Producing	204 (7.4%)	4,704 (15.5%)	$ 230,611,977 (29.2%)
Natural Resources and Mining	23 (-4.2%)	232 (8.4%)	$ 6,244,796 (11.7%)
Construction	91 (12.3%)	795 (35.0%)	$ 45,842,485 (76.8%)
Manufacturing	90 (5.9%)	3,677 (12.5%)	$ 178,524,696 (21.5%)
Service-Providing	830 (5.2%)	11,638 (5.9%)	$ 390,167,964 (18.2%)
Trade, Transportation and Utilities	262 (5.2%)	3,235 (-0.4%)	$ 111,984,611 (14.0%)
Information	14 (7.7%)	165 (*)	$ 10,865,575 (*)
Financial Services	87 (-9.4%)	378 (*)	$ 15,415,688 (*)
Professional and Business Services	128 (20.8%)	1,742 (31.2%)	$ 77,646,126 (59.4%)
Education and Health Services	130 (4.0%)	3,813 (3.1%)	$ 134,363,931 (5.2%)
Leisure and Hospitality	104 (-1.0%)	1,749 (15.8%)	$ 26,260,717 (35.4%)
Other Services	105 (10.5%)	556 (-5.6%)	$13,631,316 (8.2%)
Federal Government		99 (6.5%)	$ 5,414,474 (11.8%)
State Government		253 (3.3%)	$ 16,802,288 (24.5%)
Local Government		2,046 (-3.5%)	$ 83,618,801 (8.1%)

Table: Agriculture

Land in Farms (acres)	160,698
Number of Farms	1,122
Average size (acres)	143
Total cash receipts	$113,750,000

Per Farm	$101,382
Receipts for crops	$44,201,000
Receipts for livestock/products	$69,549,000

The median household income for an Ashland County resident is $52,730, which is considerably lower than Ohio's average of $58,642 and the national average of $65,712. Eight percent of Ashland County families' income falls below the poverty level.

Table: Household Income

Household Income		Percentage
Total Households	20,439	100%
Less than $10,000	1,127	5.5%
$10,000 to $19,999	1,704	8.3%
$20,000 to $29,999	2,279	11.2%
$30,000 to $39,999	2,577	12.6%
$40,000 to $49,999	2,024	9.9%
$50,000 to $59,999	1,914	9.4%
$60,000 to $74,999	2,364	11.6%
$75,000 to $99,999	2,916	14.3%
$100,000 to $149,999	2,448	12.0%
$150,000 to $199,999	593	2.9%
$200,000 or more	493	2.4%
Median household income	$52,730	

Ashland County has a total of 22,250 housing units, 72% of the housing units are occupied by the owner and 28% of the units are occupied by renters. Currently, 8% of Ashland County's housing units are currently vacant. In the past five (5) years, Ashland County has seen a total of 296 new residential structures, which brings the median age of Ashland County's housing to 1967. The current median value of housing units decreased in the last five years and is now $124,900.

Table: Housing Stock Age

Year structures were built		
Built 2014 or later	107	0.5%
Built 2010 to 2013	439	2.0%
Built 2000 to 2009	2,584	11.6%
Built 1990 to 1999	2,735	12.3%
Built 1980 to 1989	1,865	8.4%
Built 1970 to 1979	2,835	12.7%
Built 1960 to 1969	1,997	9.0%

Built 1950 to 1959	2,574	11.6%
Built 1940 to 1949	1,296	5.8%
Built 1939 or earlier	5,818	26.1%
Total	22,250	100%
Median year built	1967	

Table: Value of Occupied Housing Units

Housing value		
Less than $20,000	575	3.9%
$20,000 to 39,999	421	2.9%
$40,000 to $59,999	685	4.6%
$60,000 to $79,999	1,573	10.7%
$80,000 to $99,999	2,036	13.8%
$100,000 to 124,999	2,084	14.1%
$125,000 to $149,999	1,689	11.5%
$150,000 to $199,999	2,815	19.1%
$200,000 to $299,999	2,001	13.6%
$300,00 to $499,999	715	4.9%
$500,000 to $999,999	127	0.9%
$1,000,000 or more	13	0.1%
Median value	**$ 124,900**	

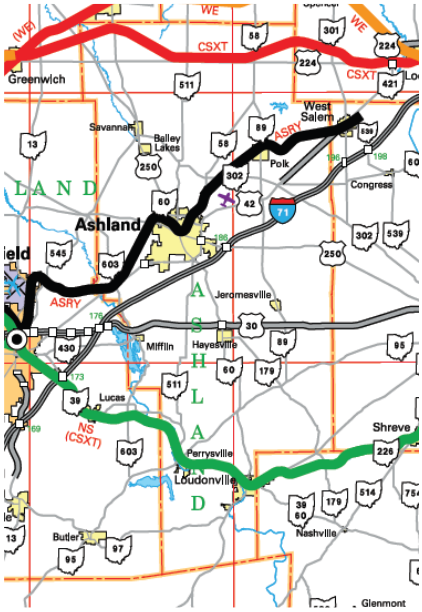
According to the 2020 county profile, Ashland County has over 687 million dollars in residential inventory and over 159 million in agriculture (see table below).

Taxable value of real property	
Residential	$ 687,329,040
Agriculture	$ 159,236,110
Industrial	$ 40,187,140
Commercial	$ 119,133,880
Mineral	$ 352,730
Total	$ 1,006,238,900

Transportation

Ashland County's transportation infrastructure is comprised mostly of land and rail components. Ashland County has approximately 16 miles of interstate highways, 70 miles of U.S. highways, 172 miles of State highways, and 819 miles of county, township, and municipal roads, with over 323 bridges. CSX Transportation Inc., Norfolk Southern Corp., and Ashland Railway are the three (3) railroads that provide freight service in Ashland County (see the railway map below).

Ohio Railway Transportation Map



There is one (1) public airport located in Ashland County. According to the FAA's Airport Master Record, Ashland County Airport handles approximately 8,225 aircraft operations per year, 98% of which are classified as general aviation.

Section Three: Planning Process

Overview

There are four core steps involved in the hazard mitigation planning process. Those steps include: organizing resources, assessing risks, developing a plan, implementing the plan and monitoring progress. This section describes the process that Ashland County used to update the mitigation plan.

Planning Process Objectives

The 2020-2021 plan update process started off similarly to the planning process executed by the planning team in 2014-2015. Ashland County's planning objectives were established based on FEMA's Local Mitigation Plan Review Tool and the Disaster Mitigation Act of 2000, and included the following activities:

1. Reconvening the Mitigation Planning Team and update points of contacts.
2. Conduct the project kickoff meeting.
3. Review and update the planning area.
4. Review and update the outreach strategy.
5. Review and update the plan maintenance section,
6. Conduct the Hazard Identification and Risk Assessment and the capability assessment.
7. Review and update the mitigation strategy and conduct cost benefit analysis to determine priorities.
8. Update the plan draft and conduct plan draft review
9. Submit final draft to the Ohio Emergency Management Agency for review/and the Federal Emergency Management Agency for approval
10. Upon FEMA approval, present the final plan to the jurisdictions for adoption

Planning Team Organization

One of the most important factors in the planning process is to acquire the services of qualified and committed individuals who will assist in the development of a formal planning document. For the 2020-2021 Ashland County Mitigation Plan update, the selection of planning team members was determined by the Ashland County Emergency Management Agency Director. Consideration for participation on the planning team was centered upon those individuals who, because of their positions within the community, their involvement in public service activities, or because of other valued qualifications, would best provide expertise and direction to the development and implementation of the mitigation plan. The EMA Director also selected individuals with different backgrounds to allow for a well-balanced discussion with different perspectives of the important issues. Representation on the planning committee did not change overmuch from the last planning team, but was updated to accommodate for personnel changes within key organizations. Ashland County's Mitigation Planning Team members for the 2020-2021 initiative are listed in the table below.

2020 Mitigation Planning Team	
Name	Organization
Mark Rafeld	Ashland County Emergency Management Agency
Mike Welch	Ashland County Commissioner
Jim Justice*	Ashland County Commissioner
Scott Markley*	Jackson Township Trustee
Rick Anderson	Ashland Fire Department
E. Wayne Risner	Ashland County Sheriff's Office
Todd Elliott*	Jeromesville Fire Department
Steve Carroll	University Hospital-Samaritan
Pat Donaldson	Ashland County Health Dept.
Shane Kremser	City of Ashland Engineer
Cindy Brady*	Ashland Solid Waste District
Larry Paxton	Ashland City Director of Finance
David Marcelli	Ashland City Police Department
Jane Hoisen*	Ashland County Soil & Water
Ed Meixner	Ashland County Engineer
Curt Young	Village of Loudonville
John Benshoff*	Village of Bailey Lakes
Bob Vinsack*	Village of Hayesville
Randy Spade*	Village of Jeromesville
Stephen Stricklen*	Village of Loudonville
Vickie Shultz*	Village of Mifflin
Heather Mullinnex*	Village of Perrysville
Donald Foster*	Village of Polk
Tom Kruse*	Village of Savannah

***** denotes a new member

Plan Participation

The success of any mitigation planning effort is completely dependent upon the level of participation from local and regional jurisdictions, special interest groups, businesses, and non-governmental organizations. Following the establishment of the planning team, a concerted effort was made to elicit support, technical assistance, feedback, and input from the organizations outlined below.

Stakeholders	Name	Title
Ashland County	Mike Welch Jim Justice	Commissioner

	Denny Bittle	
City of Ashland	Matt Miller	Mayor
Village of Bailey Lakes	John Benshoff	Mayor
Village of Hayesville	Robert Vinsack	Mayor
Village of Jeromesville	Randy Spade	Mayor
Village of Loudonville	Jason Van Sickle	Mayor
Village of Mifflin	Vickie Shultz	Mayor
Village of Perrysville	Heather Mullinnex	Mayor
Village of Polk	Donald Foster III	Mayor
Village of Savannah	Thomas Kruse	Mayor
Clear Creek Township	Timothy Calame Standley Crist David Shoup	Trustee
Green Township	Marianne Cowell Dwain Stitzlein Richard Kline	Trustee
Hanover Township	John Burkhart Ronald Endslow Timothy Mowery	Trustee
Jackson Township	Jim Power Kay Wright Jonathon Markley	Trustee
Lake Township	Mike Bender Tim Nickles Lewis Morris	Trustee
Mifflin Township	Jeff Jacobs Eric Oswalt Timothy Echelberger	Trustee
Milton Township	Rick Emmons Eric Fulk Deb Wertz	Trustee
Mohican Township	Keith Raudebaugh Michael Weber Steve Moffett	Trustee
Montgomery Township	Hugh Troth Stephen Uhler Joshua Boley	Trustee
Orange Township	David Elson George Parks Brian Canfield	Trustee

Perry Township	Brian Funk Burton Williams Kent McGovern	Trustee
Ruggles Township	Scott Stolcals Jerad White George Ashton	Trustee
Sullivan Township	Glen Goff, Sr. Samantha Shank Doug Campbell	Trustee
Troy Township	Timothy Roth Leslie White Rusty Callihan	Trustee
Vermillion Township	Doug Kamenik Ralph Owens Grant Conwell	Trustee
Neighboring County Emergency Management Agencies		
County	Name	Title
Richland	Michael Bailey	Director
Huron	Jason Roblin	Director
Lorain	Tom Kelley	Director
Medina	Christina Fozio	Director
Wayne	Joe Villegas	Director
Holmes	Gary Mellor	Director
Knox	Mark Maxwell	Director
Stakeholders/Businesses/Special Interest/Non-profit Organizations		
Ashland University		
Black River Watershed Project		
Kokosing Scenic River Advisory Council		
Muskingum Watershed Conservancy District		
North Central Ohio Land Conservancy, Inc.		

All jurisdictions were contacted through verbal or written correspondence to request mitigation project proposals and capability information for their respective jurisdictions. Upon completion of the plan draft, stakeholders and the jurisdictions were given the opportunity to review the draft and submit comments or recommendations. For jurisdictions required to adopt the plan, they will need to approve the plan by resolution upon receipt of Federal approval. The level of participation by these entities varied slightly throughout the planning process.

Plan Update/Development

Due to constraints as a result of COVID-19 worldwide pandemic, the 2020-2021 Ashland County Mitigation Plan update was rolled out in an unconventional manner due to stay-at-home orders and social distancing protocols. In person planning meetings were replaced with phone calls and email communications; work sessions were replaced with questionnaires and surveys; and plan reviews were conducted using virtual meeting platforms.

This process varied greatly compared to the Ashland County's 2014-2015 plan update process, where planning meetings were conducted on an in-person basis every two to three weeks to systematically review the previous plan and all of its data against current planning standards.

Below is a brief description of all planning activities which were executed during the 2020-2021 plan update:

In December 2019, The EMA Director and the planner met to discuss the project and required changes to the planning team as a result of personnel changes since the last initiative. Also, in an attempt to troubleshoot some of the difficulties that were encountered during the 2014-2015 plan update, Ashland County EMA decided to hold a series of pre-kickoff meeting planning sessions with key community stakeholders in an attempt to minimize lag time in compiling mitigation strategies and garner more thought-out mitigation strategies for this plan update.

Once COVID-19 made its appearance in Ohio in March 2020, the EMA Director and the planner reconvened to discuss the overall impact of COVID-19 on the Mitigation Plan planning process. In an attempt to mitigate stay-at-home orders, social distancing, and remote operations the planner developed a series of questionnaires and surveys which were emailed out to planning team members to gain input and necessary feedback from the project.

In June 2020, a virtual kick-off/planning meeting was conducted and planning team members were provided with a refresher on the purpose of mitigation and the goals regarding the mitigation plan update initiative. Planning team members were also brought up to date on actions that had already taken place, such as, survey and questionnaire results regarding hazard analysis data, capability assessment results, and mitigation strategies provided. A brief review of the current Ashland County Mitigation Plan was provided including details regarding the nine sections that make up the plan. A discussion was given on the expected changes to have within the revised plan.

Planning team members then reviewed hazard analysis results that were achieved through surveys/questionnaires and then compared the results against the previous plans hazards, resulting in an updated list of hazards for this initiative. Each hazard was then assessed by history, probability, vulnerability, speed of onset, duration, and severity. The planning team then reviewed the outreach and

plan maintenance strategy from the previous plan and determine the direction for the plan update. Lastly, the planning team conducted a review of the mitigation strategies outlined in the previous plan and reviewed proposed mitigation projects for the plan update and developing action plans. The planning team conducted a final review on the mitigation strategies/action plans and complete the prioritization of the mitigation strategies using the STAPLEE and Simple Score Method.

The planner assembled all planning team findings and incorporated the information into the Mitigation Plan draft document. Once finalized the draft was submitted to the EMA Director.

Plan Draft Review

In lieu of an in-person plan review because of COVID-19, Ashland County EMA posted the plan draft to the Ashland County Emergency Management Agency's website and emailed the draft to planning team members where the planning team, key stakeholders, and the general public could view the plan and submit comments/recommendations to the EMA Director. The EMA Director then shared with planning team members and the planner all comments/recommendations that came through the website for their consideration and incorporation into the plan prior to submission to the state. Some examples of suggested changes included correcting of typos and formatting. During the draft review, members of the planning team also assessed the plan for accuracy and overall usefulness as a working document for Ashland County.

Plan Approval

Upon completion of the plan draft review process, Ashland County EMA submitted the plan and the completed compliance crosswalk to the Ohio Emergency Management Agency (OEMA)/ Federal Emergency Management Agency (FEMA) for their final review and approval.

Plan Adoption

Following Federal approval, Ashland County and its participating jurisdictions will formally adopt the plan by Resolution. Jurisdictions will then forward a copy of the resolution to the Director of the Ashland County Emergency Management Agency for incorporation into Appendix E of this plan. Ashland County EMA Director will submit a copy of each jurisdiction resolution to the Ohio Emergency Management Agency to maintain in their files.

Plan Distribution

The final version of the Ashland County Mitigation Plan for Natural Disasters will be disseminated following the formal approval of the Federal Emergency Management Agency. Plan distribution will be the responsibility of the Ashland County Emergency Management Agency. A hardcopy of the plan will also be provided to the Ashland Public Library and the Loudonville Library for public viewing.

Section Four: Outreach Process

Federal regulation for mitigation plan approval requires that stakeholders and the general public are given the opportunity to be involved during the planning process and in the plan's maintenance and implementation. The following section defines the strategy that the Ashland County Mitigation Planning Team put in place for the plan update.

Stakeholder Outreach Methodology

For the purposes of the plan update, involving stakeholders in the planning process helps to develop support for the plan and identify barriers to implementation. Stakeholders identified by the planning team included local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development, neighboring communities, technical subject matter experts, as well as businesses, academia, and other private and nonprofit groups. The complete list of stakeholders identified for the plan update can be found in Section 3.

The planning team also identified key components which necessitated stakeholder involvement to complete the plan update. These components included providing data regarding hazard information, conducting a capability assessment of local assets, providing mitigation strategy proposals, reviewing the plan draft and providing feedback, adopting the plan, and implementing the plan upon approval.

Stakeholder Notification Process

Stakeholders were contacted on an as needed basis depending on project objectives. To obtain their assistance, the applicable stakeholder was contacted directly by either the Ashland County EMA Director or a member of the planning team through email correspondences, telephone calls, or in person. However, stakeholders also have access to the notification systems meant to alert the general public, which include news media releases, other formal or informal community meetings, the Ashland County Emergency Management Agency web site, and/or Facebook page postings. See outreach postings in Appendix A.

Public Outreach Strategy

The general public must be given the opportunity to be involved in the planning process because many mitigation actions impact private property and although they are not technical experts, the public can still assist with identifying community assets and problem areas, describe issues of concern, provide hazard history information, and review the plan draft and provide feedback. However, even after the plan is approved, it is still vital to ensure that the public be engaged in the implementation phase of the planning process.

Public Notification

The Ashland County EMA Director utilized his bi-monthly radio address on WNCO to inform the public that the Ashland County Mitigation Plan for Natural Disasters was going through a plan update. Throughout the duration of the planning process, the EMA Director continued to utilize radio addresses, along with the *Ashland Times-Gazette, and* Ashland County EMA social media pages to update the public on the plans progress and also informed them of how they could access the plan/plan draft and submit comments or suggestions to his office (See Appendix A for outreach postings, articles, etc.).

Even though the planning team implemented a variety of notification methods to give the public the opportunity to attend meetings and provide comments and/or recommendations, the public failed to participate during the 2020-2021 Mitigation Plan update, much like their response during the 2014-2015 Mitigation Plan update.

Continuous Outreach Strategy

A mechanism for providing the general public and key stakeholders with continuous access to mitigation information will be achieved through the use of the Ashland County Emergency Management Agency's website and social media pages (Facebook and Twitter). It was the intention of the planning team to utilize Ashland County Emergency Management Agency's website so that the general public and key stakeholders have continual access to the plan and other mitigation documents as they become available. The website also provides the means for individuals to submit comments or recommendations directly to the Ashland County EMA Director at any time. See outreach postings in Appendix A.

Any and all feedback (comments and/or recommendations) that the EMA Director receives from the general public and key stakeholders will be shared with planning team members at the next scheduled meeting for consideration and incorporation into the plan.

Section Five: Capabilities Assessment

A Capabilities Assessment is an appraisal of authorities, policies, programs, and resources available to respond to and/or mitigate hazards and vulnerabilities. The types of capabilities for reducing long-term vulnerability through mitigation planning include:

- Planning and regulatory capabilities
- Administrative and technical capabilities
- Financial capabilities
- Education and outreach capabilities

Planning capabilities refer to specific actions or policies that support community goals and manage growth and development. Regulatory capabilities refer to how and where land is developed as well as how or where structures are built.

Administrative capabilities refer to a community's staff, their skills, and the tools that can be used for mitigation planning and implementation. Technical capabilities refer to identifying resources that could provide technical assistance to communities that have limited resources.

Financial capabilities are the resources that a jurisdiction has access to or is eligible to use to fund mitigation actions.

Education and Outreach capabilities refer to education and outreach programs and methods already in place that could be used to implement mitigation activities and communicate hazard-related information.

Methodology and Capability Results

For the 2020-2021 plan update, a survey was developed and distributed to planning team members and local jurisdictions to complete. Surveys were collected and reviewed by the planning team. The results from the assessment are detailed in the table below.

CAPABILITIY ASSESSMENT FINDINGS

Planning and Regulations	
Capital Improvement Plan	City of Ashland and Village of Loudonville
Economic Development Plan	Ashland County, City of Ashland, and Jackson Township
Comprehensive Land Use Plan	Ashland County (includes all townships) and Village of Loudonville
Transportation Plan	City of Ashland
Stormwater Management Plan	City of Ashland and Village of Loudonville
Emergency Operations Plan	Ashland County, City of Ashland, and Village of Loudonville

Continuity of Operations Plan	City of Ashland
Disaster Recovery Plan	City of Ashland
Zoning Ordinance	All jurisdictions with the exception of Hanover and Mohican Township
Floodplain Ordinance	All jurisdictions with the exception of villages of Hayesville, Mifflin, and Savannah
Subdivision Regulations	Ashland County (includes all townships), Village of Loudonville, and Village of Savannah
Stormwater Ordinance	City of Ashland and Village of Loudonville
Building Codes	Village of Loudonville
Commercial Codes	City of Ashland and the remaining jurisdictions utilize Richland County for Commercial Codes
Administrative and Technical	
Planning Commission	Ashland County, City of Ashland, Village of Loudonville, and Village of Savannah
Mitigation Planning Committee	Ashland County
Mutual Aid Agreements	Ashland County, City of Ashland and Village of Loudonville, and Troy Township
Chief Building Official	City of Ashland
Floodplain Administrator	All jurisdictions except the Village of Savannah
Emergency Manager	Ashland County
Community Planner	Ashland County
Civil Engineer	Ashland County and City of Ashland
GIS Coordinator	None
Emergency Warning System	Ashland County, City of Ashland, and Green Township
Grant Writer	Village of Loudonville
Hazard Mapping	None
Financial	
Capital Improvement Project Funding	City of Ashland, Village of Loudonville, and Jackson Township
Authority to levy taxes for specific purposes	City of Ashland, Village of Loudonville, Green Township, and Jackson Township
Fee for water, sewer, gas, or electric services	City of Ashland, Village of Loudonville, and Village of Savannah
Impact fees for new development	Village of Loudonville
Stormwater utility fee	City of Ashland and Village of Loudonville
Incur debt through private activities	City of Ashland
Community Development Block Grant	City of Ashland, Village of Loudonville, Village of Savannah, Green Township, Jackson Township, and Troy Township

Other State or Federal funding programs	City of Ashland, Village of Loudonville, Village of Savannah, Green Township, Jackson Township, and Troy Township
Education / Outreach	
Local citizen groups or non-profit organizations focused on emergency preparedness	Village of Savannah, Jackson Township, and Troy Township
Ongoing public education or information programs	City of Ashland, Village of Loudonville, Village of Savannah, Jackson Township, and Troy Township
Hazard Awareness Campaigns (ex: Severe Weather Awareness Month)	Jackson Township
Fire Safety Program	City of Ashland, Village of Loudonville, and Jackson Township
Community Program (ex: StormReady, Firewise, etc.)	Jackson Township
Public-private partnership initiatives addressing disaster related issues	Jackson Township

During the capability assessment phase of the planning process, planning team members reviewed existing community plans to determine if any of the documents contained data that could be incorporated into the Mitigation Plan update. Plans that were reviewed by the planning team included, but were not limited to:

- The Emergency Operations Plan
- The Comprehensive Land Use Plan
- Capital Improvement Plans
- Economic Development Plans
- Community ordinances, codes, and regulations

Upon completion of the capabilities review, team members confirmed that the hazards outlined in the Emergency Operations Plan would be utilized as the basis for conducting the hazard identification and risk assessment; and that ordinances, regulations, and building codes could be improved upon and would be the primary focus for the development of mitigation goals and strategies.

Section Six: Hazard Analysis

Overview

This section of the Ashland County Mitigation Plan describes the process taken by planning team members to update the Hazard Identification and Risk Assessment (HIRA).

The purpose of the Hazard Identification and Risk Assessment is to identify the hazards that can affect the county and determine the properties and populations most at risk from the adverse impacts of natural hazards. The hazard identification and risk analysis also provide awareness for new hazards, provides information for developing disaster mitigation plans, and develops standards for response actions and recovery operations. A hazard identification and risk assessment is made up of two key components: 1) the identification of hazards and 2) the assessing of risks associated with the hazard.

Benefits for conducting the Hazard Identification and Risk Assessment (HIRA) include:

- Establishes priorities for planning, capability development, and hazard mitigation;
- Serves as a tool in the identification of hazard mitigation measures;
- Serves to educate the public and public officials about hazards and vulnerabilities; and
- Helps communities make objective judgments about acceptable risk.

Hazard Identification Process

The Hazard Identification component of the Hazard Identification and Risk Assessment is designed to recognize particular types of natural disasters that have the potential of occurring within the county. The planning team reviewed past disaster declarations and recorded incidences to determine the hazards which will be incorporated into the plan update. Sources used while conducting the HIRA update included data from local, State and Federal agencies, information from the National Weather Service and the National Oceanic and Atmospheric Administration's National Climatic Data Center, interviews, surveys, newspapers, and internet searches.

The hazards to be included in the plan update are listed below:

Hazards		
• Dam Failure	• Extreme Temperatures	• Thunderstorms
• Drought	• Flood / Flash Flood	• Tornado
• Earthquake	• Hail	• Wind Storms
• Epidemic/Pandemic	• Lightning	• Severe Winter Storms

Since July of 1969, Ashland County has had eight major emergency events and has received a total of five Presidential Disaster Declarations. The table below shows the disaster declarations/emergencies for which Ashland County was included.

Disaster Declarations –			
Disaster Number	Declared	Disaster Type	Public Assistance
DR- 266	July 15, 1969	Heavy storms and floods	$1,000,000
DR-3055-EM	January 26, 1978	Severe blizzard conditions	$3,546,669
DR-1444	November 18, 2002	Tornados, Severe Storms	$14,153,548
EM-3187*	August 23, 2003	Power Outage	$ 2,067,222
DR-1580*	February 15, 2005	Severe winter storms, ice and mudslides	$ 5,410,578
EM-3250	September 13, 2005	Hurricane Katrina Emergency Shelter Operations	$2,423,981
DR-1805	October 24, 2008	Severe wind storms associated with Tropical Depression Ike	$ 59,198,859
DR-4507	March 31, 2020	Ohio COVID-19 Pandemic	ongoing
		TOTAL	**$ 87,800,857**

Risk Assessment Methodology

The next step for the Ashland County Mitigation Planning Team regarding the HIRA is to determine the risk that each hazard poses on the county. The planning team assessed each hazard based on six factors including: probability, magnitude, severity, speed of onset, duration, and vulnerability.

Probability:
Each hazard was evaluated for the frequency in which it occurs by using available historical data. If a hazard had never occurred in the county, it was given a score of zero (0). If the hazard occurred within the county in the last 12 months, it was given a ranking of 3. The scale used for probability rankings were as follows:

0 = Event has never occurred in the county
.5= Event has occurred at some point in the county
1 = Event has occurred in the county within the last 10 years
2 = Event has occurred in the county within the last 5 years
3 = Event has occurred in the county within 12 months

Magnitude:
Each hazard was then evaluated for the negative consequences of an event, its human impact, its property impact, and its business interruption. The scale used for magnitude rankings were as follows:

Human Impact

0 = Event is likely to produce no patient surge
.5 = Event is likely to produce patient surge less than 20
1 = Event is likely to produce patient surge between 20 - 50
2 = Event is likely to produce patient surge between 50 - 100
3 = Event is likely to produce patient surge greater than 100

Property Impact

0 = Event is likely to produce no negligible response costs.
1 = Event is likely to produce damages or additional response costs between $1 and $100k.
2 = Event is likely to produce damages or additional response costs between $100k and $500k.
3 = Event is likely to produce damages or additional response more than $500k.

Business Impact

0 = Event is not likely to create any disruption of normal operations at facilities within the county.
1 = Event is likely to disrupt normal operations at facilities within the county region for up to 24 hrs.
2 = Event is likely to disrupt normal operations at facilities within the county for 2 to 3 days.
3 = Event is likely to disrupt normal operations at facilities within the county for more than 3 days.

Severity:

An incidents severity is in part based on a local jurisdictions level of preparedness and response capabilities, along with hazard impact. With that said, the planning team evaluated preparedness and response ability to determine the overall ranking. The scale used for severity rankings included the sum of the following in addition to the magnitude sum:

Preparedness

0 = not applicable
1 = Event has a local / county functional annex or has been exercised in the last 12 months
2 = Event is covered by local / county all-hazards plan and has been exercised at least once.
3 = Event is covered by local/county plan and has not been exercised

Internal Resources:

0 = N/A
1 = Sufficient resources exist at the county level to respond to this event.
2 = Moderate resources exist at the county level to respond to this event.
3 = Minimal resources exist at the county level to respond to this event.

External Resources:

0 = N/A
1 = Sufficient resources exist at the county level to respond to this event.
2 = Moderate resources exist at the county level to respond to this event.
3 = Minimal resources exist at the county level to respond to this event.

Speed of Onset:

Hazards were then classified by the speed in which they can impact the community. Hazards were either given a minimal to no warning, 6 – 12 hour, 12 – 24 hour, or an over 24 hour ranking depending on how

fast they could impact the community. A hazard's speed of onset can affect all other factors because of the lack of time to prepare for its impact. Rankings for speed of onset were given values of 1, 2, 3, or 4.

1 = over 24 hours warning time
2 = 12-24 hours warning time
3 = 6-12 hours warning time
4 = minimal to no warning

Duration:

Each hazard was then ranked to account for how long the event usually lasts or how long it takes to respond to the hazard. Hazards were classified if the event/response lasts less than a year, less than a month, less than a week, or less than a day. Rankings for duration were given values of 1, 2, 3, or 4

1 = less than a day
2 = less than a week
3 = less than a month
4 = less than a year

Vulnerability:

Brief narratives were developed for each hazard to clarify any applicable spatial tendencies for event occurrences. Some hazards are localized hazards, for that they commonly occur in the same location, whereas other hazards, like severe weather, are non-localized events that can occur anywhere in the county or are countywide events.

Hazard Summary Chart

The findings from the planning team's Hazard Identification and Risk Assessment are outlined in the table below:

Hazard	Probability	Severity (Magnitude and Mitigation)	Magnitude			Speed of Onset	Duration	Vulnerability (Severity and Probability)
			Human Impact	Property Impact	Business Impact			
Flood/Flash Flood	3	13	1	3	2	2	4	72%
Thunderstorm	3	12	1	2	2	3	2	67%
Epidemic/Pandemic	2	14	3	1	3	1	1	52%
Tornado	2	12	1	2	2	4	4	44%
Windstorm	2	11	1	2	1	1	2	41%

Winterstorm	2	11	1	2	1	1	2	41%
Hail	2	10	1	1	1	1	2	37%
Extreme Temperatures	1	10	1	1	1	1	1	19%
Drought	1	9.5	.5	1	1	1	1	18%
Lightning	1	9.5	.5	1	1	4	4	18%
Dam Failure	.5	9.5	.5	1	1	4	2	9%
Earthquake	.5	9.5	.5	1	1	4	4	9%
Landslide	.5	9.5	.5	1	1	4	4	9%

Based on the 2020 HIRA, Ashland County's top five hazards include: flood, thunderstorm, epidemic/pandemic, tornado, and windstorm.

Hazard Profiles

On the following pages, the Ashland County Mitigation Planning Team provides detailed profiles on each hazard that can affect, or will continue to affect, Ashland County. The profiles include descriptions of the hazard, history of occurrence, past event narratives, probability of occurrence, extent, location, severity, speed of onset, and duration.

Class I & Class II Dams

A dam is an artificial barrier usually constructed across a stream to impound water. The benefits of dams are numerous and include: provide drinking water, create lakes for fishing and recreation, provide irrigation for agriculture, navigation, and save lives by preventing or reducing floods.

While it is true that dams provide many benefits, they can also pose a risk to neighboring communities if they are not designed, operated, or maintained properly. In the event of a dam failure, the water stored behind them is capable of causing loss of life and great property damage to those living downstream.

There are about 80,000 dams in the U.S. today, the majority of which are privately owned. According to the Ohio Department of Natural Resources, Class I dams are selected on the basis of three criteria: height (greater than 60 feet), storage volume (greater than 5,000 acre-feet, and potential downstream hazard (probable loss of life, serious hazard to health, and structural damage to high value property). The Ohio Department of Natural Resources has identified five (5) Class I dams for Ashland County and six (6) Class II dams. All of the Class I dams are earthfill with four being located in the geographical southern half of the county.

The largest Class I dam in Ashland County is located at Pleasant Hill Lake in Hanover Township. The dam contains a capacity of 128M gallons of water and it provides flood control for the Clear Fork Mohican River and an area of recreation for public use. The reservoir was constructed in 1936 with the nearest community to the dam being Greer at a distance of 14.4 miles.

The second largest Class I dam is found in Mifflin Township at Charles Mill Lake. It was constructed in 1936 for flood control of the Black Fork Mohican River and also as a public recreation area. The dam's nearest affected community is Perrysville at a distance of 9.8 miles.

Cinnamon Lake Dam is Ashland County's third largest Class I dam and is located in Jackson Township. Cinnamon Lake Dam's capacity is 47.8M gallons. Its drainage area is 3.41 square miles with the closest affected community being West Salem, 4.2 miles away. The dam contains waters from Muddy Fork for the purpose of private recreation.

Another Class I dam is the Mohicanville Dam which is located in Mohican Township. The dam was constructed in 1936 and the nearest affected community is Lakeville, 5.3 miles away. Mohicanville Dam is a dry dam with the sole purpose of providing flood control.

The smallest of the five Class I dams is located at Artesian Lake in Montgomery Township. The dam was constructed before 1968 for the purpose of private recreation. The drainage area of the dam is calculated at 0.49 square miles.

Ohio Dam Locator

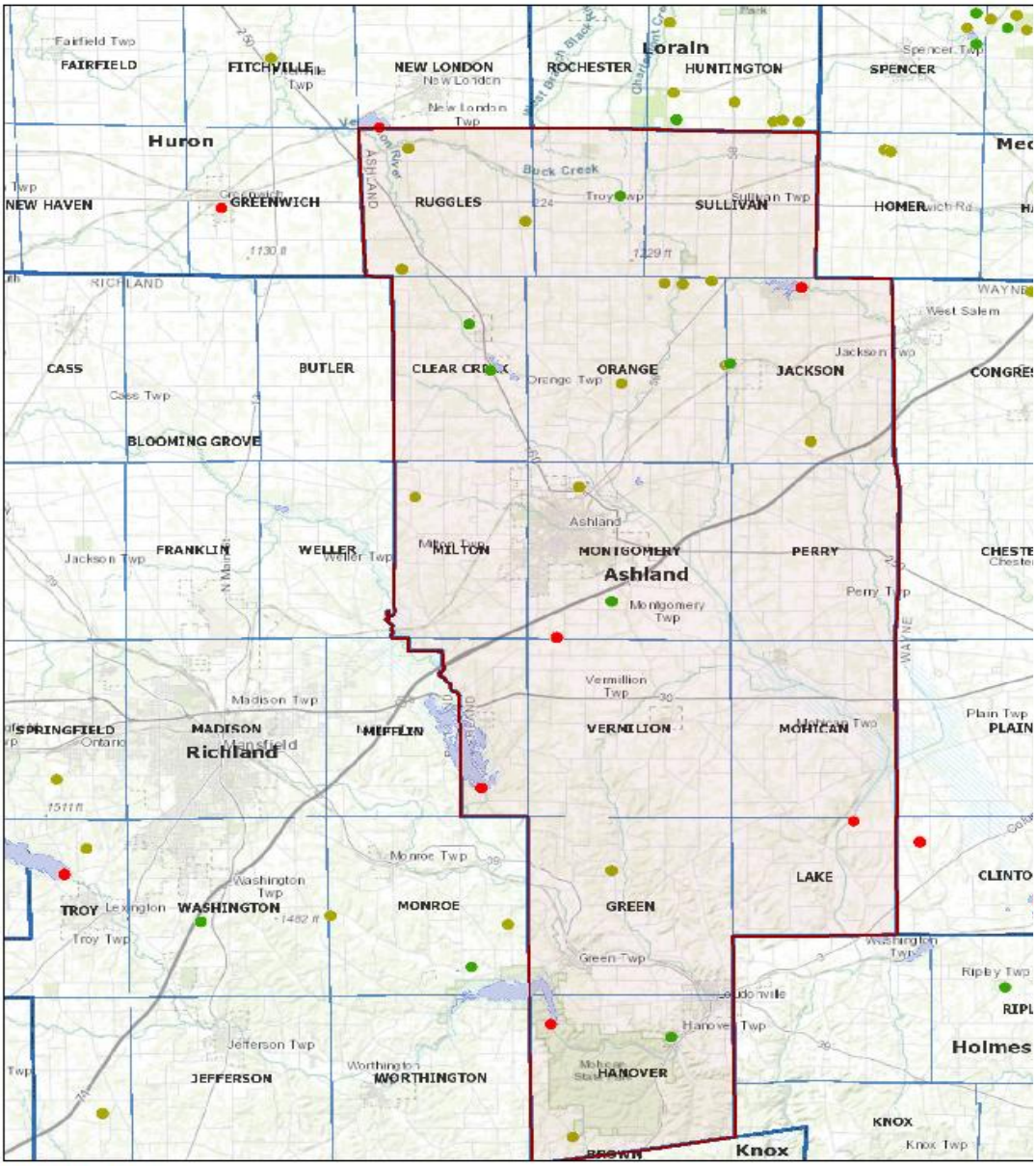


TABLE: Ashland County Dam Data Summaries

Dam Name	Swinger Pond Dam	Savannah WWTP Lagoons	Zupan Lake Dam	Bredenbeck Lake Dam	Cinnamon Lake Dam	Bash Lake Dam	Rohr's Lake Dam
NIDID	OH00998	OH02913	OH02982	OH01148	OH00095	OH01146	OH01001
Hazard Potential	Low	Significant	Low	Low	High	Low	Low
ODNR Classification	Class III	Class II	Class III	Class II	Class I	Class III	Class III
Inspection Date	11/24/2015	12/16/2015	11/24/2015	11/24/2015	11/24/2015	11/16/2015	10/19/2016
Owner Type	Private	Local Government	Private	Private	Private	Private	Private
NID Height (Ft.)	27	44	31	17.5	45	23.69	22
NID Storage	45.89	41.6	474	62	3577	141	471
Primary Purpose	Recreation	Other	Recreation	Recreation	Recreation	Recreation	Recreation
Dam Type	Earth	Earth	Earth	Earth	Earth	Earth	Earth
River	Tributary to Orange Creek	Unnamed Trib to Vermilion River	Tributary to Orange Creek	Tributary to Orange Creek	Muddy Fork	Tributary to Honey Creek	Tributary to Buck Creek
Nearest City	Nankin	Fitchville	Nankin	Nankin	West Salem	Loudonville	Fitchville
Distance To City (Mi.)	1.3	17.8	5.7	6	4.2	5.3	11.4
Permitting Authority	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Inspection Authority	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Enforcement Authority	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Eap Last Rev Date	-	-	-	-	-	-	-
Condition Assessment	Not Rated	Satisfactory	Satisfactory	Not Rated	Satisfactory	Not Rated	Not Rated
Condition Assessment Date	-	-	-	-	-	-	-
Condition Assessment Detail	-	Meets applicable hydrologic and seismic regulatory criteria	Meets applicable hydrologic and seismic regulatory criteria	-	Meets applicable hydrologic and seismic regulatory criteria	-	-

TABLE: Ashland County Dam Data Summaries (cont.)

Dam Name	Artesian Lake Dam	Charles Mill Dam	Lake Silverstone Dam No.I	Thompson Lake Dam	Bailey Lake Dam	Big T Ranch Lake Dam	Jacobs Lake Dam
NIDID	OH01144	OH00020	OH01167	OH01170	OH01145	OH01147	OH00094
Hazard Potential	High	High	Low	Significant	Significant	Low	Significant
ODNR Classification	Class I	Class I	Class III	Class II	Class II	Class III	Class II
Inspection Date	12/16/2015	7/27/2017	12/16/2015	11/19/2015	10/4/2016	11/24/2015	12/15/2015
Owner Type	Private	Federal	Private	Private	Local Government	Private	Private
NID Height (Ft.)	17.5	52	18	16.19	15.1	25	25
NID Storage	86	88000	76	33.39	43.29	206	62.6
Primary Purpose	Recreation	Flood Control	Recreation	Recreation	Recreation	Recreation	Recreation
Dam Type	Earth	Earth	Earth	Earth	Earth	Earth	Earth
River	Tributary to Newell Run	Black Fork of Mohican River	Tributary to Lang Creek	Tributary to Black Fork Mohican River - Offstream	Tributary to Vermilion River	Tributary to Orange Creek	Tributary to Newell Run
Nearest City	England	Perryville	Ashland	Greer	Bailey Lake	Nankin	England
Distance To City (Mi.)	5.7	8	5.3	11	-	4.9	3.4
Permitting Authority	Yes	No	Yes	Yes	Yes	Yes	Yes
Inspection Authority	Yes	No	Yes	Yes	Yes	Yes	Yes
Enforcement Authority	Yes	No	Yes	Yes	Yes	Yes	Yes
Eap Last Rev Date	-	1/1/2011	-	-	-	-	-
Condition Assessment	Fair	Fair	Not Rated	Not Rated	Satisfactory	Not Rated	Not Rated
Condition Assessment Date	-	5/12/2009	-	-	-	-	-
Condition Assessment Detail	-	-	-	-	Meets applicable hydrologic and seismic regulatory criteria	-	-

TABLE: Ashland County Dam Data Summaries (cont.)

Dam Name	Sellers Lake Dam	Stell Lake Dam	Mohicanville Dam	Uke Ranch Lake Dam	Nova Pond Dam	Rhoads Lake Dam (upper)	Pleasant Hill Dam
NIDID	OH00093	OH00098	OH00019	OH00099	OH00097	OH00096	OH00001
Hazard Potential	Low	Low	High	Low	Significant	Significant	High
ODNR Classification	Class III	Class III	Class I	Class III	Class II	Class II	Class I
Inspection Date	11/16/2015	10/19/2016	7/20/2017	10/4/2016	10/19/2016	11/15/2015	3/2/2016
Owner Type	Private	Private	Federal	Private	Private	Private	Federal
NID Height (Ft.)	29.6	26.3	46	29.3	15.19	18.3	113
NID Storage	97	128.5	102000	69	169.19	88.4	87700
Primary Purpose	Recreation	Recreation	Flood Control	Recreation	Recreation	Recreation	Flood Control
Dam Type	Earth	Earth	Earth	Earth	Earth	Earth	Earth
River	Tributary to Jelloway Creek	Tributary to Vermilion River	Lake Fork of Mohican River	Tributary to Buck Creek	Tributary to Buck Creek	Tributary to Orange Creek	Clear Fork of Mohican River
Nearest City	Jelloway	Fitchville	Brinkhaven	Fitchville	Fitchville	Polk	Brinkhaven
Distance To City (Mi.)	2.5	9.5	20	6	13.6	4.2	20
Permitting Authority	Yes	Yes	No	Yes	Yes	Yes	No
Inspection Authority	Yes	Yes	No	Yes	Yes	Yes	No
Enforcement Authority	Yes	Yes	No	Yes	Yes	Yes	No
Eap Last Rev Date	-	-	1/1/2011	-	-	-	1/1/2011
Condition Assessment	Satisfactory	Satisfactory	Fair	Not Rated	Not Rated	Satisfactory	Fair
Condition Assessment Date	-	-	9/1/2009	-	-	-	5/12/2009
Condition Assessment Detail	Meets applicable hydrologic and seismic regulatory criteria	Meets applicable hydrologic and seismic regulatory criteria	-	-	-	Meets applicable hydrologic and seismic regulatory criteria	-

Past History of Hazard Occurrence

There have been no failures of any of the aforementioned Class I or Class II dams in Ashland County since they were constructed.

Probability of Hazard Occurrence

Ashland County has not experienced a dam breach in the past 78 years. It would be realistic to assume that based upon past history, Ashland County would have a less than 1% chance of experiencing a dam failure in the next 100 years. However, most dam failures occur as a result of prolonged rains, flooding, or debris jams; and based on historical data, Ashland County has a 61% chance that the county will experience a flood or flash flood event any given year.

Magnitude & Severity

Flooding of nearby homes and other occupied structures would be considered a likely outcome should a breach of a Class I dam occur. Based upon the number of structures located downstream of Class 1 dams, Ashland County could potentially see damage totals as outlined in the tables below. Roadways and adjacent agricultural properties within close proximity of the dam could also be affected but were not included in the estimated totals below.

DAM FAILURE – PLEASANT HILL		
Structure Type	Structures at Risk	Potential Damage/Exposure
Residential	50	$6,750,000
Non-Residential	1	164,500
Critical Facilities	0	$ 0.00
Total	51	6,885,000

DAM FAILURE – CHARLES MILL LAKE		
Structure Type	Structures at Risk	Potential Damage/Exposure
Residential	33	$2,141,000
Non-Residential	0	$ 0.00
Critical Facilities	0	$ 0.00
Total	33	$2,141,000

DAM FAILURE – CINNAMON LAKE		
Structure Type	Structures at Risk	Potential Damage/Exposure
Residential	17	$2,295,000
Non-Residential	0	$ 0.00
Critical Facilities	0	$ 0.00

Total	17	$2,295,000

DAM FAILURE – MOHICANVILLE		
Structure Type	Structures at Risk	Potential Damage/Exposure
Residential	18	$3,006,000
Non-Residential	0	$ 0.00
Critical Facilities	0	$ 0.00
Total	18	$3,006,000

DAM FAILURE – ARTESIAN LAKE		
Structure Type	Structures at Risk	Potential Damage/Exposure
Residential	12	$2,220,000
Non-Residential	0	$ 0.00
Critical Facilities	0	$ 0.00
Total	12	$2,220,000

Speed of Onset & Duration

Dam failures or levee breaches can occur quickly with little to no warning. The duration of a dam failure will vary depending on the breach. For minor failures in the dam, a breach could occur within hours while other failures or breeches can take days to weeks.

Drought

FEMA defines drought as: "a period of unusually constant dry weather that persists long enough to cause deficiencies in water supply (surface or underground). Droughts are slow-onset hazards, but, over time, they can severely affect crops, municipal water supplies, recreational resources, and wildlife. If drought conditions extend over a number of years, the direct and indirect economic impacts can be significant. High temperatures, high winds, and low humidity can worsen drought conditions and also make areas more susceptible to wildfire. In addition, human actions and demands for water resources can accelerate drought-related impacts."

Droughts are measured using the Standardized Precipitation Index (SPI) and the Palmer Drought Severity Index. The SPI measures precipitation where the Palmer Drought Severity Index measures the duration and intensity of the drought. Long-term drought is cumulative, so the intensity of drought during the current month is dependent on the current weather patterns and the previous month's weather patterns (see table below).

Drought Severity	Return Period (years)	Description of Possible Impacts	Drought Monitoring Indices		
			Standardized Precipitation Index (SPI)	NDMC* Drought Category	Palmer Drought Index
Minor Drought	3 to 4	Going into drought; short-term dryness slowing growth of crops or pastures; fire risk above average. Coming out of drought; some lingering water deficits; pastures or crops not fully recovered.	-0.5 to -0.7	D0	-1.0 to -1.9
Moderate Drought	5 to 9	Some damage to crops or pastures; fire risk high; streams, reservoirs, or wells low, some water shortages developing or imminent, voluntary water use restrictions requested.	-0.8 to -1.2	D1	-2.0 to -2.9
Severe Drought	10 to 17	Crop or pasture losses likely; fire risk very high; water shortages common; water restrictions imposed.	-1.3 to -1.5	D2	-3.0 to -3.9
Extreme Drought	18 to 43	Major crop and pasture losses; extreme fire danger; widespread water shortages or restrictions.	-1.6 to -1.9	D3	-4.0 to -4.9
Exceptional Drought	44+	Exceptional and widespread crop and pasture losses; exceptional fire risk; shortages of water in reservoirs, streams, and wells creating water emergencies.	less than -2	D4	-5.0 or less

*NDMC - National Drought Mitigation Center

Past History of Hazard Occurrence

Based on the previous plan's hazard analysis and NOAA's National Climatic Data Center, Ashland County has seen ten (10) droughts since 1930. For a detailed list, see the table below.

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
ASHLAND (ZONE)	1930-1936		Drought					
ASHLAND (ZONE)	1939-1946		Drought					
ASHLAND (ZONE)	1952-1957		Drought					
ASHLAND (ZONE)	1959-1968		Drought					
ASHLAND (ZONE)	1988		Drought					
ASHLAND (ZONE)	08/01/1996	00:00	Drought		0	0	0.00K	0.00K
ASHLAND (ZONE)	06/01/1999	00:00	Drought		0	0	0.00K	0.00K
ASHLAND (ZONE)	07/01/1999	00:00	Drought		0	0	0.00K	0.00K
ASHLAND (ZONE)	08/01/1999	00:00	Drought		0	0	0.00K	0.00K
ASHLAND (ZONE)	09/01/1999	00:00	Drought		0	0	0.00K	9.000M
ASHLAND (ZONE)	06/01/2012	00:00	Drought		0	0	0.00K	0.000M
				Totals:	0	0	0.00K	9.000M

Past Event Narratives

The North American Drought of 1988-1989: This drought spread from the Mid-Atlantic, Southeast, Midwest, Northern Great Plains, and Western United States. It was widespread, unusually intense, and accompanied by heat waves which killed 4,800 to 17,000 people across the country and also livestock. A couple of the reasons that the Drought of 1989 was damaging to farmers might have resulted due to farming on land that was marginally arable and the pumping of groundwater near the depletion mark. The Drought of 1989 destroyed crops almost nationwide, residents' lawns went brown, and water restrictions were declared in many cities. This drought was catastrophic for multiple reasons; it continued across the Midwest States and North Plains States during 1989, not officially ending until 1990.

Ashland County Drought: September 1999 - Drought conditions continued across most of northern Ohio during September. Widespread heavy rain occurred on the 29th but did little to help crop conditions. For the month, only 1.63 inches of rain fell in Mansfield making it the 9th driest September on record. Of the 1.63 inches, 1.14 inches fell on the 29th. Even with an inch of rain on the 29th, both Toledo and Cleveland finished with below two inches of rain for the month. Losses from reduced crop yields were estimated at $200 million for northern Ohio alone.

The North American Drought of 2012: The 2012-2013 North American Drought included most of the U.S. and many counties in Ohio. The drought is an expansion of the 2010-2012 United States Drought which began in the spring of 2012, when the lack of snow in the U.S. caused very little melt water to absorb into the soil.

Ashland County was designated with moderate drought conditions by mid-June. The North American Drought has not been in place long, but has equaled the effects of droughts from the 1930s and 1950s. However, the North American Drought is expected to continue to have catastrophic economic ramifications. In most measures, the drought has exceeded the 1988-1989 North American Drought, which is the most recent comparable drought.

On July 30, 2012, the Governor sent a memorandum to the USDA requesting primary county natural disaster designations for eligible counties due to agricultural losses caused by drought and additional disasters during the 2012 crop year. The USDA reviewed the Loss Assessment Reports and determined that there were sufficient production losses in 85 counties to warrant a Secretarial disaster designation. On September 5, 2012, Ashland County was one of the designated counties.

Probability of Hazard Occurrence

Based on the county's historical data, there is a 12% chance of Ashland County experiencing a drought within a given year. The State of Ohio averages two drought events per decade.

Magnitude & Severity

Droughts primarily affect crops and livestock and rarely pose a threat to buildings and infrastructure. If a drought occurs in Ashland County, there is 160,698 acres of farmland that could be severely impacted and the water supply could be depleted.

As mentioned, losses of agricultural productivity would indeed be an issue. Data for the crop yields were acquired from the Ohio Farm Bureau and the table below highlights the losses incurred in a drought year compared to a regular growing season.

Commodity	2011 Production	2012 Drought Year	2012 % Difference	2018 Production	2019 Estimates	Potential Losses
Corn –Acres Planted	43,900	42,400	-1,500	40,000	40,000	0
Corn, Grain – Acres Harvested	34,500	36,200	+1,700	33,500	35,000	+1,500
Corn, Grain – Production measured in BU	5,014,000	4,393,000	- 621,000	5,100,000	5,100,000	0
Corn, Grain – Yield, Measured in BU/Acre	145.3	121.4	-23.9	152.2	145.7	-6.5
Hay, Alfalfa – Acres Harvested	8,800	-				0
Hay, Alfalfa – Production	40,800	-				0

measured in tons						
Hay, Alfalfa – Yield, measured in tons/acres	4.65	-				0
Soybeans – Soybeans – Acres Harvested	40,500	42,000	+1,500		35,700	0
Soybeans – Soybeans – Acres Planted	40,600	42,100	+1,500		36,000	0
Soybeans – Production measured in BU	1,832,000	1,731,000	- 101,000		1,755,000	0
Soybeans – Yield, measured in BU/Acre	45.2	41.2	- 4.0		49.2	0
Wheat – Winter-Acres Harvested	9,100	-		3,400	2,900	-500
Wheat – Winter-Acres Planted	9,800	-		5,300	4,600	-700
Wheat – Wheat, Winter-Production, measured in BU	458,000	-		200,000	155,000	-45,000
Wheat – Wheat, Winter-Yield, measured in BU/Acre	50.3	-		58.8	53.4	-5.4

Speed of Onset & Duration

Droughts are a non-spatial hazard and would impact the entire county. Droughts are a slow onset hazard where only the effects are seen. Drought duration can last from a few weeks to several years.

Earthquake

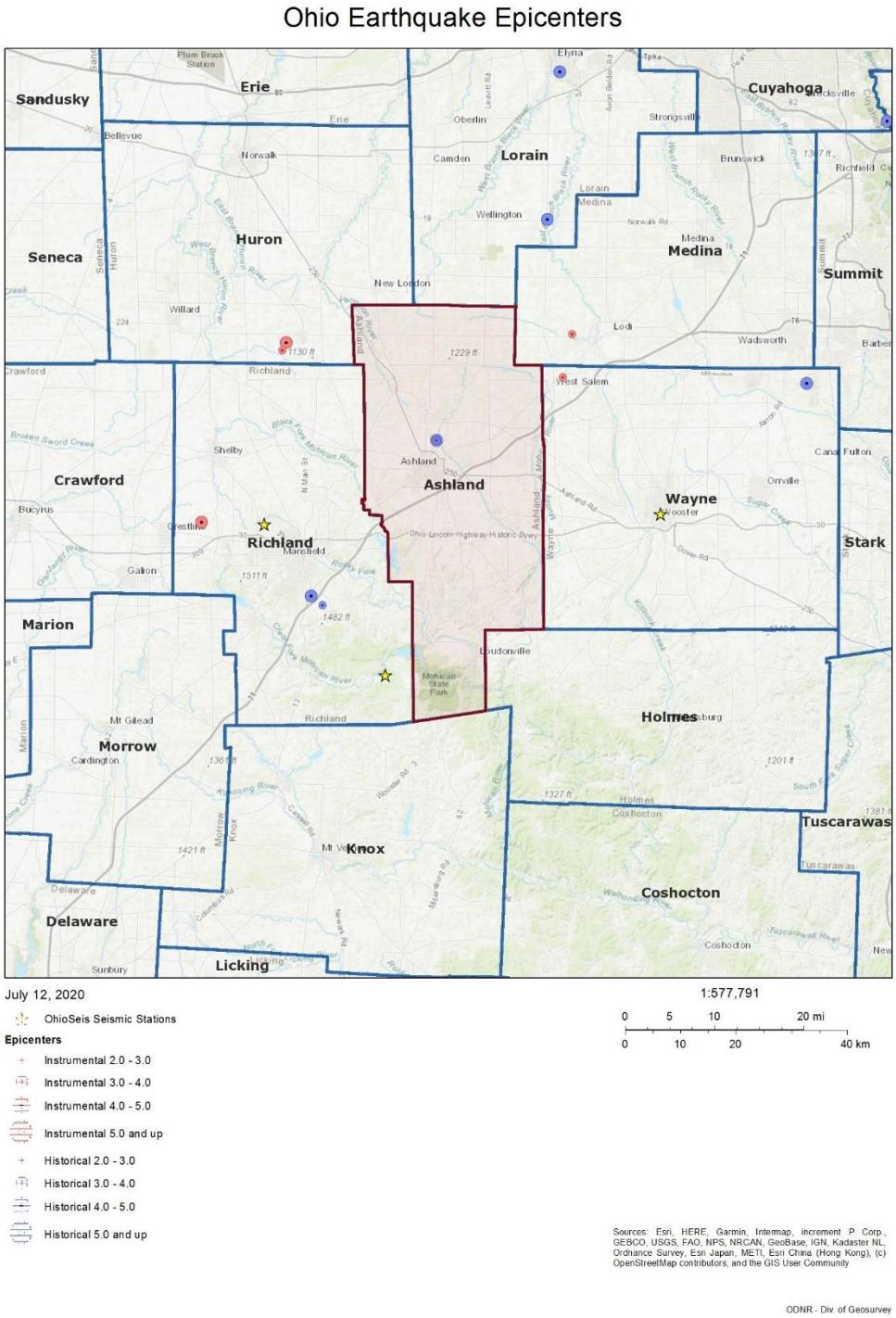
An earthquake is a sudden release of energy that creates a movement in the earth's crust. Most earthquake-related property damage and deaths are caused by the failure and collapse of structures due to ground shaking. The level of damage depends upon the extent and duration of the shaking. Other damaging earthquake effects include landslides, the down-slope movement of soil and rock (in mountain regions and along hillsides), and liquefaction.

Earthquakes are measured using the Richter and Modified Mercalli Intensity Scale. The Richter Scale assigns a single number to quantify the amount of seismic energy released by an earthquake where the Modified Mercalli Intensity Scale measures the intensity of an earthquake's effects in a given locality (based on observations of earthquake effects at specific places). See the below table.

Richter Scale	Typical Maximum Modified Mercalli Intensity		
1.0 - 3.0	I	I – INSTRUMENTAL	Not felt
3.0 - 3.9	II - III	II – WEAK	Felt by only a few people, especially on the upper floors of tall buildings.
		III – SLIGHT	Felt quite noticeably by people indoors, especially on the upper floors of buildings. Standing motor cars may rock slightly. Vibration similar to the passing of a truck.
4.0 - 4.9	IV - V	IV - MODERATE	Felt indoors by many people, by few outdoors. Standing motor cars rock noticeably. Dishes and windows rattle alarmingly. Sensation like heavy truck striking building.
		V – RATHER STRONG	Generally felt by most. Dishes and windows may break and large bells will ring. Vibrations like large train passing close to house.
5.0 - 5.9	VI- VII	VI – STRONG	Felt by all; many frightened and run outdoors, walk unsteadily. Windows, dishes, glassware broken; books fall off shelves; some heavy furniture moved or overturned; a few instances of fallen plaster. Damage slight.
		VII – VERY STRONG	Slight to moderate damage in ordinary structures
6.0 - 6.9	VII - IX	VIII – DESTRUCTIVE	Considerable damage in ordinary structures; chimneys and monuments fall.
		IX – VIOLENT	Considerable damage in all structures; ground cracks; underground pipes break.
7.0+	VIII-XII	X – INTENSE	Most structures destroyed; rails bend; landslides occur.
		XI - EXTREME	Few structures left standing; bridges destroyed; broad fissures in the ground underground pipes break.
		XII - CATASTROPHIC	Total destruction; objects thrown into the air; ground moves in waves or ripples; river routes may change direction.

Past History of Hazard Occurrence

According to data from the Ohio Seismic Network, there were four earthquakes with an RMS greater than 2.0 recorded in Ashland County since 1776. All four occurred between June and August of 1940, three with an RMS of 2.9 and one with an RMS of 3.0.



Past Event Narratives

Event Details	Event Narrative
June – August 1940 Event Type: Earthquake Location: Ashland Magnitude: 2.0 – 3.0 Fatalities/Injuries: 0/0 Property Damage: $0	According to data from the Ohio Seismic Network, Ashland County experienced four earthquakes with an RMS greater than 2.0 between June and August of 1940. Three of the earthquakes had a magnitude of 2.9 and one earthquake had a magnitude of 3.0. No damages or injuries were reported.

Probability of Hazard Occurrence

Based on historical data, Ashland County has experienced four (4) earthquakes in the last 80 years and has a 5% chance of experiencing an earthquake in any given year.

Magnitude & Severity

According to the US Geological Survey (USGS), the entirety of Ashland County falls within the New Madrid Seismic Zone. This seismic zone has been the source of numerous earthquakes that have resulted in earthquakes of magnitudes that span the Richter Scale. Effects to structures, as well as to infrastructure, may be possible from future incidences of an earthquake within the county. Past earthquake events have resulted in no structural damage. There have been no human losses (injuries or deaths). Based upon the historical data, the entirety of Ashland County would continue to have an earthquake potential. However, as previously stated, the losses that might be incurred in such events would be estimated as minimal.

The State of Ohio EMA utilized HAZUS-MH to generate an earthquake event report that estimates the potential losses that Ashland County could expect to experience if a 5.0 magnitude earthquake impacted the City of Ashland. HAZUS estimates that about 4,477 buildings will be at least moderately damaged. This is over 20.00 % of the buildings in the region. There are an estimated 288 buildings that will be damaged beyond repair. Estimated losses are documented in the tables below.

Table 1: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	%	Count	%	Count	%	Count	%	Count	%
Agriculture	119.13	0.92	50.79	0.99	58.12	1.86	28.45	2.66	6.51	2.26
Commercial	513.29	3.97	255.40	4.96	297.49	9.53	148.01	13.86	43.81	15.20
Education	23.37	0.18	10.77	0.21	12.99	0.42	5.98	0.56	1.88	0.65
Government	24.04	0.19	12.12	0.24	15.27	0.49	6.51	0.61	2.05	0.71
Industrial	163.88	1.27	82.59	1.60	109.15	3.50	61.75	5.78	17.63	6.12
Other Residential	776.92	6.01	450.64	8.74	517.44	16.58	235.82	22.08	51.18	17.75

Religion	103.90	0.80	46.96	0.91	44.68	1.43	23.26	2.18	7.21	2.50
Single Family	11207.38	86.66	4244.32	82.36	2065.89	66.19	558.45	52.28	157.98	54.80
Total	**12,932**		**5,154**		**3,121**		**1,068**		**288**	

Based on HAZUS report, UH Samaritan Medical Center had 70 hospital beds available for use before the earthquake. On the day of the earthquake the model estimates that only 10 hospital beds (16.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 27.00% of the beds will be back in service. By 30 days, 58.00% will be operational.

Table 2: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage > 50%	Complete Damage > 50%	With Functionality > 50% on day 1
Hospitals	1	1	0	0
Schools	29	10	0	10
EOCs	0	0	0	0
Police Stations	5	2	0	2
Fire Stations	8	1	0	3

Table 3: Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipeline Length (miles)	Number of Leaks	Number of Breaks
Potable Water	2,657	339	85
Waste Water	1,594	170	43
Natural Gas	1,063	58	15
Oil	0	0	0

Table 4: Expected Potable Water and Electric Power System Performance

	Total # of Households	Number of Households without Service				
		At Day 1	At Day 3	At Day 7	At Day 30	At Day 90
Potable Water	20,196	210	0	0	0	0
Electric Power		9,434	5,778	2,170	357	12

Table 5: Building-Related Economic Loss Estimates (Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income	Wages	0.0000	1.4721	18.6635	2.1577	2.1062	24.3995
	Capital-	0.0000	0.6279	14.7417	1.3033	0.5861	17.2590

	Related						
	Rental	6.2464	4.9372	6.7287	0.7721	1.0448	19.7292
	Relocation	21.7892	3.3824	12.1852	3.4107	9.4284	50.1959
	Subtotal	**28.0356**	**10.4196**	**52.3191**	**7.6438**	**13.1655**	**111.5836**
Capital Stock Losses	Structural	34.9948	9.8221	18.3425	12.8044	10.6554	86.6192
	Non-Structural	138.1287	43.5679	52.1284	40.6012	27.8016	302.2278
	Content	56.4812	12.9657	29.8245	29.5163	16.5142	145.3019
	Inventory	0.0000	0.0000	0.7322	5.7707	0.2712	6.7741
	Subtotal	229.6047	66.3557	101.0276	88.6926	55.2424	540.9230
Total		**257.64**	**76.78**	**153.35**	**96.34**	**68.41**	**652.51**

Table 6: Expected Transportation System Economic Losses (Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	1056.5967	0.0000	0.00
	Bridges	141.3418	2.8871	2.04
	Tunnels	0.0000	0.0000	0.00
	Subtotal	**1197.9385**	**2.8871**	
Railway	Segments	86.1903	0.0000	0.00
	Bridges	0.0567	0.0007	1.23
	Tunnels	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Subtotal	**86.2470**	**0.0007**	
Airport	Facilities	10.6510	4.1649	39.10
	Runways	37.9640	0.0000	0.00
	Subtotal	**48.6150**	**4.1649**	**39.10**
	TOTAL	**1,332.80**	**7.05**	

Table 7: Expected Utility System Economic Losses

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.0000	0.0000	0.00
	Facilities	69.9300	6.9051	9.87
	Distribution Lines	85.5358	1.5262	1.78
	Subtotal	**155.4658**	**8.4313**	
Waste Water	Pipelines	0.0000	0.0000	0.00
	Facilities	629.3700	88.6118	14.08
	Distribution Lines	51.3215	0.7666	1.49
	Subtotal	**680.6915**	**89.3784**	
Natural Gas	Pipelines	0.0000	0.0000	0.00
	Facilities	0.0000	0.0000	0.00
	Distribution	34.2143	0.2626	0.77

	Lines			
	Subtotal	**34.2143**	**0.2626**	
Communications	Facilities	0.3150	0.1017	32.29
	Subtotal	**0.3150**	**0.1017**	
	TOTAL	**870.69**	**98.17**	

Speed of Onset & Duration

Earthquakes are an immediate impact hazard that occur without warning. Earthquakes are relatively short in duration and only last for mere seconds.

Epidemic / Pandemic

The Centers for Disease Control and Prevention (CDC) describes an epidemic as an unexpected increase in the number of disease cases in a specific geographical area. An epidemic disease doesn't necessarily have to be contagious. Examples of an epidemic include: yellow fever, smallpox, measles, and polio.

Whereas, a pandemic is the worldwide spread of a new disease. Since most people do not have immunity, the virus spreads rapidly and infects a large number of people. Viruses that have caused past pandemics typically originated from animal influenza viruses. Species that are thought to be important in the emergence of new human strains are pigs, chickens and ducks. Influenza A viruses can occasionally be transmitted from wild birds to other species causing outbreaks in domestic poultry and may give rise to human influenza pandemics.

The World Health Organization (WHO) declares a pandemic when a disease's growth is exponential, the virus covers a wide area, and affects several countries.

Past History of Hazard Occurrence

According to the Centers for Disease Control and Prevention, the US has experienced five (5) pandemic events in the last 103 years.

Past Event Narratives

Event Details	Event Narrative
2020-2021 Event Type: Pandemic Location: Nationwide Duration: 24 months + Cases / Fatalities: 269,176,282 cases / 5,295,886 Economic Impact: TBD	COVID-19 is caused by a novel coronavirus—a new coronavirus strain that had not been previously found in people. An outbreak of COVID-19 was detected in mainland China in December 2019. Symptoms include respiratory problems, fever and cough, and can lead to pneumonia and death. Like SARS, it's spread through droplets from sneezes. Without a vaccine available until December 2020, the virus spread beyond China borders to every country in the world. As of December 2021, there have been more than 49,844,242 cases in the US, with more than 794,558 deaths.

Event Details	Event Narrative
April 15, 2009 – August 11, 2010 Event Type: Pandemic	In the spring of 2009, a novel influenza A (H1N1) virus emerged. It was detected first in the United States and spread

Location: Nationwide Duration: 16 months Fatalities/Injuries: 12,469/60.8 million cases Property Damage: $ 0	quickly across the United States and the world. This new H1N1 virus contained a unique combination of influenza genes not previously identified in animals or people. This virus was designated as influenza A (H1N1)pdm09 virus. Since the (H1N1)pdm09 virus was very different from circulating H1N1 viruses, vaccination with seasonal flu vaccines offered little cross-protection against (H1N1)pdm09 virus infection. The 2009 flu pandemic primarily affected children and young and middle-aged adults, CDC estimated there were 60.8 million cases (range: 43.3-89.3 million), 274,304 hospitalizations (range: 195,086-402,719), and 12,469 deaths (range: 8868-18,306) in the United States due to the (H1N1)pdm09 virus.

Event Details	**Event Narrative**
1918-1919 Event Type: Pandemic Location: Nationwide Duration: 1+year Fatalities/Injuries: 675,000/500 million cases Property Damage: $0	The 1918 influenza pandemic was the most severe pandemic in recent history. It was caused by an H1N1 virus with genes of avian origin and it spread worldwide during 1918-1919. In the United States, it was first identified in military personnel in spring 1918. It is estimated that about 500 million people or one-third of the world's population became infected with this virus. The number of deaths was estimated to be at least 50 million worldwide with about 675,000 occurring in the United States. Mortality was high in people younger than 5 years old, 20-40 years old, and 65 years and older. The high mortality in healthy people, including those in the 20-40 year age group, was a unique feature of this pandemic. With no vaccine to protect against influenza infection and no antibiotics to treat secondary bacterial infections that can be associated with influenza infections, control efforts worldwide were limited to non-pharmaceutical interventions such as isolation, quarantine, good personal hygiene, use of disinfectants, and limitations of public gatherings, which were applied unevenly.

Probability of Hazard Occurrence

Based on historical data, there have been five (5) pandemics in the past 103 years. Pandemics have occurred every few decades and have a 4.8% chance of occurring in any given year.

Magnitude & Severity

Pandemics are non-spatial hazards which occur world-wide. The severity of a pandemic tends to be higher because the population lacks immunity to the new virus. So, when a large portion of the population gets infected, the total number of severe cases can be quite large. History has shown that during a pandemic a minimum of 25% of the population gets infected. With the 1889–1890 and 1918-1919 flu pandemics each came in three or four waves of increasing lethality. But within any given wave, mortality was greater at the beginning of the wave.

In regards to the current COVID-19 Pandemic, Ashland County has seen 4,347 cases, has had 296 hospitalizations, and 95 deaths as of June 2021.

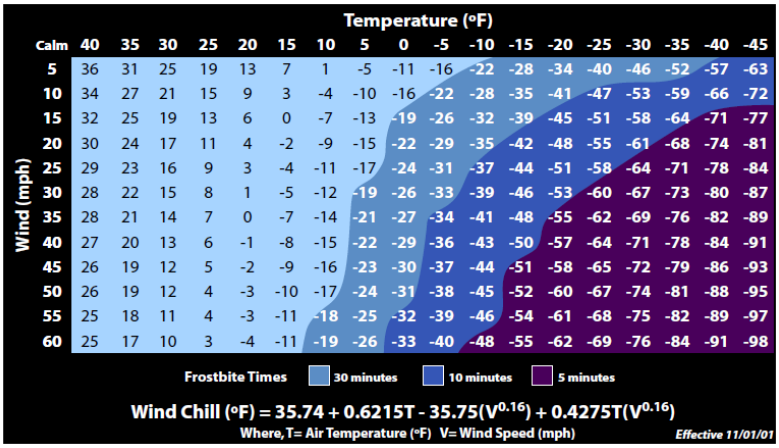
Speed of Onset & Duration

The World Health Organization (WHO) and the CDC monitor data to predict where and how a disease might spread. The primary goal of monitoring is to identify any outbreak of human-to-human transmission quickly so health officials can attempt to contain and control it.

As we have seen first-hand with COVID-19 and H1N1, a pandemic can last for well over a year or more.

Extreme Temperature

Extreme heat and extreme cold constitute different conditions in different parts of the country. Extreme cold can range from near freezing temperatures in the southern United States to temperatures well below zero in the northern states. Extremely cold temperatures often accompany a winter storm. Exposure to cold temperatures, whether indoors or outside, can cause other serious or life-threatening health problems and/or the loss of utilities, sometimes for days at a time. The Wind Chill Index (as seen below) is often used to describe the apparent severity of the cold.



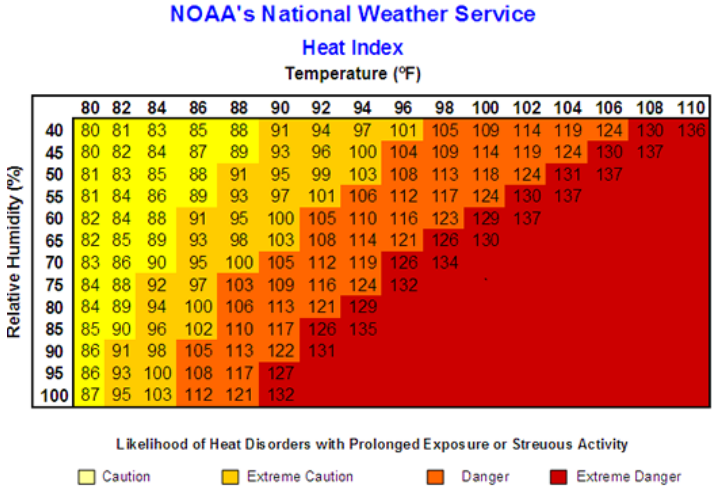
Wind (mph) \ Temperature (°F)	Calm	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
5		36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
10		34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
15		32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
20		30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
25		29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
30		28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
35		28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
40		27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
45		26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
50		26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
55		25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
60		25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98

Frostbite Times: 30 minutes | 10 minutes | 5 minutes

$$\text{Wind Chill (°F)} = 35.74 + 0.6215T - 35.75(V^{0.16}) + 0.4275T(V^{0.16})$$

Where, T= Air Temperature (°F) V= Wind Speed (mph) *Effective 11/01/01*

Similarly, extreme heat is typically recognized as the condition where temperatures consistently stay ten (10) degrees or more above the average high temperature for the region and are maintained for more than two days. In extreme heat conditions, high humidity stops the body from being able to maintain or cool itself through sweating or evaporation. Consequently, people living in urban areas are at a greater risk from the effects of a prolonged heat wave because asphalt and concrete store heat longer and gradually release it at night. The Heat Index (as seen below) can be used to determine the effects which temperature and humidity can have on the population.



NOAA's National Weather Service

Heat Index

Relative Humidity (%) \ Temperature (°F)	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	126	130					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

Caution | Extreme Caution | Danger | Extreme Danger

Category	Heat Index	Health Hazards
Extreme Danger	130°F – Higher	Heat Stroke/Sunstroke is likely with continued exposure.
Danger	105°F - 129°F	Sunstroke, muscle cramps and/or heat exhaustion possible with prolonged exposure and/or physical activity.
Extreme Caution	90°F - 105°F	Sunstroke, muscle cramps and/or heat exhaustion possible with prolonged exposure and/or physical activity.
Caution	80°F - 90°F	Fatigue possible with prolonged exposure and/or physical activity.

Past History of Hazard Occurrence

According to NOAA's National Climatic Data Center, Ashland County has experienced two (2) heat events, eight (8) extreme cold/wind chill, and four (4) cold/wind chill events between 1/01/1950 and 7/31/2020 (see the tables below).

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
ASHLAND (ZONE)	06/06/1999	00:00	Heat		0	0	0.00K	0.00K
ASHLAND (ZONE)	07/01/1999	00:00	Heat		0	0	0.00K	0.00K
				Totals:	0	0	0.00K	0.00K

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
ASHLAND (ZONE)	01/15/2009	00:00	Extreme Cold/wind Chill		0	0	0.00K	0.00K
ASHLAND (ZONE)	04/29/2012	03:00	Extreme Cold/wind Chill		0	0	100.00K	0.00K
ASHLAND (ZONE)	04/29/2012	04:00	Extreme Cold/wind Chill		0	0	100.00K	0.00K
ASHLAND (ZONE)	01/06/2014	10:00	Extreme Cold/wind Chill		0	0	0.00K	0.00K
ASHLAND (ZONE)	01/28/2014	03:00	Extreme Cold/wind Chill		0	0	0.00K	0.00K
ASHLAND (ZONE)	02/15/2015	04:00	Extreme Cold/wind Chill		0	0	0.00K	0.00K
ASHLAND (ZONE)	02/20/2015	00:00	Extreme Cold/wind Chill		0	0	0.00K	0.00K
ASHLAND (ZONE)	01/30/2019	07:00	Extreme Cold/wind Chill		0	0	0.00K	0.00K
				Totals:	0	0	200.00K	0.00K

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD

ASHLAND (ZONE)	02/02/1996	20:00	Cold/wind Chill		0	0	50.00K	0.00K
ASHLAND (ZONE)	01/10/1997	00:00	Cold/wind Chill		0	0	5.00K	0.00K
ASHLAND (ZONE)	03/27/2012	02:00	Cold/wind Chill		0	0	0.00K	0.00K
ASHLAND (ZONE)	01/08/2015	05:00	Cold/wind Chill		0	0	0.00K	0.00K
				Totals:	0	0	55.00K	0.00K

Past Event Narratives

Event Details	Event Narrative
April 29, 2014 Event Type: Extreme Cold/Wind Chill Location: Countywide Duration: 3:00am – 4:00am Fatalities/Injuries: 0/0 Property Damage: $ 100,000	An area of strong high pressure was centered over the upper Ohio Valley on the morning of April 29th. Clear skies and calm winds allowed for very cold low temperatures. Readings in some areas dipped into the lower 20s and temperatures were below freezing at most locations for several hours. As much as 80 percent of the grape crop was destroyed. Fruit trees in northern Ohio were also hit hard. Monetary losses from this freeze were significant. Temperatures dipped below freezing for several hours causing extensive damage to crops and produce. Damage to fruit trees was significant. Low temperatures were in the upper 20s many areas.

Event Details	Event Narrative
February 2, 1996 Event Type: Cold/Wind Chill Location: Countywide Duration 10:00pm Fatalities/Injuries: 0/0 Property Damage: $ 50,000	Bitter cold arctic air was over the area with overnight low temperatures averaging between zero and 10 below and daytime high temperatures in the single digits. Wind gusts of 25 mph on the 2nd dropped wind chills as low as 40 below zero and the wind picked back up on the 5th again bringing similarly low wind chills. Record lows were set at most stations across northern Ohio for the 3rd and 4th. A number of pipes and water mains froze and/or broke.

Event Details	Event Narrative
January 10, 1997 – January 19, 1997 Event Type: Cold/Wind Chill Location: Countywide Duration 12:00am – 11:59pm Fatalities/Injuries: 0/0	Low temperatures were in the single digits or below zero across all of Northern Ohio, causing frozen and ruptured water pipes. With wind chills of 40 to 50 below zero, many schools were forced to close.

Property Damage: $ 5,000	

Probability of Hazard Occurrence

Based on Ashland County's historical data, there have been fourteen (14) extreme temperature events in the past 70 years, and have a 20% chance of experiencing an extreme temperature event any given year.

Magnitude & Severity

Extreme temperature events are non-spatial hazards which occur county-wide. Extreme temperature events generally impact residents, crops, and animals but not the build environment. Fatalities can result from extreme temperatures, as they can push the human body beyond its limits (hyperthermia and hypothermia). The most severe extreme temperature event in Ashland County resulted in property damages totaling $100,000.

Speed of Onset & Duration

The National Weather Service will issue an extreme temperature warning (wind chill or excessive heat) when there is the potential for temperatures to approach hazardous levels. Warnings are usually issued 6 to 18 hours prior to the event. Extreme temperature events normally last for several days.

Flood

FEMA defines flood as a partial or complete inundation of normally dry land. Flooding could result from torrential rains occurring for a short period of time (flash floods), moderate to heavy rains lasting an extended period of time, normal level rains on saturated land areas, melting snow and ice, or from ice jams in waterways that release during increased water flow in winter. The various types of flooding include riverine flooding, coastal flooding, and shallow flooding. Common impacts of flooding include damage to personal property, buildings, and infrastructure; bridge and road closures; service disruptions; and injuries or even fatalities.

Past History of Hazard Occurrence

The table below provides data on past flooding events. This data was obtained from the National Climate Data Center. According to NOAA's National Climatic Data Center, Ashland County has experienced twelve (12) floods, thirty-five (35) flash floods, and eighty-two (82) heavy rain events since 1950. The table below provides data on all past flooding events.

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
ASHLAND (ZONE)	06/01/1997	13:00	Flood		0	0	0.00K	0.00K
ASHLAND (ZONE)	08/23/2000	19:30	Flood		0	0	0.00K	0.00K
ASHLAND (ZONE)	07/27/2003	18:10	Flood		0	0	100.00K	0.00K
ASHLAND (ZONE)	06/14/2004	16:30	Flood		0	0	0.00K	0.00K
ASHLAND (ZONE)	06/17/2004	18:00	Flood		0	0	0.00K	0.00K
ASHLAND (ZONE)	01/01/2005	18:00	Flood		0	0	1.200M	0.00K
JEROMESVILLE	05/31/2006	20:45	Flood		0	0	0.00K	0.00K
SAVANNAH	08/21/2007	09:00	Flood		0	0	0.00K	0.00K
NOVA	02/28/2011	03:00	Flood		0	0	500.00K	0.00K
JEROMESVILLE	04/04/2018	02:00	Flood		0	0	20.00K	0.00K
ASHLAND	02/07/2019	16:00	Flood		0	0	0.00K	0.00K
POLK	06/16/2019	04:00	Flood		0	0	75.00K	0.00K
LOUDONVILLE	05/09/2021	17:00	Flood		0	0	15.00K	0.00K
				Totals:	0	0	1.910M	0.00K

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
COUNTYWIDE	04/23/1996	08:30	Flash Flood		0	0	0.00K	0.00K

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
LOUDONVILLE	05/11/1996	06:40	Flash Flood		0	0	4.00K	0.00K
SULLIVAN	09/07/1996	08:30	Flash Flood		0	0	10.00K	20.00K
COUNTYWIDE	12/11/1996	16:00	Flash Flood		0	0	0.00K	0.00K
ASHLAND	12/12/1996	12:45	Flash Flood		0	0	0.00K	0.00K
COUNTYWIDE	05/25/1997	14:50	Flash Flood		0	0	0.00K	0.00K
COUNTYWIDE	06/01/1997	08:58	Flash Flood		0	0	80.00K	20.00K
COUNTYWIDE	08/16/1997	18:31	Flash Flood		0	0	0.00K	0.00K
COUNTYWIDE	01/09/1998	00:55	Flash Flood		0	0	0.00K	0.00K
LOUDONVILLE	05/03/1998	19:50	Flash Flood		0	0	0.00K	0.00K
HAYESVILLE	05/03/1998	19:50	Flash Flood		0	0	30.00K	0.00K
LOUDONVILLE	06/10/1998	09:30	Flash Flood		0	0	5.00K	0.00K
HAYESVILLE	06/29/1998	18:23	Flash Flood		0	0	40.00K	0.00K
COUNTYWIDE	08/25/1998	15:05	Flash Flood		0	0	200.00K	0.00K
COUNTYWIDE	11/10/1998	16:30	Flash Flood		0	0	50.00K	0.00K
COUNTYWIDE	01/22/1999	18:00	Flash Flood		0	0	50.00K	0.00K
LOUDONVILLE	06/16/2000	17:30	Flash Flood		0	0	0.00K	0.00K
COUNTYWIDE	07/08/2003	17:00	Flash Flood		0	0	100.00K	250.00K
ASHLAND	07/31/2003	21:00	Flash Flood		0	0	250.00K	0.00K
NORTH PORTION	08/05/2003	15:06	Flash Flood		0	0	100.00K	0.00K
NORTH PORTION	06/13/2004	21:14	Flash Flood		0	0	75.00K	0.00K
NORTH PORTION	06/22/2006	01:45	Flash Flood		0	0	250.00K	1.000M
SOUTH PORTION	07/10/2006	16:00	Flash Flood		0	0	5.200M	750.00K
SOUTH PORTION	07/12/2006	17:15	Flash Flood		0	0	150.00K	0.00K
ASHLAND	05/01/2007	19:30	Flash Flood		0	0	30.00K	0.00K
SAVANNAH	08/21/2007	05:30	Flash Flood		0	0	3.000M	750.00K
BAILEY LAKE	05/13/2011	23:00	Flash Flood		0	0	10.00K	0.00K
ASHLAND	05/14/2011	18:00	Flash Flood		0	0	15.00K	0.00K
ENGLAND	05/25/2011	21:00	Flash Flood		0	0	0.00K	0.00K
POLK	06/27/2013	21:00	Flash Flood		0	0	65.00K	0.00K

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
JEROMESVILLE	06/16/2019	01:14	Flash Flood		0	0	25.00K	0.00K
HAYESVILLE	06/16/2019	02:53	Flash Flood		0	0	50.00K	0.00K
POLK	06/17/2019	03:24	Flash Flood		0	0	120.00K	0.00K
NANKIN	06/17/2019	04:10	Flash Flood		0	0	10.00K	0.00K
ASHLAND	07/21/2019	17:45	Flash Flood		0	0	0.00K	0.00K
				Totals:	0	0	9.919M	2.790M

Past Event Narratives

Event Details	Event Narrative
July 10, 2006 Event Type: Flash flood Location: South Portion of the count Time/Duration: 4:00pm Fatalities/Injuries: 0/0 Property Damage: $ 5,200,000 Crop Damage: $ 750,000	Heavy thunderstorm rains fell on the southern portion of Ashland County during the afternoon and early evening hours of July 10th. Rainfall rates approached 3 inches per hour at times and a spotter near the intersection of State Route 3 and College Hill Road, just south of the Ashland County line, measured a storm total of 7.5 inches. Cooperative observers at the Mohicanville Dam measured 2.8 inches of rain between 3 and 4 p.m. and a storm total of 3.41 inches. Other reports from the county included: 3.26 inches in Loudonville, 2.89 inches at Pleasant Hill Dam, and 2.10 inches in the City of Ashland. Runoff from the heavy rains caused the Mohican River to rise quickly. A four foot wall of water reportedly moved down the river forcing several people in canoes to climb into trees. Firefighters later rescued eight people from the river or trees. The river continued to rise more than a foot per hour through the evening hours. Up to 700 campers had to be evacuated from Mohican State Park, many by boat. Several campgrounds on Wally Road south of Loudonville also had to be evacuated because of flooding. These evacuations continued through 10 p.m. and were hampered by several mudslides along Wally Road. A woman had to be rescued from her home on Pleasant Hill Road. Dozens of campers and mobile homes were damaged in the State Park and campgrounds. Extensive flooding also occurred along Pine Run south and west of Loudonville. Four barns along the run were washed away and a bridge on State Route 3 was heavily damaged. An historic mill along Pine Run

	sustained over $100,000 in damage. County Roads 3275, 1027 and 3175 (Wally Road) were washed out in several locations. At least seven Hanover Township roads were also washed out. Total damage to roads and bridges in the county approached $1 million. Flooding was reported as far north as the City of Ashland where several streets were flooded. Over two dozen roads in the county had to be closed because of flooding including State Route 60 south of Hayesville, and State Routes 3, 39 and 97 near Loudonville. Hundreds of homes and mobile homes sustained damage, mainly from basement flooding. Crop losses in the county are also expected to be substantial as standing water delayed the wheat crop harvest.

Event Details	Event Narrative
August 21,2007 Event Type: Flash Flood Location: Savannah Time/Duration: 5:30am Fatalities/Injuries: 0/0 Property Damage: $ 3,000,000 Crop Damage: $750,000	Moisture from the remnants of Tropical Storm Erin interacted with a stationary front to cause heavy rain producing thunderstorms over portions of northern Ohio. The thunderstorms trained across Wyanodot, Hancock, Crawford and Richland Counties during the early morning hours of August 21st. Catastrophic flooding occurred in all of these counties. Heavy rain producing thunderstorms affected Ashland County during the late evening hours of August 20th and early morning hours of August 21st. Rainfall totals from across the county included: 3.32 inches at Ashland; 3.46 inches at Jeromesville; 5.18 inches at Mifflin; and 4.02 inches at Loudonville. Runoff from this rain combined with ground already saturated from earlier rains led to significant flooding across portions of Ashland County. Widespread lowland flooding occurred across the county and many roads had to be closed because of flooding. Some of the worst flooding occurred near Loudonville after the Black Fork of the Mohican River quickly rose and left its banks. Many homes and businesses along and near the river sustained flood damage. Hundreds of other homes in the county suffered damage, mainly from basement flooding. Finally, standing water and erosion from the runoff caused damage to agricultural interests in the county.

Event Details	Event Narrative
January 1, 2005 – January 20, 2005 Event Type: Flood Location: Countywide Duration 6:00pm – 6:00pm Fatalities/Injuries: 0/0 Property Damage: $ 1,200,000	Heavy rain and runoff from snowmelt caused widespread lowland flooding in Ashland, Knox, Morrow, Richland Counties during the first two-thirds of January. January 2005 was the wettest January ever at Mansfield Lahm Airport with 6.08 inches of precipitation during the month. Rainfall totals from Knox County included: 7.51 inches at Greer; 7.97 inches at Fredericktown; 8.28 inches at Danville; and 9.99 inches at Centerburg all in Knox County. In addition to this rain, extensive snowpack existed over northern Ohio at the beginning of the month. Temperatures in the 50s the first three days of the month caused a rapid snowmelt and brought area streams and creeks to bankfull just in time for a significant winter storm on the 5th and 6th. Then, just as things began to return to normal, heavy rains fell on the area on the 11th, 12th and 13th causing conditions to once again worsen. Many streams and rivers in these counties left their banks and forced the closure of dozens of roads. Reservoirs in Ashland and Richland Counties established record high levels. The pool behind Charles Mills Dam reached its highest level ever at 1,017 feet on January 16th. Swampy areas behind the dam flooded forcing the closure of U.S. Highway 42 between Ashland and Mansfield for 10 days. Water levels behind the Mohicanville Dam in eastern Ashland County came to within a couple feet of the alltime record. 8,800 acres behind the dam were flooded. Extensive flooding occurred along the Mohican River in Loudonville where four blocks were flooded. Mohawk Lake in eastern Knox County reached its highest level ever and was up to 79 feet above normal. Homes in the Brinkhaven were affected by the Mohawk Lake flooding. Dozens of evacuations occurred during the middle of the month with most of them being in areas near the Charles Mills and Mohicanville Dams. In addition to the river and lowland flooding, sump pump failures caused by power outages from the ice storm of January 5th and 6th led to hundreds of homes sustaining major damage from basement flooding.

Probability of Hazard Occurrence

Based on historical data, there have been forty-seven (47) flood/flash flood events in Ashland County over the past 70 years and there is a 67% chance that the county will experience another flood or flash flood event within the next year.

Magnitude & Severity

Ashland County is a part of the Muskingum River Basin that includes several watersheds. Rivers and streams in the northwestern section of the county are a part of the Huron and Vermillion River Basins. The Lower Mohican River Basin, the Black Fork Basin, and the Kokosing River Basin serve as the watersheds in the southern area of the county. The county contains several rivers, streams, and ditches that could potentially flood (see Appendix B). Severe flooding would affect most Ashland County waterways and, in turn, would impact properties that represent a variety of use groups. Areas of potential flooding during a 100-year flood are presented in Appendix B.

Flooding of county rivers and streams may result in damage to structures, personal property, roadways, and other infrastructure. There are several critical facilities located within the 100-year floodplain, primarily water and wastewater treatment facilities. Based on past events, Ashland County has suffered no loss of life or injury as a result of a flood or flash flood event. Ashland County averages approximately $366,769 in damages per event. The costliest flash flood event resulted in 5.2 million dollars in property damages and $750,000 in crop damages.

The State of Ohio EMA generated a HAZUS-MH: Flood Event Report to estimate the potential losses that Ashland County could experience as a result of a 100-year flood. The estimated losses are documented in the tables below.

Table 1: Expected Building Damage by Occupancy

	1-10		11-20		21-30		31-40		41-50		>50	
	Count	%	Count	%	Count	%	Count	%	Count	%	Count	%
Agriculture	0	0	0	0	0	0	0	0	0	0	0	0
Commercial	2	40	2	40	0	0	0	0	0	0	1	20
Education	0	0	0	0	0	0	0	0	0	0	0	0
Government	0	0	0	0	0	0	0	0	0	0	0	0
Industrial	0	0	0	0	0	0	0	0	0	0	0	0
Religion	4	57	3	43	0	0	0	0	0	0	0	0
Residential	31	27	42	37	11	10	6	5	5	4	20	17
Total	**37**		**47**		**11**		**6**		**5**		**21**	

HAZUS estimates that 479 households (or 1,436 of people) will be displaced due to the flood. Displacement includes households evacuated from within or very near to the inundated area. Of these, 24 people (out of a total population of 53,139) will seek temporary shelter in public shelters.

Based on HAZUS report, UH Samaritan Medical Center had 70 hospital beds available for use before the flood. On the day of the scenario flood event, the model estimates that 70 hospital beds are available.

Table 2: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate Damage	At Least Substantial	Loss of Use
Emergency Operation Centers	0	0	0	0
Fire Stations	8	1	0	1
Hospital	1	0	0	0
Police Stations	5	0	0	0
Schools	29	0	0	0

Table 3: Building-Related Economic Loss Estimates (Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
Building Loss	Building	22.12	7.75	2.33	3.58	355.78
	Content	10.49	20.79	5.06	14.30	50.65
	Inventory	0.00	0.51	0.70	0.08	1.30
	Subtotal	**32.61**	**29.06**	**8.09**	**17.97**	**87.72**
Business Interruption	Income	0.81	17.02	0.29	9.44	27.57
	Relocation	6.39	4.41	0.19	5.73	16.71
	Rental Income	2.18	3.13	0.04	0.60	6.95
	Wage	1.91	17.27	0.27	42.30	51.76
	Subtotal	12.29	41.84	0.79	58.08	112.98
Total		**44.90**	**70.89**	**8.87**	**76.04**	**200.70**

Speed of Onset & Duration

The National Weather Service issues a flood watch when flooding is possible or expected to occur within 12–48 hours. A flood warning can be issued when flooding is imminent or occurring. When rapid flooding from heavy rain is expected, flash flood watches and warnings will be issued. The duration for a flood or a flash flood is dependent on the amount of snowmelt, precipitation, and saturation levels of the area. Floods can last anywhere from a few hours to a several days.

NATIONAL FLOOD INSURANCE PROGRAM (NFIP)

Ashland County and four (4) of its jurisdictions participate in the NFIP. As of the plan update, there are 242 NFIP insurance policies (See Table: NFIP Policies), and all jurisdictions were in compliance with NFIP requirements (refer to NFIP Compliance Table).

Table: NFIP Policies

Community Name	Policies In-force	Insurance In-force (whole $)	Written Premium In-force
Ashland County	43	$ 5,520,300	$ 32,314
City of Ashland	85	$ 9,895,200	$ 74,249
Village of Jeromesville	1	$ 93, 000	$ 1,037
Village of Loudonville	10	$ 1,259,700	$ 13,345
Village of Perrysville	4	$ 397,500	$ 4,004

Table: NFIP Compliance

CID	Community Name	Initial FHBM Identified	Initial FIRM Identified	Current Effective Map Date	Reg-Emer Date
390759	Ashland County	2/10/1978	1/1/1988	8/18/2009	1/1/1988
390007	City of Ashland	4/12/1974	1/2/1980	8/18/2009	1/2/1980
390008	Village of Jeromesville	5/3/1974	9/1/1986	8/18/2009 (M)	9/1/1986
390009	Village of Loudonville	5/31/1974	8/1/1987	8/18/2009 (M)	8/1/1987
390730	Village of Perrysville	3/28/1975	8/1/1987	8/18/2009 (M)	8/1/1987
390861	Village of Savannah*	--	--	8/18/2009	--
390799	Village of Mifflin*	07/08/77	08/18/09	08/18/09	07/08/78

*** Does not participate**

According to repetitive loss data, Ashland County currently has four (5) repetitive loss structures within the county. Total NFIP insurance losses are listed in the table below.

Table: Repetitive Loss Properties

Community	Number	Type	Number of Losses	Building Payments	Contents Payments	Total Payments
Ashland County	2	Residential	5	$ 59,388.95	$ 39,192.49	$ 98,581.43
	0	Non-	0	-	-	-

Community	Number	Type	Number of Losses	Building Payments	Contents Payments	Total Payments
		residential				
City of Ashland	1	Residential	2	0	$6,661.19	$ 6,661.19
	1	Non-residential	2	0	$ 5,114.75	$ 5,114.75
Village of Loudonville	1	Residential	2	$ 150,056.63	$ 13,954.42	$ 164,011.05
	0	Non-residential	0	-	-	-
County and jurisdiction totals:	4	Residential	9	$ 209,445.58	$ 59,808.10	$269,253.67
	1	Non-residential	2	0	$ 5,114.75	$ 5,114.75

Ashland County began their floodplain map modernization with ODNR in Fiscal Year 2006. This process began with a scoping meeting held on August 14, 2006 and culminated with revised maps becoming effective on August 18, 2009 when they were formally adopted by the County. Under the county Planning Commission, a Floodplain Ordinance is currently in effect. Section 3.0 designates a Floodplain Administrator and duties of that Office, to include updating regulations and enforcement of such regulations under Section 6.0. Additionally, the Floodplain Administrator routinely monitors flood hazard areas to enforce regulations and provide community assistance such as encouraging owners to maintain flood insurance policies.

Hail

Hail is a product of raindrops that are frozen in the upper atmosphere that fall to earth due to gravity. The size of individual hail stones vary, contingent upon their being repeatedly blown into higher elevations. Hailstorms are always associated with heavy rain, gusty winds, thunderstorms, and lightning. Depending upon the size of the hailstones and the severity of the respective storm, damage can occur to property (structures, vehicles, etc.) as well as to crops.

Past History of Hazard Occurrence

According the National Climatic Data Center, Ashland County has experienced 113 hail events from 1950 to the present (see the table below).

Location or County	Date	Time	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
ASHLAND CO.	07/24/1965	17:00	Hail	1.50 in.	0	0	0.00K	0.00K
ASHLAND CO.	04/01/1974	20:50	Hail	0.75 in.	0	0	0.00K	0.00K
ASHLAND CO.	07/29/1974	10:15	Hail	1.50 in.	0	0	0.00K	0.00K
ASHLAND CO.	08/13/1975	15:00	Hail	1.75 in.	0	0	0.00K	0.00K
ASHLAND CO.	05/31/1977	16:35	Hail	1.00 in.	0	0	0.00K	0.00K
ASHLAND CO.	07/21/1983	17:30	Hail	1.75 in.	0	0	0.00K	0.00K
ASHLAND CO.	06/29/1987	13:05	Hail	1.00 in.	0	0	0.00K	0.00K
ASHLAND CO.	08/02/1988	15:00	Hail	1.75 in.	0	0	0.00K	0.00K
ASHLAND CO.	07/13/1992	18:15	Hail	1.00 in.	0	0	0.00K	0.00K
ASHLAND CO.	07/30/1992	14:40	Hail	1.00 in.	0	0	0.00K	0.00K
Milford	06/19/1994	16:02	Hail	1.00 in.	0	0	0.00K	0.00K
S Portion	07/02/1994	13:20	Hail	1.00 in.	0	0	0.00K	0.00K
Ashland	06/21/1995	14:45	Hail	0.75 in.	0	0	0.00K	0.00K
Savanah	06/21/1995	18:50	Hail	1.50 in.	0	0	30.00K	0.00K
Ashland	05/18/1997	16:28	Hail	1.00 in.	0	0	0.00K	0.00K
Mohicanville	07/26/1997	20:44	Hail	0.75 in.	0	0	0.00K	0.00K
Sullivan	08/16/1997	17:47	Hail	0.75 in.	0	0	0.00K	0.00K
Ashland	04/08/1998	15:00	Hail	0.75 in.	0	0	0.00K	0.00K
Ashland	06/27/1998	16:09	Hail	1.75 in.	0	0	0.00K	0.00K
Ashland	06/27/1998	18:00	Hail	1.00 in.	0	0	0.00K	0.00K
Loudonville	06/27/1998	20:40	Hail	1.75 in.	0	0	0.00K	0.00K
Paradise Hill	06/28/1998	17:36	Hail	0.75 in.	0	0	0.00K	0.00K
McKay	06/29/1998	03:30	Hail	0.75 in.	0	0	0.00K	0.00K
Ashland	08/25/1998	14:10	Hail	2.00 in.	0	0	0.00K	5.00K

Location or County	Date	Time	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Polk	07/24/1999	20:20	Hail	1.00 in.	0	0	0.00K	20.00K
Polk	07/28/1999	10:30	Hail	0.75 in.	0	0	0.00K	0.00K
Countywide	10/13/1999	15:45	Hail	0.75 in.	0	0	0.00K	0.00K
Loudonville	06/02/2000	12:40	Hail	1.00 in.	0	0	0.00K	0.00K
Polk	07/28/2000	15:30	Hail	0.75 in.	0	0	0.00K	0.00K
Sullivan	07/28/2000	15:47	Hail	1.00 in.	0	0	0.00K	0.00K
Mifflin	08/23/2000	17:48	Hail	0.75 in.	0	0	0.00K	0.00K
Ashland	04/09/2001	15:10	Hail	0.88 in.	0	0	0.00K	0.00K
Ashland	04/19/2002	19:18	Hail	1.00 in.	0	0	15.00K	0.00K
Nankin	04/19/2002	19:31	Hail	0.75 in.	0	0	0.00K	0.00K
Polk	04/28/2002	11:57	Hail	1.00 in.	0	0	5.00K	0.00K
Jeromesville	06/04/2002	18:45	Hail	1.00 in.	0	0	10.00K	0.00K
Savannah	11/10/2002	17:40	Hail	0.75 in.	0	0	0.00K	0.00K
Nankin	11/10/2002	17:45	Hail	1.00 in.	0	0	5.00K	0.00K
Loudonville	04/04/2003	22:00	Hail	0.75 in.	0	0	2.00K	0.00K
Savannah	05/01/2003	15:45	Hail	0.75 in.	0	0	0.00K	0.00K
Polk	07/08/2003	16:31	Hail	0.88 in.	0	0	2.00K	0.00K
Polk	04/17/2004	18:35	Hail	1.00 in.	0	0	2.00K	0.00K
Savannah	04/17/2004	18:37	Hail	1.00 in.	0	0	2.00K	0.00K
Ashland	04/17/2004	18:55	Hail	1.00 in.	0	0	2.00K	0.00K
Hayesville	04/17/2004	19:35	Hail	0.75 in.	0	0	0.00K	0.00K
Perrysville	04/17/2004	19:38	Hail	1.00 in.	0	0	3.00K	0.00K
Loudonville	04/17/2004	20:00	Hail	0.75 in.	0	0	0.00K	0.00K
Ashland	05/17/2004	16:49	Hail	0.75 in.	0	0	0.00K	0.00K
Savannah	06/02/2004	16:35	Hail	0.75 in.	0	0	0.00K	0.00K
Perrysville	06/09/2004	17:45	Hail	0.88 in.	0	0	0.00K	0.00K
Ashland	06/24/2004	18:01	Hail	1.00 in.	0	0	0.00K	0.00K
Perrysville	08/18/2004	15:55	Hail	0.75 in.	0	0	0.00K	0.00K
Jeromesville	05/13/2005	18:40	Hail	0.75 in.	0	0	0.00K	0.00K
Nova	06/14/2005	14:51	Hail	0.75 in.	0	0	0.00K	0.00K
Mifflin	06/25/2005	16:20	Hail	1.00 in.	0	0	0.00K	0.00K
Ashland	08/13/2005	17:10	Hail	0.88 in.	0	0	0.00K	0.00K
Sullivan	08/20/2005	14:35	Hail	0.75 in.	0	0	0.00K	0.00K
Loudonville	05/25/2006	18:58	Hail	0.88 in.	0	0	0.00K	0.00K
Ashland	05/25/2006	19:19	Hail	0.75 in.	0	0	0.00K	0.00K
Ashland	06/21/2006	22:45	Hail	0.88 in.	0	0	0.00K	0.00K
Ashland	06/22/2006	12:40	Hail	0.75 in.	0	0	0.00K	0.00K

Location or County	Date	Time	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Sullivan	07/10/2006	12:46	Hail	0.75 in.	0	0	0.00K	0.00K
Ashland	07/10/2006	13:40	Hail	0.75 in.	0	0	0.00K	0.00K
Ashland	07/10/2006	14:10	Hail	1.00 in.	0	0	10.00K	0.00K
Nova	05/01/2007	16:30	Hail	0.75 in.	0	0	0.00K	0.00K
Polk	05/01/2007	16:47	Hail	1.25 in.	0	0	10.00K	0.00K
Polk	05/01/2007	18:45	Hail	0.88 in.	0	0	0.00K	0.00K
Polk	05/01/2007	19:00	Hail	1.00 in.	0	0	0.00K	0.00K
Jeromesville	06/08/2007	14:40	Hail	0.75 in.	0	0	0.00K	0.00K
Mifflin	06/17/2007	15:55	Hail	0.88 in.	0	0	0.00K	0.00K
Ashland	07/27/2007	19:05	Hail	0.88 in.	0	0	0.00K	0.00K
Sullivan	04/11/2008	20:25	Hail	0.75 in.	0	0	0.00K	0.00K
Nova	06/13/2008	17:15	Hail	1.75 in.	0	0	25.00K	0.00K
Savannah	06/15/2008	21:42	Hail	0.88 in.	0	0	0.00K	0.00K
Perrysville	05/07/2009	18:08	Hail	0.75 in.	0	0	0.00K	0.00K
Savannah	06/01/2009	21:00	Hail	0.88 in.	0	0	0.00K	0.00K
Hayesville	06/01/2009	21:00	Hail	0.88 in.	0	0	0.00K	0.00K
Perrysville	06/04/2010	12:30	Hail	1.75 in.	0	0	5.00K	0.00K
Loudonville	06/04/2010	12:37	Hail	1.75 in.	0	0	35.00K	0.00K
Nova	09/07/2010	15:50	Hail	0.88 in.	0	0	0.00K	0.00K
Loudonville	03/23/2011	14:02	Hail	0.25 in.	0	0	1.00K	0.00K
Loudonville	03/23/2011	14:20	Hail	1.00 in.	0	0	2.00K	0.00K
Ashland	05/12/2011	04:15	Hail	1.25 in.	0	0	20.00K	0.00K
Jeromesville	05/12/2011	05:15	Hail	1.00 in.	0	0	10.00K	0.00K
Ashland	05/12/2011	14:50	Hail	1.00 in.	0	0	15.00K	0.00K
Ashland	05/12/2011	14:57	Hail	1.00 in.	0	0	10.00K	0.00K
Nova	05/25/2011	18:05	Hail	1.00 in.	0	0	0.00K	0.00K
Polk	05/26/2011	02:00	Hail	0.88 in.	0	0	0.00K	0.00K
Ashland	06/05/2011	02:05	Hail	0.88 in.	0	0	0.00K	0.00K
Sullivan	06/05/2011	02:10	Hail	1.00 in.	0	0	0.00K	0.00K
Nova	06/07/2011	10:05	Hail	0.88 in.	0	0	0.00K	0.00K
Loudonville	06/09/2011	05:49	Hail	1.75 in.	0	0	50.00K	0.00K
Savannah	08/09/2011	19:27	Hail	1.75 in.	0	0	10.00K	0.00K
Rowsburg	03/19/2012	17:15	Hail	1.00 in.	0	0	0.00K	0.00K
Perrysville	05/28/2012	15:45	Hail	1.50 in.	0	0	10.00K	0.00K
Hayesville	05/28/2012	15:48	Hail	0.88 in.	0	0	0.00K	0.00K
Hayesville	05/28/2012	15:50	Hail	1.75 in.	0	0	25.00K	0.00K
Ashland	05/28/2012	16:08	Hail	1.00 in.	0	0	0.00K	0.00K

Location or County	Date	Time	Type	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Nankin	07/04/2012	20:10	Hail	1.00 in.	0	0	0.00K	0.00K
Savannah	07/04/2012	20:15	Hail	0.75 in.	0	0	0.00K	0.00K
Ashland	07/04/2012	20:22	Hail	0.88 in.	0	0	0.00K	0.00K
Loudonville	07/18/2012	12:50	Hail	0.75 in.	0	0	0.00K	0.00K
PERRYSVILLE	04/29/2014	20:22	Hail	1.00 in.	0	0	2.00K	0.00K
ASHLAND	05/07/2014	04:05	Hail	0.88 in.	0	0	0.00K	0.00K
BAILEY LAKE	05/07/2014	04:07	Hail	0.75 in.	0	0	0.00K	0.00K
JEROMESVILLE	05/07/2014	04:15	Hail	0.75 in.	0	0	0.00K	0.00K
ASHLAND	05/12/2014	15:05	Hail	1.00 in.	0	0	0.00K	0.00K
LOUDONVILLE	05/14/2014	13:35	Hail	1.00 in.	0	0	0.00K	0.00K
MIFFLIN	05/21/2014	22:00	Hail	0.88 in.	0	0	0.00K	0.00K
HAYESVILLE	05/21/2014	22:01	Hail	1.00 in.	0	0	2.00K	0.00K
MIFFLIN	05/07/2016	18:49	Hail	0.75 in.	0	0	0.00K	0.00K
ASHLAND	05/22/2018	14:50	Hail	0.75 in.	0	0	0.00K	0.00K
ENGLAND	05/22/2018	14:52	Hail	1.00 in.	0	0	0.00K	0.00K
				Totals:	0	0	320.00K	25.00K

Past Event Narratives

Event Details	Event Narrative
June 9, 2011 Event Type: Hail Location: Ashland Time: 5:49 am Fatalities/Injuries: 0/0 Property Damage: $ 50,000	A supercell thunderstorm produced golf ball size hail. Numerous vehicles and homes sustained damage as a result of the large hail.

Event Details	Event Narrative
June 4, 2010 Event Type: Hail Location: Loudonville Time: 12:40 am Fatalities/Injuries: 0/0 Property Damage: $ 35,000	Golf ball sized hail was reported in the Loudonville area. A few vehicles were damaged by the hail.

Event Details	Event Narrative
June 21,1995	Large hail fell. Lightning struck an oil tank facility and three 300

Event Type: Hail Location: Savannah Time: 6:50 pm Fatalities/Injuries: 0/0 Property Damage: $ 30,000	gallon oil tanks caught fire and burned for an hour and a half.

Probability of Hazard Occurrence

Based on past data for hail events, Ashland County has had 113 hailstorms in the last 70 years and could realistically expect to see 1 to 2 hail events per year.

Magnitude & Severity

Hailstorms are non-spatial in nature and could potentially impact any location in Ashland County. However, since hail only occurs during the mature stage of a thunderstorm's life cycle, the geographical impact area is fairly small.

Hailstorms create considerable property and crop damages and are dangerous to people caught outdoors. Ashland County averages $3,136 in damages per hail event based on past damage totals.

Hail		
Structure Type	Structures at Risk	Potential Damage/Exposure
Residential	3	$ 29,348.68
Non-Residential	1	$ 9,782.90
Critical Facilities	1	$ 9,782.90
Total	5	$ 48,914.48

Speed of Onset & Duration

The onset of a severe thunderstorm is typically gradual and usually allows for sufficient warning time. The National Weather Service (NWS) will issue a severe thunderstorm warning when hail 1 inch or larger is occurring or is imminent. The mature stage of a thunderstorm usually lasts for 10 – 20 minutes.

Lightning

Lightning is a discharge of electrical energy that results from the buildup of positive and negative charges in a thunderstorm. On average, 53 people are killed and hundreds are injured yearly from lightning strikes in the United States. Lightning can also strike communications equipment and cause significant damage to buildings, critical facilities, and infrastructure by catching fire.

Past History of Hazard Occurrence

According the National Climatic Data Center, Ashland County has experienced three (3) lightning strikes from 1950-2020 (see the table below).

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
ASHLAND	06/24/1996	11:30	Lightning		0	0	1.00K	0.00K
ASHLAND	05/03/1998	19:50	Lightning		0	0	20.00K	0.00K
LOUDONVILLE	04/07/2000	15:45	Lightning		0	0	50.00K	0.00K
				Totals:	0	0	71.00K	0.00K

Past Event Narratives

Event Details	Event Narrative
Date: 4/7/2000 Event Type: Lightning Location: Loudonville Time: 3:45 pm Fatalities/Injuries: 0/0 Property Damage: $ 50,000	Lightning struck a public school knocking out all of the transformers in the building.

Event Details	Event Narrative
Date:5/3/1998 Event Type: Lightning Location: Ashland Time: 7:50pm Fatalities/Injuries: 0/0 Property Damage: $ 20,000	Lightning struck and touched off a blaze at a house.

Event Details	Event Narrative
Date: 6/24/1996 Event Type: Lightning	Lightning struck a power/transmitter, setting off multiple alarms and disrupting power to businesses.

Location: Ashland Duration 11:30 am Fatalities/Injuries: 0/0 Property Damage: $ 1,000	

Probability of Hazard Occurrence

Ashland County has experienced three (3) lightning strikes in the past 24 years that resulted in damages and has a 13% chance of experiencing another lightning strike in any given year. Most locations in Northeast Ohio average between 2 and 4 lightning strikes per year.

Magnitude & Severity

Lightning is a non-spatial hazard and could potentially impact any location in Ashland County. Since lightning occurs in all three stages of a thunderstorm's life cycle, the amount of lightning strikes could increase to multiple locations.

Lightning can be extremely dangerous because it occurs in all thunderstorms. Lightning strikes in Ashland County have been limited to property damages. However, lightning causes an average of 55-60 fatalities and 400 injuries per year and costs more than $1 billion in insured losses. The county's costliest lightning incident resulted in $ 50,000 in damages.

Lightning loss estimates were determined based upon previous damages and documented in the table below.

Lightning		
Structure Type	Structures at Risk	Potential Damage/Exposure
Residential	3	$ 29,348.68
Non-Residential	1	$ 9,782.90
Critical Facilities	1	$ 9,782.90
Total	5	$ 48,914.48

Speed of Onset & Duration

The onset of a severe thunderstorm is typically gradual and usually allows for sufficient warning time. The National Weather Service (NWS) will issue a severe thunderstorm warning when either a severe thunderstorm is indicated by radar or a spotter reports a thunderstorm producing hail ¾ inch or larger. The typical thunderstorm lasts an average of 30 minutes.

Severe Winter Storm

Severe winter storms can produce a variety of adverse weather conditions. Severe winter storms may include snow, sleet, freezing rain, or a mix of these wintry forms of precipitation. Severe winter weather can down trees, cause widespread power outages, damage property, and cause fatalities and injuries. Severe winter storms can contribute to other losses including vehicular accidents, personal injuries, and losses of life.

Past History of Hazard Occurrence

According to NOAA's National Climatic Data Center, Ashland County has experienced thirty-four (34) winter storm events, eight (8) heavy snow events, and three (3) ice storm events from 1950 to 2020 (see tables below).

Location	Date	Time	Type	Dth	Inj	PrD	CrD
ASHLAND (ZONE)	01/02/1999	08:00	Winter Storm	0	2	15.00K	0.00K
ASHLAND (ZONE)	01/08/1999	04:00	Winter Storm	0	0	2.00K	0.00K
ASHLAND (ZONE)	01/13/1999	01:30	Winter Storm	0	0	2.00K	0.00K
ASHLAND (ZONE)	02/18/2000	03:00	Winter Storm	0	0	35.00K	0.00K
ASHLAND (ZONE)	03/16/2000	06:00	Winter Storm	0	0	15.00K	0.00K
ASHLAND (ZONE)	12/13/2000	14:00	Winter Storm	0	0	125.00K	0.00K
ASHLAND (ZONE)	03/24/2002	20:00	Winter Storm	0	0	50.00K	0.00K
ASHLAND (ZONE)	03/26/2002	01:00	Winter Storm	0	0	150.00K	0.00K
ASHLAND (ZONE)	12/05/2003	04:00	Winter Storm	0	0	200.00K	0.00K
ASHLAND (ZONE)	01/25/2004	18:00	Winter Storm	0	0	300.00K	0.00K
ASHLAND (ZONE)	02/05/2004	15:00	Winter Storm	0	0	75.00K	0.00K
ASHLAND (ZONE)	12/22/2004	07:00	Winter Storm	0	0	5.200M	0.00K
ASHLAND (ZONE)	04/02/2005	04:00	Winter Storm	0	0	250.00K	0.00K
ASHLAND (ZONE)	04/23/2005	12:00	Winter Storm	0	0	250.00K	0.00K
ASHLAND (ZONE)	02/04/2006	11:00	Winter Storm	0	0	60.00K	0.00K
ASHLAND (ZONE)	02/13/2007	04:00	Winter Storm	0	0	30.00K	0.00K
ASHLAND (ZONE)	12/15/2007	12:00	Winter Storm	0	0	150.00K	0.00K
ASHLAND (ZONE)	02/11/2008	20:00	Winter Storm	0	0	50.00K	0.00K
ASHLAND (ZONE)	02/25/2008	22:00	Winter Storm	0	0	120.00K	0.00K

Location	Date	Time	Type	Dth	Inj	PrD	CrD
ASHLAND (ZONE)	03/04/2008	05:00	Winter Storm	0	0	500.00K	0.00K
ASHLAND (ZONE)	03/07/2008	09:30	Winter Storm	0	0	800.00K	0.00K
ASHLAND (ZONE)	12/19/2008	01:45	Winter Storm	0	0	25.00K	0.00K
ASHLAND (ZONE)	01/09/2009	12:00	Winter Storm	0	0	125.00K	0.00K
ASHLAND (ZONE)	01/27/2009	16:00	Winter Storm	0	0	80.00K	0.00K
ASHLAND (ZONE)	02/05/2010	12:00	Winter Storm	0	0	350.00K	0.00K
ASHLAND (ZONE)	02/09/2010	05:00	Winter Storm	0	0	200.00K	0.00K
ASHLAND (ZONE)	02/15/2010	14:00	Winter Storm	0	0	200.00K	0.00K
ASHLAND (ZONE)	02/01/2011	00:00	Winter Storm	0	0	250.00K	0.00K
ASHLAND (ZONE)	02/21/2011	13:00	Winter Storm	0	0	250.00K	0.00K
ASHLAND (ZONE)	12/26/2012	08:30	Winter Storm	0	0	50.00K	0.00K
ASHLAND (ZONE)	02/04/2014	17:00	Winter Storm	0	0	100.00K	0.00K
ASHLAND (ZONE)	12/17/2016	21:00	Winter Storm	0	0	100.00K	0.00K
ASHLAND (ZONE)	01/12/2018	13:00	Winter Storm	0	0	150.00K	0.00K
ASHLAND (ZONE)	01/19/2019	09:00	Winter Storm	0	0	100.00K	0.00K
ASHLAND (ZONE)	12/24/2020	14:00	Winter Storm	0	0	20.00K	0.00K
ASHLAND (ZONE)	02/15/2021	04:00	Winter Storm	0	0	100.00K	0.00K
			Totals:	0	2	10.379M	0.00K

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
ASHLAND (ZONE)	01/05/2005	02:00	Ice Storm		0	0	8.800M	0.00K
ASHLAND (ZONE)	02/25/2007	00:00	Ice Storm		0	0	25.00K	0.00K
ASHLAND (ZONE)	03/15/2007	03:00	Ice Storm		0	0	100.00K	0.00K
				Totals:	0	0	8.925M	0.00K

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
ASHLAND (ZONE)	01/02/1996	09:00	Heavy Snow		0	0	100.00K	0.00K
ASHLAND (ZONE)	01/07/1996	06:00	Heavy Snow		0	0	80.00K	0.00K
ASHLAND (ZONE)	03/19/1996	23:00	Heavy Snow		0	0	12.00K	0.00K
ASHLAND (ZONE)	03/09/1999	00:15	Heavy Snow		0	0	0.00K	0.00K

ASHLAND (ZONE)	03/05/2001	19:00	Heavy Snow		0	0	30.00K	0.00K
ASHLAND (ZONE)	12/24/2002	21:00	Heavy Snow		0	0	75.00K	0.00K
ASHLAND (ZONE)	01/10/2003	13:00	Heavy Snow		0	0	25.00K	0.00K
ASHLAND (ZONE)	03/16/2004	01:30	Heavy Snow		0	0	150.00K	0.00K
				Totals:	0	0	472.00K	0.00K

Past Event Narratives

Event Details	Event Narrative
January 5, 2005 Event Type: Ice Storm Location: Ashland Time: 2:00 am Fatalities/Injuries: 0/0 Property Damage: $ 8,800,000	For the second time in just over two weeks, a devastating and historic winter storm affected Northern Ohio. Significant ice accumulations occurred over most of the area downing thousands of trees, causing widespread power outages, and making travel nearly impossible. Low pressure over Missouri moved rapidly northeast on January 5th. This low moved across eastern Ohio early on January 6th and was responsible for producing a prolonged period of freezing rain. A mixture of rain and snow changed to freezing rain from west to east during the early morning hours of the 5th. Periods of freezing rain then continued for the remainder of the 5th and through the early morning hours of the 6th. Temperatures eventually warmed enough during the late morning hours of the 6th to change the freezing rain back to rain. The hardest hit locations were west of Interstate 71 along the U.S. Route 30 corridor. Ice accumulations of greater than three quarters of an inch were reported from Hancock County eastward across Wyandot, Crawford, Richland and Ashland Counties. Northern sections of Wyandot and Marion Counties along with the southern halves of Seneca and Huron County were also hard hit. Up to 80 percent of electric customers in these nine counties lost service during the storm, some for as much as ten days. In cities like Mansfield, Bucyrus and Findlay, nearly every property in some neighborhoods sustained tree damage. To the north and south of these areas, ice accumulations ranged from one quarter to three quarters of an inch. Counties closer to Lake Erie saw snow mix with the freezing rain at times, which kept ice accumulations down to around one quarter inch and resulted in only scattered power outages. A total of 3 to 5 inches of snow was also reported in these counties. Ice build up at the Davis-Besse Nuclear Power Plant (Ottawa County) damaged the facility enough to force it to be temporarily shut down. Hundreds of crews were brought in from around the county to help restore the power outages. In

	addition to damage caused by fallen trees and limbs, basement flooding occurred as power outages prevented sump pumps from working. Clean up and repair costs for this storm were among the highest ever recorded for a natural disaster in Ohio. Damage in many counties topped $1 million with a couple counties exceeding $10 million in losses. In Richland County alone, clean up cost accrued by local governments totaled nearly $6 million. Estimates indicate that as many as one million people lost power during this storm. Several power companies reported the largest number of outages in their histories. Hundreds if not thousands of homes and businesses were damaged by fallen trees, limbs, and utility poles.

Event Details	Event Narrative
December 22-23, 2004 Event Type: Winter Storm Location: County Time: 7:00 am Fatalities/Injuries: 0/0 Property Damage: $ 5,200,000	A record setting winter storm affected northern Ohio on December 22nd and 23rd. The impact and damage caused by this storm has been compared to the Blizzard of January 1978. Low pressure developed over eastern Texas early on the 22nd and then moved quickly northeast. The low eventually tracked across eastern Ohio during the morning hours of the 23rd after dumping nearly two feet of snow on portions of Ohio. The snow began around daybreak on the 22nd and then intensified around midday. Heavy snow with visibilities of a quarter mile or less then persisted into the early morning hours of the 23rd. Snowfall rate during much of this time ranged from one to two inches per hour. Winds increased significantly during the evening hours of the 22nd as northerly winds developed on the backside of the low. Gusts to 30 mph caused significant blowing and drifting and near blizzard conditions from Marion County northeastward into Erie and Huron Counties. Drifts several feet deep were reported. Temperatures warmed slightly during the early morning hours of the 23rd as the low moved into southeast Ohio. This caused the snow to first mix with, and then change completely to, freezing rain. This change occurred at Mansfield just before 3 a.m. and at Cleveland around 4 a.m. The heaviest freezing rain fell along and west of Interstate 71 between these two cities with over one half inch of ice accumulation over much of this corridor. Snowfall totals ranged from 12 to 18 inches from Marion and Morrow Counties northeast to Erie, Lorain and Cuyahoga Counties. Within that area, there was a narrow band of even heavier snow with greater than 18 inches of accumulation from northern Morrow County across Richland County and into Ashland County. Officially, 23.0 inches of snow was measured at Mansfield Lahm Airport (Richland County) establishing a new all-time record snowfall. In

	addition, 0.57 inches of freezing rain was measured at that location. At Cleveland Hopkins International Airport (Cuyahoga County), a total of 15.5 inches of snow fell along 0.58 inches of freezing rain. The freezing rain significantly compacted the snow and official measurements made by cooperative observers around daybreak likely underestimated the actual snowfall. Had measurements been taken around midnight, reported accumulations would have likely been several inches higher at most locations. The wet and very heavy snow made travel nearly impossible across northern Ohio. Hundreds of accidents were reported and holiday travel for many was not possible. Numerous power outages as a result of the freezing rain were reported. The outages were most widespread in southern portions of Ashland and Richland Counties where some areas were without power for several days. The weight of the heavy snow damaged the roofs of dozens of homes and buildings, several of which had complete roof failures. It took several days for road crews to completely clean up after this event. Damage and clean up costs for this storm were historic with only the Blizzard of 1978 having more financial impact.

Event Details	Event Narrative
March 7-8, 2008 Event Type: Winter Storm Location: Ashland County Time: 9:30 am – 7:00 pm Fatalities/Injuries: 0/0 Property Damage: $ 800,000	Snow began across the area during the morning hours of the 7th and continued through the late afternoon hours of the 8th. During the daytime on the 7th, visibilities were reduced to a half mile or less at times, but then during the evening hours, the snow lightened up considerably. The snow intensified through the overnight hours into the 8th, and moderate to heavy snow continued through the daytime hours before tapering to flurries in the late afternoon and evening. At the end of this event, snowfall amounts ranged between 9.0 and 15.0 inches. A trained spotter in Ashland measured 13.0 inches for a storm total. Winds on the 7th and 8th were gusty causing considerable blowing and drifting of snow. Many accidents were reported during this storm.

Probability of Hazard Occurrence

The probability that Ashland County will have another severe winter storm is extremely high since they have experienced 45 events in the last 15 years. Based on that history, it is realistic to assume that Ashland County will experience 3 severe winter storm events per year.

Magnitude & Severity

Severe Winter Storms are a not-spatial hazard that could potentially impact any or all of Ashland County's build environment.

Winter storms usually impact residents and animals and can make travel throughout the county extremely difficult. Most deaths from winter storms occur as the result of traffic accidents or because of prolonged exposure to the elements. The average annual snowfall for Ashland County is 49 inches. Based on previous storms, Ashland County could see snow totals from a trace up to 18 inches; ice accumulations from ½ inch to 1 inch; winds in excess of 30 mph, or limited (1/4 mile) to no visibility. The county's costliest severe winter storm resulted in $8.8 million in damages.

Winter storm loss estimates were determined based upon the county's past damage history and is documented in the table below.

Winter Storm		
Structure Type	Structures at Risk	Potential Damage/Exposure
Residential	38	$ 6,197,572
Non-Residential	12	$ 1,965,036
Critical Facilities	3	$ 495,000
Total	54	$8,657,608

Speed of Onset & Duration

The National Weather Service will issue a Winter Storm Warning when heavy snow (approximately 6 inches of snow is expected in 12 hours or less) or a combination of heavy snow, heavy freezing rain, heavy sleet, or blowing and drifting snow is expected to occur. The heavy snow criterion for a warning follows below. Warnings are usually issued 6-18 hours prior to the weather event. Winter storms can persist for several days.

Thunderstorm

A thunderstorm is a violent, short-lived atmospheric disturbance, almost always associated with cumulonimbus clouds and accompanied by thunder and lightning. Such storms usually generate strong, gusty winds and heavy rain, and occasionally hail or tornadoes. Thunderstorms have been known to occur in almost every part of the world.

Past History of Hazard Occurrence

According to NOAA's National Climate Data Center, Ashland County has had 202 thunderstorm wind events in the county between 1950 and 2021. The following table details the thunderstorm events that have been reported over the last 70 years.

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
ASHLAND CO.	06/12/1959	16:15	Thunderstorm Wind	53 kts.	0	0	0.00K	0.00K
ASHLAND CO.	09/13/1962	19:00	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
ASHLAND CO.	01/26/1965	13:00	Thunderstorm Wind	53 kts.	0	0	0.00K	0.00K
ASHLAND CO.	11/16/1965	17:30	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
ASHLAND CO.	07/24/1967	11:00	Thunderstorm Wind	50 kts.	0	0	0.00K	0.00K
ASHLAND CO.	05/13/1970	10:45	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
ASHLAND CO.	09/03/1975	14:50	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
ASHLAND CO.	04/21/1976	16:05	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
ASHLAND CO.	05/22/1977	20:20	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
ASHLAND CO.	06/26/1978	11:00	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
ASHLAND CO.	07/05/1980	07:50	Thunderstorm Wind	69 kts.	0	0	0.00K	0.00K
ASHLAND CO.	08/02/1980	14:45	Thunderstorm Wind	60 kts.	0	0	0.00K	0.00K
ASHLAND CO.	08/21/1980	15:00	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
ASHLAND CO.	01/04/1982	08:30	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
ASHLAND CO.	03/31/1982	12:15	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
ASHLAND CO.	06/15/1982	17:55	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
ASHLAND CO.	07/17/1982	14:30	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
ASHLAND CO.	04/28/1983	11:30	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
ASHLAND CO.	07/04/1983	15:45	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
ASHLAND CO.	07/17/1983	14:15	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
ASHLAND CO.	07/10/1985	00:50	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
ASHLAND CO.	06/27/1986	13:30	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
ASHLAND CO.	07/08/1986	23:00	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
ASHLAND CO.	09/30/1986	13:30	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
ASHLAND CO.	06/29/1987	19:30	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
ASHLAND CO.	08/02/1987	20:15	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
ASHLAND CO.	05/09/1988	15:20	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
ASHLAND CO.	08/02/1988	15:45	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
ASHLAND CO.	03/18/1989	03:00	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
ASHLAND CO.	06/27/1989	14:15	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
ASHLAND CO.	06/27/1989	14:15	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
ASHLAND CO.	08/04/1989	14:00	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
ASHLAND CO.	07/09/1990	11:05	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
ASHLAND CO.	08/19/1990	02:25	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
ASHLAND CO.	09/06/1990	13:20	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
ASHLAND CO.	03/27/1991	22:50	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
ASHLAND CO.	05/30/1991	21:00	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
ASHLAND CO.	05/31/1991	21:45	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
ASHLAND CO.	07/10/1992	17:00	Thunderstorm Wind	0 kts.	0	0	0.00K	0.00K
Countywide	04/27/1994	04:54	Thunderstorm Wind	0 kts.	0	0	5.00K	0.00K
Loudenville	06/12/1994	15:20	Thunderstorm Wind	0 kts.	0	0	5.00K	0.00K
Loudenville	06/19/1994	16:10	Thunderstorm Wind	0 kts.	0	0	5.00K	0.00K
Polk	06/20/1994	16:50	Thunderstorm Wind	0 kts.	0	0	5.00K	0.00K
Countywide	06/20/1994	17:05	Thunderstorm Wind	0 kts.	0	0	50.00K	0.00K
Ashland and	06/29/1994	00:54	Thunderstorm Wind	0 kts.	0	0	5.00K	0.00K
Sullivan	08/04/1994	12:41	Thunderstorm Wind	0 kts.	0	0	50.00K	0.00K
Charles Mills State P	04/21/1995	08:10	Thunderstorm Wind	0 kts.	0	0	10.00K	0.00K
Countywide	07/13/1995	19:45	Thunderstorm Wind	0 kts.	1	0	150.00K	30.00K

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
Loudonville	07/15/1995	17:45	Thunderstorm Wind	0 kts.	0	0	2.00K	0.00K
Countywide	07/16/1995	16:50	Thunderstorm Wind	0 kts.	0	0	2.00K	0.00K
Loudenville	09/13/1995	20:10	Thunderstorm Wind	0 kts.	0	0	3.00K	0.00K
COUNTYWIDE	06/22/1996	09:34	Thunderstorm Wind	50 kts.	0	0	2.00K	0.00K
ASHLAND	06/24/1996	11:30	Thunderstorm Wind	50 kts.	0	0	1.00K	0.00K
SOUTHERN PORTION	07/07/1996	22:30	Thunderstorm Wind	60 kts.	0	0	0.00K	0.00K
NORTHERN HALF	12/01/1996	12:00	Thunderstorm Wind	50 kts.	0	0	2.00K	0.00K
COUNTYWIDE	06/28/1998	18:00	Thunderstorm Wind	69 kts.	0	0	75.00K	0.00K
SULLIVAN	07/21/1998	22:16	Thunderstorm Wind	52 kts.	0	0	0.00K	0.00K
ASHLAND	07/04/2003	14:30	Thunderstorm Wind	50 kts. EG	0	0	8.00K	0.00K
COUNTYWIDE	07/04/2003	14:30	Thunderstorm Wind	50 kts. EG	0	0	15.00K	0.00K
COUNTYWIDE	07/07/2003	14:40	Thunderstorm Wind	50 kts. EG	0	0	20.00K	0.00K
COUNTYWIDE	07/08/2003	03:45	Thunderstorm Wind	50 kts. EG	0	0	50.00K	0.00K
COUNTYWIDE	07/08/2003	16:30	Thunderstorm Wind	50 kts. EG	0	0	125.00K	0.00K
ASHLAND	07/21/2003	09:05	Thunderstorm Wind	50 kts. EG	0	0	10.00K	0.00K
MIFFLIN	08/02/2003	15:30	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
JEROMESVILLE	08/16/2003	14:45	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
COUNTYWIDE	08/26/2003	19:00	Thunderstorm Wind	50 kts. EG	0	0	10.00K	0.00K
ASHLAND	08/27/2003	03:35	Thunderstorm Wind	50 kts. EG	0	0	10.00K	0.00K
LOUDONVILLE	11/12/2003	18:30	Thunderstorm Wind	50 kts. EG	0	0	3.00K	0.00K
COUNTYWIDE	05/21/2004	15:15	Thunderstorm Wind	50 kts. EG	0	0	125.00K	0.00K
HAYESVILLE	06/13/2004	19:50	Thunderstorm Wind	50 kts. EG	0	0	4.00K	0.00K
ASHLAND	06/14/2004	16:20	Thunderstorm Wind	50 kts. EG	0	0	10.00K	0.00K
PERRYSVILLE	06/24/2004	18:00	Thunderstorm Wind	50 kts. EG	0	0	15.00K	0.00K
ASHLAND	04/20/2005	17:35	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
HAYESVILLE	06/05/2005	20:53	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
HAYESVILLE	06/28/2005	15:15	Thunderstorm Wind	50 kts. EG	0	0	10.00K	0.00K
PERRYSVILLE	06/30/2005	13:30	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
RUGGLES	07/21/2005	03:00	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
ASHLAND	07/25/2005	13:30	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
POLK	07/25/2005	13:30	Thunderstorm Wind	50 kts. EG	0	1	30.00K	0.00K
JEROMESVILLE	07/26/2005	18:40	Thunderstorm Wind	50 kts. EG	0	0	75.00K	0.00K
LOUDONVILLE	07/26/2005	20:05	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
ASHLAND	08/13/2005	16:58	Thunderstorm Wind	50 kts. EG	0	0	25.00K	0.00K
SULLIVAN	08/20/2005	14:35	Thunderstorm Wind	50 kts. EG	0	0	4.00K	0.00K
POLK	11/06/2005	10:20	Thunderstorm Wind	50 kts. EG	0	0	8.00K	0.00K
ASHLAND	05/25/2006	17:10	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
LOUDONVILLE	05/25/2006	17:50	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
HAYESVILLE	05/25/2006	19:28	Thunderstorm Wind	50 kts. EG	0	0	10.00K	0.00K
LOUDONVILLE	05/31/2006	19:30	Thunderstorm Wind	50 kts. EG	0	0	3.00K	0.00K
HAYESVILLE	06/21/2006	22:35	Thunderstorm Wind	50 kts. EG	0	0	15.00K	0.00K
SULLIVAN	06/22/2006	00:50	Thunderstorm Wind	50 kts. EG	0	0	1.00K	0.00K
COUNTYWIDE	06/22/2006	16:00	Thunderstorm Wind	70 kts. EG	0	0	450.00K	0.00K
MC ZENA	06/22/2006	16:15	Thunderstorm Wind	61 kts. EG	0	0	25.00K	0.00K
ASHLAND	07/02/2006	18:55	Thunderstorm Wind	50 kts. EG	0	0	10.00K	0.00K
PERRYSVILLE	07/10/2006	15:10	Thunderstorm Wind	50 kts. EG	0	0	20.00K	0.00K
POLK	05/02/2007	19:00	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
JEROMESVILLE	05/26/2007	13:18	Thunderstorm Wind	50 kts. EG	0	0	1.00K	0.00K
ASHLAND	06/08/2007	13:40	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
ASHLAND	08/16/2007	00:00	Thunderstorm Wind	60 kts. EG	0	0	300.00K	0.00K
ASHLAND	09/25/2007	20:30	Thunderstorm Wind	50 kts. EG	0	0	100.00K	0.00K
NOVA	06/13/2008	17:15	Thunderstorm Wind	50 kts. EG	0	0	50.00K	0.00K
SAVANNAH	07/08/2008	15:30	Thunderstorm Wind	50 kts. EG	0	0	20.00K	0.00K
ASHLAND	07/08/2008	15:36	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
POLK	06/01/2009	20:50	Thunderstorm Wind	50 kts. EG	0	0	12.00K	0.00K
JEROMESVILLE	06/19/2009	17:00	Thunderstorm Wind	55 kts. EG	0	0	30.00K	0.00K
PARADISE HILL	06/25/2009	18:10	Thunderstorm Wind	50 kts. EG	0	0	1.00K	0.00K

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
POLK	08/20/2009	16:15	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
MIFFLIN	05/07/2010	22:05	Thunderstorm Wind	50 kts. EG	0	0	1.00K	0.00K
LOUDONVILLE	06/27/2010	15:28	Thunderstorm Wind	50 kts. EG	0	0	1.00K	0.00K
LOUDONVILLE	06/27/2010	15:43	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
HAYESVILLE	06/27/2010	16:15	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
LOUDONVILLE	09/07/2010	16:44	Thunderstorm Wind	50 kts. EG	0	0	15.00K	0.00K
ASHLAND	04/27/2011	11:35	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
ASHLAND	05/26/2011	16:40	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
ASHLAND CO.	06/10/2011	18:30	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
HAYESVILLE	07/11/2011	12:45	Thunderstorm Wind	50 kts. EG	0	0	15.00K	0.00K
HAYESVILLE	09/01/2011	11:30	Thunderstorm Wind	50 kts. EG	0	0	10.00K	0.00K
JEROMESVILLE	04/30/2012	20:35	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
ASHLAND	06/18/2012	15:05	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
ASHLAND CO ARPT	06/18/2012	15:05	Thunderstorm Wind	50 kts. EG	0	0	6.00K	0.00K
PERRYSVILLE	06/29/2012	16:30	Thunderstorm Wind	56 kts. EG	0	0	750.00K	0.00K
HAYESVILLE	07/04/2012	20:35	Thunderstorm Wind	50 kts. EG	0	0	4.00K	0.00K
WIDOWVILLE	07/05/2012	06:30	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
ASHLAND	08/04/2012	22:30	Thunderstorm Wind	50 kts. EG	0	0	15.00K	0.00K
ASHLAND	04/10/2013	15:33	Thunderstorm Wind	50 kts. EG	0	0	6.00K	0.00K
RUGGLES	06/12/2013	20:22	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
ASHLAND	06/13/2013	00:39	Thunderstorm Wind	50 kts. EG	0	0	50.00K	0.00K
LOUDONVILLE	06/13/2013	01:00	Thunderstorm Wind	50 kts. EG	0	0	10.00K	0.00K
REDHAW	07/10/2013	13:50	Thunderstorm Wind	50 kts. EG	0	0	50.00K	0.00K
BAILEY LAKE	07/10/2013	14:45	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
SULLIVAN	07/10/2013	14:45	Thunderstorm Wind	50 kts. EG	0	0	1.00K	0.00K
ASHLAND	07/10/2013	15:05	Thunderstorm Wind	50 kts. EG	0	0	5.00K	0.00K
ASHLAND	11/01/2013	00:10	Thunderstorm Wind	50 kts. EG	0	0	50.00K	0.00K
PARADISE HILL	11/17/2013	19:30	Thunderstorm Wind	50 kts. EG	0	0	25.00K	0.00K
PERRYSVILLE	11/17/2013	19:50	Thunderstorm Wind	50 kts. EG	0	0	8.00K	0.00K

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
SULLIVAN	12/22/2013	00:00	Thunderstorm Wind	50 kts. EG	0	0	25.00K	0.00K
ASHLAND	05/07/2014	04:05	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
LOUDONVILLE	05/14/2014	00:45	Thunderstorm Wind	50 kts. EG	0	0	4.00K	0.00K
ASHLAND	05/21/2014	22:02	Thunderstorm Wind	50 kts. EG	0	0	3.00K	0.00K
ASHLAND	07/26/2014	16:30	Thunderstorm Wind	50 kts. EG	0	0	15.00K	0.00K
PERRYSVILLE	07/13/2016	20:15	Thunderstorm Wind	50 kts. EG	0	0	10.00K	0.00K
ASHLAND	08/09/2016	19:10	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
FIVE PTS	09/10/2016	15:57	Thunderstorm Wind	50 kts. EG	0	0	1.00K	0.00K
ASHLAND	03/01/2017	05:15	Thunderstorm Wind	50 kts. EG	0	0	6.00K	0.00K
ALBION	06/19/2017	16:27	Thunderstorm Wind	50 kts. EG	0	0	2.00K	0.00K
ASHLAND	06/19/2017	16:35	Thunderstorm Wind	50 kts. EG	0	0	1.00K	0.00K
NOVA	07/07/2017	06:32	Thunderstorm Wind	50 kts. EG	0	0	1.00K	0.00K
MIFFLIN	07/07/2017	06:50	Thunderstorm Wind	50 kts. EG	0	0	1.00K	0.00K
FIVE PTS	09/04/2017	22:10	Thunderstorm Wind	50 kts. EG	0	0	4.00K	0.00K
ASHLAND	11/05/2017	17:15	Thunderstorm Wind	50 kts. EG	0	0	25.00K	0.00K
NANKIN	09/21/2018	15:40	Thunderstorm Wind	61 kts. EG	0	0	45.00K	0.00K
MC KAY	09/21/2018	16:00	Thunderstorm Wind	50 kts. EG	0	0	1.00K	0.00K
PERRYSVILLE	09/21/2018	16:12	Thunderstorm Wind	50 kts. EG	0	0	25.00K	0.00K
SAVANNAH	04/14/2019	16:05	Thunderstorm Wind	56 kts. EG	0	0	0.00K	0.00K
POLK	07/02/2019	16:00	Thunderstorm Wind	61 kts. EG	0	0	5.00K	0.00K
ALBION	07/11/2019	12:06	Thunderstorm Wind	56 kts. EG	0	0	5.00K	0.00K
RUGGLES	07/18/2019	16:31	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
PERRYSVILLE	08/18/2019	16:08	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
MC KAY	08/18/2019	16:09	Thunderstorm Wind	52 kts. EG	0	0	2.00K	0.00K
REDHAW	08/18/2019	18:09	Thunderstorm Wind	52 kts. EG	0	0	10.00K	0.00K
ASHLAND CO ARPT	08/18/2019	22:40	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
ASHLAND CO ARPT	08/18/2019	22:45	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
ASHLAND	08/20/2019	16:54	Thunderstorm Wind	52 kts. EG	0	0	2.00K	0.00K
PERRYSVILLE	6/10/2020	18:14	Thunderstorm Wind	50 kts. EG	0	0	70.00K	0.00K
HAYESVILLE	6/10/2020	18:21	Thunderstorm Wind	50 kts. EG	0	0	15.00K	0.00K
LOUDONVILLE	6/10/2020	18:21	Thunderstorm Wind	50 kts. EG	0	0	1.00K	0.00K
LOUDONVILLE	09/07/2020	15:52	Thunderstorm Wind	55 kts. EG	0	0	0.00K	0.00K
SAVANNAH	11/15/2020	12:27	Thunderstorm Wind	60 kts. EG	0	0	0.00K	0.00K

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
LOUDONVILLE	06/29/2021	16:24	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
ASHLAND	07/07/2021	13:38	Thunderstorm Wind	50 kts. EG	0	0	0.00K	0.00K
				Totals:	1	2	4.602M	60.00k

Past Event Narratives

Event Details	Event Narrative
June 29, 2012 Event Type: Thunderstorm Wind Magnitude: 56kts. Location: Perrysville Duration: 4:30pm Fatalities/Injuries: 0/0 Property Damage: $ 750,000	An intense line of thunderstorms, or Derecho, moved across southern Ashland County during the afternoon of June 29th causing extensive damage. Winds were estimated to be as much as 65 mph. Over 50 percent of residents in the southern third of the county lost power during this event. Power was not completely restored for several days. Hundreds of trees were downed across the county along with many utility poles, forcing the closure of some of roads and streets. Damage to homes and buildings was also extensive. Dozens of homes and buildings lost roofing or siding with many other homes damaged by fallen trees. Clean up costs were extensive. The clean up was hampered by an ongoing heat wave with afternoon temperatures in the upper 90s. Significant crop losses are also expected. Damage from this storm in southern Ashland County was comparable to the remnants of Hurricane Ike in September 2008.

Event Details	Event Narrative
June 22, 2006 Event Type: Thunderstorm Wind Magnitude: 70kts Location: Countywide Duration 4:00pm – 4:10pm Fatalities/Injuries: 0/0 Property Damage: $ 450,000	During the late afternoon hours of June 22nd, severe thunderstorms moved across Ashland County and caused extensive damage. The worst damage resulted from straight line winds caused by a downburst that started east of Charles Mills Lake and continued through the Mifflin area to near Hayesville. Winds were estimated to be greater than 80 mph. Up to a thousand trees were downed along this path. Near Mifflin, a 120 foot tall radio tower was knocked down. Several homes in Mifflin lost sections of roof and three garages were also destroyed. One of the homes was damaged enough to be declared uninhabitable. In Hayesville, over half the trees in the town were blown down and many homes were damaged. Numerous roads had to be closed because of downed trees, limbs, and power lines. Across the remainder of the county, trees and power lines were reported down from as far north as Polk to Loudonville in the southeast corner of the county. At least two homes were damaged by fallen trees in Loudonville. Thousands of

	people lost power during this event.

Event Details	Event Narrative
August 16, 2007 Event Type: Thunderstorm Wind Magnitude: 60kts Location: Ashland Duration 12:00 am – 12:15 am Fatalities/Injuries: 0/0 Property Damage: $ 300,000	A portion of a roof on a grocery store was blown off. The grocery store was located on the north side of Ashland. Trees were also reported down in the area. A survey team followed up on the report and found a significant portion of the grocery store's roof was blown off. Also noted was a barn southwest of the store that had a portion of its roof blown off. Numerous trees were down mainly between State Routes 511 and 58. Two semi trailers and a construction trailer were blown onto their sides near State Route 511 and U.S. 250.

Probability of Hazard Occurrence

The probability that Ashland County will have another thunderstorm event is extremely high since they have experienced 195 events in the last 70 years. Based on that history, it is realistic to assume that Ashland County will experience 2 to 3 thunderstorm events per year.

Magnitude & Severity

Thunderstorms, since they are non-spatial in nature, could potentially impact any or all of Ashland County's build environment.

Thunderstorms can be an extremely dangerous hazard because they are often strong and fast in their approach and can be accompanied by flash flooding, lightning, hail, tornadoes, and high winds. Ashland County has experienced many severe thunderstorms that produced winds in excess of 50 knots. The county's costliest severe thunderstorm event resulted in $750,000 in damages.

Thunderstorm loss estimates were determined based upon previous damages and documented in the table below.

Thunderstorm		
Structure Type	Structures at Risk	Potential Damage/Exposure
Residential	14	$ 2,283,316
Non-Residential	4	$ 655,012
Critical Facilities	1	$ 165,000
Total	19	$ 3,103,328

Speed of Onset & Duration

The National Weather Service issues a Severe Thunderstorm Warning when either a severe thunderstorm is indicated by radar or a spotter reports hail 3/4 inch or larger in diameter and/or winds equal or exceed 58 miles an hour.

The duration of severe thunderstorms is dependent on the storm type. Single cell thunderstorm usually last between 20-30 minutes, whereas a multicell cluster thunderstorm can persist for several hours.

Tornado

Tornadoes are violent storms with rotating winds of high velocity. Tornadoes appear as funnel-shaped clouds extending toward the ground from the base of a thunderstorm cloud (wall cloud). Tornadoes are discerned by the velocity of their rotating winds. The Fujita Scale below identifies the different types of tornadoes.

The Fujita Scale

Fujita Scale			Operational EF-Scale	
F Number	Fastest 1/4-mile (mph)	3 Second Gust (mph)	EF Number	3 Second Gust (mph)
0	40-72	45-78	0	65-85
1	73-112	79-117	1	86-110
2	113-157	118-161	2	111-135
3	158-207	162-209	3	136-165
4	208-260	210-261	4	166-200
5	261-318	262-317	5	Over 200

Ashland County is located on the northeast fringe of a geographical area within the United States known as "Tornado Alley." This designation indicates an area of the United States that has a greater potential for occurrence of tornadoes. The relative strength of the storms most likely to impact Tornado Alley is also greater than in other locations of the country. According to the American Society of Civil Engineers (ASCE), Ashland County is located in Zone IV. This indicates that community shelters within this zone should be constructed to withstand a wind speed of 250 mph. Losses resulting from tornadoes within Ashland County include those to personal property, agricultural components (crops, livestock, etc.), services, as well as injuries and deaths of community residents.

Past History of Hazard Occurrence

According to the National Climate Data Center, there have been 18 tornadoes recorded for Ashland County between 1950 and 2020. The Fujita Scale ratings of these storms have ranged in strength from F-0 to F-2. The following table describes some of the tornadoes that have occurred within Ashland County over the past 50 years.

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
ASHLAND CO.	06/12/1970	13:15	Tornado	F0	0	0	2.50K	0.00K

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
ASHLAND CO.	08/17/1972	10:30	Tornado	F1	0	0	25.00K	0.00K
ASHLAND CO.	05/10/1973	16:15	Tornado	F2	0	6	250.00K	0.00K
ASHLAND CO.	04/02/1977	20:28	Tornado	F1	0	6	2.500M	0.00K
ASHLAND CO.	06/30/1977	18:15	Tornado	F0	0	0	250.00K	0.00K
ASHLAND CO.	06/08/1981	15:00	Tornado	F1	0	0	250.00K	0.00K
ASHLAND CO.	03/28/1985	22:06	Tornado	F0	0	0	250.00K	0.00K
ASHLAND CO.	10/10/1989	14:35	Tornado	F1	0	0	25.00K	0.00K
ASHLAND CO.	07/13/1992	17:20	Tornado	F0	0	0	0.00K	0.00K
ASHLAND CO.	07/13/1992	18:11	Tornado	F0	0	0	25.00K	0.00K
ASHLAND CO.	08/27/1992	14:19	Tornado	F0	0	0	25.00K	0.00K
ASHLAND	08/06/2000	21:45	Tornado	F1	0	4	2.000M	0.00K
POLK	11/10/2002	17:48	Tornado	F2	0	0	1.600M	0.00K
PERRYSVILLE	07/10/2006	14:45	Tornado	F1	0	0	150.00K	0.00K
SULLIVAN	08/09/2007	15:28	Tornado	EF1	0	0	1.400M	0.00K
ROWSBURG	07/10/2013	14:56	Tornado	EF0	0	0	75.00K	0.00K
NOVA	11/05/2017	17:23	Tornado	EFO	0	0	50.00K	0.00K
WIDOWVILLE	11/05/2017	17:29	Tornado	EF1	0	0	150.00K	0.00K
				Totals:	0	16	9.027M	0.00K

Past Event Narratives

Event Details	Event Narrative
April 2, 1977 Event Type: F1 Tornado Location: Ashland Time: 9:25 pm Fatalities/Injuries: 0/6 Property Damage: $ 2,500,000	A tornado touched down at Bailey Lakes in Ashland County at 9:28 p.m. EST. The tornado destroyed two homes and damaged 14 others. Additionally, numerous farm buildings and out buildings were destroyed. Six members of a family in one of the destroyed homes were injured.

Event Details	Event Narrative
August 6,2000 Event Type: F1 Tornado Location: Ashland	A tornado touched down on the west side of Ashland near Lindale Avenue then moved east along West Main Street causing significant damage and four minor injuries. The damage path was 50 to 100 yards

Time: 9:45 pm Fatalities/Injuries: 0/4 Property Damage: $ 2,000,000	wide, intermittent, and nearly three miles in length. The most severe damage occurred a few blocks west of downtown. Major structural damage occurred to several homes in the area including one that had an entire side blown apart. Damage to the downtown business district was much less severe with most of the damage being in the form of broken windows and torn off siding. However, three buildings lost large sections of roof and a fourth had a brick wall collapse. The roof of one of the buildings was found six blocks east of downtown. East of the business district, the damage path was intermittent with only a dozen or so homes sustaining minor damage. In total, 112 homes and 20 businesses were damaged. Of those totals, 23 homes and four businesses suffered major damage. Several cars were destroyed and hundreds of trees were toppled. Six power poles were also snapped near ground level.

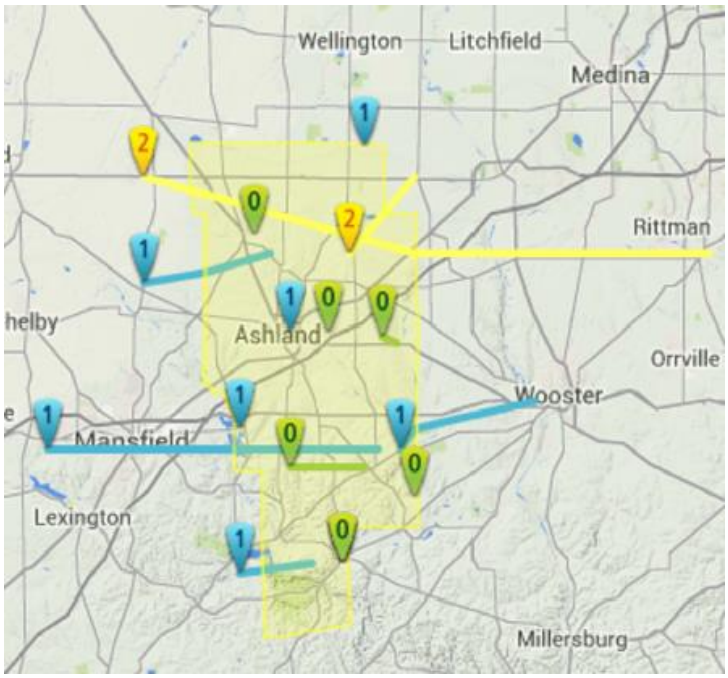
Event Details	Event Narrative
November 10, 2002 Event Type: F2 Tornado Location: Polk Time: 5:58 pm Fatalities/Injuries: 0/0 Property Damage: $ 1,600,000	A tornado touched down two miles southwest of Polk near the intersection of County Road 601 and Township Road 902. A new home at this location was destroyed. The tornado then traveled northeast across the western and northern portions of Polk. Two homes on the west side of Polk were heavily damaged and a small barn was leveled just north of town. Another 10 to 12 buildings, including two public buildings sustained minor damage in Polk. From Polk, the tornado traveled northeast across rural areas and passed just to the west of Albion. Two homes along County Road 620 just west of Township Road 521 lost entire roofs and had exterior walls partially or entirely knocked down. A nearby barn was leveled with debris thrown as much as one half mile. A small boat tethered in a pond near the barn was found a quarter mile away and the pond itself was filled with debris. A church in the area had it's steeple toppled. The tornado continued northeast and damaged several more homes and buildings. The tornado moved into Medina County just east of County Road 175. In the county, a total of five homes were either completely destroyed or declared unlivable with another 11 homes sustaining enough damage to require significant repairs. Approximately 30 additional homes and buildings suffered minor damage. A few dozen cars sustained varying amounts of damage. The tornado was on the ground in Ashland County for approximately five and a half miles with the damage path no more than 50 yards in width.

Probability of Hazard Occurrence

Ashland County has experienced 18 tornado events in last 50 years and has a 36% chance of experiencing a tornado in any given year.

Magnitude & Severity

Tornadoes are a non-spatial hazard and could potentially hit any location in Ashland County. See the below map for the locations and trajectories of tornadoes that occurred in Ashland County.



Tornadoes can occur at any time when climatic conditions are favorable. Tornadoes cause damages to structures, personal property, infrastructure, critical facilities, and can cause severe injuries or even death. Ashland County has experienced tornadoes with wind speeds between 40 and 157 mph, the longest tornado was over 40 miles long, and their widest tornado was 847 yards wide. Damages will not be countywide, but will occur in the tornado's path. Ashland County's costliest tornado resulted in $2.5 million in damages.

Tornado loss estimates were determined based upon previous event damages and documented in the table below.

Tornado		
Structure Type	Structures at Risk	Potential Damage/Exposure
Residential	38	$ 6,197,572
Non-Residential	12	$ 1,983,323

Critical Facilities	3	$ 579,902
Total	53	$ 8,760,797

Speed of Onset & Duration

The National Weather Service will issue a Tornado Warning when a tornado has been indicated by radar or been sighted by trained spotters. The current lead time for a tornado warning is 13 minutes.

On average, most tornadoes last less than 10 minutes. However, strong and violent tornadoes with wind speeds from 110 to 200 mph can last anywhere from 20 minutes to more than an hour.

Windstorm

Windstorms could be characterized as periods where either of the following occurs: 1) sustained non-rotating surface winds (1-minute average) of 40 mph (35 knots) or greater lasting for 1 hour or longer; or 2) sustained non-rotating winds or gusts of 58 mph (50 knots) or greater for any duration. Severe wind can occur alone, such as during straight-line wind events and derechos, or it can accompany other natural hazards, including hurricanes and severe thunderstorms. Severe wind poses a threat to lives, property, and vital utilities primarily due to the effects of flying debris or downed trees and power lines. Severe wind will typically cause the greatest damage to structures of light construction, particularly manufactured homes.

Past History of Hazard Occurrence

Incidents of windstorms and their resulting damages have occurred frequently in Ashland County over the last 70 years. According to NOAA's National Climate Data Center, Ashland County has experienced 40 high or strong wind events from 1950 to 2020. The following table details the high/strong wind events that have occurred in the county.

Location	Date	Time	Type	Mag	Dth	Inj	PrD	CrD
ASHLAND (ZONE)	03/25/1996	11:00	High Wind	50 kts.	0	0	25.00K	0.00K
ASHLAND (ZONE)	04/25/1996	14:00	High Wind	50 kts.	0	0	0.00K	0.00K
ASHLAND (ZONE)	09/07/1996	04:00	High Wind	50 kts.	0	0	10.00K	10.00K
ASHLAND (ZONE)	10/30/1996	00:10	High Wind	50 kts.	0	0	75.00K	100.00K
ASHLAND (ZONE)	02/21/1997	10:30	High Wind	57 kts.	0	0	0.00K	0.00K
ASHLAND (ZONE)	02/27/1997	00:15	High Wind	50 kts.	0	0	10.00K	0.00K
ASHLAND (ZONE)	03/08/2003	18:30	Strong Wind	29 kts. MG	0	0	15.00K	0.00K
ASHLAND (ZONE)	05/11/2003	10:00	Strong Wind	35 kts. EG	0	0	25.00K	0.00K
ASHLAND (ZONE)	11/12/2003	21:00	High Wind	50 kts. EG	0	0	50.00K	0.00K
ASHLAND (ZONE)	03/05/2004	12:30	High Wind	50 kts. EG	0	0	75.00K	0.00K
ASHLAND (ZONE)	11/27/2004	18:00	Strong Wind	35 kts. EG	0	0	5.00K	0.00K
ASHLAND (ZONE)	12/07/2004	12:15	High Wind	50 kts. EG	0	0	15.00K	0.00K
ASHLAND (ZONE)	02/17/2006	00:00	High Wind	50 kts. EG	0	0	25.00K	0.00K
ASHLAND (ZONE)	03/10/2006	00:30	Strong Wind	40 kts. EG	0	0	10.00K	0.00K
ASHLAND (ZONE)	12/01/2006	15:00	High Wind	50 kts. EG	0	0	30.00K	0.00K

ASHLAND (ZONE)	12/23/2007	10:15	High Wind	50 kts. EG	0	0	50.00K	0.00K
ASHLAND (ZONE)	01/30/2008	03:00	High Wind	55 kts. EG	0	0	30.00K	0.00K
ASHLAND (ZONE)	09/14/2008	14:30	High Wind	63 kts. MG	0	0	3.500M	750.00K
ASHLAND (ZONE)	02/11/2009	22:00	High Wind	52 kts. EG	0	0	500.00K	0.00K
ASHLAND (ZONE)	12/09/2009	15:00	High Wind	52 kts. EG	0	0	300.00K	0.00K
ASHLAND (ZONE)	04/28/2011	05:00	High Wind	50 kts. EG	0	0	75.00K	0.00K
ASHLAND (ZONE)	02/24/2012	12:00	High Wind	50 kts. EG	0	0	5.00K	0.00K
ASHLAND (ZONE)	10/30/2012	00:00	High Wind	50 kts. EG	0	0	50.00K	0.00K
ASHLAND (ZONE)	11/24/2014	13:00	High Wind	52 kts. EG	0	0	150.00K	0.00K
ASHLAND (ZONE)	01/10/2017	22:02	High Wind	50 kts. EG	0	0	75.00K	0.00K
ASHLAND (ZONE)	12/31/2018	23:30	Strong Wind	43 kts. EG	0	0	25.00K	0.00K
ASHLAND (ZONE)	02/24/2019	10:00	High Wind	50 kts. EG	0	0	75.00K	0.00K
ASHLAND (ZONE)	12/30/2019	04:30	High Wind	56 kts. EG	0	0	10.00K	0.00K
ASHLAND (ZONE)	01/12/2020	00:40	High Wind	50 kts. EG	0	0	0.00K	0.00K
				Totals:	0	0	5.712M	860.00K

Past Event Narratives

Event Details	Event Narrative
September 14, 2008 Event Type: High Wind Magnitude: 63 kts. Location: Ashland Time: 2:30 pm – 9:30 pm Fatalities/Injuries: 0/0 Property Damage: $ 3,500,000 Crop Damage: $750,000	High winds associated with the remnants of Hurricane Ike began late in the afternoon of September 14th and then continued through much of the evening. A peak gust of 73 mph was measured in the county. A tent at the Ashland County Fair was blown down by the winds. The fair had to be shut down early because of the high winds. Hundreds of fairgoers had to be herded inside to safety at the onset of the high winds. Amusement rides at the fair had to be taken down to prevent them from being damaged or overturned. Damage in the county was extensive with thousands of trees and many utility poles downed. Widespread power outages occurred as well. Some locations in southern Ashland County were without power for as much as a week. Home and building damage across the county was also extensive. The damage ranged from a few shingles torn off to significant structural damage caused by fallen trees landing on roofs. Windows were blown out of several homes and many awnings and gutters were torn off. There were also a few

	reports of signs blown down. Numerous vehicles were damaged by fallen trees and limbs and also by flying debris. This storm hampered travel as downed trees and power lines forced the closure of many roads. Substantial clean up costs were incurred by local governments. Most of the schools in the county were forced to close on Monday the 15th because of the power outages. Significant crop losses occurred as well. Corn yields were reduced between 3 and 5 percent in many areas with lesser losses to the soybean crop.

Event Details	Event Narrative
February 11-12, 2009 Event Type: High Wind Magnitude: 52 kts. Location: Ashland Time: 10:00 pm – 5:00 am Fatalities/Injuries: 0/0 Property Damage: $ 500,000	A strong cold front moved across Ashland County during the evening of February 11th. West to southwest winds gusted to more than 60 mph behind the front. Winds finally diminished a couple hours before daybreak on the 12th. Hundreds of trees and utility poles were downed in the county causing scattered power outages. At one time, more than 25,000 customers were without power in Richland and Ashland Counties. Many buildings in the county sustained damage. Most of this was from lost shingles, but a few buildings lost gutters or sections of siding. A large tree fell on a home northeast of Nankin and caused significant damage. At least one school district in the county canceled classes because of lack of power.

Event Details	Event Narrative
December 9, 2009 Event Type: High Wind Magnitude: 52 kts. Location: Ashland Time: 3:00 pm – 10:00 pm Fatalities/Injuries: 0/0 Property Damage: $ 300,000	A strong cold front moved across Ashland County around midday on December 9th. Southwest winds behind the front rapidly increased with gusts in excess of 45 mph by early afternoon. Gusts continued to increase the remainder of the afternoon with peak gusts of around 60 mph reported during the late afternoon hours. Winds continued to gust to as much as 50 mph through 10 pm. The high winds downed a few trees and utility poles in Ashland County. Scattered power outages were reported. Some homes and buildings in the county sustained minor damage. Most of this was from lost siding or roofing.

Probability of Hazard Occurrence

Based on history, Ashland County has experienced forty (40) high wind or strong wind events in the last 70 years and has a 57% chance of having another high wind/strong wind event any given year.

Magnitude & Severity

Windstorms, because they are non-spatial in nature, could potentially impact any or all of Ashland County. Windstorms are particularly dangerous because they bring down tree limbs, power lines, and cause damages to structures or other personal property. Out of Ashland's 23 windstorm events, 19 of them reached wind speeds in excess of 50 kts. Ashland County's costliest windstorm event resulted in $3,500,000 in property damage and $750,000 in crop damages. Windstorm loss estimates were determined based upon previous event damages and documented in the table below.

Windstorm		
Structure Type	Structures at Risk	Potential Damage/Exposure
Residential	18	$ 3,074,615
Non-Residential	6	$ 982,518
Critical Facilities	2	$ 330,00
Total	26	$ 4,387,133

Speed of Onset & Duration

The National Weather Service will issue a wind advisory when sustained winds are expected to be between 31 and 39 mph for at least an hour, or any wind gust between 46 and 57 mph. Advisories are usually issued 6-18 hours prior to the weather event. A High Wind Watch will be when there is the potential for dangerous winds. A Watch is usually issued between 12 and 48 hours before a weather event. A High Wind Warning will be issued when sustained winds will be 40 mph or greater for at least one hour, or any gust of wind expected to be 58 mph or greater. Warnings are usually issued 6-18 hours prior to the weather event.

Windstorm events are a fast-moving hazard. However, the longest lasting windstorm event in Ashland County lasted for approximately 13 hours.

Section Seven: Mitigation Strategy

This section of the plan describes the strategy that Ashland County intends to implement to minimize loss of life and property damages from natural hazards. The goals and actions were determined by the planning team based upon the results from the Hazard Identification and Risk Assessment and feedback from key stakeholders.

Mitigation Strategy

The goal of a mitigation strategy is to reduce loss of life and property damage from the effects of natural disasters. A mitigation strategy is made up of three components that include goals, actions, and an action plan for implementation. Together, these three components provided the mitigation planning team with a framework to identify, prioritize, and develop implementation actions to reduce the risk of hazards.

- Mitigation goals are general guidelines that explain what the community wants to achieve with the plan.
- Mitigation actions are specific projects and activities that help to achieve the goals.
- The action plan will describe how the mitigation actions will be implemented; including how those actions will be prioritized, administered, and incorporated.

To update mitigation goals and objectives for the plan, the Ashland County Mitigation Planning Team and key stakeholders investigated and analyzed a wide variety of mitigation actions from five different categories to determine the best strategy to combat the effects of hazards for Ashland County (see the types of mitigation actions below).

Types of Mitigation Actions

Local Plans and Regulations - These actions include government authorities, policies, or codes that influence the way land and buildings are developed and built.

- Planning and zoning
- Building codes
- Subdivision regulations
- Floodplain regulations
- Drainage system maintenance
- Capital improvement programs
- Open space preservation
- Stormwater management regulations

Structural and Infrastructure Projects - These actions involve modifying existing structures and infrastructure to protect them from a hazard or remove them from a hazard area. This could apply to public or private structures as well as critical facilities and infrastructure. This type of action also involves projects to construct manmade structures to reduce the impact of hazards.

- Acquisitions
- Elevations
- Utility undergrounding
- Floodwalls and retaining walls

- Culverts
- Safe rooms

Natural System Protection - These are actions that minimize damage and losses and also preserve or restore the functions of natural systems.

- Sediment and erosion control
- Stream corridor restoration
- Forest management
- Conservation easements
- Wetland restoration and preservation

Education and Awareness Programs - These are actions to inform and educate citizens, elected officials, and property owners about hazards and potential ways to mitigate them. These actions may also include participation in national programs, such as StormReady or Firewise Communities.

- Radio or television spots
- Websites with maps and information
- Real estate disclosure
- Presentations to school groups or neighborhood organizations
- Mailings to residents in hazard-prone areas.
- StormReady or Firewise Communities

Preparedness Actions – Those actions taken to prepare for a hazard. These actions can be included in the mitigation strategy; however, they will not meet the Federal mitigation planning requirements.

- Warning Sirens

Evaluation of the Previous Plans Mitigation Goals and Actions

The next step in the planning process was to conduct a review of the hazard mitigation actions that were developed in the previous plan to determine whether or not they had been completed over the last five years. Upon completion of the evaluation, planning team members determined that many of the original goals and objectives were ongoing actions that would be continued well into the future; a few objectives ran into administrative differences which would have to be addressed to reach full implementation; others were unobtainable during the due to a lack of funding.

Mitigation Actions	Status	Reason, if not completed
Develop countywide GIS capability	Completed	N/A
Enhance early warning systems to maximize public notification of severe weather	Completed	However, new locations were identified, along with existing sites requiring replacement was identified.
Ensure adequate back-up power is available to critical facilities during severe weather events	Not completed	Lack of available funding
Remove existing structures from flood hazard areas and/or elevate or retrofit structures,	Not completed	Lack of available funding

infrastructure, and utilities.		
Enhance the construction of safe rooms/shelters	Not completed	Lack of funding available
Educate the public on the risks associated with all-hazards	Not completed	Ongoing / continuous activity
Strengthen existing partnerships among all public and private sectors to support mitigation actions	Not completed	Ongoing / continuous activity
Integrate hazard mitigation into local planning efforts	Completed	N/A
Provide National Flood Insurance Program education	Not completed	Ongoing / continuous activity. Will be incorporated into hazard awareness education activities.
Improve stormwater drainage system capacity	Not completed	Lack of available funding
Conduct maintenance for drainage systems	Not completed	Ongoing / continuous activity
Adopt policies to reduce stormwater runoff	Not completed	Lack of local support
Improve stormwater management planning.	Not completed	Lack of available funding
Adopt and enforce residential building codes	Not completed	Lack of local support

Updating Mitigation Goals and Actions

To update the mitigation goals and actions, a mitigation proposal request form was developed and distributed to each political subdivision and planning team member for the purpose of identifying new goals and actions. The Ashland County Mitigation Planning Team, based on the Hazard Identification and Risk Assessment and feedback from the local jurisdictions, determined the following goals to be included in the plan update to reduce or avoid long-term vulnerability to flooding, severe weather events, or other hazards.

Mitigation Strategy Goals
To minimize loss of life and disruption of services due to severe weather events.
To minimize the loss of life and damage to properties during flood/flash flood events.
To educate the public on the risks associated with hazards.
To minimize losses of life and property damages through planning initiatives.
To minimize loss of life and damage to properties through structural and infrastructure projects.
To minimize building and infrastructure damages through regulation development.

Mitigation Action Plans

The development of action plans was the final step to setting the direction for implementing mitigation actions and achieving established goals. The Action Plans listed below were developed by the planning team and clarify the mitigation actions to be implemented, identify the responsible entities to complete the actions, define the potential funding sources available, estimate project costs and project timelines, and identify the specific tasks that will be conducted to fulfill the objective.

Goal #1: To minimize loss of life and property damage during flooding events.

Objective #1: To clear log jams from rivers and streams to minimize streambank erosion and debris hazards downstream.

OBJECTIVE 1	
Mitigation Action (objective)	To clear log jams from rivers and streams to minimize streambank erosion and debris hazards downstream.
Priority	4
Status	New
Estimated Cost	$ 12,000
Lead Organization	Ashland County Soil & Water Conservation District Ohio Department of Natural Resources Army Corps of Engineers Vendor/Contractor
Start Date	January 1, 2022
End Date	December 31, 2026
Details	• Identify locations of interest. • Secure landowner approvals for access • Remove large trees that have the potential to impact the dam or move down the river channel out of easement elevation or burn. • Smaller twigs, sticks, small trees, and sediment that has collected, will be placed to stabilize the streambank • Slope banks to allow for easy flow of water and reduce erosion.
Funding Sources	MWCD Private In-kind labor

Goal #2: To minimize loss of life due to severe weather events.
Objective #1: Enhance early warning systems to maximize public notification of severe weather

OBJECTIVE 2	
Mitigation Action (objective)	Enhance early warning systems to maximize public notification of severe weather
Priority	6
Status	New
Estimated Cost	$250,000
Lead Organization	Ashland County Emergency Management Agency City of Ashland Village of Loudonville Orange Township Ruggles Township Troy Township Mohican Township
Start Date	January 1, 2022

End Date	December 31, 2026
Details	• Identify most relevant locations for siren installations and/or replacements • Secure locations, if applicable • Install sirens • Test sirens
Funding Sources	Pre-Disaster Mitigation (PDM), Local Funding

Goal #3: To minimize disruption of services during severe weather events
Objective #1: Ensure adequate back-up power is available to critical facilities during severe weather events

OBJECTIVE 3		
Mitigation Action (objective)	Ensure adequate back-up power is available to critical facilities during severe weather events	
Priority	11	
Status	New	
Estimated Cost	$127,500	
Lead Organization	Ashland County Emergency Management Agency City of Ashland Village of Bailey Lakes Village of Hayesville Village of Jeromesville Village of Loudonville Village of Mifflin Village of Perrysville Village of Polk Village of Savannah Clear Creek Township Green Township Hanover Township	Jackson Township Lake Township Mifflin Township Milton Township Mohican Township Montgomery Township Orange Township Perry Township Ruggles Township Sullivan Township Troy Township Vermillion Township
Start Date	January 1, 2022	
End Date	December 31, 2026	
Details	• Identify all critical facilities within Ashland County • Determine existing capabilities at each facility • Identify locations for generator installation • Obtain cost estimates • Identify funding sources • Assist in the development and submission of funding requests • Install generator • Test generator	
Funding Sources	Pre-Disaster Mitigation (PDM)	

	Local funding

Goal #4: To minimize the loss of life and damage to properties during flood/flash flood events.
Objective #1: Remove existing structures from flood hazard areas and/or elevate or retrofit structures, infrastructure, and utilities.

OBJECTIVE 4		
Mitigation Action (objective)	Remove existing structures from flood hazard areas and/or elevate or retrofit structures, infrastructure, and utilities.	
Priority	12	
Status	New	
Estimated Cost	$ 750,000	
Lead Organization	City of Ashland Village of Bailey Lakes Village of Hayesville Village of Jeromesville Village of Loudonville Village of Mifflin Village of Perrysville Village of Polk Village of Savannah Clear Creek Township Green Township Hanover Township	Jackson Township Lake Township Mifflin Township Milton Township Mohican Township Montgomery Township Orange Township Perry Township Ruggles Township Sullivan Township Troy Township Vermillion Township
Start Date	January 1, 2022	
End Date	December 31, 2026	
Details	• Identify all properties prone to flooding in Ashland County, including repetitive loss properties and severe loss properties • Determine the cause of the flooding for each location • Assess potential strategies for corrective action • Determine the most appropriate corrective action • Obtain applicable cost estimates • Identify potential funding • Secure funding • Implement corrective measure (acquisition, retrofit, or relocation)	
Funding Sources	Flood Mitigation Assistance (FMA) Community Development Block Grant Rural Development Funding	

Goal #5: To minimize loss of life due to severe weather events.
Objective #1: Enhance the construction of safe rooms/shelters.

OBJECTIVE 5

OBJECTIVE 5		
Mitigation Action (objective)	Enhance the construction of safe rooms/shelters	
Priority	8	
Status	New	
Estimated Cost	$225,000	
Lead Organization	Ashland County City of Ashland Village of Bailey Lakes Village of Hayesville Village of Jeromesville Village of Loudonville Village of Mifflin Village of Perrysville Village of Polk Village of Savannah Clear Creek Township Green Township Hanover Township	Jackson Township Lake Township Mifflin Township Milton Township Mohican Township Montgomery Township Orange Township Perry Township Ruggles Township Sullivan Township Troy Township Vermillion Township
Start Date	January 1, 2022	
End Date	December 31, 2026	
Details	• Conduct site assessments • Arrange for and assist in plan development • Obtain cost estimates • Identify funding sources • Assist in the development and submission of funding requests • Implement • Encourage construction of safe rooms in new structures	
Funding Sources	Pre-Disaster Mitigation Funding	

Goal #6: To educate the public on the risks associated with hazards.
Objective #1: Increase hazard education and awareness activities for all-hazards.

OBJECTIVE 6		
Mitigation Action (objective)	Implement hazard awareness activities for all-hazards	
Priority	2	
Status	New	
Estimated Cost	Staffing costs	
Lead Organization	Ashland County EMA Ashland County City of Ashland	Hanover Township Jackson Township Lake Township

OBJECTIVE 6		
	Village of Bailey Lakes Village of Hayesville Village of Jeromesville Village of Loudonville Village of Mifflin Village of Perrysville Village of Polk Village of Savannah Clear Creek Township Green Township	Mifflin Township Milton Township Mohican Township Montgomery Township Orange Township Perry Township Ruggles Township Sullivan Township Troy Township Vermillion Township
Start Date	January 1, 2022	
End Date	December 31, 2026	
Details	• Develop and implement a multi-hazard public awareness program for Ashland County. • Create/publish educational material for drought, earthquakes, epidemics, extreme weather, floods and NFIP, and severe weather and include preparedness and mitigation measures. • Disseminate information through media outlets • Educate school children about hazard dangers and how to take safety precautions • Support severe weather awareness week • Promote the use of NOAA weather radios • Utilize website and social media to educate the public on hazards, preparedness, and mitigation measures.	
Funding Sources	Local funding	

Goal #7: To minimize losses of life and property damages through planning initiatives.
Objective #1: Strengthen existing partnerships among all public and private sectors to support mitigation actions.

OBJECTIVE 7	
Mitigation Action (objective)	Strengthen existing partnerships among all public and private sectors to support mitigation actions
Priority	1
Status	New (Ongoing)
Estimated Cost	Staffing
Lead Organization	Ashland County EMA
Start Date	January 1, 2022
End Date	December 31, 2026
Details	• Assess existing local, regional, state and federal partnerships involved in disaster mitigation. • Identify unmet needs and identify potential new partnerships.

	• Establish committees/workgroups to meet regularly to discuss issues and recommendations. • Develop and implement mitigation strategies determined via committees/workgroups • Maintain partnerships
Funding Sources	Local funding

Goal #8: To minimize damage and losses during flooding events and restore the functions of natural systems.
Objective #1: Expand wetland areas to expand flood storage capacity and restore habitat for migratory birds.

OBJECTIVE 8	
Mitigation Action (objective)	Restore wetland habitat, reduce sediment and expand flood storage capacity.
Priority	5
Status	New
Estimated Cost	$20,000
Lead Organization	Ashland County Soil & Water Conservation District
Start Date	January 1, 2022
End Date	December 31, 2026
Details	This project involves the restoration of 62 acres of wetland. This restored wetland complex will significantly increase water quality in the river by absorbing excess nutrients and sediment and will provide flood protection during high flow events. As part of this project, restore hydrology on the majority of the agricultural acres by construction of two low-level earthen berms, installation of vinyl sheet pile ditch plugs, and incorporation of multiple in-line water control structures. • Tile Search and removal: The actual number of tiles to remove will not be known until the site has been trenched. • Sheet pile ditch plugs: corrugated composite sheet pile (VSP) will be installed on two identified ditches that are dewatering parts of the project area. • Earthen ditch plug will be installed to repair an existing opening to restore berm integrity. • Two low-level earthen berms will be constructed to restore the south and north pools. • In-line water control structures installation • Nesting mound/micro pool habitat using clay fill
Funding Sources	MWCD Local Funding

Goal #9: To minimize loss of life and damage to properties through structural and infrastructure projects.
Objective #1: Improve stormwater drainage system capacity

OBJECTIVE 9		
Mitigation Action (objective)	Improve stormwater drainage system capacity	
Priority	10	
Status	New	
Estimated Cost	TBD	
Lead Organization	Ashland County City of Ashland Village of Bailey Lakes Village of Hayesville Village of Jeromesville Village of Loudonville Village of Mifflin Village of Perrysville Village of Polk Village of Savannah Clear Creek Township Green Township Hanover Township	Jackson Township Lake Township Mifflin Township Milton Township Mohican Township Montgomery Township Orange Township Perry Township Ruggles Township Sullivan Township Troy Township Vermillion Township
Start Date	January 1, 2022	
End Date	December 31, 2026	
Details	Evaluate existing capabilities Assess potential strategies Determine the most appropriate corrective action Obtain cost estimates Identify potential funding source Secure funding Implement	
Funding Sources	Pre-Disaster Mitigation Funding Local Funding	

Goal #10: To minimize loss of life and damage to properties through structural and infrastructure projects.
Objective #1: Conduct maintenance for drainage systems

OBJECTIVE 10		
Mitigation Action (objective)	Conduct maintenance for drainage systems	
Priority	7	
Status	New	
Estimated Cost	Staffing expenses	
Lead Organization	Ashland County City of Ashland	Jackson Township Lake Township

	Village of Bailey Lakes Village of Hayesville Village of Jeromesville Village of Loudonville Village of Mifflin Village of Perrysville Village of Polk Village of Savannah Clear Creek Township Green Township Hanover Township	Mifflin Township Milton Township Mohican Township Montgomery Township Orange Township Perry Township Ruggles Township Sullivan Township Troy Township Vermillion Township
Start Date	January 1, 2022	
End Date	December 31, 2026	
Details	Identify locations prone to flooding Determine strategies to mitigate the effects Implement the determined strategy	
Funding Sources	Local Funding	

Goal #11: To minimize building and infrastructure damages through regulation development.
Objective #1: Adopt policies to reduce stormwater runoff.

OBJECTIVE 11		
Mitigation Action (objective)	Adopt policies to reduce stormwater runoff	
Priority	3	
Status	New	
Estimated Cost	Staffing costs	
Lead Organization	Ashland County City of Ashland Village of Bailey Lakes Village of Hayesville Village of Jeromesville Village of Loudonville Village of Mifflin Village of Perrysville Village of Polk Village of Savannah Clear Creek Township Green Township Hanover Township	Jackson Township Lake Township Mifflin Township Milton Township Mohican Township Montgomery Township Orange Township Perry Township Ruggles Township Sullivan Township Troy Township Vermillion Township
Start Date	January 1, 2022	
End Date	December 31, 2026	
Details	Evaluate existing policies Develop strategies to improve stormwater capabilities	

OBJECTIVE 11	
Funding Sources	Local Funding

Goal #12: To minimize losses of life and property damages through planning initiatives.
Objective #1: Improve stormwater management planning.

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OBJECTIVE 12		
Mitigation Action (objective)	Improve stormwater management planning	
Priority	9	
Status	New	
Estimated Cost	Staffing expense	
Lead Organization	Ashland County City of Ashland Village of Bailey Lakes Village of Hayesville Village of Jeromesville Village of Loudonville Village of Mifflin Village of Perrysville Village of Polk Village of Savannah Clear Creek Township Green Township Hanover Township	Jackson Township Lake Township Mifflin Township Milton Township Mohican Township Montgomery Township Orange Township Perry Township Ruggles Township Sullivan Township Troy Township Vermillion Township
Start Date	January 1, 2022	
End Date	December 31, 2026	
Details	Update existing plans and integrate mitigation considerations	
Funding Sources	Local Funding	

Goal #13: To minimize building and infrastructure damages through regulation development.
Objective #1: Adopt and enforce residential building codes

OBJECTIVE 13		
Mitigation Action (objective)	Adopt and enforce residential building codes	
Priority	13	
Status	New	
Estimated Cost	Staffing expenses	
Lead Organization	Ashland County City of Ashland Village of Bailey Lakes	Jackson Township Lake Township Mifflin Township

	Village of Hayesville Village of Jeromesville Village of Loudonville Village of Mifflin Village of Perrysville Village of Polk Village of Savannah Clear Creek Township Green Township Hanover Township	Milton Township Mohican Township Montgomery Township Orange Township Perry Township Ruggles Township Sullivan Township Troy Township Vermillion Township
Start Date	January 1, 2022	
End Date	December 31, 2026	
Details	Review building codes and structural policies Encourage wind engineering measures and construction techniques Discourage flat roofs in areas that experience heavy snow Adopt and enforce residential building codes	
Funding Sources	Local funding	

Prioritization of Mitigation Goals and Actions

The goal of each proposed mitigation action is to reduce or prevent damage from a hazard event. In order to determine the effectiveness in accomplishing this goal, members of the planning team members were asked to prioritize each mitigation action in accordance with FEMA Publication 386-5, Benefit-Cost Review. The costs and benefits of each action were determined using Review Tool 2 and 3, then placed on a matrix and evaluated using the STAPLEE criteria in a modified Simple Score method (Method C). The Benefit-Cost Review was emphasized in the prioritization process to maximize the benefits over the costs. This approach demonstrates the actions' evaluation in terms of their pros and cons, which are represented as costs and benefits.

Section Eight: Plan Maintenance

Overview

The Ashland County Mitigation Plan is, and will continue to be, a working plan. In order for the plan to be successful, systematic maintenance is necessary. Without periodic plan reviews, the planning effort can lose its effectiveness and jeopardize the overall purpose of the plan.

With that said, the Ashland County Mitigation Planning team instituted the following mechanisms for which the Ashland County Mitigation Plan will be monitored, evaluated, and updated. This section also describes how key stakeholders and the general public will be included in the planning process beyond the plan adoption phase.

Plan Monitoring

The Ashland County Mitigation Plan for Natural Disasters will be implemented according to the mitigation strategies outlined in Section Seven. It is the responsibility of the Ashland County EMA Director to oversee the execution of the mitigation strategies and all of their corresponding actions. It is the responsibility of the agencies defined within each mitigation strategy to track and report strategy progress to the EMA Director on a quarterly basis. The Ashland County EMA Director will document all progress with strategies and update the planning team at the annual meeting or earlier as the situation requires.

Plan Evaluation

The planning team established that they will reconvene on an annual basis to evaluate the plan's effectiveness. Each strategy will be assessed on whether the actions were implemented and evaluated to see if it generated the intended results. On the other hand, if a strategy was not implemented, the planning team will strive to determine the barriers that prohibited its implementation and determine alternative actions to combat the barriers.

It is the responsibility of the EMA Director to schedule the annual meeting and to notify planning team members, key stakeholders, and the general public. The Ashland County EMA Director is also responsible for recording the results obtained during the evaluations and compile the findings into a brief report to be shared with political subdivisions as a mean to update them on the progress of the mitigation strategies.

Updating the Plan

The Ashland County Emergency Management Agency, in coordination with the planning team, will review and revise the plan at a minimum of once every 5 years to reflect changes in development, progress in local mitigation efforts, and changes in priorities. Proposed changes to the plan can be initiated by any

member of the planning team. All proposed changes are to be reviewed and approved by the planning team prior to any alterations being made to the planning document. The EMA Director is responsible for maintaining and updating the plan.

The final plan and any future plan updates will be distributed by the Ashland County Emergency Management Agency Director to each member of the planning team, the Ashland County Commissioners, all Ashland County political subdivisions, the Ohio Emergency Management Agency, the Ashland County Library, and others as requested.

Continued Public Involvement

Continued public involvement efforts will come in several forms. The public was initially contacted via news releases to request their input on the plan draft. However, after the plan is approved, it is still vital that the public be engaged in the implementation phase of the planning process. The Ashland County planning team will utilize various news media sources to alert the public of any future meetings involving the planning team. This will afford the public with the opportunity to attend these meetings and provide comments or recommendations.

Another mechanism in providing the public with continuous access to mitigation information will be achieved through the Ashland County Emergency Management Agency's Website and Facebook page. It is the intention of the planning team to utilize the website so that the public will continually have access to the plan and other mitigation documents as they become available. The website will also provide the means for residents to submit comments or recommendations to the Ashland County EMA Director at any time. As necessary, the EMA Director will share any relevant comments/suggestions that he receives with the planning team at the next annual meeting. It is the responsibility of the Ashland County EMA Director to maintain and update the information available on the website and Facebook page.

Hardcopy versions of the plan will also be maintained at the Ashland County Emergency Management Agency, Ashland County Library, and the Loudonville Library so that the plan is continuously made available for public viewing.

Plan Incorporation

Ashland County's process to integrate the data, information, and hazard mitigation goals and actions into other planning projects will be initiated by members of the planning team. These members include, but are not limited to: the County Commissioners, Township Trustees, the EMA Director, public safety representatives, floodplain administrators, and local and county engineers.

Members of the Mitigation Planning Team will take the information generated during the planning process back to their organizational leadership so that they can update or incorporate the information into plans,

regulations, codes, ordinances, policies, procedures, or other administrative instruments. This process will also allow for oversight, commitment of time, energy, and resources to change actions into projects.

Although the villages and townships did not have as many representatives serving on the planning team, their representatives are to follow the same processes as those at the county level.

Section Nine: Plan Adoption

PLAN ADOPTION

Upon receiving FEMA's designation of "Approved Pending Formal Adoption," the Director of the Ashland County Emergency Management Agency will re-distribute the plan to all political subdivisions in Ashland County for adoption. The Ashland County Board of Commissioners, the City of Ashland, Village of Bailey Lakes, Village of Hayesville, Village of Jeromesville, Village of Loudonville, Village of Mifflin, Village of Perrysville, Village of Polk, and the Village of Savannah are to put forth resolutions formally adopting the Ashland County Mitigation Plan for Natural Disasters within one year of receiving FEMA's designation.

Once the individual adoptions have been completed, the jurisdictions are to forward a copy of their resolutions to the Director of the Ashland County Emergency Management Agency. The Director will include a copy of each resolution in Appendix E of the plan and will then forward a copy of all resolutions to the Ohio Emergency Management Agency to maintain in their files.

APPENDIX A: Outreach Postings

Copy of the Facebook posting regarding plan draft review:

Copy of the Ashland Times-Gazette notice:

County mitigation plan for Jan. 22 meeting

January 9, 2015 By Chelsea Shar

The Ashland County Mitigation Plan development team will meet Jan. 22, 2015, at 2 p.m. in the Ashland County Emergency Operations Center, located in the lower level of the Ashland County Service Center.
The purpose of the meeting is to discuss the final draft of the county mitigation plan. The meeting is open to the public, and time will be allotted at the end for comments.
The county mitigation plan is required to be updated

Copy of the Ashland County Office of Homeland Security and Emergency Management Agency website page posting:

Ashland County Office of Homeland Security and Emergency Management Agency

Our Office Generously Supported and Funded by the Ashland County Commissioners.
Kim Edwards, Barb Queer, and Michael Welch

HOME PAGE
ABOUT OHS / EMA
DEFINITIONS AND TERMINOLOGY
EMERGENCY PREPAREDNESS
WEATHER SAFETY GUIDES
SAFETY CHECKLIST
EVACUATION INFORMATION
LOCAL EMERGENCY PLANNING
HOMELAND SECURITY
NOAA WEATHER RADIO
RELATED LINKS
LOCAL WEATHER CONDITIONS
REVERSE 911
ASHLAND COUNTY HOME PAGE

House Number Application Form (PDF Format)

Welcome!

by **Mark W. Rafeld, Director**

Welcome to the **Office of Homeland Security and Emergency Management Agency** web site. Our mission is "to provide a safer future for Ashland County by promoting, coordinating and providing mitigation, preparedness, response and recovery services before, during, and following any disaster." We are dedicated to protect lives, property and the environment within Ashland County.

We sincerely hope that you will take the time to browse through the information on our site. **Being prepared for emergencies or disasters** is your responsibility and should not be taken lightly. Tips on how you can prepare yourself are offered throughout our site.

We at the Ashland County EMA hope that this information will be used to protect you, your family and your property from any disaster, whether it be natural or man-made. Feel free to contact us at any time.

Please note that throughout our web site, we will use **EMA** to indicate the **Ashland County Office of Homeland Security and Emergency Management Agency.**

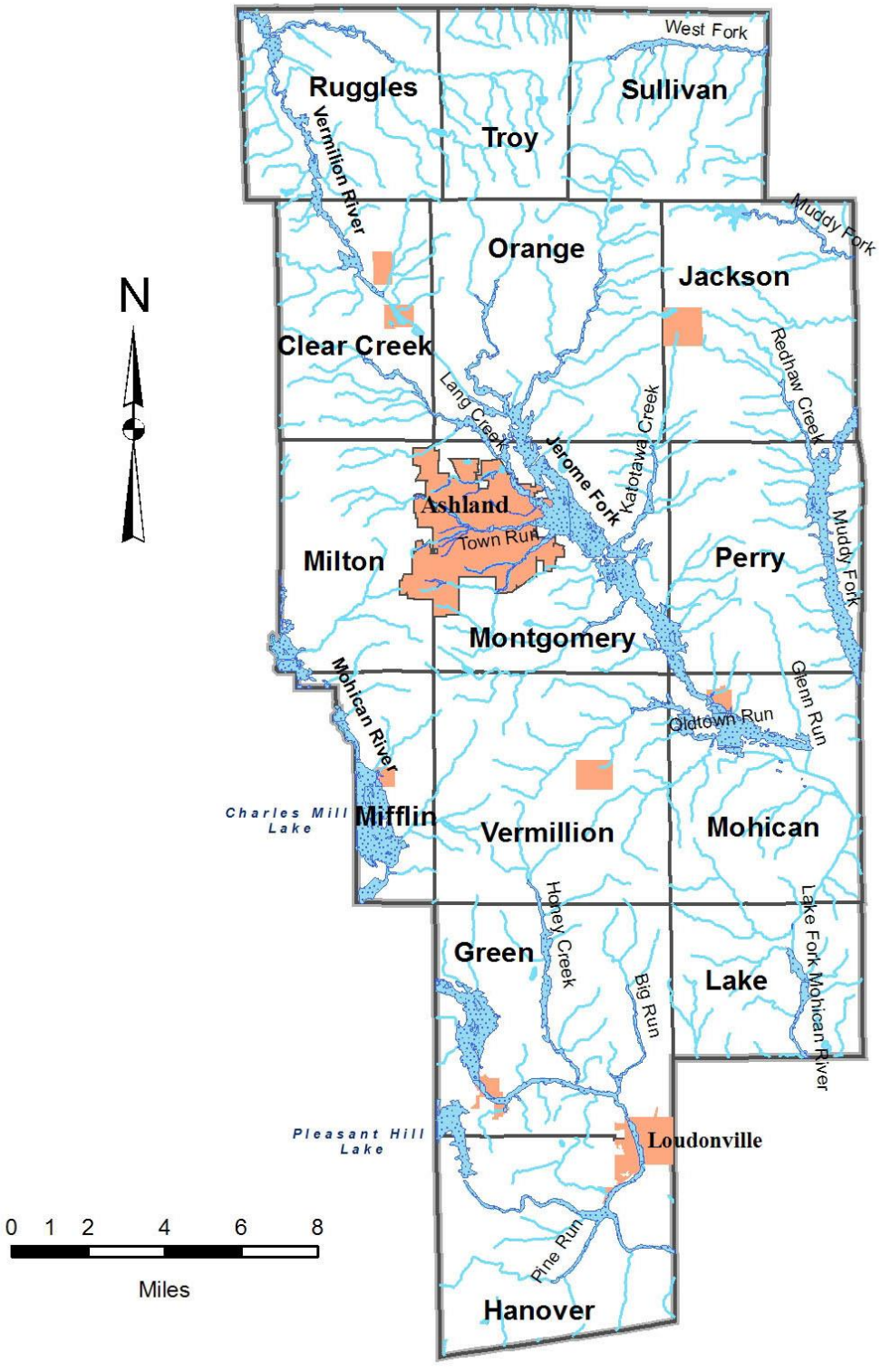
***

Ashland County EMA has incorporated a comprehensive emergency notification system called **REVERSE 911.** This **REVERSE 911** system is an Interactive Community Notification System that is used effectively in thousands of U.S. communities to improve the lines of communication to the general population and targeted groups of citizens. The system provides timely and immediate notification of critical information in times of crisis and emergencies, such as natural disasters, missing children and crime alerts. (read more)

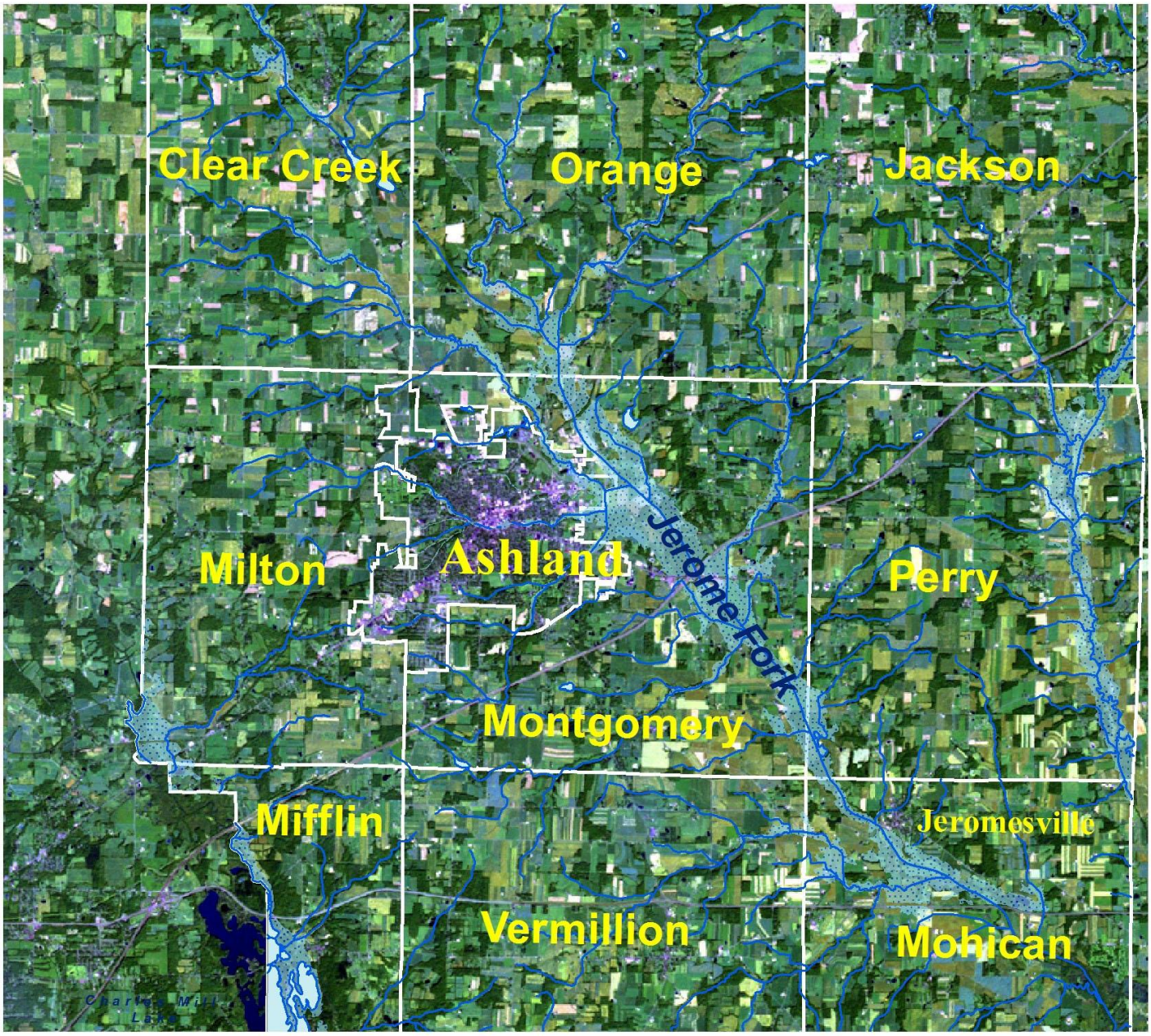
***

Ashland County Mitigation Plan for Natural Disasters (DRAFT/PDF)

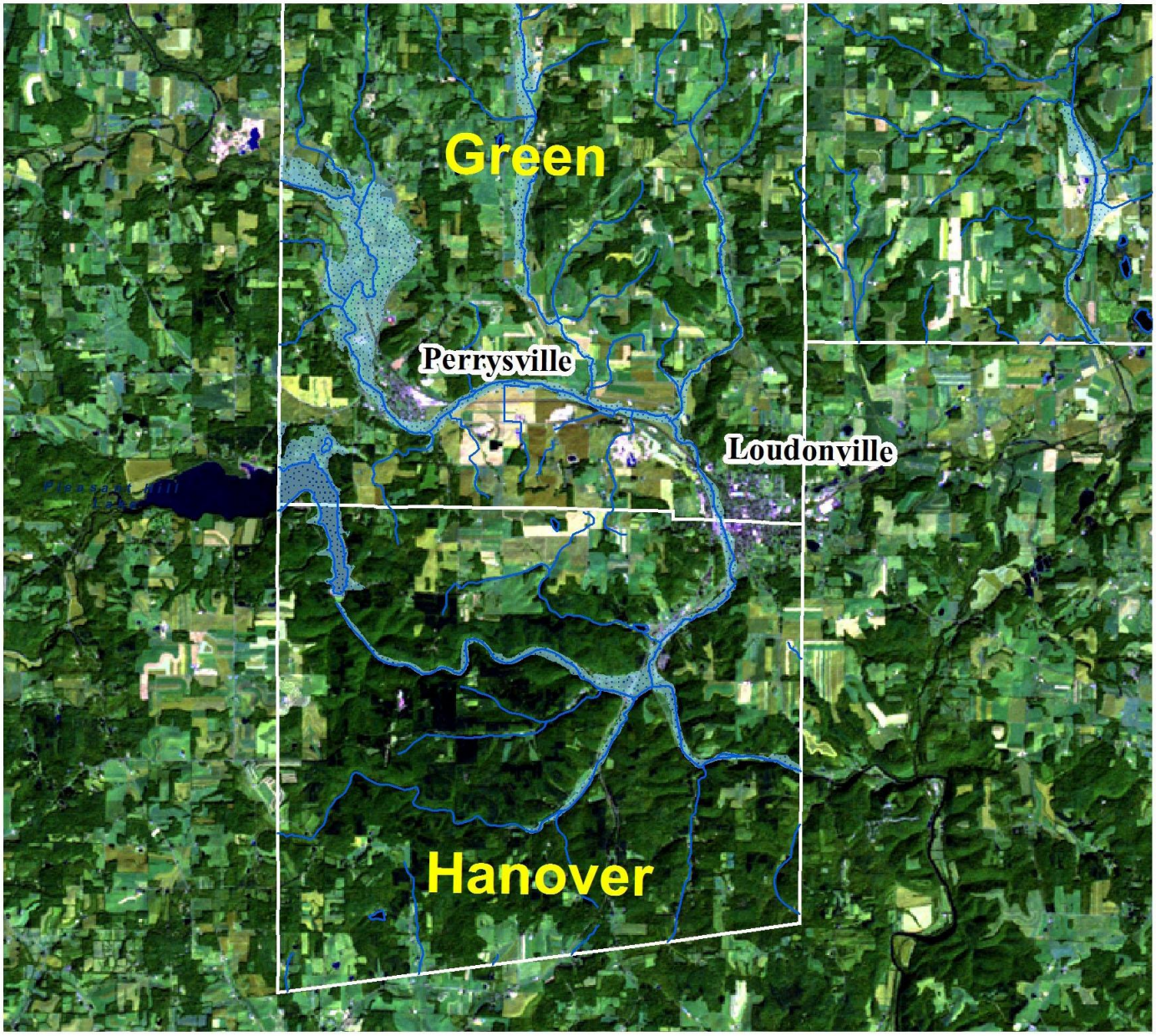
APPENDIX B: 100-Year Floodplain



100-Year Floodplain: Jerome Fork

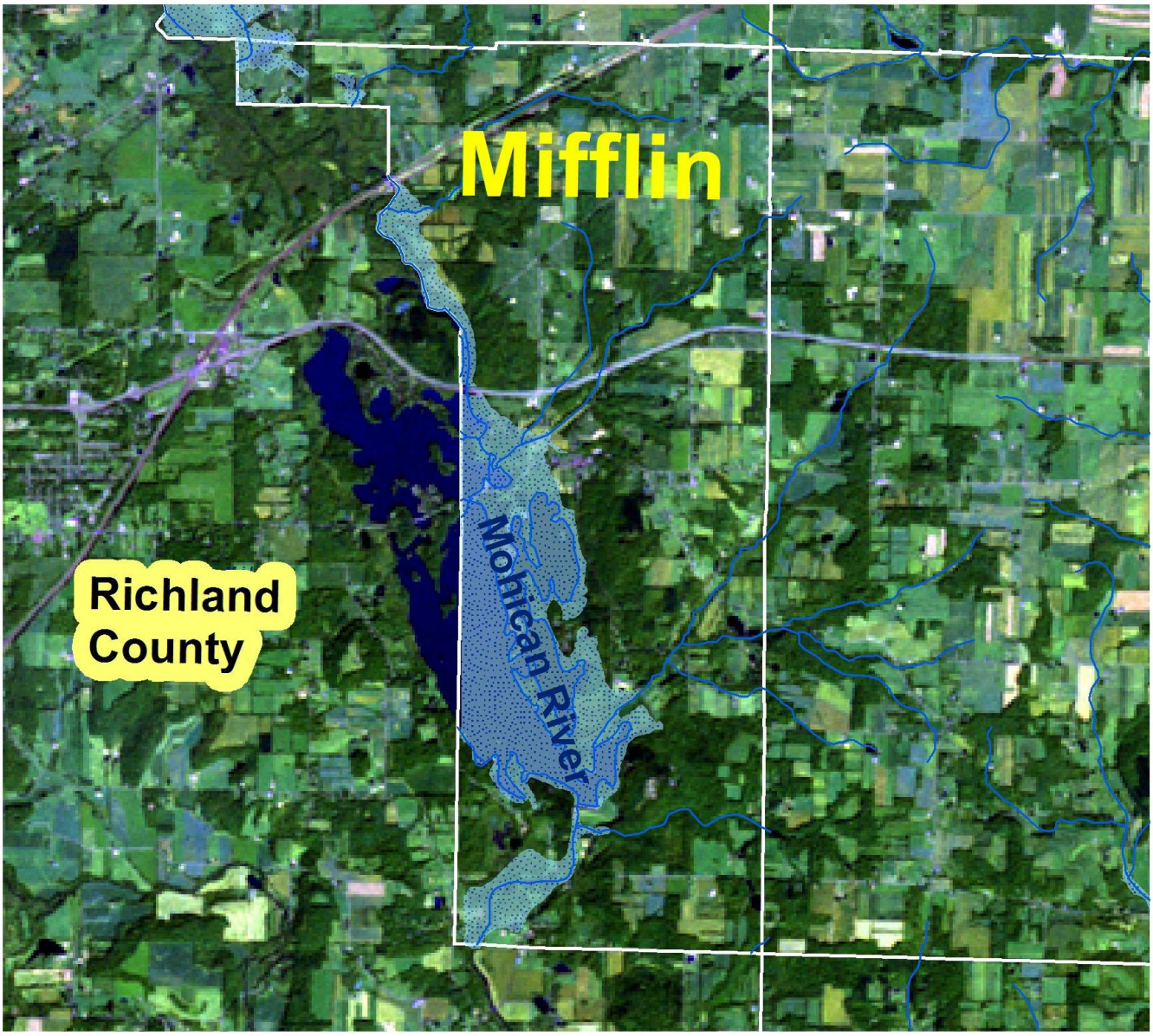


100-Year Floodplain: Black Fork of Mohican River

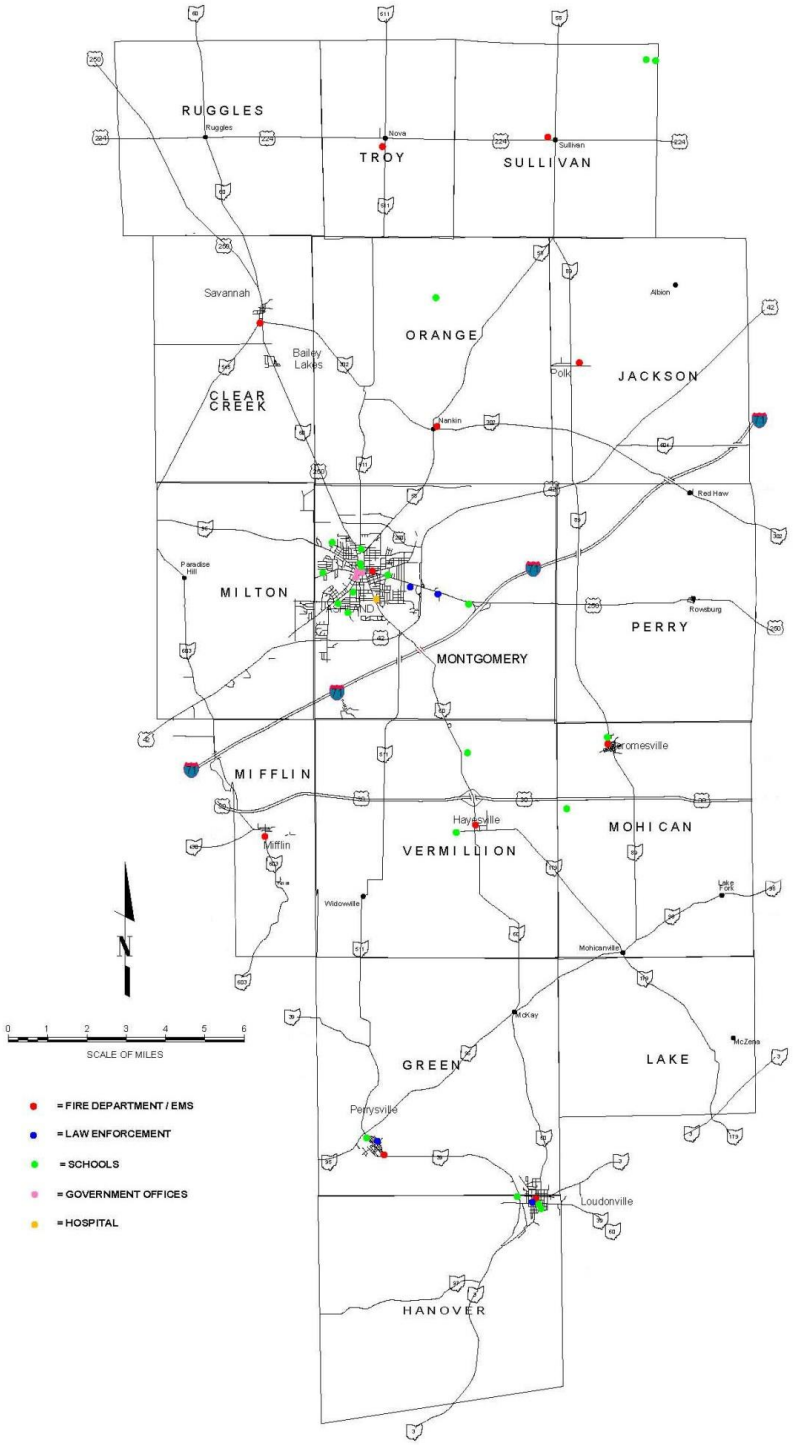


100-Year Floodplain: Vermillion River

100-Year Floodplain: Mohican River at
Charles Mill Lake



APPENDIX C: Critical Facilities



APPENDIX D: Local Mitigation Plan Review Tool

LOCAL MITIGATION PLAN REVIEW TOOL

The *Local Mitigation Plan Review Tool* demonstrates how the Local Mitigation Plan meets the regulation in 44 CFR §201.6 and offers States and FEMA Mitigation Planners an opportunity to provide feedback to the community.

- The Regulation Checklist provides a summary of FEMA's evaluation of whether the Plan has addressed all requirements.
- The Plan Assessment identifies the plan's strengths as well as documents areas for future improvement.
- The Multi-jurisdiction Summary Sheet is an optional worksheet that can be used to document how each jurisdiction met the requirements of the each Element of the Plan (Planning Process; Hazard Identification and Risk Assessment; Mitigation Strategy; Plan Review, Evaluation, and Implementation; and Plan Adoption).

The FEMA Mitigation Planner must reference this *Local Mitigation Plan Review Guide* when completing the *Local Mitigation Plan Review Tool*.

Jurisdiction:	**Title of Plan:**	**Date of Plan:**

Local Point of Contact:	**Address:**
Title:	
Agency:	
Phone Number:	**E-Mail:**

State Reviewer:	**Title:**	**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))			
A2. Does the Plan document an opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, agencies that have the authority to regulate development as well as other interests to be involved in the planning process? (Requirement §201.6(b)(2))			
A3. Does the Plan document how the public was involved in the planning process during the drafting stage? (Requirement §201.6(b)(1))			
A4. Does the Plan describe the review and incorporation of existing plans, studies, reports, and technical information? (Requirement §201.6(b)(3))			
A5. Is there discussion of how the community(ies) will continue public participation in the plan maintenance process? (Requirement §201.6(c)(4)(iii))			
A6. Is there a description of the method and schedule for keeping the plan current (monitoring, evaluating and updating the mitigation plan within a 5-year cycle)? (Requirement §201.6(c)(4)(i))			
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))			
B2. Does the Plan include information on previous occurrences of hazard events and on the probability of future hazard events for each jurisdiction? (Requirement §201.6(c)(2)(i))			
B3. Is there a description of each identified hazard's impact on the community as well as an overall summary of the community's vulnerability for each jurisdiction? (Requirement §201.6(c)(2)(ii))			
B4. Does the Plan address NFIP insured structures within the jurisdiction that have been repetitively damaged by floods? (Requirement §201.6(c)(2)(ii))			
ELEMENT B: 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))			
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))			
C3. Does the Plan include goals to reduce/avoid long-term vulnerabilities to the identified hazards? (Requirement §201.6(c)(3)(i))			
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))			
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))			
C6. Does the Plan describe a process by which local governments will integrate the requirements of the mitigation plan into other planning mechanisms, such as comprehensive or capital improvement plans, when appropriate? (Requirement §201.6(c)(4)(ii))			
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))			
D2. Was the plan revised to reflect progress in local mitigation efforts? (Requirement §201.6(d)(3))			
D3. Was the plan revised to reflect changes in priorities? (Requirement §201.6(d)(3))			
ELEMENT D: REQUIRED REVISIONS			
ELEMENT E. PLAN ADOPTION			
E1. Does the Plan include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval? (Requirement §201.6(c)(5))			
E2. For multi-jurisdictional plans, has each jurisdiction requesting approval of the plan documented formal plan adoption? (Requirement §201.6(c)(5))			
ELEMENT E: REQUIRED REVISIONS			
ELEMENT F. ADDITIONAL STATE REQUIREMENTS (OPTIONAL FOR STATE REVIEWERS ONLY; NOT TO BE COMPLETED BY FEMA)			
F1.			
F2.			
ELEMENT F: REQUIRED REVISIONS			

APPENDIX E: Copies of Signed Resolutions