

Clermont County All-Hazards Mitigation Plan Update



Approved by FEMA – January 22, 2014
Clermont County Board of Commissioners
Formal Adoption – March 5, 2014

**CLERMONT COUNTY
ALL-HAZARDS MITIGATION PLAN UPDATE**

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List of Acronyms

AAL	Average Annualized Loss
ALB	Asian-Longhorned Beetle
APHIS	Animal and Plant Health Inspection Service
EAB	Emerald Ash Borer
EAP	Emergency Action Plan
EF	Enhanced Fujita Scale
EHS	Extremely Hazardous Substance
EOP	Emergency Operations Plan
ER	Emergency Relief
FEMA	Federal Emergency Management Agency
FIRM	Flood Insurance Rate Map
FSA	Farm Service Agency
GIS	Geographic Information Systems
HAZUS-MH	Hazards U.S. Multi-Hazard
HS	Hazardous Substance
HMGP	Hazard Mitigation Grant Program
ODNR	Ohio Department of Natural Resources
ODOT	Ohio Department of Transportation
OEMA	Ohio Emergency Management Agency
MMI	Modified Mercalli Intensity
NCDC	National Climatic Data Center
NFIP	National Flood Insurance Program
NOAA	National Oceanic and Atmospheric Administration
NRCS	Natural Resources Conservation Service
NWS	National Weather Service
ODA	Ohio Department of Agriculture
PDSI	Palmer Drought Severity Index
RL	Repetitive Loss
SDC	Seismic Design Categories
SHARPP	State Hazard Analysis Resource and Planning Portal
USACE	United States Army Corps of Engineers
USDA	United States Department of Agriculture
USGS	United States Geological Survey

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Glossary

Average Annualized Loss (AAL) - estimated value of claims that will be paid per year, based upon a long-term average

Riverine Flooding - rising water levels in rivers cause river bank overtopping
Physiography - geological layout of the land

Colluvial - A loose deposit of rock debris accumulated through the action of gravity at the base of a cliff or slope

**CLERMONT COUNTY
ALL-HAZARDS MITIGATION PLAN**

1.0 Forward

In recent years, Clermont County has suffered damage to both private property and public infrastructure from a variety of natural hazards. Clermont County is committed to providing for the welfare of its residents. The County strives to alleviate suffering and protect the lives and property of its citizens by addressing mitigation, preparedness, response, and recovery for natural hazards.

Clermont County developed an All Natural Hazards Mitigation Plan in 2004 as part of their efforts to become more disaster resistant. This plan was approved by FEMA in 2006 and expired in 2011. The 2006 All Natural Hazards Mitigation Plan addressed natural disasters that could affect the local community, including flooding, tornadoes, and winter storms. This effort included development of risk assessments and mitigation strategies for each type of hazard.

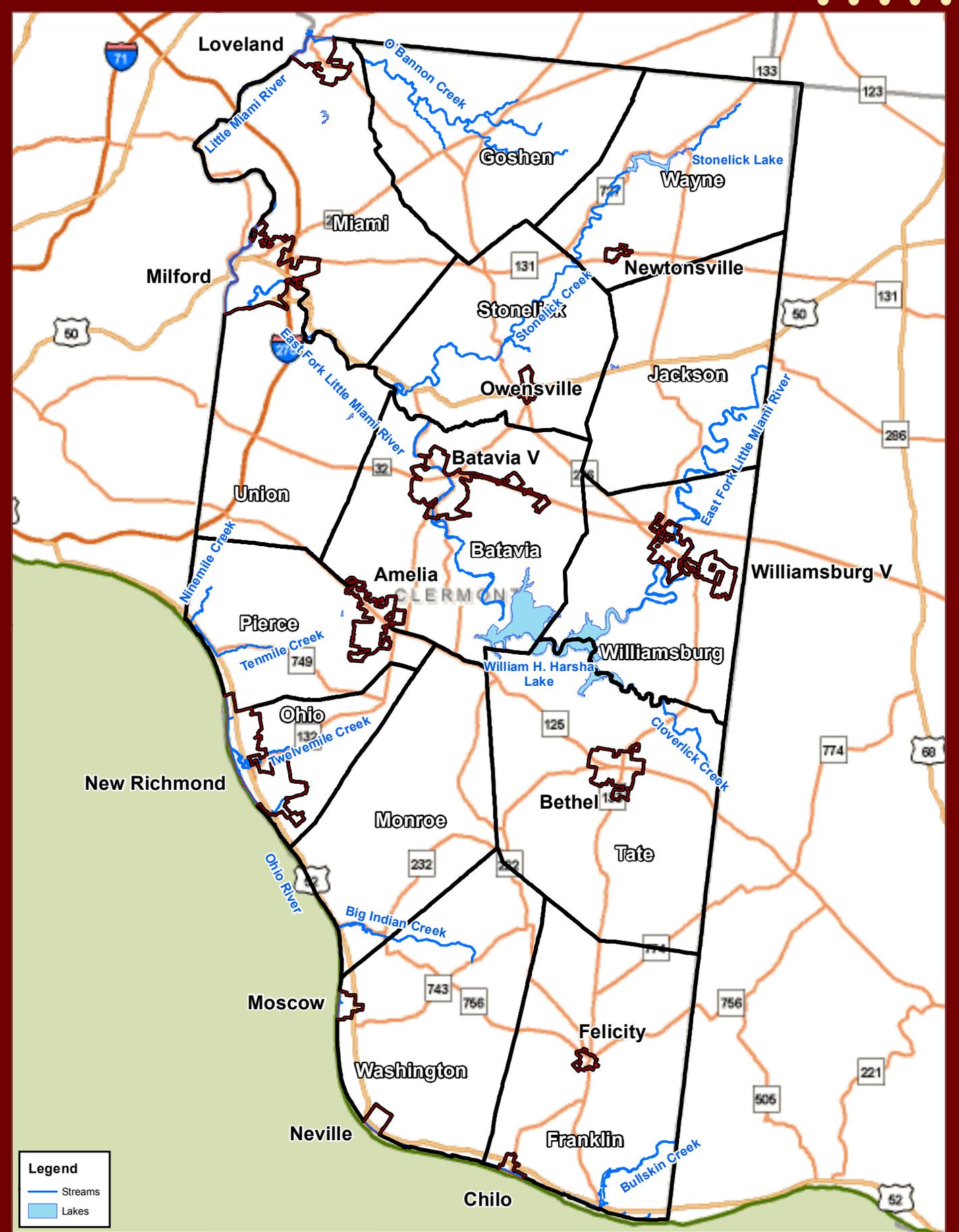
To continue the mission of protecting lives, property, economic viability and quality of life for the people of Clermont County, the County’s Emergency Management Agency has supported the effort to create an update to the 2006 Plan. This updated plan follows the guidelines and specifications for a FEMA All-Hazards Mitigation Plan. This plan covers all townships and incorporated municipalities located within the County with the exception of the Village of New Richmond who is covered under a separate plan. A list of the jurisdictions included in the updated plan is provided in Table 1 and documentation of their participation can be found in Section 3.2. Figure 1 shows each of the jurisdictions within Clermont County.

The updated All-Hazards Mitigation Plan will allow Clermont County to:

- Assist local communities with reducing risks by identifying vulnerabilities and developing strategies to lessen and/or eliminate the effects of a potential hazard;
- Build partnerships and reduce duplication of efforts among organizations with similar or overlapping goals;
- Create more sustainable and disaster-resistant communities;
- Communicate needs to state and federal officials when funding becomes available, particularly after a disaster; and
- Increase public awareness of local hazards and disaster preparedness.

Table 1. Participating Jurisdictions

County / Township	City / Village
Clermont County	City of Loveland
Batavia Twp.	City of Milford
Franklin Twp.	Village of Amelia
Goshen Twp.	Village of Batavia
Jackson Twp.	Village of Bethel
Miami Twp.	Village of Chilo
Monroe Twp.	Village of Felicity
Ohio Twp.	Village of Moscow
Pierce Twp.	Village of Neville
Stonelick Twp.	Village of Newtonsville
Tate Twp.	Village of Owensville
Union Twp.	Village of Williamsburg
Washington Twp.	
Wayne Twp.	
Williamsburg Twp.	



Legend

- Streams
- Lakes



Geographic Information Systems



Figure 1 - Jurisdictions

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CLERMONT COUNTY ALL-HAZARDS MITIGATION PLAN

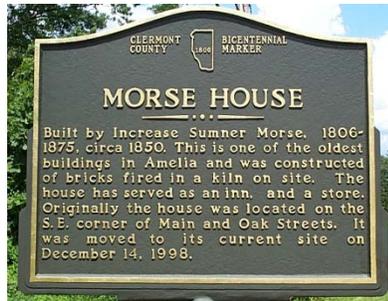
2.0 Clermont County History and Demographics

2.1 SETTING

Clermont County is located in southwestern Ohio, bounded to the south by the Ohio River, to the north by Warren and Clinton Counties, to the east by Brown County, and to the west by Hamilton County and Cincinnati. It encompasses approximately 452 square miles and is comprised of two cities, eleven villages and fourteen townships.

2.2 HISTORY

Clermont County, established in 1800, was originally composed of five large townships. The County has since been divided into a total of 14 townships. The original county seat was in Williamsburg (originally spelled Williamsburgh), where it remained until 1823. It then moved to New Richmond, along the Ohio River, for one year. Batavia became the third and final county seat of government on February 24, 1824. Early settlements included Denhamstown, (later Bethel), Withamsville (then called Witham's settlement), Miami Township, Hageman's Mills (later Milford), Stonelick Township, Chilo, Goshen Township, Felicity, Moscow, Point Isabel and Amelia. All communities date to the early decades of the 19th century.



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2.3 COMMUNICATION OUTLETS

Clermont County is served by several newspapers and periodicals, including:

- Cincinnati Business Courier,
- Cincinnati Magazine,
- Community Press,
- Cincinnati Enquirer,
- Clermont Sun,
- Loveland Magazine
- Bethel Journal, and
- Milford Miami Advertiser.

Additional County communication outlets include websites, television, radio, and social media listed below:

- Website: <http://www.clermontcountyohio.gov/>
- Twitter: @ClermontCounty
- Facebook: Clermont County Ohio Government
- Television:
 - WLWT - Channel 5 (Local News)
 - WCPO - Channel 9 (Local News)
 - WKRC - Channel 12 (Local News)
 - WXIX - Channel 19 (Local News)
 - WCET – Channel 48 (Public Access)
 - Clermont 18 (Time Warner Cable)
- Radio:
 - WLW – 700 AM – Local News Radio
 - WVXU – 91.7 FM – National Public Radio

2.4 UTILITIES

A list of several utilities that serve Clermont County is shown below:

Table 2. Clermont County Utilities

Utility	Phone Number	Alt. Phone #
Telephone and Cable		
Cincinnati Bell Telephone	513-565-6090	513-566-3158
AT&T	800-222-0300	
Belgacom North America	513-936-5281	
Nuvox Communications	513-842-7031	
Time Warner Telecom	513-644-8982	
Time Warner Cable	800-677-9767	513-489-5907
Verizon (Felicity Area)	937-378-2222	
Adelphia Communications	513-615-2627	

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Table 2. Clermont County Utilities (continued)

Utility	Phone Number	Alt. Phone #
Gas and Electric		
Bethel Electric Public Works	513-734-2243	Ext. 3
Duke Energy	513-421-9500	Elec. 513-287-3932 Gas 513-287-2457
Lykins Oil Co.	513-831-8820	
Milford Electric Supply	513-453-0208	
Rich Energy Inc.	513-271-1460	
Auxier Gas	513-724-7700	
Ferrellgas	513-575-1400	
Ohio Valley Electric Corp.	740-289-7200	513-553-4246
Clermont Electric Supply Co.	513-248-0900	
Electronic Testing Consultants	513-831-8758	
Water		
Clermont County Sewer and Water	513-732-7970	513-479-4031
Tate-Monroe Water Association Inc.	513-734-2236	
Western Water Company	513-899-3211	513-722-1682
Batavia Sewer and Water	513-479-4031	
Bethel Water	513-734-2243	
Brown County Water	937-375-4106	
Felicity Water	513-876-2013	
Milford Water and Sewer	513-248-5081	
New Richmond Water and Sewer	513-553-4146	
Williamsburg Water and Sewer	513-724-2244	
Waste		
Rumpke	800-582-3107	
CSI	513-771-4200	

2.5 CENSUS AND LAND USE INFORMATION

According to 2010 census information, Clermont County has 197,363 residents. Table 3 lists the population for each community. Clermont County has had an 11 percent increase in its population from 2000 to 2010. The County has 81,161 housing units with a homeownership rate of 77.1 percent. A housing unit is defined by the U.S. Census Bureau as a house, an apartment, a mobile home, a group of rooms, or a single room that is occupied (or if vacant, is intended for occupancy) as separate living quarters. The median value of the housing units was reported to be \$162,000 in 2010, and the median household income was reported to be \$58,472 with 9.3 percent of the population below the poverty line.

Clermont County is home to a wide range of businesses including agricultural, industrial, commercial, and retail establishments. In 2010, the county reported 3,554 non-farm establishments employing 44,640 persons. In 2007, there were \$1.25 billion in manufacturer's shipments and \$2.4 billion in retail sales (Source: 2010 U.S. Census).

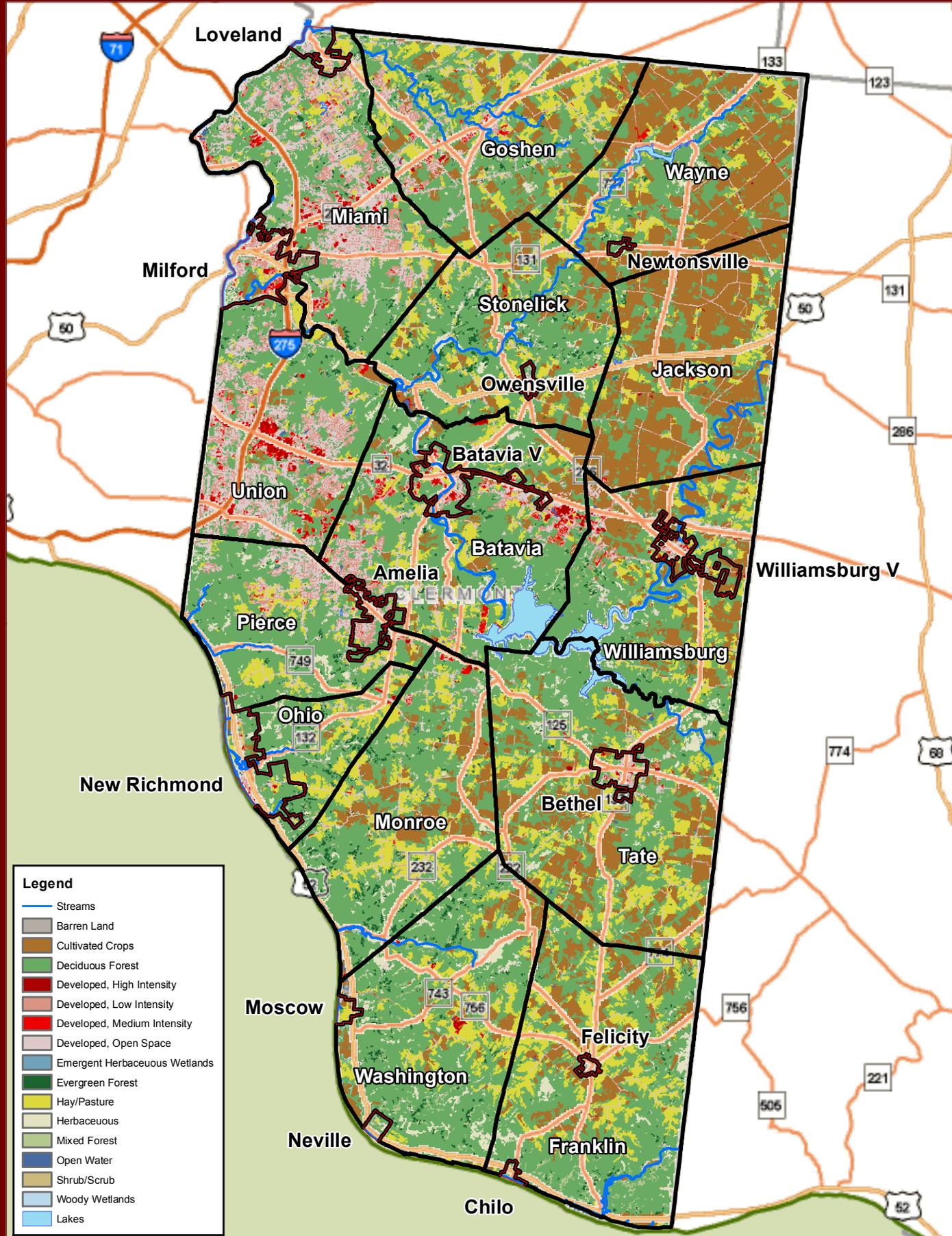
**CLERMONT COUNTY
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Table 3. 2000 – 2010 U.S. Census

FIPS CODE		Municipalities / Townships	2000 Census	2010 Census	2000-2010	
CO	Place		Total Population	Total Population	Change	% Change
025	0065	Clermont County	177,977	197,363	19,386	11%
025	0915	Amelia, Village of	2752	4,801	2,049	74%
025		Batavia Township	17,503	23,280	5,777	33%
025	0066	Batavia, Village of	1617	1,509	-108	-7%
025	0916	Bethel, Village of	2,637	2,711	74	3%
025	0067	Chilo, Village of	97	63	-34	-35%
025	0917	Felicity, Village of	922	818	-104	-11%
025		Franklin Township	4,348	4,188	-160	-4%
025		Goshen Township	13,663	15,505	1,842	13%
025		Jackson Township	2,576	2,980	404	16%
025	0068	Loveland, City of	1,835	1,941	106	6%
025		Miami Township	36,632	40,848	4,216	12%
025	0227	Milford, City of	6,249	6,709	460	7%
025		Monroe Township	8,236	7,828	-408	-5%
025	0070	Moscow, Village of	244	185	-59	-24%
025	0641	Neville, Village of	127	100	-27	-21%
025	0071	New Richmond, Village of	2,219	2,582	363	16%
025	0918	Newtonsville, Village of	492	392	-100	-20%
025		Ohio Township	5,245	5,192	-53	-1%
025	0680	Owensville, Village of	816	794	-22	-3%
025		Pierce Township	12,226	14,349	2,123	17%
025		Stonelick Township	5,816	5,890	74	1%
025		Tate Township	8,935	9,357	422	5%
025		Union Township	42,332	46,416	4,084	10%
025		Washington Township	2,351	2,278	-73	-3%
025		Wayne Township	5,025	4,885	-140	-3%
025		Williamsburg Township	5,005	5,746	741	15%
025	0072	Williamsburg, Village of	2,358	2,490	132	6%

Source: 2000 & 2010 US Census

The county is comprised of 5 major land use types: Agricultural, Commercial, Exempt (Government, Education, Religion), Industrial, and Residential. About 85 Percent of the parcels within Clermont County have a Residential land use, while Agricultural and Residential make up over 83 percent of the County’s Area shown in Figure 2.



Legend

-  Streams
-  Barren Land
-  Cultivated Crops
-  Deciduous Forest
-  Developed, High Intensity
-  Developed, Low Intensity
-  Developed, Medium Intensity
-  Developed, Open Space
-  Emergent Herbaceous Wetlands
-  Evergreen Forest
-  Hay/Pasture
-  Herbaceous
-  Mixed Forest
-  Open Water
-  Shrub/Scrub
-  Woody Wetlands
-  Lakes



Geographic Information Systems



0 4 Miles



Figure 2 - Land Use

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2.6 EXISTING PLANS AND REGULATIONS

A review of existing planning documents was undertaken during the preparation of the plan update and pertinent information from the existing planning documents was incorporated into the All-Hazards Mitigation Plan. These planning documents included:

- Building codes
- Zoning codes and regulations
- County Special Purpose Flood Damage Regulations, dated May 25, 2012
- Hazardous Materials Plan
- Subdivision regulations
- Water Management & Sediment Control regulations
- Airport zoning regulations
- The Clermont County Comprehensive Plan

In addition, specific information from the Clermont County Emergency Operations Plan (EOP) is provided below.

The Clermont County Emergency Operations Plan addresses the County's planned response to extraordinary emergency situations associated with natural, technological, and human caused disasters. It addresses the protection of health, welfare, and property of the citizens in Clermont County. It is intended to facilitate multiple-agency and multiple-jurisdictional coordination, particularly between local, state, and federal agencies, and establishes a framework for an effective system of comprehensive emergency management.



Clermont County Emergency Operations Center

The EOP contains two sections that provide the proper actions and responses to acts of terrorism. The 2002 Terrorism Annex identifies the responses from a local or national terrorism threat. The Mass Prophylaxis Plan identifies the necessary procedures and responses to biological terrorism.

As a result of the mitigation planning process, the County will integrate the data, information, goals and mitigation actions into other codes, regulations, plans and studies, as appropriate, including those documents listed above.

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This integration is implemented through members of the Core Planning Team whose organization is charged with the development of the regulation and its enforcement. It should be noted that each jurisdiction participating in this plan follows a similar process.

2.7 CLERMONT COUNTY AUTHORITY TO ADOPT PLAN

Clermont County is updating the All-Hazards Mitigation Plan as required by 44 CFR Part 201.3 and the Robert T. Stafford Disaster Relief and Emergency Assistance Act. In order for Clermont County's All-Hazards Mitigation Plan to be compliant with the Disaster Mitigation Act, the Clermont County Board of County Commissioners and participating jurisdictional governing bodies will adopt this plan upon approval from the Ohio Emergency Management Agency and the Federal Emergency Management Agency's acceptance. Table 4 provides a listing of existing authorities per community.

Documentation of plan approval is located in Appendix A.

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Table 4. Existing Hazard Mitigation Authorities

COMMUNITY	PLANNING COMMISSION	COMPREHENSIVE PLANS	FLOODPLAIN REGULATIONS	BUILDING CODES¹	ZONING ORDINANCES	CAPITAL BUDGET²	PUBLIC WORKS BUDGET²
Clermont County	YES	YES	YES	YES	YES	General Fund	Limited in-kind wages only.
City of Loveland	YES	YES	YES	YES	YES	General Fund	Limited in-kind wages only.
City of Milford	YES	YES	YES	YES	YES	General Fund	Limited in-kind wages only.
Village of Amelia	YES	YES	YES	YES	YES	General Fund	Limited in-kind wages only.
Village of Batavia	NO	NO	YES	YES	YES	General Fund	Limited in-kind wages only.
Village of Bethel	NO	NO	YES	YES	YES	General Fund	Limited in-kind wages only.
Village of Chilo	NO	NO	YES	YES	YES	General Fund	Limited in-kind wages only.
Village of Felicity	NO	NO	YES	YES	YES	General Fund	Limited in-kind wages only.
Village of Moscow	YES	NO	YES	YES	YES	General Fund	Limited in-kind wages only.
Village of Neville	NO	NO	YES	YES	YES	General Fund	Limited in-kind wages only.
Village of Newtonsville	NO	NO	YES	YES	YES	General Fund	Limited in-kind wages only.
Village of Owensville	NO	NO	YES	YES	YES	General Fund	Limited in-kind wages only.
Village of Williamsburg	YES	NO	YES	YES	YES	General Fund	Limited in-kind wages only.

1. All jurisdictions within the state now follow the State Building Code. (Ohio Administrative Code 4101:1.)
2. Budget that would allow the jurisdiction to devote financial resources toward hazard mitigation activities.

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3.0 All-Hazards Mitigation Planning Process

The All-Hazards Mitigation Plan update was a comprehensive and collaborative process. The comprehensive approach includes following FEMA’s Local Multi-Hazards Mitigation Planning Guidance dated July 1, 2008 with additional items included as requested by the planning team. The collaborative portion of creating the Plan included working with the different agencies and jurisdictions within Clermont County.

3.1 CORE PLANNING TEAM

The process to create an All-Hazards Mitigation Plan started with the formation of a “Core Planning Team” of decision makers and implementers. This group was created at the beginning of the process to lead the planning efforts. The Core Planning Team was made up of County, Township, Village, and City elected officials and administrators, special interest groups, and concerned citizens. A list of Core Planning Team members that attended at least one meeting can be seen below (Table 5).

Table 5. Core Planning Team

Agency / Organization	Contact
Water Resource Department	Lyle Bloom
Emergency Management Agency	Pam Broughton
General Health District	Tim Kelly
Community Planning and Development	Andy Kuchta
Permit Central/Building Department	Carl Lamping
Community Planning and Development-GIS	Kelly Perry
Emergency Management Agency	Laurie Schlueter
Williamsburg, Village of	Mary Ann Lefker
Monroe Township and Village of Amelia	Dani Spiegel
Central Joint Fire & EMS District	Keven Riley
Miami Township FD	Jim Whitworth
Loveland FD	Tom Benjamin
Mercy Clermont Hospital	Bonna Bauer
Ohio Emergency Management Agency	Keven Clouse
Long-Term Recovery Committee	Jim Dinkel
Core Risk Services (Cincinnati Bell)	Eugene Langschwager
Washington Township	Robin Brewer
Stantec	John Menninger
Stantec	Emily Whitehead
Stantec	Adam Pooler

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Table 6 lists each organization or agency that participated in the process. The complete list of project stakeholders notified /invited to the meetings and hazard mitigation process, comprised of County personnel, Municipal Officials, Fire and Police Officials, and local/state/federal organizations, is located in Appendix B.

Table 6. Stakeholder Involvement (Documented Participation)

Community / Organization	Position / Agency
Batavia Township	Fire Chief / Central Joint Fire & EMS District
CC Water Department	Director of Utilities / Water Resource Department
City of Loveland	Captain / Loveland Fire District
City of Milford	Chief of Police / Milford Police Department
Clermont Board of County Commissioners	Commissioners / Board of County Commissioners
Clermont Community Planning and Dev.	Planner / Community Planning and Development
Clermont County Farm Service Agency	Government Information Specialist / Clermont FSA
Clermont County Long-Term Recovery Committee	Chair / Long-Term Recovery Committee
Clermont EMA	Director and Fiscal Support Specialist / EMA
Clermont GIS Department	GIS Administrator / Clermont GIS Department
Clermont Health District	Assistant Health Commissioner / Clermont Health District
Clermont Mercy Hospital	Plant Operations, Safety and Security Manager
Clermont Office of Public Information	Director / Office of Public Information
Clermont Building Department (FPA)	FPA / Building Inspection Department
Core Risk Services	Cincinnati Bell / Core Risk Services
Franklin Township	Administrator / Franklin Township
Greater Cincinnati Hazmat Unit	Counsel / Greater Cincinnati Hazmat Unit
Jackson Township	Zoning Administrator / Jackson Township
Miami Township	Fire Chief / Miami Township Fire Department
Monroe Township	Zoning Inspector / Monroe Township
Ohio EMA	SW Ohio Region Field Liaison
Ohio Township	Fire Chief / Pierce Township
Pierce Township	Fire Chief / Pierce Township
Tri-State CART	Executive Director
U.S. Army Corps of Engineers	Dam Safety Program Manager / USACE Dam Safety
Union Township	Administrator / Union Township
Village of Amelia	Zoning Inspector / Village of Amelia
Village of Batavia	Fire Chief / Central Joint Fire & EMS District
Village of Moscow	Village Administrator / Village of Moscow
Village of Neville	Fire Chief / Washington Township and Village of Neville
Village of Owensville	Police Chief and Council / Village of Owensville
Village of Williamsburg	Mayor / Village of Williamsburg Mayor's Office
Washington Township	Chair / Washington Township Trustees
Wayne Township	Fire Chief / Wayne Township Fire Department
Williamsburg Township	Trustee / Williamsburg Township Trustees

3.2 PUBLIC NOTIFICATION PROCESS AND INVOLVEMENT

It was important to Clermont County to have active public participation in the mitigation planning process. The public was invited to participate throughout the planning process including two public meetings and a draft review comment period. The public was invited to a Risk Analysis Meeting on October 3, 2012. This meeting was held at the Clermont County Engineers Conference Room at 2381 Clermont Center Drive, Batavia, Ohio 45103. The invite was posted in the County monthly newsletter, Facebook, and sent out to each participating jurisdiction for further dissemination. All Meeting minutes were posted on the EMA website. Further, adjacent communities listed in Appendix B were invited to participate and comment on the plan.

The Draft All-Hazards Mitigation Plan was available to the Public in January 2013 for review and comment at the Local Library Branches and on the Clermont EMA website. During the review period, a final public meeting was held on February 7, 2013 for additional public input. The public was notified via County monthly newsletter, local media (Clermont County website, Fox 19, Cincinnati.com, and The Leaf Chronicle), and Township Trustees meeting. Documentation of stakeholder outreach and participation is provided in Appendix B.

3.3 MEETINGS

Five Core Planning Team/Stakeholder meetings were held during the planning process, including the 2nd and 5th meetings which were advertised to the public. Meeting presentations and minutes are available in Appendix B.

3.3.1 Kick-Off / Determination of Hazards – Meeting 1 - July 20, 2012

The kick-off meeting outlined the process for updating the All-Hazards Mitigation Plan for Clermont County. Overall goals of the Plan were discussed and initial hazards of concern were identified. The Core Planning Team decided to keep each of the six previously listed natural hazards and added four additional hazards to be included within the plan. The hazards identified included **Severe Storms, Flooding, Tornadoes, Landslides, Droughts, Earthquakes, Hazardous Materials, Dam Failure, Utility Failure, and Invasive Species**. By the end of the first meeting, the Core Planning Team members had exchanged contact information, organized and scheduled the next meeting, discussed the general planning process, and reviewed the timeline of the project.

3.3.2 Hazard Vulnerability – Meeting 2 – October 3, 2012 (Public Meeting)

The second meeting focused on the Risk Analysis/Vulnerability for the hazards selected at the first meeting. This meeting was designed to review the County's hazard vulnerability and collect feedback on populations, facilities at risk, and information on historic hazards. A quick summary of the events analyzed helped to focus the conversation. The Risk Analysis was presented in more general terms and a Risk Matrix was introduced to the audience. This meeting helped identify gaps in the analysis and additional missing datasets. By the end of the second meeting, Core Planning Team members helped finalize the Risk Analysis, schedule the hazard prioritization meeting, and reviewed the next steps in the planning process.

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3.3.3 Hazard Prioritization – Meeting 3 – October 31, 2012

The third meeting focused on the prioritization of the selected hazards. This meeting was designed to review the County’s hazard prioritization and identify potential/existing mitigation efforts to reduce the risk of future hazards. The prioritization was created for each community as a method for determining the impacts of each hazard to that community. This meeting also introduced the Mitigation portion of the planning process by providing a Mitigation Strategy Form to be filled out by the Stakeholders. By the end of the third meeting, Core Planning Team members finalized the Risk Analysis, prepared the prioritizations and Mitigation Strategy Handout for dissemination amongst the Stakeholders/Core Planning Team, scheduled the Mitigation Strategy Review meeting, and reviewed the next steps in the planning process.

3.3.4 Mitigation Strategy Review – Meeting 4 – December 7, 2012

The fourth meeting focused on the mitigation strategies developed for each hazard. This meeting was designed to review listed mitigation efforts and determine a ranking system for each Mitigation Action. By the end of the Fourth meeting, Core Planning Team members helped finalize the Mitigation Strategy, identified the high priority actions, and prepared for the Draft Plan Presentation Meeting.

3.3.5 Draft Plan Review Meeting – Meeting 5 – February 7, 2013

The fifth meeting presented the Draft All-Hazard Mitigation Plan for the hazards and communities identified at the previous meetings. This public meeting allowed the communities and general public to provide feedback on the draft plan.

3.4 PUBLIC REVIEW

The Draft All-Hazard Mitigation Plan was made available to the public on January 18, 2013. Hard copies of the Plan were placed at the 10 Clermont County Library Branches, and on the Clermont County website. The review and comment period was open through February 22, 2013.

Public feedback was solicited through hard copy and on-line survey formats. A copy of the survey and the public review comments can be found in Appendix B.

4.0 Hazard Risk Assessment

In order to identify and prioritize mitigation actions for Clermont County, the vulnerabilities and risks posed by each hazard to the community's population and infrastructure must be identified and calculated. Risk is defined as the combination of probability of a hazard occurring, the vulnerable populations, and the damage caused by the hazard. It is often expressed in terms of damage dollars per year or percent chance of life loss. The goal of the risk analysis is to compare each hazard on an even basis because some hazards may be more likely to occur with less damage (e.g. thunderstorms) and others are relatively rare but can cause catastrophic damage (e.g. tornadoes).

4.1 RISK ASSESSMENT METHODOLOGY

The following multi-step process was for the hazard risk assessment.

- Identify specific hazards of concern.
- Identify vulnerable populations, assets and critical infrastructure.
- Gather information on historic events and technical studies.
- Calculate the probability of occurrence and associated damages.
- Prioritize hazards.

4.1.1 Hazard Identification

The Core Planning Team identified the following eleven (11) hazards of concern for inclusion in the plan.

- | | |
|------------------|---------------------------------|
| 1. Thunderstorms | 7. Earthquakes |
| 2. Winter Storms | 8. Hazardous Material Accidents |
| 3. Flooding | 9. Dam Failure |
| 4. Tornadoes | 10. Utility Failure |
| 5. Landslides | 11. Invasive Species |
| 6. Droughts | |

4.1.2 Vulnerable Populations and Critical Infrastructure

At the outset of the project, data was gathered from project stakeholders including the locations of residential and commercial structures, utility and transportation infrastructure and critical facilities. Critical facilities are commonly considered to be police stations, fire and rescue facilities, hospitals, shelters, schools, nursing homes, water supply and waste treatment facilities and other structures the community identifies as essential to the health and welfare of the population and that are especially important following a disaster. These datasets were utilized in a Geographic Information System (GIS) to compare their proximities to expected hazards. Table 7 provides a summary of the number and value of all building structures located within the County. Table 8 provides a summary of critical facilities identified during the project. Additional information on specific properties and facilities at risk from individual hazards are discussed in the following sections.

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Table 7. Structural Vulnerability by Type for the Entire County

Community	Residential Value (\$)*	Commercial Value (\$)*	Industrial Value (\$)*	Exempt Value (\$)*	Agricultural Value (\$)*	Total Value (\$)*
Amelia, Village of	109,649,040	18,864,980		9,773,900	74,700	138,362,620
Batavia Township	477,097,090	116,826,850	32,506,930	65,350,700	10,256,710	702,038,280
Batavia, Village of	38,620,820	13,371,610	4,590,340	51,550,200		108,132,970
Bethel, Village of	43,697,730	14,335,050		22,058,500		80,091,280
Chilo, Village of	1,538,800	153,300		409,800		2,101,900
Felicity, Village of	9,411,200	1,900,700		2,711,400		14,023,300
Franklin Township	54,125,160	2,542,240	116,800	3,884,500	14,018,300	74,687,000
Goshen Township	403,230,610	35,151,140	3,224,300	49,186,250	10,849,800	501,642,100
Jackson Township	78,665,800	1,008,320	628,200	779,300	10,724,400	91,806,020
Loveland, City of	94,112,280	6,420,130		10,619,000		111,151,410
Miami Township	1,748,602,190	164,239,820	43,225,580	103,032,780	3,538,700	2,062,639,070
Milford, City of	163,084,380	76,754,660	9,481,980	28,805,900	293,100	278,420,020
Monroe Township	177,254,070	8,143,000	2,458,500	11,662,030	15,568,800	215,086,400
Moscow, Village of	4,443,300	179,100		1,300,900		5,923,300
Neville, Village of	1,297,000	16,200		31,700		1,344,900
New Richmond, Village of	58,337,160	10,624,210	75,000	22,200,500	600,200	91,837,070
Newtonsville, Village of	5,233,200	534,200		454,600		6,222,000
Ohio Township	73,017,000	1,852,030		1,455,400	7,340,100	83,664,530
Owensville, Village of	13,753,200	6,591,890		2,961,600		23,306,690
Pierce Township	504,325,600	25,980,350	1,430,700	35,404,300	7,469,600	574,610,550
Stonelick Township	182,131,040	5,816,670	2,608,340	17,552,900	16,750,100	224,859,050
Tate Township	207,579,960	3,179,500	194,200	8,494,500	19,145,500	238,593,660
Union Township	1,205,454,280	361,108,510	69,253,500	59,626,300	3,508,190	1,698,950,780
Washington Township	33,907,060	883,700		3,015,800	10,969,000	48,775,560
Wayne Township	106,328,100	1,062,500	110,500	2,658,600	9,284,460	119,444,160
Williamsburg Township	111,306,900	4,231,000	12,280,300	9,294,600	11,652,700	148,765,500
Williamsburg, Village of	42,698,200	12,566,820	5,975,100	9,469,600	378,900	71,088,620
Total	5,948,901,170	894,338,480	188,160,270	533,745,560	152,423,260	7,717,568,740

* Value taken from Assessors building values. Value based on Parcel, which meant multiple structures with the same Parcel Number were not duplicated within the table. Total Addresses within Clermont County is 76,897 (Provided by Clermont County GIS department.)

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Table 8. Critical Facilities Summary

Emergency	Emergency Operations Center	1
	Police Stations	25
	Fire Stations	31
Education	Schools	73
	Colleges / Universities	2
Medical & Care Facilities	Daycares	66
	Medical / Nursing Facilities / Assisted Living	21
Transportation	Airports / Heliports	10
	Bridges / Culverts	732
	Dams	119
Utilities	Electric Facility / Lines / Communication Sub-stations	4
	Cell Towers	106
	Power Plants	2
	Oil / Gas Facility / Pipeline	2
	Water Treatment Plants	4
	Water Sources	4
	Wastewater Treatment Plants / Facilities (Pump Stations)	121
Library / Community Facilities / Government		46
Hazardous Material Sites		84
Historical Structures (Not all historical sites identified during the mitigation planning process.)		10
Religious Centers / Red Cross		21
Total		1484

4.1.3 Historic Records and Relevant Technical Studies

Data from the National Climatic Data Center (NCDC) was downloaded to review historic hazard information at the County level. The NCDC website presents each hazard and the historic information associated with it for each County, offering several hazard search results including: droughts, dust storm, flooding, fog, hail, hurricanes, lightning, tornadoes, wild/forest fires, ocean/lake surf, precipitation, snow and ice, temperature extremes, thunderstorms and high winds. Of those results, dust storms, severe fog, hurricanes, wild/forest fires, ocean/lake surf and severe precipitation have either never been documented in Clermont County, or have not occurred since 1950. This left droughts, flooding, hail, lightning, tornadoes, snow and ice, temperature extremes, thunderstorms and high winds to further assess. Note that earthquakes are not part of the NCDC database. The information pertaining to earthquake susceptibility was attained from United States Geological Survey (USGS), the Ohio Department of Natural Resources (ODNR), and the Ohio Emergency Management Agency (OEMA).

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In addition to the NCDC data, other data sources were reviewed for a more comprehensive analysis. These data sources included; payments made by the Farm Service Agency (FSA) to farmers for disaster relief, the State of Ohio Enhanced Hazard Mitigation Plan - 2011, United States Army Corps of Engineers (USACE), Federal Emergency Management Agency (FEMA), Clermont County EMA and Engineer's Office, and the U.S. and Ohio Departments of Agriculture (USDA and ODA).

4.1.4 Hazard Risk Calculations

The next step was to analyze the collected data and to calculate risk for each hazard and their impact on each community. Two methods were utilized to determine risk and the prioritize hazards. The first, Average Annualized Loss (AAL) calculations, is a quantitative method that uses historic records or computer models to calculate a community's risk exposure for any given year. The AAL calculations require an understanding of both the probability of an event occurring and the expected damage.

Not all hazards had sufficient information to calculate an AAL. For this reason, a second more qualitative method was utilized to compare each hazard through a consistent framework. This method and results are described in further detail in Section 4.13.

4.2 SEVERE STORMS

This type of an event is a County-wide hazard. Clermont County, like most communities in Ohio, is susceptible to severe weather. These events may include severe thunderstorms, high wind, hail and lightning. While tornadoes and flooding may be related to these events, they have been broken out as separate categories for this plan.

A severe thunderstorm watch is issued by the National Weather Service when the weather conditions are such that damaging winds of 58 miles per hour (mph) or more, or hail three-fourths of an inch in diameter or greater, is likely to develop. Citizens should locate to a safe place in the home and listen to the radio or television for more information. A severe thunderstorm warning is issued when a severe thunderstorm has been sighted or indicated by weather radar. At this point, danger is immediate – citizens should move to a safe place and listen to a battery operated radio/TV for further instructions.

Like a Tornado Warning, the Severe Thunderstorm Warning is issued by a National Weather Service - Wilmington Field Office. Severe Thunderstorm Warnings will include where the storm was located, what towns will be affected by the severe thunderstorm, and the primary threat associated with the severe thunderstorm warning. When thunderstorms produce heavy rains (which can cause flash flooding), strong winds, hail, lightning and tornadoes, people should get inside a sturdy building and stay tuned to a battery-operated radio for weather information. Lightning is also a major threat during thunderstorms. In the United States, an average of 55 to 60 Americans are struck and killed each year by lightning (Source: NOAA).

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4.2.1 Severe Storm Events Specific to Clermont County

Federal Disaster Declarations were filed for the following severe storm events with impacts to Clermont County. The descriptions of events were gathered from NOAA and FEMA.

Federal Disaster Number DR-1390, July 17-18, 2001. While nearly 3 inches of rain fell overnight in Cincinnati, up to 8 inches fell in 3 hours in other portions of Greater Cincinnati including Clermont County. Thousands of homes and businesses were damaged or destroyed in the resulting flash flooding. Federal and state disaster declarations were approved for Hamilton, Warren, and Clermont counties.

Federal Disaster Number DR-1507, January 3 - January 30, 2004. Severe storms caused flooding throughout Ohio. Mudslides and landslides were reported in counties with a higher risk for landslides. Multiple counties received Public Assistance through FEMA.

Federal Emergency Number EM-3250, August 29 - October 1, 2005. All 88 counties in Ohio were included in the federal declaration from remnants of Hurricane Katrina. Costs were incurred due to evacuation of other states.

Federal Disaster Number DR-1651, June 21-23, 2006. Severe storms, tornadoes, straight line winds, and flooding were reported throughout Ohio.

Federal Disaster Number DR-1656, July 27 - August 4, 2006. Severe storms, straight line winds and flooding were reported in multiple Ohio counties.

Federal Disaster Number DR-1720, August 20 - August 28, 2007. Severe storms, flooding and tornadoes were reported in multiple counties in Ohio.

Federal Disaster Number DR-1805, September 14, 2008. Clermont County received \$920,409 in public assistance from severe storms associated with tropical depression Ike.

Federal Disaster Number DR-4077, June 29 - July 2, 2012. The “derecho” wind storms of late June and early July were the third-most expensive natural disaster in Ohio in 38 years. Only the tornado outbreak in Xenia in 1974 and the hurricane-borne winds of 2008 created costlier damage, according to an insurance trade association at that time. All communities/counties were eligible for hazard mitigation grants.

The complete list of historic severe storm events documented by NOAA since 1965 can be found in **Appendix C**. Table 9 below provides a summary of these events

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Table 9. Summary Table of Severe Storm Events

Hazards	Sum of Property Damage(s)	Sum of Crop Damages(s)	Sum of Deaths	Sum of Injuries
Hail	2,700,000	550,000	0	0
High Winds	26,387,000	0	2	14
Lightning	61,000	0	0	5
Total	29,148,000	550,000	2	19

4.2.2 Hazard Assessment and Vulnerability Analysis \ Potential Dollars Lost

Because severe storms are random in nature, the Core Planning Team has chosen to look at historic events to determine Clermont County’s susceptibility to severe storms. According to the National Climatic Data Center (NCDC), there have been 204 severe storms in Clermont County reported since 1965; with total losses of around \$29.2 million (please see Appendix C). Based on these results, Clermont County averages approximately 4 to 5 severe storm events per year with average annual damages of approximately \$600,000.

Critical facilities can be impacted most directly by severe storms through power outages. Those critical facilities for which power is crucial (i.e. hospitals, nursing homes, etc.) can be greatly impacted by severe storms and precautions must be taken for the provision of backup power. In terms of potential impacts on infrastructure and utilities, roads may be flooded by heavy rains associated with severe storms. Utility outages can be attributed to heavy winds. Continuous operation of services such as Sanitary, Drinking Water, Electricity, and Natural Gas are very important during a Severe Storm.

Due to the non-site-specific nature of this hazard, Table 10 lists all structures within Clermont County as having potential impact from a severe storm.

Table 10. Structure Vulnerability (Source: Clermont Parcels / Structure Inventory)

Structure Type	Number	Value of Vulnerable Structures (\$)
Residential	62,689	5,948,901,170
Non-Residential	13,271	1,234,922,010
Critical Facilities	937	533,745,560
Total	76,897	7,717,568,740

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4.2.3 Current Development Trends

Due to the non-site-specific nature of this hazard, future development trends will have no significant effects on the occurrence of severe storms. However, population growth and increased infrastructure and building stock will likely increase annual expected damages.

New construction should seek to minimize wind-load impacts for buildings and provide basement areas or other secure locations to serve as storm shelters. Additionally, utility areas could be maintained and/or built underground to reduce the number of power outages from fallen trees and/or branches due to strong winds.

4.3 WINTER STORMS

This type of an event is a County-wide hazard. Winter Storm hazards include wind chill, ice storms, heavy snow, and blizzard conditions. The leading cause of death during winter storms is transportation accidents. Preparing your vehicle for the winter season, and knowing how to react if stranded or lost on the road are vital to safe winter driving.

Extremely cold temperatures during Ohio winters can also lead to deaths. Wind chill can dramatically affect the temperature outside, causing frostbite in a matter of minutes. Wind chill is a calculation of how cold it feels outside when the effects of temperature and wind speed are combined. A strong wind combined with a temperature of just below freezing can have the same effect as a still air temperature of 0°F.

A winter storm watch indicates that severe winter weather may affect your area. A winter storm warning indicates that severe winter weather conditions are definitely imminent. A blizzard warning signifies that large amounts of falling or blowing snow and sustained winds of at least 35 mph are expected for several hours.

4.3.1 Winter Storm Events Specific to Clermont County

Federal Disaster Declarations were filed for the following winter storm events with impacts to Clermont County. The descriptions of events were gathered from NOAA and FEMA.

Federal Disaster Number DR-1453, February 14 - March 15 2003. Significant Winter Storm drops about 4 " of snow in Clermont County. Multiple counties received Public Assistance through FEMA.

Federal Emergency Number EM-3198, December 22-24, 2004. A severe snowstorm impacted multiple counties throughout Ohio. Public Assistance funds were provided to the impacted counties. Most costs incurred were from extended periods of snow removal.

Federal Disaster Number DR-1580, December 22, 2004 - February 1, 2005. Clermont County received \$278,285 in Public Assistance from a large snowstorm. The snowstorm left more than 20 inches of snow in some areas and then was followed by unseasonable warmer temperatures in January 2005, which caused flooding and mudslides. 62 counties were included the federal list of declared counties. Approximately 3,700 private

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structures were damaged or destroyed throughout Ohio. Clermont's estimated damage occurring to OEMA was around \$780,900.

Federal Emergency Number EM-3286, March 7-9, 2008. A record severe snow storm hit Clermont County and 16 other counties in Ohio. Clermont County received \$124,386 in funds for expenses incurred from snow removal.

The complete list of Winter Storm Events can be found in Appendix C. Table 11 below contains a summary of Winter Storm Events for Clermont County. All events are regional/multi-county, which skew the damage figures, since the large scale storms are not specific to Clermont County.

Table 11. Summary of Winter Storm Events for Clermont County

Hazards	Sum of Property Damage(s)	Sum of Crop Damages(s)	Sum of Deaths	Sum of Injuries
Winter Storm	16,201,000	0	3	0
Ice Storm	400,000	0	0	26
Heavy Snow / Ice	1,741,000	0	2	6
Total	18,342,000	0	5	32

4.3.2 Hazard Assessment and Vulnerability Analysis \ Potential Dollars Lost

Because the location and impacts associated with winter storms are random in nature, the Planning Team utilized historic events to determine Clermont County's susceptibility to winter storms. The NCDL has recorded 54 winter storms in Clermont County since 1993, with total losses of approximately \$18.3 million (please see **Appendix C**). Based on these results, Clermont County averages approximately two (2) to three (3) winter storm events per year with average annual damages of approximately \$339,000.

Due to the non-site-specific nature of this hazard, Table 12 lists all structures within Clermont County as having potential impact from a winter storm.

Table 12. Structure Vulnerability (Source: Clermont Parcels / Structure Inventory)

Structure Type	Number	Value of Vulnerable Structures (\$)
Residential	62,689	5,948,901,170
Non-Residential	13,271	1,234,922,010
Critical Facilities	937	533,745,560
Total	76,897	7,717,568,740

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Similar to severe storms, critical facilities can be impacted most directly by winter storms through power outages. Those critical facilities for which power is crucial (i.e. hospitals, nursing homes, etc.) can be greatly impacted by winter storms and precautions must be taken for the provision of emergency generators, etc. In terms of potential impacts on infrastructure and utilities, roads may be covered by Snow and Ice. Utility outages can be attributed to heavy winds and freezing temperatures.

4.3.3 Current Development Trends

Due to the non-site-specific nature of this hazard, future development trends will have no significant effects on the occurrence of severe storms. However, population growth and increased infrastructure and building stock will likely increase annual expected damages.

Utility areas can be maintained and/or built underground to reduce the number of power outages from fallen trees and/or branches due to the accumulation of ice and/or snow is also important.

4.4 FLOODING

This type of an event can be a County-wide or Community specific hazard. Floods are generally the result of excessive precipitation, and can be classified under two categories: flash floods, the product of heavy localized precipitation in a short time period over a given location; and riverine floods, caused by precipitation over a longer time period causing larger river systems, such as the Ohio or Little Miami River, to exceed their banks.

Damages associated with flash flooding in Clermont County have been significantly less than those caused by the Ohio River flooding. The Core Group's main concern about flash flooding is the lack of awareness the public has about the hazard. People driving in high water and children playing in hazard areas are examples of problems associated with flash flooding. Flash flooding events usually occur within minutes or hours of heavy amounts of rainfall, from a dam or levee failure, or from a sudden release of water held by an ice jam.

Riverine flooding, long lasting floods caused by larger streams and rivers, is a primary concern along the Ohio River. The communities of Chilo, Moscow, Neville, and New Richmond all lie along the river and are within FEMA's 100-Year Floodplain.

A flood is a natural event for rivers and streams and is caused in a variety of ways. Floods can develop slowly or quickly, depending on several factors. Winter or spring rains, coupled with melting snows, can fill river basins too quickly. Torrential rains from decaying hurricanes or other tropical systems can also produce flooding. The excess water from snowmelt, rainfall, or storm surge accumulates and overflows onto the banks and adjacent floodplains. A flood, as defined by the National Flood Insurance Program (NFIP), is a general and temporary condition of partial or complete inundation of two or more acres of normally dry land area, or of two or more properties from:

- Overflow of inland or tidal waters;
- Unusual and rapid accumulation or runoff of surface waters from any source;
- A mudflow;
- A collapse or subsidence of land along the shore of a lake or similar body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels that result in a flood.

The severity of a flooding event is determined by a combination of stream and river basin topography and physiography (geological layout of the land), precipitation and weather patterns, recent soil moisture conditions and the degree of vegetative clearing. Flood currents also possess tremendous destructive power as lateral forces can demolish buildings and erosion can undermine bridge foundations and footings, leading to the collapse of structures.

General floods are usually longer-term events and may last for several days. The primary types of general flooding include riverine flooding, coastal flooding, and urban flooding.

Periodic flooding of lands adjacent to rivers, streams, and shorelines is a natural and inevitable occurrence that can be expected to take place based upon established recurrence intervals. The recurrence interval of a flood is defined as the average time interval, in years, expected between a flood event of a particular magnitude and an equal or larger flood.

Flood magnitude increases with increasing recurrence interval. One way of expressing the flood frequency is the chance of occurrence in a given year, which is the percentage of the probability of flooding each year. For example, the 100-year flood has a 1% chance of occurring in any given year, rather than being that level of flooding which only occurs once a century. In other

Common Flood-Related Terms

100-Year Floodplain: The area that has a 1% chance, on average, of flooding in any given year. (Also known as the Base Flood.)

500-Year Floodplain: The area that has a 0.2% chance, on average, of flooding in any given year.

Base Flood: The elevation of the water surface resulting from a flood that has a 1% chance of occurring in any given year. The base flood elevation is the basis for most flood related planning and mitigation activities.

Floodplain: The land area adjacent to a river, stream, lake, estuary, or other water body that is subject to flooding. This area, if left undisturbed, acts to store excess floodwater. The floodplain is made up of two sections: the floodway and the flood fringe.

Floodway: The NFIP floodway definition is “the channel of a river or other watercourse and adjacent land areas that must be reserved, in order to discharge the base flood without cumulatively increasing the water surface elevation more than one foot.” The floodway carries the bulk of the floodwater downstream and is usually the area where water velocities and forces are the greatest. NFIP regulations require that the floodway be kept open and free from development or other structures that would obstruct or divert flood flows onto other properties.

Flood Fringe: The flood fringe refers to the outer portions of the floodplain, beginning at the edge of the floodway and continuing outward.

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words, it is possible to have two 100- year floods in a five year span or to not have a 25-year flood for 30 years.

4.4.1 Flooding Events Specific to Clermont County

The history of flooding in Clermont County is extensive. The National Climatic Data Center (NCDC) has comprehensive information available back to 1993. Flooding is the number two disaster in terms of frequency of events and the number one disaster in terms of dollars associated with each event.

There were 81 flood events documented between 1993 and 2012 in Clermont County (see Appendix C). Ten (10) of these flood events were associated with federally declared disasters. A few of the most significant historic flood events are described below. Table 13 summarizes the damages caused by these events.

Table 13. Summary of Flooding Events for Clermont County

Hazards	Sum of Property Damage(s)	Sum of Crop Damages(s)	Sum of Deaths	Sum of Injuries
Flooding	22,145,000	0	2	0
Flash Flood	3,207,000	0	0	1
Total	25,352,000	0	2	1

1937 Flood - The flood of 1937 has left a lasting imprint on Clermont County; it was the worst natural disaster to ever strike this area. For 10 days, the Ohio River rose, spilling out of its banks and washing away entire communities. The flood claimed 385 lives in river communities from Pittsburgh to Cairo, Illinois. “We saw the water coming up and my husband and I packed up our household items and put them in the back of our Model-T pick-up truck to take them to the second floor of a friend’s house on higher ground,” said Margaret Fulton, who was 24 years-old, newly married, and living in New Richmond in 1937. “We moved in with my in-laws, but soon the water started coming up and we had to move again.” She is one of those interviewed by the Clermont County Office of Public Information for a video on the local impact of the flood. The video is available on the website <http://www.clermontcountyohio.gov/video1937flood.aspx>. (Source: Clermont County Web Portal)

January 1996 – The combination of snow cover, warm temperatures, and rainfall produced widespread tributary flooding in the Ohio River basin starting on the 17th. Most of the tributaries were back within their banks by the 21st, but points along the Ohio River were still in flood stage at that time. Some of the tributaries that



Clermont County Sheriff’s Deputy Jeff Sellars patrols New Richmond flooded streets in a boat (Michael Snyder photo)

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experienced significant flooding were the Scioto, Great Miami, and Blanchard rivers, as well as Ohio Brush Creek.

Federal Disaster Number DR-1164, *March 1997* – Heavy rainfall occurred across Southern Ohio and Northern Kentucky on the 1st and 2nd of March, with areas along the Ohio River receiving up to 12 inches of rainfall.

The river rose rapidly, reaching a crest of 59.8 feet in Portsmouth at 10:00 PM on the 4th, where the flood stage is 50.0 feet. About 30 miles east of Cincinnati at the Meldahl Dam, where the flood stage is 51.0 feet, the river crested at 61.3 feet at 7:00 PM on the 6th. In Cincinnati, the river crested at 64.7 feet at 11:00 PM on the 5th. Many towns were flooded from Portsmouth to Cincinnati and thousands of people were evacuated from their homes for several days.

Severe flooding within Ohio was generally confined to stream reaches within 50 to 70 miles of the Ohio River. Ohio communities that border the Ohio River from Marietta downstream to Cincinnati were affected by floodwaters. Two communities along the Ohio River that were particularly hard hit by the flooding were Manchester and New Richmond, Ohio. The human impact of the March 1997 flooding in southern Ohio was appreciable. Nearly 20,000 people were evacuated during the flooding, and 5 people lost their lives. There was no loss of life in Clermont County.

Federal Disaster Number DR-1519, May 18 - June 12, 2004. Several severe thunderstorms that passed through Ohio May 17 - June 17 2004, produced large amounts of rain in already wet central and eastern Ohio, resulting in severe flooding. There were two storm or flood related deaths, 3,529 private structures damaged or destroyed, and an estimated \$17.7 million in damages.

Federal Disaster Number DR-1556, August 27 - September 27, 2004. Remnants from Hurricanes Frances and Ivan during September 2004 caused severe flooding in eastern Ohio. Damages were estimated at around \$33 million. There were four storm or flood -related deaths with 2,563 private structures damaged or destroyed.

Federal Disaster Number DR-4002, April 4 - May 15, 2011. Above normal rainfall amounts were recorded at multiple climate stations in Ohio during the months of March - May. Throughout the month of April, the southwestern portion of the state experienced greater than 300 percent of their normal rainfall amount and 6-10 inches above the mean. Clermont received around \$3,447,178 in public assistance funds.

4.4.2 Repetitive Loss and NFIP (FEMA)

The primary purpose of the NFIP is to provide flood insurance to properties located in floodplains, as delineated by Flood Insurance Rate Maps (FIRMs). The NFIP maintains records of the frequency and costs of insurance claims for each jurisdiction. Table 14 summarizes the number and value of policies and claims in Clermont County and each of the incorporated jurisdictions.

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Table 14. Summary of NFIP Policies and Claims

Community* <i>* Indicates Non-Participation in the NFIP</i>	Flood Policies	Past Claims No. /Total \$	Repetitive Loss Properties
Village of Amelia*	0	0	0
Village of Batavia	0	13 / 12,598	2
Village of Bethel*	0	0	0
Village of Chilo	15	10 / 79,935	0
Clermont County	209	120 / 1,693,155	11
Village of Felicity*	0	0	0
City of Loveland	73	29 / 162,458	3
City of Milford	22	4 / 1,764	0
Village of Moscow	40	48 / 914,764	0
Village of Neville	8	21 / 228,736	0
Village of New Richmond	252	331 / 4,615,630	12
Village of Newtownsville*	0	0	0
Village of Owensville*	0	0	0
Village of Williamsburg	2	6 / 692,396	1
Totals	621	582 / \$8,401,436	29

One of the primary concerns of the NFIP and FEMA are repetitive loss structures and payments. These structures account for approximately 4.7% of all flood insurance policies in Clermont County, but represents 19% of the total claims. Thus, minimizing, or ideally eliminating, repetitive loss structures is a primary goal of NFIP and FEMA. The majority of the repetitive loss structures throughout the county are single family residences. Table 15 provides a summary of all repetitive loss properties.

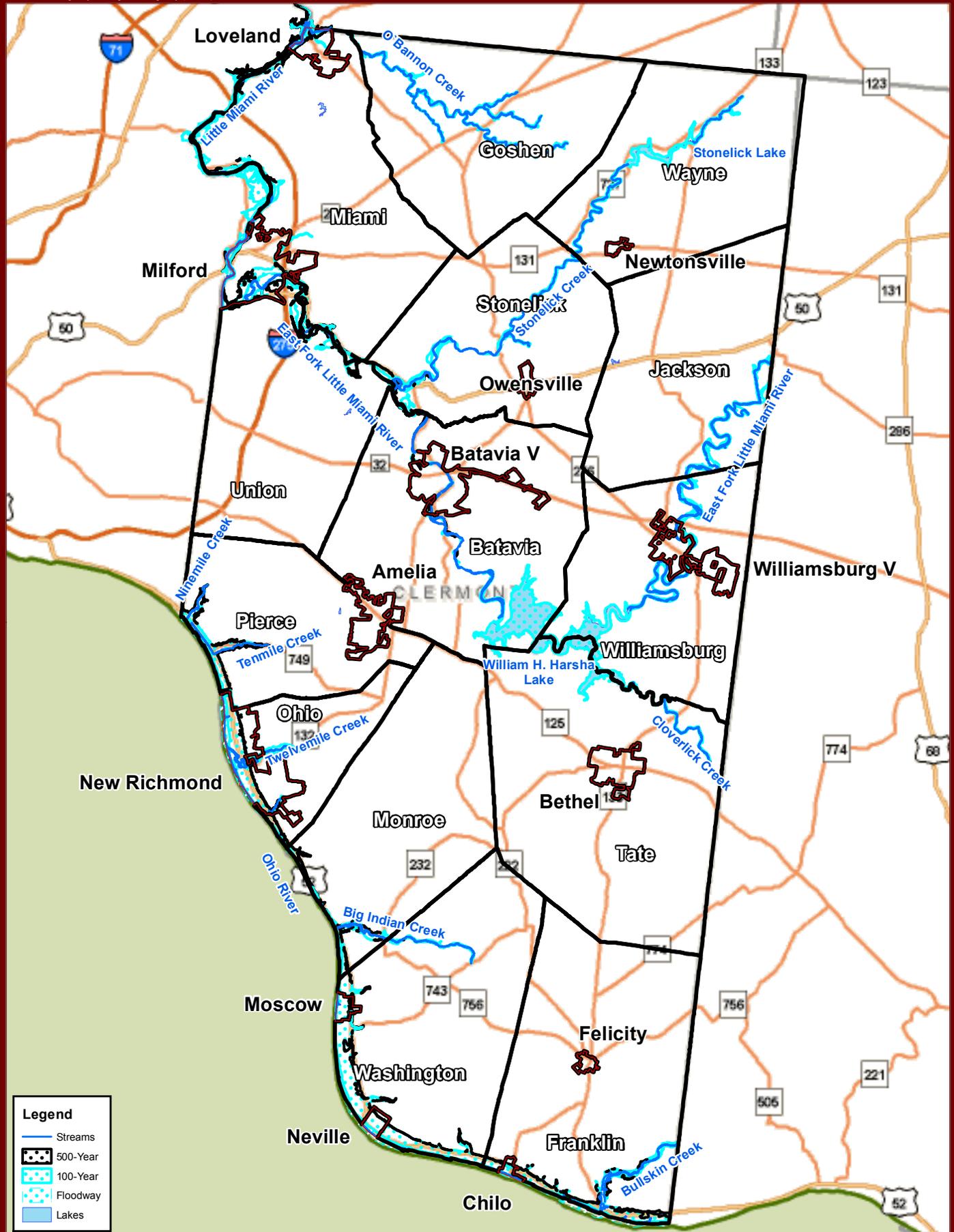
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Table 15. Summary of Repetitive Losses

Community* <i>* Indicates Non-Participation in the NFIP</i>	Repetitive Loss Properties	Structure Type	Number of Losses	Building Payments (\$)	Contents Payments (\$)	Total Payments (\$)
Clermont County	10	Residential	22	204,603.07	40,921.15	245,524.22
	1	Non-Residential	2	113,452.44	214,518.05	327,970.49
City of Loveland	3	Residential	8	44,406.03	10,351.13	54,757.16
	0	Non-Residential	0	–	–	–
Village of Batavia	2	Residential	6	10,585.00	110.00	10,695.00
	0	Non-Residential	0	–	–	–
Village of New Richmond	10	Residential	26	212,422.18	16,903.07	229,325.25
	2	Non-Residential	4	20,856.54	604,463.38	81,302.92
Village of Williamsburg	1	Residential	3	91,781.97	591.896.79	683.678.76
	0	Non-Residential	0	–	–	–
County and Jurisdictional Totals	26	Residential	65	563,798.25	660,182.14	1,223,980.39
	3	Non-Residential	6	134,308.98	274,964.43	409,273.41

FEMA’s database lists a total of 29 repetitive loss structures. These structures are located along the Little Miami River in Loveland, the East Fork Little Miami River in Miami Township, and the Ohio River in New Richmond. Figure 3 shows the current FEMA floodplains within the county.

Clermont County, the Ohio Dept. of Natural Resources and FEMA began floodplain map modernization efforts in 2003, resulting in updated floodplain maps for the county adopted and becoming effective on March 16, 2006. Additionally, Resolution Number 62-12 adopts the County Special Hazards Flood Damage Reduction Regulations as of April 25, 2012. These regulations appoint the County Building Inspector as the Floodplain Administrator in Section 3.1. Duties to be carried out by the Administrator are outlined in Section 3.2 to include routine monitoring of the floodplain, enforcement and providing community assistance such as permitting and encouragement for owners to obtain and maintain flood insurance.



Geographic Information Systems

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Figure 3 - Floodplains

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4.4.3 Structure Inventory in Clermont County

There are a total of 76,897 structures (building footprints) in Clermont County (Source: Clermont County GIS structure inventory) including 1,597 which are located in the FEMA floodplains. A breakdown of the locations of these structures is provided in Table 16 below. Figures displaying these at-risk structures by affected community are provided in Appendix F.

Table 16. Structures within Floodplain

Community	Number	Value (\$)	Community	Number	Value (\$)
Batavia Township	4	192,000	Neville, Village of	44	819,000
Batavia, Village of	2	59,700	New Richmond, Village of	762	30,968,940
Chilo, Village of	50	1,970,200	Ohio Township	49	1,944,200
Franklin Township	58	2,002,550	Pierce Township	53	12,291,100
Goshen Township	20	1,920,800	Stonelick Township	16	1,192,000
Jackson Township	1	198,500	Tate Township	1	93,600
Loveland, City of	80	6,787,290	Union Township	20	704,400
Miami Township	122	23,632,730	Washington Township	29	2,827,700
Milford, City of	96	25,999,240	Wayne Township	5	619,200
Monroe Township	65	4,082,800	Williamsburg Township	1	93,700
Moscow, Village of	114	5,286,200	Williamsburg, Village of	5	229,900
			Total	1,597	123,915,750

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4.4.4 Infrastructure and Critical Facilities

There are currently 37 critical facilities located within the floodplain. Table 17 provides a summary of these critical facilities. Figures 4-12 show the locations of the flood vulnerable critical facilities.

Table 17. Critical Facilities Inside FEMA Floodplains

Category	Type	Total
Emergency	Police Stations	3
	Fire Stations	5
Education	Schools	1
Medical & Care Facilities	Daycares	1
	Medical / Nursing Facilities / Assisted Living	1
Utilities	Cell Towers	7
	Power Plants	2
	Water Treatment Plants	1
	Water Sources	1
	Wastewater Treatment Plants / Facilities (Pump Stations)	5
Library / Community Facilities / Government		1
Hazardous Material Facilities		5
Historical Structures (Museums)		3
Total		36



Legend

	Libraries FP		Fire Station Facilities FP		Utilities FP		Power Plants		500-Year
	School Facilities FP		Police Station Facilities FP		Hazardous Materials FP		Cell Phone Towers FP		100-Year
	Daycares FP		Nursing Homes FP		Government FP		Historical Structures FP		Floodway



Geographic Information Systems

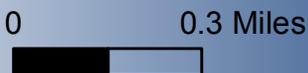
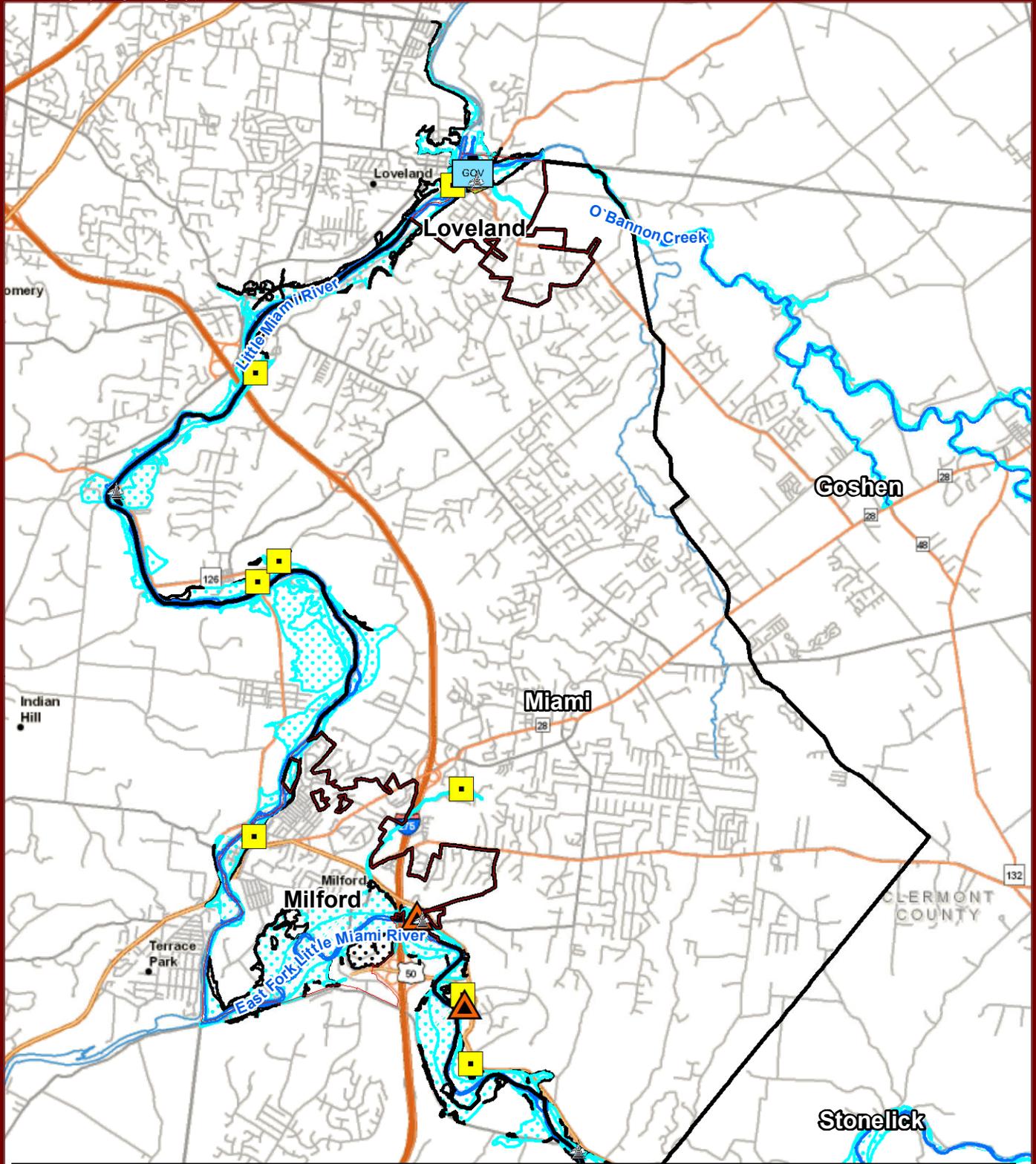


Figure 4 - Loveland
Critical Facilities Inside Floodplain
 Loveland

Clermont County All-Hazards Mitigation Plan



Legend

- | | | | | | | | | | |
|--|----------------------|--|------------------------------|--|------------------------|--|--------------------------|--|----------|
| | Libraries FP | | Fire Station Facilities FP | | Utilities FP | | Power Plants | | 500-Year |
| | School Facilities FP | | Police Station Facilities FP | | Hazardous Materials FP | | Cell Phone Towers FP | | 100-Year |
| | Daycares FP | | Nursing Homes FP | | Government FP | | Historical Structures FP | | Floodway |

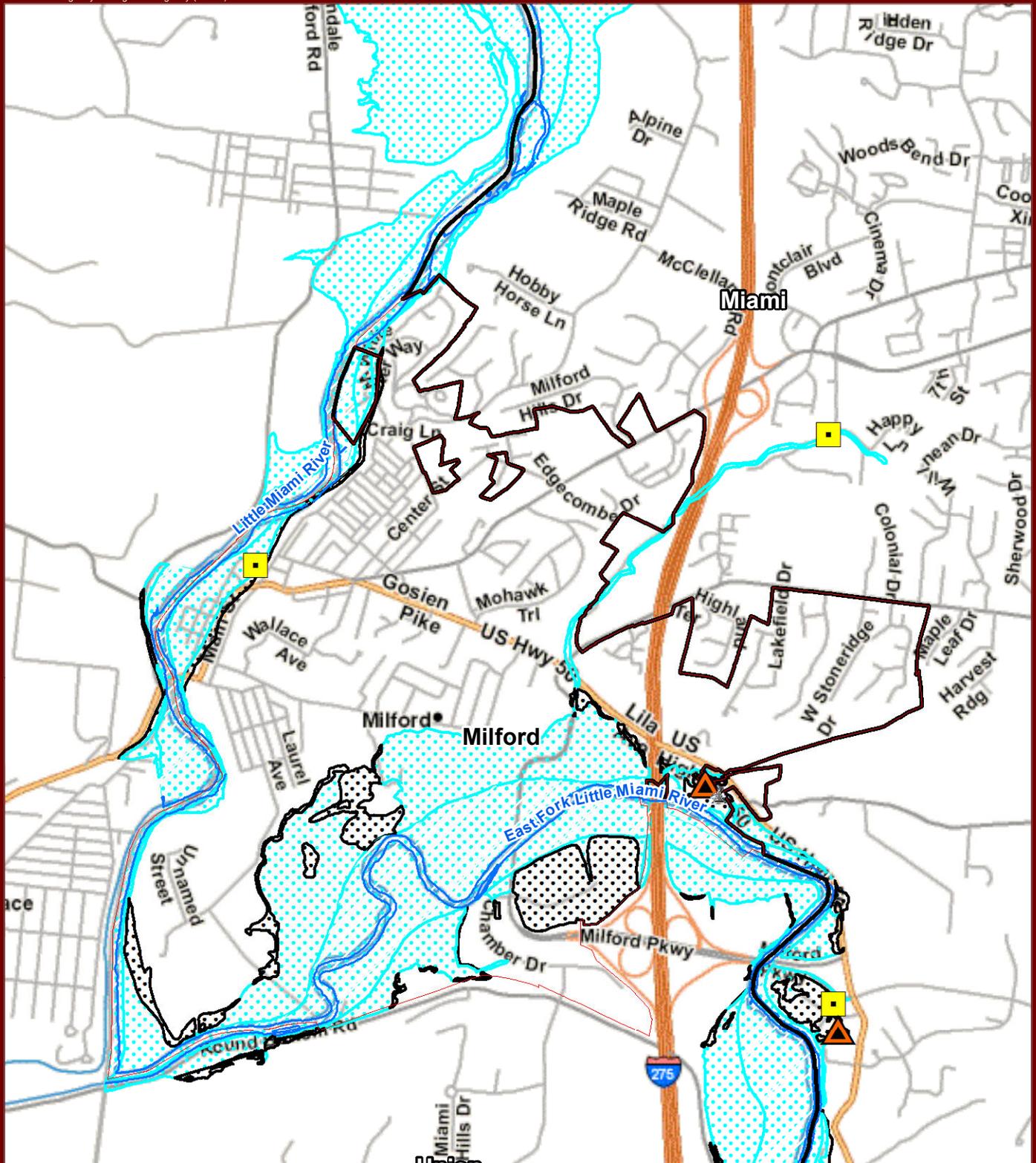


Geographic Information Systems



Figure 5 - Miami
Critical Facilities Inside Floodplain

Miami
 Clermont County All-Hazards Mitigation Plan



Legend

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|---|----------------------|---|------------------------------|---|------------------------|---|--------------------------|---|----------|
|  | Libraries FP |  | Fire Station Facilities FP |  | Utilities FP |  | Power Plants |  | 500-Year |
|  | School Facilities FP |  | Police Station Facilities FP |  | Hazardous Materials FP |  | Cell Phone Towers FP |  | 100-Year |
|  | Daycares FP |  | Nursing Homes FP |  | Government FP |  | Historical Structures FP |  | Floodway |



Geographic Information Systems



0 0.5 Miles



**Figure 6 - Milford
 Critical Facilities Inside Floodplain**

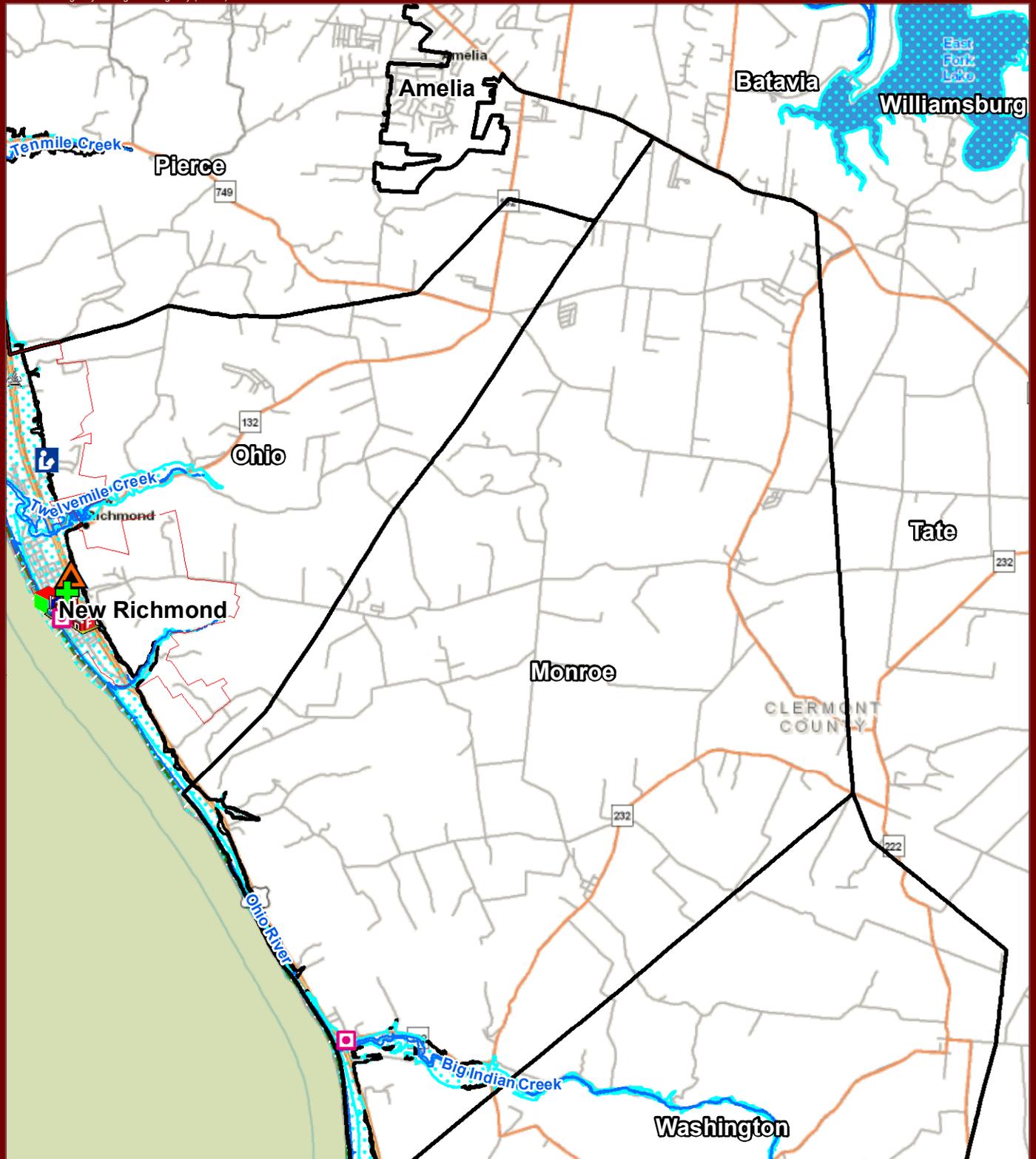
Milford

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Legend

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|---|----------------------|---|------------------------------|---|------------------------|---|--------------------------|---|-------------------|
|  | Libraries FP |  | Fire Station Facilities FP |  | Utilities FP |  | Power Plants |  | 500-Year Floodway |
|  | School Facilities FP |  | Police Station Facilities FP |  | Hazardous Materials FP |  | Cell Phone Towers FP |  | 100-Year Floodway |
|  | Daycares FP |  | Nursing Homes FP |  | Government FP |  | Historical Structures FP | | |



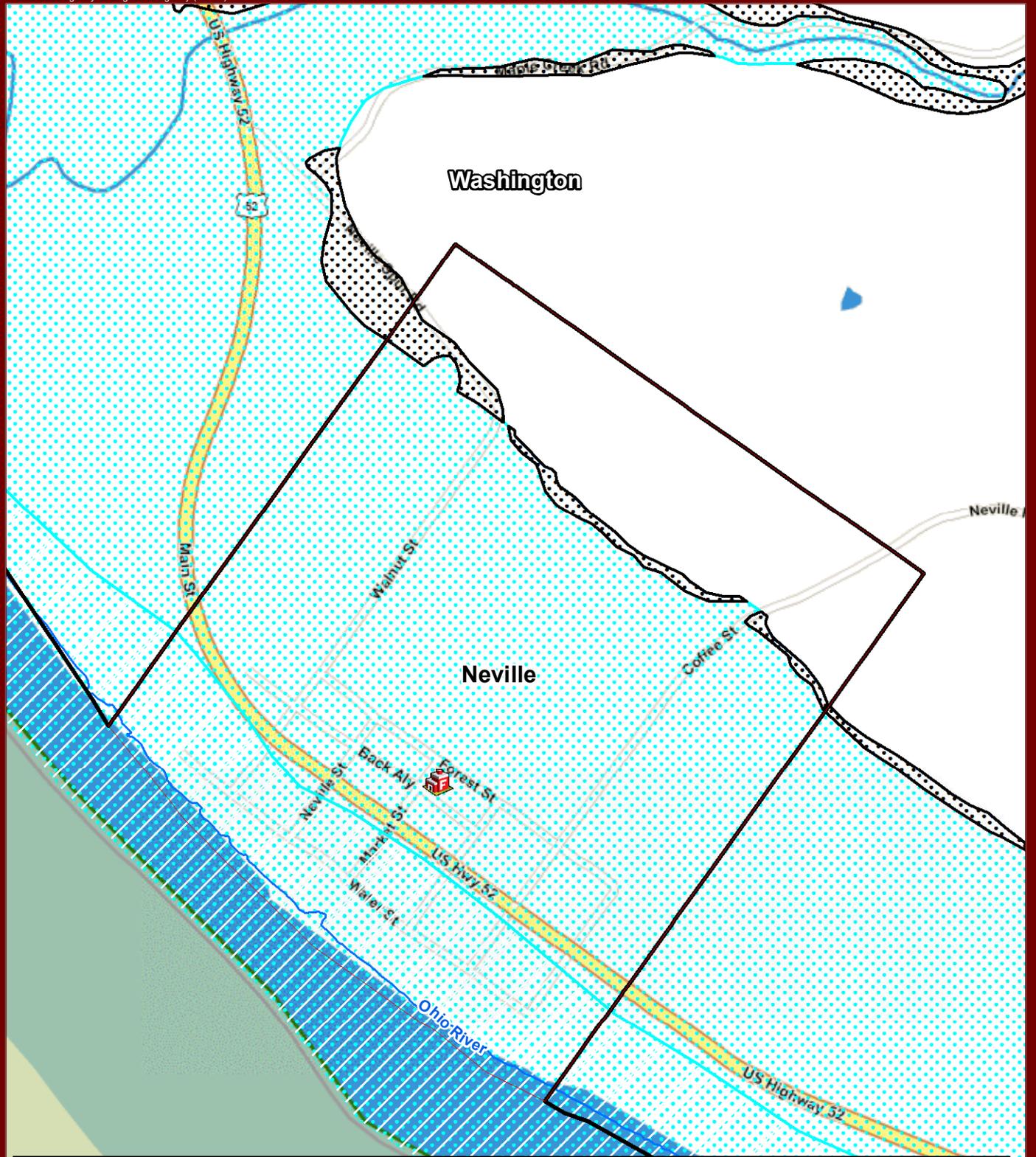
Geographic Information Systems



Figure 7 - Monroe Critical Facilities Inside Floodplain

Monroe

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Legend

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|---|----------------------|---|------------------------------|---|------------------------|---|--------------------------|---|----------|
|  | Libraries FP |  | Fire Station Facilities FP |  | Utilities FP |  | Power Plants |  | 500-Year |
|  | School Facilities FP |  | Police Station Facilities FP |  | Hazardous Materials FP |  | Cell Phone Towers FP |  | 100-Year |
|  | Daycares FP |  | Nursing Homes FP |  | Government FP |  | Historical Structures FP |  | Floodway |



Geographic Information Systems

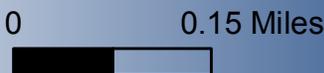
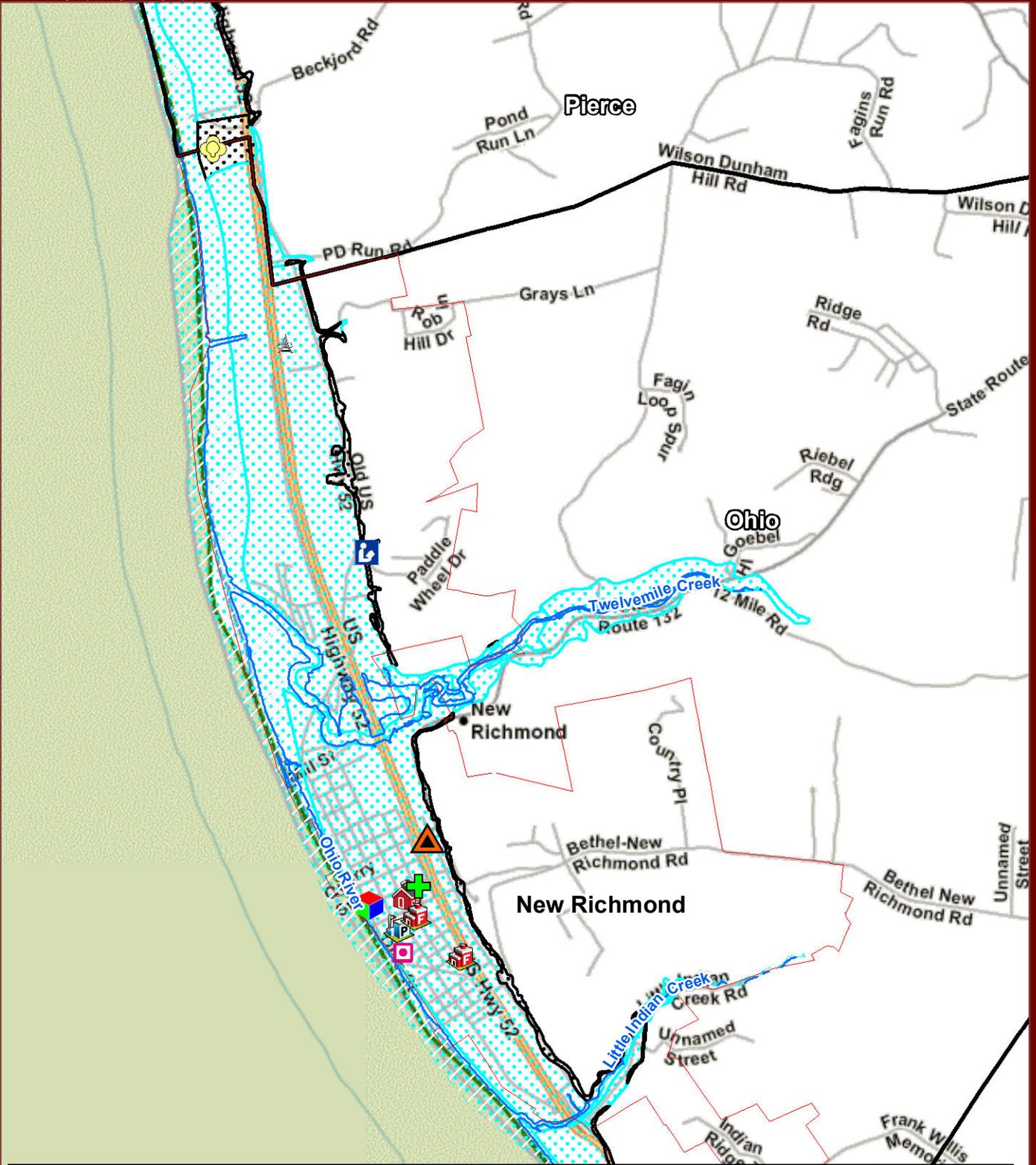


Figure 8 - Neville
 Critical Facilities Inside Floodplain

Neville

Clermont County All-Hazards Mitigation Plan



Legend

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|--|----------------------|--|------------------------------|--|------------------------|--|--------------------------|--|----------|
| | Libraries FP | | Fire Station Facilities FP | | Utilities FP | | Power Plants | | 500-Year |
| | School Facilities FP | | Police Station Facilities FP | | Hazardous Materials FP | | Cell Phone Towers FP | | 100-Year |
| | Daycares FP | | Nursing Homes FP | | Government FP | | Historical Structures FP | | Floodway |



Geographic Information Systems



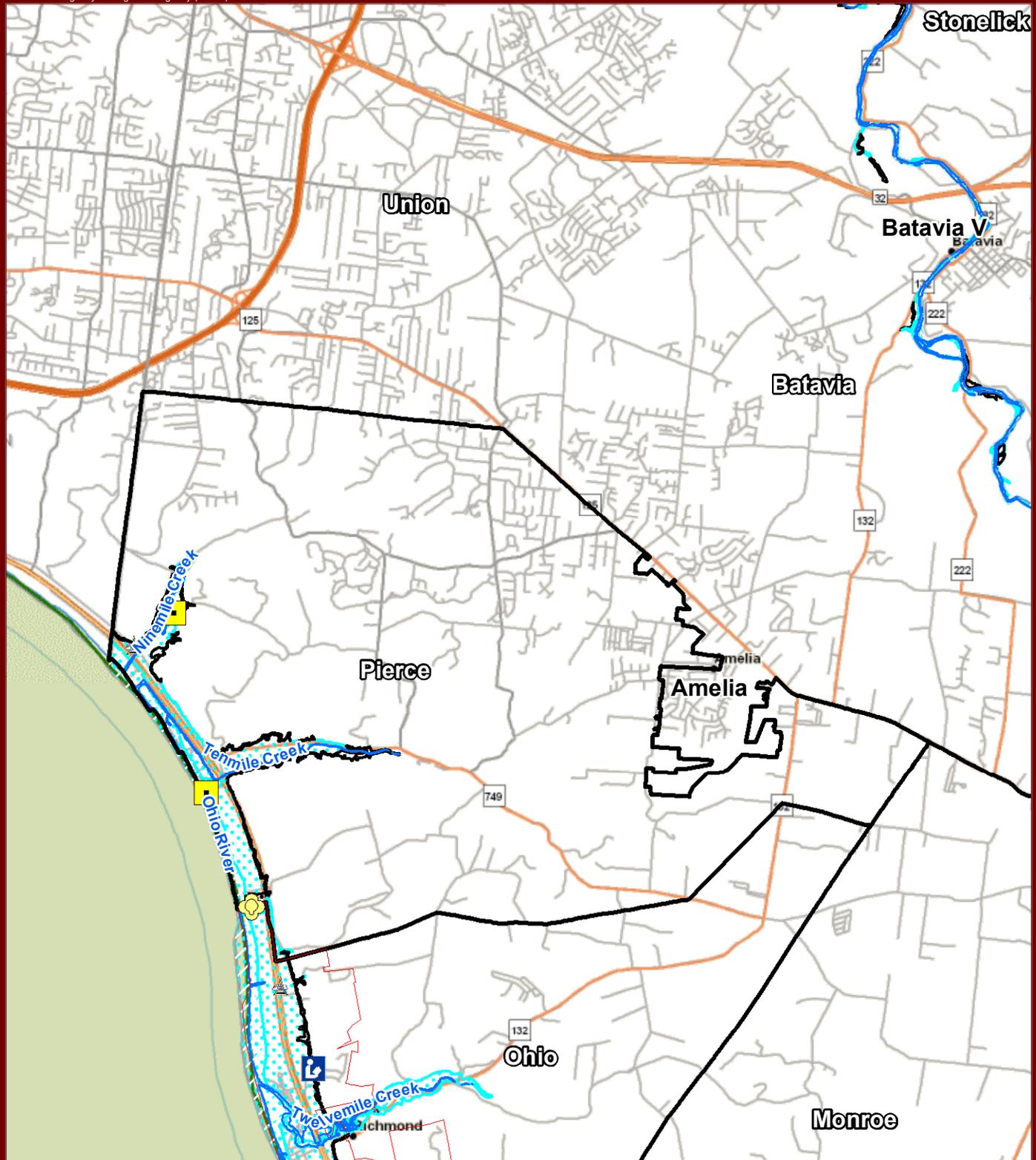
Figure 9 - New Richmond Critical Facilities Inside Floodplain

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Legend

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|---|----------------------|---|------------------------------|---|------------------------|---|--------------------------|---|----------|
|  | Libraries FP |  | Fire Station Facilities FP |  | Utilities FP |  | Power Plants |  | 500-Year |
|  | School Facilities FP |  | Police Station Facilities FP |  | Hazardous Materials FP |  | Cell Phone Towers FP |  | 100-Year |
|  | Daycares FP |  | Nursing Homes FP |  | Government FP |  | Historical Structures FP |  | Floodway |



Geographic Information Systems



0 1 Miles



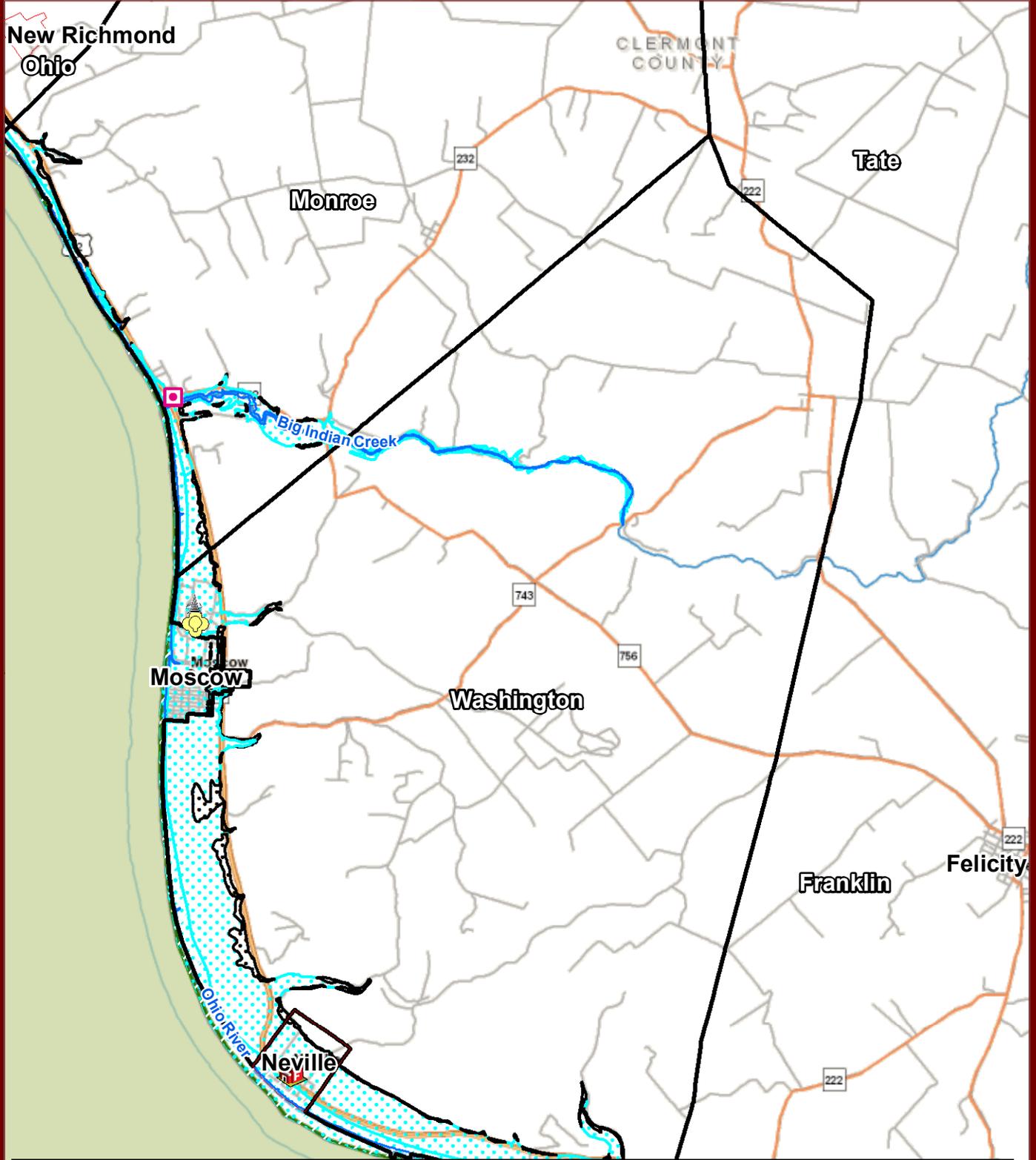
**Figure 10 - Pierce
 Critical Facilities Inside Floodplain**

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Legend

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|--|----------------------|--|------------------------------|--|------------------------|--|--------------------------|--|----------|
| | Libraries FP | | Fire Station Facilities FP | | Utilities FP | | Power Plants | | 500-Year |
| | School Facilities FP | | Police Station Facilities FP | | Hazardous Materials FP | | Cell Phone Towers FP | | 100-Year |
| | Daycares FP | | Nursing Homes FP | | Government FP | | Historical Structures FP | | Floodway |



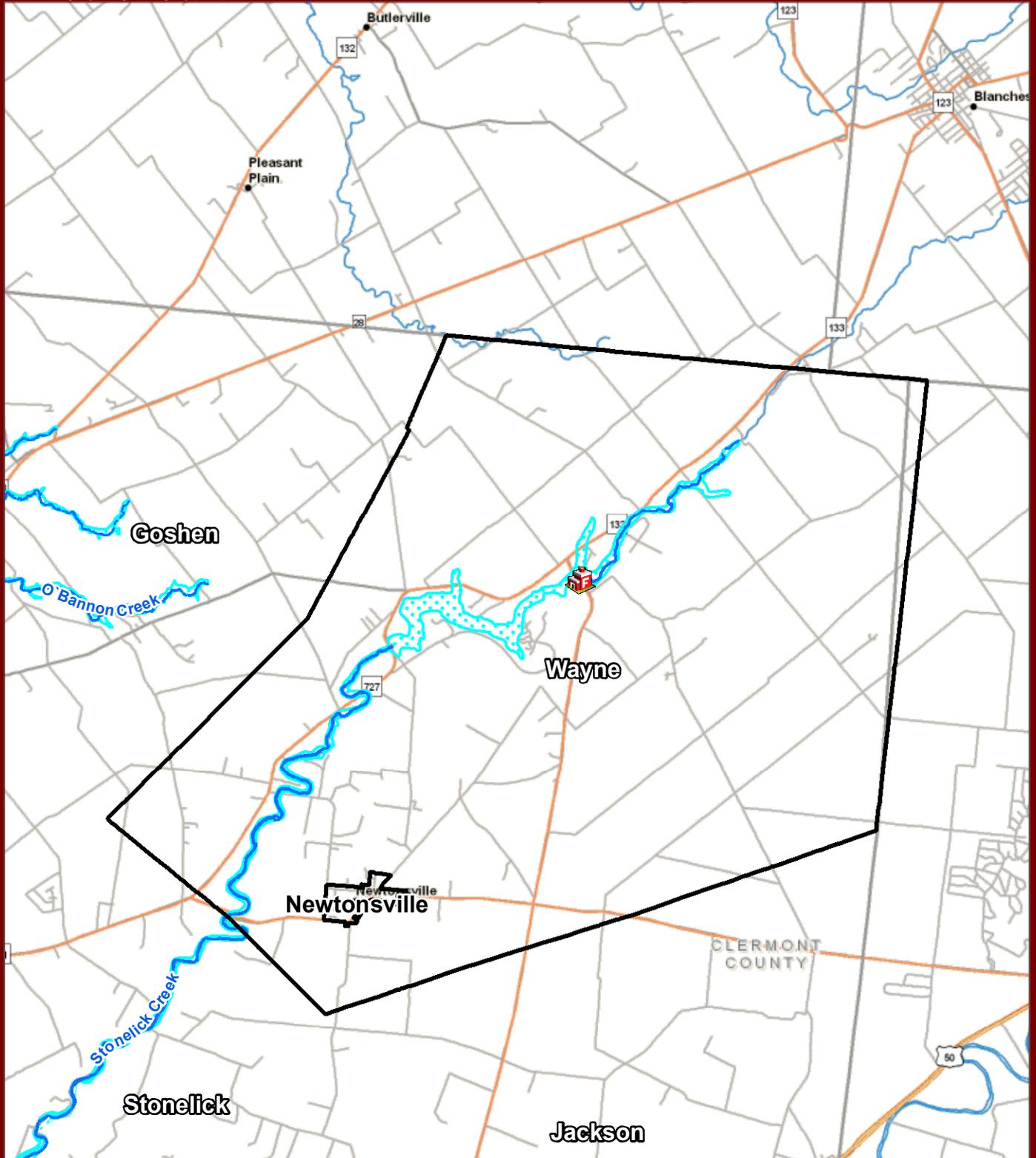
Geographic Information Systems



**Figure 11 - Washington
 Critical Facilities Inside Floodplain**

Washington

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Legend

	Libraries FP		Fire Station Facilities FP		Utilities FP		Power Plants		500-Year Floodway
	School Facilities FP		Police Station Facilities FP		Hazardous Materials FP		Cell Phone Towers FP		100-Year Floodway
	Daycares FP		Nursing Homes FP		Government FP		Historical Structures FP		Floodway



Geographic Information Systems



**Figure 12 - Wayne
 Critical Facilities Inside Floodplain**

Wayne

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4.4.5 Hazard Assessment and Vulnerability Analysis \ Potential Dollars Lost

Table 18 provides the probability of occurrence for several types of flood that the county may experience, in addition to the 1% annual chance flood. The probability of occurrence is expressed as the percent chance that a flood of a specific magnitude will occur in any given year.

Table 18. Flood Probability of Occurrence

Flood Return Interval	Chance of Occurrence in Any Given Year
10 - Year	10 %
25 - Year	5 %
50 - Year	2 %
100 - Year	1 %
500 - Year	0.2 %

To determine potential dollars lost due to flooding events, the software program Hazards United States Multi-Hazards (HAZUS-MH 2.1) was applied to Clermont County. HAZUS was developed by FEMA under contract with the National Institute of Building Sciences. Per FEMA's HAZUS website, "HAZUS-MH is a powerful risk assessment methodology for analyzing potential losses from floods, hurricane winds and earthquakes. In HAZUS-MH, current scientific and engineering knowledge is coupled with the latest geographic information systems (GIS) technology to produce estimates of hazard-related damage before, or after, a disaster occurs."

An Enhanced Level 1 analysis was performed on a countywide basis to determine flood risk. HAZUS-MH utilizes national elevation datasets, and US Census data to estimate damages resulting from specified storm events. The program performs hydrologic and hydraulic analyses to identify flood inundation limits for each stream within the County with a watershed of greater than 10 square miles. The base HAZUS-MH run was supplemented with flood study information for the Ohio and Little Miami Rivers from the Clermont County FEMA Flood Insurance Study. The FEMA flood profiles can provide a more accurate picture of flood risk, especially for large river systems. This analysis was performed for the 10%, 5%, 2%, 1% and 0.2% annual chance flood events.

The analysis produces an Average Annualized Loss (AAL) estimate based on the results of each flood event and the probability of that event occurring. The AAL is intended to provide an estimate of a community's annual flood risk exposure. The calculated AAL for Clermont County is \$26.3 Million per year. Table 19 summarizes the results of the HAZUS-MH analysis and an estimate of the number of buildings impacted for the listed flood events. The detailed HAZUS analysis results are included as Appendix F of this plan. A graphical depiction of the HAZUS-MH AAL results, at the census block level, is provided for each community in Appendix F.

The results of the HAZUS analysis indicate that Clermont County is extremely vulnerable to flood damage. However, these results are approximate and should be considered for planning purposes only. A more detailed analysis using building specific data would provide for greater certainty in future planning efforts.

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Table 19. HAZUS-MH Results Summary

Flood Annual Chance of Occurrence	Buildings Damaged / Destroyed	Total Economic Loss
10 %	166	\$216.30 Million
5%	287	\$282.83 Million
2 %	569	\$382.82 Million
1 %	623	\$427.00 Million
0.2 %	727	\$507.87 Million
AAL	N/A	\$ 26.30 Million

Tables 20 & 21 displays the potential structure loss within Clermont County found in the HAZUS results in Appendix F.

Table 20. Potential Structure Loss (Building Exposure for Study Region)

Building Exposure by Occupancy Type for Study Region (Flood – General Building Stock Table 1)						
Occupancy	Exposure (\$1,000)	% of Total	Number of Bldgs.	Building Type	Number of Buildings	Exposure (\$1,000)
Residential	9,785,009	76.1	49,723	Residential	49,723	9,785,009
Commercial	1,942,742	15.1	9,866	Non-Residential	13,721	2,701,735
Industrial	692,852	5.4	3,528			
Agricultural	66,141	0.5	327			
Religion	199,416	1.5	980	Critical Facilities	1,894	378,831,
Government	47,281	0.4	261			
Education	132,134	1	653			
Total	12,865,575	100	65,338			

Table 21. Potential Structure Loss (Vulnerability Analysis for SHARPP)

Building Exposure by Occupancy Type for Scenario (Flood – General Building Stock Table 2)						
Occupancy	Exposure (\$1,000)	% of Total	Number of Bldgs.	Building Type	Number of Buildings	Exposure (\$1,000)
Residential	1,539,299	71.5	7,822	Residential	7,822	1,539,299
Commercial	407,708	18.9	2,071	Non-Residential	2,753	542,209
Industrial	116,789	5.4	595			
Agricultural	17,712	0.8	87			
Religion	39,805	1.8	196	Critical Facilities	360	71,686
Government	10,808	0.5	60			
Education	21,073	1	104			
Total	2,153,194	100	10,935			

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4.4.6 Current Development Trends

Clermont County is growing but not in areas of the floodplain. The County is seeing significant development throughout the County and in the State Route 32 corridor, but development pressures will not affect the high-hazard areas because of the existing regulations and standards.

4.5 TORNADOES

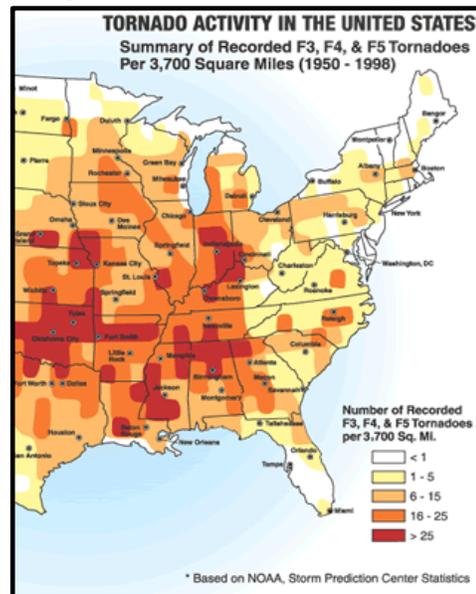
Tornadoes are produced from the energy released during a thunderstorm, but account for only a small fraction of the overall energy generated by a thunderstorm. What makes them particularly dangerous is that the energy is concentrated in such a small area, perhaps only a hundred yards in diameter.

Tornadoes occur whenever and wherever conditions are right, but they are most common in the central plains of North America, east of the Rocky Mountains and west of the Appalachian Mountains. They occur primarily during the spring and summer – the tornado season comes early in the south and later in the north according to the seasonal changes in relation to latitude – usually during the late afternoon and early evening. They have been known to occur in every state in the United States and every continent on Earth, any day of the year, and at any hour. Figure 13 shows the tornado activity in the eastern U.S. from 1950-1998.

The damaging strong winds generated from tornadoes can reach 300 miles per hour in the most violent tornadoes, causing automobiles to become airborne, ripping ordinary homes to shreds, and turning broken glass and other debris into lethal missiles. The biggest threat to living creatures (including humans) during tornadoes is flying debris and the risk of being tossed about in the wind. Contrary to previous belief, it is not true that the pressure in a tornado contributes to damage by making buildings "explode."

Although the process by which tornadoes form is not completely understood, scientific research has revealed that tornadoes usually form under certain types of atmospheric conditions. Those conditions can be predicted, but it is not yet possible to predict in advance exactly when and where they will develop, how strong they will be, or precisely what path they will follow. There are some "surprises" every year, when tornadoes form in situations that do not look like the right conditions in advance, but these are becoming less frequent. Once a tornado is formed and has been detected, warnings can be issued based on the path of the storm producing the tornado, but even these cannot be perfectly precise regarding who will, or will not, be struck.

Figure 13. Tornado Activity



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Table 22 shows that although the State of Ohio may not have the most tornadoes, those that do hit Ohio can cause significant damages.

Table 22. State Rankings for Tornado Statistics

Rank	Total Number of Tornadoes	Deaths Per 10,000 sq. miles	Number of Killer Tornadoes	Total Tornado Path Length Per 10,000 sq. miles	Killer Tornadoes as a % of all Tornadoes	Annual Tornadoes Per 10,000 sq. miles
1	Texas	Massachusetts	Texas	Mississippi	Tennessee	Florida
2	Oklahoma	Mississippi	Oklahoma	Alabama	Kentucky	Oklahoma
3	Florida	Indiana	Arkansas	Oklahoma	Arkansas	Indiana
4	Kansas	Alabama	Alabama	Iowa	Ohio	Iowa
5	Nebraska	Ohio	Mississippi	Illinois	Alabama	Kansas
6	Iowa	Michigan	Illinois	Louisiana	Mississippi	Delaware
7	Missouri	Arkansas	Missouri	Kansas	North Carolina	Louisiana
8	Illinois	Illinois	Indiana	Indiana	Michigan	Mississippi
9	South Dakota	Oklahoma	Louisiana	Nebraska	New York	Nebraska
10	Louisiana	Kentucky	Tennessee	Wisconsin	Massachusetts	Texas

Although the number of tornadoes in Ohio does not rank high compared to other states in the United States, the State does average around 14 tornadoes a year. Ohio's peak tornado season runs from April through July, with most tornadoes occurring between 2-10 P.M. Even though June has been the month with the most tornado occurrences, many of the State's major tornado outbreaks have taken place in April and May. However, history has shown that tornadoes can occur during any month of the year and at any time of the day or night. Many of these tornadoes are weak (EF0 or EF1), but Ohio has been struck by some of the most destructive (EF5) tornadoes ever, including the April 3, 1974 tornado which devastated Xenia, killing over 30 people and destroying 2,000 buildings.

Clermont County, which lies near the far southwest corner of Ohio, is within the area referred to as the Ohio Valley Tornado Alley. Because of the geography and prevailing weather patterns in the spring and summer, storm systems produce tornadoes across the Ohio Valley a few times each year. Records since 1950 suggest that Clermont County can expect a tornado every 4 years, on the average.



The Enhanced Fujita Scale was developed to measure or evaluate strength of a tornado. Table 23 provides a description of wind speed and typical damage for a given scale.

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Table 23. Enhanced Fujita Scale for Tornadoes

Scale	Wind Estimate (mph)	Typical Damage
EF0	65 - 85	Light damage: Some damage to chimneys; branches broken off trees; shallow-rooted trees pushed over; sign boards damaged.
EF1	86 - 110	Moderate damage: Peels surface off roofs; mobile homes pushed off foundations or overturned; moving autos blown off roads.
EF2	111 - 135	Considerable damage: Roofs torn off frame houses; mobile homes demolished; boxcars overturned; large trees snapped or uprooted; light-object missiles generated; cars lifted off ground.
EF3	136 - 165	Severe damage: Roofs and some walls torn off well-constructed houses; trains overturned; most trees in forest uprooted; heavy cars lifted off the ground and thrown.
EF4	166 - 200	Devastating damage: Well-constructed houses leveled; structures with weak foundations blown away some distance; cars thrown and large missiles generated.
EF5	Over 200	Incredible damage: Strong frame houses leveled off foundations and swept away; automobile-sized missiles fly through the air in excess of 100 meters (109 yds.); trees debarked; incredible phenomena will occur.

4.5.1 Historic Tornado Events

Since 1953, there have been at least 18 recorded tornado events with Clermont County. Table 24 below provides a summary of these events. Figure 14 shows the approximate location and paths of each event.

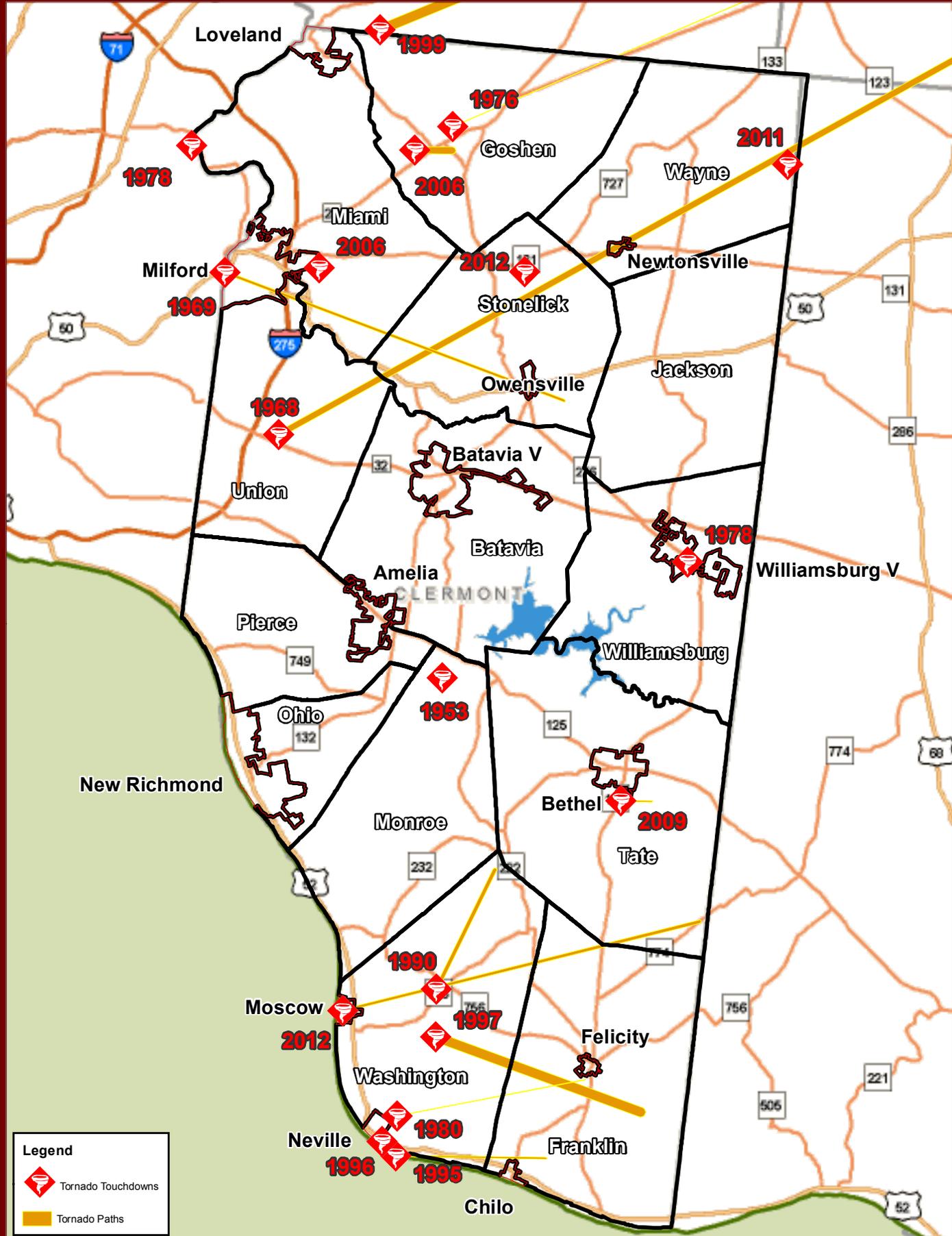
During the preliminary planning process, there were 2 events in 2012 that caused significant damages. The first was on March 2, 2012. This tornado was categorized as an EF3. The Village of Moscow, parts of Franklin, Washington, & Tate Townships were all in the direct path with 353 structures damaged and 18 residential structures destroyed causing roughly \$3,700,000 in damages with 3 lives lost and 13 injured. The Village of Moscow was hit the hardest. The second tornado event was on September 8, 2012, where 2 homes were damaged / destroyed.



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ALL-HAZARDS MITIGATION PLAN**

Table 24. Summary Table of Events

Category	# of Events	Deaths	Injuries	Damages	Average Death/Event	Average Injury/Event	Average \$/Event
EF0	8	0	0	\$ 403,000	0.00	0.00	\$ 50,375
EF1	5	0	2	\$ 430,000	0.00	0.40	\$ 86,000
EF2	1	0	0	\$ 250,000	0.00	0.00	\$ 250,000
EF3	3	3	20	\$7,910,000	1.00	6.67	\$2,636,667
EF4	1	1	29	\$2,500,000	1.00	29.00	\$2,500,000



Geographic Information Systems

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Figure 14
Historic Tornadoes

CLERMONT COUNTY ALL-HAZARDS MITIGATION PLAN

Federal/State Disaster Declarations were filed for the following severe storm events with impacts to Clermont County. The descriptions of events were gathered from NOAA and FEMA.

Federal Disaster Number DR-1227, June 24 - July 5, 1998. The national weather service indicated that there was a Tornado/Severe Storm outbreak throughout Ohio. Flash flooding, flooding, high winds, and tornadoes were reported in multiple counties.

Federal Disaster Number DR-1484, July 21 - August 25, 2003. Severe storms, flooding, high winds, and tornadoes were reported throughout Ohio. Multiple counties received Public Assistance through FEMA.

State Disaster Declaration for the March 2, 2012 tornado – Townships and Villages within Clermont County received funds through the State Disaster Relief Program, U.S. SBA low interest loans, and State Individual assistance.

4.5.2 Hazard Assessment and Vulnerability Analysis \ Potential Dollars Lost

The location, frequency and impacts of tornadoes cannot be accurately predicted. However, an analysis of historic events can provide a reasonable understanding of expected future risks.

According to NCDC and local sources, Clermont County has had 18 tornadoes in 16 unique years since 1953, with total losses of approximately \$11.5 million. (Please see Appendix C.) The annual chance of occurrence for a tornado is 23%. The annualized risk is approximately \$190,883 with 1 injury and 3% chance of life loss.

Due to the non-site-specific nature of this hazard, Table 25 lists all structures within Clermont County as having potential impact from a tornado.

Table 25. Structure Vulnerability (Source: Clermont Parcels / Structure Inventory)

Structure Type	Number	Value of Vulnerable Structures (\$)
Residential	62,689	5,948,901,170
Non-Residential	13,271	1,234,922,010
Critical Facilities	937	533,745,560
Total	76,897	7,717,568,740

4.5.3 Current Development Trends

Due to the non-site-specific nature of this hazard, future development trends will have no significant effects on the occurrence of tornadoes. However, population growth and increased infrastructure and building stock will likely increase annual expected damages.

4.6 LANDSLIDES

A landslide is a general description for a wide range of ground or soil movements (creeps, rock falls, deep failure of slopes, slumps and shallow debris flows) that can happen in an instant or over several weeks, months, or even years. Landslides occur all over the United States and present a significant problem in several Ohio regions. Figure 15 shows landslide prone areas in Ohio.

The most common types of landslide events in Clermont County are rotational slumps, earth flows, and rock falls. Rotational slumps are the largest movements of earth in Ohio. They are characterized by a large mass of weakened rock or sediment moving along a curved slip plane. An example of a typical slump is depicted in Figure 16.

An earth flow involves a smaller mass, and is more common. Earth flows entail jumbled masses of rock or sediment, usually unconsolidated glacial sediment, moving down a slope, forming odd topographical features. Rock falls are described as blocks of bedrock becoming detached and tumbling down cliffs or steep slopes.

Figure 15. Landslide Prone Areas in Ohio

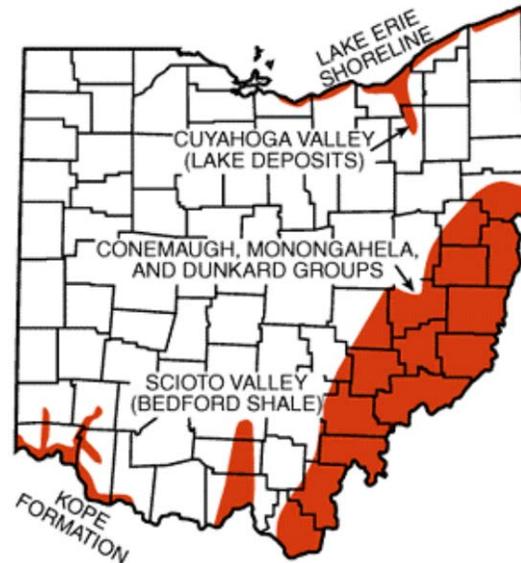
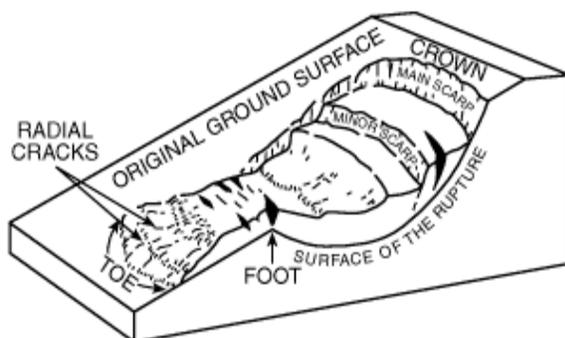


Figure 16. Rotational Slump



There are several indicators for landslide prone areas including tilted or bending trees, displaced fences, poles, or walls, a concentration of stones at the toe of a slope, irregularly shaped mounds or ridges, step-like ground and water seeps. There are two elements that come together to cause a landslide – the existing geologic conditions, combined with a trigger to set the landslide in motion. According to the Ohio Department of Natural Resources, the Cincinnati area has one of the highest per capita costs related to landslide damages in the United States. Clermont County needs to understand landslide potentials and establish mitigating actions to prevent them.

The geology of Clermont County and the greater Cincinnati area was formed primarily by three separate glacial events. Each time a glacier advanced, it left a clear and identifiable mark behind including large deposits of sand, silt, clay and other unconsolidated glacial sediment. This type of sediment is prone to instability that can lead to landslide events. Glaciers are also largely responsible for the unique cliffs and slopes that are prevalent throughout Clermont County and these features may contribute to impending landslides. Landslides can be primarily

CLERMONT COUNTY ALL-HAZARDS MITIGATION PLAN

attributed to the mix of sediment and colluvial matter that overlays the bedrock in the Kope Formation. The Kope bedrock formation primarily consists of shale and some limestone. This formation can be found along the Ohio and Little Miami Rivers in Clermont County.

Another cause for earth movements in Clermont County is the disintegration and failure of shale beds, caused by a number of factors. These conditions combine to create a unique and starkly beautiful landscape. Unfortunately, these areas are susceptible to landslide hazards unless mitigation actions are taken. More information can be found in section 4.6.1.

4.6.1 Triggers and Catalysts of Landslide Events

There are several sets of circumstances or individual events that can lead to a landslide, most of which are directly caused by alterations made to the terrain by humans. One trigger that can cause a landslide is an activity vibration. A vibration can be anything from human induced blasting, to construction, or even heavy traffic. Slope modification is another reason landslides occur. Over-steepening a slope, adding weight to the top of a slope, removing part of the toe of a slope (base of an inclined surface of a hill) and constructing an embankment or fill on a slope are all possible causes for landslides.

Vegetation that exists on slopes is important in adding stability to loose soil and rocks and absorbing excess water on the slope. If removed, the slope may weaken and fail, resulting in a landslide.

Naturally recurring phenomenon might cause landslides. Vibrations resulting from earthquakes can cause landslides, although no landslide instance involving an earthquake has ever been documented in Ohio, the possibility remains.

Large amounts of water or snowmelt can saturate the slope to the point of failure. The saturated slope could develop into a debris flow or a mudflow. Uncontrolled runoff can lead to erosion, which can add to slope instability. Though some of these catalysts cannot be foreseen, many landslides can be prevented.

4.6.2 Preventive Measures and Precautions

Many landslide hazards can be mitigated by good geologic investigations and engineering practices, and effective enforcement of land-use management regulations. Avoiding the triggers of landslides and being aware of landslide indicators are the simplest ways to avert landslide hazards. Preventing unnecessary alterations of the slope, steering clear of vibrations and leaving vegetation on slopes are all practical and common sense ways to avert landslides. Regulating building in questionable areas is another practical way to avoid a landslide catastrophe.

Measures that are more assertive can also be considered. Excavating some of the upper slope or placing fill on the toe of the slope may prevent a landslide. Improving drainage on a slope can remove stress caused by excess moisture, thereby reducing the potential for landslides. Restraining the slope by the use of cribbing, piling or retaining walls may also prevent landslides or minimize damage if one does occur. These mitigation measures should be weighed with

CLERMONT COUNTY ALL-HAZARDS MITIGATION PLAN

geologic, hydraulic and economic attributes before choosing the most suitable avenue of prevention.

4.6.3 Historic Landslide Events

The following is a list of some past road landslides that have been repaired in Clermont County:

- Felicity Cedron Slide: length 300': repair cost \$125,900. Repair was using drilled shafts into bedrock.
- Nine Mile Slide: length 400': repair cost \$168,200. Repair was drilled shafts and "t-wall".
- Benton Road Slide: length 300': repair cost \$240,600. Repair was drilled shafts into bedrock.
- Clermontville Laurel Slide: length 400': repair cost \$459,000. Repair using drilled shafts into bedrock (uphill and downhill side).
- Clermontville Laurel Slide: North of Boat Run in 2011, see Figure 17.

**Figure 17. Landslide on Clermontville
Laurel North of Boat Run in 2011**



4.6.4 Hazard Assessment and Vulnerability Analyses

The County Engineer's Office and the Ohio Department of Transportation (ODOT) fix landslides every year that affect Clermont's infrastructure. Combined, they repair an average of 5 slides per year at an average cost of \$250,000 each resulting in a rough yearly infrastructure repair cost estimate of \$1,250,000 (Source: Clermont County 2006 All Natural Hazards Mitigation Plan).

The vulnerability for landslides usually affects specific structures and infrastructure on high slopes or unstable soils. Landslides are more confined; however can still impact structures and transportation routes. The structural and transportation route damages result in economic loss and business disruption. There is also a potential for injuries and possibly fatalities. Table 26 provides a potential structure loss as determined by OEMA, Clermont County Engineer's Office, and ODOT.

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Table 26. Potential Structure Loss

Incident Type	Number	Loss Estimate
Structural*	10	\$1,166,732.00
Infrastructure**	5	\$1,250,000.00
Total	15	\$2,416,732.00

*Information from the Enhanced State of Ohio Hazard Mitigation Plan

**Information from Clermont County Engineer's Office and ODOT

The analysis provided in the Enhanced State of Ohio Hazard Mitigation Plan gives an Estimated Loss of \$1,166,732 for Clermont County. The methodology behind this estimation was the Average Structure Value within the high landslide zone multiplied by 10 structures. Figure 18 shows the landslide zones in Ohio. Clermont County is within a High Landslide Incidence zone due to high slopes. According to ODOT Engineering Division, Clermont Averages 15 slides per year.

Figure 18. Landslide Zones in Ohio

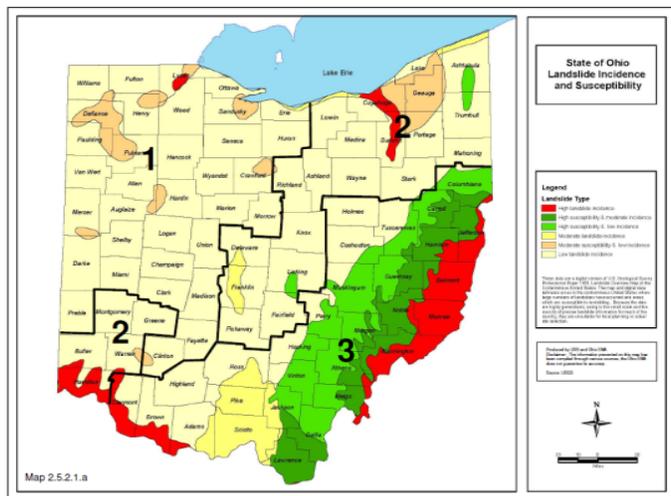
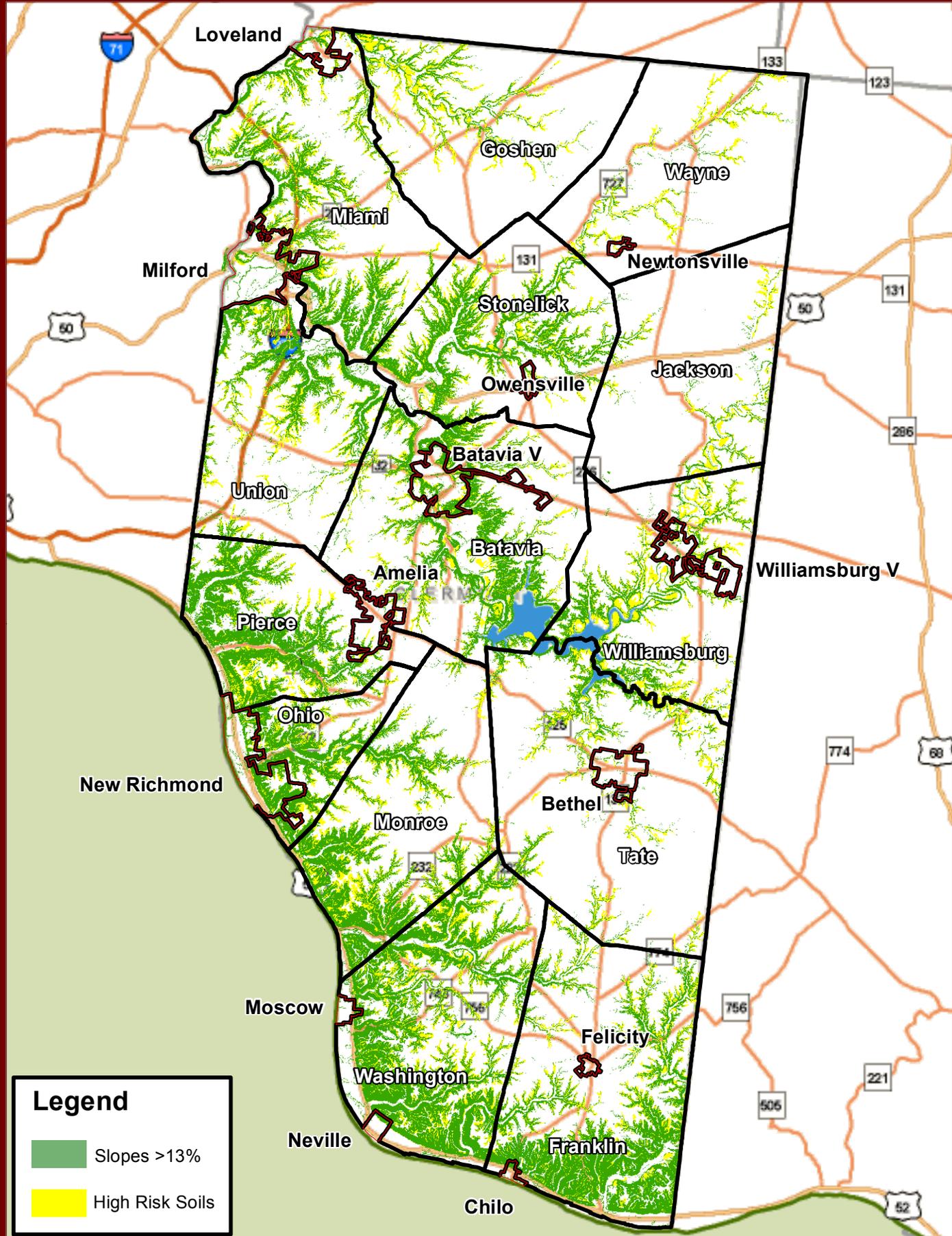


Figure 19 shows landslide prone areas Clermont County. The yellow areas on this map indicate areas where landslide prone soils exist. The varying shades of green and red indicate slopes greater than 13%.

4.6.5 Current Development Trends

Because of the steep slopes, soil types, and growth in the County the threat of landslides continues to increase. As vegetation is removed from steep slopes or these slopes are surcharged by development, the threat of landslides or slumps increases proportionally. Continued denuding of these vulnerable areas will significantly increase the risk of landslides.



Legend

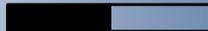
-  Slopes >13%
-  High Risk Soils



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0 4 Miles



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Figure 19
Landslide Risk

Stantec

11687 Lebanon Road Cincinnati, OH 45241 Phone 513.842.8200 Fax 513.842.8250 www.stantec.com

Clermont County All-Hazards Mitigation Plan

4.7 DROUGHT

This type of an event is a County-wide hazard. Drought is a normal, recurrent feature of climate. It occurs almost everywhere, although its features vary from region to region. Defining drought is therefore difficult; it depends on differences in regions, needs, and disciplinary perspectives. In the most general sense, drought is a period of unusually dry weather sufficiently prolonged for the lack of precipitation to cause serious hydrologic imbalance in the affected area producing below average water content in streams, reservoirs, ground-water aquifers, lakes and soils. Whatever the definition, it is clear that drought cannot be viewed solely as a physical phenomenon. The effects of drought are many including:

- lowering of water levels in lakes or reservoirs that supply water to local communities,
- low stream flows, which in some cases means streams actually dry up completely, dramatically affecting the fish and biotic populations,
- insufficient moisture for crops resulting in reduced yields,
- lack of moisture to sustain vegetation, and
- grass fires and wildfires which can spread to developed areas.

In the National Water Summary dated 1988-1989, the USGS stated that:

“The drought of 1930 – 1936 was the most severe recorded in Ohio. Precipitation totals for 1930 and 1934 were the smallest since the earliest statewide records in 1883. Since 1930 droughts in Ohio have occurred about every 10 years, with an apparent random variation in duration and severity. A short but severe drought occurred in 1988.”

Generally, droughts are gauged by comparing the current situation to the historical average, often based on a 30-year period of record. The threshold identified as the beginning of a drought (e.g., 75% of average precipitation over a specified time period) is usually established somewhat arbitrarily, rather than on the basis of its precise relationship to specific impacts.

4.7.1 Disciplinary Perspectives on Drought

Drought in a *Meteorological* sense is a measure of departure of precipitation from normal. Due to climatic differences what is considered a drought in one location may not be a drought in another location.

Agricultural drought refers to a situation when the amount of moisture in the soil no longer meets the needs of a particular crop. Figure 20 shows damage to crops from an Agricultural drought.

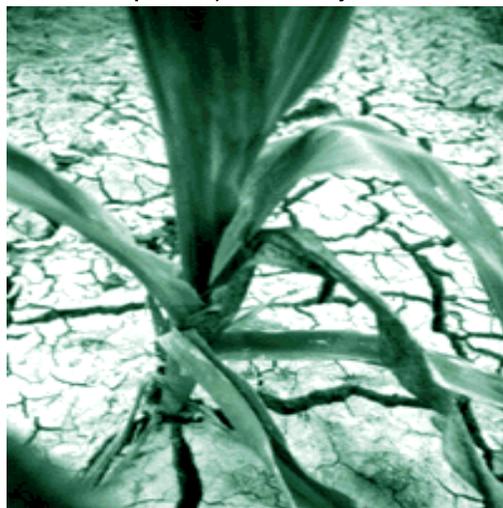


Figure 20. Agricultural Drought

**CLERMONT COUNTY
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Hydrological drought occurs when surface and subsurface water supplies are below normal.

Socioeconomic drought refers to the situation that occurs when physical water shortage begins to affect people. Wildfires, property (and crop) damage, and extreme heat can all be classified as socioeconomic effects. Socioeconomic impacts of droughts were the type that is most concerning to the Core Group. The overall goal agreed upon by the group was to save lives, increase awareness of how droughts can increase the risk of wild fires, and to be better prepared to deal with this hazard event.

4.7.2 Monitoring Drought

There are several resources for monitoring drought levels in Ohio. The United States Department of Agriculture (USDA) publishes the U.S. Drought Monitor.

Table 27 shows the Palmer Drought Severity Index (PDSI) which is used by many Federal agencies and States to evaluate the current impact of limited rainfall. The PDSI is calculated based on precipitation and temperature data, as well as the local Available Water Content (AWC) of the soil. The numerical index varies from 4.0, which is extremely wet to – 4.0, which indicates extreme drought conditions. The table defines the range of PDSI values. The data is typically plotted on a map in varying shades to reflect the variation of the severity across the country. The PDSI in Clermont County at the end of September, 2012 was rated as a moderate drought. Figure 21 shows the graphical depiction PDSI for September 2012.

Table 27. PDSI Classifications

Palmer Classifications	
4.0 or more	extremely wet
3.0 to 3.99	very wet
2.0 to 2.99	moderately wet
1.0 to 1.99	slightly wet
0.5 to 0.99	incipient wet spell
0.49 to -0.49	near normal
-0.5 to -0.99	incipient dry spell
-1.9 to -1.99	mild drought
-2.0 to -2.99	moderate drought
-3.0 to -3.99	severe drought
-4.0 or less	extreme drought

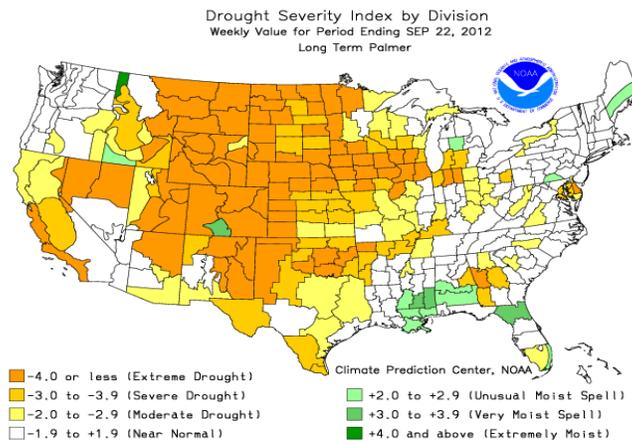


Figure 21. Drought Severity Index

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The January, 1994 Ohio Drought Response Plan utilizes the PDSI to activate the State Drought Response System, these include:

Phase I – Normal conditions, monitor and assess conditions and report monthly to OEMA.

Phase II – PDSI reaches – 1.0 to – 2.0, a “Drought Alert” is issued and the Drought Assessment Committee is activated by the Governor.

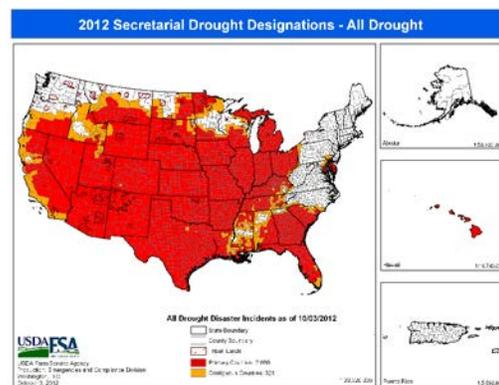
Phase III - PDSI reaches – 2.0 to – 4.0, water conservation measures are increased in affected areas.

4.7.3 Historic Drought Events

The USDA and the Farm Service Agency (FSA) follow the Secretary of Agriculture (SA) Drought Designations. In 2012 there was a widespread drought over the lower 48 states. Clermont County was part of the declared counties. This drought was not a presidentially declared disaster but it was declared by the SA. On September 10, 2012 the SA made a disaster declaration for Drought and Excessive Heat, which provided SBA Economic Injury Disaster Loans to Ohio. The FSA follows the Secretarial declarations when providing recovery funds for farmers across the nation. The FSA has multiple Emergency Programs to provide funding. More information can be found at FSA’s disaster web page: <http://disaster.fsa.usda.gov>.

- Supplemental Revenue Assistance Payment Program (SURE)
- Livestock Forage Disaster Program (LFP)
- Emergency Assistance for Livestock, Honeybees, and Farm-Raised Fish Program (ELAP)
- Livestock Indemnity Program (LIP)
- Tree Assistance Program (TAP)
- Non-Insured Crop Disaster Assistance Program (NAP)
- Emergency Conservation Program (ECP)
- Emergency Loan Program (EM Loans)
- Disaster Set-Aside (DSA)
- Haying and Grazing of Conservation Reserve Program Acres (CRP)

Farmers in Clermont County have received funds using the SURE program from 2008 - 2010. Figure 22 shows all counties with a Secretary of Agriculture Drought Designation as of October 3, 2012.



**Figure 22. 2012 Secretarial
Drought Designations**

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4.7.4 Hazard Assessment and Vulnerability Analysis \ Potential Dollars Lost

The County's vulnerability to droughts has increased over the years due to increased water consumption and population growth. Unlike most hazards, the threat of a drought tends to be dismissed because of the relative long period it takes to have damaging effects. Clermont County is fairly vulnerable to drought because the county has a significant agricultural base and there is also urban/wildlife interface throughout the county.

The FSA's SURE program supplied farmers in Clermont County with \$913,216 in Emergency Assistance from 2008 - 2010. These funds were used to recover from damages incurred by a drought.

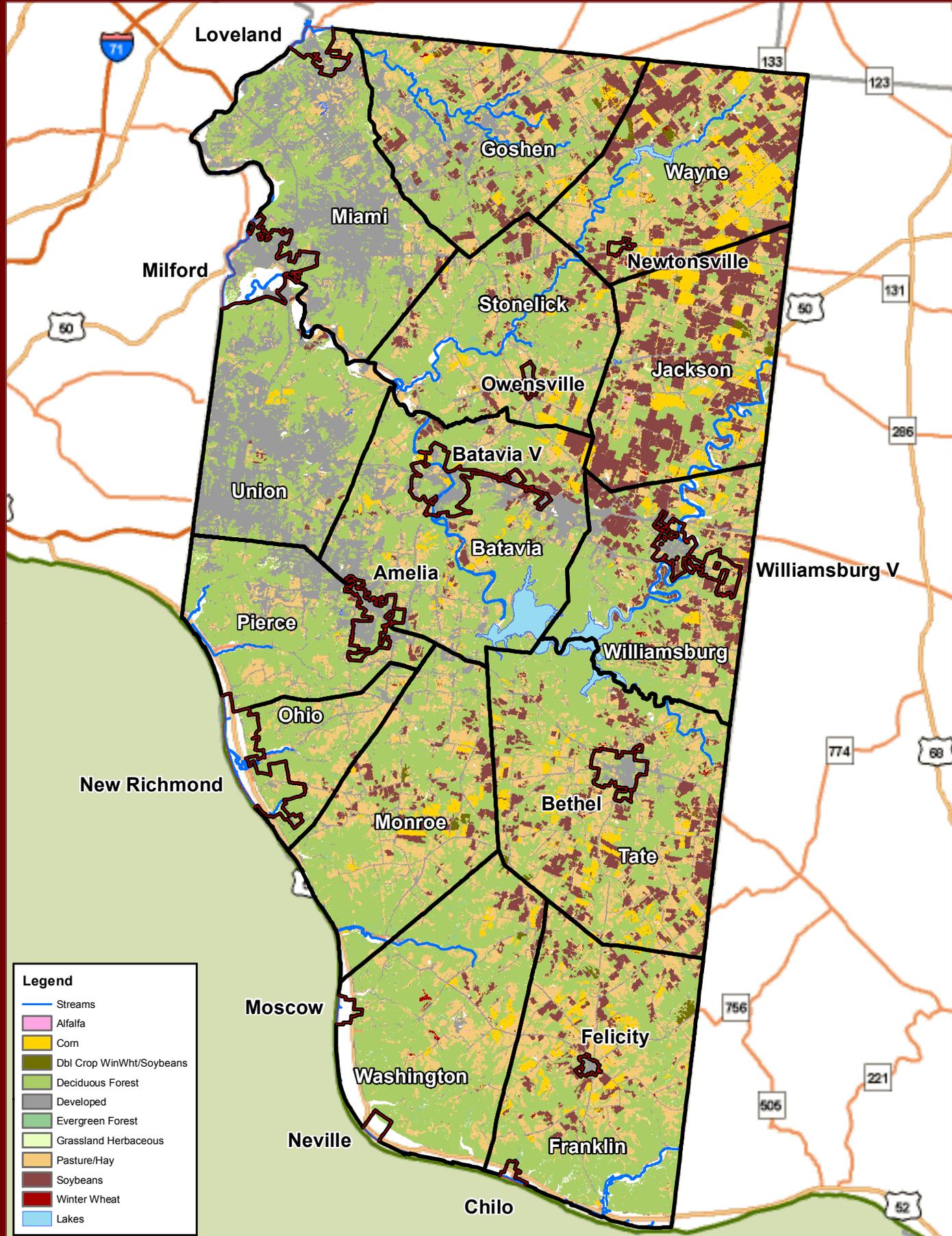
"FEMA estimated in 1995 that drought costs the United States \$6–8 billion annually. Other studies have indicated that drought losses average \$200 million to \$1.24 billion annually in the Great Plains. This range is based on crop losses and other direct and indirect losses. According to NCDC, in 1999, a drought that affected twenty-eight Ohio counties caused \$200 million in crop damages." (Source: State of Ohio Enhanced Hazard Mitigation Plan)

The vulnerability for Drought usually does not affect structures as other natural hazards. However, a sustained drought has a significant effect on impact on humans, animals, and crops. This results in injuries, possible fatalities, and crop loss.

Figure 23 shows the types of agriculture within Clermont County.

4.7.5 Current Development Trends

Clermont County has not faced significant water shortages to the municipal water system due to drought. The Clermont County Water Resources Department has developed an emergency response plan to enact during a potential shortage. Expansion of the BMW treatment plant will increase the capacity of the water system and provide for better diversification of the water supply.



Legend

-  Streams
-  Alfalfa
-  Corn
-  Dbl Crop WinWht/Soybeans
-  Deciduous Forest
-  Developed
-  Evergreen Forest
-  Grassland Herbaceous
-  Pasture/Hay
-  Soybeans
-  Winter Wheat
-  Lakes



Geographic Information Systems



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Figure 23
Drought Impacts

4.8 EARTHQUAKES

4.8.1 Historic Earthquake Events

This type of an event is a County-wide hazard. It is surprising to many Ohioans that the State has experienced more than 120 earthquakes since 1776, and that 14 of these events have caused minor to moderate damage. The largest historic earthquake in Ohio was centered in Shelby County in 1937. This event, estimated to have had a magnitude of 5.5 on the Richter scale, caused considerable damage in Anna and several other western Ohio communities, where at least 40 earthquakes have been felt since 1875. Northeastern Ohio, east of Cleveland, is the second most active area of the state. At least 20 earthquakes were recorded in the area since 1836, including a 5.0 magnitude event in 1986 that caused moderate damage. A broad area of Southern Ohio has experienced more than 30 earthquakes.

Clermont County could be impacted by two separate geologic faults that cause earthquakes. In general, earthquakes with epicenters in Ohio occur along pre-existing zones of weakness in Precambrian rocks. The Cincinnati Arch is one such zone and last contributed to an earthquake felt in Clermont County in 1875. This event caused damage in western Ohio, and affected a total area estimated at over 40,000 square miles. Walls were cracked and chimneys were toppled in Sidney and Urbana. The shock was felt sharply at Jeffersonville, Indiana. The affected area also included parts of Illinois, Indiana, Kentucky and Missouri. The Cincinnati Arch is not considered to be as big a hazard as the New Madrid Fault. A branch of the New Madrid fault line is called the Wabash Valley Seismic Zone. This zone has had multiple earthquakes, but the tectonics of this region is still unknown. Although the New Madrid Fault Line is outside the boundary of the State of Ohio, it still presents a risk. There has not been an earthquake of any significance since 1811 and 1812 but this event was felt strongly throughout Ohio and knocked down chimneys in Cincinnati. Figure 24 shows Ohio's historic Epicenters. Figure 25 shows the potential impacts from the New Madrid Fault Line.

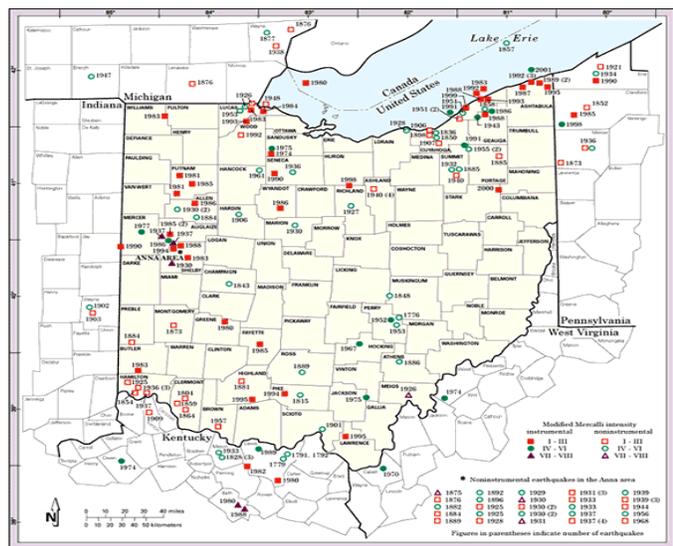
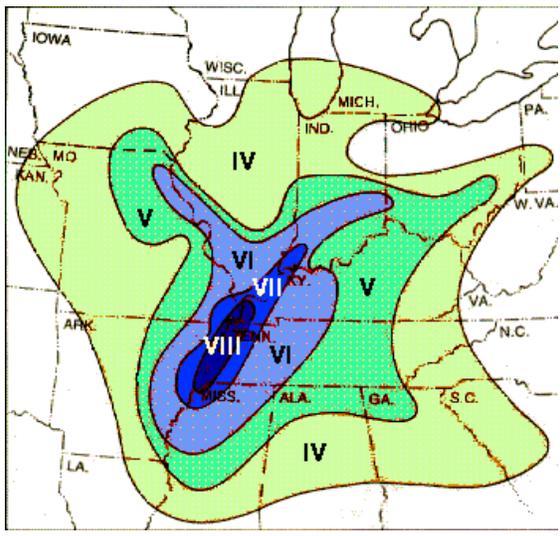


Figure 24. Ohio Historic Epicenters



**Figure 25. New Madrid Fault Impacts
Source: NOAA**

CLERMONT COUNTY ALL-HAZARDS MITIGATION PLAN

Records indicate that there have been three recorded earthquakes in Clermont County however, these earthquakes occurred in early and mid-1800s, shown in Figure 26. Table 28 lists these earthquakes; however the information on damages from these earthquakes is not available.

Figure 26. Earthquake Epicenters in/around Clermont County

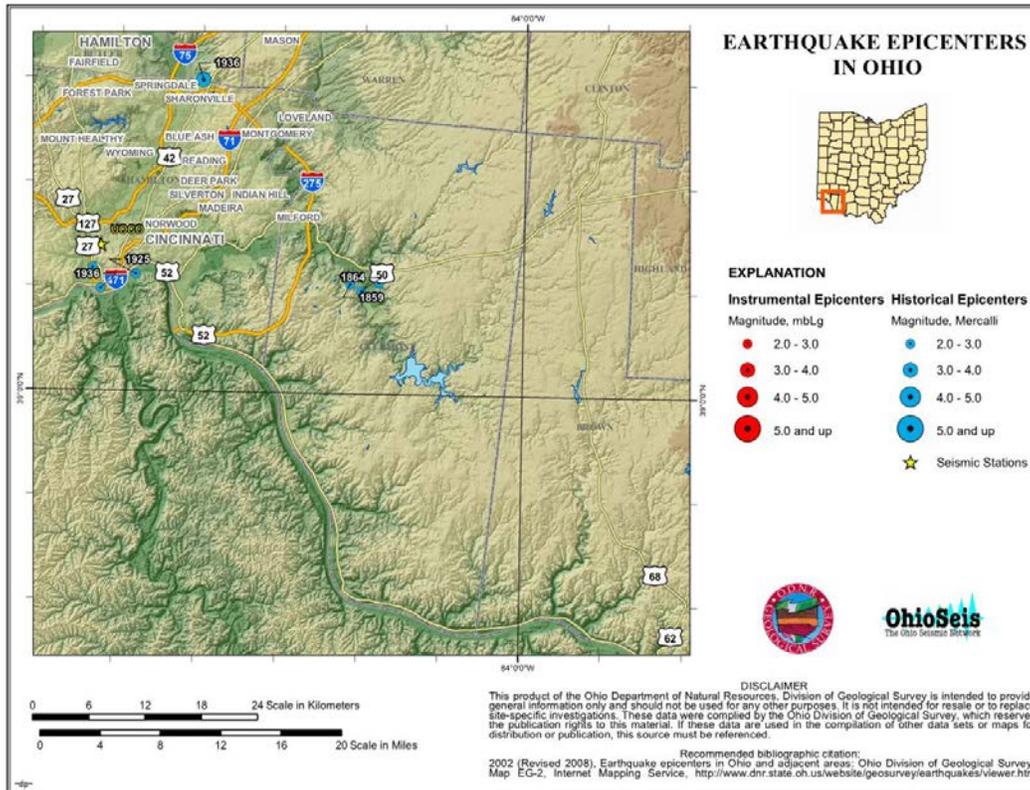


Table 28. Earthquake Epicenters in Clermont County

Year	Magnitude	Magnitude Type	Modified Mercalli Intensity
1804	2.9	2	III
1859	2.5	2	III
1864	2.5	2	III

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4.8.2 Monitoring of Earthquakes

The Ohio Department of Natural Resources (ODNR) Division of Geological Survey has established a 29 station cooperative network of seismograph stations throughout the State in order to continuously record earthquake activity.

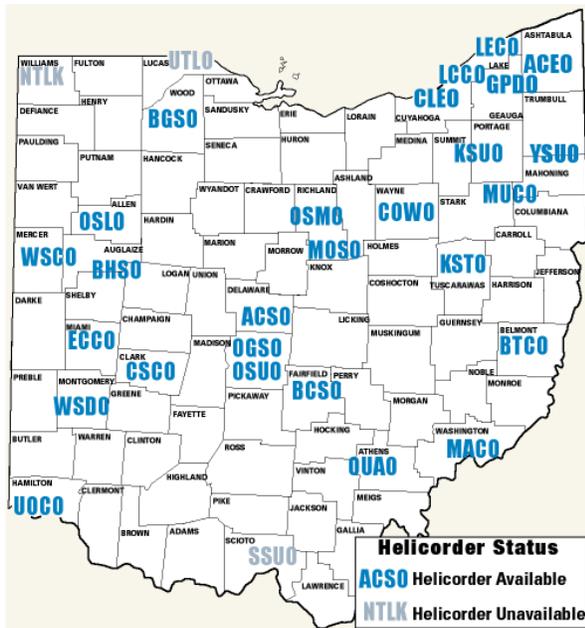
The 29 stations of the new seismograph network, which is called OhioSeis, are distributed across the state, but are concentrated in the most seismically active areas or in areas that provide optimal conditions for detecting and locating very small earthquakes that are below the threshold of human notice. These small micro earthquakes are important because they occur more frequently and help to identify the location of faults that may periodically produce larger, potentially damaging earthquakes.

The OhioSeis seismograph stations are located at colleges, universities and other institutions, employing new technology that not only makes them very accurate, but also relatively inexpensive and easy to operate and maintain. In contrast to the old technology, in which a pen made a line on a paper drum, the new system is entirely digital and uses a computer to continuously record and display data. Two other innovations have made the system unique. An inexpensive Global Positioning System (GPS) receiver is used to keep very precise time on the continuously recorded seismogram, and each station's computer is connected to the Internet for rapid data transfer.

Each OhioSeis station is a cooperative effort. Seismometers, the instrument that detects Earth's movements, and other seismic components were purchased by the Division of Geological Survey with funds provided by the Federal Emergency Management Agency (FEMA) through the Ohio Emergency Management Agency, as part of the National Earthquake Hazards Reduction Program. The computers and Internet connection were purchased and provided by the cooperating institutions.

The Division of Geological Survey is coordinating the seismic network and has established the Ohio Earthquake Information Center at the Horace R. Collins Laboratory at Alum Creek State Park, north of Columbus. This facility functions as a repository and laboratory for rock core and well cuttings, but has a specially constructed room for earthquake recording. The seismograph system allows for very rapid location of the epicenter and calculation of the magnitude of any earthquake in the State. The earthquake records, or seismograms, from at least three seismograph stations are needed to determine earthquake locations (epicenters). These records can be downloaded from the Internet at any station on the network, and location and magnitude can be determined. This system allows small earthquakes to be detected, ones that may not have been detected by distant, out-of-date seismograph stations.

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The OhioSeis network provides a completely new dimension of understanding about the pulse of the earth beneath Ohio. Although the seismograph network will not predict earthquakes or provide an alert prior to an event, it will provide insight into earthquake risk in the State so that intelligent decisions about building and facility design and construction, insurance coverage and other planning decisions can be made by individuals, business and industry, and governmental agencies.

The closest monitoring stations to Clermont County are located at the University of Cincinnati and at Wright State University near Dayton, shown in Figure 27. These locations are:

Figure 27. OhioSeis Monitoring Stations

Station UOCO

Location:
University of Cincinnati
Department of Geology
500 Geology/Physics Building
Cincinnati, OH 45221-0013

Lat: 39.140° North
Long: 84.522° West
Elev: 226 m

Station WSDO

Location:
Wright State University
Department of Geological Sciences
Brehm Lab
Dayton, OH 45435

Lat: 39.783° North
Long: 84.063° West
Elev: 289 m

FEMA uses “seismic design categories” (SDCs) to reflect the likelihood of experiencing earthquake shaking of various intensities. Building design and construction professionals use SDCs specified in building codes to determine the level of seismic resistance required for new buildings. The following table describes the SDCs and their impact on structures. Table 29 provides further information on these SDCs.

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ALL-HAZARDS MITIGATION PLAN**

Table 29. Seismic Design Category

SDC	Map Color	Earthquake Hazard	Potential Effects of Shaking*
A	White	Very small probability of experiencing damaging earthquake effects.	
B	Gray	Could experience shaking of moderate intensity.	Moderate shaking—Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
C	Yellow	Could experience strong shaking.	Strong shaking—Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built structures.
D ₀	Light orange	Could experience very strong shaking (the darker the color, the stronger the shaking).	Very strong shaking—Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures.
D ₁	Darker orange		
D ₂	Darkest orange		
E	Red	Near major active faults capable of producing the most intense shaking.	Strongest shaking—Damage considerable in specially designed structures; frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations. Shaking intense enough to completely destroy buildings.

Figure 28 shows the SDCs for Eastern United States and the faults that can impact Clermont County, New Madrid and South Carolina faults, source: NOAA. The New Madrid fault along the Mississippi River poses more of a threat to Clermont County. Seismologists utilize the Modified Mercalli Intensity Scale to describe the magnitude of an earthquake. A description of this scale is provided in Table 30.

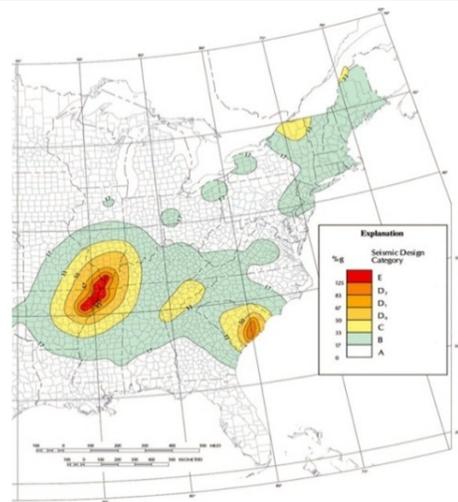


Figure 28. Faults Impacting Clermont

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Table 30. Seismic Magnitude / Intensity Scale

Scale		Description
<u>Magnitude</u>	<u>Mercalli</u>	
0-2.9	I	Detected only by sensitive instruments
	II	Felt only by a few persons at rest, especially on upper floors of buildings; delicately suspended objects may swing
	III	Felt noticeably indoors, especially on upper floors of buildings, but not always recognized as earthquake; standing autos may rock slightly; vibrations like a passing truck
2.9-4.1	IV	During the day, felt indoors by many, outdoors by few; at night, some awakened; dishes, windows, doors disturbed; walls make creaking sound; sensation like heavy truck hitting building; standing autos rock noticeably
	V	Felt by most people; some breakage of dishes, windows, and plaster; unstable objects overturned; disturbance of trees, poles, and other tall objects
4.1-5.4	VI	Felt by all, many frightened and run outdoors; some heavy furniture may move; falling plaster and chimneys, damage slight
	VII	Everyone runs outdoors; damage to buildings varies depending on quality of construction; noticed by people driving autos
5.4-7.3	VIII	Panel walls thrown out of frames; walls, monuments, chimneys fall; sand and mud ejected; drivers of autos disturbed
	IX	Buildings shifted off foundations, frame structures thrown out of plumb; ground cracked; underground pipes broken
	X	Most masonry and frame structures destroyed*; ground badly cracked, rails bent, landslides; sand and mud shift; water splashes over river banks
7.3 +	XI	Few structures remain standing; bridges destroyed; broad fissures in ground, pipes broken, landslides, rails bent
	XII	Damage total; waves seen on ground surface, lines of sight and level distorted, objects thrown up into the air

Source: ODNR

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4.8.3 Hazard Assessment and Vulnerability Analysis \ Potential Dollars Lost

As with flooding, the potential for dollars lost due to earthquakes was estimated using the HAZUS-MH software. An AAL simulation in HAZUS-MH calculates the expected damages to building stock, infrastructure and utilities for a series of 8 events with increasing return periods. These events include the 100-, 250-, 500-, 750-, 1000-, 1500-, 2000- and 2500-year return intervals. The results of each analysis is then transformed and combined to calculate a community's annual risk exposure or AAL.

The total estimated AAL for earthquakes is \$930,000. This result reflects the relatively low risk of earthquakes for the Clermont community; however, low risk should not be confused with “no” risk. Based on the simulations, a 500-year (0.02% annual chance) earthquake event in Clermont County could cause damages of approximately \$47 Million and a 2500-year event (0.0004% chance) approximately \$343 Million. The results of the AAL HAZUS analysis for earthquakes are included in Appendix F.

Table 31 displays the potential structure loss within Clermont County found in the HAZUS results in Appendix F.

Table 31. Potential Structure Loss (Source: Hazus)

Structure Type	Number	Loss Estimate (\$)
Residential	157	31,333,394.52
Non-Residential	61	14,681,565.99
Critical Facilities	0	0
Total	218	46,014,960.51

4.8.4 Current Development Trends

Since earthquakes are a non-site specific hazard, current development trends have no affect other than the potential increased population that would be susceptible to earthquakes within Clermont County. Historically, the County has a very low probability of earthquakes.

4.9 HAZARDOUS MATERIALS

4.9.1 Historic Hazardous Materials Incidents

According to records maintained by the Clermont EMA, Clermont County has had 398 recorded hazardous materials incidents from 1995 to 2012. These incidents are mainly the result of spilled fuels and oils. The fuel spills are mostly caused by motor vehicle accidents. The oil spills were mainly from defects/accidents to hydraulic/electronic equipment/facilities and motor vehicle accidents. Reports of illness and minor injuries were recorded with a small number of these spills, but no fatalities or critical injuries were associated with the hazardous material releases.

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Impacts were recorded to local streams with at least 3 fish kill incidents. No major property damages were recorded.

Clermont County has a Hazardous Materials Plan which outlines the mitigation, preparedness, response, and recovery actions to a hazardous materials spill or release. The plan was developed in accordance with Ohio Revised Code 3750.

4.9.2 Infrastructure and Critical Facilities

Clermont County has 84 hazardous materials facilities in the county. The Emergency Planning and Right to Know Act, or EPCRA, was passed as Title III of the Superfund Amendments and Reauthorization Act of 1986 (SARA), which requires a facility that processes, uses or stores extremely hazardous substances or hazardous substances as classified by the OSHA hazard communication standard. This is also codified in the Ohio Revised Code (ORC) Chapter 3750 and the Ohio Administrative Code Chapter 3750. Clermont County has 22 Extremely Hazardous Substance (EHS) Facilities, 54 Hazardous Substance (HS) Facilities, and 4 facilities that have both EHS and HS.

4.9.3 Hazard Assessment and Vulnerability Analysis \ Potential Dollars Lost

Due to the random, or unpredictable, nature of hazardous material accidents, specific probabilities of occurrence or return intervals were not developed for this hazard. A hazard vulnerability analysis is completed for each EHS facility as part of Clermont County's Hazardous Material Plan.

Additional vulnerability assessments have been prepared locally for drinking protection. There is currently a hazardous materials waste site in Jackson Township; known as CECOS. This facility is upstream of Harsha Lake. The facility has been closed for years and is monitored by the Ohio Environmental Protection Agency (OEPA) and Clermont County.

The vulnerability for hazardous material accidents usually does not affect structures as other hazards. However, a hazardous material accident can have significant impact on humans, animals, and transportation routes. This results in injuries, possibly fatalities, and blocked transportation routes. Structures located near EHS facilities and along major transportation corridors are considered at higher risk.

4.9.4 Future Development Trends

Future risks associated with hazardous materials relate to the proximity of human populations to transportation, storage and handling facilities. For mitigation of future development risks, the County could consider limitations on residential development adjacent to high risk EHS facilities.

Further, the County is coordinating with Regional partners and counties to develop a Commodity Flow Study. This study will help identify what types of hazardous materials are being transported through the County. It will help focus the County's attention on these types of

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materials and determine which communities are more vulnerable to Hazardous Materials Incidents.

The Hazardous Materials Plan was developed by the Local Emergency Planning Committee (LEPC) which is comprised of local, state, private and volunteer organizations that are tasked with hazardous materials mitigation, preparedness, response, and recovery responsibilities. The Plan is tested yearly through the annual LEPC exercise as required by ORC 3750. There is a 4 year exercise cycle. 2013 is the 4th year of the cycle and the LEPC held a full-scale exercise in May of 2013.

Additional ongoing mitigation efforts include; maintenance of a contract with Greater Cincinnati HazMat for emergency response and support during a hazardous materials incident as well as training emergency personnel in proper mitigation techniques, a Public Service Announcement (PSA) for home fuel oil safety developed in 2012, and development of well-head protection plans from local utilities.

4.10 DAM FAILURE

A dam/levee failure can result in the uncontrolled release of floodwaters downstream of a facility. The resulting flood wave can cause significant damage to buildings and infrastructure downstream. The unexpected nature of the flood wave also increases the likelihood of life loss in the impacted area due to reduced warning times.

4.10.1 Existing Dam Structures & Associated Impact

Clermont County has no record of historic dam failure incidents. Clermont County's primary concerns are Caesar Creek Lake Dam and William H. Harsha Dam. Both dams are considered high risk due to their size and potential impact downstream. The Ohio Department of Natural Resources (ODNR) has identified 119 dams within Clermont County. ODNR ranks these dams with respect to size and downstream impact. The rankings are represented by 4 classes 1 - 4; Class 1 is the highest risk, whereas Class 4 is the lowest risk. There are a total of 11 Class 1 dams in Clermont County.

The Caesar's Creek Lake Dam is located on the Little Miami River in Warren County. Even though the dam is not directly in Clermont County, a dam breach would impact the County. The dam is operated and maintained by the United States Army Corps of Engineers (USACE). A dam breach analysis was performed on the dam and provided to the Clermont County EMA office.

The William H. Harsha Dam is on the East Fork Little Miami River. This dam is operated and maintained by the USACE. A dam breach analysis was also performed on the dam and provided to the Clermont County EMA office.

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4.10.2 Infrastructure and Critical Facilities

Infrastructure directly downstream of the William H. Harsha Dam and Caesar Creek Dam could be impacted by a failure event. Particularly, bridges along the Little Miami and East Fork Little Miami Rivers would be directly impacted. Potential washout of piers and bridge footings could damage or destroy the bridges. Tables 32 and 33 provide a summary of facilities identified within the inundation zones of the two dams.

Communities likely impacted include Batavia Township, Village of Batavia, Stonelick Township, Union Township, Miami Township, City of Milford and the City of Loveland. The Village of Batavia, City of Loveland, and the City of Milford would face the most severe impacts.

Table 32. Critical Facilities Downstream of William H. Harsha Dam

Emergency	Police Stations	5
	Fire Stations	3
Education	Schools	2
Medical & Care Facilities	Daycares	3
Utilities	Cell Towers	3
	Water Treatment Plants	1
	Wastewater Treatment Plants / Facilities (Pump Stations)	8
Library / Community Facilities / Government		22
Hazardous Material Facilities		8
Total		55

Table 33. Critical Facilities Downstream of Caesar's Creek Dam

Emergency	Police Stations	2
	Fire Stations	1
Education	Schools	1
Utilities	Cell Towers	3
	Water Treatment Plants	2
	Wastewater Treatment Plants / Facilities (Pump Stations)	4
Library / Community Facilities / Government		1
Hazardous Material Facilities		2
Total		16

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4.10.3 Hazard Assessment and Vulnerability Analysis \ Potential Dollars Lost

Using the 2012 U.S. Census, there are approximately 1800 people located within the potential inundation zone of Caesar’s Creek Lake Dam. The properties at-risk include 776 buildings with a total value of \$87,571,690.

Downstream of the William H. Harsha Lake Dam there are approximately 3,300 people located within the potential inundation. The properties at-risk include 1,318 buildings with a total value of \$195,619,820.

Table 34 displays the potential structure loss within Clermont County within the inundation zones for each dam.

Table 34. Potential Structure Loss (Source: Clermont Parcels / Structure Inventory)

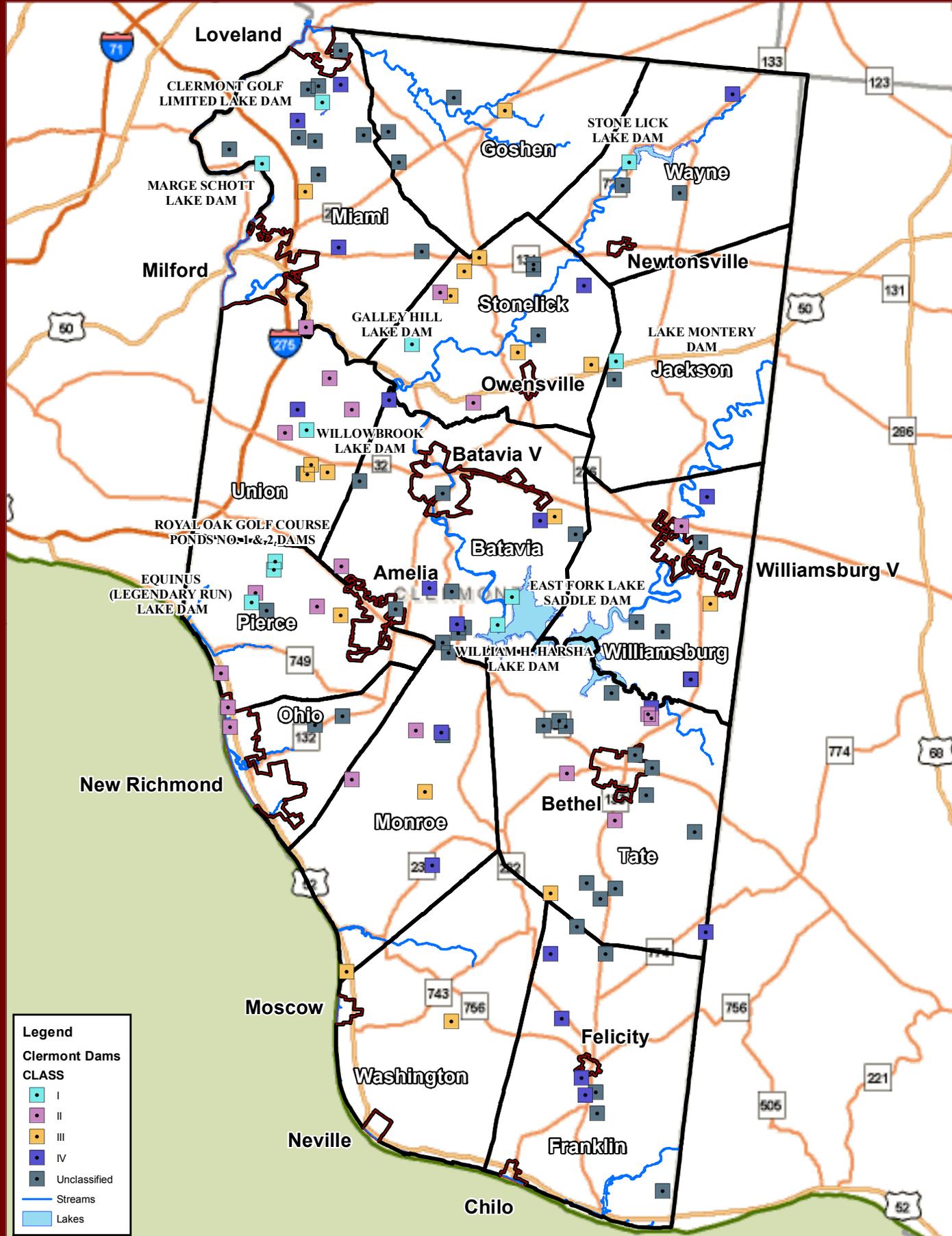
Structure Type	Number	Loss Estimate (\$)
Caesar’s Creek Dam		
Residential	299	23,040,280.00
Non-Residential	461	47,823,350.00
Critical Facilities	16	16,708,060.00
Total	776	87,571,690.00
William Harsha Dam		
Residential	800	58,117,100.00
Non-Residential	463	81,579,050.00
Critical Facilities	55	55,923,670.00
Total	1318	195,619,820.00

4.10.4 Current Development Trends

The risks associated with dam failure are directly related to the population and infrastructure located in the downstream breach path. Development should be limited in these potential impact areas. Infrastructure improvements should consider potential impacts.

Clermont County EMA has Emergency Action Plans for both Caesar Creek and William H. Harsha Dams provided by the USACE.

The remaining dams in Clermont County should be evaluated with respect to the impacts downstream and development limited in potential impact zones. Figure 29 shows all ODNR classified dams in Clermont County.



Legend

Clermont Dams

CLASS

- I
- II
- III
- IV
- Unclassified

— Streams

— Lakes



Geographic Information Systems



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Figure 29
Clermont County Dams

4.11 UTILITY/POWER FAILURE

4.11.1 Historic Utility Failures

Clermont County is concerned with non-natural hazard electrical blackouts. These are primarily caused by system overload or lack of updated infrastructure. Power failures are generally caused by natural events, such as severe storms, ice storms, tornadoes, and high winds. These power failures are common and are not easily mitigated due to the random nature of storms. However, the infrastructure can be updated to reduce the amount and frequency of these power outages.

Historical non-natural power outages have occurred in the Eastern U.S. There are 3 notable blackouts that caused power loss. These were all considered Northeast Blackouts.

The first was in 1965 which affected multiple states and Canada. The following states were affected; Connecticut, Massachusetts, New Hampshire, New Jersey, New York, and Rhode Island. The total number of people without power was estimated around 30,000,000 (Source: Canadian Broadcast Corporation). The cause of the failure was human error, due to an incorrectly set protective relay at the Niagara Falls Generating Station. The station shut-down which then in turn sent the extra power to other sub-stations and plants, which overloaded the system. This blackout did not directly impact Ohio; however it shows how human error can impact any system.

The second was in 2003 which affected multiple states and Canada. At the time, this was the most widespread blackout in history. The following states were affected Connecticut, Massachusetts, Michigan, New Jersey, New York, Ohio (Cleveland area), and Pennsylvania. The total number of people affected by the power outage in the Cleveland area was around 2.8 million (U.S. Census). This blackout was caused by the deteriorating system and transmission lines as well as mismanaged computer systems. Lines could not support the overload, which caused a series of chain reactions to other systems (Source: U.S. Department of Energy).

The third was in 2009 which affected multiple states and Canada. This blackout affected 50 million people in Michigan, New York, Ohio, and Ottawa and Toronto, Canada. The Cleveland area lost power to their water system which stopped pumping water to 1.5 million people (Source: CBS News). The main cause was a lightning strike which struck a power plant that set off outages over a 9,300 square mile area.

4.11.2 Infrastructure and Critical Facilities

Any Critical Facilities requiring power could be affected by a widespread blackout. The important issue to focus on would be, "How does a community function during an outage and where does that community need to focus its resources?" Most government and utility facilities have some sort of backup power. The question is how long can these facilities stay on backup power and how does each community notify and assist its residents.

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4.11.3 Hazard Assessment and Vulnerability Analysis \ Potential Dollars Lost

The economic impact of a power outage is unknown and can have many variables. The Northeast Blackouts showed how the system has flaws and is degrading. The difficult situation usually deals with funds to update the system. The loss of power can disrupt everything from food in a refrigerator to lost wages and income due to the power outage. These economic impacts not only are local, but also regional and national.

The vulnerability for utility /power loss usually does not affect structures as other natural hazards. However, a sustained utility outage has a significant effect on impact on humans that could result in injuries and possible fatalities.

4.11.4 Current Development Trends

Communities need to work together with the local power/utility companies during a power outage. Critical Facilities requiring backup power should have generators installed with enough fuel reserves to last during an extended period of power loss.

The Core Team has identified the need for a Power Restoration Priority Plan setup prior to any power outage. This plan should coordinate with all critical facilities the appropriate reporting mechanism during a wide spread power outage. Specifically, critical care facilities should be included with the plan (e.g. Nursing Homes, Hospitals, etc.). The Power Restoration Priority Plan will help identify which facilities need assistance during the emergency.

Another important mitigation effort would be identifying the need for backup generators at facilities. These generators would need enough fuel reserves to last the facility during an extended emergency. The Power Restoration Priority Plan will also identify what resources will be used to help re-fuel the generators.

4.12 INVASIVE SPECIES

4.12.1 Historic Invasive Species Events

This type of an event is a County-wide hazard, however Invasive Species incidents are usually in a specific area but have the potential of spreading. Ohio and Clermont County have a variety of Invasive Species that can impact the Agricultural and Tree Industries. Invasive animals and plants are currently impacting Clermont County. Without natural predators or controls, invasive non-native plants are able to spread quickly and force out native plants. In Ohio, several non-native plants are invading woodlands and displacing native spring wildflowers. Other non-native plants impact wetlands by creating monocultures. Native plant diversity is very important for wildlife habitat. Many native animals depend upon a variety of native plants for food and cover. Table 35 lists Ohio's top ten invasive plants (Source: OEMA).

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Table 35. Ohio's Top Ten Invasive Plants

Japanese Honeysuckle
Japanese Knotweed
Autumn Olive
Buckthorns
Purple Loosestrife
Common Reed
Reed Canary Grass
Garlic Mustard
Multiflora Rose
Bush Honeysuckles

The Emerald Ash Borer and the Asian Longhorned Beetle (ALB), both insects, have infested trees within Clermont County.

The Emerald Ash Borer (EAB) is a non-native phloem-feeding pest of the North American ash trees. This beetle was first found in 2002 in Michigan and Ontario, Canada. The original source is thought to have been wood packing material originating from Asia. The EAB aggressively kills healthy and stressed trees. The EAB is currently impacting the North American Ash tree, which has already cost millions of dollars in attempts to identify and isolate infected trees. The un-captured cost to treat Ash trees in Ohio will likely reach into the billions, as urban areas combat the insect (Source: Enhanced State of Ohio Hazard Mitigation Plan). Figure 30 shows the infestation of the insect in Clermont County in 2012. The spread of the Emerald Ash Borer is caused mainly by the transportation of infected firewood across counties. The State of Ohio has tried to quarantine the EAB by making it illegal to transport firewood across county boundaries.

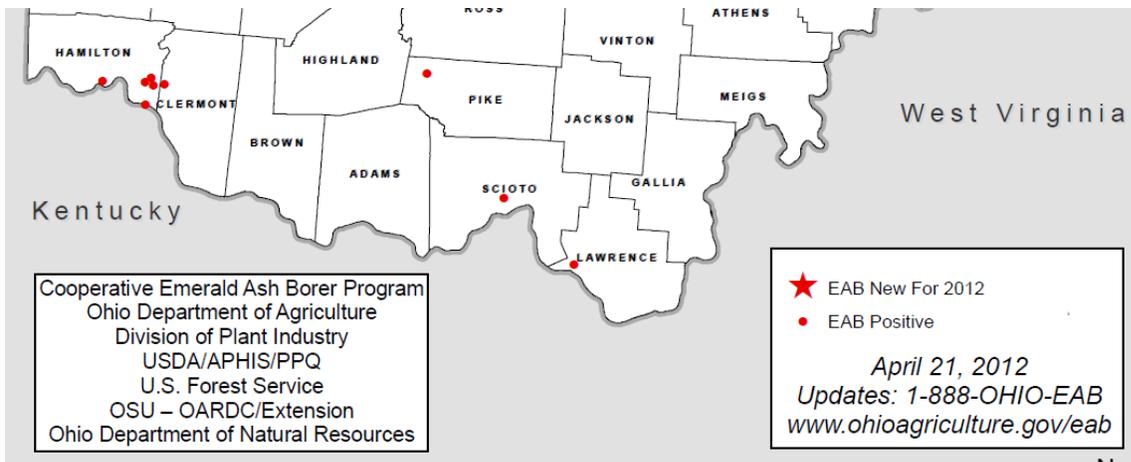


Figure 30. Emerald Ash Borer Locations

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The ALB (Figure 31) is a foreign wood-boring beetle that threatens a wide variety of hardwood trees in North America. The ALB was first discovered in the United States in August 1996 in New York City. A separate infestation was discovered in Chicago, Illinois in 1998. The largest infestation was discovered in Massachusetts in 2008. The ALB was found in Clermont County in Tate Township in June 2011. A quarantined area was set up on July 13, 2011; to survey and assess the impact of the ALB. The areas affected by the quarantine were within Tate and Monroe Townships, as well as East Fork State Park. The Monroe Township area was added to the quarantine, as a result of movement of infested firewood from Tate Township. The quarantined area spread into Stonelick Township & Batavia Township in 2012. As of Sept. 4, 2012, 170,575 trees were surveyed by the USDA and 8,716 infested trees were removed. The infestation in Clermont County is the second largest in the U.S. to date. The Animal and Plant Health Inspection Service (APHIS) is a program by the USDA which identifies and surveys the quarantined area. A Cooperative Eradication Program was established within Clermont County during an Environmental Assessment in May 2012. Figure 32 shows the quarantined area.

Figure 31. Asian Longhorned Beetle



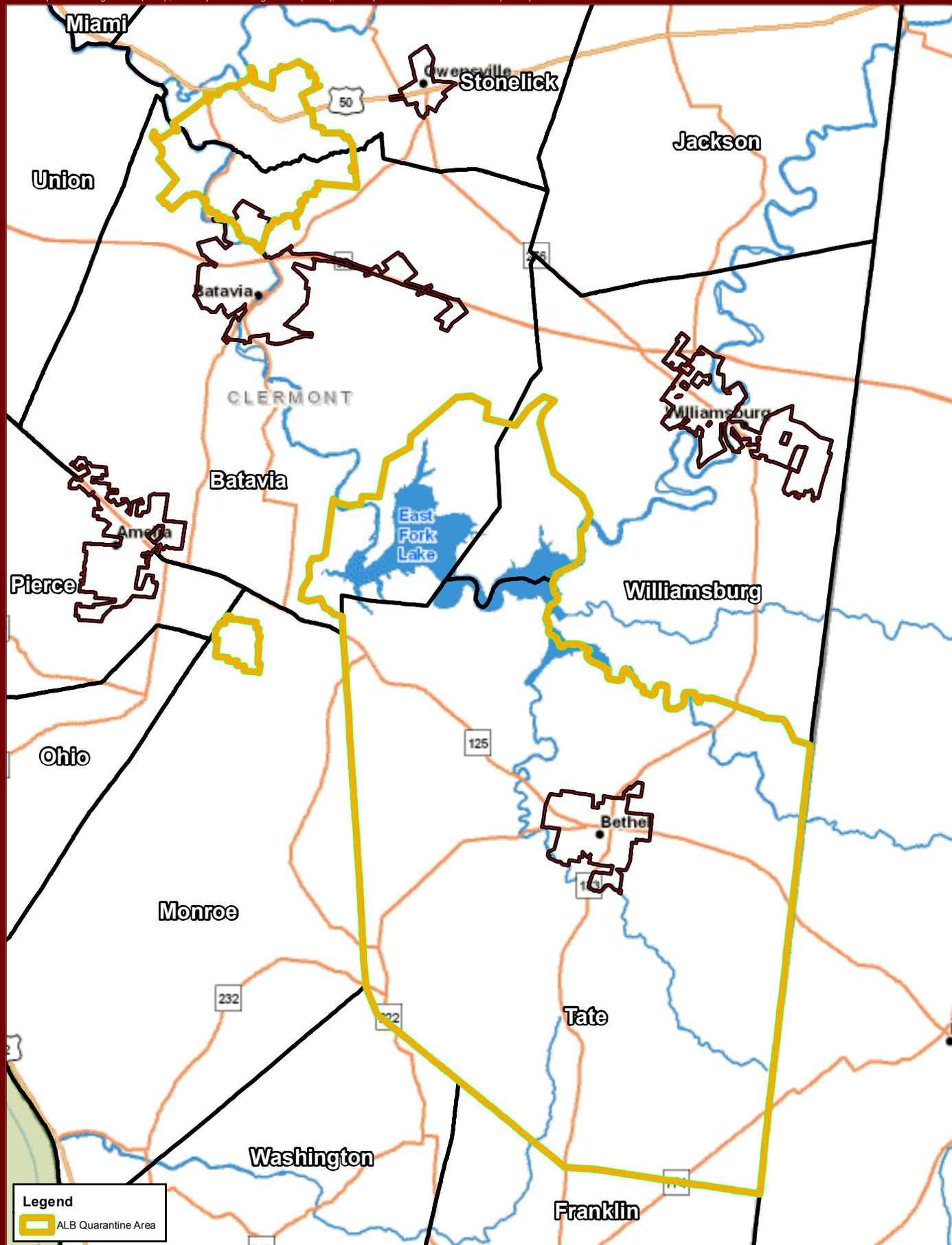
4.12.2 Hazard Assessment and Vulnerability Analysis \ Potential Dollars Lost

The EAB and ALB pose a threat to Ohio's hardwood forests. Ohio currently has \$2.5 billion in standing timber and \$5 billion in the tree nursery industry. The USDA Forest Service cites more than \$7 billion of board feet of maple wood currently standing in Ohio (Source: Ohio Department of Agriculture). In August of 2012 the USDA announced the availability of \$14.8 million in funding to prevent the spread of the ALB in Ohio. \$2 million of that funding will go toward Clermont County.

The vulnerability from Invasive Species does not affect structures as other natural hazards. However, and accumulation of Invasive Species has a significant impact on the timber industry, native plants and animals, and crops. This results in economic loss, reduced diversification of native plants and animals and potential for food shortages.

4.12.3 Current Development Trends

Parts of Clermont County are currently under quarantine due to the ALB infestation. The county will be working with the USDA and APHIS to help control the spread of ALB and EAB.



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Figure 32
ALB Quarantine 2012

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Clermont County All-Hazards Mitigation Plan

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4.13 HAZARD PRIORITIZATION

The prioritization/rankings were developed from each hazard analysis. These rankings were developed from three criteria: Probability, Vulnerability, and Severity of Impact. Table 36 provides a description of the three criteria. Once the initial prioritization/rankings were created for each hazard, the Core Planning Team provided these rankings to the Stakeholders and communities for review. Each community validated the prioritization and provided feedback. The county-wide prioritization can be found in Table 37. The community prioritization can be found in Table 38. The higher the total score indicates a higher importance of that hazard.

Table 36. Probability, Vulnerability and Severity of Impact

Probability (frequency)	
Low (1)	<1% - 20% chance of occurrence per year
Medium (2)	21% - 100% chance of occurrence per year
High (3)	Excellent chance of more than one occurrence per year
Vulnerability (percentage of people)	
Low (1)	Less than 10% of the total population of the jurisdiction
Medium (2)	10% to 25% of the total population of the jurisdiction
High (3)	More than 25% of the total population of the jurisdiction
Severity of Impact (injuries, fatalities, personal property & infrastructure)	
Low (1)	Minor injuries (under 50) & property damage (under \$1,000,000), or less than 24 hour shutdown of essential facilities
Medium (2)	Serious injury (more than 50), major property damage (structural stability) (\$1,000,001 to \$15,000,000), or 24 to 72 hour shutdown of essential facilities
High (3)	Multiple deaths (more than 5), property destroyed or damaged beyond repair (more than \$15,000,000), or more than 3 days of shutdown for essential facilities

Table 37. County-Wide Prioritization

Hazard	Average Annualized Loss (\$)	Probability	Vulnerability	Severity of Impact	Total
Flooding	26,300,000	3	2	2	7
Severe Storm	118,008	3	2	1	6
Severe Winter Storm	Unknown	2	2	1	5
Tornadoes	190,883	2	1	2	5
Landslides	1,166,732	2	1	2	5
Hazard Material Accidents	Unknown	2	1	2	5
Dam/Levee Failure	Unknown	1	1	3	5
Invasive Species	Unknown	2	1	2	5
Utility Failure	Unknown	1	2	2	5
Drought	304,405	1	2	1	4
Earthquakes	930,000	1	2	1	4

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Table 38. Each Community's Hazard Prioritization/Ranking

Community	Severe Storm	Severe Winter Storm	Flooding	Tornadoes	Landslides	Drought*	Earthquakes	Hazard Material Accidents	Dam/Levee Failure	Invasive Species	Utility Failure
Amelia, Village of	7	6	3	6	4	3	3	4	3	4	4
Batavia Township	6	5	6	5	4	6	4	6	5	5	4
Batavia, Village of	7	6	4	6	5	3	3	4	6	4	4
Bethel, Village of	7	6	3	6	3	3	3	3	3	4	4
Chilo, Village of	7	6	4	6	4	3	3	4	3	4	4
Felicity, Village of	7	6	3	6	3	3	3	3	3	4	4
Franklin Township	6	5	6	5	4	5	4	3	3	5	4
Goshen Township	6	5	6	5	3	5	4	4	3	5	4
Jackson Township	6	5	6	5	3	6	4	5	3	5	4
Loveland, City of	7	5	4	6	5	3	3	3	4	4	4
Miami Township	6	6	6	6	6	3	5	6	5	5	5
Milford, City of	7	6	4	6	5	3	3	4	6	4	4
Monroe Township	6	5	6	5	4	5	4	5	3	5	4
Moscow, Village of	7	6	6	6	4	3	3	5	3	4	5
Neville, Village of	7	6	4	6	4	3	3	4	3	4	4
New Richmond, Village of	7	6	4	6	6	3	3	5	3	4	4
Newtonsville, Village of	7	6	3	6	3	3	3	3	3	4	4
Ohio Township	6	5	6	5	4	3	4	4	3	5	4
Owensville, Village of	7	6	3	6	3	3	3	4	3	4	4
Pierce Township	6	5	6	5	5	3	4	5	4	5	4
Stonelick Township	6	5	6	5	3	5	4	3	4	5	4
Tate Township	6	5	6	5	3	5	4	3	3	5	4
Union Township	6	6	6	6	5	3	5	6	5	5	5
Washington Township	6	5	6	5	4	5	4	5	3	5	4
Wayne Township	6	5	6	5	3	5	4	3	4	5	4
Williamsburg Township	6	5	6	5	4	5	4	4	3	5	4
Williamsburg, Village of	7	6	4	6	5	3	3	4	3	4	4

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5.0 Mitigation Actions

5.1 PROGRESS SINCE LAST UPDATE

The 2006 All Natural Hazard Mitigation Plan identified six natural hazards: severe storms, flooding, tornadoes, landslides, drought, and earthquakes. The highest rated mitigation actions and their current status has been updated in Table 39. This plan update validates the priorities of the 2006 plan. The proposed priorities shown in this update are located in section 5.2.

Table 39. All Natural Hazard Mitigation Plan 2006 Actions

Mitigation Actions	Hazard Prioritization	Implementation Schedule (Year)	Funding	Responsible Entity	Mitigation Action Status
Severe Storms					
Use educational outreach (PSAs) to teach residents the importance of ditch maintenance and piping. Coordinate outreach with SWCD. Create "hotspot" database.	1	January-05	Assessment and Code Fees for the SWCD - TBD	Building Dept, Storm Water Conservation District (SWCD) & Engineers Office	Deleted
Develop a memorandum of understanding between communities to plan for severe storm recovery.	1	March-05	TBD	Prosecutor, EMA Director & SWCD	Ongoing
Develop several condition levels for severe storm events. Endorse the existing operating conditions (1-5).	1	March-05	County Staff Hours Only	DPSS / EMA	Deferred
Flooding					
Establish a storm water master plan and storm water utility.	2	January-05	Fee Assessment	Building Dept, SWCD, Engineers Office & DPSS	Deleted. Feasibility study conducted from 2005-2007. Draft General Plan of Drainage developed but not adopted. Establishment of storm water utility tabled by Board of County Commissioners in 2007.
Widen distribution of video for school age children and develop one for adults. (high hazard areas)	2	March-05	Unidentified Grants	DPSS / EMA	Completed. OPI created a video on the hazards from the 1937 Flood.
Widen distribution of video for school age children and develop one for adults. (youth in high hazard areas) Seek funding to build water facilities in parks (include water safety).	2	March-05	Unidentified Grants	Building Dept, SWCD & DPSS / EMA	Deleted
Evaluate locations for signage at repeated high water locations.	2	TBD	TBD	GIS & DPSS	Complete. The Engineer's Office has identified High Water Areas and created signage for these locations.

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Table 39. All Natural Hazard Mitigation Plan 2006 Actions (continued)

Mitigation Actions	Hazard Prioritization	Implementation Schedule (Year)	Funding	Responsible Entity	Mitigation Action Status
Tornadoes					
Create innovative PSAs on the use of weather radios and seek funding to place weather radios in all critical facilities.	3	June-07	Unidentified Grants	DPSS / EMA	Complete. Weather radios were distributed area to schools.
Seek funding for a countywide inter-operable warning system.	3	June-09	TBD	Office of Technology, Communications & Security	Ongoing. Components have been added; Mass Notification System – established. Not interoperable.
Seek funding to install multiuse shelters in parks. Work with mobile home parks to install tornado shelters.	3	Ongoing	CDBG Community Development Block Grant	State, County & Township Parks	Ongoing. EMA put up tornado shelter signs in existing Parks (Chilo and Pattinson) safe locations.
Landslides					
Work with the Planning Department to develop standards and regulations for development in landslide prone areas. (vegetation and hill cutting)	4	January-09	TBD	SWCD	Ongoing.
Work with the Planning Department to develop standards and regulations for development in landslide prone areas. (federal and state agencies)	4	January-09	TBD	SWCD	Ongoing.
Work with the Engineer's office to create a memorandum of understanding with other agencies.	4	January-08	TBD	DPSS / EMA & SWCD	Ongoing.
Drought					
Coordinate with the Fire Service Alliance for outreach concerning droughts and wildfires.	5	June-06	TBD	DPSS / EMA & Fire Chief's Alliance	Ongoing.
Develop a PSA to define the use of dry hydrants (work with SWCD).	5	June-07	Unidentified Grants	Local Fire Departments & OSU Extension Office of Soil & Water Conservation	Complete. Dry hydrant educational materials developed by Clermont SWCD and available at www.clermontswcd.org/dryhydrant.aspx
Earthquakes					
Develop a PSA concerning the effects of earthquakes in Clermont County; target school age children.	6	June-06	Unidentified Grants	Office of Public Information & DPSS / EMA	Deleted.

**CLERMONT COUNTY
ALL-HAZARDS MITIGATION PLAN**

5.2 GENERAL MITIGATION GOALS

The hazards identified within this plan require a list of general mitigation goals to help clarify hazard mitigation within Clermont County. The items listed below are the primary goals of this mitigation plan:

- Reduce loss of life and injury from hazard events.
- Minimize damage to personal and public property.
- Provide public awareness of potential hazards and mitigation efforts.
- Update critical facility locations and identify new critical facilities to prevent disruption during and after an event.
- Identify areas of greatest impact from hazards, i.e. High-water marks and Repetitive Loss.
- Coordinate Mitigation efforts through communication and collaboration between Jurisdictions and all Departments.
- Develop plans/programs to identify and reduce a hazard's risk, i.e. Emergency Action Plans or Power Restoration Plans.

5.3 PROPOSED MITIGATION ACTIONS

For the eleven (11) hazards identified by the Core Team as being the most important, multiple mitigation actions were identified. The group developed a rating system and matrix to prioritize the mitigation actions. The matrix has eight (8) criteria to help rank each action. The criteria can be seen below.

- Cost Effective? *(Is this mitigation alternative cost effective from your perspective?)*
- Technically Feasible? *(Can it be done?)*
- Environmentally Sound? *(Will this hurt the environment?)*
- Socially Equitable? *(The Mitigation Alternative will not discriminate against any social class?)*
- Meets Local Regulations? *(From your local community?)*
- Activities Reduce Risk? *(Does this activity meet our mission?)*
- Socially Acceptable? *(Will the public like the idea?)*
- Funding Available? *(Is there funding available to implement this mitigation alternative?)*

The appropriate community or organization rated each of these action items based on a scale of one (1) to three (3), with three (3) representing the most important for a given criteria using the decision matrix described in previous sections. During the fourth Core Group meeting, actions were identified and discussed. The group came to consensus on which hazards presented the greatest threat to the county and which subsequent actions would be most effective and practical for the county to undertake in mitigating those hazards. The highest rated actions the

**CLERMONT COUNTY
ALL-HAZARDS MITIGATION PLAN**

county identified for this plan period are listed below. Prior to undertaking the projects below, the project will be analyzed using FEMA’s cost-benefit module or other forms of cost-benefit review where appropriate and feasible to ensure the projects which provide the greatest cost to benefit ratio are prioritized.

The county-wide actions matrix can be found in Appendix D of this plan. The community specific action matrices can be found in Appendix E of this plan.

5.3.1 Severe Storms

The three highest rated activities for severe storm hazards are listed below.

Highest Rated Mitigation Alternatives for Severe Storms
Review potential uses of social media for education/awareness.
Identify the capabilities of back-up generators and develop recommendations for fuel prioritization.
Develop a tiered list of shelters and building code compliant Red Cross Shelters. For example, locations that can be short-term reception sites; information centers where people can get hot showers, meals, charge cell phones, etc.; temporary storm shelters, short-term overnight shelters; and long-term shelters.

5.3.2 Winter Storms

The three highest rated activities for winter storm hazards are listed below.

Highest Rated Mitigation Alternatives for Winter Storms
Review potential uses of social media for education/awareness.
Identify the capabilities of back-up generators and develop recommendations for fuel prioritization.
Develop a tiered list of shelters and building code compliant Red Cross Shelters. For example, locations that can be short-term reception sites; information centers where people can get hot showers, meals, charge cell phones, etc.; temporary storm shelters, short-term overnight shelters; and long-term shelters.

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ALL-HAZARDS MITIGATION PLAN**

5.3.3 Flooding

The three highest rated activities for flooding hazards are listed below.

Highest Rated Mitigation Alternatives for Flooding
Evaluate locations for signage at repeated high water locations.
Public Outreach – Continue to identify potential flooding and inform citizens through social media and other public notification systems.
Investigate potential funding for acquisition or flood proofing of Repetitive Loss Structures

5.3.4 Tornadoes

The two highest rated activities for tornado hazards are listed below.

Highest Rated Mitigation Alternatives for Tornadoes
Replace/Install tornado/emergency sirens in the City of Milford, Pierce Township, and Washington Township (The cities/villages and townships purchase/maintain sirens.).
Identify temporary/long-term shelters (see Winter Storms).

5.3.5 Landslides

The three highest rated activities for landslide hazards are listed below.

Highest Rated Mitigation Alternatives for Landslides
Work with the Planning Department to develop standards and regulations for development in landslide prone areas. (vegetation and hill cutting)
Work with the Planning Department to develop standards and regulations for development in landslide prone areas. (federal and state agencies)
Work with the Engineer's office to create a memorandum of understanding with other Public Works Agencies / Road Departments. This action can be applied to all other hazards.

**CLERMONT COUNTY
ALL-HAZARDS MITIGATION PLAN**

5.3.6 Droughts

The three highest rated activities for drought hazards are listed below.

Highest Rated Mitigation Alternatives for Droughts
Coordinate with the Fire Service Alliance for outreach concerning droughts and wildfires.
Develop a map of sensitive populations.
Develop a PSA to define the use of dry hydrants (work with SWCD).

5.3.7 Earthquakes

The two highest rated activities for earthquake hazards are listed below.

Highest Rated Mitigation Alternative for Earthquakes
Provide Education/Information on General Preparedness before, during, and after an Earthquake using Social Media.
Develop a mechanism to rapidly communicate with the public.

5.3.8 Hazardous Material Accidents

The two highest rated activities for hazardous material hazards are listed below.

Highest Rated Mitigation Alternative for Hazardous Materials
A Commodity Flow Study will be performed to identify the movement of hazardous materials transported through the County. Update Hazardous Materials plan based on Commodity Flow Study Information
Provide public awareness on the disposal/storage of batteries within a community and the county.
Perform annual LEPC exercises.

**CLERMONT COUNTY
ALL-HAZARDS MITIGATION PLAN**

5.3.9 Dam Failure

The two highest rated activities for dam failure hazards are listed below.

Highest Rated Mitigation Alternative for Dam Failure
Provide public outreach through all forms of media on dam safety.
Encourage the development of Emergency Action Plans for each dam.

5.3.10 Utility Failure

The two highest rated activities for utility failure hazards are listed below.

Highest Rated Mitigation Alternative for Utility/Power Outage
Create/Maintain a Power Restoration Priority Plan for the county. This Plan should coordinate with all Critical Facilities the appropriate reporting mechanism during wide spread power outages. Specifically, Critical Care Facilities need to be included within the Plan (e.g. Nursing Homes, Hospitals, etc.).
Tree Trimming of Township Roads.

5.3.11 Invasive Species

The highest rated activity for invasive species hazards is listed below.

Highest Rated Mitigation Alternative for Invasive Species
Public outreach / education on preventing the spread of invasive species.

**CLERMONT COUNTY
ALL-HAZARDS MITIGATION PLAN**

5.4 ACTION ITEMS SCHEDULE

An Action Plan for Clermont County and Communities was compiled with the items listed above. The Action Plan provides a timeline estimate of when each item will be undertaken, an estimated cost for each item, as well as a responsible individual/agency who will implement the item. The Action Plan will be utilized by County and Community officials and staff to act as a guidance document for the implementation of the action items. Table 40 lists all mitigation actions identified by the communities. The communities of Batavia, Bethel, Chilo, Felicity, Loveland, Neville, and Newtonsville will follow the County-wide actions listed in Appendix E. New Richmond currently has their own active Hazard Mitigation Plan and is not included in this plan update.

Table 40. Action Schedule

Mitigation Actions	Hazard Prioritization	Implementation Schedule (Year)	Funding	Responsible Entity	Community
All Hazards					
Installation of Emergency Generators for the PUB WTP and PUB Well Fields.	1	12/31/2019	Water Revenue Funds, Any Available Grant or Loan.	Clermont County Water Resources Department	Clermont County Water Resources Department
Replace backup generator for the Goshen Township Fire Station. This facility is a temporary storm shelter for residents and the community EOC.	1	1/1/2015 – 12/31/2016	Department fund and general fund	Goshen Twp. Fire Department – Chief Pegram	Goshen Township
Developed Township Continuity of Operations Plan 2011; now in training & exercise phase.	1	1/1/2014 – 12/31/2019	Twp. general fund	Miami Twp. Fire/EMS Chief Jim Whitworth and Police Chief Steve Bailey	Miami Township
Preparedness Month activities 2013.	3	12/31/2013	Department fund and general fund	Miami Twp. Fire/EMS – Chief Jim Whitworth	Miami Township
Preparedness Month activities 2014.	3	12/31/2014	Department fund, general fund, and DHS/FEMA	Miami Twp. Fire/EMS – Chief Jim Whitworth	Miami Township
Periodic articles in Township Newsletter and local weekly newspaper on fire/life safety and preparedness.	3	1/1/2014 – 12/31/2019	Department fund	Miami Twp. Fire/EMS – Chief Jim Whitworth	Miami Township
Review Emergency Action Plan in 2013 and update where necessary.	1	12/31/2015	General Fund	Moscow Planning Commission	Moscow, Village of
Tornado/Storm shelters.	1	1/1/2015 – 12/31/2016	Grants, Fire Fund, Private Funds etc.	PTFD	Pierce Township
Currently using County EOP. We are in process of developing our Township specific EOP.	2	12/31/2019	Grants, Twp. Funds, etc.	Clermont County. EMA and PTFD	Pierce Township

**CLERMONT COUNTY
ALL-HAZARDS MITIGATION PLAN**

Table 40. Action Schedule (continued)

Mitigation Actions	Hazard Prioritization	Implementation Schedule (Year)	Funding	Responsible Entity	Community
All Hazards					
Public Education through whatever medium(s) on how to prepare and protect their interests (web, seminars).	3	1/1/2014 – 12/31/2016	Grants, Twp. Funds etc.	Each Twp. Dept. to prepare and post their own programs and data	Pierce Township
Repair/Replacement/Upgrade of All-Hazard/Tornado Sirens in Union Township on an as-needed basis.	1	12/31/2019	Grants, & Local	Union Township	Union Township
Green Address Signs for all residential homes.	2	12/31/2015	Fire Fund	Washington Twp. - Arthur Owens	Washington Township
Purchase ATV for Disaster Assistance.	3	12/31/2013	Fire Fund	Washington Twp. - Arthur Owens	Washington Township
Expanding Rope & Water Rescue Capabilities.	3	6/1/2014	Fire Fund	Washington Twp. - Arthur Owens	Washington Township
MOU: Task Force One to House Rescue Boat for Region.	3	1/1/2014 – 12/31/2019	Fire Fund	Washington Twp. - Arthur Owens	Washington Township
Fire & EMS Prevention Program.	4	1/1/2014 – 12/31/2019	Fire Dept.	Washington Twp. - Arthur Owens	Washington Township
Newsletter Mailed 2 times a year to all residents.	4	1/1/2014 – 12/31/2019	Gen. Fund	Washington Twp. - Robin Brewer	Washington Township
Township & Fire Department Website.	4	1/1/2014 – 12/31/2019	Gen. Fund, Fire Fund	Washington Twp. - Robin Brewer	Washington Township
Policy for Emergency Shelter and Assistance during a disaster - Coordination with Township and School District.	1	12/31/2019	General Fund	Williamsburg Twp., Village of Williamsburg Mayor - Mary Ann Lefker, Safety Committee	Williamsburg, Village of
Flooding					
Storm water management system improvements/ maintenance	1	1/1/2014 – 12/31/2019	Twp. Fund	Miami Twp Service Dept. Director Mike Mantel	Miami Township
Water Management and Sediment Controls Regulations.	4	1/1/2014 – 12/31/2019	General Fund	Milford's City Engineer - Bud White	Milford
Replace or Correct Culvert Pipes along St. Rt. 222 in Nicholasville to control flooding.	2	12/31/2015	Road & Bridge Fund	ODOT & Monroe Township Maintenance - Jim Trees	Monroe Township
Implementation of the Storm Water Relief Plan - Received funding for Phase 1 to redirect storm water from surface ditches and alley junctions away from private property.	1	1/1/2014 – 12/31/2019	General Fund	Mike Perry	Owensville, Village of
Ditching/Culvert Upgrades of Township Roads.	2	12/31/2015	R&B Fund	Washington Twp. - Alan Dodson	Washington Township
Big Indian Road (off 222) Embankment Stabilization.	3	12/31/2015	R&B Fund, FEMA, OPWC	Washington Twp. , Beth Nevel or Robin Brewer	Washington Township

**CLERMONT COUNTY
ALL-HAZARDS MITIGATION PLAN**

Table 40. Action Schedule (continued)

Mitigation Actions	Hazard Prioritization	Implementation Schedule (Year)	Funding	Responsible Entity	Community
Ireton Trees Road Embankment Stabilization Pavement Restoration	3	12/31/2018	R&B Fund, FEMA, OPWC	Washington Twp. , Beth Nevel or Robin Brewer	Washington Township
Big Indian Road (off232) Embankment Stabilization Pavement Restoration	3	12/31/2018	R&B Fund, FEMA, OPWC	Washington Twp. , Beth Nevel or Robin Brewer	Washington Township
Bear Creek Road (near house # 424) Embankment Stabilization Pavement Restoration	3	12/31/2018	R&B Fund, FEMA, OPWC	Washington Twp. , Beth Nevel or Robin Brewer	Washington Township
Bear Creek Road (End) Embankment Stabilization Pavement Restoration	3	12/31/2018	R&B Fund, FEMA, OPWC	Washington Twp. , Beth Nevel or Robin Brewer	Washington Township
Boat Ramp- Retrofitting docks to protect against damages by barges during high water/flood event.	5	12/31/2015	Gen. Fund, ODNR	Washington Twp. , Robin Brewer or Beth Nevel	Washington Township
Severe Storms / Winter Storms					
Build a new Town Hall to include a Storm Shelter.	1	12/31/2019	Grants & General Funds	Amelia Village Council - Mayor Todd Hart	Amelia
Purchase back-up generator for current Village Hall.	3	12/31/2015	Grants & General Funds	Amelia Village Council - Mayor Todd Hart	Amelia
Fire code enforcement activities.	1	1/1/2014 – 12/31/2019	Department fund	Miami Twp. Fire/EMS Chief Jim Whitworth	Miami Township
Purchase Weather Radios for Residents.	5	12/31/2017	Grant or Donations	Emergency Services for Monroe Twp. - Tom Marck - Fire Chief; Denny Jowers - Safety Services Director	Monroe Township
Purchase Generator for Township Hall/R&B Dept.	1	1/1/2014	Gen. Fund , R&B Fund	Washington Twp. - Robin Brewer	Washington Township
Purchase Generator for Fire Station 68.	3	12/31/2015	Fire Fund	Washington Twp. - Arthur Owens	Washington Township
Tornado					
Purchased/installed all-hazards (tornado) warning sirens to cover 95%+ of Twp. 33 sq. miles in 2001. Now being maintained.	1	1/1/2014 – 12/31/2019	Township General Fund	Miami Twp. Fire/EMS – Chief Jim Whitworth	Miami Township
Shelter for Tornadoes and Cold Weather.	4	12/31/2019	CBDG and Other Grant Money	Monroe Township Trustees & Tom Wildey - Director of Services	Monroe Township
We have 8 sirens currently. We are in process of adding 5 additional sirens at this time.	1	1/1/2015 – 12/31/2016	Grants, Gen. Fund, Donations	Pierce Twp. and Clermont County EMA	Pierce Township

**CLERMONT COUNTY
ALL-HAZARDS MITIGATION PLAN**

Table 40. Action Schedule (continued)

Mitigation Actions	Hazard Prioritization	Implementation Schedule (Year)	Funding	Responsible Entity	Community
Replace two (2) tornado sirens in the Township that are antiquated.	1	6/1/2014	Gen. Fund, CDBG, Clermont County	Washington Twp. - Robin Brewer	Washington Township
Hazardous Materials					
Wellhead Protection Plan.	3	1/1/2014 – 12/31/2019	Water Department Fund	Milford's Water Department Supervisor - Matt Newman	Milford
MOU: House De-con /HazMat Trailer For Region.	3	1/1/2014 – 12/31/2019	Dept. of Homeland Security	Washington Twp. - Arthur Owens	Washington Township
Power/Utility Failure					
Tree Trimming of Township Roads.	2	12/31/2015	R&B Fund	Washington Twp. - Alan Dodson	Washington Township

6.0 Plan Maintenance

The Core Planning Team will meet annually for the purpose of monitoring and evaluating the Clermont County All-Hazards Mitigation Plan. The meeting will be held so that it coincides with the budget process so that future funding sources can be set aside for actions slated for that particular year. This meeting will be open to the public. Every five years, major plan updates will be sent to the Ohio Emergency Management Agency (OEMA) to ensure that the newly updated items still meet the required Hazard Mitigation Plan standards. The Core Planning Team will make the necessary changes and updates to the plan before submitting it to OEMA.

A copy of the plan will reside in the Clermont County EMA office. Each community will be responsible for keeping track of which items they are accountable for implementing. At the annual meeting, the parties responsible for various implementation actions will report on the status of their projects. This will allow for the revision of mitigation strategies if deemed necessary. Activities that have been completed will be noted as such within the plan and new activities will be added when necessary.

The Core Planning Team will review the goals and action items to determine their relevance to changing situations in the county.

The public will be involved in the monitoring and updating process as well. Local businesses and non-profit organizations as well as any representatives from academia, will be encouraged to participate in the monitoring and updating process as well.

The Clermont County All-Hazards Mitigation Plan will be incorporated into other existing planning documents and activities such as capital improvements. It will also be used in conjunction with the zoning code where appropriate. The County Emergency Operations Plan will also be reviewed by EMA officials to determine if any revisions will be required based on updates made to the All-Hazards Mitigation Plan.

Appendix A
Plan Adoption

RESOLUTION NO. 28 -14

The Board of County Commissioners, Clermont County, Ohio, met in regular session on the 5th day of March 2014, with the following members present:

David H. Uible, President

Robert L. Proud, Vice President

Edwin H. Humphrey, Member

Mr. Proud moved for the adoption of the following Resolution:

**RESOLUTION ADOPTING THE CLERMONT COUNTY
ALL-HAZARDS MITIGATION PLAN**

WHEREAS, the Federal Emergency Management Agency (FEMA) has established rules and regulations under 44 CFR Parts 201.6, which requires that “(F)or disasters declared after November 1, 2004, a local government must have a mitigation plan approved pursuant to this section in order to receive Hazard Mitigation Grant Program project grants”; and

WHEREAS, the Clermont County Emergency Management Agency received a grant from FEMA to prepare such a mitigation plan entitled the “All-Hazards Mitigation Plan”; a copy of the draft of which plan has been placed on the Clermont County EMA website (<http://ema.clermontcountyohio.gov/MitigationPlan.aspx>) for review and comment; and

WHEREAS, pursuant to the FEMA regulation 201.6 documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan must be submitted; and

WHEREAS, for multi-jurisdictional plans, each jurisdiction requesting approval of the plan must provide documentation of formal approval and adoption;

NOW, THEREFORE, BE IT RESOLVED by the Board of County Commissioners of Clermont County, Ohio with at least two-thirds of its members thereto concurring as follows:

SECTION I

That the All-Hazards Mitigation Plan of Clermont County, Ohio, which is attached hereto as Exhibit "A" and incorporated herein by reference be and is hereby adopted on behalf of Clermont County for the benefit, health, safety and welfare of the citizens in order to address natural disasters that can affect the community pursuant to provisions of the Ohio Revised Code, including but not limited to Chapter 3750.

SECTION II

That the Clermont County Emergency Management Agency prepare and submit to the Federal Emergency Management Agency and the appropriate state authorities the All-Hazards Mitigation Plan adopted herein to obtain formal approval and registration of the plan as appropriate and undertake all other necessary actions on behalf of the County to see that the plan is properly filed, registered and implemented.

SECTION III

That the Board of County Commissioners hereby finds and determines that all formal actions relative to the passage of this Resolution were taken in an open meeting of this Board, and that all deliberations of this Board and its Committees, if any, which resulted in formal action, were taken in meetings open to the public, in full compliance with all applicable legal requirements including Section 121.22 of the Ohio Revised Code.

Mr. Humphrey seconded the motion and on roll call, the vote resulted as follows:

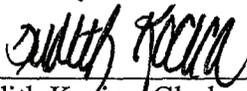
Mr. Uible Yes

Mr. Proud Yea

Mr. Humphrey Aye

This Resolution was duly passed on the 5th day of MARCH 2014.

ATTEST:



Judith Kocica, Clerk
Board of County Commissioners

This Resolution was prepared and approved as to form by the Office of the Prosecuting Attorney of Clermont County, Ohio



Allan L. Edwards,
Assistant Prosecuting Attorney

Date: 2-19-14

Appendix B

Stakeholder Involvement and Meetings

All Hazards Mitigation Plan Update Clermont County, Ohio

Initial Stakeholder Meeting
July 20, 2012



Introductions



Pam Broughton – Planning Lead
Director, Clermont County EMA
pbroughton@clermontcountyohio.gov

John Menninger, PE – Consultant
Stantec Consulting Services, Inc.
john.menninger@stantec.com

Carl Lamping – Planning Lead
Clermont Floodplain Manager
Clermonty Permit Central / Building
Inspection Department
clamping@clermontohio.gov

Emily Whitehead, GISP – Consultant
Stantec Consulting Services, Inc.
emily.whitehead@stantec.com



Introductions



Local Communities:
Clermont County and Unincorporated Areas

Incorporated Areas:

Village of Amelia	City of Milford
Village of Batavia	Village of Moscow
Village of Bethel	Village of Neville
Village of Chilo	Village of New Richmond
Village of Felicity	Village of Newtonsville
City of Loveland	Village of Owensville
	Village of Williamsburg



Introductions



Local Communities:

Townships:

Batavia	Pierce
Franklin	Stonelick
Goshen	Tate
Jackson	Union
Miami	Washington
Ohio	Wayne
	Williamsburg



Meeting Agenda



Outline

1. Introductions
2. Plan and Meeting Goals
3. Hazard Mitigation Plan - Overview
4. Hazard Identification – Discussion
5. Stakeholder Data Collection
6. Schedule / Path Forward
7. Questions / Comments



Goals



Hazard Mitigation Plan Update Goal

1. Protect lives and property through identification of Clermont County specific hazards and development of sound mitigation projects
2. Allows for Federal funding for mitigation projects.

Today's Meeting Goals

1. Introduce stakeholders to the Hazard Mitigation Planning process and solicit input and feedback.
2. Identify the specific Hazards of Concern for the Plan.



Hazard Mitigation Plan - Overview

Primary Elements

1. Planning
2. Risk Assessment
3. Mitigation Strategies
4. Plan Review and Adoption
5. Plan Maintenance



Hazard Mitigation Plan - Overview

Today's Meeting Starts the Planning Process

- Present Plan Elements
- Discuss Prioritized Hazards
- Provide Project Timeline



Hazard Mitigation Plan - Overview

Key Planning Tools

- Stakeholder Coordination Meetings
- Community Outreach / Public Meeting
- Public and Stakeholder Plan Review



Hazard Mitigation Plan - Overview

Role of the Plan Stakeholders

- Maintain Awareness of the Process
- Gather Information
- Utilize Local Expertise
- Provide Documents and Data
- Perform Draft Plan Reviews

PLEASE
SIGN IN



Hazard Mitigation Plan - Overview

Role of the Core Planning Team (CPT)

- Smaller Group that Represents Stakeholders
- Prioritize Hazards
- Develop Mitigation Rankings
- Review and Comment on Plan



Hazard Mitigation Plan - Overview

Local Jurisdiction Participation Requirements

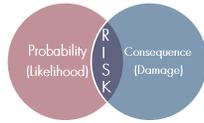
- Attend Planning Meetings
- Provide Documents and Data
- Identify Critical Facilities
- Submit List of Mitigation Actions
- Review and Comment on Plan
- Formally Adopt Plan



Hazard Mitigation Plan - Overview

Risk Assessment

- Identify County Specific Hazards (Today)
- Review History of Occurrences
- Assess Vulnerabilities
 - Population
 - Critical Facilities
 - Economic



Hazard Mitigation Plan - Overview

Mitigation Strategies

- Develop SMART Goals and Activities
 - Specific
 - Measurable
 - Attainable
 - Relevant
 - Time-Phased



Hazard Mitigation Plan - Overview

Mitigation Strategies

- Develop Goals and Objectives
- Develop Alternatives and Costs
- Create Evaluation Criteria
- Prioritize Projects



Hazard Mitigation Plan - Overview

Plan Review and Adoption

- Draft to be Reviewed by Committee and Public
- Incorporate Comments
- Submitted to State and FEMA for Review
- Adoption by Local Municipalities



Hazard Mitigation Plan - Overview

Plan Maintenance

- Implement Mitigation Strategies
- Perform Annual Meeting and Review Progress
- Update at Least Every 5 Years



Hazard Mitigation Plan - Overview

Mitigation Examples

- Public Education
- Early Warning Systems
- Levees / Floodwalls
- Tornado Shelters
- Property Buyouts

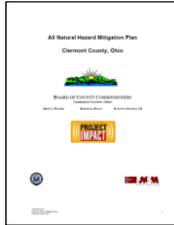


Hazard Identification - Discussion



Primary Hazards – Clermont County All Natural Hazards Mitigation Plan (2006)¹

1. Severe Storms
2. Flooding
3. Tornadoes
4. Landslides
5. Droughts
6. Earthquakes



¹Hazard ranking from highest concern to lowest concern.



Hazard Identification - Discussion



Clermont County Hazard Vulnerability Flood Insurance Policies and Data

Community	Flood Policies	Past Claims No. / Tot \$	Repetitive loss Properties
Village of Amelia*	0	0	0
Village of Batavia	0	13 / 12,598	8
Village of Bethel*	0	0	0
Village of Chilo	15	10 / 79,935	0
Clermont County	204	120 / 1,693,155	24
Village of Felicity*	0	0	0
City of Loveland	73	29 / 162,458	0
City of Milford	22	4 / 3,764	0
Village of Moscow	40	48 / 914,764	0
Village of Neville	8	21 / 228,736	0
Village of New Richmond	252	331 / 4,615,630	17
Village of Newtownsville*	0	0	0
Village of Owensville*	0	0	0
Village of Williamsburg	2	6 / 692,396	3
Totals	616	582 / \$8,401,436	52

* Indicates Non-Participation in the NFIP



Hazard Identification - Discussion



Clermont County Hazard Vulnerability Reported Weather Events

Event Type	No. Events	Deaths	Injuries	Damages
Drought	2	0	0	\$0
Excessive Heat	3	13	0	\$0
Extreme Cold	3	4	1	\$1,362,000
Floods / Heavy Rain	94	2	1	\$25,348,000
Hail	70	0	0	\$3,250,000
High Wind	10	2	14	\$24,224,000
Lightning	6	0	5	\$61,000
Thunderstorms	175	0	0	\$2,343,000
Tornadoes	16	1	38	\$5,793,000
Winter Storm / Heavy Snow / Ice	55	5	32	\$18,342,000
Totals	434	27	91	\$ 80,523,000.00

National Climatic Data Center Reported Events Since 1953 - 2011



Hazard Identification - Discussion



Clermont County Hazard Vulnerability Disaster Declarations *Funding Awarded in multiple Ohio Counties.

Event Type	Year	Category	Funding Awarded*
FLOODS	1959	Maj. Disaster	\$1,514,004
SEVERE STORMS & FLOODING	1964	Maj. Disaster	\$571,482
TORNADOES, SEVERE STORMS	1968	Maj. Disaster	\$270,000
HEAVY RAINS, FLOODING	1968	Maj. Disaster	\$600,000
BLIZZARDS AND SNOWSTORMS	1978	Maj. Disaster	\$3,846,669
FLOODING, SEVERE STORM, TORNADO	1990	Maj. Disaster	\$20,288,355
STORMS/FLOODS	1996	Maj. Disaster	\$9,496,702
FLOODING	1996	Maj. Disaster	\$14,652,749
SEVERE STORMS/FLOODING	1997	Maj. Disaster	\$81,246,517
SEVERE STORMS & FLOODING	2001	Maj. Disaster	\$9,465,334
FLOODING, SEVERE STORM	2003	Maj. Disaster	\$43,394,829
SEVERE WINTER STORMS, FLOODING AND MUDSLIDES	2005	Maj. Disaster	\$146,794,339
HURRICANE KATRINA EVACUATION	2005	Emergency Declaration	\$2,499,103
SNOW	2008	Maj. Disaster	\$6,800,000
SEVERE WIND STORM ASSOCIATED WITH TROPICAL DEPRESSION IKE	2008	Emergency Declaration	\$54,624,981
Totals	15		\$395,684,944



Hazard Identification - Discussion



Additional Possible Hazards of Concern

1. Dam Failure
2. Levee Failure
3. Land Subsidence (Mines)
4. Hazardous Materials
5. Wildfire
6. Expansive Soils
7. Invasive Species
8. Others?



Schedule and Next Steps



Task Description	2012						2013						
	JUL	AUG	SEP	OCT	NOV	DEC	JAN	FEB	MAR	APR	MAY	JUN	JUL
Stakeholders - Kickoff Meeting	█												
Planning / Data Collection	█	█	█	█	█	█							
Risk Assessment													
Public Meeting - Hazard Vulnerability													
CPT - Hazard Prioritization													
Mitigation Strategy													
CPT - Mitigation Review Meeting													
Plan Development													
Stakeholders - Draft Plan Presentation													
Local Plan Review													
State and Federal Review													
Local Adoption													



Stakeholder Data Collection



What We Need from You:

1. Data on Past Historic Events
2. Location of Critical Facilities
3. Regulatory and Planning Documents
4. Existing and Planned Mitigation Projects



Core Planning Team



Volunteers Needed!

1. Make Your Voice Heard
2. Provide an Active Role in the Plan Development
3. Set the Stage for a Safer Clermont County



Questions



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John Menninger, PE – Consultant
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All Hazards Mitigation Plan Update Clermont County, Ohio Risk Vulnerability Public Meeting

October 03, 2012



Introductions



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Meeting Agenda



Outline

1. Introductions
2. Plan and Meeting Goals
3. Hazard Mitigation Plan - Overview
4. Risk Analysis Overview
5. Hazard Profiles
6. Questions / Comments



Hazard Mitigation Plan - Timeline



- 2006 – First Hazard Mitigation Plan Adopted
- 2011 – FEMA Grant Received for Plan Update
- July 2012 - Plan Update Started
 - July 20, 2012 - Kickoff Meeting
 - Now – Risk Vulnerability Public Meeting
 - December 2012 - Draft Plan Complete
 - March 2013 - Target Adoption Date

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Hazard Mitigation Plan - Goals



Hazard Mitigation Plan Goal

1. Protect lives and property through identification of Clermont County specific hazards and development of sound mitigation projects
2. Allows for Federal funding for mitigation projects

Today's Meeting Goal

1. Review community hazard vulnerability
2. Collect community feedback on populations, facilities at risk, and historic hazards

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Hazard Mitigation Plan - Overview



Primary Elements

1. Planning
2. Risk Assessment
3. Mitigation Strategies
4. Plan Review and Adoption
5. Plan Maintenance



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Critical Facilities



Primary Facilities Identified (Facility numbers listed are currently identified within the Risk Analysis)

- Emergency Services = 58
- Schools & Daycares = 138
- Transportation Structures/Facilities = 517
- Utility Structures/Facilities = 155
- Community Structures/Facilities = 48

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Population At-Risk



County-wide Census Data

- Total 2010 U.S. Census Population = 197,363
- 5 Townships with 72% of the population
 - Batavia, Goshen, Miami, Pierce, & Union
- 13 Municipalities and 9 Townships with other 28%

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Hazard Risk Analysis



Primary Hazards

1. Severe Storms
2. Flooding
3. Tornadoes
4. Landslides
5. Droughts
6. Earthquakes
7. Hazardous Materials
8. Dam Failure
9. Utility Failures
10. Invasive Species

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Hazard Risk Analysis



Methodology

1. Calculate Event Probabilities
2. Determine Potential Impacts
 - Economic Damage, Population, Critical Facilities
3. Calculate Risks / Vulnerabilities



Hazard Risk Analysis

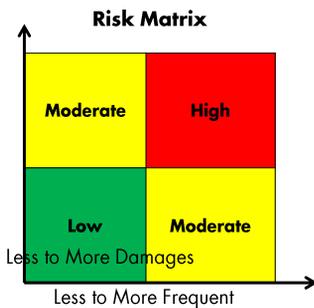


Data Sources

1. FEMA's HAZUS-MH
 - Flooding and Earthquakes
2. Historic Events
 - Tornadoes, Severe Storms, Excessive Heat, Extreme Cold, Severe Winter Storms, Landslides
3. Additional Studies
 - Drought, USACE Dam Failure, Ohio EMA
4. Qualitative Assessments
 - Dam Failure, Hazardous Materials, Invasive Species, Utility Failure



Hazard Risk Analysis



Hazard Risk Analysis – Severe Storms



Summary of Events & Future Probability

- 199 Events from 1965 -2011
 - Damages: \$29,128,000
 - Life Loss: 2
 - Injuries: 19
- Data Sources Needed: Localized Damages or Event information.



Hazard Risk Analysis – Severe Winter Storm

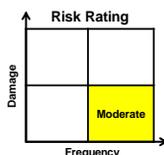


Summary of Events & Future Probability

- 54 Events from 1993 -2011
 - Damages*: \$18,342,000
 - Life Loss*: 5
 - Injuries*: 32
- Data Sources Needed: Localized Damages or Event information.



* Event data based on regional totals. Specific impacts to Clermont County unknown.



Hazard Risk Analysis – Flooding



Summary of Events & Future Probability

- 79 Events from 1993 -2011
 - Damages: \$25,348,000
 - Life Loss: 2
 - Injuries: 1
- FEMA NFIP – 178 Claims (1978-2011)
 - Value: \$8,401,436
- Data Sources Needed: Localized Damages or Event information. *Flash Flooding Areas.*
- HAZUS analysis in-progress.



Source-enquirer.com
Clermont County Sheriff's Deputy Jeff Sellers patrols New Richmond flooded streets in a boat (Michael Snyder photo)

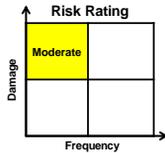


Hazard Risk Analysis – Tornadoes



Summary of Events & Future Probability

- 16 Events from 1953-2012
 - Damages: \$9,493,000
 - Life Loss: 4
 - Injuries: 38
- Data Sources Needed: Localized Damages or Event information.



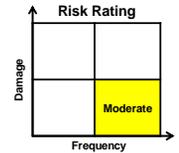
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Hazard Risk Analysis – Landslides



Summary of Events & Future Probability

- No Detailed Historical Record
- Data Sources Obtained: ODNR Landslide Incidence and Susceptibility Study
- Data Sources Needed: Localized Damages or Event information.



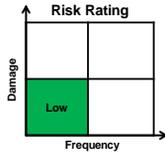
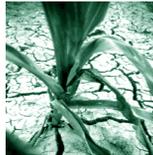
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Hazard Risk Analysis – Drought



Summary of Events & Future Probability

- 2 Events from 1914-2012
 - Damages: Unknown
- Annual Chance of Occurrence = 5% - 10% (PDSI)
- Data Sources Obtained: National Climatic Data Center (NCDC) Storm Events, ODNR
- Data Sources Needed: Localized Damages or Event information.



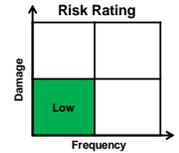
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Hazard Risk Analysis – Earthquakes



Summary of Events & Future Probability

- 3 Earthquakes from 1804-2012
 - * Unknown Impact
 - Damages*: \$ 0
 - Life Loss*: 0
 - Injuries*: 0
- Annual Chance of Occurrence = Minimal
- Data Sources Needed: Localized Damages or Event information.



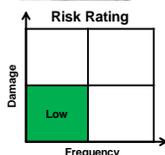
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Hazard Risk Analysis – Hazardous Material Accidents / Spills



Summary of Events & Future Probability

- No Detailed Historical Record of Accidents
- Data Sources Needed: Localized Damages or Event information.
- Potential Impacts:
 - Hazardous materials are stored throughout the County
 - Additionally multiple pipelines, rail corridors and transportation routes bisect the County



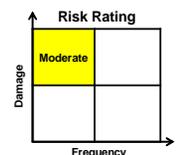
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Hazard Risk Analysis – Dam Failure



Summary of Events & Future Probability

- No Historical Records
- Primary Concerns: Harsha and Caesar Creek Lakes
- Impacts to be determined from Army Corps dam breach models
 - Potential structural damage and life loss
 - Drinking water source impacts



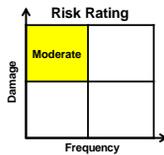
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Hazard Risk Analysis – Utility Failure



Summary of Events & Future Probability

- No Detailed Historical Record of Accidents
- Probability of Occurrence: Unknown
- Potential Impacts:
 - Extended Periods of Power Loss
 - Disruption of Communication
 - Potential Loss of Income
 - Impacts associated with Utility Failure unknown



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Hazard Risk Analysis – Invasive Species



Summary of Events & Future Probability

- No Detailed Historical Record.
- Potential Impacts: 6 of Ohio's top 10 invasive plants are found in Clermont County
- Asian Long Horn Beetle, Emerald Ash Borer, Asian Carp



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Next Steps



Public

1. Provide Local Input on the Risks and Vulnerability to the hazards identified.

Planning Team / Stakeholders

1. Completion of Risk Analysis will be provided at the Stakeholder meeting in Mid-October
2. Develop Mitigation Projects

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Questions



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All Hazards Mitigation Plan Update Clermont County, Ohio

Risk Analysis Meeting
October 31, 2012



Stantec

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Meeting Agenda



Outline

1. Introductions
2. Plan and Meeting Goals
3. Hazard Mitigation Plan - Overview
4. Risk Analysis Overview
5. Hazard Profiles
6. Vulnerability Rankings
7. Mitigation Project Development



Hazard Mitigation Plan - Goals



Hazard Mitigation Plan Goal

1. Protect lives and property through identification of Clermont County specific hazards and development of sound mitigation projects
2. Allows for Federal funding for mitigation projects.

Today's Meeting Goal

1. Review Hazard Profiles and Initial Vulnerability Rankings
2. Begin Development of Mitigation Actions



Hazard Mitigation Plan - Overview



Primary Elements

1. Planning
2. Risk Assessment
3. Mitigation Strategies
4. Plan Review and Adoption
5. Plan Maintenance



Hazard Risk Analysis



Primary Hazards

- | | |
|------------------|------------------------|
| 1. Severe Storms | 6. Earthquakes |
| 2. Flooding | 7. Hazardous Materials |
| 3. Tornadoes | 8. Dam Failure |
| 4. Landslides | 9. Utility Failures |
| 5. Droughts | 10. Invasive Species |



Hazard Risk Analysis



Methodology

1. Calculate Event Probabilities
2. Determine Potential Impacts
 - Economic Damage, Population, Critical Facilities
3. Calculate Risks / Vulnerabilities



Hazard Risk Analysis



Data Sources

1. FEMA's HAZUS-MH
 - Flooding and Earthquakes
2. Historic Events
 - Tornadoes, Severe Storms, Excessive Heat, Extreme Cold, Severe Winter Storms, Landslides
3. Additional Studies
 - Drought, USACE Dam Failure, Ohio EMA, ODNR
4. Qualitative Assessments
 - Dam Failure, Hazardous Materials, Invasive Species, Utility Failure



Hazard Risk Analysis – Severe Storms



Summary of Events & Future Probability

- 199 Events from 1965 -2011
 - Damages: \$29,148,000
 - Life Loss: 2
 - Injuries: 19
- Annual Chance of Occurrence = 100%
- Annualized Risk
 - Damages: \$620,170
 - Life Loss: 0.04
 - Injuries: 0.40

Ind. Annual Probabilities	
Hail:	100%
Wind:	63%
Lightning:	86%
Thunderstorm:	100%

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Hazard Risk Analysis – Severe Winter Storm



Summary of Events & Future Probability

- 54 Events from 1993 -2011
 - Damages*: \$18,342,000
 - Life Loss*: 5
 - Injuries*: 32
- Annual Chance of Occurrence = 35%
- Annual Risk:
 - Damages*: \$965,368
 - Life Loss*: 0.26
 - Injuries*: 1.68

* Event data based on regional totals. Specific impacts to Clermont County unknown.

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Hazard Risk Analysis – Flooding



Summary of Events & Future Probability

- 81 Events from 1993 -2012
 - Damages: \$25,352,000
 - Life Loss: 2
 - Injuries: 1
- Annual Chance of Occurrence = 100%
- Annual Risk:
 - Damages: \$1,334,316
 - Life Loss: 0.1
 - Injuries: 0.05
- HAZUSMH:
 - Average Annualized Loss = \$18,637,000

EEMA Flood Insurance	
Claims:	178
Value:	\$8,401,436

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Hazard Risk Analysis – Flooding



Streams & Communities Affected

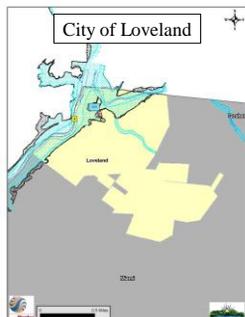
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Critical Facilities – At Risk of Flooding



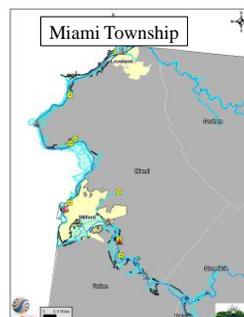
Legend

- Libraries FP
- Cell Phone Towers FP
- Power Plants FP
- Nursing Homes FP
- Government FP
- Hazardous Materials FP
- Utilities FP
- Historical Structures FP
- Fire Station Facilities FP
- Police Station Facilities FP
- Daycares FP
- School Facilities FP



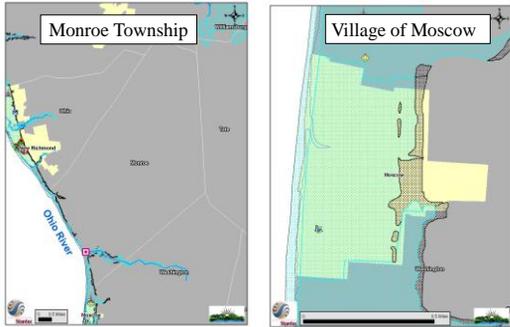
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Critical Facilities – At Risk of Flooding



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Critical Facilities – At Risk of Flooding



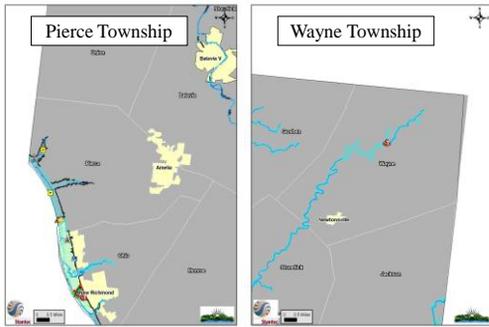
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Critical Facilities – At Risk of Flooding



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Critical Facilities – At Risk of Flooding



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Hazard Risk Analysis – Flooding

Structural Vulnerability – Community



Community	Number	Value (\$)
Batavia Township	4	192,000
Batavia, Village of	2	59,700
Chile, Village of	50	1,970,200
Franklin Township	58	2,002,550
Goshen Township	20	1,920,800
Jackson Township	1	198,500
Loveland, City of	80	6,789,250
Miami Township	122	23,632,730
Milford, City of	36	25,959,240
Monroe Township	65	4,082,800
Moscow, Village of	114	5,286,200
Neville, Village of	44	815,000
New Richmond, Village of	762	30,968,940
Ohio Township	49	1,944,200
Pierce Township	53	12,261,100
Stonelick Township	16	1,152,000
Tate Township	1	93,600
Union Township	20	704,400
Washington Township	29	2,827,700
Wayne Township	5	613,200
Williamsburg Township	1	93,700
Williamsburg, Village of	5	223,900
Total	1597	123,915,730

Legend

★ Structures Inside Floodplain

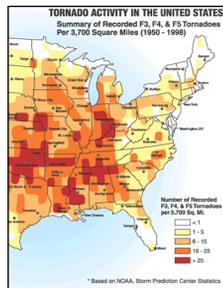
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Hazard Risk Analysis – Tornadoes



Summary of Events & Future Probability

- 18 Events from 1953-2012
 - Damages: \$11,453,000
 - Life Loss: 4
 - Injuries: 38
- Annual Chance of Occurrence = 23%
- Annualized Risk
 - Damages: \$190,883
 - Life Loss: 0.07
 - Injuries: 0.63



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Historical Tornado Touchdowns and the March 2, 2012 Tornado.



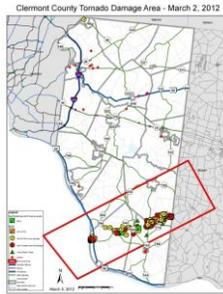
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Hazard Risk Analysis – Tornadoes



Historical Event – March 2, 2012*

- Magnitude – EF 3
- Damages – \$3,700,000
- Village of Moscow Hardest hit - 120 Homes/Buildings Damaged/Destroyed
- Life Loss – 3
- Affected Communities – Village of Moscow, Washington Twp., Tate Twp., & Franklin Twp.



* Images and Information provided by Kelly Pony (GISP)

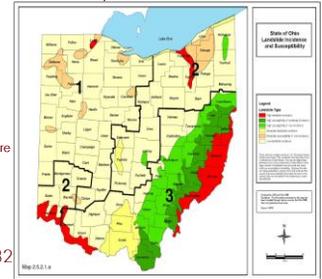
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Hazard Risk Analysis – Landslides



Summary of Events & Future Probability

- No Detailed Historical Record
- State of Ohio Hazard Mitigation Plan Methodology (Average Structure Value within the High Landslide Zone x 10 structures)
- Probability of Occurrence: Annual
- Estimated Loss: \$1,166,732



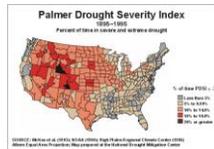
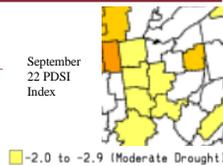
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Hazard Risk Analysis – Drought



Summary of Events & Future Probability

- NCDC - 2 Events from 1914 -2012
 - Damages: Unknown to Clermont
- Annual Chance of Occurrence = 5% - 10% (PDSI)
- Farm Service Agency (FSA) Payments 2008 – 2010 = \$913,216 - Supplemental Revenue Assistance Payments Program (SURE)



According to NOAA's National Climatic Data Center, in 1999, a drought that affected twenty-eight Ohio counties caused \$200 million in crop damages. Source: State of Ohio Hazard Mitigation Plan, Drought Section

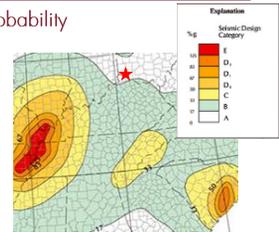
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Hazard Risk Analysis – Earthquakes



Summary of Events & Future Probability

- 3 Earthquakes from 1804-1864
 - Damages: Unknown
 - Life Loss: Unknown
 - Injuries: Unknown
- Annual Chance of Occurrence
 - Minimal
- HAZUS – MH:
 - Average Annualized Loss: \$330,000



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Hazard Risk Analysis – Hazard Material



Summary of Events & Future Probability

- No Detailed Historical Record of Accidents
- Probability of Occurrence: Unknown
- Potential Impacts:
 - Hazardous materials are stored throughout the County
 - Additionally multiple pipelines, rail corridors and transportation routes bisect the County

Stantec

Hazard Risk Analysis – Dam / Levee Failure

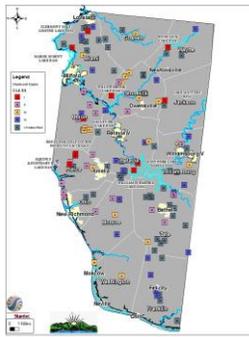


Summary of Events & Future Probability

- No Historical Record
- Probability of Occurrence: Low
- Potential Impacts:
 - Loss of Drinking Water Source
 - In-Flux of Flood Waters
 - Structures become inundated with Flood Waters

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Hazard Risk Analysis – Dam / Levee Failure



- Classes: 1 – 4 (Higher to Lower Hazard)
- Dams (119 Total):
 - Class 1 = 11
 - Class 2 = 19
 - Class 3 = 17
 - Class 4 = 21
 - Unclassified = 51



Hazard Risk Analysis – Dam / Levee Failure William H. Harsha Dam



- Dam and Levee Breach Analyses Provided by USACE – Potential Areas of Inundation Identified.
- Population AtRisk (2010 US Census with an area weighted calculation.)
 - William H. Harsha Dam – 3,327
- Property AtRisk (Structures Located inside the Inundation Zones)
 - William H. Harsha Dam – 1,318 Buildings
 - \$195,619,820



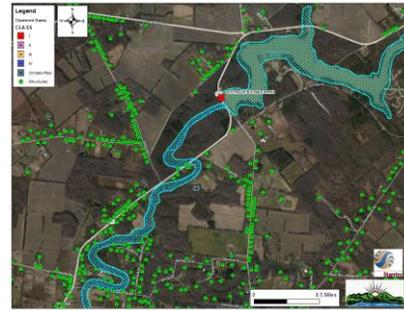
Hazard Risk Analysis – Dam / Levee Failure Caesar Creek Dam



- Dam and Levee Breach Analyses Provided by USACE – Potential Areas of Inundation Identified.
- Population AtRisk (2010 US Census with an area weighted calculation.)
 - Caesar Creek Dam – 1,787
- Property AtRisk (Structures Located inside the Inundation Zones)
 - Caesar Creek Dam – 776 Buildings
 - \$87,571,690



Hazard Risk Analysis – Dam / Levee Failure Stonelick Lake Dam



Hazard Risk Analysis – Invasive Species



Summary of Events & Future Probability – Invasive Plants and Emerald Ash Borer

- No Detailed Historical Record.
- Probability of Occurrence: Unknown
- Potential Impacts: 6 of the top 10 invasive plants are found in Clermont County.

OHIO'S TOP TEN INVASIVE PLANTS	
Japanese Honeyuckle	
Japanese Knotweed	
Autumn Olive	
Buckthorns	
Purple Loosestrife	
Common Reed	
Reed Canary Grass	
Garlic Mustard	
Multiflora Rose	
Bush Honeyuckles	

The Emerald Ash Borer which is currently impacting the north American Ash tree has already cost millions of dollars in attempts to identify and isolate infested trees. The un-captured cost to treat Ash trees in Ohio will likely reach into the millions, as urban areas combat the insect.



Hazard Risk Analysis – Invasive Species



- Asian Longhorned Beetle (ALB)
 - Found in Tate Township in June 2011
 - Restricted Areas – Tate and Monroe Townships, and East Fork State Park
 - September 4, 2012 – Ohio Department of Agriculture announced the availability of \$2 million in funding to assist with the ALB
 - As of Sept. 4, 2012 8,716 Infested trees removed out of the 170,575 Surveyed
 - Threat to Ohio's hardwood forests - \$2.5 Billion in standing maple & \$5 Billions Nursery Industry
- Asian Longhorned Beetle Cooperative Eradication Program in Clermont County, Ohio Environmental Assessment May 2012
- US Department of Agriculture



Mitigation Project Development 2006 HMP Activities



Tornadoes
Create innovative PSAs on the use of weather radios and seek funding to place weather radios in all critical facilities.
Seek funding for a countywide inter-operable warning system.
Seek funding to install multiuse shelters in parks. Work with mobile home parks to install tornado shelters.

Landslides
Work with the Planning Department to develop standards and regulations for development in landslide prone areas. (vegetation and hill cutting)
Work with the Planning Department to develop standards and regulations for development in landslide prone areas. (federal and state agencies)
Work with the Engineer's office to create a memorandum of understanding with other agencies.

Mitigation Project Development 2006 HMP Activities



Drought
Coordinate with the Fire Service Alliance for outreach concerning droughts and wildfires.
Develop a map of sensitive populations.
Develop a PSA to define the use of dry hydrants (work with SWCD).

Earthquake
Develop a PSA concerning the effects of earthquakes in Clermont County; target school age children.



Mitigation Project Worksheet



CLERMONT COUNTY HAZARD MITIGATION PLAN

Magnum History
October 31, 2012

Community Name _____ Contact Name _____ Contact Phone No. _____

Mitigation Goals:

- Preventative Activities:** Reduce risks through regulations including building codes, development outside of hazardous areas, and land planning or related improvement projects.
- Property Protection:** Reduce exposure to hazards through building or parcel specific activities such as flood proofing, structure acquisition, or razing.
- Emergency Services:** Reduce impacts through response and recovery activities that are implemented during a disaster.
- Structural Projects:** Minimize impacts through projects, such as detention basins, tornado shelters, impact areas, etc.
- Public Information:** Assist residents to prepare for risks and protective measures to better protect themselves and their property.

Item Number	Ranking	Mitigation Action	Responsible Agency & Contact Person	Funding Source	Implementation Timeline	Estimated Benefits	Estimated Costs
Example	2	Purchase homes in the 100 year floodplain and convert the system to a park.	County Planning Department - Bob Jones, Director	H&GP & General Funds	5 years	Medium	Medium
1.							
2.							
3.							
4.							
5.							

*Rank Each Mitigation Action: Higher = 1, Lower = 5

**Benefit and Cost estimates should be based on three categories:
\$100,000 - 1 = Low
\$100,000 - 3 = Medium
\$100,000 - 5 = High



Next Steps



Communities / Stakeholders

1. Review and Provide Input on Hazard Prioritization
2. Continue Development of Mitigation Goals

Planning Team

1. Complete Risk Analysis
2. Develop Mitigation Projects

Questions



Pam Broughton – Planning Lead
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Emily Whitehead, GISP – Consultant
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All Hazards Mitigation Plan Update Clermont County, Ohio

Mitigation Strategy Meeting
December 7, 2012



Introductions



Pam Broughton – Planning Lead
 Director, Clermont County EMA
pbroughton@clermontcountyohio.gov

John Menninger, PE – Consultant
 Stantec Consulting Services, Inc.
john.menninger@stantec.com



Meeting Agenda



Outline

1. Introductions
2. Mitigation Project Development
3. Prioritize and Categorize Hazards with Actions
4. Current Mitigation Actions Identified
5. Next Steps



Hazard Mitigation Plan - Goals



Hazard Mitigation Plan Goal

1. Protect lives and property through identification of Clermont County specific hazards and development of sound mitigation projects
2. Allows for Federal funding for mitigation projects.

Today's Meeting Goal

1. Review Previous Mitigation Goals
2. Identify New Mitigation Goals
3. Develop Prioritization Method



Hazard Mitigation Plan - Overview



Primary Elements

1. Planning
2. Risk Assessment
3. Mitigation Strategies
4. Plan Review and Adoption
5. Plan Maintenance



Mitigation Project Development



Mitigation Project Types

1. Preventative Actions
2. Property Protection
3. Emergency Services
4. Structural Projects
5. Public Information



Mitigation Project Worksheet



CLERMONT COUNTY HAZARD MITIGATION PLAN
 Mitigation Through
 October 31, 2012

Community Name _____ Contact Name _____ Contact Phone No. _____

Mitigation Goals:

1. Preventative Activities. Reduce risks through regulations including building codes, development outside of hazardous areas, and local planning or capital improvement projects.
2. Property Protection. Reduce exposure to hazards through building or parcel specific activities such as flood proofing, structure acquisition, or retrofitting.
3. Emergency Services. Reduce impacts through response and recovery activities that are implemented during a disaster.
4. Structural Projects. Minimize impacts through projects, such as detention basins, tornado shelters, tornado sirens, etc.
5. Public Information. Assist residents to prepare for risks and protective measures to better protect themselves and their property.

Item Number	Ranking Number*	Mitigation Action	Responsible Agency & Contact Person	Funding Source	Implementation Timeline	Estimated Benefits**	Estimated Costs**
Example	1	Purchase houses in the 100 year floodplain and convert the space to a park	County Planning Department - Bill Jones, Director	State & General Funds	2 years	Reduce	Increase
1.							
2.							
3.							
4.							
5.							

* Rank Each Mitigation Action: Higher = 1 Lower = 5
 ** Benefits and Cost estimates should be based on three categories:
 Low: less than \$100,000 + minor
 Medium: \$100,000 - \$500,000 + major
 High: more than \$500,000 + major



Mitigation Strategies



Primary Hazards

- | | |
|------------------|------------------------|
| 1. Severe Storms | 6. Earthquakes |
| 2. Flooding | 7. Hazardous Materials |
| 3. Tornadoes | 8. Dam Failure |
| 4. Landslides | 9. Invasive Species |
| 5. Droughts | 10. Power Failure |



Mitigation Strategies– Severe Storms



Mitigation Strategies

Previous Goals

- Use educational outreach (PSAs) to teach residents the importance of ditch maintenance and piping. Coordinate outreach with SWCD. Create "hotspot" database.
- Develop a memorandum of understanding between communities to plan for severe storm recovery.
- Develop several condition levels for severe storm events. Endorse the existing operating conditions (1-5).



Mitigation Strategies– Severe Storms



Mitigation Strategies

Current Goals

- Build/Incorporate Storm Shelters inside Town Hall (Village of Amelia, Washington Township)
- Purchase and Install Backup Generators in Town Hall, Fire Station, Administration Bldg., or Village Hall (Village of Amelia, City of Milford, Washington Township)
- Purchase Weather Radios for Residents (Monroe Township)



Mitigation Strategies– Severe Storms



Mitigation Strategies

Additional Options

- Public Outreach/Education
 - Educational information on the warning systems can be provided through community newsletters/websites and at public meetings and events.
 - Educational information on preparedness measures can be provided through community newsletters/websites and at public meetings and events.



Mitigation Strategies– Winter Storms



Mitigation Strategies

Current Goals

- Build/Incorporate Storm Shelters inside Town Hall (Village of Amelia, Washington Township, Monroe Township)
- Purchase and Install Backup Generators in Town Hall, Fire Station, Administration Bldg., or Village Hall (Village of Amelia, City of Milford, Washington Township)

Potential Goals

- Identify long-term shelters for extended power outages or extreme conditions
- Provide public outreach on weather conditions (Wind Chills, Snow/Ice conditions)
- Interagency cooperation agreements



Mitigation Strategies – Flooding



Mitigation Strategies

Previous Goals

- Public education
- Establish a storm water master plan and storm water utility.
- Evaluate locations for signage at repeated high water locations.
- Use educational outreach (PSAs) to teach residents the importance of ditch maintenance and piping. Coordinate outreach with SWCD. Create a "hotspot" database.



Mitigation Strategies – Flooding



Mitigation Strategies

Current Goals

- Storm Water Management System Improvements/Maintenance (Miami Township)
- Implement Water Management and Sediment Control Regulations (City of Milford)
- Stream Embankment and Pavement Stabilization (Washington Township)
- Replace or Upgrade Existing Storm Water Infrastructure to control flooding, Ditching/Culvert Pipes (Monroe Township, Washington Township)
- Implement Storm Water Relief Plan (Village of Owenville)



Mitigation Strategies – Flooding



Mitigation Strategies

Potential Goals

- Review potential for flood-proofing at-risk structures
- Identify and prioritize acquisition and demolition of repetitive loss structures
- Public Outreach
 - Continue to Identify potential Flooding and Inform citizens through community newsletters/websites and at public meetings and events.



Mitigation Strategies – Tornadoes



Mitigation Strategies

Previous Goals

- Create innovative PSAs on the use of weather radios and seek funding to place weather radios in all critical facilities.
- Seek funding for a countywide interoperable warning system.
- Seek funding to install multiuse shelters in parks. Work with mobile home parks to install tornado shelters.



Mitigation Strategies – Tornadoes



Mitigation Strategies

Current Goals

- Replace/Install Tornado/Emergency Sirens to provide 95%+ coverage area throughout Villages/Cities and Townships (Pierce Township, Miami Township, City of Milford, Washington Township)
- Provide Shelters for Temporary to Long-Term stay (Monroe Township)

Potential Goals

- Public Outreach/Education
 - Educational information on the warning systems can be provided through community newsletters/websites and at public meetings and events.
 - Educational information on preparedness measures can be provided through community newsletters/websites and at public meetings and events.



Mitigation Strategies – Landslides



Mitigation Strategies

Previous Goals

- Work with the Planning Department to develop standards and regulations for development in landslide prone areas. (vegetation and hill cutting)
- Work with the Planning Department to develop standards and regulations for development in landslide prone areas. (federal and state agencies)
- Work with the Engineer's office to create a memorandum of understanding with other agencies.

Potential Goals

- See above



Mitigation Strategies – Drought



Previous Goals

- Coordinate with the Fire Service Alliance for outreach concerning droughts and wildfires.
- The current site layout of neighborhoods and homes is poor; a fire/buffer zone should surround the home. Work with the Planning Commission to create a buffer zone regulation to prevent the spread of wildfires.
- Develop a map of sensitive populations.
- Develop a PSA to define the use of dry hydrants (work with SWCD).

Potential Goals

- Public Outreach
 - Educational information on preparedness measures can be provided through community newsletters/websites and at public meetings and events.



Mitigation Strategies – Earthquakes



Mitigation Strategies

Previous Goals

- Develop a PSA concerning the effects of earthquakes in Clermont County; target school age children.

Potential Goals

- Public Outreach
 - Educational information on preparedness measures can be provided through community newsletters/websites and at public meetings and events.

Stantec

Mitigation Strategies – Hazard Material



Mitigation Strategies

Current Goals

- House Decon /HazMat Trailer For Region. (Washington Township)
- Implement/Enforce a Wellhead Protection Plan (City of Milford)

Potential Goals

- Public Outreach
 - Educational information on the warning systems can be provided through community newsletters/websites and at public meetings and events.
 - Prepare plan for groundwater contamination from abandoned landfills

Stantec

Mitigation Strategies – Dam / Levee Failure



Mitigation Strategies

Potential Goals

- Review potential for acquisition of floodway easements downstream of dams
- Encourage the development of Emergency Action Plans for each dam
- Public Outreach
 - Education and outreach on dam safety risks

Stantec

Mitigation Strategies – Invasive Species



Mitigation Strategies

Potential Goals

- Public Outreach
 - Public outreach / education on preventing the spread of invasive species
 - Remove invasive vegetation from sensitive areas
 - Continue to Enforce the Firewood Movement Ban for reducing the spread of Emerald Ash Borer and the Asian Longhorned Beetle.

Stantec

Mitigation Strategies – Power Failure



Mitigation Strategies

Current Goals

- Increase Tree Trimming around power lines along Township Roads (Washington Township)

Potential Goals

- Provide Shelters for Temporary to Long-Term stay for extended periods of power failure.
- Public Outreach
 - Educational information on preparedness measures can be provided through community newsletters/websites and at public meetings and events.

Stantec

Mitigation Activities – County-wide Prioritization



Mitigation Ranking Categories

- Cost Effective
- Technically Feasible
- Environmentally Sound
- Socially Equitable
- Meets Local Regulations
- Activities Reduce Risk
- Socially Acceptable
- Funding Available

Stantec

Mitigation Activities – County-wide Prioritization



Provide an Importance ranking of 1 – 3 for each Category

- 1 = Low
- 2 = Normal
- 3 = High

Clermont County All Hazards Mitigation Plan	Cost Effective	Technically Feasible	Environmentally Sound	Socially Equitable	Meets Local Requirements	Activities Reduce Risk	Society Acceptable	Funding Available	Total
Hazard									



Next Steps



Communities / Stakeholders

1. Review and Provide Input on Mitigation Prioritization
2. Continue Development of Mitigation Goals

Planning Team

1. Complete Mitigation Goals – Finalize Mitigation Activities and Rankings
2. Complete Rough Draft of All Hazards Mitigation Plan



Questions



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All Hazards Mitigation Plan Update

Clermont County, Ohio

All-Hazard Mitigation Plan Meeting - County Agencies

December 18, 2012



Meeting Agenda



Outline

1. Introductions
2. Purpose /Goals
3. Risk Assessment Results
4. Mitigation Activities
5. Next Steps



Hazard Mitigation Plan - Goals



Hazard Mitigation Plan Goal

1. Protect lives and property through identification of Clermont County specific hazards and development of sound mitigation projects
2. Allows for Federal funding for mitigation projects.

Today's Meeting Goal

1. Identify New County-wide Mitigation Goals



Risk Assessment



Hazard	Probability	Vulnerability	Severity of Impact	Total
Severe Storm	3	2	1	6
Severe Winter Storm	2	2	1	5
Flooding	3	2	2	7
Tornadoes	2	1	2	5
Landslides	2	1	2	5
Drought	1	2	1	4
Earthquakes	1	2	1	4
Hazardous Material Accidents	1	1	2	4
Dam/Levee Failure	1	1	3	5
Invasive Species	2	1	2	5
Utility Failure	1	2	2	5

Low	3-4
Guarded	5
Elevated	6
High	7

Stantec

Mitigation Actions



Mitigation Project Types (Structural and Non-Structural)

1. Preparedness
2. Prevention
3. Resilience
4. Recovery

Stantec

Mitigation Strategies – Severe Storms



Mitigation Strategies

- Preparedness
 - Social media awareness campaigns
- Prevention
 - Purchase weather radios
 - Develop multi-tiered mass notification system
- Resilience
 - Build / incorporate storm shelters inside new public buildings
 - Purchase and install backup generators for critical facilities
 - Transient surge protection at water treatment plants
- Recovery
 - Identify list of building code compliant Red Cross shelters
 - Develop county-wide mutual aid compact

Stantec

Mitigation Strategies – Winter Storms



Mitigation Strategies

- See Previous Slide
- Recovery
 - Develop a tiered list of shelters based on capability and function
 - Eg. Information centers, temporary storm shelters, short-term overnight and long-term shelters

Stantec

Mitigation Strategies – Flooding



Mitigation Strategies

- Preparedness
 - Social media awareness campaigns
 - Evaluate locations for signage at repeated high water locations
- Prevention
 - Continue to implement sound floodplain management practices
 - Buy-out repetitive loss structures
 - Implement stormwater system improvements (community specific)
- Resilience
 - Retrofit / floodproof structures
 - Retrofit docks and boatramps against damages by barges
- Recovery
 - Develop county-wide mutual aid compact
 - Share lessons learned from LTRPC

Stantec

Mitigation Strategies – Tornadoes



Mitigation Strategies

- Preparedness
 - Social media awareness campaigns
- Prevention
 - Mass notification system (see Storms)
 - Replace install tornado / emergency sirens (community specific)
- Resilience
 - Build safe rooms or shelters at public parks and mobile home parks
 - Update residential building codes?
- Recovery
 - Identify long-term shelters (see Storms)
 - Share lessons learned from LTRPC

Stantec

Mitigation Strategies – Landslides



Mitigation Strategies

- Preparedness
 - Maintain stockpiles of repair materials
- Prevention
 - Work with Planning Department to develop standards for development in landslide prone areas
- Resilience
 - Fix smaller slides that have larger damage potential
- Recovery
 - Mutual aid compact



Mitigation Strategies – Drought



Mitigation Strategies

- Preparedness
 - Coordinate with Fire Service Alliance on outreach efforts re: wildfires
 - Continue outreach efforts on installation of dry hydrants
 - Develop a map of sensitive populations
- Prevention
 - Work with Planning Department to provide buffer zone to prevent spread of wildfires



Mitigation Strategies – Earthquakes



Mitigation Strategies

- Preparedness
 - Provide public education information on what to do during an earthquake



Mitigation Strategies – Hazardous Materials Release



Mitigation Strategies

- Preparedness
 - A Commodity Flow Study is being performed
- Prevention
 - Implement / enforce well head protection plans
 - Develop a Source Water Protection Plan for Harsha Lake
 - Provide public awareness on disposal / storage of hazardous materials



Mitigation Strategies – Dam Failure



Mitigation Strategies

- Preparedness
 - Public outreach and awareness initiatives
 - Encourage / participate in the development of Emergency Action Plans for each dam
- Prevention
 - Work with dam owners to encourage regular inspections
 - Limit development downstream of existing dams



Mitigation Strategies – Invasive Species



Mitigation Strategies

- Preparedness
 - Educate public on recognizing invasive species
- Prevention
 - Public outreach / education on preventing the spread of invasive species
 - Continue to enforce bans on the movement of wood from quarantine areas



Mitigation Strategies – Power Failures



Mitigation Strategies

- Preparedness
 - Encourage critical care facilities to maintain backup power and fuel reserves
- Recovery
 - Create / maintain a Power Restoration Priority Plan for the county. Specifically, Critical Care Facilities to be included in plan.

Next Steps



Communities / Stakeholders

1. Review and Provide Input on Mitigation Prioritization
2. Continue Development of Mitigation Goals

Planning Team

1. Complete Mitigation Goals – Finalize Mitigation Activities and Rankings
2. Complete Rough Draft of All Hazards Mitigation Plan



Questions



Pam Broughton – Planning Lead
Director, Clermont County EMA
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John Menninger, PE – Consultant
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Clermont County, Ohio Hazard Mitigation Plan Update

Initial Stakeholder Meeting / FILE 174332005

Date/Time: July 20, 2012 9:30 – 11:00 AM EST
Place: Clermont County Engineers Conference Room
2381 Clermont Center Drive, Batavia, Ohio 45103
Attendees: Pam Broughton - Clermont County EMA
Laurie Schlueter - Clermont County EMA
Carl Lamping - Clermont County Floodplain Manager
John Menninger - Stantec Consulting Services
Adam Pooler - Stantec Consulting Services
Various Stakeholders - Sign-In Sheet Attached

INTRODUCTION

Introductions were performed for the group. Following introductions, John Menninger (Stantec) provided an overview of the planning process and went through the Stakeholder Meeting Presentation. A copy of the presentation is provided with the meeting minutes.

PRESENTATION REVIEW

The primary elements of the presentation included:

- Introductions
- Purpose / Goals
- Hazard Mitigation Plan – Overview
- Hazard Identification – Discussion
- Stakeholder Data Collection
- Schedule / Path Forward
- Questions / Comments

Introductions



Meeting Notes

Pam Broughton provided general information about the previous Hazard Mitigation Plan and the purpose for updating the plan. Ms. Broughton also introduced Stantec as the consulting firm contracted to assist with the planning efforts.

Purpose / Goals

Mr. Menninger introduced the Powerpoint presentation and identified the main purpose and goals for updating the Plan.

Hazard Mitigation Plan – Overview

Mr. Menninger outlined the primary plan elements. These 5 main elements of the plan are: Planning, Risk Assessment, Mitigation Strategies, Plan Review and Adoption, and Plan Maintenance. While discussing mitigation strategies, a Stakeholder asked about the existing Mitigation Actions from the 2006 plan. Mr. Menninger replied that these actions will be reviewed during the subsequent meetings.

Hazard Identification

Mr. Menninger discussed the hazards identified in the 2006 plan and led a discussion regarding the hazards to be included in the current planning effort. Four additional hazards of concern were discussed. These hazards were:

- **Hazardous Materials:** Specifically related to the transportation and storage of Hazardous Materials/Waste
- **Utility Failures:** Specifically related to non-natural hazard related failures due to human or technological disruptions
- **Dam Failure:** Specifically related to the East Fork Dam. The USACE representative provided the Emergency Action Plan (EAP) and other information regarding impacts from a Dam Breach
- **Invasive Species:**
 - Asian Longhorn Beetle (Invasive insect that damages trees throughout the county.)
 - Emerald Ash Bore (Invasive insect that damages trees throughout the county and state.)
 - Unidentified Beetle which feeds off of Soybean crops.

The remaining hazards on the “Additional Possible Hazard of Concern” slide were viewed to have little or no impact to the county. A stakeholder did provide information that “Expansive Soils” have appeared within the county. However, the damage was localized to a building or two.

Additionally, Ms. Broughton identified “Local Terrorism” as a potential hazard of concern. The stakeholders do want to incorporate some information from a Terrorism report developed for the County, but recognized the difficulty in developing a risk assessment under the existing scope of work.

Stakeholder Data Collection



Meeting Notes

Mr. Menninger discussed the importance of Local Stakeholder Data Collection. The attached Stakeholder Data Collection Needs handout was provided to each participant. One Stakeholder brought up listing Nursing Homes as Critical Facilities. Mr. Menninger replied that we can include the larger Nursing Homes or Extended Care Facilities into the plan. Ms. Broughton notified everyone that the EMA has most Critical Facilities in GIS format. Local communities may need to verify their existence/status.

The Data Collection Needs will be incorporated into the Counties EMA website. This website will allow stakeholders to enter necessary information into a form. Stantec will provide a list of questions to be added to the form.

A tentative date of the end of August was provided to the Stakeholders to return the data collection needs to the Planning Team.

Ms. Broughton also requested that Stakeholders provide a list of hours/cost incurred from work on the Hazard Mitigation Planning Process. This information will be used to provide the \$10,000 Local Match. A form will be provided to the stakeholders.

Schedule / Path Forward

The schedule was then discussed. The County would like to shorten the schedule as much as possible to move the plan through in a timely manner. The County would like to have the plan adopted before the next storm season. The schedule will be reviewed by Stantec and the Clermont County EMA within the following weeks.

The Core Planning Team (CPT) was then discussed. The objective was to identify key Stakeholder members to serve as the CPT. The group decided to include each of the local stakeholder members in attendance as part of the CPT. Federal and State agencies would remain involved but not as CPT members.

Questions/Comments

There were no other questions or comments at the end of the presentation.

Key Action-Items

Stantec will provide a list of GIS resources needed to Ms. Broughton to be forward to the County GIS Department.

Stantec will create a list of questions to be placed on the County EMA website for Data Collection Needs.

Mr. Menninger and Ms. Broughton will review the schedule and attempt to fast-track the planning process.

The foregoing is considered to be a true and accurate record of the items discussed. If any discrepancies or inconsistencies are noted, please contact the writer immediately.

STANTEC CONSULTING SERVICES INC.

John Menninger, PE
Project Manager
John.Menninger@stantec.com



Meeting Notes

Clermont County, Ohio Hazard Mitigation Plan Update

Risk Analysis Meeting / FILE 174332005

Date/Time: October 03, 2012 7:00 – 9:00 PM EST
Place: Clermont County Engineers Conference Room
2381 Clermont Center Drive, Batavia, Ohio 45103
Attendees: Pam Broughton - Clermont County EMA
Bob Welch – Greater Cincinnati Hazmat
Ed Humphrey – Clermont County Board of County Commissioners
Tim Kelly – Clermont County Health District
Carl Lamping - Clermont County Floodplain Manager
John Menninger - Stantec Consulting Services
Adam Pooler - Stantec Consulting Services
Emily Whitehead – Stantec Consulting Services

INTRODUCTION

Introductions were performed for the group. Following introductions, Emily Whitehead (Stantec) provided an overview of the planning process and objectives for the Risk Analysis Meeting. John Menninger then went through the Stakeholder Meeting Risk Analysis Presentation. A copy of the presentation is provided with the meeting minutes.

PRESENTATION REVIEW

The primary elements of the presentation included:

- **Introductions**
- **Plan and Meeting Goals**
- **Hazard Mitigation Plan - Overview**
- **Risk Analysis Overview**
- **Hazard Profiles**
- **Questions / Comments**



Timeline

Emily Whitehead provided general information about the timeline of the project update: including the adoption date of the Clermont County Hazard Mitigation Plan.

Purpose / Goals

Ms. Whitehead introduced the PowerPoint presentation and identified the main purpose and goals for updating the Plan and identified the Risk Analysis Meeting goals.

Hazard Mitigation Plan – Overview, Critical Facilities, At-Risk Population, & Primary Hazards

Ms. Whitehead outlined the primary plan elements. The 5 main elements of the plan are: Planning, Risk Assessment, Mitigation Strategies, Plan Review and Adoption, and Plan Maintenance. Ms. Whitehead discussed the current Critical Facilities identified and the At-Risk Population throughout the county. Mr. Lamping asked about including Church's inside the list of Critical Facilities. Mr. Menninger and Mr. Pooler responded by saying that Religious Facilities have only been identified if there was an associated school. Ms. Broughton will provide a list of Red Cross Shelters, which can be located in churches. RAVEN911, a Region GIS tool, has potential layers depicting Critical Facilities. Ms. Whitehead then discussed the current Hazards identified by the previous plan and the Stakeholder Meeting.

Risk Analysis Overview

Mr. Menninger discussed the methodology behind the Risk Analysis and what current data sources are available for each hazard. The Risk Matrix was discussed as a general analysis provided just for this meeting since it was a public forum. A more detailed analysis will be provided at the Core Planning Team - Risk Analysis meeting. Mr. Menninger then went through each hazard slide.

Hazard Profiles

- **Severe Storms:** The National Climactic Data Center (NCDC) contains a good description of the past storm events within Clermont County. Mr. Lamping asked about how often is the NCDC storm events updated. The NCDC storm events database is updated every 3-4 months after the event. At the time of the meeting Mr. Pooler responded with all events in one year will be entered by the following year.
- **Sever Winter Storms:** NCDC provides data on a regional basis. The Stakeholder group should evaluate this hazard and provide input on its relation to Clermont County.
- **Flooding:** Flash flooding events are not accurately recorded in NCDC database or the National Flood Insurance Program (NFIP) due to their quick occurrence. Ms. Broughton will check on Clermont's set of flooding records kept by the previous EMA director. Stantec will locate additional resources by the National



Meeting Notes

Weather Service. The NWS can provide a database containing all notifications of potential flash flooding events.

- **Tornadoes:** The NCDC contained records from 1953 – 2011. 2 Tornadoes touchdowns were reported in 2012.
- **Landslide:** Major landslides occurred in Clermont in the early 2000's and 2011. Ms. Broughton will check on a landslide report due to federal funds being granted from landslide damages. Clermont County Engineer's office could have data associated with landslides. Ms. Broughton will be checking with the Engineer's office. Stantec will contact the Engineer's office as well.
- **Drought:** USDA and the Farm Service Bureau should have records of crop damages within Clermont. Mr. Menninger commented that Stantec will coordinate with the water department on water supply studies.
- **Earthquakes:** 2 major faults New Madrid and South Carolina neither would cause substantial damage. Majority of data sources for this hazard have been located.
- **Hazardous Materials;** Ms. Broughton commented on the Commodity Flow Study that will determine what is be transported into and through Clermont County. The flow study will be completed in 2013. The county has a Hazardous Materials Dump Site located in Jackson Township that could affect Harsha Lake. The County has a spills database that was started in the early 2000's, which would be populated only if the incident was reported through dispatch. There have been 2 recent incidents at the old Ford Plant. Two (2) years ago there was an incident of a car running into a gas line, which evacuated a subdivision. Ms. Broughton will gather as much information about these incidents as possible. Discussions amongst meeting attendees included what impacts, if any, could an incident have on the Ohio River.
- **Dam Failure:** The 2 Largest Dams of concern for the county would be Harsha Lake Dam and Caesar Creek Dam, which both have Emergency Action Plans (EAPs). The county GIS has a layer containing all Dams with classifications. The county would like to know the vulnerability of a dam breach at most dams across the county. There is a Dam in Union Township where 4 years ago a contractor drilled cable lines into the Dam. The retention basin Dam near Eastgate Mall is also a concern to the county. Ms. Broughton would like to know what kind of regional effects would happen if the Harsha Dam Breached. Stonelick Lake Dam should also be included.
- **Utility Failures:** Multiple Natural Hazards can cause a Utility Failure. Duke Energy could be a great source of information/incidence.
- **Invasive Species:** The main concern over invasive species would be the Long-Term Impacts on the Agricultural/Forestry Industry.



Meeting Notes

Additionally, Ms. Broughton identified "Local Terrorism" as a potential hazard of concern. The stakeholders do want to incorporate some information from a Terrorism report developed for the County, but recognized the difficulty in developing a risk assessment under the existing scope of work.

The county would also like to incorporate language into the Report concerning the risk to Biological Incidents. There is currently a Mass Prophylaxis plan that can be referenced inside the plan.

Mr. Menninger let everyone know that there will be a Mitigation Worksheet provided at the next meeting for Stakeholders. This will help identify potential mitigation efforts.

Once a draft Plan is completed, hard copies would be placed at local libraries for public review. The plan will also be provided on the EMA website. This will allow the communities/stakeholders to provide feedback directly to the EMA website.

Due to the recent declaration, local communities have expressed interest in the planning process. A potential mitigation project throughout the local jurisdictions could be the installation of Tornado Safe-Rooms.

Schedule / Path Forward

A tentative date of October 31st at 10:00 am was agreed upon for the Stakeholder Risk Assessment/Prioritization Meeting. The meeting will be moved to the Emergency Operation Center building, 2279 Clermont Center Drive, Batavia, Ohio 45103.

Ms. Broughton also requested that Stakeholders provide a list of hours/cost incurred from work on the Hazard Mitigation Planning Process. This information will be used to provide the \$10,000 Local in-kind Match.

Questions/Comments

There were no other questions or comments at the end of the presentation.

Key Action-Items

Ms. Broughton and Stantec will gather the information discussed inside each Hazard. All additional data sources will be reviewed by Stantec and added to the Risk Analysis.

Another meeting will be scheduled with Stantec and the Core Planning Team to review the Risk Assessment/Prioritization task.

The foregoing is considered to be a true and accurate record of the items discussed. If any discrepancies or inconsistencies are noted, please contact the writer immediately.

STANTEC CONSULTING SERVICES INC.

John Menninger, PE
Project Manager
John.Menninger@stantec.com



Clermont County, Ohio Hazard Mitigation Plan Update

Risk Prioritization Meeting / FILE 174332005

Date/Time: October 31, 2012 10:00 AM – 12:00 PM EST
Place: Clermont County Emergency Operation Center
2279 Clermont Center Drive, Batavia, Ohio 45103
Attendees: Pam Broughton - Clermont County EMA
Aaron Boggs – Pierce Township
Bonna Bauer – Mercy Health – Clermont County
Laurie Schlueter – Clermont County EMA
Tom Strobs – Clermont County EMA
Kevin Riley – Batavia Township
Lyle Bloom – Clermont County Water Resources Dept.
Eric Holder – Clermont County EMA
John Menninger - Stantec Consulting Services
Adam Pooler - Stantec Consulting Services
Emily Whitehead – Stantec Consulting Services

INTRODUCTION

Introductions were performed for the group. Following introductions, Emily Whitehead (Stantec) provided an overview of the planning process and objectives for the Risk Analysis Meeting. Emily Whitehead and John Menninger then went through the Stakeholder Meeting Risk Analysis Presentation. A copy of the presentation is provided with the meeting minutes.

PRESENTATION REVIEW

The primary elements of the presentation included:

- **Introductions**
- **Plan and Meeting Goals**
- **Hazard Mitigation Plan - Overview**



Meeting Notes

- **Risk Analysis Overview**
- **Hazard Profiles**
- **Vulnerability Rankings**
- **Mitigation Project Development**

Purpose / Goals

Ms. Whitehead introduced the PowerPoint presentation and identified the main purpose and goals for updating the Plan and identified the Risk Analysis Meeting goals.

Hazard Mitigation Plan – Overview, Critical Facilities, At-Risk Population, & Primary Hazards

Ms. Whitehead outlined the primary plan elements. The 5 main elements of the plan are: Planning, Risk Assessment, Mitigation Strategies, Plan Review and Adoption, and Plan Maintenance. Ms. Whitehead then discussed the current Hazards identified by the previous plan and the Stakeholder Meeting.

Risk Analysis Overview

Ms. Whitehead discussed the methodology behind the Risk Analysis and what current data sources are available for each hazard. Ms. Whitehead and Mr. Menninger then went through each Hazard Profile. Hazard profiles and risk calculations are included in the attached presentation. Additional notes and discussion of the hazards are summarized below.

Hazard Profiles

- **Severe Storms:** The National Climactic Data Center (NCDC) contains a good description of the past storm events within Clermont County. Ms. Bauer asked why the Life Loss and Injuries seemed low for 199 events. Mr. Menninger agreed with her; however the numbers are only what is reported by the NCDC.
- **Winter Storms:** NCDC provides data on a regional basis. The Stakeholder group should evaluate this hazard and provide input on its relation to Clermont County.
- **Flooding:** Ms. Whitehead and Mr. Menninger discussed the Flooding hazard with the group. It is expected that the true Average Annualized Loss is somewhere between the Annual Risk calculated from the NCDC data and that calculated from HAZUS. Ms. Whitehead went through the community slides on floodplains. A critical infrastructure site was identified in Moscow and was thought to represent a police station. The group mentioned that there are no police stations in Moscow.



Meeting Notes

- **Tornadoes:** The NCDC dataset contained records from 1953 thru a portion of 2012, including 2 Tornadoes in 2012. Ms. Broughton identified a third Tornado that touch-downed in Stonelick Twp. on September 8, 2012. This event was not in the NCDC database due to a 3 month reporting lag. There were 2 homes that were damaged. One was a major damage and the other was destroyed.
- **Landslide:** Currently Stantec has not received any information/data from the Engineer's Office about Landslides in the county. Stantec and Ms. Broughton will continue to check with the County Engineer's Office.
- **Drought:** Ms. Broughton wanted to check the State of Ohio Hazard Mitigation Plan regards to funds paid out by the Farm Service Agency (FSA). She wanted to see if the State received data from the FSA about funds paid for disaster damage. Stantec will review the state's plan and contact the State EMA if necessary to gather information about funds paid to farmers dealing with Drought.
- **Earthquakes:** The hazard profile was reviewed and the HAZUS methodology outlined.
- **Hazardous Materials:** A primary concern regarding hazardous materials would be the transportation within the County along major transportation routes.
- **Dam Failure:** The location and potential consequences of dam failure were reviewed.
- **Utility Failures:** The group agreed the focus should be on non-hazard caused utility failures; specifically, electric utility failures. Ms. Broughton discussed the Northeast Blackout that effected many states in 2009. This would be a good example to include in the report.
- **Invasive Species:** The main concern over invasive species would be the Long-Term Impacts on the Agricultural/Forestry Industry from the Asian Longhorned Beetle and the Emerald Ash Borer.

Prioritization

Mr. Menninger then discussed the next step forward, which is the Prioritization of the hazards and Mitigation Efforts. He discussed the 3 criteria used to generate the Prioritization; Probability, Vulnerability, and Severity of Impact. He then reviewed the County-wide Prioritization table and pointed out Severe Storms and Flooding are the highest ranked hazards. The group agreed with the general rankings of the County-wide table. Finally, the rankings for individual communities were discussed and handouts provided for local representatives.



Meeting Notes

Mitigation Project Development

After the prioritization process has been reviewed and finalized, mitigation actions need to be identified. Mr. Menninger described the previous Mitigation Actions from the 2006 HMP. Ms. Broughton noted that the previous actions identified have limitations. The major goal with these actions is to follow the SMART methodology. All actions need to be Specific, Measurable, Attainable, Relevant, and Time-Phased. Mitigation actions should consider limitations including funding and available staff.

Schedule / Path Forward

The group then discussed the next steps forward. The EMA office will send out a targeted community e-mail to the Stakeholder group with the Prioritization and Mitigation Forms for their review and comments. Community comments need to be returned to the EMA office by 11/16/2012.

A tentative date of December 7th, 2012 at 10:00 am was agreed upon for the Mitigation Planning Meeting. The meeting will be held at the Emergency Operation Center building, 2279 Clermont Center Drive, Batavia, Ohio 45103.

The Draft Plan will be provided to the Stakeholder Group and Core Planning Team during the second week of January 2013.

Ms. Broughton also requested that Stakeholders provide a list of hours/cost incurred from work on the Hazard Mitigation Planning Process. This information will be used to provide the \$10,000 local in-kind match.

Key Action-Items

Ms. Broughton and Stantec will continue to gather hazard information, with additional data sources reviewed by Stantec and added to the risk analysis, as appropriate.

The Presentation, Minutes, Prioritizations, and Mitigation Strategy Handout will be reviewed and prepared for distribution.

The foregoing is considered to be a true and accurate record of the items discussed. If any discrepancies or inconsistencies are noted, please contact the writer immediately.

STANTEC CONSULTING SERVICES INC.

John Menninger, PE
Project Manager
John.Menninger@stantec.com



Clermont County, Ohio Hazard Mitigation Plan Update

Mitigation Strategies Meeting / FILE 174332005

Date/Time: December 7, 2012 10:00 AM – 1:00 PM EST
Place: Clermont County Emergency Operation Center
2279 Clermont Center Drive, Batavia, Ohio 45103
Attendees: Pam Broughton - Clermont County EMA
Scott Light – Pierce Township
Tim Kelly – Clermont Health District
Carl Lamping – Clermont County Building Department
Lyle Bloom – Clermont County Water Resources Dept.
Jim Dinkel – Ohio Valley Long-Term Recovery Committee
John Menninger - Stantec Consulting Services
Adam Pooler - Stantec Consulting Services

INTRODUCTION

Introductions were performed for the group. Following introductions, John Menninger (Stantec) provided an overview of the planning process and objectives for the Mitigation Strategies Meeting. Mr. Menninger then went through the Stakeholder Meeting Mitigation Strategies Presentation. A copy of the presentation is provided with the meeting minutes.

PRESENTATION REVIEW

The primary elements of the presentation included:

- **Introductions**
- **Purpose / Goals**
- **Mitigation Project Development**
- **Mitigation Activities**
- **Next Steps**



Meeting Notes

Purpose / Goals

Mr. Menninger introduced the PowerPoint presentation and identified the main purpose and goals for updating the Plan and identified the Mitigation Strategy goals.

Mitigation Project Development

Mr. Menninger outlined the primary plan elements. The 5 main elements of the plan are: Planning, Risk Assessment, Mitigation Strategies, Plan Review and Adoption, and Plan Maintenance. Mr. Menninger went through a brief description of the different Mitigation Project Types and the Mitigation Strategy Form. He then discussed mitigation strategies for each hazard of concern.

- **Severe Storms:** The Core Group identified the following potential mitigation actions.
 - Build/Incorporate storm shelters inside new public buildings.
 - Purchase weather radios
 - Identify list of building code compliant Red Cross shelters and categorize them into different use types such as: Overnight, Basic Necessities, and Kitchen Facilities.
 - Develop a multi-tiered mass notification system that may include telephone, text messaging, e-mail, mobile device/alert applications, weather radios, social media, and warning sirens.
 - Review potential uses of social media for education/awareness.
 - Purchase and install back-up generators inside government and utility buildings/structures.
 - County-wide mutual aid compact allowing community departments to work with other communities, specifically public works and road departments.
 - Identify the capabilities of back-up generators and develop recommendations for fuel prioritization.
 - Incorporate critical care facilities into the mass notification system.
 - Review the grant potential for surge protection at the water treatment plants. Power outages that trip pumps can result in water hammer that causes damage at the plant.
- **Winter Storms:** The Winter Storms would have the same actions as the Severe Storms with one exception. The need for long-term public shelters can arise due to power loss and the extreme temperatures. The action will be to develop a tiered list of shelters based on capability and function. For example, locations that can be short-term reception sites; information centers where people can get hot showers, meals, charge cell phones, etc.; temporary storm shelters, short-term overnight shelters; and long-term shelters. This list will need to have structures



Meeting Notes

approved for certain buildings codes; however the group understands that during an emergency that is not always practical.

- **Flooding:** Carl Lamping and Lyle Bloom did not identify any major flooding issues in the county. Communities bordering the Ohio River are aware of flood risks. New structures comply with building standards including elevating the 1st floor and utilities. It is a challenge to balance flood mitigation with sustaining the social and economic heart of a community. The following actions were identified.
 - Evaluate locations for signage at repeated high water locations.
 - Storm water management system improvements/maintenance (Miami Township).
 - Implement water management and sediment control regulations (City of Milford).
 - Stream embankment and pavement stabilization projects (Washington Township).
 - Retrofit docks and boat ramps to protect against damages by barges during high water/flood events (Washington Township).
 - Replace or upgrade existing storm water infrastructure (Monroe Township and Washington Township).
 - Implement storm water relief plan (Village of Owensville)
 - Public Outreach – Continue to identify potential flooding and inform citizens through social media and the mass notification system.
 - Retrofit / flood proofing existing structures to mitigate flooding concerns.
 - Buy-out homes/structures to remove them from the hazard.

- **Tornadoes:** The following actions were identified.
 - Develop a mass notification system (see Severe Storms)
 - Build safe rooms or shelters at public parks and mobile home parks.
 - Replace/Install tornado/emergency sirens to provide 95%+ coverage area in Miami Township.
 - Replace/Install tornado/emergency sirens in the City of Milford, Pierce Township, and Washington Township (The cities/villages and townships purchase/maintain sirens.).
 - Identify temporary/long-term shelters (see Winter Storms).
- **Landslide:** The following actions were identified.
 - Work with the Planning Department to develop standards and regulations for development in landslide prone areas. (vegetation and hill cutting)



Meeting Notes

- Work with the Planning Department to develop standards and regulations for development in landslide prone areas. (federal and state agencies)
- Work with the Engineer's office to create a memorandum of understanding with other Public Works Agencies / Road Departments.
- **Drought:** The following actions were identified.
 - Coordinate with the Fire Service Alliance for outreach concerning droughts and wildfires.
 - The current site layout of neighborhoods and homes is poor; a fire/buffer zone should surround the home. Work with the Planning Commission to create a buffer zone regulation to prevent the spread of wildfires.
 - Develop a map of sensitive populations.
 - Develop a PSA to define the use of dry hydrants (work with SWCD).
- **Earthquakes:** The following actions were identified.
 - Provide Education/Information on General Preparedness before, during, and after an Earthquake using Social Media.
 - Develop a mass communication system (see Severe Storms).
- **Hazardous Materials:** The following actions were identified.
 - A Commodity Flow Study will be performed to characterize the movement of hazardous materials transported through the County.
 - Develop a Water Source Protection Plan for William H. Harsha Lake.
 - Provide public awareness on the disposal/storage of batteries within a community and the county.
 - House De-con /HazMat Trailer for region (Washington Township).
 - Implement/Enforce a Wellhead Protection Plan (City of Milford).
- **Dam Failure:** The following actions were identified.
 - Encourage the development of Emergency Action Plans for each dam.
 - Provide public outreach through social media on dam safety.
- **Invasive Species:** The following actions were identified.
 - Public outreach / education on preventing the spread of invasive species



Meeting Notes

- Remove invasive vegetation from sensitive areas
- Continue to enforce the firewood movement ban for reducing the spread of Emerald Ash Borer and the Asian Longhorned Beetle.
- **Power Failures:** The following actions were identified.
 - Create/Maintain a Power Restoration Priority Plan for the county. This Plan should coordinate with all Critical Facilities the appropriate reporting mechanism during wide spread power outages. Specifically, Critical Care Facilities need to be included within the Plan (e.g. Nursing Homes, Hospitals, etc.).

Mitigation Activities - Prioritization

The next step for the plan is to prioritize the mitigation actions. This will be done through a ranking matrix. Once all actions have been received a set of eight categories will be used to further prioritize and rank the actions.

These include:

- **Cost Effective**
- **Technically Feasible**
- **Environmentally Sound**
- **Socially Equitable**
- **Meets Local Regulations**
- **Activities Reduce Risk**
- **Socially Acceptable**
- **Funding Available**

Each Category will be ranked 1 (low) – 3 (high). The score will be totaled up the highest scores will be the Hazard Mitigation Plan Action Items. The matrix below will be completed for each hazard on a county-wide basis.

Clermont County All Hazards Mitigation Plan	Cost Effective	Technically Feasible	Environmentally Sound	Socially Equitable	Meets Local Regulations	Activities Reduce Risk	Socially Acceptable	Funding Available	Total
Hazard									



Meeting Notes

Schedule / Path Forward

The group then discussed the next steps forward. There will be a slight change in schedule due to the inclusion of an extended review period discussed at the meeting.

The Core Group wishes to meet with County Departments to get their feedback on mitigation actions and strategies. A tentative date of December 19, 2012 was selected.

The Draft Plan will be provided to the available for review by stakeholder and the general public on January 11, 2013.

The Core Group wishes to meet with the Township Trustees to provide plan information and feedback. Pam Broughton, Carl Lamping, and John Menninger will attend the Township Trustees meeting in January 2013.

There will be a Public Meeting on February 7, 2013 to introduce the plan and solicit public comment. The meeting will be held at the Clermont County Engineers Conference Room 2381 Clermont Center Drive, Batavia, Ohio 45103 at 7:00 PM

Ms. Broughton also requested that Stakeholders provide a list of hours/cost incurred from work on the Hazard Mitigation Planning Process. This information will be used to provide the \$10,000 local in-kind match.

Key Action Items

Ms. Broughton and Stantec will continue to gather hazard information and Mitigation Actions, with additional data sources reviewed by Stantec and added to the risk analysis, as appropriate. The Draft Plan will be released for public comment on January 11th, 2013. The Plan will be posted on the Clermont County EMA webpage and hard copies will be posted at all 10 Public Library Branches. Comments can be submitted electronically via the EMA webpage, via e-mail to clermontema@clermontcountyohio.gov or in hard copy at any one of the library branches. There will be a public meeting to discuss the plan, which will be held on February 07, 2013.

The presentation and minutes will be reviewed and prepared for distribution.

The foregoing is considered to be a true and accurate record of the items discussed. If any discrepancies or inconsistencies are noted, please contact the writer immediately.

STANTEC CONSULTING SERVICES INC.

John Menninger, PE
Project Manager
John.Menninger@stantec.com

Stakeholder Involvement (Notified / Invited)

County Office's & Agencies	Municipality	FD & PD Department	Other Agency / Organization
Auditor's Office	Amelia, Village of	Amelia PD	American Modern Insurance Group
Board of County Commissioners	Batavia Township	Batavia PD	American Red Cross
Clerk of Courts, Common Pleas	Batavia, Village of	Bethel PD	CECOS
Clerk of Courts, Municipal	Bethel, Village of	Bethel-Tate FD	CERT
Clermont Transportation Connection	Felicity, Village of	Central Joint Fire & EMS District	Clermont ARES (CARES)
Common Pleas Court	Franklin Township	Felicity-Franklin FD	Clermont County Farm Service Agency
Community Planning and Development	Goshen Township	Goshen Township FD	Clermont County Chamber of Commerce
Community Planning and Development - GIS	Jackson Township	Goshen Township PD	Clermont County Educational Service Center
Coroner	Loveland, City of	Jackson Township FD	Clermont County Farm Service Agency
Department of Jobs & Family Services	Miami Township	Loveland FD	Clermont County Mental Health and Recovery Board
Developmental Disabilities	Milford, City of	Loveland PD	Clermont Senior Services
Division of Public Safety Services	Monroe Township	Miami Township FD	Community Journal
Division of Public Safety Services	Moscow, Village of	Miami Township PD	Core Risk Services (Cincinnati Bell)
Emergency Management Agency	New Richmond, Village of	Milford Community FD	Duke Energy
Engineer	Newtonsville, Village of	Monroe Township FD	Greater Cincinnati Hazardous Materials Unit
Facilities	Ohio Township	New Richmond FD	Long Term Recovery Committee
General Health District	Owensville Village	New Richmond PD	Mercy Clermont Hospital
Human Resources	Pierce Township	Ohio State Highway Patrol	Ohio Department of Natural Resource
Municipal Court	Stonelick Township	Owensville PD	Ohio Department of Transportation
Office of Environmental Quality	Tate Township	Pierce Township FD	Ohio Emergency Management Agency

County Office's & Agencies	Municipality	FD & PD Department	Other Agency / Organization
Office of Management and Budget	Union Township	Pierce Township PD	Ohio Environmental Protection Agency
Office of Public Information	Washington Township	Sheriff's Office	Ohio State University Extension
Office of Technology, Communications, and Security	Wayne Township	Stonelick Township FD	Tri-State CART
Permit Central / Building Department	Williamsburg Township	Union Township FD	UC Clermont
Probate / Juvenile Court	Williamsburg, Village of	Union Township PD	United Way of Greater Cincinnati
Prosecutor's Office		Washington Township FD	US Army Corps of Engineers
Recorder's Office		Wayne Township FD	
Sheriff's Office		Williamsburg PD	
Treasurer's Office		Williamsburg Township FD	
Veterans Service Commission			
Water Resource Department			
Brown County, OH			
Clinton County, OH			
Hamilton County, OH			
Warren County, OH			
Bracken County, KY			
Campbell County, KY			
Pendleton County, KY			

Public Comments

Section	Question	Comment	Date	Type
SECTION 3.0: ALL-HAZARD MITIGATION PLANNING PROCESS	In your opinion, was there sufficient stakeholder involvement?	I did not see law enforcement represented in the process.	1/21/2013	Survey Website
SECTION 3.0: ALL-HAZARD MITIGATION PLANNING PROCESS	In your opinion, was there sufficient stakeholder involvement?	More county jurisdictions and county employees.	1/18/2013	Survey Website
SECTION 3.0: ALL-HAZARD MITIGATION PLANNING PROCESS	In your opinion, are the hazards of concern appropriate for the County?	I know biological issues are not included, but I do not understand the Federal reasoning for this. Biological events such as H1N1, other pandemics, and SARs occur and are natural events, but are not considered a hazard. I think it is wrong to not address them when it is called an "All-Hazards" mitigation Plan and these are events known to have occurred.	2/21/2013	Survey Website
SECTION 3.0: ALL-HAZARD MITIGATION PLANNING PROCESS	Do the historical events listed represent the County's risk?	Again no list of biological incidents.	2/21/2013	Survey Website
SECTION 3.0: ALL-HAZARD MITIGATION PLANNING PROCESS	In your opinion, are the hazard prioritization rankings appropriate for the County and the local municipalities?	Needs to include biological.	2/21/2013	Survey Website
: SECTION 6.0: PLAN MAINTENANCE	Is the plan maintenance and update process sufficient?	Yes for the county, however would be nice to have an easier report for the public to read and evaluate - more like a summary/overview.	1/18/2013	Survey Website
: SECTION 6.0: PLAN MAINTENANCE	Is the plan maintenance and update process sufficient?	In respect to Hazmat mitigation, Paragraph 4.9.4 found on Page 62, I would suggest the following language in the last paragraph: "maintenance of a contract with GREATER CINCINNATI HAZMAT FOR EMERGENCY RESPONSE AND SUPPORT DURING A HAZARDOUS MATERIALS INCIDENT, AS WELL AS TRAINING EMERGENCY PERSONNEL IN PROPER MITIGATION TECHNIQUES."(Caps added here to highlight suggested language.)	1/18/2013	Survey Website

Clermont County All-Hazard Mitigation Plan – Community Feedback Survey

Community feedback is vital for the success of the Clermont County All-Hazard Mitigation Plan. The survey below is organized with the same sections as the Draft Plan. Please take a moment to complete each of the fields below and once complete place in the box adjacent to the Draft Plan. Thank you for taking time to provide feedback.

Section 1.0: Forward

This section is intended to provide an introduction to the All-Hazard Mitigation planning process.

Does this section clearly outline the purpose and scope of the plan?

Yes

No

If no, what additional information should be included?

Section 2.0: Clermont County History and Demographics

This section provides an overview of Clermont County, including the represented jurisdictions and populations.

Is the background and historical information accurate?

Yes

No

If no, what items should be corrected or added?

Are the relevant planning documents included?

Yes

No

If no, what documents should be included?

Section 3.0: All-Hazard Mitigation Planning Process

This section outlines the process used to develop the draft plan.

In your opinion, was there sufficient stakeholder involvement?

Yes

No

If no, what individuals/organizations should have been included in the process?

Section 4.0: Hazard Risk Assessment

This section outlines the specific hazards of concern for Clermont County. Based on the risk and vulnerability analysis, each hazard was ranked and prioritized.

In your opinion, are the hazards of concern appropriate for the County?

Yes

No

If no, what additional hazards should be included in the plan?

- Larger map on 4.56

Section 4.0: Hazard Risk Assessment

Do the historical events listed represent the County's risk?

Yes

No

If no, what specific events should be added?

In your opinion, are the hazard prioritization rankings appropriate for the County and the local municipalities?

Yes

No

If no, what are your recommended changes?

Section 5.0: Mitigation Actions

This section outlines the mitigation actions that were identified by the County and local municipalities. These actions help communities identify projects to reduce or mitigate the future impacts of a hazard.

Do you agree with the mitigation activities identified in the plan?

Yes

No

If no, what are your recommended changes?

Are there additional mitigation activities that should be added?

Yes

No

If yes, what activities should be added?

Section 6.0: Plan Maintenance

This section outlines the maintenance and update schedule for the plan.

Is the plan maintenance and update process sufficient?

Yes

No

If no, what are your recommended changes?

Clermont County All-Hazard Mitigation Plan – Community Feedback Survey

Community feedback is vital for the success of the Clermont County All-Hazard Mitigation Plan. The survey below is organized with the same sections as the Draft Plan. Please take a moment to complete each of the fields below and once complete place in the box adjacent to the Draft Plan. Thank you for taking time to provide feedback.

Section 1.0: Forward

This section is intended to provide an introduction to the All-Hazard Mitigation planning process.

Does this section clearly outline the purpose and scope of the plan? Yes No

If no, what additional information should be included?

Section 2.0: Clermont County History and Demographics

This section provides an overview of Clermont County, including the represented jurisdictions and populations.

Is the background and historical information accurate? Yes No

If no, what items should be corrected or added?

Are the relevant planning documents included? Yes No

If no, what documents should be included?

Section 3.0: All-Hazard Mitigation Planning Process

This section outlines the process used to develop the draft plan.

In your opinion, was there sufficient stakeholder involvement? Yes No

If no, what individuals/organizations should have been included in the process?

Section 4.0: Hazard Risk Assessment

This section outlines the specific hazards of concern for Clermont County. Based on the risk and vulnerability analysis, each hazard was ranked and prioritized.

In your opinion, are the hazards of concern appropriate for the County? Yes No

If no, what additional hazards should be included in the plan?

Section 4.0: Hazard Risk Assessment

Do the historical events listed represent the County's risk?

Yes No

If no, what specific events should be added?

In your opinion, are the hazard prioritization rankings appropriate for the County and the local municipalities?

Yes No

If no, what are your recommended changes?

Section 5.0: Mitigation Actions

This section outlines the mitigation actions that were identified by the County and local municipalities. These actions help communities identify projects to reduce or mitigate the future impacts of a hazard.

Do you agree with the mitigation activities identified in the plan?

Yes No

If no, what are your recommended changes?

Are there additional mitigation activities that should be added?

Yes No

If yes, what activities should be added?

Section 6.0: Plan Maintenance

This section outlines the maintenance and update schedule for the plan.

Is the plan maintenance and update process sufficient?

Yes No

If no, what are your recommended changes?

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All-Hazard Mitigation Plan

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Response Summary

Total Started Survey: 7
Total Finished Survey: 6 (85.7%)

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PAGE: SECTION 1.0: FORWARD

1. Does this section clearly outline the purpose and scope of the plan?

[Create Chart](#) [Download](#)

	Response Percent	Response Count
Yes	100.0%	7
No	0.0%	0
If no, what additional information should be included?		0
answered question		7
skipped question		0

[Show this Page Only](#)

PAGE: SECTION 2.0: CLERMONT COUNTY HISTORY AND DEMOGRAPHICS

2. Is the background and historical information accurate?

[Create Chart](#) [Download](#)

	Response Percent	Response Count
Yes	100.0%	7
No	0.0%	0
If no, what items should be corrected or added?		0
answered question		7
skipped question		0

3. Are the relevant planning documents included?

[Create Chart](#) [Download](#)

Response Response

	response Percent	response Count
Yes	100.0%	7
No	0.0%	0
If no, what documents should be included?		0
answered question		7
skipped question		0

Show this Page Only

PAGE: SECTION 3.0: ALL-HAZARD MITIGATION PLANNING PROCESS

4. In your opinion, was there sufficient stakeholder involvement? [Create Chart](#) [Download](#)

	Response Percent	Response Count
Yes	57.1%	4
No	42.9%	3
If no, what individuals/organizations should have been included in the process? Show Responses		3
answered question		7
skipped question		0

Show this Page Only

PAGE: SECTION 4.0: HAZARD RISK ASSESSMENT

5. In your opinion, are the hazards of concern appropriate for the County? [Create Chart](#) [Download](#)

	Response Percent	Response Count
Yes	85.7%	6
No	14.3%	1
If no, what additional hazards should be included in the plan? Show Responses		1
answered question		7
skipped question		0

6. Do the historical events listed represent the County's risk? [Create Chart](#) [Download](#)

	Response Percent	Response Count
Yes	85.7%	6

No	14.3%	1
If no, what specific events should be added? Show Responses		1
answered question		7
skipped question		0
7. In your opinion, are the hazard prioritization rankings appropriate for the County and the local municipalities? Create Chart Download		
	Response Percent	Response Count
Yes	85.7%	6
No	14.3%	1
If no, what are your recommended changes? Show Responses		1
answered question		7
skipped question		0

Show this Page Only

PAGE: SECTION 5.0: MITIGATION ACTIONS

8. Do you agree with the mitigation activities identified in the plan? Create Chart Download		
	Response Percent	Response Count
Yes	100.0%	7
No	0.0%	0
If no, what are your recommended changes?		0
answered question		7
skipped question		0
9. Are there additional mitigation activities that should be added? Create Chart Download		
	Response Percent	Response Count
Yes	14.3%	1
No	85.7%	6
If yes, what activities should be added?		0
answered question		7
skipped question		0

Show this Page Only

PAGE: SECTION 6.0: PLAN MAINTENANCE

10. Is the plan maintenance and update process sufficient?		
	Create Chart	Download
	Response Percent	Response Count
Yes	100.0%	7
No	0.0%	0
If no, what are your recommended changes? Show Responses		2
answered question		7
skipped question		0

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Clermont County All-Hazard Mitigation Plan

Community Feedback Requested



Community involvement and feedback is vital for the success of the Clermont County All-Hazard Mitigation Plan.

The Draft Plan is available at:

- <http://ema.clermontcountyohio.gov/MitigationPlan.aspx>
- The 10 Clermont County Library branches

The review and comment period will be open through February 22, 2013.

Comments can be submitted through the:

- Feedback Survey (<http://ema.clermontcountyohio.gov/MitigationPlan.aspx>)
- Feedback Form (located at the 10 Clermont County Library branches)

Get Involved:

- Read the Draft Clermont County All-Hazard Mitigation Plan
- Complete the feedback form or survey
- Attend the Public Meeting on February 7, 2013 at 7:00 pm.

Location: Clermont County Engineer's Office

(2381 Clermont Center Drive, Batavia, Ohio 45103)

Clermont County Emergency Management Agency

Office: 513.732.7661 Fax: 513.735.8546 Monday - Friday 8:00 am to 4:30 pm

E-mail: clermontema@clermontcountyohio.gov

Community Feedback Requested



Get Involved:

- Read the Clermont County All-Hazard Mitigation Plan
- Complete the feedback survey

Comments will be accepted through February 22, 2013



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Clermont County is in the process of updating the County All-Hazard Mitigation Plan. We are required to update the Hazard Mitigation Plan every 5 years in order to remain eligible for pre-disaster and post-disaster mitigation grant programs. The existing County Plan was adopted in 2006. We need each jurisdictions' participation in this process. There are a variety of ways to participate.

- Attend the scheduled meetings. We will host 5 meetings during the update process (listed below). The next meeting is scheduled for October 3, 2012 from 7 pm to 9 pm at the Clermont County Engineer's Office (2381 Clermont Center Drive, Batavia, Ohio 45103); This is meeting is open to the public.
- Provide comments and data via e-mail to clermontema@clermontcountyohio.gov or via phone at 513-732-7661. We are currently in need of information on existing or planned mitigation projects for each jurisdiction. Please submit this information by October 19th, 2012.
- Visit our website at ema.clermontcountyohio.gov/MitigationPlan.aspx for information and updates

All-Hazard Mitigation Plan Update Meeting Schedule:

Timeframe	Type of Meeting	Meeting Topic
July 20, 2012	Core Planning Team Kick-Off Meeting	
October 3, 2012	Public Hazard Vulnerability	
Mid October	Core Planning Team Hazard Prioritization	
Mid November	Core Planning Team Mitigation Strategy Review	
Mid December	Partners Draft Plan Presentation	

The All-Hazard Mitigation Plan Update is very important and has become an urgent priority. The State of Ohio has received a Presidential Declaration (FEMA-4077-DR) for the June 29 – July 2, 2012 severe storms and straight line winds. While Clermont County was not included in the disaster declaration, we are eligible for the Hazard Mitigation Grant Program Funds that become available due to the Declaration. A second e-mail will follow with information on the Hazard Mitigation Grant Program. We will also post this information on our website <http://ema.clermontcountyohio.gov/>.

Again, we want to thank you for your assistance to date and we encourage all of our partners to participate in the process as we move forward.

All Hazard Mitigation Plan - Emergency Management Agency of Clermont County, Ohio
ema.clermontcountyohio.gov
 Clermont County is updating the All-Hazard Mitigation Plan as required by 44 CFR Part 201.3 and the Robert T. Stafford Disaster Relief and Emergency

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Clermont County Emergency Management Agency

The role of the Emergency Management Agency is to coordinate activities to mitigate, prepare for, respond to, and recover from natural, accidental and technological disasters.

Announcements and Upcoming Events

2013 Weather Spotter Training Rescheduled

Meteorologists from the National Weather Service will provide free training to the citizens of Clermont County. Storm spotters play an important role in identifying and relaying storm related information to the County Emergency Management Agency (EMA), local public safety officials, and the National Weather Service.

Topics Include:

- How to safely observe storms
- How to identify important features of storms
- Visual clues that may precede tornado development
- How to make accurate and timely reports

Date: Thursday, March 28, 2013

Time: 6:30 PM - 8:30 PM

Location:



Our Websites:

- [Contact Us](#)
- [LEPC](#)
- [Tornado Recovery](#)
- [Warning Sirens](#)
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All Hazard Mitigation Plan

Clermont County is updating the All-Hazard Mitigation Plan as required by 44 CFR Part 201.3 and the Robert T. Stafford Disaster Relief and Emergency Assistance Act. Local jurisdictions are required to update the Plan every 5 years in order to remain eligible for pre-disaster and post-disaster mitigation grant programs.

Community involvement and feedback is vital to the success of the Clermont County All-Hazard Mitigation Plan.

Get Involved:

- Read the **2013 Draft All-Hazard Mitigation Plan**. Hard copies of the Plan are available at the Clermont County Library Branches.
- Complete the **feedback survey**. The comment period will be open through February 22, 2013.
- **Attend the Public Meeting.**

Date: February 7, 2013 at 7:00 pm.
Location: Clermont County Engineer's Office
2381 Clermont Center Drive, Batavia, OH 45103

Meeting Notes

- 07-20-12 Kick Off Meeting
- 10-03-12 Public Meeting
- 10-03-12 Public Meeting - Presentation
- 10-31-12 Hazard Prioritization Meeting
- 10-31-12 Hazard Prioritization Presentation
- 12-07-12 Mitigation Strategies Meeting
- 12-07-12 Mitigation Strategies Presentation

2006 All-Hazard Mitigation Plan

- Letter
- Cover
- Table of Contents
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- Appendices

Frequently Asked Questions

- What is hazard mitigation?
- What is the hazard mitigation planning process?
- What is the purpose of hazard mitigation planning?
- What is the benefit of hazard mitigation planning?
- What laws govern the hazard mitigation planning process?
- Why develop a Hazard Mitigation Plan?
- What hazards are to be considered in the plan?
- What is Clermont County doing to make it more resilient to hazards?
- Where can I find additional information about hazard mitigation planning?



Commissioners Bob Proud, Ed Humphrey, and David Uible

What's Inside:

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**Labor Day is Monday,
September 3 2012 -
Clermont County
government offices will be
closed**

**Check out
Clermont County online!**

www.ClermontCountyOhio.gov



Strut Your Mutt Promises to be a Tail Waggin' Good Time!

If you have a dog that likes to dress up in costume (or not), can dance, smile, bark on command, or do any other impressive trick, or if you just love dogs, you will want to come to the second annual **Strut Your Mutt** event! Tri-State CART (County Animal Response Team) invites you and your four-legged friends to **Strut Your Mutt** on Sunday, September 23, 2012 on Front Street in New Richmond; the **Strut** will run from noon through 6 p.m. "The **Strut** is a fun day of activities for all members of the family, especially for your dogs and your kids," said Tri-State CART Executive Director and Co-founder Bonnie Morrison.



"Last year, we had a hot dog eating contest for kids, which was so much fun to watch," said Morrison. "This year, we're adding a hot dog eating contest for adults as well! And of course, this is **Strut Your Mutt**, so the hot dogs have to be eaten from dog dishes!"

Tri-State CART, in conjunction with the Clermont Emergency Management Agency, is part of



Mobile Disaster Vehicle

Clermont County Citizen Corps, a non-profit disaster response team that focuses on the care of animals during times of disaster. Last years' **Strut Your Mutt** event proceeds allowed CART to

There will be pet parade down Front Street at 2 p.m.; any pet is invited to take part – dogs, cats, rabbits, miniature ponies – as long as your pet is on a non-retractable leash. Other event highlights include live music, vendors, raffles, Canine Good Citizen testing, and all types of demonstrations, including dog agility. Various local rescue groups will be in attendance, some with dogs and cats available for adoption. One of the most popular attractions at last years' **Strut** was the pet communicator, who will be back again this year. The Clermont County Sheriff's Office K-9 unit will also be giving a demonstration with some of their police dogs.

purchase a mobile disaster vehicle, which will be invaluable during actual emergencies. "The vehicle is outfitted with crates, an area for administering medical care to the animals, a grooming area – everything we need to provide the best care possible," said Morrison. There is no cost to attend **Strut Your Mutt**; for more information about Tri-State CART or **Strut Your Mutt**, visit the website www.TriStateCART.com, or call 702-8373.

Click here to watch a video about Tri-State CART and Strut Your Mutt:
www.clermontcountyohio.gov/video0812CART.aspx

The USDA Encourages the Public to Report ALB Sightings

The United States Department of Agriculture's (USDA) Animal and Plant Health Inspection Service (APHIS) asks the public to be on the lookout for the Asian Longhorned Beetle (ALB)! Since the spread of ALB to Stonelick Township from the Bethel area, APHIS encourages citizens to become familiar with the signs ALB could be present in trees on your property.



try to capture it in a jar and place it in the freezer to preserve the insect for APHIS staff to determine if it is actually an ALB.

Another way to prevent ALB from spreading to other parts of the county and state, remember that the quarantine restricting the movement of firewood from infested areas is still in place. Hardwood

logs, firewood, stumps, roots, and branches are not to be removed from the regulated area. All of Tate Township, and parts of Monroe and Stonelick Townships are still under quarantine.

Adult beetles are most active during the summer and early fall, making September one of the peak times for emergence of this invasive pest. They can be seen on trees, branches, walls, outdoor furniture, cars, sidewalks, or even caught in pool filters. The ALB has unique characteristics, making it easy to identify.

The ALB is an invasive insect from Asia that came to the U.S. concealed in solid wood packing material used to transport goods overseas. ALB was first detected in Clermont County in June 2011.

The ALB is 1 to 1 1/2 inches in length, has long antennae with black and white bands (the antennae are longer than the beetle's body), has a shiny jet black body with random white spots, and six legs that may appear blue in color.

If you think you see signs of ALB in the trees on your property, or see an insect that you believe may be ALB, please call the local ALB Cooperative Program at 831-7180, or the USDA at 1-866-702-9938. Visit the website www.BeeleBusters.info for more information about ALB.

In addition to identifying the ALB, it is important to recognize signs ALB might be present on your property. Infested trees may have dime-sized, perfectly round exits holes in the trunk or branches, and oval depressions on the bark where the eggs are laid. You may also find sawdust-like material, called frass, on the ground and branches, and find sap seeping from wounds in the tree.



Pictured here are the dime-sized, perfectly round holes in the tree trunk, a sign of ALB

The best way to prevent further infestation is to report signs of ALB immediately. If you find a beetle,

Clermont Commissioners September Sessions

Wednesday, September 5	3 p.m.
Wednesday, September 12	10 a.m.
Monday, Sept. 17 (Informal)	10 a.m.
Wednesday, September 19	10 a.m.
Monday, Sept. 24 (Informal)	10 a.m.
Wednesday, September 26	10 a.m.

*Watch Commissioner sessions online at:
www.clermontcountyohio.gov; click on Video
Library.*

For more information about the Board of Clermont County Commissioners, call 732-7300



2275 Bauer Road Batavia, Ohio 45103 Phone: (513) 732-7213 www.permit.ClermontCountyOhio.gov

Fire Prevention: Brush Fires by Bruce Crase, Permit Central

Local fire departments in the United States respond to thousands brush and forest fires per year, according to the U.S. Fire Administration's National Fire Incident Reporting System. This is why it's critical to take a few preventative safety steps to safeguard your home, business, and personal property from brush related fires.



Landscaping is a great way to limit exposure to possible brush fires. Simply by keeping bushes and hedges below three feet will avoid overgrowth that can catch fire.

Keeping tree canopies greater than eight feet will assist in avoiding a fire that starts on the surface from reaching branches and your residence. Additionally, trimming shrubs and trees can improve the security of your residence because there are fewer places for intruders to conceal themselves. You might also want to keep branches and other vegetation away from siding and the roof to avoid a fire from spreading to the home. The use of a non-combustible material (such as gravel) instead of organic mulch near edges can help prevent various structure related fires.

The use of fire-resistant siding, screened or ember-resistant vents, and attachments, such as fences, decks and porches, can help avoid brush fires from spreading to your residence. Also, roofs constructed of Class A asphalt shingles, metal, clay tile, or concrete products also significantly reduce the chance of a tree or shrub from igniting your home. Even though these materials will improve the fire-resistance of your home, their effec-

tiveness will slowly diminish if you don't occasionally inspect your roof for breaks or other gaps between tiles and clean out the gutter system for your residence.

Although this may seem like a lot of work, it should really be one of your main priorities because leaves and other debris that gets trapped in these places can easily start a fire. Keep flammable materials away, many brush fires are caused by smoky objects, such as cigarettes, on the ground. Smoking items should always be disposed of in a fire-resistant container. You should also stay away from using fire pits, chimneys, and other outdoor fireplaces near your residence.

If you plan to hold a camp fire make certain it is in a safe distance from your residence and call your local fire department to find out if you will need a burn permit. Another device that can cause brushfires is outdoor grills and other cooking apparatuses. Outdoor grills should



always be kept at least ten feet from any structures. When the grill is not being used, be sure the propane tanks have all their valves fully closed and kept in a cool location. Fireworks are also another high statistic behind brush fires.

Know that fire damaged structures do require building permits; always check with local village or township ordinances for any zoning regulations prior to performing any repairs. For projects that require permits the owner or owner's agent should first make application by calling Clermont County Permit Central at 732-7213; visit the website www.permit.clermontcountyohio.gov for more information.

Emergency Management Agency News, by Pam Broughton, EMA Director

All-Hazard Mitigation Plan

Clermont County is updating the All-Hazard Mitigation Plan as required by 44 CFR Part 201.3 and the Robert T. Stafford Disaster Relief and Emergency Assistance Act. Local jurisdictions are required to update the plan every five years in order to remain eligible for pre-disaster and post-disaster mitigation grant programs.

The purpose of All-Hazard Mitigation Planning is to:

- Identify the hazards that impact Clermont County, including the cities, villages, and townships within the county;
- Identify actions and activities to reduce any losses from those hazards; and
- Establish a coordinated process to implement the plan.

The benefits include:

- Assisting local communities with reducing risks by identifying vulnerabilities and developing strategies to lessen and/or eliminate the effects of a potential hazard;
- Building partnerships and reducing duplication of efforts among organizations with similar or overlapping goals;
- Creating more sustainable and disaster-resistant communities;
- Communicating needs to state and federal officials when funding becomes available, particularly after a disaster; and
- Increasing public awareness of local hazards and disaster preparedness.

We are very interested in community feedback. There are a variety of ways to participate in this process.

- Attend the public forum on October 3, 2012 from 7 p.m. to 9 p.m. at the Clermont County Engineer's Office (2381 Clermont Center Drive, Batavia, Ohio 45103);
- Visit our website at www.ema.clermontcountyohio.gov/MitigationPlan.aspx; or
- Provide comments via e-mail to clermontema@clermontcountyohio.gov or phone at 732-7661.

National Preparedness Month

September is National Preparedness Month.

This year's theme is *Pledge to Prepare*

-Awareness to Action to

encourage Americans

to take steps to prepare

for emergencies in their

homes, schools, organi-

zations, businesses, and communities.

We are encourag-

ing the citizens and visitors of Clermont County to:

- Learn about the local hazards and the appropriate response;
- Make a communications plan;
- Build an emergency supply kit;
- Get involved in preparedness in the community.

For more information visit:

www.clermontcitizen corps.org or www.ready.gov



Ohio Safe Room Rebate Program

In light of the recent tornados and high wind events, Ohio Emergency Management Agency has launched the Ohio Safe Room Rebate Program. The Program provides a rebate to Ohio homeowners for the purchase and installation of safe rooms.

Homeowners that are selected for the program are eligible for a rebate of 87.5 percent of the cost to purchase, install and/or construct a safe room up to a maximum of \$6,000. The deadline to apply is October 1, 2012.

Safe rooms are defined as any above or below ground shelter which meet or exceed the requirements outlined in FEMA Publication 320 and/or 361.

Interested residents will apply directly to Ohio EMA at:

<https://ohiosharpp.ema.state.oh.us/ohiosafesroomrebate/>

Check out a new edition to the Clermont Today monthly newsletter - the Ohio Valley Long Term Recovery Committee Newsletter! View the LTRC newsletter on the next three pages...



Mission:

To assist the people of the Ohio Valley to recover from and restore their lives after any disaster in a timely manner.

Partners:

Adventist Community Services
All Saints Lutheran Church
American Red Cross
Brown County Department of Economic Development
Brown County EMA
Catholic Charities of South Western Ohio
Church of Scientology
Citizen Advocates
Clermont County Board of Developmental Disabilities
Clermont County Department of Community & Economic Development
Clermont County EMA
Clermont County Mental Health and Recovery Board
Clermont County Office of Public Information
Clermont County Permit Central/ Building Inspection
Cranston Memorial Presbyterian
Episcopal Diocese of Southern Ohio
Federal Home Loan Bank
Grant Memorial United Methodist Church
Jackson Area Ministries
Lutheran Disaster Response
Matthew 25 Ministries
Ohio EMA
Ohio Governor John Kasich's Office
Ohio Senator Tom Niehaus
Ohio VOAD
Park National Bank
People Working Corporately
Presbyterian Churches
Representative Jean Schmidt's Office
River Valley Ecumenical Churches
Saint Vincent de Paul
Tri-State COAD
Tri-State Habitat for Humanity
Two Men and a Truck
United Church of Christ
United Methodist Churches
United Way of Greater Cincinnati
U.S. Department of Agriculture, Rural Development
U.S. Senator Rob Portman's Office
U.S. Senator Sherrod Brown's Office
Village of Moscow

LTRC Officers:

Chair: Jim Dinkel
Vice-Chair: Beth Nevel
Secretary: Pam Broughton
Treasurer: Kathy Coulson

Ohio Valley LTRC

ISSUE 1

SEPTEMBER 2012

What is a Long Term Recovery Committee?

The LTRC is a cooperative body that is made up of representatives from faith-based, non-profit, government, business, and other organizations working within a community to assist individuals and families as they recover from a disaster. The goal of the LTRC is to unite recovery resources with the community need in order to ensure that even the most vulnerable in the community recover from the disaster.

The LTRC focuses on four mission areas: Disaster Case Management, Donations Management, Volunteer Management, and Spiritual and Emotional Support.

Disaster Case Management is a time-limited process by which a skilled helper (Disaster Case Manager) partners with a disaster affected individual or family (Client) to plan



Village of Moscow following the March 2, 2012 Tornado.

for and achieve realistic goals for recovery following a disaster.

Donations management provides a comprehensive process that organizes the giving, receiving and distribution of both solicited and unsolicited donated goods so that the maximum benefit is derived for the disaster survivors.

Volunteer Management is a key

component of disaster recovery. Since volunteers come with variety of skill sets, it is important to place volunteers in roles that fit their ability. Those skills and abilities may include but are not limited to: debris removal, cleaning out homes, repairing and rebuilding homes, case management, program leadership, office skills, as well as professional services such as legal advice, accounting and computer expertise.

Spiritual and Emotional Support are critical in times of disaster because people lose their sense of safety and security. Moments like these require spiritual and emotional care teams to provide comfort, hope and help. Disaster victims are often vulnerable and hurting and simply need a listening ear to bring relief to stresses brought on by loss.

For additional information on the Ohio Valley LTRC efforts, go to www.ema.clermontcountyohio.gov.

Are You Ready? Before and After the Disaster

Are you better prepared today than you were on March 2, 2012?

If the answer is no, come join us:

Tuesday, September 11, 2012

7:00 PM to 9:00 PM

River Valley Community Center

30 Wells Street

Moscow, Ohio 45153

Topics include:

- **GETTING THE MOST BANG FOR THE BUCK**
- **PURCHASING INSURANCE AND NEGOTIATING WITH ADJUSTERS**
- **CHOOSING A CONTRACTOR**
- **DISASTER PREPAREDNESS FOR THE FUTURE**

This event is sponsored by the Ohio Valley Long Term Recovery Committee.

All are welcome! Refreshments and door prizes will be provided.

A Partner's Message...



Catholic Charities of South Western Ohio and the St. Martin District Council of St. Vincent DePaul are proud to be a part of the restoration. We hope to ease the burdens of our neighbors in need by helping them to rebuild

their homes, their lives, and their spirits.

Both agencies are committed to ensuring that the people in Moscow and surrounding areas are reestablished to the position they were in before the tornado.

These organizations have a long history of assisting families in need. They have helped individuals and families rebuild their lives by providing rent and

utility assistance, trailer moving and payments, a furnace, and new appliances to those families with needs identified by the LTRC Case Manager.



“They've been tremendous to us...things are working their way out... thanks so much for your thoughtfulness ...”



Volunteer Accomplishments

In the Village of Moscow, we have had many volunteer groups working to rebuild Moscow. These groups have:

- Cleaned park and public areas of tree and storm debris;
- Replaced damaged shingles on the Park Picnic Shelter;

- Placed mulch on the plant beds throughout the park;

- Fed, watered, and edged the tree nursery;
- Constructed and painted the “Replant Moscow” Sign;
- Created park benches from fallen timbers;
- Removed damaged sidewalks and created frames for new

sidewalks;

- Guttered homes to prepare for rebuilding;
- Reclaimed historical bricks from demolished homes; and
- Picked up trash and debris from farmland.

The volunteer efforts have been invaluable to the restoration of the Village of Moscow.

Replant Moscow: Volunteers Needed

Moscow, once known for its tree line streets and shady parks, has lost its shade, noise barriers from the highway and railroad and the peacefulness created by the hundreds of green trees.

Join us on September 14 and 15, 2012 to help us plant, water and mulch trees in the Village of

Moscow. There is heavy, medium and light work to be done; whatever your pace.

Fun, laughter and lunch are promised for all who want to join us on September 14 and 15.

Meet at the Community Center at 9:00 AM. Work shoes, hat

and gloves are a must. There is a prize for the most outlandish work hat!

To register, call Susan at 513-553-4200.



Six Month Progress Report

The tremendous outpouring from citizens, the private sector, non-profit agencies, and the faith-based community has brought great healing. The volunteer hours, financial contributions, and donated goods have helped to rebuild lives, homes and families.



Two Men and a Truck offloading donated goods at the Disaster Donation Center.

Rebuilding lives: Many of the survivors that were displaced by the March 2, 2012 tornado have either resettled into a different home or are about to move back to their homes that have been rebuilt.

Rebuilding homes: The LTRC has partnered with Mr. Mattress, Furniture Fair, The Batavia Rotary, St. Vincent de Paul, Catholic

Charities of South Western Ohio, and other faith-based organizations in our community to provide vouchers for families that were under or uninsured to replace mattresses, refrigerators, stoves, dish washers, and washers and dryers.

Household items such as linens, towels, cookware, cleaning supplies, baby needs, and water were provided by donations from the public and coordinated by the Donation Management Team that operated from the Red Barn Disaster Donation Center.

Rebuilding Families: The LTRC has assisted more than 56 individuals and families that have been impacted by the March 2 tornado, the Brown County flash flood, and the June 29 Wind-storm. Of the 56 cases, 40 cases have been closed. The LTRC will continue to operate until all of the cases are closed.



Ohio Valley Long Term Recovery Committee

For Additional Information:

Ohio Valley LTRC
2238 State Route 756
Moscow, Ohio 45153

Phone: 513-528-0412
www.ema.clermontcountyohio.gov



Thank You

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Clermont County updates All-Hazard Mitigation Plan & Requests Public Feedback | News

Title (Max 100 Characters)

Clermont County updates All-Hazard Mitigation Plan & Requests Public Feedback

 Submitted by [kkinlev \(profile/70205/kkinlev\)](#), Neighborhood Reporter
Wednesday, January 2nd, 2013, 10:12am

0	0
<input type="button" value="Like"/>	<input type="button" value="Tweet"/>
Print (#)	E-mail (#)

Topics: [News \(news/news\)](#)



BATAVIA, OH (FOX19) - Clermont County governmental agencies have partnered with the local Townships, Villages, and Cities to update the All-Hazard Mitigation Plan.

The All-Hazard Mitigation Plan is required by 44 Code of Federal Regulations (CFR) Part 201.3 and the Robert T. Stafford Disaster Relief and Emergency Assistance Act. Local jurisdictions are required to update the plan every 5 years in order to remain eligible for pre-disaster and post-disaster mitigation grant programs.

The All-Hazard Mitigation Plan increases public awareness of local hazards and helps the county communicate local needs to state and federal officials when funding becomes available, particularly following a disaster.

Local communities and residents of Clermont County are invited to review the plan and provide feedback. Comments can be submitted through:

- The EMA webpage <http://ema.clermontcountyohio.gov/MitigationPlan.aspx> (<http://ema.clermontcountyohio.gov/MitigationPlan.aspx>)
- E-mail clermontema@clermontcountyohio.gov (<mailto:clermontema@clermontcountyohio.gov>)
- Fax (513-735-8546)
- Completing a feedback form at one of the library branches
- Attending the public forum on Thursday, February 7th, 2013 at 7:00 pm.

The public forum meeting will be held at the Clermont County Engineer's Office located at 2381 Clermont Center Drive in Batavia. All are welcome to attend. The review and comment period will be open from January 11th through February 22nd, 2013.

The plan will be available for review and comment on at the website <http://ema.clermontcountyohio.gov/MitigationPlan.aspx> (<http://ema.clermontcountyohio.gov/MitigationPlan.aspx>) after January 14, 2013.

Topics: [News \(news/news\)](#)

[\(#\)](#) [\(#\)](#) [\(#\)](#) [\(#\)](#)

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Enter text right here!

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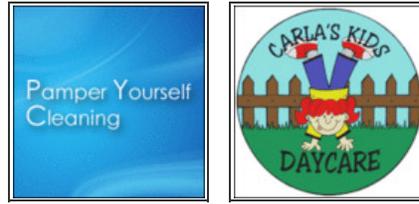
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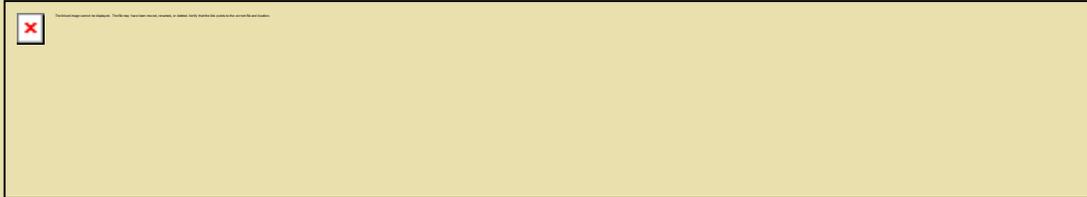
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Upcoming Events near Clermont County

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- [/h/events?ct=d&evid=282033603](#) **Rain Garden**
- [/h/events?ct=d&evid=282033603](#) **End Reunion**
- [/h/events?ct=d&evid=282033603](#) **Workshop**
- [/h/events?ct=d&evid=273541245](#) **Drew & Willy D's Acoustic**
- [/h/events?ct=d&evid=273541245](#) **Rock & Soul Duo - Drew**
- [/h/events?ct=d&evid=273541245](#) **Lanius - Willy D**

From: Meagher, Annette
Sent: Friday, January 11, 2013 8:30 AM
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CLERMONT COUNTY TODAY E-NEWS

JANUARY 2013

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[Be Healthier in the New Year](#)

[Recycle Your Holiday Trash](#)

[Eco-Friendly Ways to Fight Winter Ice](#)

[Local Students Using Art to Promote Water Conservation](#)

[County Updates All-Hazard Mitigation Plan & Requests Public Feedback](#)

[Traffic Improvement Projects Benefit Eastgate](#)

[Public Education & Involvement Necessary to Combat Local Drug Abuse](#)

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[Clermont County 2012 Year in Review Holiday Tribute](#)

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Feature Story

HAPPY NEW YEAR!



A new year is here! The Board of Clermont County Commissioners would like to wish you a happy new year and extend our sincere gratitude for your support and involvement in the county.

Local Students Using Art to Promote Water Conservation

Bethel-Tate High School art teacher Meggie Bierkan and her Advanced Sculpture and Ceramics class will partner with the Regional Stormwater Collaborative of Southwest Ohio and Northern Kentucky to paint rain barrels.



The hope is that by making rain barrels visually appealing, people will be enticed to conserve water and protect our environment.

"The one drawback to rain barrels is that they're not the prettiest things in the world," said Ken Perica, The Regional Stormwater Collaborative public relations consultant. "We thought, why not take these dull and drab rain barrels and turn them into a showcase piece of artwork?"

Read an article written by Roxanna Blevins of the Community Press [here](#).

Click [here](#) to learn how to become involved in this program.

County Updates All-Hazard Mitigation Plan & Requests Public Feedback

Clermont County governmental agencies have partnered with the local Townships, Villages, and Cities to update the county All-Hazard Mitigation Plan. Local jurisdictions are required to update the plan every 5 years in order to remain eligible for pre-disaster and post-disaster mitigation grant programs. In order to gain a sense of public opinion, the county is requesting public participation and feedback.



The Clermont County Emergency Response Management Agency Director, Pam Broughton, stated "The public review and comment period of the mitigation planning process gives citizens a real voice in developing and implementing the plan, it provides an opportunity to include public advice and suggestions." The planning process is designed to help communities identify hazards and develop strategies to lessen or eliminate risks. The plan helps to strengthen partnerships and reduce duplicated efforts among organizations with similar or overlapping goals. A draft copy of the plan will be available for public review and comment the week of January 14, 2013. [Read more...](#)



Clermont County Township Association

Clermont County, Ohio

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Clermont County Township Association Meeting

January 17, 2013

Host: Batavia Township

Meeting was called to order at 19:04 by Association President Bonnie Batchler. Sign in sheet recorded attendance. Eleven out of the fourteen Townships were represented with seventeen guests and associate members present.

Speaker Pam Broughton, of Clermont County Emergency Management Agency spoke about the County's All Hazard Mitigation Plan. The committee is currently working on a draft plan for the County. Participation in the plan is necessary for a Township to receive FEMA funding when needed.

Speaker Lauren Smalley, Public Information Officer with the Public Utilities Commission of Ohio (PUCO) spoke on electric supplier deregulation and choice for electric supply.

Jeff Graham of Mercy Clermont Hospital gave a presentation on the hospital's expansion of the emergency department, the future of healthcare and their rating as a top 100 community hospital in the US.

Marty Lambert: March's meeting will be with the Health Department and she will need to select two new Board Members.

Appointment to Terrorism Advisory Team: Guy Bainum and Carl Schultz will continue to serve.

Ernie Ramos, Clermont County Prosecutor's Office: in to serve us better, he has come up with an outline and form of how to contact him for information.

Motion made by Carl Schultz to approve the Minutes from the November 15, 2012 meeting. Seconded by Bob McGee. All in favor.

Beth Nevel gave Treasurer's report with a balance of \$ 7,787.28.

Ed Humphrey asked for any updates to Township's contact information to be forwarded to him ASAP to help keep the website information current.

Kermit Beckworth to head the banquet committee again for this year. The meetings will be held on Saturday mornings at Batavia Township.

Motion to adjourn at 20:08 by Frank Renn. Seconded by Bob McGee.

County Updates All-Hazard Mitigation Plan & Requests Public Feedback

Immediate Release

January 18, 2013

County Updates All-Hazard Mitigation Plan & Requests Public Feedback

Batavia, Ohio. Clermont County governmental agencies have partnered with the local Townships, Villages, and Cities to update the county All-Hazard Mitigation Plan. The All-Hazard Mitigation Plan is required by 44 Code of Federal Regulations (CFR) Part 201.3 and the Robert T. Stafford Disaster Relief and Emergency Assistance Act. Local jurisdictions are required to update the plan every 5 years in order to remain eligible for pre-disaster and post-disaster mitigation grant programs. In order to gain a sense of public opinion, the county is requesting public participation and feedback.



The Clermont County Emergency Management Agency (EMA) Director, Pam Broughton, stated *“The public review and comment period of the mitigation planning process gives citizens a real voice in developing and implementing the plan, it provides an opportunity to include public advice and suggestions.”* The planning process is designed to help communities identify hazards and develop strategies to lessen or eliminate risks. The plan helps to strengthen partnerships and reduce duplicated efforts among organizations with similar or overlapping goals.

As the end of the six month planning process approaches, the EMA plans to release a draft copy of the mitigation plan the week of January 14, 2013 for public review and comment. Local communities and residents of Clermont County are invited to review the plan and provide feedback.

The report can be obtained and public comments can be submitted via:

- The EMA webpage <http://ema.clermontcountyohio.gov/MitigationPlan.aspx>
- E-mail the EMA at: clermontema@clermontcountyohio.gov
- Fax the EMA at 513-735-8546
- Visiting one of Clermont County Library branches
<http://www.clermontlibrary.org/location.shtml>
- Attend the public forum scheduled for Thursday, February 7, 2013 at 7:00 pm.
The meeting will be held at the Clermont County Engineer's Office
2381 Clermont Center Drive, Batavia, Ohio 45103

The Clermont County EMA is very interested in community feedback and all are welcome to attend the public forum on February 7, 2013. The All-Hazard Mitigation Plan increases public awareness of local hazards and helps the county communicate local needs to state and federal officials when funding becomes available, particularly following a disaster. The review and comment period will be open until February 22, 2013.

Content Provided By: Pam Broughton, Clermont County EMA Director

###

For additional information about this or other county news, contact Clermont County Communications Director, Annette Meagher at (513) 732-7557 or by e-mail, ameagher@clermontcountyohio.gov

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Friday, January 18, 2013

County updates all-hazard mitigation plan, requests public feedback

Contributed By: [Annette Meagher](#) | Clermont County, Ohio

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Clermont County governmental agencies have partnered with the local townships, villages and cities to update the county All-Hazard Mitigation Plan.

The All-Hazard Mitigation Plan is required by 44 Code of Federal Regulations Part 201.3 and the Robert T. Stafford Disaster Relief and Emergency Assistance Act. Local jurisdictions are required to update the plan every five years in order to remain eligible for pre-disaster and post-disaster mitigation grant programs. In order to gain a sense of public opinion, the county is requesting public participation and feedback.

"The public review and comment period of the mitigation planning process gives citizens a real voice in developing and implementing the plan, it provides an opportunity to include public advice and suggestions," said Pam Broughton, director of the Clermont County Emergency Management Agency.

The planning process is designed to help communities identify hazards and develop strategies to lessen or eliminate risks. The plan helps to strengthen partnerships and reduce duplicated efforts among organizations with similar or overlapping goals.

As the end of the six-month planning process approaches, the EMA plans to release a draft copy of the mitigation plan Jan. 14 for public review and comment. Local communities and residents of Clermont County are invited to review the plan and provide feedback.

The report can be obtained and public comments can be submitted via:

- The EMA webpage <http://ema.clermontcountyohio.gov/MitigationPlan.aspx>
- E-mail the EMA at: clermontema@clermontcountyohio.gov
- Fax the EMA at 513-735-8546
- Visiting one of the 10 Clermont County Library branches <http://www.clermontlibrary.org/location.shtml>
- Attend the public forum scheduled for 7 p.m. Thursday, Feb. 7, at the Clermont County Engineer's Office, 2381 Clermont Center Drive in Batavia. All are welcome to attend.

The Clermont County EMA is interested in community feedback. The All-Hazard Mitigation Plan increases public awareness of local hazards and helps the county communicate local needs to state and federal officials when funding becomes available, particularly following a disaster. The review and comment period will be open until Feb. 22.



Clermont County Sheriff's Deputy Jeff Sellars patrols flooded streets during the 1997 flood event in Clermont County.

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Mitigation plan feedback sought

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Clermont County Emergency Management Agency officials are interested in community feedback on the All-Hazard Mitigation Plan.

The plan must be updated every 5 years for the county to remain eligible for pre- and post-disaster mitigation grant programs. The review and comment period is open through Feb. 22.

EMA officials are working with township, village and city leaders to update the plan, which is required by federal regulations.

"The public review and comment period of the mitigation planning process gives citizens a real voice in developing and implementing the plan, it provides an opportunity to include public advice and suggestions," said Clermont County Emergency Management Agency Director Pam Broughton.

The planning process is designed to help communities identify hazards and develop strategies to lessen or eliminate risks. The plan helps strengthen partnerships and reduce duplicated efforts among organizations with similar or overlapping goals.

The report can be read at <http://bit.ly/13QoZXt>. Hard copies are available at the 10 Clermont County Public Library branches.

Complete the feedback survey at <http://svy.mk/W6B34t>. Hard copies of the feedback survey are available at the libraries.

A final public meeting is set for 7 p.m. Feb. 7, at the Clermont County Engineer's Office, 2381 Clermont Center Drive in Batavia. All are welcome to attend.



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Appendix C

Storm Events

National Climatic Data Center Storm Events

County	End Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage (\$)	Crop Damage (\$)
OHZ026 - 034>035 - 042>046 - 051>056 - 060>065 - 070>074 - 077>082 - 088		Drought	01-Jul-99	12:00:00 AM	0	0	0	0	0
OHZ026 - 034>035 - 042>046 - 051>056 - 060>065 - 070>074 - 077>082 - 088		Drought	01-Aug-99	12:00:00 AM	0	0	0	0	0
OHZ026 - 034>035 - 042>046 - 051>056 - 060>065 - 070>074 - 077>082 - 088		Excessive Heat	20-Jul-99	12:00:00 AM	0	13	0	0	0
OHZ071 - 078>082 - 088		Excessive Heat	07-Aug-07	16:00:00 PM	0	0	0	0K	0K
OHZ061 - 070 - 078		Excessive Heat	23-Aug-07	04:00:00 AM	0	0	0	0K	0K
OHZ001>088		Extreme Cold	11-Feb-95	2000	0	4	0	100K	0
OHZ001>088		Extreme Cold	09-Dec-95	1200	0	0	1	2K	0
OHZ015>016 - 024>026 - 034>035 - 042>046 - 051>056 - 060>065 - 070>074 - 077>082 - 088		Extreme Cold	01-Feb-96	06:00:00 PM	0	0	0	1.26M	0
CLERMONT		Flash Flood	16-Aug-93	1730	0	0	1	500K	0
CLERMONT		Flash Flood	10-Apr-94	0720	0	0	0	500K	0
CLERMONT		Flash Flood	18-May-95	0935	0	0	0	7	0

National Climatic Data Center Storm Events

County	End Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage (\$)	Crop Damage (\$)
CLERMONT	Countywide	Flash Flood	24-May-95	2000	0	0	0	6K	0
CLERMONT		Flash Flood	24-May-95	2300	0	0	0	5K	0
CLERMONT	Countywide	Flash Flood	28-May-95	2345	0	0	0	4K	0
CLERMONT		Flash Flood	29-May-95	0300	0	0	0	7K	0
CLERMONT		Flash Flood	01-Jun-95	2131	0	0	0	5K	0
CLERMONT		Flash Flood	17-Jun-95	1830	0	0	0	7K	0
CLERMONT		Flash Flood	09-Aug-95	2000	0	0	0	5K	0
CLERMONT	Edenton	Flash Flood	29-Apr-96	07:00:00 AM	0	0	0	2K	0
CLERMONT	Countywide	Flash Flood	04-May-96	01:30:00 AM	0	0	0	10K	0
CLERMONT	Countywide	Flash Flood	15-May-96	09:10:00 PM	0	0	0	5K	0
CLERMONT	Franklin Twp	Flash Flood	29-Jul-96	08:30:00 PM	0	0	0	25K	0
CLERMONT	Countywide	Flash Flood	01-Dec-96	02:00:00 AM	0	0	0	0	0
CLERMONT	Felicity	Flash Flood	01-Mar-97	09:08:00 AM	0	0	0	10K	0
CLERMONT	Countywide	Flash Flood	02-Mar-97	12:30:00 AM	0	0	0	10K	0
CLERMONT	Felicity	Flash Flood	10-Jun-98	12:15:00 AM	0	0	0	100K	0
CLERMONT	Countywide	Flash Flood	17-Jul-01	11:00:00 PM	0	0	0	1.79M	0
CLERMONT	South Central Portion	Flash Flood	07-May-02	07:20:00 AM	0	0	0	3K	0
CLERMONT	South Portion	Flash Flood	08-May-02	10:15:00 AM	0	0	0	0	0

National Climatic Data Center Storm Events

County	End Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage (\$)	Crop Damage (\$)
CLERMONT	Owensville	Flash Flood	10-May-03	10:43:00 AM	0	0	0	100K	0
CLERMONT	Mt Carmel	Flash Flood	02-Aug-03	06:15:00 AM	0	0	0	0	0
CLERMONT	New Richmond	Flash Flood	05-Jan-05	10:00:00 PM	0	0	0	10K	0
CLERMONT	Batavia	Flash Flood	22-Apr-05	08:40:00 PM	0	0	0	0	0
CLERMONT	Countywide	Flash Flood	12-Mar-06	10:10:00 AM	0	0	0	0	0
CLERMONT	Felicity	Flash Flood	13-Jul-06	08:20:00 PM	0	0	0	6K	0
CLERMONT	Milford	Flash Flood	18-Jul-06	04:36:00 PM	0	0	0	0	0
CLERMONT	Mt Repose	Flash Flood	26-Jun-09	02:10:00 AM	0	0	0	1K	0K
CLERMONT	Bethel	Flash Flood	30-Jul-09	11:30:00 PM	0	0	0	15K	0K
CLERMONT	Batavia	Flash Flood	30-Jul-09	11:25:00 PM	0	0	0	15K	0K
CLERMONT	New Richmond	Flash Flood	12-Jun-10	11:30:00 AM	0	0	0	25K	0K
CLERMONT	Amelia	Flash Flood	23-Apr-11	02:36:00 PM	0	0	0	2K	0K
CLERMONT	Bethel	Flash Flood	21-Jun-11	04:25:00 PM	0	0	0	1K	0K
CLERMONT	Withamsville	Flash Flood	21-Jun-11	03:50:00 PM	0	0	0	25K	0K
CLERMONT	Amelia	Flash Flood	21-Jun-11	03:30:00 PM	0	0	0	1K	0K
CLERMONT	Pt Isabel	Flash Flood	21-Jun-11	04:25:00 PM	0	0	0	1K	0K

National Climatic Data Center Storm Events

County	End Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage (\$)	Crop Damage (\$)
CLERMONT	Felicity	Flash Flood	19-Jul-11	06:30:00 PM	0	0	0	1K	0K
CLERMONT		Flash Flood	5/1/2012	2337		0	0	3K	0
CLERMONT		Flood	18-May-95	1100	0	0	0	2K	0
OHZ024 - 034>035 - 046 - 055 - 061 - 064 - 070 - 073 - 077>082 - 088		Flood	17-Jan-96	12:00:00 PM	0	0	0	187K	0
OHZ064 - 073 - 077>082 - 088		Flood	23-Jan-96	12:00:00 PM	0	0	0	5.09M	0
OHZ071 - 077>078		Flood	29-Apr-96	04:00:00 AM	0	0	0	11K	0
OHZ071 - 077>078		Flood	11-May-96	02:00:00 AM	0	0	0	0	0
OHZ077>078		Flood	15-May-96	08:00:00 PM	0	0	0	0	0
OHZ077>079 - 081 - 088		Flood	02-Mar-97	08:30:00 AM	0	0	0	15M	0
OHZ016 - 053 - 055 - 064 - 071 - 073 - 077>078 - 081>082		Flood	01-Jun-97	01:00:00 AM	0	0	0	1M	0
CLERMONT	Countywide	Flood	01-Jun-97	12:00:00 AM	0	0	0	10K	0
CLERMONT	Batavia	Flood	16-Jun-97	06:25:00 PM	0	0	0	10K	0
CLERMONT	Countywide	Flood	18-Jun-97	10:00:00 AM	0	0	0	5K	0
OHZ071 - 078		Flood	16-Apr-98	04:00:00 AM	0	0	0	0	0

National Climatic Data Center Storm Events

County	End Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage (\$)	Crop Damage (\$)
CLERMONT	Countywide	Flood	16-Apr-98	02:20:00 AM	0	0	0	0	0
CLERMONT	Countywide	Flood	11-Jun-98	09:55:00 AM	0	0	0	5K	0
CLERMONT	Batavia	Flood	16-Jun-98	11:45:00 AM	0	0	0	0	0
CLERMONT	Countywide	Flood	03-Jan-00	09:00:00 PM	0	0	0	50K	0
OHZ077>078		Flood	04-Jan-00	01:00:00 AM	0	0	0	0	0
OHZ077>078		Flood	14-Feb-00	02:00:00 AM	0	0	0	0	0
OHZ077>078		Flood	18-Feb-00	09:00:00 PM	0	0	0	0	0
OHZ071 - 077>078		Flood	18-Feb-00	07:00:00 PM	0	0	0	0	0
CLERMONT	Countywide	Flood	18-Feb-00	04:30:00 PM	0	0	0	10K	0
OHZ078		Flood	21-Feb-00	07:00:00 AM	0	0	0	0	0
CLERMONT	Williamsburg	Flood	04-Jul-00	07:30:00 PM	0	0	0	5K	0
CLERMONT	Countywide	Flood	09-Aug-00	07:00:00 PM	0	0	0	5K	0
CLERMONT	Countywide	Flood	16-Dec-00	04:50:00 PM	0	0	0	5K	0
CLERMONT	Northwest Portion	Flood	18-May-01	03:30:00 PM	0	0	0	5K	0
CLERMONT	Felicity	Flood	06-Jun-01	08:30:00 PM	0	0	0	3K	0
OHZ078		Flood	18-Jul-01	12:00:00 AM	0	0	0	0	0

National Climatic Data Center Storm Events

County	End Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage (\$)	Crop Damage (\$)
CLERMONT	Williamsburg	Flood	25-Jul-01	08:30:00 PM	0	0	0	0	0
CLERMONT	Felicity	Flood	26-Jul-01	01:00:00 AM	0	0	0	0	0
CLERMONT	Countywide	Flood	11-Aug-01	08:15:00 PM	0	0	0	0	0
CLERMONT	Batavia	Flood	18-Aug-01	10:09:00 PM	0	0	0	0	0
OHZ044 - 078>079		Flood	19-Apr-02	06:15:00 PM	0	0	0	0	0
OHZ073 - 077>078 - 081>082		Flood	21-Apr-02	12:30:00 PM	0	0	0	0	0
OHZ078>082		Flood	28-Apr-02	03:55:00 AM	0	0	0	0	0
OHZ055>056 - 077>078		Flood	28-May-02	06:30:00 AM	0	0	0	0	0
OHZ056 - 072 - 077>078 - 081 - 088		Flood	06-Jun-02	06:50:00 AM	0	0	0	0	0
OHZ051>053 - 055 - 060>062 - 070>072 - 077>078		Flood	10-Nov-02	06:00:00 PM	0	0	0	0	0
OHZ078 - 081>082 - 088		Flood	22-Feb-03	02:30:00 PM	0	0	0	0	0
OHZ053 - 061 - 070>073 - 077 - 077>078 - 078>081 - 088		Flood	10-May-03	06:50:00 AM	0	0	0	0	0
OHZ061 - 071 - 071 - 078>079 - 081>082		Flood	10-Jul-03	01:00:00 PM	0	0	0	150K	0

National Climatic Data Center Storm Events

County	End Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage (\$)	Crop Damage (\$)
OHZ078		Flood	13-Jul-03	05:10:00 PM	0	0	0	0	0
OHZ064 - 071 - 077>078 - 081		Flood	15-Jul-03	08:15:00 PM	0	0	0	0	0
OHZ077>078 - 082		Flood	08-Aug-03	05:11:00 PM	0	0	0	0	0
OHZ055 - 078>079		Flood	31-Jul-04	05:30:00 AM	0	0	0	0	0
OHZ077>078		Flood	18-Oct-04	07:00:00 PM	0	0	0	0	0
OHZ026 - 034>035 - 042>046 - 051>056 - 060>065 - 070 - 070>071 - 071>072 - 072>074 - 074 - 077 - 077>078		Flood	05-Jan-05	07:15:00 AM	0	0	0	585K	0
OHZ070>072 - 077>078 - 082		Flood	28-Mar-05	05:15:00 AM	0	0	0	0	0
OHZ078 - 080		Flood	22-Apr-05	08:25:00 PM	0	0	0	0	0
OHZ073 - 077>078		Flood	14-Jun-05	02:00:00 PM	0	0	0	0	0
OHZ077>078		Flood	15-Nov-05	07:35:00 AM	0	0	0	0	0
CLERMONT	Cedron	Flood	09-Jun-10	03:00:00 PM	0	2	0	3K	0K
CLERMONT	New Richmond	Flood	19-Apr-11	09:10:00 AM	0	0	0	1K	0K
CLERMONT	Amelia	Flood	21-Jun-11	06:13:00 PM	0	0	0	1K	0K

National Climatic Data Center Storm Events

County	End Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage (\$)	Crop Damage (\$)
CLERMONT	Pt Isabel	Flood	21-Jun-11	06:53:00 PM	0	0	0	1K	0K
CLERMONT		Flood	12/5/2011	2033		0	0	1K	0
CLERMONT		Hail	21-Aug-77	1530	200	0	0	0	0
CLERMONT		Hail	02-May-83	1330	100	0	0	0	0
CLERMONT		Hail	07-May-86	1551	75	0	0	0	0
CLERMONT		Hail	07-May-86	1522	75	0	0	0	0
CLERMONT		Hail	07-May-86	1500	200	0	0	0	0
CLERMONT		Hail	07-May-86	1445	75	0	0	0	0
CLERMONT		Hail	27-Jul-89	2000	100	0	0	0	0
CLERMONT		Hail	16-May-90	2215	75	0	0	0	0
CLERMONT		Hail	16-May-90	2243	75	0	0	0	0
CLERMONT		Hail	08-Jul-91	0750	75	0	0	0	0
CLERMONT		Hail	12-Apr-94	2210	75	0	0	0	0
CLERMONT		Hail	29-Jul-94	1300	175	0	0	0	50K
CLERMONT		Hail	09-Jun-95	1845	75	0	0	0	0
CLERMONT		Hail	21-Jun-95	0405	75	0	0	0	0
CLERMONT		Hail	22-Jun-95	1351	75	0	0	0	0
CLERMONT	Countywide	Hail	21-May-96	05:00:00 AM	75	0	0	0	0
CLERMONT	Goshen	Hail	24-May-96	08:35:00 PM	75	0	0	0	0
CLERMONT	Miamiville	Hail	24-May-96	05:00:00 AM	75	0	0	0	0
CLERMONT	Milford	Hail	28-Mar-97	08:20:00 PM	75	0	0	0	0
CLERMONT	Batavia	Hail	08-Apr-98	02:25:00 AM	75	0	0	0	0
CLERMONT	Bethel	Hail	13-May-98	06:35:00 PM	100	0	0	0	0
CLERMONT	Batavia	Hail	13-May-98	06:15:00 PM	75	0	0	0	0
CLERMONT	Milford	Hail	23-May-98	03:36:00 PM	100	0	0	0	0
CLERMONT	Amelia	Hail	24-May-98	05:12:00 PM	75	0	0	0	0

National Climatic Data Center Storm Events

County	End Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage (\$)	Crop Damage (\$)
CLERMONT	Milford	Hail	13-Oct-99	03:33:00 PM	75	0	0	0	0
CLERMONT	Felicity	Hail	14-Jul-00	03:00:00 PM	250	0	0	100K	500K
CLERMONT	Newtonsville	Hail	14-Jul-00	02:45:00 PM	75	0	0	0	0
CLERMONT	Countywide	Hail	09-Aug-00	05:00:00 PM	100	0	0	25K	0
CLERMONT	Loveland	Hail	11-May-01	03:27:00 PM	75	0	0	0	0
CLERMONT	Milford	Hail	17-May-01	12:59:00 PM	75	0	0	0	0
CLERMONT	Summerside	Hail	20-Feb-02	02:01:00 PM	75	0	0	3K	0
CLERMONT	Milford	Hail	19-Apr-02	03:56:00 PM	100	0	0	2.5M	0
CLERMONT	Mt Repose	Hail	19-Apr-02	05:10:00 PM	75	0	0	10K	0
CLERMONT	Williamsburg	Hail	01-May-03	06:13:00 PM	75	0	0	0	0
CLERMONT	Felicity	Hail	05-May-03	04:42:00 PM	88	0	0	0	0
CLERMONT	Felicity	Hail	10-May-03	03:13:00 PM	100	0	0	0	0
CLERMONT	Williamsburg	Hail	17-May-04	06:50:00 PM	88	0	0	0	0
CLERMONT	Moscow	Hail	09-Jun-04	02:25:00 PM	75	0	0	0	0
CLERMONT	Bethel	Hail	09-Jun-04	02:45:00 PM	75	0	0	0	0
CLERMONT	Felicity	Hail	19-Aug-04	12:25:00 AM	100	0	0	0	0

National Climatic Data Center Storm Events

County	End Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage (\$)	Crop Damage (\$)
CLERMONT	Nicholsville	Hail	14-Jun-05	01:38:00 PM	75	0	0	0	0
CLERMONT	Milford	Hail	07-Apr-06	03:45:00 PM	88	0	0	0	0
CLERMONT	Perintown	Hail	07-Apr-06	03:50:00 PM	88	0	0	0	0
CLERMONT		Hail	11-Apr-07	19:05:00 PM	75	0	0	2K	0K
CLERMONT		Hail	26-Apr-07	18:58:00 PM	88	0	0	2K	0K
CLERMONT		Hail	16-Aug-07	16:34:00 PM	100	0	0	5K	0K
CLERMONT		Hail	05-Nov-07	14:57:00 PM	75	0	0	1K	0K
CLERMONT		Hail	05-Nov-07	14:45:00 PM	100	0	0	2K	0K
CLERMONT		Hail	05-Nov-07	14:27:00 PM	125	0	0	3K	0K
CLERMONT		Hail	04-Jun-08	06:56:00 AM	88	0	0	3K	0K
CLERMONT		Hail	30-May-09	09:10:00 PM	1	0	0	3K	0K
CLERMONT		Hail	30-May-09	07:10:00 PM	1	0	0	3K	0K
CLERMONT	Bethel	Hail	30-May-09	07:42:00 PM	2	0	0	20K	0K
CLERMONT		Hail	30-May-09	07:33:00 PM	1	0	0	12K	0K
CLERMONT		Hail	30-May-09	08:15:00 PM	1	0	0	5K	0K
CLERMONT		Hail	30-May-09	07:21:00 PM	1	0	0	1K	0K

National Climatic Data Center Storm Events

County	End Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage (\$)	Crop Damage (\$)
CLERMONT		Hail	02-Jun-09	10:14:00 PM	1	0	0	0K	0K
CLERMONT		Hail	25-Jun-09	03:43:00 PM	1	0	0	0K	0K
CLERMONT		Hail	25-Jun-09	02:31:00 PM	1	0	0	0K	0K
CLERMONT	Felicity	Hail	13-May-10	12:52:00 PM	1	0	0	0K	0K
CLERMONT		Hail	21-May-10	05:56:00 PM	1	0	0	0K	0K
CLERMONT		Hail	02-Jun-10	06:55:00 PM	1	0	0	0K	0K
CLERMONT		Hail	02-Jun-10	07:24:00 PM	1	0	0	0K	0K
CLERMONT		Hail	07-Sep-10	08:02:00 PM	1	0	0	0K	0K
CLERMONT	Amelia	Hail	07-Sep-10	07:40:00 PM	1	0	0	0K	0K
CLERMONT		Hail	19-Apr-11	02:05:00 AM	1	0	0	0K	0K
CLERMONT		Hail	10-Jun-11	01:12:00 PM	1	0	0	0K	0K
CLERMONT		Hail	20-Jul-11	04:28:00 PM	1	0	0	0K	0K
CLERMONT		Hail	08-Aug-11	07:50:00 PM	1	0	0	0K	0K
CLERMONT		Hail	08-Aug-11	08:15:00 PM	1	0	0	0K	0K
CLERMONT		Hail	3/2/2012	1640	0.88 in.	0	0	0	0
CLERMONT		Hail	3/2/2012	1644	1.50 in.	0	0	0	0
CLERMONT		Hail	3/2/2012	1658	1.25 in.	0	0	0	0
CLERMONT		Hail	3/30/2012	1942	0.75 in.	0	0	0	0
CLERMONT		Hail	5/1/2012	1725	1.00 in.	0	0	0	0

National Climatic Data Center Storm Events

County	End Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage (\$)	Crop Damage (\$)
CLERMONT	Saltair	Heavy Rain	26-Jun-11	07:47:00 AM	0	0	0	0K	0K
OHZ060 - 070>078	Dayton Areas	Heavy Snow	25-Dec-93	9999	0	0	0	5K	0
OHZ010 - 012>014 - 019>022 - 028>031 - 037 - 042 - 046 - 047 - 051>056 - 060>062 - 070>072 - 077 - 078 - 080		Heavy Snow	09-Mar-94	0400	0	0	0	500K	0
OHZ047>049 - 056 - 057 - 063>066 - 069>074 - 077>080		Heavy Snow	03-Feb-95	1200	0	0	0	60K	0
OHZ071>074 - 078>082 - 086		Heavy Snow	01-Mar-95	1800	0	0	0	50K	0
OHZ024 - 034>035 - 042 - 045>046 - 051>054 - 056 - 060>065 - 070>073 - 077>078 - 080>081 - 088		Heavy Snow	11-Jan-96	03:00:00 PM	0	0	0	26K	0
OHZ026 - 034>035 - 042>046 - 051>056 - 060>065 - 070>074 - 077>082 - 088		Heavy Snow	09-Mar-99	12:00:00 AM	0	0	0	0	0
OHZ073>074 - 077>082 - 088		Heavy Snow	13-Mar-99	09:00:00 AM	0	0	0	0	0

National Climatic Data Center Storm Events

County	End Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage (\$)	Crop Damage (\$)
OHZ073 - 078>082 - 088		Heavy Snow	19-Jan-01	07:00:00 PM	0	0	0	0	0
OHZ042 - 045 - 051 - 053 - 055 - 060>064 - 070>073 - 077>082 - 088		Heavy Snow	06-Feb-07	13:00:00 PM	0	0	0	0K	0K
OHZ026 - 034 - 042>045 - 051>053 - 060>063 - 070>073 - 077>082 - 088		Heavy Snow	04-Dec-07	23:00:00 PM	0	0	0	0K	0K
OHZ077>079 - 081>082 - 088		Heavy Snow	16-Dec-08	06:00:00 AM	0	0	0	0K	0K
OHZ026 - 034 - 042>046 - 051>056 - 060>065 - 070>074 - 077>082 - 088		Heavy Snow	27-Jan-09	12:00:00 AM	0	0	0	0K	0K
OHZ060 - 070 - 077>079 - 081 - 088		Heavy Snow	03-Feb-09	12:00:00 PM	0	0	0	0K	0K
OHZ026 - 034 - 042>046 - 051>056 - 060>063 - 065 - 070>074 - 077>078 - 080 - 082		Heavy Snow	05-Feb-10	08:00:00 AM	0	0	0	0K	0K
OHZ035 - 042 - 053 - 061>065 - 070>073 - 077>081 - 088		Heavy Snow	09-Feb-10	02:00:00 AM	0	0	0	0K	0K

National Climatic Data Center Storm Events

County	End Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage (\$)	Crop Damage (\$)
OHZ045 - 051>052 - 054>056 - 061>065 - 070>073 - 077>082 - 088		Heavy Snow	15-Feb-10	02:00: 00 AM	0	0	0	0K	0K
OHZ026 - 042 - 044 - 046 - 051 - 055>056 - 060>064 - 070>074 - 077>082 - 088		Heavy Snow	11-Jan-11	05:00: 00 AM	0	0	0	0K	0K
OHZ026 - 034 - 042>046 - 051>056 - 060>065 - 070>074 - 077>082 - 088		Heavy Snow	20-Jan-11	06:00: 00 AM	0	0	0	0K	0K
OHZ070>073 - 075>080 - 082>086		Heavy Snow/Ice	28-Jan-95	0600	0	0	0	600K	0
OHZ026 - 034>035 - 042>046 - 051>056 - 060>065 - 070>074 - 077>082 - 088		High Wind	11-Dec-00	09:00: 00 PM	58	1	0	100K	0
OHZ026 - 034>035 - 042>046 - 051>056 - 060>065 - 070>074 - 077>082 - 088		High Wind	09-Mar-02	12:43: 00 PM	73	1	12	971K	0
OHZ077>078		High Wind	28-Apr-02	02:15: 00 PM	50	0	0	40K	0
OHZ078		High Wind	01-Dec-06	13:00: 00 PM	36	0	0	5K	0K

National Climatic Data Center Storm Events

County	End Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage (\$)	Crop Damage (\$)
OHZ078		High Wind	14-Sep-08	12:36:00 PM	54	0	0	22.6M	0K
OHZ060 - 078		High Wind	11-Feb-09	08:00:00 PM	52	0	0	0K	0K
OHZ054 - 078		High Wind	09-Dec-09	03:30:00 PM	50	0	0	0K	0K
OHZ054>057 - 063>088		High Winds	18-Mar-94	1155	0	0	2	500K	0
OHZ072 - 077>080 -		High Winds	20-Oct-95	0900	0	0	0	3K	0
OHZ051>053 - 060>063 - 070 - 071 - 077>079		Ice Storm	06-Jan-95	0800	0	0	26	400K	0
OHZ015>016 - 024>026 - 034>035 - 042>046 - 051>056 - 060>065 - 070>074 - 077>082 - 088		Ice Storm	06-Mar-96	01:00:00 AM	0	0	0	0	0
OHZ042 - 051>056 - 060>065 - 070>072 - 077>078		Ice Storm	24-Jan-97	07:00:00 AM	0	0	0	0	0
OHZ073 - 077>082		Ice Storm	27-Jan-97	07:00:00 AM	0	0	0	0	0
OHZ045>046 - 052>056 - 060>065 - 070>074 - 077>082 - 088		Ice Storm	13-Dec-00	06:00:00 PM	0	0	0	0	0
CLERMONT	Milford	Lightning	15-May-96	03:00:00 PM	0	0	0	5K	0
CLERMONT	Owensville	Lightning	16-May-96	11:00:00 AM	0	0	0	5K	0

National Climatic Data Center Storm Events

County	End Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage (\$)	Crop Damage (\$)
CLERMONT	Union Twp	Lightning	24-May-96	10:00:00 PM	0	0	0	50K	0
CLERMONT	Milford	Lightning	06-Jun-96	06:00:00 PM	0	0	0	1K	0
CLERMONT	Central Portion	Lightning	10-Jun-99	11:05:00 PM	0	0	2	0	0
CLERMONT	Milford	Lightning	18-Aug-02	02:00:00 PM	0	0	3	0	0
OHZ001 - 003 - 007 - 015 - 016 - 024 - 034 - 035 - 042 - 043 - 051>053 - 055 - 060>065 - 070>074 - 077>079		Snow	21-Jan-95	0100	0	2	6	500K	0
OHZ078		Strong Wind	09-Mar-06	09:30:00 PM	45	0	0	5K	0
CLERMONT		Thunderstorm Wind	01-Dec-06	05:50:00 AM	50	0	0	3K	0K
CLERMONT		Thunderstorm Wind	11-Apr-07	20:00:00 PM	50	0	0	2K	0K
CLERMONT		Thunderstorm Wind	08-Jun-07	12:35:00 PM	50	0	0	2K	0K
CLERMONT	Batavia	Thunderstorm Wind	15-Jul-07	12:50:00 PM	50	0	0	4K	0K
CLERMONT		Thunderstorm Wind	16-Aug-07	17:18:00 PM	50	0	0	3K	0K
CLERMONT		Thunderstorm Wind	26-Sep-07	14:00:00 PM	55	0	0	12K	0K
CLERMONT		Thunderstorm Wind	06-Feb-08	01:45:00 AM	70	0	0	70K	0K

National Climatic Data Center Storm Events

County	End Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage (\$)	Crop Damage (\$)
CLERMONT		Thunderstorm Wind	03-Jun-08	14:46:00 PM	50	0	0	3K	0K
CLERMONT	Mt Repose	Thunderstorm Wind	04-Jun-08	17:40:00 PM	74	0	0	40K	0K
CLERMONT	Goshen	Thunderstorm Wind	04-Jun-08	17:45:00 PM	61	0	0	40K	0K
CLERMONT	Woodville	Thunderstorm Wind	04-Jun-08	17:50:00 PM	61	0	0	20K	0K
CLERMONT		Thunderstorm Wind	28-Jun-08	15:40:00 PM	50	0	0	3K	0K
CLERMONT		Thunderstorm Wind	08-Jul-08	18:33:00 PM	50	0	0	3K	0K
CLERMONT		Thunderstorm Wind	20-Jul-08	19:05:00 PM	50	0	0	3K	0K
CLERMONT		Thunderstorm Wind	22-Jul-08	02:14:00 AM	50	0	0	3K	0K
CLERMONT		Thunderstorm Wind	11-Feb-09	03:58:00 PM	50	0	0	10K	0K
CLERMONT		Thunderstorm Wind	14-Jun-09	02:47:00 PM	53	0	0	9K	0K
CLERMONT		Thunderstorm Wind	26-Jun-09	01:30:00 AM	52	0	0	1K	0K
CLERMONT		Thunderstorm Wind	02-Jun-10	06:55:00 PM	52	0	0	0K	0K
CLERMONT		Thunderstorm Wind	12-Jun-10	10:15:00 PM	50	0	0	1K	0K
CLERMONT		Thunderstorm Wind	12-Jun-10	09:53:00 PM	50	0	0	1K	0K
CLERMONT		Thunderstorm Wind	21-Jun-10	11:50:00 AM	50	0	0	2K	0K
CLERMONT		Thunderstorm Wind	27-Jun-10	12:51:00 PM	50	0	0	1K	0K

National Climatic Data Center Storm Events

County	End Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage (\$)	Crop Damage (\$)
CLERMONT		Thunderstorm Wind	04-Aug-10	02:11:00 PM	50	0	0	1K	0K
CLERMONT		Thunderstorm Wind	15-Aug-10	01:40:00 PM	50	0	0	2K	0K
CLERMONT		Thunderstorm Wind	07-Sep-10	07:45:00 PM	55	0	0	6K	0K
CLERMONT		Thunderstorm Wind	07-Sep-10	07:33:00 PM	50	0	0	1K	0K
CLERMONT	Newtonsville	Thunderstorm Wind	26-Oct-10	11:53:00 AM	60	0	0	2K	0K
CLERMONT		Thunderstorm Wind	28-Feb-11	05:59:00 AM	50	0	0	2K	0K
CLERMONT		Thunderstorm Wind	23-Mar-11	02:40:00 PM	50	0	0	1K	0K
CLERMONT		Thunderstorm Wind	27-Apr-11	08:26:00 AM	50	0	0	2K	0K
CLERMONT		Thunderstorm Wind	23-May-11	06:38:00 PM	50	0	0	3K	0K
CLERMONT		Thunderstorm Wind	25-May-11	11:34:00 PM	50	0	0	3K	0K
CLERMONT		Thunderstorm Wind	21-Jun-11	03:09:00 PM	50	0	0	3K	0K
CLERMONT		Thunderstorm Wind	21-Jun-11	03:19:00 PM	50	0	0	2K	0K
CLERMONT	Chilo	Thunderstorm Wind	19-Jul-11	05:50:00 PM	50	0	0	10K	0K
CLERMONT		Thunderstorm Wind	08-Aug-11	08:15:00 PM	50	0	0	15K	0K
CLERMONT	Woodville	Thunderstorm Wind	14-Nov-11	09:30:00 PM	50	0	0	3K	0K
CLERMONT		Thunderstorm Wind	3/23/2012	1842	50 kts.	0	0	1K	0

National Climatic Data Center Storm Events

County	End Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage (\$)	Crop Damage (\$)
CLERMONT		Thunderstorm Wind	5/1/2012	1727	50 kts.	0	0	5K	0
CLERMONT		Thunderstorm Wind	6/29/2012	1603	50 kts.	0	0	1K	0
CLERMONT		Thunderstorm Wind	6/29/2012	1610	50 kts.	0	0	3K	0
CLERMONT		Thunderstorm Wind	6/29/2012	1636	50 kts.	0	0	10K	0
CLERMONT	Goshen	Thunderstorm Winds	28-Aug-93	1525	0	0	0	50K	0
CLERMONT		Thunderstorm Winds	15-Apr-94	1120	0	0	0	500K	0
CLERMONT		Thunderstorm Winds	07-Jun-94	1338	0	0	0	50K	0
CLERMONT		Thunderstorm Winds	16-Jun-94	0948	0	0	0	5K	0
CLERMONT		Thunderstorm Winds	17-Jun-94	1915	0	0	0	5K	0
CLERMONT		Thunderstorm Winds	21-Jun-94	1750	0	0	0	5K	0
CLERMONT		Thunderstorm Winds	04-Aug-94	1631	0	0	0	5K	0
CLERMONT	Goshen	Thunderstorm Winds	29-May-95	0030	0	0	0	7K	0
CLERMONT		Tornado	15-Apr-53	1700	0	0	0	25K	0
CLERMONT		Tornado	23-Apr-68	1256	0	1	29	2.5M	0
CLERMONT		Tornado	09-Aug-69	1720	0	0	7	250K	0
CLERMONT		Tornado	24-Jun-76	1715	0	0	0	250K	0
CLERMONT		Tornado	12-Jun-78	1210	0	0	0	25K	0
CLERMONT		Tornado	12-Jun-78	1250	0	0	0	25K	0
CLERMONT		Tornado	08-Apr-80	1450	0	0	2	250K	0
CLERMONT		Tornado	02-Jun-90	2350	0	0	0	250K	0
CLERMONT		Tornado	05-Aug-95	1320	0	0	0	30K	0
CLERMONT	Neville	Tornado	08-May-96	05:46:00 PM	0	0	0	30K	0
CLERMONT	Felicity	Tornado	02-Jul-97	07:30:00 PM	0	0	0	2M	0
CLERMONT	Goshen	Tornado	24-Aug-99	02:28:00 PM	0	0	0	25K	0
CLERMONT	Milford	Tornado	11-Jul-06	07:27:00 PM	0	0	0	0	2K

National Climatic Data Center Storm Events

County	End Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage (\$)	Crop Damage (\$)
CLERMONT	Goshen	Tornado	11-Jul-06	07:39:00 PM	0	0	0	100K	0
CLERMONT	Bethel	Tornado	30-May-09	07:44:00 PM	0	0	0	1K	0K
CLERMONT	Moores Fork	Tornado	23-May-11	06:43:00 PM	0	0	0	30K	0K
CLERMONT		Tornado	02-Mar-12	1646	3	3	13	5.66M	0
CLERMONT	Willams Corner	Tornado	07-Sep-12	2337	0	0	0	40K	0
CLERMONT		Tstm Wind	26-Nov-65	2327	55	0	0	0	0
CLERMONT		Tstm Wind	13-Jul-66	1500	0	0	0	0	0
CLERMONT		Tstm Wind	18-May-69	1625	0	0	0	0	0
CLERMONT		Tstm Wind	01-Apr-74	1930	0	0	0	0	0
CLERMONT		Tstm Wind	15-Jul-76	1630	0	0	0	0	0
CLERMONT		Tstm Wind	01-Oct-77	0600	0	0	0	0	0
CLERMONT		Tstm Wind	12-May-80	1715	57	0	0	0	0
CLERMONT		Tstm Wind	02-Jun-80	1525	52	0	0	0	0
CLERMONT		Tstm Wind	02-May-83	1430	0	0	0	0	0
CLERMONT		Tstm Wind	18-Jul-83	2030	0	0	0	0	0
CLERMONT		Tstm Wind	23-Jul-83	1530	0	0	0	0	0
CLERMONT		Tstm Wind	11-Jun-85	1650	0	0	0	0	0
CLERMONT		Tstm Wind	07-May-86	1945	0	0	0	0	0
CLERMONT		Tstm Wind	06-Aug-86	1240	0	0	0	0	0
CLERMONT		Tstm Wind	26-Jul-87	1705	0	0	0	0	0
CLERMONT		Tstm Wind	23-Apr-88	1320	0	0	0	0	0
CLERMONT		Tstm Wind	05-Aug-88	1835	0	0	0	0	0
CLERMONT		Tstm Wind	29-Apr-89	1556	0	0	0	0	0
CLERMONT		Tstm Wind	12-Jul-89	1800	0	0	0	0	0
CLERMONT		Tstm Wind	27-Jul-89	2100	0	0	0	0	0
CLERMONT		Tstm Wind	27-Jul-89	2035	0	0	0	0	0
CLERMONT		Tstm Wind	05-Aug-89	1645	0	0	0	0	0
CLERMONT		Tstm Wind	06-Jun-90	1635	0	0	0	0	0
CLERMONT		Tstm Wind	05-Jul-90	1720	0	0	0	0	0
CLERMONT		Tstm Wind	09-Jul-90	1850	0	0	0	0	0
CLERMONT		Tstm Wind	11-Jul-90	1420	0	0	0	0	0
CLERMONT		Tstm Wind	20-Jul-90	1445	0	0	0	0	0
CLERMONT		Tstm Wind	22-Aug-90	1710	0	0	0	0	0
CLERMONT		Tstm Wind	28-Aug-90	2215	0	0	0	0	0
CLERMONT		Tstm Wind	14-Sep-90	1510	0	0	0	0	0
CLERMONT		Tstm Wind	09-Apr-91	1500	0	0	0	0	0
CLERMONT		Tstm Wind	23-Apr-91	1950	0	0	0	0	0
CLERMONT		Tstm Wind	16-May-91	1819	0	0	0	0	0

National Climatic Data Center Storm Events

County	End Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage (\$)	Crop Damage (\$)
CLERMONT		Tstm Wind	16-May-91	1900	0	0	0	0	0
CLERMONT		Tstm Wind	17-May-91	2021	0	0	0	0	0
CLERMONT		Tstm Wind	02-Jul-91	1657	0	0	0	0	0
CLERMONT		Tstm Wind	03-Aug-91	2025	0	0	0	0	0
CLERMONT		Tstm Wind	08-Aug-91	1617	0	0	0	0	0
CLERMONT		Tstm Wind	10-Apr-92	1335	0	0	0	0	0
CLERMONT		Tstm Wind	18-Jun-92	1930	0	0	0	0	0
CLERMONT		Tstm Wind	18-Jun-92	0430	0	0	0	0	0
CLERMONT		Tstm Wind	09-Jul-92	2242	0	0	0	0	0
CLERMONT		Tstm Wind	11-Jul-92	1550	0	0	0	0	0
CLERMONT		Tstm Wind	18-Jul-92	1205	0	0	0	0	0
CLERMONT		Tstm Wind	21-Sep-92	1700	0	0	0	0	0
CLERMONT	New Richmond	Tstm Wind	20-Apr-96	03:33:00 AM	50	0	0	2K	0
CLERMONT	Manchester	Tstm Wind	23-Apr-96	11:00:00 AM	50	0	0	1K	0
CLERMONT	Batavia	Tstm Wind	29-Apr-96	03:43:00 PM	50	0	0	2K	0
CLERMONT	Batavia	Tstm Wind	04-May-96	02:30:00 PM	50	0	0	3K	0
CLERMONT	Felicity	Tstm Wind	04-May-96	12:10:00 AM	50	0	0	2K	0
CLERMONT	Neville	Tstm Wind	08-May-96	05:46:00 PM	50	0	0	10K	0
CLERMONT	Bethel	Tstm Wind	24-May-96	08:54:00 PM	50	0	0	3K	0
CLERMONT	Amelia	Tstm Wind	14-Jun-96	06:40:00 PM	50	0	0	5K	0
CLERMONT	Batavia	Tstm Wind	24-Jun-96	02:30:00 PM	50	0	0	3K	0
CLERMONT	Countywide	Tstm Wind	07-Nov-96	04:40:00 PM	50	0	0	10K	0
CLERMONT	Goshen	Tstm Wind	05-Jan-97	12:25:00 AM	50	0	0	5K	0

National Climatic Data Center Storm Events

County	End Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage (\$)	Crop Damage (\$)
CLERMONT	Batavia	Tstm Wind	28-Mar-97	10:05:00 PM	52	0	0	0	0
CLERMONT	Bethel	Tstm Wind	19-May-97	03:50:00 PM	60	0	0	100K	0
CLERMONT	Clermontville	Tstm Wind	22-Jul-97	10:30:00 AM	50	0	0	5K	0
CLERMONT	Countywide	Tstm Wind	27-Jul-97	07:24:00 PM	50	0	0	10K	0
CLERMONT	Countywide	Tstm Wind	17-Aug-97	01:45:00 PM	50	0	0	15K	0
CLERMONT	Lindale	Tstm Wind	27-Aug-97	04:00:00 PM	50	0	0	5K	0
CLERMONT	Loveland	Tstm Wind	13-May-98	08:00:00 PM	50	0	0	5K	0
CLERMONT	Batavia	Tstm Wind	19-May-98	11:00:00 PM	50	0	0	3K	0
CLERMONT	Laurel	Tstm Wind	10-Jun-98	02:48:00 AM	50	0	0	3K	0
CLERMONT	Felicity	Tstm Wind	10-Jun-98	12:10:00 AM	50	0	0	3K	0
CLERMONT	Owensville	Tstm Wind	11-Jun-98	11:35:00 PM	50	0	0	3K	0
CLERMONT	Countywide	Tstm Wind	12-Jun-98	09:45:00 PM	50	0	0	10K	0
CLERMONT	Milford	Tstm Wind	16-Jun-98	11:30:00 AM	50	0	0	3K	0
CLERMONT	Goshen	Tstm Wind	19-Jun-98	01:50:00 AM	50	0	0	10K	0
CLERMONT	Batavia	Tstm Wind	22-Jun-98	04:40:00 PM	50	0	0	5K	0
CLERMONT	Milford	Tstm Wind	29-Jun-98	10:30:00 PM	50	0	0	3K	0

National Climatic Data Center Storm Events

County	End Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage (\$)	Crop Damage (\$)
CLERMONT	Countywide	Tstm Wind	19-Jul-98	10:30:00 PM	60	0	0	20K	0
CLERMONT	Batavia	Tstm Wind	10-Nov-98	02:35:00 PM	50	0	0	3K	0
CLERMONT	Countywide	Tstm Wind	09-Apr-99	04:49:00 AM	50	0	0	10K	0
CLERMONT	Amelia	Tstm Wind	06-May-99	12:40:00 PM	50	0	0	3K	0
CLERMONT	Countywide	Tstm Wind	10-Jun-99	10:45:00 PM	57	0	0	500K	0
CLERMONT	Amelia	Tstm Wind	11-Jun-99	05:07:00 PM	50	0	0	16K	0
CLERMONT	Goshen	Tstm Wind	13-Jun-99	06:00:00 PM	52	0	0	6K	0
CLERMONT	Goshen	Tstm Wind	09-Jul-99	08:30:00 PM	50	0	0	3K	0
CLERMONT	Bethel	Tstm Wind	20-Apr-00	06:20:00 PM	50	0	0	5K	0
CLERMONT	Loveland	Tstm Wind	20-Apr-00	05:55:00 PM	50	0	0	5K	0
CLERMONT	Milford	Tstm Wind	02-Jun-00	03:20:00 PM	52	0	0	4K	0
CLERMONT	Marathon	Tstm Wind	02-Jun-00	03:30:00 PM	55	0	0	15K	0
CLERMONT	Owensville	Tstm Wind	26-Jun-00	05:30:00 PM	52	0	0	3K	0
CLERMONT	New Richmond	Tstm Wind	17-Aug-00	10:45:00 PM	50	0	0	5K	0
CLERMONT	Batavia	Tstm Wind	20-Sep-00	08:00:00 PM	50	0	0	5K	0
CLERMONT	Miamiville	Tstm Wind	20-Sep-00	06:45:00 PM	50	0	0	5K	0

National Climatic Data Center Storm Events

County	End Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage (\$)	Crop Damage (\$)
CLERMONT	Batavia	Tstm Wind	23-Sep-00	03:27:00 PM	50	0	0	10K	0
CLERMONT	Countywide	Tstm Wind	09-Nov-00	04:45:00 PM	50	0	0	100K	0
CLERMONT	Pt Pleasant	Tstm Wind	06-Apr-01	05:52:00 PM	50	0	0	3K	0
CLERMONT	Countywide	Tstm Wind	12-Jun-01	07:55:00 PM	55	0	0	5K	0
CLERMONT	Mt Pisgah	Tstm Wind	08-Jul-01	01:18:00 PM	50	0	0	5K	0
CLERMONT	Miamiville	Tstm Wind	08-Jul-01	07:10:00 PM	50	0	0	3K	0
CLERMONT	Felicity	Tstm Wind	08-Jul-01	12:07:00 PM	50	0	0	10K	0
CLERMONT	Batavia	Tstm Wind	17-Jul-01	11:20:00 PM	50	0	0	50K	0
CLERMONT	Felicity	Tstm Wind	17-Jul-01	08:50:00 PM	50	0	0	3K	0
CLERMONT	Milford	Tstm Wind	17-Jul-01	07:53:00 PM	50	0	0	3K	0
CLERMONT	Countywide	Tstm Wind	11-Aug-01	08:10:00 PM	50	0	0	0	0
CLERMONT	Countywide	Tstm Wind	24-Oct-01	07:35:00 PM	50	0	0	5K	0
CLERMONT	Saltair	Tstm Wind	07-May-02	07:40:00 AM	50	0	0	25K	0
CLERMONT	Amelia	Tstm Wind	29-Jul-02	06:25:00 PM	51	0	0	3K	0
CLERMONT	Milford	Tstm Wind	11-Aug-02	04:27:00 PM	50	0	0	5K	0
CLERMONT	Countywide	Tstm Wind	04-Jul-03	08:50:00 PM	50	0	0	7K	0

National Climatic Data Center Storm Events

County	End Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage (\$)	Crop Damage (\$)
CLERMONT	Milford	Tstm Wind	09-Jul-03	07:05:00 PM	50	0	0	2K	0
CLERMONT	New Richmond	Tstm Wind	09-Jul-03	06:45:00 PM	50	0	0	3K	0
CLERMONT	Batavia	Tstm Wind	15-Jul-03	08:16:00 PM	50	0	0	3K	0
CLERMONT	Loveland	Tstm Wind	15-Jul-03	08:03:00 PM	50	0	0	3K	0
CLERMONT	Loveland	Tstm Wind	21-Jul-03	07:15:00 AM	50	0	0	2K	0
CLERMONT	Williamsburg	Tstm Wind	27-May-04	07:20:00 PM	50	0	0	3K	0
CLERMONT	Countywide	Tstm Wind	30-May-04	11:46:00 PM	50	0	0	8K	0
CLERMONT	Felicity	Tstm Wind	30-May-04	05:00:00 PM	50	0	0	2K	0
CLERMONT	Countywide	Tstm Wind	09-Jul-04	04:36:00 PM	50	0	0	5K	0
CLERMONT	Williamsburg	Tstm Wind	10-Jul-04	05:20:00 PM	50	0	0	3K	0
CLERMONT	Batavia	Tstm Wind	10-Jul-04	04:30:00 PM	50	0	0	3K	0
CLERMONT	Pt Pleasant	Tstm Wind	22-Apr-05	07:25:00 PM	50	0	0	3K	0
CLERMONT	Batavia	Tstm Wind	14-Jun-05	01:40:00 PM	50	0	0	3K	0
CLERMONT	Milford	Tstm Wind	20-Aug-05	03:15:00 PM	50	0	0	8K	0
CLERMONT	Chilo	Tstm Wind	23-Sep-05	05:45:00 PM	50	0	0	3K	0
CLERMONT	Felicity	Tstm Wind	31-Mar-06	11:15:00 PM	50	0	0	6K	0

National Climatic Data Center Storm Events

County	End Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage (\$)	Crop Damage (\$)
CLERMONT	Milford	Tstm Wind	02-Apr-06	10:20:00 PM	60	0	0	60K	0
CLERMONT	Loveland	Tstm Wind	02-Apr-06	10:20:00 PM	60	0	0	10K	0
CLERMONT	Loveland	Tstm Wind	25-May-06	06:15:00 PM	50	0	0	2K	0
CLERMONT	Milford	Tstm Wind	25-May-06	07:10:00 PM	50	0	0	3K	0
CLERMONT	Goshen	Tstm Wind	22-Jun-06	04:34:00 PM	50	0	0	3K	0
CLERMONT	Milford	Tstm Wind	04-Jul-06	03:10:00 PM	50	0	0	3K	0
CLERMONT	Williamsburg	Tstm Wind	14-Jul-06	03:10:00 PM	50	0	0	3K	0
CLERMONT	Milford	Tstm Wind	18-Jul-06	04:30:00 PM	50	0	0	3K	0
CLERMONT	Williamsburg	Tstm Wind	21-Jul-06	06:00:00 PM	50	0	0	3K	0
OHZ034>035 - 042 - 046 - 051>056 - 060>065 - 070>074 - 077>082 - 088		Winter Storm	06-Jan-96	03:00:00 PM	0	2	0	14.25M	0
OHZ015>016 - 024>026 - 034>035 - 042>046 - 051>056 - 060>065 - 070>074 - 077>082 - 088		Winter Storm	19-Mar-96	04:00:00 PM	0	1	0	0	0
OHZ063 - 070>073 - 077>082 - 088		Winter Storm	03-Feb-98	11:00:00 PM	0	0	0	0	0

National Climatic Data Center Storm Events

County	End Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage (\$)	Crop Damage (\$)
OHZ026 - 034>035 - 042>046 - 051>056 - 060>065 - 070>074 - 077>080		Winter Storm	01-Jan-99	10:00:00 PM	0	0	0	0	0
OHZ026 - 034>035 - 042>046 - 051>056 - 060>065 - 070>074 - 077>078 - 080		Winter Storm	07-Jan-99	10:00:00 PM	0	0	0	0	0
OHZ070>074 - 077>082 - 088		Winter Storm	05-Dec-02	03:15:00 AM	0	0	0	0	0
OHZ070 - 078 - 082 - 088		Winter Storm	16-Jan-03	05:30:00 PM	0	0	0	0	0
OHZ070>073 - 077>082 - 088		Winter Storm	16-Feb-03	03:00:00 AM	0	0	0	1.5M	0
OHZ026 - 034>035 - 042>046 - 051>056 - 060>065 - 070>074 - 077>082 - 088		Winter Storm	25-Jan-04	05:00:00 PM	0	0	0	0	0
OHZ026 - 034>035 - 042>046 - 051>056 - 060>065 - 070>073 - 077>081		Winter Storm	22-Dec-04	08:20:00 AM	0	0	0	451K	0
OHZ042 - 060>062 - 070>072 - 077>081		Winter Storm	20-Jan-05	06:20:00 PM	0	0	0	0	0
OHZ026 - 046 - 056 - 062>065 - 071>074 - 077>081		Winter Storm	22-Jan-05	06:50:00 AM	0	0	0	0	0

National Climatic Data Center Storm Events

County	End Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage (\$)	Crop Damage (\$)
OHZ026 - 034>035 - 042>046 - 051>055 - 060>063 - 070>072 - 077>080		Winter Storm	08-Dec-05	06:30:00 PM	0	0	0	0	0
OHZ070>071 - 077>079 - 081		Winter Storm	21-Mar-06	10:00:00 AM	0	0	0	0	0
OHZ026 - 034 - 042>044 - 051 - 060 - 064 - 070>071 - 073 - 078 - 080>082 - 088		Winter Storm	12-Feb-08	00:00:00 AM	0	0	0	0K	0K
OHZ051 - 054>055 - 060>062 - 064>065 - 071>074 - 077>082 - 088		Winter Storm	21-Feb-08	19:30:00 PM	0	0	0	0K	0K
OHZ026 - 034 - 042>046 - 051>056 - 060>065 - 070>074 - 077>082 - 088		Winter Storm	07-Mar-08	12:00:00 PM	0	0	0	0K	0K
OHZ042 - 051 - 053>056 - 060>065 - 070>074 - 077>082 - 088		Winter Storm	16-Dec-10	12:00:00 AM	0	0	0	0K	0K

National Climatic Data Center Storm Events

County	End Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage (\$)	Crop Damage (\$)
OHZ026 - 034 - 042>045 - 051>053 - 060>063 - 070>073 - 077>082 - 088		Winter Weather	04-Dec-07	23:00:00 PM	0	0	0	OK	OK
OHZ026 - 034 - 042>046 - 051>056 - 060>065 - 070>072 - 074 - 077>078 - 080		Winter Weather	07-Dec-07	00:00:00 AM	0	0	0	OK	OK
OHZ026 - 034 - 042>044 - 051>053 - 055 - 060>063 - 065 - 070>074 - 077>078 - 080>082 - 088		Winter Weather	01-Jan-08	06:00:00 AM	0	0	0	OK	OK
OHZ051 - 054>055 - 060>062 - 064>065 - 071>074 - 077>082 - 088		Winter Weather	21-Feb-08	19:30:00 PM	0	0	0	OK	OK
OHZ034 - 044>046 - 052 - 056 - 063 - 070>073 - 077>082 - 088		Winter Weather	22-Feb-08	04:00:00 AM	0	0	0	OK	OK
OHZ077>079 - 081>082 - 088		Winter Weather	16-Dec-08	06:00:00 AM	0	0	0	OK	OK

National Climatic Data Center Storm Events

County	End Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage (\$)	Crop Damage (\$)
OHZ026 - 034 - 042>043 - 045 - 051>056 - 061>063 - 065 - 071>074 - 077>080 - 082 - 088		Winter Weather	07-Jan-10	05:00:00 AM	0	0	0	0K	0K
OHZ042>046 - 053>056 - 060>062 - 064>065 - 070>073 - 078>082 - 088		Winter Weather	26-Feb-10	02:00:00 PM	0	0	0	0K	0K
OHZ042>044 - 046 - 051>053 - 055>056 - 060>061 - 064 - 070>073 - 077>078 - 080>082 - 088		Winter Weather	12-Dec-10	08:00:00 AM	0	0	0	0K	0K
OHZ042 - 051 - 053>056 - 060>065 - 070>074 - 077>082 - 088		Winter Weather	16-Dec-10	12:00:00 AM	0	0	0	0K	0K
OHZ026 - 042 - 044 - 046 - 051 - 055>056 - 060>064 - 070>074 - 077>082 - 088		Winter Weather	11-Jan-11	05:00:00 AM	0	0	0	0K	0K

National Climatic Data Center Storm Events

County	End Location	Type	Date	Time	Magnitude	Fatalities	Injuries	Property Damage (\$)	Crop Damage (\$)
OHZ026 - 034 - 042>046 - 051>056 - 060>065 - 070>074 - 077>082 - 088		Winter Weather	20-Jan-11	06:00: 00 AM	0	0	0	0K	0K
Total						13	104	85.7M	552K

Federal Public Assistance Grants Awarded Per Declared Disaster

COUNTY:	Clermont		
DISASTER NUMBER	DISASTER TYPE	DECLARED	PUBLIC ASSISTANCE
DR-1164	Severe Summer Storm Flooding	3/21/1997	
DR-1227	Flood Severe Summer Storm Tornado	7/5/1998	
DR-1390	Severe Storm Flood	8/27/2001	\$ 1,777,912.17
DR-1453	Winter Storms	3/15/2003	
DR-1484	Tornadoes Flooding Severe Storms High Winds	8/1/2003	
DR-1507	Flood Mud/Landslide Severe Summer Storm	1/26/2004	
DR-1519	Flood Severe Summer Storm	6/3/2004	
DR-1556	Flood Severe Summer Storm	9/19/2004	
DR-1580	Flood Mud/Landslide Winter Storm	2/15/2005	\$ 278,284.92
DR-1651	Severe Summer Storm Straight Line Winds Flooding	7/2/2006	
DR-1656	Severe Summer Storm Straight Line Winds Flooding	8/1/2006	
DR-1720	Severe Summer Storm Flooding Tornadoes	8/27/2007	
DR-1805	Severe Wind Storm Associated with Tropical Depression IKE	10/24/2008	\$ 920,408.55
DR-4002	Flood Severe Summer Storm	7/13/2011	\$ 3,447,177.83
DR-4077	Severe Summer Storm Straight Line Winds	8/20/2012	\$ 344,553.08
EM-3250	Hurricane Katrina Shelter Operations	9/13/2005	
EM-3198	Snow Storm	11/1/2005	
EM-3286	Record / Near Record Snow Storm	4/24/2008	
EM-3187	Power Outage	9/23/2003	

Appendix D

Mitigation Actions Countywide

Mitigation Actions Countywide

		Cost Effective	Technically Feasible	Environmentally Sound	Socially Equitable	Meets Local Regulations	Activities Reduce Risk	Socially Acceptable	Funding Available	Total
Hazard	Mitigation Actions	Rankings								
Severe Storms / Winter Storms	Build/Incorporate storm shelters inside new public buildings.	2	2	3	3	3	2	3	2	20
Severe Storms / Winter Storms	Purchase weather radios.	3	3	3	3	3	2	3	2	22
Severe Storms / Winter Storms	Review potential public notification systems that may include but not limited to; telephone, text messaging, e-mail, mobile device / alert applications, weather radios, social media, and warning sirens.	2	2	3	3	3	3	3	3	22
Severe Storms / Winter Storms	Review potential uses of social media for education / awareness.	3	3	3	3	3	3	3	3	24
Severe Storms / Winter Storms	Purchase and install back-up generators inside government and utility buildings / structures.	2	2	3	3	3	3	3	2	21

Mitigation Actions Countywide

		Cost Effective	Technically Feasible	Environmentally Sound	Socially Equitable	Meets Local Regulations	Activities Reduce Risk	Socially Acceptable	Funding Available	Total
Hazard	Mitigation Actions	Rankings								
Severe Storms / Winter Storms	County-wide mutual aid compact allowing community departments to work with other communities, specifically public works and road departments.	2	2	3	3	3	3	3	2	21
Severe Storms / Winter Storms	Identify the capabilities of back-up generators and develop recommendations for fuel prioritization.	3	3	3	3	3	3	3	3	24
Severe Storms / Winter Storms	Incorporate critical care facilities into a public notification system.	2	2	3	3	3	3	3	3	22
Severe Storms / Winter Storms	Review the grant potential for surge protection at the water treatment plants. Power outages that trip pumps can result in water hammer that causes damage at the plant.	2	2	3	3	3	3	3	2	21

Mitigation Actions Countywide

		Cost Effective	Technically Feasible	Environmentally Sound	Socially Equitable	Meets Local Regulations	Activities Reduce Risk	Socially Acceptable	Funding Available	Total
Hazard	Mitigation Actions	Rankings								
Severe Storms / Winter Storms	Develop a tiered list of shelters and building code compliant Red Cross Shelters. For example, locations that can be short-term reception sites; information centers where people can get hot showers, meals, charge cell phones, etc.; temporary storm shelters, short-term overnight shelters; and long-term shelters.	3	3	3	3	3	3	3	3	24
Flooding	Evaluate locations for signage at repeated high water locations.	3	3	3	3	3	3	3	3	24
Flooding	Storm water management system improvements/maintenance (Miami Township).	2	2	3	3	3	3	3	3	22
Flooding	Implement water management and sediment control regulations (City of Milford).	2	2	3	3	3	3	3	2	21

Mitigation Actions Countywide

		Cost Effective	Technically Feasible	Environmentally Sound	Socially Equitable	Meets Local Regulations	Activities Reduce Risk	Socially Acceptable	Funding Available	Total
Hazard	Mitigation Actions	Rankings								
Flooding	Stream embankment and pavement stabilization projects (Washington Township).	1	3	3	3	3	3	3	3	22
Flooding	Retrofit docks and boat ramps to protect against damages by barges during high water/flood events (Washington Township).	1	1	2	3	3	1	3	1	15
Flooding	Replace or upgrade existing storm water infrastructure (Monroe Township and Washington Township).	2	2	3	3	3	3	3	2	21
Flooding	Implement storm water relief plan (Village of Owensville)	2	2	3	3	3	3	3	3	22
Flooding	Public Outreach – Continue to identify potential flooding and inform citizens through social media and other public notification systems.	3	3	3	3	3	3	3	3	24

Mitigation Actions Countywide

		Cost Effective	Technically Feasible	Environmentally Sound	Socially Equitable	Meets Local Regulations	Activities Reduce Risk	Socially Acceptable	Funding Available	Total
Hazard	Mitigation Actions	Rankings								
Flooding	Retrofit / flood proofing existing structures to mitigate flooding concerns.	2	2	3	3	3	3	3	2	21
Flooding	Identify and Mitigate Repetitive Loss Structures along the Little Miami River and East Fork Little Miami River within Miami Township and City of Loveland.	2	2	3	3	3	3	3	2	21
Flooding	Identify and Mitigate Repetitive Loss Structures within the Village of Williamsburg.	2	2	3	3	3	3	3	2	21
Tornado	Develop a mechanism to rapidly communicate with the public.	2	2	3	3	3	3	3	2	21
Tornado	Build safe rooms or shelters at public parks and mobile home parks.	2	2	3	3	3	3	3	2	21
Tornado	Replace/Install tornado/emergency sirens to provide 95%+ coverage area in Miami Township.	2	2	3	3	3	3	3	2	21

Mitigation Actions Countywide

		Cost Effective	Technically Feasible	Environmentally Sound	Socially Equitable	Meets Local Regulations	Activities Reduce Risk	Socially Acceptable	Funding Available	Total
Hazard	Mitigation Actions	Rankings								
Tornado	Replace/Install tornado/emergency sirens in the City of Milford, Pierce Township, and Washington Township (The cities/villages and townships purchase/maintain sirens.).	1	3	3	3	3	3	3	3	22
Tornado	Identify temporary / long-term shelters (see Winter Storms).	3	3	3	3	3	3	3	3	24
Landslides	Work with the Planning Department to develop standards and regulations for development in landslide prone areas. (vegetation and hill cutting)	2	2	3	3	3	3	3	2	21
Landslides	Work with the Planning Department to develop standards and regulations for development in landslide prone areas. (federal and state agencies)	2	2	3	3	3	3	3	2	21

Mitigation Actions Countywide

		Cost Effective	Technically Feasible	Environmentally Sound	Socially Equitable	Meets Local Regulations	Activities Reduce Risk	Socially Acceptable	Funding Available	Total
Hazard	Mitigation Actions	Rankings								
Landslides	Work with the Engineer's office to create a memorandum of understanding with other Public Works Agencies / Road Departments.	3	2	3	3	3	3	3	2	22
Drought	Coordinate with the Fire Service Alliance for outreach concerning droughts and wildfires.	3	3	3	3	3	3	3	3	24
Drought	The current site layout of neighborhoods and homes is poor; a fire/buffer zone should surround the home. Work with the Planning Commission to create a buffer zone regulation to prevent the spread of wildfires.	2	2	3	3	3	3	3	2	21
Drought	Develop a map of sensitive populations.	3	2	3	3	3	3	3	3	23
Drought	Develop a PSA to define the use of dry hydrants (work with SWCD).	2	2	3	3	3	3	3	2	21

Mitigation Actions Countywide

		Cost Effective	Technically Feasible	Environmentally Sound	Socially Equitable	Meets Local Regulations	Activities Reduce Risk	Socially Acceptable	Funding Available	Total
Hazard	Mitigation Actions	Rankings								
Earthquake	Provide Education/Information on General Preparedness before, during, and after an Earthquake using Social Media.	3	3	3	3	3	3	3	3	24
Earthquake	Develop a mechanism to rapidly communicate with the public.	2	2	3	3	3	3	3	2	21
Hazardous Materials	A Commodity Flow Study will be performed to identify the movement of hazardous materials transported through the County.	3	3	3	3	3	3	3	3	24
Hazardous Materials	Develop a Water Source Protection Plan for William H. Harsha Lake.	3	3	3	3	3	3	3	2	23
Hazardous Materials	Provide public awareness on the disposal/storage of batteries within a community and the county.	3	3	3	3	3	3	3	3	24
Hazardous Materials	House De-con / HazMat Trailer for region (Washington Township).	3	3	3	3	3	3	3	3	24

Mitigation Actions Countywide

		Cost Effective	Technically Feasible	Environmentally Sound	Socially Equitable	Meets Local Regulations	Activities Reduce Risk	Socially Acceptable	Funding Available	Total
Hazard	Mitigation Actions	Rankings								
Hazardous Materials	Implement/Enforce a Wellhead Protection Plan (City of Milford).	3	3	3	3	3	3	3	3	24
Dam Failure	Encourage the development of Emergency Action Plans for each dam.	2	3	3	3	3	3	3	2	22
Dam Failure	Provide public outreach through all forms of media on dam safety.	3	3	3	3	3	3	3	3	24
Invasive Species	Public outreach / education on preventing the spread of invasive species	3	3	3	3	3	3	3	3	24
Invasive Species	Remove invasive vegetation from sensitive areas	1	2	2	2	3	1	2	2	15
Invasive Species	Continue to enforce the firewood movement ban for reducing the spread of Emerald Ash Borer and the Asian Longhorned Beetle.	2	3	3	3	3	3	2	2	21

Appendix E

Mitigation Actions Community Identified

Mitigation Actions Community Identified

Hazard	Community	Mitigation Actions	Cost Effective	Technically Feasible	Environmentally Sound	Socially Equitable	Meets Local Regulations	Activities Reduce Risk	Socially Acceptable	Funding Available	Total
			Rankings								
All Hazards	Clermont County Water Resources Department	Installation of Emergency Generators for the PUB WTP and PUB Well Fields.	3	3	3	3	3	3	3	2	23
All Hazards	Goshen Township	Replace backup generator for the Goshen Township Fire Station.	3	3	3	3	3	3	3	2	23
All Hazards	Miami Township	Developed Township Continuity of Operations Plan 2011; now in training & exercise phase.	3	3	3	3	3	1	3	3	22
All Hazards	Miami Township	Preparedness Month activities 2013.	3	3	3	3	3	1	3	3	22
All Hazards	Miami Township	Preparedness Month activities 2014.	3	3	3	3	3	1	3	3	22
All Hazards	Miami Township	Periodic articles in Township Newsletter and local weekly newspaper on fire/life safety and preparedness.	3	3	3	3	3	1	3	3	22

Mitigation Actions Community Identified

Hazard	Community	Mitigation Actions	Cost Effective	Technically Feasible	Environmentally Sound	Socially Equitable	Meets Local Regulations	Activities Reduce Risk	Socially Acceptable	Funding Available	Total
			Rankings								
All Hazards	Moscow, Village of	Review Emergency Action Plan in 2013 and update where necessary.	3	3	3	3	3	3	3	2	23
All Hazards	Pierce Township	Tornado/Storm Shelters.	3	3	3	3	3	3	3	1	22
All Hazards	Pierce Township	Currently using County EOP. We are in process of developing our Township specific EOP	3	3	3	3	3	3	3	3	24
All Hazards	Pierce Township	Public Education through whatever medium(s) on how to prepare and protect their interests (web, seminars)	3	2	3	3	3	3	3	2	22
All Hazards	Washington Township	Green Address Signs for all residential homes	3	3	3	3	3	3	3	3	24
All Hazards	Washington Township	Purchase ATV for Disaster Assistance	3	3	2	3	3	3	3	3	23
All Hazards	Washington Township	Expanding Rope & Water Rescue Capabilities	3	3	3	3	3	3	3	3	24

Mitigation Actions Community Identified

			Cost Effective	Technically Feasible	Environmentally Sound	Socially Equitable	Meets Local Regulations	Activities Reduce Risk	Socially Acceptable	Funding Available	Total
Hazard	Community	Mitigation Actions	Rankings								
All Hazards	Washington Township	MOU: Task Force One to House Rescue Boat for Region	3	3	3	3	3	3	3	3	24
All Hazards	Washington Township	Fire & EMS Prevention Program	3	3	3	3	3	3	3	3	24
All Hazards	Washington Township	Newsletter Mailed 2 times a year to all residents	1	3	1	3	3	3	3	3	20
All Hazards	Washington Township	Township & Fire Department Website.	3	3	3	3	3	3	3	3	24
All Hazards	Williamsburg, Village of	Policy for Emergency Shelter and Assistance during a disaster - Coordination with Township and School District.	3	3	3	3	3	2	3	1	21
Flooding	Miami Township	Storm water management system improvements/maintenance.	2	2	3	3	3	3	3	3	22
Flooding	Milford	Water Management and Sediment Controls Regulations.	2	2	3	3	3	3	3	2	21

Mitigation Actions Community Identified

			Cost Effective	Technically Feasible	Environmentally Sound	Socially Equitable	Meets Local Regulations	Activities Reduce Risk	Socially Acceptable	Funding Available	Total
Hazard	Community	Mitigation Actions	Rankings								
Flooding	Monroe Township	Replace or Correct Culvert Pipes along St. Rt. 222 in Nicholasville to control flooding.	2	2	3	3	3	3	3	2	21
Flooding	Owensville, Village of	Implementation of the Storm Water Relief Plan - Received funding for Phase 1 to redirect storm water from surface ditches and alley junctions away from private property.	2	2	3	3	3	3	3	3	22
Flooding	Washington Township	Ditching/Culvert Upgrades of Township Roads	3	3	2	3	3	3	3	3	23
Flooding	Washington Township	Maple Creek Road Embankment Restoration	1	3	3	3	3	3	3	3	22
Flooding	Washington Township	Big Indian Creek Ford Restabilization	1	3	3	3	3	3	3	3	22

Mitigation Actions Community Identified

			Cost Effective	Technically Feasible	Environmentally Sound	Socially Equitable	Meets Local Regulations	Activities Reduce Risk	Socially Acceptable	Funding Available	Total
Hazard	Community	Mitigation Actions	Rankings								
Flooding	Washington Township	Big Indian Road (off 222) Embankment Stabilization	1	3	3	3	3	3	3	3	22
Flooding	Washington Township	Ireton Trees Road Embankment Stabilization Pavement Restoration.	1	3	3	3	3	3	3	3	22
Flooding	Washington Township	Big Indian Road (off232) Embankment Stabilization Pavement Restoration.	1	3	3	3	3	3	3	3	22
Flooding	Washington Township	Bear Creek Road (near house # 424) Embankment Stabilization Pavement Restoration.	1	3	3	3	3	3	3	3	22
Flooding	Washington Township	Bear Creek Road (End) Embankment Stabilization Pavement Restoration.	1	3	3	3	3	3	3	3	22

Mitigation Actions Community Identified

			Cost Effective	Technically Feasible	Environmentally Sound	Socially Equitable	Meets Local Regulations	Activities Reduce Risk	Socially Acceptable	Funding Available	Total
Hazard	Community	Mitigation Actions	Rankings								
Flooding	Washington Township	Boat Ramp-Retrofitting docks to protect against damages by barges during high water/flood event.	1	1	2	3	3	1	3	1	15
Hazardous Materials	Milford	Wellhead Protection Plan.	3	3	3	3	3	3	3	3	24
Hazardous Materials	Washington Township	MOU: House De-con /HazMat Trailer For Region.	3	3	3	3	3	3	3	3	24
Power Failure	Washington Township	Tree Trimming of Township Roads.	3	3	3	3	3	3	3	3	24
Severe Storm	Amelia	Build a new Town Hall to include a Storm Shelter.	1	2	3	3	3	3	3	2	20
Severe Storm	Amelia	Purchase back-up generator for current Village Hall.	3	3	3	3	3	2	3	2	22
Severe Storm	Miami Township	Fire code enforcement activities.	3	3	3	3	3	3	3	3	24

Mitigation Actions Community Identified

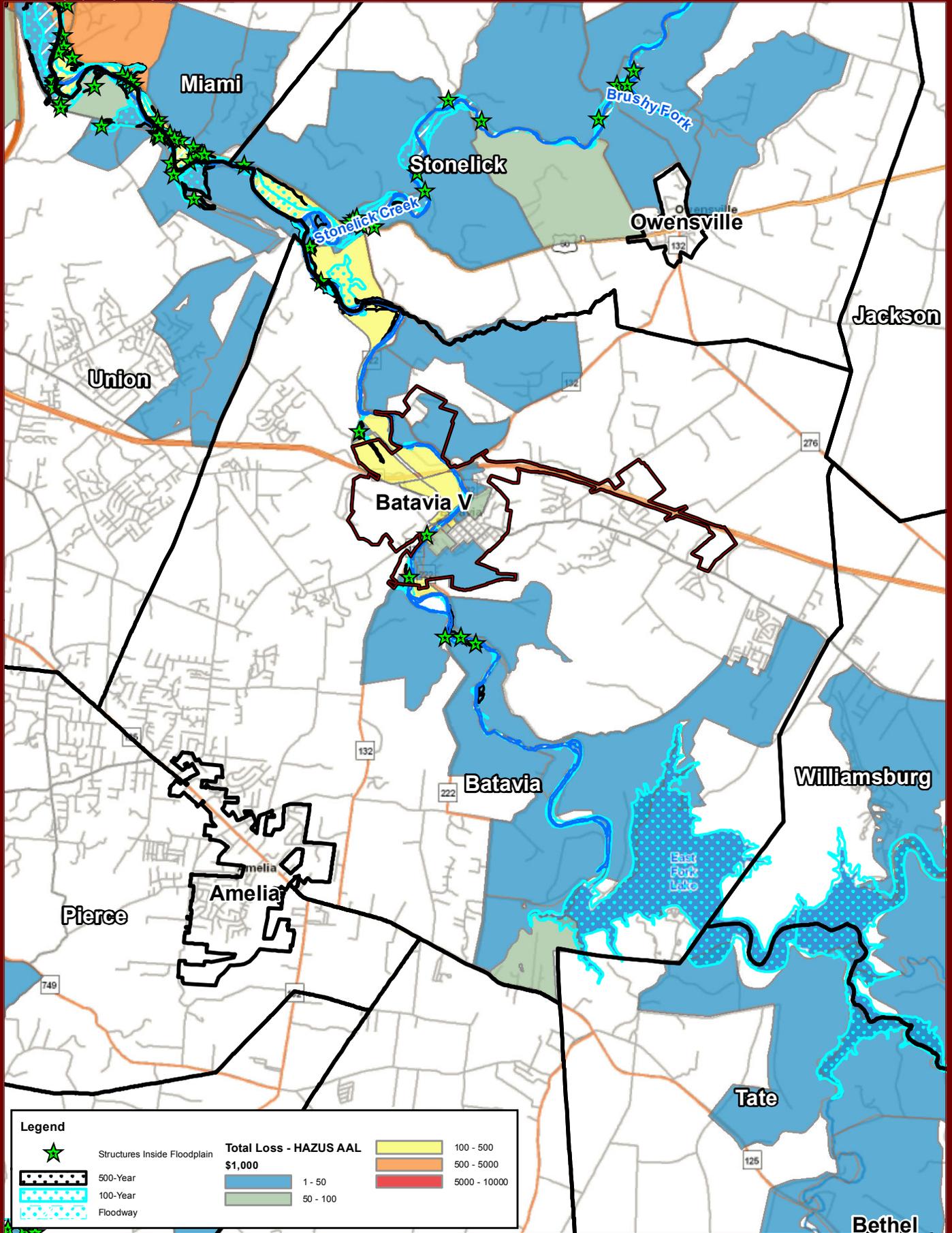
			Cost Effective	Technically Feasible	Environmentally Sound	Socially Equitable	Meets Local Regulations	Activities Reduce Risk	Socially Acceptable	Funding Available	Total
Hazard	Community	Mitigation Actions	Rankings								
Severe Storm	Milford	Installed a diesel generator at the City Administration Building.	3	3	3	3	3	3	3	3	24
Severe Storm	Monroe Township	Purchase Weather Radios for Residents.	3	3	3	3	3	1	3	2	21
Severe Storm	Washington Township	Purchase Generator for Township Hall/R&B Dept.	1	3	3	3	3	3	3	3	22
Severe Storm	Washington Township	Purchase Generator for Fire Station 68.	1	3	3	3	3	3	3	3	22
All Hazards	Union Township	Repair / Replacement / Upgrade of All-Hazard / Tornado Sirens in Union Township on an as-needed basis.	3	3	3	3	3	3	3	3	24

Mitigation Actions Community Identified

Hazard	Community	Mitigation Actions	Cost Effective	Technically Feasible	Environmentally Sound	Socially Equitable	Meets Local Regulations	Activities Reduce Risk	Socially Acceptable	Funding Available	Total
			Rankings								
Tornadoes	Miami Township	Purchased/installed all-hazards (tornado) warning sirens to cover 95%+ of Twp 33 sq. miles in 2001. Now being maintained.	3	3	3	3	3	3	3	3	24
Tornadoes	Milford	Replaced Emergency Notification Siren	3	3	3	3	3	3	3	3	24
Tornadoes	Monroe Township	Shelter for Tornadoes and Cold Weather.	2	2	3	3	3	3	3	2	21
Tornadoes	Pierce Township	We have 8 sirens currently. We are in process of adding 5 additional sirens at this time.	3	3	3	3	3	3	2	3	23
Tornadoes	Washington Township	Replace two (2) tornado sirens in the Township that are antiquated.	1	3	3	3	3	3	3	3	22

Appendix F

HAZUS Analysis Flooding and Earthquake



Legend		Total Loss - HAZUS AAL	
	Structures Inside Floodplain		1 - 50
	500-Year		50 - 100
	100-Year		100 - 500
	Floodway		500 - 5000
			5000 - 10000



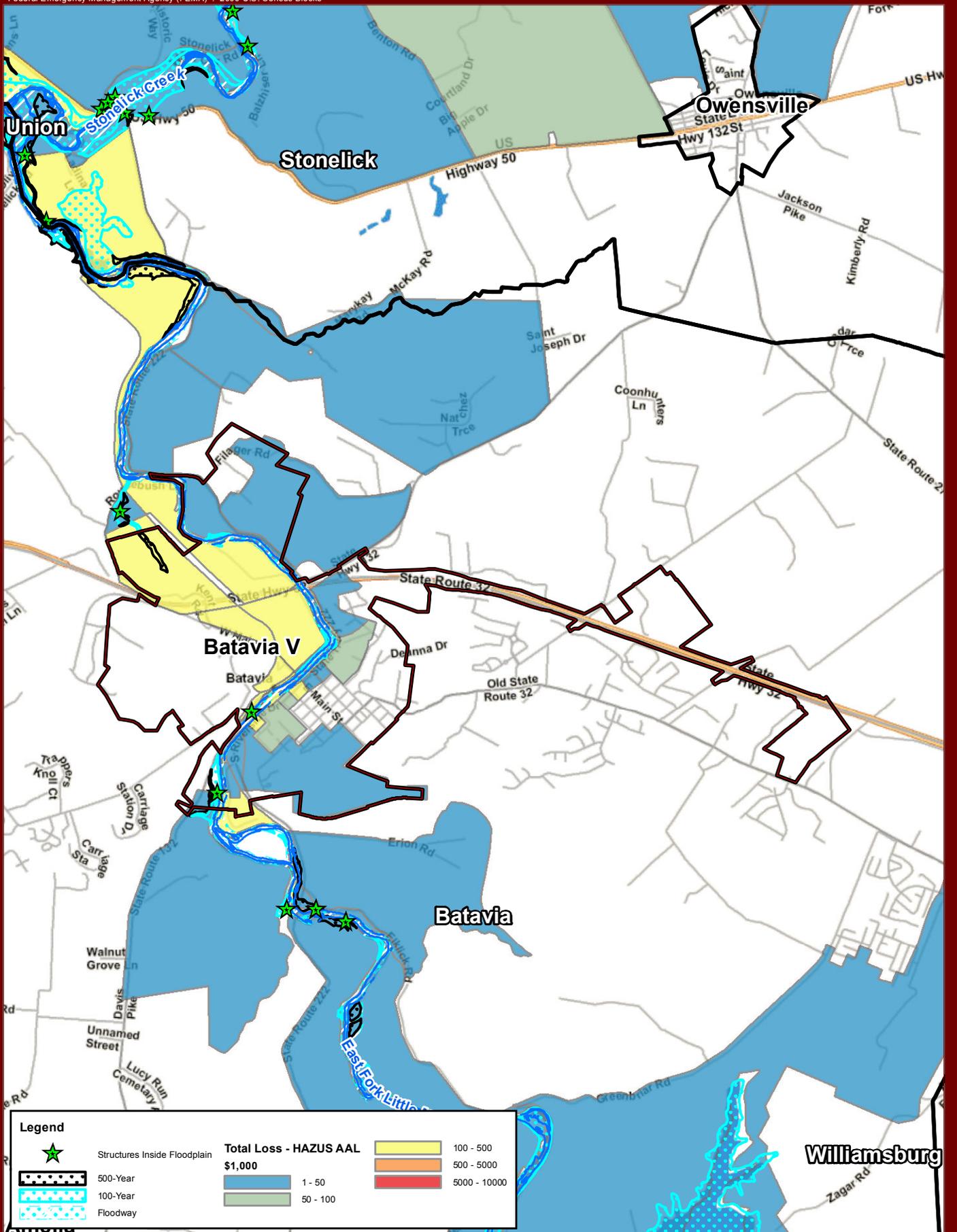
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HAZUS - AAL Potential Loss

Batavia

Clermont County All-Hazards Mitigation Plan



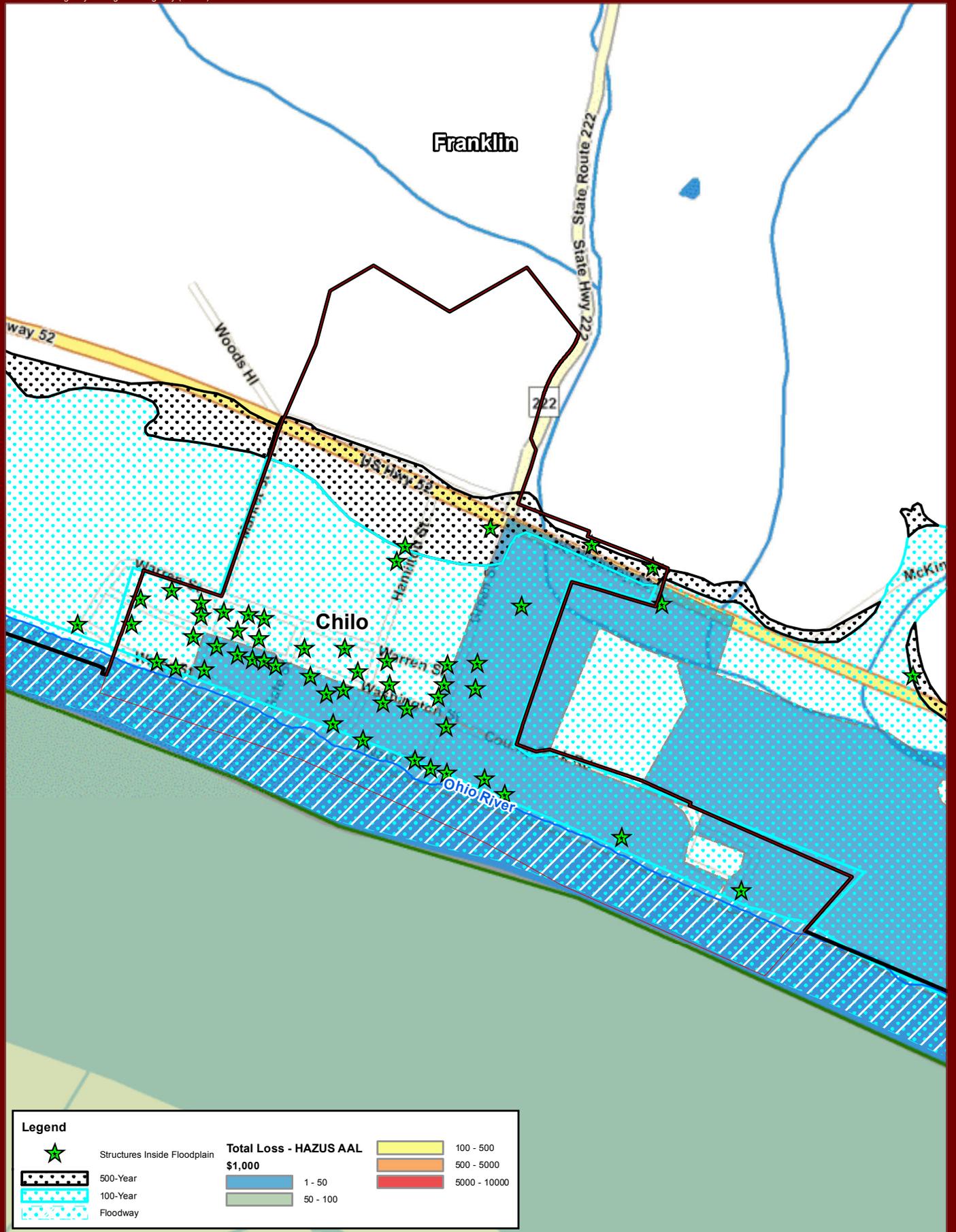
0 0.75 Miles



HAZUS - AAL Potential Loss

Batavia V

Clermont County All-Hazards Mitigation Plan



Geographic Information Systems



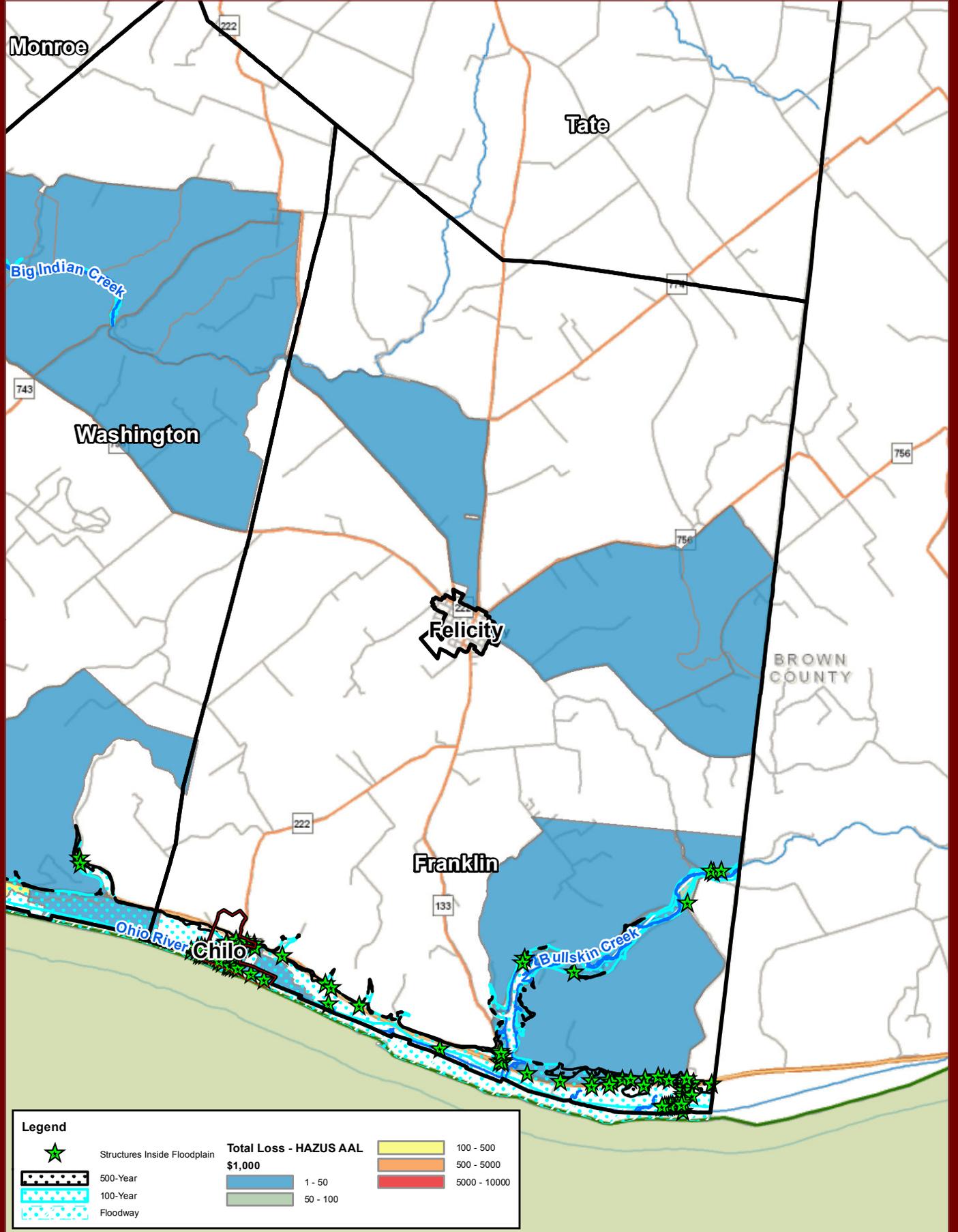
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Appendix F Page 3 Printed: 3/11/13

HAZUS - AAL
Potential Loss
 Chilo

Clermont County All-Hazards Mitigation Plan

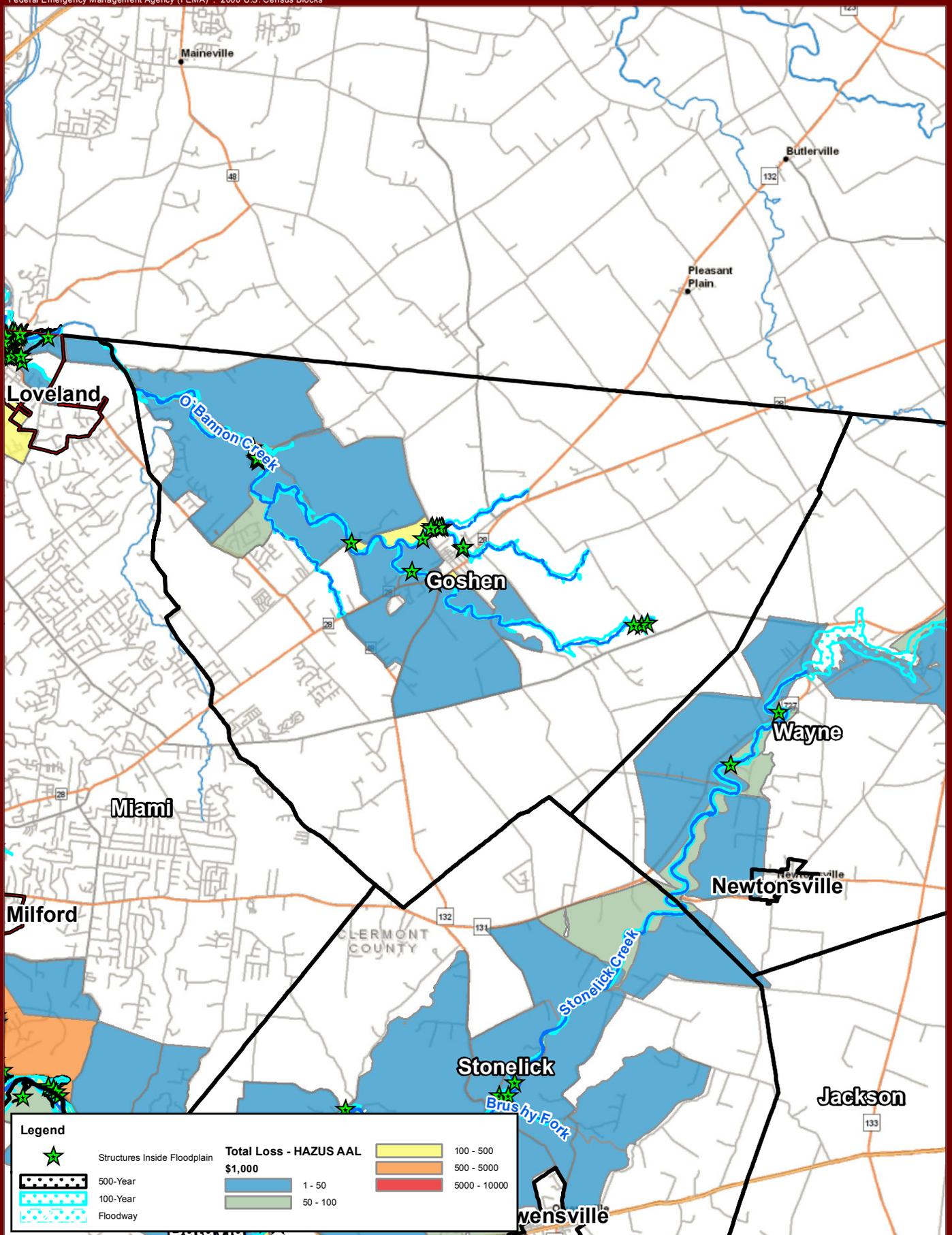


Legend

- Structures Inside Floodplain
- 500-Year
- 100-Year
- Floodway

Total Loss - HAZUS AAL \$1,000

- 1 - 50
- 50 - 100
- 100 - 500
- 500 - 5000
- 5000 - 10000

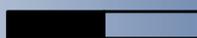


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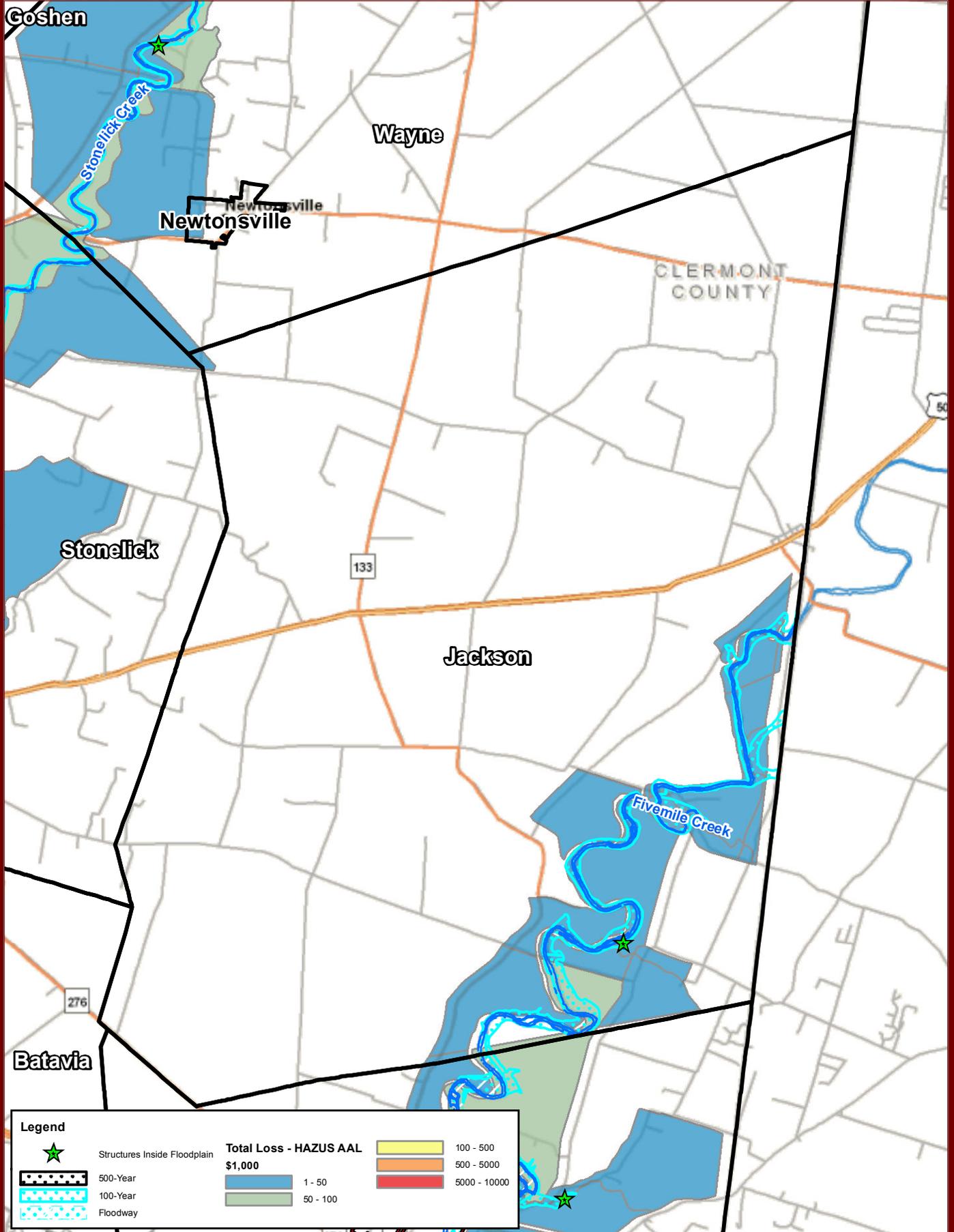
0 1.5 Miles



HAZUS - AAL
Potential Loss

Goshen

Clermont County All-Hazards Mitigation Plan

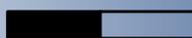


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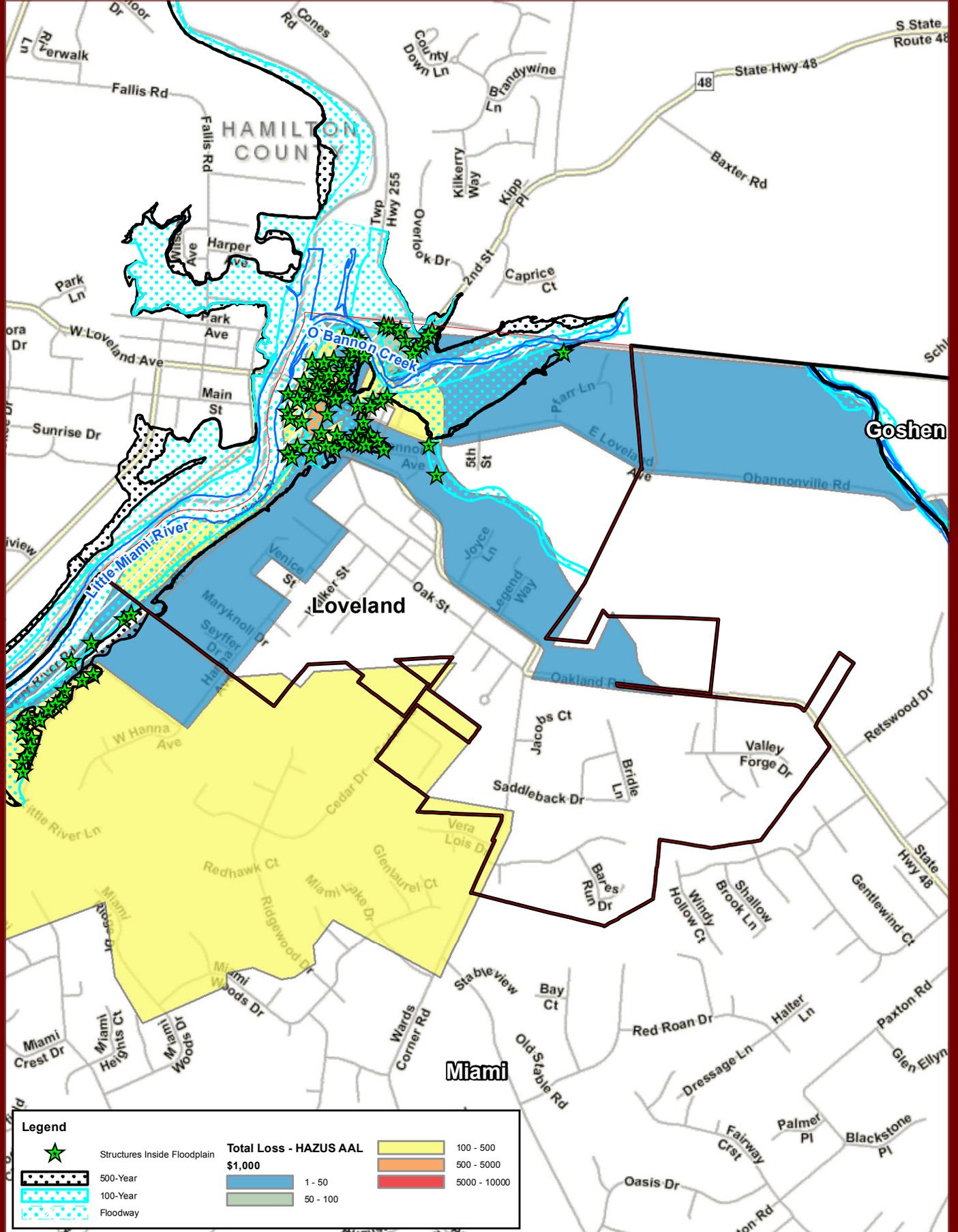
0 1 Miles



HAZUS - AAL
Potential Loss

Jackson

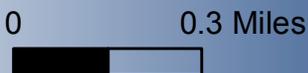
Clermont County All-Hazards Mitigation Plan



Legend		Total Loss - HAZUS AAL \$1,000	
	Structures Inside Floodplain		1 - 50
	500-Year		500 - 5000
	100-Year		5000 - 10000
	Floodway		100 - 500
			50 - 100



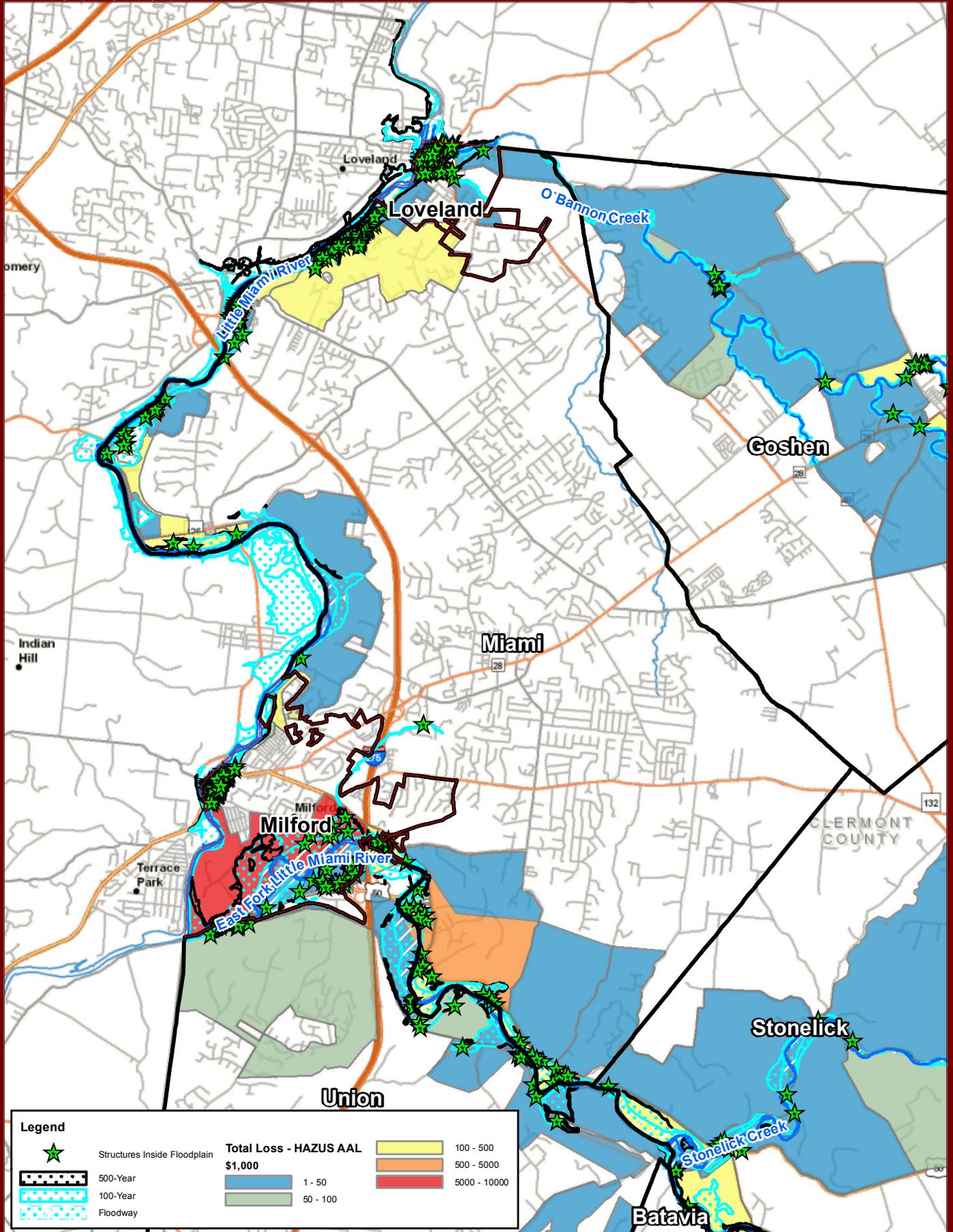
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HAZUS - AAL Potential Loss

Loveland

Clermont County All-Hazards Mitigation Plan

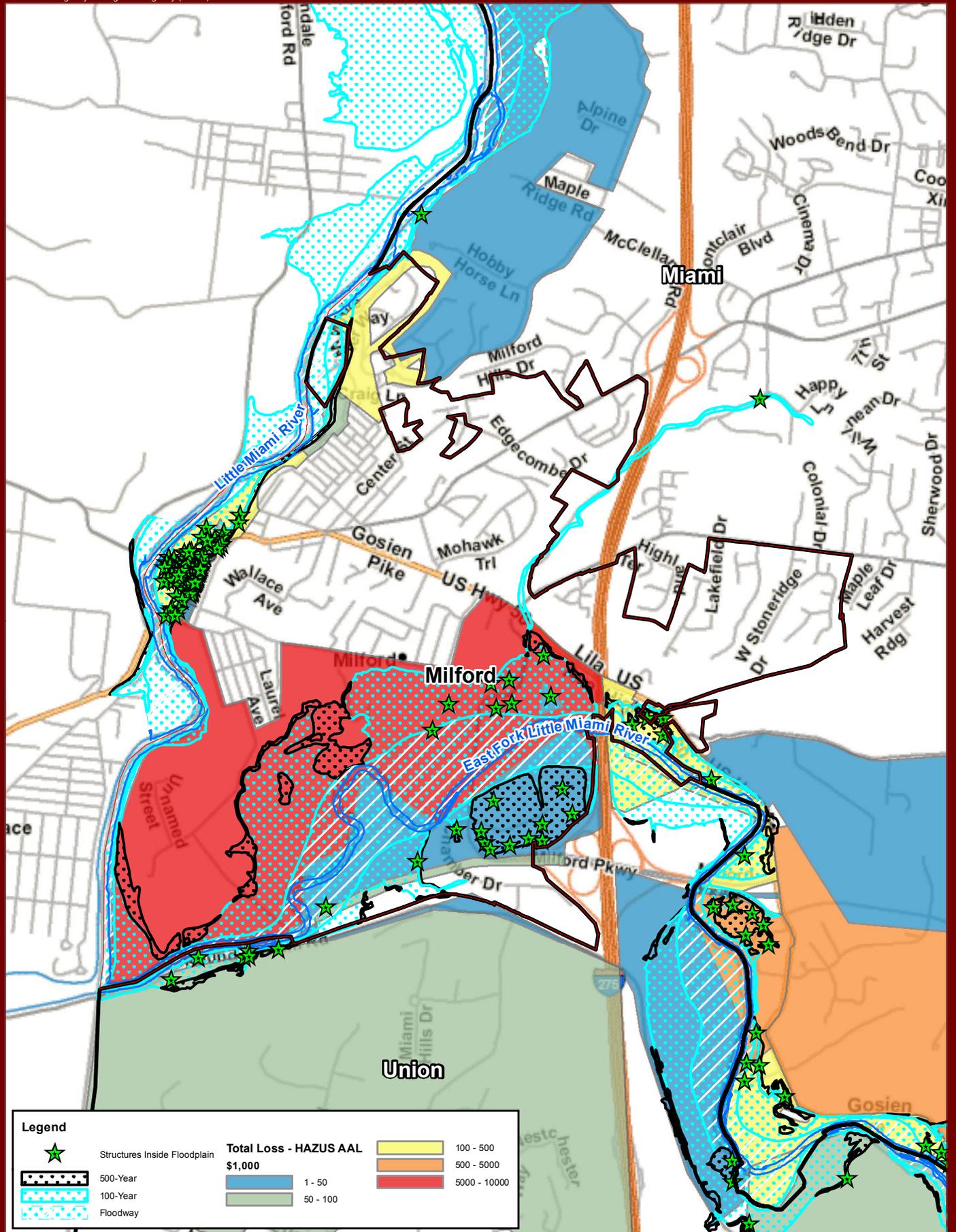


Geographic Information Systems



HAZUS - AAL Potential Loss

Miami
 Clermont County All-Hazards Mitigation Plan



Legend

	Structures Inside Floodplain	Total Loss - HAZUS AAL		100 - 500	
	500-Year		1 - 50		500 - 5000
	100-Year		50 - 100		5000 - 10000
	Floodway				



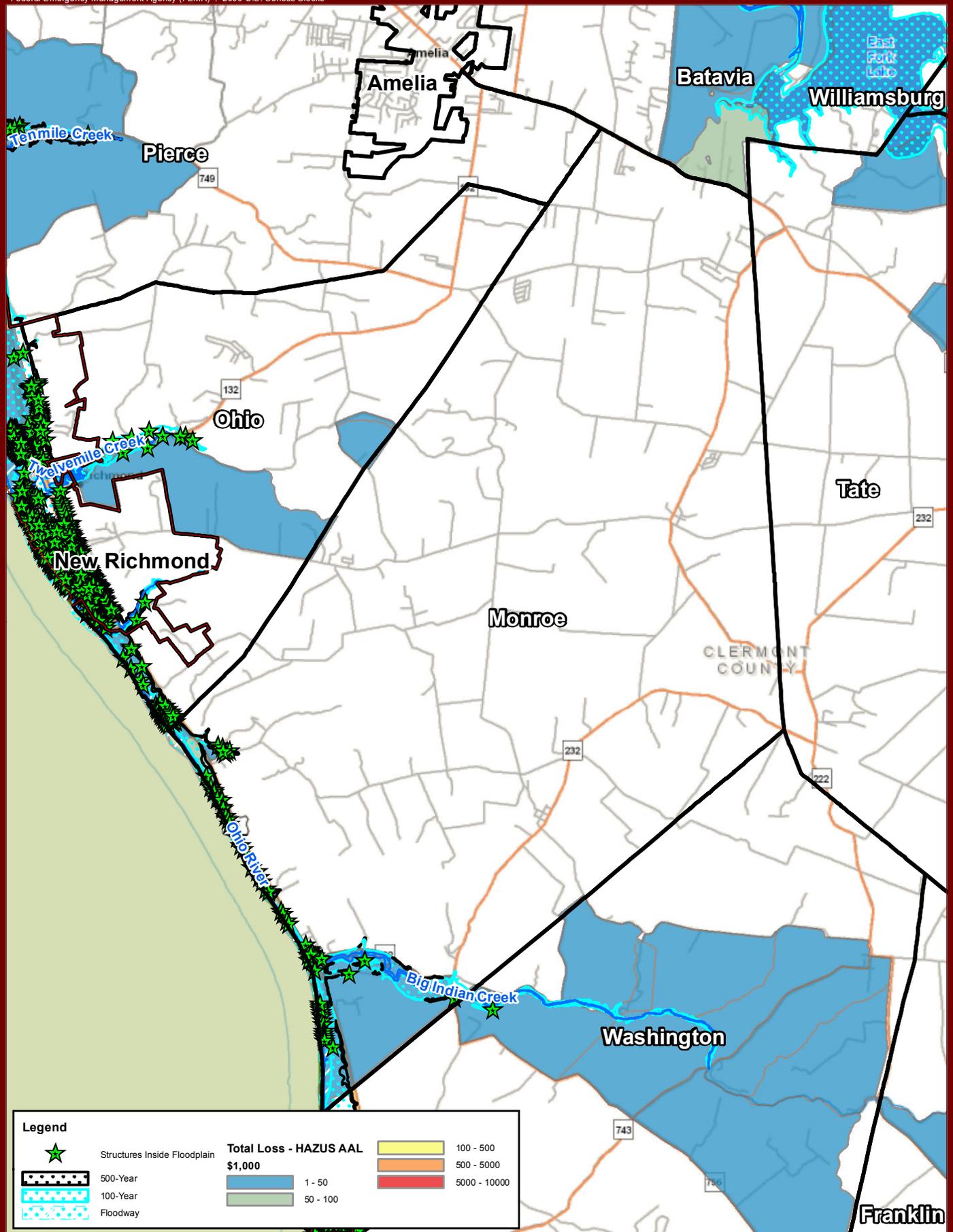
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HAZUS - AAL

Potential Loss

Milford
 Clermont County All-Hazards Mitigation Plan



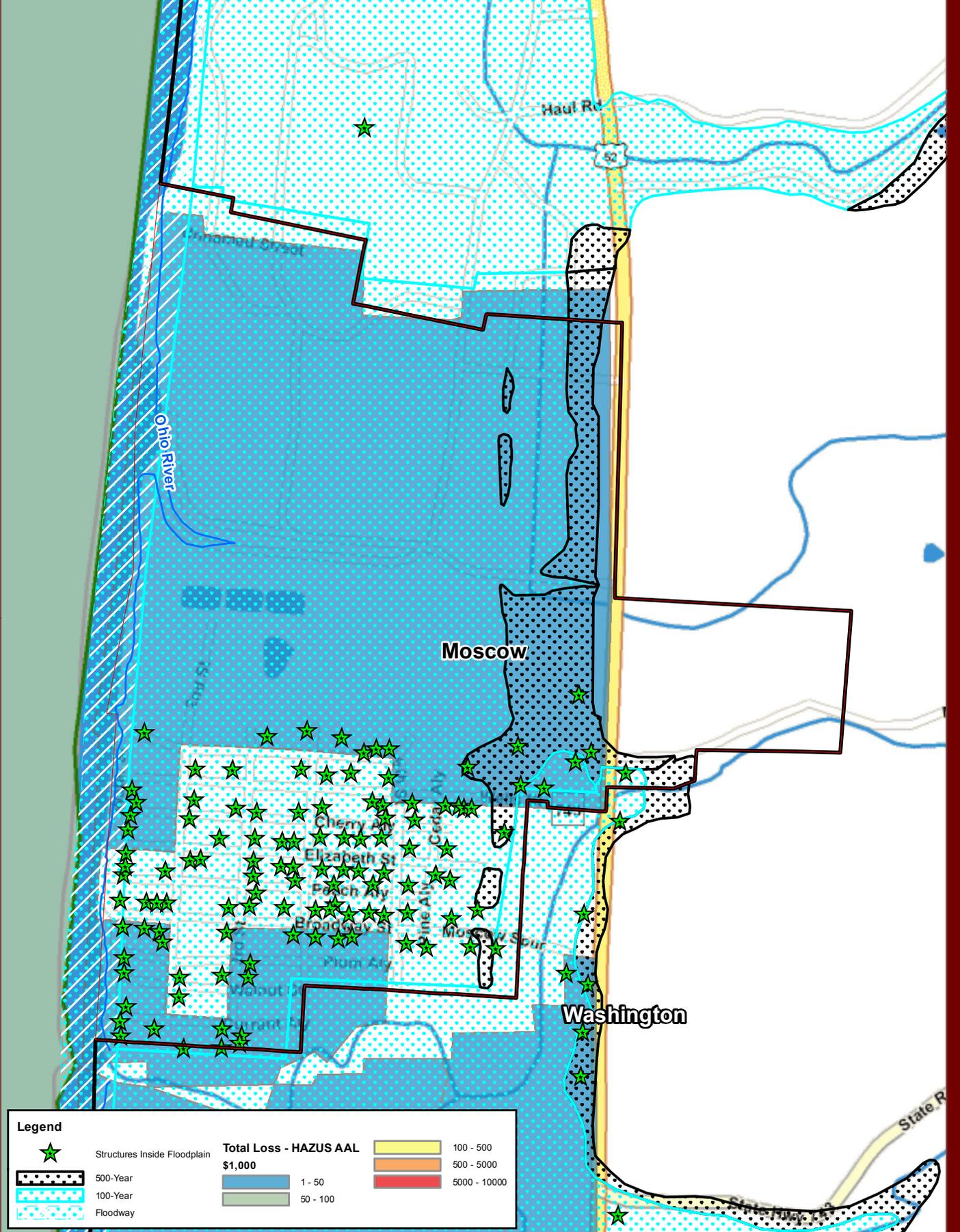
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HAZUS - AAL Potential Loss

Monroe

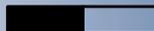
Clermont County All-Hazards Mitigation Plan



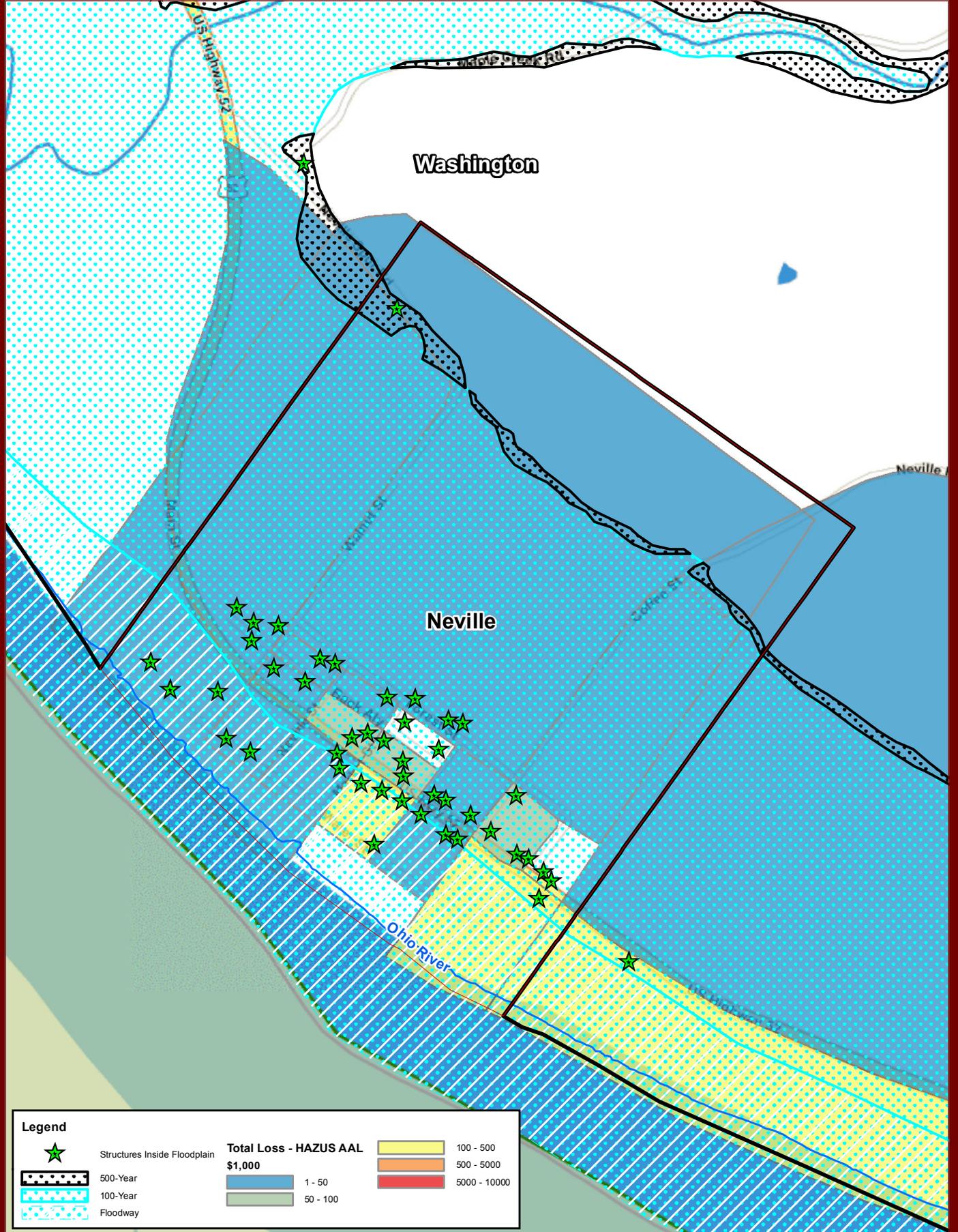
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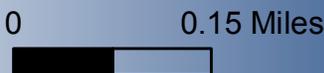
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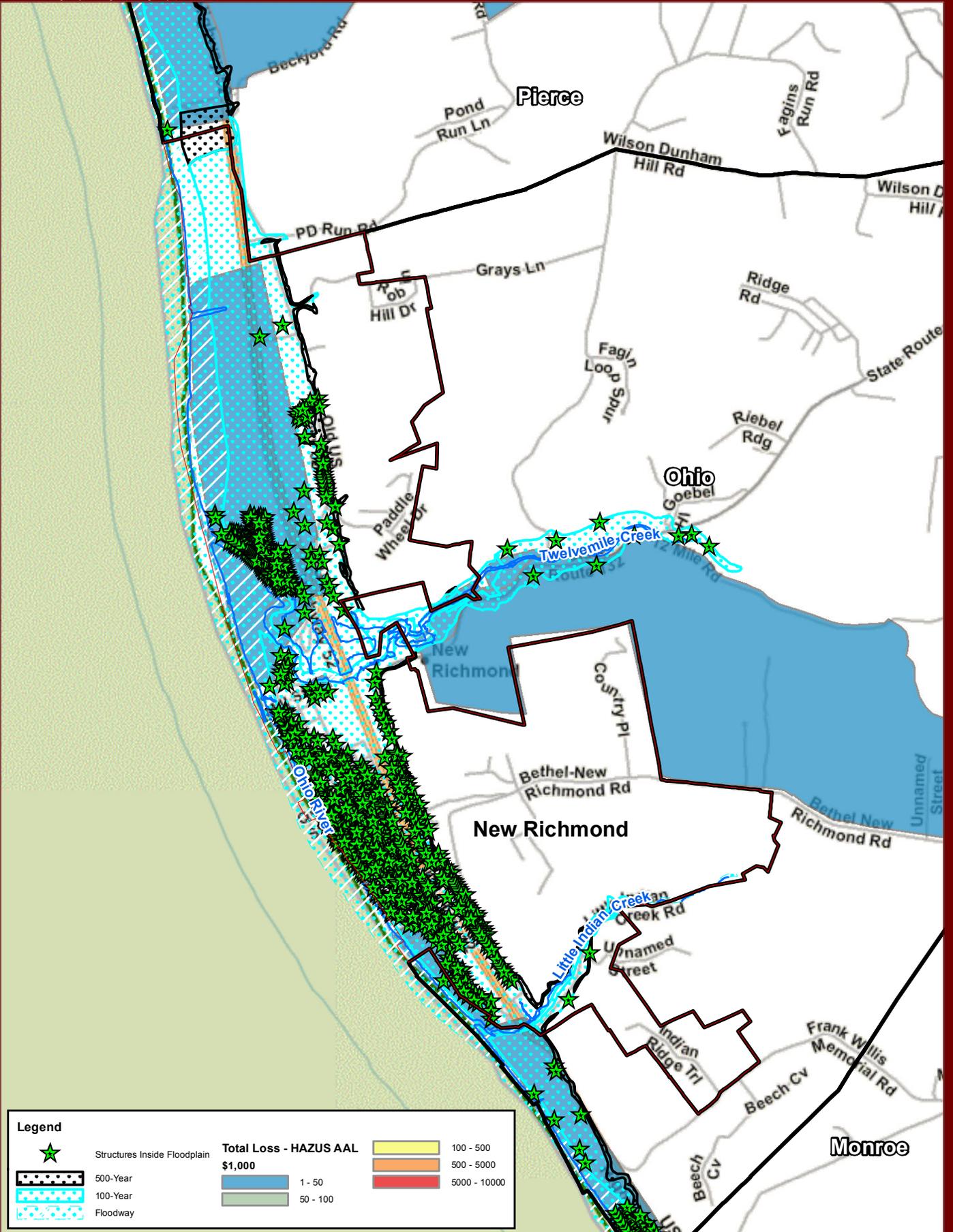
HAZUS - AAL
Potential Loss
 Moscow



Geographic Information Systems



HAZUS - AAL
Potential Loss
 Neville



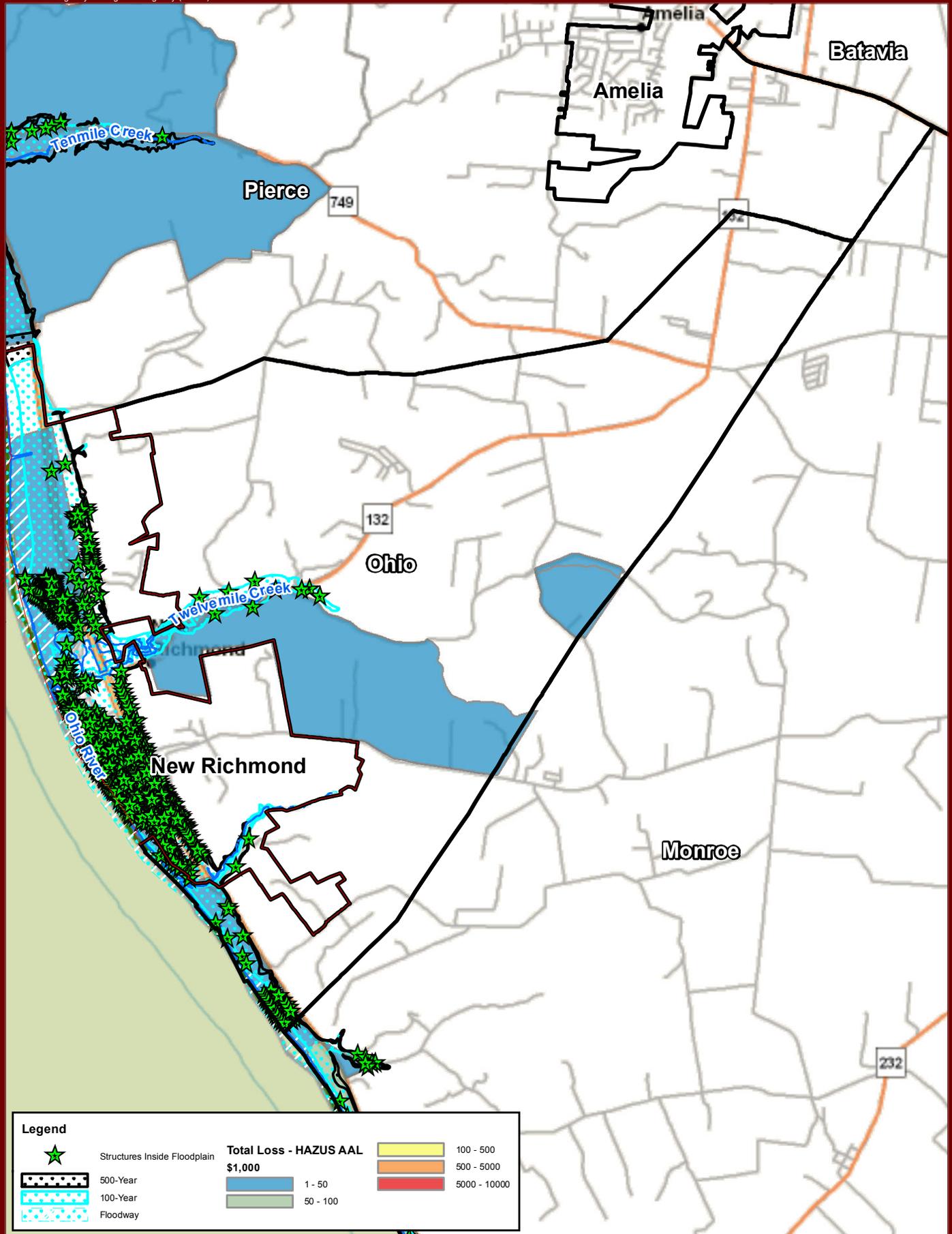
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0 0.55 Miles



HAZUS - AAL
Potential Loss
 New Richmond

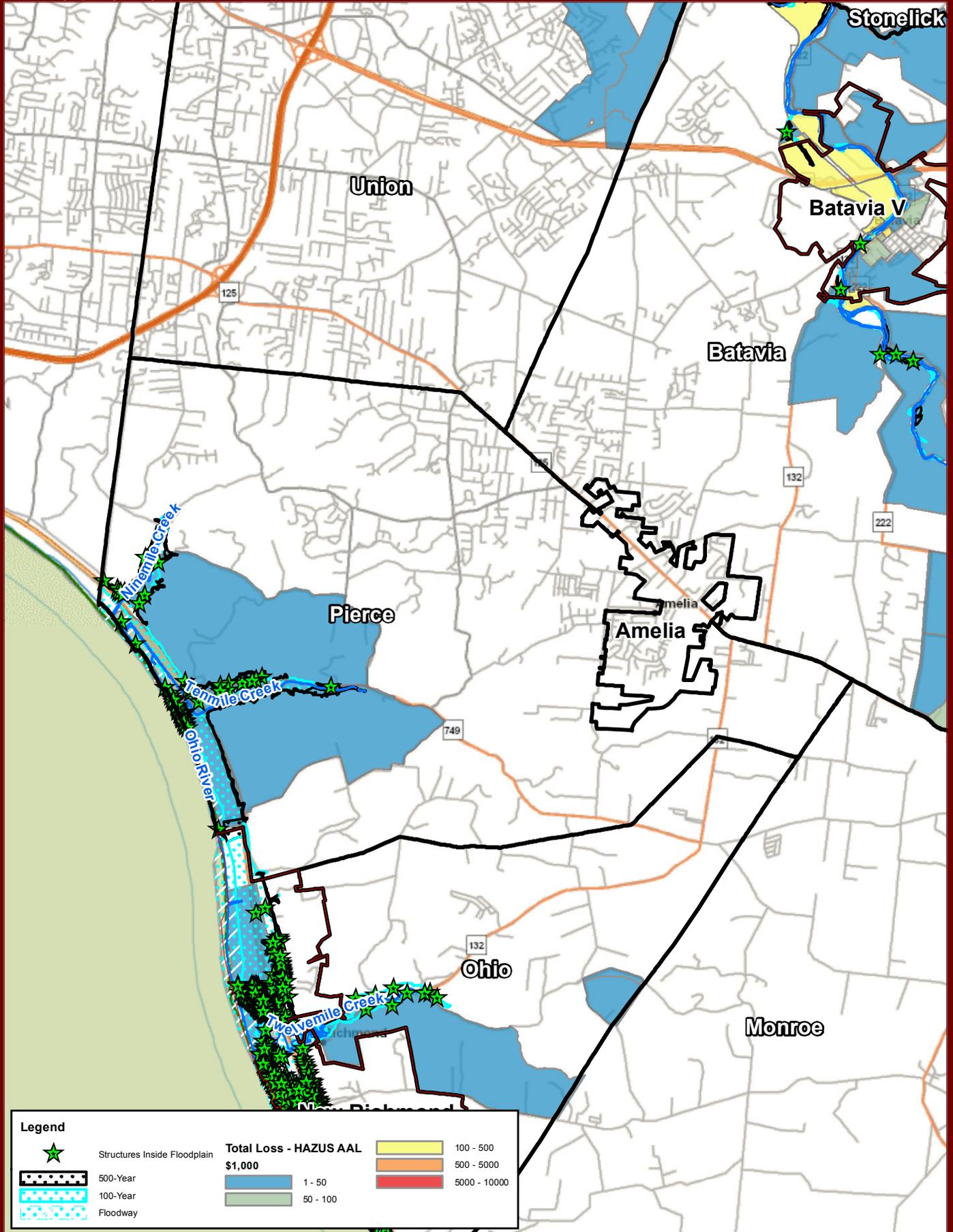


Geographic Information Systems



HAZUS - AAL Potential Loss

Ohio
 Clermont County All-Hazards Mitigation Plan



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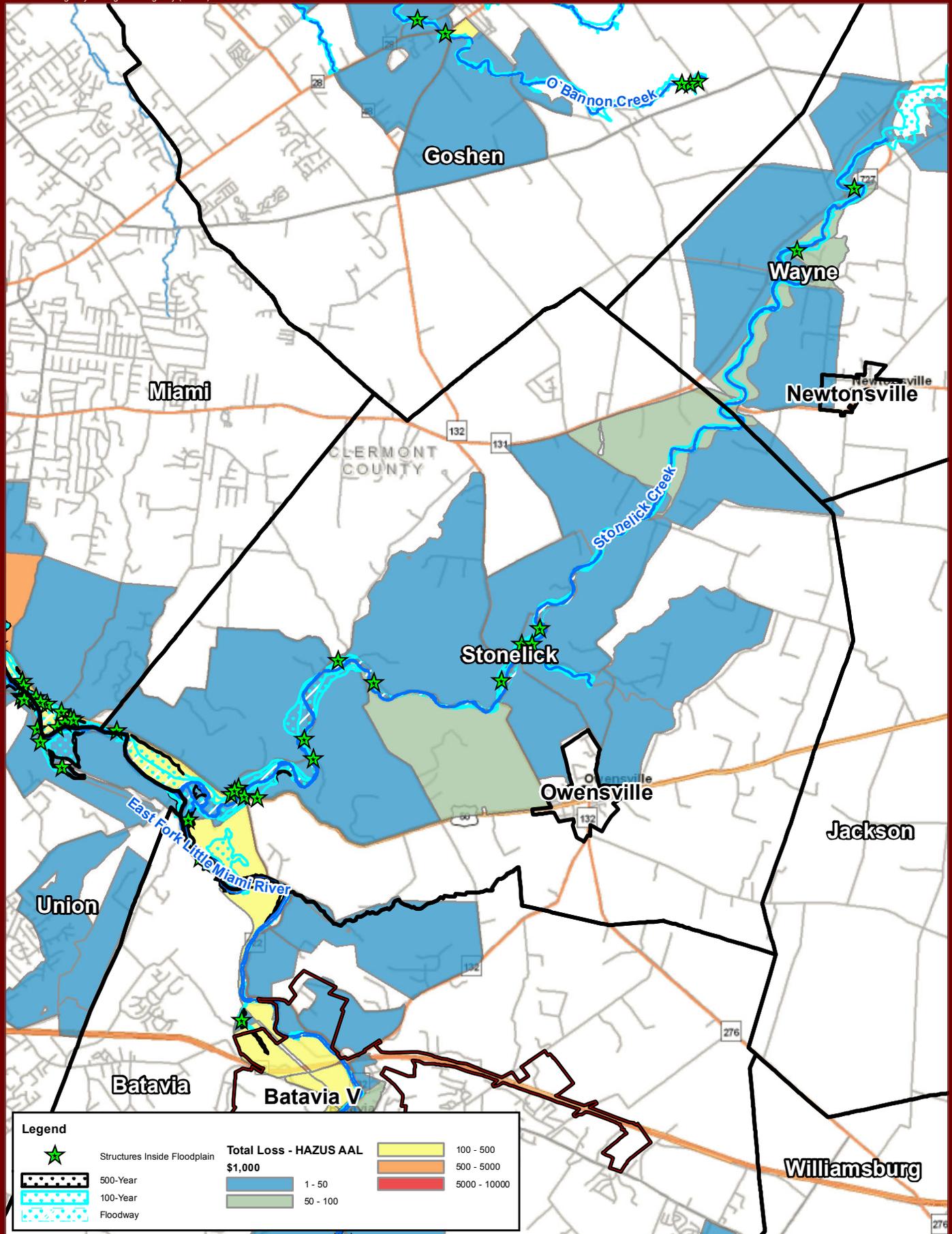
0 1 Miles



HAZUS - AAL
Potential Loss

Pierce

Clermont County All-Hazards Mitigation Plan



Legend		Total Loss - HAZUS AAL	
	Structures Inside Floodplain		1 - 50
	500-Year		50 - 100
	100-Year		100 - 500
	Floodway		500 - 5000
			5000 - 10000

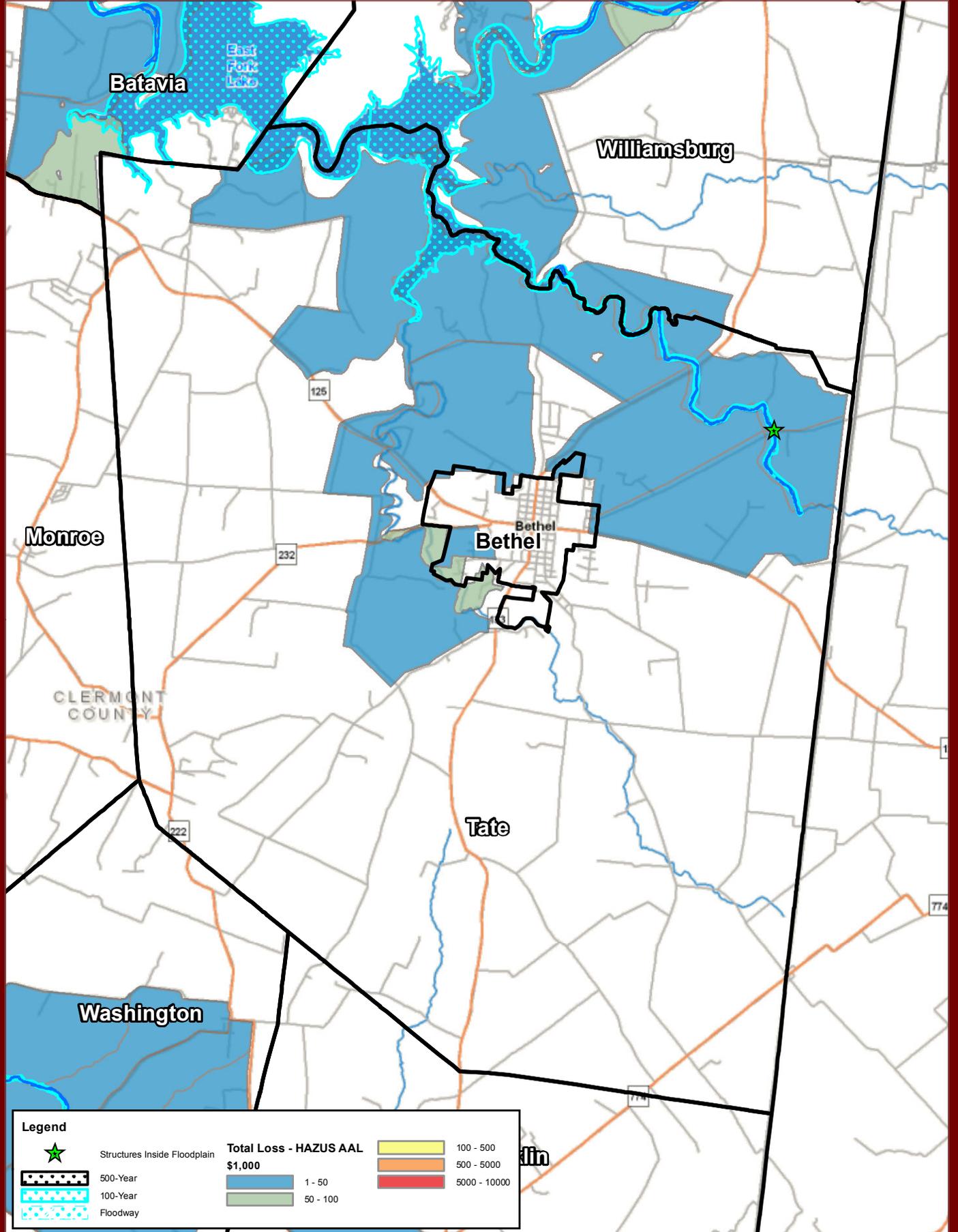


Geographic Information Systems



HAZUS - AAL Potential Loss

Stonelick
 Clermont County All-Hazards Mitigation Plan

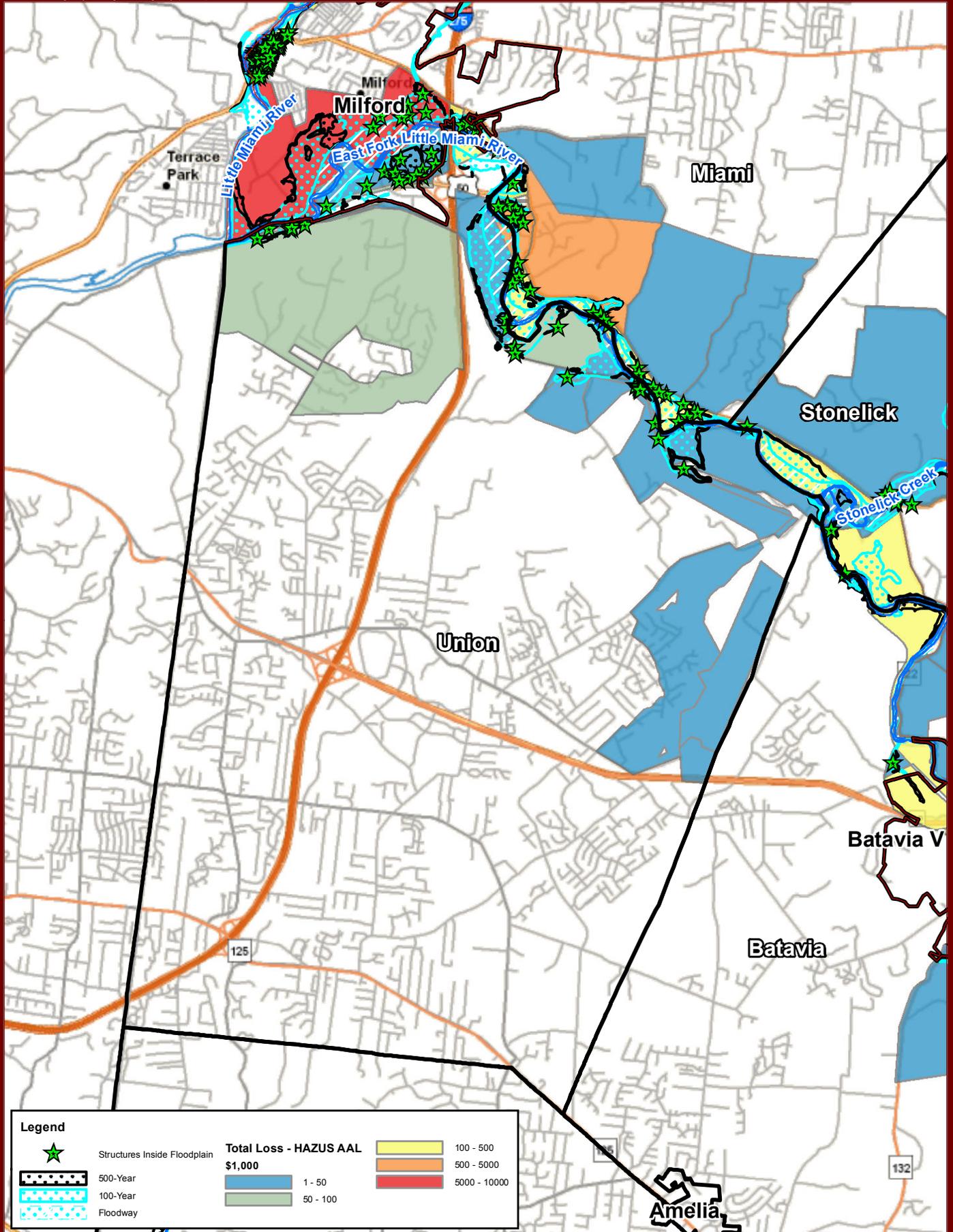


Legend

- ★ Structures Inside Floodplain
- 500-Year Floodplain (dotted pattern)
- 100-Year Floodplain (dashed pattern)
- Floodway (wavy pattern)

Total Loss - HAZUS AAL \$1,000

- Light Blue: 1 - 50
- Green: 50 - 100
- Yellow: 100 - 500
- Orange: 500 - 5000
- Red: 5000 - 10000



Legend		Total Loss - HAZUS AAL \$1,000	
	Structures Inside Floodplain		1 - 50
	500-Year		500 - 5000
	100-Year		5000 - 10000
	Floodway		50 - 100

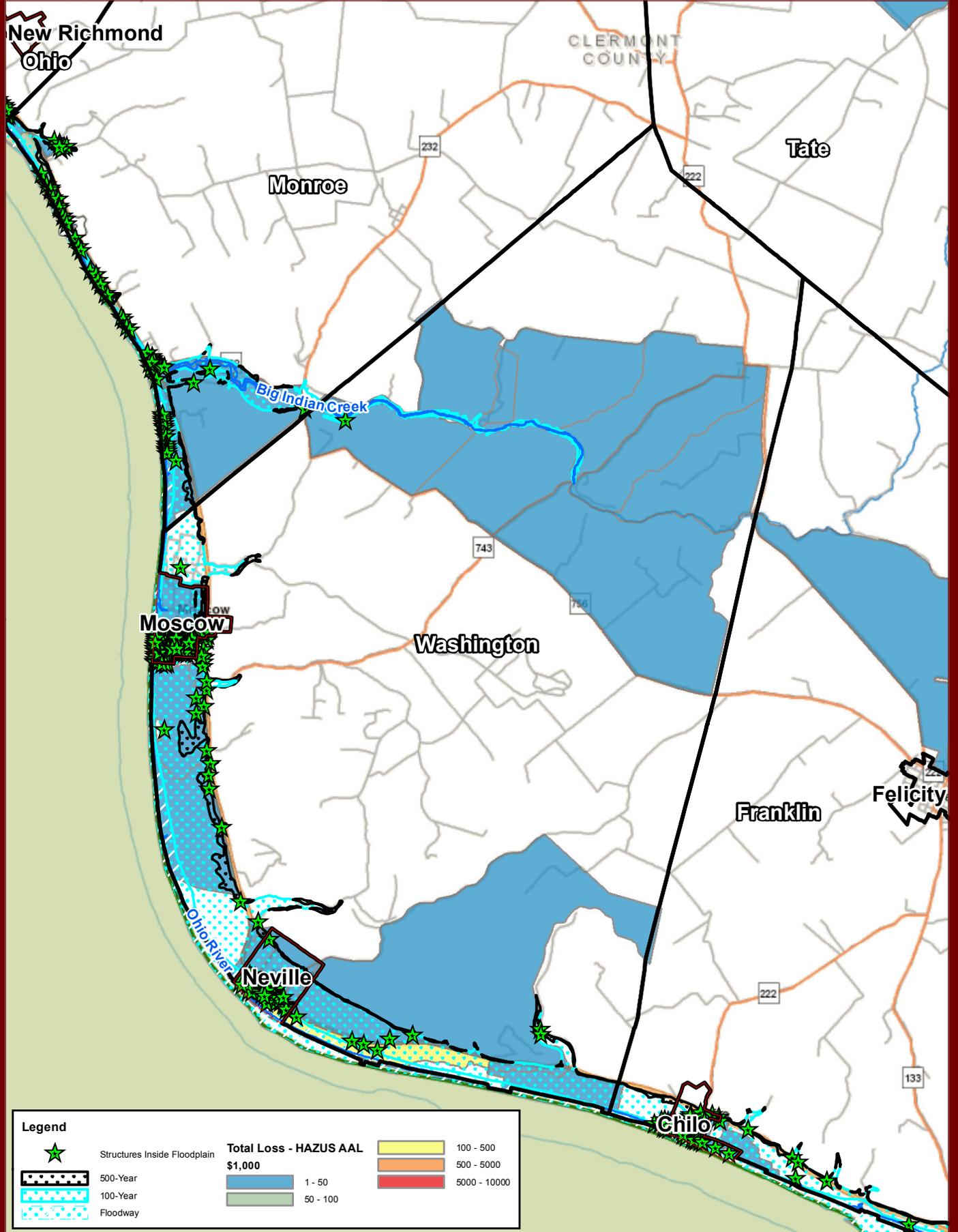


Geographic Information Systems



HAZUS - AAL Potential Loss

Union
Clermont County All-Hazards Mitigation Plan



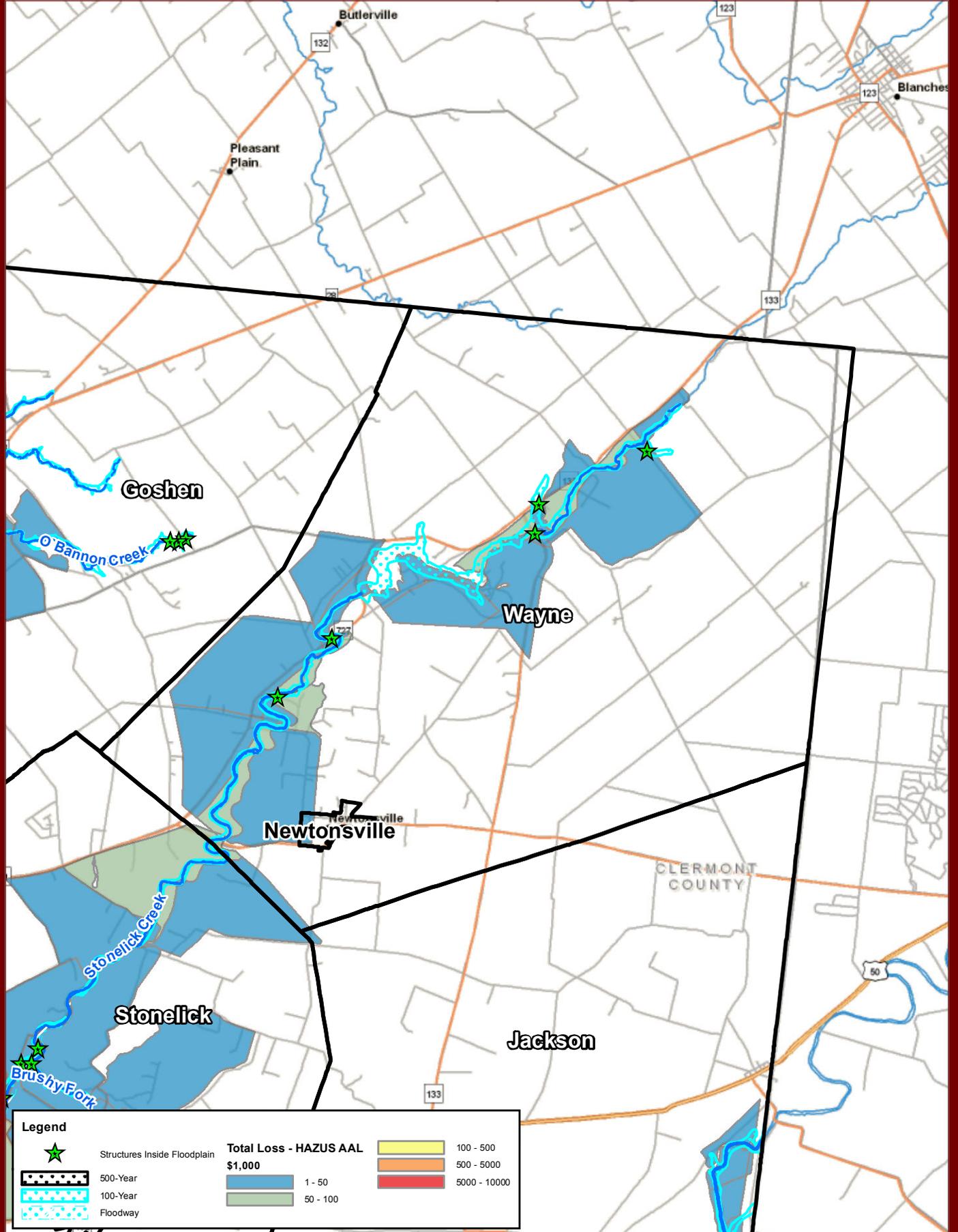
Geographic Information Systems



0 1 Miles



HAZUS - AAL
Potential Loss
 Washington



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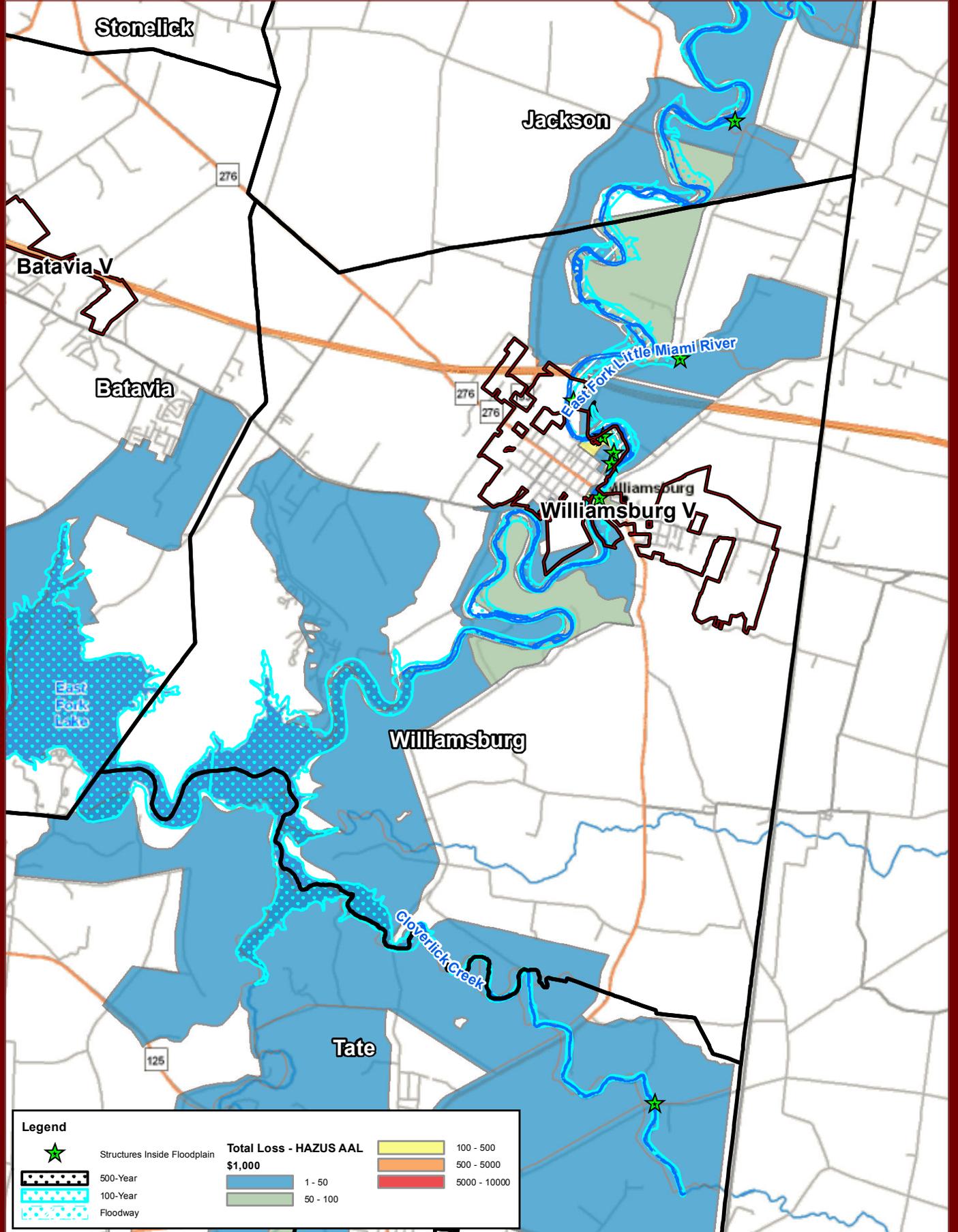


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HAZUS - AAL
Potential Loss
 Wayne

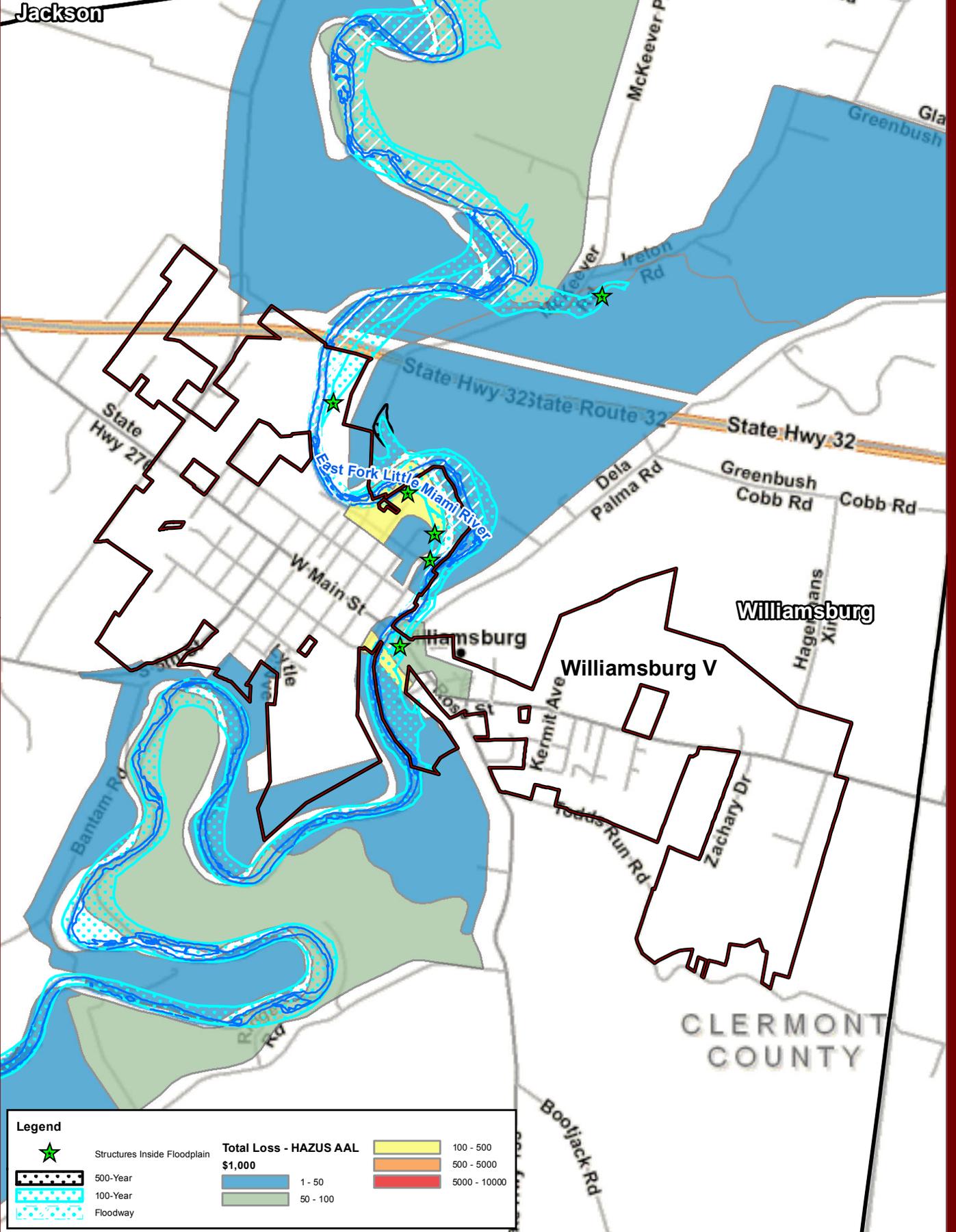
Clermont County All-Hazards Mitigation Plan



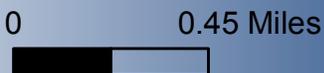
Geographic Information Systems



HAZUS - AAL
Potential Loss
 Williamsburg



Geographic Information Systems



HAZUS - AAL
Potential Loss
 Williamsburg V

Hazus-MH: Flood Event Report

Region Name: Clermont_County_AAL

Flood Scenario: AAL

Print Date: Tuesday, October 16, 2012

Disclaimer:

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

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

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General Description of the Region

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

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

- Ohio

Note:

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

The geographical size of the region is 452 square miles and contains 2,651 census blocks. The region contains over 66 thousand households and has a total population of 177,977 people (2000 Census Bureau data). The distribution of population by State and County for the study region is provided in Appendix B .

There are an estimated 65,339 buildings in the region with a total building replacement value (excluding contents) of 12,866 million dollars (2006 dollars). Approximately 92.98% of the buildings (and 76.06% of the building value) are associated with residential housing.

Building Inventory

General Building Stock

Hazus estimates that there are 65,339 buildings in the region which have an aggregate total replacement value of 12,866 million (2006 dollars). Table 1 and Table 2 present the relative distribution of the value with respect to the general occupancies by Study Region and Scenario respectively. Appendix B provides a general distribution of the building value by State and County.

Table 1
Building Exposure by Occupancy Type for the Study Region

Occupancy	Exposure (\$1000)	Percent of Total
Residential	9,785,009	76.1%
Commercial	1,942,742	15.1%
Industrial	692,852	5.4%
Agricultural	66,141	0.5%
Religion	199,416	1.5%
Government	47,281	0.4%
Education	132,134	1.0%
Total	12,865,575	100.00%

Table 2
Building Exposure by Occupancy Type for the Scenario

Occupancy	Exposure (\$1000)	Percent of Total
Residential	1,539,299	71.5%
Commercial	407,708	18.9%
Industrial	116,789	5.4%
Agricultural	17,712	0.8%
Religion	39,805	1.8%
Government	10,808	0.5%
Education	21,073	1.0%
Total	2,153,194	100.00%

Essential Facility Inventory

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 107 beds. There are 65 schools, 20 fire stations, 19 police stations and 1 emergency operation center.

Flood Scenario Parameters

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

Study Region Name:	Clermont_County_AAL
Scenario Name:	AAL
Return Period Analyzed:	Annual
Analysis Options Analyzed:	No What-Ifs

Building Damage

General Building Stock Damage

Analysis has not been performed for this Scenario.

Table 3: Expected Building Damage by Occupancy

Occupancy	1-10		11-20		21-30		31-40		41-50		Substantially	
	Count	(%)	Count	(%)								

Analysis has not been performed for this Scenario.

Table 4: Expected Building Damage by Building Type

Building Type	1-10		11-20		21-30		31-40		41-50		Substantially	
	Count	(%)	Count	(%)								

Analysis has not been performed for this Scenario.

Essential Facility Damage

Before the flood analyzed in this scenario, the region had 107 hospital beds available for use. On the day of the scenario flood event, the model estimates that 107 hospital beds are available in the region.

Table 5: Expected Damage to Essential Facilities

Classification	Total	# Facilities		
		At Least Moderate	At Least Substantial	Loss of Use
Fire Stations	20	0	0	0
Hospitals	1	0	0	0
Police Stations	19	0	0	0
Schools	65	0	0	0

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

- (1) None of your facilities were flooded. This can be checked by mapping the inventory data on the depth grid.
- (2) The analysis was not run. This can be tested by checking the run box on the Analysis Menu and seeing if a message box asks you to replace the existing results.

Induced Flood Damage

Debris Generation

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

Analysis has not been performed for this Scenario.

Social Impact

Shelter Requirements

Analysis has not been performed for this Scenario.

Economic Loss

The total economic loss estimated for the flood is 26.30 million dollars, which represents 1.22 % of the total replacement value of the scenario buildings.

Building-Related Losses

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

The total building-related losses were 26.18 million dollars. 0% of the estimated losses were related to the business interruption of the region. The residential occupancies made up 33.72% of the total loss. Table 6 below provides a summary of the losses associated with the building damage.

Table 6: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Residential	Commercial	Industrial	Others	Total
<u>Building Loss</u>						
	Building	5.68	4.90	0.84	0.53	11.96
	Content	3.19	7.78	1.67	1.17	13.80
	Inventory	0.00	0.12	0.28	0.02	0.42
	Subtotal	8.86	12.79	2.80	1.72	26.18
<u>Business Interruption</u>						
	Income	0.00	0.05	0.00	0.00	0.06
	Relocation	0.00	0.01	0.00	0.00	0.01
	Rental Income	0.00	0.01	0.00	0.00	0.01
	Wage	0.00	0.03	0.00	0.02	0.05
	Subtotal	0.01	0.10	0.00	0.02	0.12
ALL	Total	8.87	12.90	2.80	1.74	26.30

Appendix A: County Listing for the Region

Ohio

- Clermont

Appendix B: Regional Population and Building Value Data

	Building Value (thousands of dollars)			Total
	Population	Residential	Non-Residential	
Ohio				
Clermont	177,977	9,785,009	3,080,566	12,865,575
Total	177,977	9,785,009	3,080,566	12,865,575
Total Study Region	177,977	9,785,009	3,080,566	12,865,575

Hazus-MH: Earthquake Event Report

Region Name: Clermont_Earthquake_new

Earthquake Scenario: annualized_new

Print Date: January 11, 2013

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

Disclaimer:

The estimates of social and economic impacts contained in this report were produced using Hazus loss estimation methodology software which is based on current scientific and engineering knowledge. There are uncertainties inherent in any loss estimation technique. Therefore, there may be significant differences between the modeled results contained in this report and the actual social and economic losses following a specific earthquake. These results can be improved by using enhanced inventory, geotechnical, and observed ground motion data.

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General Description of the Region

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

The earthquake loss estimates provided in this report was based on a region that includes 1 county(ies) from the following state(s):

Ohio

Note:

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

The geographical size of the region is 457.16 square miles and contains 33 census tracts. There are over 66 thousand households in the region which has a total population of 177,977 people (2002 Census Bureau data). The distribution of population by State and County is provided in Appendix B.

There are an estimated 65 thousand buildings in the region with a total building replacement value (excluding contents) of 12,865 (millions of dollars). Approximately 93.00 % of the buildings (and 76.00% of the building value) are associated with residential housing.

The replacement value of the transportation and utility lifeline systems is estimated to be 1,995 and 2,014 (millions of dollars) , respectively.

Building and Lifeline Inventory

Building Inventory

Hazus estimates that there are 65 thousand buildings in the region which have an aggregate total replacement value of 12,865 (millions of dollars) . Appendix B provides a general distribution of the building value by State and County.

In terms of building construction types found in the region, wood frame construction makes up 65% of the building inventory. The remaining percentage is distributed between the other general building types.

Critical Facility Inventory

Hazus breaks critical facilities into two (2) groups: essential facilities and high potential loss facilities (HPL). Essential facilities include hospitals, medical clinics, schools, fire stations, police stations and emergency operations facilities. High potential loss facilities include dams, levees, military installations, nuclear power plants and hazardous material sites.

For essential facilities, there are 1 hospitals in the region with a total bed capacity of 107 beds. There are 80 schools, 31 fire stations, 25 police stations and 1 emergency operation facilities. With respect to high potential loss facilities (HPL), there are 42 dams identified within the region. Of these, 11 of the dams are classified as 'high hazard'. The inventory also includes 49 hazardous material sites, 0 military installations and 0 nuclear power plants.

Transportation and Utility Lifeline Inventory

Within Hazus, the lifeline inventory is divided between transportation and utility lifeline systems. There are seven (7) transportation systems that include highways, railways, light rail, bus, ports, ferry and airports. There are six (6) utility systems that include potable water, wastewater, natural gas, crude & refined oil, electric power and communications. The lifeline inventory data are provided in Tables 1 and 2.

The total value of the lifeline inventory is over 4,009.00 (millions of dollars). This inventory includes over 292 kilometers of highways, 141 bridges, 5,489 kilometers of pipes.

Table 1: Transportation System Lifeline Inventory

System	Component	# Locations/ # Segments	Replacement value (millions of dollars)
Highway	Bridges	141	135.20
	Segments	67	1,768.00
	Tunnels	0	0.00
	Subtotal		1,903.20
Railways	Bridges	2	0.30
	Facilities	0	0.00
	Segments	6	36.50
	Tunnels	0	0.00
	Subtotal		36.80
Light Rail	Bridges	0	0.00
	Facilities	0	0.00
	Segments	0	0.00
	Tunnels	0	0.00
	Subtotal		0.00
Bus	Facilities	1	1.10
	Subtotal		1.10
Ferry	Facilities	0	0.00
	Subtotal		0.00
Port	Facilities	3	6.00
	Subtotal		6.00
Airport	Facilities	1	10.70
	Runways	1	38.00
	Subtotal		48.60
		Total	1,995.70

Table 2: Utility System Lifeline Inventory

System	Component	# Locations / Segments	Replacement value (millions of dollars)
Potable Water	Distribution Lines	NA	54.90
	Facilities	1	35.00
	Pipelines	0	0.00
		Subtotal	89.90
Waste Water	Distribution Lines	NA	32.90
	Facilities	25	1,748.30
	Pipelines	0	0.00
		Subtotal	1,781.20
Natural Gas	Distribution Lines	NA	22.00
	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	22.00
Oil Systems	Facilities	0	0.00
	Pipelines	0	0.00
		Subtotal	0.00
Electrical Power	Facilities	2	231.00
		Subtotal	231.00
Communication	Facilities	1	0.10
		Subtotal	0.10
		Total	2,124.10

Earthquake Scenario

Hazus uses the following set of information to define the earthquake parameters used for the earthquake loss estimate provided in this report.

Scenario Name	annualized_new
Type of Earthquake	Probabilistic
Fault Name	NA
Historical Epicenter ID #	NA
Probabilistic Return Period	Annualized
Longitude of Epicenter	NA
Latitude of Epicenter	NA
Earthquake Magnitude	NA
Depth (Km)	NA
Rupture Length (Km)	NA
Rupture Orientation (degrees)	NA
Attenuation Function	NA

Building Damage

Building Damage

Hazus estimates that about 218 buildings will be at least moderately damaged. This is over 0.00 % of the buildings in the region. There are an estimated 0 buildings that will be damaged beyond repair. The definition of the 'damage states' is provided in Volume 1: Chapter 5 of the Hazus technical manual. Table 3 below summarizes the expected damage by general occupancy for the buildings in the region. Table 4 below summarizes the expected damage by general building type.

Table 3: Expected Building Damage by Occupancy

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Agriculture	96	0.16	0	0.00	0	0.00	0	0.00	0	0.00
Commercial	1,228	2.03	0	0.00	0	0.00	0	0.00	0	0.00
Education	13	0.02	0	0.00	0	0.00	0	0.00	0	0.00
Government	7	0.01	0	0.00	0	0.00	0	0.00	0	0.00
Industrial	470	0.78	0	0.00	0	0.00	0	0.00	0	0.00
Other Residential	10,555	17.43	242	22.74	61	28.24	0	0.00	0	0.00
Religion	125	0.21	0	0.00	0	0.00	0	0.00	0	0.00
Single Family	48,050	79.36	822	77.26	155	71.76	2	100.00	0	0.00
Total	60,544		1,064		216		2		0	

Table 4: Expected Building Damage by Building Type (All Design Levels)

	None		Slight		Moderate		Extensive		Complete	
	Count	(%)	Count	(%)	Count	(%)	Count	(%)	Count	(%)
Wood	41,476	68.51	416	39.10	26	12.04	0	0.00	0	0.00
Steel	308	0.51	0	0.00	0	0.00	0	0.00	0	0.00
Concrete	30	0.05	0	0.00	0	0.00	0	0.00	0	0.00
Precast	58	0.10	0	0.00	0	0.00	0	0.00	0	0.00
RM	15	0.02	0	0.00	0	0.00	0	0.00	0	0.00
URM	12,999	21.47	411	38.63	129	59.72	2	100.00	0	0.00
MH	5,658	9.35	237	22.27	61	28.24	0	0.00	0	0.00
Total	60,544		1,064		216		2		0	

*Note:

RM Reinforced Masonry
 URM Unreinforced Masonry
 MH Manufactured Housing

Essential Facility Damage

Before the earthquake, the region had 107 hospital beds available for use. On the day of the earthquake, the model estimates that only 10 hospital beds (10.00%) are available for use by patients already in the hospital and those injured by the earthquake. After one week, 19.00% of the beds will be back in service. By 30 days, 48.00% will be operational.

Table 5: 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	80	36	0	30
EOCs	1	0	0	1
PoliceStations	25	0	0	25
FireStations	31	0	0	31

Transportation and Utility Lifeline Damage

Table 6 provides damage estimates for the transportation system.

Table 6: Expected Damage to the Transportation Systems

System	Component	Number of Locations_				
		Locations/ Segments	With at Least Mod. Damage	With Complete Damage	With Functionality > 50 %	
					After Day 1	After Day 7
Highway	Segments	67	0	0	67	67
	Bridges	141	0	0	141	141
	Tunnels	0	0	0	0	0
Railways	Segments	6	0	0	6	6
	Bridges	2	0	0	2	2
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Light Rail	Segments	0	0	0	0	0
	Bridges	0	0	0	0	0
	Tunnels	0	0	0	0	0
	Facilities	0	0	0	0	0
Bus	Facilities	1	0	0	1	1
Ferry	Facilities	0	0	0	0	0
Port	Facilities	3	0	0	3	3
Airport	Facilities	1	0	0	1	1
	Runways	1	0	0	1	1

Note: Roadway segments, railroad tracks and light rail tracks are assumed to be damaged by ground failure only. If ground failure maps are not provided, damage estimates to these components will not be computed.

Tables 7-9 provide information on the damage to the utility lifeline systems. Table 7 provides damage to the utility system facilities. Table 8 provides estimates on the number of leaks and breaks by the pipelines of the utility systems. For electric power and potable water, Hazus performs a simplified system performance analysis. Table 9 provides a summary of the system performance information.

Table 7 : Expected Utility System Facility Damage

System	# of Locations				
	Total #	With at Least Moderate Damage	With Complete Damage	with Functionality > 50 %	
				After Day 1	After Day 7
Potable Water	1	0	0	1	1
Waste Water	25	0	0	25	25
Natural Gas	0	0	0	0	0
Oil Systems	0	0	0	0	0
Electrical Power	2	0	0	2	2
Communication	1	0	0	1	1

Table 8 : Expected Utility System Pipeline Damage (Site Specific)

System	Total Pipelines Length (kms)	Number of Leaks	Number of Breaks
Potable Water	2,745	5	1
Waste Water	1,647	2	1
Natural Gas	1,098	1	0
Oil	0	0	0

Table 9: 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	66,013	0	0	0	0	0
Electric Power		0	0	0	0	0

Induced Earthquake Damage

Fire Following Earthquake

Fires often occur after an earthquake. Because of the number of fires and the lack of water to fight the fires, they can often burn out of control. Hazus uses a Monte Carlo simulation model to estimate the number of ignitions and the amount of burnt area. For this scenario, the model estimates that there will be 0 ignitions that will burn about 0.00 sq. mi 0.00 % of the region's total area.) The model also estimates that the fires will displace about 0 people and burn about 0 (millions of dollars) of building value.

Debris Generation

Hazus estimates the amount of debris that will be generated by the earthquake. The model breaks the debris into two general categories: a) Brick/Wood and b) Reinforced Concrete/Steel. This distinction is made because of the different types of material handling equipment required to handle the debris.

The model estimates that a total of 0.01 million tons of debris will be generated. Of the total amount, Brick/Wood comprises 78.00% of the total, with the remainder being Reinforced Concrete/Steel. If the debris tonnage is converted to an estimated number of truckloads, it will require 360 truckloads (@25 tons/truck) to remove the debris generated by the earthquake.

Social Impact

Shelter Requirement

Hazus estimates the number of households that are expected to be displaced from their homes due to the earthquake and the number of displaced people that will require accommodations in temporary public shelters. The model estimates 8 households to be displaced due to the earthquake. Of these, 4 people (out of a total population of 177,977) will seek temporary shelter in public shelters.

Casualties

Hazus estimates the number of people that will be injured and killed by the earthquake. The casualties are broken down into four (4) severity levels that describe the extent of the injuries. The levels are described as follows;

- Severity Level 1: Injuries will require medical attention but hospitalization is not needed.
- Severity Level 2: Injuries will require hospitalization but are not considered life-threatening
- Severity Level 3: Injuries will require hospitalization and can become life threatening if not promptly treated.
- Severity Level 4: Victims are killed by the earthquake.

The casualty estimates are provided for three (3) times of day: 2:00 AM, 2:00 PM and 5:00 PM. These times represent the periods of the day that different sectors of the community are at their peak occupancy loads. The 2:00 AM estimate considers that the residential occupancy load is maximum, the 2:00 PM estimate considers that the educational, commercial and industrial sector loads are maximum and 5:00 PM represents peak commute time.

Table 10 provides a summary of the casualties estimated for this earthquake

Table 10: Casualty Estimates

		Level 1	Level 2	Level 3	Level 4
2 AM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	0	0	0	0
2 PM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	0	0	0	0
5 PM	Commercial	0	0	0	0
	Commuting	0	0	0	0
	Educational	0	0	0	0
	Hotels	0	0	0	0
	Industrial	0	0	0	0
	Other-Residential	0	0	0	0
	Single Family	0	0	0	0
	Total	0	0	0	0

Economic Loss

The total economic loss estimated for the earthquake is 0.93 (millions of dollars), which includes building and lifeline related losses based on the region's available inventory. The following three sections provide more detailed information about these losses.

Building-Related Losses

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

The total building-related losses were 0.46 (millions of dollars); 29 % of the estimated losses were related to the business interruption of the region. By far, the largest loss was sustained by the residential occupancies which made up over 53 % of the total loss. Table 11 below provides a summary of the losses associated with the building damage.

Table 11: Building-Related Economic Loss Estimates

(Millions of dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses							
	Wage	0.00	0.00	0.02	0.00	0.00	0.03
	Capital-Related	0.00	0.00	0.02	0.00	0.00	0.02
	Rental	0.01	0.00	0.01	0.00	0.00	0.03
	Relocation	0.02	0.01	0.02	0.00	0.00	0.06
	Subtotal	0.03	0.01	0.08	0.01	0.01	0.14
Capital Stock Losses							
	Structural	0.04	0.01	0.02	0.01	0.01	0.09
	Non_Structural	0.09	0.03	0.04	0.01	0.01	0.18
	Content	0.02	0.00	0.01	0.01	0.00	0.05
	Inventory	0.00	0.00	0.00	0.00	0.00	0.00
	Subtotal	0.16	0.05	0.08	0.03	0.02	0.33
	Total	0.19	0.06	0.15	0.04	0.02	0.46

Transportation and Utility Lifeline Losses

For the transportation and utility lifeline systems, Hazus computes the direct repair cost for each component only. There are no losses computed by Hazus for business interruption due to lifeline outages. Tables 12 & 13 provide a detailed breakdown in the expected lifeline losses.

Hazus estimates the long-term economic impacts to the region for 15 years after the earthquake. The model quantifies this information in terms of income and employment changes within the region. Table 14 presents the results of the region for the given earthquake.

Table 12: Transportation System Economic Losses
(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Highway	Segments	1,768.00	\$0.00	0.00
	Bridges	135.19	\$0.00	0.00
	Tunnels	0.00	\$0.00	0.00
	Subtotal	1903.20	0.00	
Railways	Segments	36.48	\$0.00	0.00
	Bridges	0.27	\$0.00	0.00
	Tunnels	0.00	\$0.00	0.00
	Facilities	0.00	\$0.00	0.00
	Subtotal	36.80	0.00	
Light Rail	Segments	0.00	\$0.00	0.00
	Bridges	0.00	\$0.00	0.00
	Tunnels	0.00	\$0.00	0.00
	Facilities	0.00	\$0.00	0.00
	Subtotal	0.00	0.00	
Bus	Facilities	1.14	\$0.00	0.38
	Subtotal	1.10	0.00	
Ferry	Facilities	0.00	\$0.00	0.00
	Subtotal	0.00	0.00	
Port	Facilities	5.99	\$0.03	0.45
	Subtotal	6.00	0.00	
Airport	Facilities	10.65	\$0.04	0.38
	Runways	37.96	\$0.00	0.00
	Subtotal	48.60	0.00	
	Total	1995.70	0.10	

Table 13: Utility System Economic Losses

(Millions of dollars)

System	Component	Inventory Value	Economic Loss	Loss Ratio (%)
Potable Water	Pipelines	0.00	\$0.00	0.00
	Facilities	35.00	\$0.01	0.02
	Distribution Lines	54.90	\$0.02	0.04
	Subtotal	89.86	\$0.03	
Waste Water	Pipelines	0.00	\$0.00	0.00
	Facilities	1,748.30	\$0.30	0.02
	Distribution Lines	32.90	\$0.01	0.03
	Subtotal	1,781.19	\$0.31	
Natural Gas	Pipelines	0.00	\$0.00	0.00
	Facilities	0.00	\$0.00	0.00
	Distribution Lines	22.00	\$0.00	0.02
	Subtotal	21.96	\$0.00	
Oil Systems	Pipelines	0.00	\$0.00	0.00
	Facilities	0.00	\$0.00	0.00
	Subtotal	0.00	\$0.00	
Electrical Power	Facilities	231.00	\$0.05	0.02
	Subtotal	231.00	\$0.05	
Communication	Facilities	0.10	\$0.00	0.00
	Subtotal	0.11	\$0.00	
Total		2,124.12	\$0.39	

Table 14. Indirect Economic Impact with outside aid

(Employment as # of people and Income in millions of \$)

LOSS	Total	%

Appendix A: County Listing for the Region

Clermont,OH

Appendix B: Regional Population and Building Value Data

State	County Name	Population	Building Value (millions of dollars)		
			Residential	Non-Residential	Total
Ohio	Clermont	177,977	9,785	3,080	12,865
Total State		177,977	9,785	3,080	12,865
Total Region		177,977	9,785	3,080	12,865