WAYNE COUNTY

NATURAL HAZARD MITIGATION PLAN

Prepared For:

Wayne County

Missouri

Prepared By:

Ozark Foothills Regional Planning Commission

3019 Fair Street

Poplar Bluff, MO 63901

2018

Wayne County Hazard Mitigation Planning Committee
Jurisdictional/Stakeholder Representatives

Name	Title	Jurisdiction/Agency/Organization
Lynn Schultz	City Clerk	City of Williamsville, MO
Dean Finch	Sherriff	Wayne County, MO
Bill Hovis	Associate Commissioner	Wayne County, MO
James Harris	Associate Commissioner	Wayne County, MO
Brian Polk	Presiding Commissioner	Wayne County, MO
Chad Henson	Associate Commissioner	Wayne County, MO
Brenda Seal	County Clerk	Wayne County, MO
Tammy Thurman	City Clerk	City of Piedmont, MO
Carol Hale	Treasurer	Wayne County, MO
Angela Clyburn	Chairman of the Board of Trustees	Village of Mill Spring, MO
Todd Porter	Superintendent	Greenville R-II School District
Deborah Hood	Superintendent	Clearwater R-I Scool District
Judy Osborne	City Clerk	City of Greenville, MO

Stakeholders are individuals or groups that are affected by a mitigation action or policy and include businesses, private organizations, and citizens. Unlike planning team members, stakeholders may not be involved in all stages of the planning process, but they inform the planning team on a specific topic or provide input from different points of view in the community.

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EXECUTIVE SUMMARY

The purpose of hazard mitigation is to reduce or eliminate long-term risk to people and property from natural hazards. Wayne County, its participating jurisdictions and school/special districts developed this multi-jurisdictional local hazard mitigation plan update to reduce future losses from hazard events occurring within the County. The current document is an update of a plan that was approved on November 29, 2012. The plan and the update were prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 to result in eligibility for the Federal Emergency Management Agency (FEMA) Hazard Mitigation Grant Programs.

Wayne County's natural hazard nitigation p lan is a multi-jurisdictional plan covering the following jurisdictions that participated in the planning process:

- Unincorporated Wayne County in Missouri
- City of Greenville, MO
- City of Piedmont, MO
- City of Williamsville, MO
- Village of Mill Spring, MO
- Greenville R-II School District
- Clearwater R-I School District

Wayne County and the entities listed above developed a multi-jurisdictional natural hazard mitigation plan that was approved by FEMA on November 29, 2012 (hereafter referred to as the *2012 Wayne County Hazard Mitigation Plan)*. This current planning effort serves to update that previously approved plan.

The plan update process followed a methodology prescribed by FEMA, which began with the formation of a Mitigation Planning Committee (MPC) comprised of representatives from Wayne County and its participating jurisdictions. The MPC updated the risk assessment that identified and profiled hazards posing a risk to Wayne County and analyzed jurisdictional vulnerability to these hazards. The MPC also examined the capabilities in place to mitigate the hazard damages, with emphasis on changes that have occurred since the previously approved plan was adopted. t he MPC d e t e r m i n e d t h a t t h e planning area is vulnerable to several hazards which are identified, profiled, and analyzed in this plan. Riverine and flash flooding, winter storms, severe thunderstorms/hail/lightning/high winds, and tornadoes are among the hazards that historically have had a significant impact upon Wayne County and its jurisdictions.

Based upon the risk assessment, the MPC updated its goals for reducing risk from natural hazards. The goals are listed below:

Goal 1: Implement mitigation actions that improve the protection of human life, health, and safety from the adverse effects of disasters

Goal 2: Implement mitigation actions that improve the continuity of government and essential services from the adverse effects of disasters

Goal 3: Implement mitigation actions that improve the protection of public and private property from the adverse effects of disasters

Goal 4: Implement mitigation actions that preserve community tranquility following a natural disaster.

To advance the identified goals, the MPC developed recommended mitigation actions, which are detailed in Chapter 4 of this plan. Further, the MPC developed an implementation plan for each action, which identifies priority level, background information, ideas for implementation, responsible agencies, timeline, cost estimate, potential funding sources, etc. The implementation plans can be found within Chapters 4 and 5 of this planning document.

44 CFR requirement 201.6(c)(5): The local hazard mitigation plan shall include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan. For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.

This plan has been reviewed and adopted via resolution by all participating jurisdictions and participating schools/special districts. Documentation of each adoption is included in Appendix B, and a model resolution can be found on the following page.

The following jurisdictions participated in the development of the current document and have adopted the multi-jurisdictional plan.

- Unincorporated Wayne County in Missouri
- City of Greenville, MO
- City of Piedmont, MO
- City of Williamsville, MO
- Village of Mill Spring, MO
- Greenville R-II School District
- Clearwater R-I School District

Model Resolution

(*LOCAL GOVERNING BODY/SCHOOL DISTRICT*), Missouri RESOLUTION NO. _____

A RESOLUTION OF THE (*LOCAL GOVERNING BODY /SCHOOL DISTRICT*) ADOPTING THE (*PLAN NAME*)

WHEREAS the (*local governing body/school district*) recognizes the threat that natural hazards pose to people and property within the (local governing body/school district); and

WHEREAS the (*local governing body/school district*) has participated in the preparation of a multi-jurisdictional local hazard mitigation plan, hereby known as the (*plan name*), hereafter referred to as the *Plan*, in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS the *Plan* identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the *(local governing body/school district*) from the impacts of future hazards and disasters; and

WHEREAS the (*local governing body*) recognizes that land use policies have a major impact on whether people and property are exposed to natural hazards, the (*local governing body/school district*) will endeavor to integrate the *Plan* into the comprehensive planning process; and

WHEREAS adoption by the (*local governing body/school district*) demonstrates their commitment to hazard mitigation and achieving the goals outlined in the *Plan*.

NOW THEREFORE, BE IT RESOLVED BY THE (*LOCAL GOVERNMENT/SCHOOL DISTRICT*), in the State of Missouri, THAT:

In accordance with (*local rule for adopting resolutions*), the (*local governing body/school district*) adopts the final *FEMA-approved Plan*.

ADOPTED by a vote of__in favor and____against, and____abstaining, this_day of _____,_____.

By (Sig):_____
Print name: _____

ATTEST: By (Sig.): Print name: _____

APPROVED AS TO FORM:
By (Sig.): _____
Print name: _____

1 INTRODUCTION AND PLANNING PROCESS

1.1 PURPOSE

Mitigation is the effort to reduce loss of life and property by lessening the impact of a disaster. For hazard mitigation to be effective, specific mitigation actions need to be ongoing so as to prevent injury, loss of life, and financial costs.

Following tornado and flooding events and a consequential presidential disaster declaration during the spring of 2002 (DR-1412), the Missouri State Emergency Management Agency (SEMA) received flood buyout project proposals from 23 communities in the State of Missouri. Fortunately, SEMA was able to assist some of these communities in relocating residents out of the floodplain with federal mitigation grant funding provided by the Federal Emergency Management Agency (FEMA).

- Effective November 1, 2004, communities that experience a natural disaster may receive federal disaster public assistance and individual assistance but are not eligible for pre-disaster mitigation assistance unless they have a FEMA approved disaster mitigation plan on file. For nearly 1,000 communities and 114 counties in Missouri, mitigation plans are required. All jurisdictions that participate in the development of the hazard mitigation plan and adopt the completed plan are eligible to receive federal mitigation grant funding. Jurisdictions that choose not to participate in the development or adoption of the plan are ineligible for mitigation funding. The resulting regulations established the requirements for local hazard mitigation plans and can be found in the Robert T. Stafford Disaster Relief and Emergency Act (Public Law 93-288).

The above described eligibility requirement for an adopted hazard mitigation plan pertaining to federal hazard mitigation grant funding is set forth in the following legislation:

- *The Disaster Mitigation Act of 2000* (Public Law 106-390) and the implementing regulations set forth by the Interim Final Rule published in the *Federal Register* on February 26, 2002, (44 CFR §201.6) and finalized on October 31, 2007. (Hereafter, these requirements and regulations will be referred to collectively as the Disaster Mitigation Act or DMA).

1.2 BACKGROUND AND SCOPE

This plan is an update of the current *Wayne County Hazard Mitigation Plan* that was approved during January 2012. FEMA approved hazard mitigation plans are required to be updated every five years to remain compliant, and valid, and to ensure the plan is addressing current trends and needs of the participating jurisdictions.

The *Wayne County Hazard Mitigation Plan* that was approved in 2012 and this update were prepared by the Ozark Foothills Regional Planning Commission (OFRPC). The OFRPC, a member of the Missouri Association of Councils of Government (MACOG) was created in 1967. The commission serves the five county region that includes Butler, Carter, Wayne, Reynolds, and Ripley Counties, as well as all municipalities within those five counties.

Information in this plan should be used as a guide for the coordination of mitigation activities and decisions regarding local land use planning in the future. The actions included in this plan are not final solutions but should be thought of as ongoing efforts that will have long-term strategic impact when implemented.

1.3 PLAN ORGANIZATION

This plan update is organized into five chapters and an appendix. Following is the list of chapters and their respective titles.

- Chapter 1: Introduction and Planning Process
- Chapter 2: Planning Area Profile and Capabilities
- Chapter 3: Risk Assessment
- Chapter 4: Mitigation Strategy
- Chapter 5: Plan Implementation and Maintenance
- Appendices

1.4 PLANNING PROCESS

44 CFR Requirement 201.6(c)(1): [The plan shall document] the planning process used to develop the plan, including how it was prepared, who was involved in the process, and how the public was involved.

As mentioned above, the OFRPC was contracted to facilitate the update of the multi-jurisdictional, local hazard mitigation plan. The roles and responsibilities of the OFRPC throughout the process were as follows:

- assist in establishing a Mitigation Planning Committee (MPC) as defined by the Disaster Mitigation Act (DMA);
- determine if the MPC established for the previously approved plan was a standing committee that met in the interim, and set forth any changes in the MPC membership and procedures since adoption of the previous plan;

- assess whether there was adherence to the maintenance process set forth in the previously approved plan (e.g., did the MPC meet regularly as specified in the previously approved plan), and explain how adherence occurred, and/or why it did not occur;
- ensure the updated plan meets the DMA requirements as established by federal regulations and follows the most current planning guidance of the Federal Emergency Management Agency (FEMA);
- facilitate the entire plan development process;
- identify the data that MPC participants could provide and conduct the research and documentation necessary to augment that data;
- assist in soliciting public input; and,
- produce the draft and final plan update in a FEMA-approvable document and Coordinate the Missouri State Emergency Management Agency (SEMA) and (FEMA) plan reviews.

Table 1.1 Mitigation Planning Team Membership

NAME	TITLE	JURISDICTION/ORGANIZATION	DEPARTMENT
Lynn Schultz	City Clerk	City of Williamsville, MO	City Government
Dena Finch	Sheriff	Wayne County, MO	Law Enforcement
James Harris	Associate Commissioner	Wayne County, MO	County Government
Brian Polk	Presiding Commissioner	Wayne County, MO	County Government
Chad Henson	Associate Commissioner	Wayne County, MO	County Government
Brenda Seal	County Clerk	Wayne County, MO	County Government
Tammy Thurman	City Clerk	City of Piedmont, MO	Local Government
Carol Hale	Treasurer	Wayne County, MO	County Government
Angela Clyburn	Chairman of the Board	Village of Mill Spring, MO	Local Government
Todd Porter	Superintendent	Greenville R-II Schools	Public Education
Deborah Hand	Superintendent	Clearwater R-I Schools	Public Education
Judy Osborne	City Clerk	City of Greenville, MO	Local Government

The above listed individuals represented their respective organizations in the form of a committee to update the *Wayne County Hazard Mitigation Plan*. Each participant fulfilled the requirements of attending a meeting and/or completing the survey for the jurisdiction he/she represented.

1.4.1 Multi-Jurisdictional Participation

44 CFR Requirement §201.6(a)(3): Multi-jurisdictional plans may be accepted, as appropriate, as long as each jurisdiction has participated in the process and has officially adopted the plan.

The Ozark Foothills Regional Planning Commission (OFRPC), on behalf of Wayne County, invited all cities, school districts, and private nonprofit it entities in the County to participate in this update of the Wayne County Multi-Jurisdictional Hazard Mitigation Plan. DMA 2000 requires that jurisdictions represented by a multi-jurisdictional plan participate in the planning

process and formally adopt the plan. Each participating jurisdiction was required to meet plan participation requirements as defined by the MPC at the beginning of the planning process. Minimum participation requirements were defined as follows:

- Designation of a representative from each participating jurisdiction to serve on the MPC;
- Participation in planning area-wide MPC meetings by either direct participation or authorized representation, or, in the event of a jurisdictional representative's inability to attend a planning meeting, the provision of a timely and complete *Data Collection Questionnaire* for the participatin jurisdiction;
- Each participating jurisdiction must provide to the MPC sufficient information to support plan development by completion and return of *Data Collection Questionnaires* and validating/correcting critical facility inventories;
- provide progress reports on mitigation actions from the previously approved plan and identify additional mitigation actions for the plan;
- eliminate from further consideration those actions from the previously approved plan that were not implemented because they were impractical, inappropriate, not cost-effective, or were otherwise not feasible;
- review and comment on plan drafts;
- actively solicit input from the public, local officials, and other interested parties about the planning process and provide an opportunity for them to comment on the plan; and,
- Formally adopt the mitigation plan prior to submittal to SEMA and FEMA for final approval.

Table 1.2 shows the representation of each participating jurisdiction at the planning meetings, the provision of responses to the Data Collection Questionnaire, and, if they provided an update/development of mitigation actions.

Table 1.2 Jurisdictional Participation in Planning Process

Jurisdiction	Kick-off Meeting	Meeting #2	Meeting #3	Data Collection Questionnaire Response	Update/Develop Mitigation Actions	Solicit Input	Adopt the Plan
Wayne County	x	x	x	x	x	x	x
City of Greenville				x	x	x	x
Village of Mill Spring		x		x	x	x	x
City of Piedmont	x	x		x	x	x	x
City of Williamsville	x	x	x	x	x	x	x
Greenville R-II		x		x	x	x	x
Clearwater R-I				x	x	x	x

1.4.2 The Planning Steps

Data for this plan was obtained through a series of public meetings held within Wayne County. The planning process for the *Wayne County Hazard Mitigation Plan* began during the summer of 2017, with presentations to elected officials, community members, members of neighboring communities, and other interested parties. These individuals were invited to attend planning meetings, with a special effort to invite participants representing various business and service interests throughout Wayne County communities. The Clearwater Superintendent was unable to participate in the planning meetings, so she participated via phone and online by completing the survey. Participants were asked to donate their time by attending three pre-

planned meetings to discuss the content of the updated plan. During each meeting the plan was broken into parts, shared with those in attendance, and asked for their input. Each person was able to count their time as donated match time toward the plans local match requirement. Participants were asked to identify critical infrastructure, ranking the likelihood of disaster occurrence, perform a susceptibility analysis based on these factors, and determine appropriate mitigation strategies for each individual hazard. This data was recorded and assimilated into this plan by OFRPC staff.

Background and statistical data for this plan were collected from a variety of sources, including Data Collection Questionnaires, the United States Census Bureau, the United States Geological Society, the United States Corps of Engineers, the Missouri Department of Natural Resources, the Missouri Department of Conservation, the Center for Agricultural, Resources and Environmental Systems at the University of Missouri-Columbia, and the National Climatic Data Center. *The Missouri State Hazard Mitigation Plan* was last updated in 2013 and provided information regarding tornado, earthquake, and flood hazard affecting Wayne

County. Flood hazard data from the 2006 HAZUS-MH loss run for Wayne County was incorporated into the plan providing updated information on vulnerable structures, shelter requirements, and loss estimates. Other sources of information including Comprehensive Land Use Plans, Zoning Ordinances, Building Codes, Storm Water Regulations, and Subdivision Regulations were reviewed for applicability to the plan.

Table 1.3 describes the 10-step planning process adapted from FEMA's Community Rating System and Flood Mitigation Assistance Program. The 10-step process allowed the plan to meet the funding eligibility requirements of the Hazard Mitigation Grant Program, Pre-Disaster Mitigation Program, Community Rating System, and the Flood Mitigation Assistance Program.

The sources for the plan update framework and development process used were FEMA's *Local Mitigation Planning Handbook (March 2013)*, *Local Mitigation Plan Review Guide (October 1, 2011)*, and *Integrating Hazard Mitigation into Local Planning: Case Studies and Tools for Community Officials (March 1, 2013)*. The planning "How To" guides developed prior to 2012 are no longer current.

Table 1.3 Wayne County Mitigation Plan Update Process

Community Rating System (CRS) Planning Steps (Activity 510)	Local Mitigation Planning Handbook Task (44 CFR Part 201)
Step 1: Organize the Planning Committee	Task 1: Determine the Planning Area and Resources Task 2: Build the Planning Team [44 CFR 201.6(c)(1)]
Step 2: Involve the Public	Task 3: Create an Outreach Strategy [(44 CFR 201.6 (b)(1)]
Step 3: Coordinate	
Step 4: Assess the Hazard	Task 5: Conduct a Risk Assessment [44 CFR 201.6(c)(2)(i), (ii), & (iii)]
Step 5: Assess the Problem	Task 4: Review Community Capabilities [44 CFR 201.6(b)(2) & (3)]
Step 6: Set Goals Step 7: Review Possible Activities Step 8: Draft an Action Plan	Task 6: Develop a Mitigation Strategy [(44 CFR 201.6(c)(3)(i), (ii), & (iii)]
Step 9: Adopt the Plan	Task 8: Review and Adopt the Plan
Step 10: Implement, Evaluate, & Revise the Plan	Tash 7: Keep the Plan Current Task 9: Create a Safe & Resilient Community [(44 CFR 201.6(c)(4)]

Step 1: Organize the Planning Team (Handbook Tasks 1 & 2)

During the informational meeting that was held on May 23, 2017, those in attendance were given an overview of hazard mitigation, the planning area was recognized as Wayne County. During the scoping meeting, a tentative schedule was set, identification of possible MPC members was established, and general methodology was discussed.

Table 1.4 provides a brief overview, with dates for the three planning meetings held in the process of updating the *2012 Wayne Conty Hazard Mitigaiton Plan*. The Data Collection Questionnaires were distributed to all jurisdictions represented at the first meeting and emailed to the jurisdictions not present at the informational meeting.

Table 1.4 Schedule of MPC Meetings

Meeting	Topic	Date
Kick-off Meeting	An overview of hazard mitigation was provided, jurisdictions were asked to name a representative to the MPC, future meeting dates and locations were selected, public input and solicitation for surveys were discussed.	May 23, 2017
Planning Meeting #2	Identify and profile hazards, previous disaster declarations, and discussion of data sources.	June 20, 2017
Planning Meeting #3	2012 Wayne County goals were reviewed and updated. STAPLEE worksheets were utilized for determining future goals.	July 25, 2017

Step 2: Plan for Public Involvement (Handbook Task 3)

44 CFR Requirement 201.6(b): An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include: (1) An opportunity for the public to comment on the plan during the drafting stage and prior to plan approval.

A kickoff meeting was held on June 20, 2017 at the Wayne County Courthouse in the Commission Chambers in Greenville, Missouri. Those in attendance discussed the best and most effective way to solicit public input. A survey was provided to the group to share with their contacts and communities. The survey was also made available for pick up and drop-off at local city halls. Fifty surveys were completed by the public. An online version of the survey was created using SurveyMonkey. The link to the online survey was shared through emails, social media, and jurisdictional websites. Feedback from the surveys was reviewed and summarized by the planner and presented to the HMP. The public survey information was consulted by the HMP during the process of creating and updating mitifation actions, as well as updating the remainder of the plan when applicable.

To meet the second requirement of opportunity for public participation, a draft of the plan was provided to each jurisdiction for public review. The draft document was also placed on the Ozark Foothills Regional Planning Commission's regional website at www.ofrpc.org for public viewing and comment prior to plan approval. Advertisement of the public comment period was disseminated via regional social media pages, word-of-mouth, electronic messaging, and

public announcements with feedback solicitations made at multiple regional regularly schedule public meetings. Documentation of attendance at such meetings is included as an attachment to this document within Appendix B.

Step 3: Coordinate with Other Departments and Agencies and Incorporate Existing Information (Handbook Task 3)

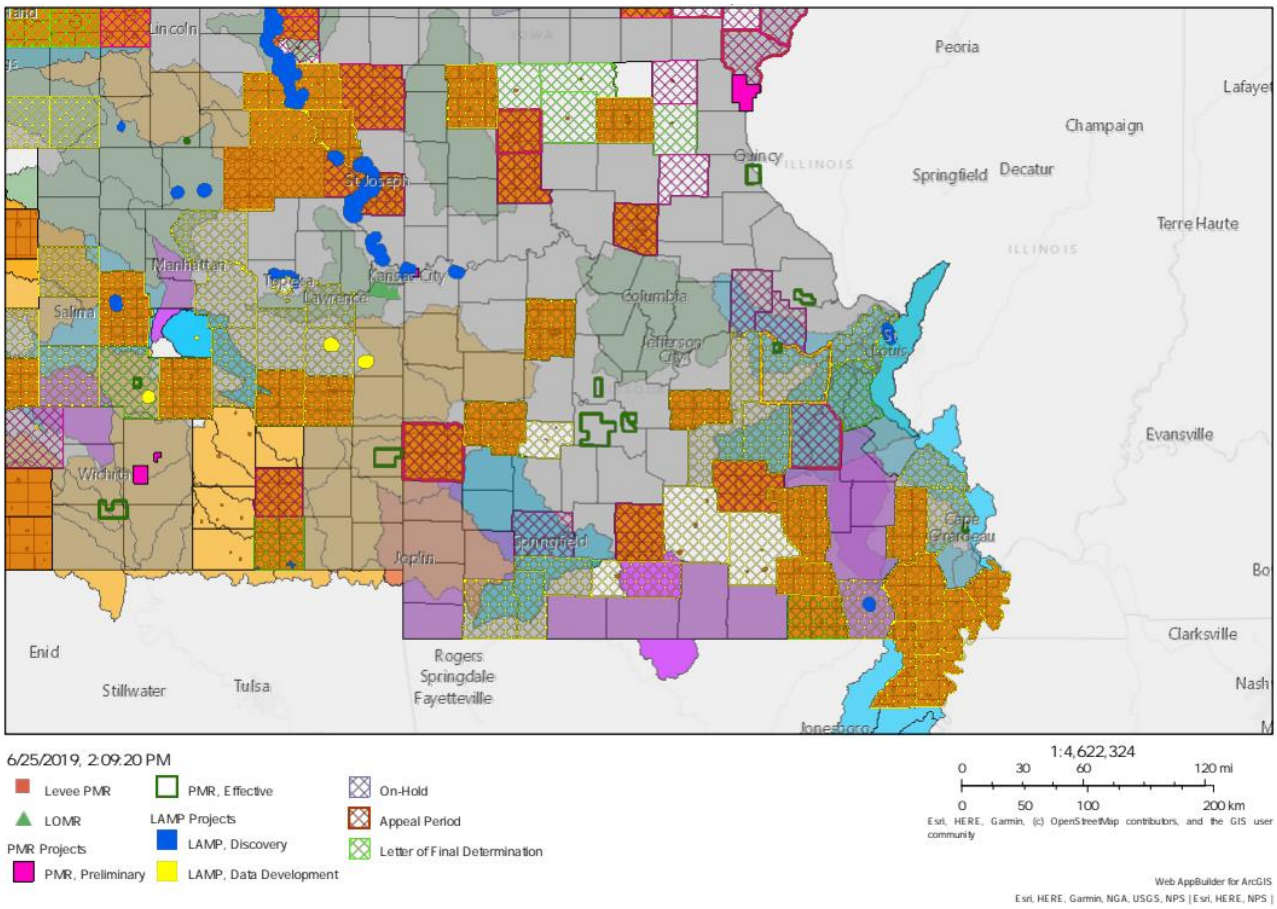
44 CFR Requirement 201.6(b): An open public involvement process is essential to the development of an effective plan. In order to develop a more comprehensive approach to reducing the effects of natural disasters, the planning process shall include: (2) An opportunity for neighboring communities, local and regional agencies involved in hazard mitigation activities, and agencies that have the authority to regulate development, as well as businesses, academia and other private and non-profit interests to be involved in the planning process. (3) Review and incorporation, if appropriate, of existing plans, studies, reports, and technical information.

Invitations were sent to a variety of organizations in addition to participating jurisdictions. The following organizations were included:

- Raejean Crutchfield, Administrator, Wayne County Health Department
- Dean Finch, Sheriff, Wayne County, MO
- Michael Ridings, Director, East Wayne County Ambulance District
- Fire Chief, Clearwater Fire Protection District
- Fire Chief, Piedmont Fire Department
- Fire Chief, Williamsville Fire Department
- Fire Chief, Greenville Fire Department
- Fire Chief, Mill Spring Fire Department
- Felicity Ray, Director, Ozark Foothills Deveopment Association
- Dr. Gene Oakley, Chairman, Ozark Foothills Regional Planning Commission
- Karen White, Missouri Highlands Healthcare

Figure 1.1 below shows there are no RiskMap projects currently underway in Wayne County.

Figure1.1 RiskMap Analysis for Wayne County, Missouri



Source: FEMA Risk MAP Project

Integration of Other Data, Reports, Studies, and Plans

The update process was presented to neighboring counties and other interested parties at two regular meetings of the Ozark Foothills Regional Planning Commission. An opportunity to review and comment on the plan update was provided. The previous plan was made available on the OFRPC website as a reference for those who wished to review. Data was gathered from area agencies via phone, email, and fax. All participating jurisdictions and local agencies were eager to provide information when requested and often provided the information in a timely manner.

A variety of sources were used to gather technical data. Some of the resources included:

- *2013 Missouri State Hazard Mitigation Plan*
- Data from various university extensions

- Flood Insurance Studies
- Flood Insurance Rate Maps
- Missouri Department of Natural Resources
- Missouri Department of Transportation
- National Inventory of Dams
- State fire reports
- Wildland/Urban Interface and Intermix areas from SILVIS LAB
- Local comprehensive plans
- USDA, Risk Management Agency, Crop Loss Statistics
- Local city, county, and school district budgets.

All sources are cited throughout the plan as they are used to give credit for data, tables, and maps included in this plan.

Step 4: Assess the Hazard: Identify and Profile Hazards (Handbook Task 5)

During the Kickoff meeting at the Wayne County Courthouse information was presented to the MPC that identified and profiled the hazards to be included within the plan. As a part of this discussion previous disaster declarations were discussed with local input provided by those who had experienced events surrounding those declarations. The hazards included in the 2013 State Plan were also presented to the MPC, along with the hazards identified in the previous Wayne County Plan.

Data Collection Questionnaires were collected at this meeting for each jurisdiction. The questionnaires were discussed and the use of the data within the plan was also discussed with each jurisdiction represented. In reviewing the questionnaires, it was explained that information and data from the jurisdictions existing community's plans would be incorporated into this plan and that each participating jurisdiction was required to incorporate the final updated hazard mitigation plan into all future planning documents.

In addition to the questionnaires, the MPC discussed other data sources available that could be used in the plan update. These additional data sources included internet searches, GIS analysis, local newspaper articles, and local officials. Included in Section 3 is a risk assessment, this assessment provides additional detail on conclusions drawn from the data collected.

Step 5: Assess the Problem: Identify Assets and Estimate Losses (Handbook Task 4)

A variety of sources were used to identify local assets in Wayne County. The 2013 State Plan was used along with US Census Data, GIS data, HAZUS data, and the Data Collection Questionnaires distributed to all jurisdictions. Once assets were identified, losses were estimated utilizing information in the 2013 State Plan as well as other available data such as dam inundation maps and prior loss history for events.

Section 2 of this plan provides information regarding each jurisdiction's capabilities and area profiles. This section includes information on the participating jurisdiction's regulatory, personnel, fiscal, and technical capabilities. This information was collected through a review of local ordinances, staff members, and annual budgets.

Section 3 of this plan includes a discussion of vulnerabilities for each hazard in the plan. These vulnerability estimates were taken from the 2013 State Plan, as the best and most recent data available.

Step 6: Set Goals (Handbook Task 6)

During the second planning meeting held at the Wayne County Courthouse in Greenville, the MPC reviewed the goals from the previous plan. The 2012 County plan included six goals that members of the MPC suggested as needing to be updated to fit the needs of each jurisdiction. The four goals included in the 2013 State Plan were provided for review and the MPC felt that it was best to adopt the state goals as the goals for Wayne County.

The *2012 Wayne County Hazard Mitigation* Plan included the following six goals:

1. Reduce loss of life and property.
2. Increase public education and awareness.
3. Improve warning systems and time.
4. Eliminate hazard prone areas.
5. Promote strategies to protect against damages.
6. Decrease negative impacts on business and industry.

The goals for the updated plan are as follows:

1. Implement mitigation actions that improve the protection of human life, health, and safety from the adverse effects of disasters.
2. Implement mitigation actions that improve the continuity of government and essential services from the adverse effects of disasters.
3. Implement mitigation actions that improve the protection of public and private property from the adverse effects of disasters.
4. Implement mitigation actions that improve the protection of community tranquility from the adverse effects of disasters.

Step 7: Review Possible Mitigation Actions and Activities (Handbook Task 6)

The third planning meeting occurred at the Wayne County Courthouse in Greenville, Missouri. At this meeting MPC members reviewed the mitigation strategies from the 2012 County plan and proposed new and different strategies. For participation, each jurisdiction was responsible for a minimum of one action being brought to this meeting. Members were asked to consider actions that substantially addressed long term risks identified in the risk assessment in Section 3 of this plan.

The FEMA publication *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards (January 2013)* was used as a reference in the development of action projects. Participants were encouraged to focus on long term mitigation solutions and consideration was given to the potential cost of each project in relation to the anticipated future cost and savings. The MPC used a modified STAPLEE method to prioritize actions that are included in this update.

Step 8: Draft an Action Plan (Handbook Task 6)

At the third planning meeting, MPC members used a modified STAPLEE method to prioritize mitigation actions. Once all actions were scored, actions were prioritized based on the

STAPLEE scores. Projects with lower scores were either not included in the plan or given lower priority.

Step 9: Adopt the Plan (Handbook Task 8)

Each jurisdiction adopted the plan at their respected board meetings via a resolution provided to the board for approval. A copy of the plan was provided for review and reference. A copy of the resolution is provided in the Executive Summary of this plan, and the approved resolutions are located in Appendix D.

Step 10: Implement, Evaluate, and Revise the Plan (Handbook Tasks 7 & 9)

At the final planning meeting, the MPC developed and agreed upon an overall strategy for plan implementation and for monitoring and maintaining the plan over time. Section 5 provides additional information on plan maintenance and monitoring over the five years following plan approval.

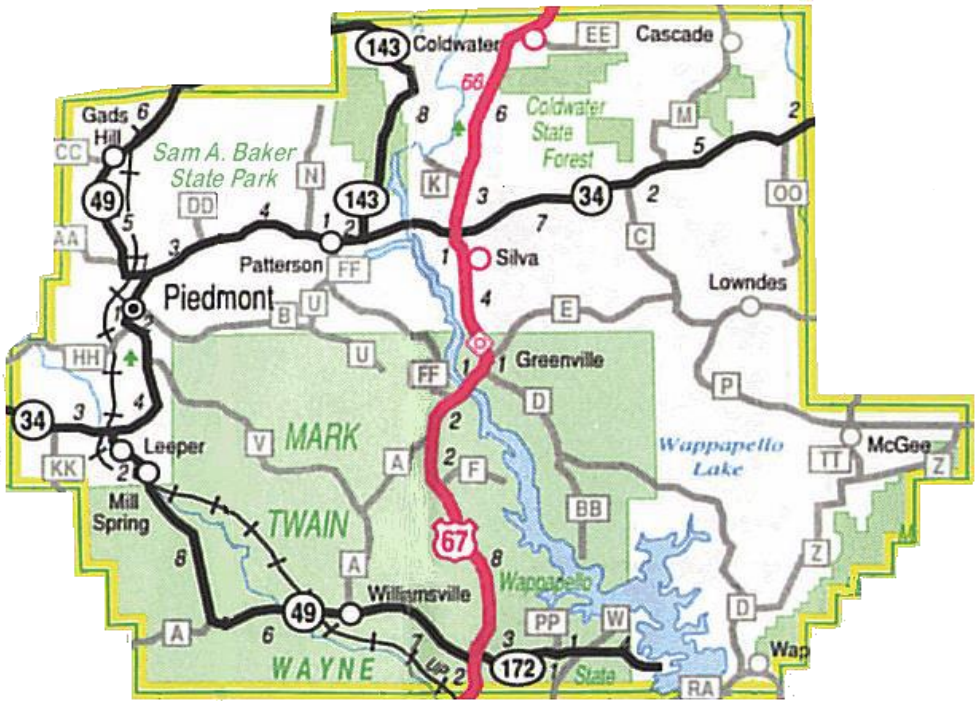
2 PLANNING AREA PROFILE AND CAPABILITIES

2.1 Wayne County Planning Area Profile

Figure 2.1 Map of Wayne County within the State of Missouri

Source: Ozark Foothills Regional Planning Commission, www.ofrpc.org

Figure 2.2 Map of Wayne County



Source: Missouri Department of Transportation

The population of Wayne County, as reported in the 2010 United States Census, was 13,521, a growth of 262 residents from the 2000 US Census that was reported as 13,259. In reviewing the
2010-2014 American Community Survey 5-year Estimates, the population has not changed much since the 2010 Census.

In reviewing this census data, Wayne County, as much of rural America, experienced a much lower rate of growth than both the State of Missouri and the country as a whole from 2000 through 2010. Wayne County grew at a rate of 1.98% compared to Missouri's growth rate of 7.0%.

Wayne County is also a county with a low median household income (MHI), as compared to the state of Missouri. According to the American Community Survey 5-year Estimates reports that the MHI for Wayne County is $33,473an increase from the 2010 Census, where the Medium Household Income was reported as $28,846.

2.1.2 Geography, Geology and Topography

Located at the eastern edge of the Ozark Mountains Wayne County, Missouri, has been fortunate to avoid many of the natural hazards that impact other areas of North America. The county is virtually unknown to hurricanes, tsunamis, tidal surges, landslides, and forest fires. However, Wayne County is susceptible to other natural hazards. Tornadoes and severe thunderstorms, flooding, dam failure, wildfires, land subsidence/sinkholes, severe winter storms, earthquakes, drought, and heat waves are all hazards that impact the county on a routine basis, endangering

both lives and property.

2.1.3 Climate

According to the National Weather Service (NWS) the average annual precipitation is 49.65 inches, higher than the United States average of 37 inches. It is reported that of these 49.65 inches of precipitation, 10 inches of that is snowfall annually. The average US city gets 25 inches of snow per year. The number of days with any measurable precipitation is 97 annually. On average, there are 212 sunny days per year in Wayne County. The month with the highest average temperature is July. The month with the lowest average temperature is January with an average low of 32 degrees. The High Plains Regional Climate Center provides monthly climate averages based on data collected from 1981-2010. According to this data the Maximum average monthly temperature in Wayne County occurs in July and the Minimum occurs in January.

2.1.4 Population/Demographics

The following table **(Table 2.1)** provides the populations for each city and the unincorporated county for 2000 and 2010 along with the percentage change in population. The unincorporated population was determined by subtracting the populations of the incorporated areas from the overall county population.

Table 2.1 Wayne County Population 2000-2010 by Community

Jurisdiction	2000 Population	2010 Population	2000-2010 # Change	2000-2010 % Change
City of Greenville	451	511	+60	13.3%
City of Williamsville	379	342	-37	9.76%
City of Piedmont	1,992	1,977	-15	.75%
Village of Mill Spring	219	189	-30	13.69%
Unincorporated County	10,218	10,502	+284	2.78%
Total	13,259	13,521		

Source: U.S. Bureau of the Census, Decennial Census, *population includes the portions of these cities in adjacent counties

In reviewing population data provided by the US Census Bureau, vulnerable populations can also be identified. The first vulnerable populations to consider are those persons under the age of 5 years old, according to the Decennial Census, there are 708 children under the age of 5 residing in Wayne County. This number represents 5.2% of the total population of the county, a rate that is lower than the percentage of children under 5 in the State of Missouri (6.5%), and in the United States (6.5%). Other vulnerable populations to consider are those residents over the age of 65. In Wayne County there are 2,895 persons over the age of 65, or 21.4%of the County Population. This rate of seniors residing in the county is higher than the rates reported for the State of Missouri (14%) and the United States (13%). When considering hazard mitigation planning, measures need to be considered to deal with these vulnerable populations and their safety.

The Decennial Census reports that there are 5,717 households in Wayne County, with an average household size of 2.34 persons. The average household size for Missouri is Similar, being reported as 2.45 persons per household, while the average household size for the United

States is slightly higher being reported as 2.58 persons per household.

The median age of residents of Wayne County is 46.5 years of age compared to Missouri at 37.9, and the United States being reported as 37.2 years. The largest percentage differences in population between Wayne County and residents elsewhere is that 25.9% of all Wayne County residents are over the age of 62—a much lower rate for persons over 62 than either the State of Missouri (17.2%) or the United States (16.2%).

The University of South Carolina developed an index to evaluate and rank the ability to respond to, cope with, recover from, and adapt to disasters. The index (abbreviated as SoVI) synthesizes thirty socioeconomic variables which research suggests contribute to a reduction in a community's ability to prepare for, respond to, and recover from hazards. Theypes of variables analyzed include socioeconomic status, gender, age, employment loss, rural/urban residency, property values, education, medical services, etc. After considering the afore-mentioned thirty variables, Wayne County is categorized as having high social vulnerability with a level of 32.4%. Data sources include primarily that available from the United States Census Bureau analyzed by the University of South Carolina's Hazards and Vulnerability Research Institute.

In the table below, further demographic data is provided to present a better picture of the local population in comparison to the State of Missouri and the United States as a whole. As can be seen from this data, the residents are poorer and less educated than residents across the state and the nation.

Table 2.2 Unemployment, Poverty, Education, and Language Percentage Demographics, Wayne County, Missouri

Jurisdiction	Total in Labor Force	Percent of Population Unemploye	Percent of Families Below the Poverty Level	Percentage of Population (High School graduate)	Percentage of Population (Bachelor's degree or higher)	Percentage of population (spoken language other than English
Wayne County	47%	9.1%	31.5%	75.3%	11.9%	1.1%
City of Greenville	415	10%	27%	76%	22%	1%
City of Piedmont	1,967	7.3%	78.6%	76%	70.3%	.5%
City of Williamsville	323	19.4%	69.8%	72%	9%	.3%
Vil. of Mill Spring	112	11.3%	75%	41%	2%	0%
State	3,054,519	5.3%	11.1%	88%	26.7%	6.1%
Nation	158,965,511	5.8%	11.5%	86.3%	29.3%	20.9%

Source: U.S. Census, 2011 American Community Survey, 5-year Estimates.

2.1.5 History

Wayne County, with a population of 13,521, is located in the northeastern portion of the Ozark Foothills Region. Some major industries and employers in the county include Windsor Foods, Clark Mountain Nursing Home, Corlair Corporation, Nu-Dell Plastics, McAllister Software, and Hickory Specialties. Three healthcare clinics offer high-quality medical assistance to county residents, while four public and two private school systems educate children living in the county. A variety of recreational areas, including Clearwater Lake, Wappapello Lake, Sam A. Baker State Park, Markham Springs, Old Greenville U.S. Historic Site, Mark Twain National Forest, Coldwater State Forest, Black River, and the Saint Francis River are also located in Wayne County.

2.1.6 Occupations

The table below **(Table 2.3)** provides occupation statistics for the incorporated cities and the county as a whole.

Table 2.3 Occupation Statistics, Wayne County, Missouri

Place	Mangement, Business, Science & Arts Occupations	Service Occupations	Sales & Office Occupations	Natural Resources, Construction, & Maintnenance Occupations	Production, Transportation, & Material Moving Occupations
Wayne County	24.9	21.1	20.8	15.1	18.0
City of Greenville	17.7	25.8	28.3	6.6	21.7
City of Piedmont	19.6	23.4	22.0	15.7	19.3
City of Williamsville	13.8	29.3	12.1	21.6	23.3
Village of Mill Spring	18.2	16.4	29.1	0.0	36.4

Source: U.S. Census, 2011 American Community Survey, 5-year Estimates.

2.1.7 Agriculture

According to the United States Department of Agriculture, 116,617 acres in Wayne County are utilized as farm land. There are reportedly 411 farms in the County with an average size of 284 acres. Wayne County farms produce a variety of crops. 915 acres of farmland is used to produce corn for grain. This information was found via the most recent USDA's Census of Agriculture report that was produced in 2017.The Census also reports that 304 acres of farmland is used to grow wheat.

Livestock and poultry farming is also an important part of Wayne County agriculture. According to the USDA Census of Agriculture, Wayne County is home to 253 cattle farms. Cattle and calf farming comprise the majority of livestock farming, with an inventory of 12,674 heads. Farmers also have an inventory of hogs, sheep, and poultry such as chickens.

2.1.8 FEMA Hazard Mitigation Assistance Grants in Planning Area

According to the Federal Emergency Management Agency, there have been ten Hazard Mitigation Grant Awards made to jurisdictions within the boundaries of Wayne County. Two of these grant awards were for school districts to construct tornado safe rooms and the other projects were removing structures from the floodplain through a flood buyout program conducted by the City of Piedmont and Wayne County. The total dollar amount of these ten projects has been $6,021,285. The table below provides information for each of the projects.

Table 2.4 FEMA HMA Grants in Wayne County from 1993-2017

Project Type	Sub applicant	Award Date	Project Total
Acquisition	Piedmont	8/13/1997	$297,800
Acquisition	Piedmont	2/19/1999	$544,139
Acquisition	Piedmont	01/16/1998	$35,530
Acquisition	Piedmont	01/16/1998	$355,834
Acquisition	Piedmont	11/05/2007	$434,166
Acquisition	Unincorporated Wayne County	08/22/2013	$211,723
Acquisition	Piedmont	12/03/2013	$779,357
Acquisition	Unincorporated Wayne County	10/30/2014	$187,276
Safe Room	Greenville School District	10/06/2015	$1,612,700
Safe Room	Clearwater School District	04/02/2014	$1,562,760
Total			$6,021,285

Source: Missouri State Emergency Management Agency

2.2 Jurisdictional Profiles and Mitigation Capabilities

This section will include individual profiles for each participating jurisdiction. It will also include a discussion of previous mitigation initiatives in the planning area. There will be a summary table indicating specific capabilities of each jurisdiction that relate to their ability to implement mitigation opportunities. The unincorporated county is profiled first, followed by the incorporated communities, and the public school districts.

2.2.1 Unincorporated Wayne County

Wayne County is a third-class county administered by a three-member County Commission. One commissioner from each of the two County Districts join a Presiding Commissioner elected at-large for terms of four years. County property taxes are collected to support the road, school, and library infrastructure of the county. The Commission has general supervision of the county public roads and maintains the courthouse and other county owned buildings. The Commission oversees the budgets of a number of independently elected officers such as the County Clerk, Sheriff, Prosecuting Attorney, Coroner, Public Administrator, Assessor, Collector, Treasurer, and Surveyor.

The County Commission meets weekly in the courthouse located in the county seat of Greenville on Monday mornings from 9:00am-12:00pm and at other times in special session as needed. The County Clerk is also present for these meetings and serves as the Chief Financial Officer of the Commission.

Following is a list of county officials:

- Presiding County Commissioner, Brian Polk
- Associate Commissioner East District, Bill Hovis
- Associate Commissioner West District, Chad Henson
- County Clerk, Brenda Seal
- Prosecuting Attorney, Michael Jackson
- Recorder, Cindy Stout
- Assessor, Frances Huitt

- County Sheriff, Dean Finch
- County Collector, Mary Hampton
- Emergency Management Director, Brian Polk
- Treasurer, Carol Hale
- Public Administrator, Donna Eads
- Circuit Clerk, Darren T Garrison
- Coroner, Gary Umfleet

Mitigation Initiatives/Capabilities

Wayne County is a small, poor, rural county that lacks in many staffed positions. The County highway department has a supervisor that manages the maintenance of the county roads and reports directly to the commissioners. The County also has an emergency management director that also serves as Presiding Commissioner.

Due to the size of Wayne County, its small staff and lack of resources, many times planning is conducted on a regional basis as opposed to county level. The county works often with the Ozark Foothills Regional Planning Commission on projects such as developing a regional Comprehensive Economic Development Strategy Plan, or on transportation planning such as the Regional Transportation Plan and the regional Public Transit-Human Services Transportation Plan. The county also works with a regional Local Emergency Planning District (LEPD), The Ozark Foothills LEPD that includes Ripley, Butler, and Wayne Counties.

Wayne County utilizes its elected prosecuting attorney for legal direction and services. It Highway Department supervisor is responsible for overseeing the county's transportation infrastructure, which consists primarily of gravel-surfaced roadways. The county funds a sheriff's department, which is responsible for maintaining order and enforcing law within the county. The county's emergency management director also serves as the county floodplain manager. Wayne County has established no planning and zoning committee or land use designations within the balance of the county.

Wayne County participates within the Ozark Foothills Local Emergency Planning District (LEPD), and is, consequently, included within the district's *Local Emergency Operations Plan*. The data found in **Table 2.5** beginning on the following page is based upon information reported via the county's *Data Collection Questionnaire.*

Table 2.5 Unincorporated Wayne County Mitigation Capabilities

Capabilities	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	None
Builder's Plan	None
Capital Improvement Plan	None
City Emergency Operations Plan	None
County Emergency Operations Plan	*Ozark Foothills Emergency Operations Plan 2004*
Local Recovery Plan	None
County Recovery Plan	None
City Mitigation Plan	None
County Mitigation Plan	*Wayne County Hazard Mitigation Plan, 2018*
Debris Management Plan	None
Economic Development Plan	*Ozark Foothills Regional Comprehensive Economic Development Strategy, 2018*
Transportation Plan	*Statewide Transportation Improvement Program, 2017*
Land-use Plan	None
Flood Mitigation Assistance (FMA) Plan	None
Watershed Plan	None
Firewise or other fire mitigation plan	None
School Mitigation Plan	Yes
Critical Facilities Plan (Mitigation/Response/Recovery)	None
Policies/Ordinance	
Zoning Ordinance	None
Building Code	None
Floodplain Ordinance	Yes
Subdivision Ordinance	None
Tree Trimming Ordinance	None
Nuisance Ordinance	None
Storm Water Ordinance	None
Drainage Ordinance	None
Site Plan Review Requirements	None
Historic Preservation Ordinance	None
Landscape Ordinance	None
Program	
Zoning/Land Use Restrictions	None
Codes Building Site/Design	None
Hazard Awareness Program	None
National Flood Insurance Program (NFIP)	Yes
Community Rating System (CRS) program under the National Flood Insurance Program	None
National Weather Service Storm Ready	None
Firewise Community Certification	None
Building Code Effectiveness Grading (BCEGs)	None
ISO Fire Rating	None
Capabilities	**Status Including Date of Document or Policy**
Economic Development Program	Yes
Land Use Program	None
Public Education/Awareness	Yes
Property Acquisition	None
Planning/Zoning Boards	None
Stream Maintenance Program	None

Tree Trimming Program	None
Engineering Studies for Streams (Local/Count	None
Mutual Aid Agreem ents	None
Studies/Reports/Maps	
Hazard Analysis/Risk Assessment (Local)	None
Hazard Analysis/Risk Assessment (Count y)	None
Flood Insurance Maps	Yes, 6-6-2011
FEMA Flood Insurance Study (Detailed)	Yes, 6-16-2011
Evacuation Route Map	None
Critical Facilities Inventor y	None
Vulnerable Population Inventor y	None
Land Use Map	None
Staff/Department	
Building Code Official	None
Building Inspector	None
Mapping Specialist (GIS)	None
Engineer	None
Development Planner	None
Public W ork s Off icial	None
Emergency Management Director	Yes
NFIP Floodplain Adm inistrator	Yes
Bomb and/or Arson Squad	None
Emergency Response T eam	None
Hazardous Materials Expert	None
Local Emergency Planning Com mittee	None
County Emergency Management Comission	Yes
Sanitation Department	None
Transportation Department	None
Economic Development Department	None
Housing Departm ent	None
Planning Consultant	None
Regional Planning Agencies	Yes
Historic Preservation	Yes
Non-Governmental Organizations (NGOs)	
Am erican Red Cross	None
Salvation Arm y	None
Veterans Groups	None
Local Environmental Organization	None
Hom eowner Associations	Yes
Neighborhood Associations	None
Chamber of Comm erce	Yes
Community Organizations (Lions, Kiwanis, etc.	Yes
Local Funding Availability	
Apply for Community Development Block Grants	Yes
Fund projects through Capital Improvements	None
Capabilities	
Authority to levy taxes f or a specific purpose	None
Fees f or water, sewer, gas, or electric services	None
Impact f ees f or new developm ent	None
Ability to incur debt through general obligation	None
Ability to incur debt through special tax bonds	None
Ability to incur debt through private activities	None
W ithhold spending in hazard prone areas	None

Source: Data Collection Questionnaire, 2017

2.2.2 City of Piedmont

Total Population	1938
Median Age	42.9
Classification Class	4
Leadership	Mayor/City Council
Total Housing Units	849
Median Gross Rent	$500
Median Housing Value	Owner-Occupied $69,700
Median Household Income, 2010	$20,515
Median Family Income, 2010	$31,125
Per Capita Personal Income, 2010	$14,364
Persons 16 Yrs. & Over in Labor Force	970
Comprehensive Plan	No
Zoning Regulations	Flood Zone
Building Regulations	Yes
Subdivision Regulations	Yes
Floodplain Regulations	Yes
NFIP	Yes
Water Service	City of Piedmont
Sewer Service	City of Piedmont
Electric Service	Black River Electric Coop
Natural Gas Service	Atmos Energy
Telephone Service	Winstream Telephone
Law Enforcement	City of Piedmont
Fire Service	City of Piedmont
Ambulance Service	Clearwater Ambulance District

The table beginning on the following page **(Table 2.6)** is based on the *Data Collection Questionnaire* distributed to each jurisdiction.

Table 2.6 City Of Piedmont Mitigation Capabilities

Capability	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	None
Builder's Plan	None
Capital Improvement Plan	None
Local Emergency Plan	None
County Emergency Plan	*Ozark Foothills Emergency Operations Plan, 2004*
Local Recovery Plan	None
County Recovery Plan	None
Local Mitigation Plan	Yes
County Mitigation Plan	Yes-2011
Local Mitigation Plan (PDM)	None
County Mitigation Plan (PDM)	None
Economic Development Plan	*Ozark Foothills Regional Comprehensive Economic Development Strategy, 2018*
Transportation Plan	*Statewide Transportation Improvement Program, 2017*
Land-use Plan	None
Flood Mitigation Assistance (FMA) Plan	None
Watershed Plan	None
Firewise or other fire mitigation plan	None
School Mitigation Plan	None
Critical Facilities Plan (Mitigation/Response/Recovery)	None
Policies/Ordinance	**Status Including Date of Document or Policy**
Zoning Ordinance	Yes
Building Code	Yes
Floodplain Ordinance	Yes
Subdivision Ordinance	None
Tree Trimming Ordinance	None
Nuisance Ordinance	None
Storm Water Ordinance	None
Drainage Ordinance	None
Capability	**Status Including Date of Document or Policy**
Site Plan Review Requirements	None
Historic Preservation Ordinance	Yes
Landscape Ordinance	None
Iowa Wetlands and Riparian Areas Conservation	None
Debris Management Plan	None
Program	**Status Including Date of Document or Policy**
Zoning/Land Use Restrictions	None
Codes Building Site/Design	None
National Flood Insurance Program (NFIP) Participant	Yes
NFIP Community Rating System (CRS) Participating	None
Hazard Awareness Program	None
National Weather Service (NWS) Storm Ready	None
Building Code Effectiveness Grading (BCEGs)	None
ISO Fire Rating	None
Economic Development Program	SET
Land Use Program	None
Public Education/Awareness	None
Property Acquisition	None
Planning/Zoning Boards	None
Stream Maintenance Program	None
Tree Trimming Program	None
Engineering Studies for Streams (Local/County/Regional)	None
Mutual Aid Agreements	None
Studies/Reports/Maps	**Status Including Date of Document or Policy**
Hazard Analysis/Risk Assessment (Local)	N/A

Hazard Analysis/Risk Assessment (County)	Yes, *Wayne County Hazard Mitigation Plan*, 2018
Flood Insurance Maps	Yes, 6/16/2011
FEMA Flood Insurance Study (Detailed)	Yes – 6/16/2011
Evacuation Route Map	None
Critical Facilities Inventory	None
Vulnerable Population Inventory	None
Land Use Map	None
Staff/Department	**Status Including Date of Document or Policy**
Building Code Official	None
Building Inspector	None
Mapping Specialist (GIS)	None
Engineer	None
Development Planner	None
Public Works Official	Yes
Emergency Management Coordinator	Yes
NFIP Floodplain Administrator	Yes
Bomb and/or Arson Squad	None
Emergency Response Team	None
Hazardous Materials Expert	None
Local Emergency Planning Committee	None
County Emergency Management Commission	None
Sanitation Department	None
Transportation Department	None
Economic Development Department	Yes
Housing Department	None
Planning Consultant	None
Regional Planning Agencies	Yes
Historic Preservation	Yes
Non-Governmental Organizations (NGOs)	**Status Including Date of Document or Policy**
American Red Cross	None
Salvation Army	None
Capability	**Status Including Date of Document or Policy**
Veterans Groups	None
Environmental Organization	None
Homeowner Associations	None
Neighborhood Associations	None
Chamber of Commerce	None
Community Organizations (Lions, Kiwanis, etc.	Yes
Local Funding Availability	**Status Including Date of Document or Policy**
Ability to apply for Community Development Block Grants	Yes
Ability to fund projects through Capital Improvements funding	Yes
Authority to levy taxes for a specific purpose	No
Fees for water, sewer, gas, or electric services	Yes
Impact fees for new development	None
Ability to incur debt through general obligation bonds	None
Ability to incur debt through special tax bonds	None
Ability to incur debt through private activities	None
Ability to withhold spending in hazard prone areas	None

Source: *Data Collection Questionnaire, 2017*

2.2.3 City of Greenville

Total Population, (2010)	511
Median Age	45.9
Classification Class	4
Leadership	Mayor/Board of Aldermen
Total Housing Units	234
Median Gross Rent	$450
Median Housing Value, Owner-Occupied	$49,500
Median Household Income, 2010	$16,657
Median Family Income, 2010	$22,344
Per Capita Personal Income, 2010	$11,186
Persons 16 Yrs. & Over in Labor Force	284
Comprehensive Plan	No
Zoning Regulations	No
Building Regulations	No
Subdivision Regulations	No
NFIP	Yes
Water Service	COG PWSD #1
Sewer Service	City of Greenville
Electric Service	Ozark Border Electric Cooperative
Propane Gas Service	Chilton Oil Company, Ferrell Gas/ Empire Gas Atmos Energy
Telephone Service	Windstream
Law Enforcement	City of Greenville
Fire Service	Wayne County FPD #1
Ambulance Service	East Wayne Co Ambulance District

The table beginning on the following page **(Table 2.7)** is based on the *Data Collection Questionnaire* distributed to each jurisdiction.

Table 2.7 City of Greenville Mitigation Capabilities

Capability	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	None
Builder's Plan	None
Capital Improvement Plan	None
Local Emergency Plan	None
County Emergency Plan	*Ozark Foothills Emergency Operations Plan, 2004*
Local Recovery Plan	None
County Recovery Plan	None
Local Mitigation Plan	Yes
County Mitigation Plan	Yes-2011
Local Mitigation Plan (PDM)	None
County Mitigation Plan (PDM)	None
Economic Development Plan	*Ozark Foothills Regional Comprehensive Economic Development Strategy, 2018*
Transportation Plan	*Statewide Transportation Improvement Program, 2017*
Land-use Plan	None
Flood Mitigation Assistance (FMA) Plan	None
Watershed Plan	None
Firewise or other fire mitigation plan	None
School Mitigation Plan	None
Critical Facilities Plan (Mitigation/Response/Recovery)	None
Policies/Ordinance	**Status Including Date of Document or Policy**
Zoning Ordinance	Yes
Building Code	No
Floodplain Ordinance	Yes
Subdivision Ordinance	None
Tree Trimming Ordinance	None
Nuisance Ordinance	None
Storm Water Ordinance	None
Drainage Ordinance	None
Capability	**Status Including Date of Document or Policy**
Site Plan Review Requirements	None
Historic Preservation Ordinance	Yes
Landscape Ordinance	None
Iowa Wetlands and Riparian Areas Conservation Plan	None
Debris Management Plan	None
Program	**Status Including Date of Document or Policy**
Zoning/Land Use Restrictions	None
Codes Building Site/Design	None
National Flood Insurance Program (NFIP) Participant	Yes
NFIP Community Rating System (CRS) Participating Community	None
Hazard Awareness Program	None
National Weather Service (NWS) Storm Ready	None
Building Code Effectiveness Grading (BCEGs)	None
ISO Fire Rating	None
Economic Development Program	Regional Stronger Economies Together Initiative Participant
Land Use Program	None
Public Education/Awareness	None
Property Acquisition	None
Planning/Zoning Boards	None
Stream Maintenance Program	None
Tree Trimming Program	None
Engineering Studies for Streams (Local/County/Regional)	None
Mutual Aid Agreements	None
Studies/Reports/Maps	**Status Including Date of Document or Policy**
Hazard Analysis/Risk Assessment (Local)	Yes, *Wayne County Hazard Mitigation Plan*, 2018

Hazard Analysis/Risk Assessment (County)	Yes, *Wayne County Hazard Mitigation Plan*, 2018
Flood Insurance Maps	Yes, 6/16/2011
FEMA Flood Insurance Study (Detailed)	Yes – 6/16/2011
Evacuation Route Map	None
Critical Facilities Inventory	None
Vulnerable Population Inventory	None
Land Use Map	None
Staff/Department	**Status Including Date of Document or Policy**
Building Code Official	None
Building Inspector	None
Mapping Specialist (GIS)	None
Engineer	None
Development Planner	None
Public Works Official	Yes
Emergency Management Coordinator	Yes
NFIP Floodplain Administrator	Yes
Bomb and/or Arson Squad	None
Emergency Response Team	None
Hazardous Materials Expert	None
Local Emergency Planning Committee	None
County Emergency Management Commission	None
Sanitation Department	None
Transportation Department	None
Economic Development Department	Yes
Housing Department	None
Planning Consultant	None
Regional Planning Agencies	Yes
Historic Preservation	Yes
Non-Governmental Organizations (NGOs)	**Status Including Date of Document or Policy**
American Red Cross	None
Salvation Army	None
Capability	**Status Including Date of Document or Policy**
Veterans Groups	None
Environmental Organization	None
Homeowner Associations	None
Neighborhood Associations	None
Chamber of Commerce	None
Community Organizations (Lions, Kiwanis, etc.	Yes
Local Funding Availability	**Status Including Date of Document or Policy**
Ability to apply for Community Development Block Grants	Yes
Ability to fund projects through Capital Improvements funding	Yes
Authority to levy taxes for a specific purpose	No
Fees for water, sewer, gas, or electric services	Yes
Impact fees for new development	None
Ability to incur debt through general obligation bonds	None
Ability to incur debt through special tax bonds	None
Ability to incur debt through private activities	None
Ability to withhold spending in hazard prone areas	None

Source: *Data Collection Questionnaire, 2017*

2.2.4 City of Williamsville

Total Population, (2010)	342
Median Age	44.5
Classification Class	4
Leadership	Mayor/Board of Aldermen
Total Housing Units	188
Median Gross Rent	$533
Median Housing Value, Owner-Occupied	$37,314
Median Household Income, 2010	$31,403
Median Family Income, 2010	$25,344
Per Capita Personal Income, 2010	$13,584
Persons 16 Yrs. & Over in Labor Force	252
Comprehensive Plan	No
Zoning Regulations	No
Building Regulations	No
Subdivision Regulations	No
NFIP	Yes
Water Service	City of Williamsville
Sewer Service	City of Williamsville
Electric Service	Ozark Border Electric Cooperative Black River Electric Cooperative
Propane Gas Service	Chilton Oil Company, Ferrell Gas, Empire Gas Atmos Energy
Telephone Service	AT&T & Windstream
Law Enforcement	City of Williamsville
Fire Service	Williamsville Volunteer Fire Department
Ambulance Service	East Wayne County Ambulance District

The table beginning on the following page **(Table 2.8)** is based on the Data Collection Questionnaire distributed to each jurisdiction.

Table 2.8 City of Williamsville Mitigation Capabilities

Capability	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	Yes
Builder's Plan	None
Capital Improvement Plan	None
Local Emergency Plan	None
County Emergency Plan	*Ozark Foothills Emergency Operations Plan, 2004*
Local Recovery Plan	None
County Recovery Plan	None
Local Mitigation Plan	None
County Mitigation Plan	Yes-2011
Local Mitigation Plan (PDM)	None
County Mitigation Plan (PDM)	None
Economic Development Plan	*Ozark Foothills Regional Comprehensive Economic Development Strategy, 2018*
Transportation Plan	*Statewide Transportation Improvement Program, 2017*
Land-use Plan	None
Flood Mitigation Assistance (FMA) Plan	None
Watershed Plan	None
Firewise or other fire mitigation plan	None
School Mitigation Plan	None
Critical Facilities Plan (Mitigation/Response/Recovery)	None
Policies/Ordinance	**Status Including Date of Document or Policy**
Zoning Ordinance	None
Building Code	No
Floodplain Ordinance	Yes
Subdivision Ordinance	None
Tree Trimming Ordinance	None
Nuisance Ordinance	None
Storm Water Ordinance	None
Drainage Ordinance	None
Capability	**Status Including Date of Document or Policy**
Site Plan Review Requirements	None
Historic Preservation Ordinance	None
Landscape Ordinance	None
Iowa Wetlands and Riparian Areas Conservation Plan	None
Debris Management Plan	None
Program	**Status Including Date of Document or Policy**
Zoning/Land Use Restrictions	None
Codes Building Site/Design	None
National Flood Insurance Program (NFIP) Participant	Yes
NFIP Community Rating System (CRS) Participating Community	None
Hazard Awareness Program	None
National Weather Service (NWS) Storm Ready	None
Building Code Effectiveness Grading (BCEGs)	None
ISO Fire Rating	None
Economic Development Program	Stronger Economies Together Participant, 2017
Land Use Program	None
Public Education/Awareness	None
Property Acquisition	None
Planning/Zoning Boards	None
Stream Maintenance Program	None
Tree Trimming Program	None
Engineering Studies for Streams (Local/County/Regional)	None
Mutual Aid Agreements	Yes for Fire Suppression Services
Studies/Reports/Maps	**Status Including Date of Document or Policy**
Hazard Analysis/Risk Assessment (Local)	Yes, *Wayne County Hazard Mitigation Plan*, 2018

Hazard Analysis/Risk Assessment (County)	Yes, *Wayne County Hazard Mitigation Plan*, 2018
Flood Insurance Maps	Yes, 6/16/2011
FEMA Flood Insurance Study (Detailed)	Yes – 6/16/2011
Evacuation Route Map	None
Critical Facilities Inventory	None
Vulnerable Population Inventory	None
Land Use Map	None
Staff/Department	**Status Including Date of Document or Policy**
Building Code Official	None
Building Inspector	None
Mapping Specialist (GIS)	None
Engineer	None
Development Planner	None
Public Works Official	Yes
Emergency Management Coordinator	Yes
NFIP Floodplain Administrator	Yes
Bomb and/or Arson Squad	None
Emergency Response Team	None
Hazardous Materials Expert	None
Local Emergency Planning Committee	None
County Emergency Management Commission	None
Sanitation Department	None
Transportation Department	None
Economic Development Department	Yes
Housing Department	None
Planning Consultant	None
Regional Planning Agencies	Yes
Historic Preservation	Yes
Non-Governmental Organizations (NGOs)	**Status Including Date of Document or Policy**
American Red Cross	None
Salvation Army	None
Capability	**Status Including Date of Document or Policy**
Veterans Groups	None
Environmental Organization	None
Homeowner Associations	None
Neighborhood Associations	None
Chamber of Commerce	None
Community Organizations (Lions, Kiwanis, etc.	Yes
Local Funding Availability	**Status Including Date of Document or Policy**
Ability to apply for Community Development Block Grants	Yes
Ability to fund projects through Capital Improvements funding	Yes
Authority to levy taxes for a specific purpose	No
Fees for water, sewer, gas, or electric services	Yes
Impact fees for new development	None
Ability to incur debt through general obligation bonds	None
Ability to incur debt through special tax bonds	None
Ability to incur debt through private activities	None
Ability to withhold spending in hazard prone areas	None

Source: *Data Collection Questionnaire, 2017*

2.2.5 Village of Mill Spring

Total Population, (2010)	189
Median Age	37.8
Classification Class	Village/Board of Trustees
Leadership Mayor/City Council	
Total Housing Units	106
Median Gross Rent	$507
Median Housing Value, Owner-Occupied	$24,769
Median Household Income, 2010	$17,712
Median Family Income, 2010	$20,256
Per Capita Personal Income, 2010	$10,728
Persons 16 Yrs. & Over in Labor Force	284
Comprehensive Plan	No
Zoning Regulations	No
Building Regulations	No
Subdivision Regulations	No
NFIP	Yes
Water Service	Village of Mill Spring
Sewer Service	Private Septic
Electric Service	Ozark Border Electric Cooperative Black River Electric Cooperative
Propane Gas Service	Chilton Oil Company, Ferrell Gas, Empire Gas, Atmos Energy, Liberty Utilities
Telephone Service	AT&T & Windstream
Law Enforcement	Wayne County Sheriff's Department
Fire Service	Mill Spring Volunteer Fire Department
Ambulance Service	EastWayne County Ambulance District

The table beginning on the following page **(Table 2.9)** is based on *the Data Collection Questionnaire* distributed to each jurisdiction.

Table 2.9 Village of Mill Spring Mitigation Capabilities

Capability	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	None
Builder's Plan	None
Capital Improvement Plan	None
Local Emergency Plan	None
County Emergency Plan	*Ozark Foothills Emergency Operations Plan, 2004*
Local Recovery Plan	None
County Recovery Plan	None
Local Mitigation Plan	Yes
County Mitigation Plan	Yes-2011
Local Mitigation Plan (PDM)	None
County Mitigation Plan (PDM)	None
Economic Development Plan	*Ozark Foothills Regional Comprehensive Economic Development Strategy, 2018*
Transportation Plan	*Statewide Transportation Improvement Program, 2017*
Land-use Plan	None
Flood Mitigation Assistance (FMA) Plan	None
Watershed Plan	None
Firewise or other fire mitigation plan	None
School Mitigation Plan	None
Critical Facilities Plan (Mitigation/Response/Recovery)	None
Policies/Ordinance	**Status Including Date of Document or Policy**
Zoning Ordinance	No
Building Code	No
Floodplain Ordinance	Yes
Subdivision Ordinance	None
Tree Trimming Ordinance	None
Nuisance Ordinance	None
Storm Water Ordinance	None
Drainage Ordinance	None
Capability	**Status Including Date of Document or Policy**
Site Plan Review Requirements	None
Historic Preservation Ordinance	Yes
Landscape Ordinance	None
Wetlands and Riparian Areas Conservation Plan	None
Debris Management Plan	None
Program	**Status Including Date of Document or Policy**
Zoning/Land Use Restrictions	None
Codes Building Site/Design	
National Flood Insurance Program (NFIP) Participant	Yes
NFIP Community Rating System (CRS) Participating Community	None
Hazard Awareness Program	None
National Weather Service (NWS) Storm Ready	None
Building Code Effectiveness Grading (BCEGs)	None
ISO Fire Rating	None
Economic Development Program	Stronger Economies Together Planning Initiative - 2017
Land Use Program	None
Public Education/Awareness	None
Property Acquisition	None
Planning/Zoning Boards	None
Stream Maintenance Program	None
Tree Trimming Program	None
Engineering Studies for Streams (Local/County/Regional)	None
Mutual Aid Agreements	None
Studies/Reports/Maps	**Status Including Date of Document or Policy**
Hazard Analysis/Risk Assessment (Local)	Yes, *Wayne County Hazard Mitigation Plan*, 2018

Hazard Analysis/Risk Assessment (County)	Yes, *Wayne County Hazard Mitigation Plan*, 2018
Flood Insurance Maps	Yes, 6/16/2011
FEMA Flood Insurance Study (Detailed)	Yes, 6/16/2011
Evacuation Route Map	None
Critical Facilities Inventory	None
Vulnerable Population Inventory	None
Land Use Map	None
Staff/Department	**Status Including Date of Document or Policy**
Building Code Official	None
Building Inspector	None
Mapping Specialist (GIS)	None
Engineer	None
Development Planner	None
Public Works Official	None
Emergency Management Coordinator	None
NFIP Floodplain Administrator	Yes – County Level
Bomb and/or Arson Squad	None
Emergency Response Team	None
Hazardous Materials Expert	None
Local Emergency Planning Committee	None
County Emergency Management Commission	None
Sanitation Department	None
Transportation Department	None
Economic Development Department	None
Housing Department	None
Planning Consultant	None
Regional Planning Agencies	Yes – Ozark Foothills Regional Planning Commission
Historic Preservation	None
Non-Governmental Organizations (NGOs)	**Status Including Date of Document or Policy**
American Red Cross	None
Salvation Army	None
Capability	**Status Including Date of Document or Policy**
Veterans Groups	None
Environmental Organization	None
Homeowner Associations	None
Neighborhood Associations	None
Chamber of Commerce	None
Community Organizations (Lions, Kiwanis, etc.	None
Local Funding Availability	**Status Including Date of Document or Policy**
Ability to apply for Community Development Block Grants	Yes
Ability to fund projects through Capital Improvements funding	No
Authority to levy taxes for a specific purpose	Yes
Fees for water, sewer, gas, or electric services	Yes
Impact fees for new development	None
Ability to incur debt through general obligation bonds	Yes
Ability to incur debt through special tax bonds	Yes
Ability to incur debt through private activities	No
Ability to withhold spending in hazard prone areas	No

Source: *Data Collection Questionnaire*, *2017*

The following table summarizes the mitigation capabilities of Wayne County, Missouri and the incorporated communities within Wayne County.

Table 2.10 Mitigation Capabilities Summary Table

CAPABILITIES	Unincorporated Wayne County	City of Greenville	City of Williamsville	City of Piedmont	Village of Mill Spring
Planning Capabilities					
Comprehensive Plan	None	None	None	None	None
Builder's Plan	None	None	None	None	None
Capital Improvement Plan	None	None	None	None	None
Local Emergency Plan	N/A	None	None	Yes - 8/29/2000	None
County Emergency Plan	Yes - 2004	Yes - 2004	Yes - 2004	Yes - 2004	Yes - 2004
Local Recovery Plan	None	None	None	None	None
County Recovery Plan	None	None	None	None	None
Local Mitigation Plan	N/A	None	None	Yes - 8/29/2000	None
County Mitigation Plan	Yes - 2019	Yes - 2019	Yes - 2019	Yes - 2019	Yes - 2019
Local Mitigation Plan (PDM)	None	None	None	None	None
County Mitigation Plan (PDM)	Yes - 2019	Yes - 2019	Yes - 2019	Yes - 2019	Yes - 2019
Debris Management Plan	None	None	None	None	None
Economic Development Plan	Yes– 2018	Yes - 2018	Yes–2018	Yes–2018	Yes–2018
Transportation Plan	Yes - June 2017	Yes - June 2017	Yes - June 2017	Yes - June 2017	Yes - June 2017
Land-use Plan	None	None	None	None	None
Flood Mitigation Assistance (FMA) Plan	None	None	None	Yes - 7/1998	None
Watershed Plan	None	None	None	Yes - 7/1998	None
Firewise or other fire mitigation plan	None	None	None	None	None
School Mitigation Plan	None	None	None	None	None
Critical Facilities Plan (Mitigation/Response/Recovery)	None	None	None	None	None

CAPABILITIES	Unincorporated Wayne County	City of Greenville	City of Williamsville	City of Piedmont	Village of Mill Spring
Policies/Ordinances					
Zoning Ordinance	None	None	None	None	None
Building Code	None	None	None	Yes	None
Floodplain Ordinance	Yes	Yes	Yes	Yes	Yes
Subdivision Ordinance	None	None	None	Yes	None
Tree Trimming Ordinance	None	None	None	None	None
Nuisance Ordinance	None	None	None	Yes	None
Storm Water Ordinance	No	No	No	No	No
Drainage Ordinance	No	No	No	No	No
Site Plan Review Requirements	No	No		No	No
Historic Preservation Ordinance	Yes	Yes	Yes	No	No
Landscape Ordinance	No	No	No	No	No
Iowa Wetlands and Riparian Areas Conservation Plan	No	No	No	No	No
Programs					
Zoning/Land Use Restrictions	No	No	No	No	No
Codes Building Site/Design	No	No	No	Yes	No
National Flood Insurance Progra m (NFIP) Participant	Yes	Yes	Yes	Yes	Yes
NFIP Community Rating System (CRS) Participating	No	No	No	Yes	No
Hazard Awareness Program	No	No	No	Yes	No
National Weather Service (NWS) Storm Ready	No	No	No	No	No
Building Code Effectiveness Grading (BCEGs)	No	No	No	No	No
ISO Fire Rating	No	No	No	Yes - 5	No
Economic Development Program	No	No	No	No	No
Land Use Program	No	No	No	No	No
Public Education/Awareness	No	No	Yes	No	No
Property Acquisition	Yes	No	No	Yes	No
Planning/Zoning Boards	No	No	No	Yes	No
Stream Maintenance Program	No	No	No	No	No
Tree Trimming Program	No	No	No	No	No
Engineering Studies for Streams (Local/County/Regional)	No	No	No	No	No
Mutual Aid Agreements	Yes	Yes	Yes	Yes	No

CAPABILITIES	Unincoporated Wayne County	City of Greenville	City of Williamsville	City of Piedmont	Village of Mill Spring
Studies/Reports/Maps					
Hazard Analysis/Risk Assessment (Local)	No	No	No	Yes	No
Hazard Analysis/Risk Assessment (County)	No	No	No	No	No
Flood Insurance Maps	Yes - 6/16/2011	Yes - 6/16/2011	Yes - 6/16/2011	Yes - 6/16/2011	Yes - 6/16/2011
FEMA Flood Insurance Study (Detailed)	Yes – 6/16/2011	Yes – 6/16/2011	Yes – 6/16/2011	Yes – 6/16/2011	Yes – 6/16/2011
Evacuation Route Map	Yes	No	No	No	No
Critical Facilities Inventory	No	No	No	No	No
Vulnerable Population Inventory	No	No	No	No	No
Land Use Map	No	No	No	No	No
Staff/Department					
Building Code Official	No	No	No	No	No
Building Inspector	No	No	No	Yes	No
Mapping Specialist (GIS)	No	No	No	No	No
Engineer	No	No	No	No	No
Development Planner	No	No	No	No	No
Public Works Official	No	Yes	No	Yes	No
Emergency Management Coordinator	Yes	Yes	Yes	Yes	No
NFIP Floodplain Administrator	Yes	Yes	Yes	Yes	Yes
Bomb and/or Arson Squad	No	No	No	No	No
Emergency Response Team	No	No	No	Yes	No
Hazardous Materials Expert	No	No	No	No	No
Local Emergency Planning Committee	No	No	No	Yes	No
County Emergency Management Commission	Yes	Yes	Yes	Yes	Yes
Sanitation Department	None	None	None	None	None
Transportation Department	Yes	None	None	None	None
Economic Development Department	None	None	None	None	None
Housing Department	None	None	None	None	None
Planning Consultant	None	None	None	None	None
Regional Planning Agencies	Yes	Yes	Yes	Yes	Yes
Historic Preservation	Yes	Yes	Yes	No	No

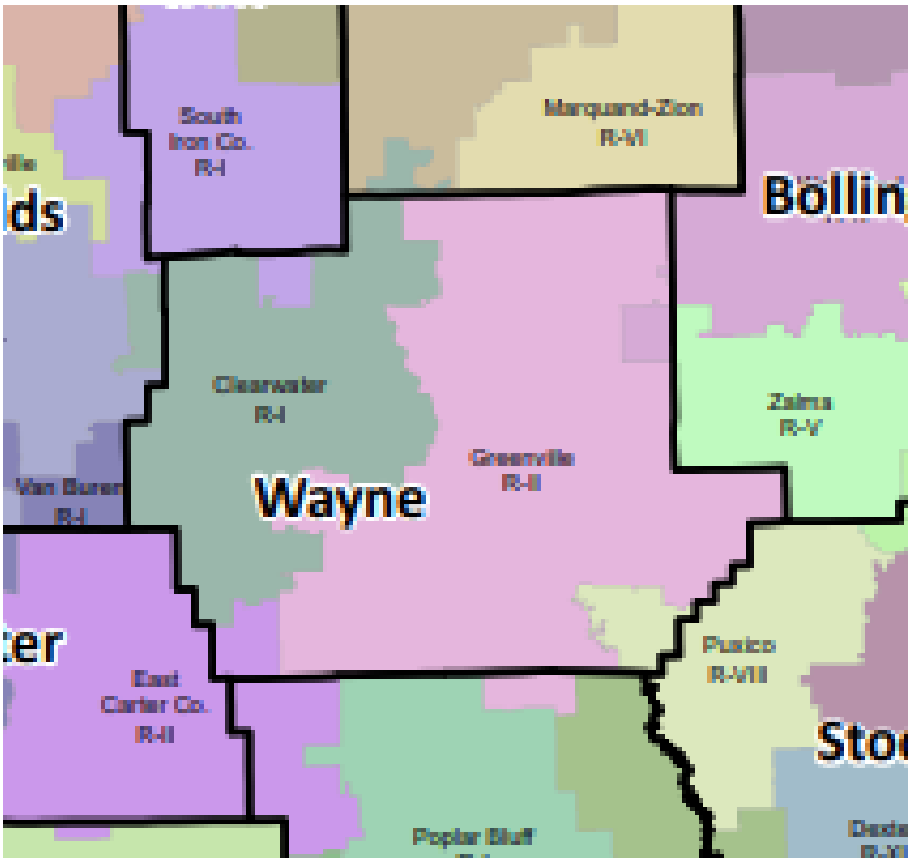
CAPABILITIES	Unincorpoated Wayne County	City of Greenville	City of Williamsville	City of Piedmont	Village of Mill Spring
Non-Governmental Organizations (NGOs)					
American Red Cross	No	No	No	No	No
Salvation Army	No	No	No	No	No
Veterans Groups	No	No	No	No	No
Environmental Organization	No	No	No	No	No
Homeowner Associations	Yes	No	No	No	No
Neighborhood Associations	No	No	No	No	No
Chamber of Commerce	Yes	No	No	Yes	No
Community Organizations (Lions, Kiwanis, etc.)	No	Yes	Yes	Yes	No
Financial Resources					
Apply for Community Development Block Grants	Yes	Yes	Yes	Yes	Yes
Fund projects through Capital Improvements funding	No	Yes	No	Yes	No
Authority to levy taxes for specific purposes	No	No	No	No	No
Fees for water, sewer, gas, or electric services	Yes – PWSD's	Yes – Water/Sewer	Yes – Water/Sewer	Yes – Water/Sewer	Yes – Water
Impact fees for new development	No	No	No	No	No
Incur debt through general obligation bonds	Yes	Yes	Yes	Yes	Yes
Incur debt through special tax bonds	Yes	Yes	Yes	Yes	Yes
Incur debt through private activities	No	No	No	No	No
Withhold spending in hazard prone areas	No	No	No	No	No

Source: *Data Collection Questionnaires, 2017*

2.2.6 Public School District Profiles and Mitigation Capabilities

Both school districts within Wayne County, Missouri participated within the current plan update. The two school Districts include Clearwater R-I School district and Greenville R-II School District. Clearwater R-I School School District is headquartered in Piedmont, Misosuri while Greenville R-II is headquartered in Greeville, Missouri. A map of the school districts within Wayne County is depicted below within **Figure 2.3**.

Figure 2.3 School Districts in Wayne County, Missouri



Source: Missouri Department of Elementary and Secondary Education

Table 2.11 Greenville R-II and Clearwater R-I Buildings and Enrollment Data, 2017

District Name	Building Name	Building Enrollment
Clearwater R-I School District	Elementary School	424
Clearwater R-I School District	Middle School	284
Clearwater R-I School District	High School	292
Greenville R-II School District	Elementary School	461
Greenville R-II School District	Jr. High School	115
Greenville R-II School District	High School	236

http://mcds.dese.mo.gov/quickfacts/Pages/District-and-School-Information.aspx

Table 2.12 on the following page summarizes the school districts capabilities for hazard mitigation. The information in this table was also received from the completed *Data Collection Questionnaires.*

Table 2.12 Summary of Mitigation Capabilities-School District Clearwater R-I & Greenville R-II

Capability	Greenville R-II School District	Clearwater R-I School District
Planning Elements		
Master Plan/Date	Yes 08/2010	Yes 12/2016
Capital Improvement Plan/Date	Yes 08/2010	Yes 01/2015
School Emergency Plan/Date	Yes 08/2010	Yes 09/11/2017
Weapons Policy/Date	Yes 08/2017	Yes
Personnel Resources		
Full-Time Building Official (Principal)	Yes Principal	Yes
Emergency Manager	Yes Superintendent	Yes Principal/School Resource Officer
Grant Writer	Yes Technical Assistant	No
Public Information Officer	Yes Superintendent	Yes Superintendent
Financial Resources		
Capital Improvements Project Funding	Yes	No
Local Funds	Yes	No
General Obligation Bonds	Yes	Yes
Special Tax Bonds	No	No
Private Activities/Donations	No	No
State and Federal Funds/Grants	Yes	No
Other		
Public Education Programs	Yes	Yes
Capability	**Greenville R-II School District**	**Clearwater R-I School District**
Privately or Self-Insured?	Privately	Privately
Fire Evacuation Training	Yes	Yes
Tornado Sheltering Exercises	Yes	Yes
Public Address/Emergency Alert System	Yes	Yes
NOAA Weather Radios	Yes	Yes
Lock-Down Security Training	Yes	Yes
Mitigation Programs	Yes	Yes
Tornado Shelter/Saferoom	Yes	Yes
Campus Police	Yes	Yes

Source: *Data Collection Questionnaires*, 2017

3 RISK ASSESSMENT

44 CFR Requirement §201.6(c)(2): [The plan shall include] A risk assessment that provides the factual basis for activities proposed in the strategy to reduce losses from identified hazards. Local risk assessments must provide sufficient information to enable the jurisdiction to identify and prioritize appropriate mitigation actions to reduce losses from identified hazards.

Following is a community-wide risk assessment for Wayne County, Missouri. The data used to compile this assessment can be found throughout the body of this document, primarily in the profile of each hazard and capabilities of each jurisdiction. The natural hazards discussed throughout this document were examined using available data relevant and necessary for determining the types of hazard, frequency and strength of those hazards, areas vulnerable to those hazards, potential impacts, and probability that each hazard will occur.

The goal of the risk assessment is to estimate potential loss in the planning area, including loss of life, personal injury, property damage, and economic loss, from a hazard event. The risk assessment process allows communities and school/special districts in the planning area to better understand their potential risk to the identified hazards. It will provide a framework for developing and prioritizing mitigation actions to reduce risk from future hazard events.

The previously approved Wayne County Hazard Mitigation Plan was approved in January of 2012. Since that time there has been little change in the development of the county. Wayne County has had a minimal population decrease of -2.8% since the last update occurred. There have been no areas annexed by any of the cities within Wayne County in the past five years. Officials also report that there have not been any large multi-family housing complexes constructed. With no changes in development, the jurisdictions's overall vulnerabilities were not impacted. As a result, the HMP did not find it necessary to revise the 2012 plan to reflect changes in development within the county or any other participating jurisdiction.

This chapter is divided into four main parts:

- **Section 3.1 Hazard Identification** identifies the hazards that threaten the planning area and provides a factual basis for elimination of hazards from further consideration;
- **Section 3.2 Assets at Risk** provides the planning area's total exposure to natural hazards considering critical facilities and other community assets at risk;
- **Section 3.3 Future Land Use and Development** discusses areas of planned future development; and,
- **Section 3.4 Hazard Profiles and Vulnerability Analysis** provides more detailed information about the hazards impacting the planning area. For each hazard, there are three sections:

    1) Hazard Profile provides a general description and discusses the threat to the planning area, the geographic location at risk, potential severity/magnitude/extent, previous occurrences of hazard events, probability of future occurrence, risk summary by jurisdiction, impact of future development on the risk;
    2) Vulnerability Assessment further defines and quantifies populations, buildings, critical facilities, and other community/school or special district assets at risk to natural hazards; and,
    3) Problem Statement briefly summarizes the problem and develops

possible solutions.

3.1 Hazard Identification

Requirement §201.6(c)(2)(i): [The risk assessment shall include a] description of the type…of all natural hazards that can affect the jurisdiction.

The Wayne County Hazard Mitigation Planning Committee has determined that this updated plan, as with past county plans, will address only natural hazards. Natural hazard has been defined by I. Burton, R. Kates, and G. White in *The Environment as Hazard,* as "those elements of the physical environment, harmful to man and caused by forces extraneous to him." Consistent with this definition, war, chemical contamination, and other manmade phenomena are excluded from classification as natural hazards.

Natural hazards can take many forms (e.g. tornado, wildfire, flood, landslide, and earthquake). Happenings such as those listed above, which occur in a populated area, are, according to the Organization of American States, referred to as hazardous events. It is not until significant property damage and loss of life result from a natural hazard that the phenomena can legitimately be classified as a natural disaster.

3.1.1 Review of Existing Mitigation Plans

The planning committee reviewed the hazard identified in the 2012 Wayne County Hazard Mitigation Plan. In the 2012 plan there were ten natural hazards that were identified:

- Tornado
- Floods
- Severe Winter Weather
- Drought
- Heat Wave
- Earthquake
- Dam Failure
- Levee Failure
- Wildfire
- Land Subsidence/Sinkholes

The planning committee reviewed these hazards and compared them to the known historical hazards that have impacted jurisdictions within Wayne County. After this review the committee added the hazard of thunderstorm/high winds/lightning/hail to the above list. The committee then decided to order the hazards alphabetically for cleaner presentation in this updated version of the hazard mitigation plan. Levee failure will not be reviewed in this plan, according to the Wayne County Commission no levees exist within Wayne County. The updated plan will review and analyze the following natural hazards in the order listed below:

- Dam Failure
- Drought
- Earthquakes
- Extreme Heat
- Fires
- Flooding
- Land Subsidence/Sinkholes

- Thunderstorms/High Winds/Lightning/Hail
- Tornado
- Winter Weather/Snow/Ice/Severe Cold

All of the above listed phenomena have either occurred within Wayne County at some point in time, or could occur given the geography and other environmental conditions which exist within the county. Some of the above hazards are more likely to occur in this area, while some are less likely. In the pages that follow, each hazard will be described, its history of occurrence in Wayne County examined, and its probability of reoccurrence assessed.

Due to the location and geography of Wayne County, the occurrence of certain natural hazards, which may take place elsewhere in the world, is virtually impossible. The following list contains natural hazards, which have been determined to be insignificant threats within Wayne County:

- Hurricane and other Tropical Storm-related phenomena
- Tsunami
- Volcano and other volcanic-related phenomena
- Arid and Semi-Arid-related phenomena

Hurricanes, tropical storms, and tsunamis do not occur in or near Wayne County due to its central location within North America. Furthermore, the geologic and soil structure found in Wayne County does not encourage volcanic activity. Because of this, there are no volcanoes within or near the county. Finally, arid and semi-arid-related phenomena do not occur in Wayne County due to its climate and geology.

The planning committee discussed including man-made hazard in the *Wayne County Hazard Mitigation Plan.* However, as only natural hazards are required by FEMA regulations, the committee decided to only include natural hazards.

3.1.2 Review Disaster Declaration History

The federal government may, at times, issue disaster declarations. These declarations are made when the severity and magnitude of an event surpasses the ability of the local government to respond and recover without assistance. The first step in the declaration process is that a state may issue a disaster declaration that would allow for the provision of assistance to the local jurisdictions from the state government. If the disaster is so severe that both the local and state governments' capacities are surpassed, a federal emergency or disaster may be declared, allowing for assistance to be provided to local jurisdictions from the federal government.

The Stafford Act provides for two types of disaster declarations: emergency declarations and major disaster declarations. Declarations discussed within this plan include both types. The emergency declarations authorize the President to provide supplemental disaster assistance. Major disaster declarations provide for a wide range of federal assistance programs for individuals and public entities for both emergency and permanent repairs.

Individual assistance includes assistance to individuals and households for things such as crisis counseling, case management, unemployment assistance, legal services and

supplemental nutrition assistance program. Public assistance provides monetary resources to states, tribes, and local governments for things such as debris removal, emergency protective measures, roads and bridges, water control facilities, buildings and equipment, utilities, and park, recreational and other facilities.

As noted above, FEMA also issues emergency declarations, which are more limited in scope and do not include the long-term federal recovery programs of major disaster declarations. Determinations for declaration type are based on scale and type of damages and institutions or industrial sectors affected.

The following table (**Table 3.1**) is a list of all federal disaster declarations issued from 1990-2017 that included Wayne County. The table lists the disaster number, a short description, the date of declaration, the period of incident, and the amounts of Individual Assistance (IA) and Public Assistance (PA) distributed.

Table 3.1 FEMA Disaster Declarations that included Wayne County, Missouri, 1990-2017

Disaster Number	Description	Declaration Date Incident Period	IIndividual Assistance (IA) Public Assistance (PA)
DR-1980	Severe Storms, Tornadoes, Flooding	5-9-11 4/19/11-6/06/11	IA-$37,115,639.63 PA-$173,932,353.47
DR-1822	Severe W inter Storm	2-17-09	PA-$11.34 per capita
DR-1809	Severe Storms, Flooding, Tornado	11-13-08 9/11/08-9/24/08	PA-$8,543,883.40
DR-1749	Severe Storms and Flooding	3-19-08 3/17/08-5/09/08	IA-$13,924,227.09 PA-$26,045,574.54
DR-1748	Severe W inter Storms, and Flooding	3-12-08 2/10/08-2/14/08	PA-$10,068,998.77
DR-1412	Severe Storms, Tornadoes	5/06/02 4/24/02-6/10/02	PA-$35,296,057.96
DR-1006	Severe Storm, Tornadoes	12-1-93 11/13/93-	N/A
DR-995	Flooding, Severe Storm	7-9-93 6/10/93-10/25/93	N/A
DR-1847	Severe Storms, Tornado, Flooding	6/9/2009	IA-$5,417,824.37 PA-$27,072,334.75
EM-3232	MO Hurricane Katrina Evacuation Route	8/29/05-10/1/05 9/10/05	N/A
EM-3303	MO Severe Winter Storms	1/26/09-1/28/09 1/30/09	N/A
EM-3317	MO Severe Winter Storm	2/3/11 1/31/11-2/5/11	N/A
EM-3325	MO Flooding	6/30/2011 6/1/11-8/1/11	N/A
EM-3267	MO Severe Storms	7/21/06 7/19/06-7/21/06	N/A
EM-3281	MO Severe Winter Storms	12/12/07 12/8/07-12/15/07	N/A
DR-4317	Severe Storms, Tornadoes, Straight-Line Winds &Flooding	6/2/2017 4/28/17–5/11/17	IA-$12,558,424.90 PA-$64,934,938.37

Source: Federal Emergency Management Agency http://www.fema.gov/disastershttp://www.fema.gov/disasters

3.1.3 Research Additional Sources

Multiple sources were utilized for research during the development of this plan. Data sources consulted during the development of this plan include the following:

- *Missouri State Hazard Mitigation Plans* (2010 and 2013)
- Previously approved *Wayne County Hazard Mitigation Plan* (2012)
- Federal Emergency Management Agency (FEMA)
- Missouri Department of Natural Resources (MDNR)
- National Drought Mitigation Center Drought Reporter
- US Department of Agriculture's (USDA) Risk Management Agency Crop Insurance Statistics
- National Agricultural Statistics Service (Agriculture production/losses)
- *Data Collection Questionnaires* completed by each jurisdiction
- State of Missouri GIS data
- Environmental Protection Agency
- Flood Insurance Administration
- Hazards US (HAZUS)
- Missouri Department of Transportation
- Missouri Division of Fire Marshal Safety
- National Fire Incident Reporting System (NFIRS)
- National Oceanic and Atmospheric Administration's (NOAA) National Climatic Data Center (NCDC)
- Wayne County Emergency Management Agency
- Wayne County Flood Insurance Rate Map, FEMA
- Flood Insurance Study, FEMA
- U.S. Army Corps of Engineers
- U.S. Department of Transportation
- United States Geological Survey (USGS)
- University of Wisconsin – Madison, Silvus Lab
- Various articles and publications available on the internet (citations provided in the body of the plan when applicable).

The only centralized source of data for many of the weather-related hazards is the National Oceanic and Atmospheric Administration's (NOAA) National Climatic Data Center (NCDC). Although it is usually the best and most current source, there are limitations to the data which should be noted. The NCDC documents the occurrence of storms and other significant weather phenomena having sufficient intensity to cause loss of life, injuries, significant property damage, and/or disruption to commerce. In addition, it is a partial record of other significant meteorological events, such as record maximum or minimum temperatures or precipitation that occurs in connection with another event. Some information appearing in the NCDC may be provided by or gathered from sources outside the National Weather Service (NWS), such as the media, law enforcement and/or other government agencies, private companies, individuals, etc. An effort is made to use the best available information but because of time and resource constraints, information from these sources may be unverified by the NWS.

The NCDC damage amounts are estimates received from a variety of sources, including those listed above in the Data Sources section. For damage amounts, the NWS makes a best guess using all available data at the time of the publication. Property and crop damage figures should be considered as a broad estimate. Damages reported are in dollar values as they existed at the time of the storm event and do not represent current dollar values.

The database currently contains data from January 1950 to March 2014, as entered by the NWS. Due to changes in the data collection and processing procedures over time, there are unique periods of record available depending on the event type. The following timelines show the different time spans for each period of unique data collection and processing procedures.

1. Tornado: From 1950 through 1954, only tornado events were recorded.
2. Tornado, Thunderstorm Wind and Hail: From 1955 through 1992, only tornado, thunderstorm wind and hail events were keyed from the paper publications into digital data. From 1993 to 1995, only tornado, thunderstorm wind and hail events have been extracted from the Unformatted Text Files.
3. All Event Types (48 from Directive 10-1605): From 1996 to present, 48 event types are recorded as defined in NWS Directive 10-1605.

Injuries and deaths caused by a storm event are reported on an area-wide basis. When reviewing a table resulting from an NCDC search y county, the death or injury listed in connection with that county search did not necessarily occur in that county. When local information is available, the information regarding the numbers of injuries and deaths are listed specifically for Wayne County.

3.1.4 Hazards Identified

Not all of the hazards included in this plan impact the entire planning area in the same manner; yet, some hazards do have the potential to impact the entire planning area. For example, winter weather will impact the entire planning area as the county, all cities and school districts will be impacted to some degree when severe winter weather strikes the county. The table below lists each jurisdiction and each hazard. An "x" indicates that the hazard has the potential to impact a jurisdiction whereas an "-" indicates the hazard is not applicable to the jurisdiction.

Table 3.2. Hazards Identified for Each Jurisdiction

Jurisdiction	Dam Failure	Drought	Earthquake	Extreme Heat	Fires (Structural/Urban/Wild)	Flooding (River and Flash)	Land Subsidence/Sinkholes	Severe Winter Weather	Thunderstorm/Lightning/Hail /High Wind	Tornado
Wayne County	x	x	x	x	x	x	x	x	x	x
City of Greenville	x	-	x	x	x	x	x	x	x	x
City of Piedmont	x	-	x	x	x	x	x	x	x	x
City of Williamsville	-	-	x	x	x	x	x	x	x	x
Village of Mill Spring	-	-	x	x	x	x	x	x	x	x
Clearwater School District	x	x	x	x	x	-	-	x	x	x
Greenville School District	-	x	x	x	x	-	-	x	x	x

3.1.5 Multi-Jurisdictional Risk Assessment

Following is a multi-jurisdictional hazard profile for Wayne County, Missouri and all the jurisdictions within the boundaries of Wayne County. The data used to compile this assessment can be found throughout the body of Section 3 as well as the tables included in this section. This plan is an update of the *Wayne County Natural Hazard Mitigation Plan* approved in 2012. The data and information included reflect changes and updates in the time since the approval.

Each of the hazards has a profile that includes an assessment of the risks to the local participating jurisdictions. Some hazards, such as flooding, vary in risk across the planning area. These variations in risk are discussed within the profile of each hazard.

Wayne County is located in the northeastern portion of the Ozark Foothills Region. The climate in Wayne County is consistent throughout the year; temperatures and precipitation are fairly uniform. There are some variations of topography throughout the county. A variety of recreational areas, including Clearwater Lake, Wappapello Lake, Sam A. Baker State Park, Markham Springs, Old Greenville U.S. Historic Site, Mark Twain National Forest, Coldwater State Forest, Black River, and the Saint Francis River are also located in Wayne County. These topographical differences and the relative impact of hazards will be discussed in more detail throughout the hazard profiles.

In addition to topographical differences there are other variations across the county that will be discussed in greater detail throughout the hazard profiles. Some of these differences include the locations of dams that can impact certain areas, flooding that will impact different areas of the county in various extents, and sinkholes.

3.2 Assets at Risk

This section assesses the planning area population, structures, critical facilities and infrastructure, and other important assets that maybe at risk of damage from natural hazards. There have been limited changes to the planning areas since the approval of the *2012 Wayne County Hazard Mitigation Plan.*

3.2.1 Total Exposure of Population and Structures

In the following three tables, population data is based on 2010 Census Bureau data. Building counts and building exposure values are based on parcel data provided by the State of Missouri Geographic Information Systems (GIS) database which can be found at the following website: http://sema.dps.mo.gov/programs/mitigation_management.php. Contents exposure values were calculated by factoring a multiplier to the building exposure values based on usage type. The multipliers were derived from the HAZUS MH 2.1 and are defined wihtin the source documentation for **Table 3.3** below.

Land values have been purposely excluded from consideration because land remains following disasters, and subsequent market devaluations are frequently short term and difficult to quantify. Another reason for excluding land values is that state and federal disaster assistance programs generally do not address loss of land (other than crop insurance).

It should be noted that the total valuation of buildings is based on Wayne County Assessor's data which may not be current. In addition, government-owned properties are usually taxed differently or not at all, and so may not be an accurate representation of true value. Note that public school district assets and special districts assets are included in the total exposure tables by community and county.

Table 3.3 shows the total population, building count, estimated value of buildings, estimated value of contents and estimated total exposure to parcels for the unincorporated portion of the county and each incorporated city. **Table 3.4** that follows provide the building value exposures for the county and each city in the planning area broken down by usage type. Finally, **Table 3.5** provides the building count total for the county and each city in the planning area broken out by building usage types (i.e. residential, commercial, industrial, and agricultural).

Table 3.3. Maximum Population and Building Exposure by Jurisdiction-

Jurisdiction	2010 Population	Building Count	Building Exposure ($)	Contents Exposure ($)	Total Exposure ($)
City of Greenville	511	314	21,010,368	10,873,200	31,833,568
City of Piedmont	1,977	1,221	81,030,432	41,886,912	122,917,344
City of W illiamsville	342	210	14,051,520	7,259,952	21,311,472
Village of Mill Spring	189	118	430,846,368	220,073,568	650,919,936
Unincorporated W ayne County	10,5022	6,439	7,895,616	4,148,544	12,044,160
Totals	**13,521**	**8,352**	**554,834,304**	**284,242,176**	**839,076,480**

Sources: Population, 2010 U.S. Census; Building Count and Building Exposure, Missouri GIS Database: http://sema.dps.mo.gov/programs/mitigation_management.php;
Note: Contents Exposure derived by applying multiplier to Building Exposure based on HAZUS MH 2.1 standard contents multipliers per usage type as follows: Residential (50%), Commercial (100%), Industrial (150%), Agricultural (100%). For purposes of these calculations, government, school, and utility were calculated at the commercial contents rate.

Table 3.4 Building & Contents Values/Exposure by Usage Type

Jurisdiction	Residential ($)	Commercial ($)	Industrial ($)	Agricultural ($)	Total ($)
City of Greenville - Buildings	20,408,160	401,472	133,824	66,912	21,010,368
City of Piedmont - Buildings	78,822,336	1,605,888	535,296	66,912	81,030,432
City of W illiamsville - Buidlings	13,650,048	267,648	66,912	66,912	14,051,520
W ayne County - Buildings	418,802,208	8,497,824	2,676,480	869,856	430,846,368
Village of Mill Spring - Buildings	7,561,056	200,736	66,912	66,912	7,895,616
Totals (Buildings)	**539,243,808**	**10,973,568**	**3,479,424**	**1,137,504**	**554,834,304**
City of Greenville – Contents	10,204,080	401,472	200,736	66,912	10,873,200
City of Piedmont – Contents	39,411,168	1,605,888	802,944	66,912	41,886,912
City of Williamsville – Contents	6,825,024	267,648	100,368	66,912	7,259,952
Wayne County – Contents	209,401,104	8,497,824	1,304,784	869,856	220,073,568
Village of Mill Spring – Contents	3,780,528	200,736	100,368	66,912	4,148,544
Totals (Contennts)	**269,621,904**	**10,973,568**	**2,509,200**	**1,137,504**	**284,242,176**

Source: Missouri GIS Database, http://sema.dps.mo.gov/programs/mitigation_management.php;

Table 3.5 Building Counts by Usage Type

Jurisdiction	Residential Counts	Commercial Counts	Industrial Counts	Agricultural Counts	Total
City of Greenville	305	6	2	1	314
City of Piedmont	1,178	24	8	1	1,211
City of W illiamsville	204	4	1	1	210
Village of Mill Spring	113	3	1	1	118
Unincorporated W ayne County	6,259	127	40	13	6,439
Totals	8,059	164	52	17	8,292

Source: Missouri GIS Database, http://sema.dps.mo.gov/programs/mitigation_management.php;
Public School Districts and Special Districts

Even though schools and special districts' total assets are included in the tables above, additional discussion is needed, based on the data that is available from the districts' completion of the Data Collection Questionnaire and district-maintained websites. The number of enrolled students at the participating public school districts is provided in **Table 3.6** below. Additional information includes the number of buildings including sheds and other small service buildings, building values (building exposure) and contents value (contents exposure). These numbers will represent the total enrollment and building count for the public school districts regardless of the county in which they are located.

Table 3.6 Population and Building Exposure by Public School Districts

Public School District	Enrollment	Building Count	Building Exposure ($)	Contents Exposure ($)	Total Exposure ($)
Greenville R-II School District	812	13	$22,090,717	$22,090,717	$44,181,434
Clearwater R-I School District	1,000	11	$29,425,668	$29,425,668	$55,851,336

Source: http://mcds.dese.mo.gov/quickfacts/Pages/District-and-School-Information.aspx.,

3.2.2 Critical and Essential Facilities and Infrastructure

This section will include information from the Data Collection Questionnaire and other sources concerning the vulnerability of participating jurisdictions' critical, essential, high potential loss, and transportation/lifeline facilities to identified hazards. Definitions of each of these types of facilities are provided below.

- Critical Facility: Those facilities essential in providing utility or direction either during the response to an emergency or during the recovery operation.
- Essential Facility: Those facilities that, if damaged, would have devastating impacts on disaster response and/or recovery.
- High Potential Loss Facilities: Those facilities that would have a high loss or impact on the community.
- Transportation and Lifeline Facilities: Those facilities and infrastructure critical to transportation, communications, and necessary utilities.

Table 3.7 includes a summary of the inventory of critical and essential facilities and infrastructure in the planning area. The list was compiled from the Data Collection Questionnaires as well as the following sources:

- Chemical Facilities (Tier II Facilities) information can be obtained by contacting the county LEPC.
- HAZUS contains an inventory of critical facilities.
- The Homeland Security Infrastructure Protection Program (HSIPP) is another source.
- The Wayne County Jail is an identified critical facility within each jurisdiction.

Table 3.7 Inventory of Critical/Essential Facilities and Infrastructure by Jurisdiction

Jurisdiction	Airport Facility	Bus Facility	Childcare Facility	Communications Tower	Electric Power Facility	Emergency Operations	Fire Service	Government	Housing	Shelters	Highway Bridge	Hospital/Health Care	Military	Natural Gas Facility	Nursing Homes	Police Station	Potable Water Facility	Rail	Sanitary Pump Stations	School Facilities	Stormwater Pump Stations	Tier II Chemical Facility	Wastewater Facility	Total
City of Greenville	0	0	1	1	1	0	1	1	0	0	1	0	0	0	1	1	1	0	1	3	0	0	1	14
City of Piedmont	1	1	1	1	1	0	1	1	0	0	1	1	0	0	1	1	1	1	1	1	0	0	1	16
City of Williamsville	0	0	0	1	1	0	1	2	0	0	0	0	0	0	0	1	1	1	1	0	0	0	1	10
Village of Mill Spring	0	0	0	1	1	0	0	2	0	0	0	0	0	0	0	0	1	1	1	0	0	0	1	8
Unincorporated Wayne County	0	0	0	2	1	0	5	2	0	0	1	0	0	0	1	1	1	1	0	2	0	0	0	17

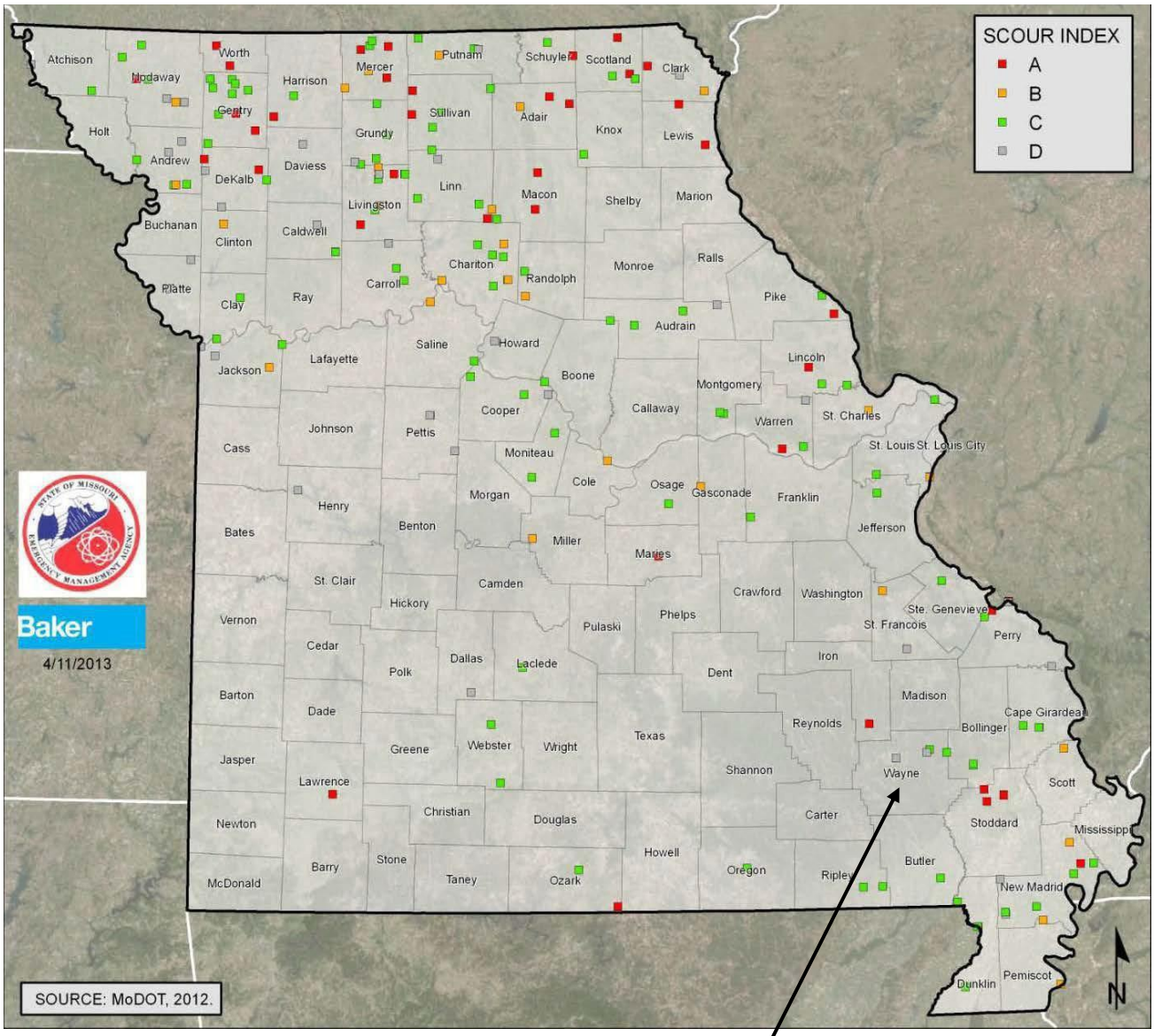
Bridges:

Within Wayne County and its incorporated jurisdictions the Missouri Department of Transportation reports there are a total of 181 bridges. Of this total, 116 bridges are state-maintained, while the remaining sixty-five bridges are owned and maintained by either the county, municipalities, or private landowners. Due to the number of bridges, a map is not provided here, but can be located at: https://www.modot.org/sites/default/files/documents/wayne_2013%5B1%5D.pdf

The following map, **Figure 3.1**, identifies the bridges that are "scour critical." This term refers to one of the database elements in the National Bridge Inventory. This element is quantified using a "scour index", which is a number indicating the vulnerability of a bridge to scour during a flood. Bridges with a scour index between 1 and 3 are considered "scour critical", or a bridge with a foundation determined to be unstable for the observed or evaluated scour condition.

According to the National Bridge Inventory, there are 156 bridges located within Wayne County, with four of those being "scour critical." A scour critical bridge is susceptible to scouring or the removal of sediments, such as sand and rocks from around the bridge abutments or piers by swiftly moving water. The Missouri Department of Transportation uses a classification system of A-D to indicate the potential for scour. Those bridges in the "A" class are those that are most vulnerable and those in the "D" class are the least vulnerable to scour. As can be seen upon the map, four scour bridges are rated C, and D.

Figure 3.1 **MoDOT State-Owned Flood Scour Critical Bridges**



Source: *Missouri State Hazard Mitigation Plan*, 2013

Planning Area

3.2.3 Other Assets

Assessing the vulnerability of the planning area to disaster also requires data on the natural, historic, cultural, and economic assets of the area. This information is important for many reasons.

- These types of resources warrant a greater degree of protection due to their unique and irreplaceable nature and contribution to the overall economy.
- Knowing about these resources in advance allows for consideration immediately following a hazard event, which is when the potential for damages is higher.
- The rules for reconstruction, restoration, rehabilitation, and/or replacement are often different for these types of designated resources.
- The presence of natural resources can reduce the impacts of future natural hazards, such as wetlands and riparian habitats which help absorb floodwaters.
- Losses to economic assets like these (e.g., major employers or primary economic sectors) could have severe impacts on a community and its ability to recover from disaster.

ThreatenedandEndangeredSpecies: Table 3.8 below shows federally threatened and endangered species within the planning area.

Table 3.8 Threatened and Endangered Species in Wayne County

Common Name	Scientific Name	Status
Gray Bat	Myotis Grisescens	Endangered
Indian Bat	Myotis Sodalis	Endangered
Northern Long Eared Bat	Myotis Septentrionalis	Threatened
Hines Emerald Dragonfly	Somtaochbora Hineana	Critical Habitat Designated
Curtis' Pearlymussed	Epioblasma Florentina Curtisi	Endangered
Pink Mucket	Lampsilis Abrupta	Endangered
Rabitsfoot	Quadrula Cybrdrica Cybrdrica	Threatened, Critical Habitat
Snuffbox	Epioblasma Triquetra	Endangered
Running Buffalo Clover	Trifolium Stoloniferum	Endangered

Source: U.S. Fish and Wildlife Service, http://www.fws.gov/midwest/Endangered/lists/missouri-cty.html;

NaturalResources: **Table 3.9** below provides the names and locations of parks and conservation areas in the planning area.

Table 3.9 Parks in Wayne County

Area Name	Address	City/Community
Sam A. Baker State Park	Rt. 1, Patterson, MO 63956	Patterson
Lake Wappapello State Park	MO-172, Wappapello, MO 63956	Williamsville

Source: http://mdc4.mdc.mo.gov/applications/moatlas/AreaList.aspx?txtUserID=guest&txtAreaNm=s

HistoricResources: The National Register of Historic Places is the official list of registered cultural resources worthy of preservation. It was authorized under the National Historic Preservation Act of 1966 as part of a national program. The purpose of the program is to coordinate and support public and private efforts to identify, evaluate, and protect our historic and archeological resources. The National Register is administered by the National Park Service under the Secretary of the Interior. Properties listed in the National Register include districts, sites, buildings, structures and objects that are significant in American history, architecture, archeology, engineering, and culture.

Properties in Wayne County that are listed upon the National Register of Historic Places are shown in **Table 3.10** below.

Table 3.10 Wayne County Properties on the National Register of Historic Places

Property	Address	City	Date Listed
Fort Benton	MO 67/34	Patterson	10/21/02
Old Greenville	MO 67	Greenville	2/17/90
Sam A Baker State Park	MO 34	Patterson	2/27/85

Source: Missouri Department of natural Resources – Missouri National Register Listings by County http://dnr.mo.gov/shpo/mnrlist.htm

The **Table 3.11** below list the major non-government employers that reside within Wayne County.

Table 3.11 Major Non-Government Employers in Wayne County

Employer Name	Main Locations	Product or Service	Employees
Clearwater School District	Williamsville	Education	170
McAllister Software	Piedmont	Technology	180
Greenville School District	Greenville	Education	118
Fine Labs	Piedmont	Technology	100

Source: Data Collection Questionnaires; local Economic Development Commissions

Agriculture

Agriculture plays an important role in Wayne County and consists primarily of livestock farming. According to the United States Department of Agriculture 2012 Census of Agriculture, there were 411 farms in Wayne County and 116,617 acres of land in farms. The market value of agricultural products sold that were produced within Wayne County in 2012 was $7,788,000. 20% of this total was crop sales at $1,555,000 and 80% was livestock sales at $6,233,000.

3.3 Land Use and Development

3.3.1 Development Since Previous Plan Update

Table 3.12 provides the population growth statistics for all cities in Wayne County as well as the unincorporated portion of the county.

Table 3.12 Wayne County Population Growth, 2000-2010

Jurisdiction	Total Population 2010	Total population 2000	2000-2010 # Change	2000-2010 % Change
Unincorporated Wayne County	10,502	10,218	+284	2.78
City of Greenville	511	451	+60	11.74
City of Piedmont	1,977	1,992	-15	.76
City of Williamsville	342	379	-37	10.82
Village of Mill Spring	189	219	-30	15.87

Source: U.S. Bureau of the Census, Decennial Census; Population Statistics are for entire incorporated areas.

Population growth or decline is generally accompanied by increases or decreases in the number of housing units. **Table 3.13** provides the change in numbers of housing units in the planning area from 2000 to 2010.

Table 3.13 Change in Housing Units, 2000-2010

Jurisdiction	Housing Units 2010	Housing Units 2000	2000-2010 # Change	2000-2010 % change
Unincorporated Wayne County	7,555	6,980	+575	7.61
City Greenville	234	222	+12	5.13
City of Williamsville	188	190	-2	1.05
Village of Mill Spring	106	104	+2	1.87

Source: U.S. Bureau of the Census, Decennial Census; Population statistics are for entire incorporated areas.

The American Community Survey estimates that Wayne County population increased by 262 people. As the previous data figure shows the increase in residents are primarily located in Greenville, and Unincorporated Wayne County. The additional population is created by net migration and natural births occurring in the communities.

3.3.2 Future Land Use and Development

Future Development

No plans are currently in existence for future development within Wayne County, the City of

Greenville, Village of Mill Spring, City of Williamsville, or City of Piedmont. Furture land uses within the participating jurisdictions are anticipated to remain unchanged.

Little future development is expected in each school district. The population of students within each of the two school districts is expected to stay the same or show only a slight increase. The facilities and classrooms currently in use will be sufficient for the planned future student population. Williamsville Elementary is currently constructing a tornado safe room; this is the only development in progress among the school districts within Wayne County.

3.4 Hazard Profiles, Vulnerability, and Problem Statements

Each hazard has been analyzed individually in a hazard profile. The profile consists of a general hazard description, location, severity/magnitude/extent, previous events, future probability, a discussion of risk variations between jurisdictions, and how anticipated development could impact risk. At the end of each hazard profile is a vulnerability assessment, followed by a summary problem statement.

Hazard Profiles

Requirement §201.6(c)(2)(i): [The risk assessment shall include a] description of the…location and extent of all natural hazards that can affect the jurisdiction. The plan shall include information on previous occurrences of hazard events and on the probability of future hazard events.

Each hazard identified in Section **3.1.4** has been profiled individually in this section in alphabetical order. The level of information presented in the profiles varies by hazard based on the information available. With each update of this plan, new information will be incorporated to provide better evaluation and prioritization of the hazards that affect the planning area. Detailed profiles for each of the identified hazards include information categorized as follows:

Hazard Description: This section consists of a general description of the hazard and the types of impacts it may have on a community or school/special district.

Geographic Location: This section describes the geographic location of the hazard in the planning area. For some hazards, the entire planning area is at risk.

Severity/Magnitude/Extent: This includes information about the severity, magnitude, and extent of a hazard. For some hazards, this is accomplished with description of a value on an established scientific scale or measurement system, such as an EF2 tornado on the Enhanced Fujita Scale. Severity, magnitude, and extent can also include the speed of onset and the duration of hazard events. Describing the severity/magnitude/extent of a hazard is not the same as describing its potential impacts on a community. Severity/magnitude/extent defines the characteristics of the hazard regardless of the people and property it affects.

Previous Occurrences: This section includes available information on historic incidents and their impacts. Historic event records form a solid basis for probability calculations.

Probability of Future Occurrence: The frequency of recorded past events is used to estimate the likelihood of future occurrences. Probability was determined by dividing the number of recorded events by the number of years and multiplying by 100. This gives the percent chance of the event happening in any given year. For events occurring more than once annually, the probability will be reported 100% in any given year, with a statement of the average number of events annually.

Vulnerability Assessments

Requirement §201.6(c)(2)(ii) :[The risk assessment shall include a] description of the jurisdiction's vulnerability to the hazards described in paragraph (c)(2)(i) of this section. This description shall include an overall summary of each hazard and its impact on the community.

Requirement §201.6(c)(2)(ii)(A) :The plan should describe vulnerability in terms of the types and numbers of existing and future buildings, infrastructure, and critical facilities located in the identified hazard areas.

Requirement §201.6(c)(2)(ii)(B) :[The plan should describe vulnerability in terms of an] estimate of the potential dollar losses to vulnerable structures identified in paragraph (c)(2)(i)(A) of this section and a description of the methodology used to prepare the estimate.

Requirement §201.6(c)(2)(ii)(C): [The plan should describe vulnerability in terms of] providing a general description of land uses and development trends within the community so that mitigation options can be considered in future land use decisions.

Requirement §201.6(c)(2)(ii): (As of October 1, 2008) [The risk assessment] must also address National Flood Insurance Program (NFIP) insured structures that have been repetitively damaged in floods.

Following the hazard profile for each hazard will be the vulnerability assessment. The vulnerability assessment further defines and quantifies populations, buildings, critical facilities, and other community assets at risk to damages from natural hazards. The vulnerability assessments will be based on the best available county-level data, which is in the *Missouri Hazard Mitigation Plan* (2010). The county-level assessments in the State Plan were based on the following sources:

- Statewide GIS data sets compiled by state and federal agencies; and
- FEMA's HAZUS-MH loss estimation software.

The vulnerability assessments in the Wayne County Hazard Mitigation Plan will also be based on:

- Written descriptions of assets and risks provided by participating jurisdictions;
- Existing plans and reports;
- Personal interviews with planning committee members and other stakeholders; and
- Other sources as cited.

Within the Vulnerability Assessment, the following sub-headings will be addressed:

- ✓ **Vulnerability Overview**

- ✓ **Potential Losses to Existing Development:** This section will examine the types and numbers, of buildings, critical facilities, etc. currently existing.

- ✓ **Previous and Future Development:** This section will include information on how

changes in development have impacted the community's vulnerability to this hazard.

- ✓ **Hazard Summary by Jurisdiction:** For hazard risks that vary by jurisdiction, this section will provide an overview of the variation and the factual basis for that variation.

Problem Statements

Each hazard analysis must conclude with a brief summary of the problems created by the hazard in the planning area, and possible ways to resolve those problems. Include jurisdiction-specific information in those cases where the risk varies across the planning area.

3.4.1 Dam Failure

Hazard Profile

Hazard Description

According to the State of Missouri's Hazard Mitigation Plan, the National Dam Safety Act defines a dam as an artificial barrier impounding and/or diverting water and having the following characteristics:

1. Height in excess of six feet and storage capacity of fifty acre-feet or more.
2. Height at least twenty-five feet and storage capacity more than fifteen acre-feet.

Levees are not considered dams by definition.

Dams can be owned and overseen by either private residents or public institutions. The responsibility for the safe operation and regular maintenance of dams falls to the owner of the property. In some states, the State may regulate the construction, modification, maintenance, and operations of any dam. In Missouri, according to the Department of Natural Resources, the State regulates "all non-agricultural, non-federal dams more than thirty-five feet in height" and provides technical assistance and informational resources to all dam owners.

A dam is defined as a barrier constructed across a watercourse for the purpose of storage, control, or diversion of water. Dams are typically constructed of earth, rock, concrete, or mine tailings. Dam failure is the uncontrolled release of impounded water resulting in downstream flooding, affecting both life and property. Dam failure can be caused by any of the following:

1. Overtopping - inadequate spillway design, debris blockage of spillways or settlement of the dam crest.
2. Piping: internal erosion caused by embankment leakage, foundation leakage and deterioration of pertinent structures appended to the dam.
3. Erosion: inadequate spillway capacity causing overtopping of the dam, flow erosion, and inadequate slope protection.
4. Structural Failure: caused by an earthquake, slope instability or faulty construction.

Table 3.14 MDNR Dam Hazard Classification Definitions

Hazard Class	Definition
Class I	The area downstream from the dam that would be affected by inundation contains ten (10) or more permanent dwellings or any public building. Inspection of these dams must occur every two years
Class II	The area downstream from the dam that would be affected by inundation contains one (1) to nine (9) permanent dwellings, or one (1) or more campgrounds with permanent water, sewer, and electrical services or one (1) or more industrial buildings. Inspection of these dams must occur every three years
Class III	The area downstream from the dam that would be affected by inundation does not contain any of the structures identified for Class I or Class II dams. Inspection of these dams must occur once every five years.

Source: Missouri Department of Natural Resources, http://dnr.mo.gov/env/wrc/docs/rules_reg_94.pdf

Table 3.15 NIF Fsm Hazard Classification Definitions

Hazard Class	Definition
Low Hazard	Equal or exceed 25 feet in height and which exceed 15 acre-feet in storage, or Equal of exceed 50 acre-feet and exceed 6 feet in height
Significant Hazard	Possible loss of human life and likely significant property or environmental destruction
High Hazard	Loss of one human life is likely if the dam fails

Source: National Inventory of Dams

Geographic Location

Dams in Planning Area

The Missouri Department of Natural Resources (DNR) lists 36 dams in Wayne County, 6 of which are regulated by the DNR. Five are federally regulated dams. Structures located below these dams are most susceptible to dam failure events.

Table 3.16 provides a list of the names, locations, and hazard class for all high hazard dams in the planning area.

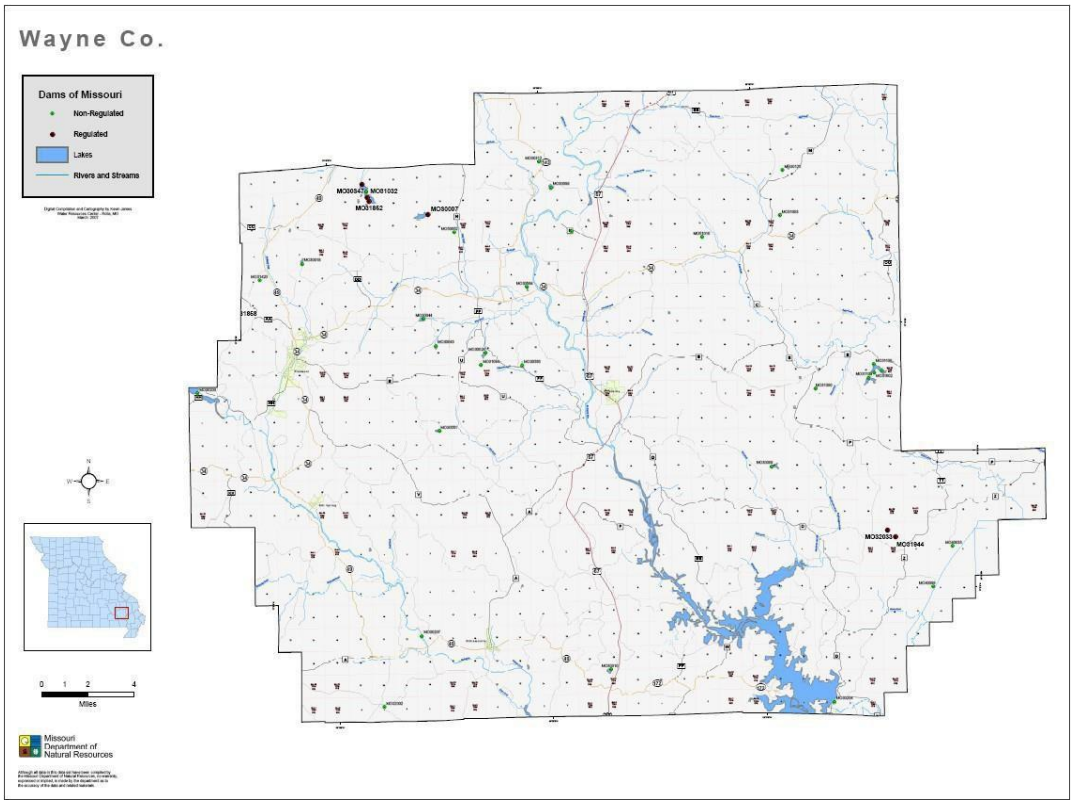
Table 3.16 High Hazard Dams in the Wayne County Planning Area

Dam Name	Emergency Action Plan	Dam Height (Ft)	Normal Storage (Acre-Ft)	River	Nearest Downstream City	Hazard Class	NID Class
A O Shearrer Lake Dam	No	28	10	Little Lake Creek	Patterson	3	High
Lake of the Pines	No	44	39	TR-Barnes Creek	Lowndes	1	High
Eagle Sky Lake DamW ard Lake	Yes	57	110	Camp Creek	Patterson	1	High
Turners Dream Lake	No	35	50	TR-Barnes Creek	Lowndes	1	High
Wappapello Lake Dam	Yes	114	8400	St. Francis	Wappapello	1	High
Lake Ray Dam	Yes	42	38	TR Lick Creek	Cobb	2	High
Rothwell Ranch Lake Dam	No	31	3	TR Mckenzie Creek	Piedmont	2	High
Lake Jeano Dam	No	22	14	Greasy Creek	Piedmont	1	High
Seven Lakes Dam #1	Yes	55	57	Goose Creek	Des Arc	1	High
Clearwater Dam	Yes	155	23,000	Clearwater Lake	Leeper	1	High
Lottes Dam	No	34	20	TR. W est Fork Lost Creek	Shook	3	High
Seven Lakes Dam #2	No	28	15	Goose Creek	Des Arc	1	High
Lake Potashnik Dam	No	26	7	TR-St Francis River	Greenville	1	High
Porter Dam	No	23	19	TR-W et Fork Otter Creek	Wappapello	2	High
Seven Lakes Dam #3	Yes	45	61	Goose Creek	Des Arc	1	High
Lake Julia Dam	No	34	21	TR-Barnes Creek	Lowndes	1	High
Collins Lake Dam Sect-16	No	20	12	TR Big Creek	Greenville	2	High
Collins Lake Dam Sect-31	No	25	5	Little Lake Creek	Wappappello	2	High
Williams Lake Sect-31 Dam	No	20	8	TR-Bear Creek	Clubb	2	High
Sunrise Lake Dam	No	24	9	TR-Rings Creek	Patterson	1	High
Mountain Lake Dam	No	24	19	TR-Rings Creek	Greenville	1	High
Lake Janna Dam	No	32	3	TR-Barnes Creek	Lowndes	1	High
Lake Lynn Dam	Yes	59	25	TR-Lick Creek	Mcgee	2	High

Sources: Missouri Department of Natural Resources, http://dnr.mo.gov/env/wrc/dam-safety/statemap.htm and National Inventory of Dams, http://nid.usace.army.mil/cm_apex/f?p=838:12

The map following, **Figure 3.2**, provides the location of the dams within Wayne County. The map provided by the Missouri Department of Natural Resource displays the location of all thirty-six (36) dams; the non-regulated dams are indicated with a green dot while the regulated dams are marked with a red dot on the map. There are twenty-three (23) high hazard dams within the boundaries of Wayne County. The vulnerability assessment on the pages following will discuss in greater detail, the assets that would be impacted by a dam failure.

Figure 3.2 High Hazard Dam Locations in Wayne County & Areas Impacted in the Event of Breach



Source: U.S. Army Corps of Engineers, Missouri Department of Natural Resources

UpstreamDamsOutsidethePlanningArea

In reviewing information from the Missouri Department of Natural Resources, the United States Army Corps of Engineers, and the National Inventory of Dams, the planning committee has determined that there are no dams that are upstream of Wayne County that have the potential to impact Wayne County if they were to fail.

Severity/Magnitude/Extent

Seventeen of the Wayne County dams are Class I dams under the Missouri DNR classification system. This is a relatively high number compared to other counties in the state. The USACE also maintains the National Inventory of Dams (NID). The NID categorizes dams according to downstream hazard potential, and the definitions are different from the DNR's definitions. The NID definitions are as follows:

• Low Hazard Potential: Dams assigned the low hazard potential classification are those where failure or disoperation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the property owners.

• Significant Hazard Potential: Dams assigned the significant hazard potential classification are those dams where failure or disoperation results in no probable loss of human life but can cause economic loss, environmental change, disruption of lifeline facilities, or impact other concerns. Significant hazard potential classification dams are often located in predominately rural or agricultural areas but could be located in areas with population and significant infrastructure.

• High Hazard Potential: Dams assigned the high hazard potential classification are those where failure or disoperation will probably cause loss of human life.

The NID lists 39 dams in the county, with 23 of them classified as "high hazard," or ones which could cause the loss of human life in the event of failure. The last two columns in Table 3.16 above include, for each dam, the NID classification, and the nearest community. A review of the columns show several high hazard dams located in close proximity to communities. However, dam breach inundation area maps were not available for the dams impacting the planning area. The Planning Committee will try to obtain this information for the next plan update. A dam of real concern to county officials is Clearwater Dam, which is located in Wayne County, and boasts 23,000 acres of lake. This property is maintained by the USACE and restricts flow along the Black River. Should this structure fail Wayne County would be affected.

In a historic flood event during the Spring of 2017 the Clearwater Dam and Lake Wappapello Dam overtopped due to excessive rain fall. Route T in Wayne County was damaged due to the overtopping of the Wappapello Dam, the bridge has since been repaired. A narrative from the NCDC has been pasted below regarding the flooding episode in Piedmont during this same flood.

"Record or near-record flooding occurred after a succession of thunderstorm complexes dumped heavy rain in late April, bringing three-day rainfall totals up to a foot in isolated locations. A large complex of thunderstorms moved southeast across southeast Missouri during the evening hours of the 29th. During the overnight hours through the early morning of the 30th, an even larger complex of thunderstorms dumped widespread very heavy rain. This complex occurred along the same front, which moved back north as a warm front across southeast Missouri. These storms accelerated rises in area rivers, which were already above flood stage in some cases."

"Flooding of the Black River occurred below Clearwater Dam. The lake levels behind the dam reached a record height. For the first time in the dam's history, water passed through the emergency spillway of the dam. This prompted concerns about flooding below the dam. A mandatory evacuation was considered for some residents below the dam. Several roads were closed, including Route 49 at Mill Spring. Damage to public property, including roads, bridges, and utilities, was estimated near one million dollars."

Previous Occurrences

Before the 2017 spring flood in Wayne County there had been minimal reported dam failure or overtopping. In April of 2011, overtopping occurred that damaged county roads and washed out T Highway in Wayne County.

Probability of Future Occurrence

According to data offered by the Water Resources Program of the Missouri DNR, there have been no significant dam failures within Wayne County. This data, however, should not be understood to mean that there will be no dam failures in Wayne County's future. Understandably as dams age the likelihood that one

may fail increases.

Vulnerability

Vulnerability Overview

As stated above, The Missouri Department of Natural Resources lists 36 dams in Wayne County, 6 of which are regulated by the DNR. Five are federally regulated dams. Structures located below these dams are most susceptible to dam failure events. Of the dams in Wayne County 23 are rated as High Hazard Dams. Of these 23 dams, 3 are rated at Hazard Class 3 based on the NID criteria, meaning that the loss of human life should the dam fail as well as environmental and significant property damage. There are no school district facilities or critical facilities that are located within the inundation area of any dam in Wayne County. Dams fail on an individual basis, when one dam fails, not all dams fail. Any vulnerability will be limited to those persons and structures that are within the inundation zone of a failed dam. Therefore, the vulnerability of the county to one dam breaking is minimal.

Potential Losses to Existing Development.

Currently in Wayne County there is not major development in progress. Should a dam failure event occur, the most vulnerable buildings would be historical buildings, or large infrastructure in a flood zone.

Impact of Previous and Future Development

Wayne County is very rural and sparsely populated. There is little to no development anticipated within the inundation areas of any of the dams located in the county.

Hazard Summary by Jurisdiction

The communities around Wappapello Lake and Clearwater Lake are at a higher risk of damage in the event dam failure occurs in Wayne County. No school districts or special interest districts will be harmed in the event of dam failure; due to the fact they are not immediately located within the flooding area. County roads are at the highest risk of being damaged, like in previous events, in the event of dam failure in Wayne County.

Problem Statement

The failure of a damn in the planning area can cause significant damage to nearby structures. The committee has created actions to lessen the impact such as educational materials, relocating residents, and regular maintainence of damns.

3.4.2 Drought

Hazard Profile

Hazard Description

Drought is generally defined as a condition of moisture levels significantly below normal for an extended period of time over a large area that adversely affects plants, animal life, and humans. A drought period can last for months, years, or even decades. There are four types of drought conditions relevant to Missouri, according to the State Plan, which are as follows:

- Meteorological drought is defined in terms of the basis of the degree of dryness (in

comparison to some “normal” or average amount) and the duration of the dry period. A meteorological drought must be considered as region-specific since the atmospheric conditions that result in deficiencies of precipitation are highly variable from region to region.

- Hydrological drought is associated with the effects of periods of precipitation (including snowfall) shortfalls on surface or subsurface water supply (e.g., streamflow, reservoir and lake levels, ground water). The frequency and severity of hydrological drought is often defined on a watershed or river basin scale. Although all droughts originate with a deficiency of precipitation, hydrologists are more concerned with how this deficiency plays out through the hydrologic system. Hydrological droughts are usually out of phase with or lag the occurrence of meteorological and agricultural droughts. It takes longer for precipitation deficiencies to show up in components of the hydrological system such as soil moisture, streamflow, and ground water and reservoir levels. As a result, these impacts also are out of phase with impacts in other economic sectors.

- Agricultural drought focus is on soil moisture deficiencies, differences between actual and potential evaporation, reduced ground water or reservoir levels, etc. Plant demand for water depends on prevailing weather conditions, biological characteristics of the specific plant, its stage of growth, and the physical and biological properties of the soil.

- Socioeconomic drought refers to when physical water shortage begins to affect people.

Geographic Location

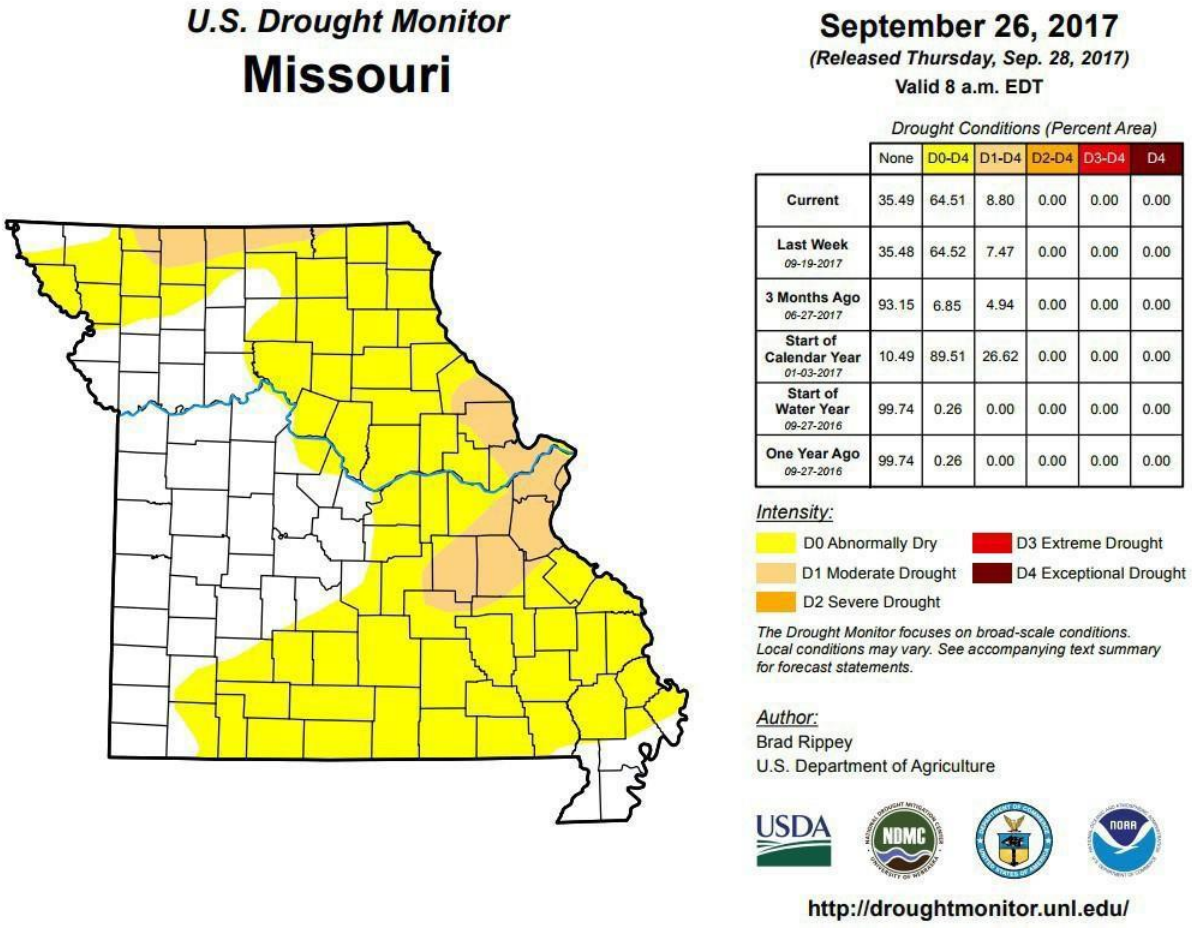
The entire planning area of Wayne County is vulnerable to the effects of drought. Although all jurisdictions in the county are at risk, droughts most directly impact the agriculture sector. According to the United States Department of Agriculture, Ag Census 2012 there are 411 farms in Wayne County and 116,617 acres of the county are used for agriculture. The majority of row crop farming that includes rice, soybeans and corn is found in the flat fertile soils. This cropland makes up 27,981 acres; the remaining farmland is used for livestock, the average farm is 284 acres in Wayne County.

Severity/Magnitude/Extent

The National Drought Monitor Center at the University of Nebraska at Lincoln summarized the potential severity of drought as follows. Drought can create economic impacts on agriculture and related sectors, including forestry and fisheries, because of the reliance of these sectors on surface and subsurface water supplies. In addition to losses in yields in crop and livestock production, drought is associated with increases in insect infestations, plant disease, and wind erosion. Droughts also bring increased problems with insects and disease to forests and reduce growth. The incidence of forest and range fires increases substantially during extended droughts, which in turn place both human and wildlife populations at higher levels of risk. Income loss is another indicator used in assessing the impacts of drought because so many sectors are affected. Finally, while drought is rarely a direct cause of death, the associated heat, dust and stress can all contribute to increased mortality.

The following US Drought Monitor Map for September 26, 2017, **Figure 3.3**, is a weekly map of drought conditions that is produced jointly by the National Oceanic and Atmospheric Administration, the U.S Department of Agriculture, and the National Drought Mitigation Center at the University of Nebraska-Lincoln. The map is a composite index that includes the measurements of climatic, hydrological, and soil conditions as well as reported impacts and observations from more than 350 contributors around the country.

Figure 3.3 U.S. Drought Monitor Map of Missouri on September 26, 2017



Source: U.S. Drought Monitor, http://droughtmonitor.unl.edu/Home/StateDroughtMonitor.aspx?MO

The Palmer Index, Published by the National Oceanic and Atmospheric Administration and the U.S Department of Agriculture, measures both dryness and wetness using a -4.0 to +4.0 scale. This is done by comparing water supply (from precipitation and soil moisture) to water demand (the amount needed to maintain river, lake, and reservoir levels and keep soil sufficiently moist).

Because the Palmer Drought Severity index is primarily a reactive measuring tool, other indicators of drought have been identified as somewhat more proactive. They include the following:

- a decline in precipitation;
- declining reservoir levels;
- falling well water levels;
- low soil moisture levels;
- water demand versus water supply; and,
- streamflow stage reductions.

These types of observations provide more immediate indicators of dryness, yet are more limited

than the Palmer Drought Severity Index in that they provide more localized data rather than regional data. Most likely, the best assessment of drought is a combination of both the Palmer Index and the above bulleted indicators.

Previous Occurrences

According to the National Climatic Database, from January 1, 2010 through August 31, 2017 there were seventeen droughts that impacted Wayne County. A listing of those events follows:

07/02/2010-07/31/2010 Moderate drought conditions developed over much of southeast Missouri after a very dry June. Poplar Bluff received only about one-half inch of rain in June. Rainfall during July consisted of isolated to widely scattered showers and thunderstorms. Hot conditions increased evaporation rates and crop stress. Corn yields were expected to be cut by half where irrigation was not used. An upper level ridge of high pressure was firmly entrenched over the southeastern states early in the month. The high slowly migrated toward the southern Plains by mid-month and toward the southwestern U.S. by the 20th. It eventually re-established itself over the Southeast late in the month.

08/01/2010-08/31/2010 Moderate drought conditions persisted over much of southeast Missouri. After a very dry June, some areas received beneficial rain in July and August. Rainfall for the months of July and August was variable, consisting of isolated to widely scattered showers and thunderstorms. Many locations were one to over three inches below normal for the month of August. Hot conditions increased evaporation rates and crop stress. Unirrigated corn yields were expected to be a total failure in some places. Livestock producers in Ripley and Carter Counties were feeding hay due to pastures that were burned up by not having significant rainfall for six weeks. Livestock water was also becoming a concern for some producers. An upper level ridge of high pressure remained firmly entrenched over the southern states during most of the month.

09/01/2010-09/30/2010 Severe drought developed over a few counties near the Mississippi River, while moderate drought conditions persisted south and west of Cape Girardeau. With the exception of a heavy rainfall event from the remnants of Tropical Storm Hermine, rainfall was rather hard to come by in September. Hermine brought three to five inches of rain on the 9th and 10th to parts of southeast Missouri. While this rainfall was very beneficial, there was generally less than an inch the rest of the month. Hermine greatly improved short-term rainfall deficits, but year-to-date rainfall deficits were still 4 to 8 inches. By month's end, 32 percent of the Missouri cotton harvest was rated poor or very poor. Eighty-seven percent of pasture land in the extreme southeast corner of the state was rated as poor or very poor, which impacted hay crops. Crop harvests were well underway in September, but crop damage figures were not yet available. Unirrigated corn yields were expected to be a total failure in some places.

10/01/2010-10/31/2010 Drought conditions expanded and worsened across southeast Missouri during the month of October. Extreme drought developed over a few counties near the Missouri Bootheel, mainly south of Charleston. Severe drought expanded as far north and west as the Poplar Bluff and Sikeston areas. Moderate drought expanded north and west across the remainder of southeast Missouri. Total rainfall for the month was only one-half inch at Cape Girardeau and 1.11 inches at Poplar Bluff. Outdoor fire danger became very high at times. Outdoor burning was banned in Cape Girardeau County. By month's end, 85 percent of pastureland was rated poor or very poor.

Ninety-two percent of topsoil was rated short or very short on moisture. A federal disaster declaration was granted for most of southeast Missouri due to anticipated crop losses. Crop harvests were completed in October, but final crop damage figures were not yet available. Unirrigated corn yields were expected to be a total failure in some places.

11/01/2010-11/25/2010 Drought conditions worsened across southeast Missouri during the first half of

November, then improved with heavy rainfall on the 24th and 25th. At its most widespread extent, extreme drought extended as far north as a Doniphan to Dexter to Charleston line. Moderate to severe drought covered the remainder of southeast Missouri south of Perry County. At the start of the month, 86 percent of pastureland was rated as poor or very poor, and 92 percent of topsoil was short or very short on moisture. Outdoor fire danger became very high at times. A series of wildfires occurred early in the month in Carter and Wayne Counties. Most of the fires were less than 100 acres, and no structures were known to have burned. There were some bans on outdoor burning until heavy rainfall on the 24th and 25th. The cumulative effect of this drought, a catastrophic ice storm in '09, winds from Hurricane Ike in '08, and a record late spring freeze in '07 resulted in a mortality spiral among trees and shrubs. According to a local arborist, the series of damaging weather events diminished the long-term ability of trees to recover from future events. Crop harvests were completed in October, but final crop damage figures were not yet available. Unirrigated corn yields were expected to be a total failure in some places.

12/1/2010-12/31/2010 Severe to extreme drought lingered across extreme southern parts of Missouri, mainly along the Arkansas border from Doniphan to New Madrid. Moderate drought extended as far north as a line from Van Buren to Sikeston. Elsewhere in southeast Missouri, the drought ended in December. Subsoil moisture remained low. For the year 2010, most locations ended the year with precipitation deficits of 10 to 13 inches. The long-term moisture deficits were reflected in below normal streamflow's on some waterways. Agricultural impacts were minimal since the growing season ended in the fall.

01/01/2011-01/31/2011 Severe to extreme drought lingered across extreme southern parts of Missouri, mainly along the Arkansas border from Doniphan to New Madrid. Moderate drought extended as far north as a line from Van Buren to Sikeston. The drought began during the summer of 2010, and a very dry January exacerbated the drought. Total precipitation for January was only 0.34 inch at Poplar Bluff. Normal monthly precipitation is about three inches. Subsoil moisture remained low. Long-term moisture deficits were reflected in below normal streamflows on some waterways. Agricultural impacts were minimal since the growing season ended in the fall.

05/18/2012-05/31/2012 One of the warmest and driest Mays on record worsened the rare spring drought over southeast Missouri. At Cape Girardeau, spring of 2012 was the driest spring on record. Only 5.25 inches of rain fell from March through May. The month of May was the second driest on record. Only 0.79 inch fell at Cape Girardeau in May. By the end of May, the drought was severe in the extreme southeast Missouri counties of New Madrid and Mississippi. Moderate drought conditions existed elsewhere to the south of the Perryville area. Soils continued to dry out, and topsoil moisture deficits began to be reported. Pasture land rapidly deteriorated. Streamflows were running below normal by the end of the month.

06/01/2012-06/30/2012 The spring drought worsened considerably across southeast Missouri as summer arrived. By the end of June, all of southeast Missouri except for the Perryville and Van Buren areas was upgraded to extreme drought. Severe drought spread across the remainder of southeast Missouri. Soil moisture deficits continued to increase. By the end of June, 80 to 100 percent of the region's topsoil moisture was reported as short or very short, and 70 to 95 percent of the subsoil moisture was reported as short or very short. Many crops were showing stress. The majority of the corn and soybeans were listed in fair to poor condition. Increasing amounts of livestock and pasture were showing stress. The percentage of pastures rated as poor or very poor was growing. Ponds across the region were drying quickly. Fire danger increased to the point where bans on outdoor burning were implemented in parts of southeast Missouri, including Bollinger, Cape Girardeau, New Madrid, and Scott Counties. A number of cities also imposed bans on burning, including Dexter, Bloomfield, Doniphan, Charleston, East Prairie, and Scott City. In the Mark Twain National Forest, open fires were prohibited due to high fire danger. Streamflows were running below normal. At Cape Girardeau, total rainfall for June was 1.37 inches, which is less than half the normal amount of 3.41 inches. The drought began in May and continued into July.

07/01/2012-07/31/2012 The drought which began in May worsened considerably across southeast Missouri as summer progressed. By the end of July, all of southeast Missouri was upgraded to extreme to exceptional drought. The exceptional drought conditions were along and south of a line from Poplar Bluff to Jackson, including Cape Girardeau. The remainder of southeast Missouri was classified as having extreme drought conditions. Soil moisture deficits continued to increase. By the end of July, 90 to 100 percent of the region's topsoil and subsoil moisture was reported as short or very short. Many crops were showing stress, and the situation became dire for many farmers. A majority of the corn and soybeans were listed in poor to very poor condition. Increasing amounts of livestock and pasture were showing stress. The percentage of pastures rated as poor or very poor continued to grow. Ponds across the region were dry or drying quickly. Even with the isolated rainfall from thunderstorms, fire danger remained high. Bans on outdoor burning were in place for most of southeast Missouri, including Carter, Bollinger, Cape Girardeau, Mississippi, New Madrid, Ripley, Stoddard, and Scott Counties. Additionally, numerous individual towns and villages issued burn bans. Fourth of July fireworks shows were cancelled or banned in many places. Streamflows were running below normal. At Cape Girardeau, total rainfall for July was 2.24 inches, which was 1.12 inches below normal. The drought began in May and continued into August.

08/01/2012-08/31/2012 The drought which began in May reached its most extreme stage by early August. Through the month of August, all of southeast Missouri was in extreme to exceptional drought. The exceptional drought conditions were along and south of a line from Doniphan to Jackson. The remainder of southeast Missouri was in extreme drought conditions. Soil moisture deficits remained very high. Throughout the month of August, 80 to 100 percent of the region's topsoil and subsoil moisture was reported as short or very short. Many crops were heavily damaged, and numerous counties were declared natural disaster areas. Corn crops were a partial or complete loss. Soybeans were faring somewhat better. The percentage of pastures rated as poor or very poor held steady from July. Some small trees and shrubs were killed. Ponds across the region were dry or drying quickly. Even with the isolated rainfall from thunderstorms, fire danger remained high. Bans on outdoor burning were in place for numerous counties in southeast Missouri. Streamflows were running
normal to below normal. At the Cape Girardeau airport, 1.44 inches of rain fell in August, which was only about half of normal. Rainfall for the year-to-date was 14.27 inches, which was 16.58 inches below normal. The drought began in May and continued into September.

09/01/2012-09/30/2012 Significant improvement in drought conditions occurred during the month of September. Heavy rain from the remnants of Hurricane Isaac at the start of the month was a notable factor. The extreme to exceptional summer drought gave way to only moderate drought from Cape Girardeau north and west, including Perryville. The area of extreme drought conditions shrank to include only New Madrid and Mississippi Counties in the southeast corner of the state. All other areas of southeast Missouri improved to severe drought conditions by month's end. Soil moisture deficits decreased greatly. By the end of September, soil moisture was near normal. Most of the corn crop was either harvested or plowed under, and corn crop losses were expected to be very high. Estimates on soybean crop losses were not available yet. Numerous counties were declared natural disaster areas earlier in the growing season. Pastures improved, but a majority of them remained in poor or very poor condition. Fire danger decreased significantly, and all bans on outdoor burning were lifted. Streamflows were running about normal. At the Cape Girardeau airport, 6.20 inches of rain fell in September, which was about three inches above normal. The drought began in May and continued into October.

10/01/2012-10/31/2012 Slight improvement in long-term drought conditions was observed during the month of October. While the more active fall weather pattern resulted in more frontal passages in October, most locations still reported below normal precipitation for the month. The drought officially ended in Perry County. The small area of extreme drought conditions that had been near the Bootheel area improved to severe drought. By the end of the month, areas south and west of a line

from Cape Girardeau to Greenville were in severe drought. The remainder of the drought area was classified as moderate. The main impact of the long-term drought was on farm ponds used for irrigating fields or raising livestock. Soil moisture was near normal. The soybean crop was harvested, but soybean crop loss estimates were not available yet. Some pastures remained in poor or very poor condition, but many of them improved to adequate condition. Streamflows were running about normal. At Cape Girardeau, October rainfall was 2.58 inches, which was about an inch-and-a-quarter below normal. The year-to-date rainfall deficit hovered around 13 inches. The drought began in May and continued into November in most areas.

11/01/2012-11/30/2012 There was slight improvement in long-term drought conditions during the month of November. Rainfall was below normal during the month, but this deficit was partially offset by low evaporation rates caused by unseasonably cool air. The drought officially ended along and north of a line from Marble Hill to Cape Girardeau. The area of severe drought improved to moderate drought. By the end of the month, areas south and west of a line from Cape Girardeau to Marble Hill were in moderate drought. The main impact of the long-term drought was on farm ponds used for irrigating fields or raising livestock. Soil moisture was near normal. Some pastures remained in poor or very poor condition, but many of them improved to adequate condition. Streamflows were running about normal. At Cape Girardeau, November rainfall was 1.32 inches, which was 3.12 inches below normal. The year-to-date rainfall deficit hovered around 18 inches. The drought began in May and continued into December in most areas.

12/01/2012-12/31/2012 There was no appreciable change in long-term drought conditions during the month of December. Rainfall was below normal during the month of December, but this deficit was partially offset by low evaporation rates from colder winter weather. Moderate drought conditions persisted throughout the month south and west of a line from Cape Girardeau to Marble Hill. Impacts were very few, since the growing season was over for most crops. Farm ponds used for irrigating livestock remained low. At the Cape Girardeau and Poplar Bluff airports, December monthly rainfall was two to two and one-half inches below normal. The drought began in May and continued into January.

01/01/2013-01/12/2013 The drought which began in May of 2012 officially ended across the remainder of southern Illinois. Water supplies returned to normal.

11/01/2016-11/30/2016 Severe drought conditions spread into extreme southeast Missouri, southeast of a line from Cape Girardeau to Poplar Bluff. Moderate drought conditions encompassed the remainder of southeast Missouri. A lack of precipitation caused soil moisture to decrease rapidly. Pasture land deteriorated, causing some farmers to begin feeding hay to livestock. Stock ponds began to run low. Some farmers began hauling in water for their livestock. Across the Mississippi River, Paducah, Kentucky recorded its driest September-October combination on record. Only about one-quarter inch of rain fell during the first few weeks of November. This lack of precipitation, combined with above normal temperatures, contributed to the rapid onset of drought conditions. At Paducah, 1.28 inches of rain fell from September 1 to November 18. This was 8.69 inches below normal for that period. Small streams as well as larger rivers were running well below normal. A heavy rainfall event late in the month brought some improvement in the drought.

Probability of Future Occurrence

The seventeen incidents reported above span over twenty years of data, or 240 months. This means Wayne County experience 17 events over 20 years, 17/20. This shows that in the future there is a 70% chance that another drought event could occur in Wayne County. The timing and duration of drought is not predictable, but long-range outlooks and predicted impacts of climate change could indicate an increased chance of drought.

Vulnerability

Vulnerability Overview

According to the Missouri State Drought Plan, Wayne County has a moderate susceptibility to droughts. The USDA's Risk Management Agency 2011 Missouri Crop Insurance Profile indicates that the crop loss ratio for Wayne County is "Low". In table 3.5.9a in the 2013 Missouri State Hazard Mitigation Plan it is reported that the total crop insurance paid for drought damage from 1998-2012 in Wayne County was $152,009 with a total crop exposure based on the 2007 Census of Agriculture of $1,389,000. The county has a loss ratio of 1 according to the table, with an annual crop claims ration of 0.73%.

Potential Losses to Existing Development

Potential crop losses in Wayne County are anticipated to be low based on historical data such as that presented above. The total annualized crop insurance claims/drought damage during the 1998-2012 time periods in the county was $10,134.

Impact of Future Development

Little future development is anticipated within Wayne County due to its being so rural. Any future development will not result in increased impacts from droughts. All of the public water supply districts have ample capacity to meet all foreseen future development. No significant increase is anticipated in the number of acres farmed.

Hazard Summary by Jurisdiction

Groundwater is a valuable commodity that is readily available in Wayne County. Even when creeks, streams, and rivers may be at low levels, groundwater is readily available. Although the drought conditions are typically constant across the county, in the incorporated cities the magnitude will be different from that experienced by farmers. Where farmers potentially experience crop loss or damage, in cities only lawns and gardens would be impacted. The capacity of the organized public water supply districts is sufficient to provide ample water to local residents. However, there are many local residents that rely on private wells for water supply that could potentially be impacted by a severe drought. In severe drought conditions, there is the possibility for building foundations to be weakened due to shrinking and expanding soils.

Problem Statement

Drought is a hazard that impacts large geographic regions of the country. The sector that is most impacted in Wayne County is the acres that are used for farming. Drought causes damages to crops and can negatively impact the yield of crops depending on the time the drought occurs.

3.4.3 Earthquakes

Hazard Profile

Hazard Description

An earthquake is a sudden motion or trembling that is caused by a release of energy accumulated within or along the edge of the earth's tectonic plates. Earthquakes occur primarily along fault zones and tears in the earth's crust. Along these faults and tears in the crust, stresses can build until

one side of the fault slips, generating compressive and shear energy that produces the shaking and damage to the built environment. Heaviest damage generally occurs nearest the earthquake epicenter, which is that point on the earth's surface directly above the point of fault movement. The composition of geologic materials between these points is a major factor in transmitting the energy to buildings and other structures on the earth's surface.

In the United States, there are several thousand earthquakes annually. The State of California experiences the most damaging earthquakes, while Alaska experiences the highest number of earthquakes. According to an article by the United States Geological Survey, however, earthquakes occurring in the New Madrid seismic zone affect a much larger area than that which is affected by activity along other fault lines. In fact, the New Madrid seismic "region has more earthquakes than any other part of the United States east of the Rocky Mountains," according to the article.

Earthquakes occur primarily along fault zones and tears in the earth's crust. Along these faults and tears in the crust, stresses can build until one side of the fault slips, generating compressive and shear energy that produces the shaking and damage to the built environment. Heaviest damage generally occurs nearest the earthquake epicenter, which is that point on the earth's surface directly above the point of fault movement. The composition of geologic materials between these points is a major factor in transmitting the energy to buildings and other structures on the earth's surface.

As explained by the Federal Emergency Management Agency, major earthquakes and their accompanying foreshocks and aftershocks can be measured in two different ways. In 1935, the Richter Scale was developed by Charles F. Richter to measure the amount of energy released by an earthquake. The Modified Mercalli Intensity Scale was also developed as a tool to measure the severity of a quake using damage observations. The Mercalli Scale uses Roman numerals I to XII to rate an earthquake's intensity. A description of various Richter Scale and Modified Mercalli Scale intensities is offered below:

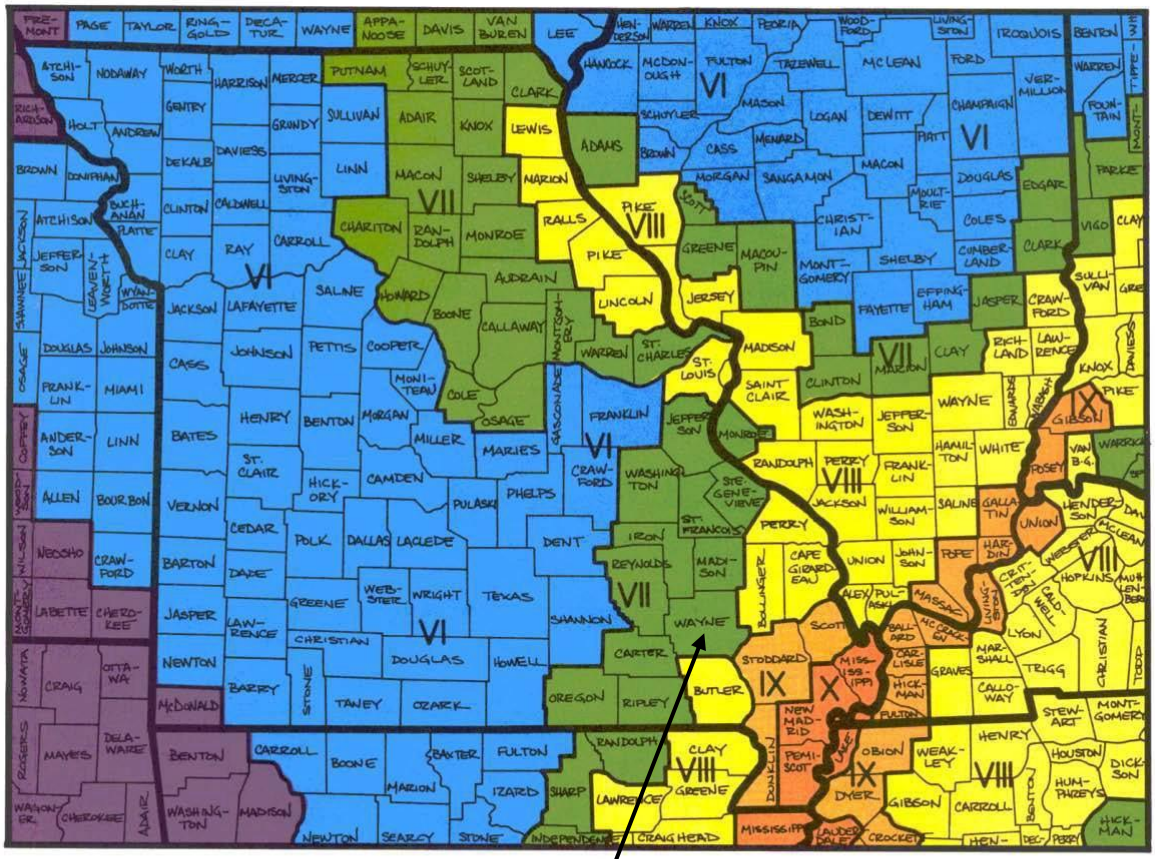
The most severe earthquakes in the New Madrid Sesmic Zone (NMSZ) from December 16, 1811 through March 12, 1812, with the most severe occurring on December 16, 1811 and February 7,1812. These quakes rank seventh and ninth respectively among the largest earthquakes recorded in the United States.

Geographic Location

The New Madrid Seismic Zone is made up of several thrust faults that stretch throughout Southeast Missouri. The effects of a large earthquake will impact the entire county indiscriminately. All jurisdictions are expected to experience the same intensity across the planning area. Wayne County is at risk for strong ground movements and has a high potential for soil liquefaction due to the presence of loose, sandy consolidated sediments and a high-water table. The immediate vicinity of the Ozarks is also at risk from the earthquakes in the Mew Madrid Seismic Zone because, like in the Bootheel, subsurface conditions of the Mississippi and Missouri River Valleys can amplify earthquakes.

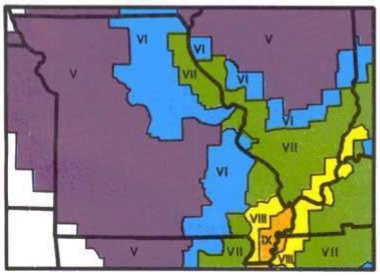
The map below shows the highest projected Modified Mercalli intensities by county from a potential magnitude 7.6 earthquake whose epicenter could be anywhere along the length of the New Madrid Seismic Zone. The secondary maps in Figure 3.6 on page 3.98 show the same regional intensities for 6.7 and 8.6 earthquake, respectively.

Figure 3.4 Impact Zones for Earthquake Along the New Madrid Fault



This map shows the highest projected Modified Mercalli intensities by county from a potential magnitude – 7.6 earthquake whose epicenter could be anywhere along the length of the New Madrid seismic zone.

6.7

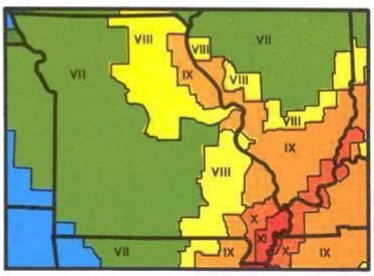


This map shows the highest projected Modified Mercalli intensities by county from a potential magnitude – 6.7 earthquake whose epicenter could be anywhere along the length of the New Madrid seismic zone.

7.6

This map shows the highest projected Modified Mercalli intensities by county from a potential magnitude – 8.6 earthquake whose epicenter could be anywhere along the length of the New Madrid seismic zone.

8.6



Planning Area

PROJECTED EARTHQUAKE INTENSITIES

MODIFIED MERCALLI INTENSITY SCALE

I. People do not feel any Earth movement.

II. A few people might notice movement.

III. Many people indoors feel movement. Hanging objects swing.

IV. Most people indoors feel movement. Dishes, windows.and doors rattle. Walls and frames of struclUres creak. Liquids in open vessels are slightly disturbed. Parked cars rock.

V. Almost everyone feels movement. Most people are awakened. Doors swing open or closed. Dishes are broken. Pictures on the wall move. Windows crack in some eases. Small objects move or are turned over. Liquids might spill out of open containers.

VI. Everyone feels movement. Poorly built buildings are damaged lightly. Considera- ble quantities of dishes and glassware. and some windows are broken. People have trouble walking. Pictures fall off walls. Objects fall from shelves. Plaster in walls might crack. Some furniture is ovenurned. Small bells in churches chapels and schools ring.

VII. People have difficulty standing. Consider- able damage in poorly built or bad ly designed buildings, adobe houses, old walls, spires and others. Damage is slight to moderate in well-built buildings. Numerous windows are broken. Weak chimneys break at roof lines. Cornices from towers and high buildings fall. Loose bricks fall from buildings. Heavy furnitu re is overturned and damaged. Some sand and gravel stream banks cave in.

VIII. Drivers have trouble steering. Poorly built structures suffer severe damage. Ordinary substantial buildings partially collapse. Damage slight in structures especially built to withstand earthquakes. Tree branches break. Houses not bolted down might shift on their foundations. Tall structures such as towers and chimneys might twist and fall. Temporary or permanent changes in springs and wells. Sand and mud is ejected in small amounts.

IX. Most buildings suffer damage. Houses that are not bolted down move off their foundations. Some underground pipes arc broken. The ground cracks conspicuously. Reservoirs suffer severe damage.

X. Well-built wooden structures are severely damaged and some destroyed. Most masonry and frame structures are des- troyed. including their foundations. Some bridges arc destroyed. Dams are seriously damaged. Large landslides occur. Water is thrown on the banks of canals, rivers, and lakes. Railroad tracks are bent slightly. Cracks are opened in cement pavements and asphalt road surfaces.

XI. Few if any masonry structures remain standing. Large. well-built bridges are *des-* troyed. Wood frame structures are Severely damaged, especially near epicenters. Buried pipelines are rendered com- pletely useless. Railroad tracks are badly bent. Water mixed with sand, and mudis ejected in large amounts.

XII. Damage is total, and nearly all works of construction are damaged g reatly or des- troyed. Objects are thrown into the air. The ground moves in waves or ripples. Large amounts of rock may move. Lakes are dammed, waterfalls formed and rivers are deflected.

Intensity is a numerical index describing the effects of an earthquake on the surface of the Earth, on man, and on structures built by man. The intensities shown in these maps are the highest likely under the most adverse geologic conditions. There will actually be a range in intensities within any small area such as a town or county, with the highest intensity generally occurring at only a few sites. Earthquakes of all three magnitudes represented in these maps occurred during the 1811 -1812 "New Madrid earthquakes. The isoseismal patterns shown here, however, were simulated based on actual patterns of somewhat smaller but damaging earthquakes that occurred in the New Madrid seismic zone in 1843 and 1895.

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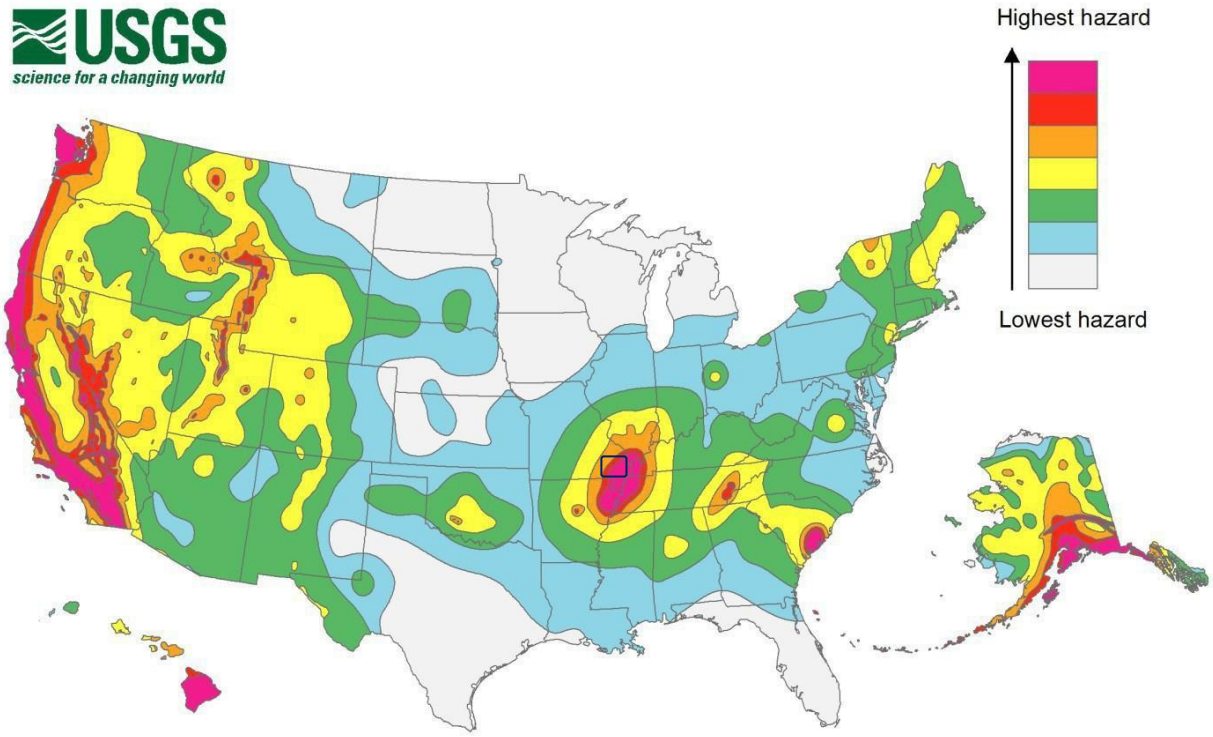
Figure **3.5** illustrates seismicity in the United States. W ayne County is located near the New Madrid Seismic Zone, this places the county in a higher hazard area.

Figure 3.5 United States Seismic Hazard Map



Source: United States Geological Survey at http://earthquake.usgs.gov/hazards/products/conterminous/2014/HazardMap2014_lg.jpg

Severity/Magnitude/Extent

The extent or severity of earthquakes is generally measured in two ways: 1) the Richter Magnitude Scale is a measure of earthquake magnitude; and 2) the Modified Mercalli Intensity Scale is a measure of earthquake severity. The two scales are defined as follows.

Richter Magnitude Scale

The Richter Magnitude Scale was developed in 1935 as a device to compare the size of earthquakes. The magnitude of an earthquake is measured using a logarithm of the maximum extent of waves recorded by seismographs. Adjustments are made to reflect the variation in the distance between the various seismographs and the epicenter of the earthquakes. On the Richter Scale, magnitude is expressed in whole numbers and decimal fractions. For example, comparing a 5.3 and a 6.3 earthquake shows that the 6.3 quake is ten times bigger in magnitude. Each whole number increase in magnitude represents a tenfold increase in measured amplitude because of the logarithm. Each whole number step in the magnitude scale represents a release of approximately 31 times more energy.

Modified Mercalli Intensity Scale

The intensity of an earthquake is measured by the effect of the earthquake on the earth's surface. The intensity scale is based on the responses to the quake, such as people awakening, movement of furniture, damage to chimneys, etc. The intensity scale currently used in the United States is the Modified Mercalli (MM) Intensity Scale. It was developed in 1931 and is composed of 12 increasing levels of intensity. They range from imperceptible shaking to catastrophic destruction, and each of the twelve levels is denoted by a Roman numeral. The scale does not have a mathematical basis, but is based on observed effects. Its use gives the laymen a more meaningful idea of the severity.

Previous Occurrences

According to the Missouri Department of Natural Resources there were 236 earthquakes that ranged between Magnitude 2.0 and Magnitude 4.9 that shook southeast Missouri from 2000-2010. In reviewing the specific incidents, during that time period five these earthquakes had an epicenter in Wayne County.

The largest earthquakes ever felt in the United States occurred along the New Madrid fault line during the winter of 1811-1812. During the course of three months, three earthquakes registering above 8.0 on the Richter Scale were felt by nearly the entire eastern half of the United States. According to the United States Geological Survey, church bells in Boston, Massachusetts rang as a result of the tremendous shaking. In fact, the New Madrid quakes were two to three times stronger than the 1964Alaska earthquake and ten times more powerful than the 1906 San Francisco quake.

Probability of Future Occurrence

The probability of a magnitude 2.0 through 4.9 earthquakes impacting the area is nearly certain in any given year based on the historical data that 236 occurred in southeast Missouri in 10 years. The probability of an earthquake having an epicenter in Wayne County is at 30% based on the data provided by USGS.

Hazard Summary by Jurisdiction

The earthquake intensity is not likely to vary greatly throughout the planning area; therefore the risk will be the same throughout. The City of Greenville with his historic Old Greenville Days Park and the county courthouse are more vulnerable to damages from the earthquake due to their age. No specific area of Wayne County is more susceptible to earthquakes than another area.

Impact of Future Development

Future development is not expected to increase the risk other than contributing to the overall exposure of what could become damaged as a result of an earthquake event.

Vulnerability

Vulnerability Overview
Potential Losses to Existing Development

HAZUS 2.1 was used to analyze vulnerability and estimate losses due to earthquakes. All HAZUS analyses were run using an enhanced Level 2 inventory database comprised of updated demographic and aggregated data using the 2010 US Census. The information and data for this

vulnerability overview and potential loss were gathered from the 2013 Missouri State Hazard Mitigation Plan.

The updated annualized loss scenario presented here shows the economic losses to buildings annualized over eight earthquake return periods (100, 200, 500, 1, 500, 2,000, and 2,500 years). HAZUS defines annualized loss as the expected value of loss in any one year. The software develops annualized loss estimates by aggregating the losses and their exceedance probabilities from the eight return periods. Annualized loss is the maximum potential annual dollar loss resulting from various return periods averaged on a 'per year' basis.

Reported in Table 3.5.4a in the 2013 Missouri State Hazard Mitigation Plan is that the building loss in Wayne County would be $503,000 or a loss ratio of 0.03%. Annualized income loss is projected to be $100,000 and total economic loss to buildings at $603,000. Wayne County ranks 11th in the state for its loss ratio, whereas Pemiscot County which borders the Mississippi River is ranked first.

A second scenario, based on an event with a 2% probability of exceedance in 50 years was also done to model a worst case scenario. The methodology is based on a probabilistic seismic hazard shaking grids developed by the USGS. The maps provide estimates of peak ground acceleration and spectral acceleration at periods of 0.3 second and 1.0 second, respectively, which have a 2% probability of exceedance in the next 5 years. This scenario used a 7.7 driving magnitude, which is typical New Madrid fault planning scenario.

As reported in Table 3.5.4c in the 2013 Missouri State hazard Mitigation Plan, structural damage would amount to $58,508,000, with non-structural damage estimated at $192,620,000. Also contents damage and inventory loss are estimated at $58,908,000. Total economic loss to buildings in Wayne County is estimated at $369,798,000. The loss ratio for the county is estimated at 21.25% which would rank twelfth in the state.

Impact of Previous and Future Development

Future development is not expected to increase the risk other than contributing to the overall exposure of what could become damaged as a result of an event.

Hazard Summary by Jurisdiction

Since the earthquake intensity is not likely to vary greatly throughout the planning area, that the risk will be the same throughout. However, damages could differ if there are structural variations in the planning area built environment.

Problem Statement

Wayne County is very near the New Madrid Seismic Zone, enough that substantial damage would result in Wayne County from a severe earthquake. The estimated loss data provided above demonstrates the level of loss the county would experience in both scenarios presented above. Wayne County ranks in the top fifteen counties within the state in regards to loss ratio.

The only area that has a higher potential for damage, as discussed above is the City of Greenville. The greatest concern of the MPC was the loves of local residents. To address this concern, the MPC developed the goal to continue earthquake education and participation in practice events.

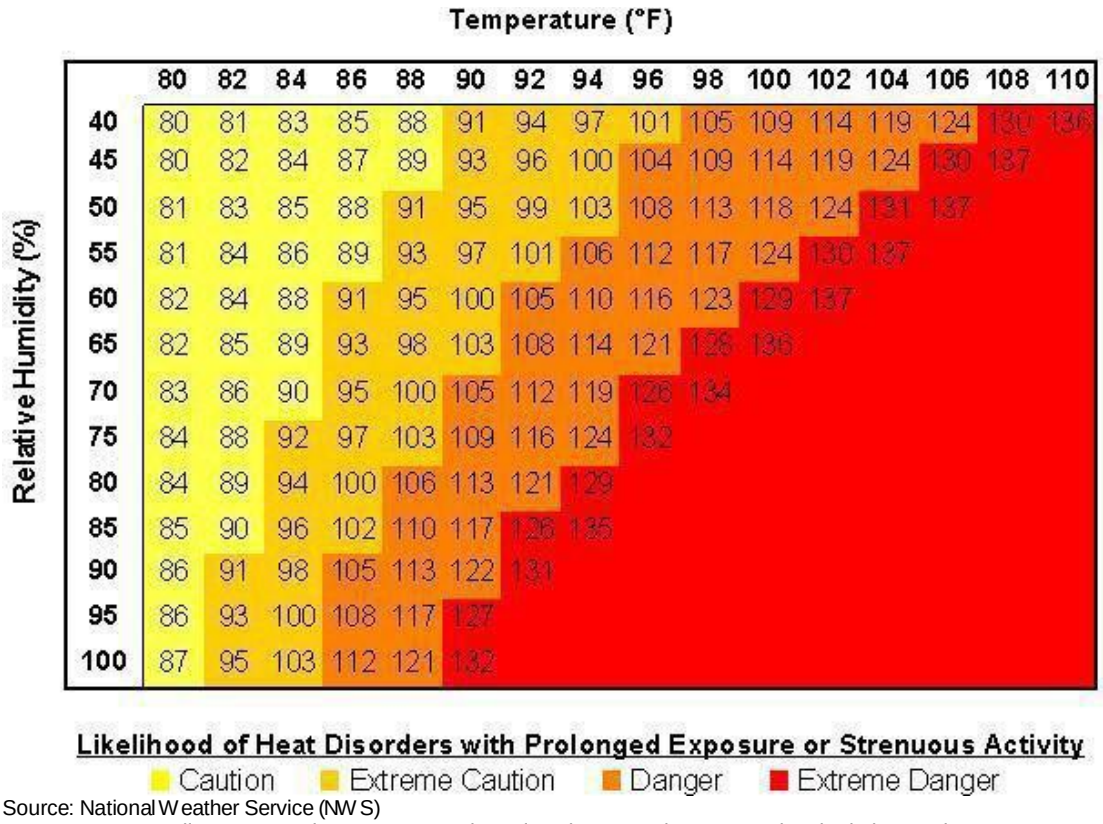
3.4.4 Extreme Heat

Hazard Profile

Hazard Description

Extreme temperature events, both hot and cold, can impact human health and mortality, natural ecosystems, agriculture and other economic sectors. The remainder of this section profiles extreme heat. Extreme cold events are profiled in combination with Winter Storm in **Section 3.4.11.** According to information provided by FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks. Ambient air temperature is one component of heat conditions, with relative humidity being the other. The relationship of these factors creates what is known as the apparent temperature. The Heat Index chart shown in **Figure 3.6** uses both factors to produce a guide for the apparent temperature or relative intensity of heat conditions.

Figure 3.6 Heat Index (HI) Chart



Source: National Weather Service (NWS)
Note: Exposure to direct sun can increase Heat Index values by as much as 15°F. The shaded zone above 105°F corresponds to a HI that may cause increasingly severe heat disorders with continued exposure and/or physical activity.

Geographic Location

Extreme heat is an area-wide hazard event, and the risk of extreme heat does not vary across the planning area. All areas are equally susceptible to the impacts of extreme heat. Extreme heat events are typically regional in nature and impact multiple counties, and even multiple states.

Severity/Magnitude/Extent

Extreme heat can cause stress to crops and animals. According to USDA Risk Management Agency, losses to insurable crops during the 10-year time period were $3,220. Extreme heat can also strain electricity delivery infrastructure overloaded during peak use of air conditioning during extreme heat events. Another type of infrastructure damage from extreme heat is road damage. When asphalt is exposed to prolonged extreme heat, it can cause buckling of asphalt-paved roads, driveways, and parking lots.

From 1988-2011, there were 3,496 fatalities in the U.S. attributed to summer heat. This translates to an annual national average of 146 deaths. During the same period, two deaths were recorded in the planning area, according to NCDC data. The National Weather Service stated that among natural hazards, no other natural disaster—not lightning, hurricanes, tornadoes, floods, or earthquakes—causes more deaths.

Those at greatest risk for heat-related illness include infants and children up to five years of age, people 65 years of age and older, people who are overweight, and people who are ill or on certain medications. However, even young and healthy individuals are susceptible if they participate in strenuous physical activities during hot weather. In agricultural areas, the exposure of farm workers, as well as livestock, to extreme temperatures is a major concern.

Table 3.17 lists typical symptoms and health impacts due to exposure to extreme heat.

Table 3.17 Typical Health Impacts of Extreme Heat

Heat Index (HI)	Disorder
80-90° F (HI)	Fatigue possible with prolonged exposure and/or physical activity
90-105° F (HI)	Sunstroke, heat cramps, and heat exhaustion possible with prolonged exposure and/or physical activity
105-130° F (HI)	Heatstroke/sunstroke highly likely with continued exposure

Source: National Weather Service Heat Index Program, www.weather.gov/os/heat/index.shtml

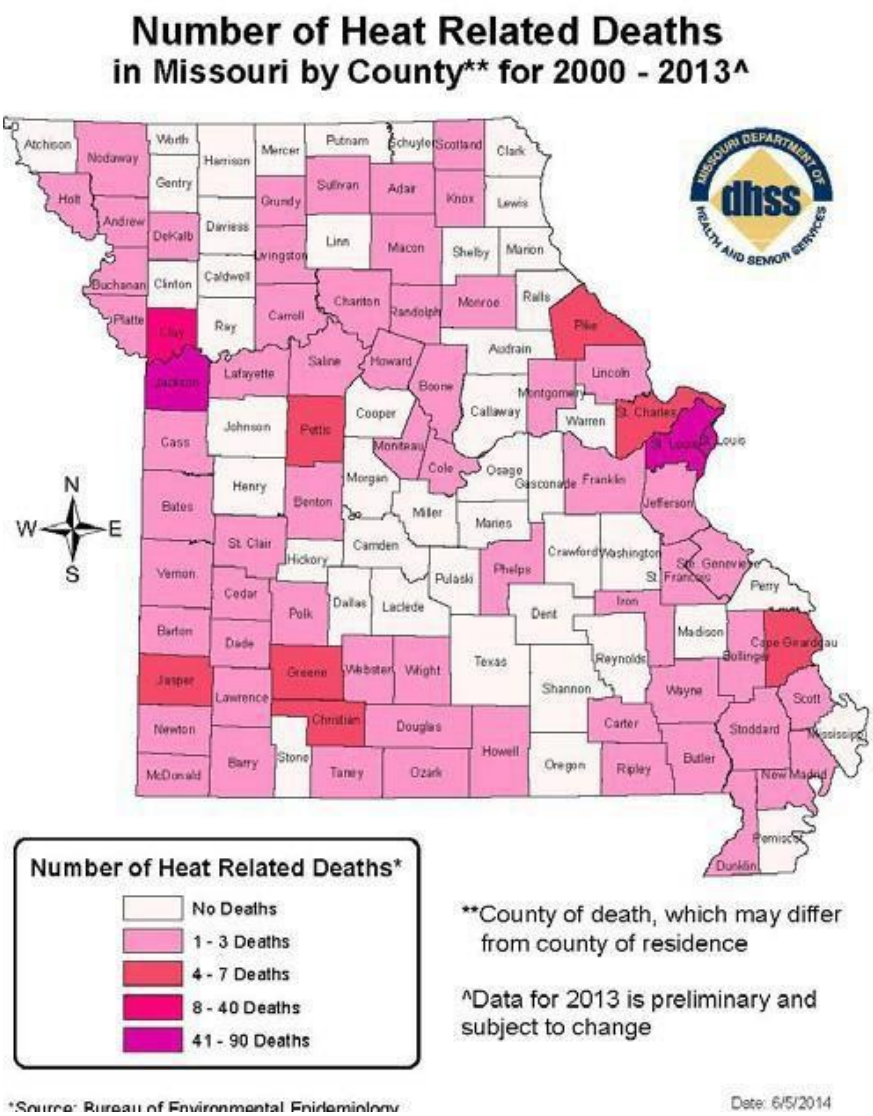
The National Weather Service has an alert system in place (advisories or warnings) when the Heat Index is expected to have a significant impact on public safety. The expected severity of the heat determines whether advisories or warnings are issued. A common guideline for issuing excessive heat alerts is when for two or more consecutive days: (1) when the maximum daytime Heat Index is expected to equal or exceed 105 degrees Fahrenheit (°F); and the night time minimum Heat Index is 80°F or above. A heat advisory is issued when temperatures reach 105 degrees and a warning is issued at 115 degrees.

Previous Occurrences

According to the National Climatic Data Center (NCDC) database, from August 1, 2010 through August 1, 2015 there were nine reported excessive heat events. These nine events included, thirty-eight days of excessive heat. In reviewing the reports provided by the NCDC there were two deaths reported within Wayne County and surrounding counties.

The following map (Figure 3.7), depicts the number of heath related deaths by county from 2000-2013. Wayne County falls within the same colored category as many of its neighbors that have experienced 1-3 deaths during this time period.

Figure 3.7 Heat Related Deaths in Missouri 2000 - 2013



Probability of Future Occurrence

The probability of future occurrence can be calculated by dividing the number of extreme heat events by the number of years, in this case nine events divided by five years is equal to a sum greater than 100% probability that an extreme heat event will occur in any given year. The average number of events per year would be approximately two. Extreme heat events are often underreported any this data is based on those events reported by NOAA through its NCDC.

Vulnerability

Vulnerability Overview

All areas of the county are vulnerable to impacts of extreme heat, however, those with a higher percentage of elderly may be more at risk due to the heightened vulnerability of this segment of the population. The 2010 US Census reports that 21.4% of the population of Wayne County is over

65years of age; the median age of Wayne County is 45.1.

Potential Losses to Existing Development
The historical amount paid for crop insurance damage is $3,220, so it can be assumed that during future events some damage may occur. Drought will impact the entire Wayne County planning area. Areas with crops are more susceptible to costly damage.

Impact of Future Development
Population growth can result in increases in the age-groups that are most vulnerable to extreme heat. Population growth also increases the strain on electricity infrastructure, as more electricity is needed to accommodate the growing population. There has been a slight decrease in the percentage of local residents over the age of 65 between 2000 and 2010. In the 2010 US Census it was reported that 26.6% of county residents were over age 65, which is down 5.2% from 26.6% reported in the 2000 US Census.

Hazard Summary by Jurisdiction
Those at greatest risk for heat-related illness and deaths include children up to five years of age, people 65 years of age and older, people who are overweight, and people who are ill or on certain medications. To determine jurisdictions within the planning area with populations more vulnerable to extreme heat, demographic data was obtained from the 2010 census on population percentages in each jurisdiction comprised of those under age 5 and over age 65. Data was not available for overweight individuals and those on medications vulnerable to extreme heat. **Table 3.18** below summarizes vulnerable populations in the participating jurisdictions. Note that school and special districts are not included in the table because students and those working for the special districts are not customarily in these age groups.

Table 3.18 County Population Under Age 5 and Over Age 65, 2010 Census Data

Jurisdiction	Population Under 5 yrs	Population 65 yrs and over
Unincorporated Wayne County	708	2,895
City of Greenville	39	123
City of Piedmont	117	418
City of Williamsville	22	69
Village of Mill Spring	11	29

Source: U.S. Census Bureau, (*) includes entire population of each city or county

All school district buildings in the county have air conditioners that are utilized in times of high temperatures. School is typically not in session during the hottest time of the year which is typically the month of July. All school districts in the county remain open regardless of temperature. However, accommodations are made for extreme heat events such as keeping children indoors during recess times to reduce potential exposure to extreme heat. Additionally, all schools in the county comply with the Missouri State High School Activities Association guidelines for avoiding heat-related problems during practice and sporting events.

All other strategic buildings and critical facilities within the county are air conditioned with no increased susceptibility to damages from extreme heat.

Problem Statement

The risks presented in this section resulting from extreme heat include heat related illness and death and damage to crops in Wayne County. To address the problem of extreme heat the MPC have included the action to educate residents on heat related illnesses.

3.4.5 Wildfires

Hazard Profile

Hazard Description

Due to the rural nature of Wayne County urban and structural fires are not discussed within this plan. The greater hazard in Wayne County is wildfires. The fire incident types for wildfires include: 1) natural vegetation fire, 2) outside rubbish fire, 3) special outside fire, and 4) cultivated vegetation, crop fire.

The Missouri Division of Fire Safety (MDFS) indicates that approximately 80 percent of the fire departments in Missouri are staffed with volunteers. Whether paid or volunteer, these departments are often limited by lack of resources and financial assistance. The impact of a fire to a single-story building in a small community may be as great as that of a larger fire to a multi-story building in a large city.

The Forestry Division of the Missouri Department of Conservation (MDC) is responsible for protecting privately owned and state-owned forests and grasslands from wildfires. To accomplish this task, eight forestry regions have been established in Missouri for fire suppression. The Forestry Division works closely with volunteer fire departments and federal partners to assist with fire suppression activities. Currently, more than 900 rural fire departments in Missouri have mutual aid agreements with the Forestry Division to obtain assistance in wildfire protection if needed.

Most of Missouri fires occur during the spring season between February and May. The length and severity of both structural and wildland fires depend largely on weather conditions. Spring in Missouri is usually characterized by low humidity and high winds. These conditions result in higher fire danger. In addition, due to the recent lack of moisture throughout many areas of the state, conditions are likely to increase the risk of wildfires. Drought conditions can also hamper firefighting efforts, as decreasing water supplies may not prove adequate for firefighting. It is common for rural residents burn their garden spots, brush piles, and other areas in the spring. Some landowners also believe it is necessary to burn their forests in the spring to promote grass growth, kill ticks, and reduce brush. Therefore, spring months are the most dangerous for wildfires. The second most critical period of the year is fall. Depending on the weather conditions, a sizeable number of fires may occur between mid-October and late November.

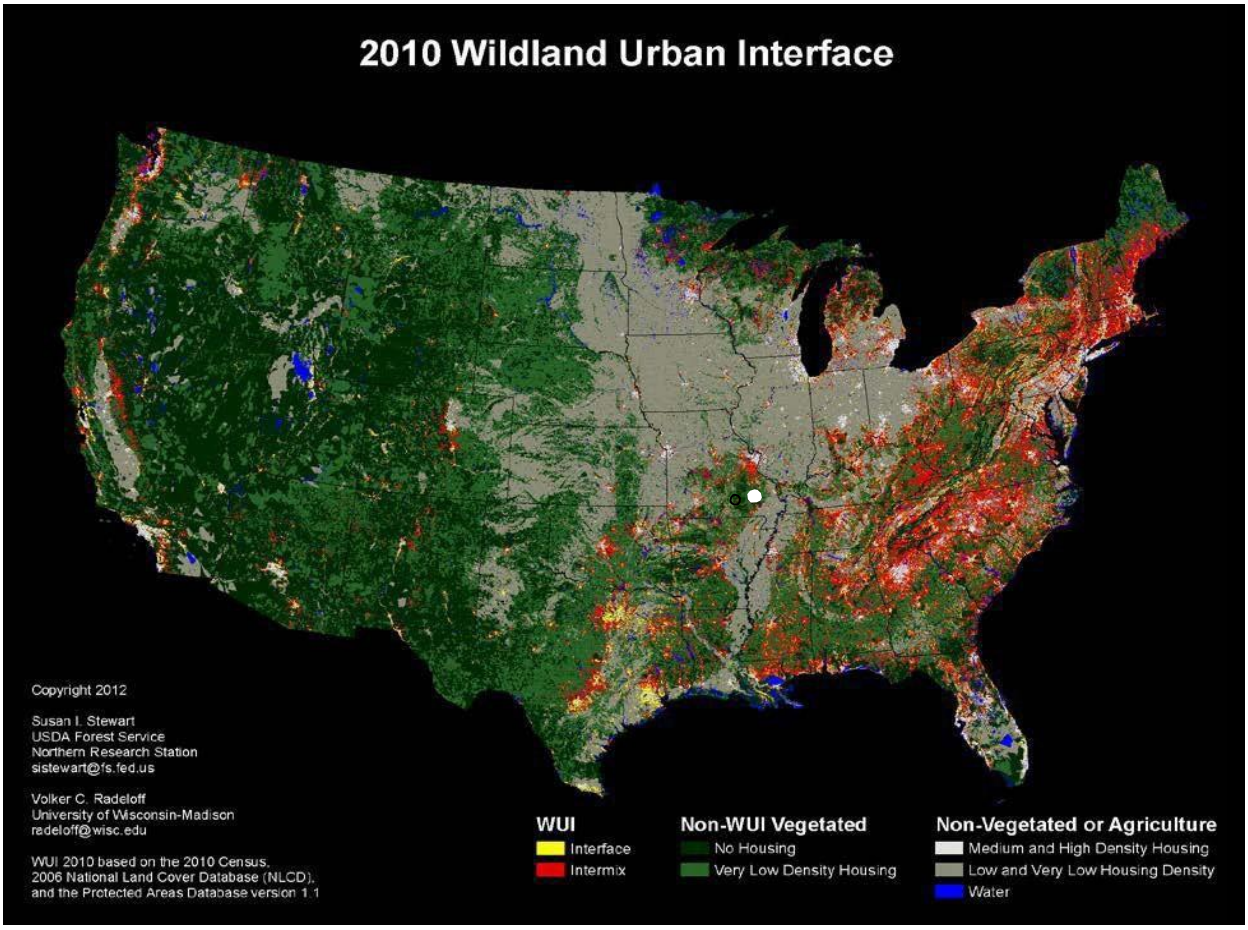
Geographic Location

Damages due to wildfires would be higher in communities with more wildland–urban interface (WUI) areas. The term refers to the zone of transition between unoccupied land and human development and needs to be defined in the plan. Within the WUI, there are two specific areas identified: 1) Interface and 2) Intermix. The interface areas are those areas that abut wildland vegetation and the Intermix areas are those areas that intermingle with wildland areas.

The maps below show the Wildland Urban Interface for the United States and planning area. The

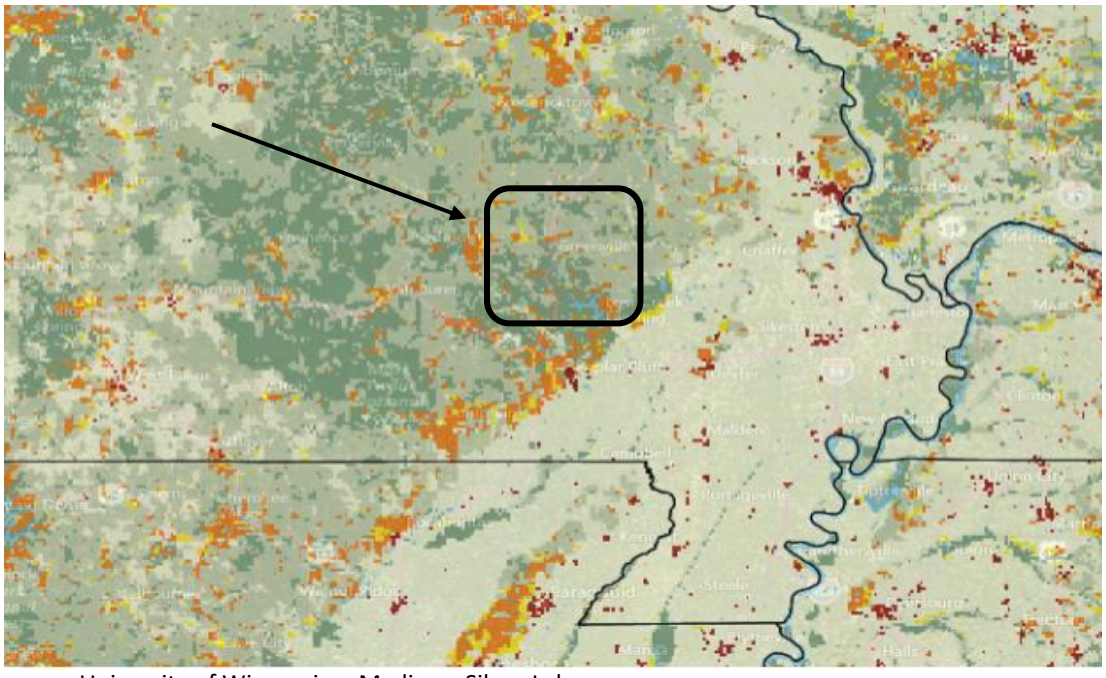
white dot in **Figure 3.8** indicates Wayne County, which has low housing density/ no housing. **Figure 3.9** shows an enhancement of Southeast Missouri, better depicting the planning area. "Intermix" areas are those in which housing and vegetation intermingle; "interface" areas are those where housing is in the vicinity of contiguous wildland vegetation The areas of interface (indicated by the colors yellow & orage) exist near the county's population clusters of Greenville, Williamsville, Mill Spring, Piedmont, and Wappapello. No planning area portions fall into the "Intermix (red) shading of the map.

Figure 3.8 2010 Wildland Urban Interface (WUI) Map - Continental U.S.



Source: University of Wisconsin – Madison, Silvus Lab

Figure 3.9 Wildland Urban Interface (WUI) Map – Southeast Missouri



Source: University of Wisconsin – Madison, Silvus Lab

Severity/Magnitude/Extent

Wildfires damage the environment, killing some plants and occasionally animals. Firefighters have been injured or killed, and structures can be damaged or destroyed. The loss of plants can heighten the risk of soil erosion and landslides. Although Missouri wildfires are not the size and intensity of those in the Western United States, they could impact recreation and tourism in and near the fires. Wildland fires in Missouri have been mostly a result of human activity rather than lightning or some other natural event. Wildfires in Missouri are usually surface fires, burning the dead leaves on the ground or dried grasses. They do sometimes "torch" or "crown" out in certain dense evergreen stands like eastern red cedar and shortleaf pine. However, Missouri does not have the extensive stands of evergreens found in the western US that fuel the large fire storms seen on television news stories.

While very unusual, crown fires can and do occur in Missouri native hardwood forests during prolonged periods of drought combined with extreme heat, low relative humidity, and high wind. Tornadoes, high winds, wet snow and ice storms in recent years have placed a large amount of woody material on the forest floor that causes wildfires to burn hotter and longer. These conditions also make it more difficult for fire fighters suppress fires safely.

Often wildfires in Missouri go unnoticed by the general public because the sensational fire behavior that captures the attention of television viewers is rare in the state. Yet, from the standpoint of destroying homes and other property, Missouri wildfires can be quite destructive.

Previous Occurrences

According to the Missouri Department of Conservation Wildfire Data Search, there have 272 reported fires in Wayne County from July 1, 2002 through July 31, 2016. A search was performed for a 20 year time period; however, the query results only covered a fourteen year time span. According to the Missouri Department of Conservation, 573 acres burned in Wayne County as a result of 42 wildfires during the year 2010.

Probability of Future Occurrence

To calculate the probability of future occurrences of wildland fires: (272 number of reported wildland fires in 14 years equals 20 probability in any given year). Therefore, it can be predicted that approximately 20 fires occur each year within Wayne County. From interviews with local fire fighters and the county emergency management director this probability seems to be accurate from past experiences, articles, or other sources.

Vulnerability

Vulnerability Overview

A large portion of Wayne County is either farmland or National or State Forest. Nearly 65% of the southeastern portion of the county is pasture and farmland, while the northeastern corner of the county consists almost entirely of forests. These circumstances render the county somewhat susceptible to wildfires, especially during periods of prolonged dryness. As presented in the data above, it is certain that a wildland fire will occur, with an historical average of 20 per year. However, most of these fires are small in size, with the average fire burning 5 acres. In reviewing the data from the reported fires, available in the Missouri State Hazard Mitigation Plan beginning on page 3.383, it can be seen that many of the fires are less than an acre with only a limited number of fires annually being several acres.

The greatest areas of vulnerability are in areas of Wildland/Urban Interfaces (WUI). These areas are defined as zones of transition between unoccupied land and human development. Communities that are within 0.5 miles of the zone may also be included. These lands and communities adjacent to and surrounded by wildlands are at risk of wildfires.

Potential Losses to Existing Development

Although dollar values are not assigned to prior losses, it can be determined that over the 14 years of data available from the Missouri Department of Conservation, there have been damages to four residences and five outbuildings. The departmnet also reports that six residences and three outbuildings have been destroyed by this hazard.

Impact of Future Development

Future development is not anticipated to increase the potential impact of wildland fires in Wayne County.

Hazard Summary by Jurisdiction

All of the communities within Wayne County are in WUI areas, and, consequently, hold a slightly greater risk of wildland fires. Absent demographic factors or other variations in housing construction, risk of structural fire probably does not vary greatly within communities across the planning area.

Problem Statement

With the rural nature of Wayne County and the large areas of farmland and forest wildland fires are inevitable. The greatest risk to property damages occur in the Wildland/Urban Interface areas where residential areas intersect with the wildland areas. Based upon historical data, residences and outbuildings, though limited in number, have been damaged and destroyed by wildland fires.

In reviewing the risk of wildland fires and the historical data related to wildland fires, the Mitigation Planning Committee continued with the action to develop fire safety awareness for all types of fires.

3.4.6 Flooding (Flash and River)

Profile

Hazard Description

A flood is partial or complete inundation of normally dry land areas. Riverine flooding is defined as the overflow of rivers, streams, drains, and lakes due to excessive rainfall, rapid snowmelt, or ice. There are several types of riverine floods, including headwater, backwater, interior drainage, and flash flooding. Riverine flooding is defined as the overflow of rivers, streams, drains, and lakes due to excessive rainfall, rapid snowmelt or ice melt. The areas adjacent to rivers and stream banks that carry excess floodwater during rapid runoff are called floodplains. A floodplain is defined as the lowland and relatively flat area adjoining a river or stream. The terms “base flood” and “100- year flood” refer to the area in the floodplain that is subject to a one percent or greater chance of flooding in any given year. Floodplains are part of a larger entity called a basin, which is defined as all the land drained by a river and its branches.

Flooding caused by dam and levee failure is discussed in Section 3.4.1 and will not be addressed in this section.

A flash flood occurs when water levels rise at an extremely fast rate as a result of intense rainfall over a brief period, sometimes combined with rapid snowmelt, ice jam release, frozen ground, saturated soil, or impermeable surfaces. Flash flooding can happen in Special Flood Hazard Areas (SFHAs) as delineated by the National Flood Insurance Program (NFIP), and can also happen in areas not associated with floodplains.

Ice jam flooding is a form of flash flooding that occurs when ice breaks up in moving waterways, and then stacks on itself where channels narrow. This creates a natural dam, often causing flooding within minutes of the dam formation.

In some cases, flooding may not be directly attributable to a river, stream, or lake overflowing its banks. Rather, it may simply be the combination of excessive rainfall or snowmelt, saturated ground, and inadequate drainage. With no place to go, the water will find the lowest elevations – areas that are often not in a floodplain. This type of flooding, often referred to as sheet flooding, is becoming increasingly prevalent as development outstrips the ability of the drainage infrastructure to properly carry and disburse the water flow.

Most flash flooding is caused by slow-moving thunderstorms or thunderstorms repeatedly moving over the same area. Flash flooding is a dangerous form of flooding which can reach full peak in only a few minutes. Rapid onset allows little or no time for protective measures. Flash flood waters move at very fast speeds and can move boulders, tear out trees, scour channels, destroy buildings, and obliterate bridges. Flash flooding can result in higher loss of life, both human and animal, than slower developing river and stream flooding.

In certain areas, aging storm sewer systems are not designed to carry the capacity currently needed to handle the increased storm runoff. Typically, the result is water backing into basements, which damages mechanical systems and can create serious public health and safety concerns. This combined with rainfall trends and rainfall extremes all demonstrate the high probability, yet generally unpredictable nature of flash flooding in the planning area.

Although flash floods are somewhat unpredictable, there are factors that can point to the likelihood of flash floods occurring. Weather surveillance radar is being used to improve monitoring capabilities of intense rainfall. This, along with knowledge of the watershed characteristics, modeling techniques, monitoring, and advanced warning systems has increased the warning time for flash floods.

Geographic Location

Riverine flooding is most likely to occur in SFHAs. Historically there are three sources of common flooding within Wayne County; Mckenzie Creek near Piedmont, Black River, and St. Francis River. Area surrounding Wappapello Lake is also a common place to experience flooding. The riverine flooding history below was gathered from the National Climatic Data Center (NCDC), for a twenty-year period of January 1, 1997 to October 1, 2017. Table 3.19 shows Wayne County flood event history.

Table 3.19 Wayne County NCDC Flood Events by Location, 1995-2017

Location	# of Events
Unincorporated Wayne County	59
-Unincorporated Wayne County (unspecified)- 20 flood events	
-Unincorporated Wayne County (Patterson)- 5 flood events	
-Unincorporated Wayne County (Silva)-27 flood events	
-Unincorporated Wayne County (Leeper)-1 flood events	
-Unincorporated Wayne County (Lodi)-1 flood events	
-Unincorporated Wayne County (Wappapello)-2 flood events	
-Unincorporated Wayne County (Hiram)-1 Flood Event	
-Unincorporated Wayne County (Taskee Station)-1 Flood Event	
-Unincorportaed Wayne County (Shook)-1 Flood Event	
City of Greenville	4
City of Williamsville	1
City of Piedmont	4

Source: National Climatic Data Center

Flash flooding occurs in SFHAs and those locations in the planning area that are low-lying. They also occur in areas without adequate drainage to carry away the amount of water that falls during intense rainfall events. Inside city limits are more streets and impervious areas that often lead to causing of flash flooding. Areas such as streets, sidewalks, parking lots, and driveways prevent rain water from being absorbed by the ground and create runoff water that can lead to flash flooding, especially in low lying areas of the city. In reviewing incidents reported by the NCDC database for the time period January 1, 1997-October 1, 2017 there were 30 flash flood events in Wayne County. **Table 3.20 provides** the number of flash flood events by location recorded in NCDC for the 20- year period.

Table 3.20 Wayne County NCDC Flash Flood Events by Location, 1997-2017

Location	# of Events
Unincorporated Wayne County	21
-Unincorporated County (unspecified)- 12 flood events	
-Unincorporated County (Patterson)-4 flood events	
-Unincorporated County (Wappapello)-3 flood events	
-Unincorporated County (Cascade)- 1 flood events	
-Unincorporated County (Village of Mill Spring)- 1 flood events	
City of Greenville	5
City of Piedmont	2
City of Williamsville	2

Source: National Climatic Data Center

Severity/Magnitude/Extent

Missouri has a long and active history of flooding over the past century, according to the 2010 State Hazard Mitigation Plan. Flooding along Missouri's major rivers generally results in slow-moving disasters. River crest levels are forecast several days in advance, allowing community's downstream sufficient time to take protective measures, such as sandbagging and evacuations. Nevertheless, floods exact a heavy toll in terms of human suffering and losses to public and private property. By contrast, flash flood events in recent years have caused a higher number of deaths and major property damage in many areas of Missouri.

Flooding presents a danger to life and property, often resulting in injuries, and in some cases, fatalities. Floodwaters themselves can interact with hazardous materials. Hazardous materials stored in large containers could break loose or puncture as a result of flood activity. Examples are bulk propane tanks. When this happens, evacuation of citizens is necessary.

Public health concerns may result from flooding, requiring disease and injury surveillance. Community sanitation to evaluate flood-affected food supplies may also be necessary. Private water and sewage sanitation could be impacted, and vector control (for mosquitoes and other entomology concerns) may be necessary.

When roads and bridges are inundated by water, damage can occur as the water scours materials around bridge abutments and gravel roads. Floodwaters can also cause erosion undermining road beds. In some instances, steep slopes that are saturated with water may cause mud or rock slides onto roadways. These damages can cause costly repairs for state, county, and city road and bridge maintenance departments. When sewer back-up occurs, this can result in costly clean-up for home and business owners as well as present a health hazard.

National Flood Insurance Program (NFIP) Participation

Table 3.21 provides details on NFIP participation for the communities in the planning area. **Table 2.2**) shows the number of policies in force, amount of insurance in force, number of closed losses, and total payments for each jurisdiction, where applicable. The second table provides data as of July 31, 2017.

Table 3.21 NFIP Participation in Wayne County

Community ID #	Community Name	NFIP Participant (Y/N)	Current Effective Map Date	Regular-Emergency Program Entry Date
290450	City of Greenville	Y	6/16/11	8/1/86
290499	Village of Mill Spring	Y	6/16/11	8/1/86
290451	City of Piedmont	Y	6/16/11	9/30/88
290449	Wayne County	Y	6/16/11	11/21/87
290452	City of Williamsville	Y	6/16/11	8/1/86

Source: NFIP Community Status Book, 9/26/2013; BureauNet, http://www.fema.gov/national-flood-insurance-program/national-flood-insurance-program-community-status-book; M= No elevation determined – all Zone A, C, and X: NSFHA = No Special Flood Hazard Area; E=Emergency Program

Table 3.22 NFIP Policy and Claim Statistics as of July 31,2017

Community Name	Policies in Force	Closed Losses	Total Payments
City of Greenville	1	1	$27,628.82
Village of Mill Spring	1	1	$5,473.86
City of Piedmont	72	62	$1,382,808.92
Wayne County	57	46	$1,673,521.05

Source: NFIP Community Status Book, [insert date]; BureauNet, http://bsa.nfipstat.fema.gov/reports/reports.html; *Closed Losses are those flood insurance claims that resulted in payment. Loss statistics are for the period from [date] to [date].

The City of Piedmont had the most closed losses with sixty-two total payments for such claims totaling $1,382,808.92.

Repetitive Loss/Severe Repetitive Loss Properties

Repetitive Loss (RL) properties are those insured properties with at least two flood insurance payments of $5,000 or more in a 10-year period. According to the Flood Insurance Administration, jurisdictions included in the planning area have a combined total of twenty-three residential RL properties. As of November 15, 2017, only one residential RL property had been mitigated. A total of $671,059.53 had been paid for both building and contents, with the average payment totaling $246,334.51 in Piedmont and $38,378.48 in the balance of Wayne County.

Table 3.23 lists the RL properties within Wayne County.

Table 3.23 Wayne County Repetitive Loss (RL) Properties

Jurisdiction	# of Properties	Property Type	# Mitigated	Building Payments	Contents Payments	Total Payments	# of Losses
Wayne County	5	3-single family 1-condo 1-other-nonresidential	1 – single family	$286,750.06	$307,552.52	$594,302.58	15
City of Greenville	0	0	0	$0	$0	$0	0
City of Piedmont	4	4-single family	0	$76,756.95	$0	$76,756.95	8
City of Williamsville	0	0	0	$0	$0	$0	0
Village of Mill Spring	0	0	0	$0	$0	$0	0
Total	**9**	**-**	**1**	**$363,507.01**	**$307,552.52**	**$671,059.53**	**23**

Source: Federal Emergency Management Agency, Flood Insurance Administration

Severe Repetitive Loss (SRL): An SRL property is defined it as a single-family property (consisting of one to four residences) that is covered under flood insurance by the NFIP; and has

(1) incurred flood-related damage for which four or more separate claims payments have been paid under flood insurance coverage with the amount of each claim payment exceeding $5,000 and with cumulative amounts of such claim payments exceeding $20,000; or,
(2) for which at least two separate claims payments have been made with the cumulative amount of such claims exceeding the reported value of the property.

Of the repetitive loss properties within Wayne County and its four participating municipalities, there is only one validated non-residential uninsured SRL structure. This structure is located within the City of Piedmont.

Previous Occurrences

Following is a listing of presidential flooding disaster declarations in the past twenty years, Jan-1997 through Aug-2017, which included the planning area and their impact:

- DR-1980-Declared 05/09/2011 for incidents beginning 04/19/2011 and ending 06/06/2011 for severe storms, tornadoes, and flooding.
- DR-1749-Declared 03/19/2008 for incidents beginning 03/17/2008 and ending 05/09/2008 for severe storms and flooding.
- DR-4317-Declared 06/02/2017 for incidents beginning 04/28/2017 and ending 05/11/2017 for severe storms, tornadoes, straight line winds, and flooding.
- DR-1847-Declared 6/19/20119 for incidents that occurred on 05/20/2009 that resulted in flooding, high winds, and tornadoes.
- DR-1748-Declared 3/12/2008 for incidents that occurred on 2/10/2008-2/14/2008 for severe winter storms and flooding.
- DR-1809-Declared 11-13-2008 for severe storms, flooding and a tornado that occurred 9/11/2008-9/24/2008.
- DR-4317-Declared 6/2/2017 for severe storms, straight-line winds, tornado and flooding that occurred on 4/28/2017 – 5/11/2017.

The following tables (**Table 3.24** and **Table 3.25**) provide annual flash flooding and riverine flooding for Wayne County. The data was obtained through the NOAA National Climatic Data Center using the data for events occurring January 1, 1997 - August 31, 2017.

Table 3.24 NCDC Wayne County Flash Flood Events Summary, 1997 to 2017

Year	# of Events	# of Deaths	# of Injuries	Property Damages ($)	Crop Damages ($)
1997	2	0	0	0	0
1998	4	0	0	40,000	0
1999	3	0	0	0	0
2000	2	0	0	0	0
2001	1	0	0	0	0
2002	5	0	0	260,000	0
2003	1	0	0	0	0
2004	1	0	0	5,000	0
2005	2	0	0	500,000	0
2006	1	0	0	0	0
2007	0	0	0	0	0
2008	0	0	0	0	0
2009	1	0	0	0	0
2010	1	0	0	0	0
2011	1	0	0	20,000,000	0
2012	0	0	0	0	0
2013	1	0	0	10,000	0
2014	0	0	0	0	0
2015	0	0	0	0	0
2016	1	0	0	0	0
2017	1	0	0	0	0

Source: NCDC, Date Accessed: 11/17/2017

Table 3.25 NCDC Wayne County Riverine Flood Events Summary, 1997 to 2017

Year	# of Events	# of Deaths	# of Injuries	Property Damages ($)	Crop Damages ($)
1997	1	0	0	0	0
1998	2	0	0	0	0
1999	4	0	0	35,000	0
2000	0	0	0	0	0
2001	4	0	0	0	0
2002	4	0	0	10,000	0
2003	1	0	0	0	0
2004	1	0	0	0	0
2005	3	0	0	0	0
2006	2	0	0	0	0
2007	4	0	0	0	0
2008	6	0	0	92,075,000	0
2009	10	0	0	0	0
2010	0	0	0	0	0
2011	4	0	0	203,000	0
2012	0	0	0	0	0
2013	6	0	0	0	0
2014	0	0	0	0	0
2015	7	0	0	7,000	0
2016	5	0	0	0	0
2017	4	0	0	1,400,000	0

Source: NCDC, Date Accessed: 11/17/2017

Probability of Future Occurrence

The historical data presented above demonstrates that there has been 59 flooding events over a 20-year time period. The probability of a flood occurring in any given year is over 100% somewhere in the planning area. The average number of flooding events based on this data is 3.4 per year.

Vulnerability

Vulnerability Overview

The vulnerability overview for Wayne County comes primarily from HAZUS data included in the *2013 Missouri State Hazard Mitigation Plan*. HAZUS uses GIS technology to estimate the impacts of disasters. HAZUS-MH produces a flood polygon and flood depth grid that represents the base flood. Data for Wayne County utilized HAZUS flood data. The 2013 state plan includes Level 2 HAZUS flood analysis for all 114 Missouri counties, this data is coupled with DFIRM depth grids and enhanced building inventory.

DFIRM data is not available for Wayne County, and impact estimates in counties where DFIRM data was integrated typically increases the losses when compared to counties such as Wayne County where only HAZUS-generated flood data was utilized. The damage building counts generated by HAZUS are susceptible to rounding errors and are likely the weakest output of the model due to the use of HAZUS census blocks for analysis.

Potential Losses to Existing Development

In reviewing the *2013 Misouri State Hazard Mtigation Plan*, Table 3.5.1e, provides potential loss estimates at risk to the 100-year flood. The data for Wayne County includes and estimates the following:

- $56,844,490.76 in structural damage
- $61,644,501.85 in contents damage
- $2,882,861.98 in inventory loss
- $121,371,854.59 in total direct loss
- $984,068.56 in total income loss
- Loss ratio for the county: 9.0%
- Displaced households: 2,431
- Population requiring shelter: 1,015

In reviewing available data and discussing with school districts, there are no school district assets located in flood plains, and no prior damage reports from the schools resulting from flooding. In discussion with county personnel and local residents, there has been no damage to any critical facilities in the county that resulted from flooding. Greenville would be the community with the highest risk of loss factors due to the infrastructure present, such as the courthouse.

Of the four participating municipal jurisdictions, only portions of Piedmont and Mill Spring are at slight risk of flooding. The City of Piedmont has implemented numerous mitigation projects (primarily voluntary residential flood buyouts) to lessen the impact of flooding upon its jurisdiction. Piedmont has no populations or critical facilties at risk of flooding. Vulnerability of the Village of Mill Spring is minimal as few structures exist near the flood source—a tributary to the Black River. The village, with less than six residential structures at risk of flooding, has no critical facilites at risk of flooding. The cities of Williamsville and Greenville have no strutures, populations, or critical facilities at risk of a flooding event.

Risk mapping, Assessment, and Planning (RiskMAP) is a new FEMA program that provides communities with flood information and tools they can use to enhance their mitigation plans and better protect citizens. Through more accurate flood maps, risk assessment tools, and outreach RiskMap builds on Map Modernization and strengthens local ability to make informed decisions about reducing risk. There currently is no activity shown via RIskMap in Wayne County.

Impact Future Development

As there is little future development anticipated within Wayne County or any of the jurisdictions within the planning area, the impact of flooding is not anticipated to increase in the county or any of the incorporated citiies.

Hazard Summary by Jurisdiction

Vulnerability to flooding varies greatly across the county. Areas near Lake Wappapello, Clearwater Lake, and along the Black River are the those most prone to flooding. All such areas are located within the balance of the county. As previously mentioned the road leading to Lake Wappapello was washed out during the most recent flood event resulting in a presidential disaster declaration.

The City of Piedmon utilized mitigation grnat funding and local resources to acquire and demolish many residential properties susceptible to flooding. Because of this, the city is no longer at risk of damage from flooding. The Village of Mill Springs is somewhat susceptible to flooding with five city streets (with a total length of less than one mile) and a few residential structues at risk of minimal flooding. Riverine and flash Flooding are not primary concerns within the cities of

Greenville and Williamsville.

Problem Statement

Wayne County is home to two large lakes that have the ability to overtop or flood. The entire county is susceptible to both types of flooding, riverine, and flash flooding. Both types of flooding have caused damage to the county in previous events. Within the jurisdiction of Greenville for example, the historic Greenville Days Park and Campground experience flooding. Within the other communities, retail buildings experience the impacts of flooding. Due to the risk involved in flooding the MPC included actions in this plan to mitigate loss during future events.

FIRMS

The following figures (**Figure 3.10 – Figure 3.14**) are FIRMettes for each incorporated community in Wayne County that includes a Special flood Hazard Area. The complete set of FIRMs for Wayne County can be found at: https://msc.fema.gov/portal/advanceSearch.

Figure 3.10

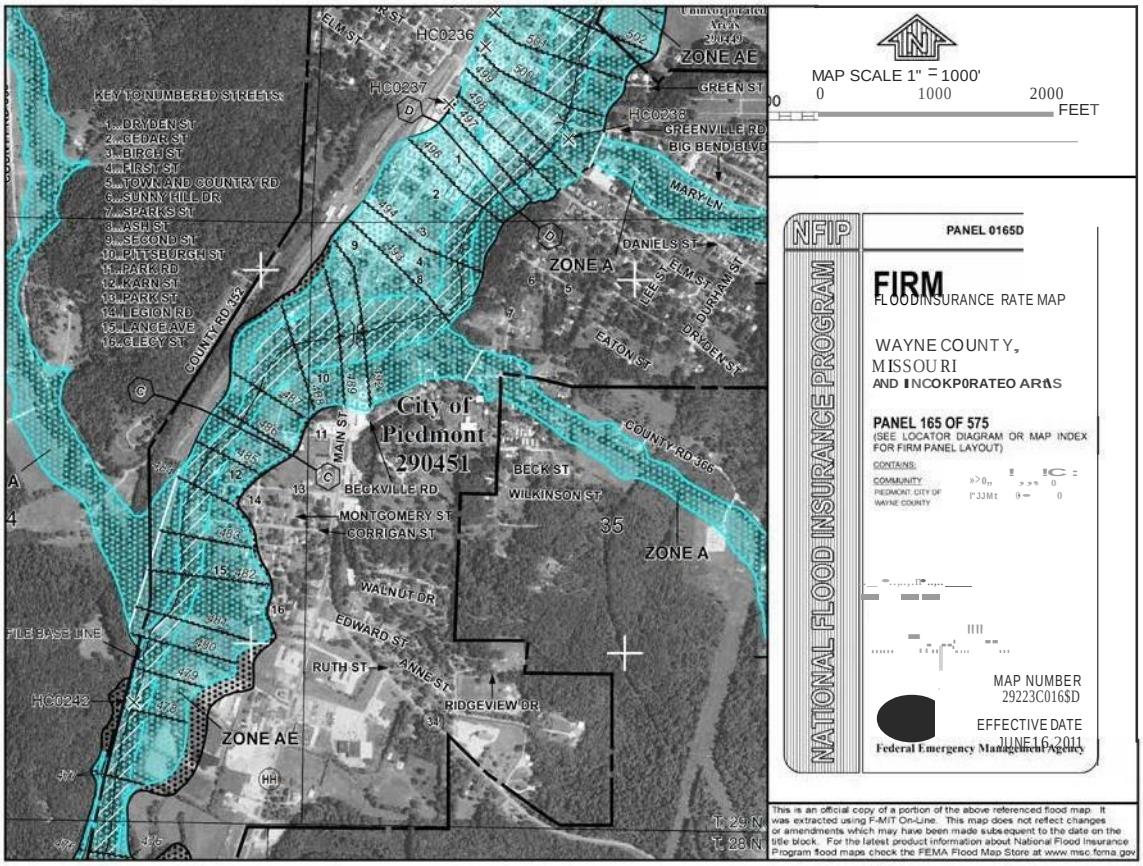


Figure 3.11

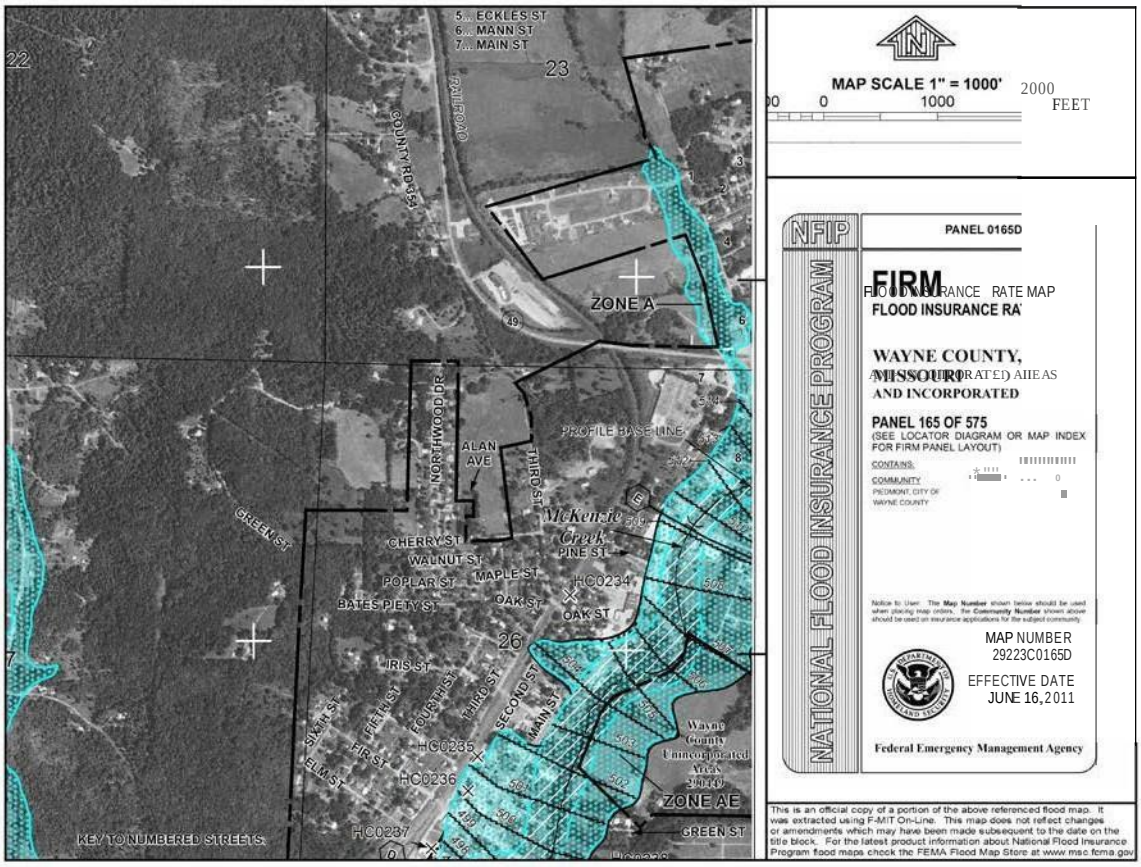

5... ECKLES ST
6... MANN ST
7... MAIN ST
RAILROAD
COUNTY RD 354
ZONE A
NORTHWOOD DR
ALAN AVE
THIRD ST
PROFILE BASE LINE
McKenzie Creek
CHERRY ST
WALNUT ST
PINE ST
POPLAR ST
MAPLE ST
BATES PIETY ST
OAK ST
HC0234
IRIS ST
FOURTH ST
SECOND ST
MAIN ST
SIXTH ST
FIFTH ST
FIR ST
ELM ST
HC0235
HC0236
HC0237
Wayne County Unincorporated Areas 290140
ZONE AE
GREEN ST
KEY TO NUMBERED STREETS
MAP SCALE 1" = 1000'
2000 FEET
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0165D
FIRM
FLOOD INSURANCE RATE MAP
WAYNE COUNTY, MISSOURI
AND INCORPORATED
PANEL 165 OF 575
(SEE LOCATOR DIAGRAM OR MAP INDEX FOR FIRM PANEL LAYOUT)
CONTAINS:
COMMUNITY
PIEDMONT, CITY OF
WAYNE COUNTY
MAP NUMBER
29223C0165D
EFFECTIVE DATE
JUNE 16, 2011
Federal Emergency Management Agency
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

Figure 3.12

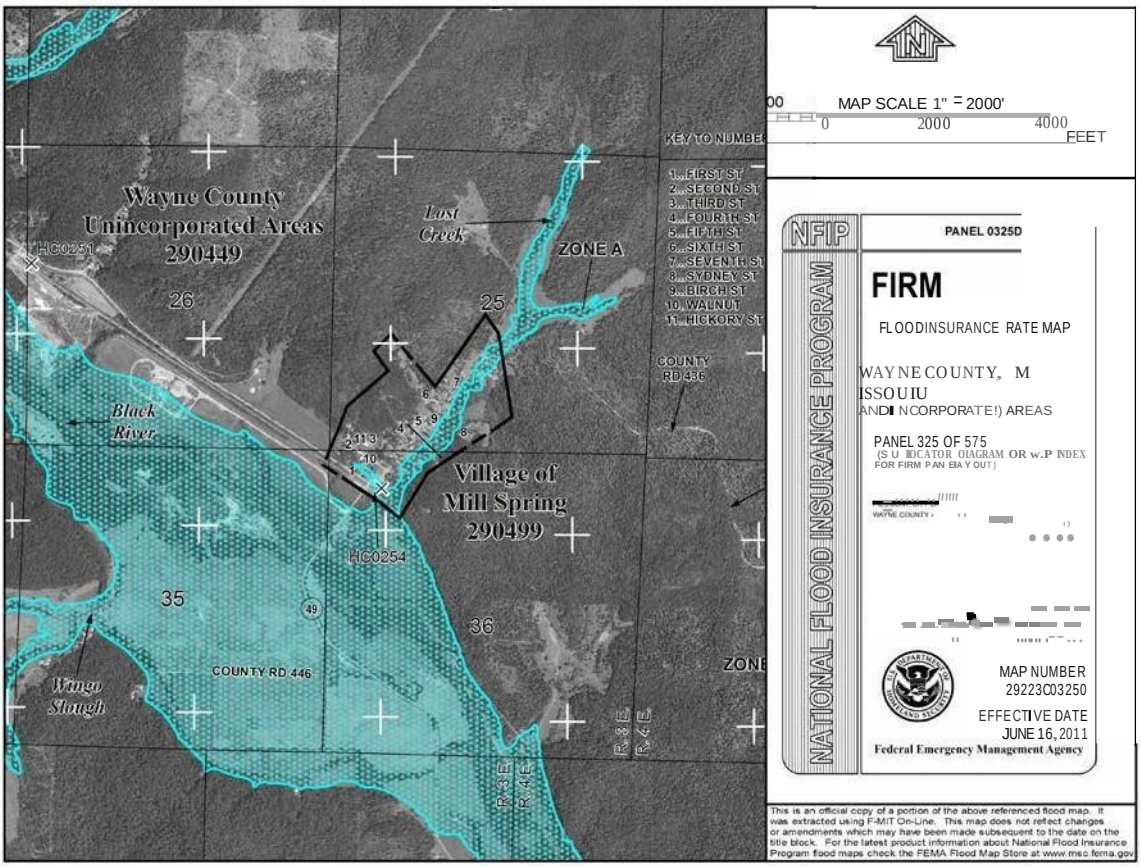

Wayne County
Unincorporated Areas
290449
Lost Creek
ZONE A
HC0251
26
25
Black River
Village of
Mill Spring
290499
HC0254
35
36
COUNTY RD 446
Wingo Slough
COUNTY RD 436
MAP SCALE 1" = 2000'
0
2000
4000
FEET
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0325D
FIRM
FLOOD INSURANCE RATE MAP
WAYNE COUNTY, MISSOURI
(AND INCORPORATE!) AREAS
PANEL 325 OF 575
MAP NUMBER
29223C03250
EFFECTIVE DATE
JUNE 16, 2011
Federal Emergency Management Agency
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

Figure 3.13

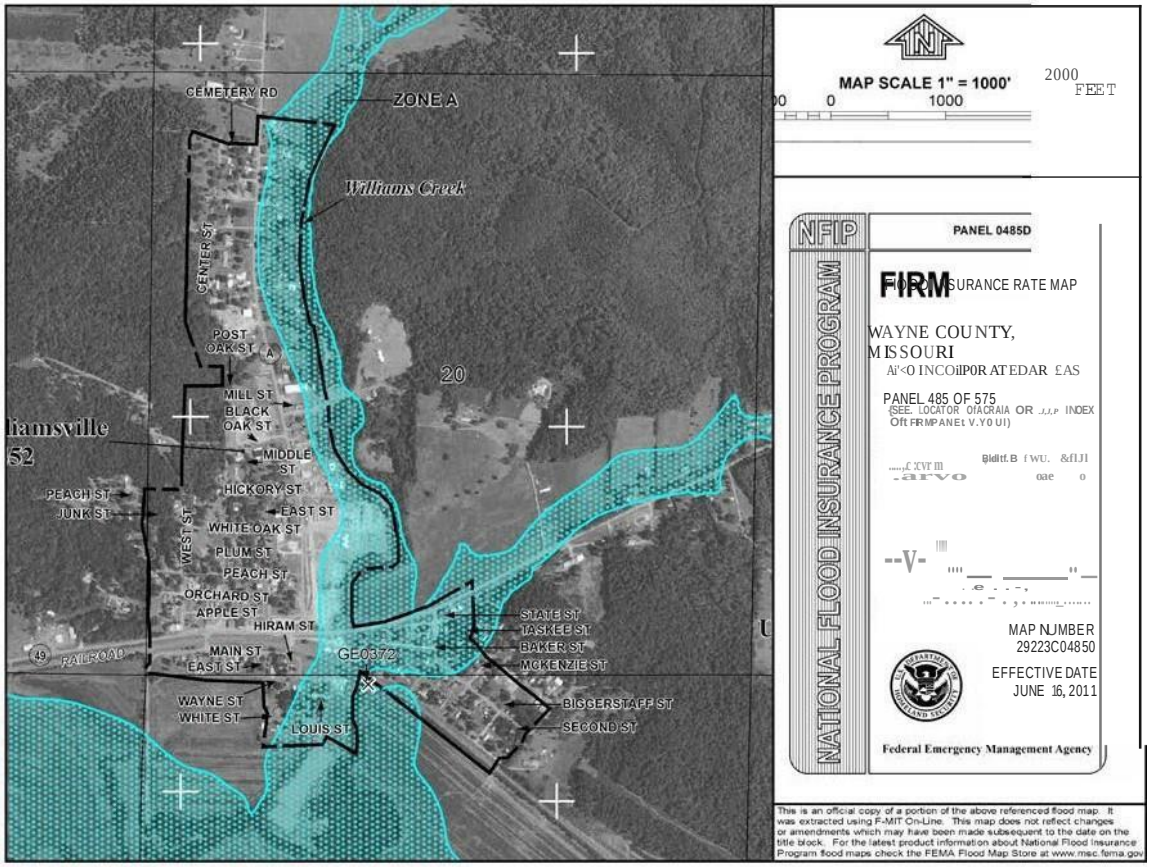

CEMETERY RD
ZONE A
Williams Creek
CENTER ST
POST OAK ST
MILL ST
BLACK OAK ST
MIDDLE ST
HICKORY ST
EAST ST
WHITE OAK ST
PLUM ST
PEACH ST
ORCHARD ST
APPLE ST
HIRAM ST
MAIN ST
EAST ST
WEST ST
PEACH ST
JUNK ST
WAYNE ST
WHITE ST
LOUIS ST
STATE ST
TASKEE ST
BAKER ST
MCKENZIE ST
BIGGERSTAFF ST
SECOND ST
RAILROAD
GE0372
20
MAP SCALE 1" = 1000'
2000 FEET
1000
NFIP
PANEL 0485D
FIRM
WAYNE COUNTY, MISSOURI
PANEL 485 OF 575
MAP NUMBER 29223C0485D
EFFECTIVE DATE JUNE 16, 2011
Federal Emergency Management Agency
NATIONAL FLOOD INSURANCE PROGRAM
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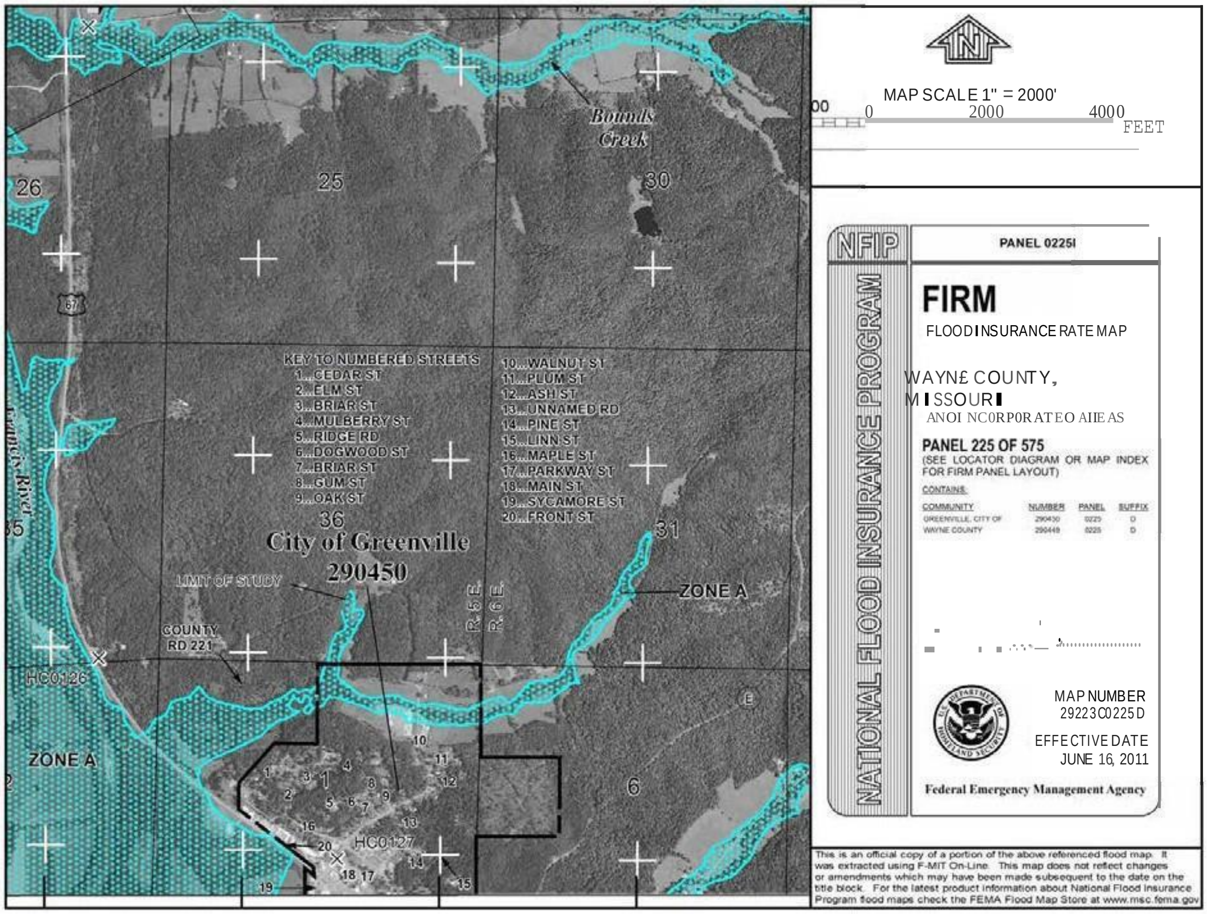
Figure 3.14


MAP SCALE 1" = 2000'
0
2000
4000
FEET
Bounds Creek
26
25
30
KEY TO NUMBERED STREETS
1...CEDAR ST
2...ELM ST
3...BRIAR ST
4...MULBERRY ST
5...RIDGE RD
6...DOGWOOD ST
7...BRIAR ST
8...GUM ST
9...OAK ST
10...WALNUT ST
11...PLUM ST
12...ASH ST
13...UNNAMED RD
14...PINE ST
15...LINN ST
16...MAPLE ST
17...PARKWAY ST
18...MAIN ST
19...SYCAMORE ST
20...FRONT ST
36
31
City of Greenville
290450
LIMIT OF STUDY
ZONE A
COUNTY RD 221
HC0126
ZONE A
HC0127
6
NFIP
NATIONAL FLOOD INSURANCE PROGRAM
PANEL 0225I
FIRM
FLOOD INSURANCE RATE MAP
WAYNE COUNTY, MISSOURI
PANEL 225 OF 575
(SEE LOCATOR DIAGRAM OR MAP INDEX FOR FIRM PANEL LAYOUT)
MAP NUMBER
29223C0225D
EFFECTIVE DATE
JUNE 16, 2011
Federal Emergency Management Agency
This is an official copy of a portion of the above referenced flood map. It was extracted using F-MIT On-Line. This map does not reflect changes or amendments which may have been made subsequent to the date on the title block. For the latest product information about National Flood Insurance Program flood maps check the FEMA Flood Map Store at www.msc.fema.gov

3.4.7 Land Subsidence/Sinkholes

Hazard Profile

Hazard Description

Sinkholes are common where the rock below the land surface is limestone, carbonate rock, salt beds, or rocks that naturally can be dissolved by ground water circulating through them. As the rock dissolves, spaces and caverns develop underground. The sudden collapse of the land surface above them can be dramatic and range in size from broad, regional lowering of the land surface to localized collapse. However, the primary causes of most subsidence are human activities: underground mining of coal, groundwater or petroleum withdrawal, and drainage of organic soils. In addition, sinkholes can develop as a result of subsurface void spaces created over time due to the erosion of subsurface limestone (karst).

Land subsidence occurs slowly and continuously over time, as a general rule. On occasion, it can occur abruptly, as in the sudden formation of sinkholes. Sinkhole formation can be aggravated by flooding.

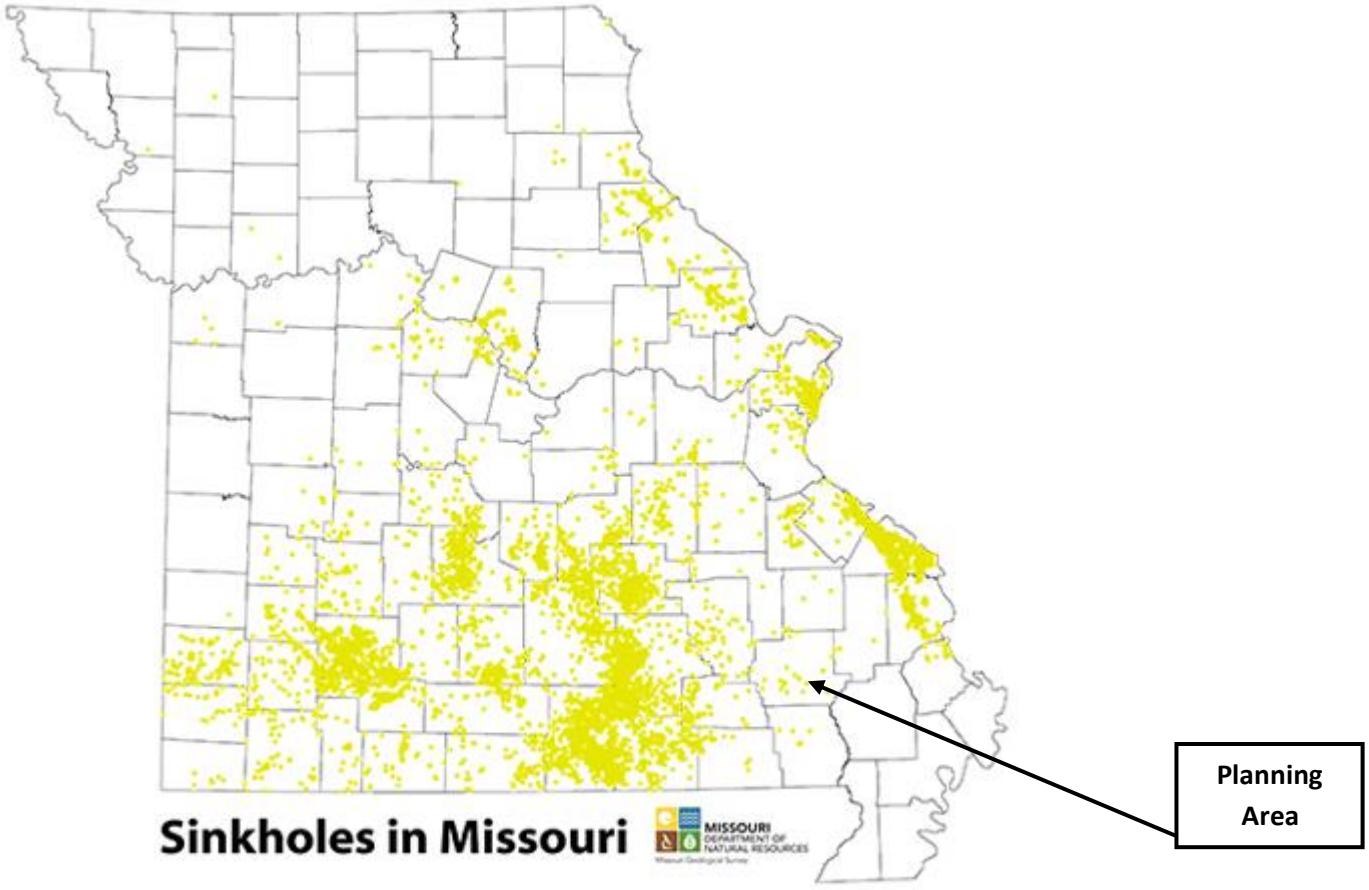
In the case of sinkholes, the rock below the surface is rock that has been dissolving by circulating groundwater. As the rock dissolves, spaces and caverns form, and ultimately the land above the spaces collapse. In Missouri, sinkhole problems are usually a result of surface materials above openings into bedrock caves eroding and collapsing into the cave opening. These collapses are called "cover collapses" and geologic information can be applied to predict the general regions where collapse will occur. Sinkholes range in size from several square yards to hundreds of acres and may be quite shallow or hundreds of feet deep.

According to the U.S. Geological Survey (USGS), the most damage from sinkholes tends to occur in Florida, Texas, Alabama, Missouri, Kentucky, Tennessee, and Pennsylvania. Fifty-nine percent of Missouri is underlain by thick, carbonate rock that makes Missouri vulnerable to sinkholes. Sinkholes occur in Missouri on a fairly frequent basis. Most of Missouri's sinkholes occur naturally in the State's karst regions (areas with soluble bedrock). They are a common geologic hazard in southern
Missouri, but also occur in the central and northeastern parts of the State. Missouri sinkholes have varied from a few feet to hundreds of acres and from less than one to more than 100 feet deep. The largest known sinkhole in Missouri encompasses about 700 acres in western Boone County southeast of where Interstate 70 crosses the Missouri River. Sinkholes can also vary is shape like shallow bowls or saucers whereas other have vertical walls. Some hold water and form natural ponds.

Geographic Location

The map below shoes the location of sinkholes in the planning area. Relative to the remainder of the state (particularly south central Missouri), Wayne County has few sinkholes. For those that have been identified within the county, most are near Williamsville within the southwestern portion of the county.

Figure 3.15 State of Missouri Sinkhole Area Map



Source: Missouri Department of Natural Resources, https://dnr.mo.gov/geology/geosrv/envgeo/sinkholes.htm

Severity/Magnitude/Extent

Sinkholes vary in size and location, and these variances will determine the impact of the hazard. A sinkhole could result in the loss of a personal vehicle, a building collapse, or damage to infrastructure such as roads, water, or sewer lines. Groundwater contamination is also possible f rom a sinkhole. Because of the relationship of sinkholes to groundwater, pollutants captured or dumped in sinkholes could affect a community's groundwater system. Sinkhole collapse could be triggered by large earthquakes. Sinkholes located in floodplains can absorb floodwaters but make detailed flood hazard studies difficult to model.

The *2013 Missouri State Hazard Mitigation Plan* included only seven documented sinkhole "notable events". The plan stated that sinkholes are common to Missouri and the probability is high that they will occur in the future. To date, Missouri sinkholes have historically not had major impacts on development nor have they caused serious damage. Thus, the severity of future events is likely to be low.

Previous Occurrences

According to the 2013 State Plan sinkholes are a regular occurrence in Missouri, but that there are rarely events of any significance. There have been no damage reports resulting from sinkholes in Wayne County and few from around the State of Missouri. In the 2013 State Plan on page 3.104 there recent events are described from around the state. The first event occurred in 2012 when a sinkhole caused a road to collapse near the Springfield-Branson National Airport. A water main broke as a result of the collapsed roadway, and the sinkhole likely formed as a result of heavy rains.

Probability of Future Occurrence

The probability of future occurrences of sinkholes is high; however, the severity is likely low. The map above depicts the general location of sinkholes that are known within the State of Missouri. Other sinkholes may be found later that are not currently identified. The MPC felt like a more accurate map of sinkholes in the county could prevent future development near the sites and help mitigate future damages.

Vulnerability

Vulnerability Overview

Sinkholes are a common feature in Missouri, however in Wayne County there are only eighteen documented sinkholes. There have been no reports of damages resulting from these sinkholes. Many of these sinkholes in Wayne County have occurred in areas of very low population density.

Potential Losses to Existing Development

All known sinkholes are in remote and very rural areas of the county, there have been no reported sinkholes near populations or developments. Therefore, the potential loss to existing development is very low and not expected.

Impact Future Development

All known sinkholes are in remote and very rural areas that are at risk of sinkhole formation are in extremely rural areas that are not anticipated for any type of future development. Therefore, there is not expected to be any impacts on future development from sinkholes.

Hazard Summary by Jurisdiction

No reported sinkholes are in the vicinity of critical facilities or school district assets. Documented sinkholes are located in the rural area of the county, with a slight concentration in the southwestern portion of the county near Williamsville.

Problem Statement

The risk for damages due to sinkholes is limited and unlikely. However, the MPC felt that having more accurate mapping of existing sinkholes could help militate against future damages if the county and city officials were more aware of the locations.

3.4.8 Thunderstorm/High Winds/Lightning/Hail

Hazard Profile

Hazard Description

Thunderstorms

A thunderstorm is defined as a storm that contains lightning and thunder which is caused by unstable atmospheric conditions. When cold upper air sinks and warm moist air rises, storm clouds or 'thunderheads' develop resulting in thunderstorms. This can occur singularly, as well as in clusters or lines. The National Weather Service defines a thunderstorm as "severe" if it includes hail that is one inch or more, or wind gusts that are at 58 miles per hour or higher. At any given moment across the world, there are about 1,800 thunderstorms occurring. Severe thunderstorms most often occur in Missouri in the spring and summer, during the afternoon and evenings, but can occur at any time. Other hazards associated with thunderstorms are heavy rains resulting in flooding (discussed separately in **Section 3.4.6**) and tornadoes (discussed separately in **Section 3.4.9**).

High Winds

A severe thunderstorm can produce winds causing as much damage as a weak tornado. The damaging winds of thunderstorms include downbursts, microbursts, and straight-line winds. Downbursts are localized currents of air blasting down from a thunderstorm, which induce an outward burst of damaging wind on or near the ground. Microbursts are minimized downbursts covering an area of less than 2.5 miles across. They include a strong wind shear (a rapid change in the direction of wind over a short distance) near the surface. Microbursts may or may not include precipitation and can produce winds at speeds of more than 150 miles per hour. Damaging straight-line winds are high winds across a wide area that can reach speeds of 140 miles per hour.

Lightning

All thunderstorms produce lightning which can strike outside of the area where it is raining and is has been known to fall more than 10 miles away from the rainfall area. Thunder is simply the sound that lightning makes. Lightning is a huge discharge of electricity that shoots through the air causing vibrations and creating the sound of thunder.

Hail

According to the National Oceanic and Atmospheric Administration (NOAA), hail is precipitation that is formed when thunderstorm updrafts carry raindrops upward into extremely cold atmosphere causing them to freeze. The raindrops form into small frozen droplets. They continue to grow as they come into contact with super-cooled water which will freeze on contact with the frozen rain droplet. This frozen droplet can continue to grow and form hail. As long as the updraft forces can support or suspend the weight of the hailstone, hail can continue to grow before it hits the earth.

At the time when the updraft can no longer support the hailstone, it will fall down to the earth. For example, a ¼" diameter or pea sized hail requires updrafts of 24 miles per hour, while a 2 ¾" diameter or baseball sized hail requires an updraft of 81 miles per hour. According to the NOAA, the largest hailstone in diameter recorded in the United States was found in Vivian, South Dakota on July 23, 2010. It was eight inches in diameter, almost the size of a soccer ball.

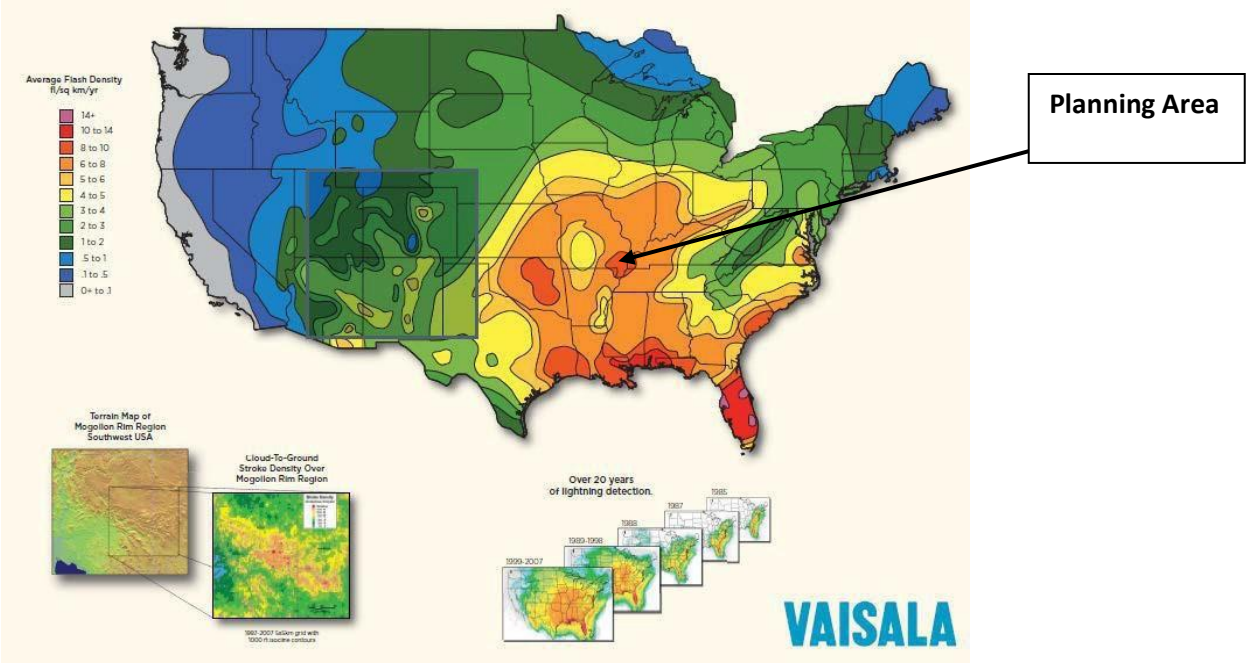
Soccer-ball-sized hail is the exception, but even small pea-sized hail can do damage.

Geographic Location

Thunderstorms/ high winds/hail/lightning events are an area-wide hazard that can happen anywhere in the county. Although these events occur similarly throughout the planning area, they are more frequently reported in more urbanized areas. In addition, damages are more likely to occur in more densely developed urban areas.

The map below (**Figure 3.16**) shows lightning frequency in the country. From viewing the map and legend, it can be determined that the average flash density for Wayne County is 9-10 ft. /sq. km/yr. This indicates the number of lightning flashes to the ground per kilometer squared per year.

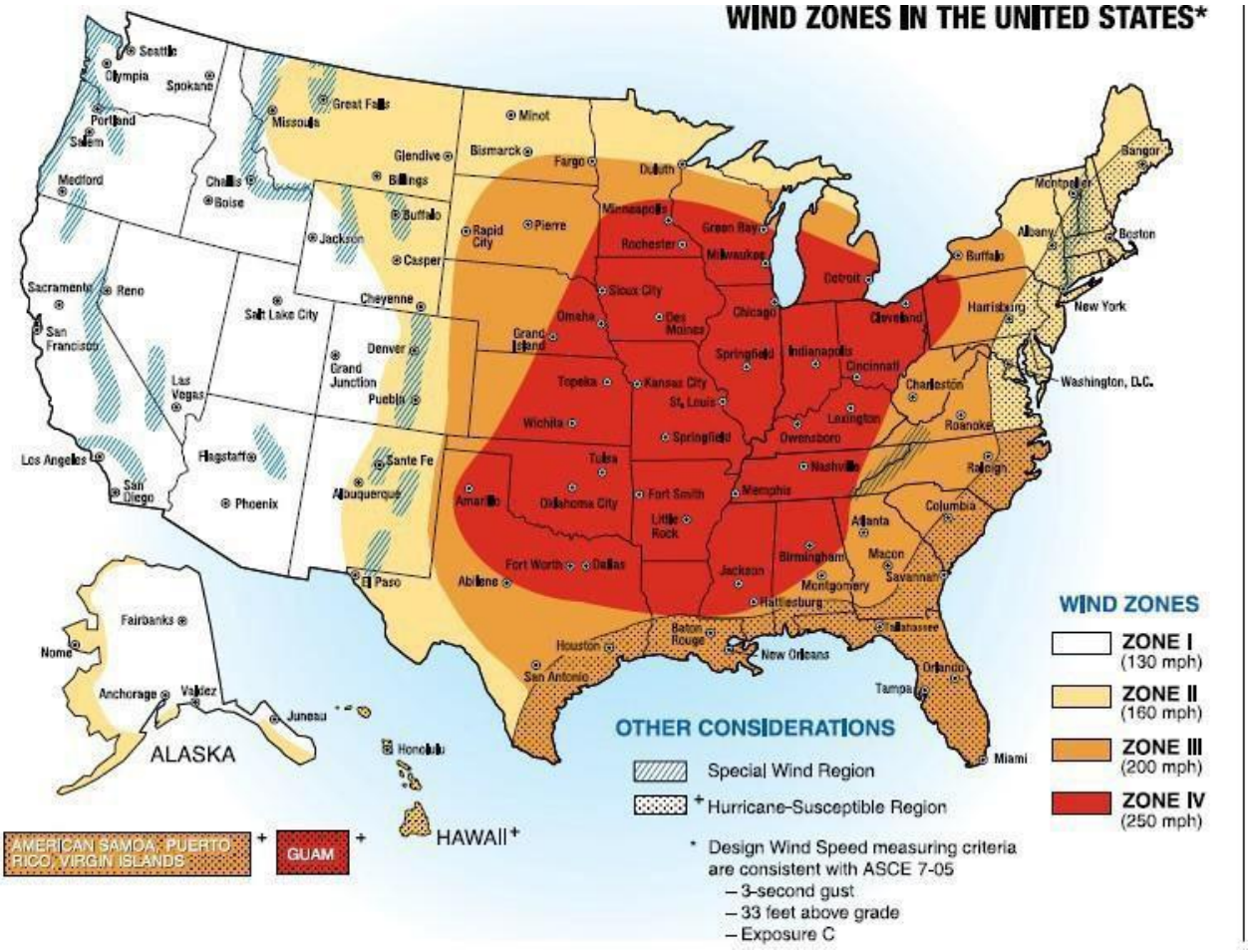
Figure 3.16 Location and Frequency of Lightning in Missouri



Source: National Weather Service, http://www.lightningsafety.noaa.gov/stats/08_Vaisala_NLDN_Poster.pdf

The map below **(Figure 3.17)** depicts wind zones in the United States. Wayne County is located within Zone IV.

Figure 3.17 Wind Zones in the United States



Source: FEMA 320, Taking Shelter from the Storm, 3rd edition,http://www.weather.gov/media/bis/FEMA_SafeRoom.pdf

Severity/Magnitude/Extent

Severe thunderstorm losses are usually attributed to the associated hazards of hail, downburst winds, lightning and heavy rains. Losses due to hail and high wind are typically insured losses that are localized and do not result in presidential disaster declarations. However, in some cases, impacts are severe and widespread and assistance outside state capabilities is necessary. Hail and wind also can have devastating impacts on crops. Severe thunderstorms/heavy rains that lead to flooding are discussed in the flooding hazard profile. Hailstorms cause damage to property, crops, and the environment, and can injure and even kill livestock. In the United States, hail causes more than $1 billion in damage to property and crops each year. Even relatively small hail can shred plants to ribbons in a matter of minutes. Vehicles, roofs of buildings and homes, and landscaping are also commonly damaged by hail. Hail has been known to cause injury to humans, occasionally fatal injury.

In general, assets in the County vulnerable to thunderstorms with lightning, high winds, and hail include people, crops, vehicles, and built structures. Although this hazard results in high annual losses, private property insurance and crop insurance usually cover the majority of losses. Considering insurance coverage as a recovery capability, the overall impact on jurisdictions is reduced.

Most lightning damages occur to electronic equipment located inside buildings. But structural damage can also occur when a lightning strike causes a building fire. In addition, lightning strikes can cause damages to crops if fields or forested lands are set on fire. Communications equipment and warning transmitters and receivers can also be disabled by lightning strikes.

Based on information provided by the Tornado and Storm Research Organization (TORRO), **Table 3.26** below describes typical damage impacts of the various sizes of hail.

Table 3.26 Tornado and Storm Research Organization Hailstorm Intensity Scale

Intensity Category	Diameter (mm)	Diameter (inches)	Size Description	Typical Damage Impacts
Hard Hail	5-9	0.2-0.4	Pea	No damage
Potentially Damaging	10-15	0.4-0.6	Mothball	Slight general damage to plants, crops
Significant	16-20	0.6-0.8	Marble, grape	Significant damage to fruit, crops, vegetation
Severe	21-30	0.8-1.2	Walnut	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
Severe	31-40	1.2-1.6	Pigeon's egg > squash ball	Widespread glass damage, vehicle bodywork damage
Destructive	41-50	1.6-2.0	Golf ball > Pullet's egg	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
Destructive	51-60	2.0-2.4	Hen's egg	Bodywork of grounded aircraft dented, brick walls pitted
Destructive	61-75	2.4-3.0	Tennis ball > cricket ball	Severe roof damage, risk of serious injuries
Destructive	76-90	3.0-3.5	Large orange > Soft ball	Severe damage to aircraft bodywork
Super Hailstorms	91-100	3.6-3.9	Grapefruit	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open
Super Hailstorms	>100	4.0+	Melon	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open

Source: Tornado and Storm Research Organization (TORRO), Department of Geography, Oxford Brookes University

Straight-line winds are defined as any thunderstorm wind that is not associated with rotation (i.e., is not a tornado). It is these winds, which can exceed 100 miles per hour, which represent the most common type of severe weather. They are responsible for most wind damage related to thunderstorms. Since thunderstorms do not have narrow tracks like tornadoes, the associated wind damage can be extensive and affect entire (and multiple) counties. Objects like trees, barns, outbuildings, high-profile vehicles, and power lines/poles can be toppled or destroyed, and roofs, windows, and homes can be damaged as wind speeds increase.

The tables below (**Tables 3.27** through **Table 3.30**) summarize past crop damages as indicated by crop insurance claims. The tables, if populated, would illustrate the magnitude of the impact on the planning area's agricultural economy. As shown in the tables below, within the reported five years of data, no crop loss claims were reported in Wayne County due to high winds, thunderstorms, lightning, or hail.

Table 3.27 Crop Insurance Claims Paid in Wayne County from Thunderstorms, January 2011 - December 2015.

Crop Year	Crop Name	Cause of Loss Description	Insurance Paid
2011			0
2012			0
2013			0
2014			0
2015			0
Total			0

Source: USDA Risk Management Agency, Insurance Claims, http://www.rma.usda.gov/data/cause.htm

Table 3.28 Crop Insurance Claims Paid in Wayne County from High Winds, January 2011 - December 2015

Crop Year	Crop Name	Cause of Loss Description	Insurance Paid
2011			0
2012			0
2013			0
2014			0
2015			0
Total			0

Source: USDA Risk Management Agency, Insurance Claims, http://www.rma.usda.gov/data/cause.htm

Table 3.29 Crop Insurance Claims Paid in Wayne County from Lightning, January 2011 - December 2015.

Crop Year	Crop Name	Cause of Loss Description	Insurance Paid
2011			0
2012			0
2013			0
2014			0
2015			0
Total			0

USDA Risk Management Agency, Insurance Claims, http://www.rma.usda.gov/data/cause.htm

Table 3.30 Crop Insurance Claims Paid in Wayne County from Hail, January 2011-December 2015

Crop Year	Crop Name	Cause of Loss Description	Insurance Paid
2011			0
2012			0
2013			0
2014			0
2015			0
Total			0

USDA Risk Management Agency, Insurance Claims, http://www.rma.usda.gov/data/cause.htm

The onset of thunderstorms with lightning, high wind, and hail is generally rapid. Duration is less than six hours and warning time is generally six to twelve hours. Nationwide, lightning kills 75 to 100 people each year. Lightning strikes can also start structural and wildland fires, as well as damage electrical systems and equipment.

Previous Occurrences

Table 3.31and **Table 3.32** provide previous high wind and hail events for January 1, 2006 thorugh December 31,2016 based on data from the NCDC. The high wind events include all wind events with wind speeds reported above 50 knots during this time period. Hail events listed below include incidences in whcih hail of 1" or greater was reported. Lighting events occurring within Wayne County are listed within **Table 3.33**. Only one lighting event was recorded from January 1, 2006 thorugh December 31, 2016. It should be noted that "NCDC reported lightning events are limited in that only lightning events resulting in fatality, injury and/or property and crop damage are recorded by the NDDC."

Table 3.31 High Winds, Greater than 50 Knots - Jan 1, 2006 - December 31, 2016

Date	Location	Knots	Property Damage
1/29/2008	Unincorporated Wayne County	52	$6,000
9/14/2008	Unincorporated Wayne County	56	$3.00M

Source: *National Climatic Data Center*

Table 3.32 Hail Events, Diameter 1" or greater - Jan 1, 2006 - December 31, 2016

Date	Size	Property Damage	Location
2/16/2006	1.75	0	Patterson
3/12/2006	1.75	0	Piedmont
3/13/2006	3	$10,000	Piedmont
4/30/2006	1	0	Wappapello
2/20/2007	1	0	Wappapello
2/20/2007	1.25	0	Wappapello
8/4/2009	1	0	Greenville
4/19/2011	1	0	Piedmont
4/27/2011	1	0	Wappapello
5/25/2011	1	0	Patterson
5/25/2011	1	0	Village of Mill Spring

Source: *National Climatic Data Center*

Table 3.33 Lightning Events - Jan 1, 2006-December 31, 2016

Date	Injury	Property Damage	Location
5/31/2006	1	0	Lowndes

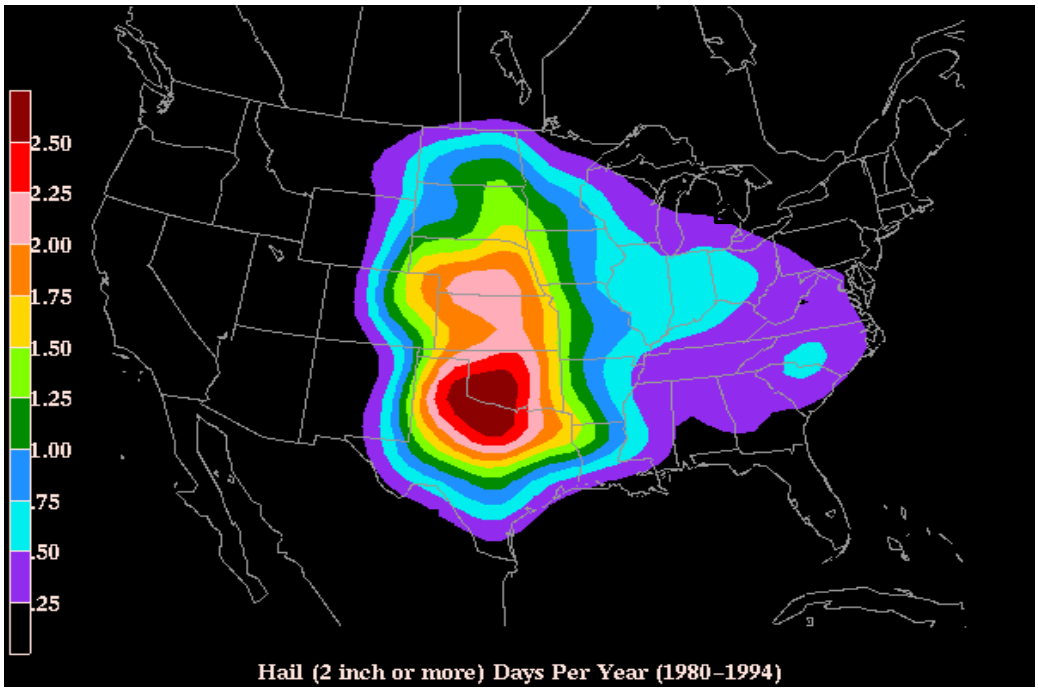
Source: *National Climatic Data Center*

Probability of Future Occurrence

In reviewing the ten-year history presented above, the probability of a high wind event with winds greater than 50 knots is more than 100% in the planning area in any given year. In fact, a review of this data shows that there is an average of one high wind event each year, within any area of the county.

Figure 3.18 is a map showing the annual probability of a hailstorm, that would produce hail with a diameter or two inches or greater. Wayne County falls within the range of .5% -.75% chance per year.

Figure 3.18 Annual Hailstorm Probability (2" diameter or larger), 1980 - 1994



Source: NSSL, http://www.nssl.noaa.gov/users/brooks/public_html/bighail.gif Note:

Vulnerability

Vulnerability Overview

Severe thunderstorms are common in Missouri and Wayne County. These events include winds, hail, and lightning, which are all contributing elements of severe thunderstorms. The MPC has included wind speeds over 50 knots and hail events 1" and larger in diameter. In reviewing the 2013 state plan, data was gathered from several sources including the National Climatic Data Center, USDA Crop Insurance Claims, the US Census, and the calculated Social Vulnerability Index from the Hazards and Vulnerability Research Institute in the Department of Geography at the University of South Carolina.

Table 3.34 below provides the building exposure, crop exposure and social vulnerability index for Wayne County as reported in Table 3.5.6a of the *2013 Missouri State Hazard Mitigation Plan*. These are the common elements for the analysis of wind, hail, and lightning with one exception: the lightning analysis did not consider crop exposure as crop loss is an unlikely result of lightning events.

Table 3.34 Housing & Crop Exposure to Severe Thunderstorms

Housing Units/sq Mile	Total Building Exposure $	Crop Exposure (2007 Census of Ag)	Social Vulnerability Index (-5)
14.5	$554,834,304	$1,389,000	4

Source: *2013 Missouri State Hazard Mitigation Plan*

Table 3.35 below provides additional data obtained to complete the overall vulnerability analysis.

Table 3.35 Data for Vulnerability Analysis

Total Hail Incidents	Total Hail Property Loss ($)	Total Crop Ins. Paid for Hail ($)	Total Wind Incidents	Total Wind Property Loss ($)	Total Crop Ins. Paid for Wind ($)	Total Lightning Incidents	Total Lightning Property Loss ($)
73	$170,000	0	45	$1,026,000	0	2	2

Source: *2013 Missouri State Hazard Mitigation Plan*

From this statistical data collected, five factors were considered in determining overall vulnerability to lightning as follows, housing density, likelihood of occurrence, building exposure, average annual property loss ratio, and social vulnerability. For hail and wind, the two additional factors of crop exposure and average annual crop insurance claims as a result of these hazards were considered.

To complete the vulnerability analysis utilizing the factors described above, a rating value of 1-5 was assigned to the data obtained for each factor. These values correspond to the follow descriptive terms:

1 - Low
2 - Medium-low
3 - Medium
4 - Medium-high
5 - High

Wayne County has a high probability of experiencing an episode of high winds, thunderstorms, hail, or tornadoes within the next five years if not annually. Due to their geographical location and the historical events within the area.

Potential Losses to Existing Development

Based on prior events and the vulnerability assessment, it can be determined that the potential losses to existing development will be, and has been, minimal when compared to the potential exposure.

Future Development

With little future development expected in Wayne County, the exposure and losses associated with thunderstorm events are not expected to change.

Hazard Summary by Jurisdiction

Although thunderstorms/high winds/lightning/hail events are area-wide, places with a large concentration of population are at greater risk for more significant damage. These areas include trailer parks, subdivisions, and assisted living facilities within all of Wayne County and more often located near or within the population centers of Piedmont, Greenville, Mill Spring, and Williamsville.

Problem Statement

Thunderstorms and the associated risks of high winds, lightning, and hail can result in property and crop damage and have the potential to cause injuries or death to residents. These storms are common occurrences within the county; however, due to in large part to the sparse population density of the county, the damages resulting from these events is relatively limited. Some of the recommendations of the MPC were to seek out funding for emergency generators for critical f acilities that are not equipped with generators. Also, to ensure that critical facilities were equipped with some form of lightning protection for assets located at the facility such as communication equipment.

3.4.9 Tornado

Hazard Profile

Hazard Description

The NW S defines a tornado as "a violently rotating column of air extending from a thunderstorm to the ground." It is usually spawned by a thunderstorm and produced when cool air overrides a layer of warm air, forcing the warm air to rise rapidly. Often, vortices remain suspended in the atmosphere as funnel clouds. W hen the lower tip of a vortex touches the ground, it becomes a tornado.

High winds not associated with tornadoes are profiled separately in this document in **Section 3.4.8,** Thunderstorm/High W ind/Hail/Lightning.

Essentially, tornadoes are a vortex storm with two components of winds. The first is the rotational winds that can measure up to 500 miles per hour, and the second is an uplifting current of great strength. The dynamic strength of both these currents can cause vacuums that can overpressure structures from the inside.

Although tornadoes have been documented in all 50 states, most of them occur in the central United States due to its unique geography and presence of the jet stream. The jet stream is a high-velocity stream of air that separates the cold air of the north from the warm air of the south. During the winter, the jet stream flows west to east from Texas to the Carolina coast. As the sun moves north, so does the jet stream, which at summer solstice flows from Canada across Lake Superior to Maine.
During its move northward in the spring and its recession south during the fall, the jet stream crosses Missouri, causing the large thunderstorms that breed tornadoes.

A typical tornado can be described as a funnel-shaped cloud in contact with the earth's surface that is "anchored" to a cloud, usually a cumulonimbus. This contact on average lasts 30 minutes and covers an average distance of 15 miles. The width of the tornado (and its path of destruction) is usually about 300 yards. However, tornadoes can stay on the ground for upward of 300 miles and can be up to a mile wide. The National W eather Service, in reviewing tornadoes occurring in Missouri between 1950 and 1996, calculated the mean path length at 2.27 miles and the mean path area at 0.14 square mile.

The average forward speed of a tornado is 30 miles per hour but may vary from nearly stationary to 70 miles per hour. The average tornado moves from southwest to northeast, but tornadoes have been known to move in any direction. Tornadoes are most likely to occur in the afternoon and evening but have been known to occur at all hours of the day and night.

Geographic Location

As with the previous hazard of thunderstorms, tornadoes can occur anywhere in Wayne County and impact all jurisdictions in the county.

Severity/Magnitude/Extent

Tornadoes are the most violent of all atmospheric storms and are capable of tremendous destruction. Wind speeds can exceed 250 miles per hour and damage paths can be more than one mile wide and fifty miles long. Tornadoes have been known to lift and move objects weighing more than 300 tons a distance of thirty feet, toss homes more than 300 feet from their foundations, and siphon millions of tons of water from water bodies. Tornadoes also can generate a tremendous amount of flying debris or "missiles," which often become airborne shrapnel that causes additional damage. If wind speeds arehigh enough, missiles can be thrown at a building with enough force to penetrate windows, roofs, and walls. However, the less spectacular damage is much more common.

Tornado magnitude is classified according to the EF- Scale (or the Enhance Fujita Scale, based on the original Fujita Scale developed by Dr. Theodore Fujita, a renowned severe storm researcher). The EF- Scale (see **Table 3.36)** ranks tornadoes according to wind speed based on the damage caused. This update to the original F-Scale was implemented in the U.S. on February 1, 2007.

Table 3.36 Enhanced F Scale for Tornado Damage

FUJITA SCALE			DERIVED EF SCALE		OPERATIONAL EF SCALE	
F Number	Fastest ¼-mile (mph)	3 Second Gust (mph)	EF Nu	3 Second Gust (mph)	EF Number	3 Second Gust (mph)
0	40-72	45-78	0	65-85	0	65-85
1	73-112	79-117	1	86-109	1	86-110
2	113-157	118-161	2	110-137	2	111-135
3	158-207	162-209	3	138-167	3	136-165
4	208-260	210-261	4	168-199	4	166-200
5	261-318	262-317	5	200-234	5	Over 200

Source: The National Weather Service, www.spc.noaa.gov/faq/tornado/ef-scale.html

The wind speeds for the EF Scale and damage descriptions are based on information on the NOAA Storm Prediction Center as listed in **Table 3.37.** The below damage descriptions are summaries. For the actual EF scale, it is necessary to look up the damage indicator (type of structure damaged) and refer to the degrees of damage associated with that indicator. Information on the Enhanced Fujita Scale's damage indicators and degrees or damage is located online at www.spc.noaa.gov/ef scale/ef-scale.html.

Table 3.37 Enhanced Fujita Scale with Potential Damage

Enhanced Fujita Scale			
Scale	Wind Speed (mph)	Relative Frequency	Potential Damage
EF0	65-85	53.5%	Light. Peels surface off some roofs; some damage to gutters o siding; branches broken off trees; shallow-rooted trees push e over. Confirmed tornadoes with no reported damage (i.e. those tha remain in open fields) are always rated EF0).
EF1	86-110	31.6%	Moderate. Roofs severely stripped; mobile homes overturned or badly damaged; loss of exterior doors; windows and other glass broken.
EF2	111-135	10.7%	Considerable. Roofs torn off well-constructed houses; foundations of frame homes shifted; mobile homes complete destroyed; large trees snapped or uprooted; light object missiles generated; cars lifted off ground.
EF3	136-165	3.4%	Severe. Entire stores of well-constructed houses destroyed; severe damage to large buildings such as shopping malls; trains overturned; trees debarked; heavy cars lifted off the ground and thrown; structures with weak foundations blown away some
EF4	166-200	0.7%	Devastating. W ell-constructed houses and whole frame houses completely levelled; cars thrown and small missiles generated.
EF5	>200	<0.1%	Explosive. Strong frame houses levelled off foundations and swept away; automobile-sized missiles fly through the air in excess of 300 ft.; steel reinforced concrete structure badly damaged; high rise buildings have significant structural deformation; incredible phenomena will occur.

Source: NOAA Storm Prediction Center, http://www.spc.noaa.gov/efscale/ef-scale.html

Enhanced weather forecasting has provided the ability to predict severe weather likely to produce tornadoes days in advance. Tornado watches can be delivered to those in the path of these storms several hours in advance. Lead time for actual tornado warnings is about 30 minutes. Tornadoes have been known to change paths very rapidly, thus limiting the time in which to take shelter. Tornadoes may not be visible on the ground if they occur after sundown or due to blowing dust or driving rain and hail.

Previous Occurrences

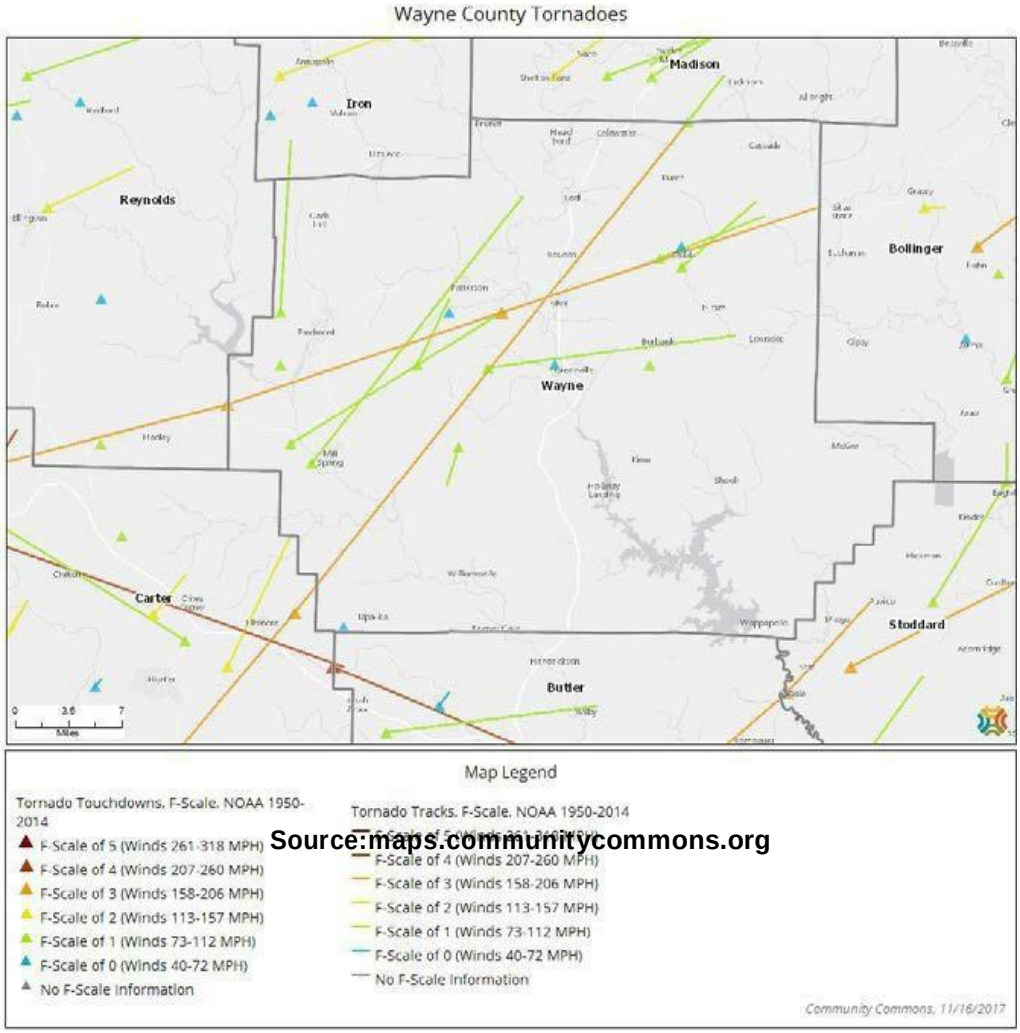
Table 3.38 includes NCDC reported tornado events and damages since 1993 in the planning area. Prior to that date, only really destructive tornadoes were recorded. It is necessary to go back as far as possible because of the random and intermittent nature of tornado events. There are limitations to the use of NCDC tornado data that must be noted. For example, one tornado may contain multiple segments as it moves geographically. A tornado that crosses a county line or state line is considered a separate segment for the purposes of reporting to the NCDC. Also, a tornado that lifts off the ground for less than 5 minutes or 2.5 miles is considered a separate segment. If the tornado lifts off the ground for greater than 5 minutes or 2.5 miles, it is considered a separate tornado. Tornadoes reported in Storm Data and the Storm Events Database is in segments.

Table 3.38 Recorded Tornadoes in Wayne County, 1993 –2016

Date	Beginning	Ending Location	Length (miles)	Width (yards)	F/EF Rating	Death	Injury	Property Damage	Crop Damages
6/8/1995	Clubb	Clubb Clubb	0.5	50	F0	0	0	$10,000	0
7/8/1997		Patterson	0.2	30	F0	0	0	$0	0
4/24/2004	Patterson	Leeper	4.0	100	F1	0	0	$100,000	0
5/1/2004	Leeper	Cascade	0.2	50	F1	0	0	$5,000	0
4/19/2011	Clubb	Williamsville	5.16	500	EF1	0	0	$25,000	0
4/22/2011	Old Greenville	Lowndes	2.07	300	EF1	0	0	$100,000	0
4/25/2011	Silva	Gravelton	11.78	200	EF1	0	0	$25,000	0
4/25/2011	Clubb	Burch	5.88	500	EF1	0	0	$70,000	0
5/25/2011	Leeper	Lodi	32.99	1200	EF3	0	0	$500,000	0
5/25/2011	Mill Spring	Mill Spring	17.77	150	EF1	0	0	$70,000	0
12/23/2015	Mill Spring	Patterson	2.95	50	EF1	0	0	$5,000	0
12/232015	Patterson	Patterson	3.04	75	EF1	0	0	$50,000	0
	Total		86.54	3,205		0	0	$960,000	0

As can be seen from the table above, From January 1, 1993 to December 31, 2016 there were a total of twelve reported tornadoes in Wayne County. The resulting damage was $960,000 to property, no death or injury resulted in these events. **Figure 3.19** provides a map of tornadoes experienced by Wayne County and their associated paths.

Figure 3.19 Wayne County Map of Historic Tornado Events



Probability of Future Occurrence

In reviewing tornado history data provided from the NCDC covering the dates January 1, 1993 through December 31, 2016. According to this data, there have been twelve tornados during the designated time period; consequently, it is reasonable to estimate a 52% chance a tornado could occur somewhere in the county in any given year (12 tornadoes/23 years). Given this historical data for Wayne County, it can be assumed that at least one tornado will occur every two years.

Vulnerability

Vulnerability Overview

Wayne County is located within the eastern side of Tornado Alley. This is a region in the U.S with high frequency of dangerous and destructive tornadoes. **Figure 3.20** illustrates the area where historically dangerous tornadoes have occurred.

Figure 3.20 Tornado Alley in the U.S.

Source:
http://www.tornadochaser.net/tornalley.html

The *2013 Missouri State Hazard Mitigation Plan* was reviewed to determine further vulnerability of the county to tornadoes. The State looked at four factors to determine tornado vulnerability. The analysis measured the likelihood of future tornadoes impacts, average annual property loss ratio, population change, and housing change. Scaled were created to rank these factors: likelihood (1-3), loss ratio with exposure as of 2012 (1-3), population change from 2000-2010 (1-3), and housing change from 2000-2010 (1-3). **Table 3.39** provides a listing of factors considered. These factors were added together for the county for the purposes of ranking total county vulnerability.

The data used for this analysis varies slightly from the historic data presented above. The data used in the State Plan and in the following vulnerability analysis provides information from 1950-July 31, 2012 from the National Climatic Data Center.

Table 3.39 Factors Considered

Factors Considered	Moderate (1)	High (2)	Very High (3)
Likelihood of Occurrence (# of events/ yrs. of data)	6-24	25-49	50-68
Loss Ratio %	0-.113	0.114-.226	0.227-0.340
Population % Change	Below 6	7-22	23-39
Housing % Change	Below 12	13-25	26-39
Overall Vulnerability Rating	4 and 5 Rating	6 and 7 Rating	3 and 9 Rating

The table below (**Table 3.40**), from the *2013 Missouri State Hazard Mitigation Plan* examines the rating factors for tornado vulnerability in Wayne County.

Table 3.40 Risk Factors for Tornado Vulnerability in Wayne County

# Of Tornadoes	Likelihood of Occurrence	Probability Rating	Total Building Exp ($)	Annualized Historic Loss	Loss Ratio	Loss Ratio Rating	Population Growth % Change	Population Change Rating	Housing % Change	Housing Ratio Rating	Total Vulnerability
16	26.02%	2	$554,834,304	$460,465	0.039%	1	2.0%	1	2.99%	1	Moderate

Source: *2013 Missouri State Hazard Mitigation Plan*

Potential Losses to Existing Development

As stated above, there is a 52% chance that a tornado with the potential to cause damage to property could develop somewhere in the county in any given year. Historically, annual losses resulting from tornado events in Wayne County average $460,465. Given Wayne County's minimal population growth over time, it is reasonalbe to utilize this amount ($460.465), when analyzing the jurisdictions potential losses to existing development, with not one jurisdiction being more heavily weighted due to the lack of specific tornado location predictability.

Future Development

Little future development is anticipated in Wayne County, therefore, the vulnerability to tornadoes and the resulting damages are not expected to increase.

Hazard Summary by Jurisdiction

As with thunderstorm hazards, higher population concentration has the potential to result in greater risk and loss to individual jurisdictions. The cities of Greenville and Piedmont have a higher concentration of people and housing than other rural areas of Wayne County, therefore the risk for damages and injuries and deaths are higher. As of the updating of this plan, Williamsville Elementary is in the process of constructing a tornado safe room. The addition of a safe room will reduce the risk of death and injury for those who seek shelter during a tornado event.

Problem Statement

Tornados are destructive and can impact any area of the county with very short notice. Tornadoes are capable of causing injury, loss of life, damage to property and to crops. One of the priorities set forth by the MPC was to continue education and practice events should a tornado occur.

3.4.10 Winter Weather/Snow/Ice/Severe Cold

Hazard Profile

Hazard Description

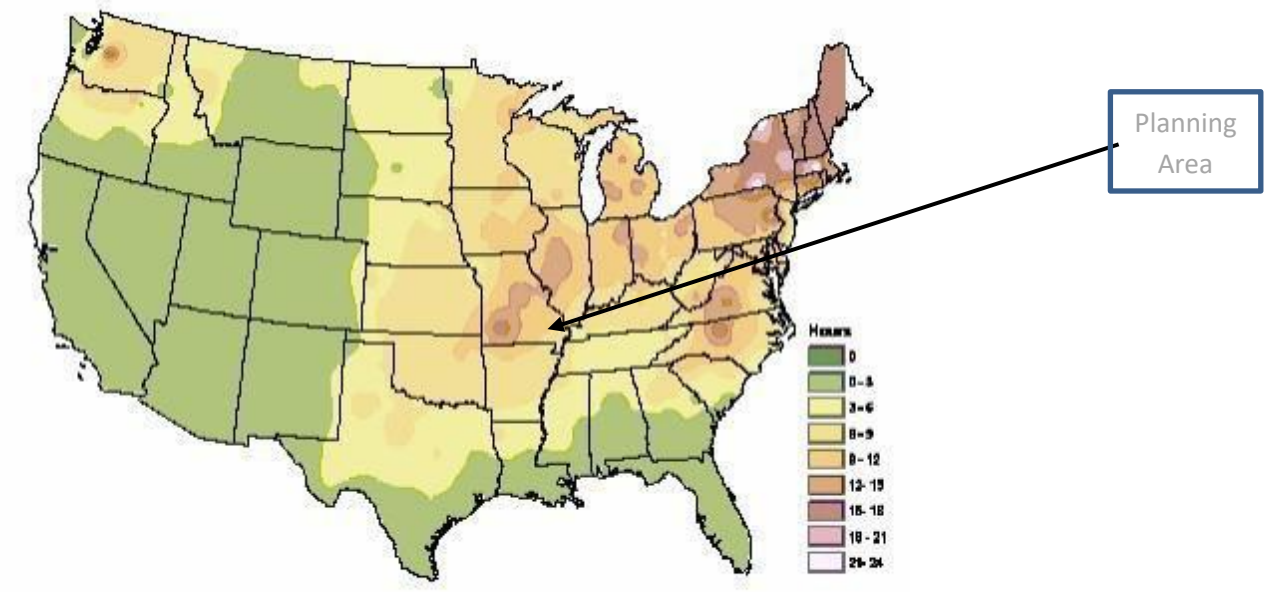
A major winter storm can last for several days and be accompanied by high winds, freezing rain or sleet, heavy snowfall, and cold temperatures. The National Weather Service describes different types of winter storm events as follows.

- **Blizzard**—Winds of 35 miles per hour or more with snow and blowing snow reducing visibility to less than ¼ mile for at least three hours.
- **Blowing Snow**—Wind-driven snow that reduces visibility. Blowing snow may be falling snow and/or snow on the ground picked up by the wind.
- **Snow Squalls**—Brief, intense snow showers accompanied by strong, gusty winds. Accumulation may be significant.
- **Snow Showers**—Snow falling at varying intensities for brief periods of time. Some accumulation is possible.
- **Freezing Rain**—Measurable rain that falls onto a surface with a temperature below freezing. This causes it to freeze to surfaces, such as trees, cars, and roads, forming a coating or glaze of ice. Most freezing-rain events are short lived and occur near sunrise between the months of December and March.
- **Sleet**—Rain drops that freeze into ice pellets before reaching the ground. Sleet usually bounces when hitting a surface and does not stick to objects.

Geographic Location

All jurisdictions within the county are at risk for severe winter weather including heavy snow, ice, extreme cold temperatures, and freezing rain. According to the map below, **Figure 3.21**, Wayne County is on the border of the area that receives 8-9 and 9-12 hours of freezing rain per year.

Figure 3.21 NWS Statewide Average Number of Hours per Year with Freezing Rain



Source: American Meteorological Society. "Freezing Rain Events in the United States." http://ams.confex.com/ams/pdfpapers/71872.pdf

Severity/Magnitude/Extent

Severe winter storms include extreme cold, heavy snowfall, ice, and strong winds which can push the wind chill well below zero degrees in the planning area. Heavy snow can bring a community to a standstill by inhibiting transportation (in whiteout conditions), weighing down utility lines, and by causing structural collapse in buildings not designed to withstand the weight of the snow. Repair and snow removal costs can be significant. Ice buildup can collapse utility lines and communication towers, as well as make transportation difficult and hazardous. Ice can also become a problem on roadways if the air temperature is high enough that precipitation falls as freezing rain rather than snow.

Extreme cold often accompanies severe winter storms and can lead to hypothermia and frostbite in people without adequate clothing protection. Cold can cause fuel to congeal in storage tanks and supply lines, stopping electric generators. Cold temperatures can also overpower a building's heating system and cause water and sewer pipes to freeze and rupture. Extreme cold also increases the likelihood for ice jams on flat rivers or streams. When combined with high winds from winter storms, extreme cold becomes extreme wind chill, which is hazardous to health and safety.

The National Institute on Aging estimates that more than 2.5 million Americans are elderly and especially vulnerable to hypothermia, with the isolated elders being most at risk. About 10 percent of people over the age of 65 have some kind of bodily temperature-regulating defect, and 3-4 percent of all hospital patients over 65 are hypothermic.

Also at risk are persons without shelter, stranded, or those who live in a home that is poorly insulated or without heat. Other impacts of extreme cold include asphyxiation (unconsciousness or death from a lack of oxygen) from toxic fumes from emergency heaters; household fires, which can be caused by fireplaces and emergency heaters; and frozen/burst pipes.

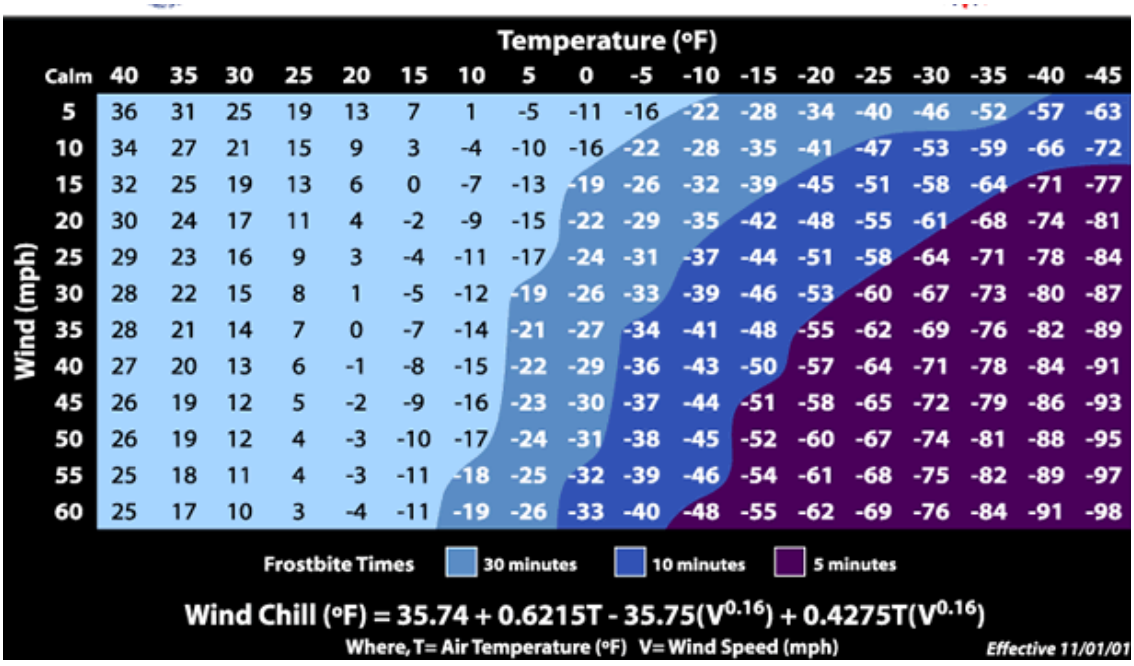
Buildings with overhanging tree limbs are more vulnerable to damage during winter storms when limbs fall. Businesses experience loss of income as a result of closure during power outages. In general, heavy winter storms increase wear and tear on roadways though the cost of such damages is difficult to determine. Businesses can experience loss of income as a result of closure during winter storms.

Overhead power lines and infrastructure are also vulnerable to damages from winter storms. In particular ice accumulation during winter storm events damage to power lines due to the ice weight on the lines and equipment. Damages also occur to lines and equipment from falling trees and tree limbs weighted down by ice. Potential losses could include cost of repair or replacement of damaged facilities, and lost economic opportunities for businesses.

Secondary effects from loss of power could include burst water pipes in homes without electricity during winter storms. Public safety hazards include risk of electrocution from downed power lines. Specific amounts of estimated losses are not available due to the complexity and multiple variables associated with this hazard. Standard values for loss of service for utilities reported in FEMA's 2009 BCA Reference Guide, the economic impact as a result of loss of power is $126 per person per day of lost service.

Wind can greatly amplify the impact of cold ambient air temperatures. Provided by the National Weather Service**, Figure 3.22** below shows the relationship of wind speed to apparent temperature and typical time periods for the onset of frostbite.

Figure 3.22 Wind Chill Chart



Source: National Weather Service, http://www.nws.noaa.gov/om/winter/windchill.shtml

Winter storms, cold, frost and freeze take a toll on crop production in the planning area. The table below, **Table 3.34** lists the USDA's Risk Management Agency payments for insured crop losses in the planning area resulting from cold conditions and snow 2010-2015. As illustrated in the table below, there were no crops lost due to winter weather in the planning area during the five-year timeframe.

Table 3.34. Crop Insurance Claims Paid in Wayne County as a Result of Cold Conditions and Snow 01/01/2010 - 12/31/2015

Crop Year	Crop Name	Cause of Loss Description	Insurance Paid
N/A	0	0	0

Source: USDA Risk Management Agency, http://www.rma.usda.gov/data/cause.htm

Previous Occurrences

Table 3.35 below provides previous occurrences and damages as reported by the NCDC for January 1, 2007 through July 31, 2017. These events and damages are for blizzard, cold/wind chill, extreme cold/wind chill, heavy snow, ice storm, sleet, winter storm, and winter weather.

Table 3.35 NCDC Wayne County Winter Weather Events Summary, January 1, 2007-July 31, 2017

Date	Event Type	Deaths	Injuries	Property Damages $	Crop Damages $
1/31/2007	Winter Weather	0	0	0	0
2/1/2007	Winter Weather	0	0	0	0
2/3/2007	Winter Weather	0	0	0	0
12/15/2007	Winter Weather	0	0	0	0
1/31/2008	Winter Storm	0	0	0	0
2/1/2008	Winter Storm	0	0	0	0
2/11/2008	Winter Storm	0	0	1,000,000	0
3/3/2008	Winter Storm	0	0	0	0
3/7/2008	Winter Storm	0	0	0	0
12/15/2008	Winter Storm	0	0	0	0
12/16/2008	Winter Weather	0	0	0	0
12/18/2008	Winter Weather	0	0	0	0
12/23/2008	Winter Weather	0	0	0	0
1/5/2009	Winter Weather	0	0	0	0
1/15/2009	Extreme	0	0	0	0
1/26/2009	Winter Storm	0	0	1,000,000	0
1/6/2010	Winter Weather	0	0	0	0
1/8/2010	Cold/Wind Chill	0	0	0	0
1/29/2010	Heavy Snow	0	0	0	0
2/8/2010	Winter Weather	0	0	0	0
12/15/2010	Winter Weather	0	0	0	0
1/11/2011	Winter Weather	0	0	0	0
1/17/2011	Winter Weather	0	0	0	0
1/20/2011	Winter Storm	0	0	0	0
2/4/2011	Winter Weather	0	0	0	0
2/9/2011	Winter Weather	0	0	0	0
11/28/2011	Winter Weather	0	0	0	0
2/13/2012	Winter Weather	0	0	0	0
12/25/2012	Winter Storm	0	0	0	0
12/28/2012	Winter Weather	0	0	0	0
3/21/2013	Winter Weather	0	0	0	0
12/5/2013	Winter Storm	0	0	0	0
1/5/2014	Winter Weather	0	0	0	0
1/5/2014	Cold/Wind Chill	0	0	0	0
2/2/2014	Winter Weather	0	0	0	0
2/4/2014	Winter Storm	0	0	0	0
3/2/2014	Winter Storm	0	0	0	0

11/16/2014	Winter Weather	0	0	0	0
12/1/2014	Winter Weather	0	0	0	0
1/11/2015	Winter Weather	0	0	0	0
1/15/2015	Winter Weather	0	0	0	0
2/15/2015	Heavy Snow	0	0	0	0
2/17/2015	Winter Weather	0	0	0	0
2/19/2015	Cold/Wind Chill	0	0	0	0
2/20/2015	Winter Storm	0	0	0	0
2/28/2015	Winter Weather	0	0	0	0
3/1/2015	Winter Weather	0	0	0	0
3/4/2015	Winter Storm	0	0	0	0
1/19/2016	Winter Weather	0	0	0	0
2/14/2016	Winter Weather	0	0	0	0
2/24/2016	Winter Weather	0	0	0	0
1/5/2017	Winter Weather	0	0	0	0
1/13/2017	Winter Weather	0	0	0	0

Source: NCDC, data accessed 11/16/2017

The most significant winter weather event in recent memory is included in the table above as a Winter Storm on January 26, 2009. The storm resulted in $1 million dollars in property damage in Wayne County. Households were without electricity for days and remote households for weeks. It is reported that in southeast Missouri the property damages were $120.450 million. The storm included heavy snow to the north; however, the largest problem was the ice that caused overhead power lines to fall as the weight of the ice broke utility poles, sometimes for miles in a stretch.

Probability of Future Occurrence

The probability of a future occurrence of severe winter weather is greater than 100% chance to occur somewhere in the county in any given year. According to the 10 years of incidents reported above, the average year sees four winter weather events ranging from extreme cold temperatures to snow and ice.

Vulnerability

Vulnerability Overview

In reviewing the *2013 Missouri State Hazard Mitigation Plan* the vulnerability for winter storms to impact Wayne County can be determined. The method used to determine this vulnerability in the 2013 State Plan was statistical analysis of data from several sources: the NCDC storm events database from 1993-December 2012, FEMA's Public Assistance funds from DR-1672, DR-1736, DR-1748, DR-1822, and DR-1961, Crop Insurance Claims data from the USDA Risk Management Agency (1998-2012), total building exposure from HAZUS, US Census Data, and the USDA Census of Agriculture.

Below in **Table 3.36** are the housing density, building exposure, crop exposure, total incidents, total property loss, and total crop insurance paid for Wayne County. These are common data elements for the analysis of severe winter weather. The total property loss column represents a combination of NCDC and FEMA PA funds. For declared events, the PA damage figures were used in lieu of NCDC data. CDC damages represent early estimates and the FEMA PA funds represent actual expenditures.

Table 3.36 Housing Density, Building Exposure, Crop Exposure, Incidents, Property Loss, and Crop Loss

Housing Units/Sq Mile	Total Building Exposure ($)	Crop Exposure (2007) ($)	Total Incidents	Total Property Loss ($)	Total Crop Insurance Paid ($)
10.6	$554,834,304	$1,389,000	65	$10,326,267	$1,131

Source: *2013 Missouri State Hazard Mitigation Plan*

From this statistical data collected, seven factors were considered in determining overall winter storm vulnerability: housing density, likelihood of occurrence, building exposure, crop exposure, average annual property loss ratio, average annual crop insurance claims, and social vulnerability.

To complete the vulnerability analysis utilizing the factors above, a rating value of 1-5 was assigned to the data obtained for each factor. These rating values correspond to the following descriptive terms:

1. Low
2. Medium-low
3. Medium
4. Medium-high
5. High

The rating values of all factors were then considered in determining overall vulnerability rating. The table below (**Table 3.37**) from the 2013 state plan provides the factors considered and the rating value assigned.

Table 3.37 Factors Considered for Wayne County Vulnerability Rating – Severe Thunderstorms

Factors Considered	Low (1)	Medium-Low (2)	Medium (3)	Medium-high (4)	High (5)
Housing Density (# per sq. mile)	<50	50-99	100-299	300-499	>500
Crop Exposure ($)	<$10M	$10M-$24M	$25M-$49M	$50M-$99M	>$100M
Social Vulnerability	1	2	3	4	5
Likelihood of Occurrence (# of events/ yrs. of data)	1.000-1.473	1.473-1.842	1.842-2.473	2.473-3.684	3.684-4.631
Annualized Property Loss Ratio (annual property loss/ exposure)	0.0 – 0.000110	0.000111 – 0.000274	0.000275 – 0.000636	0.000637 – 0.001397	0.001398 – 0.003270

Once the ranges were determined and applied to all factors considered in the analysis for severe winter weather they were weighed equally and factored together to determine an overall vulnerability rating. The following table (**Table 3.38**) provides the calculated vulnerability rating for each factors considered in the vulnerability analysis of Wayne County as provided in the *2013 Missouri State Hazard Mitigation Plan.*

Table 3.38 Calculated Vulnerability Rating

Housing Density Rating	Likelihood Rating	Property Loss Ratio Rating	Crop Exposure Rating	Crop Loss Ratio Rating	Social Vulnerability Index	Total Score and Vulnerability
1	4	3	1	1	4	14

As determined through this vulnerability analysis, Wayne County has a medium vulnerability to future winter weather events.

Potential Losses to Existing Development

In reviewing the loss data as presented by the NCDC for 2006-2016 there were 53 events that resulted in $2 million of property damage. Therefore, the potential future losses, based on this historic data would be an average of $200,000 annually. However, without the large loss that came due to the extreme event in 2009, the annualized losses would be much less. Without that one incident, future losses would be projected as $40,000 per year. Many future property loss incidents occur as a result of utility failure or loss of power.

Future Development

There is little future development projected for Wayne County, therefore the potential impact of winter weather is not expected to increase due to development.

Hazard Summary by Jurisdiction

All jurisdictions within Wayne County are equally vulnerable to winter weather events. However, the incorporated cities are at a higher risk of damages resulted in an event to properties. This is due to the higher concentration of population, or more vulnerable population such as senior citizens in the nursing homes.

Problem Statement

Winter weather comes with a myriad of impacts that start with health concerns from extreme cold temperatures, to falling and motor vehicle accidents caused by icy surfaces, to power outages caused by ice accumulating on overhead powerlines. The MPC was concerned about the availability of emergency power generators at critical facilities and has proposed an action to continue to increase the availability of generators.

44 CFR Requirement §201.6(c)(3): The plan shall include a mitigation strategy that provides the jurisdiction's blueprint for reducing the potential losses identified in the risk assessment, based on existing authorities, policies, programs and resources, and its ability to expand on and improve these existing tools.

This section presents the mitigation strategy updated by the Mitigation Planning Committee (MPC) based on the updated risk assessment. The mitigation strategy was developed through a collaborative group process. The process included review of [updated] general goal statements to guide the jurisdictions in lessening disaster impacts as well as specific mitigation actions to directly reduce vulnerability to hazards and losses. The following definitions are taken from FEMA's *Local Hazard Mitigation Review Guide (October 1, 2012)*.

- **Mitigation Goals** are general guidelines that explain what you want to achieve. Goals are long-term policy statements and global visions that support the mitigation strategy. The goals address the risk of hazards identified in the plan.

- **Mitigation Actions** are specific actions, projects, activities, or processes taken to reduce or eliminate long-term risk to people and property from hazards and their impacts. Implementing mitigation actions helps achieve the plan's mission and goals.

4.1 Goals

44 CFR Requirement §201.6(c)(3)(i): [The hazard mitigation strategy shall include a] description of mitigation goals to reduce or avoid long-term vulnerabilities to the identified hazards.

This planning effort is an update to Wayne County's existing hazard mitigation plan approved by FEMA on November 29, 2011. Therefore, the goals from the 2011 Wayne County Hazard Mitigation Plan were reviewed to see if they were still valid, feasible, practical, and applicable to the defined hazard impacts. The MPC conducted a discussion session during their second meeting to review and update the plan goals. To ensure that the goals developed for this update were comprehensive and supported State goals, the 2011 State Hazard Mitigation Plan goals were reviewed. The MPC also reviewed the goals from current surrounding county plans and the 2013 State Hazard Mitigation Plan.

The goals for the updated plan are as follows:

1. Implement mitigation actions that improve the protection of human life, health, and safety from the adverse effects of disasters.
2. Implement mitigation actions that improve the continuity of government and essential services from the adverse effects of disasters.

3. Implement mitigation actions that improve the protection of public and private property from the adverse effects of disasters.
4. Implement mitigation actions that improve the protection of community tranquility ffrom the adverse effects of disasters.

In the planning meeting to set these goals, the MPC reviewed the goals included in the *2013 Missouri State Hazard Mitigation Plan* and decided that the best course of action was to mirror the goals from the statewide plan. The MPC felt that the four goals listed in the state plan conveyed the committee's goals for Wayne County and all of the goals from the 2011 Wayne County Plan could be combined and better defined by the aforementioned four broader goals.

The *2012 Wayne County Hazard Mitigation Plan* included the following goals:

1) Reduce loss of life and property.
2) Increase public education and awareness.
3) Improve warning systems and timing.
4) Eliminate hazard prone areas.
5) Promote strategies to protect against damages.
6) Decrease negative impacts on business and industry.

The MPC felt that several of these goals were duplicated and by reducing the number of goals and utilizing the goals of the state plan the updated plan would convey the needs of the community in a more concise manner.

4.2 Identification and Analysis of Mitigation Actions

44 CFR Requirement §201.6(c)(3)(ii): The mitigation strategy shall include a section that identifies and analyzes a comprehensive range of specific mitigation actions and projects being considered to reduce the effects of each hazard, with particular emphasis on new and existing buildings and infrastructure.

During the second MPC meeting, the results of the risk assessment update were provided to the MPC members for review and the key issues were identified for specific hazards. Changes in risk since adoption of the previously approved plan were discussed. The second meeting concluded with the distribution of a list of possible mitigation actions to prompt discussions within and among the jurisdictions. The discussions occurred during jurisdictional break-out meetings. The list included possible new mitigation actions, as well as actions from the previously approved plan. Actions from the previous plan included completed actions, on-going actions, and actions upon which progress had not been made. The MPC discussed SEMA's identified funding priorities and the types of mitigation actions generally recognized by FEMA.

The MPC determined to include problem statements in the plan update at the end of each hazard profile, which had not been done in the previously approved plan. The problem statements summarize the risk to the planning area presented by each hazard and include possible methods to reduce that risk. Use of the problem statements allowed the MPC to recognize new and innovative strategies for mitigate risks in the planning area.

The focus of Meeting #3 was update of the mitigation strategy. For a comprehensive range of mitigation actions to consider, the MPC reviewed the following information during Meeting #3:

- A list of actions proposed in the previous mitigation plan, the current State Plan, and approved plans in surrounding counties;
- Key issues from the risk assessments, including the Problem Statements concluding each

hazard profile and vulnerability analysis;
- State priorities established for Hazard Mitigation Assistance grants; and
- Public input during meetings, responses to Data Collection Questionnaires, and other efforts to involve the public in the plan development process.

For Meeting #3, individual jurisdictions, including school and special districts, developed final mitigation strategy for submission to the MPC. They were encouraged to review the details of the risk assessment vulnerability analysis specific to their jurisdiction. They were also provided a link to the FEMA's publication, *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards (January 2013).* This document was developed by FEMA as a resource for identification of a range of potential mitigation actions for reducing risk to natural hazards and disasters.

The MPC reviewed the actions from the previously approved plan for progress made since the plan had been adopted. Prior to Planning Meeting #3, the list of actions for each jurisdiction was emailed to that jurisdiction's MPC representative. Each jurisdiction was instructed to provide information regarding the "Action Status" with one of the following status choices:

- Completed, with a description of the progress;
- Not Started/Continue in Plan Update, with a discussion of the reasons for lack of progress;
- In Progress/Continue in Plan Update, with a description of the progress made to date; or,
- Delete, with a discussion of the reasons for deletion.

The FEMA-approved *2012 Wayne County Hazard Mitigation Plan* outlined six mitigation goals and twenty-five action steps. The goals and actions identified by the 2012 MPC are listed within **Table 4.1**. **Table 4.1** provides the status of each action with regard to the current planning effort. The status indicated for each action applies to each jurisdiction noted within each action step.

Table 4.1. *2012 Wayne County Hazard Mitigation Plan* Actions Status Summary

ACTION	DELETED	COMPLETED	CONTINUED (Not Yet Started)	CONTINUED (Started)
1.1 Examine city ordinaces regarding floodpains. (Applicable to Wayne County, City of Greenville, City of Piedmont, City of Williamsville, & Village of Mill Spring)		x		
1.2 Seek funding to construct community tornado saferooms. (Applicable to Clearwater R-I & Greenville R-II School Districts)		x		
1.3 School districts will follow MSHSAA policies regarding lightning and severe thunderstorms during outdoor athletic events. (Applcable to Clearwater R-I & Greenville R-II School Districts)				x (see Section 4.2, Action 3.8)
2.1 Identify travel routes susceptible to flash flooding with signage and PSA's. (Applicable to Wayne County, City of Greenville, City of Piedmont, Village of Mill Spring, and the City of Williamsville)			x (see Section 4.2, Action 3.4)	
2.2 Conduct a campaign regarding the dangers of heat related illnesses. (Applicable to Wayne County, City of Greenville, City of Piedmont, Village of Mill Spring, the City of Williamsville, Clearwater R-I and Greenville R-II School Districts)			x (see Section 4.2, Action 1.2)	
2.3 Participate in earthquake awareness events,			x	

providing information to the public. (Applicable to Wayne County, City of Greenville, City of Piedmont, Village of Mill Spring, the City of Williamsville, Clearwater R-I and Greenville R-II School Districts)			(see Section 4.2, Action 1.3)	
2.4 Provide tornado safety information in schools. (Applicable to Clearwater R-I & Greenville R-II School Districts)				x (see Section 4.2, Action 1.4)
2.5 Distribute fire safety brochures and information. (Applicable to Wayne County, City of Greenville, City of Piedmont, Village of Mill Spring, and the City of Williamsville)			x (see Section 4.2, Action 1.5)	
2.6 Make a copy of the *Wayne County Hazard Mitigation Plan* available to the public. (Applicable to Wayne County, City of Greenville, City of Piedmont, Village of Mill Spring, and the City of Williamsville)		x		
3.1 Enhance and upgrade warning sirens. (Applicable to Wayne County, City of Greenville, City of Piedmont, Village of Mill Spring, and the City of Williamsville)			x (see Section 4.2, Action 2.2)	
3.2 Increase training opportunities for EMS volunteers. (Applicable to Wayne County)			x (see Section 4.2, Action 2.3)	
3.3 Increase weather spotting training to volunteers. (Applicable to Wayne County)	x			
4.1 Examine the possibility of levee and/or ditch construction in areas highly susceptible to flooding. (Applicable to Wayne County, City of Greenville, City of Piedmont, City of Williamsville, & Village of Mill Spring)	x			
4.2 Trim trees around overhead utilitiy lines. (Applicable to Wayne County, City of Greenville, City of Piedmont, City of Williamsville, & Village of Mill Spring)	x			
4.3 Reinforce vulnerable bridges and roadways. (Applicable to Wayne County, City of Greenville, City of Piedmont, City of Williamsville, & Village of Mill Spring)			x (see Section 4.2, Action 3.2)	
4.4 Relocate residents from floodways. (Applicable to Wayne County, City of Greenville, City of Piedmont, Village of Mill Spring, and the City of Wiliamsville)				x (see Section 4.2, Action 3.3
4.5 Establish alternate/emergency routes. (Applicable to Wayne County, City of Greenville, City of Piedmont, City of Williamsville, Village of Mill Spring, Clearwater R-I and Greenville R-II School Districts)			x (see Section 4.2, Action 3.4)	
4.6 Jurisdictions participating in the NFIP will continue to participate and enforce floodplains regulations. (Applicable to Wayne County, City of Greenville, City of Piedmont, City of Williamsville, & Village of Mill Spring)				x (see Section 4.2, Action 1.1)
5.1 Provide 2-way radios on all school buses. (Applicable to Clearwater R-I & Greenville R-II School Districts)	x			
5.2 Promote fan collection drives and air conditioner donations. (Applicable to Wayne County, City of Greenville, City of Piedmont, City of Williamsville, Village of Mill Spring, Clearwater R-I and Greenville R-II School Districts)	x			
5.3 Utilize heat-resistant road construction methods. (Applicable to Wayne County, City of Greenville, City of Piedmont, City of Williamsville, & Village of Mill Spring)	x			
5.4 Allow fire departments to issue burn bans. (Applicable to Wayne County & City of Piedmont)				x (see Section 4.2, Action 3.5)
6.1 Promote use of NOAA weather radios in public facilities such as schools, nursing homes, and businesses. (Applicable to Wayne County, City of Greenville, City of Piedmont, City of Williamsville,		x		

	Village of Mill Spring, Clearwater R-I and Greenville R-II School Districts)				
6.2	Continue scheduled maintenance of snow removal equipment. (Applicable to Wayne County, City of Greenville, City of Piedmont, City of Williamsville, & Village of Mill Spring)		x		
6.3	Continue to promote the need for emergency power generators in public facilities. (Applicable to Wayne County, City of Greenville, City of Piedmont, City of Williamsville, & Village of Mill Spring)				x (see Section 4.2, Action 3.6)

Sources: Previously approved *Wayne County Hazard Mitigation Plan* & Data Collection Questionnaires

Table 4.2 provides a summary of the completed and deleted actions from the previous plan.

Table 4.2. Summary of Completed and Deleted Actions from the Previous Plan

COMPLETED ACTIONS	COMPLETION DETAILS (DATE, AMOUNT, FUNDING SOURCE)
1.1 Examine city ordinaces regarding floodpains	2013-2017, $N/A, (N/A)
1.2 Seek funding to construct community tornado saferooms.	Tornado Safe Room - Greenville R-II School District, $1,209,525, 10/06/2015 (FEMA & School District) Tornado Safe Room - Clearwater R-1 School District $1,172,070--1/21/2015 (FEMA & School District)
2.6 Make a copy of the *Wayne County Hazard Mitigation Plan* available to the public.	2012-2017, $N/A, (N/A)

4.4 Relocating residents from floodways	Wayne County Flood Buyouts: 2013--$742,464 & 2014--$149,457 (FEMA & ODPC)
6.1 Promote use of NOAA weather radios in public facilities such as schools, nursing homes, and businesses.	2012-2017, $N/A, (N/A)
6.2 Continue scheduled maintenance of snow removal	2012-2017, $N/A, (N/A)
DELETED ACTIONS	**REASON FOR DELETION**
3.3 Increase weather spotting training to volunteers.	No longer needed
4.1 Examine the possibility of levee and/or ditch construction in areas highly susceptible to flooding.	Cost prohibitive
4.2 Trim trees around overhead utilitiy lines.	Conducted by e lectric cooperative as needed
5.1 Provide 2-way radios on all school buses	Action upgraded to reflect advancements in technology
5.2 Promote fan collection drives and air conditioner	A local non-profit specializes in fan distribution
5.3 Utilize heat-resistant road construction methods.	No longer relevant

Sources: Previously approved *Wayne County Hazard Mitigation Plan* & Data Collection Questionnaires

As shown in the tables above, some mitigation actions (identified within the 2012 *Wayne County Hazard Mitigation Plan*) were neither completed, nor carried forward to the current document. The reasons for deleting these formerly identified actions are outlined as follows:

- increasing weather spotting training for volunteers was eliminated due to lack of funding to support effort facilitators;
- examining the possibility of levee and/or ditch construction in areas susceptible to flooding was deleted due to the lack of funding to implement the recommendations resulting from such examainations;
- trimming trees around overhead utility lines was determined to be the responsibility of the local electric cooperative;
- promoting the use of NOAA weather radios was removed as an action because the MPC felt that weather radios were not as relevant as five years ago due to the increase in advancements of communications technology;
- fan collection drives were reoved as an action as a local nonprofit, not a local jurisdiction organizes the efforts of collecting and distributing fans; and,
- heat resistant road construction methods were removed as an action becuas they are is not an immediate priority of Missouri Department of Transportaiton and, consequently, are unlikely to occur.

The following actions from the *2012 Wayne County Hazard Mitigation Plan* have been carried forward into this current plan update:

- school districts will follow Missouri State High School Activities Association (MSHSAA) policies regarding lightning and severe thunderstorms during outdoor athletic events;
- Identify travel routes susceptible to flash flooding with signage and PSA's;
- conduct a campaign regarding the dangers of heat related illnesses;
- participate in earthquake awareness events, providing information to the public.
- provide tornado safety information in schools;
- distribute fire safety brochures and information;
- enhance and upgrade warning sirens;
- incerase training opportunities for EMS volunteers;
- reinforce vulnerable bridges and roadways;
- relocate residents from floodways;
- establish alternate/emergency routes;
- Jurisdictions participating in the NFIP will continue to participate and enforce floodplain regulations;
- allow fire departments to issue burn bans; and,
- continue to promote the need for emergency power generators in public facilities.

Included in the *2012 Wayne County Hazard Mitigation Plan* was a mitigation action to construct tornado safe rooms at school campuses in the county. Since that time, funding was secured and two safe rooms were constructed—one within the City of Williamsville upon the Greenville R-II Elementary School campus and one within the City of Greenvillle upon the Greenville R-II High School campus. Other mitigation projects that were implemented within Wayne County inlcuded two residential voluntary flood buyouts completed during 2013 and 2014.

The goals and actions of this updated plan were developed through review and discussions of the mitigation planning committee. All actions were found to be cost effective, environmentally sound and technically feasible. The following set of underlying operating principles will improve fiscal and operational efficiency, promote maintenance of focus upon the overall goal of community improvement and well-being, and help ensure implementation of the suggested actions. Each action will be implemented according to the following strategies:

1. Incorporate mitigation objectives into existing and future plans, regulations, programs, and projects.
2. Promote and encourage collaboration between disparate agencies and departments to create synergy that results in benefits that would not be possible through a single agency.
3. Employ sustainable principles and techniques in the implementation of each objective to attain maximum benefits.
4. Create and implement a prioritization process that includes monetary, environmental, and sociological considerations.

4.3 Implementation of Mitigation Actions

44 CFR Requirement §201.6(c)(3)(ii): The mitigation strategy shall include an action strategy describing how the actions identified in paragraph (c)(2)(ii) will be prioritized, implemented, and administered by the local jurisdiction. Prioritization shall include a special emphasis on the extent to which benefits are maximized according to a cost benefits review of the proposed projects and their associated costs.

Jurisdictional MPC members were encouraged to meet with others in their community to finalize the actions to be submitted for the updated mitigation strategy. Throughout the MPC consideration and discussion, emphasis was placed on the importance of a benefit-cost analysis in determining project priority. The Disaster Mitigation Act requires benefit-cost review as the primary method by which mitigation projects should be prioritized. The MPC decided to pursue implementation according to when and where damage occurs, available funding, political will, jurisdictional priority, and priorities identified in the *Missouri State Hazard Mitigation Plan*. The benefit/cost review at the planning stage primarily consisted of a qualitative analysis and was not the detailed process required grant funding application. For each action, the plan sets forth a narrative describing the types of benefits that could be realized from action implementation. The cost was estimated as closely as possible, with further refinement to be supplied as project development occurs.

The plan must indicate if the prioritization process and/or methodology have changed since the previous plan's adoption. If the process has changed, describe how it changed and why it changed. If the prioritization process and methodology have not changed, state this here in the plan with a description. Sample text if FEMA's suggested STAPLEE methodology is used follows: FEMA's STAPLEE methodology was used to assess the costs and benefits, overall feasibility of mitigation actions, and other issues impacting project. During the prioritization process, the MPC used worksheets to assign scores. The worksheets posed questions based on the STAPLEE elements as well as the potential mitigation effectiveness of each action. Scores were based on the responses to the questions as follows:

Definitely yes = 3 points
Maybe yes = 2 points
Probably no = 1
Definitely no = 0

The following questions were asked for each proposed action.

S: Is the action socially acceptable?
T: Is the action technically feasible and potentially successful?
A: Does the jurisdiction have the administrative capability to successfully implement this action?
P: Is the action politically acceptable?
L: Does the jurisdiction have the legal authority to implement the action?
E: Is the action economically beneficial?
E: Will the project have an environmental impact that is either beneficial or neutral? (score "3" if positive and "2" if neutral)

Will the implemented action result in lives saved?
Will the implanted action result in a reduction of disaster damage?

Figure 4.1 Blank STAPLEE Worksheet

STAPLEE Worksheet		
Name of Jurisdiction:		
Action or Project		
Action/Project Number:	Insert a unique action number for this action for future tracking purposes. This can be a combination of the jurisdiction name, followed by the goal number and action number (i.e. Joplin1.1)	
Name of Action or Project:		
Mitigation Category:	Prevention; Structure and Infrastructure Projects; Natural Systems Protection; Education and Outreach; Emergency Services	
STAPLEE Criteria **Evaluation Rating** Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0		**Score**
S: Is it **Socially** Acceptable		
T: Is it **Technically** feasible and potentially successful?		
A: Does the jurisdiction have the **Administrative** capacity to execute this action?		
P: Is it **Politically** acceptable?		
L: Is there **Legal** authority to implement?		
E: Is it **Economically** beneficial?		
E: Will the project have either a neutral or positive impact on the natural **Environment**?		
Will historic structures be saved or protected?		
Could it be implemented quickly?		
	STAPLEE SCORE	
Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives will be saved.	
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	
	MITIGATION EFFECTIVENESS SCORE	
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	

☐ **High Priority (30+ points)**	☐ **Medium Priority (25 - 29 points)**	☐ **Low Priority (<25 points)**

Completed by
(Name, Title, Phone Number) _____

Goal 1: *Implement mitigation actions that improve the protection of human life, health, and safety from the adverse effects of disaster.*

Action 1.1 Enforce floodplain ordinance

Action Worksheet	
Name of Jurisdiction:	Wayne County
Risk / Vulnerability	
Problem being Mitigated:	Floodplain construction ordinances
Hazard(s) Addressed:	Flooding, Dam Failure, Levee Failure
Action or Project	
Action/Project Number:	Flooding 1
Name of Action or Project:	Adopt and/or enforce floodplain ordinances
Action or Project Description:	Examine city ordinances regarding construction in floodplains
Applicable Goal Statement:	Improve the protection of human life, health, and safety from adverse effects of disaster
Estimated Cost:	n/a
Benefits:	Regulating the type of construction in a flood zone will help prevent future damage. Helps reduce flood insurance rates.
Plan for Implementation	
Responsible Organization/Department:	County Floodplain Manager
Action/Project Priority:	High
Timeline for Completion:	1-3 years
Potential Fund Sources:	Local funds
Local Planning Mechanisms to be Used in Implementation, if any:	*Wayne County Hazard Mitigation Plan, 2018* *Ozark Foothills Regional Comprehensive Economic Development Strategy, 2018*
Progress Report	
Action Status	In progress.
Report of Progress	
Completed by:	

Action 1.1 Enforce floodplain ordinance

Action Worksheet	
Name of Jurisdiction:	City of Piedmont
Risk / Vulnerability	
Problem being Mitigated:	Floodplain construction ordinances
Hazard(s) Addressed:	Flooding, Dam Failure, Levee Failure
Action or Project	
Action/Project Number:	Flooding 1
Name of Action or Project:	Adopt and/or enforce floodplain ordinances
Action or Project Description:	Examine city ordinances regarding construction in floodplains
Applicable Goal Statement:	Improve the protection of human life, health, and safety from adverse effects of disaster
Estimated Cost:	n/a
Benefits:	Regulating the type of construction in a flood zone will help prevent future damage. Helps reduce flood insurance rates.
Plan for Implementation	
Responsible Organization/Department:	City Mayor
Action/Project Priority:	High
Timeline for Completion:	1-3 years
Potential Fund Sources:	Local funds
Local Planning Mechanisms to be Used in Implementation, if any:	*Wayne County Hazard Mitigation Plan, 2018* *Ozark Foothills Regional Comprehensive Economic Development Strategy, 2018*
Progress Report	
Action Status	In progress subject to funding availability.
Report of Progress	
Completed by:	

Action 1.1 Enforce floodplain ordinance

Action Worksheet	
Name of Jurisdiction:	City of Greenville
Risk / Vulnerability	
Problem being Mitigated:	Floodplain construction ordinances
Hazard(s) Addressed:	Flooding, Dam Failure, Levee Failure
Action or Project	
Action/Project Number:	Flooding 1
Name of Action or Project:	Adopt and/or enforce floodplain ordinances
Action or Project Description:	Examine city ordinances regarding construction in floodplains
Applicable Goal Statement:	Improve the protection of human life, health, and safety from adverse effects of disaster
Estimated Cost:	n/a
Benefits:	Regulating the type of construction in a flood zone will help prevent future damage. Helps reduce flood insurance rates.
Plan for Implementation	
Responsible Organization/Department:	City Mayor
Action/Project Priority:	High
Timeline for Completion:	1-3 years
Potential Fund Sources:	Local funds
Local Planning Mechanisms to be Used in Implementation, if any:	*Wayne County Hazard Mitigation Plan, 2018* *Ozark Foothills Regional Comprehensive Economic Development Strategy, 2018*
Progress Report	
Action Status	In progress subject to funding availability.
Report of Progress	
Completed by:	

Action 1.1 Enforce floodplain ordinance

Action Worksheet	
Name of Jurisdiction:	City of Williamsville
Risk / Vulnerability	
Problem being Mitigated:	Floodplain construction ordinances
Hazard(s) Addressed:	Flooding, Dam Failure, Levee Failure
Action or Project	
Action/Project Number:	Flooding 1
Name of Action or Project:	Adopt and/or enforce floodplain ordinances
Action or Project Description:	Examine city ordinances regarding construction in floodplains
Applicable Goal Statement:	Improve the protection of human life, health, and safety from adverse effects of disaster
Estimated Cost:	n/a
Benefits:	Regulating the type of construction in a flood zone will help prevent future damage. Helps reduce flood insurance rates.
Plan for Implementation	
Responsible Organization/Department:	City Mayor
Action/Project Priority:	High
Timeline for Completion:	1-3 years
Potential Fund Sources:	Local funds
Local Planning Mechanisms to be Used in Implementation, if any:	*Wayne County Hazard Mitigation Plan, 2018* *Ozark Foothills Regional Comprehensive Economic Development Strategy, 2018*
Progress Report	
Action Status	In progress due to funding availability.
Report of Progress	
Completed by:	

Action 1.1 Enforce floodplain ordinance

Action Worksheet	
Name of Jurisdiction:	Village of Mill Spring
Risk / Vulnerability	
Problem being Mitigated:	Floodplain construction ordinances
Hazard(s) Addressed:	Flooding, Dam Failure, Levee Failure
Action or Project	
Action/Project Number:	Flooding 1
Name of Action or Project:	Adopt and/or enforce floodplain ordinances
Action or Project Description:	Examine city ordinances regarding construction in floodplains
Applicable Goal Statement:	Improve the protection of human life, health, and safety from adverse effects of disaster
Estimated Cost:	n/a
Benefits:	Regulating the type of construction in a flood zone will help prevent future damage. Helps reduce flood insurance rates.
Plan for Implementation	
Responsible Organization/Department:	President of the Board of Trustees
Action/Project Priority:	High
Timeline for Completion:	1-3 years
Potential Fund Sources:	Local funds
Local Planning Mechanisms to be Used in Implementation, if any:	*Wayne County Hazard Mitigation Plan, 2018* *Ozark Foothills Regional Comprehensive Economic Development Strategy, 2018*
Progress Report	
Action Status	In progress due to funding availability.
Report of Progress	
Completed by:	

Action 1.2 Education Regarding Extreme Heat

Action Worksheet	
Name of Jurisdiction:	Wayne County
Risk / Vulnerability	
Problem being Mitigated:	Heat-related illnesses
Hazard(s) Addressed:	Extreme Heat
Action or Project	
Action/Project Number:	Heat 1
Name of Action or Project:	Education Regarding Dangers Associated with Extreme Heat
Action or Project Description:	Provide educational resources to residents on avoiding heat related illnesses and accidents
Applicable Goal Statement:	Improve the protection of human life, health, and safety from adverse effects of disaster
Estimated Cost:	n/a
Benefits:	Regulating the type of construction in a flood zone will help prevent future damage. Helps reduce flood insurance rates.
Plan for Implementation	
Responsible Organization/Department:	Director of County Health Department
Action/Project Priority:	Medium, 28
Timeline for Completion:	1-3 years
Potential Fund Sources:	Local funds
Local Planning Mechanisms to be Used in Implementation, if any:	*Wayne County Hazard Mitigation Plan, 2018*
Progress Report	
Action Status	Ongoing action as information changes and seasons shift.
Report of Progress	
Completed by:	

Action 1.3 Earthquake Awareness

Action Worksheet	
Name of Jurisdiction:	Clearwater R-1 School District
Risk / Vulnerability	
Problem being Mitigated:	Earthquake awareness.
Hazard(s) Addressed:	Earthquake
Action or Project	
Action/Project Number:	Earthquake 1
Name of Action or Project:	Earthquake Awareness
Action or Project Description:	Provide educational resources to students on earthquake procedure and how to stay safe.
Applicable Goal Statement:	Improve the protection of human life, health, and safety from adverse effects of disasters.
Estimated Cost:	n/a
Benefits:	Reduction in accidents, and deaths due to earthquakes.
Plan for Implementation	
Responsible Organization/Department:	Superintendent of the School District
Action/Project Priority:	Medium, 25
Timeline for Completion:	1-3 years
Potential Fund Sources:	Local funds
Local Planning Mechanisms to be Used in Implementation, if any:	School Master Plan
Progress Report	
Action Status	In progress subject to funding availability.
Report of Progress	
Completed by:	

Action 1.3 Earthquake Awareness

Action Worksheet	
Name of Jurisdiction:	Greenville R-II School District
Risk / Vulnerability	
Problem being Mitigated:	Earthquake awareness.
Hazard(s) Addressed:	Earthquake
Action or Project	
Action/Project Number:	Earthquake 1
Name of Action or Project:	Earthquake Awareness
Action or Project Description:	Provide educational resources to residents on earthquake procedure and how to stay safe
Applicable Goal Statement:	Improve the protection of human life, health, and safety from adverse effects of disaster
Estimated Cost:	n/a
Benefits:	Reduction in accidents, and deaths due to earthquakes.
Plan for Implementation	
Responsible Organization/Department:	Superintendent of the School District
Action/Project Priority:	Medium ,25
Timeline for Completion:	1-3 years
Potential Fund Sources:	Local funds
Local Planning Mechanisms to be Used in Implementation, if any:	School Master Plan
Progress Report	
Action Status	In progress subject to funding availability
Report of Progress	
Completed by:	

Action 1.4 Tornado Safety Drills

Action Worksheet	
Name of Jurisdiction:	Clearwater R-I School District
Risk / Vulnerability	
Problem being Mitigated:	Tornado Safety
Hazard(s) Addressed:	Tornado
Action or Project	
Action/Project Number:	Tornado 1
Name of Action or Project:	Tornado Safety Drills
Action or Project Description:	Execute drills at the school buildings for protection of students and staff
Applicable Goal Statement:	Improve the protection of human life, health, and safety from adverse effects of disasters
Estimated Cost:	n/a
Benefits:	Reduction in accidents, and deaths due to tornados.
Plan for Implementation	
Responsible Organization/Department:	Superintendent of the School District
Action/Project Priority:	Low, 21
Timeline for Completion:	1 year
Potential Fund Sources:	Local funds
Local Planning Mechanisms to be Used in Implementation, if any:	School Master Plan
Progress Report	
Action Status	In progress.
Report of Progress	
Completed by:	

Action 1.4 Tornado Safety Drills

Action Worksheet	
Name of Jurisdiction:	Greenville R-II School District
Risk / Vulnerability	
Problem being Mitigated:	Tornado Safety
Hazard(s) Addressed:	Tornado
Action or Project	
Action/Project Number:	Tornado 1
Name of Action or Project:	Tornado Safety Drills
Action or Project Description:	Execute drills at the schools buildings for protection of students and staff
Applicable Goal Statement:	Improve the protection of human life, health, and safety from adverse effects of disasters.
Estimated Cost:	n/a
Benefits:	Reduction in accidents, and deaths due to tornados.
Plan for Implementation	
Responsible Organization/Department:	Superintendent of the School District
Action/Project Priority:	Low, 21
Timeline for Completion:	1 year
Potential Fund Sources:	Local funds
Local Planning Mechanisms to be Used in Implementation, if any:	School Master Plan
Progress Report	
Action Status	In progress
Report of Progress	
Completed by:	

Action 1.5 Fire Education and Alarms

Action Worksheet	
Name of Jurisdiction:	Wayne County
Risk / Vulnerability	
Problem being Mitigated:	Fire Awareness
Hazard(s) Addressed:	Fire
Action or Project	
Action/Project Number:	Fire 1
Name of Action or Project:	Fire Education and Alarms
Action or Project Description:	Provide education for residents. Install smoke detectors throughout the county.
Applicable Goal Statement:	Improve the protection of human life, health, and safety from adverse effects of disasters.
Estimated Cost:	$70,000
Benefits:	Reduction in accidents, and deaths due to fire or damage from smoke. Protect structures or prevent full destruction.
Plan for Implementation	
Responsible Organization/Department:	Director of the County Health Department
Action/Project Priority:	Medium, 29
Timeline for Completion:	1 year
Potential Fund Sources:	Local funds, grants, and community matching.
Local Planning Mechanisms to be Used in Implementation, if any:	*Wayne County Hazard Mitigation Plan, 2018*
Progress Report	
Action Status	In progress subject to funding availability.
Report of Progress	
Completed by:	

Action 1.6 Provide Satellite phones for emergency communication

Action Worksheet	
Name of Jurisdiction:	Clearwater R-I School District
Risk / Vulnerability	
Problem being Mitigated:	Improved Communications
Hazard(s) Addressed:	All
Action or Project	
Action/Project Number:	All 2
Name of Action or Project:	Satellite Phones
Action or Project Description:	Provide satellite phones on school buses and to first responders
Applicable Goal Statement:	Improve the protection of human life, health, and safety from adverse effects of disasters.
Estimated Cost:	$150,0000
Benefits:	Improved communication within the county due to poor cell phone and radio service
Plan for Implementation	
Responsible Organization/Department:	School Superintendent
Action/Project Priority:	Medium, 29
Timeline for Completion:	1 year
Potential Fund Sources:	Local funds, grants, and community matching.
Local Planning Mechanisms to be Used in Implementation, if any:	School Capital Improvement Plan
Progress Report	
Action Status	In progress subject to funding availability.
Report of Progress	
Completed by:	

Action 1.6 Provide Satellite phones for emergency communication

Action Worksheet	
Name of Jurisdiction:	Greenville R-II School District
Risk / Vulnerability	
Problem being Mitigated:	Improved Communications
Hazard(s) Addressed:	All
Action or Project	
Action/Project Number:	All 2
Name of Action or Project:	Satellite Phones
Action or Project Description:	Provide satellite phones on school buses and to first responders
Applicable Goal Statement:	Improve the protection of human life, health, and safety from adverse effects of disasters.
Estimated Cost:	$100,0000
Benefits:	Improved communication within the county due to poor cell phone and radio service
Plan for Implementation	
Responsible Organization/Department:	School Superintendent
Action/Project Priority:	Medium, 29
Timeline for Completion:	1 year
Potential Fund Sources:	Local funds, grants, and community matching.
Local Planning Mechanisms to be Used in Implementation, if any:	School Capital Improvement Plan
Progress Report	
Action Status	In progress subject to funding availability.
Report of Progress	
Completed by:	

Goal 2: *Implement mitigation actions that improve the continuity of government and essential services from the adverse effects of disasters.*

Action 2.1 Making Mitigation Plan Available

Action Worksheet	
Name of Jurisdiction:	Wayne County
Risk / Vulnerability	
Problem being Mitigated:	Availability of Mitigation Plan
Hazard(s) Addressed:	All
Action or Project	
Action/Project Number:	HMP 1
Name of Action or Project:	Making Mitigation Plan Available
Action or Project Description:	Make the hazard mitigation plan more easily available to the public. Provide a copy to the city, schools, and local health department.
Applicable Goal Statement:	Implement mitigation actions that improve the continuity of government and essential services from the adverse effects of disasters.
Estimated Cost:	n/a
Benefits:	Improve the awareness of hazard mitigation planning and its benefits.
Plan for Implementation	
Responsible Organization/Department:	Wayne County Presiding Commissioner
Action/Project Priority:	Low, 20
Timeline for Completion:	1 year
Potential Fund Sources:	n/a
Local Planning Mechanisms to be Used in	n/a
Progress Report	
Action Status	In progress.
Report of Progress	
Completed by:	

Action 2.2 Warning Siren Mapping

Action Worksheet	
Name of Jurisdiction:	Wayne County
Risk / Vulnerability	
Problem being Mitigated:	Tornado Sirens
Hazard(s) Addressed:	Tornado
Action or Project	
Action/Project Number:	Tornado 2
Name of Action or Project:	Warning Siren Mapping & Testing
Action or Project Description:	Created an updated map of warning sirens in the area and test sirens.
Applicable Goal Statement:	Implement mitigation actions that improve the continuity of government and essential services from the adverse effects of disasters.
Estimated Cost:	$10,000
Benefits:	Improve the warning time of a spotted hazard.
Plan for Implementation	
Responsible Organization/Department:	Wayne County Emergency Management Director
Action/Project Priority:	Low, 20
Timeline for Completion:	1 -5 years
Potential Fund Sources:	Local
Local Planning Mechanisms to be Used in Implementation, if any:	n/a
Progress Report	
Action Status	In progress.
Report of Progress	
Completed by:	

Action 2.3 Hazard Training for Local Emergency Service Deployment

Action Worksheet	
Name of Jurisdiction:	Wayne County
Risk / Vulnerability	
Problem being Mitigated:	Hazard Training
Hazard(s) Addressed:	All
Action or Project	
Action/Project Number:	HMP 2
Name of Action or Project:	Create/ Distribute Emergnecy Volunteers List
Action or Project Description:	Create list of volunteers for the local EMA, VFD, Health Department, EMS/ambulance, law enforcement, weather spotters, and etc.
Applicable Goal Statement:	Implement mitigation actions that improve the continuity of government and essential services from the adverse effects of disasters.
Estimated Cost:	n/a
Benefits:	Improve the response time to and knowledge of hazards.
Plan for Implementation	
Responsible Organization/Department:	Wayne County Emergency Management Director
Action/Project Priority:	Medium, 26
Timeline for Completion:	1 -5 years
Potential Fund Sources:	Local, grant matching, educational opportunities.
Local Planning Mechanisms to be Used in Implementation, if any:	n/a
Progress Report	
Action Status	In progress.
Report of Progress	
Completed by:	

Goal 3: *Implement mitigation actions that improve the protections of public and private property from the adverse effects of disasters.*

Action 3.1 Replace low water crossings with culverts

Action Worksheet	
Name of Jurisdiction:	Wayne County
Risk / Vulnerability	
Problem being Mitigated:	Flooding
Hazard(s) Addressed:	Flooding, Dam Failure
Action or Project	
Action/Project Number:	Flooding 2
Name of Action or Project:	Culvert installation
Action or Project Description:	Replace low-water crossings with culverts
Applicable Goal Statement:	Implement mitigation actions that improve the protection of public and private property from the adverse effects of disasters.
Estimated Cost:	$200,000
Benefits:	Protection of roadways, surrounding property, and preventive measure for damages.
Plan for Implementation	
Responsible Organization/Department:	Wayne County Commission
Action/Project Priority:	Low, 20
Timeline for Completion:	1 -5 years
Potential Fund Sources:	Local, grant funds
Local Planning Mechanisms to be Used in Implementation, if any:	Regional Transportation Plan
Progress Report	
Action Status	In progress subject to funding availability.
Report of Progress	
Completed by:	

Action 3.1 Replace low water crossings with culverts

Action Worksheet	
Name of Jurisdiction:	City of Piedmont
Risk / Vulnerability	
Problem being Mitigated:	Flooding
Hazard(s) Addressed:	Flooding, Dam Failure
Action or Project	
Action/Project Number:	Flooding 2
Name of Action or Project:	Culvert installation
Action or Project Description:	Replace low-water crossings with culverts
Applicable Goal Statement:	Implement mitigation actions that improve the protection of public and private property from the adverse effects of disasters.
Estimated Cost:	$200,000
Benefits:	Protection of roadways, surrounding property, and preventive measure for damages.
Plan for Implementation	
Responsible Organization/Department:	City Council
Action/Project Priority:	Low, 20
Timeline for Completion:	1 -5 years
Potential Fund Sources:	Local, grant funds
Local Planning Mechanisms to be Used in Implementation, if any:	Regional Transportation Plan
Progress Report	
Action Status	In progress subject to funding availability.
Report of Progress	
Completed by:	

Action 3.1 Replace low water crossings with culverts

Action Worksheet	
Name of Jurisdiction:	City of Greenville
Risk / Vulnerability	
Problem being Mitigated:	Flooding
Hazard(s) Addressed:	Flooding, Dam Failure
Action or Project	
Action/Project Number:	Flooding 2
Name of Action or Project:	Culvert installation
Action or Project Description:	Replace low-water crossings with culverts
Applicable Goal Statement:	Implement mitigation actions that improve the protection of public and private property from the adverse effects of disasters.
Estimated Cost:	$200,000
Benefits:	Protection of roadways, surrounding property, and preventive measure for damages.
Plan for Implementation	
Responsible Organization/Department:	Board of Aldermen
Action/Project Priority:	Low, 20
Timeline for Completion:	1 -5 years
Potential Fund Sources:	Local, grant funds
Local Planning Mechanisms to be Used in Implementation, if any:	Regional Transportation Plan
Progress Report	
Action Status	In progress subject to funding availability.
Report of Progress	
Completed by:	

Action 3.1 Replace low water crossing with culverts

Action Worksheet	
Name of Jurisdiction:	City of Williamsville
Risk / Vulnerability	
Problem being Mitigated:	Flooding
Hazard(s) Addressed:	Flooding, Dam Failure
Action or Project	
Action/Project Number:	Flooding 2
Name of Action or Project:	Culvert installation
Action or Project Description:	Replace low-water crossings with culverts
Applicable Goal Statement:	Implement mitigation actions that improve the protection of public and private property from the adverse effects of disasters.
Estimated Cost:	$200,000
Benefits:	Protection of roadways, surrounding property, and preventive measure for damages.
Plan for Implementation	
Responsible Organization/Department:	City Council
Action/Project Priority:	Low, 20
Timeline for Completion:	1 -5 years
Potential Fund Sources:	Local, grant funds
Local Planning Mechanisms to be Used in Implementation, if any:	Regional Transportation Plan
Progress Report	
Action Status	In progress subject to funding availability.
Report of Progress	
Completed by:	

Action 3.2 Prioritize work on bridges and roadways that are vulnerable to earthquakes.

Action Worksheet	
Name of Jurisdiction:	Wayne County
Risk / Vulnerability	
Problem being Mitigated:	Bridges and Roadways
Hazard(s) Addressed:	Earthquake
Action or Project	
Action/Project Number:	Earthquake 2
Name of Action or Project:	Prioritize work on bridges and roadways that are vulnerable to earthquakes.
Action or Project Description:	Reinforce vulnerable bridges and roadways.
Applicable Goal Statement:	Implement mitigation actions that improve the protection of public and private property from the adverse effects of disasters.
Estimated Cost:	n/a
Benefits:	Structural protection.
Plan for Implementation	
Responsible Organization/Department:	Western District Commissioner Eastern District Commissioner
Action/Project Priority:	Medium, 26
Timeline for Completion:	Ongoing
Potential Fund Sources:	Local, grant funds if needed, and city capital improvement tax.
Local Planning Mechanisms to be Used in Implementation, if any:	Regional Transportation Plan
Progress Report	
Action Status	In progress subject to funding availability.
Report of Progress	
Completed by:	

Action 3.3 Relocate residents from floodways

Action Worksheet	
Name of Jurisdiction:	Wayne County
Risk / Vulnerability	
Problem being Mitigated:	Persons residing within 100-year floodplain
Hazard(s) Addressed:	Flooding
Action or Project	
Action/Project Number:	Flood 3
Name of Action or Project:	Relocation residents from floodways.
Action or Project Description:	Voluntary flood buyout
Applicable Goal Statement:	Implement mitigation actions that improve the protection of public and private property from the adverse effects of disasters.
Estimated Cost:	n/a
Benefits:	Structural protection and reduction of injury
Plan for Implementation	
Responsible Organization/Department:	Wayne County Commission
Action/Project Priority:	Medium, 26
Timeline for Completion:	Ongoing
Potential Fund Sources:	FEMA/SEMA
Local Planning Mechanisms to be Used in Implementation, if any:	*Wayne County Hazard Mitigation Plan, 2018* *Ozark Foothills Regional Comprehensive Economic Development Strategy, 2018*
Progress Report	
Action Status	In progress subject to funding availability and resident cooperation.
Report of Progress	
Completed by:	

Action 3.4 Establish Alternate Transportation Routes

Action Worksheet	
Name of Jurisdiction:	City of Greenville
Risk / Vulnerability	
Problem being Mitigated:	Obsructed Transporation Routes
Hazard(s) Addressed:	All
Action or Project	
Action/Project Number:	HMP 3
Name of Action or Project:	Establish Alternate Transportation
Action or Project Description:	Establish alternate routes during an emergency.
Applicable Goal Statement:	Implement mitigation actions that improve the protection of public and private property from the adverse effects of disasters.
Estimated Cost:	n/a
Benefits:	Safety
Plan for Implementation	
Responsible Organization/Department:	City Council with Direction from the City Mayor
Action/Project Priority:	Low, 22
Timeline for Completion:	Ongoing
Potential Fund Sources:	Local Funds, Missouri Dept. of Transportation
Local Planning Mechanisms to be Used in Implementation, if any:	Regional Transportation Plan
Progress Report	
Action Status	In progress.
Report of Progress	
Completed by:	

Action 3.5 Implement Burn Bans

Action Worksheet	
Name of Jurisdiction:	Wayne County
Risk / Vulnerability	
Problem being Mitigated:	Institute safe burn guidelines.
Hazard(s) Addressed:	Fire
Action or Project	
Action/Project Number:	Fire 3
Name of Action or Project:	Burn Bans
Action or Project Description:	Allow fire departments and forest service to identify safe burn periods and issues bans.
Applicable Goal Statement:	Implement mitigation actions that improve the protection of public and private property from the adverse effects of disasters.
Estimated Cost:	n/a
Benefits:	Structural protection.
Plan for Implementation	
Responsible Organization/Department:	Wayne County Commission
Action/Project Priority:	Low, 23
Timeline for Completion:	Ongoing
Potential Fund Sources:	No funding required
Local Planning Mechanisms to be Used in Implementation, if any:	n/a
Progress Report	
Action Status	In progress as seasons change and precipitation trends place county at risk
Report of Progress	
Completed by:	

Action 3.5 Implement Burn Bans

Action Worksheet	
Name of Jurisdiction:	City of Piedmont
Risk / Vulnerability	
Problem being Mitigated:	Institute safe burn guidelines.
Hazard(s) Addressed:	Fire
Action or Project	
Action/Project Number:	Fire 3
Name of Action or Project:	Burn Bans
Action or Project Description:	Allow fire departments and forest service to identify safe burn periods and issues bans.
Applicable Goal Statement:	Implement mitigation actions that improve the protection of public and private property from the adverse effects of disasters.
Estimated Cost:	n/a
Benefits:	Structural protection.
Plan for Implementation	
Responsible Organization/Department:	City Council
Action/Project Priority:	Low, 23
Timeline for Completion:	Ongoing
Potential Fund Sources:	No funding required
Local Planning Mechanisms to be Used in Implementation, if any:	n/a
Progress Report	
Action Status	In progress as seasons change and precipitation trends place city at risk
Report of Progress	
Completed by:	

Action 3.5 Implement Burn Bans

Action Worksheet	
Name of Jurisdiction:	City of Grenville
Risk / Vulnerability	
Problem being Mitigated:	Institute safe burn guidelines.
Hazard(s) Addressed:	Fire
Action or Project	
Action/Project Number:	Fire 3
Name of Action or Project:	Burn Bans
Action or Project Description:	Allow fire departments and forest service to identify safe burn periods and issues bans.
Applicable Goal Statement:	Implement mitigation actions that improve the protection of public and private property from the adverse effects of disasters.
Estimated Cost:	n/a
Benefits:	Structural protection.
Plan for Implementation	
Responsible Organization/Department:	Board of Aldermen
Action/Project Priority:	Low, 23
Timeline for Completion:	Ongoing
Potential Fund Sources:	No funding required
Local Planning Mechanisms to be Used in Implementation, if any:	n/a
Progress Report	
Action Status	In progress as seasons change and precipitation trends place city at risk
Report of Progress	
Completed by:	

Action 3.5 Implement Burn Bans

Action Worksheet	
Name of Jurisdiction:	Village of Mill Spring
Risk / Vulnerability	
Problem being Mitigated:	Institute safe burn guidelines.
Hazard(s) Addressed:	Fire
Action or Project	
Action/Project Number:	Fire 3
Name of Action or Project:	Burn Bans
Action or Project Description:	Allow fire departments and forest service to identify safe burn periods and issues bans.
Applicable Goal Statement:	Implement mitigation actions that improve the protection of public and private property from the adverse effects of disasters.
Estimated Cost:	n/a
Benefits:	Structural protection.
Plan for Implementation	
Responsible Organization/Department:	Village Board of Trustees
Action/Project Priority:	Low, 23
Timeline for Completion:	Ongoing
Potential Fund Sources:	No funding required
Local Planning Mechanisms to be Used in Implementation, if any:	n/a
Progress Report	
Action Status	In progress as seasons change and precipitation trends place village at risk
Report of Progress	
Completed by:	

Action 3.5 Implement Burn Bans

Action Worksheet	
Name of Jurisdiction:	City of Williamsville
Risk / Vulnerability	
Problem being Mitigated:	Institute safe burn guidelines.
Hazard(s) Addressed:	Fire
Action or Project	
Action/Project Number:	Fire 3
Name of Action or Project:	Burn Bans
Action or Project Description:	Allow fire departments and forest service to identify safe burn periods and issues bans.
Applicable Goal Statement:	Implement mitigation actions that improve the protection of public and private property from the adverse effects of disasters.
Estimated Cost:	n/a
Benefits:	Structural protection.
Plan for Implementation	
Responsible Organization/Department:	City Council
Action/Project Priority:	Low, 23
Timeline for Completion:	Ongoing
Potential Fund Sources:	No funding required
Local Planning Mechanisms to be Used in Implementation, if any:	n/a
Progress Report	
Action Status	In progress as seasons change and precipitation trends place city at risk
Report of Progress	
Completed by:	

Action 3.6 Obtain and promote safe and proper use of emergency power generators to local businesses and industry

Action Worksheet	
Name of Jurisdiction:	Wayne County
Risk / Vulnerability	
Problem being Mitigated:	Power Outage
Hazard(s) Addressed:	Storm, Snow, Ice, Tornado
Action or Project	
Action/Project Number:	Tornado 3
Name of Action or Project:	Promote safe and proper use of emergency power generatorsbyo local governments, businesses, and industry for critical facilities
Action or Project Description:	Provide information on safe and proper use of generators
Applicable Goal Statement:	Implement mitigation actions that improve the protection of public and private property from the adverse effects of disasters.
Estimated Cost:	$80,000
Benefits:	Continuity of government and private services
Plan for Implementation	
Responsible Organization/Department:	Wayne County Emergency Management Director
Action/Project Priority:	Medium, 29
Timeline for Completion:	Ongoing
Potential Fund Sources:	FEMA/SEMA, Public Funds, Grants
Local Planning Mechanisms to be Used in Implementation, if any:	*Wayne County Emergency Operations Plan* *Ozark Foothills Regional Comprehensive Economic Development Strategy, 2018*
Progress Report	
Action Status	In progress subject to funding availability
Report of Progress	
Completed by:	

Action 3.7 Upgrade Water Systems

Action Worksheet	
Name of Jurisdiction:	Wayne County
Risk / Vulnerability	
Problem being Mitigated:	Water
Hazard(s) Addressed:	Drought
Action or Project	
Action/Project Number:	Flooding 4
Name of Action or Project:	Upgrade water systems.
Action or Project Description:	Seek funding to improve water and sewage throughout the county.
Applicable Goal Statement:	Implement mitigation actions that improve the protection of public and private property from the adverse effects of disasters.
Estimated Cost:	$1,500,000
Benefits:	Improve public water supply
Plan for Implementation	
Responsible Organization/Department:	PWSD Boards of Directors in Wayne County
Action/Project Priority:	Low, 19
Timeline for Completion:	Ongoing
Potential Fund Sources:	Public Funds, Grants
Local Planning Mechanisms to be Used in Implementation, if any:	*Ozark Foothills Regional Comprehensive Economic Development Strategy, 2018*
Progress Report	
Action Status	In progress subject to funding availability
Report of Progress	
Completed by:	

Action 3.8 Lightning Protection

Action Worksheet	
Name of Jurisdiction:	Wayne County
Risk / Vulnerability	
Problem being Mitigated:	Lightning
Hazard(s) Addressed:	Thunderstorm
Action or Project	
Action/Project Number:	Storm 1
Name of Action or Project:	Lightning Protection
Action or Project Description:	Explore needed lightning protection at critical facilities and communication equipment
Applicable Goal Statement:	Implement mitigation actions that improve the protection of public and private property from the adverse effects of disaster
Estimated Cost:	$8,000
Benefits:	Continuity of services
Plan for Implementation	
Responsible Organization/Department:	County Emergency Management Director
Action/Project Priority:	Low, 24
Timeline for Completion:	Ongoing
Potential Fund Sources:	Public Funds, Grants as needed.
Local Planning Mechanisms to be Used in Implementation, if any:	n/a
Progress Report	
Action Status	In Progress
Report of Progress	
Completed by:	

Action 3.8 Lightning Protection

Action Worksheet	
Name of Jurisdiction:	City of Piedmont
Risk / Vulnerability	
Problem being Mitigated:	Lightning
Hazard(s) Addressed:	Thunder Storm
Action or Project	
Action/Project Number:	Storm 1
Name of Action or Project:	Lightning Protection
Action or Project Description:	Explore needed lightning protection at critical facilities and communication equipment
Applicable Goal Statement:	Implement mitigation actions that improve the protection of public and private property from the adverse effects of disaster
Estimated Cost:	$8,000
Benefits:	Continuity of services
Plan for Implementation	
Responsible Organization/Department:	Director of Public Works
Action/Project Priority:	Low, 24
Timeline for Completion:	Ongoing
Potential Fund Sources:	Public Funds, Grants as needed.
Local Planning Mechanisms to be Used in Implementation, if any:	n/a
Progress Report	
Action Status	In Progress
Report of Progress	
Completed by:	

Action 3.8 Lightning Protection

Action Worksheet	
Name of Jurisdiction:	City of Williamsville
Risk / Vulnerability	
Problem being Mitigated:	Lightning
Hazard(s) Addressed:	Thunder Storm
Action or Project	
Action/Project Number:	Storm 1
Name of Action or Project:	Lightning Protection
Action or Project Description:	Explore needed lightning protection at critical facilities and communication equipment
Applicable Goal Statement:	Implement mitigation actions that improve the protection of public and private property from the adverse effects of disaster
Estimated Cost:	$8,000
Benefits:	Continuity of services
Plan for Implementation	
Responsible Organization/Department:	Director of Public Works
Action/Project Priority:	Low, 24
Timeline for Completion:	Ongoing
Potential Fund Sources:	Public Funds, Grants as needed.
Local Planning Mechanisms to be Used in Implementation, if any:	n/a
Progress Report	
Action Status	In Progress
Report of Progress	
Completed by:	

Action 3.8 Lightning Protection

Action Worksheet	
Name of Jurisdiction:	City of Greenville
Risk / Vulnerability	
Problem being Mitigated:	Lightning
Hazard(s) Addressed:	Thunder Storm
Action or Project	
Action/Project Number:	Storm 1
Name of Action or Project:	Lightning Protection
Action or Project Description:	Explore needed lightning protection at critical facilities and communication equipment
Applicable Goal Statement:	Implement mitigation actions that improve the protection of public and private property from the adverse effects of disaster
Estimated Cost:	$8,000
Benefits:	Continuity of services
Plan for Implementation	
Responsible Organization/Department:	Director of Public Works
Action/Project Priority:	Low, 24
Timeline for Completion:	Ongoing
Potential Fund Sources:	Public Funds, Grants as needed.
Local Planning Mechanisms to be Used in Implementation, if any:	n/a
Progress Report	
Action Status	In Progress
Report of Progress	
Completed by:	

Action 3.8 Lightning Protection

Action Worksheet	
Name of Jurisdiction:	Village of Mill Spring
Risk / Vulnerability	
Problem being Mitigated:	Lightning
Hazard(s) Addressed:	Thunder Storm
Action or Project	
Action/Project Number:	Storm 1
Name of Action or Project:	Lightning Protection
Action or Project Description:	Explore needed lightning protection at critical facilities and communication equipment
Applicable Goal Statement:	Implement mitigation actions that improve the protection of public and private property from the adverse effects of disaster
Estimated Cost:	$8,000
Benefits:	Continuity of services
Plan for Implementation	
Responsible Organization/Department:	President of the Board of Trustees
Action/Project Priority:	Low, 24
Timeline for Completion:	Ongoing
Potential Fund Sources:	Public Funds, Grants as needed.
Local Planning Mechanisms to be Used in Implementation, if any:	n/a
Progress Report	
Action Status	In Progress
Report of Progress	
Completed by:	

Action 3.8 Lightning Protection

Action Worksheet	
Name of Jurisdiction:	Clearwater R-I School District
Risk / Vulnerability	
Problem being Mitigated:	Lightning
Hazard(s) Addressed:	Thunderstorm
Action or Project	
Action/Project Number:	Storm 1
Name of Action or Project:	Lightning Protection
Action or Project Description:	Explore needed lightning protection at critical facilities and communication equipment
Applicable Goal Statement:	Implement mitigation actions that improve the protection of public and private property from the adverse effects of disaster
Estimated Cost:	$8,000
Benefits:	Continuity of services
Plan for Implementation	
Responsible Organization/Department:	School Superintendent
Action/Project Priority:	Low, 24
Timeline for Completion:	Ongoing
Potential Fund Sources:	Public Funds, Grants as needed.
Local Planning Mechanisms to be Used in Implementation, if any:	n/a
Progress Report	
Action Status	In Progress
Report of Progress	
Completed by:	

Action 3.8 Lightning Protection

Action Worksheet	
Name of Jurisdiction:	Greenville R-II School District
Risk / Vulnerability	
Problem being Mitigated:	Lightning
Hazard(s) Addressed:	Thunder Storm
Action or Project	
Action/Project Number:	Storm 1
Name of Action or Project:	Lightning Protection
Action or Project Description:	Explore needed lightning protection at critical facilities and communication equipment
Applicable Goal Statement:	Implement mitigation actions that improve the protection of public and private property from the adverse effects of disaster
Estimated Cost:	$8,000
Benefits:	Continuity of services
Plan for Implementation	
Responsible Organization/Department:	School Superintendent
Action/Project Priority:	Low, 24
Timeline for Completion:	Ongoing
Potential Fund Sources:	Public Funds, Grants as needed.
Local Planning Mechanisms to be Used in Implementation, if any:	n/a
Progress Report	
Action Status	In Progess
Report of Progress	
Completed by:	

Action 3.9 Mapping of Sinkholes

Action Worksheet	
Name of Jurisdiction:	Wayne County
Risk / Vulnerability	
Problem being Mitigated:	Sink Holes
Hazard(s) Addressed:	Sink Holes, Land Subsidence
Action or Project	
Action/Project Number:	Land Subsidence 2
Name of Action or Project:	Mapping of Sinkholes
Action or Project Description:	Create a county wide map of active, and potential sinkholes.
Applicable Goal Statement:	Implement mitigation actions that improve the protection of public and private property from the adverse effects of disasters.
Estimated Cost:	$8,000
Benefits:	Public education, prevent future accidents
Plan for Implementation	
Responsible Organization/Department:	County Emergency Management Director
Action/Project Priority:	Medium, 26
Timeline for Completion:	Ongoing
Potential Fund Sources:	Public Funds, Grants as needed.
Local Planning Mechanisms to be Used in Implementation, if any:	*Wayne County Hazard Mitigation Plan, 2018*
Progress Report	
Action Status	In progess subject to funding availability
Report of Progress	
Completed by:	

Action 3.10 Integrate Into Other Plans

Action Worksheet	
Name of Jurisdiction:	Wayne County
Risk / Vulnerability	
Problem being Mitigated:	Education
Hazard(s) Addressed:	Integration, All
Action or Project	
Action/Project Number:	HMP 6
Name of Action or Project:	Integrate into other plans
Action or Project Description:	Integrate hazard mitigation plan into other community plans, such as the comprehensive plan so all documents work together
Applicable Goal Statement:	Implement mitigation actions that improve the protection of community tranquility from the adverse effects of disasters
Estimated Cost:	n/a
Benefits:	Public information, planning alignment
Plan for Implementation	
Responsible Organization/Department:	Presiding Commissioner
Action/Project Priority:	Low, 23
Timeline for Completion:	Ongoing
Potential Fund Sources:	Public Funds
Local Planning Mechanisms to be Used in Implementation, if any:	n/a
Progress Report	
Action Status	In progress as opportunity permits
Report of Progress	
Completed by:	

Action 3.10 Integrate Into Other Plans

Action Worksheet	
Name of Jurisdiction:	City of Greenville
Risk / Vulnerability	
Problem being Mitigated:	Education
Hazard(s) Addressed:	Integration, All
Action or Project	
Action/Project Number:	HMP 6
Name of Action or Project:	Integrate into other plans
Action or Project Description:	Integrate hazard mitigation plan into other community plans, such as the comprehensive plan so all documents work together
Applicable Goal Statement:	Implement mitigation actions that improve the protection of community tranquility from the adverse effects of disasters
Estimated Cost:	n/a
Benefits:	Public information, planning alignment
Plan for Implementation	
Responsible Organization/Department:	City Mayor
Action/Project Priority:	Low, 23
Timeline for Completion:	Ongoing
Potential Fund Sources:	Public Funds
Local Planning Mechanisms to be Used in	n/a
Implementation, if any:	
Progress Report	
Action Status	In progress as opportunity permits
Report of Progress	
Completed by:	

Action 3.10 Integrate Into Other Plans

Action Worksheet	
Name of Jurisdiction:	City of Williamsville
Risk / Vulnerability	
Problem being Mitigated:	Education
Hazard(s) Addressed:	Integration, All
Action or Project	
Action/Project Number:	HMP 6
Name of Action or Project:	Integrate into other plans
Action or Project Description:	Integrate hazard mitigation plan into other community plans, such as the comprehensive plan so all documents work together
Applicable Goal Statement:	Implement mitigation actions that improve the protection of community tranquility from the adverse effects of disasters
Estimated Cost:	n/a
Benefits:	Public information, planning alignment
Plan for Implementation	
Responsible Organization/Department:	City Mayor
Action/Project Priority:	Low, 23
Timeline for Completion:	Ongoing
Potential Fund Sources:	Public Funds
Local Planning Mechanisms to be Used in	n/a
Implementation, if any:	
Progress Report	
Action Status	In progress as opportunity permits
Report of Progress	
Completed by:	

Action 3.10 Integrate Into Other Plans

Action Worksheet	
Name of Jurisdiction:	Village of Mill Spring
Risk / Vulnerability	
Problem being Mitigated:	Education
Hazard(s) Addressed:	Integration, All
Action or Project	
Action/Project Number:	HMP 6
Name of Action or Project:	Integrate into other plans
Action or Project Description:	Integrate hazard mitigation plan into other community plans, such as the comprehensive plan so all documents work together
Applicable Goal Statement:	Implement mitigation actions that improve the protection of community tranquility from the adverse effects of disasters
Estimated Cost:	n/a
Benefits:	Public information, planning alignment
Plan for Implementation	
Responsible Organization/Department:	President of the Board of Trustees
Action/Project Priority:	Low, 23
Timeline for Completion:	Ongoing
Potential Fund Sources:	Public Funds
Local Planning Mechanisms to be Used in	n/a
Implementation, if any:	
Progress Report	
Action Status	In progress as opportunity permits
Report of Progress	
Completed by:	

Action 3.10 Integrate Into Other Plans

Action Worksheet	
Name of Jurisdiction:	City of Piedmont
Risk / Vulnerability	
Problem being Mitigated:	Education
Hazard(s) Addressed:	Integration, All
Action or Project	
Action/Project Number:	HMP 6
Name of Action or Project:	Integrate into other plans
Action or Project Description:	Integrate hazard mitigation plan into other community plans, such as the comprehensive plan so all documents work together
Applicable Goal Statement:	Implement mitigation actions that improve the protection of community tranquility from the adverse effects of disasters
Estimated Cost:	n/a
Benefits:	Public information, planning alignment
Plan for Implementation	
Responsible Organization/Department:	City Mayor
Action/Project Priority:	Low, 23
Timeline for Completion:	Ongoing
Potential Fund Sources:	Public Funds
Local Planning Mechanisms to be Used in	n/a
Implementation, if any:	
Progress Report	
Action Status	In progress as opportunity permits
Report of Progress	
Completed by:	

3.10 Integrate Into Other Plans

Action Worksheet	
Name of Jurisdiction:	Greenville R-II School District
Risk / Vulnerability	
Problem being Mitigated:	Education
Hazard(s) Addressed:	Integration, All
Action or Project	
Action/Project Number:	HMP 6
Name of Action or Project:	Integrate into other plans
Action or Project Description:	Integrate hazard mitigation plan into other community plans, such as the comprehensive plan so all documents work together
Applicable Goal Statement:	Implement mitigation actions that improve the protection of community tranquility from the adverse effects of disasters
Estimated Cost:	n/a
Benefits:	Public information, planning alignment
Plan for Implementation	
Responsible Organization/Department:	School Superintendent
Action/Project Priority:	Low, 23
Timeline for Completion:	Ongoing
Potential Fund Sources:	Public Funds
Local Planning Mechanisms to be Used in	n/a
Implementation, if any:	
Progress Report	
Action Status	In progress as opportunity permits
Report of Progress	
Completed by:	

Action 3.10 Integrate Into Other Plans

Action Worksheet	
Name of Jurisdiction:	Clearwater R-I School District
Risk / Vulnerability	
Problem being Mitigated:	Education
Hazard(s) Addressed:	Integration, All
Action or Project	
Action/Project Number:	HMP 6
Name of Action or Project:	Integrate into other plans
Action or Project Description:	Integrate hazard mitigation plan into other community plans, such as the comprehensive plan so all documents work together
Applicable Goal Statement:	Implement mitigation actions that improve the protection of community tranquility from the adverse effects of disasters
Estimated Cost:	n/a
Benefits:	Public information, planning alignment
Plan for Implementation	
Responsible Organization/Department:	School Superintendent
Action/Project Priority:	Low, 23
Timeline for Completion:	Ongoing
Potential Fund Sources:	Public Funds
Local Planning Mechanisms to be Used in	n/a
Implementation, if any:	
Progress Report	
Action Status	In progress as opportunity permits
Report of Progress	
Completed by:	

Goal 4: *Implement mitigation actions that improve the protection of community tranquility from the adverse effects of disasters.*

Action 4.1 NFIP Community Rating System

Action Worksheet	
Name of Jurisdiction:	Wayne County
Risk / Vulnerability	
Problem being Mitigated:	Public Awareness
Hazard(s) Addressed:	Flooding
Action or Project	
Action/Project Number:	Flood 5
Name of Action or Project:	National Flood Insurance Program
Action or Project Description:	Explore CRS participation county-wide and receive a community rating
Applicable Goal Statement:	Implement mitigation actions that improve the protection of community tranquility from the adverse effects of disasters
Estimated Cost:	$20,000
Benefits:	Flood hazard awareness
Plan for Implementation	
Responsible Organization/Department:	County Emergency Management Director – Action Identification County Commisison - Implementation
Action/Project Priority:	Low, 19
Timeline for Completion:	Ongoing
Potential Fund Sources:	Public Funds, Grants as needed.
Local Planning Mechanisms to be Used in Implementation, if any:	*Ozark Foothills Regional Comprehensive Economic Development Strategy, 2018*
Progress Report	
Action Status	In progress subject to funding availability
Report of Progress	
Completed by:	

5 PLAN MAINTENANCE PROCESS

This section provides an overview of the overall strategy for plan maintenance and outlines the method and schedule for monitoring, updating and evaluating the plan. The chapter also discusses incorporating the plan into existing planning mechanisms and how to address continued public involvement.

5.1 Monitoring, Evaluating, and Updating the Plan

44 CFR Requirement 201.6(c)(4): The plan maintenance process shall include a section describing the method and schedule of monitoring, evaluating, and updating the mitigation plan within a five-year cycle.

5.1.1 Responsibility for Plan Maintenance

The Mitigation Planning Committee (MPC) will be a standing committee appointed by the Wayne County Commission, with oversight provided by the Ozark Foothills Regional Planning Commission. The role of the MPC in regard to implementation monitoring, action evaluation and plan maintenance is descried below. The participating jurisdictions, public water supply districts, and school districts commit to conduct the following:

- Meet annually, and after a disaster event, to monitor and evaluate the implementation of the plan;
- Act as a forum for hazard mitigation issues;
- Disseminate hazard mitigation ideas and activities to all participants;
- Pursue the implementation of high priority, low- or no-cost recommended actions;
- Maintain vigilant monitoring of multi-objective, cost-share, and other funding opportunities to help the community implement the plan's recommended actions for which no current funding exists;
- Monitor and assist in implementation and update of this plan;
- Keep the concept of mitigation in the forefront of community decision making by identifying plan recommendations when other community goals, plans, and activities overlap, influence, or directly affect increased community vulnerability to disasters;

- Report upon plan progress and recommended changes to the County Commissioners and governing bodies of participating jurisdictions; and
- Inform and solicit input from the public.

The MPC is an advisory body and can only make recommendations to county, city, town, or district elected officials. Its primary duty is to see the plan successfully carried out and to report to the community governing boards and the public on the status of plan implementation and mitigation opportunities. Other duties include reviewing and promoting mitigation proposals, hearing stakeholder concerns about hazard mitigation, passing concerns on to appropriate entities, and posting relevant information in areas accessible to the public.

5.1.2 Plan Maintenance Schedule

The MPC agrees to meet annually and after a state or federally-declared hazard event as appropriate to monitor progress and update the mitigation strategy. The Wayne County Emergency Management Director will be responsible for initiating the plan reviews and will invite members of the MPC to the meeting, as well as document all review meetings.

In coordination with all participating jurisdictions, a five-year written update of the plan will be submitted to the Missouri State Emergency Management Agency (SEMA) and FEMA Region VII per Requirement §201.6(c)(4)(i) of the Disaster Mitigation Act of 2000, unless disaster or other circumstances (e.g., changing regulations) require a change to this schedule.The presiding commissioner of Wayne County, Missouri will be responsible for initiating the five-year update.

The Ozark Foothills Regional Planning Commission, upon direction from the Wayne County Commission, will begin the planning and updating of the plan in five years. From that point forward, the plan will be updated every five years via committee meetings and discussion. The MPC will take into consideration all notes and reports discussed at each annual review preceding the five-year plan update.

5.1.3 Plan Maintenance Process

Progress on the proposed actions can be monitored by evaluating changes in vulnerabilities identified within the plan. The staff at the OFRPC will be responsible for iniating the update process for the Plan. The MPC, during the annual meeting, should review changes in vulnerability identified as follows:

- Decreased vulnerability as a result of implementing recommended actions,
- Increased vulnerability as a result of failed or ineffective mitigation actions,
- Increased vulnerability due to hazard events, and/or
- Increased vulnerability as a result of new development (and/or annexation).

Future five-year updates to this plan will include the following activities:

- Consideration of changes in vulnerability due to action implementation,
- Documentation of success stories where mitigation efforts have proven effective,
- Documentation of unsuccessful mitigation actions and why the actions were not effective,
- Documentation of previously overlooked hazard events that may have occurred since the previous plan approval,

- Incorporation of new data or studies with information on hazard risks,
- Incorporation of new capabilities or changes in capabilities,
- Incorporation of growth data and changes to inventories, and
- Incorporation of ideas for new actions and changes in action prioritization.

To best evaluate any changes in vulnerability resulting from plan implementation, the participating jurisdictions will adopt the following process:

- Each proposed action in the plan identified an individual, office, or agency responsible for action implementation. This entity will track and report on an annual basis to the jurisdictional MPC member on action status. The entity will provide input on whether the action as implemented meets the defined objectives and is likely to be successful in reducing risk.
- If the action does not meet identified objectives, the jurisdictional MPC member will determine necessary remedial action, making any required modifications to the plan.

Changes will be made to the plan to remedy actions that have failed or are not considered feasible. Feasibility will be determined after a review of action consistency with established criteria, time frame, community priorities, and/or funding resources. Actions that were not ranked high but were identified as potential mitigation activities will be reviewed as well during the monitoring of this plan. Updating of the plan will be accomplished by written changes and submissions, as the MPC deems appropriate and necessary. Changes will be approved by the Wayne County Commission and the governing boards of the other participating jurisdictions.

5.2 Incorporation into Existing Planning Mechanisms

44 CFR Requirement §201.6(c)(4)(ii): [The plan shall include a] process by which local governments incorporate the requirements of the mitigation plan into other planning mechanisms such as comprehensive or capital improvement plans, when appropriate.

Actions identified from the prevous (2012) hazard mitigation plan were incorporated into the region's *2013 Comprehensive Economci Develoment Strategy* completed by the Ozark Foothills Regional Planning Commission for five scounties—one of which was Wayne County. All jurisdictions within the five southeastern Missorui counties—including Wayne County—were included within the regional planning document. Actions and recommendations from the *2012 Wayne County Hazard Mitigation Plan* were incorporated where feasible.

Following this update and when possible, plan participants, including school and special districts, will incorporate the hazard mitigation actions identified within this planning document into existing plans and/or programs. Those existing plans and programs were described in Section 2 of this plan. Wayne County and its participating jurisdictions did not incorporate identified mitigation actions from the *2013 Wayne County Hazard Mitigation Plan* into other planning mechanisms.

Based on the capability assessments of the participating jurisdictions, communities in Wayne County will continue to plan and implement programs to reduce losses to life and property from hazards. The *2018 Wayne County Hazard Mitigation Plan* will be consulted when developing/ updating other plans created for Wayne County to promote economic resiliency of the participating jurisdictions. This plan builds upon the momentum developed through previous planning efforts and mitigation programs, and recommends incorporating implementation actions, where possible, within the following plans:

- general, master, or comprehensive plans of participating jurisdictions;
- ordinances of participating jurisdictions;
- the *Ozark Foothills Regional Comprehensive Economic Development Strategy*;
- the *Wayne County Emergency Operations Plan*;
- capital improvement plans and budgets;
- other community plans within/for the county, such as water conservation plans, storm water management plans, and parks and recreation plans;
- school and special district plans and budgets; and,
- other plans and policies outlined in the capability assessment sections for each jurisdiction in Section 2 of this plan.

The MPC members involved in updating these existing planning mechanisms will be responsible for integrating the findings and actions of the mitigation plan, as appropriate. The MPC is also responsible for monitoring this integration and incorporation of the appropriate information into the five-year update of the multi-jurisdictional hazard mitigation plan.

Additionally, after the annual review of the Hazard Mitigation Plan, the Wayne County Emergency Management Director will provide the updated Mitigation Strategy with current status of each mitigation action to the County Commission, as well as all Mayors, City Clerks, and School District Superintendents. The Emergency Manager Director will request that the mitigation strategy be incorporated, where appropriate, in other planning mechanisms.

Table 5.1 below lists the planning mechanisms by jurisdiction into which the *Wayne County Hazard Mitigation Plan* will be integrated.

Table 5.1 Planning Mechanisms Identified for Integration of Hazard Mitigation Plan

Jurisdiction	Planning Mechanisms
Unincorporated Wayne County	County Mitigation Plan Regional Comprehensive Economic Devleopment Strategy Regoinal Transportation Plan
City of Greenville	County Mitigation Plan Regional Transportation Plan
Village of Mill Spring	County Mitigation Plan Regional Transportation Plan Regional Comprehensive Economic Devleopment Strategy
City of Piedmont	Local Emergency Plan County Mitigation Plan City Comprehensive Plan Regional Comprehensive Economic Devleopment Strategy Regional Transportation Plan
City of Williamsville	County Mitigation Plan Regional Comprehensive Economic Devleopment Strategy Regional Transportation Plan
Clearwater R-I	Emergency Operations Plan Annual Budget School Calendar Safety and Security Procedures

Greenville R-II	Emergency Operations Plan Annual Budget School Calendar Safety and Security Procedures

5.3 Continued Public Involvement

44 CFR Requirement §201.6(c)(4)(iii): [The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.

The hazard mitigation plan update process provides an opportunity to publicize success stories resulting from the plan's implementation and seek additional public comment. Information about the annual reviews will be posted in the local newspaper as well as on the Wayne County website following each annual review of the mitigation plan. When the MPC reconvenes for the five-year update, it will coordinate with all stakeholders participating in the planning process. Included in this group will be those who joined the MPC after the initial effort, to update and revise the plan. Public notices will be posted and public participation will be actively solicited, at a minimum, through available website/social media postings and press releases to local media outlets—primarily newspapers.

APPENDICES

Appendix A
Participation Documentation

WAYNE COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN UPDATE
KICKOFF MEETING—SIGN-IN SHEET

Project:	Wayne County, Missouri Multi-jurisdictional Hazard Mitigation Plan Update	**Meeting Date/Time:**	11/23/2017-11:00 A.M.
Facilitator:	Samantha Rodgers, Ozark Foothills Regional Planning Commission	**Place/Room:**	Wayne County Courthouse-Commissioner Chambers

Name	Title	Department/Agency	Email	Phone #	Signature
Bill Hovis	EAST DIST Commissioner	WAYNE County		M 573-495 2449 C 573-714 5970	James W Hovis
BRIAN POLK	Commissioner	Wayne Co	Wayne @ sos mo gov bpolk @ windstream.net	573-2245600 573-429-6365	
Chad Henson	WEST DIST. Commissioner	Wayne Co.	hensonfire@yahoo.com	573-223-7454 " 429-3234	
Brenda Seal	County Clerk	Wayne Co	wayne@sos.mo.gov	573-224-5600 x 4	Brenda Seal
Tammy Thurman	City Clerk	City of Piedmont	tammy@cityofpiedmont.com	573-323-7100	Tammy Thurman
Carol Hale	Wayne County Treasurer	Wayne Co	Waynetreasurer@windstream.net	573-224-5600 Ext 229	Carol Hale
Lynn Schultz	City Clerk Williamsville	City of Williamsville	Lynn Schultz III @ Yahoo.com	573-9983184	Lynn Schultz
Matt Winters	OFRC				

WAYNE COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN UPDATE
MEETING #2—SIGN-IN SHEET

Project:	Wayne County, Missouri Multi-jurisdictional Hazard Mitigation Plan Update	**Meeting Date/Time:**	6/20/2017 11:00 AM
Facilitator:	Samantha Rodgers –Ozark Foothills Regional Planning Commission	**Place/Room:**	Wayne County Courthouse

Name	Title	Department/Agency	Email	Phone #	Signature
Tammy Thurman	City Clerk	City of Piedmont	tammy@cityofpiedmont.com	573-223-7660	Tammy Thurman
Lynn Scholitz	City Clerk	City of Williamsville	lynnscholtz111@yahoo.com	573-998-3184	Lynn Scholitz
Angela Clyburn	Chairman	Village Mill Spring	abeclyburn@windstream.net	573-223-2832	
Richard L. Russell	Private Citizen	Self	None	858-525-1849	Richard L. Russell
Carol Hale	Treasurer	Wayne County	waynetreasurer@windstream.net	573-224-5600 x2229	Carol Hale
Bill Hovis	Commissioner	Wayne County		573-495-2447	Bill Hovis
Brian Polk	Commissioner	Wayne Co	wayne@sos.mo.gov	573-224-5600	Brian Polk
Chad Henson	Commissioner	Wayne Co.	hensonfive@yahoo.com	573-224-5600 ext 4	Chad Henson
Brenda Seal	Clerk	Wayne Co	wayne@sos.mo.gov	573-224-5600x4	Brenda Seal
Todd Porter	Superintendent	Greenville R-II School	tporter@bears.k12.mo.us	573-224-5000	Todd Porter

WAYNE COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN UPDATE
MEETING #3—SIGN-IN SHEET

Project:	Wayne County, Missouri Multi-jurisdictional Hazard Mitigation Plan Update	**Meeting Date/Time:**	7/25/2017 11:00 AM
Facilitator:	Samantha Rodgers, Ozark Foothills Regional Planning Commission Project Coordinator	**Place/Room:**	Wayne County Courthouse- Commissioner Chambers

Name	Title	Department/Agency	Email	Phone #	Signature
Robin Bales	deputy clerk	County Clerk	wayne@sos.mo.gov	573-224-5600 ext 4	
Lynn Schultz	City Clerk	City Wappapello	LynnSchultz111@yahoo.com	573-998-3184	
Dean Finch	Sheriff	Wayne County	deanfinch@windstream.net	573-224-3219	
James W Yates	Commissioner	Wayne County		573-495-2443	
BRIAN POLK	commissioner	Wayne Co	Wayne@sos.mo.gov	573-224-5600	
Chad Henson	Commissioner	Wayne Co.	henson five@yahoo.com	573 429-3234	

OZARK FOOTHILLS REGIONAL PLANNING COMMISSION

LAKE WAPPAPELLO
BILL R. EMERSON VISITORS' CENTER
August 29, 2017

SIGN IN SHEET

	NAME	AFFILIATION
1.	Debbie Griffin	Cong. Smith's office
2.	Angela Smith	Williamsville MO
3.	Helen Carter	Williamsville Mo
4.	Lyn Schultz	Williamsville (City Clerk)
5.	HELEN Edwards	Williamsville MO.
6.	DAVID EdWARDS	Williamsville MO.
7.	Donald Black	Carter County
8.	Wayne Gibbs	CARTER
9.	Becky Gibbs	CARTER Co.
10.	Brenee Poe	Wayne
11.	Ronda Poe	" "
12.	Witt Kilpatrick	Piedmont
13.	Tina Bell	" "
14.	Niki Harp	OFRPC
15.	Mike WATKINS	OFRPC
16.	Ilene Ward	OFRPC
17.	[illegible]	OFRPC
18.	Eugene Shanor	OFRPC
19.	Bill Kenner	Ripley County
20.	Ed DeBarris	Poplar Bluff
	Samantha Rodgers	Staff

OZARK FOOTHILLS REGIONAL PLANNING COMMISSION
LAKE WAPPAPELLO
BILL R. EMERSON VISITORS' CENTER
August 29, 2017

SIGN IN SHEET

	NAME	AFFILIATION
1.	Kim Diamond	City of Fisk
2.	Paul Anderson	Recycling Center
3.	Dale J. Bowen	Recycling Center
4.		Mayor Neelyville
5.	Ronnie Pritchett	Village of Millspring
6.	Susan Pritchett	" "
7.	Vince Lampe	Butler County
8.	Cathy Lampe	Butler County
9.	Dennis Avery	City of PB
10.	Margaret Carter	First Midwest Bk-Comm
11.	Paul Johnson	Reynolds Co.
12.	Edwd Cary	Butler County
13.	Darrell Dement	Reynolds Ct.
14.	Gloria Dement	Reynolds County
15.	Mildred Cooper	Poplar Bluff, Mo
16.	Joanne Ritter	Guest @ PB
17.	Camille Donnell	OFRPC
18.	Matt Winters	OFRPC
19.		OFRPC
20.	Clifford Smith	Williamsville

OZARK FOOTHILLS REGIONAL PLANNING COMMISSION

LAKE WAPPAPELLO
BILL R. EMERSON VISITORS' CENTER
August 29, 2017

SIGN IN SHEET

	NAME	AFFILIATION
1.	Diana Ferguson	OFRPC
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OZARK FOOTHILLS REGIONAL PLANNING COMMISSION

3019 FAIR ST.
POPLAR BLUFF, MISSOURI 63901
JUNE 14, 2017

SIGN IN SHEET

	NAME	AFFILIATION
1.	Carolyn Meeks	OFRPC
2.	[illegible]	OFRPC
3.	Nicola Ferguson	OFRPC
4.	Becky Gibbs	CARTER Co.
5.	Wayne Giggs	CARTER Co.
6.	Niki Harp	OFRPC
7.	[illegible]	OFRPC Recycle
8.	Angela Smith	Wayne/Williamsville
9.	Camille Donnell	OFRPC
10.	Ed. DeBarris	City of Poplar Bluff
11.	[illegible]	OFRPC
12.	Dennis Avery	City of PB
13.	John Anderson	OFRPC Recycling
14.	Gary Emmons	Ripley Co. Comm.
15.	Donald Black	CARTER County
16.	[illegible]	Wayne/Piedmont
17.	Eugene Shannon	OFRPC Recycling
18.	Vince Lample	Butler County
19.	Matt Winters	
20.	[illegible]	

OZARK FOOTHILLS REGIONAL PLANNING COMMISSION

3019 FAIR ST.
POPLAR BLUFF, MISSOURI 63901
JUNE 14, 2017

SIGN IN SHEET

	NAME	AFFILIATION
1.	Chatchai Pinthuprapa	DED/DE
2.	Paul Johnson	Reynolds Co.
3.	Brian Polk	Wayne County
4.	[illegible]	Guest - Wayne
5.	Felicity Ray	OFRPC
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OZARK FOOTHILLS REGIONAL PLANNING COMMISSION
3019 FAIR ST.
POPLAR BLUFF, MO 63901
DECEMBER 14, 2017

SIGN IN SHEET

	NAME/PRINT	AFFILIATION
1.	Camille Donnell	OFRPC
2.	Mike Watkins	OFRPC
3.	Kim Diamond	City of Fisk
4.	Kyle Arbuckle	Jason Smith's office
5.	Russell French	~~SEMO Insurance~~
6.	Sarah French	SEMO Insurance
7.	Eugene Sharon	OFRPC
8.	Ronnie Pritchett	Village of Millspring
9.	Susan Pritchett	" "
10.	Wm Harper	Butler County
11.	Georgia Woods	City of Piedmont
12.	Matt Winters	OFRPC
13.	KENT BOAZMAN	WAYNE CO. EMA
14.	Sharon Bowman	wayne Co EMA
15.	Bobby Gibson	Carter County
16.	Wayne Gibbs	CARTER
17.	Sharron Sargent	Neelyville
18.	Joe Loyd	Reynolds Co.
19.	Edward Conway	Poplar Bluff UEHDC
20.	Andrew Mentz	OFRPC

OZARK FOOTHILLS REGIONAL PLANNING COMMISSION
3019 FAIR ST.
POPLAR BLUFF, MO 63901
DECEMBER 14, 2017

SIGN IN SHEET

	NAME/PRINT	AFFILIATION
1.	PETE KAPUSNSKI	BURNS & McDONNELL
2.	Christy Mercer	U.S. Senator Claire McCaskill
3.	Arnold Smith	Wayne/Williamsville
4.	Lisa Lansford	Spouse
5.	Clifford Smith	Williamsville
6.	John/Mary Anderson	Recycle Employee
7.	GREGORY & PAM KIRK	UGRM
8.	Ed DeGaris	City of P.B.
9.	Tosha Roberts	City of Fisk
10.	Gene Billey	City of Williamsville
11.	Betty Billey	" " "
12.	HECEN CRITES	" " "
13.	Mildred Causey	" " Poplar Bluff
14.	Ronda Polk	Guest - Wayne Co
15.	Margaret Carter	Board Comm.
16.	Gloria Clement	Reynolds Co
17.	Dennis Avery	City of PB
18.	Carolyn Meeks	OFRPC
19.	Hannah Barnett	OFRPC
20.	Niki Harp	OFRPC

OZARK FOOTHILLS REGIONAL PLANNING COMMISSION

3019 FAIR ST.
POPLAR BUFF, MO 63901
DECEMBER 14, 2017

SIGN IN SHEET

	NAME/PRINT	AFFILIATION
1.	Jamie Lansford	Recycle
2.	EDDIE WILLIAMS	Reynolds Co.
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Appendix B
Adoption Resolutions

Greenville R-II School District Resolution

Greenville R-II School District, Missouri RESOLUTION NO. 01-2018

A RESOLUTION OF THE Board of the Greenville R-II School District ADOPTING THE Wayne County Hazard Mitigation Plan

WHEREAS the Board of Greenville R-II School District recognizes the threat that natural hazards pose to people and property within the Greenville R-II School District; and

WHEREAS the Board of Directors of the Greenville R-II School District has participated in the preparation of a multi-jurisdictional local hazard mitigation plan, hereby known as the Wayne County Hazard Mitigation Plan, hereafter referred to as the *Plan*, in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS the *Plan* identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the Greenville R-II School District from the impacts of future hazards and disasters; and

WHEREAS the Greenville R-II School District recognizes that land use policies have a major impact on whether people and property are exposed to natural hazards, the Greenville R-II School District will endeavor to integrate the *Plan* into the comprehensive planning process; and

WHEREAS adoption by the Greenville R-II School District demonstrates their commitment to hazard mitigation and achieving the goals outlined in the *Plan*.

NOW THEREFORE, BE IT RESOLVED BY THE Board of the Greenville R-II School District, in the State of Missouri, THAT:

In accordance with the guidelines, the Greenville R-II School District adopts the final *FEMA-approved Plan*.

ADOPTED by a vote of 4 in favor and 0 against, and 0 abstaining, this 15th day of February, 2018.

By (Sig): Brad C. Miller

Print name: Brad Miller

ATTEST:

By (Sig.): Paul B. Allen

Print name: Paul B. Allen

APPROVED AS TO FORM:

By (Sig.): _____

Print name: _____

Principals

Rick Clubb, Jr.
Junior High School
High School
(573) 224-3618
Fax: 224-3580

Scottie Blackburn
Greenville Elem.
(573) 224-3617
Fax: 224-3819

Diane Meyer
Williamsville Elem.
(573) 998-2313
Fax: 998-2339

Board of Education

Brad Miller
President

Steve Marler
Vice President

Brian Allen
Secretary of the Board

Patti McDaniel
Treasurer

Members:

John Berger
Rick Clubb Sr.
Gail Golden
Lee Hillis

GREENVILLE R-II SCHOOL DISTRICT

Todd Porter, Superintendent
127 Walnut Street
PO Box 320
Greenville MO 63944
Telephone (573) 224-3844 Fax (573) 224-3412

BOARD MEETING MINUTES

DATE: FEBRUARY 15, 2018 6:00 P.M.

ESTHER FRAZIER ADMINISTRATION BUILDING

I. ROLL CALL 6:00 p.m.

Allen Berger Clubb Golden Hillis Marler Miller

Board members absent from meeting: Allen, Clubb, Golden

II. APPROVAL OF AGENDA

Motion: To approve agenda
Motion by: Lee Hillis Second by: Steve Marler Carried: 4-0

III. CONSENT AGENDA

a. Approval of Board Minutes – January 18, 2018 Regular Meeting
b. Payment of Bills
c. MSBA Update of Policies, Procedures, and Forms
d. Substitute List

Motion: To approve consent agenda
Motion by: Brad Miller Second by: John Berger Carried: 4-0

IV. REGULAR AGENDA

Old Business

V. Reports

a. Building Principal Reports

Motion: None

VI. District-Wide Evaluation of Programs/Reports

a. A+

Motion: None

b. Curriculum Report – Math Collaboration

Motion: None

VII. Discussion

a. 2018-19 School Calendar

Motion: To approve the 2018-19 school calendar

Motion by: John Berger Second by: Lee Hillis Carried: 4-0

b. Summer School – June 4-29, 2018

Motion: To set summer school dates for June 4-29, 2018

Motion by: Lee Hillis Second by: Steve Marler Carried: 4-0

c. 2018-19 Milk Prices

Motion: To set the 2018-19 milk prices at $.40

Motion by: John Berger Second by: Steve Marler Carried: 4-0

d. Bus Purchase

Motion: To lease purchase 3 new buses

Motion by: Lee Hillis Second by: Brad Miller Carried: 4-0

e. Hazard Mitigation Plan

Motion: To adopt the Wayne County Hazard Mitigation Plan

Motion by: John Berger Second by: Steve Marler Carried: 4-0

f. Vocational Enhancement Grant

Motion: To approve the Vocational Enhancement Grant for the 2018-19 school year

Motion by: Lee Hillis Second by: John Berger Carreid: 4-0

g. Safe Room

Motion: None

VIII. EXECUTIVE (CLOSED) SESSION-Pursuant to 610.021 RSMO (No 1, No. 3 and No. 13)

Motion: To enter executive session Time:

Motion by: Second by: Carried:

Allen () Berger () Clubb () Golden () Hillis () Marler () Miller ()

a. Resignations

b. Hiring, Firing, Disciplining or Promoting Employee

Dismiss Executive Session

Motion: To Dismiss Executive Session Time:
Motion by: Second by: Carried:
Allen () Berger () Clubb () Golden () Hillis () Marler () Miller ()

XI. Adjournment

Motion: To Dismiss Meeting Time: 6:22 pm
Motion by: Brad Miller Second by: Lee Hillis Carried: 4-0

Brad Miller, Board President

Brian Allen, Board Secretary

Village of Mill Spring Resolution

Village of Mill Spring, Missouri RESOLUTION NO. ____

A RESOLUTION OF THE Board of Directors ADOPTING THE Wayne County Hazard Mitigation Plan

WHEREAS the Board of Village of Mill Spring recognizes the threat that natural hazards pose to people and property within the Village of Mill Spring; and

WHEREAS the Village of Mill Spring has participated in the preparation of a multi-jurisdictional local hazard mitigation plan, hereby known as the Wayne County Hazard Mitigation Plan, hereafter referred to as the *Plan*, in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS the *Plan* identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the *Village of Mill Spring* from the impacts of future hazards and disasters; and

WHEREAS the Village of Mill Spring recognizes that land use policies have a major impact on whether people and property are exposed to natural hazards, the Village of Mill Spring will endeavor to integrate the *Plan* into the comprehensive planning process; and

WHEREAS adoption by the Board of Directors of the Village of Mill Spring demonstrates their commitment to hazard mitigation and achieving the goals outlined in the *Plan*.

NOW THEREFORE, BE IT RESOLVED BY THE Board of Directors of the Village of Mill Spring, in the State of Missouri, THAT:

In accordance within the Village of Mill Spring Ordinance, the Village of Mill Spring adopts the final *FEMA-approved Plan.*

ADOPTED by a vote of__in favor and___against, and___abstaining, this_day of _____,_____.

X By (Sig): _____
Print name: A B Clyburn.

ATTEST:
Fema → By (Sig.): _____
Print name: _____

APPROVED AS TO FORM:
X By (Sig.): Michael E. Smith
Print name: Michael E. Smith

Clearwater R-I School District Resolution

Clearwater R-I School District, Missouri RESOLUTION NO. 1

A RESOLUTION OF THE Board of the Clearwater R-I School District ADOPTING THE Wayne County Hazard Mitigation Plan

WHEREAS the Board of Clearwater R-I School District recognizes the threat that natural hazards pose to people and property within the Clearwater R-I School District; and

WHEREAS the Board of Directors of the Clearwater R-I School District has participated in the preparation of a multi-jurisdictional local hazard mitigation plan, hereby known as the Wayne County Hazard Mitigation Plan, hereafter referred to as the *Plan*, in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS the *Plan* identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the Clearwater R-I School District from the impacts of future hazards and disasters; and

WHEREAS the Clearwater R-I School District recognizes that land use policies have a major impact on whether people and property are exposed to natural hazards, the Clearwater R-I School District will endeavor to integrate the *Plan* into the comprehensive planning process; and

WHEREAS adoption by the Clearwater R-I School District demonstrates their commitment to hazard mitigation and achieving the goals outlined in the *Plan*.

NOW THEREFORE, BE IT RESOLVED BY THE Board of the Clearwater R-I School District, in the State of Missouri, THAT:

In accordance with the guidelines, the Cleawater R-I School District adopts the final *FEMA-approved Plan*.

ADOPTED by a vote of 7 in favor and 0 against, and 0 abstaining, this day of January 8, 2018.

By (Sig): _____
Print name: Robert Gayle

ATTEST:
By (Sig.): _____
Print name: Tom SEAL

APPROVED AS TO FORM:
By (Sig.): _____
Print name: _____

City of Williamsville Resolution

City of Williamsville, Missouri RESOLUTION NO. 01092018

A RESOLUTION OF THE City of Williamsville ADOPTING THE Wayne County Hazard Mitigation Plan

WHEREAS the City Council of Williamsville recognizes the threat that natural hazards pose to people and property within the City of Williamsville; and

WHEREAS the City of Williamsville has participated in the preparation of a multi-jurisdictional local hazard mitigation plan, hereby known as the Wayne County Hazard Mitigation Plan, hereafter referred to as the *Plan*, in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS the *Plan* identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the *City of Williamsville* from the impacts of future hazards and disasters; and

WHEREAS the City of Williamsville recognizes that land use policies have a major impact on whether people and property are exposed to natural hazards, the City of Williamsville will endeavor to integrate the *Plan* into the comprehensive planning process; and

WHEREAS adoption by the City of Williamsville demonstrates their commitment to hazard mitigation and achieving the goals outlined in the *Plan*.

NOW THEREFORE, BE IT RESOLVED BY THE City of Williamsville, in the State of Missouri, THAT:

In accordance with the City of Williamsville City Ordinance, the City of Williamsville adopts the final *FEMA-approved Plan*.

ADOPTED by a vote of 4 in favor and 0 against, and 0 abstaining, this 9 day of Jan. 2018

By (Sig): Angela Smith
Print name: Angela Smith

ATTEST:
By (Sig.): Lynn Schultz
Print name: Lynn Schultz

APPROVED AS TO FORM:
By (Sig.): _____
Print name: _____

City of Greenville Resolution

City of Greenville, Missouri RESOLUTION NO. [illegible]

A RESOLUTION OF THE City of Greenville ADOPTING THE Wayne County Hazard Mitigation Plan

WHEREAS the City Council of Greenville recognizes the threat that natural hazards pose to people and property within the City of Greenville; and

WHEREAS the City of Greenville has participated in the preparation of a multi-jurisdictional local hazard mitigation plan, hereby known as the Wayne County Hazard Mitigation Plan, hereafter referred to as the *Plan*, in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS the *Plan* identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the *City of Greenville* from the impacts of future hazards and disasters; and

WHEREAS the City of Greenville recognizes that land use policies have a major impact on whether people and property are exposed to natural hazards, the City of Greenville will endeavor to integrate the *Plan* into the comprehensive planning process; and

WHEREAS adoption by the City of Greenville demonstrates their commitment to hazard mitigation and achieving the goals outlined in the *Plan*.

NOW THEREFORE, BE IT RESOLVED BY THE City of Greenville, in the State of Missouri, THAT:

In accordance with the City of Greenville City Ordinance, the City of Greenville adopts the final *FEMA-approved Plan*.

ADOPTED by a vote of [illegible] in favor and___against, and [illegible] abstaining, this [illegible] day of [illegible], [illegible].

By (Sig): [signature]
Print name: CARROLL RAINWATER

ATTEST:
By (Sig.): [signature]
Print name: [illegible]

APPROVED AS TO FORM:
By (Sig.): ____________________
Print name: ____________________

County of Wayne Resolution

County of Wayne, Missouri RESOLUTION NO. 1-2018

A RESOLUTION OF THE County of Wayne ADOPTING THE Wayne County Hazard Mitigation Plan

WHEREAS the Wayne County Commission recognizes the threat that natural hazards pose to people and property within Wayne County; and

WHEREAS the Wayne County Commission has participated in the preparation of a multi-jurisdictional local hazard mitigation plan, hereby known as the Wayne County Hazard Mitigation Plan, hereafter referred to as the *Plan*, in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS the *Plan* identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in Wayne County from the impacts of future hazards and disasters; and

WHEREAS the Wayne County Commission recognizes that land use policies have a major impact on whether people and property are exposed to natural hazards, the Wayne County Commission will endeavor to integrate the *Plan* into the comprehensive planning process; and

WHEREAS adoption by the Wayne County Commission demonstrates their commitment to hazard mitigation and achieving the goals outlined in the *Plan*.

NOW THEREFORE, BE IT RESOLVED BY THE Commission of Wayne County, in the State of Missouri, THAT:

In accordance with Wayne County Ordinance, the Wayne County Commission adopts the final *FEMA-approved Plan*.

ADOPTED by a vote of 3 in favor and ___ against, and ___ abstaining, this 2nd day of Jan, 2018

By (Sig): Brian Polk
Print name: BRIAN POLK

ATTEST:
By (Sig.): Brenda Seal by: Robin Banks d.c.
Print name: Brenda Seal by: Robin Banks d.c.

APPROVED AS TO FORM:
By (Sig.): _____
Print name: _____

City of Piedmont Resolution

City of Piedmont, Missouri RESOLUTION NO. 2017-03

A RESOLUTION OF THE City of Piedmont ADOPTING THE Wayne County Hazard Mitigation Plan

WHEREAS the City Council of Piedmont recognizes the threat that natural hazards pose to people and property within the City of Piedmont; and

WHEREAS the City of Piedmont has participated in the preparation of a multi-jurisdictional local hazard mitigation plan, hereby known as the Wayne County Hazard Mitigation Plan, hereafter referred to as the *Plan*, in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS the *Plan* identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the *City of Piedmont* from the impacts of future hazards and disasters; and

WHEREAS the City of Piedmont recognizes that land use policies have a major impact on whether people and property are exposed to natural hazards, the City of Piedmont will endeavor to integrate the *Plan* into the comprehensive planning process; and

WHEREAS adoption by the City of Piedmont demonstrates their commitment to hazard mitigation and achieving the goals outlined in the *Plan*.

NOW THEREFORE, BE IT RESOLVED BY THE City of Piedmont, in the State of Missouri, THAT:

In accordance with City of Piedmont City Ordinance, the City of Piedmont adopts the final *FEMA-approved Plan*.

ADOPTED by a vote of 3 in favor and 0 against, and 0 abstaining, this 12th day of Dec, 2017.

By (Sig): Wm H Kirkpatrick
Print name: Wm H. KIRKPATRICK

ATTEST:
By (Sig.): Tammy Thurman
Print name: Tammy Thurman

APPROVED AS TO FORM:
By (Sig.): _____
Print name: _____

Appendix C
Public Survey Document

Wayne County Hazard Mitigation

Public Survey: Wayne County Multi-Jurisdictional Hazard Mitigation Plan

The federal government requires all states and local governments to have hazard mitigation plans approved by FEMA that are consistent with the Disaster Mitigation Act of 2000. Approved mitigation plans are required to maintain eligibility for certain types of federal Hazard Mitigation Assistance Grants.

A planning committee comprised of representatives from Wayne County, the incorporated cities, and the public school districts is currently developing an update to the comprehensive Wayne County Multi-Jurisdictional Hazard Mitigation Plan with a strategy to reduce the vulnerability of people and property in the planning area to the impacts of hazards and to remain eligible for mitigation funding programs from FEMA.

One of the key components of a hazard mitigation plan is public input during the planning process. The planning committee will be evaluating information on the hazards that impact each jurisdiction within Wayne County. The committee is seeking your input on the hazards that will be evaluated as well as your opinions on the types of activities that should be considered to reduce future impacts. Your comments will be considered by your community's representatives on the planning committee as the plan is developed. Please take a few moments to answer the following questions. Thank you for your participation.

1. Please select your jurisdiction from the list. You may only select one for each survey completed.

- ☐ Unincorporated Wayne County
- ☐ City of Greenville
- ☐ City of Piedmont
- ☐ City of Williamsville
- ☐ Village of Mill Spring
- ☐ Clearwater R-I Schools
- ☐ Greenville R-II Schools

2. The hazards addressed in the Multi-Jurisdictional Hazard Mitigation Plan Update are listed below. Please indicate your opinion opinion on the likelihood for each hazard. **Please rate EACH hazard 1 through 4 as follows: 1=Unlikely, 2=Occasional, 3=Likely, 4=Highly Likely**

	Unlikely	Occasional	Likely	Highly Likely
Dam Failure	Dam Failure Unlikely	Dam Failure Occasional	Dam Failure Likely	Dam Failure Highly Likely
Drought	Drought Unlikely	Drought Occasional	Drought Likely	Drought Highly Likely
Earthquakes	Earthquakes Unlikely	Earthquakes Occasional	Earthquakes Likely	Earthquakes Highly Likely
Extreme Heat	Extreme Heat Unlikely	Extreme Heat Occasional	Extreme Heat Likely	Extreme Heat Highly Likely
Fires	Fires Unlikely	Fires Occasional	Fires Likely	Fires Highly Likely
Flooding	Flooding Unlikely	Flooding Occasional	Flooding Likely	Flooding Highly Likely
Sinkholes	Sinkholes Unlikely	Sinkholes Occasional	Sinkholes Likely	Sinkholes Highly Likely
Tornado	Tornado Unlikely	Tornado Occasional	Tornado Likely	Tornado Highly Likely
Winter Weather/Snow/Ice/Severe Cold	Winter Weather/Snow/Ice/Severe Cold Unlikely	Winter Weather/Snow/ Ice/Severe Cold Occasional	Winter Weather/Snow/Ice/Severe Cold Likely	Winter Weather/Snow/Ice/Severe Cold Highly Likely
Levee Failure	Levee Failure Unlikely	Levee Failure Occasional	Levee Failure Likely	Levee Failure Highly Likely
Thunderstorm/High Winds/Lightning/Hail	Thunderstorm/High Winds/Lightning/Hail Unlikely	Thunderstorm/High Winds/Lightning/Hail Occasional	Thunderstorm/High Winds/Lightning/Hail Likely	Thunderstorm/High Winds/Lightning/Hail Highly Likely

3. Please indicate your opinion on the potential magnitude of each hazard's impact on your jurisdiction (identified above). **Please rate EACH hazard 1 through 4 as follows: 1=Negligible, 2=Limited, 3=Critical, 4=Catastrophic**

	Negligible	Limited	Critical	Catastrophic
Dam Failure	Dam Failure Negligible	Dam Failure Limited	Dam Failure Critical	Dam Failure Catastrophic

	Negligible	Limited	Critical	Catastrophic
Drought	Drought Negligible	Drought Limited	Drought Critical	Drought Catastrophic
Earthquakes	Earthquakes Negligible	Earthquakes Limited	Earthquakes Critical	Earthquakes Catastrophic
Fires	Fires Negligible	Fires Limited	Fires Critical	Fires Catastrophic
Flooding	Flooding Negligible	Flooding Limited	Flooding Critical	Flooding Catastrophic
Sinkholes	Sinkholes Negligible	Sinkholes Limited	Sinkholes Critical	Sinkholes Catastrophic
Tornado	Tornado Negligible	Tornado Limited	Tornado Critical	Tornado Catastrophic
Winter Weather/Snow/Ice/Severe Cold	Winter Weather/Snow/Ice/Severe Cold Negligible	Winter Weather/Snow/Ice/Severe Cold Limited	Winter Weather/Snow/Ice/Severe Cold Critical	Winter Weather/Snow/Ice/Severe Cold Catastrophic
Levee Failure	Levee Failure Negligible	Levee Failure Limited	Levee Failure Critical	Levee Failure Catastrophic
Thunderstorm/High Winds/Lightning/Hail	Thunderstorm/High Winds/Lightning/Hail Negligible	Thunderstorm/High Winds/Lightning/Hail Limited	Thunderstorm/High Winds/Lightning/Hail Critical	Thunderstorm/High Winds/Lightning/Hail Catastrophic

4. FEMA Hazard Mitigation Assistance Grants are administered by the State Emergency Management Agency. Listed below are some of the types of projects considered. **Please check all those that could benefit your jurisdiction, in your opinion.**

- [ ] Flood-prone Property Acquisition & Structure Demolition/Relocation
- [ ] Flood-Prone Structure Elevation
- [ ] Dry Floodproofing of Historical Residential Structures and/or Non-residential Structures
- [ ] Minor Localized Flood Reduction Projects (storm water management or localized flood control projects)
- [ ] Structural Retrofitting of Existing Buildings to Add a Tornado Safe Room
- [ ] Retrofitting of Existing Buildings, and Facilities, from Wind Damage
- [ ] New Tornado Safe Room Construction
- [ ] Electrical Utilities Infrastructure Retrofit
- [ ] Soil Erosion Stabilization
- [ ] Wildfire Management

☐ Other (please specify)

5. Please comment on any other issues that Wayne County Hazard Mitigation Planning Committee should consider in developing a strategy to reduce future losses caused by natural hazard events.

Done