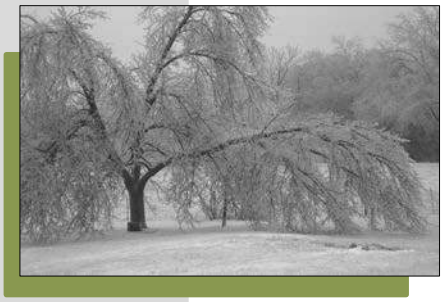

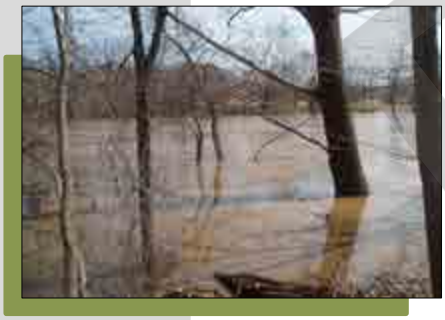

Washington County Multi-Jurisdiction Natural Hazard Mitigation Plan

Meramec Regional Planning Commission ● November 2017

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CONTRIBUTORS

Washington County Hazard Mitigation Planning Committee

The individuals invited to participate in the Washington County hazard mitigation planning committee are as follows:

Jurisdictional Representatives

Name	Title	Department	Jurisdiction/Agency/Organization
Marvin Wright	Presiding Commissioner	County	Washington Co.
Doug Short	Associate Commissioner	County	Washington Co.
Cody Brinley	Associate Commissioner	County	Washington Co.
Jeanette Allen	County Clerk	County	Washington Co.
Zach Jacobsen	Sherriff	Sherriff's Dept.	Washington Co.
Doris Coffman	EMD	Emergency Management	Washington Co.
-	-	Highway Dept.	Washington Co.
Nicholas Hughey	Administrator	Health Dept.	Washington Co.
John Robinson III	Chairperson	City Admin.	Caledonia
Bob Haworth	Fire Chief	Fire Dept.	Belgrade
Nina Gilliam	Clerk	City Admin.	Caledonia
Michael Green	Maintenance/Water	Public Works	Caledonia
Chuck Hampton	Fire Chief	Fire Dept.	Caledonia
Doris Keim	Mayor	City Admin.	Irondale
Amanda Shelton	Clerk	City Admin.	Irondale
Patrick Forrester	Water, Street, & Waste Superintendent	Public Works	Irondale
Ryan Hardy	Fire Chief	Fire Dept.	Irondale
Gary Mitchell	Deputy	Police Dept.	Irondale
Bill Byers	EMD	Emergency Management	Irondale
Robin Husky	Chairperson	City Admin.	Mineral Point
T.R. Dudley	Mayor	City Admin.	Potosi
Roger P. Coleman	Clerk	City Admin.	Potosi
Jeff Benson	Public Works Director	Public Works	Potosi
Doris Coffman	EMD	Emergency Management	Potosi
Roger LaChance	Fire Chief	Fire Dept.	Potosi
Michael Gum	Chief of Police	Police Dept.	Potosi
David Hoffmann Jr.	Fire Chief	Fire Dept.	Richwoods
Alex McCaul	Superintendent	School District	Kingston K-14
Randy Davis	Superintendent	School District	Potosi R-III
Bethany Deal	Superintendent	School District	Richwoods R-VII
Brad Crocker	Superintendent	School District	Valley R-VI

*Sign in sheets from planning meetings are included in Appendix B.

The individuals invited to represent stakeholders on the Washington County hazard mitigation planning committee are as follows:

Stakeholder Representatives

Name	Title	Agency/Organization
Michele Meyer	Interim CEO	Washington Co. Memorial Hospital
-	-	Ameren UE
-	-	Crawford Electric Cooperative
Ronald S. Johnson	Captain	MSHP, Troop C
-	-	MoDOT
-	-	Socket Internet Services
-	Administrator	South Haven 8
-	Administrator	Potosi Manor
-	Administrator	Georgian Gardens Nursing Home
-	-	American Red Cross
-	-	MO SEMA
-	-	U.S. Army Corps of Engineers
-	-	FEMA Region VII
Josh Hundley	-	U.S. Fish & Wildlife Service
-	-	Missouri Dept. of Conservation
-	-	USDA, NRCS
-	-	Century Link
-	-	Independent Journal

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EXECUTIVE SUMMARY

The purpose of hazard mitigation is to reduce or eliminate long-term risk to people and property from hazards. Washington County and participating cities and school districts developed this multi-jurisdictional local hazard mitigation plan update to reduce future losses to the county and its communities and schools resulting from hazard events. The plan is an update of a plan that was approved on March 27, 2013. The original plan was approved in April 2005. The plan was prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 and to achieve eligibility for the Federal Emergency Management Agency (FEMA) Hazard Mitigation Assistance Grant Programs.

The county Multi-Hazard Mitigation Plan is a multi-jurisdictional plan that covers the following 9 jurisdictions that participated in the planning process:

- Washington County
- Village of Caledonia
- City of Irondale
- Village of Mineral Point
- City of Potosi
- Kingston K-14 School District
- Potosi R-III School District
- Richwoods R-VII School District
- Valley R-VI School District

Washington County and the jurisdictions listed above developed a multi-jurisdictional Hazard Mitigation Plan that was originally approved by FEMA in April 2005 with an update approved by FEMA on March 27, 2013. This current planning effort serves as an update (hereafter referred to as the 2018 Hazard Mitigation Plan).

The plan update process followed a methodology prescribed by FEMA, which began with the formation of a Mitigation Planning Committee (MPC) comprised of representative from Washington County and participating jurisdictions. The MPC updated the risk assessment that identified and profiled hazards that pose a risk to Washington County and analyzed the vulnerability to these hazards. The MPC also examined the capabilities in place to mitigate them, with emphasis on changes that have occurred since the previously approved plan was adopted. The MPC determined that the planning area is vulnerable to several hazards that are identified, profiled and analyzed in this plan. Riverine and flash flooding, winter storms, severe thunderstorms/hail/ lightening/high winds and tornadoes are among the hazards that historically have had a significant impact.

Based upon the risk assessment, the MCP reviewed goals for reducing risk from hazards. The goals are listed below:

Goal 1: Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.

Goal 2: Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.

Goal 3: Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.

Goal 4: Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.

Goal 5: Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefit of special interests.

Goal 6: Secure resources for investment in hazard mitigation.

To meet the identified goals, the MPC developed recommended mitigation actions, which are detailed in Chapter 4 of this plan. The MPC developed an implementation plan for each action, which identifies priority level, responsible agency, timeline, cost estimate, potential funding sources and progress to date.

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 by and adopted with resolutions or other documentation of adoption by all participating jurisdictions and schools districts. The documentation of adoptions is included in Appendix D.

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

- Washington County
- Village of Caledonia
- City of Irondale
- Village of Mineral Point
- City of Potosi
- Kingston K-14 School District
- Potosi R-III School District
- Richwoods R-VII School District
- Valley R-VI School District

Model Resolution

RESOLUTION NO. _____

A RESOLUTION TO ADOPT THE WASHINGTON COUNTY MULTI-JURISDICTION NATURAL HAZARDS MITIGATION PLAN

WHEREAS, (Government/District) recognizes the threat that natural hazards pose to people and property within our community; and

WHEREAS, undertaking hazard mitigation actions will reduce the potential for harm to people and property from future hazard occurrences; and

WHEREAS, the U.S. Congress passed the Disaster Mitigation Act of 2000 emphasizing the need for pre-disaster mitigation of potential hazards and made available hazard mitigation grants to state and local governments; and

WHEREAS, an adopted Multi-Jurisdiction Natural Hazards Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre-and post-disaster mitigation grant programs; and

WHEREAS, (Government/District) fully participated in the FEMA prescribed mitigation planning process to prepare this Mitigation Plan; and

WHEREAS, the Missouri State Emergency Management Agency and Federal Emergency Management Agency officials have reviewed the Washington County Multi-Jurisdictional Natural Hazards Mitigation Plan and approved it contingent upon this official adoption of the participating governing body; and

WHEREAS, (Government/District) desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts by formally adopting the Washington County Multi-Jurisdiction Natural Hazards Mitigation Plan; and

WHEREAS, adoption by the governing body of (Government/District) demonstrates the jurisdiction's commitment to fulfilling the mitigation goals and objectives outlined in this Mitigation Plan; and

WHEREAS, adoption of this legitimizes the plan and authorizes responsible agencies to carry out their responsibilities under the plan;

NOW, THEREFORE BE IT RESOLVED, that (Government/District) adopts the Washington County Multi-Jurisdictional Natural Hazards Mitigation Plan as an official plan and will submit this Adoption Resolution to the Missouri Emergency Management Agency and the Federal Emergency Management Agency officials to enable the plan's final approval.

_____ _____

Certifying Official Date

_____ _____

Witness Date

1 Introduction and Planning Process

1.1 Purpose

Washington County and eight other jurisdictions prepared this local hazard mitigation plan to guide hazard mitigation planning for the purpose of better protecting the people and property of the county from the effects of natural hazard events. Hazard mitigation is defined by FEMA as "any sustained action taken to reduce or eliminate long-term risk to human life and property from a hazard event." Hazard mitigation planning is the process through which hazards that threaten communities are identified, likely impacts of those hazards are determined, mitigation goals are set and appropriate strategies to lessen impacts are determined, prioritized and implemented.

The mission of the Washington County Hazard Mitigation Plan is to substantially and permanently reduce the county's vulnerability to natural hazards. This plan demonstrates the communities' commitment to reducing risks from hazards and serves as a tool to help decision makers direct mitigation activities and resources for the next five years. The plan is intended to promote sound public policy designed to protect citizens, critical facilities, infrastructure, private property and the natural environment. This can be achieved by increasing public awareness, documenting resources for risk reduction and loss prevention and identifying activities to guide the community towards the development of a safer, more sustainable community.

This plan was also developed to make Washington County and participating cities and school districts eligible for certain federal disaster assistance as required by the Robert T. Stafford Disaster Relief and Emergency Act (Public Law 93-288). Those programs include the Federal Emergency Management Agency's (FEMA) Hazard Mitigation Grant Program, Pre-Disaster Mitigation Program and Flood Mitigation Assistance Program. The plan has been prepared in accordance with the requirements of the Disaster Mitigation Act of 2000 (Public Law 106-390) and developed and organized within the rules and regulations established under 44 CFR 201.6 published in the *Federal Register* on February 26, 2002 and finalized in October 31, 2007. Those jurisdictions within Washington County that do not adopt the 2018 plan will not be eligible for funding through these grant programs.

1.2 Background and Scope

The 2018 Washington County Hazard Mitigation Plan is an update of the original plan developed and approved in April 2005. The most recent update was approved by FEMA on March 27, 2013. The revised document will be valid for five years from approval by FEMA. It is a multi-jurisdictional plan that covers the participating jurisdictions within the county's borders, all of whom adopted both the 2013 and 2018 plan, including the following:

- Washington County
- Village of Caledonia
- City of Irondale
- Village of Mineral Point
- City of Potosi
- Kingston K-14 School District
- Potosi R-III School District
- Richwoods R-VII School District
- Valley R-VI School District

The information and guidance in this plan document will be used to help guide and coordinate mitigation activities and decisions for local jurisdictions and organizations. Proactive mitigation planning will help reduce the cost of disaster response and recover to local communities and residents by protecting critical infrastructure, reducing liability exposure and minimizing overall community impacts and disruptions. Washington County has been affected by natural disasters in the past and participating jurisdictions and organizations are committed to reducing the impacts of future incidents and becoming eligible for hazard mitigation-related funding opportunities.

1.3 Plan Organization

The plan contains a mitigation action listing, a discussion of the purpose and methodology used to develop the plan, a profile on Washington County, as well as the hazard identification and vulnerability assessment of natural hazards. In addition, the plan offers a discussion of the community's current capability to implement the goals, objectives and strategies identified through the planning process.

The plan is organized as follows:

- Executive Summary
- 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

To assist in the explanation of the above identified contents, there are several appendices included which provide more detail on specific subjects. This plan is intended to improve the ability of Washington County and the jurisdictions within to handle disasters and will document valuable local knowledge on the most efficient and effective ways to reduce loss.

Table 1.1 Summary of 2017 Revisions to Plan

Chapter	Summary of Revisions
Chapter 1 Introduction and Planning Process	Updated with 2017 information and reformatted to follow the 4-4-17 model outline. Provided information on how the planning process followed the *Local Mitigation Planning Guidance (March 2013),* the *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).* Added information on RiskMAP
Chapter 2 Planning Area Profile and Capabilities	Updated with 2017 data and reformatted to follow the 4-4-17 model outline.
Chapter 3 Risk Assessment	Updated with 2017 data and reformatted to follow the 4-4-17 model outline.
Chapter 4 Mitigation Strategy	Updated with 2017 data and reformatted to follow the 4-4-17 model outline, including substituting action item worksheets for the narrative used in the previous plan to provide required information for each action item.
Chapter 5 Plan Implementation and Maintenance	Updated with 2017 data and reformatted to follow the 4-4-17 model outline.
Appendices	Updated with 2017 data and reformatted to follow the 4-4-17 model outline.

*2017 data encompasses the most recent available data.

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.

The Washington County Hazard Mitigation Planning Committee first organized in 2005 when the Missouri State Emergency Management Agency (SEMA) provided grant funds and contracted with the Meramec Regional Planning Commission (MRPC) to develop a hazard mitigation plan for the county. MRPC is a council of local governments in south central Missouri serving Crawford, Dent, Gasconade, Maries, Osage, Phelps, Pulaski and Washington counties. The initial plan was completed and approved in April 2005. An update was completed and approved in March 2013.

MRPC's role in developing and updating the Washington County Hazard Mitigation plan included assisting in the formation of the MPC and facilitating the planning meetings; soliciting public input; and producing the draft and final plan for review by the MPC, SEMA and FEMA. Staff carried out the research and documentation necessary for the planning process. In addition, MRPC compiled and presented the data for the plan, helped the MPC with the prioritization process and insured that the final document met the DMA requirements established by federal regulations and the most current planning guidance.

In recent years, SEMA secured a grant to review and update the Washington County Multi-Hazard Mitigation Plan and contracted with MRPC to facilitate the planning process for the plan update. MRPC staff has followed the most current planning guidance provided by FEMA for the purpose of insuring that the updated plan meets all of the requirements of the Disaster Mitigation Act as established by federal regulations.

The Washington County Multi-Hazard Mitigation Plan was developed as the result of a collaborative effort among Washington County, the cities/villages of Caledonia, Irondale, Mineral Point, Potosi, Kingston K-14 School District, Potosi R-III School District, Richwoods R-VII School District, Valley R-VI School District, public agencies, non-profit organizations, the private sector as well as regional, state and federal agencies. MRPC contacted and asked for volunteers to serve on the planning committee from the county and local city governments, school districts, the county health department, local businesses and utility companies. The mailing list is included in **Appendix B: Planning Process**. This cross-section of local representatives was chosen for their experience and expertise in emergency planning and community planning in Washington County. Staff worked with the Washington County MPC to collect and analyze information on hazards and disasters that have impacted the county as well as document mitigation activities that have occurred during the past five years.

Due to time and duty constraints, not all the jurisdictions that were invited to participate in the MPC were able to attend meetings. However, all of the jurisdictions provided information to update the document, reviewed the plan and provided input. Interviews were conducted with stakeholders from the community and several planning meetings were conducted during the plan review and update.

The 2018 planning process began with a meeting held on April 17, 2017. MRPC staff provided an overview of the planning process and review of the existing hazard mitigation plan. The

group reviewed and discussed hazard mitigation goals and what progress had been made on hazard mitigation action items over the past four years. The second meeting was held on May 22, 2017. The MPC reviewed and updated the list of action items, making note of those that had been accomplished, those that were no longer applicable and adding a number of projects to the list. The group then reviewed the action items, applying the STAPLEE method (Social; Technical; Administrative; Political; Legal; Economic; Environmental) and applying cost benefit analysis to best determine priorities. A full description of the prioritization process is included in Chapter 4.

The final list of prioritized action items were mailed out to all jurisdictions and entities that had been invited to participate on the MPC. Recipients were asked to review and provide feedback if they had concerns about how any of the projects were ranked. The draft plan was made available on-line and MPC members were notified on where to find the document and asked to review and provide feedback.

All planning committee members were provided drafts of sections of the plan as they became available. Members of the planning committee reviewed the draft chapters and provided valuable input to MRPC staff. Additionally, through public committee meetings, press releases and draft plan posting on MRPC's website, ample opportunity was provided for public participation. Jurisdictions in surrounding counties were also notified of where to view the revised plan and encouraged to provide input. Any comments, questions and discussions resulting from these activities were given strong consideration in the development of this plan.

Washington County further assisted in the planning process by issuing public notice of the planning meetings as well as by providing meeting facilities at the courthouse. County officials attended and participated in meetings.

The MPC contributed to the planning process by:

- Attending and participating in meetings;
- Collecting data for the plan;
- Making decisions on plan content;
- Reviewing drafts of the plan document;
- Developing a list of needs:
- Prioritizing needs and potential mitigation projects; and
- Assisting with public participation and plan adoption

The MPC did not formally meet on a regular basis as recommended in the plan. However, mitigation has become a regular topic of discussion among the majority of jurisdictions included in the plan. A number of mitigation projects have been completed in the county and hazard mitigation concepts are being incorporated into other planning projects.

Table 1.2 provides information on who actively participated in the planning process and who they represented:

Table 1.2 Jurisdictional Representatives Washington County Mitigation Planning Committee

Name	Title	Department	Jurisdiction/Agency/ Organization	Direct Participation	Indirect Participation
Doris Coffman	EMA	Emergency Management	Washington Co.	X	
Nicholas Hughey	Administrator	Health Dept.	Washington Co.	X	
Marvin Wright	Presiding Commissioner	County	Washington Co.	X	
Steve Besemer	Area Coordinator	Emergency Management	SEMA	X	
David Sansegraw	-	Hospital	Washington Co. Memorial Hospital	X	
John Lucas	-	Representative	Caledonia	X	
Todd Davies	Trooper	Highway Patrol	MSHP	X	
Casey Price	Police Officer	Police Dept.	Potosi PD	X	
William Goad	Director	911	Washington Co.	X	
Lillian Moses	Office Chair	City Admin.	Caledonia	X	
Brad Crocker	Superintendent	School District	Valley R-III	X	
Bethany Deal	Superintendent	School District	Richwoods R-VII	X	
John Robinson III	Chairperson	City Admin.	Caledonia		X
John W. Taylor	-	-	Mineral Point		X
Amanda Shelton	City Clerk	City Admin.	Irondale		X
T.R. Dudley	Mayor	City Admin.	Potosi		X
Bruce Morgan	Technology Director/SIS Manager/Safety Coordinator	School District	Potosi R-III		X
Alex McCaul	Superintendent	School District	Kingston K-14		X

1.5 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.

Washington County invited incorporated cities, school districts, utility companies, medical facilities, nursing facilities, county health department, and not-for-profits to participate in the hazard mitigation planning process. Letters and/or emails were sent to each of the following:

- Washington County
- Village of Caledonia
- City of Irondale
- Village of Mineral Point
- City of Potosi
- Kingston K-14 School District
- Potosi R-III School District
- Richwoods R-VII School District
- Valley R-VI School District
- Crawford Electric Co-Op Inc.
- Ameren UE
- Socket Internet Services
- Washington Co. Memorial Hospital
- Washington Co. Health Dept.
- American Red Cross
- South Haven 8
- Potosi Manor
- Georgian Gardens Nursing Home
- Missouri Dept. of Conservation
- MO SEMA
- MoDOT
- Missouri State Highway Patrol
- FEMA Region VII
- USFWS
- USACE
- USDA, NRCS
- CenturyLink
- Independent Journal

A copy of the mailing list and invitation letters are included in **Appendix B: Planning Process**.

The Disaster Mitigation Act requires that each jurisdiction must participate in the planning process and formally adopt the plan. There were a number of criteria established for participation. In order to be considered participating in the planning process, jurisdictions needed to do at least one of the following as well as adopt the plan:

- Providing a representative to serve on the planning committee;
- Participating in at least one or more meetings of the planning committee;
- Providing data for plan development through surveys and/or interviews;
- Provide information on existing mitigation actions from the previous plan and/or provide additional mitigation actions for the plan;
- Remove actions from the previous plan that were not implemented because they were impractical, inappropriate, not cost effective or were otherwise not feasible;
- Identify goals and mitigation actions for the plan;
- Prioritize mitigation actions/projects for the plan;
- Review and comment on the draft plan document;
- Informing the public, local officials and other interested parties about the planning process and providing opportunities for them to comment on the plan;
- Provide in-kind match documentation; and
- Formally adopt the plan prior to submittal of the final draft to SEMA and FEMA for final approval.

Not all jurisdictions were able to attend the MPC meetings. Most communities and school districts in Washington County are small and understaffed. It was not always feasible for representatives to travel to the meetings. However, all jurisdictions met at least one of the participation criteria. The jurisdictions that participated in the process, as well as their level of participation in the process are shown in Table 1.3. Documentation of meetings, including sign-in sheets are included in Appendix B: Planning Process.

Table 1.3 Jurisdictional Participation in the Planning Process

Jurisdiction	Meeting #1	Meeting #2	Interviews	Data Collection Survey/Call	Update/Develop/ Prioritize Mitigation Actions	Review/ Comment on Plan
Washington Co.	X	X		X	X	
Caledonia	X	X		X	X	
Irondale				X	X	
Mineral Point				X	X	
Potosi	X	X		X	X	
Kingston K-14			X	X	X	
Potosi R-III		X		X	X	
Richwoods R-VII		X		X	X	
Valley R-VI		X		X	X	

1.6 The Planning Steps

Washington County and MRPC worked together to develop the plan and based the planning process in FEMA's *Local Mitigation Planning Guidance (March 2013),* the *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 guides used for the initial plan development are no longer current and were not used in the update. The planning process has included organizing the county's resources, assessing the risks to the county, developing the mitigation plan and implementing the plan and monitoring the progress of plan implementation.

The planning committee based their activities on the 10-step planning process adapted from FEMA's Community Rating System (CRS) and Flood Mitigation Assistance programs. By following the 10-step planning process, the plan met funding eligibility requirements of the Hazard Mitigation Grant Program, Pre-Disaster Mitigation Program, Community Rating System and Flood Mitigation Assistance Program.

Table 1.4 Washington County Plan Update Process

Community Rating System (CRS) Planning Steps (Activity 510)	Local Mitigation Planning Handbook Tasks (44 CFR Part 201)
Step 1: Organize	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)(2) & (3)
Step 3: Coordinate	Task 4: Review Community Capabilities 44 CFR 201.6(b)(2) & (3)
Step 4: Assess the hazard	Task 5: Conduct a Risk Assessment 44 CFR 201.6(c)(2)(i) 44 CFR 201.6(c)(2)(ii) & (iii)
Step 5: Assess the problem	
Step 6: Set goals	Task 6: Develop a Mitigation Strategy 44 CFR 201.6(c)(3)(i); 44 CFR 201.6(c)(3)(iii)
Step 7: Review possible activities	
Step 8: Draft an action plan	
Step 9: Adopt the plan	Task 8: Review and Adopt the Plan
Step 10: Implement, evaluate, revise	Task 7: Keep the Plan Current Task 9: Create a Safe and Resilient Community 44 CFR 201.6(c)(4)

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

The planning area was determined by the boundaries of Washington County. MRPC staff provided general information on the hazard mitigation plan review process at regular MRPC board meetings – providing both written and oral reports on the review process, schedules for the various plans; which ones had been funded; described match requirements; and asked mayors and commissioners to think about who should be included on the planning committees for each respective county.

The planning team was selected by contacting the leadership of each jurisdiction, explaining the process, and asking them to send appropriate representation to the planning meetings. In addition they were asked to provide input on who they wanted to include on the planning

committee. Stakeholders such as electric cooperatives and sewer districts were also contacted and invited. In addition, it was suggested that representatives of some of the local critical facilities be included on the planning committee, such as medical clinics and nursing homes. All meetings were also publicized to allow additional interested parties to attend and participate. Washington County offered to host the meetings in conjunction with the regular commission meetings and two meeting dates were selected – April 17, 2017 and May 22, 2017.

At the first meeting on April 17, 2017, MRPC staff made introductions and provided an overview of hazard mitigation planning and the Washington County Hazard Mitigation plan. The group reviewed and discussed the goals and objectives. A good deal of the meeting was spent sharing information on what progress had been made in five years and discussing current and future needs and adding new mitigation actions to the existing list. Staff wrapped up the meeting by explaining the process that would be used to prioritize the action items at the next meeting – using both the STAPLEE method and analyzing the cost benefit.

At the second meeting on May 22, 2017, the group reviewed the complete list of action items developed at the April 11, 2017 meeting. MRPC provided an explanation of the prioritization process using both STAPLEE and cost benefit scoring. The MCP then provided input on prioritizing all of the action items. Staff took those recommendations and developed a matrix of the action items with the STAPLEE and cost benefit scores. This matrix was mailed out to all of the individuals and organizations on the mailing list for the MPC with a request for feedback. All suggestions for changes were incorporated into the plan. The group also reviewed the list of critical facilities in the plan and provided feedback on any changes or additions to that list. It was decided at this meeting that staff would mail out data collection surveys to each of the jurisdictions and begin working on the plan. Plan chapters would be shared with the MPC via mail, email and website. If necessary the group would meet again but no date was set.

Table 1.5 Schedule of MPC Meetings outlines the dates that meetings were held and topics covered.

Documentation of the planning process can be found in **Appendix B: Planning Process**.

Table 1.5 Schedule of MPC Meetings

Meeting	Topics	Date
Planning Meeting #1	Overview of mitigation planning & Washington County plan; Discussion of goals & objectives; Discussion of changes to goals and action items; Discussion of natural hazard events of the last five years, any new data and any changes in mitigation needs	April 17, 2017
Planning Meeting #2	Review of action items & prioritization process; discussion and identification of critical facilities	May 22, 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.

The MPC followed the same process for public involvement and input as was followed during the initial planning process. All MPC meetings were held at the Washington County Ambulance District, House 1 Headquarters. Public notices were placed at the courthouse and press releases were done prior to the meeting to make the public aware. Meetings were also posted on the MRPC webpage. The public was notified each time the plan or sections of the plan was presented for review and discussion. MPC members and public officials within the county as well as in surrounding counties were contacted, directed to the MRPC website (www.meramecregion.org) where a copy of the draft plan could be viewed or downloaded. The document was made available on the website on March 22, 2018. Hard copies of the final draft were placed at the Washington County Courthouse and city hall buildings for Caledonia, Irondale, Mineral Point, and Potosi. A hard copy of the draft could be obtained directly from MRPC by request. Members of the local media, both radio, newspaper and on-line were invited to attend planning meetings. Information was shared by these media outlets with the public on the planning process and where to find draft copies of the plan. Copies of public notices and press release are included in **Appendix A: Planning Process**.

No comments were received from the public.

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.

Every effort was made to encourage input from stakeholders whose goals and interests interface with hazard mitigation in Washington County including:

- Neighboring communities
- Local and regional agencies involved in hazard mitigation activities
- Agencies with the authority to regulate development
- Businesses
- Academia
- Other private and non-profit interests

Stakeholders involved in the hazard mitigation planning process included the Missouri State Highway Patrol (HSHP), Missouri State Emergency Management Agency (SEMA), and Washington Co. Memorial Hospital. Representatives attended the planning meetings and provided input. No federal stakeholders were involved during the planning process.

Jurisdictional representatives on the MPC were asked to share and solicit information from within and outside of their jurisdictions. A broad spectrum of entities other than the jurisdictions named in the plan, were invited to participate in the planning process.

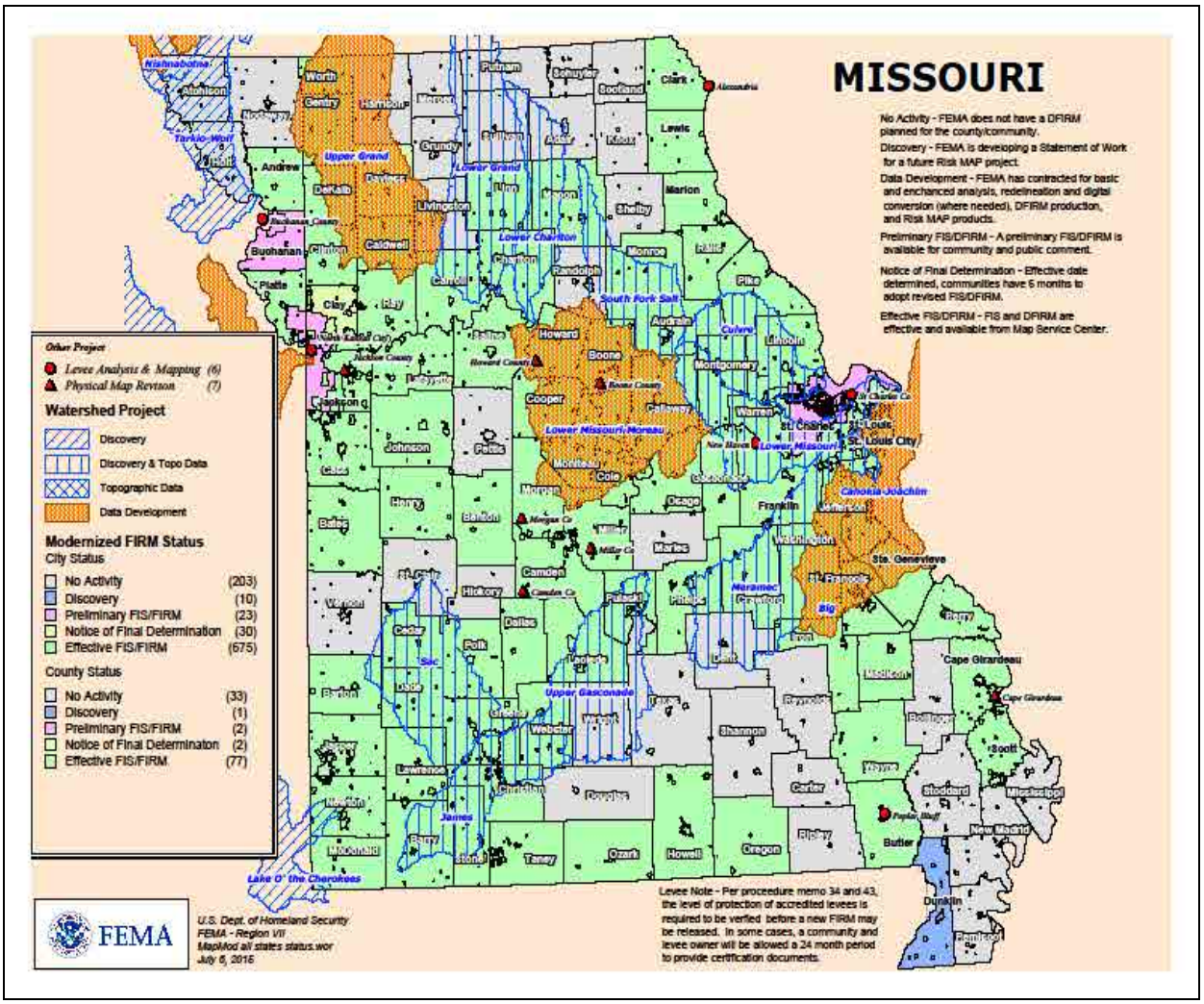
The survey provided to every jurisdiction asked how mitigation actions were being incorporated into other planning documents. The county road and bridge department did a good job of incorporating mitigation projects into their regular maintenance program. Those projects have been incorporated into the updated plan document. Hazard mitigation goals and action items have also be incorporated, where applicable, in the Community Economic Development Strategy (CEDS).

Coordination with FEMA Risk MAP Project

Washington County is currently in the Data Development and Discovery and Topo Data phase of the Watershed Project. The western portion of the county has an Effective FIS/FIRM for the Modernized FIRM Status. Risk MAP provides mitigation planning support in a variety of ways including helping in the assessment of risks and identifying action items to reduce vulnerability. In addition, this project will provide tools to improve the understanding of risk by local officials and the general public.

Figure 1.1 illustrates the current status of Missouri counties in regards to RiskMap projects.

Figure 1.1. Map of RiskMAP projects



Integration of Other Data, Reports, Studies and Plans

The MPC researched available plans, studies, reports and technical information during development of the Update. The intent was to identify existing data and information, shared objectives and past and ongoing activities that would add to the Update. The goal was to identify the existing capabilities and planning mechanisms to implement the mitigation strategy. Washington County is a rural area with the largest community's population at approximately 2,661 (Potosi). Not all of the participating communities have planning or zoning, subdivision regulations or other mechanisms for controlling the development of land. Some of the jurisdictions do have ordinances and planning documents. Following is a list of the documents that were reviewed:

- Local planning and zoning ordinances
- County EOP
- Crisis Plans (school districts)
- Comprehensive Plans

- Economic Development Plans
- Capital improvement plans
- Regional Transportation Plan
- Floodplain management ordinances and flood Insurance Risk Maps (FIRMs)

In addition to information available from local jurisdictions, a number of data sources, reports, studies and plans were used in updating the plan. Every attempt was made to gather the best available data to develop the vulnerability assessment and identify assets in the county. The Missouri State Hazard Mitigation Plan (2013) was reviewed and referenced throughout the document. Other data sources included dam information from the Missouri Department of Natural Resources and National Inventory of Dams (NID); fire reports from state agencies; Wildland/Urban Interface and Intermix data from the SILVIS Lab – Department of Forest Ecology and Management – University of Wisconsin; the Community Economic Development Strategy (CEDS); capital improvement plans from the participating jurisdictions; historic weather data and damage estimates from the National Oceanic and Atmospheric Administration; the critical facilities inventory conducted by MRPC; and road and bridge department plans/budgets.

All documents were reviewed so that the MPC would have a broad foundation of data upon which to base the planning area's risk assessment. Information from these documents and data sources are incorporated into the plan update as indicated throughout the update document.

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

The MPC reviewed the hazards that affected Washington County at the first planning meeting on April 17, 2017 including discussions of any hazard events that occurred during the last five years and all of the hazards included in the Missouri Hazard Mitigation plan. A variety of sources were used to identify and profile hazards. These included U.S. Census data, GIS data, HAZUS, the Missouri Spatial Data Information Service (MSDIS), statewide datasets compiled by state and federal agencies, existing plans and reports, personal interviews with MPC members and the survey completed by each jurisdiction. Data was compiled and compared to the original plan document and updates made in the 2013 revision. Every effort was made to use the most current and best data available. Additional information on the risk assessment and the conclusions drawn from the available data can be found in Chapter 3.

Step 5: Assess the Problem: Identify Assets and Estimate Losses

Assets for each jurisdiction were identified based on responses to the data collection survey distributed to all jurisdictions, interviews with MPC members and the critical facilities inventory conducted by MRPC. Additional sources included U.S. census, GIS data, MSDIS and HAZUS.

Losses were calculated using HAZUS data and the most recent U.S. census data available. Values reflected in the update are on structures only and do not include land values.

Jurisdictions provided information on their regulatory, personnel, fiscal and technical abilities by completing the data collection survey. The vulnerability assessment was completed using estimates from the 2013 State plan. For more information on planning area profiles and capabilities, please see **Chapter 2**.

Step 6: Set Goals (Handbook Task 6)

The goals from the initial hazard mitigation plan were reviewed at the first planning meeting on April 17, 2017. Those goals are as follows:

Goal 1: Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.

Goal 2: Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.

Goal 3: Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.

Goal 4: Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.

Goal 5: Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefit of special interests.

Goal 6: Secure resources for investment in hazard mitigation.

The group indicated that the original goals were still applicable and met the needs of the jurisdictions and determined that there would be no changes to the goals.

Step 7: Review Possible Mitigation Actions and Activities

Mitigation strategy and specific action items were discussed at both MPC meetings as well as at the meeting with the Washington County Road and Bridge staff. At the first MPC meeting the group reviewed the list in the existing plan and decided which actions could be eliminated; what needed to remain on the list; and what needed to be added. It was emphasized that any mitigation actions in the current plan that were not likely to be accomplished, due to cost factors or that did not address the risks identified in the risk assessment, should be removed from the list.

Discussions also included mitigation activities that had been completed or were in process that had not been in the original plan document. Each jurisdiction and stakeholder group was asked to provide information about mitigation activities that were needed as well as those that had been accomplished over the past five years. Meeting facilitators offered to share ideas for mitigation projects from the FEMA publication *Mitigation Ideas: As Resource for Reducing Risk to Natural Hazards (January 2013)* to help stimulate ideas and discussion.

As RiskMAP is still in the Data Development and Discovery and Topo Data Phase in Washington County, no projects have been identified through that process at this time.

In order to prioritize action items, the MPC was asked to use the STAPLEE method as well as assign a cost benefit to each activity. This allowed the group to consider a broad range of issues in order to decide which actions should be considered high, moderate or low priority. The prioritization process used by the MPC is explained as follows:

STAPLEE stands for the following:

- **Social:** Will the action be acceptable to the community? Could it have an unfair effect on a particular segment of the population?
- **Technical:** is the action technically feasible? Are there secondary impacts? Does it offer a long-term solution?
- **Administrative:** Are there adequate staffing, funding and maintenance capabilities to implement the project?
- **Political:** Will there be adequate political and public support for the project?
- **Legal:** Does your jurisdiction have the legal authority to implement the action?
- **Economic:** is the action cost-beneficial? Is there funding available: Will the action contribute to the local economy?
- **Environmental:** Will there be negative environmental consequences from the action? Does it comply with environmental regulations? Is it consistent with community environmental goals?

Each question was scored based on a 0 to 3 point value system:

3 = Definitely YES
2 = Maybe YES
1 = Probably NO
0 = Definitely NO

For the Benefit/Cost Review portion of the prioritization process, these two aspects were scored as follows:

Benefit – two (2) points were added for each of the following avoided damages (8 points maximum = highest benefit)

- Injuries and/or casualties
- Property damages
- Loss-of-function/displacement impacts
- Emergency management costs/community costs

Cost – points were subtracted according to the following cost scale (-5 points maximum = highest cost)

- (-1) = Minimal – little cost to the jurisdiction involved
- (-3) = Moderate – definite cost involved but could likely be worked into operating budget
- (-5) = Significant – cost above and beyond most operating budgets; would require extra appropriations to finance or to meet matching funds for a grant

Note: For the Benefit/Cost Review, the benefit and cost of actions which used the word "encourage" were evaluated as if the action or strategy being encouraged was actually to be carried out.

Total Score – The scores for the STAPLEE Review and Benefit/Cost Review were added to determine a Total Score for each action.

Priority Scale – To achieve an understanding of how a Total Score might be translated into a Priority Rating, a sample matrix was filled out for the possible range of ratings an action might receive on both the STAPLEE and Benefit/Cost Review. The possible ratings tested ranged between:

- A hypothetical action with "Half probably NO and half maybe YES" answers on STAPLEE (i.e. poor STAPLEE score) and Low Benefit/High Cost: Total Score = 7
- A hypothetical action with "All definitely YES" on STAPLEE and High Benefit/Little Cost: Total Score = 28

An inspection of the possible scores within this range led to the development of the following Priority Scale based on the Total Score in the STAPLEE- Benefit/Cost Review process:

20 – 28 points = High Priority
14-19 points = Medium Priority
13 points and below = Low Priority

The benefit portion of the prioritization process helped the MPC focus on long-term mitigation solutions that demonstrated the future cost savings that could be realized by completing mitigation projects that safeguard lives and protect property.

Step 8: Draft an Action Plan

The MPC reviewed the final list of action items at the May 22, 2017 meeting and completed the prioritization process. The final list was then mailed out to all jurisdictions and members of the MPC for review and approval as everyone was not able to attend the meeting. Staff were directed by the MPC to take the finalized list after allowing time for comments, remove all action items that scored a 13 or below, and draft an action plan.

Step 9: Adopt the Plan (Handbook Task 8)

When the first draft of the plan was completed, staff posted the document on the MRPC website and provided a hard copy to the county courthouse. All MPC members, jurisdictions and surrounding jurisdictions were notified on where to find a copy of the plan to review. If requested, additional hard copies of the plan document were provided. After allowing time for comments, a letter was mailed out to all jurisdictions asking them to formally adopt the plan and providing a sample adoption resolution. A deadline was provided in order to insure receipt of adoption resolutions prior to submitting a final draft to FEMA for approval.

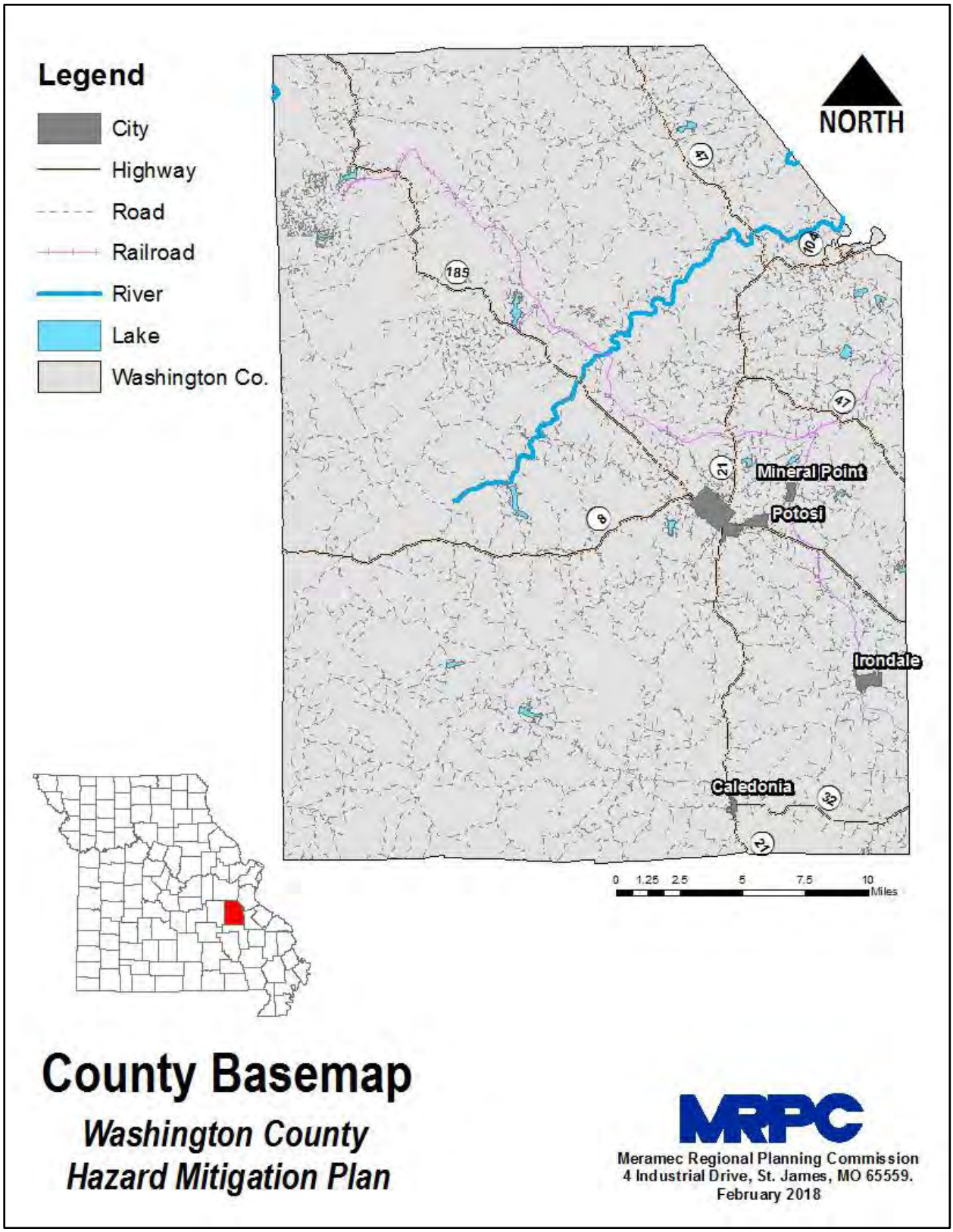
Step 10: Implement, Evaluate, and Revise the Plan (Handbook Tasks 7 & 9)

At both planning meetings (April 17, 2017 and May 22, 2017) MRPC staff advised the MPC and participating jurisdictions of the importance of continuing to meet periodically to discuss implementation of the plan as well as monitoring and maintaining the plan into the future. Chapter 5 provides details on Washington County's strategy for implementation, evaluation and revising the plan.

2 PLANNING AREA PROFILE AND CAPABILITIES

2.1 Washington County Planning Area Profile

Figure 2.1. Map of Washington County



Washington County has a population of approximately 25,002 according to the most recent census data[1]. **Table 2.1** illustrates the percentage population growth since 2000 as compared to the statewide and national population growth. The median household income and percentage growth since 2000, as compared to statewide and national figures can be found in **Table 2.2.** Furthermore**,** median house value percentage growth for Washington County, Missouri, and the United States is provided in **Table 2.3**

Table 2.1. Percent Population Growth for County, State, and Nation 2000 - 2016

	Total Population		Change Over Period	
Demographic Region	**2000**	**2016**	**Change**	**Percent**
Washington County	23,344	25,002	1,658	7.1
Missouri	5,595,211	6,059,651	464,440	8.3
United States	282,162,411	318,558,162	36,395,751	12.9

Source: U.S. Census Bureau, Census 2000 Summary File 1; U.S. Census Bureau, 2012-2016 5-Year American Community Survey

Table 2.2. Median Household Income and Percentage Growth for County, State, and Nation 2000 - 2016

	Median Household Income (USD)		Change Over Period	
Demographic Region	**200**	**2016**	**Change**	**Percent**
United States	$41,994	$55,322	$13,328	31.7
Missouri	$37,934	$49,593	$11,659	30.7
Washington County	$27,112	$36,701	$9,589	35.4

Source: U.S. Census Bureau, Census 2000 Summary File 3; U.S. Census Bureau, 2012-2016 5-Year American Community Survey

Table 2.3. Median House Value Percentage Growth for County, State, and Nation 2000 - 2016

	Median House Value (USD)		Change Over Period	
Demographic Region	**2000**	**2016**	**Change**	**Percent**
United States	$119,600	$184,700	$65,100	54.4
Missouri	$89,900	$141,200	$51,300	57.1
Washington County	$57,600	$95,600	$38,000	66.0

Source: U.S. Census Bureau, Census 2000 Summary File 3; U.S. Census Bureau, 2012-2016 5-Year American Community Survey

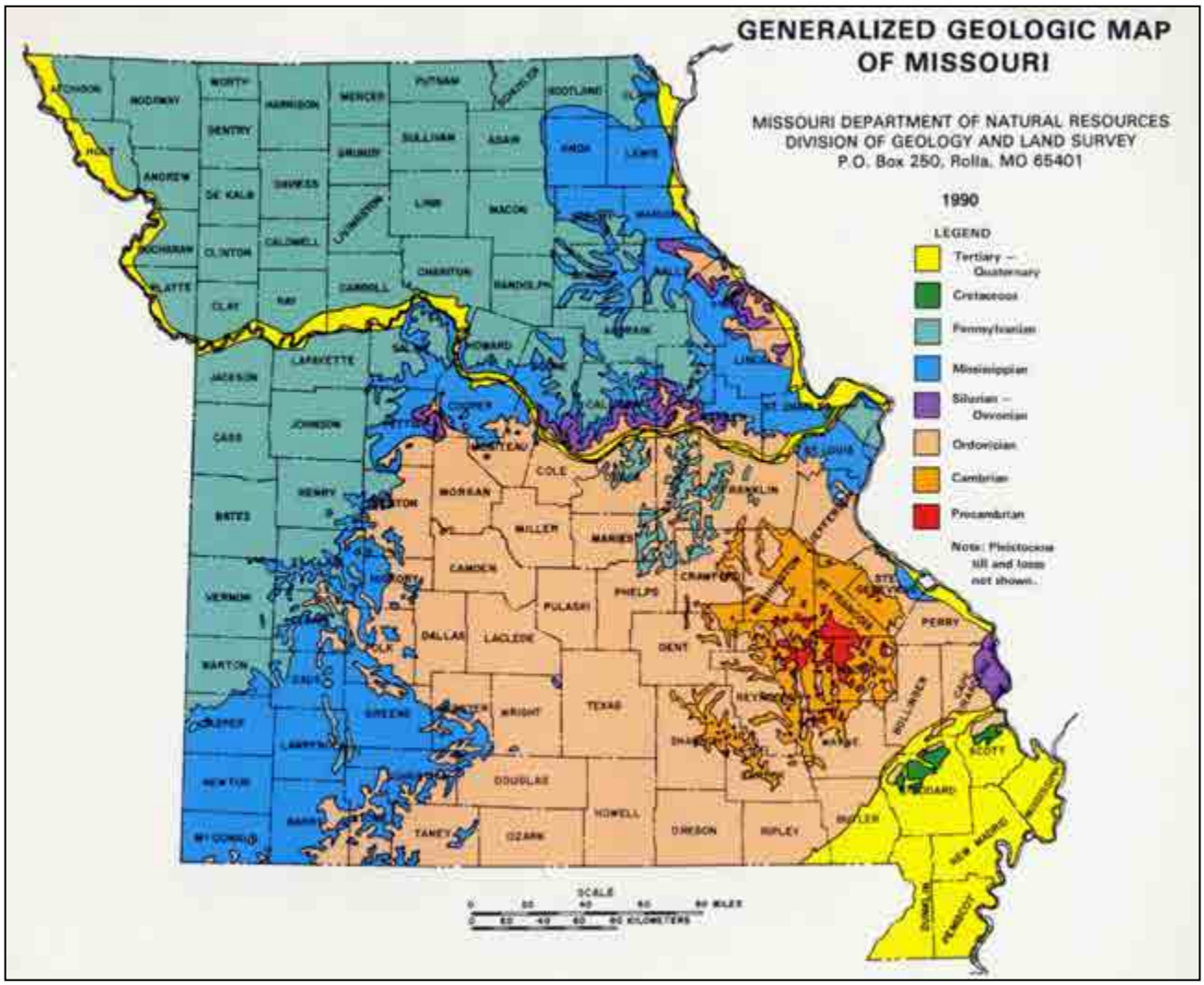
2.1.2 Geography, Geology and Topography

Washington County has a total land area of 762 square miles with 2.6 square miles of total water area. Approximately 70 percent of the land cover in the county is deciduous forest intermixed with 16 percent of grassland. Six percent of the land cover within the county is deciduous woody/herbaceous. The area has karst terrain, which is characterized by springs, caves, losing streams, and sinkholes. Incorporated jurisdictions within the county include the Village of Caledonia, City of Irondale, Village of Mineral Point, and City of Potosi.

[1] U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates

The county seat, Potosi, is located in the central portion of the county, approximately 116 miles south east of the state capital of Jefferson City, approximately 177 miles northeast of Springfield, Mo., and approximately 69 miles south west of St. Louis, Mo. The county is bordered on the north by Franklin County. On the east side the county is bordered by Jefferson and St. Francois Counties. To the south the county is bordered by Iron County. Crawford County shares a border with Washington to the west.

Figure 2.2. Generalized Geologic Map of Missouri



The county is located in the Ozark Plateau – the largest outcrop area of Ordovician-age rocks in the United States. This rock is 505 to 441 million years old and made up primarily of carbonates and thin shales with three distinctive sandstone layers; the Gunter at the base of the column, the red and white Roubidoux which is often used as a building stone, and the St. Peter glass sand. This stone is the result of a time period when Missouri was covered by a shallow sea and the stone frequently produces aquatic fossils from that time period. Portions of this formation contain rock that dissolves and fractures over time from rainwater, thus resulting in the karst features found throughout the Ozarks.

The topography of Washington County is divided by a line coincident with Highway 21. The topography west of Highway 21 is very hilly. The ridges in this area are sharp and the hills are steep sloping. East of Highway 21, the topography is gentle with broad valleys and rounded ridges. The maximum relief in the county is approximately 700 feet.

Two basic soil types are found in Washington County – The Ozark soils and Ozarks Dome soils. The Ozarks soils are located in an area of narrow, cherty limestone ridges that break sharply to steep side slopes of narrow valleys. Loess occurs in a thin mantle or is absent. Soils formed in the residuum from cherty limestone or dolomite range from deep to shallow and contain a high percentage of chert in most places. Some of the soils formed in a thin mantle of loess are on the ridges. Soils formed in loamy, sandy and cherty alluvium are in narrow bottom-land areas. These soils are found in the western part of Washington County. The Ozarks soils include the Lebanon-Goss-Bardley-Peridge, Needleye-Viration-Wilderness, Gerald-Union-Goss, Lebanon-Hobson-Clarksville, Hobson-Coulstone-Clarksville, Captina-Clarksville-Hartville-Ashton-Cedargap-Nolin soil associations. The Hartville-Ashton-Cedargap-Nolin soils association is located along the Meramec River.

The Ozark Dome soils are located on mountainous slopes of rhyolite flows, granite domes and valley slopes on dolomite and sandstone formations. These soils are found in south-eastern Washington County. The Ozark Dome solid include Knobtop-Irondale-Selassus-Syenite and Peridge-Cantwell-Gasconade soil associations.

A majority of the general soil makeup in Washington County is Rueter-Sonsac-Useful association. Goss-Gravois, Cayneville-Gatewood-Aaron-Courtois, and Gravois-Goss associations are the other main soil types found in the county.

Washington County is located in three river basins: Big, Upper St. Francis, and Meramec. The Meramec River includes the following tributaries: Bourbeuse River, Dry Creek, Huzzah Creek, Courtois Creek, Hazel Creek, Big River and Mineral Fork. The watersheds located in the county can be seen in **Figure 2.3**.

The Big River Watershed is located within the northeastern quarter of the Ozark Highlands. The basin drains approximately 955 square miles of the Ozark Plateau in portions of six counties, including Washington. Main sub-basins range from 26 to 189 square miles, with the largest being Mineral Fork. The Big River, originating in Iron County, has eight, order five tributaries and flows north 138 miles until it reaches the Meramec River. The Big River's average gradient is 6.6 ft/mile, yet steepest near the St. Francois Mountains. Due to past lead and barite mining activity in the area, damage to some aquatic habitats and streams exist. Unsafe mine dams and poorly-stored mine waste continue to degrade habitat or biota in about 110 miles of basin streams. The United States Army Corps of Engineers predicts catastrophic results from 27 high-hazard, unsafe dams during a moderate earthquake or major flood[2].

The St. Francis Watershed is divided by the high-relief Ozark Plateau and the low-relief Mississippi Alluvial Plain. The watershed is separated into two subbasins, the upper and lower. The St. Francis River originates in Iron County and flows 225 miles to the Missouri/Arkansas border. The basin drains 1,839 square miles, 71 percent of the drainage area is in the upper

[2] https://mdc.mo.gov/sites/default/files/watersheds/big.pdf

subbasin. The upper subbasin's average gradient is 5 ft/mile. The St. Francis River basin ranked 13th in total recreational worth for Missouri. Lastly, streambank erosion is not a major issue in the upper subbasin due to heavily forested riparian corridors[3].

Seven miles northeast of the town of Salem in Southeastern Missouri, a spring-fed brook called the Watery Fork merges with a larger wet-weather branch and becomes the source of the Meramec River. For many millions of years the Meramec has been carving its twisting, sometimes-tortuous 240-mile course into the solid rock of the Ozark Plateau, scouring its way through a deep, slowly widening valley, bordered by limestone bluffs and steep hills. It is joined along the way by innumerable springs, creeks, and four large tributaries, which transform the Meramec into a 100-yard to 200-yard wide floodplain stream at its confluence with the Mississippi River eighteen miles below St. Louis.

Maramec Spring is the first of the four major contributors. It pours an average volume of 100 million gallons of cold clear water into the Meramec River per day, swelling the river to twice its size. It is interesting to note that the Dry Fork creek, which is about the same size as the Meramec River in that area, loses most of its volume underground to become a major contributor to Maramec Spring, and in a round-about way—a major contributor to the Upper Meramec. Over the next 30 miles, the inflows from many smaller branches turn the river into a prime stream. Then, from the right, the translucent waters of the second and largest of the headwater contributors, the Courtois-Huzzah creek, mingles with the Meramec, giving it the impression of a truly big river. Swirling on past Onondaga Cave (Leasburg), Meramec State Park (Sullivan), and the Meramec Caverns (Stanton)—all on the left—the Meramec receives the cloudy waters of the Bourbeuse River—its only major contributor from the west. As the darker waters flow on, the valley widens, and the river becomes a series of long, slow, wide pools, connected by short, fast, riffles. Around 25 miles below the Bourbeuse River confluence, the last major contributor, the Big River, flows into the Meramec from the right. Now, even wider and more sluggish, it enters the Mississippi floodplain, and wends its way another thirty miles before draining into the Mississippi. The name Meramec is of Algonquin Indian origin (probably the Fox tribe), and is widely thought to mean 'the good fish' or 'catfish', which were abundant in its waters. But, there is evidence that the river may get its name after a tribe of Indians called the Maroa, who once lived in Illinois across from the Meramec's mouth. Since the Algonquin syllable 'mec' or meg' stands for Small River or stream, the names Meramec or Merameg (the river has been called Merameg in the past) could be derived from the Algonquin Maroamec, which means 'Little River of the Maroas'. The name of the Mississippi is also of Algonquin origin, derived from their term mesisi-piya, meaning Big River. Also, the title of this state Missouri is of Indian origin, meaning People of the Big Canoe or He of the Big Canoe.

Even in geological time, the Meramec is a very old river. It does not drain its northeastern section of the Ozark Plateau with the reckless abandon of a mountain stream. Instead, it meanders through the landscape in a countless succession of bends, riffles, and placid slow stretches, each of which is another small step in the Meramec's 800-foot decent from the Ozark Plateau to the Mississippi River.

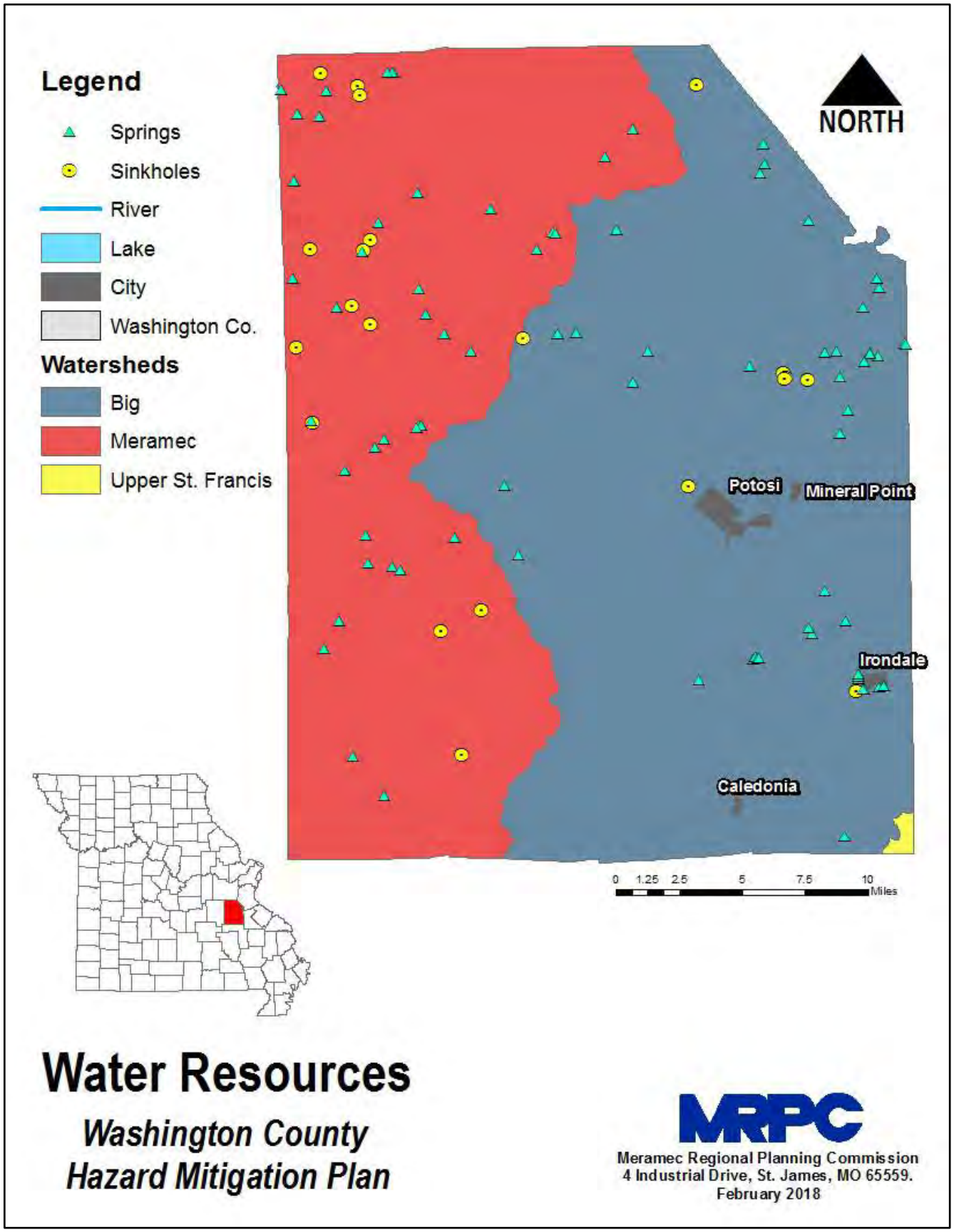
During the last 100 years, stream channels in the Ozarks have become wider and shallower and deep-water fish habitat has been lost. Historical data indicate that channel disturbances have

[3] https://mdc.mo.gov/sites/default/files/watersheds/StFrancisWatershed380.pdf

resulted most directly from clearing of vegetation along stream channels, which decreases bank strength. Historical and stratigraphic data show that after 1830, Ozarks streams responded to land-use changes by depositing more gravel and less muddy sediment, compared to pre-settlement conditions. Because less muddy sediment is being deposited on flood plains, many stream banks now lack cohesive sediments, and, therefore, no longer support steep banks. Land use statistics indicate that the present trend in the rural Ozarks is toward increased populations of cattle and increased grazing density; this trend has the potential to continue the historical stream-channel disturbance by increasing storm-water runoff and sediment supply.

Physiographic features, such as river basins and watersheds, play an important role in the development of any given area. Practical planning and engineering methods take advantage of the topography in planning and designing sewer and water facilities. The individual watersheds should form the basis for sewer and water districts, while several contiguous watersheds within the same drainage basin may be combined to form a sewer or water district.

Figure 2.3. Washington County Watershed/Water Resources



2.1.3 Climate

Snow occurs between November and April, both inclusive, but most of the snow falls in December, January and February. An average of about 14 inches of snow occurs annually in the Meramec Region. It is unusual for snow to stay on the ground for more than a week or two before it melts. Winter precipitation usually is in the form of rain, snow or both. Conditions sometimes borderline between rain and snow, and in these situations freezing drizzle or freezing rain occurs. Spring, summer and early fall precipitation comes largely in the form of showers or thunderstorms. Thunderstorms are most frequent from April to July. The average annual precipitation is 45.82 inches, which occurs on the average of less than 100 days per year. About half of these will be days with thunderstorms.

Because of its inland location, Missouri and Washington County are subject to frequent changes in temperature. The average annual temperature is 54.45°F. The average annual high temperature is 64.5°F with the average annual low at 44.4°F. The average high and low in January is 40°F and 21°F, respectively. In July the average high and low are 86°F and 67°F, respectively. A heat index of 120 degrees has been observed in the county.

While winters are cold and summers are hot, prolonged periods of very hot weather are unusual. Occasional periods of mild, above freezing temperatures are noted almost every winter. Conversely, during the peak of the summer season occasional periods of dry, cool weather break up stretches of hot, humid weather. About half of the days in July and August will have temperatures of 90°F or above, but it is not unusual for the temperature to drop into the 50s by the evening. In winter, there is an average of about 100 days with temperatures below 32°F. Temperatures below 0°F are infrequent with only about three days per year reaching this low temperature. The first frost occurs in mid-October, and the last frost occurs about mid-April.

2.1.4 Population/Demographics

Table 2.4 provides population/demographic data for Washington County between 2000 and 2016 by jurisdiction. The unincorporated area of Washington County was determined by subtracting the populations of the incorporated areas from the overall county population.

Table 2.4. Washington County Population 2000-2016 by Jurisdiction

Jurisdiction	2000 Population	2016 Population	2000-2016 # Change	2000-2016 % Change
Unincorporated Washington County	19,724	21,269	1,545	7.8
Caledonia	158	195	37	23.4
Irondale	437	420	-17	-3.9
Mineral Point	363	457	94	25.9
Potosi	2,662	2,661	-1	-0.04

Source: U.S. Census Bureau, Census 2000 Summary File 1; U.S. Bureau of the Census, 2012-2016 5-Year American Community Survey

Table 2.5 provides information regarding the percent of individuals under the age of 5, and over 65 for the county, State, and Nation. In addition, average household size is illustrated in **Table 2.6**

including figures for Washington County, Missouri, and the U.S. In 2016 there were an estimated 9,045 households within the county[4].

Table 2.5. Percent of Individuals Under the Age of 5, and Over 65 for County, State, and Nation (2016)

Location	% Under Age of 5	% Over Age of 65
Washington County	5.6	15.2
Missouri	6.2	15.3
United States	6.2	14.5

Source: U.S. Census Bureau, 2012-2016 5-Year American Community Survey

Table 2.6. 2016 Average Household Size for County, State, and Nation

Location	Average Household Size
Washington County	2.64
Missouri	2.48
United States	2.64

Source: *U.S. Census Bureau, 2012-2016 American Community 5-Year Estimates

Social Vulnerability Index (SoVI ®)

The University of South Carolina developed the Social Vulnerability Index to evaluate and rank the ability to respond to, cope with, recover from, and adapt to natural disasters. The index synthesizes 30 socioeconomic variables which are primarily derived from the United States Census Bureau. **Table 2.7** depicts the Social Vulnerability Index for Washington County along with its national percentile.

Table 2.7. Social Vulnerability Index (SoVI ®)

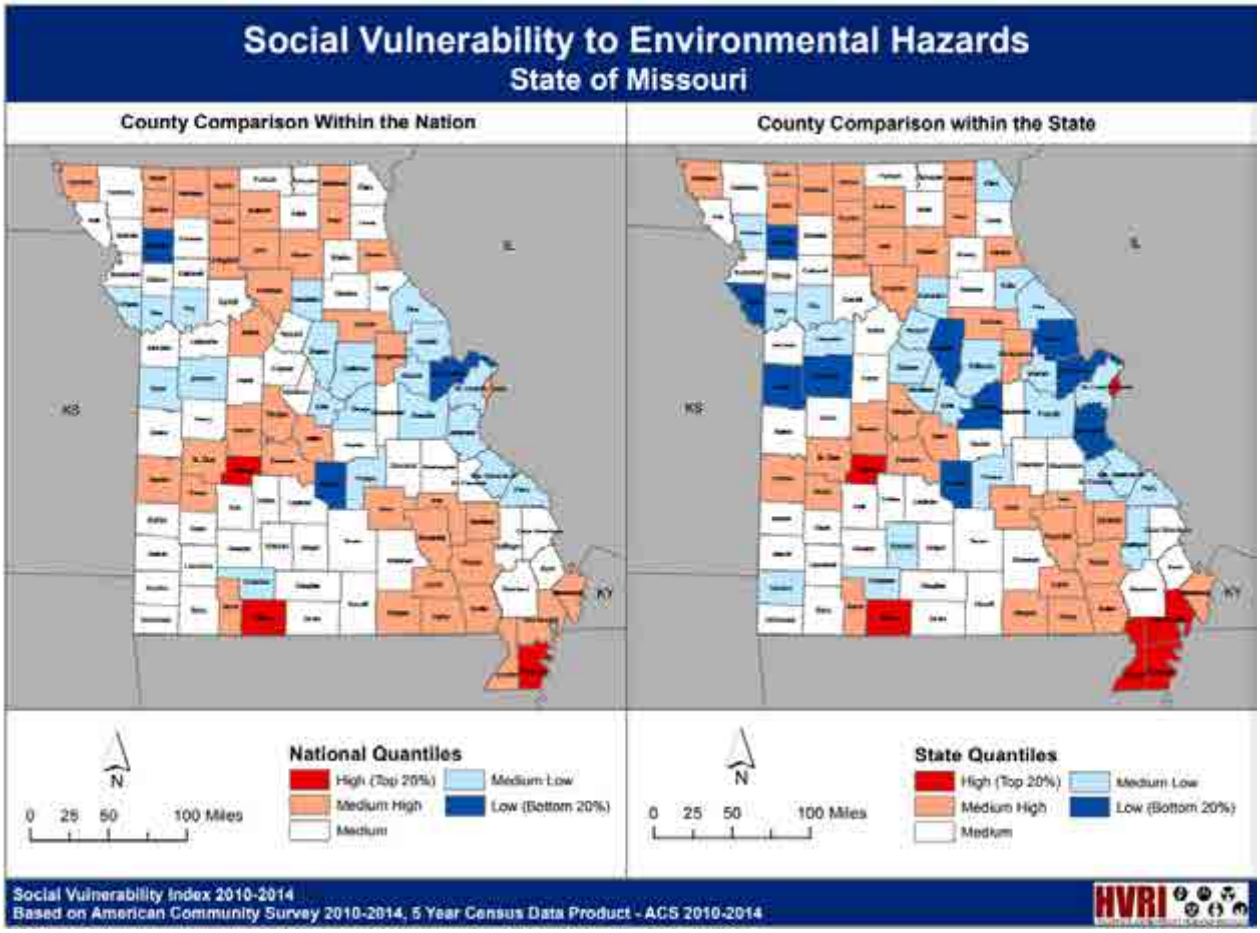
State	County	SoVI Score (06 - 10)	National Percentile (06 - 10)
Missouri	Washington County	0.150000006	52.8%

Source: http://artsandsciences.sc.edu/geog/hvri/sovi-data

The analysis of 30 socioeconomic variables includes the standardization of data, and reduction of variables into a condensed set of statistically optimized components; positive component loadings (+) are linked with amplified vulnerability, and negative component loadings (-) are linked with diminished vulnerability. Scores are represented as a numeric value, but have no inherent mathematical properties. To simplify the metrics of the SoVI ® Score, a negative number illustrates a county's resiliency to hazard events, and a positive number illustrates a decrease in resiliency[5]. Washington County's SoVI ® Score illustrates an decreased resiliency to cope with natural disasters. Additionally, Washington County is included in the medium category in comparison within the nation. **Figure 2.4** depicts Missouri's SoVI ® to environmental hazards between 2010 and 2014. Furthermore, **Figure 2.5** depicts the Nation's SoVI ® to environmental hazards between 2010 and 2014.

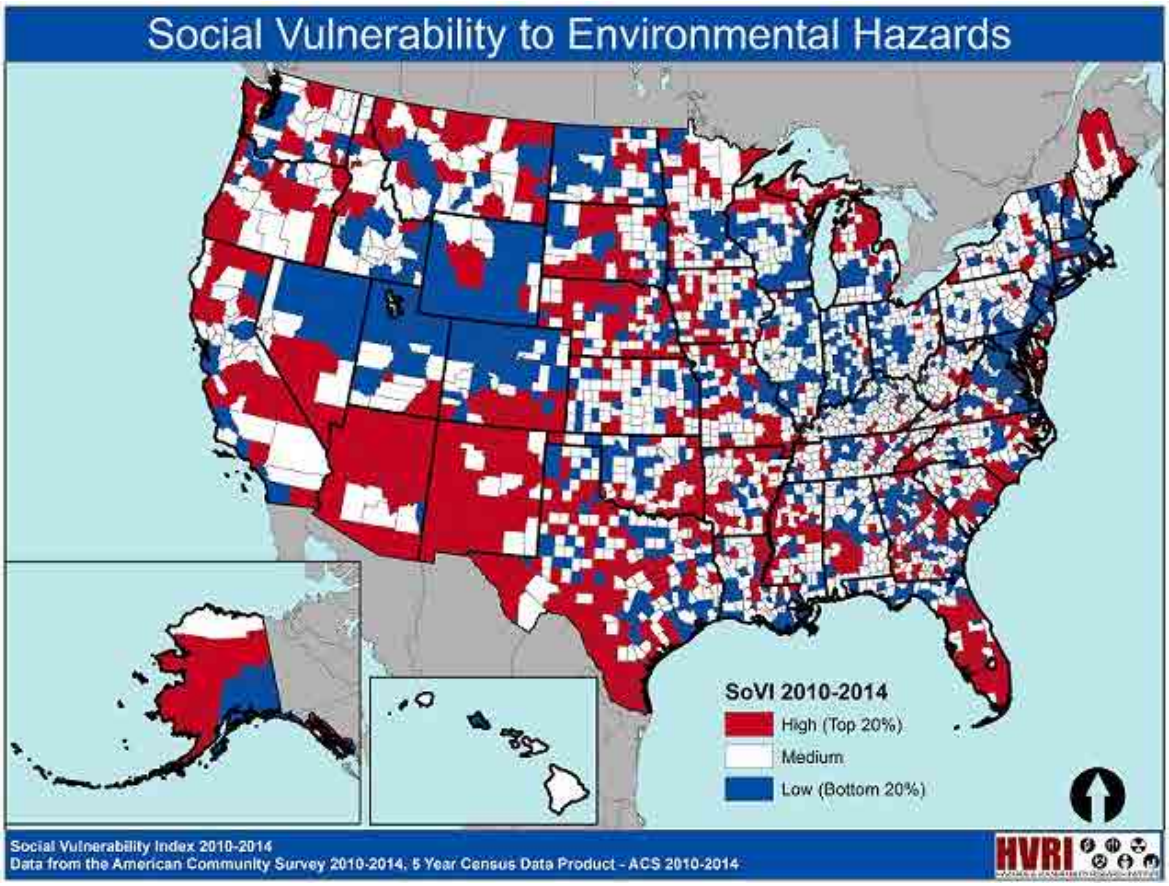
[4] U.S. Census Bureau, 2012-2016 5-Year American Community Survey
[5] http://webra.cas.sc.edu/hvri/products/sovifaq.aspx

Figure 2.4. 2010 – 2014 Missouri Social Vulnerability to Environmental Hazards (SoVI ®)



Source: http://artsandsciences.sc.edu/geog/hvri/sites/sc.edu.geog.hvri/files/attachments/MO_1014.pdf

Figure 2.5. 2010 – 2014 U.S. Social Vulnerability to Environmental Hazards (SoVI ®)



Source: http://artsandsciences.sc.edu/geog/hvri/sovi%C2%AE-0

Table 2.8 provides additional demographic and economic indicators for Washington County.

Table 2.8. 2016 Unemployment, Poverty, Education, and Language Percentage Demographics, Washington County, Missouri

Jurisdiction	% in Labor Force	% of Population Unemployed	% of Families Below the Poverty Level	High School Diploma ONLY, ages 25+ (%)	Bachelor's degree or higher, ages 25+	% of population (language spoken at home other than English
Washington County	51.6	10.9	16.1	41.2	8.0	1.9
Caledonia	63.9	7.9	5.4	50.8	3.3	0.5
Irondale	47.1	6.9	30.4	44.7	5.7	4.5
Mineral Point	48.1	20.5	17.3	45.3	0.4	3.7
Potosi	52.3	11.2	17.1	24.3	14.1	0.9

Source: U.S. Census Bureau, 2012-2016 American Community Survey, 5-Year American Community Survey

2.1.5 History

It is not known when the first permanent settlement was made in the territory now included in Washington County. Historians agree that the first white men who explored this part of Missouri were Frenchmen. About 1760, Francis Breton discovered a mine near Potosi that bears his name, Mine-a-Breton. A mining camp was established near the present site of Potosi, and in 1765 families located there. Near the end of the century the Spanish government made concessions to individuals, and the first recorded permanent village, Mine-a-Breton was established. Early settlers were drawn to Washington County because of its abundant mineral resources. Lead, iron ore, zinc, barite, and silver have been mined in the county. The first metallic zinc made west of the Mississippi was smelted in Alex Anderson's furnace near Potosi. Iron ore and barite have been extensively mined until recently..

Washington County was organized on August 21, 1813, and was named after George Washington, the first president of the United States. The territory of which the county is composed was previously a part of Saint Genevieve County. Saint Genevieve County was one of the original five districts of which the Territory of Missouri had been composed at the time of its organization in 1812. As it was originally laid out, the county contained more territory than it does at the present time. In 1857 by subsequent acts of the Legislature, the county had been reduced in size to its present limits.

The commissioners appointed to select a county seat site designated the village of Mine a Breton as the temporary seat of justice for the county. On February 26, 1814, the permanent county seat was established on 40 acres of land donated by Moses Austin and 10 acres of land donated by John Rice Jones. The new town was briefly named St. George, but was later renamed Potosi in honor of the Spanish silver mining town in Bolivia. Potosi and Mine a Breton remained separate villages until May 2, 1826, when they were incorporated under the single name of Potosi.

A large courthouse, suitable for a future state capital was planned for Potosi. In the Territorial convention, Potosi lost its bid for the site of the capital to Jefferson City. Although Potosi was not successful in becoming the capital of the new state, the State Supreme Court met twice a year in Potosi between 1837 and 1843.

In May 1861, the citizens of Potosi went on record in favor of armed neutrality in the Civil War and organized a home guard to maintain their neutrality. Later that month, Union troops overran the town and arrested several southern sympathizers. In August, Colonel White and a Confederate Calvary detachment invaded Potosi, but left shortly thereafter. In September 1864, General Shelby and his troops invaded the town, only to be met by a resistance force that had barricaded itself in the courthouse. The defenders were unsuccessful, and several of them were shot on the courthouse lawn following the engagement.

Caledonia is a portion of the Miles Gorforth Spanish Grant. The community was founded in the early 1800's by Alexander Craighead, a Scottsman, who named the village after his native Scotland in 1819. The first school in the area was built in 1804. A two-room school was built in Caledonia in the 1830s. The Bellevue Collegiate Institute was built by the St. Louis Conference of the Methodist Church South in 1864 closing around 1902. The building was used as a public school until 1952 when the structure was demolished. In 1936 the Caledonia High School was built also serving as an Elementary School.

Irondale is one of the oldest towns in the vicinity, established in 1807. Irondale was incorporated as a village in 1910. It is situated between some of the most beautiful hills of the Ozarks, northeast of Hughes Mountain. Grenia Springs, Thompson Spring, and the Big River. The abundance of iron ore made this a choice area for settlers. The Iron Furnace Company manufactured pig iron, and

the Washington County Mining Company manufactured oxide zinc. Irondale also was the home of a soda bottling plant, saw and grist mill, brick factory, and dairy.

In 1864 during the Civil War, General Price's Army came to town, raided the stores, lived off the people and burned the railroad bridge over Big River north of town.

The town of Mineral Point is located west of Potosi on Highway O and was laid out in 1858 by William C. Inks. The town was incorporated as a village in 1905. It was originally located on the St. Louis Iron Mountain & Southern Railway which was later changed to a branch of the Missouri Pacific Railways. The oldest part of town is around the railroad tracks and still has a general store and the old Mineral Point Hotel which is no longer used.

2.1.6 Occupations

Table 2.9 provides occupation statistics for the incorporated jurisdictions and incorporated county.

Table 2.9. Occupation Statistics, Washington County, Missouri

Place	Management, Business, Science, and Arts Occupations	Service Occupations	Sales and Office Occupations	Natural Resources, Construction, and Maintenance Occupations	Production, Transportation, and Material Moving Occupations
Washington County	1,894	2,041	1,743	1,675	1,791
Caledonia	26	13	22	18	14
Irondale	23	37	15	27	32
Mineral Point	14	43	0	18	49
Potosi	285	238	211	102	155

Source: U.S. Census, 2012-2016 American Community Survey, 5-year Estimates.

2.1.7 Agriculture

Due to the rural nature of the area, agriculture and timber are significant factors in the local economy. According to the 2007 Census of Agriculture, the number of farms in the county was 558 encompassing 137,304 total acres. In addition, the average farm was 246 acres. According to the 2012 Census of Agriculture, Washington County had fallen to 531 farms encompassing 123,960 acres, with an average farm size of 233 acres. Furthermore, there are only approximately 20 farms with 1,000 or more acres in the county. Land in farms by land use for the county includes woodland (39.5%), pastureland (34.6%), cropland (19.6%), and other uses (6.3%). In 2012, 20,698 acres of cropland were harvested, with forage (hay, haylage, grass silage, and greenchop) being the top crop in the county. Moreover, 16,426 cattle and calves were raised. The market value of products sold included crop sales ($2.3 million) and livestock sales ($8.8 million). The average market value of products sold per farm was $20,846[6].

The Ozarks region of Missouri is the focal point of several converging ranges of plant associations. Eastern hardwoods, southern pines and western prairies and the wildlife each supports, all reach the outward limits of their range in this area. As a result, various types of forest lands and animal habitats co-exist within a limited area. Several sawmills operate in the

[6] 2012 Census of Agriculture, Missouri Farm Commodity Sales, USDA, National Agriculture Statistics Service

area and the large amount of National Forest Lands in the region also contribute to the importance of timber production and logging to the local economy.

2.1.8 FEMA Hazard Mitigation Assistance Grants in Planning Area

FEMA's Hazard Mitigation Assistance (HMA) grant program provides funding for mitigation activities which have the potential to reduce disaster losses and protect life and property from future disaster damages[7]. No FEMA HMA Grants have been issued in the planning area (**Table 2.10)**.

Table 2.10. FEMA HMA Grants in County from 1993-2011

Project Type	Sub applicant	Declaration	Project Total ($)
-	-	-	-
Total			$0

Source: https:/www.fema.gov/openfema-dataset-hazard-mitigation-grants-v1

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, the special districts, and the public school districts.

2.2.1 Unincorporated Washington County

Overview

The jurisdiction of Washington County includes all unincorporated areas within the county boundaries. Washington County is governed by a three-member County Commission. The Commission is composed of a presiding commissioner, representing all of the county's population who is elected for a four-year term. Two associate commissioners representing roughly half the county's population each, are elected for four-year terms. The commission meets on Monday of each week. Other elected county officials include the County Clerk, Assessor, Collector, Circuit Clerk, Treasurer, Prosecuting Attorney, Sheriff, County Surveyor, Public Administrator, Associate Circuit Judge, and Coroner.

Washington County operates as a third class county. The county government has the authority to administer county structures, infrastructures, and finances as well as floodplain regulations. Third class counties do not have building regulations. Other county officials include the Emergency Management Director, Floodplain Administrator, 911 Director, Health Dept. Administrator, and Road and Bridge Supervisor.

Technical and Fiscal Resources

[7] https://www.fema.gov/media-library/assets/documents/103279

There are six fire departments located in the county. Those departments include Belgrade Volunteer Fire Dept., Caledonia Fire Protection District, Irondale Community Volunteer Fire Department, Potosi Fire Protection District, Richwoods Fire Protection District, and Sullivan Fire Protection District. The county is served by the Washington Co. Sheriff's Office. The county has a 911 Central Dispatch Center located at 12252 N State Highway 21, Cadet, Missouri. The county is served by the Washington County Ambulance District. The Washington County Memorial Hospital is located within the county. There are approximately 5 warning sirens within the county. Additionally, the county operates Nixle, a mass notification system. The county owns fixed and/or portable generators.

Fiscal tools or resources that the county could potentially use to help fund mitigation activities include Community Development Block Grants, Capital Improvements project funding, levy taxes for specific purposes, fees for water, sewer, gas, or electric services, impact fees for new development, incur debt through general obligation bonds, incur debt through special tax bonds, and incur debt through private activities.

Existing Plans and Policies

Washington County participates in the National Flood Insurance Program. The County Commissioner serves as the Floodplain Manager. The county has a Local Emergency Operations Plan, Hazard Mitigation Plan, Regional Transportation Plan (MRPC), and a Regional Comprehensive Economic Development Strategy (MRPC).

Other Mitigation Activities

The Office of Emergency Management, local fire departments, and the Washington County Health Department have conducted public education campaigns to raise awareness and increase preparedness among the county's population. Those programs have included Ready-In-3 emergency preparedness, fire safety, storm preparedness, weather radio education, dissemination of SEMA brochures, and other health/safety trainings.

Table 2.11. Demographic and Structure Risk Parameters For Unincorporated Washington County

Jurisdiction	Population with a Disability	Non-English Speaking Populations	Population Below Poverty Level	Population Under 5 Yrs	Population 65 Yrs and Over	# of Residences Built Prior to 1939	# of Mobile Homes
Unincorporated Washington County	5,178	394	3,856	1,106	3,161	774	3,545

Source: Source: U.S. Census Bureau, 2012-2016 5-Years American Community Survey

Table 2.12. Unincorporated Washington County Mitigation Capabilities

Capabilities	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	No
Builder's Plan	No
Capital Improvement Plan	No

City Emergency Operations Plan	N/A
County Emergency Operations Plan	Yes
Local Recovery Plan	No
County Recovery Plan	No
City Mitigation Plan	N/A
County Mitigation Plan	2013
Debris Management Plan	No
Economic Development Plan	CEDS
Transportation Plan	Regional Transportation Plan (MRPC)
Land-use Plan	No
Flood Mitigation Assistance (FMA) Plan	No
Watershed Plan	No
Firewise or other fire mitigation plan	No
Critical Facilities Plan	No
Policies/Ordinance	
Zoning Ordinance	No
Building Code	No
Floodplain Ordinance	Yes
Subdivision Ordinance	No
Tree Trimming Ordinance	No
Nuisance Ordinance	No
Storm Water Ordinance	No
Drainage Ordinance	No
Site Plan Review Requirements	No
Historic Preservation Ordinance	No
Landscape Ordinance	No
Program	
Zoning/Land Use Restrictions	No
Codes Building Site/Design	No
Hazard Awareness Program	No
National Flood Insurance Program	Yes
NFIP Community Rating System (CRS) Participating Community	No
National Weather Service (NWS) Storm Ready Certification	No
Firewise Community Certification	No
Building Code Effectiveness Grading (BCEGs)	No
ISO Fire Rating	-
Economic Development Program	No
Land Use Program	No
Public Education/Awareness	Yes
Property Acquisition	No
Planning/Zoning Boards	Yes
Stream Maintenance Program	No
Tree Trimming Program	No
Engineering Studies for Streams	No
Mutual Aid Agreements	Yes
Studies/Reports/Maps	
Hazard Analysis/Risk Assessment (City)	No
Hazard Analysis/Risk Assessment (County)	No

Evacuation Route Map	No
Critical Facilities Inventory	No
Vulnerable Population Inventory	No
Land Use Map	No
Staff/Department	
Building Code Official	No
Building Inspector	No
Mapping Specialist (GIS)	-
Engineer	-
Development Planner	-
Public Works Official	Yes
Emergency Management Director	Yes
NFIP Floodplain Administrator	Yes
Bomb and/or Arson Squad	-
Emergency Response Team	-
Hazardous Materials Expert	-
Local Emergency Planning Committee	MREPC
County Emergency Management Commission	No
Sanitation Department	-
Transportation Department	Yes
Economic Development Department	No
Housing Department	Phelps Co. PHA
Regional Planning Agencies	MRPC
Historic Preservation	No
Non-Governmental Organizations (NGOs)	
American Red Cross	Yes
Salvation Army	Yes
Veterans Groups	Yes
Environmental Organization	No
Homeowner Associations	No
Neighborhood Associations	No
Chamber of Commerce	Yes
Community Organizations (Lions, Kiwanis, etc.)	Yes
Financial Resources	
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	Yes
Fees for water, sewer, gas, or electric services	Yes
Impact fees for new development	Yes
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	Yes
Ability to withhold spending in hazard prone areas	No

Source: Data Collection Questionnaire, 2017

2.2.2 Village of Caledonia

Overview

Caledonia is located southwest of Irondale, in the Bellevue Valley. Caledonia was founded by Alexander Craighead, a Scotchman, who opened a frontier store on Goose Creek. Craighead constructed his home in 1816, which still stands today.

The first school was built in 1804. A two-room school was built in Caledonia in the 1830s. The Bellevue Collegiate Institute was built by the St. Louis Conference of the Methodist Church South in 1864, closing around 1902. The building was used as a public school until 1952 when the structure was demolished. In 1936 the Caledonia High School was built and also served as an Elementary School.

According to the 2016 Census, the community has a population of 195. Caledonia is incorporated as a village with five trustees and a chairperson make decisions regarding city issues. Village personnel include a Secretary/Clerk, Office Manager, and Maintenance/Sewer/Water Supt.

Technical and Fiscal Resources

Caledonia is a participating community in the National Flood Insurance Program. Law enforcement in the community is provided by the Washington Co. Sheriff's Office. The Washington County Ambulance District provides ambulance service for the village and surrounding area. The city is served by the Caledonia Fire Protection District. The village has one warning siren; activated by 911. The village owns and operates one generator. The village has a Floodplain Administrator.

Fiscal tools or resources that the city could potentially use to help fund mitigation activities include Community Development Block Grants, Capital Improvements project funding, levy taxes for specific purposes, fees for water, sewer, gas, and electric services, impact fees for new development, debt through general obligation bonds, and debt through special tax bonds.

Existing Plans and Policies

Caledonia has a Hazard Mitigation Plan, Regional Transportation Plan (MRPC), and Regional Comprehensive Economic Development Strategy (MRPC). The village has a Nuisance Ordinance, Floodplain Ordinance, and Historic Preservation Ordinance.

Other Mitigation Activities

Caledonia does not currently provide education/awareness and emergency preparedness programs.

Table 2.13. Demographic and Structure Risk Parameters For Caledonia

Jurisdiction	Population with a Disability	Non-English Speaking Populations	Population Below Poverty Level	Population Under 5 Yrs	Population 65 Yrs and Over	# of Residences Built Prior to 1939	# of Mobile Homes
Caledonia	48	1	7	13	34	38	12

Source: Source: U.S. Census Bureau, 2012-2016 5-Years American Community Survey

Table 2.14. Village of Caledonia Mitigation Capabilities

Capabilities	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	No
Builder's Plan	No
Capital Improvement Plan	No
City Emergency Operations Plan	No
County Emergency Operations Plan	N/A
Local Recovery Plan	No
County Recovery Plan	No
City Mitigation Plan	2013
County Mitigation Plan	N/A
Debris Management Plan	No
Economic Development Plan	CEDS
Transportation Plan	Regional Transportation Plan (MRPC)
Land-use Plan	No
Flood Mitigation Assistance (FMA) Plan	No
Watershed Plan	No
Firewise or other fire mitigation plan	No
Critical Facilities Plan	No
Policies/Ordinance	
Zoning Ordinance	No
Building Code	No
Floodplain Ordinance	Yes
Subdivision Ordinance	No
Tree Trimming Ordinance	No
Nuisance Ordinance	Yes
Storm Water Ordinance	No
Drainage Ordinance	No
Site Plan Review Requirements	No
Historic Preservation Ordinance	Yes
Landscape Ordinance	No
Program	
Zoning/Land Use Restrictions	No
Codes Building Site/Design	No
Hazard Awareness Program	No
National Flood Insurance Program	Yes
NFIP Community Rating System (CRS) Participating Community	No
National Weather Service (NWS) Storm Ready Certification	No

Firewise Community Certification	No
Building Code Effectiveness Grading (BCEGs)	No
ISO Fire Rating	9
Economic Development Program	No
Land Use Program	No
Public Education/Awareness	No
Property Acquisition	No
Planning/Zoning Boards	No
Stream Maintenance Program	No
Tree Trimming Program	No
Engineering Studies for Streams	No
Mutual Aid Agreements	Yes
Studies/Reports/Maps	
Hazard Analysis/Risk Assessment (City)	No
Hazard Analysis/Risk Assessment (County)	N/A
Evacuation Route Map	No
Critical Facilities Inventory	No
Vulnerable Population Inventory	No
Land Use Map	No
Staff/Department	
Building Code Official	No
Building Inspector	No
Mapping Specialist (GIS)	No
Engineer	No
Development Planner	No
Public Works Official	Yes
Emergency Management Director	No
NFIP Floodplain Administrator	Yes
Bomb and/or Arson Squad	No
Emergency Response Team	No
Hazardous Materials Expert	No
Local Emergency Planning Committee	MREPC
County Emergency Management Commission	N/A
Sanitation Department	No
Transportation Department	No
Economic Development Department	No
Housing Department	Phelps Co. PHA
Regional Planning Agencies	MRPC
Historic Preservation	No
Non-Governmental Organizations (NGOs)	
American Red Cross	No
Salvation Army	No
Veterans Groups	Yes
Environmental Organization	No
Homeowner Associations	No
Neighborhood Associations	No
Chamber of Commerce	Yes
Community Organizations (Lions, Kiwanis, etc.)	Yes
Financial Resources	
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	Yes
Fees for water, sewer, gas, or electric services	Yes
Impact fees for new development	Yes
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

2.2.3 City of Irondale

Overview

Irondale is one of the larger towns in Washington County and is located nine miles southeast of Mineral Point in Concord Township. Irondale was laid out in 1858 by the Hon. John G. Scott. The Irondale furnace was owned by John G. Scott and manufactured pig iron which was then transported to St. Genevieve for shipping downriver. The construction of the Iron Mountain & Southern Railway in 1856 was a more efficient means of transporting iron rather than using the tedious, overland journey to St. Genevieve.

The Big River, which runs by Irondale, provided an abundant source of clay. A brick manufacturing business, utilizing this source of clay, operated for around twenty years in Irondale. This brick was used to make some of the older buildings still remaining in Irondale such as the old Company Hotel, Terrill Saloon, and part of the United Methodist Church.

The United Methodist Church was once the Methodist Episcopal Church, South. The split between Methodist Church North and South occurred during the Civil War. The Civil War also left its mark on Irondale in 1864 when General Price and his troops raided the town, looting the stores and burning the railroad bridge. After the Civil War the Churches reunited to create the United Methodist Church. There are many older churches in Irondale and many older houses reminiscent of its age and history.

According to the 2016 Census, the community has a population of 420. Irondale, a fourth-class city, has four aldermen and a mayor to make decisions regarding city issues. City personnel include a City Clerk, Attorney, Water/Street/Waste Supt., and Fire Chief.

Technical and Fiscal Resources

Irondale is a participating community in the National Flood Insurance Program. Law enforcement in the community is provided by the Irondale Police Dept. The Washington County Ambulance District provides ambulance service for the village and surrounding area. The city is served by the Irondale Community Volunteer Fire Department. The city does not have a warning siren. The city possesses one portable generator. The city has a Floodplain Administrator.

Fiscal tools or resources that the city could potentially use to help fund mitigation activities include Community Development Block Grants, Capital Improvements project funding, levy taxes for specific purposes, fees for water, sewer, gas, and electric services, impact fees for new development, debt through general obligation bonds, and debt through special tax bonds.

Existing Plans and Policies

Irondale has a Hazard Mitigation Plan, Regional Transportation Plan (MRPC), and Regional Comprehensive Economic Development Strategy (MRPC). The city has a Zoning Ordinance, Floodplain Ordinance, Building Code, and Nuisance Ordinance.

Other Mitigation Activities

Irondale does not currently provide education/awareness and emergency preparedness programs.

Table 2.15. Demographic and Structure Risk Parameters For Irondale

Jurisdiction	Population with a Disability	Non-English Speaking Populations	Population Below Poverty Level	Population Under 5 Yrs	Population 65 Yrs and Over	# of Residences Built Prior to 1939	# of Mobile Homes
Irondale	87	17	156	46	81	63	21

Source: Source: U.S. Census Bureau, 2012-2016 5-Years American Community Survey

Table 2.16. City of Irondale Mitigation Capabilities

Capabilities	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	No
Builder's Plan	No
Capital Improvement Plan	No
City Emergency Operations Plan	No
County Emergency Operations Plan	N/A
Local Recovery Plan	No
County Recovery Plan	No
City Mitigation Plan	2013
County Mitigation Plan	N/A
Debris Management Plan	No
Economic Development Plan	CEDS
Transportation Plan	Regional Transportation Plan (MRPC)
Land-use Plan	No
Flood Mitigation Assistance (FMA) Plan	No
Watershed Plan	No
Firewise or other fire mitigation plan	No
Critical Facilities Plan	No
Policies/Ordinance	
Zoning Ordinance	Yes
Building Code	Yes
Floodplain Ordinance	Yes

Subdivision Ordinance	No
Tree Trimming Ordinance	No
Nuisance Ordinance	Yes
Storm Water Ordinance	No
Drainage Ordinance	No
Site Plan Review Requirements	No
Historic Preservation Ordinance	No
Landscape Ordinance	No
Program	
Zoning/Land Use Restrictions	Yes
Codes Building Site/Design	Yes
Hazard Awareness Program	No
National Flood Insurance Program	Yes
NFIP Community Rating System (CRS) Participating Community	No
National Weather Service (NWS) Storm Ready Certification	No
Firewise Community Certification	No
Building Code Effectiveness Grading (BCEGs)	No
ISO Fire Rating	-
Economic Development Program	No
Land Use Program	No
Public Education/Awareness	No
Property Acquisition	No
Planning/Zoning Boards	No
Stream Maintenance Program	No
Tree Trimming Program	No
Engineering Studies for Streams	No
Mutual Aid Agreements	Yes
Studies/Reports/Maps	
Hazard Analysis/Risk Assessment (City)	No
Hazard Analysis/Risk Assessment (County)	N/A
Evacuation Route Map	No
Critical Facilities Inventory	No
Vulnerable Population Inventory	No
Land Use Map	No
Staff/Department	
Building Code Official	No
Building Inspector	Yes
Mapping Specialist (GIS)	No
Engineer	No
Development Planner	No
Public Works Official	Yes
Emergency Management Director	Yes
NFIP Floodplain Administrator	Yes
Bomb and/or Arson Squad	No
Emergency Response Team	No
Hazardous Materials Expert	No
Local Emergency Planning Committee	MREPC
County Emergency Management Commission	N/A
Sanitation Department	No

Transportation Department	No
Economic Development Department	No
Housing Department	Phelps Co. PHA
Regional Planning Agencies	MRPC
Historic Preservation	No
Non-Governmental Organizations (NGOs)	
American Red Cross	No
Salvation Army	No
Veterans Groups	No
Environmental Organization	No
Homeowner Associations	No
Neighborhood Associations	No
Chamber of Commerce	No
Community Organizations (Lions, Kiwanis, etc.)	Yes
Financial Resources	
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	Yes
Fees for water, sewer, gas, or electric services	Yes
Impact fees for new development	Yes
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

2.2.4 Village of Mineral Point

Overview

The town of Mineral Point is located west of Potosi and was laid out in 1858 by William C. Inks. It was originally located on the St. Louis Iron Mountain & Southern Railway which was later changed to a branch of the Missouri Pacific Railway. The oldest part of town resides near the railroad tracks. The village still has a general store and Mineral Point Hotel which is no longer used.

According to 2016 Census, the community has a population of 457. Mineral Point was incorporated as a village in 1905. A two-member board of trustees and a chairperson make decisions regarding village issues. The village employs a Clerk/Treasurer and Water/Sewer Manager.

Technical and Fiscal Resources

Mineral Point is a participating community in the National Flood Insurance Program. Law enforcement in the community is provided by the Washington Co. Sheriff's Office. The Washington County Ambulance District provides ambulance service for the village and surrounding area. The village is served by the Potosi Fire Protection District. The village does not

have an outdoor warning siren. The village owns and operates one generator. Mineral Point has a Floodplain Administrator.

Fiscal tools or resources that the city could potentially use to help fund mitigation activities include Community Development Block Grants, fees for water, sewer, gas, and electric services, debt through general obligation bonds, and debt through special tax bonds.

Existing Plans and Policies

Mineral Point has a Hazard Mitigation Plan, Regional Transportation Plan (MRPC), and Regional Comprehensive Economic Development Strategy (MRPC). Mineral Point has a Floodplain Ordinance.

Other Mitigation Activities

Mineral Point does not currently provide education/awareness and emergency preparedness programs.

Table 2.17. Demographic and Structure Risk Parameters For Mineral Point

Jurisdiction	Population with a Disability	Non-English Speaking Populations	Population Below Poverty Level	Population Under 5 Yrs	Population 65 Yrs and Over	# of Residences Built Prior to 1939	# of Mobile Homes
Mineral Point	154	16	88	29	58	16	67

Source: Source: U.S. Census Bureau, 2012-2016 5-Years American Community Survey

Table 2.18. Village of Mineral Point Mitigation Capabilities

Capabilities	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	No
Builder's Plan	No
Capital Improvement Plan	No
City Emergency Operations Plan	No
County Emergency Operations Plan	N/A
Local Recovery Plan	No
County Recovery Plan	No
City Mitigation Plan	2013
County Mitigation Plan	N/A
Debris Management Plan	No
Economic Development Plan	CEDS
Transportation Plan	Regional Transportation Plan (MRPC)
Land-use Plan	No
Flood Mitigation Assistance (FMA) Plan	No
Watershed Plan	No
Firewise or other fire mitigation plan	No
Critical Facilities Plan	No
Policies/Ordinance	
Zoning Ordinance	No
Building Code	No

Floodplain Ordinance	Yes
Subdivision Ordinance	No
Tree Trimming Ordinance	No
Nuisance Ordinance	No
Storm Water Ordinance	No
Drainage Ordinance	No
Site Plan Review Requirements	No
Historic Preservation Ordinance	No
Landscape Ordinance	No
Program	
Zoning/Land Use Restrictions	No
Codes Building Site/Design	No
Hazard Awareness Program	No
National Flood Insurance Program	Yes
NFIP Community Rating System (CRS) Participating Community	No
National Weather Service (NWS) Storm Ready Certification	No
Firewise Community Certification	No
Building Code Effectiveness Grading (BCEGs)	No
ISO Fire Rating	-
Economic Development Program	No
Land Use Program	No
Public Education/Awareness	No
Property Acquisition	No
Planning/Zoning Boards	No
Stream Maintenance Program	No
Tree Trimming Program	No
Engineering Studies for Streams	No
Mutual Aid Agreements	Yes
Studies/Reports/Maps	
Hazard Analysis/Risk Assessment (City)	No
Hazard Analysis/Risk Assessment (County)	N/A
Evacuation Route Map	No
Critical Facilities Inventory	No
Vulnerable Population Inventory	No
Land Use Map	No
Staff/Department	
Building Code Official	No
Building Inspector	No
Mapping Specialist (GIS)	No
Engineer	No
Development Planner	No
Public Works Official	Yes
Emergency Management Director	Yes
NFIP Floodplain Administrator	Yes
Bomb and/or Arson Squad	No
Emergency Response Team	No
Hazardous Materials Expert	No
Local Emergency Planning Committee	MREPC
County Emergency Management Commission	N/A

Sanitation Department	No
Transportation Department	No
Economic Development Department	No
Housing Department	Phelps Co. PHA
Regional Planning Agencies	MRPC
Historic Preservation	No
Non-Governmental Organizations (NGOs)	
American Red Cross	Yes
Salvation Army	Yes
Veterans Groups	Yes
Environmental Organization	No
Homeowner Associations	No
Neighborhood Associations	No
Chamber of Commerce	Yes
Community Organizations (Lions, Kiwanis, etc.)	Yes
Financial Resources	
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	No
Fees for water, sewer, gas, or electric services	Yes
Impact fees for new development	No
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

2.2.5 City of Potosi

Overview

Moses Austin is credited as the "Founding Father of Potosi". After hearing about the rich lead mines of the southeast Missouri Territory (at that time called Upper Louisiana) Moses Austin, set out from Virginia in 1796 to investigate. Austin, a wealthy, ambitious business man, received a grant for 7,153 arpents [pre-metric French unit of area] of land and transformed lead mining and smelting into Missouri's first major industry. Austin sank the first mine shaft in Missouri and built the first reverbatory furnace west of the Mississippi River. As a condition of Austin's grant, Austin provided many improvements for the area. He, and his forty or fifty slaves/employees built bridges, roads, store, blacksmith shop, flour mill, saw mill, and shot tower. Austin produced the first sheet lead and cannonballs made in Missouri. In 1798 Austin moved his wife and family to the area where they resided in Durham Hall.

In 1807 the village of Mine Au Breton had about forty houses. From the time of the discovery of lead a continuous settlement has existed there.

When Washington County was organized in August of 1813, Moses Austin donated forty acres

of land on the north side of Breton Creek for the establishment of a county seat. Lots and a public square were laid out and a new town evolved around Durham Hall. The town was named Potosi in honor of a silver mining town in Bolivia. Potosi acquired a post office and was the home of two distilleries. The first courthouse was built in 1814-15.

Potosi was located on the north side of Breton Creek and Mine Au Breton. In 1826 the towns consolidated under the sole name of Potosi.

Moses Austin died on June 10, 1821 and was buried at Hazel Run. In 1828 his body was moved and reburied in the Potosi City Cemetery where it remains today. There are cracks in Austin's tomb made in 1938 when Texans tried to steal Moses Austin's body and move it to Texas. The undertaker from Texas was caught chipping away at the tomb, thinking that the body was just inside (the body is down in the ground). The Marshall was called and the Texans fled back to Texas. A few weeks later the Governor sent the Secretary of the State of Texas to Potosi with a public apology for the incident. To this day Potosians like to brag that they are the only town that took on the state of Texas and won.

According to the 2016 Census, the community has a population of 2,661. Potosi is a fourth-class city with a four-member board of aldermen and a mayor. The city employs a Clerk/Collector, Attorney, Police Chief, Public Works Director, Natural Gas Supt., Building Inspector, Municipal Judge, and Court Clerk.

Technical and Fiscal Resources

Potosi is a participating community in the National Flood Insurance Program. Law enforcement in the community is provided by the Potosi Police Department. The Washington County Ambulance District provides ambulance service for the city and surrounding area. The city is served by the Potosi Fire Protection District. The city has two outdoor warning sirens; activated by 911 and the police department. The city utilizes Nixle for emergency alerts/mass notifications. The city possesses two generators. Potosi has a Floodplain Administrator and Emergency Management Director.

Fiscal tools or resources that the city could potentially use to help fund mitigation activities include Community Development Block Grants, Capital Improvements project funding, levy taxes for specific purposes, fees for water, sewer, gas, and electric services, and debt through general obligation bonds.

Existing Plans and Policies

Potosi has a Comprehensive Plan, Builder's Plan, City Emergency Operations Plan, Local Recovery Plan, Hazard Mitigation Plan, Regional Transportation Plan (MRPC), and Regional Comprehensive Economic Development Strategy (MRPC), Land-use Plan, Flood Mitigation Assistance Plan, and Watershed Plan. The city has a Zoning Ordinance, Building Code, Floodplain Ordinance, Subdivision Ordinance, Storm Water Ordinance, Nuisance Ordinance, and Site Plan Review Requirements.

Other Mitigation Activities

Potosi has recently replaced low water bridges, removed debris from streams, and has a tree-trimming program.

Table 2.19. Demographic and Structure Risk Parameters For Potosi

Jurisdiction	Population with a Disability	Non-English Speaking Populations	Population Below Poverty Level	Population Under 5 Yrs	Population 65 Yrs and Over	# of Residences Built Prior to 1939	# of Mobile Homes
Potosi	777	21	571	209	467	164	42

Source: Source: U.S. Census Bureau, 2012-2016 5-Years American Community Survey

Table 2.20. City of Potosi Mitigation Capabilities

Capabilities	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	Yes, 2004
Builder's Plan	Yes
Capital Improvement Plan	No
City Emergency Operations Plan	Yes
County Emergency Operations Plan	N/A
Local Recovery Plan	Yes
County Recovery Plan	N/A
City Mitigation Plan	2013
County Mitigation Plan	N/A
Debris Management Plan	No
Economic Development Plan	CEDS
Transportation Plan	Regional Transportation Plan (MRPC)
Land-use Plan	Yes
Flood Mitigation Assistance (FMA) Plan	Yes
Watershed Plan	Yes
Firewise or other fire mitigation plan	No
Critical Facilities Plan	No
Policies/Ordinance	
Zoning Ordinance	Yes
Building Code	2015 IBC
Floodplain Ordinance	Yes
Subdivision Ordinance	Yes
Tree Trimming Ordinance	No
Nuisance Ordinance	Yes
Storm Water Ordinance	Yes
Drainage Ordinance	No
Site Plan Review Requirements	Yes
Historic Preservation Ordinance	No
Landscape Ordinance	No
Program	
Zoning/Land Use Restrictions	Yes
Codes Building Site/Design	Yes
Hazard Awareness Program	No
National Flood Insurance Program	Yes
NFIP Community Rating System (CRS) Participating Community	No
National Weather Service (NWS) Storm Ready Certification	Yes

Firewise Community Certification	No
Building Code Effectiveness Grading (BCEGs)	No
ISO Fire Rating	-
Economic Development Program	No
Land Use Program	No
Public Education/Awareness	No
Property Acquisition	No
Planning/Zoning Boards	Yes
Stream Maintenance Program	Yes
Tree Trimming Program	Yes
Engineering Studies for Streams	No
Mutual Aid Agreements	Yes
Studies/Reports/Maps	
Hazard Analysis/Risk Assessment (City)	No
Hazard Analysis/Risk Assessment (County)	N/A
Evacuation Route Map	No
Critical Facilities Inventory	No
Vulnerable Population Inventory	No
Land Use Map	Yes
Staff/Department	
Building Code Official	Yes
Building Inspector	Yes
Mapping Specialist (GIS)	No
Engineer	Yes
Development Planner	No
Public Works Official	Yes
Emergency Management Director	Yes
NFIP Floodplain Administrator	Yes
Bomb and/or Arson Squad	No
Emergency Response Team	Yes
Hazardous Materials Expert	No
Local Emergency Planning Committee	MREPC
County Emergency Management Commission	N/A
Sanitation Department	Contracted
Transportation Department	No
Economic Development Department	Yes
Housing Department	Phelps Co. PHA
Regional Planning Agencies	MRPC
Historic Preservation	No
Non-Governmental Organizations (NGOs)	
American Red Cross	Yes
Salvation Army	Yes
Veterans Groups	Yes
Environmental Organization	Yes
Homeowner Associations	No
Neighborhood Associations	No
Chamber of Commerce	Yes
Community Organizations (Lions, Kiwanis, etc.)	Yes
Financial Resources	
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	Yes
Fees for water, sewer, gas, or electric services	Yes
Impact fees for new development	No
Ability to incur debt through general obligation bonds	Yes
Ability to incur debt through special tax bonds	No
Ability to incur debt through private activities	No
Ability to withhold spending in hazard prone areas	No

Source: Data Collection Questionnaire, 2017

Table 2.21 summarizes the mitigation capabilities of Washington County and its jurisdictions.

Table 2.21. Mitigation Capabilities Summary Table

Capabilities	Unincorporated Washington Co.	Caledonia	Irondale	Mineral Point	Potosi
Planning Capabilities					
Comprehensive Plan	No	No	No	No	Yes, 2004
Builder's Plan	No	No	No	No	Yes
Capital Improvement Plan	No	No	No	No	No
City Emergency Operations Plan	N/A	No	No	No	Yes
County Emergency Operations Plan	Yes	N/A	N/A	N/A	N/A
Local Recovery Plan	No	No	No	No	Yes
County Recovery Plan	No	No	No	No	N/A
City Mitigation Plan	N/A	2013	2013	2013	2013
County Mitigation Plan	2013	N/A	N/A	N/A	N/A
Debris Management Plan	No	No	No	No	No
Economic Development Plan	CEDS	CEDS	CEDS	CEDS	CEDS
Transportation Plan	Regional Transportation Plan (MRPC)	Regional Transportation Plan (MRPC)	Regional Transportation Plan (MRPC)	Regional Transportation Plan (MRPC)	Regional Transportation Plan (MRPC)
Land-use Plan	No	No	No	No	Yes
Flood Mitigation	No	No	No	No	Yes
Watershed Plan	No	No	No	No	Yes
Firewise or other fire mitigation plan	No	No	No	No	No
Critical Facilities Plan (Mitigation/Response/Recovery)	No	No	No	No	No
Policies/Ordinance					
Zoning Ordinance	No	No	Yes	No	Yes
Building Code	No	No	Yes	No	2015 IBC
Floodplain Ordinance	Yes	Yes	Yes	Yes	Yes
Subdivision Ordinance	No	No	No	No	Yes
Tree Trimming Ordinance	No	No	No	No	No

Nuisance Ordinance	No	Yes	Yes	No	Yes
Storm Water Ordinance	No	No	No	No	Yes
Drainage Ordinance	No	No	No	No	No
Site Plan Review Requirements	No	No	No	No	Yes
Historic Preservation Ordinance	No	Yes	No	No	No
Landscape Ordinance	No	No	No	No	No
Program					
Zoning/Land Use	No	No	Yes	No	Yes
Codes Building Site/Design	No	No	Yes	No	Yes
Hazard Awareness Program	No	No	No	No	No
National Flood Insurance Program	Yes	Yes	Yes	Yes	Yes
NFIP Community Rating System (CRS) Participating Community	No	No	No	No	No
National Weather Service (NWS) Storm Ready	No	No	No	No	Yes
Firewise Community Certification	No	No	No	No	No
Building Code Effectiveness Grading	No	No	No	No	No
ISO Fire Rating	-	9	-	-	-
Economic Development Program	No	No	No	No	No
Land Use Program	No	No	No	No	No
Public Education/Awareness	Yes	No	No	No	No
Property Acquisition	No	No	No	No	No
Planning/Zoning Boards	Yes	No	No	No	Yes
Stream Maintenance	No	No	No	No	Yes
Tree Trimming Program	No	No	No	No	Yes
Engineering Studies for Streams (Local/County/Regional)	No	No	No	No	No
Mutual Aid Agreements	Yes	Yes	Yes	Yes	Yes
Studies/Reports/Maps					

Hazard Analysis/Risk Assessment (City)	No	No	No	No	No
Hazard Analysis/Risk Assessment (County)	No	N/A	N/A	N/A	N/A
Evacuation Route Map	No	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	Yes
Staff/Department					
Building Code Official	No	No	No	No	Yes
Building Inspector	No	No	Yes	No	Yes
Mapping Specialist (GIS)	-	No	No	No	No
Engineer	-	No	No	No	Yes
Development Planner	-	No	No	No	No
Public Works Official	Yes	Yes	Yes	Yes	Yes
Emergency Management Director	Yes	No	Yes	Yes	Yes
NFIP Floodplain Administrator	Yes	Yes	Yes	Yes	Yes
Bomb and/or Arson Squad	-	No	No	No	No
Emergency Response Team	-	No	No	No	Yes
Hazardous Materials Expert	-	No	No	No	No
Local Emergency Planning Committee	MREPC	MREPC	MREPC	MREPC	MREPC
County Emergency Management Commission	No	N/A	N/A	N/A	N/A
Sanitation Department	-	No	No	No	Contracted
Transportation Department	Yes	No	No	No	No
Economic Development Department	No	No	No	No	Yes
Housing Department	Phelps Co. PHA	Phelps Co. PHA	Phelps Co. PHA	Phelps Co. PHA	Phelps Co. PHA
Regional Planning Agencies	MRPC	MRPC	MRPC	MRPC	MRPC
Historic Preservation	No	No	No	No	No
Non-Governmental					

American Red Cross	Yes	No	No	Yes	Yes
Salvation Army	Yes	No	No	Yes	Yes
Veterans Groups	Yes	Yes	No	Yes	Yes
Environmental Organization	No	No	No	No	Yes
Homeowner Associations	No	No	No	No	No
Neighborhood Associations	No	No	No	No	No
Chamber of Commerce	Yes	Yes	No	Yes	Yes
Community Organizations (Lions, Kiwanis, etc.)	Yes	Yes	Yes	Yes	Yes
Financial Resources					
Ability to apply for Community Development Block	Yes	Yes	Yes	Yes	Yes
Ability to fund projects through Capital Improvements funding	Yes	Yes	Yes	No	Yes
Authority to levy taxes for a specific purpose	Yes	Yes	Yes	No	Yes
Fees for water, sewer, gas, or electric services	Yes	Yes	Yes	Yes	Yes
Impact fees for new development	Yes	Yes	Yes	No	No
Ability to incur debt through general obligation bonds	Yes	Yes	Yes	Yes	Yes
Ability to incur debt through special tax bonds	Yes	Yes	Yes	Yes	No
Ability to incur debt through private activities	Yes	No	No	No	No
Ability to withhold spending in hazard	No	No	No	No	No

Source: Data Collection Questionnaires, 2017

2.2.6 Public School District Profiles and Mitigation Capabilities

The following school districts are participating jurisdictions in this plan: Kingston K-14 School District, Potosi R-III School District, Richwoods R-VII School District, and Valley R-VI School District. As public institutions responsible for the care and education of the county's children, these school districts share an interest with Washington County in public safety and hazard mitigation planning. **Figure 2.6** provides the boundaries of the school districts participating in this planning process.

Technical and Fiscal Resources

All schools within the four school districts have NOAA all hazard radios on site to provide early warning of hazard events. In addition, each school district has fire alarms and intercom systems capable of providing specific instructions in the event of an emergency. Three districts reported using a mass notification system for public address/emergency alert; BlackBoard Connect and Textcaster.

All school districts have an full-time building official. Potosi R-III reported having a grant writer. Kingston K-14, Potosi R-III and Richwoods R-VII have an Emergency Manager. All school districts can obtain financial resources from local funds, and state and federal funds/grants.

Since the last plan update, Kingston K-14 built a new elementary school, where the hallways are designed to be tornado shelters, Valley R-VI reported construction of two school domes. Potosi R-III built a new science wing at the high school and early childhood wing at the elementary school. Valley R-VI's entire elementary school is designated as a tornado shelter and meets FEMA standards except the doors. Kingston K-14 anticipates a possible remodel at the high school and junior high. Valley R-VI anticipates an additional dome with full FEMA standards. Potosi R-III plans to construct a tornado shelter at the elementary school dependent upon grant funds.

Existing Plans and Policies

All school districts have an emergency management plan and weapons policy. Kingston K-14, Potosi R-III, and Richwoods R-VII have a Master Plan. Richwoods R-VII and Valley R-VI have Capital Improvement Plans.

Other Mitigation Activities

All school districts actively participate in fire, tornado, earthquake, and lock-down security training at least annually. All school districts regularly utilize local fire departments to educate students on fire safety, as well as their families. Kingston K-14 participates in earthquake preparedness training. Potosi R-III anticipates the installation of a door access system at all buildings. Each classroom has been outfitted with a door barricade system. Classroom windows and doors are labeled from the outside for fire, EMS, and law enforcement.

Table 2.22. School District Buildings and Enrollment Data, 2017

District Name	Building Name	Enrolment
Kingston K-14 School District		
	Kingston Primary	207

	Kingston Elem.	200
	Kingston Middle	183
	Kingston High	205
Potosi R-III School District		
	Potosi Elem.	695
	John A. Evans Middle	346
	Trojan Intermediate	513
	Potosi High	706
	Citadel School	9
Richwoods R-VII School District		
	Richwoods Elem.	188
Valley R-VI School District		
	Caledonia Elem.	119
	Valley High	196

Source: https://ogi.oa.mo.gov/DESE/schoolSearch/index.html

Figure 2.6. Washington County School Districts

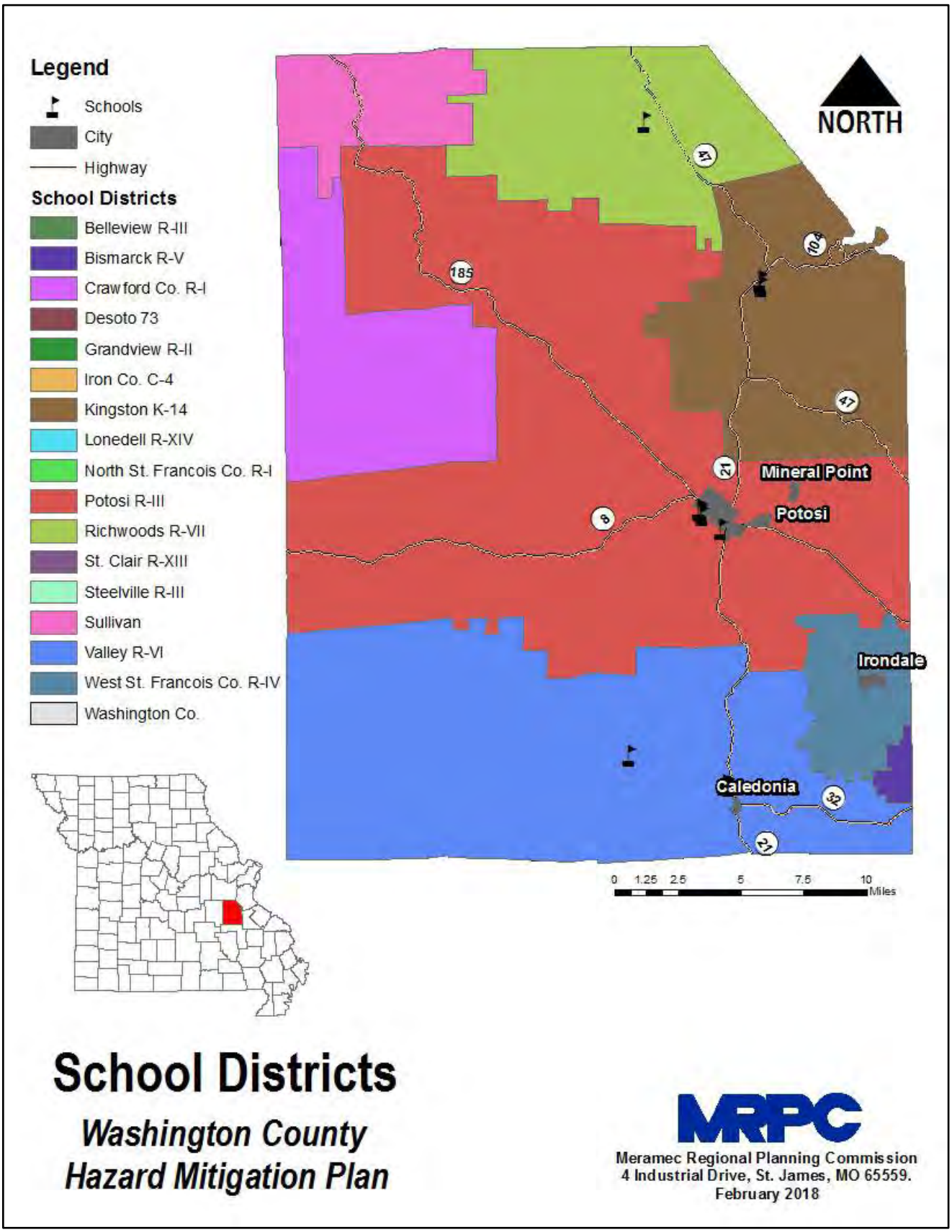


Table 2.23. Summary of Mitigation Capabilities- Washington Co. School Districts

Capability	Kingston K-14	Potosi R-III	Richwoods R-VII	Valley R-VI
	Planning Elements			
Master Plan/Date	2017	8/2/2010	Yes	N/A
Capital Improvement	No	No	1/14/16	Yes
School Emergency Plan/Date	2017	8/2/2010	1/14/16	2011
Weapons Policy/Date	Yes	1/16/2001	Yes	May 2013
	Personnel Resources			
Full-Time Building Official (Principle)	Yes	Yes	Yes	Yes
Emergency Manager	Yes	Yes	Yes	N/A
Grant Writer	No	Yes	No	N/A
Public Information Officer	Yes	Yes	No	Yes
	Financial Resources			
Capital Improvements Project Funding	Yes	No	Yes	N/A
Local Funds	Yes	Yes	Yes	Yes
General Obligation	Yes	Yes	No	N/A
Special Tax Bonds	Yes	No	No	N/A
Private Activities/Donations	No	No	Yes	N/A
State and Federal Funds/Grants	Yes	Yes	Yes	Yes
	Other			
Public Education Programs	Fire Awareness	Fire Awareness	Fire/Safety	Fire/Safety
Privately or Self-Insured?	MUSIC	N/A	-	MUSIC
Fire Evacuation Training	Biannually	Quarterly	Quarterly	Biannual
Tornado Sheltering Exercises	Quarterly	Quarterly	Quarterly	Biannual
Public Address/Emergency Alert System	BlackBoard Connect	BlackBoard Connect	Textcaster	Intercom
NOAA Weather Radios	Yes	Yes	Yes	Yes
Lock-Down Security Training	Annually	Annually	Annually	Biannual
Mitigation Programs	Yes	Yes	Yes	-
Tornado Shelter/Safe-room	Yes	Yes	No	Elementary School
Campus Police	No	Yes	No	No

Source: Data Collection Questionnaires, 2017

2.2.7 Critical Facilities

The table below (**Table 2.24**) provides information for critical facilities in the planning area. Specific information includes a Hazus ID if applicable, jurisdiction, building name/owner, and address. Facilities addressed include emergency, fire department, law enforcement, medical, and schools. Furthermore, **(Table 2.25)** provides information in regards to colleges/universities located in the planning area.

Table 2.24. Washington County Critical Facilities by Type and Jurisdiction

HazusID	Jurisdiction	Building Name	Address	City	State	Zip
Emergency Facilities						
	Washington Co.	Emergency Management Director	1105 Evans Avenue	Potosi	MO	63664
	Washington Co.	Washington Co. E-911	12252 N State Highway 21	Cadet	MO	63630
Fire Department Facilities						
MO000138	Belgrade	Belgrade Volunteer Fire Dept.	14126 State Hwy C	Belgrade	MO	63622
MO000715	Caledonia	Caledonia Fire Protection Dist.	155 Webster Road	Caledonia	MO	63631
	Irondale	Irondale Community Vol. Fire Dept.	107 West Pine St.	Irondale	MO	63648
MO000517	Potosi	Potosi Fire Prot. Dist., No. 1	313 East Jefferson St.	Potosi	MO	63664
	Potosi	Potosi Fire Prot. Dist., No. 2	10441 State Hwy AA	Potosi	MO	63664
	Potosi	Potosi Fire Prot. Dist., No. 3	10047 Tiff Road	Cadet	MO	63630
	Potosi	Potosi Fire Prot. Dist., No. 4	19076 North State Hwy 21	Cadet	MO	63630
	Potosi	Potosi Fire Prot. Dist., No. 5	10051 Jeff City Road	Potosi	MO	63664
MO000137	Richwoods	Richwoods Fire Prot. Dist.	10015 Turtle Road	Richwoods	MO	63071
	Sullivan	Sullivan Fire Protection District, Station 2	11890 Mine Road	Sullivan	MO	63080
Law Enforcement Facilities						
MO000137	Washington Co.	Washington Co. Sheriff	116 W High St.	Potosi	MO	63664
MO000169	Potosi	Potosi Police Dept.	1 Police Plaza	Potosi	MO	63664
	Irondale	Irondale Police Dept.	-	Irondale	MO	63648
Medical Facilities						
MO000099	Potosi	Washington Co. Memorial Hospital	300 Health Way	Potosi	MO	63664
	Washington Co.	Washington Co. Health Dept.	520 Purcell Drive	Potosi	MO	63664

HazusID	Jurisdiction	Building Name	Address	City	State	Zip
School Facilities						
	Cadet	Kingston Primary	10047 Diamond Road	Cadet	MO	63630
MO001824	Cadet	Kingston Elem.	10047 Diamond Road	Cadet	MO	63630
MO001825	Cadet	Kingston Middle	10047 Diamond Road	Cadet	MO	63630
MO001120	Cadet	Kingston High	10047 Diamond Road	Cadet	MO	63630
MO000822	Potosi	Potosi Elem.	205 State Hwy P	Potosi	MO	63664
MO000825	Potosi	Trojan Intermediate	367 Intermediate Drive	Potosi	MO	63664
MO000823	Potosi	John A. Evans Middle	303 S Lead St.	Potosi	MO	63664
MO000824	Potosi	Potosi High	1 Trojan Drive	Potosi	MO	63664
MO000173	Potosi	Citadel School	400 S Mine	Potosi	MO	63664
MO001177	Richwoods	Richwoods Elem.	10788 State Hwy A	Richwoods	MO	63071
MO001827	Caledonia	Caledonia Elem.	1 Viking Drive	Caledonia	MO	63631
MO001828	Caledonia	Valley High	1 Viking Drive	Caledonia	MO	63631

Source: Meramec Region Community Data Mining for Hazard Mitigation Planning (2014); Facilities, Missouri_SEMA, ArcGIS Online.

Although there are no post-secondary schools in Washington County, there are numerous colleges located within the region. These campuses and their locations are shown in **Table 2.25**.

Table 2.25. Local County Colleges/Universities

College/University	Location	Description
State Technical College of Missouri	One Technology Drive, Linn, MO 65051	Associates Degree and Certificates
East Central College	1964 Prairie Dell Road, Union, MO 63084	Associate Degree
Missouri University of Science and Technology	Parker Hall Rolla, MO 65401	Main campus in Rolla, MO Bachelor, Masters, and Doctoral degrees
Drury University	Forum Plaza Rolla, MO 65401	Main campus in Springfield, MO Bachelor degrees
Webster University	1103 Kingshighway Rolla, MO 65401	Main campus in St. Louis, MO Bachelor and Masters degrees
Metro Business College	Hwy 72 Rolla, MO 65401	Main campus in Jefferson City, Mo Associate degrees
Columbia College	Hwy 63 N. Rolla, MO 65401	Main campus in Columbia, MO Bachelor degrees

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.

The goal of the risk assessment is to estimate the 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.

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
- **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 primary phase in the development of a hazard mitigation plan is to identify specific hazards which may impact the planning area. To initiate this process, the Hazard Mitigation Planning Committee (HMPC) reviewed a list of natural hazards provided by the Federal Emergency Management Agency (FEMA). From that list, the HMPC selected pertinent natural hazards of concern that have the potential to impact Washington County. These selected natural hazards are further profiled and analyzed in this plan.

3.1.1 Review of Existing Mitigation Plans

Within the State of Missouri, local hazard mitigation plans customarily include only natural hazards, as only natural hazards are required by federal regulations. Nevertheless, there is an opportunity to include man made or technical hazards within the plan. However, it was decided that only natural hazards were appropriate for the purpose of this plan. Based on past history and future probability, the Hazard Mitigation Planning Committee (HMPC) determined that the following potential hazards would be included in the Washington County Hazard Mitigation Plan:

- Dam Failure
- Drought
- Earthquake
- Extreme Heat
- Fires (Urban/Structural and Wild)
- Flooding
- Land Subsidence/Sinkholes
- Thunderstorm/High Winds/Lightning/Hail
- Tornado
- Severe Winter Weather

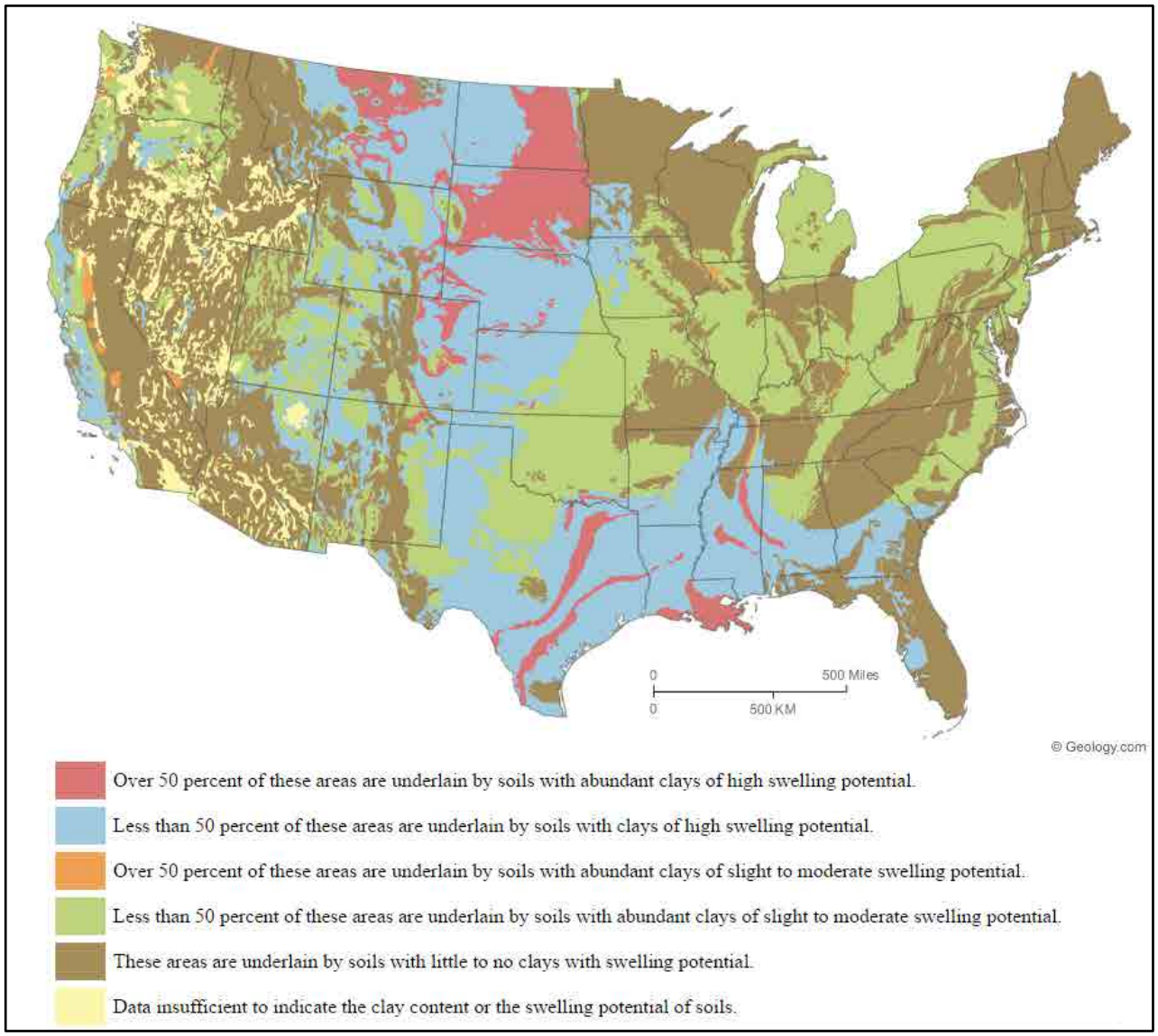
Hazards not occurring in the planning area, or considered insignificant were eliminated from this plan. **Table 3.1** outlines the hazards eliminated from the plan and the reasons for doing so. Additionally, some hazards were combined in the Washington County Plan to match the hazards listed in the Missouri State Hazard Mitigation Plan. The hazards covered in the previous Washington County Hazard Mitigation Plan vary slightly from this plan. Urban/structural fires were included with wildfires, landslides were left out of this plan following the guidance of the 2013 Missouri State Plan, and tornadoes are a separate hazard while lightning was added to thunderstorms.

Table 3.1. Table 3.1 Hazards Not Profiled in the Plan

Hazard	Reason for Omission
Avalanche	No mountains in the planning area.
Coastal Erosion	Planning area is located in the Midwest, not on any coast.
Coastal Storm	Planning area is located in the Midwest, not on any coast.
Debris Flow	There are no mountainous areas in the planning area where this type of event occurs.
Expansive Soils	No expansive soils exist within the planning area. According to the USGS National Geologic Map Database[1], the planning area is underlain by soils with little to no clays with swelling potential (**Figure 3.1**).
Hurricane	Planning area is located in the Midwest, not on any coast.
Levee Failure	According to the US Army Corps of Engineers' National Levee Database [2], and local officials, there are no levees located in the planning area. However, low-head agricultural levees could be present. Unfortunately, no data could be found indicating damages in the event of failure.
Volcano	There are no volcanic areas in the county.

[1] http://ngmdb.usgs.gov/Prodesc/proddesc_10014.htm
[2] http://nld.usace.army.mil/egis/f?p=471:1:0::NO

Figure 3.1. Swelling clays map of the conterminous United States



Source: http://ngmdb.usgs.gov/Prodesc/proddesc_10014.htm

3.1.2 Review Disaster Declaration History

In order to assess risk, it was logical to review the disaster declaration history for the State of Missouri and specifically for Washington County. Federal and State disaster declarations are granted when the severity and magnitude of a hazard event surpasses the ability of local government to respond and recover. Disaster assistance is initiated when the local government's response and recovery capabilities have been exhausted. In this type of situation, the state may declare a disaster and provide resources from the state level. If the disaster is so great that state resources are also overwhelmed, a federal disaster may be declared in order to allow for federal assistance.

There are three agencies through which a federal disaster declaration can be issued – FEMA, the U.S. Department of Agriculture (USDA) and/or the Small Business Administration. A federally declared disaster generally includes long-term federal recovery programs. The type of declaration is determined by the type of damage sustained during a disaster and what types of institutions or industries are affected.

A declaration issued by USDA indicates that the affected area has suffered at least a 30 percent loss in one or more crops or livestock industries. This type of declaration provides those farmers affected with access to low-interest loans and other programs to assist with disaster recovery and mitigation.

Missouri has been especially hard hit by natural disasters in the recent past. The state has had 68 federally declared disasters since 1953. Of those, 38 have occurred between 2000 and 2016. All of these disasters have been weather related – severe wind and rain storms, tornadoes, flooding, hail, ice storms and winter storms. **Table 3.2** lists the federal disaster declarations for Washington County from 1990 through 2017.

Table 3.2. FEMA Disaster Declarations that included Washington County, Missouri, 1990-2017

Disaster Number	Description	Declaration Date Incident Period	Individual Assistance (IA) Public Assistance (PA)
DR-995	Severe Storms & Flooding	Incident Period: June 10, 1993-October 25, 1993 Declaration Date: July 09, 1993	-
DR-1006	Missouri Flooding, Severe Storm, Tornadoes	Incident Period: November 13, 1993-November 19, 1993 Declaration Date: December 01, 1993	-
DR-1023	Missouri Severe Storm, Flooding, and Tornadoes	Incident Period: April 09, 1994-May 05, 1994 Declaration Date: April 21, 1994	-
DR-1328	Missouri Severe Thunderstorms & Flash Flooding	Incident Period: May 06, 2000-May 07, 2000 Declaration Date: May 12, 2000	PA

Disaster Number	Description	Declaration Date Incident Period	Individual Assistance (IA) Public Assistance (PA)
DR-1412	Missouri Severe Storms & Tornadoes	Incident Period: April 24, 2002-June 10, 2002 Declaration Date: May 06, 2002	PA
DR-1463	Missouri Severe Storms, Tornadoes, and Flooding	Incident Period: May 04, 2003-May 30, 2003 Declaration Date: May 06, 2003	IA, PA
EM-3232	Missouri Hurricane Katrina Evacuation	Incident Period: August 29, 2005-October 01, 2005 Declaration Date: September 10, 2005	PA
EM-3267	Missouri Severe Storms	Incident Period: July 19, 2006-July 21, 2006 Declaration Date: July 21, 2006	PA
DR-1631	Missouri Severe Storms, Tornadoes, and Flooding	Incident Period: March 08, 2006-March 13, 2006 Declaration Date: March 16, 2006	IA
DR-1673	Missouri Severe Winter Storms	Incident Period: November 30, 2006-December 02, 2006 Declaration Date: December 29, 2006	PA
EM-3281	Missouri Severe Winter Storms	Incident Period: December 08, 2007-December 15, 2007 Declaration Date: December 12, 2007	-
DR-1749	Missouri Severe Storms & Flooding	Incident Period: March 17, 2008-May 09, 2008 Declaration Date: March 19, 2008	IA, PA
DR-1847	Missouri Severe Storms, Tornadoes, and Flooding	Incident Period: May 08, 2009-May 16, 2009 Declaration Date: June 19, 2009	IA, PA
EM-3303	Missouri Severe Winter Storms	Incident Period: January 26, 2009-January 28, 2009 Declaration Date: January 30, 2009	-
DR-1980	Missouri Severe Storms, Tornadoes, and Flooding	Incident Period: April 19, 2011-June 06, 2011 Declaration Date: May 09, 2011	PA

Disaster Number	Description	Declaration Date Incident Period	Individual Assistance (IA) Public Assistance (PA)
EM-3317	Missouri Severe Winter Storm	Incident Period: January 31, 2011-February 05, 2011 Declaration Date: February 03, 2011	-
DR-4238	Missouri Severe Storms, Tornadoes, Straight-line Winds, and Flooding	Incident Period: May 15, 2015-July 27, 2015 Declaration Date: August 07, 2015	PA
EM-3374	Missouri Severe Storms, Tornadoes, Straight-line Winds, and Flooding	Incident Period: December 22, 2015-January 09, 2016 Declaration Date: January 02, 2016	-
DR-4250	Missouri Severe Storms, Tornadoes, Straight-line Winds, and Flooding	Incident Period: December 23, 2015-January 09, 2016 Declaration Date: January 21, 2016	PA
DR-4317	Missouri Severe Storms, Tornadoes, Straight-line Winds, and Flooding	Incident Period: April 28, 2017-May 11, 2017 Declaration Date: June 02, 2017	PA

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

3.1.3 Research Additional Sources

List the additional sources of data on locations and past impacts of hazards in the planning area:

- Missouri Hazard Mitigation Plans (2010 and 2013)
- Previously approved planning area Hazard Mitigation Plan (12/1/2011)
- 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

- Missouri Public Service Commission
- National Fire Incident Reporting System (NFIRS)
- National Oceanic and Atmospheric Administration's (NOAA) National Climatic Data Center (NCDC);
- Pipeline and Hazardous Materials Safety Administration
- County and local Comprehensive Plans to the extent available
- County Emergency Management
- County Flood Insurance Rate Map, FEMA
- Flood Insurance Study, FEMA
- SILVIS Lab, Department of Forest Ecology and Management, University of Wisconsin
- U.S. Army Corps of Engineers
- U.S. Department of Transportation
- United States Geological Survey (USGS)
- Various articles and publications available on the internet (sources are cited in the body of the Plan)

Remarkably, 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. Those using information from NCDC should be cautious as the NWS does not guarantee the accuracy or validity of the information.

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. They 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 by county, the death or injury listed in connection with that county search did not necessarily occur in that county.

3.1.4 Hazards Identified

Table 3.3 lists the hazards that significantly impact each jurisdiction within the planning area and were chosen for further analysis in alphabetical order. However, not all hazards impact every jurisdiction such as dam failure. “X” indicates the jurisdiction is impacted by the hazard, and a "-" indicates the hazard is not applicable to that jurisdiction. As Washington County is predominately rural, limited variations occur across the county. However, jurisdictions with a high percentage of housing comprised of mobile homes, for example, could be more at risk to damages from a tornado. **Table 3.4** depicts a summary of natural hazard profiles and severity ratings by participating jurisdictions.

Table 3.3. Hazards Identified for Each Jurisdiction

Jurisdiction	Dam Failure	Drought	Earthquake	Extreme Heat	Fires (Urban/Structural and wild)	Flooding (River and Flash)	Land Subsidence/Sinkholes	Thunderstorms/High Winds/ Lightning/Hail	Tornado	Severe Winter Weather
Washington Co.	x	x	x	x	x	x	x	x	x	x
Caledonia	x	x	x	x	x	x	x	x	x	x
Irondale	x	x	x	x	x	x	x	x	x	x
Mineral Point	x	x	x	x	x	x	x	x	x	x
Potosi	x	x	x	x	x	x	x	x	x	x
School Districts										
Kingston K-14	x	x	x	x	x	x	x	x	x	x
Potosi R-III	x	x	x	x	x	x	x	x	x	x
Richwoods R-VII	x	x	x	x	x	x	x	x	x	x
Valley R-VI	x	x	x	x	x	x	x	x	x	x

Table 3.4. Natural Hazard Probability (P) and Vulnerability (V) Ratings by Participating Jurisdiction

		Washington County	Caledonia	Irondale	Mineral Point	Potosi	Kingston K-14	Potosi R-III	Richwoods R-VII	Valley R-VI
Dam Failure	P	14%	14%	14%	14%	14%	14%	14%	14%	14%
	V	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA
Drought	P	13.3%	13.3%	13.3%	13.3%	13.3%	13.3%	13.3%	13.3%	13.3%
	V	L	L	L	L	L	L	L	L	L
Earthquake	P	15%	15%	15%	15%	15%	15%	15%	15%	15%
	V	M-L	M-L	M-L	M-L	M-L	M-L	M-L	M-L	M-L
Extreme Heat	P	100%	100%	100%	100%	100%	100%	100%	100%	100%
	V	M-L	M-L	M-L	M-L	M-L	M-L	M-L	M-L	M-L
Fires (Urban/Structural and *Wild)	P	100%	100%	100%	100%	100%	100%	100%	100%	100%
	V	H	H	H	H	H	H	H	H	H
*Flood/Flash Flood	P	10%	10%	10%	10%	10%	10%	10%	10%	10%
	V	L	L	L	L	L	L	L	L	L
Land Subsidence/Sinkholes	P	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA
	V	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA	NDA
Thunderstorm: *Heavy Rain/High Winds/Lightning/Hail	P	5%	5%	5%	5%	5%	5%	5%	5%	5%
	V	L	L	L	L	L	L	L	L	L
Tornado	P	60%	60%	60%	60%	60%	60%	60%	60%	60%
	V	M-H	M-H	M-H	M-H	M-H	M-H	M-H	M-H	M-H
Severe Winter Weather/Snow/Ice/Severe Cold	P	100%	100%	100%	100%	100%	100%	100%	100%	100%
	V	M-L	M-L	M-L	M-L	M-L	M-L	M-L	M-L	M-L

Vulnerability Rating Key: L = Low, L-M = Low-Medium, M = Medium, M-H = Medium-High, H = High, NDA = No Data Avail.

*indicates hazard utilized for probability.

3.1.5 Multi-Jurisdictional Risk Assessment

For this multi-jurisdictional hazard mitigation plan, each hazard is profiled in which the risks are assessed on a planning area wide basis. Some hazards, such as dam failure, vary in risk across the county. If variations exist within the planning area, discussion is included in each profile. Washington County is uniform across the county in terms of climate, topography, and building construction characteristics. Weather-related hazards will impact the entire county in much the same fashion, as do topographical/geological related hazards such as earthquake. Sinkholes are widespread in the county, but more localized in their effects. Areas of urbanization include Caledonia, Irondale, Mineral Point, and Potosi. These urbanized areas have more assets at a greater density, and therefore have greater vulnerability to weather-related hazards. Rural areas include agricultural assets (livestock/crops) that are also vulnerable to damages. Differences among jurisdictions for each hazard will be discussed in greater detail in the vulnerability section of each hazard.

3.2 Assets at Risk

This section assesses the planning area's population, structures, critical facilities, infrastructure, and other important assets that may be at risk to hazards.

3.2.1 Total Exposure of Population and Structures

Unincorporated County and Incorporated Cities

In the following three tables, population data is based on 2016 Census Bureau data. Building counts values are based on parcel data provided by the Missouri Spatial Data Information Service which can be found at the following website, http://msdis.missouri.edu. Contents exposure values were unable to be calculated due to incompatibility/technical issues with HAZUS MH 4.0. Total exposure for Unincorporated Washington County was obtained from the 2013 Washington Co. Hazard Mitigation Plan.

Table 3.5. Maximum Population and Building Exposure by Jurisdiction

Jurisdiction	2016 Population	Building Count	Building Exposure ($)	Contents Exposure ($)	Total Exposure ($)
Caledonia	195	202	-	-	-
Irondale	420	344	-	-	-
Mineral Point	457	246	-	-	-
Potosi	2,661	1,703	-	-	-
Unincorporated Washington County	21,269	32,274	-	-	-
Total	25,002	34,769	-	-	$804,605,000

Sources: U.S. Census Bureau, 2012-2016 5-Year American Community Survey; 2013 Washington Co. Hazard Mitigation Plan; MO_2014_Missouri_Structures_Project_gdb

Table 3.6. Building Values/Exposure by Usage Type

Jurisdiction	Residential	Commercial	Industrial	Agricultural	Other	Total
Caledonia	-	-	-	-	-	-
Irondale	-	-	-	-	-	-
Mineral Point	-	-	-	-	-	-
Potosi	-	-	-	-	-	-
Unincorporated Washington County	$686,131,000	$65,751,000	$15,282,000	$3,497,000	$33,944,000	$804,605,000
Total	$686,131,000	$65,751,000	$15,282,000	$3,497,000	$33,944,000	$804,605,000

Source: 2013 Washington County Hazard Mitigation Plan

Table 3.7. Building Counts by Usage Type

Jurisdiction	Residential Counts	Commercial Counts	Industrial Counts	Agricultural Counts	Other	Total
Caledonia	63	22	0	14	103	202
Irondale	173	12	0	1	158	344
Mineral Point	124	1	0	0	121	246
Potosi	886	183	6	6	622	1,703
Unincorporated Washington County	7,877	173	33	6,300	17,891	32,274
Total	9,123	391	39	6,321	18,895	34,769

Source: MO_2014_Missouri_Structures_Project_gdb

Table 3.8 below, provides additional information for school districts, including the number of 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 3.8. Population and Building Exposure by Jurisdiction-Public School Districts

Public School District	Enrollment	Building Count	Building Exposure ($)	Contents Exposure ($)	Total Exposure ($)
Kingston K-14	795	10	$23,139,216	$3,490,579	$26,629,795
Potosi R-III	2,269	6	54,328,599	7,678,170	62,006,769
Richwoods R-VI	188	2	2,200,000	1,050,000	3,250,000
Valley R-VI	315	8	13,908,000	802,000	14,710,000

Source: https://ogi.oa.mo.gov/DESE/schoolSearch/index.html; 2017 Data Collection Questionnaire

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 3.9 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 Questionnaire as well as the following sources:

- 2013 Washington County Hazard Mitigation Plan

Table 3.9. Inventory of Critical/Essential Facilities and Infrastructure by Jurisdiction

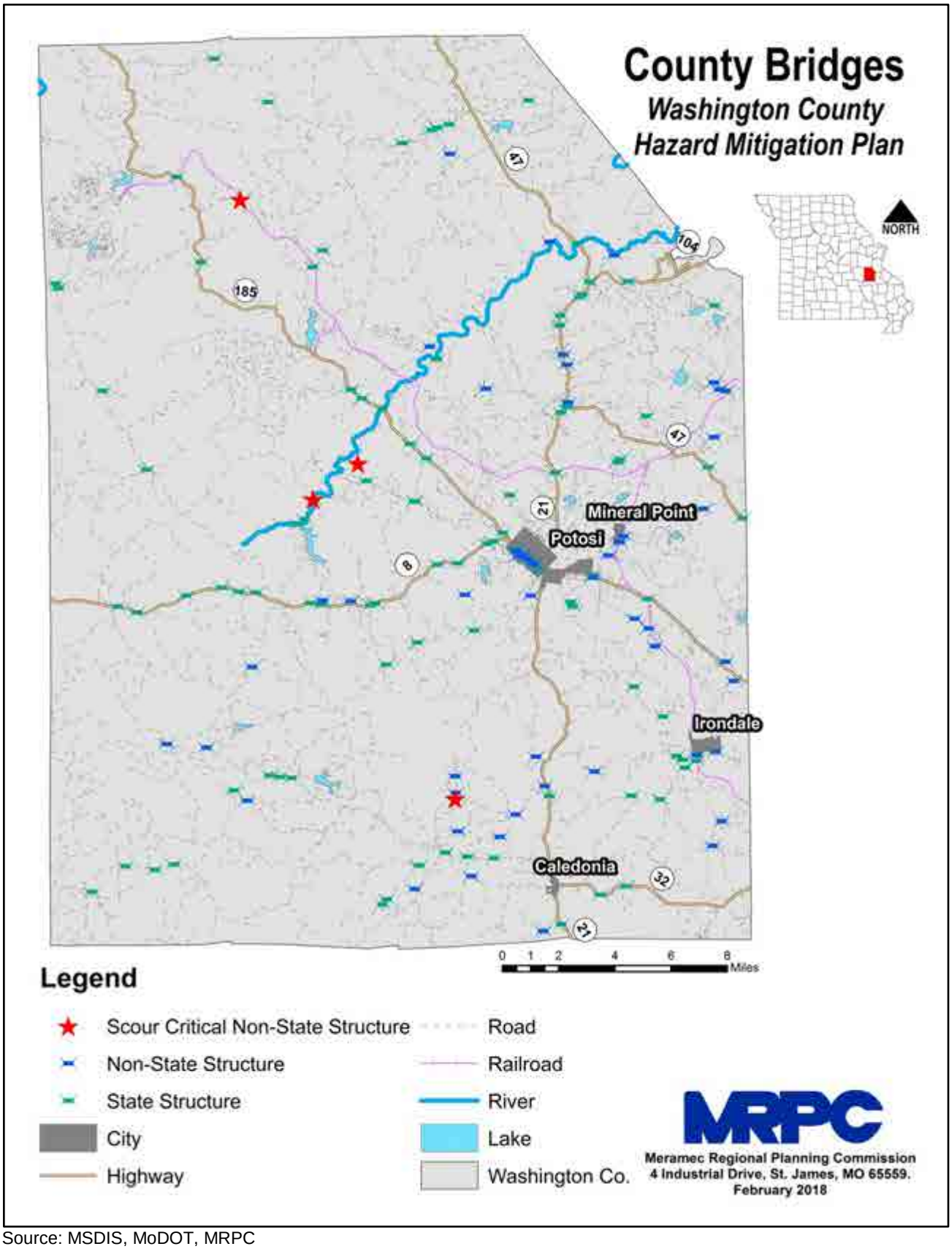
	Airport Facility	Bus Facility	Childcare Facility	Communications Tower	Electric Power Facility	Emergency Operations	Fire Service	Government	Housing	Shelters	Highway Bridge	Hospital/Health Care	Military	Natural Gas Facility	Nursing Homes	Police Station	Potable Water Facility	Rail	Sanitary Pump Stations	School Facilities	Stormwater Pump Stations	Tier II Chemical Facility	Wastewater Facility	Total
Unincorporated Washington County	1	0	4	-	-	1	3	1	1	0	34	0	0	-	0	1	-	1	-	5	-	10	-	62
Caledonia	0	0	0	-	-	0	1	1	1	0	0	0	0	-	0	0	-	0	5	2	-	2	-	12
Irondale	0	0	0	-	-	0	1	1	1	0	0	0	0	-	0	1	-	1	-	0	-	1	-	6
Mineral Point	0	0	1	-	-	0	0	1	1	0	0	0	0	-	0	0	-	1	-	0	-	4	-	8
Potosi	0	0	5	-	-	0	5	1	1	1	3	1	0	-	3	1	-	0	-	5	-	14	-	40
Totals	1	0	10	-	-	1	10	5	5	1	37	1	0	-	3	3	-	3	5	12	-	31	-	128

Source: Data Collection Questionnaires

According to the National Bridge Inventory there are a total of 153 bridges in Washington County[3]. **Figure 3.2** shows the locations of State regulated bridges and non-State bridges in the planning area along with scour critical bridges. Scour critical 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. Nonetheless, there are 4 scour critical non-state structures within the county.

[3] http://www.fhwa.dot.gov/bridge/nbi/no10/county.cfm

Figure 3.2. Washington County Bridges



Source: MSDIS, MoDOT, MRPC

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.

Threatened and Endangered Species: **Table 3.10** depicts Federally Threatened, Endangered, Proposed and Candidate Species in the county.

Table 3.10. Threatened and Endangered Species in Washington County

Common Name	Scientific Name	Status
Mammal		
Gray bat	*Myotis grisescens*	Endangered (F) (S)
Indiana bat	*Myotis sodalis*	Endangered (F) (S)
Northern long-eared bat	*Myotis septentrionalis*	Threatened (F) Endangered (S)
Mollusk		
Scaleshell	*Leptoea leptodon*	Endangered (F) (S)
Sheepnose	*Plethobasus cyphyus*	Endangered (F)
Slippershell	*Alasmidonta viridis*	Endangered (S)
Snuffbox	*Epioblasma triquetra*	Endangered (F) (S)
Spectaclecase	*Cumberlandia monodonta*	Endangered (F)
Salamander		
Eastern Hellbender	*Cryptobranchus alleganiensis allenganiensis*	Endangered (S)

Note: S = State, F = Federal
Source: U.S. Fish and Wildlife Service, http://www.fws.gov/midwest/Endangered/lists/missouri-cty.html; MDC Missouri Natural Heritage Program Search

Natural Resources: The Missouri Department of Conservation (MDC) provides a database of lands owned, leased, or managed for public use. **Table 3.11** provides the names and locations of parks and conservation areas in Washington County.

Table 3.11. Conservation Areas in Washington County

Area Name	Address	City
Bootleg Access	From Potosi, take Highway 21 south 10 miles to Big River.	Potosi
Hughes Mountain NA	From Potosi, take Highway 21 south 11 miles, then Route M east 5 miles to parking lot on south side of road 200 yards east of Cedar Creek Road (CR 541).	Potosi
Kingston Access	From the main entrance of Washington State Park, take Highway 21 west 3 miles, then Dugout Road north 2 miles to the area.	-
Little Indian Creek CA	North entrance: From Highway 30, take Route K south across the Meramec River, then Old Route K left 0.50 mile, then Little Indian Creek Road 3 miles to the area sign. South entrance to new shooting range: From I-44, take Highway 185 south 7 miles, then Route A east 6 miles to the area sign.	-
MO DNR (Washington State Park Access)	The Washington State Park Access (MO DNR) is north off of Highway 21 between De Soto and Old Mines. The access is located on the west side of the Big River.	-
Pea Ridge CA	Pea Ridge Conservation Area consists of several tracts and is marked with a sign on Highway 185 between Sullivan and Potosi.	Potosi
Potosi (Roger Bilderback Lake)	In Potosi City Park, located along Route P.	Potosi

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

Table 3.12 provides information pertaining to community owned/operated parks within Washington County.

Table 3.12. Community Owned Parks in Washington County

Park Name	Address	City
Townsend St. City Park	Townsend St., Caledonia, MO	Caledonia
Irondale City Park	Ash St., Irondale, MO 63648	Irondale
Bilderback Park	Clara Ave, Potosi, MO 63664	Potosi
Cresswell Park	South Lead St., Potosi, MO 63664	Potosi
Heritage Park	S Mine St. Potosi, MO 63664	Potosi
Howell Park	Stone St., Potosi, MO 63664	Potosi
Potosi City Park	Park Dr., Potosi, MO 63664	Potosi
Thurman Park	E Jefferson St., Potosi, MO 63664	Potosi

Source: Google Search

Historic Resources: 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. **Table 3.13** provides information in regards to properties on the National Register of Historic Places in Washington County.

Table 3.13. Washington County Properties on the National Register of Historic Places

Property	Address	City	Date Listed
Caledonia Historic District	roughly bounded by Patrick, College, and Alexander Sts., and MO 21 on Main St., Caledonia	Caledonia	10/27/86
Cresswell Petroglyph Archaeological Site	address restricted	-	2/12/71
Cresswell, George, Furnance	MO F, Potosi vicinity	Potosi	5/23/88
Land Archaeological Site	address restricted	-	5/05/72
Lost Creek Pictograph Archaeological Site	address restricted	-	1/25/71
Palmer Historic Mining District	address restricted	-	11/29/10
Queen, Harrison, House	Hwy C, 1.3 mi. W of MO 21, Caledonia vicinity	Caledonia	6/27/02
Susan Cave	address restricted	-	7/08/89
Washington County Courthouse	102 N. Missouri St., Potosi	Potosi	10/25/11
Washington State Park CCC Historic District	Potosi vicinity	Potosi	3/04/85
Washington State Park Petroglyph Archaeological Site	Fertile vicinity	-	4/03/70

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

Economic Resources: **Table 3.14** provides major non-government employers in the planning area. There are approximately 375 employer establishments within the county, employing on average 9 individuals each[4].

Table 3.14. Major Non-Government Employers in Washington County

Employer Name	Product or Service	Employees
Potosi Correctional Center	Corrections	800
Washington Co. Memorial Hospital	Hospital	250
Red Wing Shoe Store	Retail	175
Purcell Tire Co.	Tire	150
Potosi R-III	Education	400
Walmart Supercenter	Retail	175
YMCA Trout Lodge	-	250+

Source: https://missourieconomy.org/Employers/default.aspx, Data Collection Questionnaire 2017

Agriculture plays an important role in Washington County in terms of employment. The Agribusiness Employment Location Quotient for the County is greater than 1.5; meaning that there is a high share of agribusiness employment to its share of total national employment[5]. In addition, there were 73 individuals working in the agriculture industry, comprising 0.8% of the total workforce in 2016[6]. In addition, the market value of products sold in 2012 was $11.1 million; 79% from livestock sales, and 21% from crop sales.

[4] https://www.census.gov/quickfacts/fact/table/washingtoncountymissouri,crawfordcountymissouri/HSG650216
[5] http://www.missourieconomy.org/pdfs/missouri_farms_and_agribusiness.pdf;
[6] https://factfinder.census.gov/faces/tableservices/jsf/pages/productview.xhtml?pid=ACS_16_5YR_DP03&prodType=table

3.3 Future Land Use and Development

Table 3.15 provides population growth statistics for Washington County.

Table 3.15. Washington County Population Growth, 2000-2016

Jurisdiction	Total Population 2000	Total population 2016	2000-2016 # Change	2000-2016 % Change
Unincorporated Washington	19,724	21,269	1,545	7.8
Caledonia	158	195	37	23.4
Irondale	437	420	-17	-3.9
Mineral Point	363	457	94	25.9
Potosi	2,662	2,661	-1	-0.04

Source: U.S. Bureau of the Census, 2012-2016 5 Year American Community Survey; Census 2000 Summary File 1

Typically population growth or decline is generally accompanied by an increase or decrease in the number of housing units. **Table 3.16** provides the change in numbers of housing units in the planning area from 2000-2016.

Table 3.16. Change in Housing Units, 2000-2016

Jurisdiction	Housing Units 2000	Housing Units 2016	2000-2016 # Change	2000-2016 % change
Unincorporated Washington	8,270	9,267	997	12.1
Caledonia	79	73	-6	-7.6
Irondale	198	176	-22	-11.1
Mineral Point	136	172	36	26.5
Potosi	1,211	1,183	-28	-2.3

Source: U.S. Census Bureau, 2012-2016 5 Year American Community Survey; U.S. Bureau of the Census, Census 2000 Summary File 1

Since the last update of the Washington County Hazard Mitigation Plan (2013), multiple jurisdictions reported commercial and industrial developments. The City of Potosi reported the addition of a new ambulance district building, and private building in the industrial park. Kingston K-14 building a new elementary school in 2013. The halls were engineered to serve as a tornado shelter. Potosi R-III reported a new science wing at the high school and early childhood wing at the elementary school. Valley R-VI reported the construction of two additional domes.

Jurisdictions also reported anticipated future developments within the next 5 years (2018-2023). Kingston K-14 anticipates a possible remodel at the high school and junior high for safety purposes. Potosi R-III anticipates the construction of a tornado shelter at the elementary school dependent upon grant funds. Valley R-VI anticipates the construction of another dome with full FEMA standards. Potosi, Mineral Point, Irondale, Caledonia, Washington Co., and Richwoods R-VII did not report future developments within the next 5 years.

New development can impact a jurisdiction's vulnerability to natural hazards. As the number of buildings, critical facilities, and assets increase, vulnerability increases as well. For example, real estate development can increase storm water runoff, which often increases localized flooding. However, some development such as infrastructure improvements can help reduce vulnerability risks. Unfortunately, quantitative data is not available to further examine each jurisdictions new development and its correlation to natural hazard vulnerabilities.

Socioeconomic Profile

The University of Missouri Extension developed a Social and Economic Profile for Washington County. Population trend data suggests that Washington County will increase by 2,292 individuals within the next 2 to 12 years[7]. Furthermore, business incentives are available in the County including MissouriWorks, a program for qualified job creators which enables the retention of withholding tax or tax credits that can be transferrable, refundable and/or saleable; BUILD, a financial incentive for the location or expansion of large business projects; sales tax exemptions exist for qualified manufacturers; and. industrial infrastructure grants are available up to $2 million or $20,000 per job created[8]. **Figure 3.3** displays socioeconomic data for Washington County compared to the State of Missouri.

[7] UM Extension Social and Economic Profile http://mcdc.missouri.edu/cgi-bin/broker?_PROGRAM=websas.cntypage.sas&county=29221
[8] https://www.ded.mo.gov/Programs.aspx

Figure 3.3. Washington County Socioeconomic Profile

Sales Tax

	Rate
Potosi	1.5%
Washington County	2.5%
Missouri	4.23%
Total	8.73%

Property Tax

	Rate
Washington County	0.715%

Median Household Income

Washington County	$36,701
Missouri	$49,593

Median Housing Value

Washington County	$95,600
Missouri	$151,400

Cost of Living

Community	Cost of living index	Year
Washington County	79.4	2017
Missouri	89.2	2017

Total Retail Sales

Year	Washington County
2012	$122,281,000

Per Capita Income

Washington County	$18,472	2016
Missouri	$27,044	2016

Transportation

Airport	8WC
Highways	-
State Highways	8, 21, 47, 185
Transportation Services	SMTS
Railroad	Union Pacific
Parcel Service	UPS, Fed Ex, DHL, USPS

Sources:

1. U.S. Census Bureau, 5-Year American Community Survey
2. https://www.taxrates.com/state-rates/missouri/cities/linn/
3. http://www.city-data.com
4. https://smartasset.com/taxes/missouri-property-tax-calculator
5. https://www.missourieconomy.org/indicators/cost_of_living/
6. Missouri Economic Research and Information Center
7. Missouri Spatial Data Information Service

3.4 Hazard Profiles, Vulnerability, and Problem Statements

Each hazard that has been determined to be a potential risk to Washington County is profiled individually in this section of the plan document. The profile will consist 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 will be 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** will be profiled individually in this section in alphabetical order. The level of information presented in the profiles will vary 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. Where available, use maps to indicate the specific locations of the planning area that are vulnerable to the subject hazard. 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.

The discussion on the probability of future occurrence should also consider changing future conditions, including the effects of long-term changes in weather patterns and climate on the identified hazards. NOAA has a new tool that can provide useful information for this purpose.

- NOAA Climate Explorer, http://toolkit.climate.gov/climate-explorer2/

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 (2013). 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 Washington County 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: This section will include a brief review of the vulnerability of each hazard.

Potential Losses to Existing Development: (including types and numbers, of buildings, critical facilities, etc.)

Future Development: This section will include information on anticipated future development in the county, and how that would impact hazard risk in the planning area.

Previous and Future Development: This section will include information on how changes in development have impacted the community's vulnerability to this hazard. Describe how any changes in development that occurred in known hazard prone areas since the previous plan have increased or decreased the community's vulnerability. Describe any anticipated future development in the county, and how that would impact hazard risk in the planning area.

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. Additionally, variations in risk between geographic areas will be included.

3.4.1 Dam Failure

Some specific sources for this hazard are:

- Missouri Department of Natural Resources, Dam and Reservoir Safety, http://dnr.mo.gov/env/wrc/dam-safety/statemap.htm
- Stanford University's National Performance of Dams Program; http://npdp.stanford.edu/index.html
- National Inventory of Dams, http://geo.usace.army.mil/
- MO DNR Dam & Reservoir Safety Program;
- National Resources Conservation Service http://www.nrcs.usda.gov
- DamSafetyAction.org, http://www.damsafetyaction.org/MO/
- Missouri Spatial Data Information Service, http://msdis.missouri.edu

Hazard Profile

Hazard Description

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.

Information regarding dam classification systems under both the Missouri Department of Natural Resources (MDNR) and the National Inventory of Dams (NID), which differ, are provided in **Table 3.17** and **Table 3.18**, respectively.

Table 3.17. MDNR Dam Hazard Classification Definitions

Hazard Class	Definition
Class I	Contains 10 or more permanent dwellings or any public building
Class II	Contains 1 to 9 permanent dwellings or 1 or more campgrounds with permanent water, sewer, and electrical services or 1 or more industrial buildings
Class III	Everything else

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

Table 3.18. NID Dam Hazard Classification Definitions

Hazard Class	Definition
Low Hazard	A dam located in an area where failure could damage only farm or other uninhabited buildings, agricultural or undeveloped land including hiking trails, or traffic on low volume roads that meet the requirements for low hazard dams.
Significant Hazard	A dam located in an area where failure could endanger a few lives, damage an isolated home, damage traffic on moderate volume roads that meet certain requirements, damage low-volume railroad tracks, interrupt the use or service of a utility serving a small number of customers, or inundate recreation facilities, including campground areas intermittently used for sleeping and serving a relatively small number of persons.
High Hazard	A dam located in an area where failure could result in any of the following: extensive loss of life, damage to more than one home, damage to industrial or commercial facilities, interruption of a public utility serving a large number of customers, damage to traffic on high-volume roads that meet the requirements for hazard class C dams or a high-volume railroad line, inundation of a frequently used recreation facility serving a relatively large number of persons, or two or more individual hazards described for significant hazard dams.

Source: National Inventory of Dams

Geographic Location

Dams in Planning Area

According to the Department of Natural Resources there are 119 dams within Washington County; including Class 1 (41), Class 2 (44), and Class 3 (34) dams (**Table 3.19**). In addition, the state regulates 60 of the 119 dams. The NID recognizes 115 dams in the planning area; including high (85), significant (2), and low (28) NID hazard class dams. Of the 115 recognized dams, 41 have a primary purpose of storing mining operation byproducts, also known as tailings dams. One of the dams is federally owned or operated. Other county dams are privately or commercially owned. **Table 3.20** provides the names, locations, and other pertinent information for all NID High Hazard Dams in the planning area.

Table 3.19. Washington County Dams Hazard Risk

Name of Dam	DNR Hazard Class	NID Hazard Class
ARNAULT BRANCH MINE DAM	2	High
ARTESIAN LAKE DAM	2	High
ASHLEY BRANCH DAM	2	High
ASSAF LAKE DAM	3	Low
BAHA TRAIL LAKE DAM	2	High
BELGRADE DAM	2	High
BELL-SETTLE LAKE DAM	1	High
BIG FOUR MINE DAM	1	High
BLACK TAILINGS DAM	1	High
BLACKWELL MINE DAM	1	High
BLUE HERON DAM	2	High

Name of Dam	DNR Hazard Class	NID Hazard Class
BOTTOM DIGGINS DAM	2	High
BRESSIE LAKE(TOO SMALL)	3	Low
BUST LAKE DAM (BREACHED)	3	-
CADET MINE TAILINGS DAM	2	High
CADET NO. 1 DAM	2	High
CADET NO. 2 DAM	2	High
CADET NO. 3 DAM	2	Low
CARTER LAKE DAM	3	High
CASEY LAKE DAM	1	High
CASEY LAKE DAM	2	Low
CATES LAKE DAM	3	Low
CLICK LAKE DAM	3	High
CRYSTAL LAKE DAM	2	High
DAVIS LAKE DAM	2	Low
DEL LAGO LAKE DAM	3	Low
DEL VISTA LAKE DAM	3	Low
DELLISTRI DAM (DRY)	3	High
DESOTO MINE PIT & PLANT A DAM	2	High
DESOTO PIT & PLANT B DAM	2	High
DESSIEUX LAKE DAM	1	High
DITCH CREEK DAM	2	High
DORLAC LAKE DAM	2	High
DRESSER #1 DAM	1	High
DRESSER IND. OLD #1	1	High
DRESSER MINERALS #7 DAM NORTH(DRY)	2	High
DRESSER MINERALS #7 DAM SOUTH (DRY)	2	Low
DRESSER MINERALS DAM SEC 24 (DRY)	3	Low
DRESSER MINERALS NO 7 DAM (DRY)	3	High
DRESSER NO.4 DAM	1	High
EMERALD LAKE DAM	2	High
ESHBAUGH-MARTIN DAM	2	High
FLOYD LAKE DAM	1	High
FLYING "S" BAR RANCH DAM	1	High
FOREST LAKE DAM	1	High
FOUR WINDS WAY DAM	2	High
GIBSON MEMORIAL DAM	1	High

Name of Dam	DNR Hazard Class	NID Hazard Class
GUDAITIS LAKE DAM	1	High
GUN CLUB LAKE DAM	2	High
HAHN LAKE DAM/(DRY)	2	High
HEIMOS LAKE DAM	1	High
HEMATITE LAKE DAM (BREACHED)	3	-
HENPECK HOLLOW DAM	1	Low
HILL VIEW LAKE DAM SOUTH	3	High
HILLVIEW LAKE DAM	3	Low
HOFFMAN LAKE DAM	2	High
HOPKINS LAKE DAM	3	High
HOWELL MINE DAM	2	High
INDIAN CREEK MINE DAM - UPPER	1	Low
INDIAN CREEK MINE DAM- LOWER	1	Low
JOHNS DAM	3	High
JONES LAKE DAM	3	High
KEUSS DAM	2	High
KEYES BRANCH MINE DAM	1	High
KING ARTHUR'S DAM	2	High
KINGSTON NO. 1 DAM	2	High
LAC SHAYNE DAM	2	High
LAKE APACHE DAM	2	Low
LAKE CHEROKEE DAM	1	High
LAKE MELISSA DAM	3	High
LAKEVIEW DAM	1	High
LITTLE INDIAN CREEK DAM	1	Significant
LOWER DRESSER NO. 4 DAM	1	Significant
LUTTRELL LAKE DAM LOWER	3	High
LUTTRELL LAKE UPPER DAM	3	High
MINERAL POINT #1	1	High
MINERAL POINT #2	1	Low
MINNETONKA LAKE DAM	2	Low
MONONAME 267	3	Low
MONONAME 551	3	-
MONONAME 558	3	Low
MONONAME 563	3	High
MONONAME 582	3	Low
MONONAME 588	3	High
MONONAME 862	3	-

Name of Dam	DNR Hazard Class	NID Hazard Class
MONONAME 875	2	High
MOOSEHORN LAKE DAM	3	Low
NATIONAL LEAD INDUSTRIES DAM	1	High
OLD MINES TAILINGS DAM	1	High
OLD WOLF DAM	1	High
PALMER MINE DAM	1	High
PAROLE MINE DAM	1	High
PEA RIDGE TAILINGS DAM	1	High
PINE TREE LAKE EAST DAM	1	High
PINE TREE LAKE WEST DAM	1	High
PINSON GRAVEL COMPANY DAM	2	High
PIONEER ROD&GUN CLUB DAM	3	Low
PODORSKI LAKE DAM	2	High
POTOSI LAKE DAM	1	High
POWDER SPRING LAKE DAM	1	High
RACOLA TAILINGS DAM	2	High
RICHWOODS MINE B DAM	1	High
RIEFFER LAKE DAM	3	Low
ROGUE CREEK UPPER DAM (IMCOMPLETED)	2	High
RUSSEL ELSEY DAM	1	High
SAMPSON LAKE DAM	3	Low
SAYERSBROOK DAM	2	High
SCHNELLE LAKE DAM	2	High
SETTLE MINE DAM #2	2	High
SOMETHING GREEN A DAM	1	High
SOMETHING GREEN B DAM	1	High
SPRING GLEN LAKE DAM	2	High
SPRING LAKE DAM	1	High
SPRING LAKE DAM	3	Low
SUN MINE DAM	2	High
SUNNEN DAM	2	High
THE PLACE LAKE DAM	1	High
TIMBERLANE DAM (FEDERAL)	3	Low
WING LAKE DAM	3	Low

Source: Missouri Department of Natural Resources, Water Resources Program

Table 3.20. NID High Hazard Class Dams in the Washington County Planning Area

Dam Name	NIDID	Hazard Potential *	NID Height (Ft.)	NID Storage	River	Nearest City *	Distance To City (Mi.) *
ARNAULT BRANCH MINE DAM	MO30716	High	46	582	TRIB-ARNAULT CREEK	OLD MINES	3
ARTESIAN LAKE DAM	MO30470	High	26	195	TR-LITTLE INDIAN CREEK	RICHWOODS	3
ASHLEY BRANCH DAM	MO31857	High	58	1,970	ASHLEY BRANCH CREEK	BOURBON	14
BAHA TRAIL LAKE DAM	MO31306	High	30	433	TR-DRY BR-INDIAN CREEK	SULLIVAN	6
BELGRADE DAM	MO30696	High	55	281	TR-FURNACE CREEK	LEADWOOD	17
BELL-SETTLE LAKE DAM	MO30480	High	33	230	TR-MINE A BRETON CREEK	POTOSI	2
BIG FOUR MINE DAM	MO30729	High	73	1,980	TRIB-CALICO CREEK	FLETCHER	2
BLACK TAILINGS DAM	MO31154	High	70	22	MILL CREEK-OFFSTREAM	MINERAL POINT	0
BLACKWELL MINE DAM	MO30709	High	85	2,100	TRIB MADDEN CREEK	POTOSI	1
BLUE HERON DAM	MO30478	High	51	2,176	POND CREEK	TIFF	7
BOTTOM DIGGINS DAM	MO30750	High	41	300	TR-MILL CREEK	TIFF	3
CADET MINE TAILINGS DAM	MO30715	High	97	103	TR-MILL CREEK	TIFF	3
CADET NO. 1 DAM	MO30704	High	53	264	MILLCREEK TRIB OFFSTREAM	BLACKWELL	7
CADET NO. 2 DAM	MO30707	High	77	33	TR-MILL CREEK	TIFF	4
CADET NO. 3 DAM	MO31830	High	74	765	SHIBBOLETH BRANCH	CADET	4
CASEY LAKE DAM	MO31005	High	57	120	TR-OLD MINES CREEK	MORSE MILL	26
CASEY LAKE DAM	MO30695	High	36	117	TR-CLEAR CREEK	LEADWOOD	20
CRYSTAL LAKE DAM	MO31837	High	65	1,770	HARRIS BRANCH	ANTHONIES MILL	10
DAVIS LAKE DAM	MO31000	High	30	48	TR-TYREY CREEK	MORSE MILL	21
DESOTO MINE PIT & PLANT A DAM	MO30468	High	78	3,700	TRIB-DITCH CREEK	RICHWOODS	2

Dam Name	NIDID	Hazard Potential *	NID Height (Ft.)	NID Storage	River	Nearest City *	Distance To City (Mi.) *
DESOTO PIT & PLANT B DAM	MO30469	High	54	248	DITCH CREEK	RICHWOODS	2
DESSIEUX LAKE DAM	MO30994	High	28	470	TR BATES CREEK	BATES CREEK CAMP	2
DITCH CREEK DAM	MO30726	High	60	1,500	TR-DITCH CREEK	MORSE MILL	16
DORLAC LAKE DAM	MO30731	High	45	758	TR-MINERAL FORK-BIG RIVER	OLD MINES	6
DRESSER #1 DAM	MO31117	High	30	1,295	RUBENEAU BRANCH - OFFSTREAM	MINERAL POINT	0
DRESSER IND. OLD #1	MO30753	High	45	1,300	RUBENEAU BRANCH-OFFSTREAM	MINERAL POINT	0
DRESSER MINERALS #7 DAM NORTH(DRY)	MO31145	High	15	305	TR-CADET CREEK	CADET	0
DRESSER MINERALS #7 DAM SOUTH (DRY)	MO31147	High	34.6	80	TR-MILL CREEK	BLACKWELL	0
DRESSER NO.4 DAM	MO30474	High	105	4,325	TR-MILL CREEK	TIFF	2
EMERALD LAKE DAM	MO31836	High	46	405	TR HARRIS BRANCH	SULLIVAN	16
ESHBAUGH-MARTIN DAM	MO30711	High	115	81	TR BIG RIVER	MORSE MILL	26
FLOYD LAKE DAM	MO30744	High	21	90	TR-OLD MINES CREEK	OLD MINES	2
FLYING "S" BAR RANCH DAM	MO31124	High	62	127	TR MILL CREEK	TIFF	1
FOREST LAKE DAM	MO30101	High	50	409	SWAN CREEK	LATTY	2
FOUR WINDS WAY DAM	MO30722	High	31	199	TR-MINERAL FORK-BIG RIVER	APTUE	1
GIBSON MEMORIAL DAM	MO32036	High	45	184	ASHLEY BRANCH	SHRILEY	0
GUDAITIS LAKE DAM	MO30702	High	25	158	TR-CLEAR CREEK	IRONDALE	12
GUN CLUB LAKE DAM	MO30476	High	85	1,400	TR-MINE A BRETON CREEK	CRUISE	11
HAHN LAKE DAM/(DRY)	MO31122	High	30	241	TR-SALT MINES CREEK	MORSE MILL	25

Dam Name	NIDID	Hazard Potential *	NID Height (Ft.)	NID Storage	River	Nearest City *	Distance To City (Mi.) *
HEIMOS LAKE DAM	MO30999	High	37	37	TRIB-LITTLE INDIAN CREEK	RICHWOODS	1
HENPECK HOLLOW DAM	MO31256	High	24	141	TR-COURTOIS CREEK	BERRYMAN	4
HOFFMAN LAKE DAM	MO31484	High	25	134	TR-LITTLE INDIAN CREEK	RICHWOODS	0
HOWELL MINE DAM	MO30700	High	58	1,460	ISHMAEL BR HAZEL CREEK	SHIRLEY	9
INDIAN CREEK MINE DAM - UPPER	MO31036	High	56	791	GOOSE CREEK	SULLIVAN	13
INDIAN CREEK MINE DAM-LOWER	MO30717	High	84	875	GOOSE CREEK	RICHWOODS	5
KEUSS DAM	MO40120	High	45	378	TURKEY CREEK	-	0
KEYES BRANCH MINE DAM	MO30386	High	77	1,192	TRIBUTARY KEYES BRANCH CREEK	TIFF	0
KING ARTHUR'S DAM	MO31825	High	80	2,000	POND CREEK	MINERAL POINT	6
KINGSTON NO. 1 DAM	MO30728	High	85	1,700	TR-MINERAL FK-BIG RIVER	BLISS	2
LAC SHAYNE DAM	MO31835	High	72	2,475	POND CREEK	TERRE DU LAC	6
LAKE APACHE DAM	MO30703	High	41	142	TR DRY CREEK	IRONDALE	1
LAKE CHEROKEE DAM	MO30751	High	27	72	TR DRY CREEK	IRONDALE	1
LAKEVIEW DAM	MO30688	High	68	1,750	TR BATES CREEK	FLETCHER	23
LITTLE INDIAN CREEK DAM	MO30718	High	58	1,280	TR-LITTLE INDIAN CREEK	RICHWOODS	1
LOWER DRESSER NO. 4 DAM	MO31123	High	31	116	TRIBUTAR TO MILL CREEK	TIFF	2
MINERAL POINT #1	MO30705	High	72	2,200	TR-MILL CREEK	BLACKWELL	9
MINERAL POINT #2	MO31158	High	95	1,191	TRIB-MILL CREEK	MINERAL POINT	1
MINNETONKA LAKE DAM	MO30727	High	74	2,500	TRIB-DITCH CREEK	RICHWOODS	1
MONONAME 875	MO31006	High	20	235	SYCAMORE CREEK	BLISS	0
NATIONAL LEAD INDUSTRIES	MO30708	High	99	363	TR-MILL CREEK	BLACKWELL	2

Dam Name	NIDID	Hazard Potential *	NID Height (Ft.)	NID Storage	River	Nearest City *	Distance To City (Mi.) *
DAM							
OLD MINES TAILINGS DAM	MO30706	High	61	286	MUD TOWN CREEK	RACOLA	1
OLD WOLF DAM	MO31118	High	48	182	TR CADET CREEK	TIFF	4
PALMER MINE DAM	MO30482	High	76	1,460	TR HAZEL CREEK	SHIRLEY	9
PAROLE MINE DAM	MO30483	High	64	1,000	SPRINGTOWN BRANCH	PAROLE	9
PEA RIDGE TAILINGS DAM	MO30473	High	150	4,100	TR-MARYS CREEK	MORSE MILL	-
PINE TREE LAKE EAST DAM	MO30992	High	33	159	TRIB-FOURCHEARENAULT CREEK	POTOSI	0
PINE TREE LAKE WEST DAM	MO30995	High	28	120	TRIB-FOURCHE A RENAULT CREEK	POTOSI	0
PINSON GRAVEL COMPANY DAM	MO31155	High	79	875	TR-OLD MINES CR	CRUISE MILL	0
PODORSKI LAKE DAM	MO30697	High	26	83	TR-CLEAR CREEK	LEADWOOD	19
POTOSI LAKE DAM	MO30477	High	33	438	TRIB-BIG RIVER	LEADWOOD	10
POWDER SPRING LAKE DAM	MO30749	High	28	195	BUST BRANCH O MILL CREEK	TIFF	2
RACOLA TAILINGS DAM	MO30475	High	78	29	OLD MINES CREEK	RACOLA	1
RICHWOODS MINE B DAM	MO31404	High	48	1,000	TR-DITCH CREEK	RICHWOODS	0
ROGUE CREEK UPPER DAM (IMCOMPLETED)	MO31849	High	17	109	ROGUE CREEK	POTOSI	3
RUSSEL ELSEY DAM	MO30102	High	21	224	NORTH FORK FOURCHE A RENAULT	POTOSI	0
SAYERSBROOK DAM	MO30112	High	67	1,080	ASHLY BRANCH	APTUE	6
SCHNELLE LAKE DAM	MO31329	High	25	134	TR-BIG RIVER	BELGRADE	4
SETTLE MINE DAM #2	MO30479	High	68	300	TR-MINE A BRETON CREEK	POTOSI	2
SOMETHING GREEN A DAM	MO30720	High	27	347	ROUGE CREEK	POTOSI	8

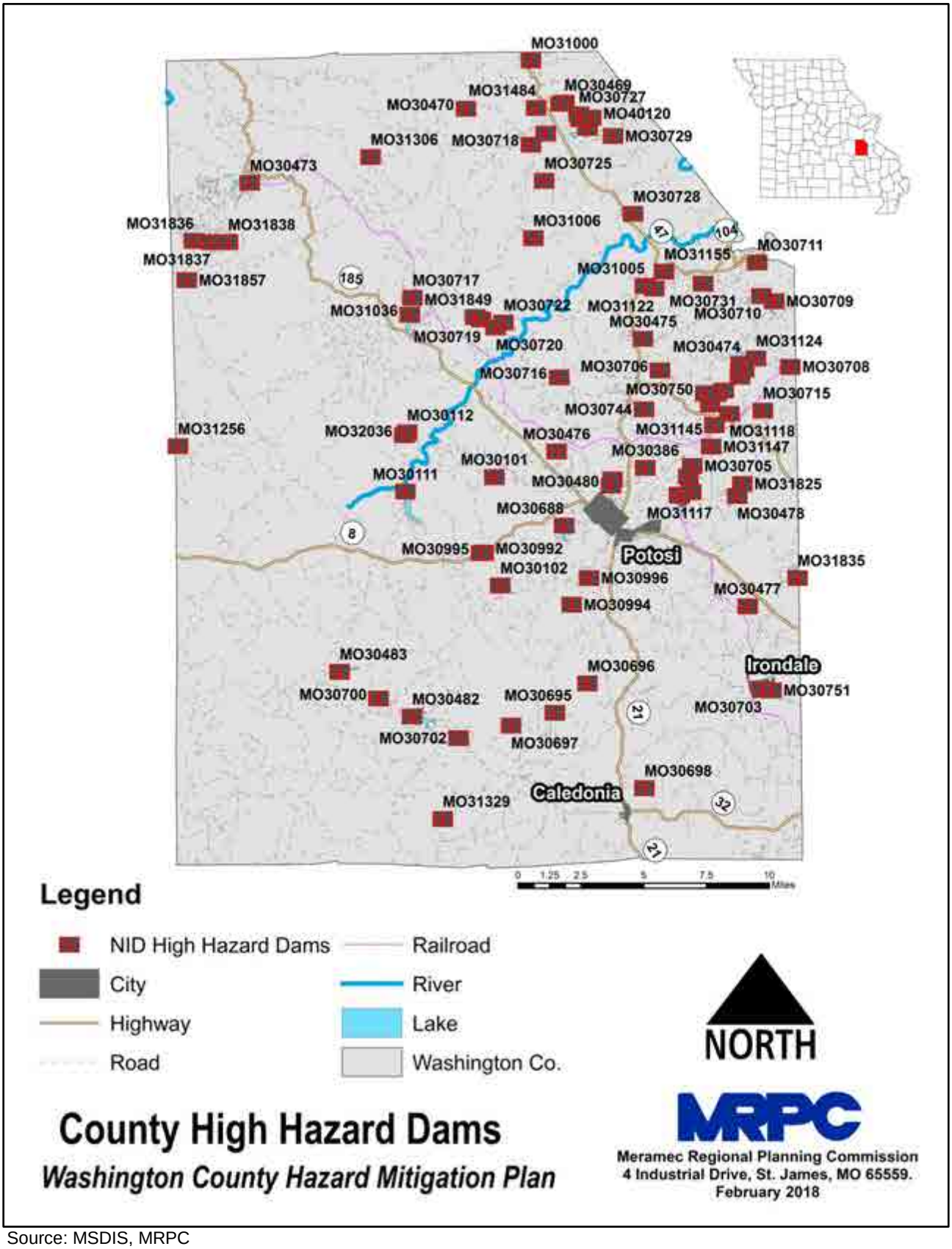
Dam Name	NIDID	Hazard Potential *	NID Height (Ft.)	NID Storage	River	Nearest City *	Distance To City (Mi.) *
SOMETHING GREEN B DAM	MO30719	High	22	118	ROUGE CREEK	POTOSI	9
SPRING GLEN LAKE DAM	MO30698	High	33	194	GOOSE CREEK	LEADWOOD	17
SPRING LAKE DAM	MO30725	High	27	92	TRIB-LITTLE INDIAN CREEK	RICHWOODS	2
SUN MINE DAM	MO30710	High	73	2,100	MADDIN CREEK	POTOSI	11
SUNNEN DAM	MO30111	High	51	5,000	FOURCHE A RENAULT	APTUE	7
THE PLACE LAKE DAM	MO30996	High	16	94	TR-MINE A BRETON CREEK	POTOSI	2

Sources: National Inventory of Dams, http://nid.usace.army.mil/cm_apex/f?p=838:12.

Figure 3.3 depicts locations of NID high hazard dams located in the planning area. If a dam failure were to occur in Washington County, depending upon dam and location, the severity would range between negligible to life threatening. Road infrastructure, residential structures, commercial buildings, and public buildings are all vulnerable to losses. There is one area of assembly in dam inundation zones within the county. Kingston K-14 Schools are located between two tailings dams, MO31122 and MO31005. The distance from the dams to school assets are less than 385 yards.

Ten dam inundation maps were available from the Missouri Department of Natural Resources. These Regulated Dams include Ashley Branch Dam, Crystal Lake Dam, Emerald Lake Dam, Forest Lake Dam, Gibson Memorial Dam, Keuss Dam, Lac Shayne Dam, Lake Apache Dam, Sayersbrook Dam, and Sunnen Dam (**Figure 3.4** to **Figure 3.13**). No other dam inundation maps were available for the remaining NID High Hazard Dams in the county.

Figure 3.3. NID High Hazard Dam Locations in Washington County



Source: MSDIS, MRPC

Figure 3.4. Ashley Branch Dam Inundation Zone

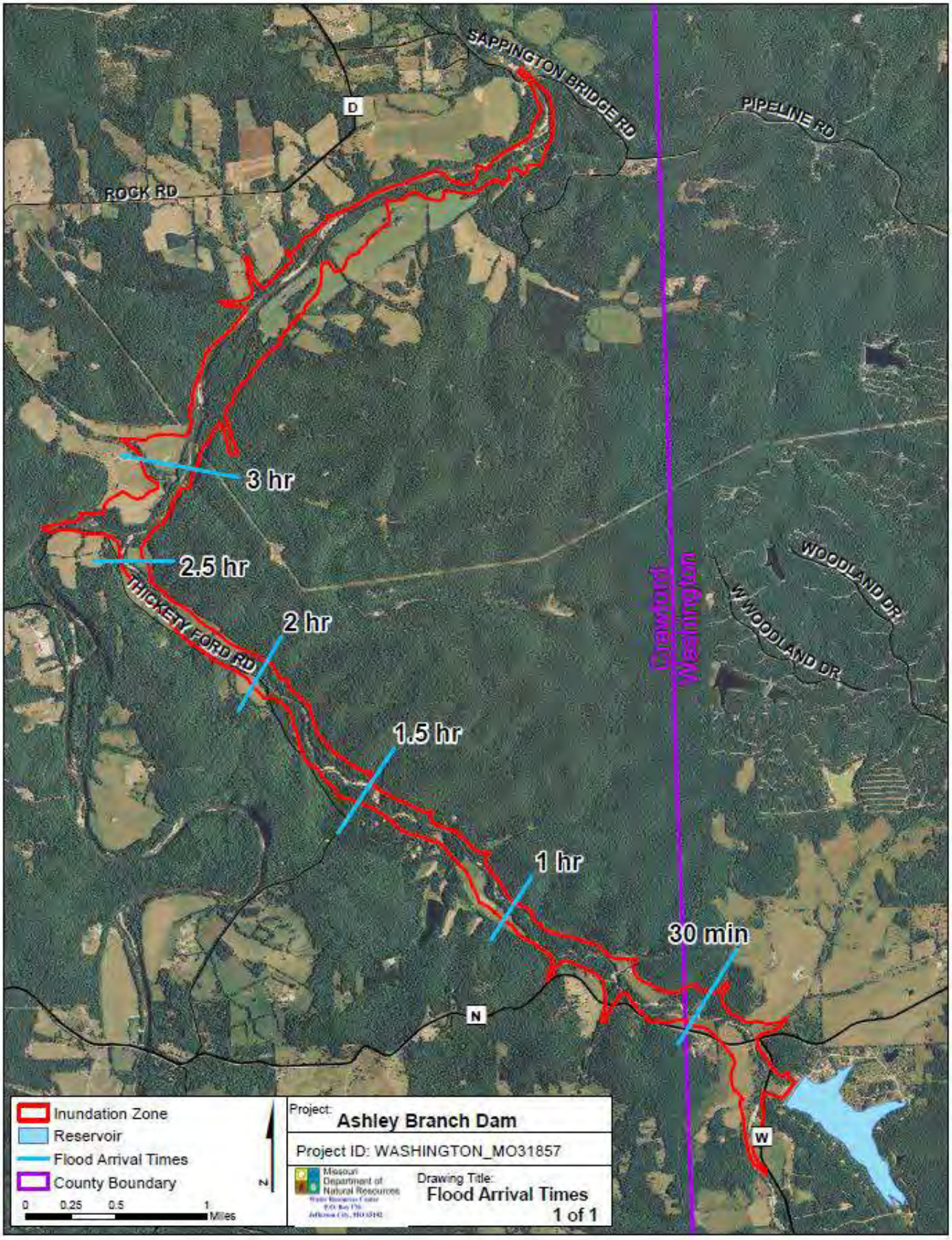


Figure 3.5. Crystal Lake Dam Inundation Zone

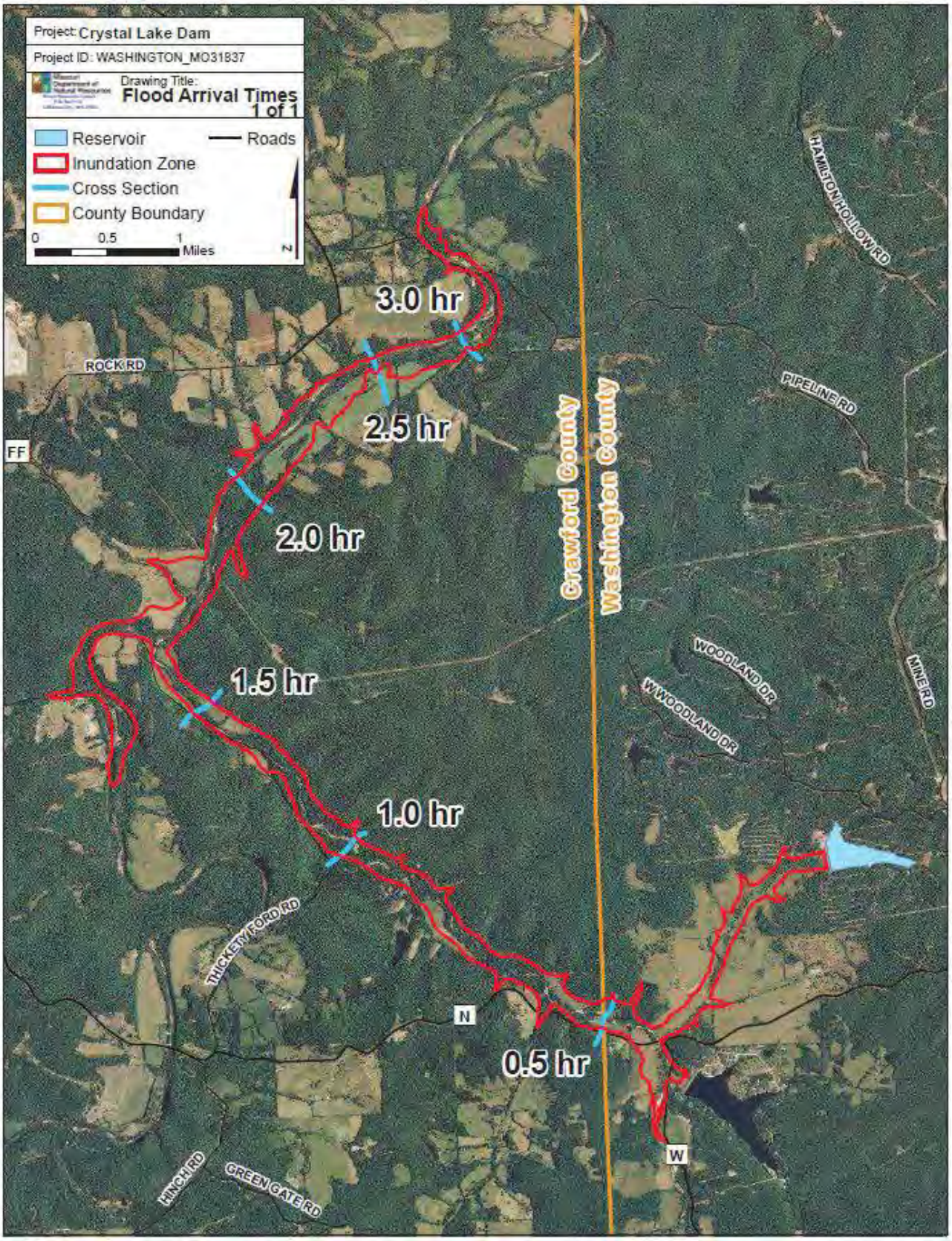


Figure 3.6. Emerald Lake Dam Inundation Zone

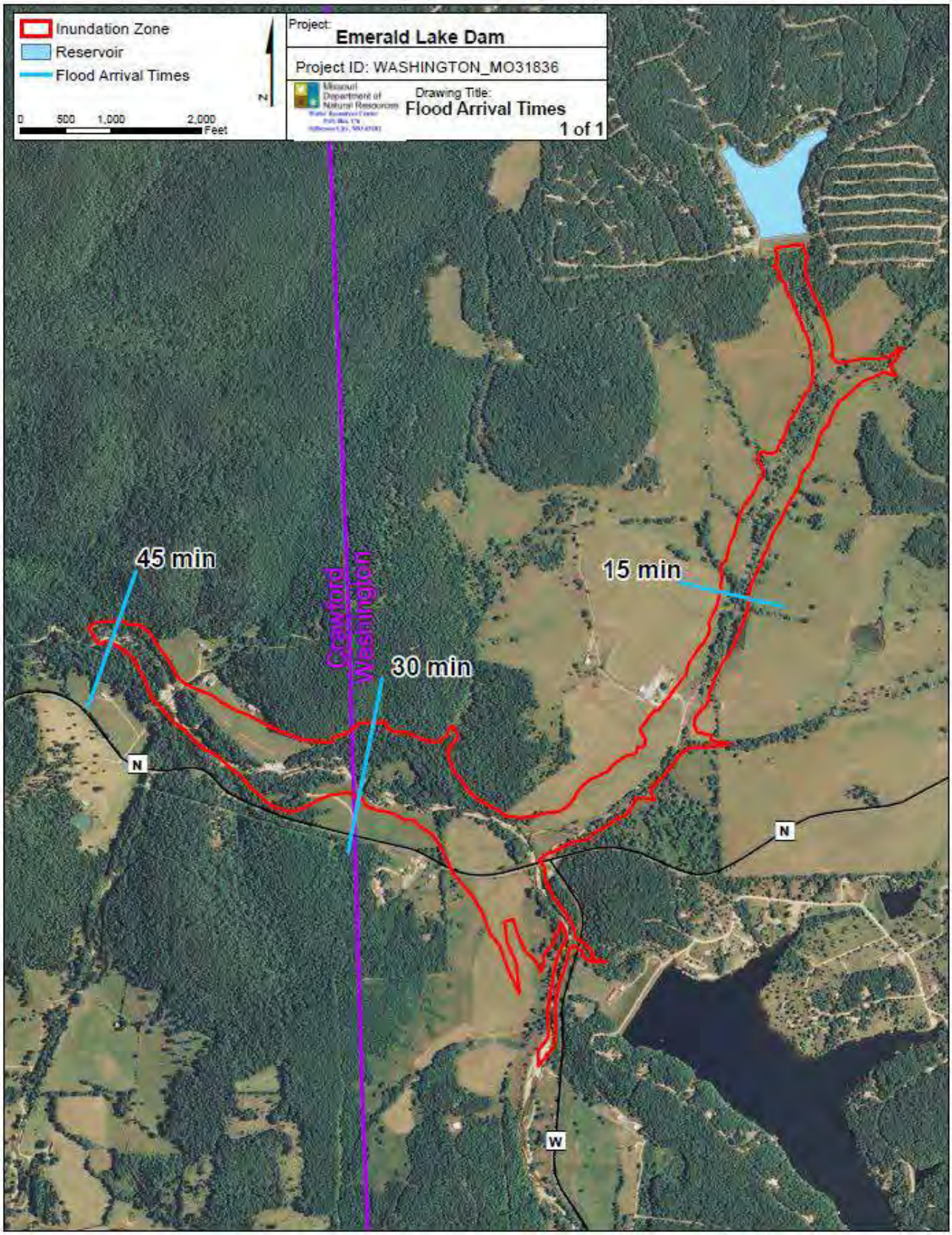


Figure 3.7. Forest Lake Dam Inundation Zone

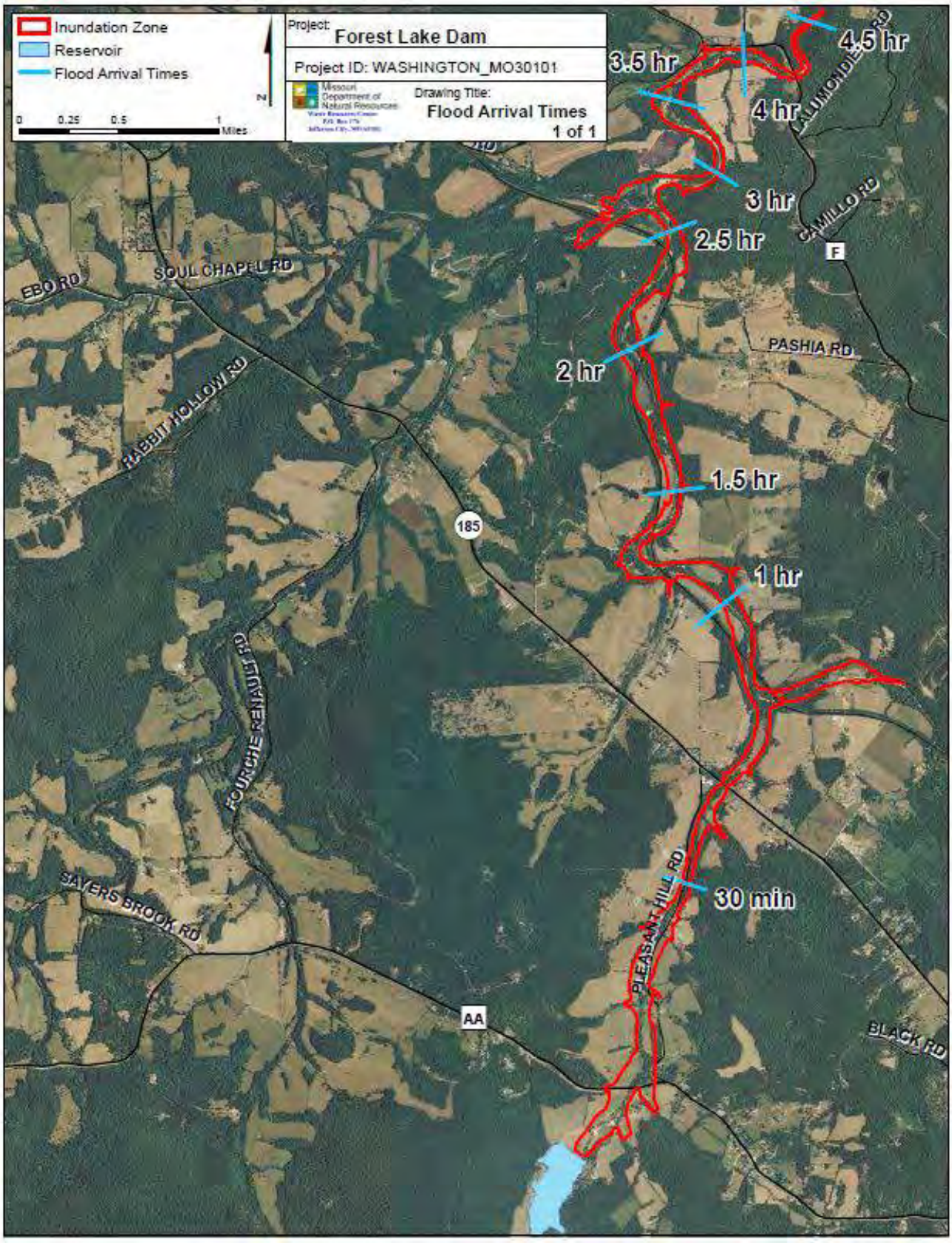


Figure 3.8. Gibson Memorial Dam Inundation Zone

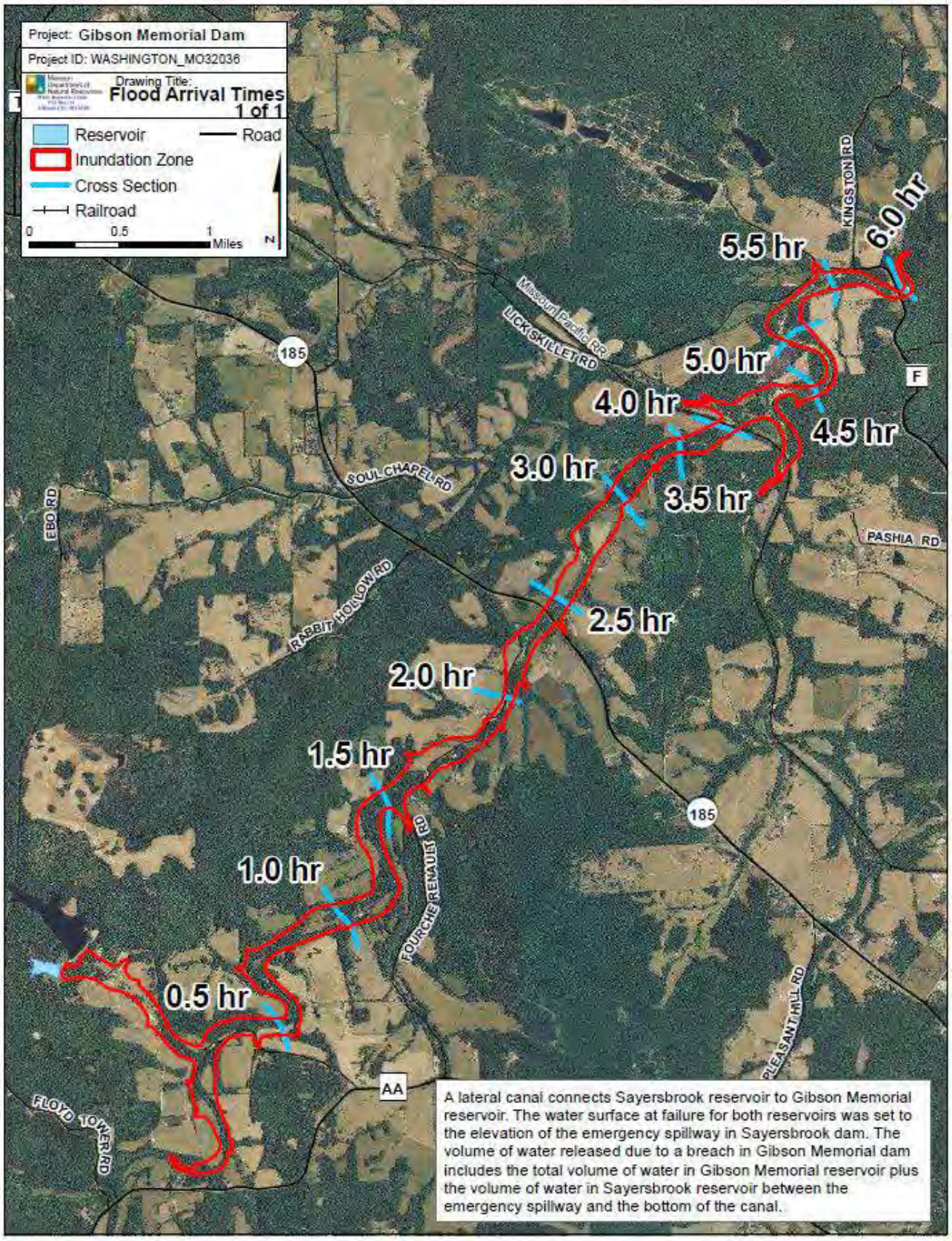


Figure 3.9. Keuss Dam Inundation Zone

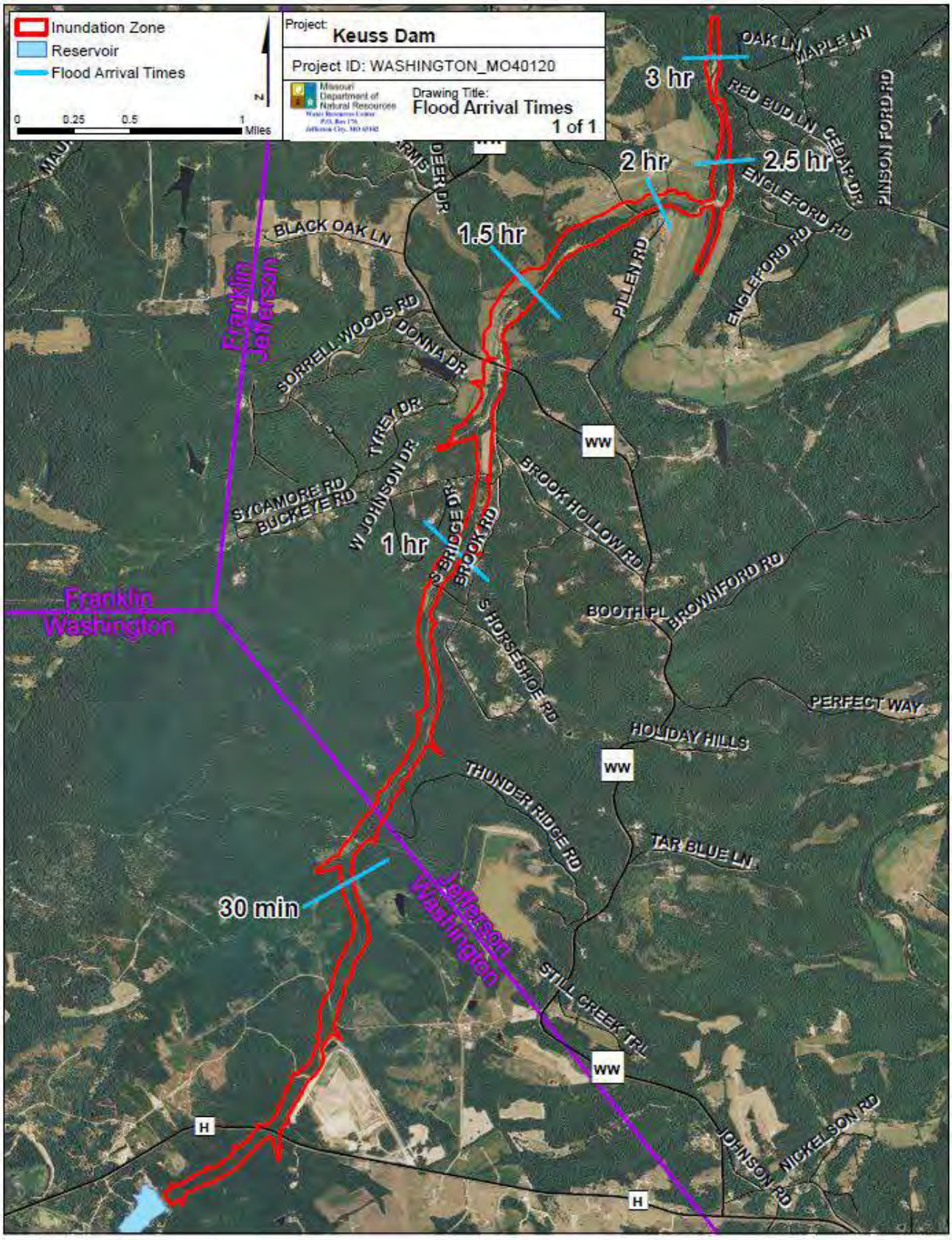


Figure 3.10. Lac Shayne Dam Inundation Zone

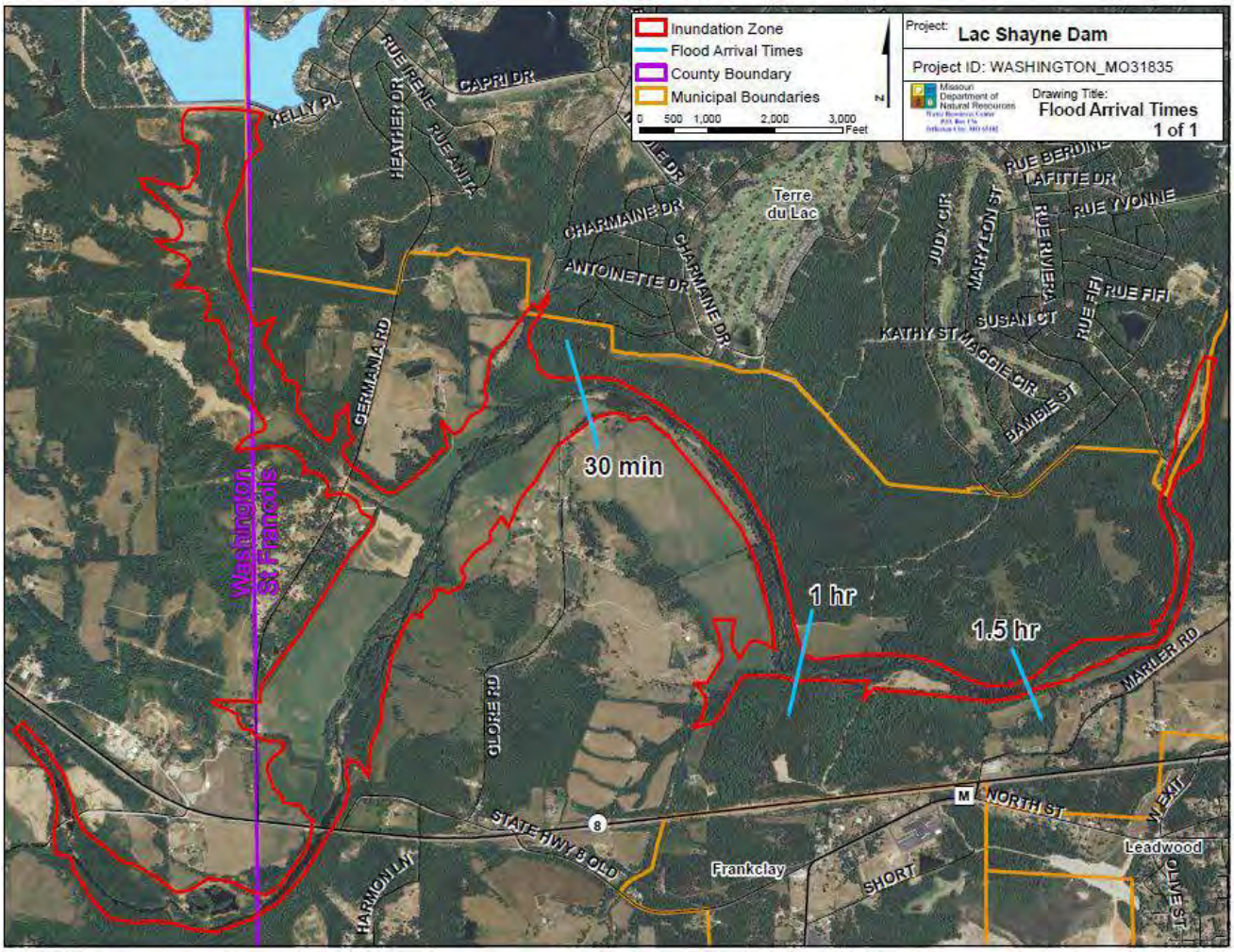


Figure 3.11. Lake Apache Dam Inundation Zone

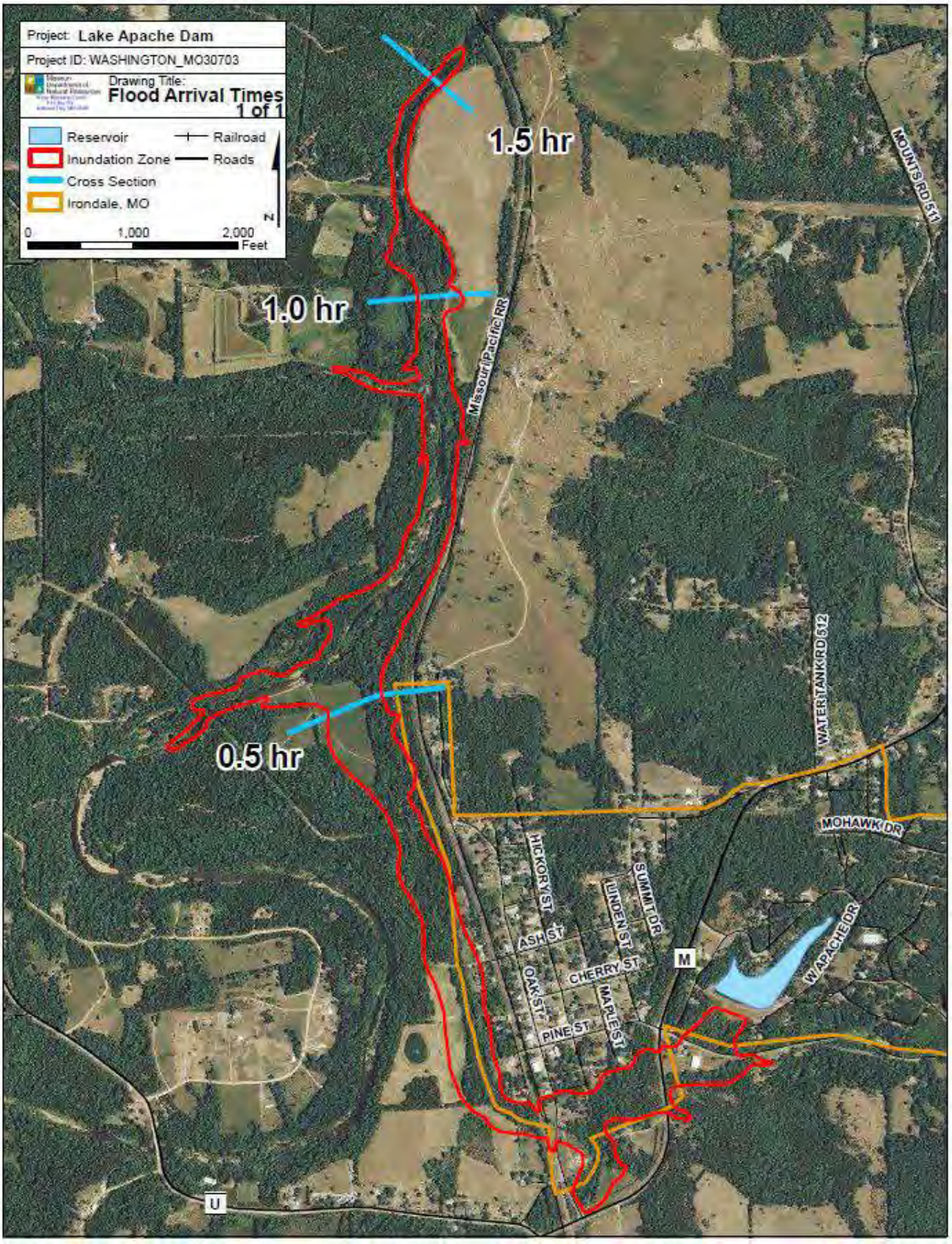


Figure 3.12. Sayersbrook Dam Inundation Zone

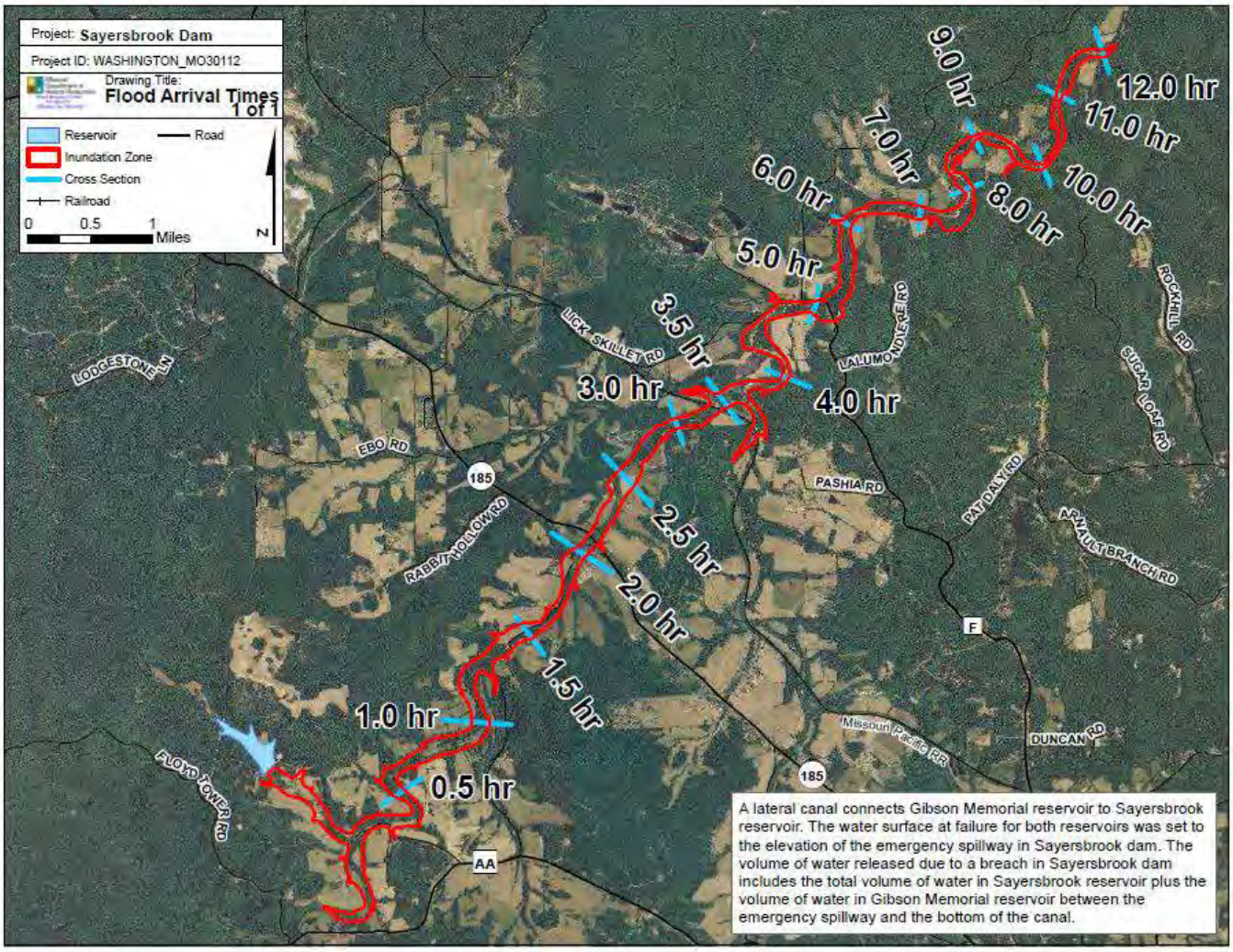
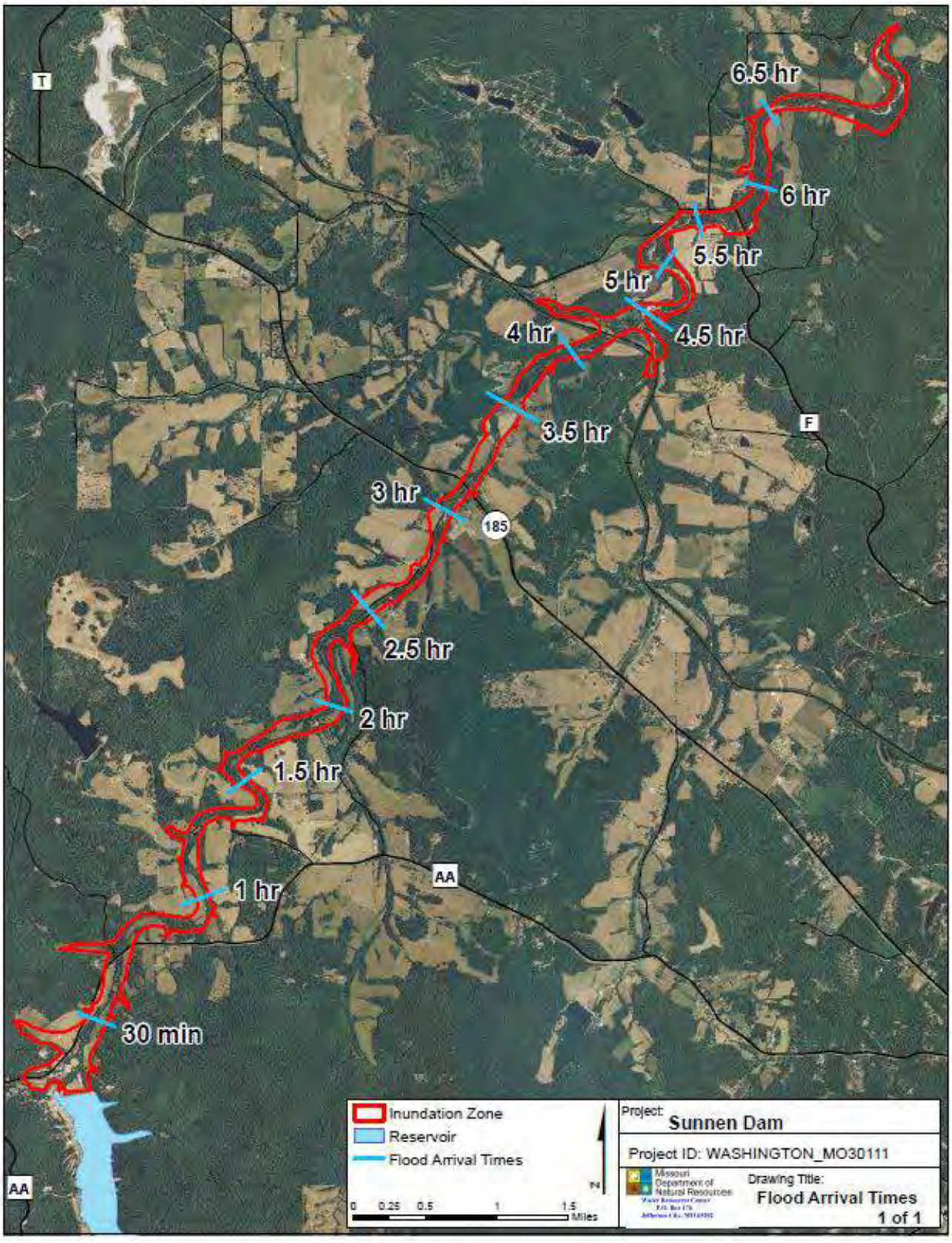


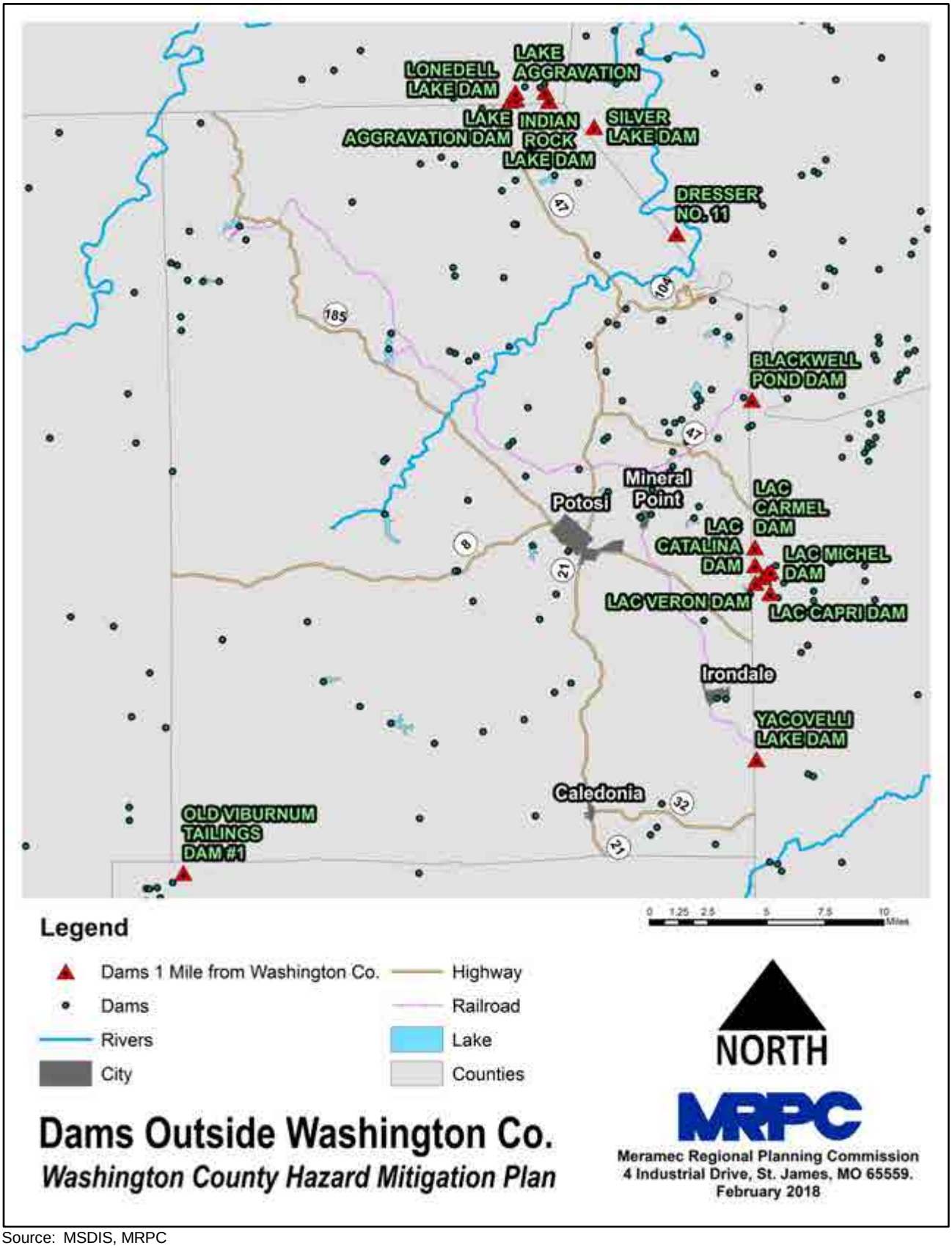
Figure 3.13. Sunnen Dam



Upstream Dams Outside the Planning Area

Figure 3.14 depicts dams outside of Washington County. Seventeen High Hazard dams (11 regulated) are located within a 1 mile buffer of the county. According to the Missouri Department of Natural Resources, Missouri Geological Survey, Water Resources Center, there are eight regulated high hazard dams that could flow into Washington County from surrounding counties during a failure event; Blackwell Pond Dam in St. Francois County (Regulated, High Hazard, Class 1) resides approximately 293 yards from the county (**Figure 3.15**); Lac Bourbon Dam (Regulated, High Hazard, Class 2), Lac Capri Dam (Regulated, High Hazard, Class 1), Lac Carmel Dam (Regulated, High Hazard, Class 2), Lac Darcie Dam (Regulated, High Hazard, Class 2), Lac Michel Dam (Regulated, High Hazard, Class 2), and Lac Veron Dam (Regulated, High Hazard, Class 2) in St. Francois County reside 300+ yards from the county line (**Figure 3.16**). Additionally, Old Viburnum Tailings Dam #1 in Iron County (Regulated, High Hazard, Class 1) resides 900 yards from the county (**Figure 3.17**). Two unregulated dams Lac Catalina Dam (Unregulated, High Hazard, Class 1) and Yacovelli Lake Dam (Unregulated, High Hazard, Class 2) in St. Francois County reside 200 to 300+ yards from the county (**Figure 3.16** and **Figure 3.18**).

Figure 3.14. Upstream Dams Outside Washington County



Source: MSDIS, MRPC

Figure 3.15. Blackwell Pond Dam

Figure 3.16. Lac Dams (7)

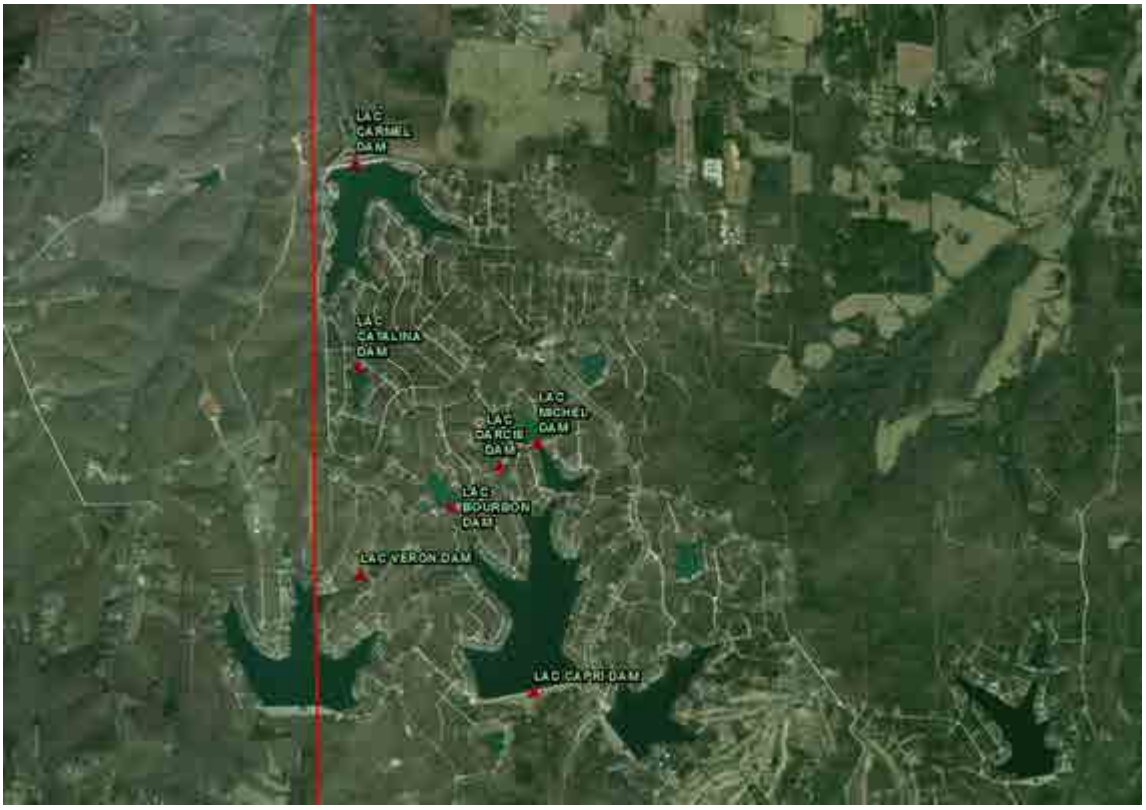


Figure 3.17. Old Viburnum Tailings Dam #1

Figure 3.18. Yacovelli Lake Dam

Severity/Magnitude/Extent

The severity/magnitude of dam failure would be similar in some cases to the impacts associated with flood events (see the flood hazard vulnerability analysis and discussion). Based on the hazard class definitions, failure of any of the High Hazard/Class I dams could result in a serious threat of loss of human life, serious damage to residential, industrial or commercial areas, public utilities, public buildings, or major transportation facilities. Catastrophic failure of any high hazard dams has the potential to result in greater destruction due to the potential speed of onset and greater depth, extent, and velocity of flooding. Worst case scenario would be a catastrophic failure at any of the high hazard class dams designated in **Table 3.20**.

Previous Occurrences

According to Stanford University's National Performance of Dams Program and the Missouri State Emergency Management Agency, there were 69 recorded dam incidents in Missouri between 1917 and 2008. Fourteen were considered failures[9,10]. Fortunately, only one drowning has been associated with a dam failure in the state. The problem of unsafe dams in Missouri was underscored by dam failures at Lawrenceton in 1968, Washington County in 1975, Fredricktown in 1977, and a near failure in Franklin County in 1979. A severe rainstorm and flash flooding in October 1998 compromised about a dozen small, unregulated dams in the Kansas City area. But perhaps the most spectacular and widely publicized dam failure in recent years was the failure of the Taum Sauk Hydroelectric Power Plant Reservoir atop Profitt Mountain in Reynolds County, MO.

In the early morning hours of December 14, 2005, a combination of human and mechanical error in the pump station resulted in the reservoir being overfilled. The manmade dam around the reservoir failed and dumped over a billion gallons of water down the side of Profitt Mountain, into and through Johnson's Shut-Ins State Park and into the East Fork of the Black River. The massive wall of water scoured a channel down the side of the mountain that was over 6000 feet wide and 7,000 feet long that carried a mix of trees, rebar, concrete, boulders and sand downhill and into the park[11]. The deluge destroyed Johnson's Shut-Ins State Park facilities, including the campground, and deposited sediment, boulders and debris into the park. The flood of debris diverted the East Fork of the Black River into an older channel and turned the river chocolate brown. Fortunately the breach occurred in mid-winter. Five people were injured when the park superintendent's home was swept away by the flood, but all were rescued and eventually recovered. Had it been summer, and the campground filled with park visitors, the death toll could have been very high[12]. This catastrophe has focused the public's attention on the dangers of dam failures and the need to adequately monitor dams to protect the vulnerable.

Despite the significance of the immediate damage done by the Taum Sauk Reservoir dam failure, the incident also highlights the long-term environmental and economic impacts of an event of this magnitude. Four years later, the toll of the flooding and sediment on aquatic life in the park and Black River is still being investigated. Even after the removal of thousands of dump truck loads of debris and mud, the river is still being affected by several feet of sediment left in the park. The local economy, heavily reliant upon the tourism from the park and Black River, has also been hit hard[13].

Overall, many of Missouri's smaller dams are becoming a greater hazard as they continue to age and

[9] http://npdp.stanford.edu/dam_incidents

[10] 2013 Missouri State Hazard Mitigation Plan

[11] United States Geological Survey. Damage Evaluation of the Taum Sauk Reservoir Failure using LiDAR. http://mcgsc.usgs.gov/publications/t_sauk_failure.pdf

[12] The Alert. Spring 2006. After the Deluge…What's Ahead for Taum Sauk? By Dan Sherburne.

[13] The Alert. Spring 2006. After the Deluge…What's Ahead for Taum Sauk? By Dan Sherburne.

deteriorate. While hundreds of them need to be rehabilitated, lack of available funding and often questions of ownership loom as obstacles difficult to overcome[14].

Event Description

According to Stanford University's National Performance of Dams Program, 3 dam incidents have been recorded for Washington County since 1990[15]. Rogue Creek Upper Dam experienced an inflow flood on May 25, 1990. An embankment slide occurred at Lac Shayne Dam in October 7, 1993. Furthermore, concrete deterioration was observed at Four Winds Way Dam on March 1, 1994. Additionally, both Bust Lake Dam and Hematite Lake Dam were breached according to MoDNR; specific data was not given. Lastly, on October 15, 1975 piping failed at the Dresser No. 4 Dam in Washington Co., resulting in failure.

Probability of Future Occurrence

Table 3.40Table 3.21 illustrates the annual average percent probability of dam failure in Washington County. The County's likelihood of enduring a failure event per year is 14% (6 events/43 years x 100 = 14).

Table 3.21. Annual Average % Probability of Dam Failure in Washington County

Location	Annual Avg. % P
Washington County	14%

Vulnerability

Vulnerability Overview

Data was obtained from the 2013 Missouri State Hazard Mitigation Plan for the vulnerability analysis of dam failure for Washington County. There are however data limitations regarding dams unregulated by the State of Missouri due to height requirements. These limitations hinder vulnerability analysis; nonetheless, failure potential still exists. **Table 3.22** provides vulnerability analysis data for the failure of State-regulated dams in Missouri.

[14] United States Geological Survey Fact Sheet 131-02. October 2002
[15] http://www.npdp.standord.edu/dam_incidents

Table 3.22. Vulnerability Analysis for Failure of State-regulated Dams in Missouri

County	Class 1	Class 2	Class 3	Total	Estimated # of Buildings Vulnerable	Average Exposure Value per Structure ($)	Estimated Total Potential Building Exposure ($)	Estimated Total Population Exposure	Estimated Building Losses ($)
Washington	24	30	3	57	390	71,570	51,635,370	8	25,817,685

Source: 2013 Missouri State Hazard Mitigation Plan

For the vulnerability analysis of State regulated dams, the State developed the following assumptions for overview.

- Class 1 dams, the number of structures in the inundation area was estimated to be 10 buildings since this is the minimum threshold for a dam being considered a class 1 dam.
- Class 2 dams, the number of structures in the inundation area was estimated to be 5 buildings. This is the mid-range of buildings in the inundation area for a dam to be considered a class 2 dam.
- Class 3 dams, the number of structures in the inundation area was estimated to be 0 buildings since class 3 dams do not have any structures within their inundation area.

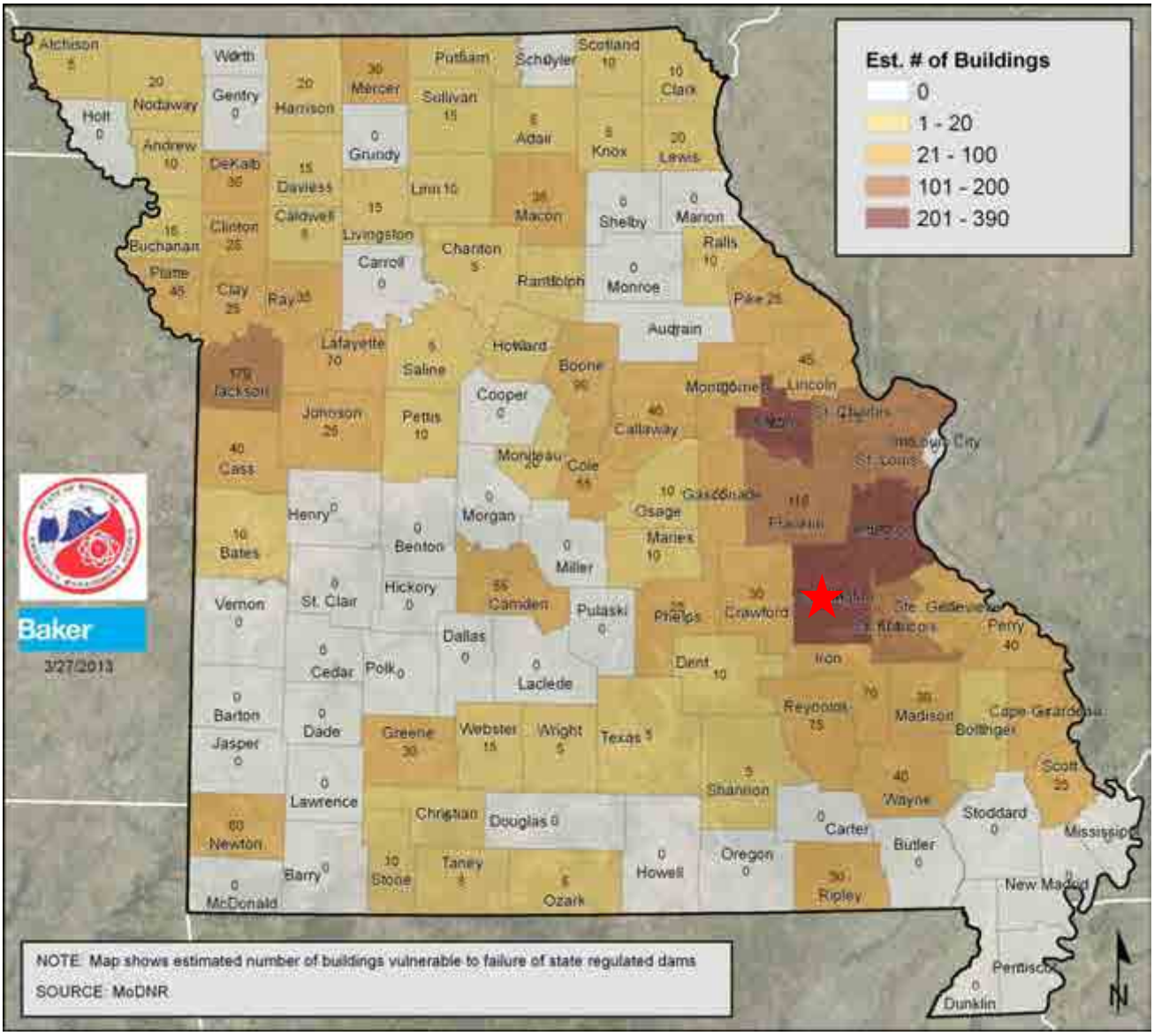
According to the 2013 Missouri State Hazard Mitigation Plan, there is an estimated 201-390 buildings vulnerable to failure of State-regulated dams (**Figure 3.19**). Washington County ranks first in the state for estimated number of buildings vulnerable to failure (390). Furthermore, the state quantified potential loss estimates in terms of property damages. To execute the analysis, the following assumptions were utilized.

- Average values for residential structures were obtained for each county from HAZUS-MH MR4. Residential structures were chosen as the most prevalent structure-type downstream of dams. Although certainly other building types are present, the numbers and values are not known.
- The estimated structure loss was estimated to be at 50 percent of the value of the structure. Actual losses will vary based on the depth of inundation.
- For population exposure, United States Census blockers were intersected with available State regulated dam inundation areas to identify the vulnerable population for each county[16].

Figure 3.20 and **Figure 3.21** depict the total estimated building losses and population exposure by county, respectively. The estimated building loss from failure of state-regulated dams is greater than $15 million. Washington County ranks second in the state for estimated building loss. The estimated population exposure to failure of state-regulated dams ranges between 1 and 130.

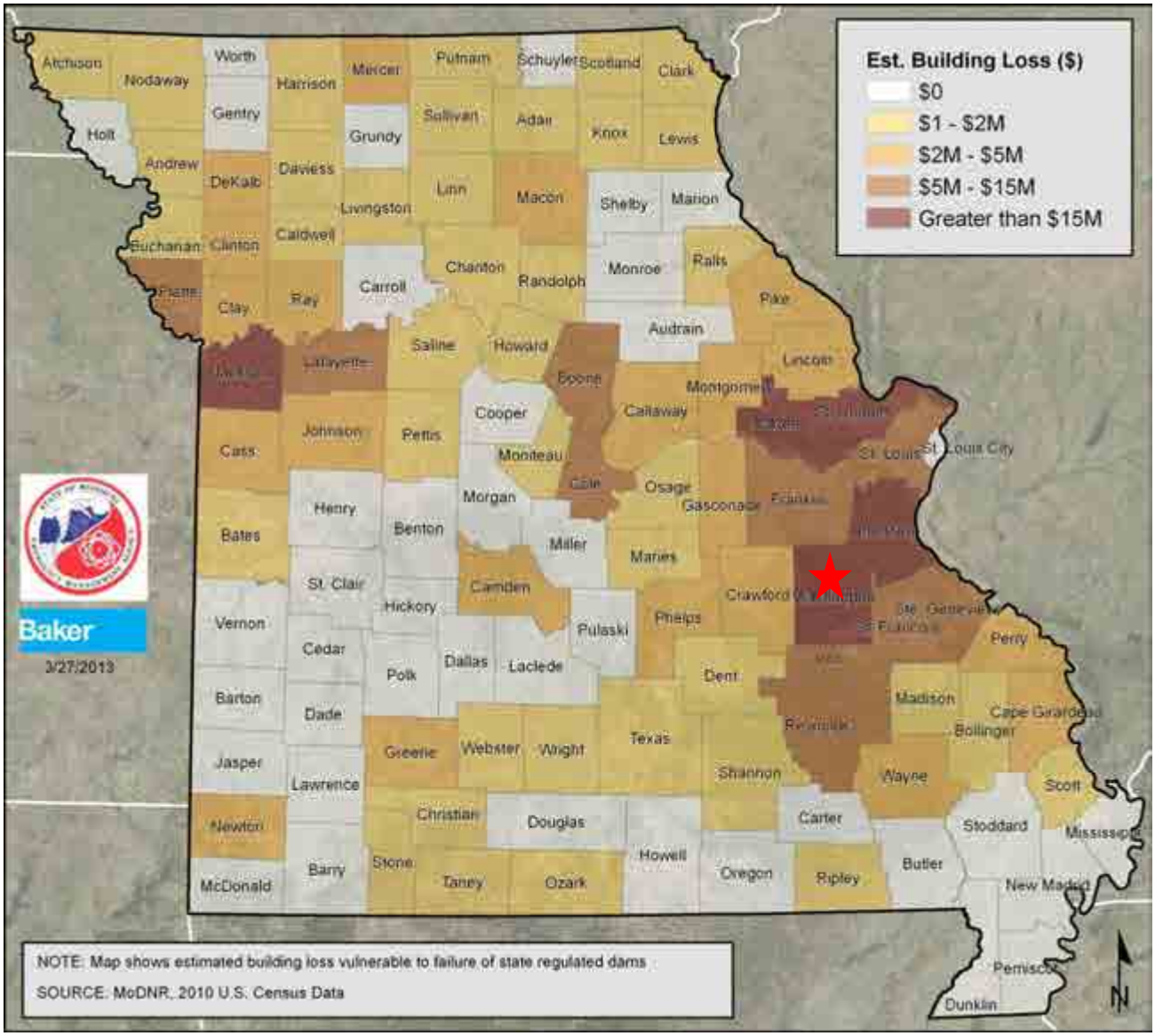
[16] 2013 Missouri State Hazard Mitigation Plan

Figure 3.19. Estimated Number of Buildings Vulnerable to Failure of State-regulated Dams



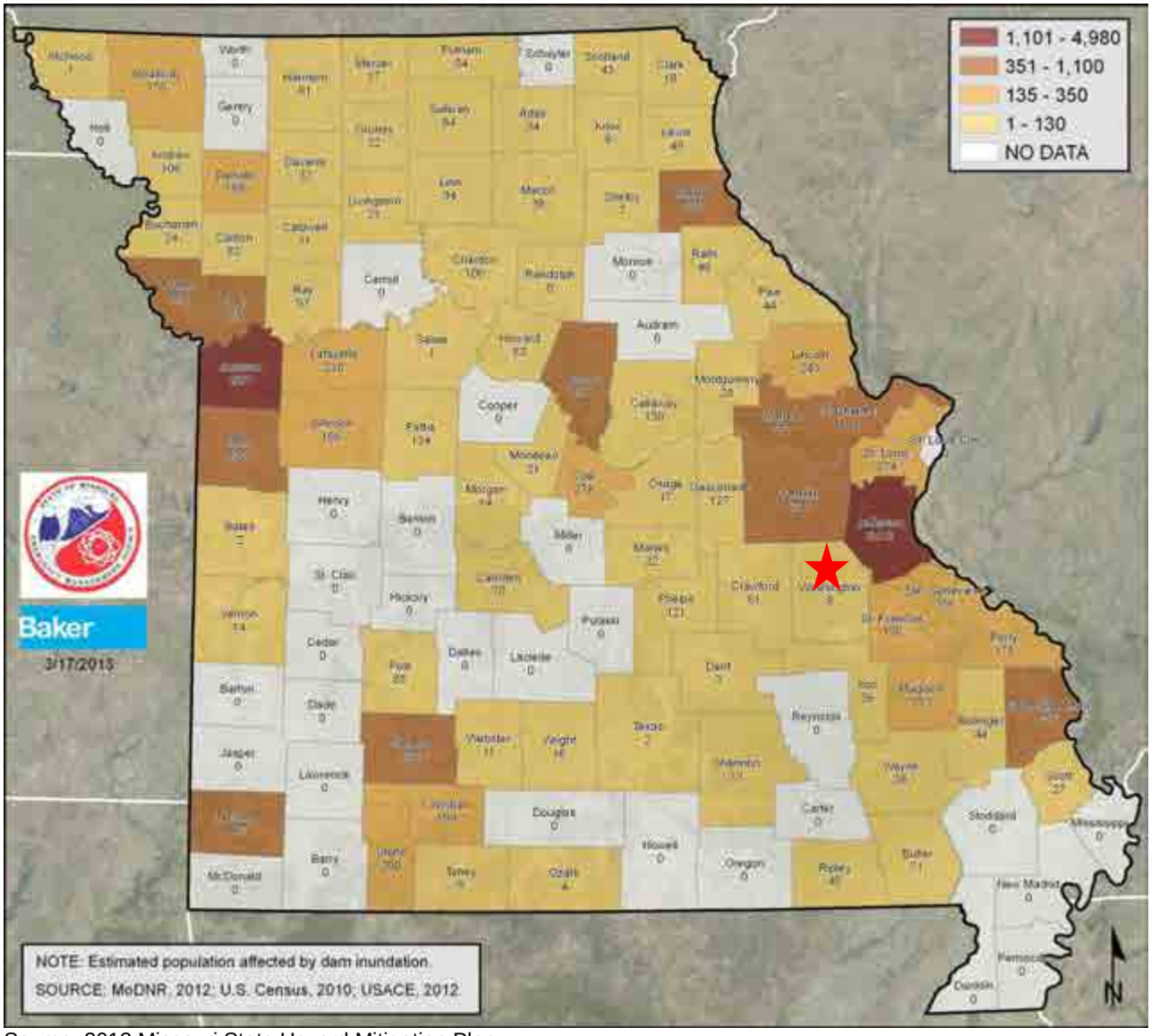
Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Washington County

Figure 3.20. Estimated Building Losses from Failure of State-regulated Dams



Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Washington County

Figure 3.21. Estimated Population Exposure to Failure of State-regulated Dams



Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Washington County

Potential Losses to Existing Development: (including types and numbers, of buildings, critical facilities, etc.)

The most obvious worst case dam failure scenario would occur at any High Hazard/Class 1 dam. During a failure event, serious loss to road infrastructure, commercial and residential structures, and human life is likely. However, the majority of dams in Washington County are rural in nature.

Impact of Future Development

Future development within the county that has potential to be influenced by dam failure includes any areas downstream of a dam within the 100 Year Floodplain.

Hazard Summary by Jurisdiction

Kingston K-14 School District has assets located in two tailings dam inundation areas. Other jurisdictions have road and utility infrastructure assets located in dam breach inundation areas. Most dams within the county are rural in nature. Regardless, Washington County ranks second in the state for estimated building loss due to state regulated dam failure. Additionally, the county has the highest number of buildings vulnerable to failure of state regulated dams in the state.

Problem Statement

In summary, the hazard risk for dam failure in Washington County ranges between high and low, dependent upon the dam. If a dam does fail, the expected impacts could vary from negligible to critical, and could potentially affect road infrastructure, residential structures, commercial buildings, public structures, and human life. It is recommended to encourage land use management practices to decrease the potential for damage from a dam collapse; including the discouragement of development in areas with the potential for sustaining damage from a dam failure. Installation of education programs to inform the public of dam safety measures and preparedness activities would be beneficial. In addition, the availability of training programs to encourage land owners how to properly inspect their dams, and develop emergency action plans would be advantageous.

3.4.2 Drought

Some specific sources for this hazard are:

- Maps of effects of drought, National Drought Mitigation Center (NDMC) located at the University of Nebraska in Lincoln; http://www.drought.unl.edu/.
- Historical drought impacts, National Drought Mitigation Center (NDMC) located at the University of Nebraska in Lincoln; at http://droughtreporter.unl.edu/ .
- Recorded low precipitation, NOAA Regional Climate Center, (http://www.hprcc.unl.edu).
- Water shortages, Missouri's Drought Response Plan, Missouri Department of Natural Resources, http://dnr.mo.gov/pubs/WR69.pdf
- Populations served by groundwater by county, USGS-NWIS, http://maps.waterdata.usgs.gov/mapper/index.html
- Census of Agriculture, http://www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1,_Chapter_2_County_Level/Missouri/and http://www.agcensus.usda.gov/Publications/2012/Online_Resources/County_Profiles/Missouri/
- USDA Risk Management Agency, Insurance Claims, http://www.rma.usda.gov/data/cause.htm
- Natural Resources Defense Council, http://www.nrdc.org/globalWarming/watersustainability/

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 2013 Missouri State Hazard Mitigation 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[17].

Geographic Location

All areas and jurisdictions in Washington County are susceptible to drought, but particularly cities where thousands of residents are served by the same source of water. These cities use deep hard rock wells that are 1,100 to 1,800 feet deep and can experience drought when recharge of these wells is low. The number of individuals within the county served by groundwater is 5,888[18]. However, rural residences with individual wells will likely be affected as well. Approximately 25.4% of the land in the county is utilized for agricultural purposes. Furthermore, livestock sales comprise 79.3% of the market of agricultural products sold in Washington County. A drought would directly impact livestock production and the agriculture economy in Washington County[19].

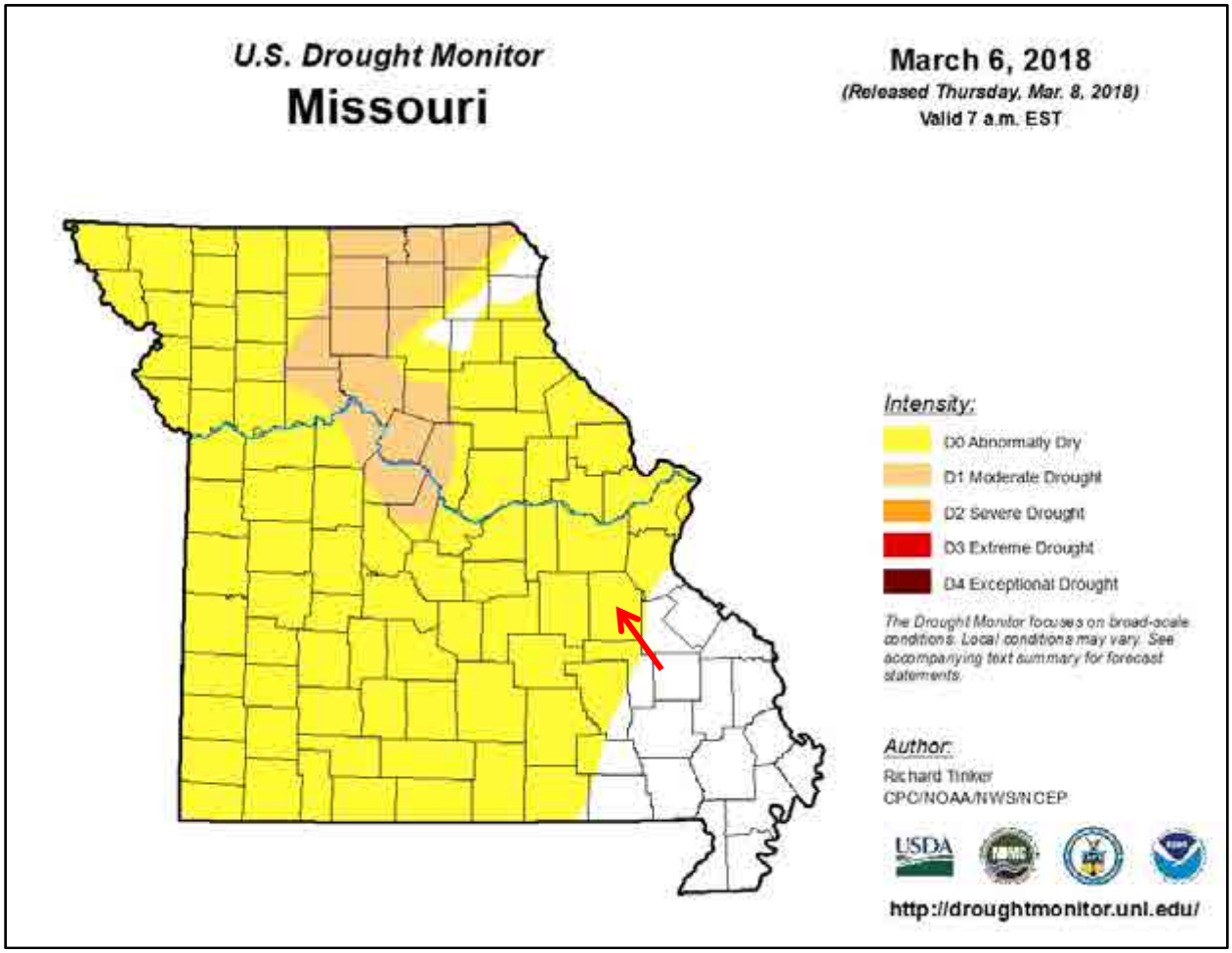
Severity/Magnitude/Extent

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[20].

Figure 3.22 depicts a U.S. Drought Monitor map of Missouri on March 6, 2018. This map illustrates the planning area, which could be in drought at any given moment in time. A red arrow indicates the location of the planning area (Washington County).

[17] http://www.drought.unl.edu/ http://droughtreporter.unl.edu/
[18] 2013 Missouri State Hazard Mitigation Plan
[19] http://www.agcensus.usda.gov/Publications/2012/Online_Resources/County_Profiles/Missouri/cp29161.pdf
[20] Ibid

Figure 3.22. U.S. Drought Monitor Map of Missouri on March 6, 2018



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

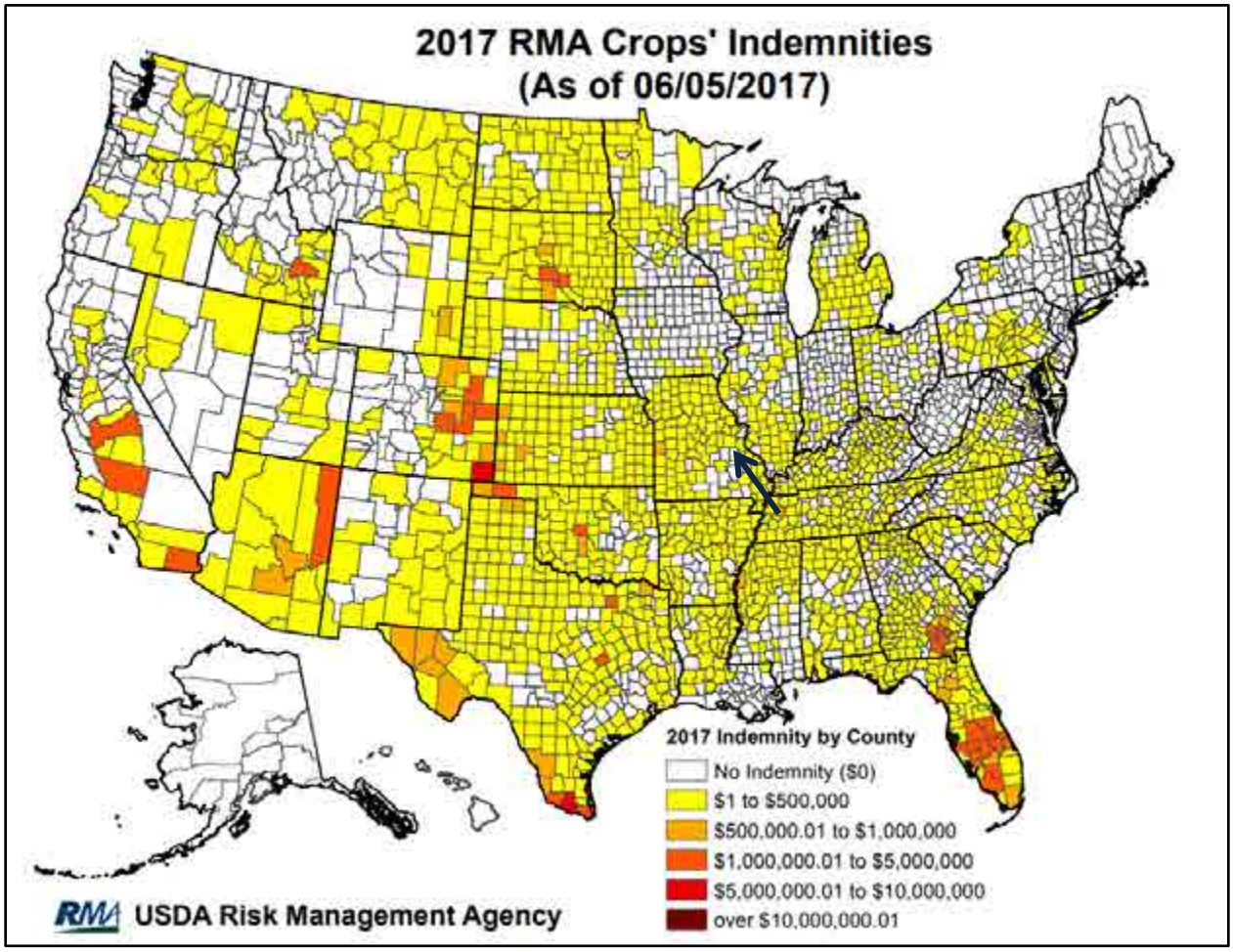
Table 3.23 details crop losses between 1998 and 2012 for Washington County. Additionally, **Figure 3.23** illustrates RMA crop indemnities for 2017 across the United States. Washington County fell in the range of $0 for crop indemnities.

Table 3.23. Washington County Crop Losses 1998 – 2012 (USDA Risk Management Agency)

Total Crop Insurance Paid for Drought Damage 1998-2012	Crop Claims Ratio Rating	Annualized Crop Insurance Claims/Drought Damage	Crop Exposure (2007 Census of Agriculture)	Annual Crop Claims Ration	Crop Loss Ratio Rating
$0	1	$0	$711,000	0.00%	1

Source: 2013 Missouri State Hazard Mitigation Plan, USDA Risk Management Agency and USDA crop exposure

Figure 3.23. 2017 RMA Crop Indemnities for the United States



Source: http://www.rma.usda.gov/data/indemnity/
*Black arrow indicates Washington County

According to the USDA's Risk Management Agency, there have been zero crop insurance payments due to drought between since 1998.

The Palmer Drought Indices measure dryness based on recent precipitation and temperature. The indices are based on a "supply-and-demand model" of soil moisture. Calculation of supply is relatively straightforward, using temperature and the amount of moisture in the soil. However demand is more complicated as it depends on a variety of factors, such as evapotranspiration and recharge rates. These rates are harder to calculate. Palmer tried to overcome these difficulties by developing an algorithm that approximated these rates, and based the algorithm on the most readily available data — precipitation and temperature.

The Palmer Index has proven most effective in identifying long-term drought of more than several months. However, the Palmer Index has been less effective in determining conditions over a matter of weeks. It uses a "0" as normal, and drought is shown in terms of negative numbers; for example, negative 2 is moderate drought, negative 3 is severe drought, and negative 4 is extreme drought. Palmer's algorithm also is used to describe wet spells, using corresponding positive numbers.

Palmer also developed a formula for standardizing drought calculations for each individual location based on the variability of precipitation and temperature at that location. The Palmer index can

therefore be applied to any site for which sufficient precipitation and temperature data is available.

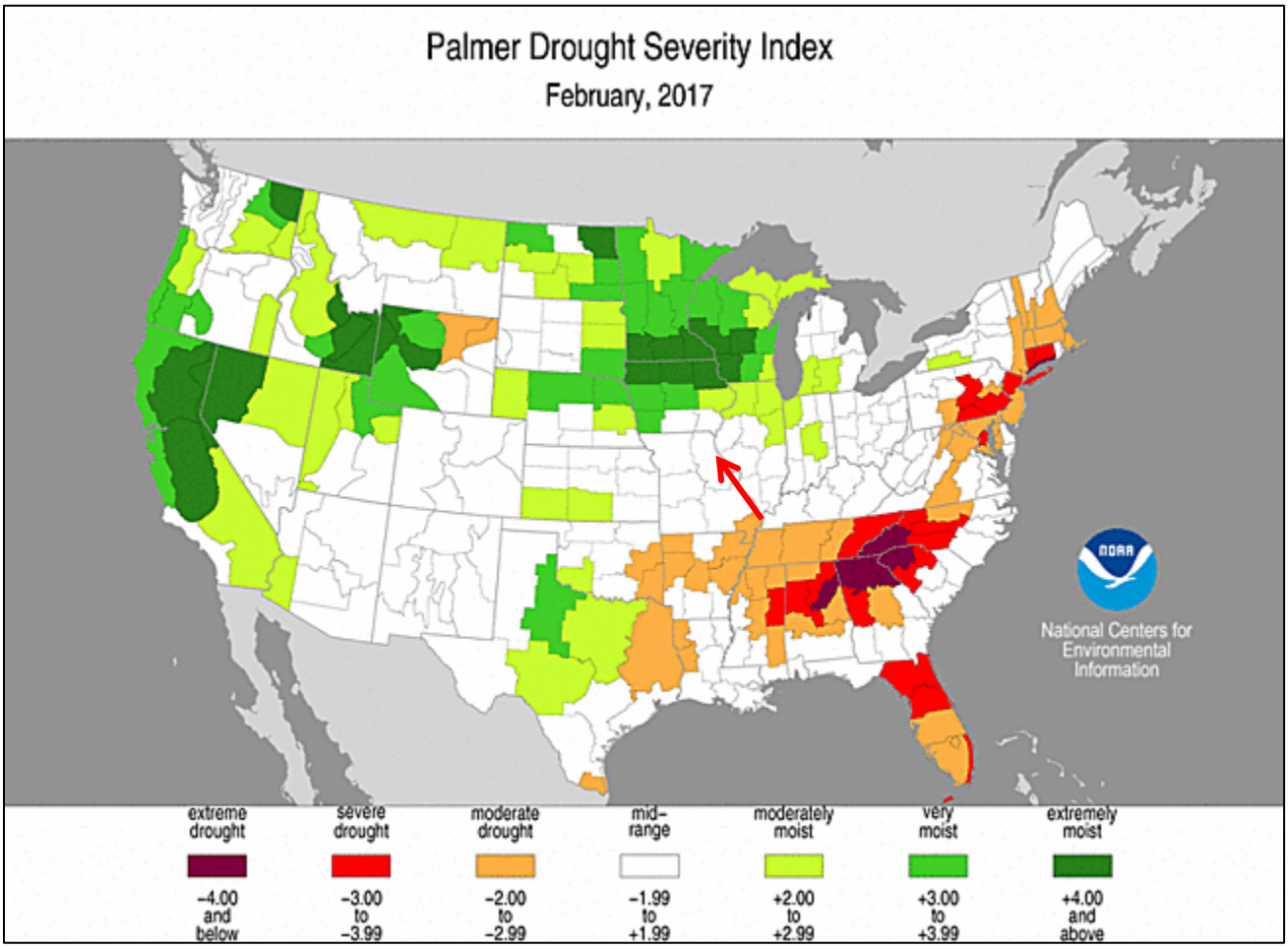
Figure 3.24 illustrates the Palmer Drought Severity Index sub-regions of Missouri. Washington County is categorized under the Southeast sub-region.

Figure 3.24. Palmer Drought Severity Index: Missouri Sub-regions

Source: 2013 Missouri State Hazard Mitigation Plan; *Red star indicates Washington County

Figure 3.25 is an example of the Palmer Modified Drought Index for the United States on September, 2016.

Figure 3.25. Palmer Modified Drought Index National Map February, 2017



Source: http://www.ncdc.noaa.gov/temp-and-precip/drought/historical-palmers/; *Red arrow indicates Washington County

Data was collected from the Missouri Department of Natural Resources (2016 Census of Missouri Public Water Systems) to determine water source by jurisdiction. All Washington County jurisdictions utilize well water as their sole source of water (**Table 3.24**). Communities that exclusively depend upon ground water could experience hardship in the event of a long term drought.

Table 3.24. 2017 Water Source by Jurisdiction

Jurisdiction	% of source that is groundwater
Caledonia	100
Irondale	100
Mineral Point	100
Potosi	100

Source: Missouri Dept. of Natural Resources, 2017 Census of Missouri Public Water Systems

Previous Occurrences

Table 3.25 offers Palmer Drought Severity Index data for Washington County between 2010 and 2017. This information exemplifies drought conditions on a monthly basis for Missouri's Southeast sub-region within the United States.

Table 3.25. Palmer Drought Severity Index for Washington County, MO (2010 – 2017)

	Year							
Month	**2010**	**2011**	**2012**	**2013**	**2014**	**2015**	**2016**	**2017**
Jan.	Extremely moist	Mid-range	Mid-range	Mid-range	Moderately moist	Mid-range	Very moist	Mid-range
Feb.	Mid-range	Mid-range	Mid-range	Mid-range	Mid-range	Mid-range	Very moist	Mid-range
March	Mid-range	Mid-range	Mid-range	Mid-range	Mid-range	Mid-range	Moderately moist	Mid-range
April	Mid-range	Very moist	Mid-range	Mid-range	Mid-range	Mid-range	Mid-range	Moderately moist
May	Mid-range	Very moist	Moderate drought	Mid-range	Mid-range	Mid-range	Moderately moist	Very moist
June	Mid-range	Mid-range	Moderate drought	Mid-range	Mid-range	Mid-range	Mid-range	Moderately moist
July	Mid-range	Mid-range	Severe drought	Mid-range	Mid-range	Moderately moist	Moderately moist	Moderately moist
Aug.	Mid-range	Mid-range	Severe drought	Moderately moist	Mid-range	Very moist	Very moist	Moderately moist
Sept.	Mid-range	Mid-range	Severe drought	Moderately moist	Mid-range	Moderately moist	Very moist	Mid-range
Oct.	Mid-range	Mid-range	Moderate drought	Moderately moist	Mid-range	Mid-range	Very moist	Mid-range
Nov.	Mid-range	Mid-range	Severe drought	Moderately moist	Mid-range	Very moist	Very moist	Moderate drought
Dec.	Mid-range	Mid-range	Severe drought	Moderately moist	Mid-range	Extremely moist	Moderately moist	Severe drought

Source: http://www.ncdc.noaa.gov/temp-and-precip/drought/historical-palmers/psi/201001-201511

Probability of Future Occurrence

To calculate the probability of future occurrence of drought in Washington County, historical climate data was analyzed. There were 32 months of recorded drought (**Table 3.26**) over a 20 year span (January, 1998 to December, 2017). The number of months in drought (32) was divided by the total number of months (240) and multiplied by 100 for the annual average percentage probability of drought (**Table 3.27**). Although drought is not predictable, long-range outlooks and predicted impacts of climate change could indicate an increase change of drought.

Table 3.26. Palmer Drought Severity Index for Washington County, MO (1998 – 2017)

	Year											
Month	**January**	**February**	**March**	**April**	**May**	**June**	**July**	**August**	**September**	**October**	**November**	**December**
1998												
1999										x	x	x
2000	x	x	x	x	x	x	x	x	x	x	x	x
2001	x		x	x	x							
2002												
2003												
2004												
2005						x						
2006												
2007										x	x	
2008												
2009												
2010												
2011												
2012					x	x	x	x	x	x	x	x
2013												
2014												
2015												
2016												
2017											x	x

Source: http://www.ncdc.noaa.gov/temp-and-precip/drought/historical-palmers/zin/199409-201511
*x indicates drought

Table 3.27. Annual Average Percentage Probability of Drought in Washington County, MO

Location	Annual Avg. % P of Drought
Washington County	13.3%

Source: NOAA National Centers for Environmental Information, Historical Palmer Drought Indices
*P = probability; see page 3.24 for definition.

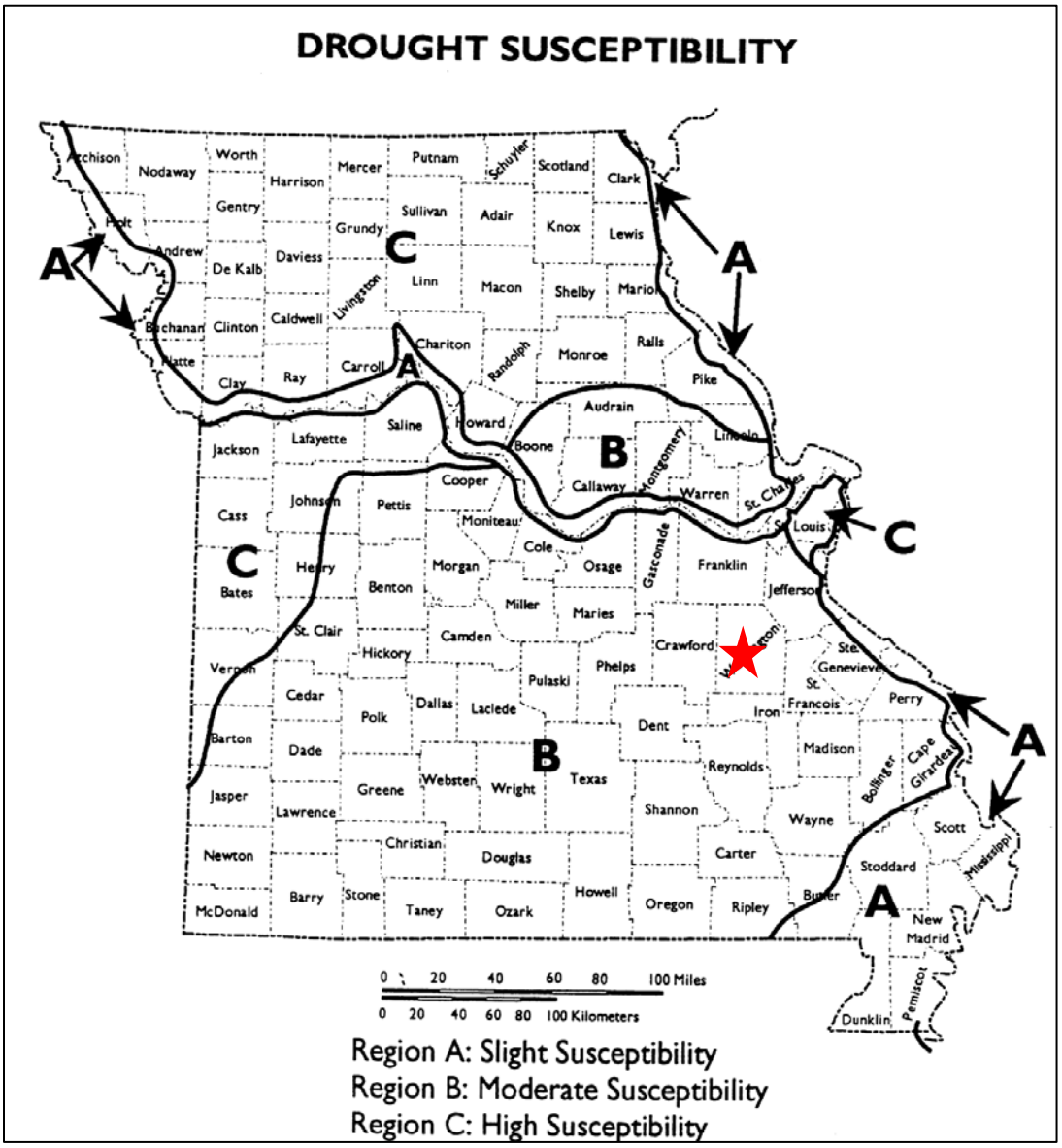
Vulnerability

Vulnerability Overview

Data was obtained from the 2013 Missouri State Hazard Mitigation Plan for the drought vulnerability analysis. **Table 3.28** depicts the ranges for drought vulnerability factor ratings created by SEMA. The array ranges between 1 (low) and 5 (high). The factors considered include crop loss ratio rating and annualized crop claims paid. These two factors were utilized as agricultural losses data is readily available; thus making them the best factors to determine drought vulnerability throughout the State. Washington County is determined as having a low vulnerability to crop loss (**Table 3.23**) as a result of a drought. Additionally, SEMA has divided the State into 3 regions in regards to drought susceptibility (**Figure 3.26**). Washington County is included in Region B (Moderate Susceptibility). Region B is described as having groundwater sources that are suitable in meeting domestic and municipal water needs, but due to required well depths, irrigation wells are very expensive. Also, the topography is commonly unsuitable for row-crop irrigation[21].

[21] 2013 Missouri State Hazard Mitigation Plan

Figure 3.26. Drought Susceptibility in Missouri



Source: 2013 Missouri State Hazard Mitigation Plan: *Red star indicates Washington County

Table 3.28. Ranges for Drought Vulnerability Factor Ratings

Factors Considered	Low (1)	Medium-low (2)	Medium (3)	Medium-high (4)	High (5)
Crop Loss Ratio Rating	0 – 2%	2 – 4%	4 – 6%	6 – 8%	>8%
Annualized Claims Paid	<$500,000	$500,000-$1.5 M	$1.5M-$2.5 M	$2.5 M-$3.5 M	>$3.5 M

Source: 2013 Missouri State Hazard Mitigation Plan

Table 3.29. Vulnerability of Washington County to Drought

County	Total Crop Insurance Paid for Drought Damage 1998 - 2012	Crop Claims Ratio Rating	Annualized Crop Insurance Claims/Drought Damage	Crop Exposure (2007 Census of Agriculture)	Annual Crop Claims Ratio	Crop Loss Ratio Rating
Washington	$0	1	$0	$711,000	0.00%	1

Source: 2013 Missouri State Hazard Mitigation Plan

Potential Losses to Existing Development

Drought is not limited to a hazard that affects just agriculture, but can extend to encompass the nation's whole economy. Its impact can adversely affect a small town's water supply, the corner grocery store, commodity markets, or tourism. Additionally, extreme droughts have the ability to damage roads, water mains, and building foundations. On average, drought costs the U.S. economy about $7 billion to $9 billion a year, according to the National Drought Mitigation Center. Moreover, drought prone regions are also prone to increased fire hazards[22].

Impact of Future Development

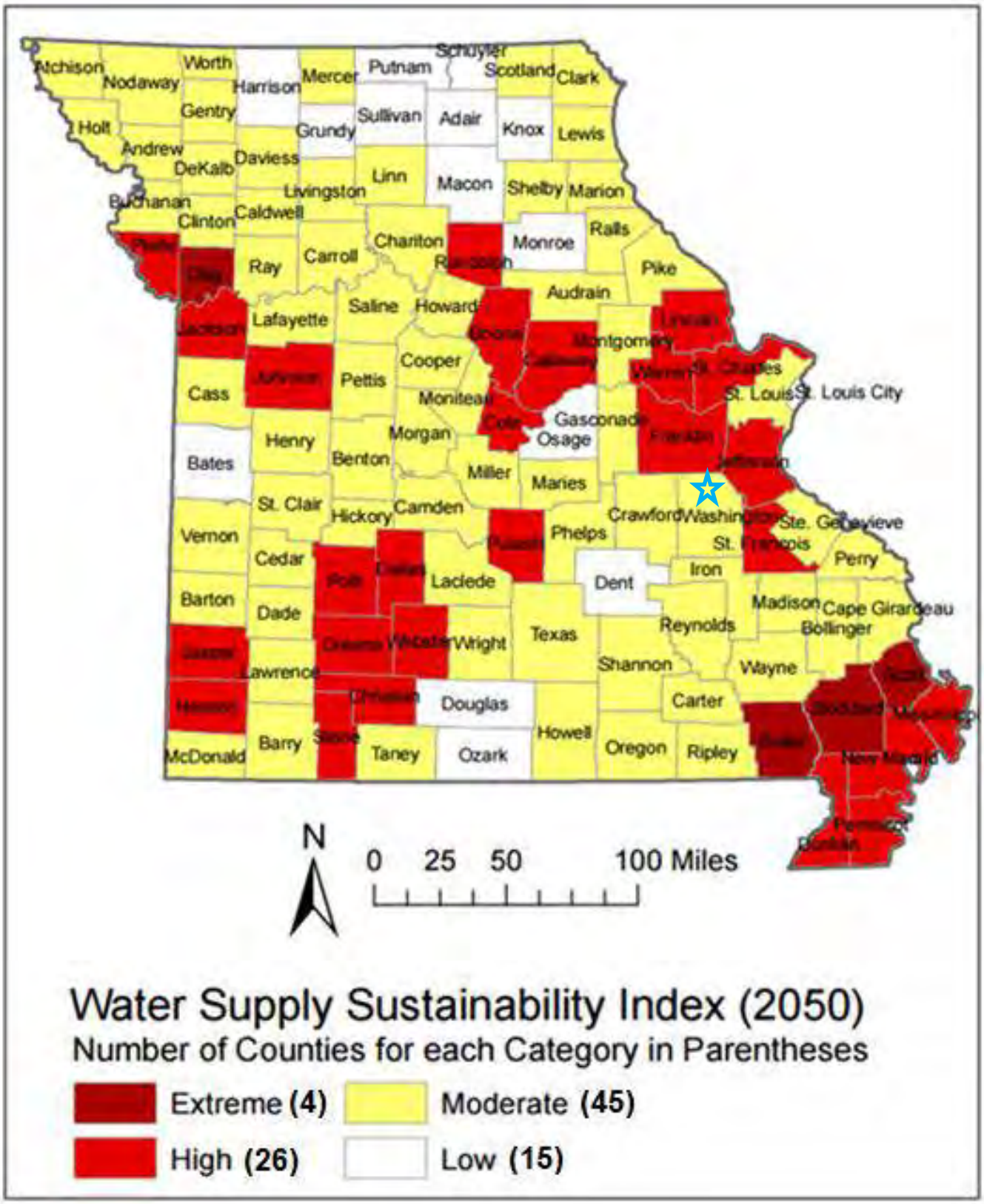
Impacts of drought on future development within Washington County would be negligible. Population trend analysis from the University of Missouri Extension suggests that Washington County will increase by approximately 2,292 individuals within the next 2 to 12 years[23]. Moreover, with an increasing population, water use and demand would be expected to increase as well; potentially straining the water supply systems. Furthermore, any agriculture related development in terms of crop or livestock production would also be at risk.

Impact of Climate Change

A new analysis, performed for the Natural Resources Defense Council, examined the effects of climate change on water supply and demand in the contiguous United States. The study found that more than 1,100 counties will face higher risks of water shortages by mid-century as a result of climate change. Two of the principal reasons for the projected water constraints are shifts in precipitation and potential evapotranspiration (PET). Climate models project decreases in precipitation in many regions of the U.S., including areas that may currently be described as experiencing water shortages of some degree. Washington County is predicted to experience moderate water shortages as a result of global warming (**Figure 3.27**) by the year 2050.

[22] 2015 Boone County Hazard Mitigation Plan
[23] UM Extension Social and Economic Profile http://mcdc.missouri.edu/cgi-bin/broker?_PROGRAM=websas.cntypage.sas&county=29221

Figure 3.27. Water Supply Sustainability Index (2050) with Climate Change Impacts



Source: Natural Resources Defense Council (NRDC), Climate Change, Water, and Risk
*Blue star indicates Washington County

Hazard Summary by Jurisdiction

The variations between jurisdictions are non-existent to minimal. All jurisdictions within Washington County utilize ground/well water as their municipal water source. In cities, the drought conditions would be the same as those experienced in rural areas, but the magnitude would be different with only lawns and local gardens impacted. Long term drought, spanning months at a time, could negatively impact the amount of potable drinking water available to the various jurisdictions within the county. In an event of long term drought various jurisdictions may be required to impose restrictions on water use.

Problem Statement

In summary, drought within Washington County is considered low risk, as of now. However, climate change predictions suggest increased risks by the year 2050. Washington County has a relatively strong agricultural economy. Drought would impact commodities, specifically livestock and crops. Potential impacts to local economies and infrastructures are foreseeable in the event of a long term drought.

All cities and the county commission should adopt water conservation ordinances that limit the amount of water that residents may use during a period of drought. The county and its jurisdictions should develop water monitoring plans as an early warning system. Each sector should inventory and review their reservoir operation plans. A water conservation awareness program should be presented to the public either through pamphlets, workshops or a drought information center. Voluntary water conservation should be encouraged to the public. The county and its jurisdictions should continually look for and fund water system improvements, new systems and new wells.

3.4.3 Earthquakes

Some specific sources for this hazard are:

- U.S. Seismic Hazard Map, United States Geological Survey, http://earthquake.usgs.gov/hazards/products/conterminous/2014/HazardMap2014_lg.jpg;
- 6.5 Richter Magnitude Earthquake Scenario, New Madrid Fault Zone map, http://www.igsb.uiowa.edu/Browse/quakes/quakes.htm;
- Probability of magnitude 5.0 or greater within 100 Years, United States Geological Survey, https://geohazards.usgs.gov/eqprob/2009/index.php

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.

The closest fault to Washington County is the New Madrid Seismic Zone (NMSZ). The NMSZ is the most active seismic area in the United States east of the Rocky Mountains. Unfortunately, the faults in the NMSZ are poorly understood due to concealment by alluvium deposits. Moreover, the NMSZ is estimated to be 30 years overdue for a 6.3 magnitude earthquake[24].

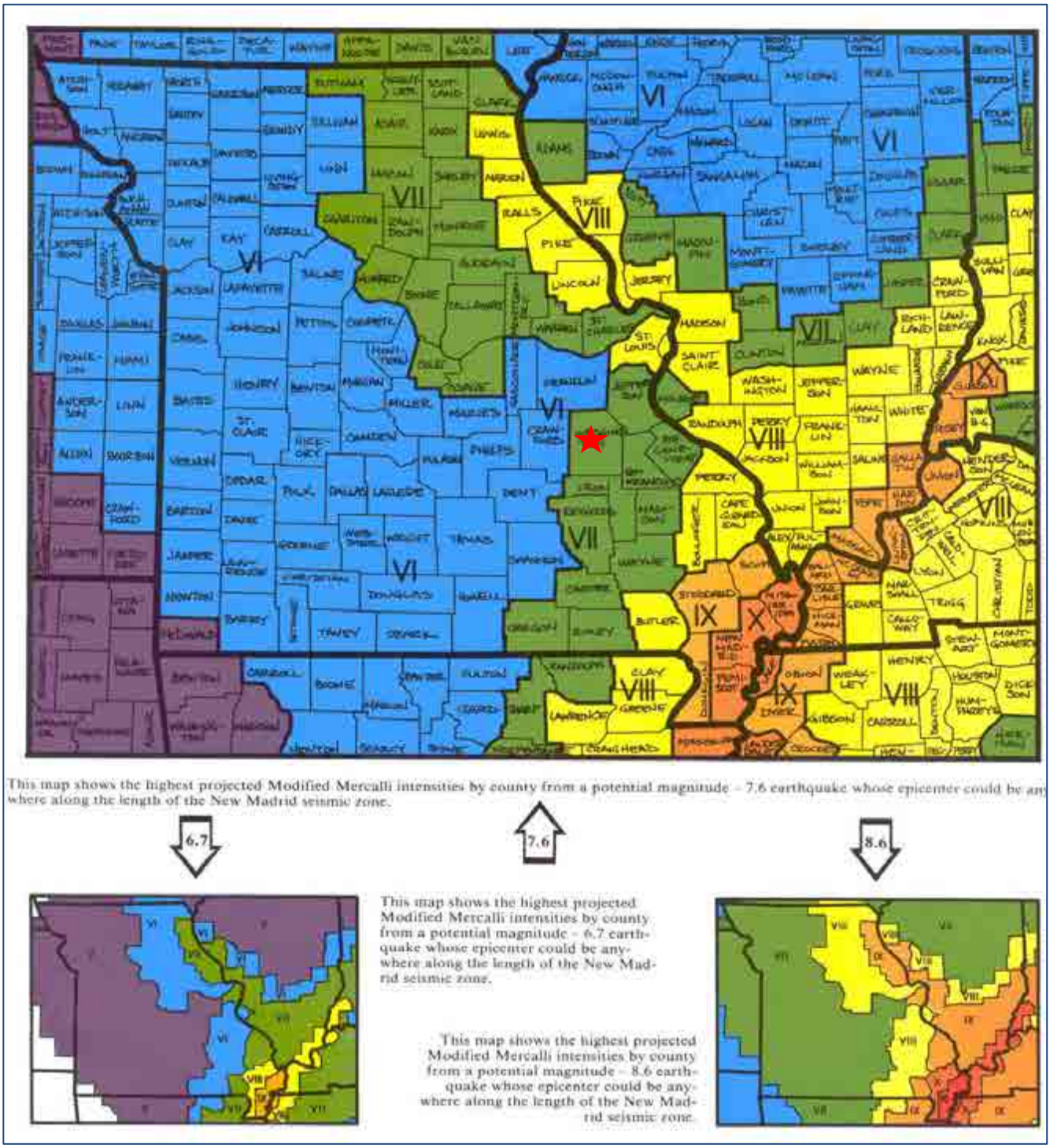
Geographic Location

There are eight earthquake source zones in the Central United States, one of which is located within the state of Missouri—the New Madrid Fault. Other seismic zones, because of their close proximity, also affect Missourians. These are the Wabash Valley Fault, Illinois Basin, and the Nemaha Uplift. The most active zone is the New Madrid Fault, which runs from Northern Arkansas through Southeast Missouri and Western Tennessee and Kentucky to the Illinois side of the Ohio River Valley.

Figure 3.28 depicts impact zones for a magnitude 7.6 earthquake along the New Madrid Fault along with associated Modified Mercalli Intensities. Washington County is indicated by a red star. Furthermore, the Modified Mercalli Intensities for potential 6.7 and 8.6 magnitude earthquakes are illustrated. In the event of a 6.7 magnitude earthquake, Washington County would experience a Modified Mercalli Intensity of VI (**Figure 3.29**). This intensity is categorized as being almost felt by everyone. Poorly built buildings are damaged slightly. Dishes, glassware, and windows are broken. People will have trouble walking. Plaster in walls might crack and some furniture is overturned. Additionally, in the occurrence of 7.6 and 8.6 magnitude earthquakes; the County would experience Modified Mercalli Intensities of VII and VIII respectively. Earthquake intensities will not vary across the planning area, which is the case for most Missouri counties**. Figure 3.29** and **Table 3.30** further define Richter Scale intensities.

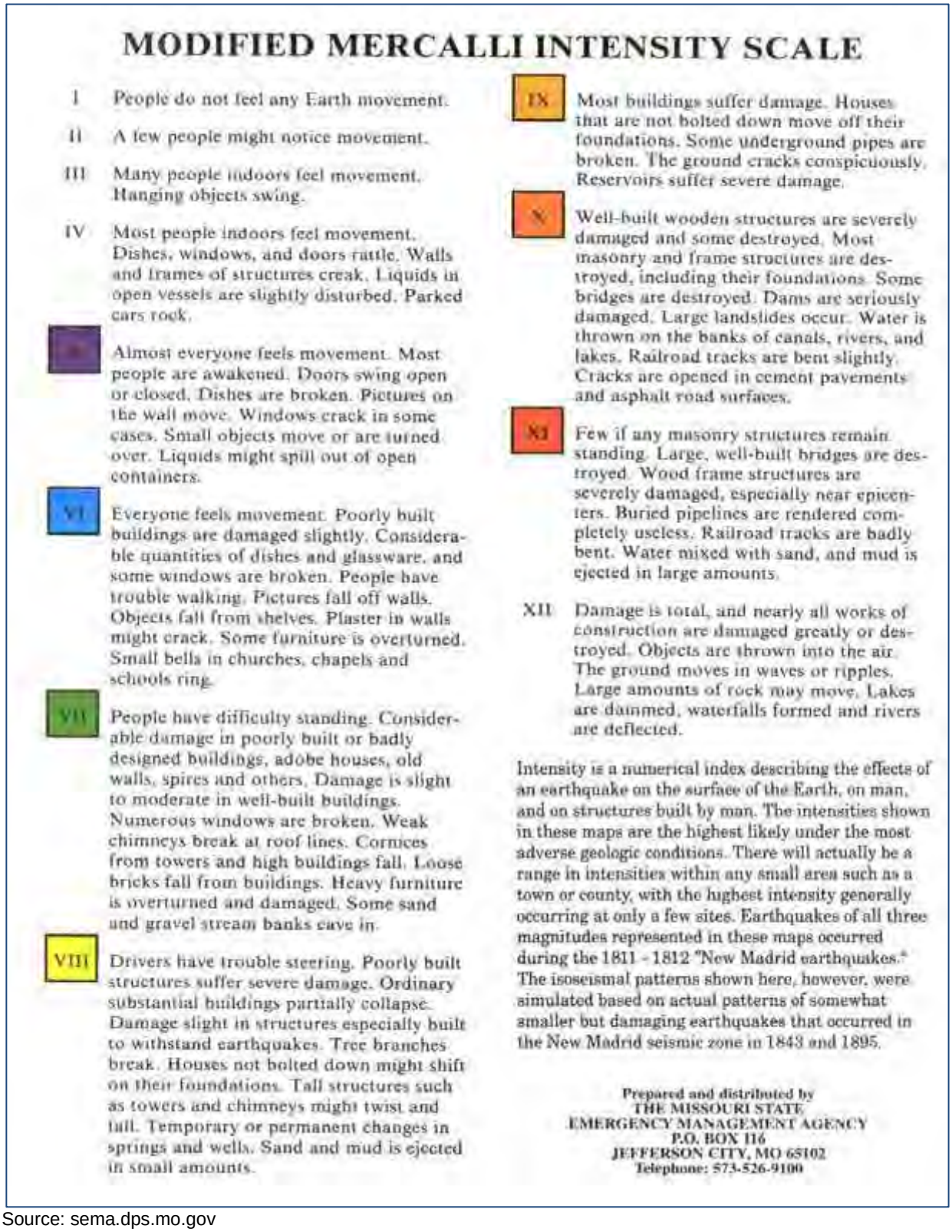
[24] Missouri Department of Natural Resources, Facts about the New Madrid Seismic Zone

Figure 3.28. Impact Zones for Earthquake Along the New Madrid Fault



Source: sema.dps.mo.gov; *Red star indicates Washington County

Figure 3.29. 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 structures 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 cases. Small objects move or are turned over. Liquids might spill out of open containers.

VI Everyone feels movement. Poorly built buildings are damaged slightly. Considerable 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 overturned. Small bells in churches, chapels and schools ring.

VII People have difficulty standing. Considerable damage in poorly built or badly 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 furniture 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 are 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 destroyed, including their foundations. Some bridges are 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 destroyed. Wood frame structures are severely damaged, especially near epicenters. Buried pipelines are rendered completely useless. Railroad tracks are badly bent. Water mixed with sand, and mud is ejected in large amounts.

XII Damage is total, and nearly all works of construction are damaged greatly or destroyed. 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.

Prepared and distributed by
THE MISSOURI STATE
EMERGENCY MANAGEMENT AGENCY
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JEFFERSON CITY, MO 65102
Telephone: 573-526-9100

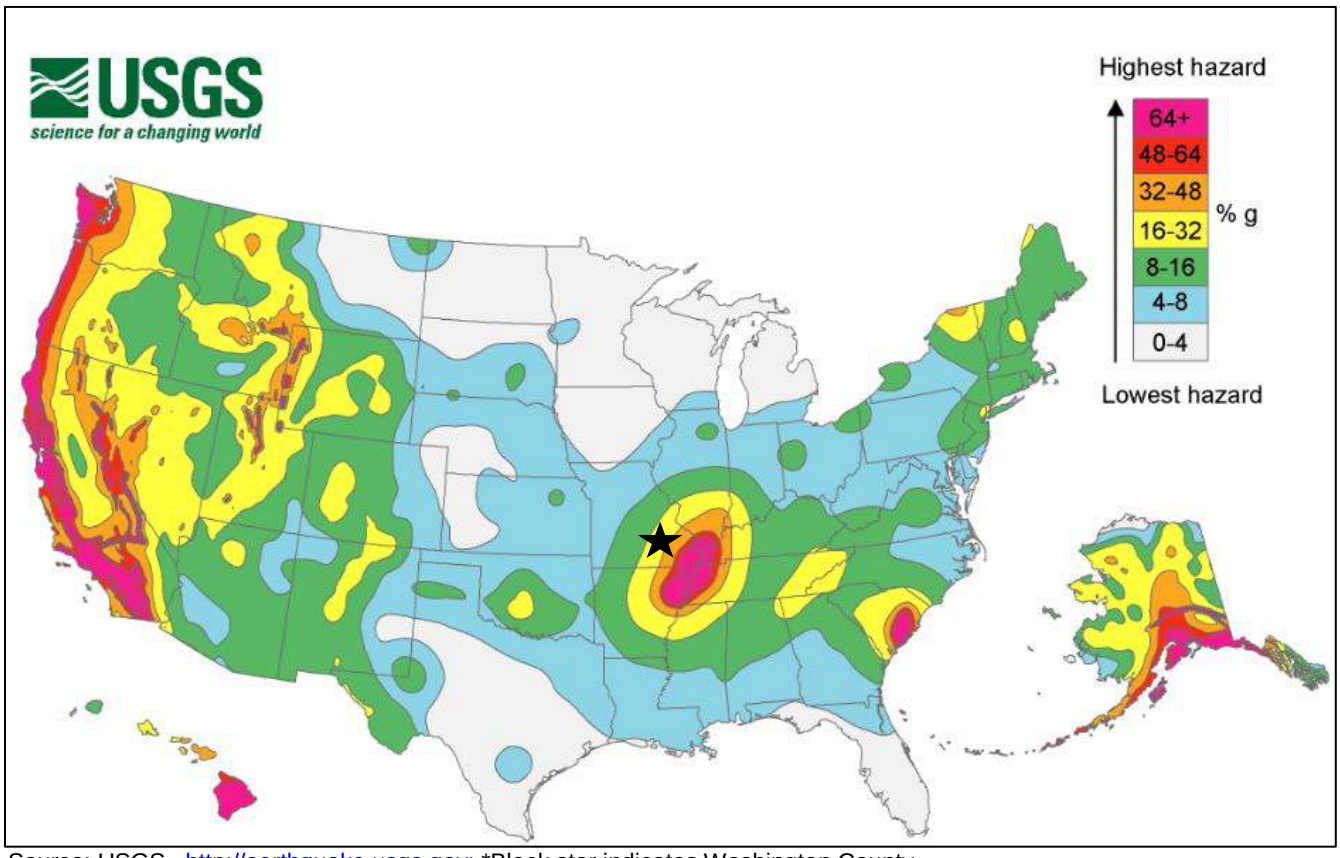
Source: sema.dps.mo.gov

Table 3.30. Richter Scale of Earthquake Magnitude

Magnitude Level	Category	Effects	Earthquake per Year
Less than 1.0 to 2.9	Micro	Generally not felt by people, though recorded on local instruments	More than 100,000
3.0-3.9	Minor	Felt by many people; no damage	12,000-100,000
4.0-4.9	Light	Felt by all; minor breakage of objects	2,000-12,000
5.0-5.9	Moderate	Some damage to weak structures	200-2,000
6.0-6.9	Strong	Moderate damage in populated areas	20-200
7.0-7.9	Major	Serious damage over large areas; loss of life	3-20
8.0 and higher	Great	Severe destruction and loss of life over large areas	Fewer than 3

Figure 3.30 illustrates the seismicity in the United States. A black star indicates the location of Washington County. The seismic hazard map displays earthquake peak ground acceleration (PGA) that has a 2% chance of being exceeded in 50 years; which has a value between 16-32% g.

Figure 3.30. United States Seismic Hazard Map



Source: USGS, http://earthquake.usgs.gov; *Black star indicates Washington County

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 a 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. Each whole number increase in magnitude represents a tenfold increase in measured amplitude; an estimate of energy. For example, comparing a 5.3 and a 6.3 earthquake shows that a 6.3 earthquake is ten times bigger than a magnitude 5.3 earthquake on a seismogram, but is 31.622 times stronger (energy release)[25].

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

Most of Missouri's earthquake activity has been concentrated in the southeast corner of the state, which lies within the New Madrid seismic zone. The written record of earthquakes in Missouri prior to the nineteenth century is virtually nonexistent; however, there is geologic evidence that the New Madrid seismic zone has had a long history of activity. The first written account of an earthquake in the region was by a French missionary on a voyage down the Mississippi River. He reported feeling a distinct tremor on Christmas Day 1699 while camped in the area of what is now Memphis, TN.

Whatever the seismic history of the region may have been before the first Europeans arrived, after Dec. 16, 1811, there could be no doubt about the area's potential to generate severe earthquakes. On that date, shortly after 2 a.m., the first tremor of the most violent series of earthquakes in the United States history struck southeast Missouri. In the small town of New Madrid, about 290 kilometers south of St. Louis, residents were aroused from their sleep by the rocking of their cabins, the cracking of timbers, the clatter of breaking dishes and tumbling furniture, the rattling of falling chimneys, and the crashing of falling trees. A terrifying roaring noise was created as the earthquake waves swept across the ground. Large fissures suddenly opened and swallowed large quantities of river and marsh water. As the fissures closed again, great volumes of mud and sand were ejected along with the water.

The earthquake generated great waves on the Mississippi River that overwhelmed many boats and washed others high upon the shore. The waves broke off thousands of trees and carried them into the river. High river banks caved in, sand bars gave way, and entire islands disappeared. The

[25] Measuring the Size of an Earthquake, http://earthquake.usgs.gov/learn/topics/measure.php

violence of the earthquake was manifested by great topographic changes that affected an area of 78,000 to 130,000 square kilometers.

On Jan. 23, 1812, a second major shock, seemingly more violent than the first, occurred. A third great earthquake, perhaps the most severe of the series, struck on Feb. 7, 1812.

The three main shocks probably reached intensity XII, the maximum on the Modified Mercalli scale, although it is difficult to assign intensities, due to the scarcity of settlements at the time. Aftershocks continued to be felt for several years after the initial tremor. Later evidence indicates that the epicenter of the first earthquake (Dec. 16, 1811) was probably in northeast Arkansas. Based on historical accounts, the epicenter of the Feb. 7, 1812, shocks was probably close to the town of New Madrid.

Although the death toll from the 1811-12 series of earthquakes has never been tabulated, the loss of life was very slight. It is likely that if at the time of the earthquakes the New Madrid area had been as heavily populated as at present, thousands of persons would have perished. The main shocks were felt over an area covering at least 5,180,000 square kilometers. Chimneys were knocked down in Cincinnati, Ohio, and bricks were reported to have fallen from chimneys in Georgia and South Carolina. The first shock was felt distinctly in Washington, D.C., 700 miles away, and people there were frightened badly. Other points that reported feeling this earthquake included New Orleans, 804 kilometers away; Detroit, 965 kilometers away; and Boston, 1,769 kilometers away.

The New Madrid seismic zone has experienced numerous earthquakes since the 1811-12 series, and at least 35 shocks of intensity V or greater have been recorded in Missouri since 1811. Numerous earthquakes originating outside of the state's boundaries have also affected Missouri. Five of the strongest earthquakes that have affected Missouri since the 1811-12 series are described below.

On Jan. 4, 1843, a severe earthquake in the New Madrid area cracked chimneys and walls at Memphis, Tennessee. One building reportedly collapsed. The earth sank at some places near New Madrid; there was an unverified report that two hunters were drowned during the formation of a lake. The total felt area included at least 1,036,000 square kilometers.

The Oct. 31, 1895, earthquake near Charleston, MO probably ranks second in intensity to the 1811-12 series. Every building in the commercial area of Charleston was damaged. Cairo, Illinois, and Memphis, Tennessee, also suffered significant damage. Four acres of ground sank near Charleston and a lake was formed. The shock was felt over all or portions of 23 states and at some places in Canada.

A moderate earthquake on April 9, 1917, in the Ste. Genevieve/St. Mary’s area was reportedly felt over a 518,000 square kilometer area from Kansas to Ohio and Wisconsin to Mississippi. In the epicentral area people ran into the street, windows were broken, and plaster cracked. A second shock of lesser intensity was felt in the southern part of the area.

The small railroad town of Rodney, MO experienced a strong earthquake on Aug. 19, 1934. At nearby Charleston, windows were broken, chimneys were overthrown or damaged, and articles were knocked from shelves. Similar effects were observed at Cairo Mounds and Mound City, IL, and at Wickliff, KY. The area of destructive intensity included more than 596 square kilometers.

The Nov. 9, 1968, earthquake centered in southern Illinois was the strongest in the central United States since 1895. The magnitude 5.5 shock caused moderate damage to chimneys and walls at

Hermann, St. Charles, St. Louis, and Sikeston, Missouri. The felt areas include all or portions of 23 states.[i]

Table 3.31 describes earthquakes that have occurred within the planning area within the past 20 years (1998-2017).

Table 3.31. Washington County Earthquake Events 1998 - 2017

Date	Magnitude	Location	Depth
March 7, 2009	2.6	4 miles southeast of Sullivan	4.3 miles
June 7, 2011	3.9	11 miles northwest of Potosi	13 miles
February 3, 2014	2.6	11 miles northwest of Potosi	8.3 miles

Small earthquakes continue to occur frequently in Missouri. Averages of 200 earthquakes are detected every year in the New Madrid Seismic Zone alone. Most are detectable only with sensitive instruments, but on an average of every 18 months, southeast Missouri experiences an earthquake strong enough to crack plaster in buildings[26].

Probability of Future Occurrence

Washington County has reported a total of three earthquakes since 1998. The county, located in east central Missouri, a good distance from the southeast corner of the state that has the potential for moderate damage should a significant earthquake occur. Probability of future occurrence for some magnitude earthquake within the county is 15% (3 event/20 years x 100).

Table 3.32. Annual Average Percentage Probability of Earthquake in Washington County

Location	Annual Avg. % P
Washington County	15%

Furthermore, in 2002 the University of Memphis estimated a 25% to 40% chance for one occurrence of a 6.0 magnitude earthquake in the next fifty years (by year's end 2052) in the New Madrid Seismic Zone. Ideally, if an occurrence is to happen within the next 50 years, it would occur at the midway point (25 years) year 2027. Given this hypothetical situation, there would be one chance in twenty-five (1/25 .04 or 4%) of an occurrence, and it represents an annualized percentage since the divisor (25) is the number of years; estimating that the earthquake will happen at the end of the 25th year over the intervening period. The 4% number becomes the "object of interest" (objective) and it has an estimated chance of happening.

The University of Memphis has fundamentally estimated this 4% objective has a 25% to 40% chance of occurrence. If we apply these percentages to the annualized figure of 4%, the result is the overall annualized percentages. At the 25% level, the likelihood of an earthquake happening in a given year is 1.0% (4% x 25%). At the 40% level, the likelihood of an earthquake happening in a given year is 1.6% (4% x 40%)[27].

[26] Missouri State Hazard Mitigation Plan May 2007
[27] SEMA

Vulnerability

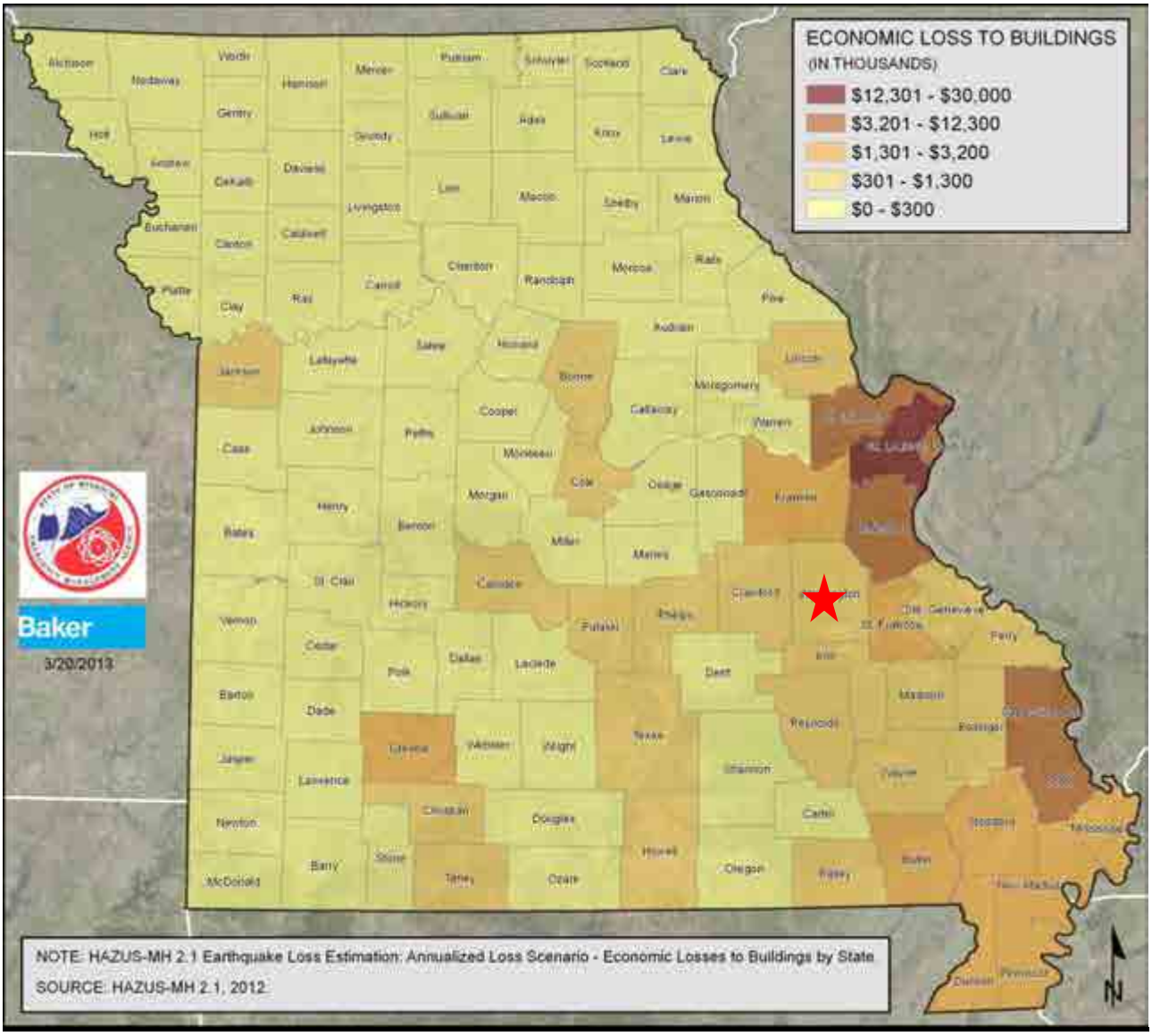
Vulnerability Overview

SEMA utilized Hazus 2.1 to analyze vulnerability and estimate losses to earthquakes. Hazus is a program developed by FEMA which is a nationally applicable standardized methodology that encompasses models for assessing potential losses from earthquakes, floods, and hurricanes. Geographic Information Systems (GIS) is utilized to assess physical, economic, and social impacts of disasters[28]. For the vulnerability analysis, an annualized loss scenario for each county was analyzed. Secondly, statistics from an event with a 2% probability of exceedance in 50 years was analyzed, suggesting outcomes of a worst case scenario.

Annualized loss is the maximum potential annual dollar loss resulting from eight return periods (100, 200, 500, 750, 1,000, 1,500, 2,000, and 2,500 years) averaged on a 'per year' basis[29]. The Hazus earthquake loss estimation is depicted in **Figure 3.31** and **Table 3.33**. Washington County's buildings are suggested to lose between $301,000 and $1,300,000 in any one year; thus ranking the county as having the 19th highest expected loss in the state, or medium-low vulnerability. This loss ratio indicates impacts on local economies in the event of an earthquake, and the difficulty for jurisdictions to recover from said event.

[28] www.fema.gov/hazus
[29] 2013 Missouri State Hazard Mitigation Plan

Figure 3.31. Hazus Earthquake Loss Estimation: Annualized Loss Scenario –Total Economic Losses to Buildings.



Source: 2013 Missouri State Hazard Mitigation Plan; *Red star indicates Washington County

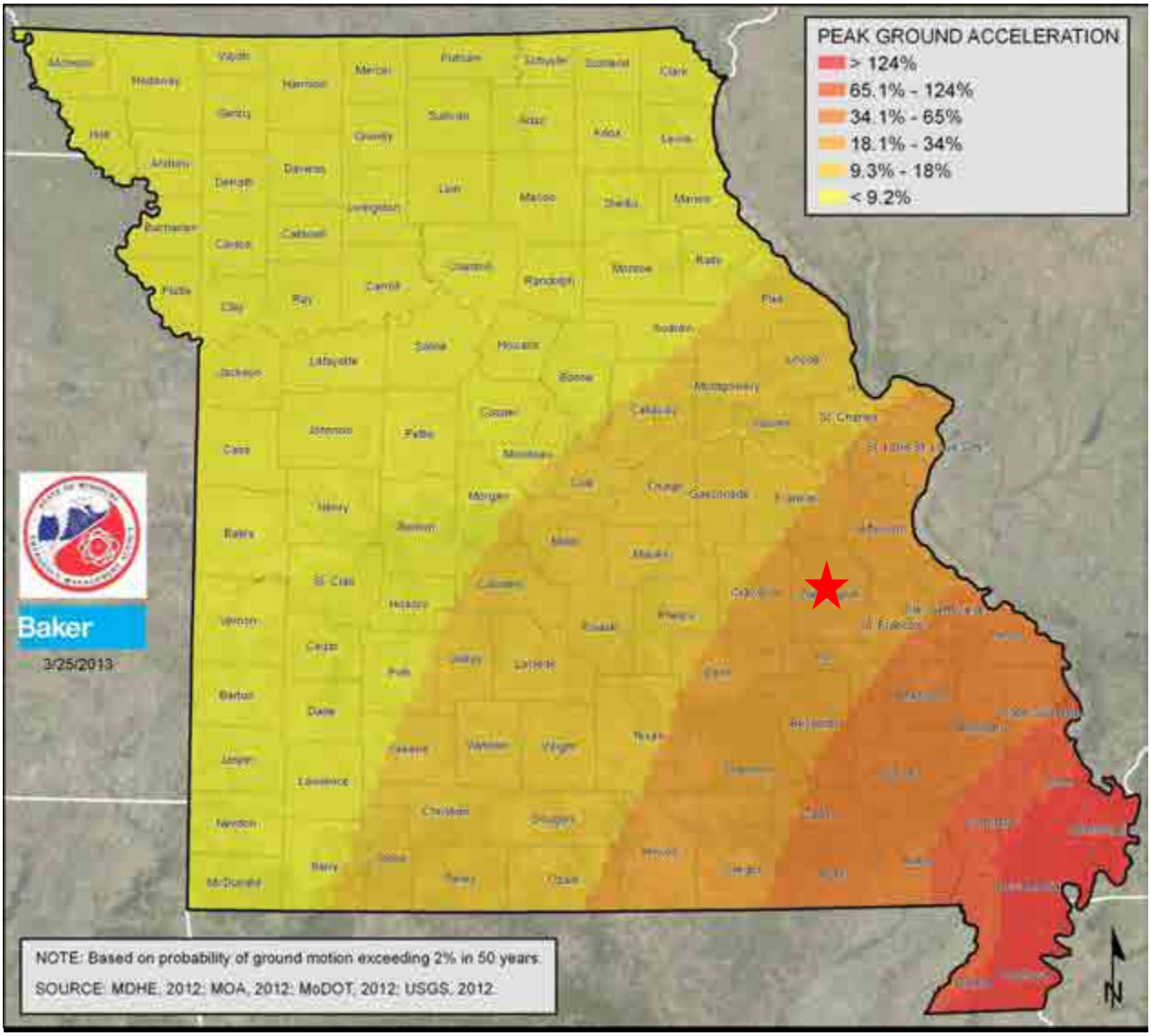
Table 3.33. Hazus Earthquake Loss Estimation: Annualized Loss Scenario

Location	Building Loss Total ($)*	Loss Ratio %**	Income Loss Total ($)*	Total Economic Loss to Buildings ($)*	Loss Ratio Rank
Washington	423	0.02	97	520	19

Source: Hazus 2.1
*All $values are in thousands
**Loss ratio is the sum of structural and nonstructural damage divided by the entire building inventory value within a county

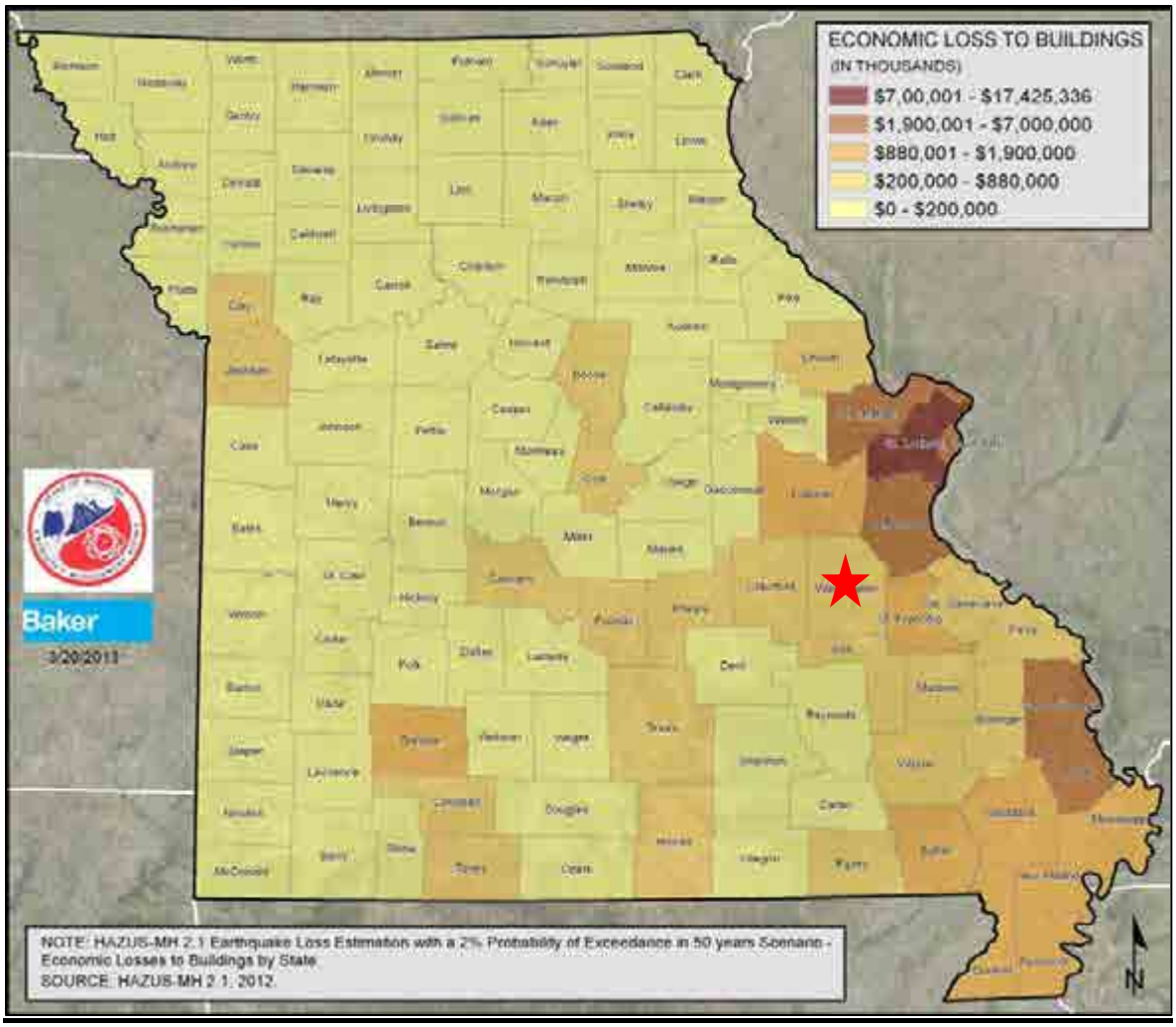
Likewise, SEMA developed a second scenario which incorporated a 2% probability of exceedance in 50 years. This model was to demonstrate a worst case scenario. **Figure 3.32** provides estimates of peak ground acceleration and spectral acceleration (ground shaking potential) at intervals of 0.3 and 1.0 seconds, respectively. These acceleration events have a 2% probability of exceedance in the next 50 years. A 7.7 magnitude earthquake was utilized in this scenario, which is typically utilized for New Madrid fault planning scenarios in Missouri. Washington County is estimated to have peak ground acceleration between 18.1 and 34%. Furthermore, **Figure 3.33** illustrates total economic loss to buildings including content and inventory loss, and wage/income loss in the event of the modeled earthquake. Washington County is anticipated to lose between $200,000 and $880,000 in a 50 year scenario. Moreover, in the same event the county is estimated to experience between 7.1% and 15% loss (damage) of the total building inventory (**Figure 3.34). Table 3.34** further exemplifies the County's loss ratio.

Figure 3.32. Hazus Earthquake 2% Probability of Exceedance in 50 Years – Ground Shaking Potential



Source: 2013 Missouri State Hazard Mitigation Plan; *Red star indicates Washington County

Figure 3.33. Hazus Earthquake Loss Estimation with a 2% Probability of Exceedance in 50 Years Scenario – Total Economic Loss to Buildings



Source: 2013 Missouri State Hazard Mitigation Plan; *Red star indicates Washington County

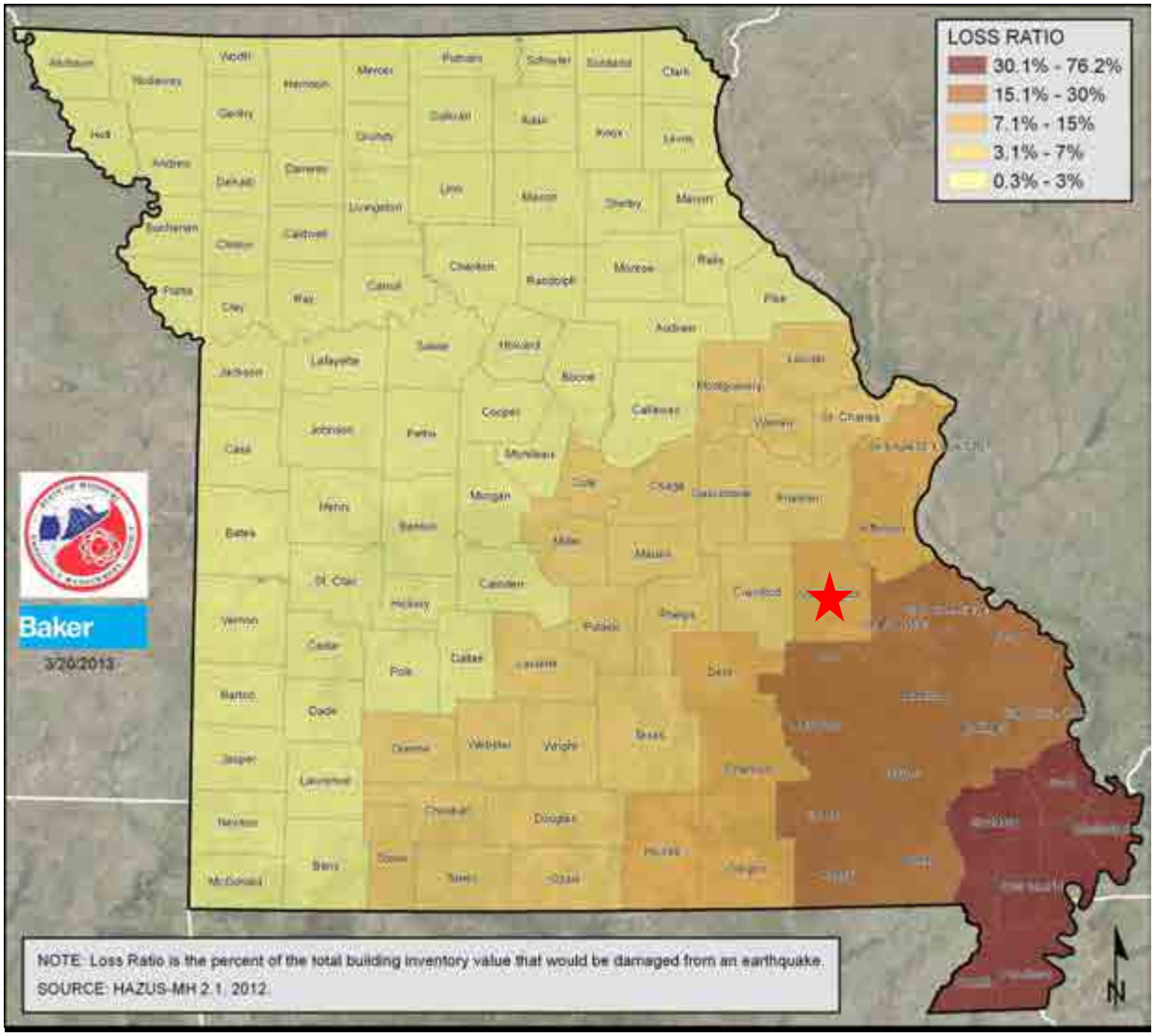
Table 3.34. Hazus-MH Earthquake Loss Estimation: 2% Probability of Exceedance in 50 Years Scenario Results Building Impacts by County, Ranked by Highest Building Losses

County	Structural Damage ($)*	Non-Structural Damage ($)*	Contents Damage and Inventory Loss ($) *	Loss Ratio (%) **	Income Loss ($)*	Total Economic Loss to Buildings ($)*,***	Loss Ratio Rank
Washington	49,09	156,018	46,886	12.22	58,654	310,648	20

Source: 2013 Missouri State Hazard Mitigation Plan, Hazus 2.1

*All $ values are in thousands
**Loss ratio is the sum of structural and nonstructural damage divided by the entire building inventory value within a county
***Total economic loss to buildings includes inventory loss, relocation loss, capital-related loss, wages loss, and rental income loss
****Note: Total loss numbers provide an estimate of total losses and due to rounding, these numbers may differ slightly from the global summary report outputs from HAZUS

Figure 3.34. Hazus Earthquake Loss Estimation with a 2% Probability of Exceedance in 50 Years Scenario – Loss Ratio



Source: 2013 Missouri State Hazard Mitigation Plan; *Red star indicates Washington County

In terms of social impacts for the same earthquake event, **Table 3.35** defines casualty severity, displaced households, and short-term shelter needs that are utilized in **Table 3.36.** During this scenario, Washington County is estimated to have 155 injuries requiring medical attention without hospitalization, 35 injuries requiring hospitalization, 4 life threatening injuries, and 8 deaths. Moreover, 279 individuals are expected to become displaced from their homes, along with 204 individuals requiring short-term shelter needs.

Table 3.35. Casualty Severity, Displaced Households, and Short-Term Shelter Needs

Casualty Severity Level 1	Injuries will require medical attention but hospitalization is not needed
Casualty Severity Level 2	Injuries will require hospitalization but are not considered life-threatening
Casualty Severity Level 3	Injuries will require hospitalization and can become life threatening if not promptly treated
Casualty Severity Level 4	Victims are killed by the earthquake
Displaced Households	The number of households that are expected to be displaced from their homes due to the earthquake
Short-Term Shelter Needs	The number of displace people that will require accommodations in temporary public shelters

Source: Hazus 2.1

Table 3.36. Social Impact Estimates by County from the 2% Probability of Exceedance in 50 Years Scenario 2 a.m. Time of Occurrence

County	MMI Zone	Level 1	Level 2	Level 3	Level 4	Total	Displaced Households	Short-Term Shelter Needs
Washington	VII	155	35	4	8	202	279	204

Source: 2013 Missouri State Hazard Mitigation Plan

Potential Losses to Existing Development

Economic loss to buildings in the event of an earthquake can be found in the Vulnerability Overview. Infrastructures across the planning area would also be expected to experience losses. Additional losses expected would be environmental and economic.

Impact of Future Development

Future development at risk includes new remodeling at Kingston K-12 high school and junior high, Potosi R-III's proposed tornado shelter, and Valley R-VI's anticipated dome. Future development will not increase the risk of an earthquake, rather contributing to the overall exposure of damaged property. As new development arises, minimum standards of building codes should be established in all jurisdictions to decrease the potential damage/loss should an earthquake occur.

The Revised Statutes of MO, Section 160.451 require that: The governing body of each school district which can be expected to experience an intensity of ground shaking equivalent to a Modified Mercalli Intensity of VII or above from an earthquake occurring along the New Madrid Fault with a potential magnitude of 7.6 on the Richter Scale shall establish an earthquake emergency procedure system in every school building under its jurisdiction[30].

[30] 2015 Boone County Hazard Mitigation Plan

Hazard Summary by Jurisdiction

Since earthquake intensity is not likely to vary greatly throughout the planning area, the risk will be the same throughout. Washington County is not near the New Madrid Shock Zone, but it will most likely endure mild secondary effects from the earthquake, such as fire, structure damage, utility disruption, environmental impacts, and economic disruptions/losses. However, damages could differ if there are structural variations in the planning area's built environment. For example, if one community has a higher percentage of residences built prior to 1939 than the other participants, that community is likely to experience higher damages. **Table 3.37** depicts the percent of residences built prior to 1939 in Washington County. Caledonia (54.5%), Irondale (33.6%), and Potosi (15.3%) have the most residences susceptible to damage in the event of an earthquake. If a major earthquake should occur, Washington County would likely be deeply impacted by the number of refugees traveling through the area seeking safety and assistance.

Table 3.37. Percent of Washington County Residences Built Prior to 1939

Jurisdiction	% of Residences built prior to 1939
Unincorporated Washington County	8.1
Caledonia	54.5
Irondale	33.6
Mineral Point	10.6
Potosi	15.3

Source: U.S. Census Bureau, 2012-2016 American Community Survey 5 – Year Estimates

Problem Statement

In the event of a 7.7 magnitude earthquake (worst case scenario), Washington County is estimated to have 155 injuries requiring medical attention without hospitalization, 35 injuries requiring hospitalization, 4 life threatening injuries, and 8 deaths. Moreover, 279 individuals are expected to become displaced from their homes, along with 204 individuals requiring short-term shelter needs. Additionally, the county is expected to encounter $200,000 to $880,000 in total economic losses to buildings. Moreover, Caledonia, Irondale, and Potosi are particularly at risk due to the percent of residences built prior to 1939.

Jurisdictions should encourage purchase of earthquake hazard insurance. As well as establishing structurally sound emergency shelters in several parts of the county. In addition, stringent minimum standards of building codes should be established. Lastly, outreach and education should be utilized more frequently to prepare citizens for the next occurrence.

3.4.4 Extreme Heat

Hazard Profile

Some specific sources for this hazard are:

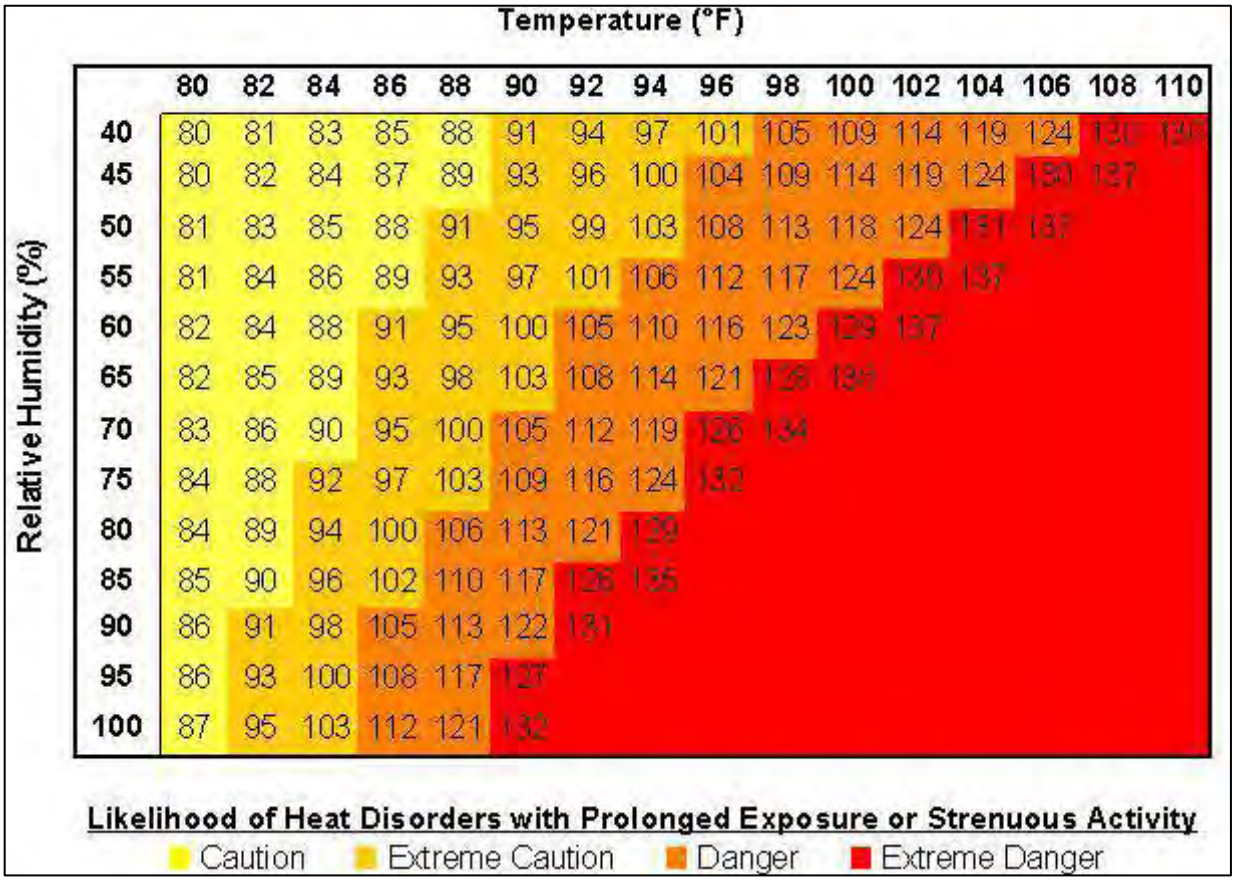
- National Climatic Data Center, Storm Events Database, http://www.ncdc.noaa.gov/stormevents/
- Heat Index Chart & typical health impacts from heat, National Weather Service; National Weather Service Heat Index Program, www.weather.gov/os/heat/index.shtml ;
- Daily temperatures averages and extremes, High Plains Regional Climate Summary, http://www.hprcc.unl.edu/data/historical/index.php?state=ia&action=select_state&submit=Select+State;
- Hyperthermia mortality, Missouri; Missouri Department of Health and Senior Service, http://health.mo.gov/living/healthcondiseases/hyperthermia/pdf/hyper1.pdf;
- Hyperthermia mortality by Geographic area, Missouri Department of Health and Senior Services,
- http://health.mo.gov/living/healthcondiseases/hyperthermia/pdf/hyper2.pdf;

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 3.4.10.** 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. These high temperatures generally occur from June through September, but are most prevalent in the months of July and August. Regional reports indicate all of Missouri is subject to heat wave during the summer months. 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 3.35** uses both of these factors to produce a guide for the apparent temperature or relative intensity of heat conditions.

High humidity, a common factor in Missouri, can magnify the effects of extreme heat. While heat-related illness and death can occur from exposure to intense heat in just one afternoon, heat stress on the body has a cumulative effect. The persistence of a heat wave increases the threat to public health.

Figure 3.35. 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 considered to be an area-wide hazard event. In such a case, the chance of variation in temperatures across Washington County is minimal to nonexistent.

Severity/Magnitude/Extent

Extreme heat can cause stress to crops and animals. According to USDA Risk Management Agency, Washington County did not report losses to insurable crops during a 20-year time period from 1998 to 2017 due to extreme heat. 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 1979 to 2013, there were approximately 9,000 fatalities in the U.S. attributed to heat. This translates to an annual national average of 264 deaths[31]. Fortunately, there were no recorded heat related deaths in the planning area, according to the Bureau of Environmental Epidemiology[32]. The

[31] https://www3.epa.gov/climatechange/pdfs/print_heat-deaths-2015.pdf
[32] http://health.mo.gov/living/healthcondiseases/hyperthermia/pdf/hyper2b.pdf

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

Table 3.38. 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

Table 3.39 provides data in relation to record heat events between 1998 and 2017 in Washington County. Maximum heat index values and temperatures are shown for each extreme temperature event. Fortunately, there were zero recorded injuries and fatalities during this time. In addition, **Figure 3.36** illustrates heat related deaths by county in Missouri between 2000 and 2013.

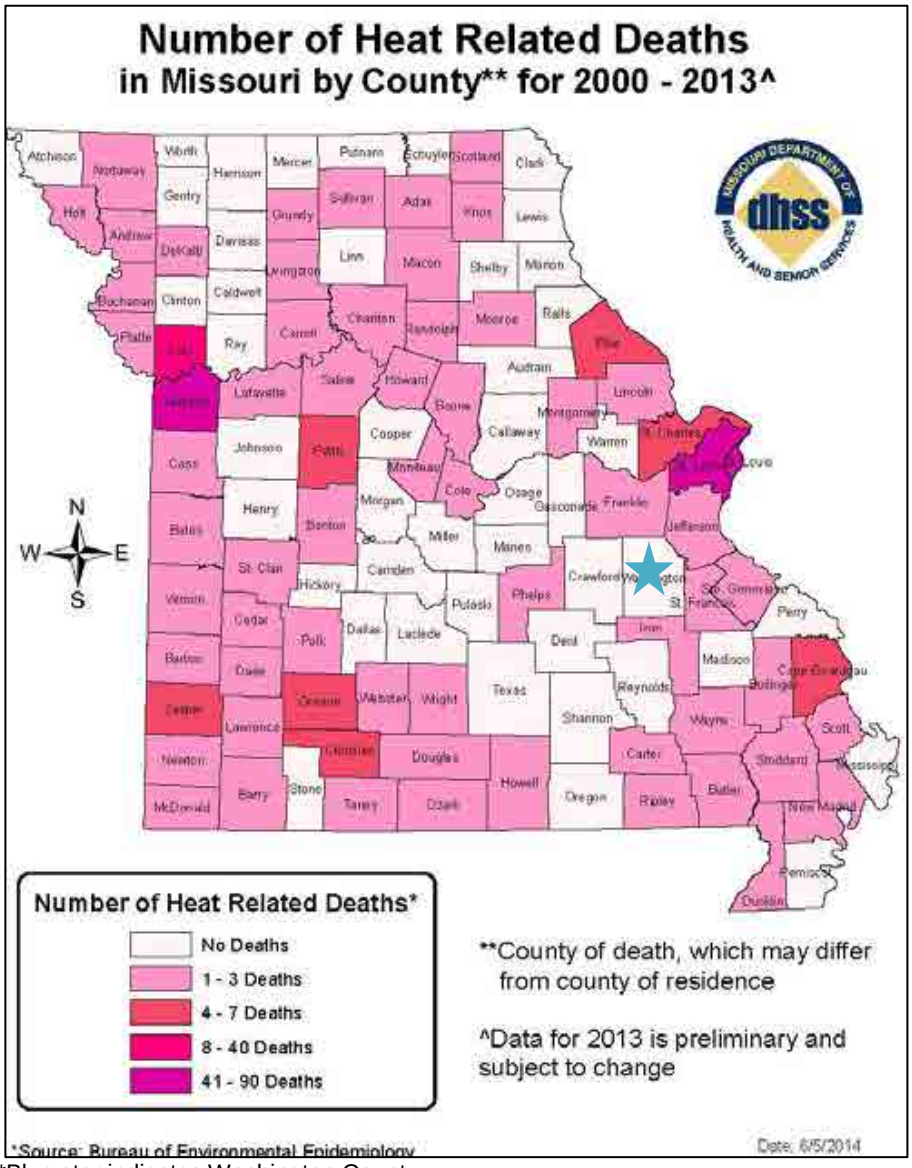
Table 3.39. Washington County Recorded Heat Events 1998 – 2017

Month, Year	# of Event Days	Fatalities	Injuries	Temperature (F°)	Heat Index Values (F°)
7/18/1999	14	0	0	95-100	105-115
7/7/2001	4	0	0	95-99	105-110
7/17/2001	1	0	0	95-99	110-115
7/21/2001	4	0	0	95-99	105-115
7/29/2001	3	0	0	90-95	105-110
8/1/2001	2	0	0	95-99	105
8/7/2001	3	0	0	95-99	102-110
8/21/2001	1	0	0	95-100	105-110
6/1/2002	4	0	1	85+	-
7/8/2002	2	0	0	95-99	105-110
7/20/2002	3	0	0	95-99	105-115
7/26/2002	6	0	3	95-99	105-115
8/1/2002	6	0	1	99-101	-
8/15/2003	7	0	9	95-104	-
8/24/2003	5	0	0	95-100	105-110
7/20/2004	3	0	0	90-95	105-110
7/20/2005	7	0	0	100-105	105-120
7/17/2006	4	0	0	95-100	105-110
7/30/2006	2	0	0	95-100	105-110
8/1/2006	2	0	0	100+	-
8/5/2007	12	0	0	100-105	-
6/21/2009	7	0	0	90-99	100-107
6/18/2010	6	0	0	95+	100-105
7/14/2010	1	0	0	90-95	105-110
7/17/2010	1	0	0	95+	105
7/22/2010	3	0	0	95-99	105-110
8/2/2010	3	0	0	100	110
8/8/2010	1	0	0	95-100	110-115

7/1/2011	3	0	0	90-99	105
7/10/2011	3	0	0	95-102	-
7/17/2011	15	0	0	90-100	105-110
8/1/2011	3	0	0	100-108	105-115
8/6/2011	2	0	0	95-99	105-110
8/31/2011	1	0	0	103	105-110
9/1/2011	3	0	0	100-104	105
6/27/2012	4	0	43	100-109	-
7/1/2012	8	0	0	100-107	-
7/22/2012	6	0	0	106-108	-
7/31/2012	1	0	0	105	105-110
8/1/2012	1	0	0	105	105-110
8/31/2013	1	0	0	100	105-110
9/1/2013	1	0	0	100	105-110
8/20/2014	8	0	0	95-99	105-110
7/12/2015	3	0	0	95-99	110
7/18/2015	2	0	0	90-95	105-110
7/25/2015	1	0	0	90+	105
7/27/2015	3	0	0	95+	110
6/15/2016	2	0	0	95-99	105
7/18/2016	6	0	0	95-99	110
7/21/2017	3	0	0	95-100	105-110
Total	**197**	**0**	**57**	**-**	**-**

Source: http://www.ncdc.noaa.gov/stormevents/

Figure 3.36. Heat Related Deaths in Missouri 2000 - 2013



*Blue star indicates Washington County

Probability of Future Occurrence

Table 3.40 illustrates the annual average percent probability of extreme heat in Washington County. The county's likelihood of enduring an extreme heat event per year is 100% (50 events/20 years x 100 = 2.5). The average number of events per year is 2.5. Extreme heat events can be found in **Table 3.39.**

Table 3.40. Annual Average % Probability of Extreme Heat in Washington County

Location	Annual Avg. % P	Avg. Number of Events
Washington County	100%	2.5

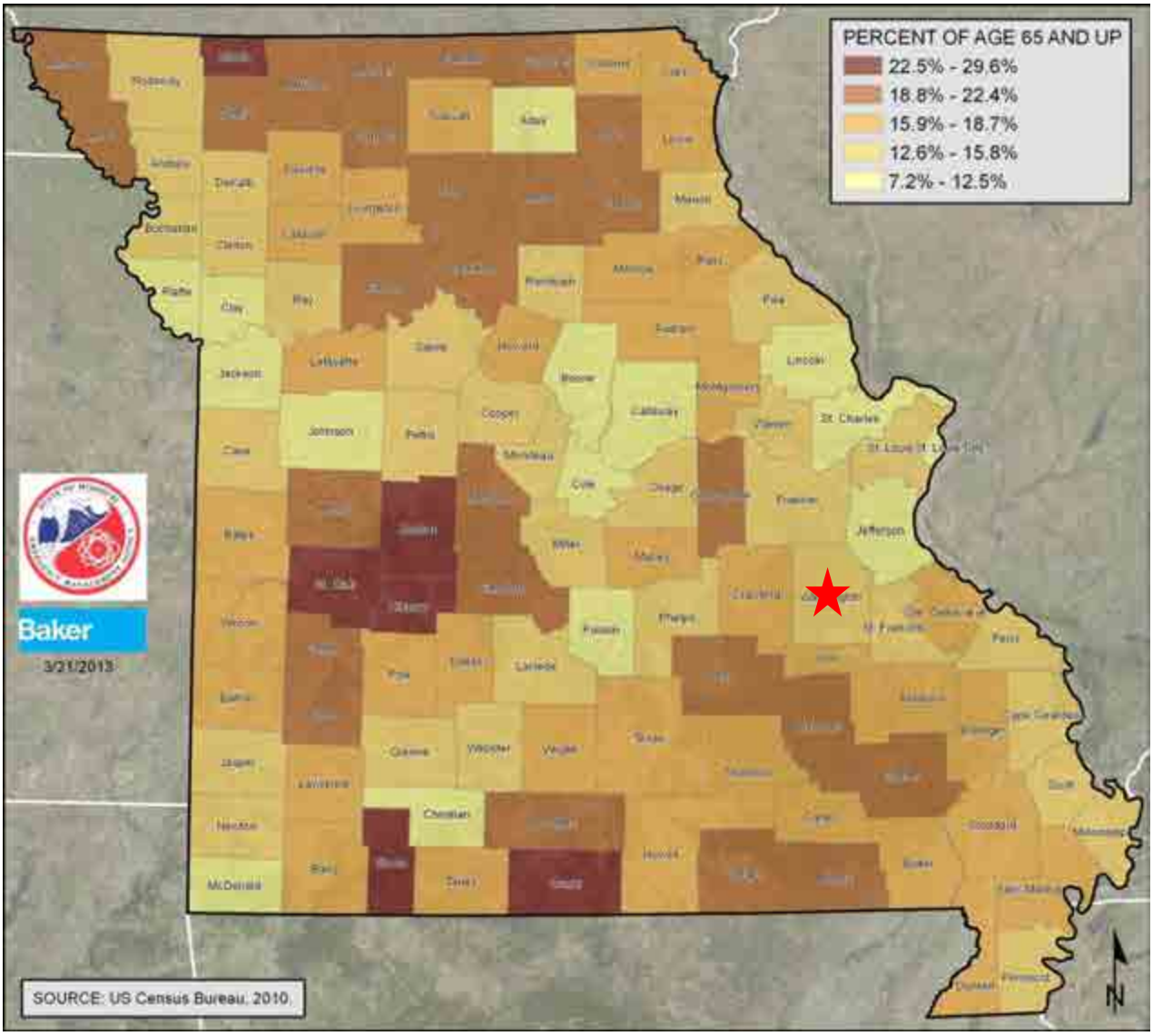
*P = probability; see page 3.24 for definition.

Vulnerability

Vulnerability Overview

Washington County, along with the rest of the state of Missouri is vulnerable to extreme heat. However, those jurisdictions with higher percentages of individuals below the age of 5, and above the age of 65 tend to be more at risk (**Table 3.41**). **Figure 3.37** depicts the distribution of the elderly population across Missouri. In 2010, 12.6 to 15.8% of the county was comprised of individuals ages 65 and up.

Figure 3.37. Distribution of Elderly Population



Source: 2013 Missouri State Hazard Mitigation Plan; *Red star indicates Washington County

Potential Losses to Existing Development

During extreme heat events structural, road, and electrical infrastructure are vulnerable to damages. Depending upon temperatures and duration of extreme heat, losses will vary.

Impact of Future Development

Population trends from 2000 to 2016 for Washington County and various jurisdictions indicate that 3 out of 5 jurisdictions were growing. Population growth can result in increased age groups that are more susceptible to extreme heat. Additionally, as populations increase, so does the strain on each jurisdiction's electricity and road infrastructure. Local government and the City Emergency Management Director should take extreme heat in consideration while electrical upgrades are underway.

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 2012-2016 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 3.41** 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 3.41. County Population Under Age 5 and Over Age 65 (2012-2016)

Jurisdiction	% Population Under 5 Years	% Population 65 Years and over
Incorporated Washington County	5.6	15.2
Caledonia	6.7	17.4
Irondale	11.0	19.3
Mineral Point	6.3	12.7
Potosi	7.9	17.5

Source: U.S. Census Bureau, 2012-2016 American Community Survey 5-Year Estimates

Due to lack of data, strategic buildings that lack air-conditioning could not be analyzed for this report. Additionally, school policy data in regard to extreme heat were not available.

Problem Statement

In summary, the risks of extreme heat can impact the health/lives of citizens within the county, specifically the young and elderly. Irondale has the highest percent of individuals under 5 and over 65. This jurisdiction is most vulnerable to extreme heat.

Many people do not realize how deadly a heat wave can be. Extreme heat is a natural disaster that is not as dramatic as floods or tornadoes. Working with the Washington County Health Department and EMD, local governments should encourage residents to reduce the level of physical activity, wear lightweight clothing, eat fewer protein-rich foods, drink plenty of water, minimize their exposure to the sun, and spend more time in air-conditioned places. People who work outdoors should be educated about the dangers and warning signs of heat disorders. Buildings, ranging from homes (particularly those of the elderly) to factories, should be equipped with properly installed, working air conditioning units, or have fans that can be used to generate adequate ventilation. Charitable organizations and the health department should work together to provide fans to at-risk residents during times of critical heat.

3.4.5 Fires (Urban/Structural and Wild)

The specific sources for this hazard are:

- Missouri Department of Conversation Wildfire Data Search at http://mdc4.mdc.mo.gov/applications/FireReporting/Report.aspx
- Statistics, Missouri Division of Fire Safety;
- National Statistics, US Fire Administration;
- Fire/Rescue Mutual Aid Regions in Missouri;
- Forestry Division of the Missouri Dept. of Conservation;
- National Fire Incident Reporting System (NFIRS), http://www.dfs.dps.mo.gov/programs/resources/fire-incident-reporting-system.asp
- Firewise Missouri, http://www.firewisemissouri.org/wildfire-in-missouri.html
- University of Wisconsin Slivis Lab, http://silvis.forest.wisc.edu/maps/wui_main

Hazard Profile

Hazard Description

The incident types considered for urban/structural fire include all fires in the following categories: 1) general fires, 2) structure fire, 3) fire in mobile property used as a fixed structure, and 4) mobile property (vehicle) fire. 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.

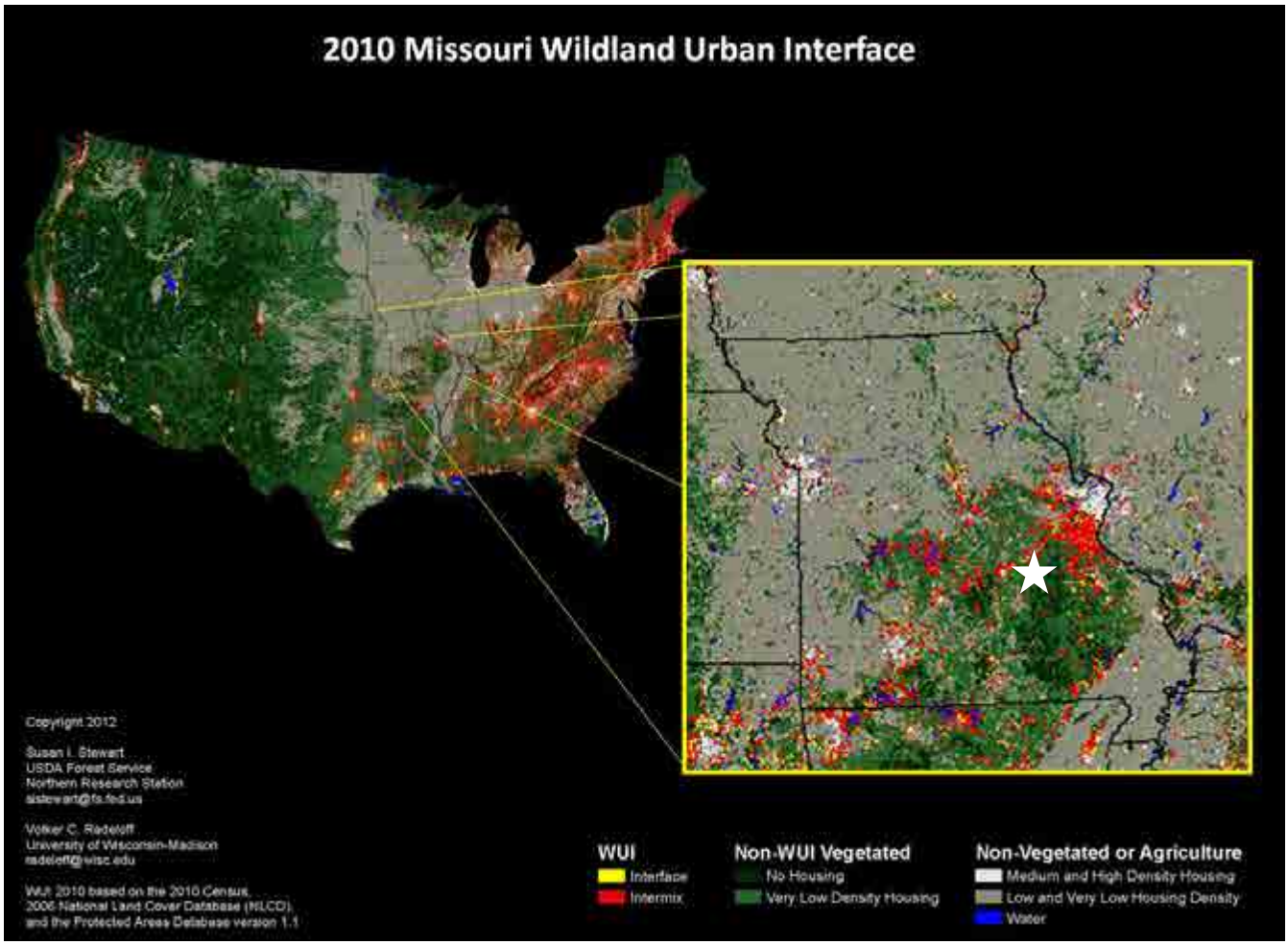
The Forestry Division of the Missouri Department of Conservation (MDC) is responsible for protecting privately owned and state-owned forests and grasslands from wildfires. To accomplish this task, eight forestry regions have been established in Missouri for fire suppression. The Forestry Division works 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

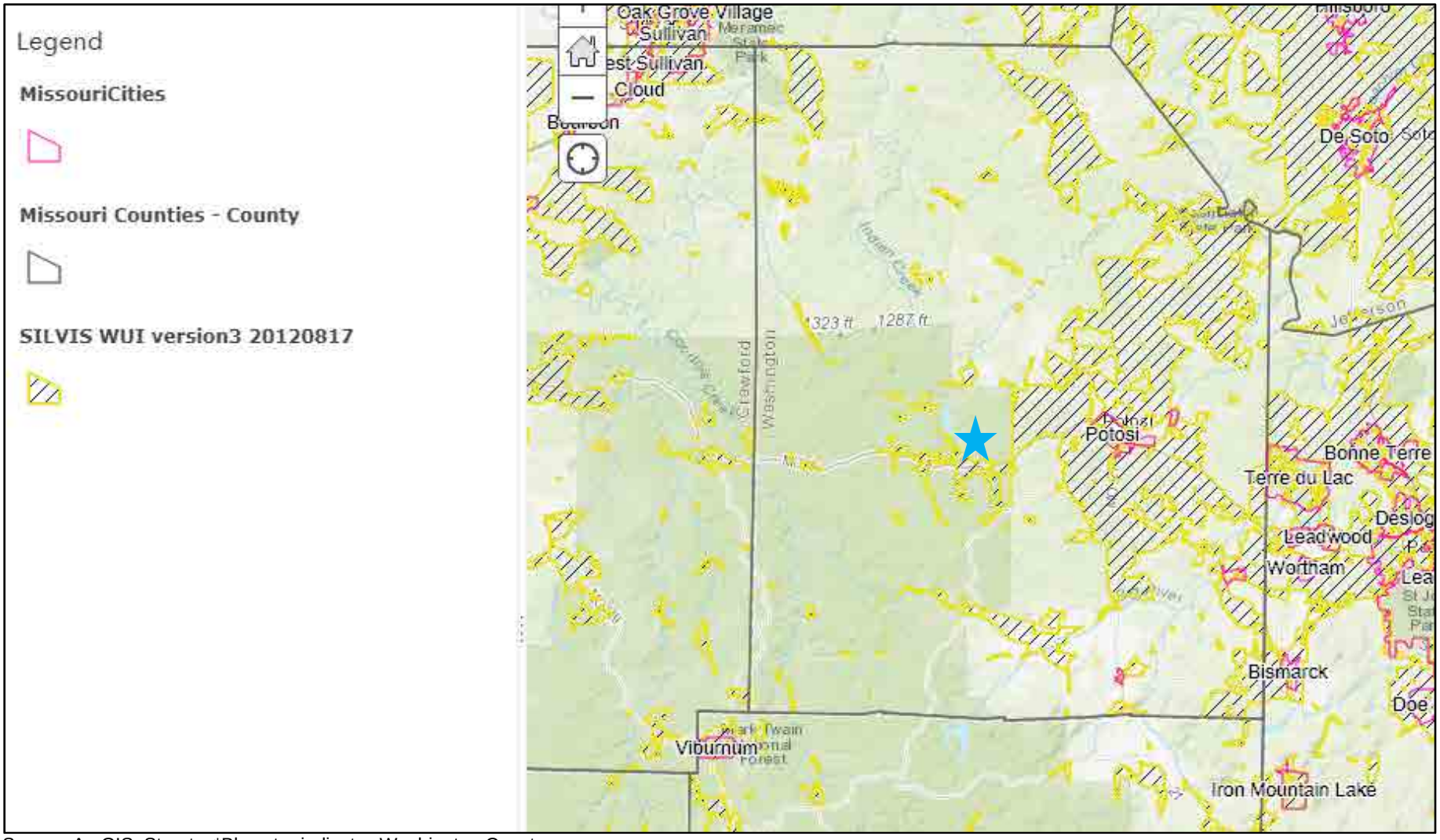
The risk of structural fire does not vary widely across the planning area. However, damages due to wildfires are expected to be higher in communities with more wildland–urban interface (WUI) areas. WUI refers to the zone of transition between unoccupied land and human development and needs to be defined 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 (**Figure 3.38**). To determine specific WUI areas and variations, data was obtain from ArcGIS, Streets and SILVIS (**Figure 3.39**). According to the WUI area map of Washington County, each jurisdiction resides in a WUI area.

Figure 3.38. 2010 Missouri Wildland Urban Interface (WUI)



Source: http://silvis.forest.wisc.edu/maps/wui; Note: White star roughly estimates Washington County's location

Figure 3.39. Washington County Wildlife Urban Interface



Source: ArcGIS, Streets; *Blue star indicates Washington County

Severity/Magnitude/Extent

Structural and urban fires are a daily occurrence throughout the state. Statewide, approximately 100 fatalities occur annually, as well as numerous injuries affecting the lives of the victims, their families, and many others—especially those involved in fire and medical services. Unlike other disasters, structural fires can be caused by human criminal activity: arson. All citizens pay the costs of arson whether through increased insurance rates, higher costs to maintain fire and medical services, or the costs of supporting the criminal justice system.

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.

No information in regards to the severity of damages from structural fires is available for Washington County.

Previous Occurrences

Between 2009 and 2012 there was an estimated 301 annual average of urban/structural fires in Washington County. Additionally, the average annual property loss was $388,550. Total deaths and injuries reported totaled 5 and 17, respectively[33].

Between 1998 and 2017, wildfires consumed 27,800 acres in Washington County[34]. Between 2004 and 2012 there were 1,183 wildfires in the county, which consumed 20,408.31 acres and damaged 44 buildings[35].

Records for school and special districts are not available at this time.

[33] 2013 Missouri State Hazard Mitigation Plan
[34] http://mdc7.mdc.mo.gov/applications/FireReporting/Report.aspx
[35] 2013 Missouri State Hazard Mitigation Plan

Probability of Future Occurrence

From the data obtained from the Missouri Department of Conservation[36] (**Appendix: E**), 1,806 wildfire events occurred in Washington County between 1998 and 2017. This information was utilized to determine the annual average percent probabilities of wildfires. Since multiple occurrences are anticipated per year (1,806 events/20 years), the probability of wildfires per year is 100% with an average of 90.3 events per year (**Table 3.42**). In addition, 44 buildings were considered damaged due to wildfires between 2004 and 2012. The average percent probability of structural damage due to wildfires is 100% (44 events/9 years *100) with an average of 4.9 events per year (**Table 3.43**). Lastly, according to the 2013 Missouri State Hazard Mitigation Plan, the probability of structural/urban fires in Washington County per year is 100% with an average of 75.25 structural fires annually[37] (**Table 3.44**).

Table 3.42. Annual Average Percentage Probability of Wildfires in Washington County

Location	Annual Avg. % P	Avg. Number of Events
Washington County	100%	90.3

*P = probability; see page 3.24 for definition.

Table 3.43. Annual Average Percentage Probability of Structural Damage due to Wildfires in Washington County

Location	Annual Avg. % P	Avg. Number of Events
Washington County	100%	4.9

*P = probability; see page 3.24 for definition.

Table 3.44. Annual Average Percentage Probability of Structural/Urban Fires in Washington County

Location	Annual Avg. % P	Avg. Number of Events
Washington County	100%	75.25

*P = probability; see page 3.24 for definition.

[36] http://mdc7.mdc.mo.gov/applications/FireReporting/Report.aspx
[37] 2013 Missouri State Hazard Mitigation Plan

Vulnerability

Vulnerability Overview

Data was collected from the National Fire Incident Reporting System (NFIRS) between 2009 and 2012. The data was analyzed to delineate overall statewide vulnerability for urban/structural fires in Washington County. Unfortunately, only 61 percent of fire departments in the State of Missouri reported occurrences to NFIRS. **Table 3.45** depicts the ranges for urban/structure fire vulnerability ratings. Furthermore, **Table 3.46** illustrates vulnerability analysis utilizing statistical data for urban/structural fires for Washington County between 2009 and 2012[38]. The overall vulnerability rating of urban/structural fires in Crawford County is medium-low (2).

Table 3.45. Ranges for Urban/Structure Fire Vulnerability Factor Ratings

Factors Considered	Low (1)	Medium-Low (2)	Medium (3)	Medium-High (4)	High (5)
Housing Density (3 per sq. mile)	<50	50 to 99	100 to 199	200 to 499	>500
Urban Fire Likelihood (# of events/ yrs. Of data)	0 to 49	50 to 99	100 to 299	300 to 499	500+
Building Exposure ($)	<$0.5B	$0.5B to $0.9B	$1B to $1.9B	$2B to $5.9B	>$6B
Annualized Property Loss Ratio Rating (annual Property loss/exposure)	0-.000099	.0001 to .000299	.0003 to .000599	.0006 to .000999	.001+
Death/Injury Rating (2x # of deaths + # of injuries)	0 to 4	5 to 9	10 to 19	20 to 49	50+
Death/Injury/Number of events Rating (Death Injury Rating factor/ # of events)	0 to 0.1	0.1 to 0.2	0.2 to 0.3	0.3 to 0.4	0.4+
Overall Vulnerability Rating (Average of all ratings)	1 to 1.67	1.67 to 2.35	2.36 to 3.03	3.04 to 3.71	3.72 to 4.4

Source: 2013 Missouri State Hazard Mitigation Plan

[38] 2013 Missouri State Hazard Mitigation Plan

Table 3.46. Statistical Data and Factor Ratings for Urban/Structure Fire Vulnerability (2004 to 2008)

County	Housing Units /sq. mi.	Housing Density Rating	Annual # Average	Likelihood Rating	Total Building Exposure ($)	Building Exposure Rating	Average Annual Property Loss ($)	Annual Property Loss Ratio	Property Loss Ratio Rating	Total Deaths/Injuries		Death/Injury Factor	Death/Injury Factor Rating	Death/Injury/# of Fires Factor	Death/Injury/# of Fires Factor Rating	Average of Factors	Overall Vulnerability Rating
Washington	14.5	1	301	4	1,678,841,000	3	388,550	0.000231	2	5	17	27	4	0.09	1	2.2	2

Source: 2013 Missouri State Hazard Mitigation Plan, US Census, 2010

For wildfires, data was obtained from the Missouri Department of Conservation (MDC). **Table 3.47** depicts the ranges for wildfire vulnerability factor ratings, including the two factors considered; likelihood and annualized acres burned. **Table 3.48** illustrates the statistical data and factor ratings for wildfire vulnerability. The data collected from MDC included wildfire reported between 2004 and 2012. The overall vulnerability of wildfires in Washington County is high (5).

Table 3.47. Ranges for Wildfire Vulnerability Factor Ratings

Factors Considered	Low (1) Level 1 Range	Medium-low (2) Level 2 Range	Medium (3) Level 3 Range	Medium-high (4) Level 4 Range	High (5) Level 5 Range
Likelihood Rating	<29.56	29.56 to 59.11	59.12 to 88.67	88.68 to 118.23	>118.23
Annualized Acres Burned Rating	<100	100 to 199	200 to 499	500 to 999	>999
Vulnerability (Average of values above)	0.0 to 1.0	1.0 to 2.0	2.0 to 3.0	3.0 to 4.0	4.0 to 5.0

Source: 2013 Missouri State Hazard Mitigation Plan

Table 3.48. Statistical Data and Factor Ratings for Wildfire Vulnerability

County	Wildfires 2004 -2012	Average Annual # of Wildfires	Likelihood Rating 1-5	Acres Burned	Average Annual Acres Burned	Average Acres Burned Rating	Total Buildings Damaged	Overall Vulnerability
Washington	1183	131.4	5	20408.31	2268	5	44	5

Source: 2013 Missouri State Hazard Mitigation Plan

Potential Losses to Existing Development

According to the 2013 Missouri State Hazard Mitigation Plan, the average annual property loss due to urban/structure fires was $388,550 (2009 to 2012). Unfortunately, due to lack of data, a monetary value could not be associated with wildfire loss. However the annual average percent probability for structural loss due to wildfires is 100%.

Impact of Future Development

Few future developments are anticipated in WUI areas, however due to lack of data, it is difficult to enumerate. Additionally, as previously mentioned, each jurisdiction within the county resides in a WUI area. This increases the risk of fire hazards for future development.

Hazard Summary by Jurisdiction

As long as drought conditions are not seriously inflamed, future wildfires in Washington County should have a negligible adverse impact on the community, as it would affect a small percentage of the population. Nonetheless, homes and businesses located in unincorporated areas are at higher risk from wildfires due to proximity to woodland and distance from fire services. Variations in both structural/urban and wildfires are not able to be determined at this time due to lack of data. However, both fire types are expected to occur on an annual basis across the county.

Problem Statement

Both structural/urban fires and wildfires are expected to occur on an annual basis. To mitigate adverse impacts a comprehensive community awareness and educational campaign on wildfire danger should be designed and implemented. This campaign should include the development of capabilities, systems, and procedures for pre-deploying fire-fighting resources during times of high wildfire hazards; training of local fire departments for wildfire scenarios; encouraging the development and dissemination of maps relating to the fire hazards (WUI areas) to help educate and assist builders and homeowners in being engaged in wildfire mitigation activities; and guidance of emergency services during response.

3.4.6 Flooding (Flash and River)

Some specific sources for this hazard are:

- Watershed map, Environmental Protection Agency, http://cfpub.epa.gov/surf/county.cfm?fips_code=19169
- FEMA Map Service Center, Digital Flood Insurance Rate Maps (DFIRM) for all jurisdictions, if available, msc.fema.gov/portal
- NFIP Community Status Book, http://www.fema.gov/national-flood-insurance-program/national-flood-insurance-program-community-status-book
- NFIP claims status, BureauNet, http://bsa.nfipstat.fema.gov/reports/reports.html
- Flood Insurance Administration—Repetitive Loss List (this must be requested from the State Floodplain Management agency or FEMA)
- National Climatic Data Center, Storm Events Database, http://www.ncdc.noaa.gov/stormevents/
- USDA Risk Management Agency, Insurance Claims, http://www.rma.usda.gov/data/cause.htm

Hazard 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 failure is discussed in **Section 3.1.** It 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.

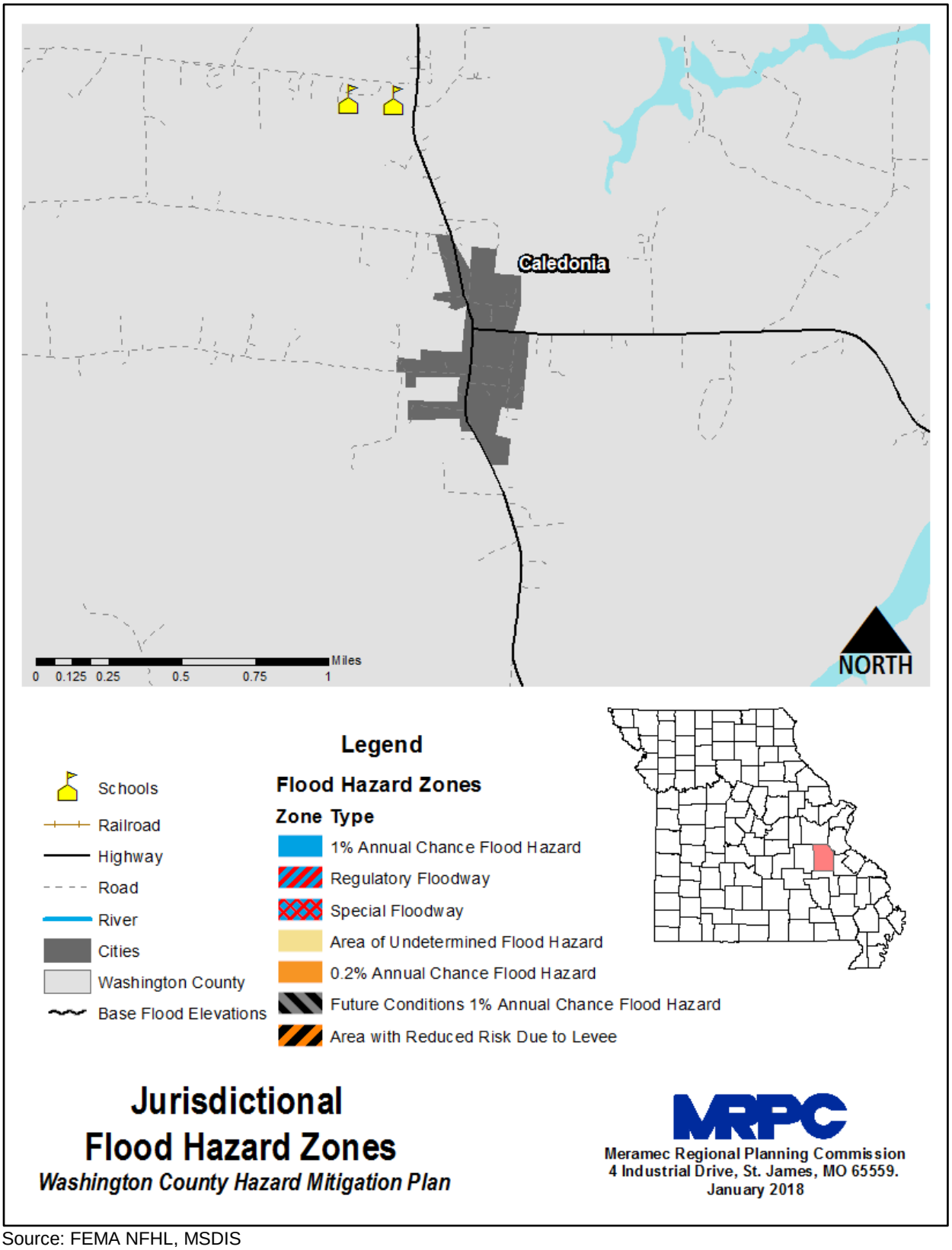
In certain areas, aging storm sewer systems are not designed to carry the capacity currently needed to handle the increased storm runoff. Typically, the result is water backing into basements, which damages mechanical systems and can create serious public health and safety concerns. This combined with 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

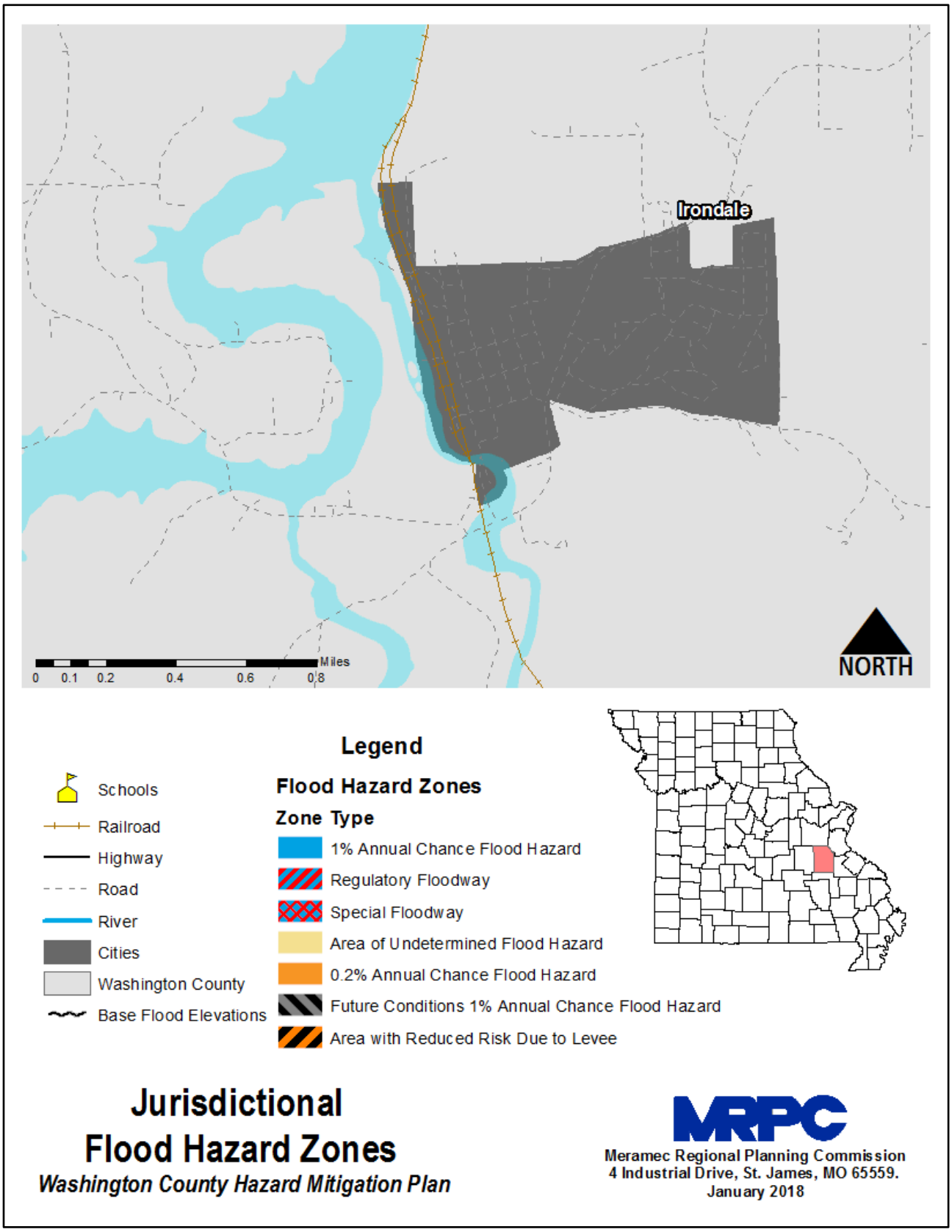
Riverine flooding is most likely to occur in SFHAs. Below are SFHAs for all jurisdictions except Unincorporated Washington County (**Figure 3.40** to **Figure 3.43**). Included in the maps are public schools within each jurisdiction. **Table 3.49** shows Washington County NCDC flood events by location between 1998 and 2017.

Figure 3.40. Caledonia, Missouri Special Flood Hazard Areas (SFHAs)



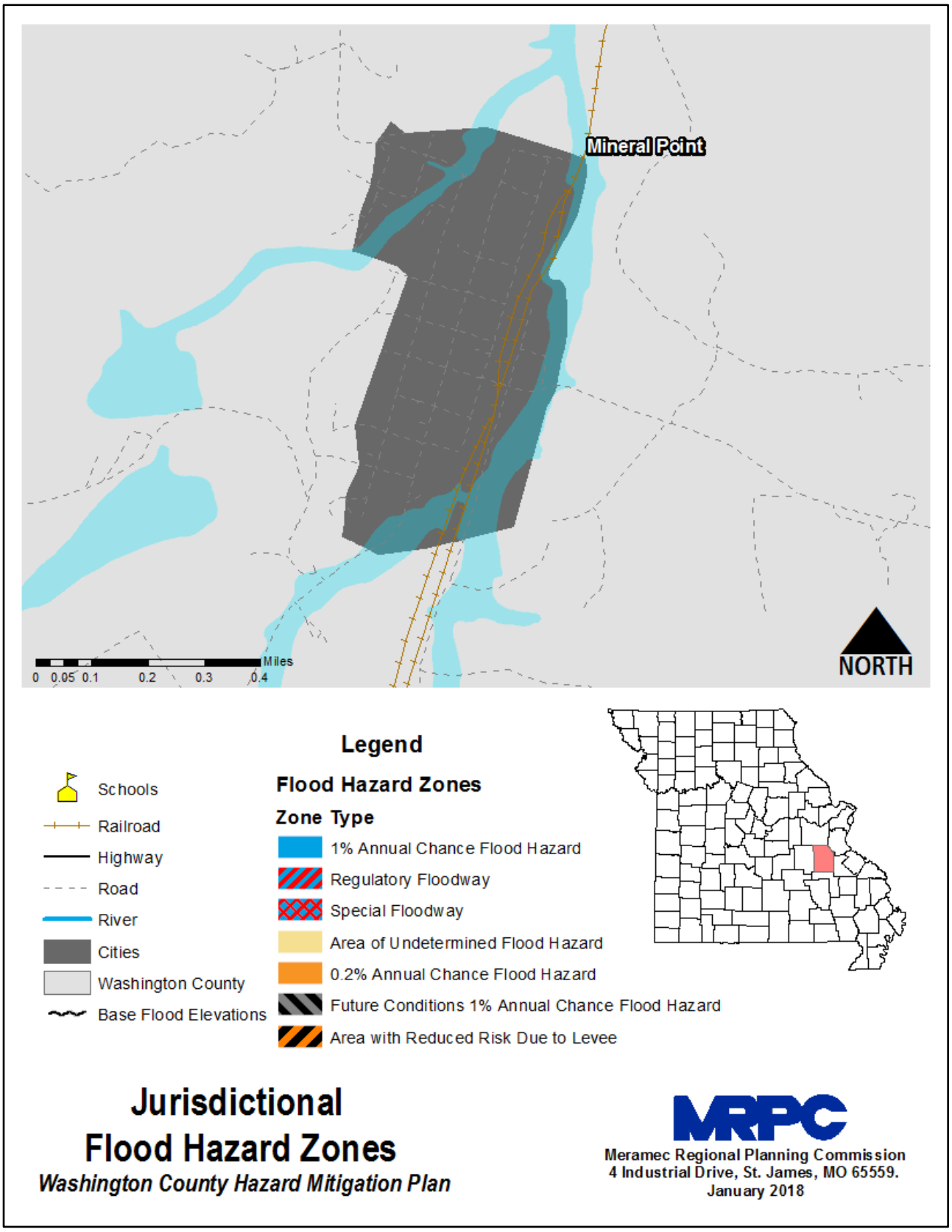
Source: FEMA NFHL, MSDIS

Figure 3.41. Irondale, Missouri Special Flood Hazard Areas (SFHAs)



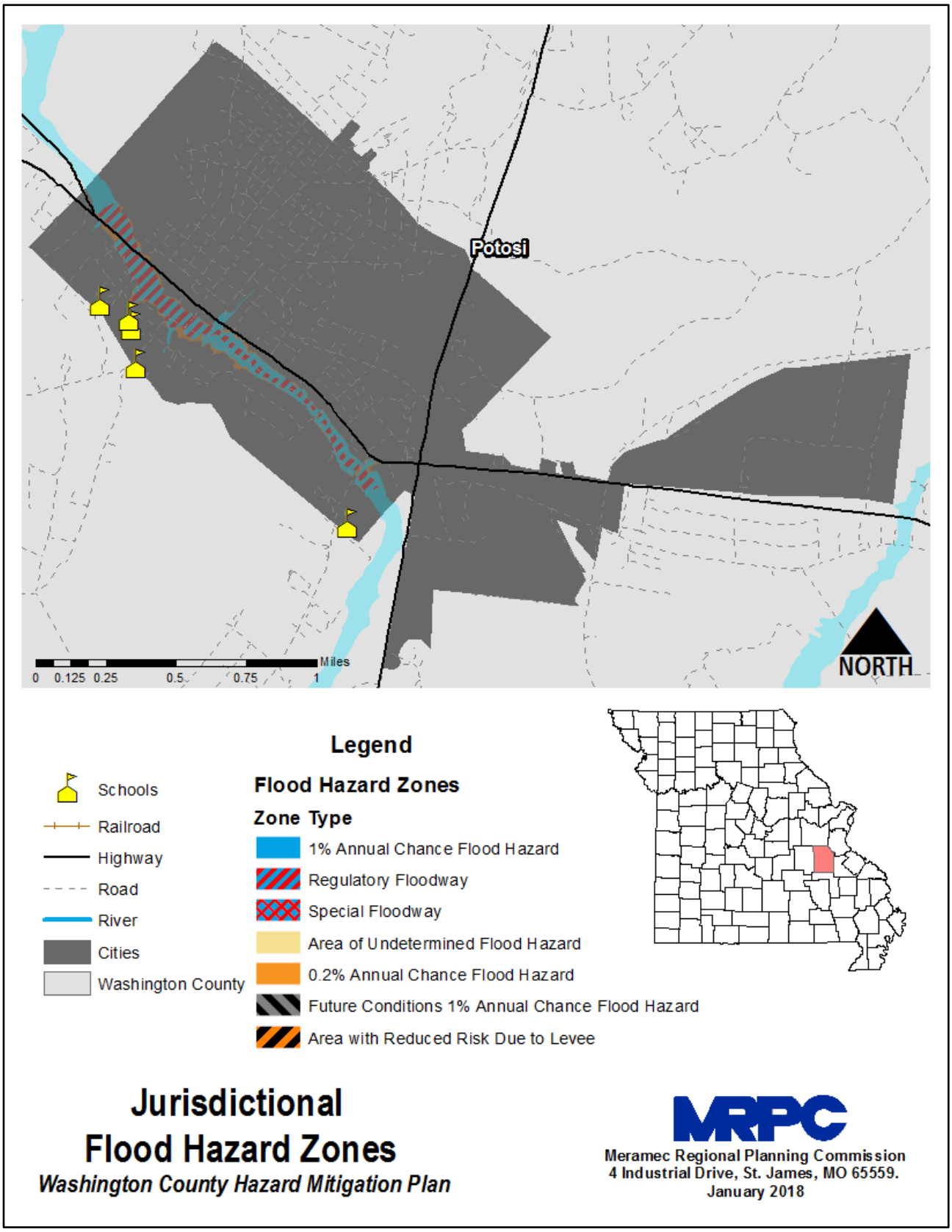
Source: FEMA NFHL, MSDIS

Figure 3.42. Mineral Point, Missouri Special Flood Hazard Areas (SFHAs)



Source: FEMA NFHL, MSDIS

Figure 3.43. Potosi, Missouri Special Flood Hazard Areas (SFHAs)



Source: FEMA NFHL, MSDIS

Table 3.49. Washington County NCDC Flood Events by Location, 1998-2017

Location	# of Events
Pea Ridge	1
Potosi	1

Source: National Climatic Data Center

Flash flooding occurs in SFHAs and 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. After review of NCDC data, Potosi is the most prone jurisdiction to flash flooding events. **Table 3.50** provides information in regards to flash flood events between 1998 and 2017.

Table 3.50. Washington County NCDC Flash Flood Events by Location, 1998-2017

Location	# of Events
Aptus	1
Baryties	1
Central Portion	1
Countywide	2
Courtois	2
Cruise	1
Hopewell	1
Maryden	2
Pea Ridge	1
Potosi	2
Richwoods	1
Springtown	1
Troutt	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 2013 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 communities 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. Further information regarding scour critical bridges can be found in **Section 3.2.2**.

Between 1998 and 2017, there were zero recorded crop insurance claims in loss due to flooding within Washington County[39].

National Flood Insurance Program (NFIP) Participation

Table 3.51 lists jurisdictions within the planning area that participate in NFIP. In addition, **Table 3.52** provides the number of policies in force, amount of insurance in force, number of closed losses, and total payments for each jurisdiction.

Table 3.51. NFIP Participation in Washington County

Community ID #	Community Name	NFIP Participant (Y/N)	Current Effective Map Date	E Pro Date
290846	Washington County	Y	12/19/06	05/24/10
290850	Caledonia	Y	NSFHA	04/15/16
290446	Irondale	Y	12/19/06	07/15/03
290571	Mineral Point	Y	12/19/06	03/15/93
290447	Potosi	Y	12/19/06	09/04/85

Source: NFIP Community Status Book, 2/16/18; 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 3.52. NFIP Policy and Claim Statistics as of [01/31/2018]

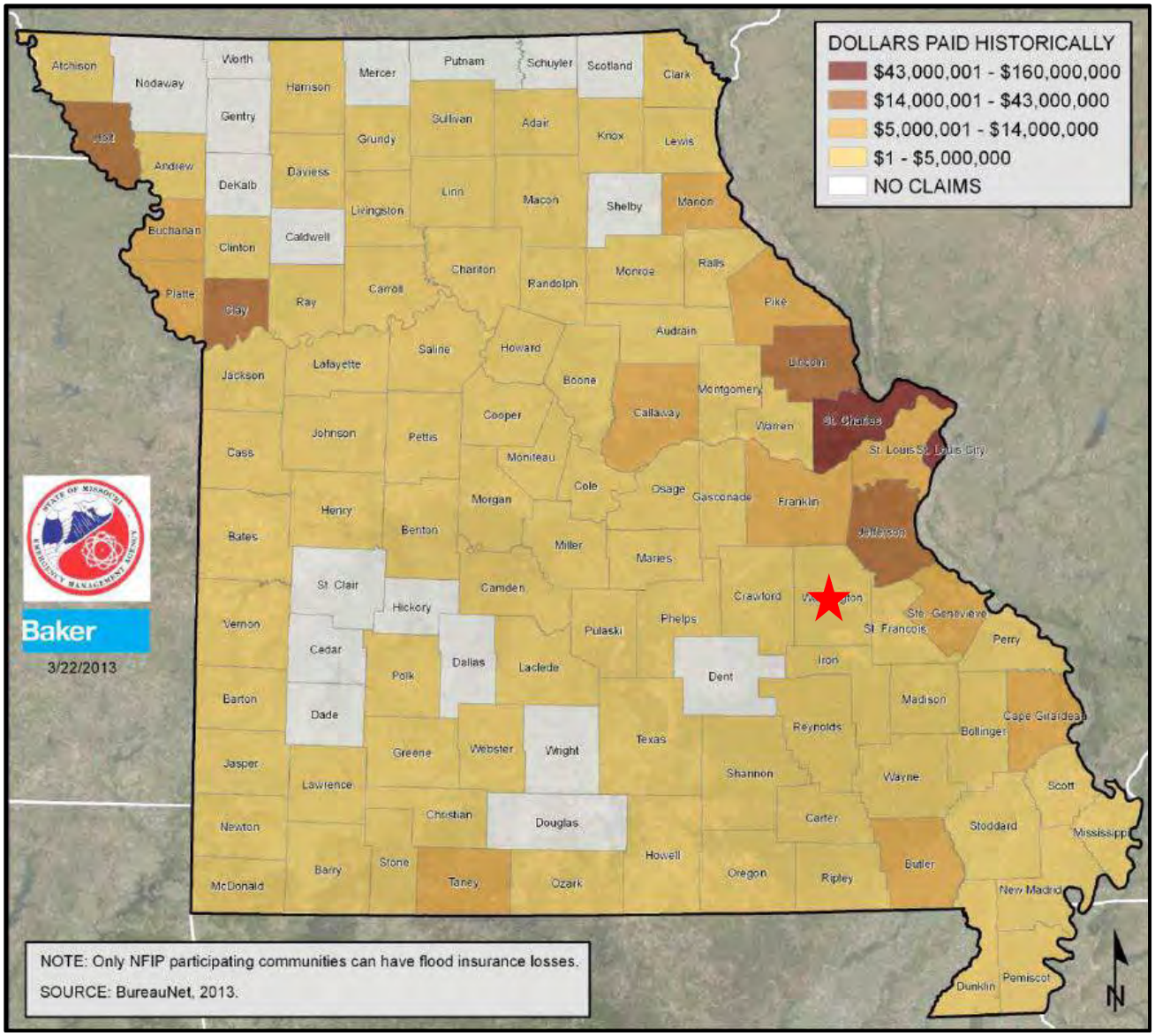
Community Name	Total Losses	Closed Losses	Open Losses	CWOP Losses	Total Payments
Washington County	1	0	0	1	.00
Potosi	11	9	0	2	86,672.46

Source: NFIP Community Status Book, [01/31/2018]; BureauNet, http://bsa.nfipstat.femxa.gov/reports/reports.html; *Closed Losses are those flood insurance claims that resulted in payment.

The following figures depict the dollars paid historically for flood insurance losses in Missouri by county from 1978 to Jan. 2013 (**Figure 3.44**)**,** and historical flood loss claims in Missouri by county, 1979 to Jan. 2013 (**Figure 3.45**).

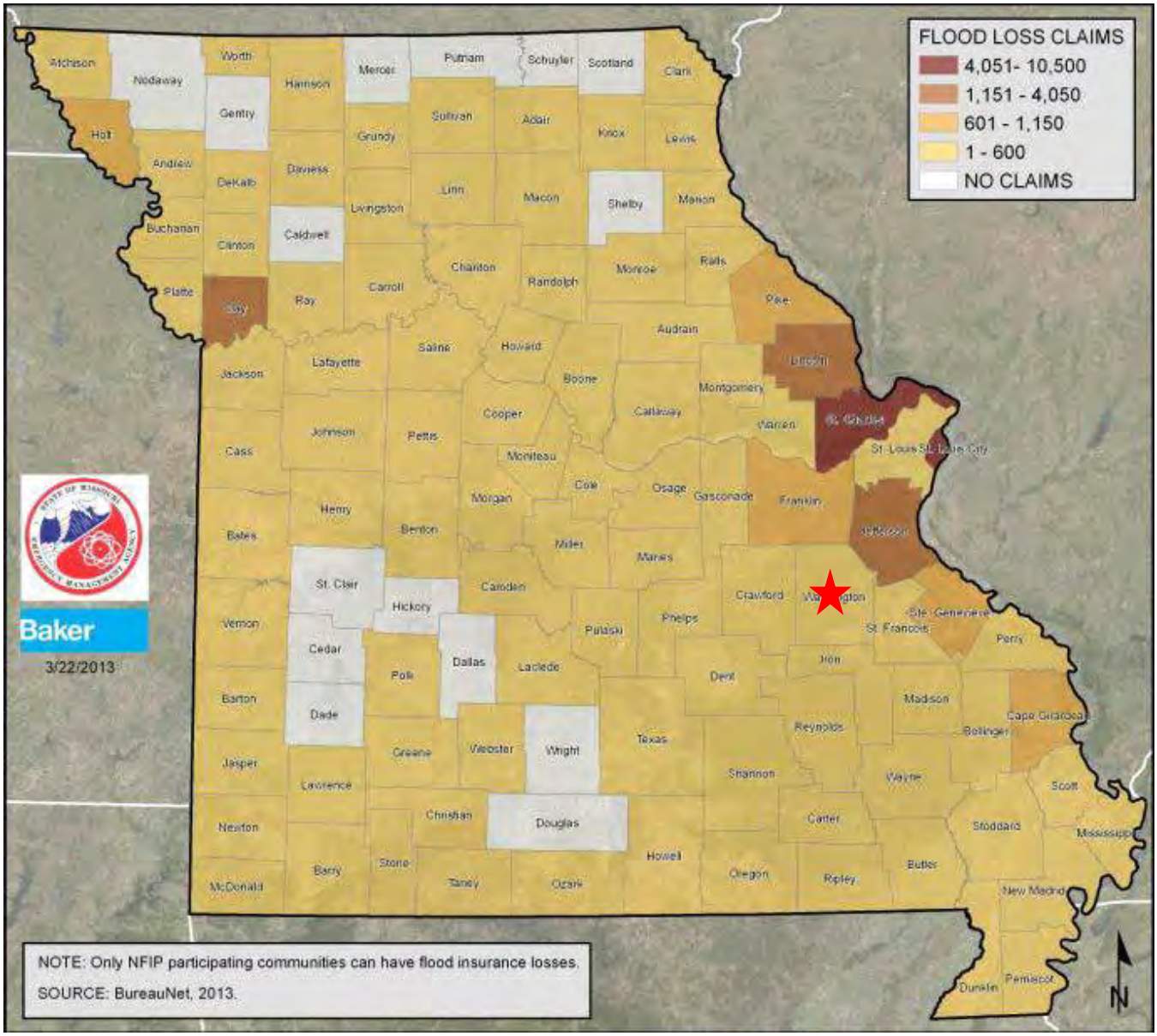
[39] http://www.rma.usda.gov/data/cause.html

Figure 3.44. Dollars Paid Historically for Flood Insurance Losses in Missouri by County, 1978 to Jan. 2013



Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Washington County

Figure 3.45. Historical Flood Loss Claims in Missouri by County, 1978 to Jan. 2013

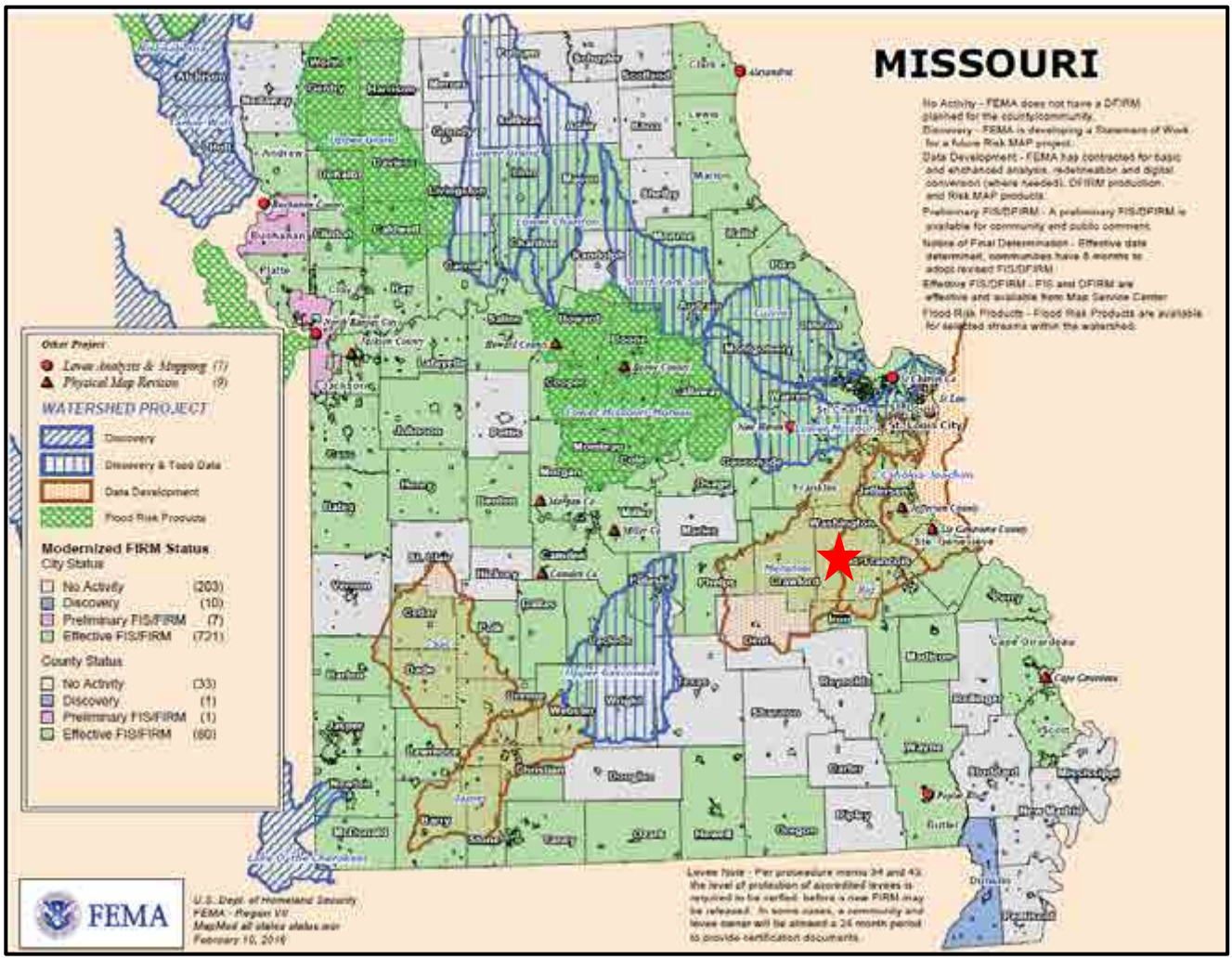


Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Washington County

RiskMAP

Risk mapping, assessment, and planning is a FEMA program which provides communities with flood information and tools to enhance their mitigation plan and take action to better protect their citizens. Washington County is in the data development phase with an effective FIS/FIRM. **Figure 3.46** below depicts various watershed projects and FIRM statuses for Missouri.

Figure 3.46. RiskMAP 2015



Source: SEMA, 2016
*Red star indicates Washington County

Repetitive Loss/Severe Repetitive Loss Properties (data requested from SEMA)

Repetitive Loss Properties are those properties with at least two flood insurance payments of $5,000 or more in a 10-year period. According to the Flood Insurance Administration, there is 1 repetitive loss property in Mineral Pont with 2 losses as of 11/30/2017. The property is residential (non-mitigated).

Total payments (building and contents) were $15,338.16. The average payment was $7,669.08. The property has not been mitigated.

Severe Repetitive Loss (SRL): A 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 claims 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. According to FEMA there are no SRL properties in Washington County.

Previous Occurrences

Table 3.53 provides information regarding Presidential Flooding Disaster Declarations between 1998 and 2017 for Washington County.

Table 3.53. Washington County Presidential Flooding Disaster Declarations 1998 to 2017

Declaration No.	Date	State	Incident Description
DR-1328	5/06/200	Missouri	Missouri Severe Thunderstorms & Flash Flooding
DR-1463	05/04/2003	Missouri	Missouri Severe Storms, Tornadoes, and Flooding
DR-1631	3/08/2006	Missouri	Missouri Severe Storms, Tornadoes, and Flooding
DR-1749	3/17/2008	Missouri	Missouri Severe Storms and Flooding
DR-1847	5/08/2009	Missouri	Missouri Severe Storms, Tornadoes, and Flooding
DR-1980	4/19/2011	Missouri	Missouri Severe Storms, Tornadoes, and Flooding
DR-4238	5/15/2015	Missouri	Missouri Severe Storms, Tornadoes, Straight-line Winds, and Flooding
EM-3374	12/22/15	Missouri	Missouri Severe Storms, Tornadoes, Straight-line Winds, and Flooding
DR-4250	12/23/2015	Missouri	Missouri Severe Storms, Tornadoes, Straight-line Winds, and Flooding
DR-4317	4/28/17	Missouri	Missouri Severe Storms, Tornadoes, Straight-line Winds, and Flooding

FEMA, Disaster Declarations for Missouri, Flooding

Data was obtained from the NCDC regarding flash and river flooding over the last 20 years. **Table 3.54** and **Table 3.55** provide this information. Additionally, narratives available for each event are included.

Table 3.54. NCDC Washington County Riverine Flood Events Summary, 1998 to 2017

Year	# of Events	# of Deaths	# of Injuries	Property Damages ($)	Crop Damages ($)
2007	1	0	0	0	0
2015	1	0	0	0	0

Source: NCDC, data accessed [3/16/2018]

Narratives on flood events:

1. **01/13/2007:** Several inches of rain caused flooding of small creeks and streams and low-water crossings mainly across southern Washington County.

2. **06/16/2015:** The Missouri Highway Patrol reported a vehicle attempted to cross a flooded low water crossing. The vehicle was swept into the stream and overturned. The drive was killed.

Table 3.55. NCDC Washington County Flash Flood Events Summary, 1998 to 2017

Year	# of Events	# of Deaths	# of Injuries	Property Damages ($)	Crop Damages ($)
2002	1	0	0	0	0
2005	1	0	0	0	0
2006	1	0	0	0	0
2008	2	0	0	0	0
2009	1	0	0	0	0
2011	3	0	0	0	0
2013	2	0	0	0	0
2014	1	0	0	0	0
2015	3	0	0	0	0
2016	2	0	4	0	0
2017	1	0	0	0	0

Source: NCDC, data accessed [3/16/2018]

Narratives on flood events:

1. **05/12/2002:** Some of the worse flash flooding in recent years hit on Sunday, Mother's Day, and continued into early Monday. Around 6 inches of rain fell on ground already saturated by previous rain. For several counties, it was the worst flooding in memory. Iron County was especially hard hit. Virtually every creek and small stream flooded closing roads throughout the county. There were numerous water rescues as people were trapped in their cars. Emergency shelters in the County were opened to help stranded motorists and people who were flooded out of homes. The story was similar in Reynolds County as Highways 49 and 21 had to be closed. In Fredericktown, in Madison County, many city streets flooded. Several people were stranded in flooded vehicles and could not be reached for an hour or so. Numerous roads were flooded across Crawford, St. Francois, Ste. Genevieve and Washington Counties as well. The only death that occurred happened in Iron County near Ironton. A 43 year old man was trying to cross Stouts Creek on foot to get to his home to rescue his dogs. He was knocked down, but managed to grab hold of a tree. He was swept away and drowned by the rising water before rescue workers could reach him.

2. **04/21/2005:** Heavy rain from several thunderstorms caused flash flooding in Washington County, mainly in the central part of the county. Some areas around Potosi reported up to 7 inches of rain. Flooding was reported on Highway F 10 miles north of Potosi. Breton Creek in Potosi flooded, closing all the road crossings over the creek. There were reports of some basements flooded, otherwise there was no major damage.

3. **03/12/2006:** Several rounds of thunderstorms moved through the area dumping between 3 and 5 inches of rain in a short amount of time. Numerous county roads were closed. State Highway E was closed near Potosi. Also, Britton Creek in Potosi was out of its banks causing flooding of several streets in town.

4. **02/05/2008:** Two to four inches of rain fell over portions of Washington county causing flash flooding. Old Mines Creek rose quickly and flooded a portion of Highway 21 for a brief time. Also, numerous low water crossings, ditches and creeks in the Potosi area were out of their banks for a time.

5. **03/18/2008:** Two to three inches of rain fell onto already saturated soils in Washington county from the evening hours of March 17th through March 18th. Numerous roads and low water crossings were flooded including streets in Potosi, Highway 47 at Kingston Road northwest of Cruise Mill, and New Diggins Road in Springtown.

6. **05/08/2009:** Up to three inches of rain fell in a short amount of time causing flash flooding. Numerous roads were flooded for a time including Mill and Jefferson streets in Potosi and New Diggins Road southeast of Potosi. Also, the Big River overtopped its banks and flooded portions of Highway M northeast of Caledonia.

7. **04/24/2011:** Between 4 and 6 inches of rain fell over several days causing flash flooding. Numerous roads were flooded including Route E.

8. **06/26/2011:** Up to two inches of rain fell in a short amount of time causing flash flooding. Several roads were flooded including Highway E between Blackwell and Cadet.

9. **07/13/2011:** Up to two inches of rain fell in a short amount of time causing flash flooding. Several roads were flooded including Highway F north northwest of Potosi.

10. **05/31/2013:** Up to five inches of rain fell in a short amount of time causing flash flooding. Highway 135 was flooded in several spots southeast of the intersection with Highway T for about a four mile stretch.

11. **06/01/2013**: Up to five inches of rain fell in a short amount of time causing flash flooding. Highway 135 was flooded in several spots southeast of the intersection with Highway T for about a four mile stretch.

12. **04/03/2014:** Up to five inches of rain fell in a short amount of time causing flash flooding. Several roads were flooded including Highway 185 between Pea Ridge and Caseyville.

13. **04/07/2015**: Up to three inches of rain fell in a short amount of time causing flash flooding. Several roads were flooded including Route U near intersection with John Smith Road.

14. **04/08/2015:** Up to three inches of rain fell in a short amount of time causing flash flooding in Potosi. Mine A Breton Creek overflowed its banks in town onto Jefferson Street. Several water rescues had to be made in this area.

15. **08/10/2015:** Up to five inches of rain fell in a short amount of time causing flash flooding. Numerous roads were flooded. Highway C, three miles east northeast of Courtois, was closed both ways due to Cub Creek well out of its banks.

16. **05/11/2016**: Up to four inches of rain in a short amount of time caused flash flooding across the northern portions of Washington County. Several water rescues had to be performed around the Richwoods area. Numerous roads were closed due to flooding including Highway 47 near Richwoods. Four people were treated for minor injuries.

17. **08/15/2016:** Up to 6 inches of rain fell over already saturated soil causing flash flooding. Numerous roads were flooded across the southeastern and eastern portions of Washington County. Holiday Shores Road was flooded and a water rescue had to be performed in this area. Also, Mounts Road (County Road 511) bridge over the Big River was under about 4 feet of water. The intersection of Highways 21 and 32 in Caledonia was flooded.

18. **04/29/2017:** Between 5 and 7 inches of rain fell causing widespread flash flooding. Numerous roads were flooded including Route CC between Highway 21 and Route E.

Probability of Future Occurrence

From the data obtained from the NCDC[40], there were 2 riverine flood events (**Table 3.55)** over a period of 20 years. This information was utilized to determine the annual average percent probability of riverine flooding (**Table 3.56**). The probability of riverine flooding in Washington County per year is 10% (2 events/20 years x 100 = 10%). Furthermore, data was obtained for flash flooding within the county. Washington County endured 18 flash flooding events (**Table 3.54**) over a 20 year period. The probability of flash flooding in Washington County per year is 90% (18 events/20 years x 100 = 90%) (**Table 3.57**).

Table 3.56. Annual Average % Probability of Riverine Flooding in Washington County

Location	Annual Avg. % P
Washington County	10%

*P = probability; see page 3.24 for definition.

Table 3.57. Annual Average % Probability of Flash Flooding in Washington County

Location	Annual Avg. % P
Washington County	90%

*P = probability; see page 3.24 for definition.

Vulnerability

Vulnerability Overview

For the vulnerability analysis of riverine and flash flooding for Washington County, data was obtained from the 2013 Missouri State Hazard Mitigation Plan. The 2013 Plan was updated by enhancing the flood vulnerability assessment and loss estimation capabilities of Hazus by leveraging a number of improved local data inputs. This was achieved by integrating DFIRM depth grids for 51 additional counties. Furthermore, the State re-analyzed the previous 29 depth grids used in 2010, to utilize the latest enhancements available in Hazus 2.1; bringing the total number of regions analyzed using DFIRM depth grids to 80 jurisdictions. The subsequent set of improved data inputs included an enhanced building inventory database, which is an improvement over the standard Hazus 2.1 stock data. That data, coupled with the DFIRM depth grids, enabled Level 2 Hazus flood analysis for all 114 counties[41].

Figure 3.47 depicts the 100-year floodplain boundaries for all counties within Missouri. These DFIRM floodplains are comprised of streams based on a <1 sq. mile drainage area.

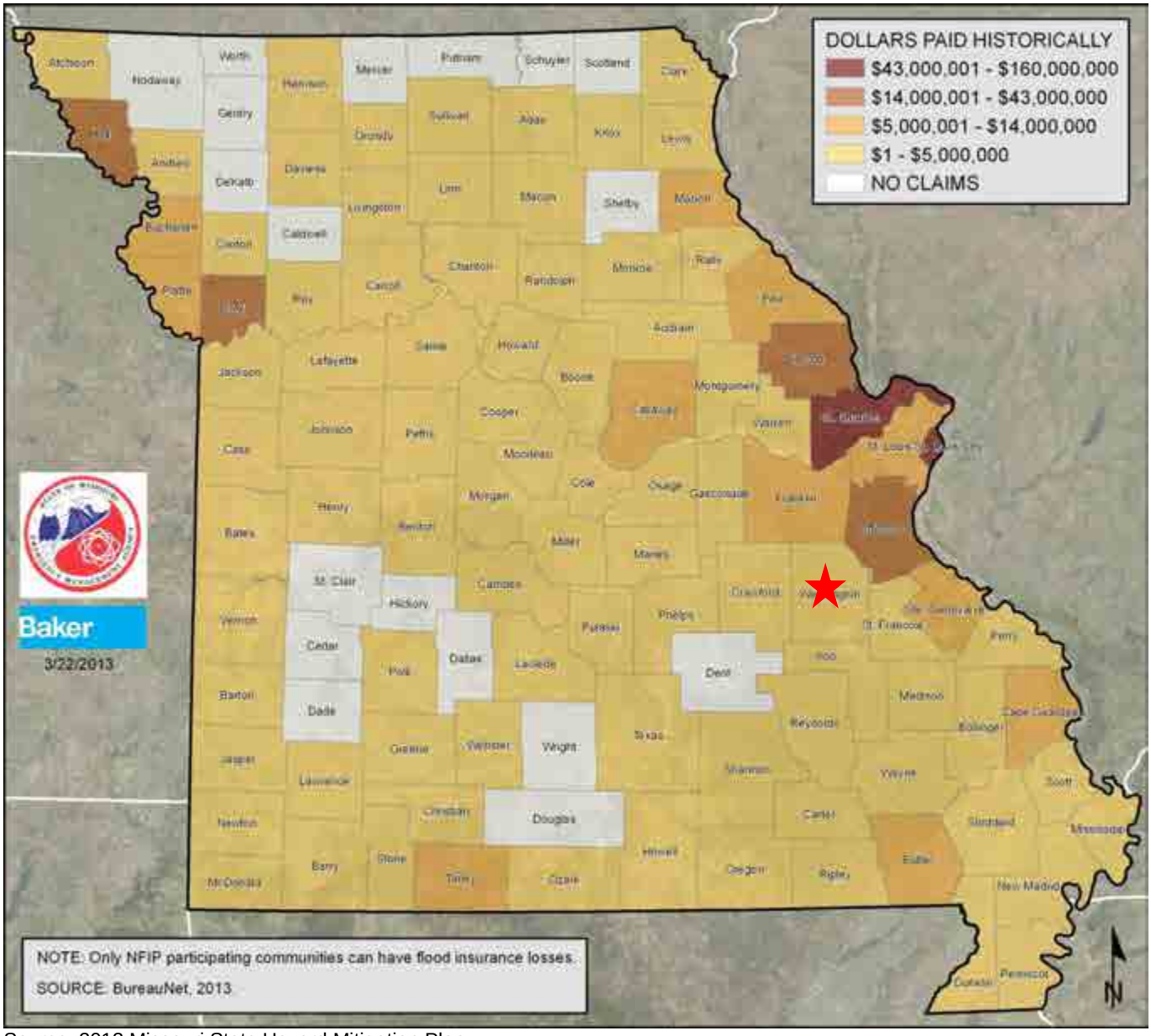
[40] http://www.ncdc.noaa.gov/stormevents/choosedates.jsp?statefips=29%2CMISSOURI
[41] 2013 Missouri State Hazard Mitigation Plan

Figure 3.47. DFIRM and Hazus Countywide Base-Flood Scenarios: Modeled Floodplain Boundaries

Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Washington County

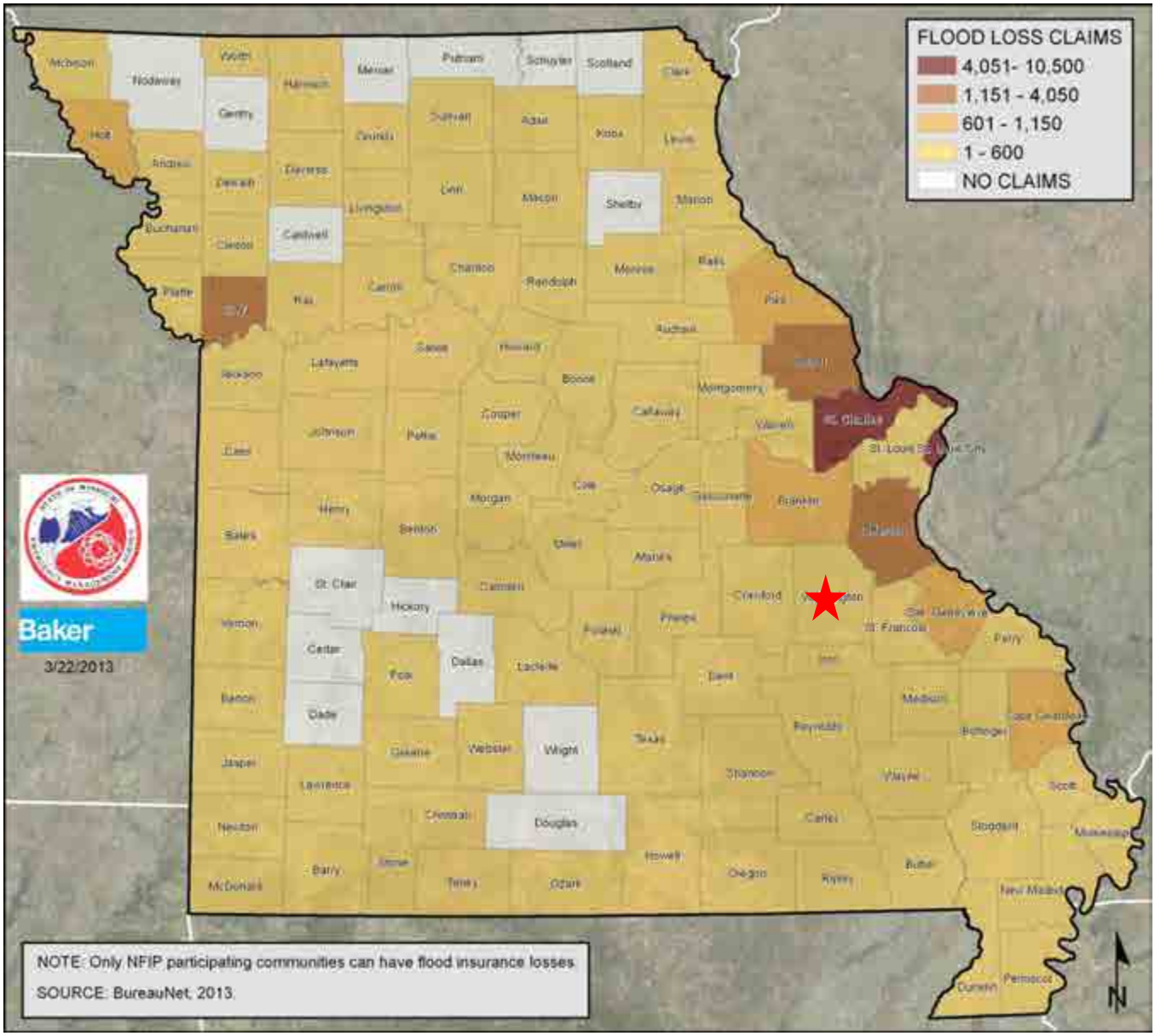
In addition, the state analyzed NFIP flood-loss data to establish areas in Missouri that are most at risk to flooding. **Figure 3.48** illustrates the dollars paid historically for flood insurance losses in Missouri by county from 1978 to 2013. Moreover, **Figure 3.49** depicts flood loss claims in Missouri during the same timeline.

Figure 3.48. Dollars Paid Historically for Flood Insurance Losses in Missouri by County, 1978 –Jan 2013



Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Washington County

Figure 3.49. Flood Loss Claims in Missouri by County, 1978 – Jan 2013



Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Washington County

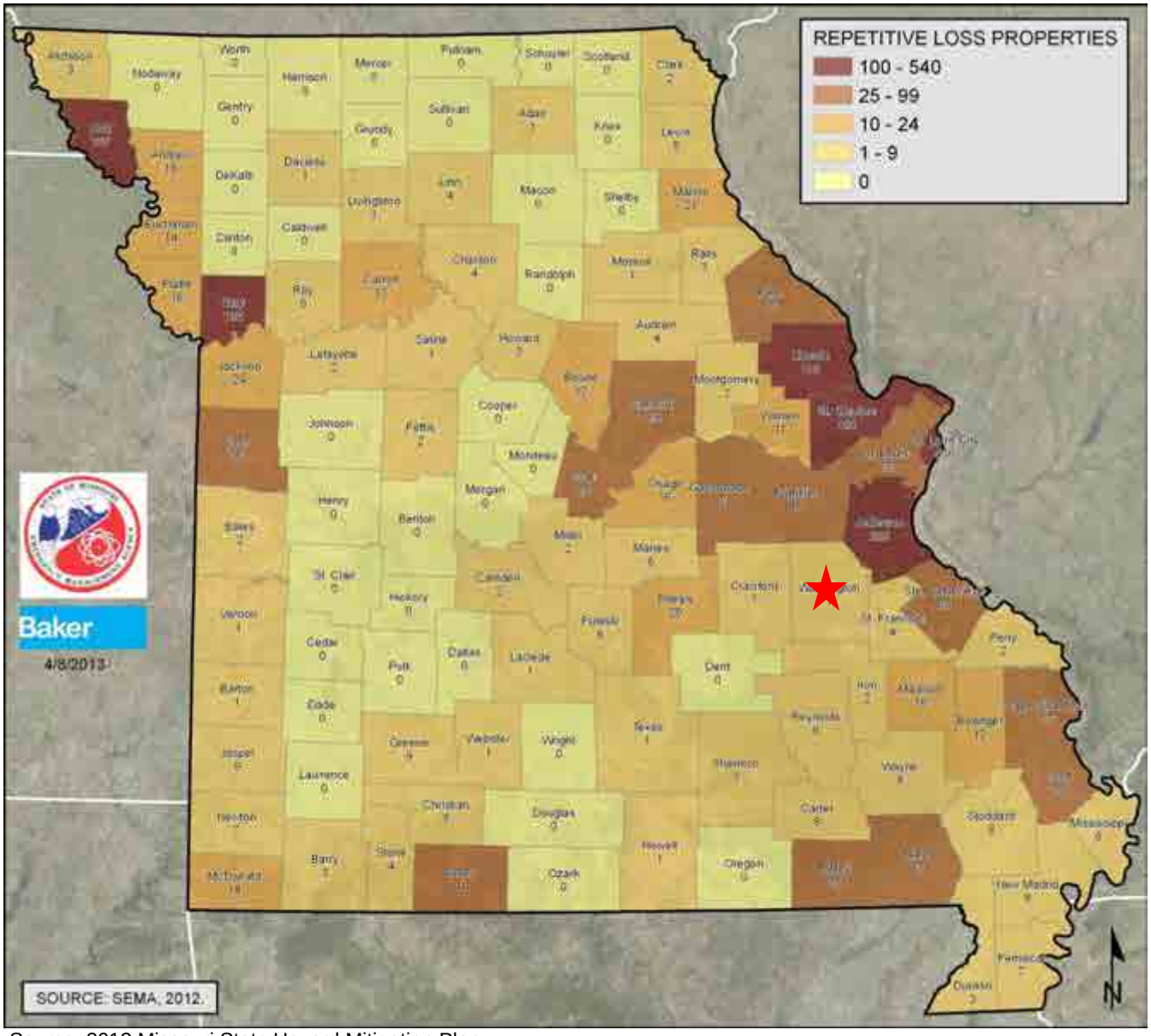
Table 3.58 and **Figure 3.50** illustrate the number of repetitive loss properties in Washington County.

Table 3.58. Washington County's Repetitive Loss Property Summary

County	Number of Repetitive Loss Properties	Number of Losses	Total Paid ($)	Loss Ratio	Average Payment
Washington	1	2	$15,338	2.0	$7,669

Source: 2013 Missouri State Hazard Mitigation Plan

Figure 3.50. Repetitive Flood Loss Properties by County, 1978 - 2009



Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Washington County

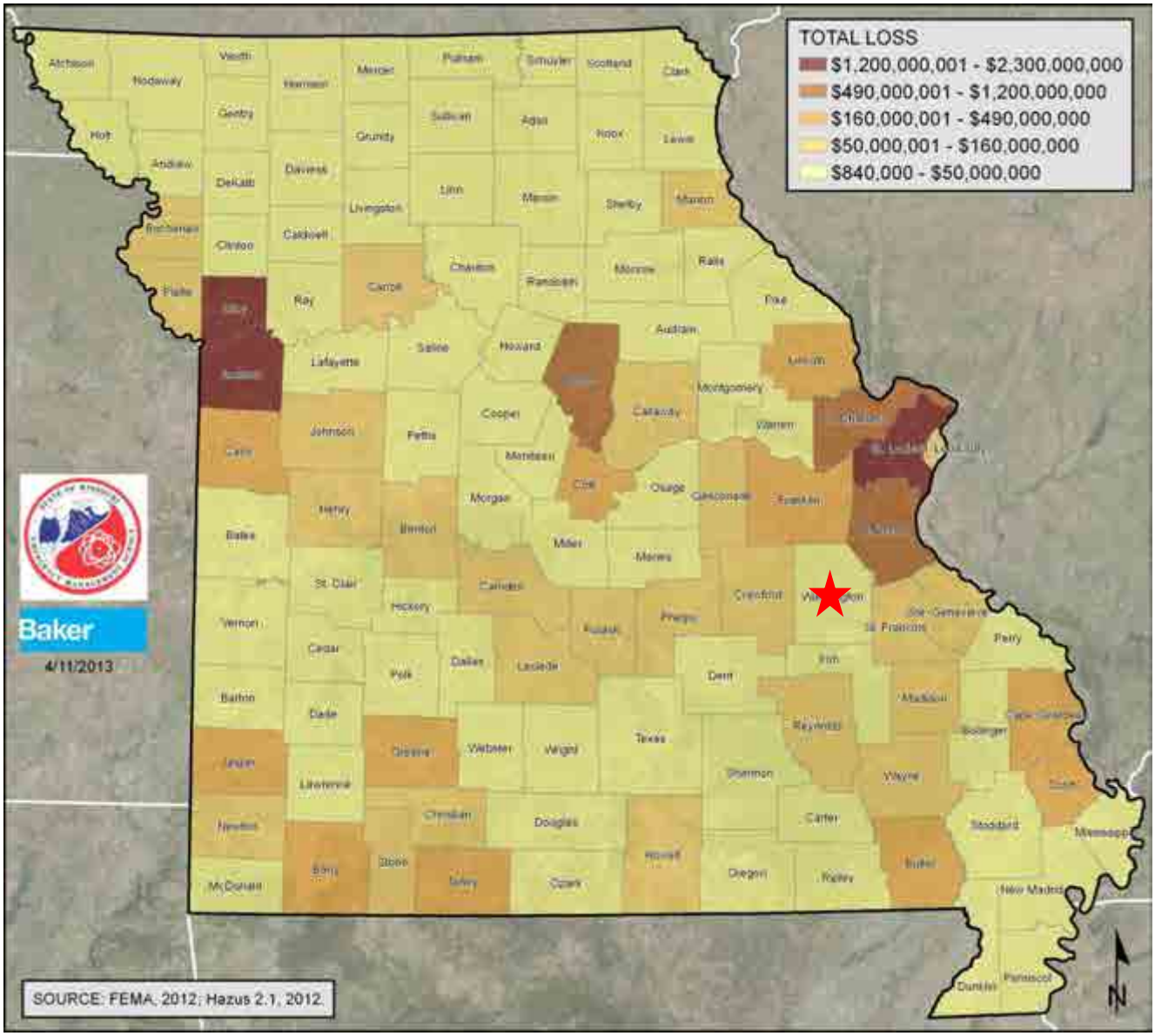
Furthermore, the state analyzed potential loss estimates to flooding. The purpose of the analysis is to determine where flood losses can occur and the degree of severity. These results were generated from DFIRM data and Hazus floodplain data. **Table 3.59** provides information regarding total direct building loss and income loss to Washington County. In addition, **Figure 3.51** and **Figure 3.52** depict Hazus countywide base-flood (100 year) scenarios including building and income loss for total loss and loss ratio respectively.

Table 3.59. Total Direct Building Loss and Income Loss to Washington County

County	Structural Damage	Contents Damage	Inventory Loss	Total Direct Loss	Total Income Loss	Total Direct and Income Loss	Calc. Loss Ratio
Washington	$6,745,844.76	$8,942,291.81	$269,833.79	$15,957,970.36	$302,213.85	$16,260,184.20	1.30

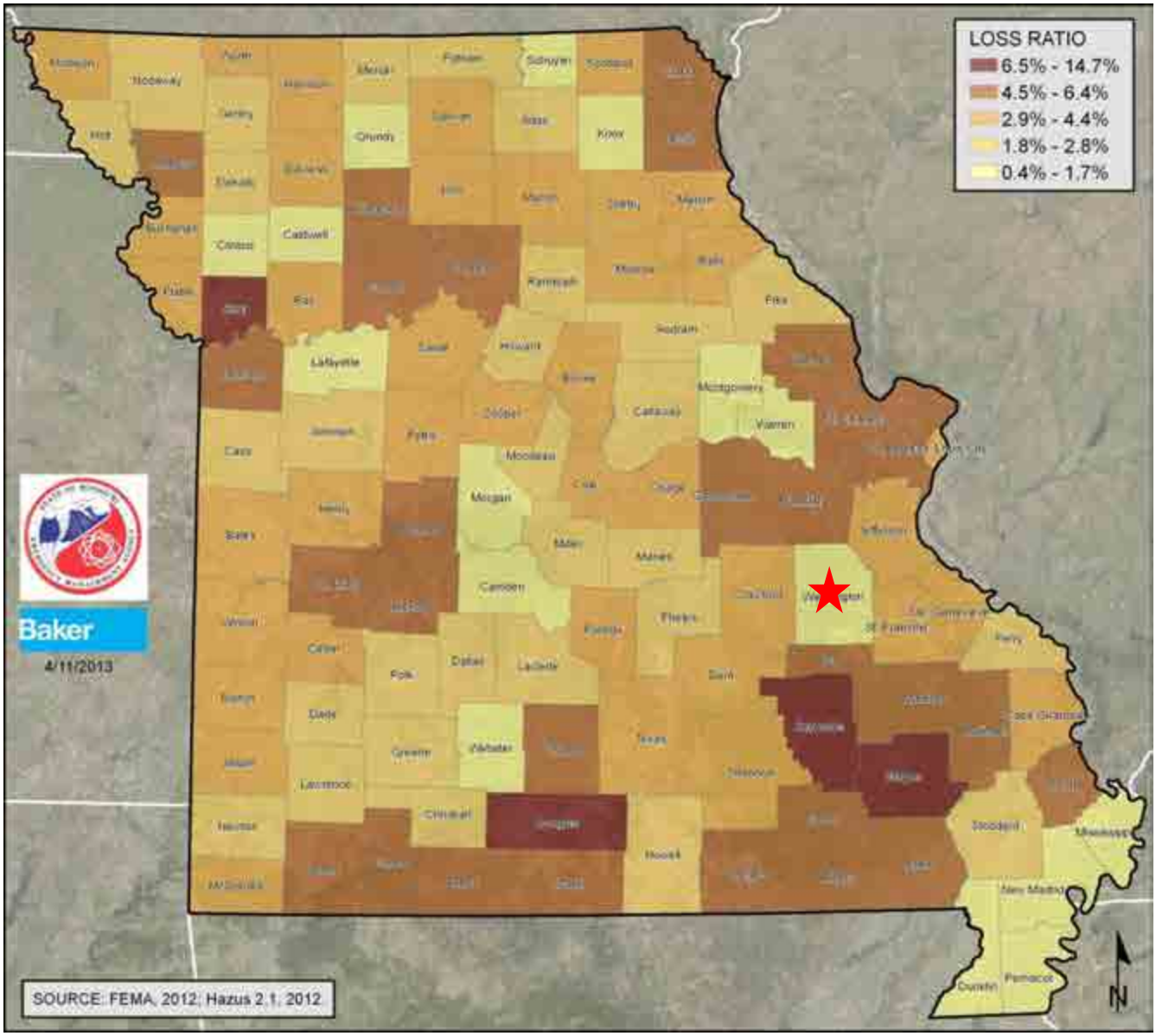
Source: 2013 Missouri State Hazard Mitigation Plan

Figure 3.51. Hazus Countywide Base-Flood Scenarios: Building and Income Loss



Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Washington County

Figure 3.52. Hazus Countywide Base-Flood Scenarios: Building Loss Ratio



Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Washington County

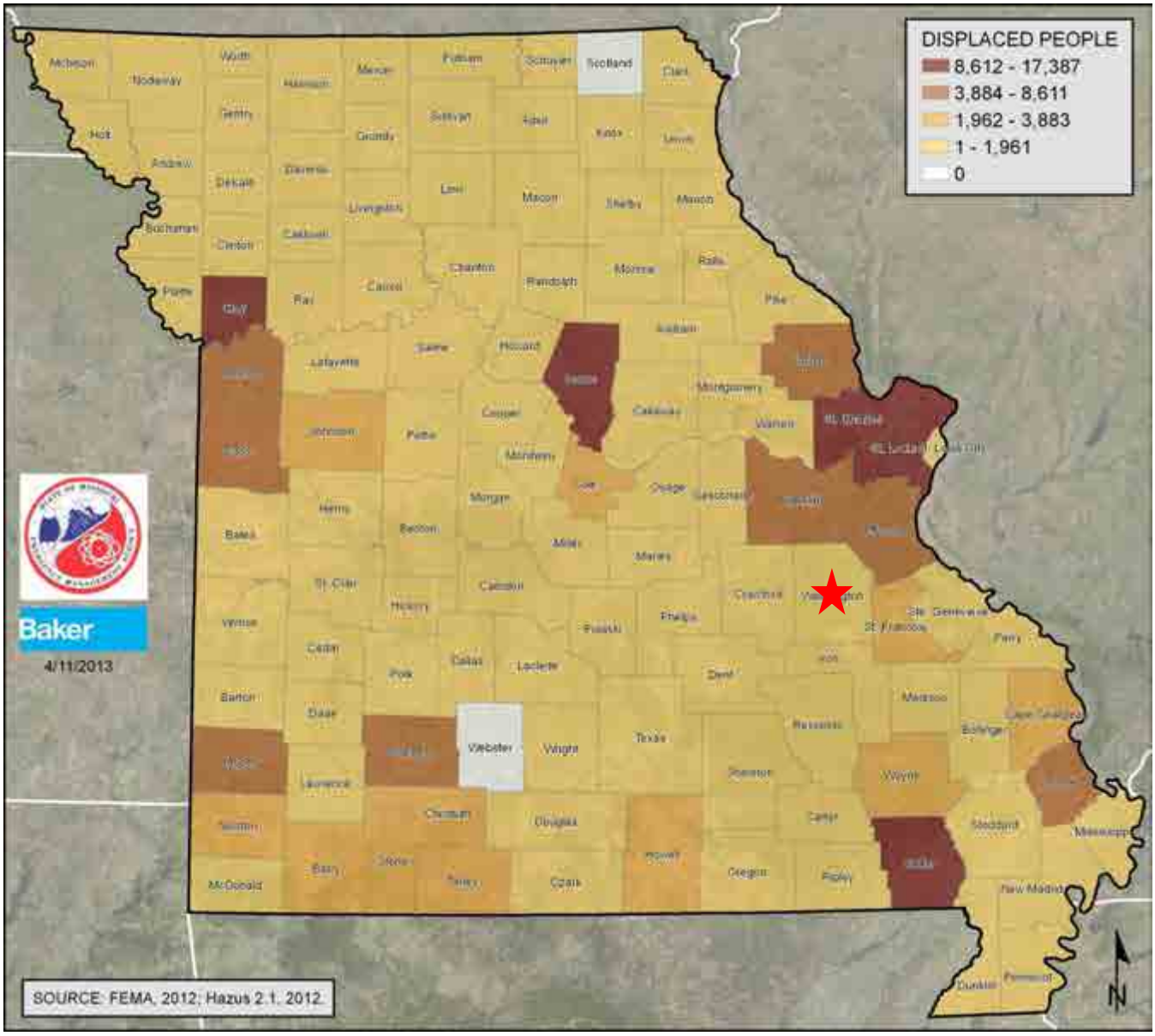
Lastly, the State determined the estimated number of displaced households and need for shelters within Washington County in the event of a 100 year flood. **Table 3.60** and **Figure 3.53** illustrate this information.

Table 3.60. Estimated Displaced households and Shelter Needs for Washington County

County	Displaced Households	Displaced Population Requiring Shelter
Washington	848	138

Source: 2013 Missouri State Hazard Mitigation Plan

Figure 3.53. Hazus Countywide Base-Flood Scenarios: Displaced People



Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Washington County

Potential Losses to Existing Development

Every jurisdiction in Washington County contains a portion of the 100 Year Floodplain except for Caledonia. According to the HAZUS model, Washington County has a building loss ratio of 0.4% to 1.7% for countywide base-flood scenarios, which is low in relation with other counties in the state. Additionally, the county has one repetitive loss property. With the annual average probability for flooding at 10% and 90% for flash floods, Washington County's existing development is vulnerable. Especially development located in low-lying areas, near rivers or streams, or where drainage systems are not adequate are all prone to flooding.

According to the 2017 Questionnaire, no school districts within the county have buildings located

within the floodplain.

Impact of Future Development

Impact of future development is correlated to floodplain management and regulations set forth by the county and jurisdictions[42]. Future development within low-lying areas near rivers and streams, or where interior drainage systems are not adequate to provide drainage during heavy rainfall events should be avoided. Additionally, future development would also increase impervious surface causing additional water run-off and drainage problems during heavy rainfall events.

Hazard Summary by Jurisdiction

Vulnerability to flooding slightly varies across the planning area. The jurisdictions most vulnerable to flooding include Unincorporated Washington County and Potosi. Other jurisdictions within the planning area are not as vulnerable; however some do have few properties within the floodplain.

Problem Statement

The county has already adopted a Floodplain Management Ordinance concerning construction in the floodplain. The county should consider buyouts of properties that are flood prone and have had repetitive losses to mitigate future disasters. Local governments should make a strong effort to further improve warning systems to insure that future deaths and injuries do not occur. Local governments should consider making improvements to roads and low water crossings that consistently flood by placing them on a hazard mitigation projects list, and actively seek funding to successful complete the projects.

[42] 2015 Boone County Hazard Mitigation Plan

3.4.7 Land Subsidence/Sinkholes

Some specific sources for this hazard are:

- http://www.dnr.mo.gov/geology/geosrv/envgeo/sinkholes.htm http://strangesounds.org/2013/07/us-sinkhole-map-these-maps-show-that-around-40-of-the-u-s-lies-in-areas-prone-to-sinkholes.html
- http://www.businessinsider.com/where-youll-be-swallowed-by-a-sinkhole-2013-3
- http://water.usgs.gov/edu/sinkholes.html
- http://pubs.usgs.gov/fs/2007/3060/

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.

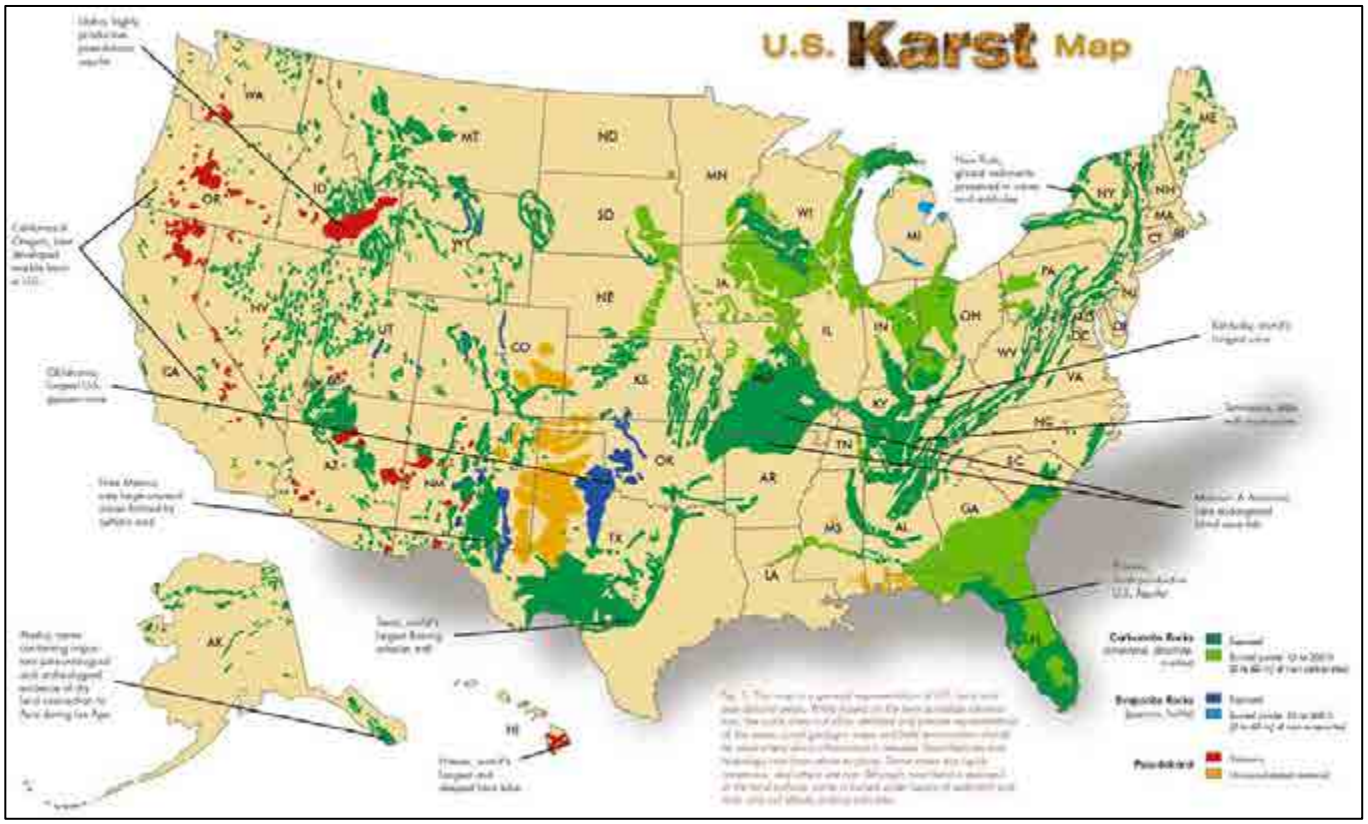
In the case of sinkholes, the rock below the surface is rock that has been dissolving by circulating groundwater. As the rock dissolves, spaces and caverns form, and ultimately the land above the spaces collapse. In Missouri, sinkhole problems are usually a result of surface materials above openings 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 in shape like shallow bowls or saucers whereas other have vertical walls. Some hold water and form natural ponds.

Geographic Location

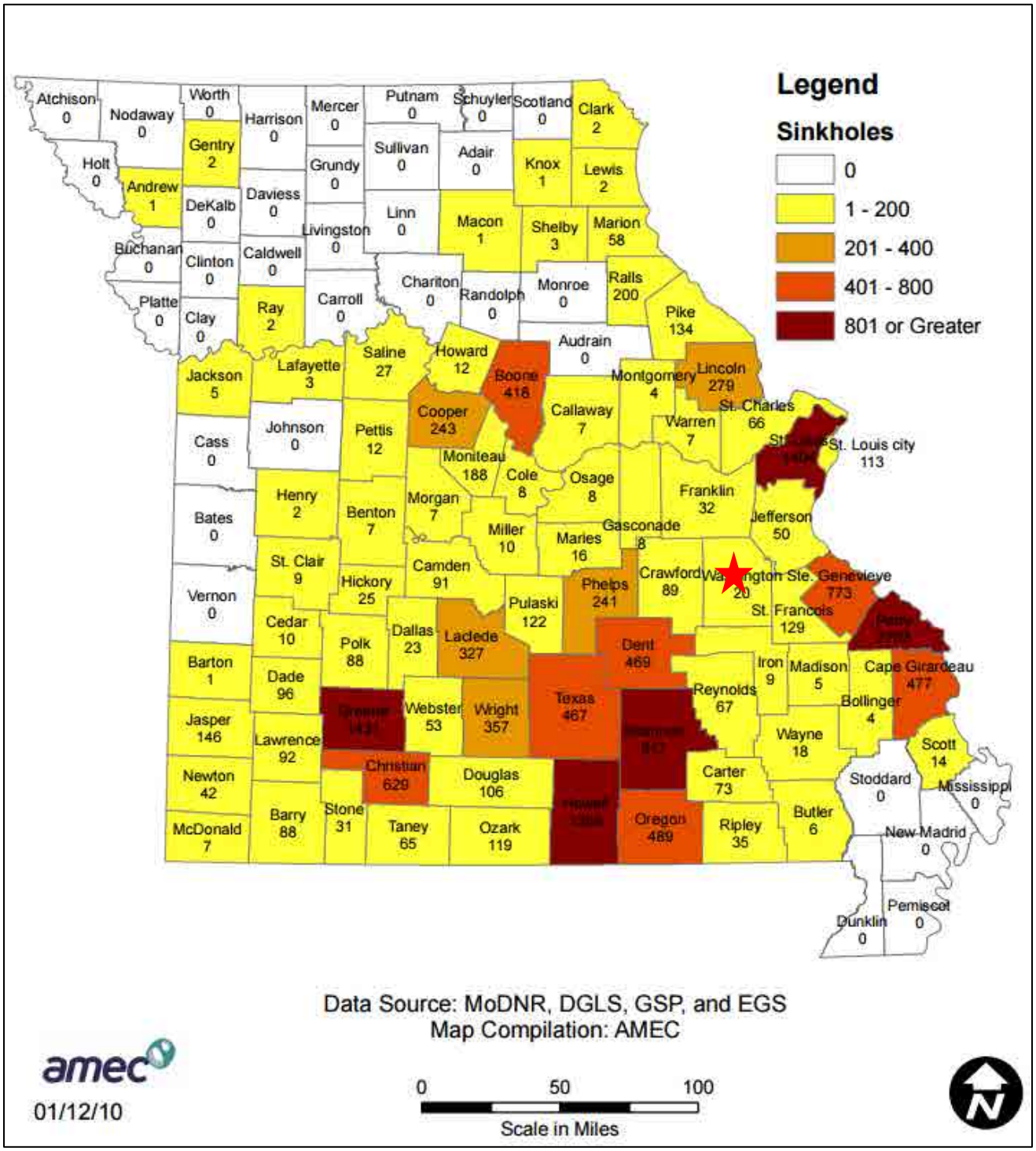
Figure 3.54 depicts karst topography across the United States. Missouri's kart topography is comprised of carbonate rocks such as limestone, dolomite, and marble. Variability in areas prone to sinkholes does not differ greatly across the county. There are approximately 20 sinkholes that have been recorded within Washington County (**Figure 3.55**). According to **Figure 3.56** there are approximately 1,372 mines in Washington County. According to the Missouri Department of Natural Resources, Washington County primarily produces iron-magnetite, phosphate, and lead. Activities such as mining or drilling are known to be responsible for the formation of sinkholes.

Figure 3.54. U.S. Karst Map



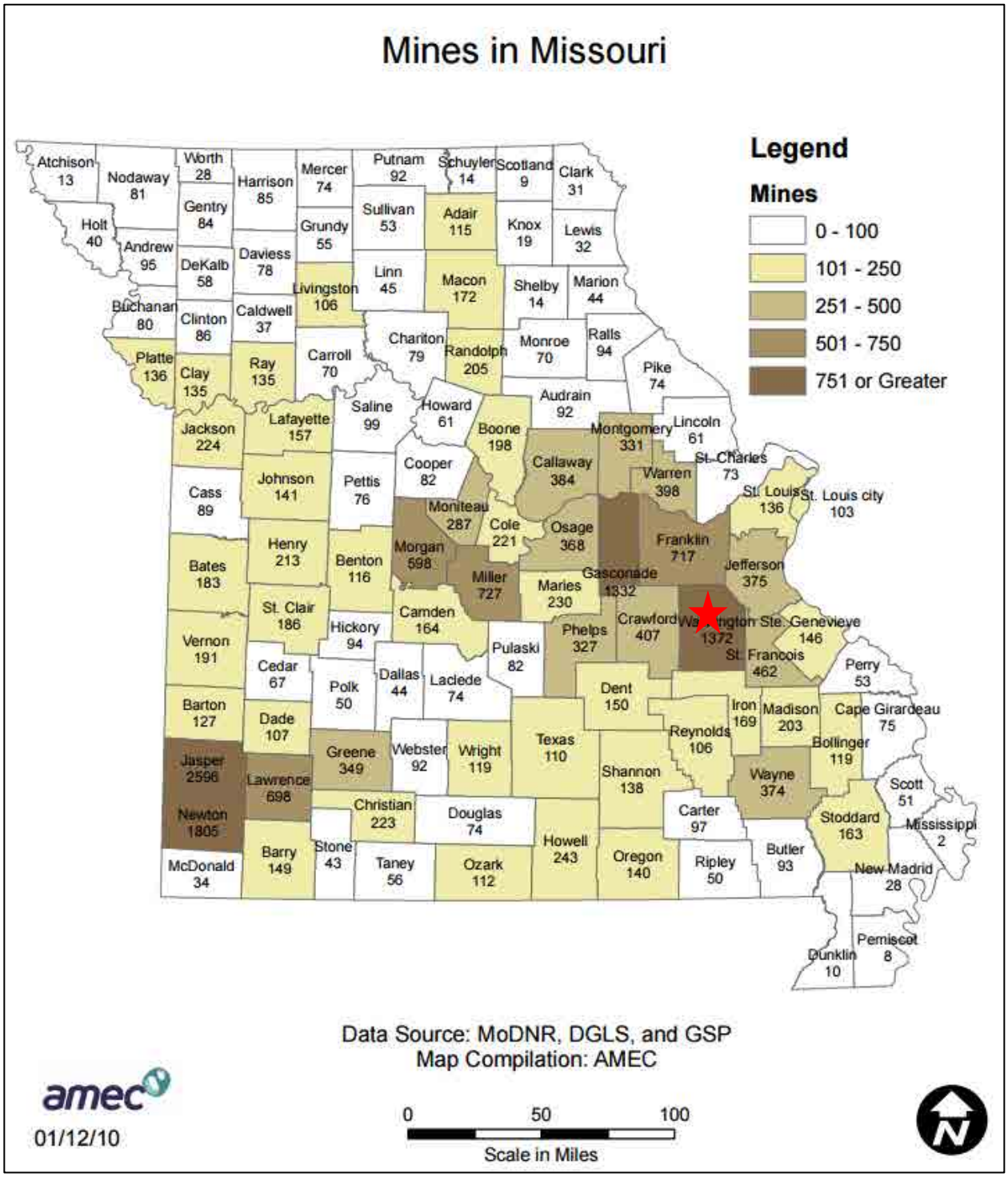
Source: http://www.northeastern.edu/protect/wp-content/uploads/US_KarstMap.jpg

Figure 3.55. Sinkholes in Missouri



Source: http://sema.dps.mo.gov/programs/mitigation_management.php; *Red star indicates Washington County

Figure 3.56. Mines in Missouri



Source: https://emgis.oa.mo.gov/dps/mitigation/MO_mines.pdf; *Red star indicates Washington County

Severity/Magnitude/Extent

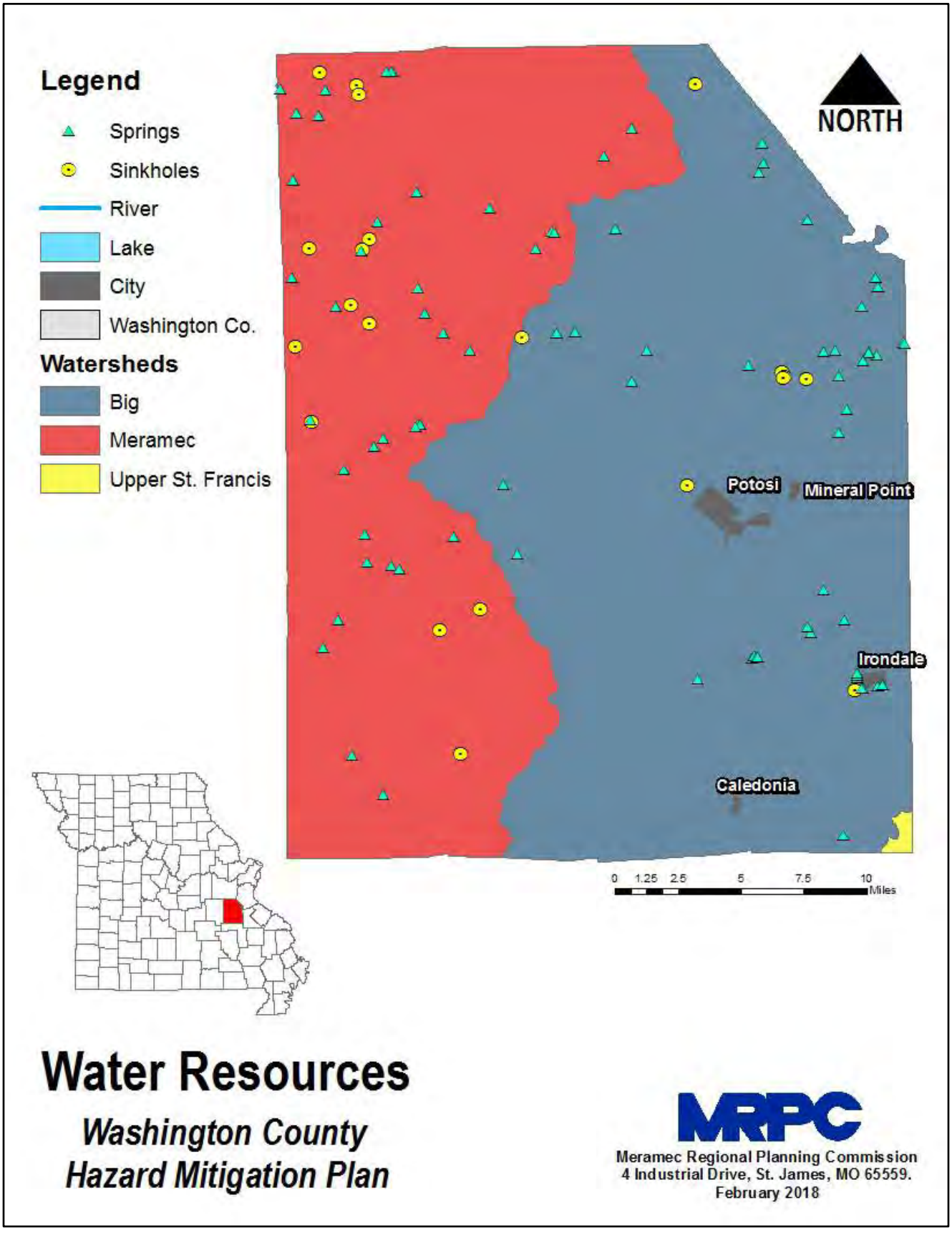
Sinkholes vary in size and location, and these variances will determine the impact of the hazard. A sinkhole could result in the loss of a personal vehicle, a building collapse, or damage to infrastructure such as roads, water, or sewer lines. Groundwater contamination is also possible from a sinkhole. 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 State 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

Although there are few sinkholes and sinkhole areas in Washington County, incidents have occurred in other parts of southern Missouri. Fortunately, there are no recorded incidents of death due to sinkholes in the county. Historically, it was noted in the 2013 Missouri State Hazard Mitigation Plan that a mine collapse occurred in Washington County; specific information was no available. Based on **Figure 3.57**, recorded sinkholes are rural in nature and reside within unincorporated parts of the county.

Figure 3.57. Washington County Watershed/Water Resources



Probability of Future Occurrence

Due to the lack of data for previous sinkhole events in Washington County, a probability could not be calculated.

Vulnerability

Vulnerability Overview

Unfortunately, no statistics are available for the number of subsurface locations that may potentially collapse in the future, forming a sinkhole. However, areas have been identified that have the greatest vulnerability for future sinkholes including Cape Girardeau, Dent, Greene, Howell, Laclede, Oregon, Perry, Shannon, St. Louis, and Texas Counties[43].

Potential Losses to Existing Development

The most likely type of damage to occur in conjunction with a sinkhole collapse is property damage related to foundation disturbance. Signs include cracks in interior and exterior walls; doors and windows that no longer sit square or open and close properly; depressions forming in the yard; cracks in the street, sidewalk, foundation or driveway; and turbidity in local well water. All of these can be early indicators that a sinkhole is forming in the vicinity[44]. In the event of a sudden collapse, an open sinkhole can form in a matter of minutes and swallow lawn, automobiles and homes. This has occurred in some parts of Missouri, particularly in the southwest part of the state, but there have been no dramatic incidents like this in Washington County

Impact of Future Development

Future development over or near abandoned mines and in locations at risk of sinkhole formation will increase the hazard vulnerability. Information regarding regulations limiting construction near sinkholes is very limited. The 2013 Missouri State Hazard Mitigation Plan only lists two counties that limit construction near mines or sinkholes including Greene and Christian Counties.

Hazard Summary by Jurisdiction

Figure 3.57 illustrates 20 sinkholes in Washington County. The jurisdiction most likely to be impacted by sinkholes is unincorporated Washington County.

Problem Statement

Sinkholes and sinkhole areas are well documented by both the US Geological Survey and the Missouri Department of Natural Resources Geologic Resources Section. The risk of sinkhole collapse can be lessened by avoiding the construction of structures in these areas and avoiding those activities that significantly alter the local hydrology, such as drilling and mining. In addition, communities should avoid leaking water and sewer lines through appropriate maintenance and monitoring. Local residents should be educated on the risks associated with sinkholes and advised to avoid placing themselves and their property in danger by building in sinkhole areas. Communities with building codes should include prohibitions on building in known sinkhole areas.

[43] 2013 Missouri State Hazard Mitigation Plan
[44] http://sinkhole.org/commonsigns.php

3.4.8 Thunderstorm/High Winds/Lightning/Hail

Some Specific Sources for this hazard are:

- FEMA 320, Taking Shelter from the Storm, 3rd edition, http://www.weather.gov/media/bis/FEMA_SafeRoom.pdf Lightning Map, National Weather Service, http://www.lightningsafety.noaa.gov/stats/08_Vaisala_NLDN_Poster.pdf National Weather Service, http://www.lightningsafety.noaa.gov/stats/08_Vaisala_NLDN_Poster.pdf
- Death and injury statistics from lightning strikes, National Weather Service.
- Wind Zones in the U.S. map, FEMA, http://www.fema.gov/plan/prevent/saferoom/tsfs02_wind_zones.shtm;
- Annual Windstorm Probability (65+knots) map U.S. 1980-1994, NSSL, http://www.nssl.noaa.gov/users/brooks/public_html/bigwind.gif
- Hailstorm intensity scale, The Tornado and Storm Research Organization (TORRO), http://www.torro.org.uk/site/hscale.php;
- NCDC data;
- USDA Risk Management Agency, Insurance Claims, http://www.rma.usda.gov/data/cause.htm
- National Severe Storms Laboratory – hail map, http://www.nssl.noaa.gov/users/brooks/public_html/bighail.gif

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 (**Section 3.4.6**) and tornadoes (**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 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.

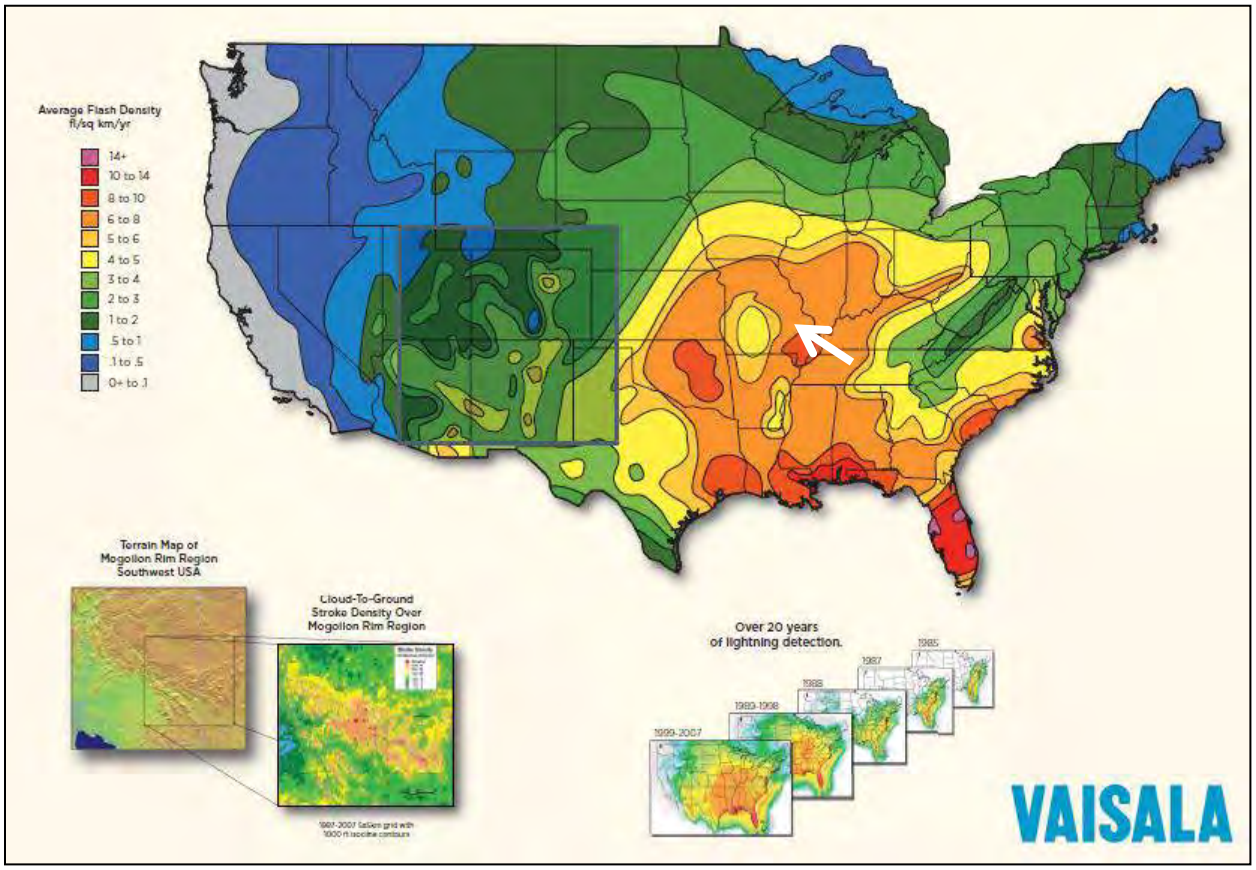
At the time when the updraft can no longer support the hailstone, it will fall down to the earth. For example, a ¼" diameter or pea sized hail requires updrafts of 24 miles per hour, while a 2 ¾" diameter or baseball sized hail requires an updraft of 81 miles per hour. According to the NOAA, the largest 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, and lightning events are an area-wide hazard that can take place anywhere across the United States. Furthermore, these events do not vary greatly across the planning area; they are more frequently reported in urbanized areas. Additionally, densely developed urban areas are more likely to experience damaging events.

Figure 3.58 depicts the location and frequency of lightning in Missouri. Additionally, the map indicates that the flash density of Washington County ranges between 6 and 8 flashes per square kilometer per year.

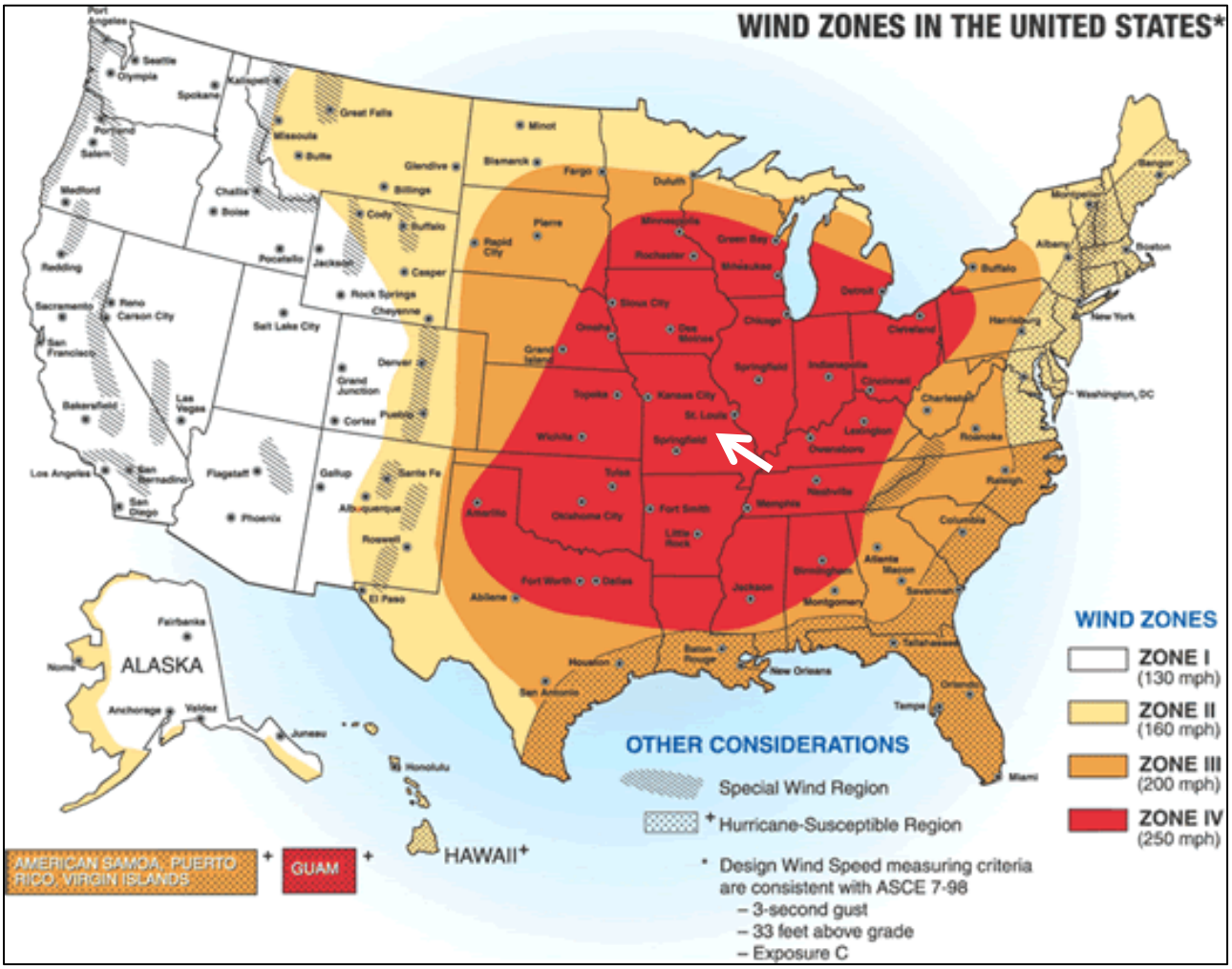
Figure 3.58. Location and Frequency of Lightning in Missouri



Source: National Weather Service, http://www.lightningsafety.noaa.gov/stats/08_Vaisala_NLDN_Poster.pdf.
* Washington County is indicated by a white arrow.

There are four wind zones that are characterized across the United States. These zones range from Zone I to Zone IV. All of Missouri as well as most of the Midwest fall within Zone IV. Within Zone IV, winds can reach up to 250 mph (**Figure 3.59**).

Figure 3.59. Wind Zones in the United States



Source: http://extension.missouri.edu/webster/images/weather/US-WindZones01.gif
* Washington County is indicated by a white arrow.

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 knocked out by lightning strikes.

Based on information provided by the Tornado and Storm Research Organization (TORRO), **Table 3.61** below describes typical damage impacts of the various sizes of hail.

Table 3.61. 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, 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
Notes: In addition to hail diameter, factors including number and density of hailstones, hail fall speed and surface wind speeds affect severity. http://www.torro.org.uk/site/hscale.php

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.

Between 1998 and 2017, there were 0 recorded crop insurance claims for Thunderstorms, lightning, high wind, and hail in Washington County.

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.

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Previous Occurrences

Due to the lack of available parameters, heavy rain is utilized in the place of thunderstorms in **Table 3.62**. Moreover, thunderstorm wind and strong wind was included with high winds. NCDC data was obtained for lightning, and hail events between 1998 and 2017 as well (**Table 3.63**, **Table 3.64**, and **Table 3.65).** However, limitations to the use of NCDC reported lightning events include the fact that only lightning events that result in fatality, injury and/or property and crop damage are in the NCDC.

Table 3.62. NCDC Washington County Heavy Rain Events Summary, 1998 to 2017

Year	# of Events	# of Deaths	# of Injuries	Property Damages	Max Rainfall (Inch)
2003	1	0	0	0	2-5
Total	**1**	**0**	**0**	**0**	**-**

Source: NCDC, data accessed [3/16/18]

Table 3.63. NCDC Washington County High Wind Events Summary, 1998 to 2017

Year	# of Events	# of Deaths	# of Injuries	Property Damages	Max Estimated Gust (kts.)
1998	4	0	0	0	56
1999	1	0	0	0	53
2001	4	0	0	0	55
2002	3	0	0	0	60
2003	1	0	0	0	60
2004	4	0	0	0	60
2005	4	0	0	0	57
2006	3	0	0	0	70
2008	3	0	0	0	56
2009	5	0	0	1.00K	52
2010	2	0	0	0	61
2011	3	0	0	0	56
2012	2	0	0	0	56
2013	2	0	0	0	61
2014	1	0	0	0	52
2015	1	0	0	0	56
2016	3	0	0	0	70
2017	1	0	0	0	66
Total	**60**	**0**	**0**	**1.00K**	**-**

Source: NCDC, data accessed [3/16/18]

Table 3.64. NCDC Washington County Lightning Events Summary, 1998 to 2017

Year	# of Events	# of Deaths	# of Injuries	Property Damages	Crop Damage
-	0	0	0	0	0
Total	**0**	**0**	**0**	**0**	**0**

Source: NCDC, data accessed [3/16/18]

Table 3.65. NCDC Washington County Hail Events Summary, 1998 to 2017

Year	# of Events	# of Deaths	# of Injuries	Property Damages	Max Hail Size (inch)
1998	3	0	0	0	1.75
1999	2	0	0	0	1.00
2000	1	0	0	0	.75
2001	2	0	0	0	1.00
2002	2	0	0	0	1.75
2003	2	0	0	0	1.75

Year	# of Events	# of Deaths	# of Injuries	Property Damages	Max Hail Size (inch)
2004	6	0	0	0	1.75
2005	3	0	0	0	1.00
2006	10	0	0	0	2.50
2007	1	0	0	0	1.25
2008	7	0	0	0	1.25
2009	7	0	0	0	2.75
2011	8	0	0	0	2.00
2012	4	0	0	0	1.00
2014	2	0	0	0	1.25
2015	4	0	0	0	2.75
2016	1	0	0	0	1.25
2017	1	0	0	0	1.75
Total	**66**	**0**	**0**	**0**	**-**

Source: NCDC, data accessed [3/16/18]

Probability of Future Occurrence

From the data obtained from the NCDC[45], annual average percent probabilities were calculated for heavy rainfall, high winds, lightning, and hail. Heavy rainfall has a 5 percent annual average percent probability of occurrence (1 events/20 years x 100) (**Table 3.66**). Heavy rainfall events can be found in **Table 3.62**.

Since multiple high wind occurrences are anticipated each year (60 events/20 years), the probability of high winds is 100% with an average of 3 events per year (**Table 3.67).** High wind events can be found in **Table 3.63.**

In Washington County, 0 lightning events (**Table 3.64**) in 20 years were recorded.

Lastly, the annual average percent probability of hail occurrence is 100% (66 events/20 years) with an average of 3.3 events per year (**Table 3.69**). Hail events can be found in **Table 3.65**.

Table 3.66. Annual Average % Probability of Heavy Rain in Washington County

Location	Annual Avg. % P
Washington County	5%

*P = probability; see page 3.24 for definition.

[45] http://www.ncdc.noaa.gov/stormevents/choosedates.jsp?statefips=29%2CMISSOURI

Table 3.67. Annual Average % Probability of High Winds in Washington County

Location	Annual Avg. % P	Avg. # of Events
Washington County	100%	3

*P = probability; see page 3.24 for definition.

Table 3.68. Annual Average % Probability of Lightning in Washington County

Location	Annual Avg. % P
Washington County	0%

*P = probability; see page 3.24 for definition.

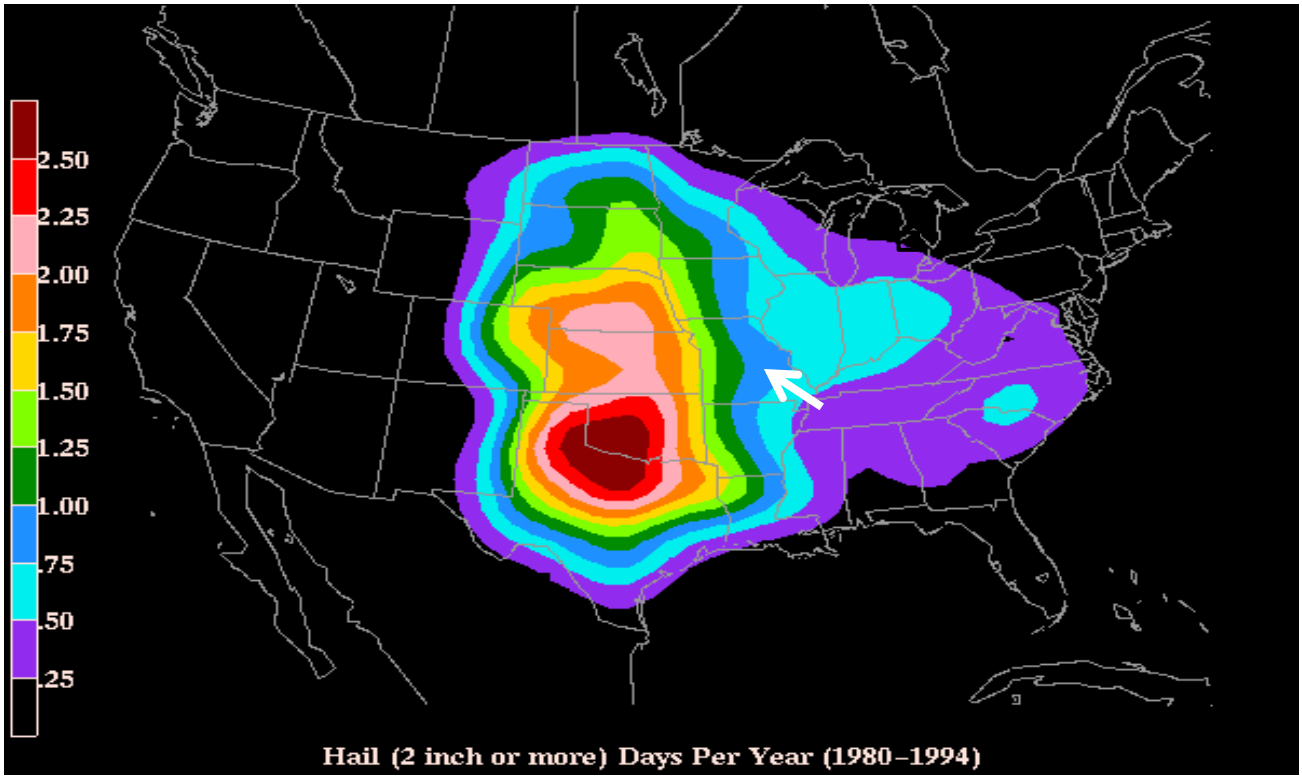
Table 3.69. Annual Average % Probability of Hail in Washington County

Location	Annual Avg. % P	Avg. # of Events
Washington County	100%	3.3

*P = probability; see page 3.24 for definition.

Figure 3.60 depicts a map based on hailstorm data from 1980-1994. It shows the probability of hailstorm occurrence (2" diameter or larger) based on number of days per year. The location of Washington County is identified with a white arrow.

Figure 3.60. Annual Hailstorm Probability (2'' diameter or larger), 1980- 1994



Source: NSSL,http://www.nssl.noaa.gov/users/brooks/public_html/bighail.gif
* White arrow indicates Washington County

Vulnerability

Vulnerability Overview

Data was obtained from the 2013 Missouri State Hazard Mitigation Plan for vulnerability overview and analysis. Since severe thunderstorms occur frequently throughout Missouri, specific parameters were analyzed for each hazard. These parameters include damaging winds in excess of 67 mph (58 kts.), hail in excess of 0.75 inches, and damaging lightning strikes. **Table 3.70** illustrates housing density, building exposure, and crop exposure for Washington County. Moreover, **Table 3.71** provides additional statistical data for the vulnerability analysis.

Table 3.70. Washington County Housing Density, Building Exposure and Crop Exposure

County	Housing Units/sq. mi.	Total Building Exposure ($)	Crop Exposure (2007 Census of Ag.)	Social Vulnerability Index
Washington	34.3	$1,678,841,000	$711,000	2

Source: 2013 Missouri State Hazard Mitigation Plan

Table 3.71. Additional Statistical Data Compiled for Vulnerability Analysis

County	Total Hail Incidences	Total hail Property Loss ($)	Total Crop Insurance Paid for Hail Damage ($)	Total Wind Incidence ($)	Total Wind Property Loss ($)	Total Crop Insurance Paid for wind Damage ($)	Total Lightning Incidences	Total Lightning Property Loss ($)
Washington	116	$1,200	$0	63	$504,000	$0	0	$0

Source: 2013 Missouri State Hazard Mitigation Plan

Five factors were utilized in the overall vulnerability analysis of lightning. These factors include housing density, likelihood of occurrence, building exposure, average annual property loss ratio, and social vulnerability. For hail and wind, crop exposure and average annual crop insurance claims were also utilized. To better analyze the vulnerability analysis of severe thunderstorms, rating values were established; low, medium-low, medium, medium-high, and high (**Table 3.72**).

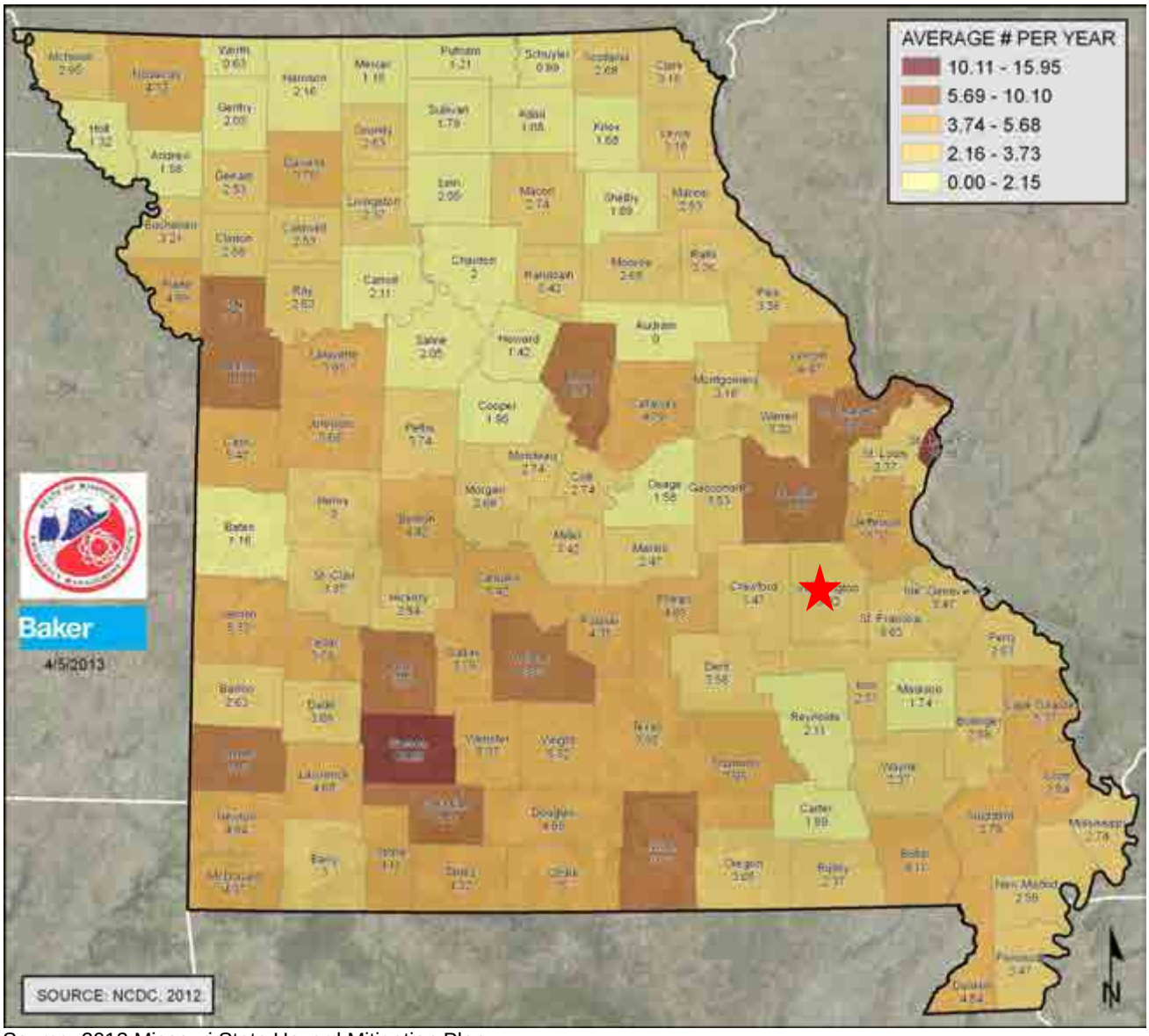
Table 3.72. Ranges for Severe Thunderstorm Vulnerability Factor Ratings

Factors considered	Low (1)	Medium-low (2)	Medium (3)	Medium-high (4)	High (5)
Common Factors					
Housing Density (# per sq. mile)	<50	50 to 99	100 to 299	300 to 499	>500
Crop Exposure ($ in millions) (hail and wind only)	<$10,000	$10,000 to $24,999	$25,000 to $49,999	$50,000 to $99,999	>$100,000
Social Vulnerability	1	2	3	4	5
Wind					
Likelihood of Occurrence (# of events/ yrs. Of data)	0 to 2.15	2.16 to 3.73	3.74 to 5.68	5.60 to 10.10	10.11 to 15.95
Average Annual Property Loss Ratio (annual property loss/exposure)	0.00 - 0.000027	0.000028 - 0.000092	0.000093 - 0.000231	0.000232 - 0.000489	0.000490 - 0.001273
Wind Crop Loss Ratio (annual crop claims/exposure)	0 - 0.000084	0.000085 - 0.000250	0.000251 - 0.000250	0.000715 - 0.001398	0.001399 - 0.003574
Hail					
Likelihood of Occurrence (# of events/ yrs. Of data)	0.78 to 3.10	3.11 to 5.26	5.27 to 7.89	7.90 to 12.10	12.11 to 18.48
Average Annual Property Loss Ratio (annual property loss/exposure)	0 - 0.000034	0.000035 - 0.000149	0.000280 - 0.000269	0.000280 - 0.000460	0.000461 - 0.001090
Hail Crop Loss Ratio (annual crop claims/exposure)	0 - 0.0000270	0.000271 - 0.000974	0.000975 - 0.000974	0.002305 - 0.003698	0.003699 - 0.007516
Lightning					
Likelihood of Occurrence (# of events/ yrs. Of data)	0 to 0.05	0.06 to 0.15	0.16 to 0.26	0.27 to 0.42	0.43 to 0.74
Average Annual Property Loss Ratio (annual property loss/exposure)	0 - 0.000001	0.000002 - 0.000003	0.000004 - 0.000006	0.000007 - 0.000015	0.000016 - 0.000037

Source: 2013 Missouri State Hazard Mitigation Plan

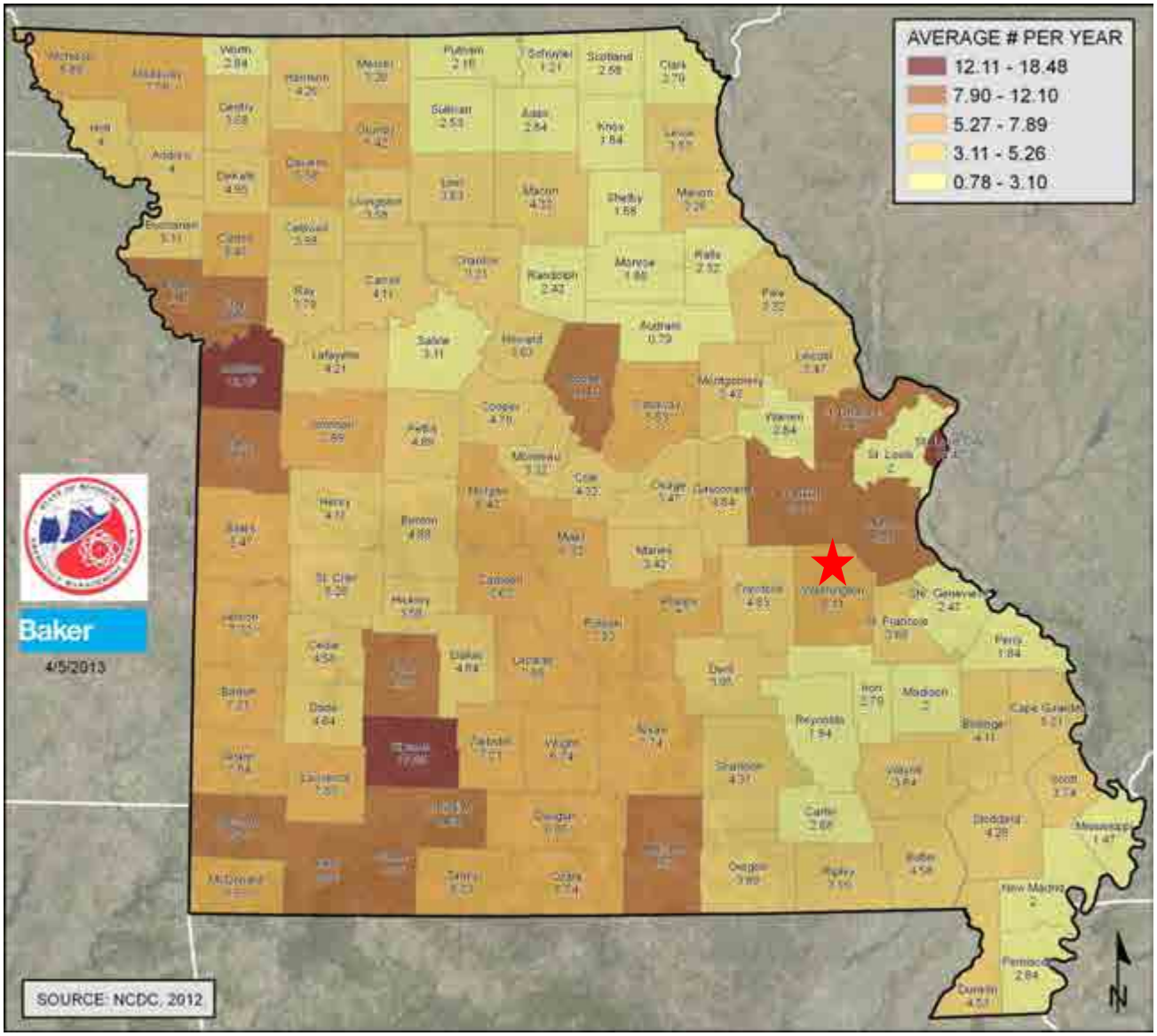
Figure 3.61 through **Figure 3.63** depicts the likelihood of occurrence of high winds, hail, and lightning events in Missouri.

Figure 3.61. Likelihood of Occurrence of High Wind Events (67 MPH and higher)



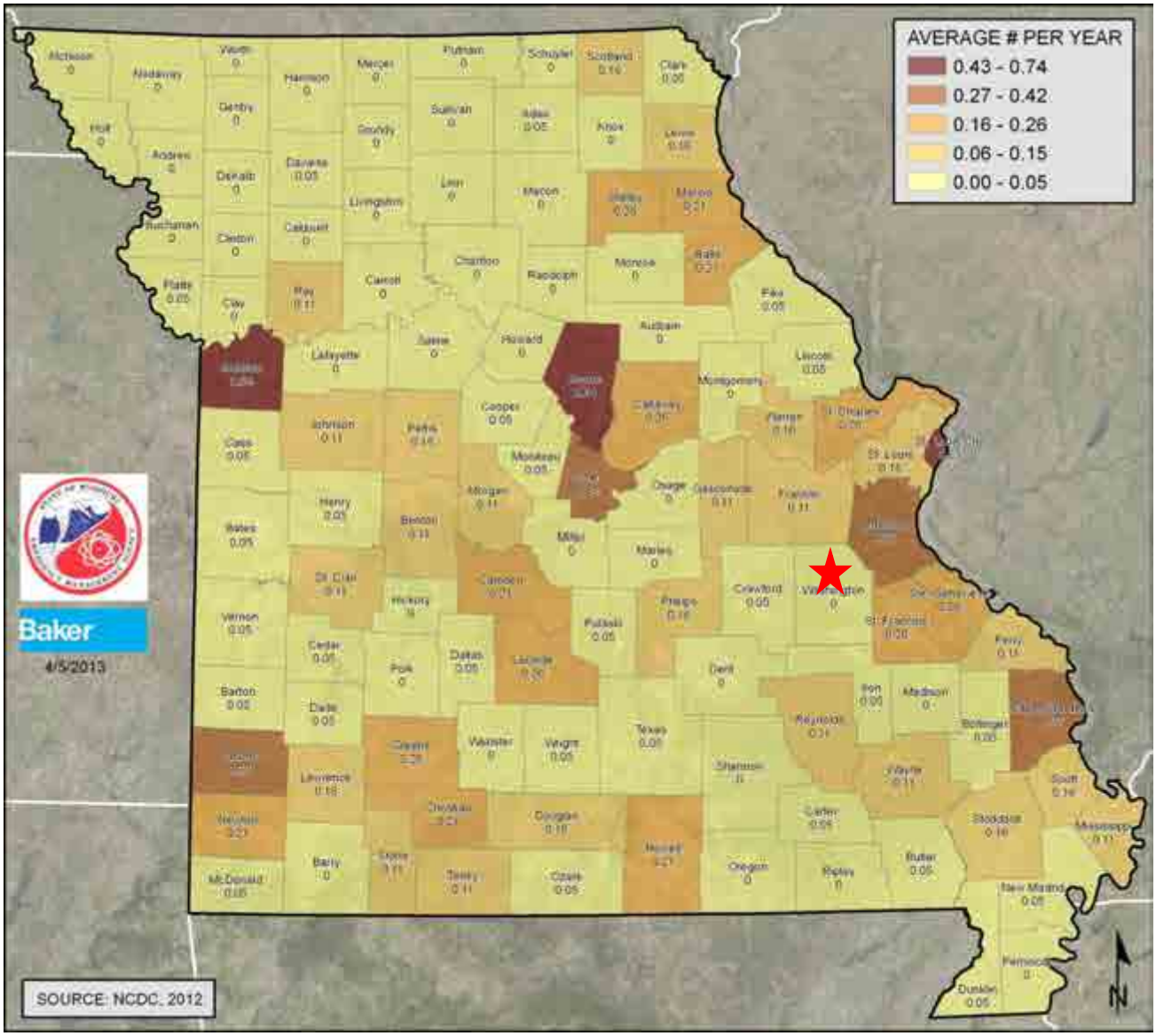
Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Washington County

Figure 3.62. Likelihood of Occurrence of Damaging Hail Events (.75 inches and larger)



Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Washington County

Figure 3.63. Likelihood of Occurrence of Damaging Lightning Events



Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Washington County

After ranges were applied to all factors in the analysis for wind, hail, and lightning, they were weighted equally and factored together to determine an overall vulnerability rating. Following, a combined vulnerability rating was calculated. The following data provides the calculated rages applied to determine overall vulnerability of Missouri counties to severe thunderstorms (**Table 3.73**). **Table 3.74** provides the calculated vulnerability rating for the severe thunderstorm hazard. **Figure 3.64** that follows provides the mapped results of this analysis by county[46].

[46] 2013 Missouri State Hazard Mitigation Plan

Table 3.73. Ranges for Severe Thunderstorm Combined Vulnerability Rating

	Low (1)	Medium-low (2)	Medium (3)	Medium-high (4)	High (5)
Severe Thunderstorm Combined Vulnerability	9 to 11	12 to 14	15 to 17	18 to 20	21 to 26

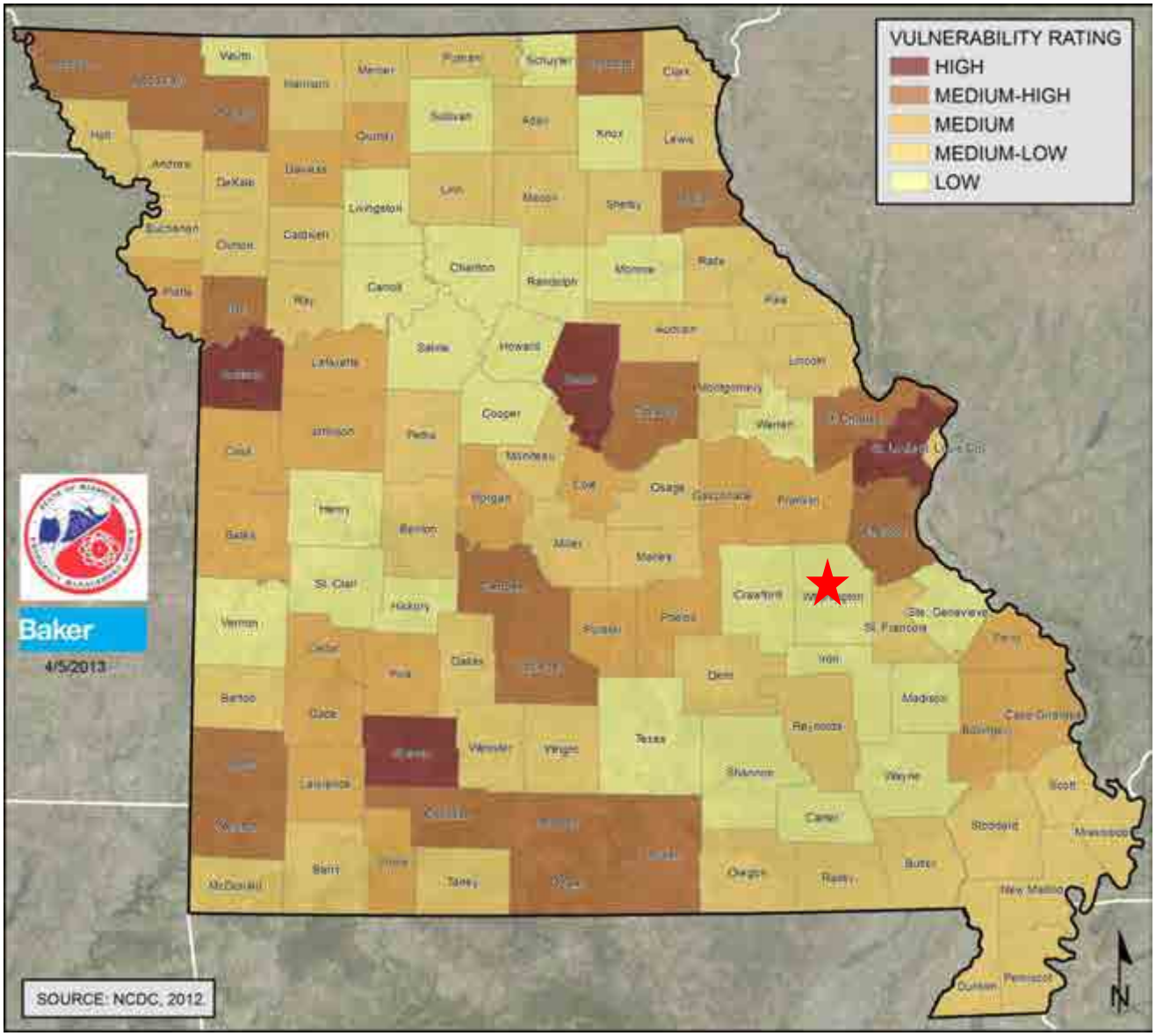
Source: 2013 Missouri State Hazard Mitigation Plan

Table 3.74. Severe Thunderstorm Combined Vulnerability Rating

County	Housing Density Rating	Wind Likelihood Rating	Annualized Wind Property Loss	Annualized Wind Crop Loss	Hail Likelihood Rating	Annualized Hail Property Loss	Annualized Hail Crop Loss	Lightning Likelihood Rating	Annualized Lightning Property Loss	Total Thunderstorm Vulnerability	Combined Vulnerability
Washington	1	1	1	3	1	1	1	1	1	10	Low

Source: 2013 Missouri State Hazard Mitigation Plan

Figure 3.64. Vulnerability Summary for Severe Thunderstorms



Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Washington County

Potential Losses to Existing Development

According to the NCDC Washington County experienced approximately $1,000 in property damages from severe thunderstorms between 1998 and 2017. Most of the property damage caused by storms is covered by private insurance and data is not available. In addition, most damage from severe thunderstorms occurs to vehicles, roofs, siding, and windows. However, there is a variety of impacts from severe thunderstorms. Moreover, secondary effects from hazards, falling trees and debris, can cause destruction within the planning area[47].

[47] 2015 Boone County Hazard Mitigation Plan

Future Development

As previously mentioned, the population within Washington County is expected to increase by approximately 2,292 within the next 2 to 12 years. However, it is difficult to determine future impacts. However, anticipated development in each jurisdiction will result in increased exposure (**Page 3.23**). Likewise, increased development of residential structures will increase jurisdiction's vulnerability to damages from severe thunderstorms/ high winds/lightning/hail.

Hazard Summary by Jurisdiction

Although thunderstorms/high winds/lightning/hail events are area-wide, there are demographics indicating higher losses in one jurisdiction as compared to another. Jurisdictions with high percentages of housing built before 1939 are more prone to damages from severe thunderstorms. The jurisdictions with the highest percent of houses build before 1939 include Caledonia, Irondale, and Potosi. Additionally, Mineral Point, Washington County, and Irondale have higher percentages of mobile homes and unsecured buildings, which are more prone to damages.

Problem Statement

Early warnings are possibly the best hope for residents when severe weather strikes. Cities that do not already possess warning systems should plan to purchase a system. Additional public awareness also includes coverage by local media sources. Storm shelters are another important means of mitigating the effects of severe thunderstorms. A community-wide shelter program should be adopted for residents who may not have adequate shelter in their homes. Residents should also be encouraged to build their own storm shelters to prepare for emergencies. Local governments should encourage residents to purchase weather radios to ensure that everyone has sufficient access to information in times of severe weather.

3.4.9 Tornado

Some specific sources for this hazard are:

- Enhanced F Scale for Tornado Damage, NWS, www.spc.noaa.gov/faq/tornado/ef-scale.html;
- Enhanced Fujita Scale's damage indicators and degrees of damage table, NOAA Storm Prediction Center, www.spc.noaa.gov/efscale/ef-scale.html;
- Tornado Activity in the U.S. map (1950-2006), FEMA 320, Taking Shelter from the Storm, 3rd edition;
- Tornado Alley in the U.S. map, http://www.tornadochaser.net/tornalley.html
- Enhanced Fujita Scale, www.spc.noaa.gov/efscale/ef-scale.html
- National Climatic Data Center, http://www.ncdc.noaa.gov/stormevents/
- Tornado History Project, map of tornado events, http://www.tornadohistoryproject.com/tornado/Missouri

Hazard Profile

Hazard Description

The NWS 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. When 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 Wind/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 Weather 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

In Missouri, tornadoes occur most frequently between April and June, with April and May usually producing the most tornadoes. However, tornadoes can arise at any time of the year. While tornadoes can happen at any time of the day or night, they are most likely to occur between 3 p.m. and 9 p.m. Furthermore, tornadoes can occur anywhere across the state of Missouri, including Washington 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 50 miles long. Tornadoes have been known to lift and move objects weighing more than 300 tons a distance of 30 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 are high 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 (**Table 3.75**) attempts to rank 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 3.75. Enhanced F Scale for Tornado Damage

Fujita Scale			Derived EF Scale		Operational Scale	
F #	Fastest 1/4 - Mile (mph)	3 Second Gust (mph)	EF #	3 Second Gust (mph)	EF #	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 3.76**. The 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.

Table 3.76. 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 or siding; branches broken off trees; shallow-rooted trees pushed over. Confirmed tornadoes with no reported damage (i.e. those that remain in open fields) are always rated EF0).
EF1	**86-110**	**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 distance.
EF4	**166-200**	**0.7%**	Devastating. Well-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 3.77 illustrates NCDC data reported for tornado events and damages from 1998 to 2017 in the planning area. Prior to 1993, only highly destructive tornadoes were recorded.

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 are in segments.

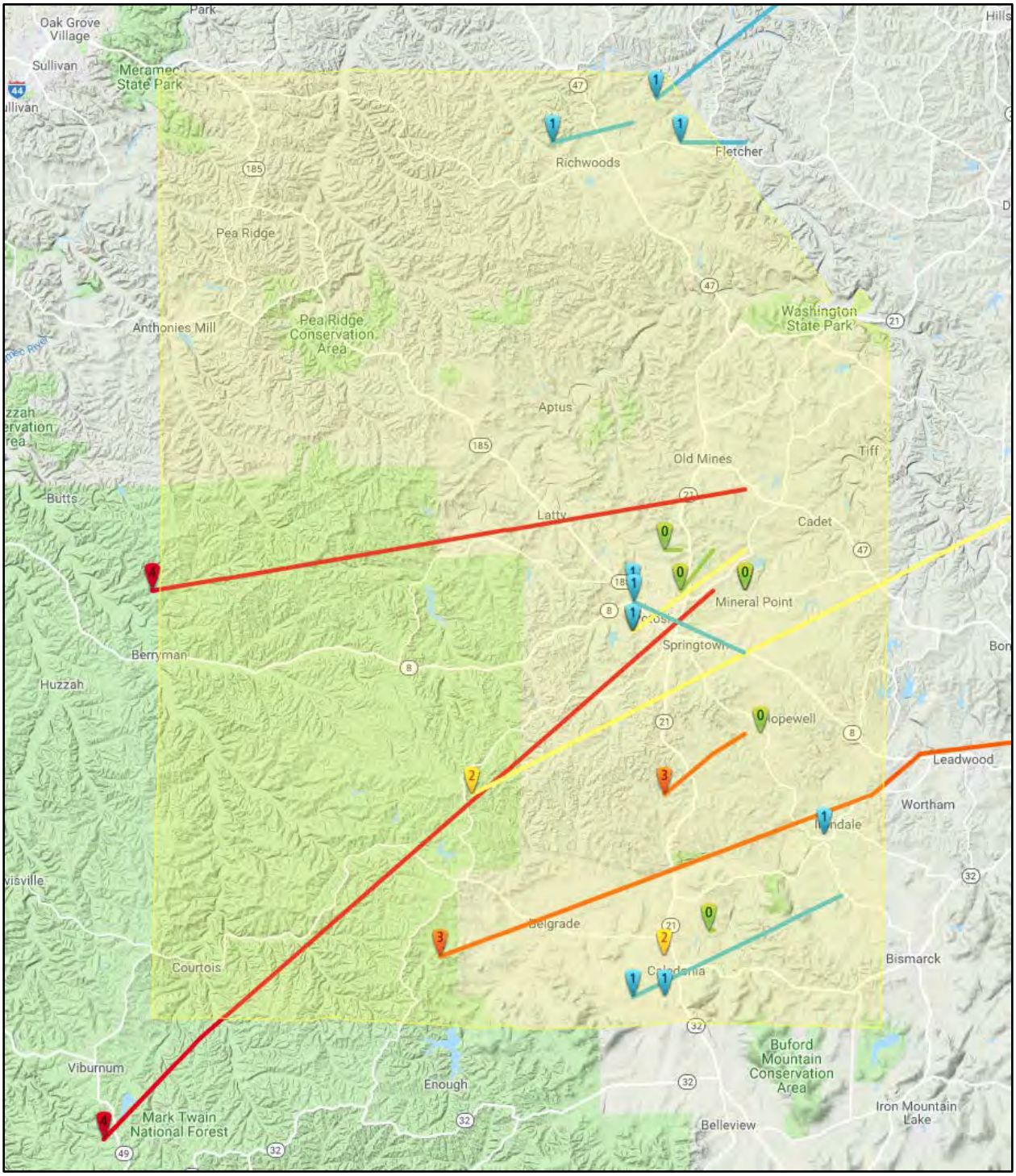
Table 3.77. Recorded Tornadoes in Washington County, 1998 – 2017

Date	Beginning Location	Ending Location	Length (miles)	Width (yards)	F/EF Rating	Death	Injury	Property Damage	Crop Damages
4/24/2002	1S Caledonia	1S Caledonia	1	75	F1	0	0	0	0
5/12/2002	-	-	.1	30	F0	0	0	0	0
10/18/2004	1NE Potosi	1NE Potosi	.2	80	F1	0	7	0	0
10/18/2004	1NE Potosi	2NE Potosi	.8	50	F0	0	0	0	0
10/18/2004	2ENE Potosi	3ENE Potosi	.8	40	F0	0	0	0	0
10/18/2004	-	Mineral Point	.8	40	F0	0	0	0	0
10/18/2004	-	1NE Mineral Point	.8	40	F0	0	0	0	0
9/22/2008	1SW Richwoods	2ENE Richwoods	3.1	150	F1	0	0	0	0
9/22/2006	4E Richwoods	5E Richwoods	1.4	100	F1	0	0	0	0
4/30/2010	3ENE Richwoods	4ENE Richwoods	.73	100	EF0	0	0	0	0
4/8/2015	0S Potosi	1S Potosi	4.1	300	EF1	0	0	0	0
7/8/2015	2ENE Caledonia	2ENE Caledonia	.18	100	EF0	0	0	0	0
Total	**-**	**-**	**-**	**-**	**-**	**0**	**0**	**0**	**0**

Source: National Climatic Data Center, http://www.ncdc.noaa.gov/stormevents/

Figure 3.65 depicts historic tornado paths across Washington County.

Figure 3.65. Washington County Map of Historic Tornado Paths



Source: http://www.tornadohistoryproject.com/tornado/Missouri

According to the USDA Risk Management Agency's record, there were no insurance payments in Washington County for crop damages as a result of tornadoes between 1998 and 2017.

Probability of Future Occurrence

From the data obtained from the NCDC[48], an annual average percent probability was calculated for tornadoes within Washington County (**Table 3.78).** There is a 60 percent annual average probability of a tornado occurrence (12 events/20 years x 100). Tornado events can be found in **Table 3.77**. In addition, **Figure 3.66,** obtained from the 2013 Missouri State Hazard Mitigation Plan, also illustrates tornado probabilities across the State.

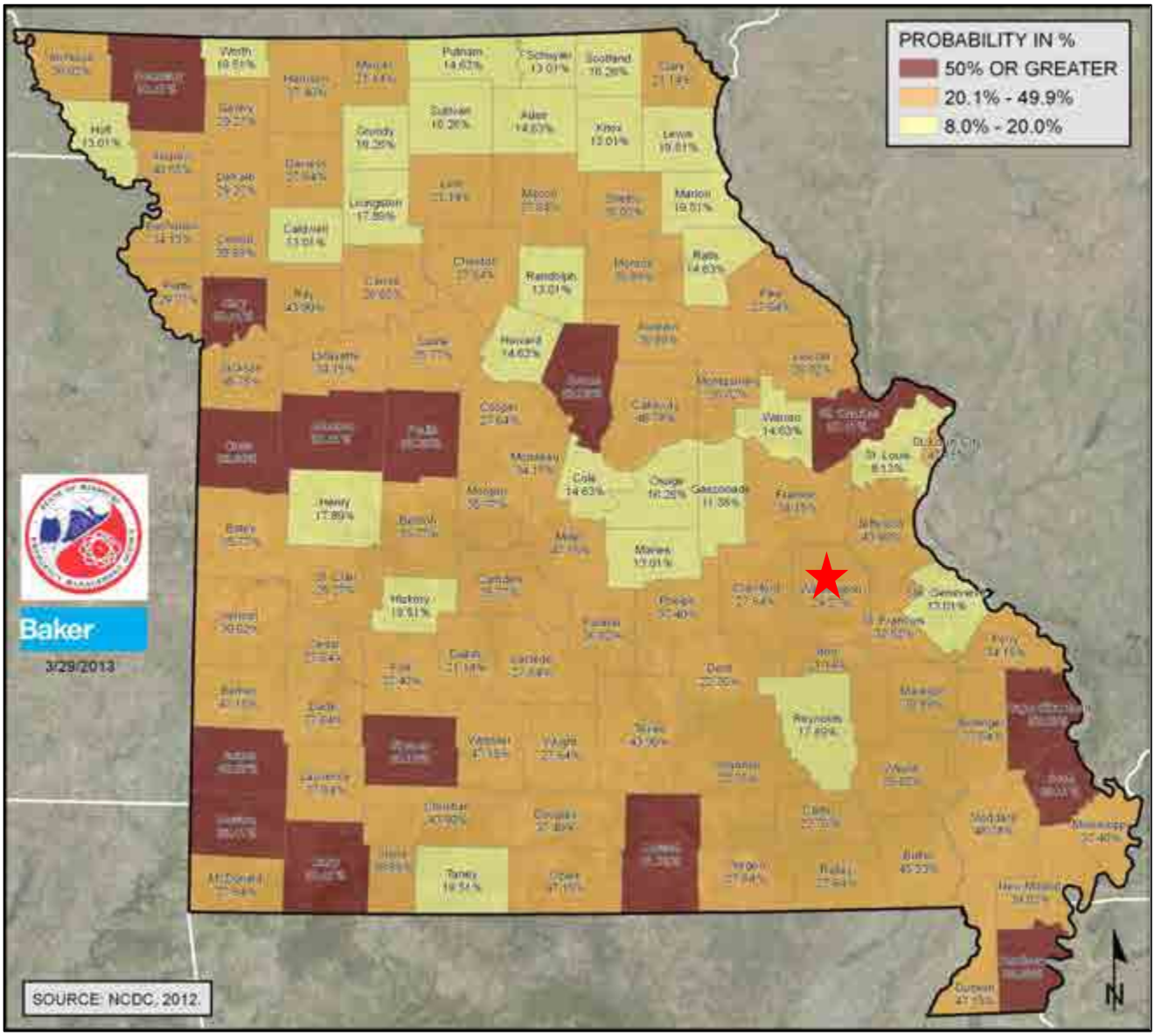
Table 3.78. Annual Average % Probability of Tornadoes in Washington County

Location	Annual Avg. % P
Washington County	60%

*P = probability; see page 3.24 for definition.

[48] http://www.ncdc.noaa.gov/stormevents/choosedates.jsp?statefips=29%2CMISSOURI

Figure 3.66. Missouri Tornado Probability



Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Washington County

Vulnerability

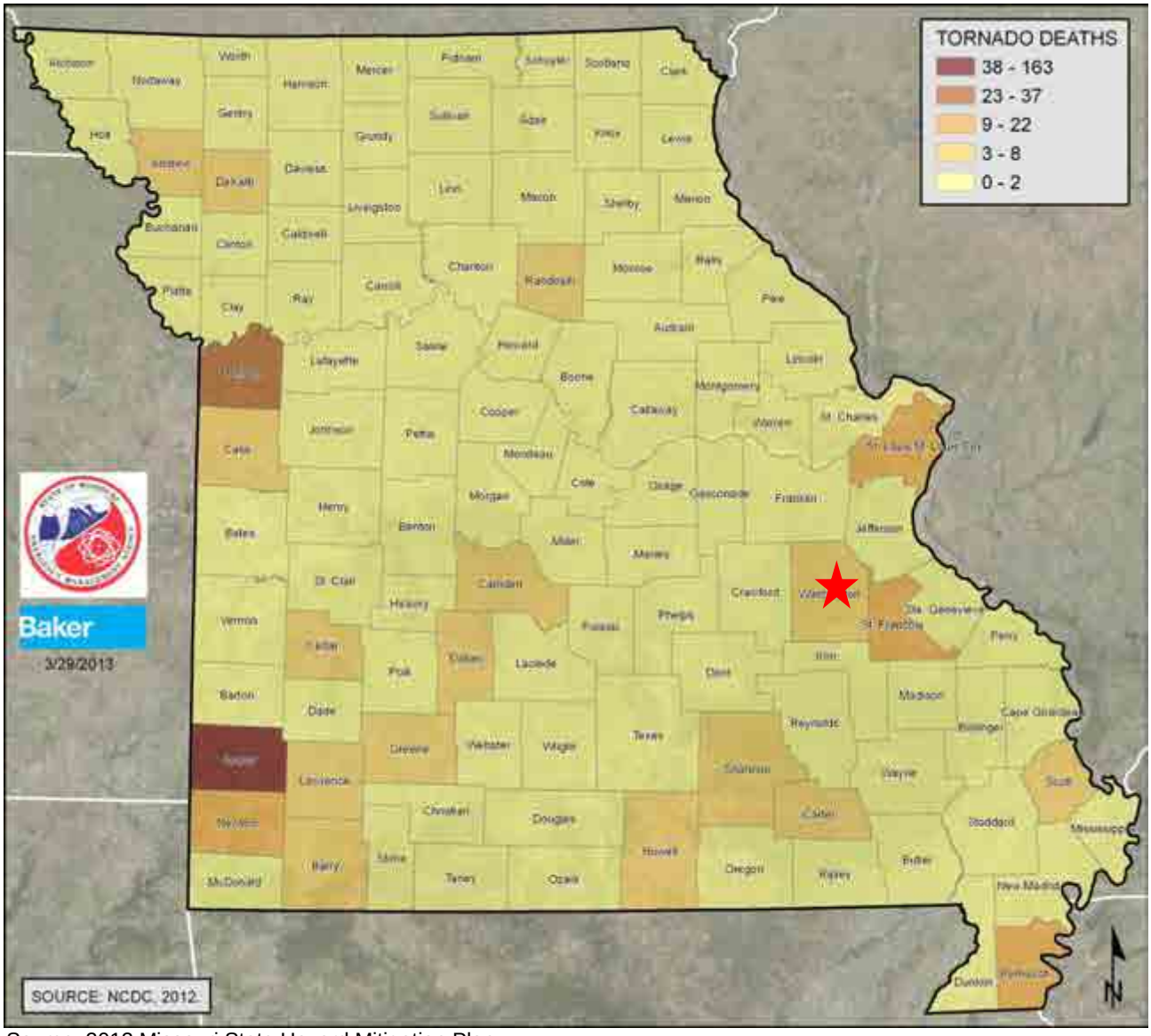
Vulnerability Overview

Washington County resides in a region of the United States that has a high frequency of dangerous and destructive tornadoes. This region seen in **Figure 3.67** is referred to as "Tornado Alley". Furthermore, **Figure 3.68** illustrates areas where perilous tornadoes historically have occurred in Missouri.

Figure 3.67. Tornado Alley in the U.S.

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

Figure 3.68. Missouri Tornado Deaths by county, 1950 – March 17, 2012



Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Washington County

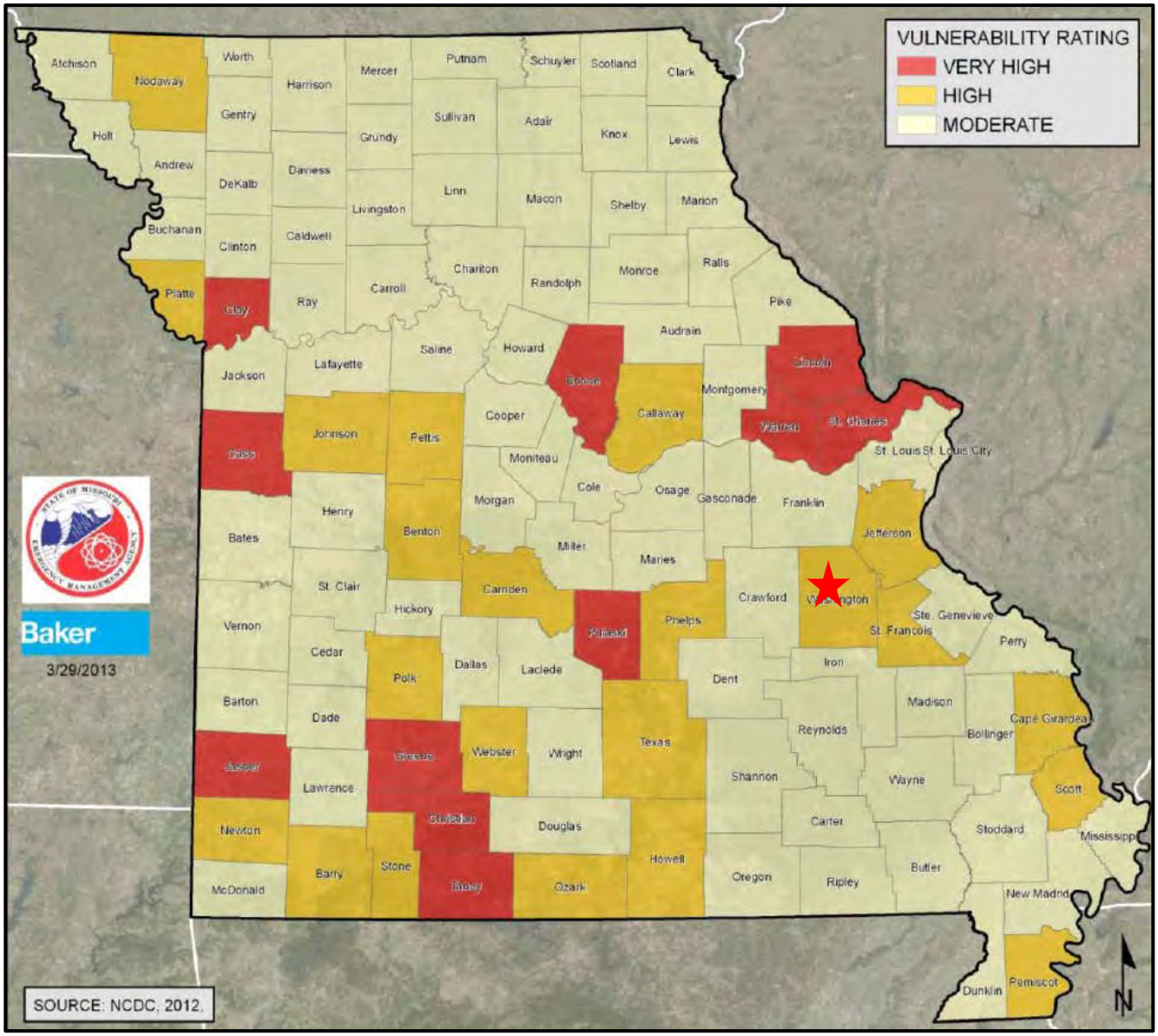
Data was obtained from the 2013 Missouri State Hazard Mitigation Plan for tornado vulnerability. The analysis depicts the likelihood of future tornado impacts, average annual property loss ratio, population change, and house change. Factors were ranked from 1 to 3; moderate, high, and very high, respectively. The factor scores are totaled to estimate Washington County's vulnerability to tornadoes (**Table 3.79**). Since tornadoes are probable to occur across the state, the lowest risk factor is still considered moderate. **Figure 3.69** depicts the vulnerability summary for tornadoes across Missouri by county.

Table 3.79. Factors and Ranges Considered in Tornado Vulnerability Analysis

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

Source: 2013 Missouri State Hazard Mitigation Plan

Figure 3.69. Vulnerability Summary for Tornadoes



Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Washington County

Table 3.80 provides information in regards to tornado probability, potential loss, and risk summary for Washington County. This table was calculated to determine 10 counties with the largest annualized historic tornado losses between 1950 and July 31, 2012 (**Table 3.81** and **Figure 3.70**).

Table 3.80. Tornado Probability, Potential Loss, and Risk Summary

County	# of Tornadoes	Likelihood of Occurrence	Probability Rating	Total Exposure ($)	Annualized Historic Loss	Loss Ratio	Loss Ratio Rating	Population Growth % Change	Pop. Change Rating	House % Change	Housing Ratio Rating	Total Vulnerability
Washington	18	29.27 %	2	$1,678,841,000	$445,988	0.027 %	1	7.9 %	2	11.29 %	1	High

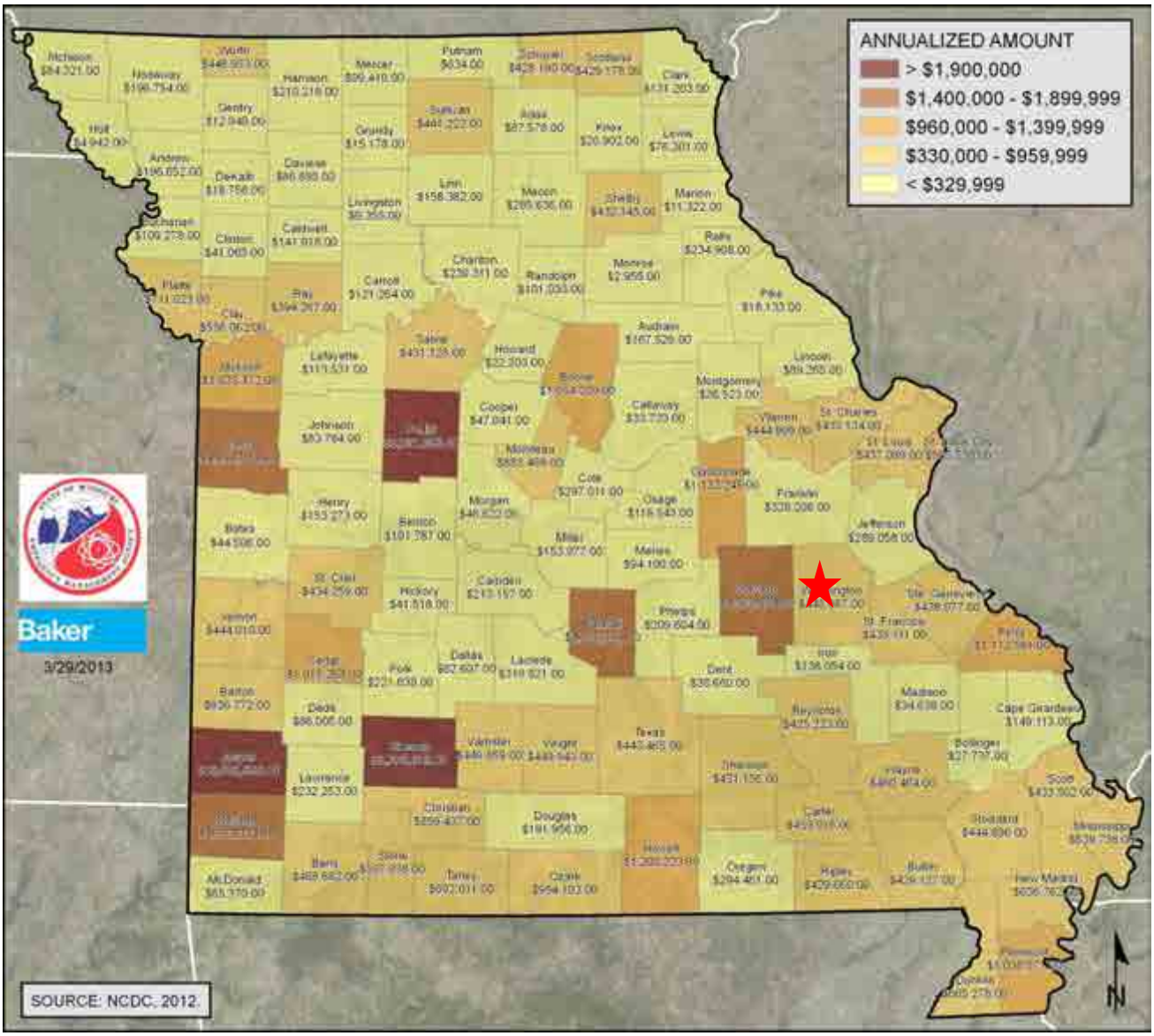
Source: 2013 Missouri State Hazard Mitigation Plan

Table 3.81. Top 10 Counties Ranked by Annualized Historic Tornado Loss 1950 – July 2012

County	Annualized Historic Loss 1950 - July 31, 2012
Jasper	$48,523,987
Greene	$2,305,620
Pettis	$2,031,696
Cass	$1,890,914
Phelps	$1,876,552
Newton	$1,793,334
Crawford	$1,569,054
Perry	$1,172,592
Howell	$1,200,223
Gasconade	$1,132,245

Source: 2013 Missouri State Hazard Mitigation Plan

Figure 3.70. Annualized Tornado Damages



Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Washington County

Potential Losses to Existing Development

The annualized damage for Washington County due to tornadoes is $445,988 (previous 60 years[49]). With this information we can estimate that each year there will be approximately $7,433.13 in loss to existing development. Additionally, the largest recorded tornado in the planning area has been an EF-1. Utilizing this information we can infer that there is potential for another tornado of equivalence.

[49] 2013 Missouri State Hazard Mitigation Plan

Future Development

As populations and development increases across the county, the vulnerability will increase as well. In order to protect jurisdictions from increased tornado vulnerabilities future analysis, training, and implementation should be considered at the planning, engineering, and architectural design stages.

Hazard Summary by Jurisdiction

As previously stated, a tornado event could occur anywhere in the planning area. However, some jurisdictions would suffer heavier damages because of the age of housing or high concentration of mobile homes. See **Table 3.37** for jurisdictions most vulnerable to damage due to the age of the structure. Furthermore, data was obtained from the U.S. Census Bureau for the number of mobile homes in Washington County. From the information provided in **Table 3.82,** Mineral Point, Washington County, and Caledonia are most vulnerable to losses due to the number of mobile homes residing within the jurisdiction.

Table 3.82. Percentage of Mobile Homes in Washington County, 2016

Jurisdiction	Number of Mobile Homes	Percentage of Mobile Homes*
Unincorporated Washington County	3,687	33.9
Caledonia	12	16.4
Irondale	21	11.9
Mineral Point	67	39.0
Potosi	42	3.6

Source: U.S. Census Bureau, 2012-2016 5-Year American Community Survey
*Number of mobile homes per jurisdiction/total housing units per jurisdiction
**Total housing units for all jurisdictions = 10,871

Problem Statement

Early warnings are possibly the best hope for residents when severe weather strikes. While more than two hours warning is not possible for tornados, citizens must immediately be aware when a city will be facing a severe weather incident. Jurisdictions that do not already possess warning systems should plan to purchase a system. Storm shelters are another important means of mitigating the effects of tornados. Additional public awareness also includes coverage by local media sources. A community-wide shelter program should be adopted for residents who may not have adequate shelter in their homes. Residents should also be encouraged to build their own storm shelters to prepare for emergencies. Local governments should encourage residents to purchase weather radios to ensure that everyone has sufficient access to information in times of severe weather.

3.4.10 Winter Weather/Snow/Ice/Severe Cold

Some specific sources for this hazard are:

- Wind chill chart, National Weather Service, http://www.nws.noaa.gov/om/winter/windchill.shtml;
- Average Number of House per year with Freezing Rain, American Meteorological Society. "Freezing Rain Events in the United States." http://ams.confex.com/ams/pdfpapers/71872.pdf;
- USDA Risk Management Agency, Insurance Claims, http://www.rma.usda.gov/data/cause.htm
- Any local Road Department data on the cost of winter storm response efforts.
- National Climatic Data Center, Storm Events Database, http://www.ncdc.noaa.gov/stormevents/

Hazard Profile

Hazard Description

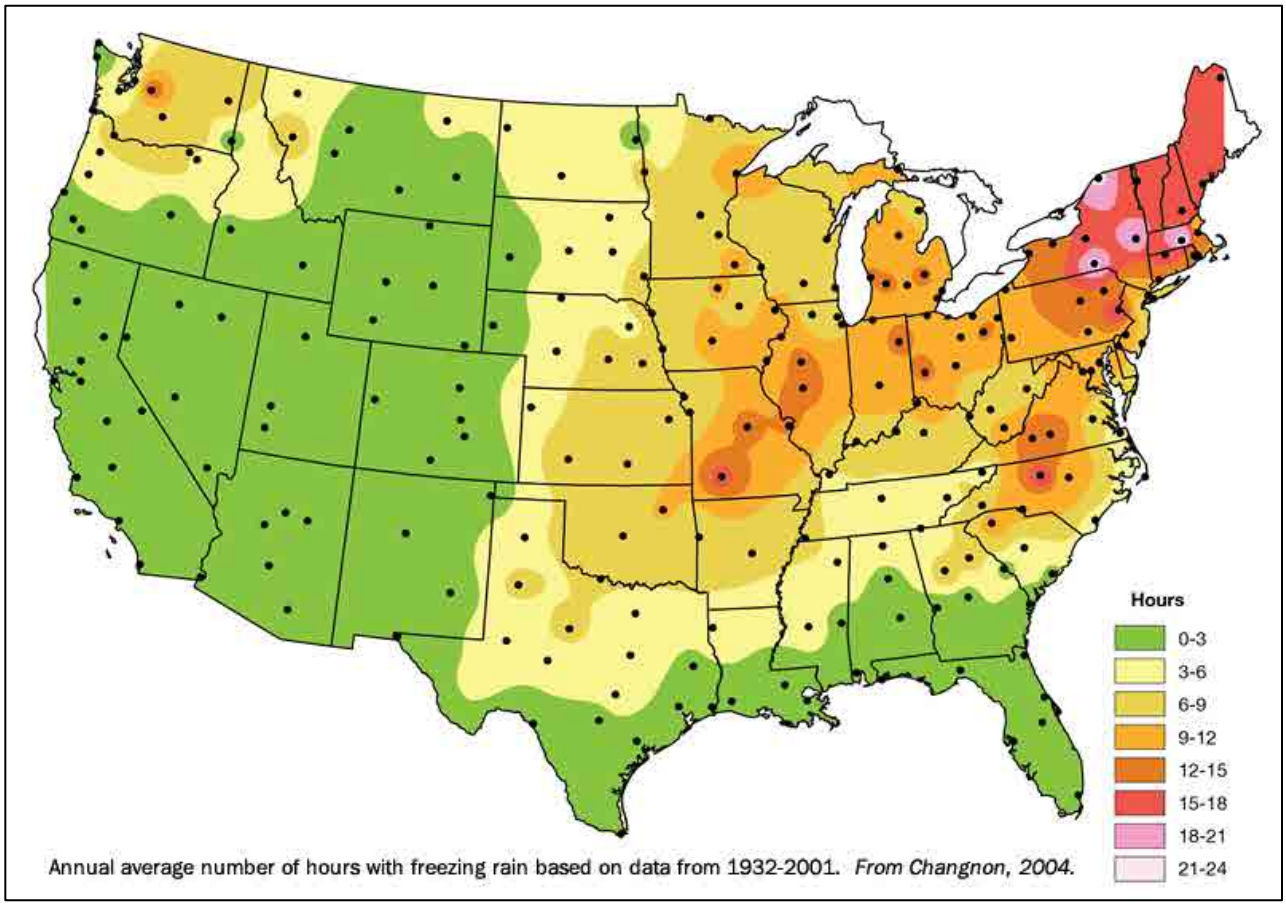
A major winter storm can last for several days and be accompanied by high winds, freezing rain or sleet, heavy snowfall, and cold temperatures. The National Weather Service describes different types of winter storm events as follows.

- **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

Severe winter weather typically strikes Missouri more than once every year. Washington County receives winter weather events from heavy snows to freezing rain annually. Major snowstorms typically occur once each year, causing multiple school closings, as well as suspending business and government activity. Washington County is vulnerable to heavy snow, ice, extreme cold temperatures and freezing rain. **Figure 3.71** illustrates statewide average number of hours per year with freezing rain. Washington County receives approximately 9 to 12 hours.

Figure 3.71. NWS Statewide Average Number of Hours per Year with Freezing Rain



Source: Changon, 2004, http://mrcc.isws.illinois.edu/living_wx/icestorms/

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 those without shelter, those who are stranded, or 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.

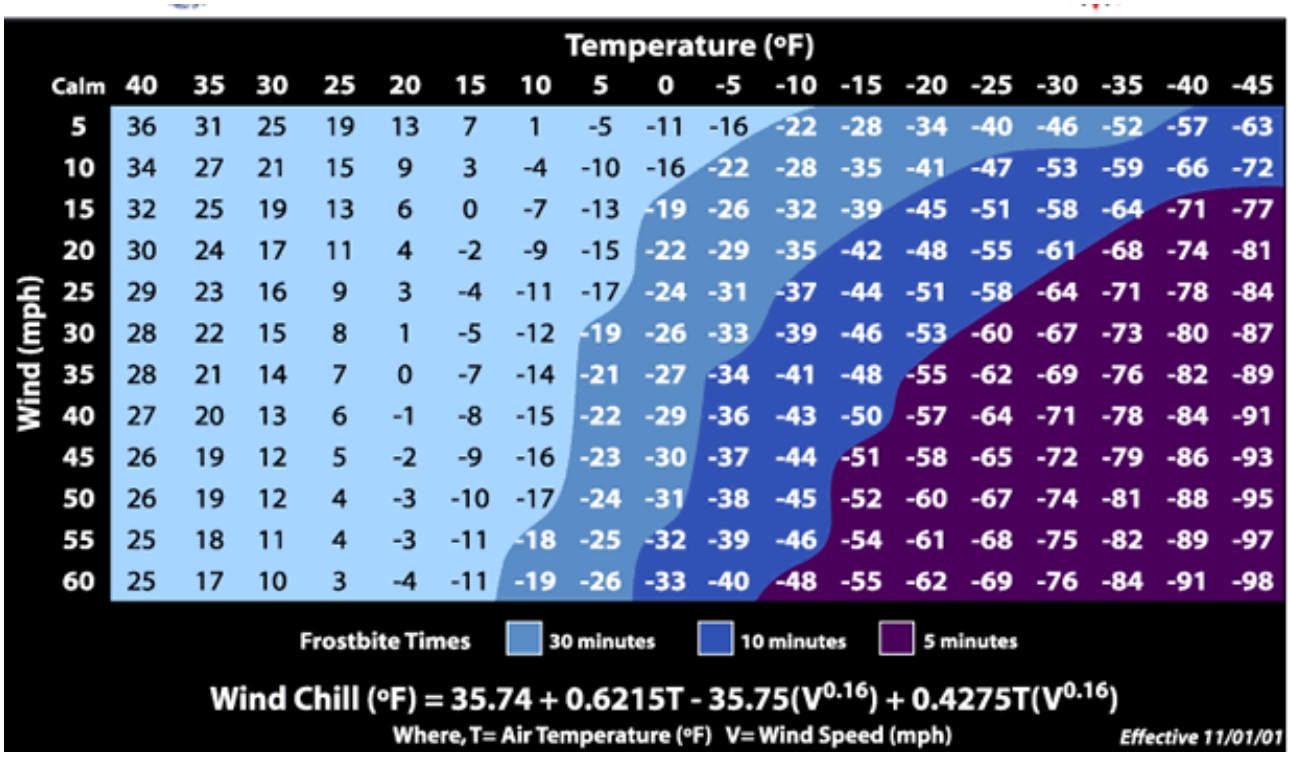
Overhead power lines and infrastructure are also vulnerable to damages from winter storms. In particular, ice accumulation during winter storms can damage power lines and equipment. Damages also occur to lines and equipment from falling trees and tree limbs weighted down by ice. Potential losses could 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 3.72** below shows the relationship of wind speed to apparent temperature and typical time periods for the onset of frostbite.

Winter storms, cold, frost, and freeze all can influence or negatively impact crop production. However, data obtained from the USDA's Risk Management Agency for insured crop losses indicates that there were no claims paid in Washington County between 1998 and 2017 for severe winter weather.

Figure 3.72. Wind Chill Chart



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

Previous Occurrences

Data was obtained from the NCDC for winter weather reported events and damages between 1998 and 2017 **(Table 3.83**). This data includes variables such as blizzard, cold/wind chill, extreme cold/wind chill, heavy snow, ice storm, sleet, winter storm, and winter weather. Additionally, narratives for specific events are listed below.

Table 3.83. NCDC County A Winter Weather Events Summary, 1998 - 2017

Type of Event	Inclusive Dates	# of Injuries	Property Damages	Crop Damages
Winter Storm	1/12/1998	0	0	0
Winter Storm	3/8/1998	0	0	0
Winter Storm	12/21/1998	0	0	0
Winter Storm	1/1/1999	0	0	0
Ice Storm	1/13/1999	0	0	0
Winter Storm	3/13/1999	0	0	0
Winter Storm	1/28/2000	0	0	0
Heavy Snow	12/13/2000	0	0	0
Extreme Cold/Wind	12/16/2000	0	0	0
Ice Storm	2/21/2001	0	0	0
Winter Storm	2/25/2002	0	0	0

Type of Event	Inclusive Dates	# of Injuries	Property Damages	Crop Damages
Winter Storm	12/4/2002	0	0	0
Winter Storm	12/24/2002	0	0	0
Winter Storm	2/23/2003	0	0	0
Winter Storm	2/23/2003	0	0	0
Winter Storm	12/13/2003	0	0	0
Winter Storm	1/25/2004	0	0	0
Winter Storm	12/8/2005	0	0	0
Winter Storm	11/30/2006	0	100.00K	0
Winter Storm	12/1/2006	0	215.00K	0
Winter Weather	12/8/2007	0	0	0
Heavy Snow	12/15/2007	0	0	0
Sleet	2/21/2008	0	0	0
Winter Weather	2/23/2008	0	0	0
Winter Storm	3/3/2008	0	0	0
Winter Storm	1/26/2009	0	0	0
Cold/Wind Chill	1/1/2010	0	0	0
Winter Storm	1/31/2011	0	0	0
Winter Storm	2/1/2011	0	0	0
Winter Storm	2/21/2013	0	0	0
Winter Storm	12/5/2013	0	0	0
Winter Storm	1/5/2014	0	0	0
Cold/Wind Chill	1/6/2014	0	0	0
Winter Storm	3/1/2014	0	0	0
Heavy Snow	2/20/2015	0	0	0
Ice Storm	1/13/2017	0	0	0
Total	**36**	**0**	**315.00K**	**0**

Source: NCDC, data accessed [3/16/18]

Notable Winter Narratives:

1. **11/30/2006 – 12/01/2006:** A major winter storm hit Central, Northeast, East Central and parts of Southeast Missouri from November 30 through December 1. Over a foot of snow fell across parts of Central Missouri while a major ice storm hit parts of East Central and Southeast Missouri, including the St. Louis area. Ice accumulations of 1 inch or more downed trees and power lines resulting in at least 300,000 electric customers losing service for up to a week. Downed limbs and trees damaged homes and automobiles across the area as well. Many rural schools were closed for several days due to slick roads and power outages. The National Guard was called out to several counties to assist with debris removal and other emergency services. In the City of St. Louis the National Guard went door-to-door to check on residents who had lost power. Damages across the region were expected to be in excess of $100 million.

Probability of Future Occurrence

From the data obtained from the NCDC[50], annual average percent probabilities were calculated for winter weather within Washington County (**Table 3.84)**. There were 36 recorded events (**Table 3.83**) over a 20 year period. There is 100 percent annual average probability of winter weather occurrence (36 events/20 years x 100)**,** with an average of 1.8 events per year.

Table 3.84. Annual Average % Probability of Winter Weather in Washington County

Location	Annual Avg. % P	Avg. # of Events
Washington County	100%	1.8

*P = probability; see page 3.24 for definition.

Vulnerability

Vulnerability Overview

Data was obtained from the 2013 Missouri State Hazard Mitigation Plan for vulnerability information regarding Washington County. Various data sources were utilized for statistical analysis including the following:

- National Climatic Data Center (NCDC)
- FEMA's Public Assistance Funds
- Crop Insurance Claims data from the USDA's Risk Management Agency
- HAZUS-MR4
- U.S. Census Data
- USDA's Census of Agriculture

The following Table (**Table 3.85**) includes data elements for severe winter weather.

Table 3.85. Washington County Housing Density, Building Exposure, Crop Exposure, Social Vulnerability Index, Total incidents, Total Property Loss, and Total Crop Insurance Paid Data

County	Housing Units/sq. mi.	Total Building Exposure ($)	Crop Exposure (2007) ($)**	Total Incidences	Total $ Property Los ($)	Total Crop Insurance Paid ($)
Washington	14.5	$1,678,841,000	$711,000	33	$5,300,000	$0

[50] http://www.ncdc.noaa.gov/stormevents/choosedates.jsp?statefips=29%2CMISSOURI

Seven factors were utilized to determine overall severe winter storm vulnerability. These factors include housing density, likelihood of occurrence, building exposure, crop exposure, average annual property loss ratio, average annual crop insurance claims and social vulnerability. Furthermore, 5 rating values were developed for each factor. **Table 3.86** illustrates vulnerability analysis rating factors.

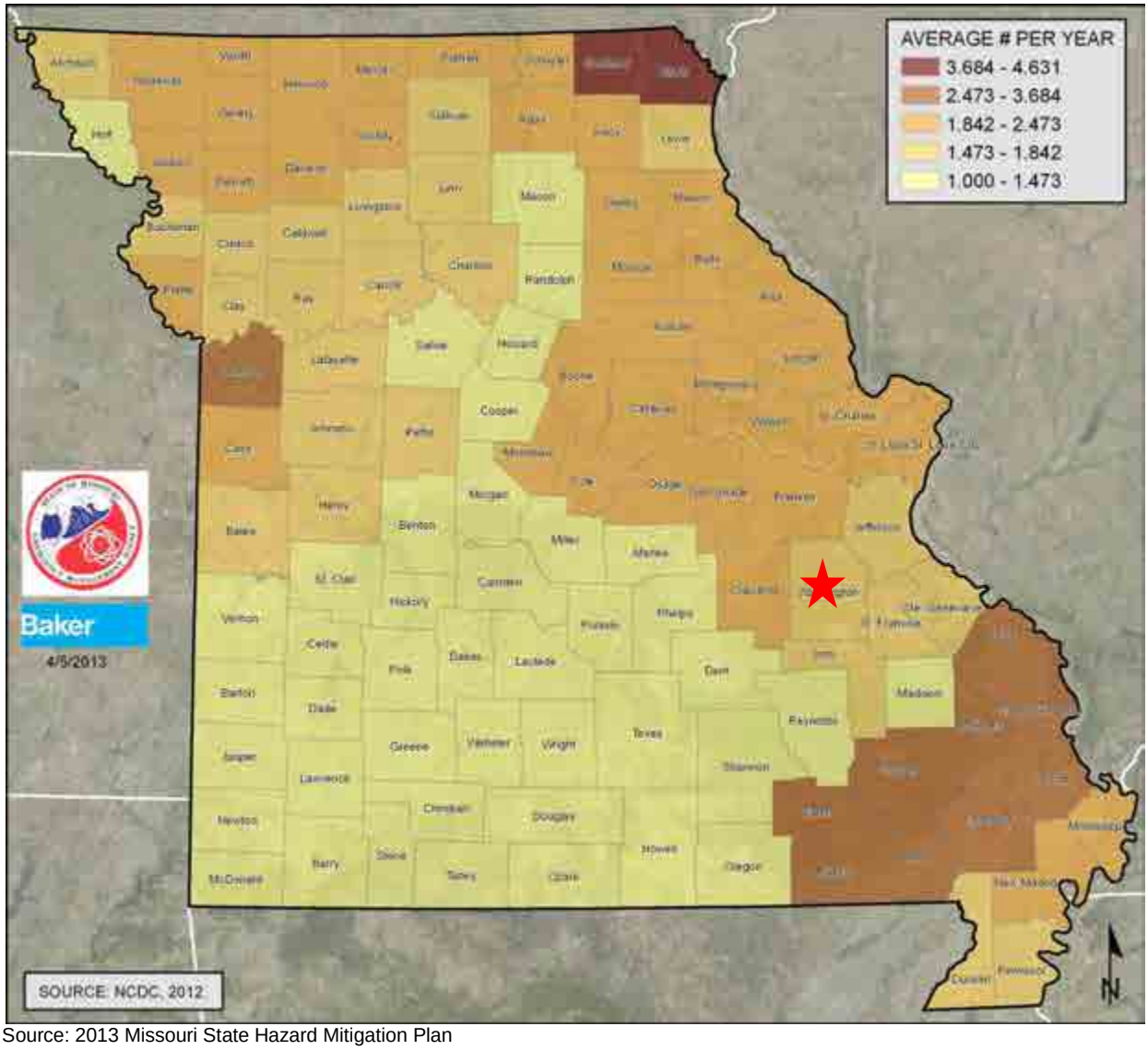
Table 3.86. Vulnerability Analysis Rating Factors

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 (4)	<$10M	$10M to $24M	$25M to $49M	$50M to $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

Source: 2013 Missouri State Hazard Mitigation Plan

Figure 3.73 illustrates the likelihood of occurrence of severe winter weather across Missouri. Washington County was estimated to have an average of 1.473 to 1.842 severe winter weather events per year.

Figure 3.73. Likelihood of Occurrence of Severe Winter Weather



Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Washington County

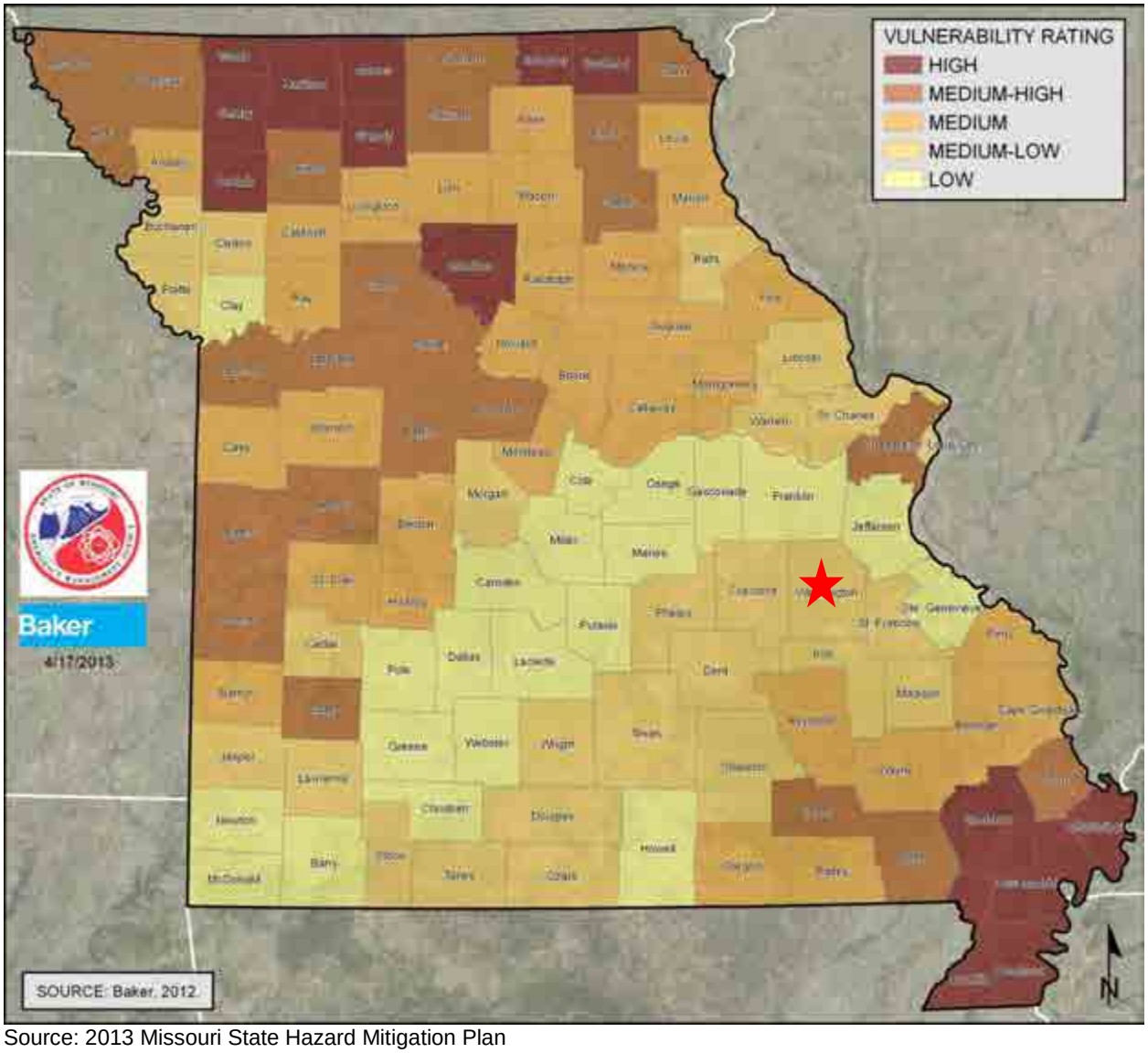
Table 3.87 depicts the calculated vulnerability rating for each factor considered in the vulnerability analysis for severe winter weather hazards. The overall vulnerability rating for severe winter weather in Washington County is medium-low. Moreover, **Figure 3.74** illustrates vulnerability ratings for each county within Missouri.

Table 3.87. Washington County Vulnerability Analysis for Severe Winter Weather

County	Housing Density Rating	Likelihood Rating	Property Loss Rating	Crop Exposure Rating	Crop Loss Ratio Rating	Social Vulnerability Index	Total Score and Vulnerability	Vulnerability Rating
Washington	1	2	2	1	1	4	11	Medium-Low

Source: 2013 Missouri State Hazard Mitigation Plan

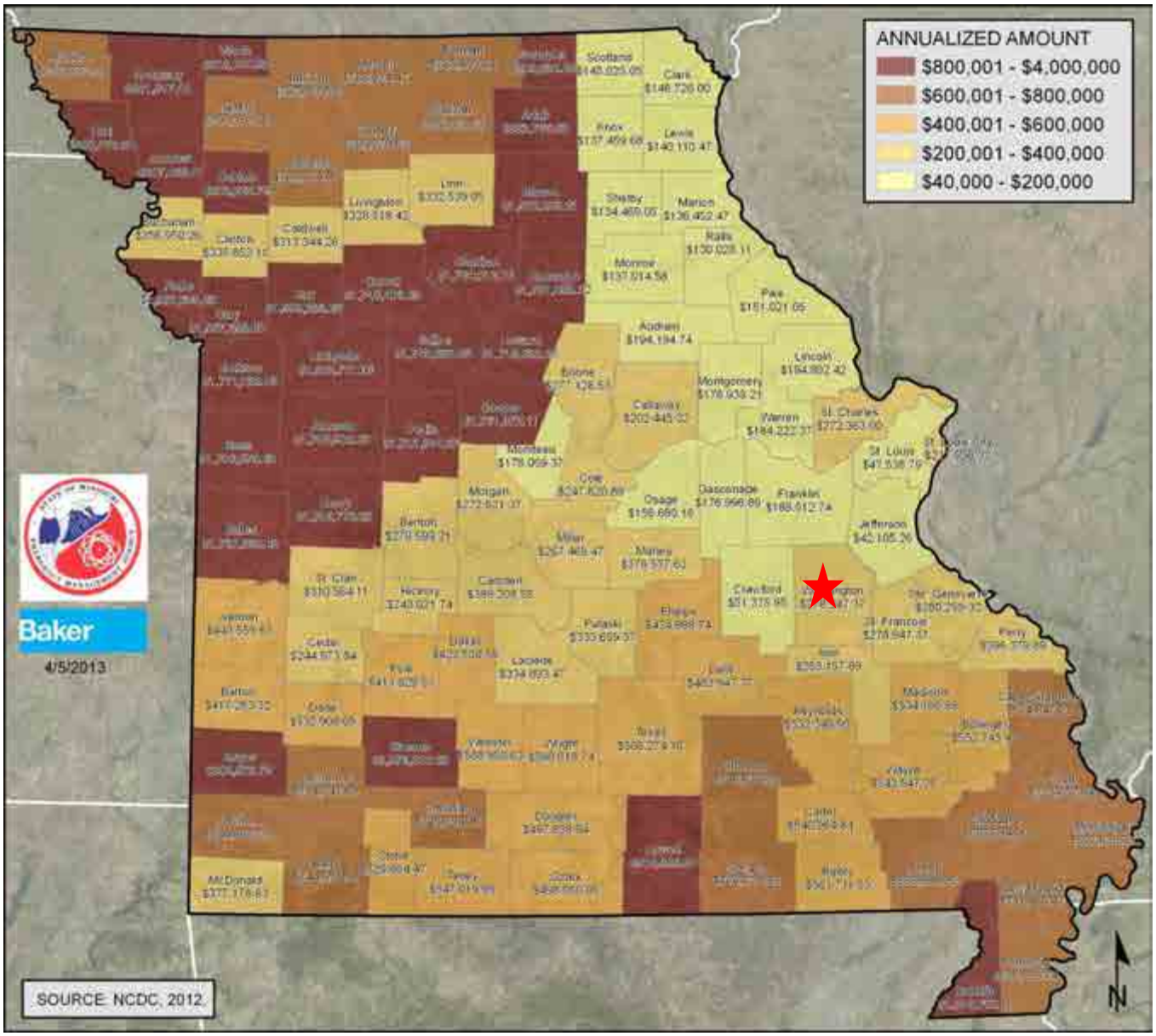
Figure 3.74. Vulnerability Summary for Severe Winter Storm



Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Washington County

Annualized severe winter weather damages were obtained from the 2013 Missouri State Hazard Mitigation Plan. Washington County is estimated as having $200,001 to $400,000 in damages per year due to severe winter weather (**Figure 3.75**).

Figure 3.75. Annualized Severe Winter Weather Damages



Source: 2013 Missouri State Hazard Mitigation Plan
*Red star indicates Washington County

Potential Losses to Existing Development

The next severe winter storm will most likely close schools and businesses for multiple days, and make roadways hazardous for travel. Heavy ice accumulation may damage electrical infrastructures, causing prolonged power outages for large portions of the region. In addition, freezing temperatures make water lines vulnerable to freeze/thaw. Fallen tree limbs also pose a threat to various structures/infrastructures across the county.

Future Development

Data for future development for the planning area is sparse. However, winter weather will affect the county as a whole. Any future development is at risk to damages and increased exposure. In addition, the county's population is anticipated to increase, which would increase the number of individuals at risk during a winter weather event.

Hazard Summary by Jurisdiction

Variations in impacts are not anticipated for severe winter weather across the planning area. Yet, areas with high number of mobile homes tend to experience increased damages. Mineral Point, Washington County, and Caledonia have the highest abundance of mobile homes, making the area more prone to increase exposure to damage.

Problem Statement

In summary, Washington County is expected to experience at least one to two severe winter weather events annually; however the county has a low vulnerability rating. Jurisdictions should enhance their weather monitoring to be better prepared for severe weather hazards. If jurisdictions monitor winter weather, they can dispatch road crews to prepare for the hazard. County and city crews can also trim trees along power lines to minimize the potential for outages due to snow and ice. Citizens should also be educated about the benefits of being proactive to alleviate property damage as well preparing for power outages.

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 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 Washington County's existing hazard mitigation plan originally approved by FEMA in April 2005 and updated and approved by FEMA on March 22, 2013. Therefore, the goals from the updated 2013 Washington 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 first meeting to review and update the plan goals. To ensure that the goals developed for this update were comprehensive and supported State goals, the 2013 State Hazard Mitigation Plan goals were reviewed. As the existing goals were broad, still applicable, and supported the 2013 State Hazard Mitigation Plan goals, the MPC saw no reason to make any changes. The Washington County goals are as follows:

Goal 1: Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.

Goal 2: Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.

Goal 3: Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.

Goal 4: Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.

Goal 5: Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefit of special interests.

Goal 6: Secure resources for investment in hazard mitigation.

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 first MPC meeting, the committee discussed what needed to be updated in the risk assessment. Changes in risk since adoption of the previously approved plan were discussed. Since the last update, there has not been death due to natural hazard events. Action items were reviewed and suggestions made for changes to address the changes in risk. Discussions from the 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.

The focus of Meeting #2 was to review, prioritize and update the mitigation strategy. The MPC reviewed the list of actions proposed in the previous mitigation plan and proposed additional mitigation actions. Facilitators also provided suggestions for actions based on what some of the surrounding counties had included in their plans. Participants were also encouraged to refer to the current State Plan and 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.

During the review of the plan document, MPC members were encouraged to review the details of the risk assessment vulnerability analysis specific to their jurisdiction.

The MPC reviewed the actions from the previously approved plan for progress made since the plan had been adopted. Copies of the list of actions for each jurisdiction were provided to MPC members at planning meetings and were emailed out to all members. Action items were reviewed and the MPC provided updates on the status of action items during both planning meetings and the meeting with the road and bridge department. Each action item was reviewed and assigned one of the following:

- 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
- Deleted, with a discussion of the reasons for deletion.

Based on the status updates, there were eight completed actions, eight deleted actions, and 34 continuing actions.

Table 4.1 provides a summary of the action statuses for each jurisdiction. See **Appendix C: Completed/Deleted Mitigation Actions** for a summary of the completed and deleted actions from the previous plan.

Table 4.1. Summary of Completed and Deleted Actions from the Previous Plan

Completed Actions	**Completion Details (date, amount, funding source)**
1.1.1: Implement an education program on personal emergency preparedness that teaches residents how to prepare emergency medical kits that include water, blankets, flashlights, etc. and how to shut off their home utilities in times of emergency.	This action item has been addressed through Ready in 3 outreach, referrals to information, health dept. press releases, emergency kit giveaways, and social media.
1.1.2: Continue to educate residents about precautions that should be taken during severe heat.	This action item has been addressed by the health dept. by radio announcements, press release, social media, and pamphlets.
1.1.6: Schools need to continue to conduct emergency preparedness exercises on a regular basis.	This action item has been/is being addressed by all school districts within the planning area.
1.2.3: Partner with local radio stations to assure that appropriate warning of impending disasters is provided to all residents in the countywide listening area.	This action item has been/is being addressed (KTJJ, Froggy, KFMO, 104, etc.)
1.3.5: Regularly review and update school emergency plans	All school districts regularly update and review school emergency plans.
3.1.2: Distribute regular press releases from county and city EMD offices concerning hazards, where they strike, frequency, preparation, and how to mitigate.	This action item is included in the day to day operations of the EMDs and health dept.
3.2.1: Encourage local residents to purchase weather radios through press releases and brochures.	This action item has been/is being addressed. Additionally, local residents are encouraged to sign up for Nixel, download weather apps, and following appropriate social media outlets.
3.4.1: Encourage county health department to use publicity campaigns that make residents aware of proper measures to take during times of threatening conditions (e.g. drought or heat wave).	This action item is being addressed through social media, press release, and flyers.
Deleted Actions	**Reason for Deletion**

1.3.7 Encourage the designation of storm shelters and the construction of tornado safe rooms in any facility that typically has large numbers of people present (such as large employers).	This action item has been combined with 1.3.6
Deleted Actions	**Reason for Deletion**
2.1.2 Encourage businesses/government/schools to develop emergency plans.	This action item has been combined with 1.1.3
2.1.3: Monitor developments in data availability concerning the impact of dam failure, tornadoes, sinkholes, land subsidence, and wildfire upon Osage County and all jurisdictions through local, state, and federal agencies for use in hazard	This action item is repetitive and contains an error (Osage County)
4.2.1 Re-evaluate the hazard mitigation plan, merge with other community planning and coordinate and integrate hazard mitigation activities, where appropriate, with emergency operations plans and procedures.	This action item is repetitive and has been combined with 3.3.1.
5.1.1: Promotion of enhanced warning systems and encourage communities to budget for said systems.	This action item is repetitive and has been combined with 1.2.1
5.1.2: Encourage all communities to develop storm water management plans.	This action item was rated as low and removed from the list.
5.1.3:Re-evaluate the hazard mitigation plan, merge with other community planning and coordinate and integrate hazard mitigation activities, where appropriate, with emergency operations plans and procedures.	The planning committee determined this action item to be repetitive.
6.1.1 Encourage meetings between EMD, city/county officials, MRPC and SEMA to familiarize officials with mitigation planning, implementation and budgeting for mitigation projects.	This action item is repetitive and has been combined with 3.2.2.
6.2.2 Implement public awareness program about the benefits of hazard mitigation projects, both public and private.	This action item is repetitive and has been combined with 3.3.2

Source: Previously approved County Hazard Mitigation Plan; MPC committee; data collection questionnaires

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 discuss the actions to be included in 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.

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 worked together to review and assign scores. The process 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?

In addition to the STAPLEE process, each action item was also reviewed for Benefit/Cost. These two aspects of the prioritization process were scored as follows:

Benefit – two (2) points were added for each of the following avoided damages (8 points maximum = highest benefit)

- Injuries and/or casualties
- Property damages
- Loss-of-function/displacement impacts
- Emergency management costs/community costs

Cost – points were subtracted according to the following cost scale (-5 points maximum = highest cost)

- (-1) = Minimal – little cost to the jurisdiction involved
- (-3) = Moderate – definite cost involved but could likely be worked into operating budget
- (-5) = Significant – cost above and beyond most operating budgets; would require extra appropriations to finance or to meet matching funds for a grant

Note: For the Benefit/Cost Review, the benefit and cost of actions which used the word "encourage" were evaluated as if the action or strategy being encouraged was actually to be carried out.

In addition, the group considered the cost of mitigation versus the long-term savings in relation to potential lives saved and property damage avoided.

Total Score – The scores for the STAPLEE Review and Benefit/Cost Review were added to determine a Total Score for each action.

Priority Scale – To achieve an understanding of how a Total Score might be translated into a Priority Rating, a sample matrix was filled out for the possible range of ratings an action might receive on both the STAPLEE and Benefit/Cost Review. The possible ratings tested ranged between:

- A hypothetical action with "Half probably NO and half maybe YES" answers on STAPLEE (i.e. poor STAPLEE score) and Low Benefit/High Cost: Total Score = 7
- A hypothetical action with "All definitely YES" on STAPLEE and High Benefit/Little Cost: Total Score = 28

An inspection of the possible scores within this range led to the development of the following Priority Scale based on the Total Score in the STAPLEE- Benefit/Cost Review process:

20 – 28 points = High Priority
14-19 points = Medium Priority
13 points and below = Low Priority

The results of the STAPLEE process and Benefit/Cost analysis were then mailed out to all MPC members for feedback and consensus.

The final scores are listed below in the analysis of each action. Correspondence regarding the STAPLEE process is included in Appendix C: A spreadsheet with the action items and final scores is illustrated in Figure 4.1.

Jurisdictional Floodplain Management Programs

Every jurisdiction in Washington County regulates development in the floodplain by reviewing permit applications for all development including new and existing structures. Elevation certificates are required for all new construction, and existing structures with 50% or more damage following a flood are required to elevate. Floodplain maps are available in hard copy at each jurisdiction's courthouse or municipal building. Furthermore floodplain maps can be found online through FEMA's website https://msc.fema.gov/portal. Lastly, none of the jurisdictions currently participate in active monitoring activities within the floodplain.

Table 4.1. Jurisdictional Floodplain Ordinance Adoption Date

Community Name	Ordinance Adoption Date
Washington County	12/19/06
Caledonia	11/5/76
Irondale	5/13/77
Mineral Point	8/8/75
Potosi	12/28/73

Source: Data Collection Questionnaires, 2017

Figure 4.4 Prioritization of Mitigation Actions		3 = Def YES 1 = Prob NO 2 = Maybe YES 0 = Def NO													
Action No.	Mitigation Actions	S	T	A	P	L	E	E	STAPLEE Total	Losses Avoided (2 pts. Each)	Benefit	Cost	B/C Total	Total	Priority
1.1.3	Promote development of emergency plans by businesses and public entities by providing information on business continuity and emergency planning through local chambers of commerce and emergency management offices.	3	3	3	3	3	2	3	20	IC, PD, LF, EMCC	8	-1	7	27	H
1.1.4	Continue to provide CERT training and encourage the development of CERT teams.	3	3	3	3	3	2	3	20	IC, PD, LF, EMCC	8	-1	7	27	H
1.1.5	Educate school staff on natural hazards and make sure all staff are familiar with school emergency plan including evacuation and safety procedures.	3	2	2	3	3	2	2	17	IC, PD, LF, EMCC	8	-3	5	22	H
1.2.1	Actively seek funding to assist cities in obtaining early warning systems and improved communication systems and updating existing warning systems.	3	2	2	3	3	2	3	18	IC, PD, LF, EMCC	8	-2	6	24	H
1.2.2	Promote the use of weather radios by local residents to ensure advanced warning about threatening weather.	3	3	3	3	3	3	2	20	IC, PD, LF, EMCC	8	-3	5	25	H
1.2.4	Monitor developments in data availability concerning the impact of dam failure, tornadoes, sinkholes, land subsidence, and wildfire upon Washington County and all jurisdictions through local, state, and federal agencies for use in hazard mitigation planning.	3	3	3	3	3	3	3	21	IC, PD, LF, EMCC	8	-1	7	28	H
1.3.1	Place water height gauges and signs near low water crossings.	3	3	3	3	3	3	3	21	IC, PD, LF, EMCC	8	-1	7	28	H
1.3.2	Provide information on tree trimming and dead tree removal programs to utility companies and local government.	3	2	2	3	3	3	3	19	IC, LF, EMCC	6	-1	5	24	H
1.3.3	Review and consider road and bridge upgrades to improve drainage and reduce flooding and the risk to residents and property.	3	3	2	3	3	2	3	19	IC, EMCC	4	-2	2	21	H
1.3.4	Establish cooling centers where residents can go during extreme heat or power outages.	3	3	3	3	3	2	3	20	IC, PD, LF, EMCC	8	-1	7	27	H

	Figure 4.4 Prioritization of Mitigation Actions	3 = Def YES 1 = Prob NO 2 = Maybe YES 0 = Def NO													
Action No.	Mitigation Actions	S	T	A	P	L	E	E	STAPLEE Total	Losses Avoided (2 pts. Each)	Benefit	Cost	B/C Total	Total	Priority
1.3.6	Disseminate information on the importance of and funding sources for storm shelters and tornado safe rooms near areas of high population densities (large employers).	3	2	2	2	2	1	2	14	IC, LF, EMCC	6	-5	1	15	M
2.1.1	Provide information on self-inspection programs to critical facilities to assess earthquake and tornado resistance.	2	1	1	1	2	1	3	11	IC, PD, LF, EMCC	8	-3	5	16	M
2.1.4	Promote development of emergency plans by businesses and public entities by providing information on business continuity and emergency planning through local chambers of commerce and emergency management offices.	3	2	2	3	3	3	3	19	IC, PD, LF, EMCC	8	-2	6	25	H
2.2.1	Educate residents about the dangers of floodplain development and the benefits of the National Flood Insurance Program.	3	3	3	3	3	3	3	21	IC, PD, LF, EMCC	8	-1	7	28	H
2.2.2	Continue to enforce flood damage prevention/floodplain management ordinances in compliance with NFIP requirements.	3	3	3	3	3	3	3	21	IC, PD, LF, EMCC	8	-1	7	28	H
2.3.1	Develop minimum standards for building codes in county and cities.	1	1	1	2	3	2	2	12	IC, PD, LF, EMCC	8	-3	5	17	M
2.3.2	Have local jurisdictions review their floodplain ordinances and if not included, add language for securing hazardous materials tanks and mobile homes in floodplain areas to reduce hazards during storms and flooding.	1	1	1	1	3	2	3	12	IC, PD, LF, EMCC	8	-3	5	17	M
2.3.3	Encourage the Mark Twain National Forest to levy stricter fines for persons causing fire hazards.	3	2	2	3	3	3	3	19	IC, PD, LF, EMCC	8	-2	6	25	H
3.1.1	Distribute SEMA brochures on natural hazards and preparedness at public facilities and events.	2	3	2	2	3	3	3	18	PD, EMCC	4	-2	2	20	H
3.2.2	Encourage meetings between EMD, city/county officials and SEMA to familiarize officials with mitigation planning, implementation and budgeting for mitigation projects.	3	3	3	3	3	3	3	21	IC, PD, LF, EMCC	8	-1	7	28	H
3.3.1	Re-evaluate the hazard mitigation plan, merge with other community planning and coordinate and integrate hazard mitigation activities, where appropriate, with emergency operations plans and procedures.	2	2	2	2	3	3	3	17	IC, PD, LF, EMCC	8	-3	5	22	H
3.3.2	Implement a public awareness program about the benefits of hazard mitigation projects, both public and private, including distributing press releases by cities/county regarding adopted mitigation measures to keep public abreast of changes and/or new regulations.	1	2	2	2	3	3	3	16	IC, PD, LF, EMCC	8	-1	7	23	H

Figure 4.4 Prioritization of Hazard Mitigation Actions		3 = Def YES 1 = Prob NO 2 = Maybe YES 0 = Def NO.													
Action No.	Mitigation Actions	S	T	A	P	L	E	E	STAPLEE Total	Losses Avoided (2 pts. Each)	Benefit	Cost	B/C Total	Total	Priority
3.4.2	Publicize county or citywide drills.	3	3	2	3	3	2	3	19	IC, EMCC	4	-2	4	21	H
4.1.1	Schedule joint meetings with different organizations/agencies for mitigation planning.	3	3	3	3	3	3	3	21	IC, LF, EMCC	8	-1	7	28	H
4.1.2	Continue to encourage joint training (or drills) between agencies, public and private entities (including schools and businesses)	3	2	2	2	3	3	3	18	IC, LF, EMCC	8	-2	6	24	H
4.1.3	Pool different agency resources to achieve widespread mitigation results.	3	2	2	2	3	3	3	18	IC, LF, EMCC	8	-2	6	24	H
5.1.4	Encourage cities to require contractor storm water management plans in all new development – both residential and commercial properties.	1	1	1	2	2	2	3	12	IC, LF, EMCC	8	-3	5	17	M
5.2.1	Encourage local governments to purchase properties in the floodplain as funds become available and convert that land into public space/recreation area.	1	1	1	1	3	1	3	11	IC, LF, EMCC	8	-5	3	14	M
5.2.2	Encourage communities to discuss zoning repetitive loss properties in the floodplain as open space.	1	1	1	1	3	1	3	11	IC, LF, EMCC	8	-3	5	16	M
6.1.2	Structure grant proposals for road/bridge upgrades so that hazard mitigation concerns are also met.	3	2	2	3	3	3	3	19	IC, LF, EMCC	8	-1	7	26	H
6.1.3	Work with state/local/federal agencies to include mitigation in all economic and community development projects.	3	2	2	3	3	3	3	19	IC, LF, EMCC	8	-1	7	28	H
6.1.4	Provide information to jurisdictions on the benefits of budgeting for and implementing hazard mitigation projects.	3	2	2	3	3	3	3	19	IC, LF, EMCC	8	-1	7	26	H
6.2.1	Provide information on the benefits of local governments implementing cost-share programs with private property owners for hazard mitigation projects that benefit the community as a whole	2	1	1	2	3	1	2	12	IC, LF, EMCC	8	-5	3	15	M
6.3.1	Prioritize mitigation projects, based on cost-effectiveness and starting with those sites facing the greatest threat to life, health, and property.	3	2	2	2	3	3	3	18	IC, LF, EMCC	8	-2	6	24	H

Washington County

Goal 1: Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.

Action 1.1.3: Promote development of emergency plans by businesses and public entities by providing information on business continuity and emergency planning through local chambers of commerce and emergency management offices.

Action Worksheet	
Name of Jurisdiction:	Washington County
Risk / Vulnerability	
Problem being Mitigated:	Absence of emergency plans by businesses.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.1.3
Name of Action or Project:	Promote the development of emergency plans by businesses/government/schools.
Action or Project Description:	Promote development of emergency plans by businesses and public entities by providing information on business continuity and emergency planning through local chambers of commerce and emergency management offices.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	$4,500 - $5,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	27 – High Priority
Timeline for Completion:	1 – 5 years
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard mitigation plan, Meramec Region Community Economic Development Strategy (CEDS) – includes Chapter 8 – Economic Recovery and Resiliency Strategy
Progress Report	
Action Status	Continuing and updated – in progress
Report of Progress	During the last update of the CEDS, a chapter on economic recovery and resiliency was added which is a tool for local leaders to reduce vulnerability to natural hazards and expedite recovery public and private infrastructure. Implementation progress has been restricted due to lack of funding to develop a program to encourage and assist businesses and public entities in developing emergency plans. EMDs are encouraged to share resources available through SEMA and FEMA on emergency planning for businesses and public entities and through chambers of commerce.

Action 1.1.4: Continue to provide CERT training and encourage the development of CERT teams.

Action Worksheet	
Name of Jurisdiction:	Washington County
Risk / Vulnerability	
Problem being Mitigated:	Lack of CERT Teams and CERT training throughout the planning area.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.1.4
Name of Action or Project:	Continue to provide CERT training and encourage the development of CERT teams.
Action or Project Description:	Provide CERT training and encourage the development of CERT teams throughout the planning area.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$2,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	27 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	N/A
Progress Report	
Action Status	In progress and on-going
Report of Progress	There is one CERT team within the county (Richwoods), but is active.

Action 1.2.1: Actively seek funding to assist cities in obtaining early warning systems and improved communication systems and updating existing warning systems.

Action Worksheet	
Name of Jurisdiction:	Washington County
Risk / Vulnerability	
Problem being Mitigated:	Need to improve warning and communications systems throughout the county.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.2.1
Name of Action or Project:	Actively seek funding to assist cities in obtaining early warning systems and improved communication systems and updating existing warning systems.
Action or Project Description:	Provide information to local governments and citizens on the existing warning systems in place in Crawford County and encourage better utilization of those systems. In addition, actively search for funding to improve both warning systems and communications throughout the county.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	Unknown
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Superintendent
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going - with goal of 2020 for having 80 percent or more of the population signed up for Nixel.
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, Hazard Mitigation Plan, School Emergency Plan
Progress Report	
Action Status	Continuing– in progress
Report of Progress	Currently there are storm sirens in Washington Co., Caledonia, and Potosi. Currently the only phone based warning/messaging systems available in the county is Nixle. Kingston K-14 (BlackBoard Connect), Potosi R-III (BlackBoard Connect), and Richwoods R-VII (Textcaster) utilize phone based warning/messaging systems. In addition, the county and cities need to continue to work to improve communications systems within the county to improve county-wide as well as state-wide communications during disasters and joint response efforts.

Action 1.2.2: Promote the use of weather radios by local residents to ensure advanced warning about threatening weather.

Action Worksheet	
Name of Jurisdiction:	Washington County
Risk / Vulnerability	
Problem being Mitigated:	Lack of storm warning systems in rural areas of Washington County
Hazard(s) Addressed:	Severe Storms and Tornados
Action or Project	
Action/Project Number:	1.2.2
Name of Action or Project:	Promote weather radio use
Action or Project Description:	Promote the use of weather radios by local residents to ensure advanced warning about threatening weather.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$2,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	25 – High Priority
Timeline for Completion:	1-5 Years
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard mitigation plan, LEOP
Progress Report	
Action Status	Continuing in progress
Report of Progress	County includes information on weather radios in preparedness kits

Action 1.2.4: Monitor developments in data availability concerning the impact of dam failure, tornadoes, sinkholes, land subsidence, and wildfire upon Washington County and all jurisdictions through local, state, and federal agencies for use in hazard mitigation planning.

Action Worksheet	
Name of Jurisdiction:	Washington County
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with lack of information/data on some hazards such as dam failure, tornadoes, sinkholes, land subsidence and wildfire in Washington County.
Hazard(s) Addressed:	Dam Failure, Tornados, Sinkholes/Land Subsidence, Wildfire
Action or Project	
Action/Project Number:	1.2.4
Name of Action or Project:	Improving information/data for risk assessments and planning
Action or Project Description:	Monitor developments in data availability concerning the impact of dam failure, tornadoes, sinkholes, land subsidence and wildfire upon Crawford County and all jurisdictions through local, state and federal agencies for use in hazard mitigation planning.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$1,500 - $5,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, local planners
Action/Project Priority:	28 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard mitigation plan, LEOPs, floodplain ordinance
Progress Report	
Action Status	Continuing in progress
Report of Progress	The MPC continues to monitor data availability and information sources for additional information that can used in updating and improving the hazard mitigation plan.

Action 1.3.1: Place water height gauges and signs near low water crossings.

Action Worksheet	
Name of Jurisdiction:	Washington County
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with lack of signage and monitoring tools near low water crossings
Hazard(s) Addressed:	Floods
Action or Project	
Action/Project Number:	1.3.1
Name of Action or Project:	Reducing Vulnerability of People
Action or Project Description:	Place water height gauges and signs near low water crossings.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	$2,500 - $3,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties and property damage, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	County Road and Bridge Dept.
Action/Project Priority:	28 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Capital Improvements Plan, Hazard Mitigation Plan
Progress Report	
Action Status	Continuing in Progress
Report of Progress	The county has replaced numerous gauges throughout the county. Progress is on-going.

Action 1.3.2: Provide information on tree trimming and dead tree removal programs to utility companies and local government.

Action Worksheet	
Name of Jurisdiction:	Washington County
Risk / Vulnerability	
Problem being Mitigated:	Power outages due to dead trees/over-hanging limbs
Hazard(s) Addressed:	Severe Storm (Hail/Wind), Tornado, and Severe Winter Weather
Action or Project	
Action/Project Number:	1.3.2
Name of Action or Project:	Provide information on tree trimming and dead tree removal programs to utility companies and local government.
Action or Project Description:	Jurisdictions will continue to trim dead trees and over hanging limbs to prevent power outages during severe weather.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$5,500 - $9,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damage, loss of function/displacement impacts and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Road and Bridge/Utility Departments
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, Hazard Mitigation Plan
Progress Report	
Action Status	Continuing and updated – in progress
Report of Progress	The county's road and bridge dept., along with electrical co-op will continue to trim dead trees and over hanging limbs to protect electrical lines and property.

Action 1.3.3: Review and consider road and bridge upgrades to improve drainage and reduce flooding and the risk to residents and property.

Action Worksheet	
Name of Jurisdiction:	Washington County
Risk / Vulnerability	
Problem being Mitigated:	Risks and vulnerabilities associated with flooding
Hazard(s) Addressed:	Flooding
Action or Project	
Action/Project Number:	1.3.3
Name of Action or Project:	Review and consider road and bridge upgrades to improve drainage and reduce flooding and the risk to residents and property.
Action or Project Description:	Continue to review and consider road and bridge upgrades to improve drainage and reduce flooding and the risk to residents and property.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$5,000 - $10,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damage, loss of function/displacement impacts and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Road and Bridge Department, County Commission
Action/Project Priority:	21 - H
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Transportation Plan, Comprehensive Plan, Regional Transportation Plan
Progress Report	
Action Status	Revised and continuing - in progress
Report of Progress	Jurisdictions regularly consider road and bridge upgrades. CDBG funds are regularly pursued for bridge upgrades.

Action 1.3.4: Establish cooling centers where residents can go during extreme heat or power outages.

Action Worksheet	
Name of Jurisdiction:	Washington County
Risk / Vulnerability	
Problem being Mitigated:	Lack of public access to cooling centers and areas with generators during power outages.
Hazard(s) Addressed:	Extreme Heat
Action or Project	
Action/Project Number:	1.3.4
Name of Action or Project:	Establish cooling centers where residents can go during extreme heat or power outages.
Action or Project Description:	Develop relationships with community businesses, schools, churches, to house public during extreme heat and power outages. Discuss mutual agreements for generators/funding sources.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$1,000 - $50,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, County Commission
Action/Project Priority:	27 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP
Progress Report	
Action Status	Continuing in Progress
Report of Progress	Funding for generators has been a stumbling block in progress.

Action 1.3.6: Disseminate information on the importance of and funding sources for storm shelters and tornado safe rooms near areas of high population densities (large employers).

Action Worksheet	
Name of Jurisdiction:	Washington County
Risk / Vulnerability	
Problem being Mitigated:	Lack of storm shelters and tornado safe rooms
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.3.6
Name of Action or Project:	Disseminate information on the importance of and funding sources for storm shelters and tornado safe rooms near areas of high population densities (large employers).
Action or Project Description:	Designation of storm shelters and tornado safe rooms where large numbers of people congregate.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	Unknown
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Superintendent
Action/Project Priority:	15 – Medium
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, Hazard Mitigation Plan, School Emergency Plan
Progress Report	
Action Status	Continuing– in progress
Report of Progress	Kingston K-14 and Valley-VI both have storm shelters

Goal 2: Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.

Action 2.1.1: Provide information on self-inspection programs to critical facilities to assess earthquake and tornado resistance.

Action Worksheet	
Name of Jurisdiction:	Washington County
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with construction of critical facilities which may make them vulnerable to earthquakes and tornadoes
Hazard(s) Addressed:	Earthquakes, Tornados
Action or Project	
Action/Project Number:	2.1.1
Name of Action or Project:	Critical facility inspection
Action or Project Description:	Provide information on self-inspection programs to critical facilities to assess earthquake and tornado resistance.
Applicable Goal Statement:	Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.
Estimated Cost:	$1,500 – $5,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damage, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	County EMD, local emergency response agencies
Action/Project Priority:	16 – Medium Priority
Timeline for Completion:	1 – 5 years
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, capital improvement plans, hazard mitigation plan, local critical facility budgets
Progress Report	
Action Status	Continuing – in progress
Report of Progress	Kingston K-14 and Valley R-VI both have built structures to resist tornado and earthquake damage.

Action 2.1.4: Promote development of emergency plans by businesses and public entities by providing information on business continuity and emergency planning through local chambers of commerce and emergency management offices.

Action Worksheet	
Name of Jurisdiction:	Washington County
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities of natural hazard damages to businesses and public resources.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	2.1.4
Name of Action or Project:	Property & Infrastructure Protection
Action or Project Description:	Promote development of emergency plans by businesses and public entities by providing information on business continuity and emergency planning through local chambers of commerce and emergency management offices.
Applicable Goal Statement:	Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.
Estimated Cost:	$5,000 - $10,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMDs, County Commission, City Councils
Action/Project Priority:	25 – High Priority
Timeline for Completion:	5 years
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, Meramec Regional CEDS
Progress Report	
Action Status	In-progress and on-going
Report of Progress	Most jurisdictions have not had the resources available to complete emergency plans for their planning area. In some cases they fall under the county plan.

Action 2.2.1: Educate residents about the dangers of floodplain development and the benefits of the National Flood Insurance Program.

Action Worksheet	
Name of Jurisdiction:	Washington County
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with the general public not being aware of the dangers of floodplain development and benefits of the NFIP.
Hazard(s) Addressed:	Floods
Action or Project	
Action/Project Number:	2.2.1
Name of Action or Project:	Floodplain education/awareness program.
Action or Project Description:	Educate residents about the dangers of floodplain development and the benefits of the National Flood Insurance Program.
Applicable Goal Statement:	Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.
Estimated Cost:	$1,500 - $4,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damage, loss of function/displacement impacts and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	County EMD and floodplain manager
Action/Project Priority:	28 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard mitigation plan, LEOP, floodplain management ordinance
Progress Report	
Action Status	In-progress and on-going
Report of Progress	The county floodplain manager actively distributes brochures, press releases and information on floodplain management and development requirements.

Action 2.2.2: Continue to enforce flood damage prevention/floodplain management ordinances in compliance with NFIP requirements.

Action Worksheet	
Name of Jurisdiction:	Washington County
Risk / Vulnerability	
Problem being Mitigated:	The need to improve floodplain management enforcement procedures that will help reduce risk and vulnerability.
Hazard(s) Addressed:	Floods
Action or Project	
Action/Project Number:	2.2.2
Name of Action or Project:	Continue to enforce flood damage prevention/floodplain management ordinances in compliance with NFIP requirements.
Action or Project Description:	The city floodplain manager, with the assistance of the board of aldermen, needs to establish enforcement procedures to make sure the city stays in compliance with the city floodplain management ordinance and NFIP requirements.
Applicable Goal Statement:	Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.
Estimated Cost:	$4,500 - $5,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Floodplain Managers
Action/Project Priority:	28 – High Priority
Timeline for Completion:	1 – 5 years
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Jurisdictional Ordinances
Progress Report	
Action Status	Continuing– in progress
Report of Progress	Jurisdictions would benefit from establishing procedures for enforcing the ordinance.

Action 2.3.1: Provide information on the benefits of establishing minimum building codes to those jurisdiction that currently lack minimum building code requirements.

Action Worksheet	
Name of Jurisdiction:	Washington County
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities to property and communities in the event of a natural disaster due to substandard construction.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	2.3.1
Name of Action or Project:	Information/awareness program for the benefits of minimum building codes.
Action or Project Description:	Provide information on the benefits of establishing minimum building codes to those jurisdictions that currently lack minimum building code requirements.
Applicable Goal Statement:	Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.
Estimated Cost:	$3,000 - $10,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	County Commission and City Councils
Action/Project Priority:	17 – Medium Priority
Timeline for Completion:	5 years
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services
Local Planning Mechanisms to be Used in Implementation, if any:	N/A
Progress Report	
Action Status	Continuing Not Started
Report of Progress	There has been no progress in this area due to the communities not having the resources to enforce building codes.

Action 2.3.2: Have local jurisdictions review their floodplain ordinances and if not included, add language for securing hazardous materials tanks and mobile homes in floodplain areas to reduce hazards during storms and flooding.

Action Worksheet	
Name of Jurisdiction:	Washington County
Risk / Vulnerability	
Problem being Mitigated:	Unsecured hazardous materials tank such as propane and unsecured mobile homes pose risks during floods, severe storms and tornadoes.
Hazard(s) Addressed:	Floods, Severe Storms, and Tornados
Action or Project	
Action/Project Number:	2.3.2
Name of Action or Project:	Establishing regulations for the securing of hazardous materials tanks and mobile homes.
Action or Project Description:	Have local jurisdictions review their floodplain ordinances and if not included, add language for securing hazardous materials tanks and mobile homes in floodplain areas to reduce hazards during storms and flooding.
Applicable Goal Statement:	Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.
Estimated Cost:	$2,500 - $5,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Crawford County Commission
Action/Project Priority:	17 – Medium Priority
Timeline for Completion:	1 – 5 years
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard mitigation plan, LEOP, floodplain ordinances, building codes
Progress Report	
Action Status	Continuing – in progress
Report of Progress	No progress has been made on this action item.

Action 2.3.3: Encourage the Mark Twain National Forest to levy stricter fines for persons causing fire hazards.

Action Worksheet	
Name of Jurisdiction:	Washington County
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with wildfires
Hazard(s) Addressed:	Wildfire
Action or Project	
Action/Project Number:	2.3.3
Name of Action or Project:	Encourage the Mark Twain National Forest to levy stricter fines for persons causing fire hazards.
Action or Project Description:	Pursue and encourage stricter fines for individuals causing fire hazards/arson on Mark Twain National Forest lands.
Applicable Goal Statement:	Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.
Estimated Cost:	$1,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, County Commission
Action/Project Priority:	25 – High Priority
Timeline for Completion:	1-5 Years
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs
Progress Report	
Action Status	In-progress
Report of Progress	No information was provided by the MPC.

Goal 3: Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.

Action 3.1.1: Distribute SEMA brochures on natural hazards and preparedness at public facilities and events.

Action Worksheet	
Name of Jurisdiction:	Washington County
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with lack of awareness of emergency management and best practices during hazardous events.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.1.1
Name of Action or Project:	Distribute SEMA brochures on natural hazards and preparedness at public facilities and events.
Action or Project Description:	Provide information by distributing SEMA brochures and press releases on types of hazards, best practices during a disaster (Ready in 3) and other informational documents.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities
Estimated Cost:	$1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	City EMD, local emergency response agencies, county health department
Action/Project Priority:	20 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP
Progress Report	
Action Status	Continuing in Progress
Report of Progress	The health department and some local emergency response agencies regularly distribute emergency related brochures and information at local events. The county EMD and health department also distribute press releases on hazards and how to prepare for them.

Action 3.2.2: Encourage meetings between EMD, city/county officials and SEMA to familiarize officials with mitigation planning, implementation and budgeting for mitigation projects.

Action Worksheet	
Name of Jurisdiction:	Washington County
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with lack of knowledge/understanding of the importance of hazard mitigation activities
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.2.2
Name of Action or Project:	Awareness/education program on hazard mitigation for local elected officials and planning organizations
Action or Project Description:	Ask SEMA mitigation specialists to present information to city councils, county commission and local planning organizations.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities
Estimated Cost:	$1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	County Commission, EMD
Action/Project Priority:	28 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs, Floodplain Ordinance
Progress Report	
Action Status	Continuing in progress
Report of Progress	The Region C SEMA area coordinator conducts quarterly meetings in the region and has included hazard mitigation in those meetings. In addition, MRPC has had presentations on hazard mitigation at its meetings that included representatives from Washington County.

Action 3.3.1: Re-evaluate the hazard mitigation plan, merge with other community planning and coordinate and integrate hazard mitigation activities, where appropriate, with emergency operations plans and procedures.

Action Worksheet	
Name of Jurisdiction:	Washington County
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with not regularly reviewing and updating the mitigation plan and incorporating mitigation activities into emergency operations plans and procedures.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.3.1
Name of Action or Project:	Re-evaluate the hazard mitigation plan and merge with other community planning activities.
Action or Project Description:	Re-evaluate the hazard mitigation plan, merge with other community planning activities and documents and incorporate hazard mitigation into the long-range planning and development activities of the county and each jurisdiction.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities
Estimated Cost:	$5,500 - $10,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	County EMD, Local Planners, MPC
Action/Project Priority:	22 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOPs, hazard mitigation plan, school crisis management plans, comprehensive plans, builder's plans, capital improvement plan, economic development plan, transportation plan, land-use plan, floodplain ordinances, storm water plans/ordinances
Progress Report	
Action Status	Continuing in Progress
Report of Progress	Hazard mitigation goals and actions have been incorporated into the regional Community and Economic Development Strategy. Mitigation actions are part of the county LEOP. As more local officials become familiar with mitigation and understand how it fits within other planning activities, this action item will continue to expand.

Action 3.3.2: Implement a public awareness program about the benefits of hazard mitigation projects, both public and private, including distributing press releases by cities/county regarding adopted mitigation measures to keep public abreast of changes and/or new regulations.

Action Worksheet	
Name of Jurisdiction:	Washington County
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with the public's lack of knowledge in regards to hazard mitigation and the benefits of adopting mitigation measures.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.3.2
Name of Action or Project:	Awareness program on local mitigation activities.
Action or Project Description:	Distribute press releases by cities/county regarding adopted mitigation measures
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.
Estimated Cost:	$500-$1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	County EMD, County Commission
Action/Project Priority:	23 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, hazard mitigation plan, floodplain ordinance
Progress Report	
Action Status	Continuing in Progress
Report of Progress	The county regularly does press releases on road and bridge upgrades

Action 3.4.2: Publicize county or citywide drills.

Action Worksheet	
Name of Jurisdiction:	Washington County
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with the lack of knowledge in regards to the proper measures to take during hazard events.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.4.2
Name of Action or Project:	Publicize county or citywide drills.
Action or Project Description:	Publicize county or citywide drills to make the general public aware of training/exercises being conducted locally and raise awareness of emergency preparedness and what measures should be taken.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.
Estimated Cost:	$500 - $1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	21– High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOPs
Progress Report	
Action Status	Continuing in Progress
Report of Progress	This is an on-going activity. Local governments make the public aware of drills/trainings/exercises through press releases to the media and follow up articles on drills. SEMA also publicizes drills that are being done on a regional or statewide level.

Goal 4: Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.

Action 4.1.1: Schedule joint meetings with different organizations/agencies for mitigation planning.

Action Worksheet	
Name of Jurisdiction:	Washington County
Risk / Vulnerability	
Problem being Mitigated:	Lack of synergy/communication among organizations/agencies for mitigation related planning.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	4.1.1
Name of Action or Project:	Schedule joint meetings with different organizations/agencies for mitigation planning.
Action or Project Description:	Schedule joint meetings with different organizations/agencies for mitigation planning and continued communications amongst jurisdictions/organizations/agencies.
Applicable Goal Statement:	Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.
Estimated Cost:	$500 - $1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMDs
Action/Project Priority:	28 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP
Progress Report	
Action Status	Continuing in Progress
Report of Progress	This is an on-going activity. Region C Fire Chiefs meet regularly. The Region C SEMA area coordinator holds quarterly meetings throughout the region.. This program could benefit from a more coordinated, focused effort to bring different agencies together to discuss mitigation issues.

Action 4.1.2: Continue to encourage joint training (or drills) between agencies, public and private entities (including schools and businesses).

Action Worksheet	
Name of Jurisdiction:	Washington County
Risk / Vulnerability	
Problem being Mitigated:	Lack of synergy/communication/coordination among agencies, public, and private entities on disaster training and emergency drills/exercises.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	4.1.2
Name of Action or Project:	Encourage joint training/drills/exercises among all jurisdictions and local businesses.
Action or Project Description:	Continue to encourage joint training (and drills) between agencies, public and private entities (including schools/businesses).
Applicable Goal Statement:	Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.
Estimated Cost:	$1,000 - $10,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	County EMD, City EMDs, Emergency Response Agencies, School Superintendents
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOPS, School Emergency Plan
Progress Report	
Action Status	Continuing in Progress
Report of Progress	Jurisdictions, EMDs and emergency response agencies within Washington County cooperate on training and drills on a regular basis. Fire and police departments regularly train with local school districts. The Region C SEMA area coordinator works with local entities throughout the area to do at least one exercise each year that is either regional or state-wide. The Meramec Regional Emergency Planning Committee (MREPC) coordinates tabletop and full-scale exercises from time to time throughout the region.

Action 4.1.3: Pool different agency resources to achieve widespread mitigation results.

Action Worksheet	
Name of Jurisdiction:	Washington County
Risk / Vulnerability	
Problem being Mitigated:	Lack of resources among agencies which hinder mitigation results.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	4.1.3
Name of Action or Project:	Pooling resources for mitigation activities
Action or Project Description:	Pool different agency resources to achieve widespread mitigation planning results.
Applicable Goal Statement:	Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.
Estimated Cost:	$1,000 - $4,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, County Commission
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation plan, LEOPs, Capital Improvement plans, Comprehensive plans, Strategic plans
Progress Report	
Action Status	Continuing in Progress
Report of Progress	All jurisdictions reported that they are interested in finding ways to pool resources to accomplish mitigation projects. There has been interest in thinking outside the box on funding upgrades to low water crossing projects and tapping into different funding sources (Missouri Department of Conservation funds to protect endangered species and open streams to allow free movement of fish.)

Goal 5: Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefit of special interests.

Action 5.2.1: Encourage local governments to purchase properties in the floodplain as funds become available and convert that land into public space/recreation area.

Action Worksheet	
Name of Jurisdiction:	Washington County
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with floodplain properties
Hazard(s) Addressed:	Floods
Action or Project	
Action/Project Number:	5.2.1
Name of Action or Project:	Government purchase of properties in the floodplain
Action or Project Description:	Encourage local governments to purchase properties in the floodplain as funds become available and convert that land into public space/recreation area.
Applicable Goal Statement:	Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefits of special interests.
Estimated Cost:	$1,000 - $100,000
Benefits:	Losses avoided by implementing this action include property damage, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Local Government, County & City EMDs, Floodplain Managers
Action/Project Priority:	14 – Medium Priority
Timeline for Completion:	Continuous
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Floodplain Ordinance, Comprehensive Plans, Hazard Mitigation Plan
Progress Report	
Action Status	Continuing
Report of Progress	No progress

Action 5.2.2: Encourage communities to discuss zoning repetitive loss properties in the floodplain as open space.

Action Worksheet	
Name of Jurisdiction:	Washington County
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with repetitive loss properties.
Hazard(s) Addressed:	Floods
Action or Project	
Action/Project Number:	5.2.2
Name of Action or Project:	Zoning repetitive loss properties as open space.
Action or Project Description:	Encourage communities to discuss zoning repetitive loss properties in the floodplain as open space.
Applicable Goal Statement:	Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefits of special interests.
Estimated Cost:	$1,500 - $5,500
Benefits:	Losses avoided by implementing this action include property damage, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	City Government, Local Planners, City EMDs, Floodplain Managers
Action/Project Priority:	16 – Medium Priority
Timeline for Completion:	Continuous
Potential Fund Sources:	Local general revenue funds
Local Planning Mechanisms to be Used in Implementation, if any:	Floodplain ordinances, Hazard Mitigation plan, comprehensive plans, strategic plans
Progress Report	
Action Status	Continuing – no progress
Report of Progress	No action has been taken thus far.

Goal 6: Secure resources for investment in hazard mitigation.

Action 6.1.2: Structure grant proposals for road/bridge upgrades so that hazard mitigation concerns are also met.

Action Worksheet	
Name of Jurisdiction:	Washington County
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities in relation to inadequate roads/bridges
Hazard(s) Addressed:	Severe Winter Weather, Extreme Heat, Flooding
Action or Project	
Action/Project Number:	6.1.2
Name of Action or Project:	Structure grant proposals for road/bridge upgrades so that hazard mitigation concerns are also met.
Action or Project Description:	Actively seek and structure grant proposals for road/bridge upgrades to also cover hazard mitigation concerns and action items.
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	$5,000 - $5 Million
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	County Commission, Road and Bridge Dept.
Action/Project Priority:	26 – High Priority
Timeline for Completion:	1-5 Years
Potential Fund Sources:	Grants
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Transportation Plan, Regional Transportation Plan
Progress Report	
Action Status	Continuing in Progress
Report of Progress	Lack of financial resources for construction/upgrades continues to be the main obstacle

Action 6.1.3: Work with state/local/federal agencies to include mitigation in all economic and community development projects.

Action Worksheet	
Name of Jurisdiction:	Washington County
Risk / Vulnerability	
Problem being Mitigated:	Lack of synergy/communication/coordination of mitigation in community development projects and integration of mitigation actions into economic and community development projects.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	6.1.3
Name of Action or Project:	Coordination with state/local/federal agencies to integrate mitigation into economic and community development projects
Action or Project Description:	Work with state/local/federal agencies to include mitigation in all economic and community development projects.
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	$2,500 - $9,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	County Commission
Action/Project Priority:	28 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Capital Improvement Plans, Comprehensive Plans, Economic Development Plans, CEDS, strategic plans, land-use plans
Progress Report	
Action Status	Continuing in Progress
Report of Progress	Hazard mitigation goals and actions have been incorporated into the regional Community Economic Development Strategy (CEDS). As mitigation awareness grows, additional efforts will be made to incorporate mitigation activities into economic and community development projects.

Action 6.1.4: Provide information to jurisdictions on the benefits of budgeting for and implementing hazard mitigation projects.

Action Worksheet	
Name of Jurisdiction:	Washington County
Risk / Vulnerability	
Problem being Mitigated:	Lack of funding for mitigation projects among local jurisdictions
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	6.1.4
Name of Action or Project:	Budgeting and implementing hazard mitigation projects.
Action or Project Description:	Provide information to jurisdictions on the benefits of budgeting for and implementing hazard mitigation projects.
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	$500 - $1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, County Commission
Action/Project Priority:	26 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Local general revenue funds
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Capital Improvements Plans, Comprehensive Plans, CEDS, strategic plans, LEOPs
Progress Report	
Action Status	Continuing in Progress
Report of Progress	As awareness of the importance of mitigation grows, more local jurisdictions are seeing the long-term benefits and working toward budgeting for mitigation activities.

Action 6.2.1: Provide information on the benefits of local governments implementing cost-share programs with private property owners for hazard mitigation projects that benefit the community as a whole.

Action Worksheet	
Name of Jurisdiction:	Washington County
Risk / Vulnerability	
Problem being Mitigated:	Lack of cost-share programs with private property owners for hazard mitigations projects.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	6.2.1
Name of Action or Project:	Encourage development and implementation of mitigation cost-share programs
Action or Project Description:	Provide information on the benefits of local governments implementing cost-share programs with private property owners for hazard mitigation projects that benefit the community as a whole
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	$ unknown – dependent upon projects and interest
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	County Commission
Action/Project Priority:	15 – Medium Priority
Timeline for Completion:	5 -10 years to implement and then on-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Capital Improvement Plans, Comprehensive Plans
Progress Report	
Action Status	Continuing in Progress
Report of Progress	The county and Potosi are currently implementing cost-share programs that will benefit the jurisdiction as a whole.

Action 6.3.1: Prioritize mitigation projects, based on cost-effectiveness and starting with those sites facing the greatest threat to life, health, and property.

Action Worksheet	
Name of Jurisdiction:	Washington County
Risk / Vulnerability	
Problem being Mitigated:	Lack of organization/priority of mitigation projects based on cost-effectiveness, and severity in regards to threat to life, health, and property.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	6.3.1
Name of Action or Project:	Prioritizing mitigation projects
Action or Project Description:	Prioritize mitigation projects, based on cost-effectiveness and starting with those sites facing the greatest threat to life, health and property.
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	$1,500 - $4,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, County Commission
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan
Progress Report	
Action Status	Continuing in Progress
Report of Progress	Hazard mitigation projects were prioritized in the initial plan. The MPC reviewed and updated that list of prioritized items, including considering the greatest threat to life, health and property. This is an on-going activity. The list of prioritized action items should be reviewed at a minimum of every five years and following any major disaster events in the county.

Caledonia

Goal 1: Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.

Action 1.1.3: Promote development of emergency plans by businesses and public entities by providing information on business continuity and emergency planning through local chambers of commerce and emergency management offices.

Action Worksheet	
Name of Jurisdiction:	Caledonia
Risk / Vulnerability	
Problem being Mitigated:	Absence of emergency plans by businesses.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.1.3
Name of Action or Project:	Promote the development of emergency plans by businesses/government/schools.
Action or Project Description:	Promote development of emergency plans by businesses and public entities by providing information on business continuity and emergency planning through local chambers of commerce and emergency management offices.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	$4,500 - $5,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	27 – High Priority
Timeline for Completion:	1 – 5 years
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard mitigation plan, Meramec Region Community Economic Development Strategy (CEDS) – includes Chapter 8 – Economic Recovery and Resiliency Strategy
Progress Report	
Action Status	Continuing and updated – in progress
Report of Progress	During the last update of the CEDS, a chapter on economic recovery and resiliency was added which is a tool for local leaders to reduce vulnerability to natural hazards and expedite recovery public and private infrastructure. Implementation progress has been restricted due to lack of funding to develop a program to encourage and assist businesses and public entities in developing emergency plans. EMDs are encouraged to share resources available through SEMA and FEMA on emergency planning for businesses and public entities and through chambers of commerce.

Action 1.1.4: Continue to provide CERT training and encourage the development of CERT teams.

Action Worksheet	
Name of Jurisdiction:	Caledonia
Risk / Vulnerability	
Problem being Mitigated:	Lack of CERT Teams and CERT training throughout the planning area.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.1.4
Name of Action or Project:	Continue to provide CERT training and encourage the development of CERT teams.
Action or Project Description:	Provide CERT training and encourage the development of CERT teams throughout the planning area.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$2,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	27 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	N/A
Progress Report	
Action Status	In progress and on-going
Report of Progress	There is one CERT team within the county (Richwoods), but is active.

Action 1.2.1: Actively seek funding to assist cities in obtaining early warning systems and improved communication systems and updating existing warning systems.

Action Worksheet	
Name of Jurisdiction:	Caledonia
Risk / Vulnerability	
Problem being Mitigated:	Need to improve warning and communications systems throughout the county.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.2.1
Name of Action or Project:	Actively seek funding to assist cities in obtaining early warning systems and improved communication systems and updating existing warning systems.
Action or Project Description:	Provide information to local governments and citizens on the existing warning systems in place in Crawford County and encourage better utilization of those systems. In addition, actively search for funding to improve both warning systems and communications throughout the county.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	Unknown
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Superintendent
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going - with goal of 2020 for having 80 percent or more of the population signed up for Nixel.
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, Hazard Mitigation Plan, School Emergency Plan
Progress Report	
Action Status	Continuing– in progress
Report of Progress	Currently there are storm sirens in Washington Co., Caledonia, and Potosi. Currently the only phone based warning/messaging systems available in the county is Nixle. Kingston K-14 (BlackBoard Connect), Potosi R-III (BlackBoard Connect), and Richwoods R-VII (Textcaster) utilize phone based warning/messaging systems. In addition, the county and cities need to continue to work to improve communications systems within the county to improve county-wide as well as state-wide communications during disasters and joint response efforts.

Action 1.2.2: Promote the use of weather radios by local residents to ensure advanced warning about threatening weather.

Action Worksheet	
Name of Jurisdiction:	Caledonia
Risk / Vulnerability	
Problem being Mitigated:	Lack of storm warning systems in rural areas of Washington County
Hazard(s) Addressed:	Severe Storms and Tornados
Action or Project	
Action/Project Number:	1.2.2
Name of Action or Project:	Promote weather radio use
Action or Project Description:	Promote the use of weather radios by local residents to ensure advanced warning about threatening weather.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$2,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	25 – High Priority
Timeline for Completion:	1-5 Years
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard mitigation plan, LEOP
Progress Report	
Action Status	Continuing in progress
Report of Progress	County includes information on weather radios in preparedness kits

Action 1.3.2: Provide information on tree trimming and dead tree removal programs to utility companies and local government.

Action Worksheet	
Name of Jurisdiction:	Caledonia
Risk / Vulnerability	
Problem being Mitigated:	Power outages due to dead trees/over-hanging limbs
Hazard(s) Addressed:	Severe Storm (Hail/Wind), Tornado, and Severe Winter Weather
Action or Project	
Action/Project Number:	1.3.2
Name of Action or Project:	Provide information on tree trimming and dead tree removal programs to utility companies and local government.
Action or Project Description:	Jurisdictions will continue to trim dead trees and over hanging limbs to prevent power outages during severe weather.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$5,500 - $9,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damage, loss of function/displacement impacts and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Road and Bridge/Utility Departments
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, Hazard Mitigation Plan
Progress Report	
Action Status	Continuing and updated – in progress
Report of Progress	The county's road and bridge dept., along with electrical co-op will continue to trim dead trees and over hanging limbs to protect electrical lines and property.

Action 1.3.4: Establish cooling centers where residents can go during extreme heat or power outages.

Action Worksheet	
Name of Jurisdiction:	Caledonia
Risk / Vulnerability	
Problem being Mitigated:	Lack of public access to cooling centers and areas with generators during power outages.
Hazard(s) Addressed:	Extreme Heat
Action or Project	
Action/Project Number:	1.3.4
Name of Action or Project:	Establish cooling centers where residents can go during extreme heat or power outages.
Action or Project Description:	Develop relationships with community businesses, schools, churches, to house public during extreme heat and power outages. Discuss mutual agreements for generators/funding sources.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$1,000 - $50,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, City Council
Action/Project Priority:	27 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP
Progress Report	
Action Status	Continuing in Progress
Report of Progress	Funding for generators has been a stumbling block in progress.

Action 1.3.6: Disseminate information on the importance of and funding sources for storm shelters and tornado safe rooms near areas of high population densities (large employers).

Action Worksheet	
Name of Jurisdiction:	Caledonia
Risk / Vulnerability	
Problem being Mitigated:	Lack of storm shelters and tornado safe rooms
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.3.6
Name of Action or Project:	Disseminate information on the importance of and funding sources for storm shelters and tornado safe rooms near areas of high population densities (large employers).
Action or Project Description:	Designation of storm shelters and tornado safe rooms where large numbers of people congregate.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	Unknown
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Superintendent
Action/Project Priority:	15 – Medium
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, Hazard Mitigation Plan, School Emergency Plan
Progress Report	
Action Status	Continuing– in progress
Report of Progress	Kingston K-14 and Valley-VI both have storm shelters

Goal 2: Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.

Action 2.1.1: Provide information on self-inspection programs to critical facilities to assess earthquake and tornado resistance.

Action Worksheet	
Name of Jurisdiction:	Caledonia
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with construction of critical facilities which may make them vulnerable to earthquakes and tornadoes
Hazard(s) Addressed:	Earthquakes, Tornados
Action or Project	
Action/Project Number:	2.1.1
Name of Action or Project:	Critical facility inspection
Action or Project Description:	Provide information on self-inspection programs to critical facilities to assess earthquake and tornado resistance.
Applicable Goal Statement:	Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.
Estimated Cost:	$1,500 – $5,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damage, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	County EMD, local emergency response agencies
Action/Project Priority:	16 – Medium Priority
Timeline for Completion:	1 – 5 years
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, capital improvement plans, hazard mitigation plan, local critical facility budgets
Progress Report	
Action Status	Continuing – in progress
Report of Progress	Kingston K-14 and Valley R-VI both have built structures to resist tornado and earthquake damage.

Action 2.1.4: Promote development of emergency plans by businesses and public entities by providing information on business continuity and emergency planning through local chambers of commerce and emergency management offices.

Action Worksheet	
Name of Jurisdiction:	Caledonia
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities of natural hazard damages to businesses and public resources.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	2.1.4
Name of Action or Project:	Property & Infrastructure Protection
Action or Project Description:	Promote development of emergency plans by businesses and public entities by providing information on business continuity and emergency planning through local chambers of commerce and emergency management offices.
Applicable Goal Statement:	Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.
Estimated Cost:	$5,000 - $10,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMDs, County Commission, City Councils
Action/Project Priority:	25 – High Priority
Timeline for Completion:	5 years
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, Meramec Regional CEDS
Progress Report	
Action Status	In-progress and on-going
Report of Progress	Most jurisdictions have not had the resources available to complete emergency plans for their planning area. In some cases they fall under the county plan.

Action 2.2.1: Educate residents about the dangers of floodplain development and the benefits of the National Flood Insurance Program.

Action Worksheet	
Name of Jurisdiction:	Caledonia
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with the general public not being aware of the dangers of floodplain development and benefits of the NFIP.
Hazard(s) Addressed:	Floods
Action or Project	
Action/Project Number:	2.2.1
Name of Action or Project:	Floodplain education/awareness program.
Action or Project Description:	Educate residents about the dangers of floodplain development and the benefits of the National Flood Insurance Program.
Applicable Goal Statement:	Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.
Estimated Cost:	$1,500 - $4,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damage, loss of function/displacement impacts and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	County EMD and floodplain manager
Action/Project Priority:	28 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard mitigation plan, LEOP, floodplain management ordinance
Progress Report	
Action Status	In-progress and on-going
Report of Progress	The county floodplain manager actively distributes brochures, press releases and information on floodplain management and development requirements.

Action 2.3.1: Provide information on the benefits of establishing minimum building codes to those jurisdiction that currently lack minimum building code requirements.

Action Worksheet	
Name of Jurisdiction:	Caledonia
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities to property and communities in the event of a natural disaster due to substandard construction.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	2.3.1
Name of Action or Project:	Information/awareness program for the benefits of minimum building codes.
Action or Project Description:	Provide information on the benefits of establishing minimum building codes to those jurisdictions that currently lack minimum building code requirements.
Applicable Goal Statement:	Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.
Estimated Cost:	$3,000 - $10,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	County Commission and City Councils
Action/Project Priority:	17 – Medium Priority
Timeline for Completion:	5 years
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services
Local Planning Mechanisms to be Used in Implementation, if any:	N/A
Progress Report	
Action Status	Continuing Not Started
Report of Progress	There has been no progress in this area due to the communities not having the resources to enforce building codes.

Action 2.3.2: Have local jurisdictions review their floodplain ordinances and if not included, add language for securing hazardous materials tanks and mobile homes in floodplain areas to reduce hazards during storms and flooding.

Action Worksheet	
Name of Jurisdiction:	Caledonia
Risk / Vulnerability	
Problem being Mitigated:	Unsecured hazardous materials tank such as propane and unsecured mobile homes pose risks during floods, severe storms and tornadoes.
Hazard(s) Addressed:	Floods, Severe Storms, and Tornados
Action or Project	
Action/Project Number:	2.3.2
Name of Action or Project:	Establishing regulations for the securing of hazardous materials tanks and mobile homes.
Action or Project Description:	Have local jurisdictions review their floodplain ordinances and if not included, add language for securing hazardous materials tanks and mobile homes in floodplain areas to reduce hazards during storms and flooding.
Applicable Goal Statement:	Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.
Estimated Cost:	$2,500 - $5,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, City Council
Action/Project Priority:	17 – Medium Priority
Timeline for Completion:	1 – 5 years
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard mitigation plan, LEOP, floodplain ordinances, building codes
Progress Report	
Action Status	Continuing – in progress
Report of Progress	No progress has been made on this action item.

Goal 3: Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.

Action 3.1.1: Distribute SEMA brochures on natural hazards and preparedness at public facilities and events.

Action Worksheet	
Name of Jurisdiction:	Caledonia
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with lack of awareness of emergency management and best practices during hazardous events.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.1.1
Name of Action or Project:	Distribute SEMA brochures on natural hazards and preparedness at public facilities and events.
Action or Project Description:	Provide information by distributing SEMA brochures and press releases on types of hazards, best practices during a disaster (Ready in 3) and other informational documents.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities
Estimated Cost:	$1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	City EMD, local emergency response agencies, county health department
Action/Project Priority:	20 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP
Progress Report	
Action Status	Continuing in Progress
Report of Progress	The health department and some local emergency response agencies regularly distribute emergency related brochures and information at local events. The county EMD and health department also distribute press releases on hazards and how to prepare for them.

Action 3.2.2: Encourage meetings between EMD, city/county officials and SEMA to familiarize officials with mitigation planning, implementation and budgeting for mitigation projects.

Action Worksheet	
Name of Jurisdiction:	Caledonia
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with lack of knowledge/understanding of the importance of hazard mitigation activities
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.2.2
Name of Action or Project:	Awareness/education program on hazard mitigation for local elected officials and planning organizations
Action or Project Description:	Ask SEMA mitigation specialists to present information to city councils, county commission and local planning organizations.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities
Estimated Cost:	$1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	City Council, EMD
Action/Project Priority:	28 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs, Floodplain Ordinance
Progress Report	
Action Status	Continuing in progress
Report of Progress	The Region C SEMA area coordinator conducts quarterly meetings in the region and has included hazard mitigation in those meetings.

Action 3.3.1: Re-evaluate the hazard mitigation plan, merge with other community planning and coordinate and integrate hazard mitigation activities, where appropriate, with emergency operations plans and procedures.

Action Worksheet	
Name of Jurisdiction:	Caledonia
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with not regularly reviewing and updating the mitigation plan and incorporating mitigation activities into emergency operations plans and procedures.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.3.1
Name of Action or Project:	Re-evaluate the hazard mitigation plan and merge with other community planning activities.
Action or Project Description:	Re-evaluate the hazard mitigation plan, merge with other community planning activities and documents and incorporate hazard mitigation into the long-range planning and development activities of the county and each jurisdiction.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities
Estimated Cost:	$5,500 - $10,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, City Council, Local Planners, MPC
Action/Project Priority:	22 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOPs, hazard mitigation plan, school crisis management plans, comprehensive plans, builder's plans, capital improvement plan, economic development plan, transportation plan, land-use plan, floodplain ordinances, storm water plans/ordinances
Progress Report	
Action Status	Continuing in Progress
Report of Progress	Hazard mitigation goals and actions have been incorporated into the regional Community and Economic Development Strategy. Mitigation actions are part of the county LEOP. As more local officials become familiar with mitigation and understand how it fits within other planning activities, this action item will continue to expand.

Action 3.3.2: Implement a public awareness program about the benefits of hazard mitigation projects, both public and private, including distributing press releases by cities/county regarding adopted mitigation measures to keep public abreast of changes and/or new regulations.

Action Worksheet	
Name of Jurisdiction:	Caledonia
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with the public's lack of knowledge in regards to hazard mitigation and the benefits of adopting mitigation measures.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.3.2
Name of Action or Project:	Awareness program on local mitigation activities.
Action or Project Description:	Distribute press releases by cities/county regarding adopted mitigation measures
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.
Estimated Cost:	$500-$1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, City Council
Action/Project Priority:	23 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, hazard mitigation plan, floodplain ordinance
Progress Report	
Action Status	Continuing in Progress
Report of Progress	The county regularly does press releases on road and bridge upgrades

Action 3.4.2: Publicize county or citywide drills.

Action Worksheet	
Name of Jurisdiction:	Caledonia
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with the lack of knowledge in regards to the proper measures to take during hazard events.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.4.2
Name of Action or Project:	Publicize county or citywide drills.
Action or Project Description:	Publicize county or citywide drills to make the general public aware of training/exercises being conducted locally and raise awareness of emergency preparedness and what measures should be taken.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.
Estimated Cost:	$500 - $1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	21– High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOPs
Progress Report	
Action Status	Continuing in Progress
Report of Progress	This is an on-going activity. Local governments make the public aware of drills/trainings/exercises through press releases to the media and follow up articles on drills. SEMA also publicizes drills that are being done on a regional or statewide level.

Goal 4: Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.

Action 4.1.1: Schedule joint meetings with different organizations/agencies for mitigation planning.

Action Worksheet	
Name of Jurisdiction:	Caledonia
Risk / Vulnerability	
Problem being Mitigated:	Lack of synergy/communication among organizations/agencies for mitigation related planning.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	4.1.1
Name of Action or Project:	Schedule joint meetings with different organizations/agencies for mitigation planning.
Action or Project Description:	Schedule joint meetings with different organizations/agencies for mitigation planning and continued communications amongst jurisdictions/organizations/agencies.
Applicable Goal Statement:	Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.
Estimated Cost:	$500 - $1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMDs
Action/Project Priority:	28 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP
Progress Report	
Action Status	Continuing in Progress
Report of Progress	This is an on-going activity. Region C Fire Chiefs meet regularly. The Region C SEMA area coordinator holds quarterly meetings throughout the region.. This program could benefit from a more coordinated, focused effort to bring different agencies together to discuss mitigation issues.

Action 4.1.2: Continue to encourage joint training (or drills) between agencies, public and private entities (including schools and businesses).

Action Worksheet	
Name of Jurisdiction:	Caledonia
Risk / Vulnerability	
Problem being Mitigated:	Lack of synergy/communication/coordination among agencies, public, and private entities on disaster training and emergency drills/exercises.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	4.1.2
Name of Action or Project:	Encourage joint training/drills/exercises among all jurisdictions and local businesses.
Action or Project Description:	Continue to encourage joint training (and drills) between agencies, public and private entities (including schools/businesses).
Applicable Goal Statement:	Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.
Estimated Cost:	$1,000 - $10,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	County EMD, City EMDs, Emergency Response Agencies, School Superintendents
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOPS, School Emergency Plan
Progress Report	
Action Status	Continuing in Progress
Report of Progress	Jurisdictions, EMDs and emergency response agencies within Washington County cooperate on training and drills on a regular basis. Fire and police departments regularly train with local school districts. The Region C SEMA area coordinator works with local entities throughout the area to do at least one exercise each year that is either regional or state-wide. The Meramec Regional Emergency Planning Committee (MREPC) coordinates tabletop and full-scale exercises from time to time throughout the region.

Action 4.1.3: Pool different agency resources to achieve widespread mitigation results.

Action Worksheet	
Name of Jurisdiction:	Caledonia
Risk / Vulnerability	
Problem being Mitigated:	Lack of resources among agencies which hinder mitigation results.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	4.1.3
Name of Action or Project:	Pooling resources for mitigation activities
Action or Project Description:	Pool different agency resources to achieve widespread mitigation planning results.
Applicable Goal Statement:	Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.
Estimated Cost:	$1,000 - $4,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, City Council
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation plan, LEOPs, Capital Improvement plans, Comprehensive plans, Strategic plans
Progress Report	
Action Status	Continuing in Progress
Report of Progress	All jurisdictions reported that they are interested in finding ways to pool resources to accomplish mitigation projects. There has been interest in thinking outside the box on funding upgrades to low water crossing projects and tapping into different funding sources (Missouri Department of Conservation funds to protect endangered species and open streams to allow free movement of fish.)

Goal 5: Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefit of special interests.

Action 5.1.4: Encourage cities to require contractor storm water management plans in all new development – both residential and commercial properties.

Action Worksheet	
Name of Jurisdiction:	Caledonia
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with non-existent storm water management plans
Hazard(s) Addressed:	Floods, Severe Storms, Severe Winter Storms
Action or Project	
Action/Project Number:	5.1.4
Name of Action or Project:	Encourage all communities to develop storm water management plans.
Action or Project Description:	Encourage all communities/jurisdictions to develop storm water management plans.
Applicable Goal Statement:	Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefits of special interests.
Estimated Cost:	$800 - $1,800
Benefits:	Losses avoided by implementing this action include property damages.
Plan for Implementation	
Responsible Organization/Department:	Local Planners, Local Governments
Action/Project Priority:	17 – Medium Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services
Local Planning Mechanisms to be Used in Implementation, if any:	City Ordinances
Progress Report	
Action Status	Continuing – no progress
Report of Progress	No updates were provided by the MPC.

Goal 6: Secure resources for investment in hazard mitigation.

Action 6.1.2: Structure grant proposals for road/bridge upgrades so that hazard mitigation concerns are also met.

Action Worksheet	
Name of Jurisdiction:	Caledonia
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities in relation to inadequate roads/bridges
Hazard(s) Addressed:	Severe Winter Weather, Extreme Heat, Flooding
Action or Project	
Action/Project Number:	6.1.2
Name of Action or Project:	Structure grant proposals for road/bridge upgrades so that hazard mitigation concerns are also met.
Action or Project Description:	Actively seek and structure grant proposals for road/bridge upgrades to also cover hazard mitigation concerns and action items.
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	$5,000 - $5 Million
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	City Council, Road and Bridge Dept.
Action/Project Priority:	26 – High Priority
Timeline for Completion:	1-5 Years
Potential Fund Sources:	Grants
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Transportation Plan, Regional Transportation Plan
Progress Report	
Action Status	Continuing in Progress
Report of Progress	Lack of financial resources for construction/upgrades continues to be the main obstacle

Action 6.1.3: Work with state/local/federal agencies to include mitigation in all economic and community development projects.

Action Worksheet	
Name of Jurisdiction:	Caledonia
Risk / Vulnerability	
Problem being Mitigated:	Lack of synergy/communication/coordination of mitigation in community development projects and integration of mitigation actions into economic and community development projects.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	6.1.3
Name of Action or Project:	Coordination with state/local/federal agencies to integrate mitigation into economic and community development projects
Action or Project Description:	Work with state/local/federal agencies to include mitigation in all economic and community development projects.
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	$2,500 - $9,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	City Council
Action/Project Priority:	28 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Capital Improvement Plans, Comprehensive Plans, Economic Development Plans, CEDS, strategic plans, land-use plans
Progress Report	
Action Status	Continuing in Progress
Report of Progress	Hazard mitigation goals and actions have been incorporated into the regional Community Economic Development Strategy (CEDS). As mitigation awareness grows, additional efforts will be made to incorporate mitigation activities into economic and community development projects.

Action 6.1.4: Provide information to jurisdictions on the benefits of budgeting for and implementing hazard mitigation projects.

Action Worksheet	
Name of Jurisdiction:	Caledonia
Risk / Vulnerability	
Problem being Mitigated:	Lack of funding for mitigation projects among local jurisdictions
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	6.1.4
Name of Action or Project:	Budgeting and implementing hazard mitigation projects.
Action or Project Description:	Provide information to jurisdictions on the benefits of budgeting for and implementing hazard mitigation projects.
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	$500 - $1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, City Council
Action/Project Priority:	26 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Local general revenue funds
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Capital Improvements Plans, Comprehensive Plans, CEDS, strategic plans, LEOPs
Progress Report	
Action Status	Continuing in Progress
Report of Progress	As awareness of the importance of mitigation grows, more local jurisdictions are seeing the long-term benefits and working toward budgeting for mitigation activities.

Action 6.2.1: Provide information on the benefits of local governments implementing cost-share programs with private property owners for hazard mitigation projects that benefit the community as a whole.

Action Worksheet	
Name of Jurisdiction:	Caledonia
Risk / Vulnerability	
Problem being Mitigated:	Lack of cost-share programs with private property owners for hazard mitigations projects.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	6.2.1
Name of Action or Project:	Encourage development and implementation of mitigation cost-share programs
Action or Project Description:	Provide information on the benefits of local governments implementing cost-share programs with private property owners for hazard mitigation projects that benefit the community as a whole
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	$ unknown – dependent upon projects and interest
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	City Council
Action/Project Priority:	15 – Medium Priority
Timeline for Completion:	5 -10 years to implement and then on-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Capital Improvement Plans, Comprehensive Plans
Progress Report	
Action Status	Continuing in Progress
Report of Progress	The county and Potosi are currently implementing cost-share programs that will benefit the jurisdiction as a whole.

Action 6.3.1: Prioritize mitigation projects, based on cost-effectiveness and starting with those sites facing the greatest threat to life, health, and property.

Action Worksheet	
Name of Jurisdiction:	Caledonia
Risk / Vulnerability	
Problem being Mitigated:	Lack of organization/priority of mitigation projects based on cost-effectiveness, and severity in regards to threat to life, health, and property.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	6.3.1
Name of Action or Project:	Prioritizing mitigation projects
Action or Project Description:	Prioritize mitigation projects, based on cost-effectiveness and starting with those sites facing the greatest threat to life, health and property.
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	$1,500 - $4,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, City Council
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan
Progress Report	
Action Status	Continuing in Progress
Report of Progress	Hazard mitigation projects were prioritized in the initial plan. The MPC reviewed and updated that list of prioritized items, including considering the greatest threat to life, health and property. This is an on-going activity. The list of prioritized action items should be reviewed at a minimum of every five years and following any major disaster events in the county.

Irondale

Goal 1: Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.

Action 1.1.3: Promote development of emergency plans by businesses and public entities by providing information on business continuity and emergency planning through local chambers of commerce and emergency management offices.

Action Worksheet	
Name of Jurisdiction:	Irondale
Risk / Vulnerability	
Problem being Mitigated:	Absence of emergency plans by businesses.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.1.3
Name of Action or Project:	Promote the development of emergency plans by businesses/government/schools.
Action or Project Description:	Promote development of emergency plans by businesses and public entities by providing information on business continuity and emergency planning through local chambers of commerce and emergency management offices.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	$4,500 - $5,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	27 – High Priority
Timeline for Completion:	1 – 5 years
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard mitigation plan, Meramec Region Community Economic Development Strategy (CEDS) – includes Chapter 8 – Economic Recovery and Resiliency Strategy
Progress Report	
Action Status	Continuing and updated – in progress
Report of Progress	During the last update of the CEDS, a chapter on economic recovery and resiliency was added which is a tool for local leaders to reduce vulnerability to natural hazards and expedite recovery public and private infrastructure. Implementation progress has been restricted due to lack of funding to develop a program to encourage and assist businesses and public entities in developing emergency plans. EMDs are encouraged to share resources available through SEMA and FEMA on emergency planning for businesses and public entities and through chambers of commerce.

Action 1.1.4: Continue to provide CERT training and encourage the development of CERT teams.

Action Worksheet	
Name of Jurisdiction:	Irondale
Risk / Vulnerability	
Problem being Mitigated:	Lack of CERT Teams and CERT training throughout the planning area.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.1.4
Name of Action or Project:	Continue to provide CERT training and encourage the development of CERT teams.
Action or Project Description:	Provide CERT training and encourage the development of CERT teams throughout the planning area.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$2,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	27 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	N/A
Progress Report	
Action Status	In progress and on-going
Report of Progress	There is one CERT team within the county (Richwoods), but is active.

Action 1.2.1: Actively seek funding to assist cities in obtaining early warning systems and improved communication systems and updating existing warning systems.

Action Worksheet	
Name of Jurisdiction:	Irondale
Risk / Vulnerability	
Problem being Mitigated:	Need to improve warning and communications systems throughout the county.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.2.1
Name of Action or Project:	Actively seek funding to assist cities in obtaining early warning systems and improved communication systems and updating existing warning systems.
Action or Project Description:	Provide information to local governments and citizens on the existing warning systems in place in Crawford County and encourage better utilization of those systems. In addition, actively search for funding to improve both warning systems and communications throughout the county.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	Unknown
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Superintendent
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going - with goal of 2020 for having 80 percent or more of the population signed up for Nixel.
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, Hazard Mitigation Plan, School Emergency Plan
Progress Report	
Action Status	Continuing– in progress
Report of Progress	Currently there are storm sirens in Washington Co., Caledonia, and Potosi. Currently the only phone based warning/messaging systems available in the county is Nixle. Kingston K-14 (BlackBoard Connect), Potosi R-III (BlackBoard Connect), and Richwoods R-VII (Textcaster) utilize phone based warning/messaging systems. In addition, the county and cities need to continue to work to improve communications systems within the county to improve county-wide as well as state-wide communications during disasters and joint response efforts.

Action 1.2.2: Promote the use of weather radios by local residents to ensure advanced warning about threatening weather.

Action Worksheet	
Name of Jurisdiction:	Irondale
Risk / Vulnerability	
Problem being Mitigated:	Lack of storm warning systems in rural areas of Washington County
Hazard(s) Addressed:	Severe Storms and Tornados
Action or Project	
Action/Project Number:	1.2.2
Name of Action or Project:	Promote weather radio use
Action or Project Description:	Promote the use of weather radios by local residents to ensure advanced warning about threatening weather.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$2,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	25 – High Priority
Timeline for Completion:	1-5 Years
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard mitigation plan, LEOP
Progress Report	
Action Status	Continuing in progress
Report of Progress	County includes information on weather radios in preparedness kits

Action 1.3.2: Provide information on tree trimming and dead tree removal programs to utility companies and local government.

Action Worksheet	
Name of Jurisdiction:	Irondale
Risk / Vulnerability	
Problem being Mitigated:	Power outages due to dead trees/over-hanging limbs
Hazard(s) Addressed:	Severe Storm (Hail/Wind), Tornado, and Severe Winter Weather
Action or Project	
Action/Project Number:	1.3.2
Name of Action or Project:	Provide information on tree trimming and dead tree removal programs to utility companies and local government.
Action or Project Description:	Jurisdictions will continue to trim dead trees and over hanging limbs to prevent power outages during severe weather.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$5,500 - $9,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damage, loss of function/displacement impacts and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Road and Bridge/Utility Departments
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, Hazard Mitigation Plan
Progress Report	
Action Status	Continuing and updated – in progress
Report of Progress	The county's road and bridge dept., along with electrical co-op will continue to trim dead trees and over hanging limbs to protect electrical lines and property.

Action 1.3.4: Establish cooling centers where residents can go during extreme heat or power outages.

Action Worksheet	
Name of Jurisdiction:	Irondale
Risk / Vulnerability	
Problem being Mitigated:	Lack of public access to cooling centers and areas with generators during power outages.
Hazard(s) Addressed:	Extreme Heat
Action or Project	
Action/Project Number:	1.3.4
Name of Action or Project:	Establish cooling centers where residents can go during extreme heat or power outages.
Action or Project Description:	Develop relationships with community businesses, schools, churches, to house public during extreme heat and power outages. Discuss mutual agreements for generators/funding sources.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$1,000 - $50,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, City Council
Action/Project Priority:	27 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP
Progress Report	
Action Status	Continuing in Progress
Report of Progress	Funding for generators has been a stumbling block in progress.

Action 1.3.6: Disseminate information on the importance of and funding sources for storm shelters and tornado safe rooms near areas of high population densities (large employers).

Action Worksheet	
Name of Jurisdiction:	Irondale
Risk / Vulnerability	
Problem being Mitigated:	Lack of storm shelters and tornado safe rooms
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.3.6
Name of Action or Project:	Disseminate information on the importance of and funding sources for storm shelters and tornado safe rooms near areas of high population densities (large employers).
Action or Project Description:	Designation of storm shelters and tornado safe rooms where large numbers of people congregate.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	Unknown
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Superintendent
Action/Project Priority:	15 – Medium
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, Hazard Mitigation Plan, School Emergency Plan
Progress Report	
Action Status	Continuing– in progress
Report of Progress	Kingston K-14 and Valley-VI both have storm shelters

Goal 2: Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.

Action 2.1.1: Provide information on self-inspection programs to critical facilities to assess earthquake and tornado resistance.

Action Worksheet	
Name of Jurisdiction:	Irondale
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with construction of critical facilities which may make them vulnerable to earthquakes and tornadoes
Hazard(s) Addressed:	Earthquakes, Tornados
Action or Project	
Action/Project Number:	2.1.1
Name of Action or Project:	Critical facility inspection
Action or Project Description:	Provide information on self-inspection programs to critical facilities to assess earthquake and tornado resistance.
Applicable Goal Statement:	Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.
Estimated Cost:	$1,500 – $5,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damage, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	County EMD, local emergency response agencies
Action/Project Priority:	16 – Medium Priority
Timeline for Completion:	1 – 5 years
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, capital improvement plans, hazard mitigation plan, local critical facility budgets
Progress Report	
Action Status	Continuing – in progress
Report of Progress	Kingston K-14 and Valley R-VI both have built structures to resist tornado and earthquake damage.

Action 2.1.4: Promote development of emergency plans by businesses and public entities by providing information on business continuity and emergency planning through local chambers of commerce and emergency management offices.

Action Worksheet	
Name of Jurisdiction:	Irondale
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities of natural hazard damages to businesses and public resources.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	2.1.4
Name of Action or Project:	Property & Infrastructure Protection
Action or Project Description:	Promote development of emergency plans by businesses and public entities by providing information on business continuity and emergency planning through local chambers of commerce and emergency management offices.
Applicable Goal Statement:	Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.
Estimated Cost:	$5,000 - $10,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMDs, County Commission, City Councils
Action/Project Priority:	25 – High Priority
Timeline for Completion:	5 years
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, Meramec Regional CEDS
Progress Report	
Action Status	In-progress and on-going
Report of Progress	Most jurisdictions have not had the resources available to complete emergency plans for their planning area. In some cases they fall under the county plan.

Action 2.2.1: Educate residents about the dangers of floodplain development and the benefits of the National Flood Insurance Program.

Action Worksheet	
Name of Jurisdiction:	Irondale
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with the general public not being aware of the dangers of floodplain development and benefits of the NFIP.
Hazard(s) Addressed:	Floods
Action or Project	
Action/Project Number:	2.2.1
Name of Action or Project:	Floodplain education/awareness program.
Action or Project Description:	Educate residents about the dangers of floodplain development and the benefits of the National Flood Insurance Program.
Applicable Goal Statement:	Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.
Estimated Cost:	$1,500 - $4,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damage, loss of function/displacement impacts and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	County EMD and floodplain manager
Action/Project Priority:	28 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard mitigation plan, LEOP, floodplain management ordinance
Progress Report	
Action Status	In-progress and on-going
Report of Progress	The county floodplain manager actively distributes brochures, press releases and information on floodplain management and development requirements.

Action 2.2.2: Continue to enforce flood damage prevention/floodplain management ordinances in compliance with NFIP requirements.

Action Worksheet	
Name of Jurisdiction:	Irondale
Risk / Vulnerability	
Problem being Mitigated:	The need to improve floodplain management enforcement procedures that will help reduce risk and vulnerability.
Hazard(s) Addressed:	Floods
Action or Project	
Action/Project Number:	2.2.2
Name of Action or Project:	Continue to enforce flood damage prevention/floodplain management ordinances in compliance with NFIP requirements.
Action or Project Description:	The city floodplain manager, with the assistance of the board of aldermen, needs to establish enforcement procedures to make sure the city stays in compliance with the city floodplain management ordinance and NFIP requirements.
Applicable Goal Statement:	Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.
Estimated Cost:	$4,500 - $5,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Floodplain Managers
Action/Project Priority:	28 – High Priority
Timeline for Completion:	1 – 5 years
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Jurisdictional Ordinances
Progress Report	
Action Status	Continuing– in progress
Report of Progress	Jurisdictions would benefit from establishing procedures for enforcing the ordinance.

Action 2.3.1: Provide information on the benefits of establishing minimum building codes to those jurisdiction that currently lack minimum building code requirements.

Action Worksheet	
Name of Jurisdiction:	Irondale
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities to property and communities in the event of a natural disaster due to substandard construction.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	2.3.1
Name of Action or Project:	Information/awareness program for the benefits of minimum building codes.
Action or Project Description:	Provide information on the benefits of establishing minimum building codes to those jurisdictions that currently lack minimum building code requirements.
Applicable Goal Statement:	Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.
Estimated Cost:	$3,000 - $10,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	County Commission and City Councils
Action/Project Priority:	17 – Medium Priority
Timeline for Completion:	5 years
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services
Local Planning Mechanisms to be Used in Implementation, if any:	N/A
Progress Report	
Action Status	Continuing Not Started
Report of Progress	There has been no progress in this area due to the communities not having the resources to enforce building codes.

Action 2.3.2: Have local jurisdictions review their floodplain ordinances and if not included, add language for securing hazardous materials tanks and mobile homes in floodplain areas to reduce hazards during storms and flooding.

Action Worksheet	
Name of Jurisdiction:	Irondale
Risk / Vulnerability	
Problem being Mitigated:	Unsecured hazardous materials tank such as propane and unsecured mobile homes pose risks during floods, severe storms and tornadoes.
Hazard(s) Addressed:	Floods, Severe Storms, and Tornados
Action or Project	
Action/Project Number:	2.3.2
Name of Action or Project:	Establishing regulations for the securing of hazardous materials tanks and mobile homes.
Action or Project Description:	Have local jurisdictions review their floodplain ordinances and if not included, add language for securing hazardous materials tanks and mobile homes in floodplain areas to reduce hazards during storms and flooding.
Applicable Goal Statement:	Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.
Estimated Cost:	$2,500 - $5,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, City Council
Action/Project Priority:	17 – Medium Priority
Timeline for Completion:	1 – 5 years
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard mitigation plan, LEOP, floodplain ordinances, building codes
Progress Report	
Action Status	Continuing – in progress
Report of Progress	No progress has been made on this action item.

Goal 3: Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.

Action 3.1.1: Distribute SEMA brochures on natural hazards and preparedness at public facilities and events.

Action Worksheet	
Name of Jurisdiction:	Irondale
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with lack of awareness of emergency management and best practices during hazardous events.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.1.1
Name of Action or Project:	Distribute SEMA brochures on natural hazards and preparedness at public facilities and events.
Action or Project Description:	Provide information by distributing SEMA brochures and press releases on types of hazards, best practices during a disaster (Ready in 3) and other informational documents.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities
Estimated Cost:	$1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	City EMD, local emergency response agencies, county health department
Action/Project Priority:	20 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP
Progress Report	
Action Status	Continuing in Progress
Report of Progress	The health department and some local emergency response agencies regularly distribute emergency related brochures and information at local events. The county EMD and health department also distribute press releases on hazards and how to prepare for them.

Action 3.2.2: Encourage meetings between EMD, city/county officials and SEMA to familiarize officials with mitigation planning, implementation and budgeting for mitigation projects.

Action Worksheet	
Name of Jurisdiction:	Irondale
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with lack of knowledge/understanding of the importance of hazard mitigation activities
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.2.2
Name of Action or Project:	Awareness/education program on hazard mitigation for local elected officials and planning organizations
Action or Project Description:	Ask SEMA mitigation specialists to present information to city councils, county commission and local planning organizations.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities
Estimated Cost:	$1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	City Council, EMD
Action/Project Priority:	28 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs, Floodplain Ordinance
Progress Report	
Action Status	Continuing in progress
Report of Progress	The Region C SEMA area coordinator conducts quarterly meetings in the region and has included hazard mitigation in those meetings.

Action 3.3.1: Re-evaluate the hazard mitigation plan, merge with other community planning and coordinate and integrate hazard mitigation activities, where appropriate, with emergency operations plans and procedures.

Action Worksheet	
Name of Jurisdiction:	Irondale
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with not regularly reviewing and updating the mitigation plan and incorporating mitigation activities into emergency operations plans and procedures.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.3.1
Name of Action or Project:	Re-evaluate the hazard mitigation plan and merge with other community planning activities.
Action or Project Description:	Re-evaluate the hazard mitigation plan, merge with other community planning activities and documents and incorporate hazard mitigation into the long-range planning and development activities of the county and each jurisdiction.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities
Estimated Cost:	$5,500 - $10,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, City Council, Local Planners, MPC
Action/Project Priority:	22 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOPs, hazard mitigation plan, school crisis management plans, comprehensive plans, builder's plans, capital improvement plan, economic development plan, transportation plan, land-use plan, floodplain ordinances, storm water plans/ordinances
Progress Report	
Action Status	Continuing in Progress
Report of Progress	Hazard mitigation goals and actions have been incorporated into the regional Community and Economic Development Strategy. Mitigation actions are part of the county LEOP. As more local officials become familiar with mitigation and understand how it fits within other planning activities, this action item will continue to expand.

Action 3.3.2: Implement a public awareness program about the benefits of hazard mitigation projects, both public and private, including distributing press releases by cities/county regarding adopted mitigation measures to keep public abreast of changes and/or new regulations.

Action Worksheet	
Name of Jurisdiction:	Irondale
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with the public's lack of knowledge in regards to hazard mitigation and the benefits of adopting mitigation measures.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.3.2
Name of Action or Project:	Awareness program on local mitigation activities.
Action or Project Description:	Distribute press releases by cities/county regarding adopted mitigation measures
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.
Estimated Cost:	$500-$1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, City Council
Action/Project Priority:	23 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, hazard mitigation plan, floodplain ordinance
Progress Report	
Action Status	Continuing in Progress
Report of Progress	The county regularly does press releases on road and bridge upgrades

Action 3.4.2: Publicize county or citywide drills.

Action Worksheet	
Name of Jurisdiction:	Irondale
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with the lack of knowledge in regards to the proper measures to take during hazard events.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.4.2
Name of Action or Project:	Publicize county or citywide drills.
Action or Project Description:	Publicize county or citywide drills to make the general public aware of training/exercises being conducted locally and raise awareness of emergency preparedness and what measures should be taken.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.
Estimated Cost:	$500 - $1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	21– High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOPs
Progress Report	
Action Status	Continuing in Progress
Report of Progress	This is an on-going activity. Local governments make the public aware of drills/trainings/exercises through press releases to the media and follow up articles on drills. SEMA also publicizes drills that are being done on a regional or statewide level.

Goal 4: Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.

Action 4.1.1: Schedule joint meetings with different organizations/agencies for mitigation planning.

Action Worksheet	
Name of Jurisdiction:	Irondale
Risk / Vulnerability	
Problem being Mitigated:	Lack of synergy/communication among organizations/agencies for mitigation related planning.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	4.1.1
Name of Action or Project:	Schedule joint meetings with different organizations/agencies for mitigation planning.
Action or Project Description:	Schedule joint meetings with different organizations/agencies for mitigation planning and continued communications amongst jurisdictions/organizations/agencies.
Applicable Goal Statement:	Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.
Estimated Cost:	$500 - $1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMDs
Action/Project Priority:	28 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP
Progress Report	
Action Status	Continuing in Progress
Report of Progress	This is an on-going activity. Region C Fire Chiefs meet regularly. The Region C SEMA area coordinator holds quarterly meetings throughout the region.. This program could benefit from a more coordinated, focused effort to bring different agencies together to discuss mitigation issues.

Action 4.1.2: Continue to encourage joint training (or drills) between agencies, public and private entities (including schools and businesses).

Action Worksheet	
Name of Jurisdiction:	Irondale
Risk / Vulnerability	
Problem being Mitigated:	Lack of synergy/communication/coordination among agencies, public, and private entities on disaster training and emergency drills/exercises.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	4.1.2
Name of Action or Project:	Encourage joint training/drills/exercises among all jurisdictions and local businesses.
Action or Project Description:	Continue to encourage joint training (and drills) between agencies, public and private entities (including schools/businesses).
Applicable Goal Statement:	Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.
Estimated Cost:	$1,000 - $10,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	County EMD, City EMDs, Emergency Response Agencies, School Superintendents
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOPS, School Emergency Plan
Progress Report	
Action Status	Continuing in Progress
Report of Progress	Jurisdictions, EMDs and emergency response agencies within Washington County cooperate on training and drills on a regular basis. Fire and police departments regularly train with local school districts. The Region C SEMA area coordinator works with local entities throughout the area to do at least one exercise each year that is either regional or state-wide. The Meramec Regional Emergency Planning Committee (MREPC) coordinates tabletop and full-scale exercises from time to time throughout the region.

Action 4.1.3: Pool different agency resources to achieve widespread mitigation results.

Action Worksheet	
Name of Jurisdiction:	Irondale
Risk / Vulnerability	
Problem being Mitigated:	Lack of resources among agencies which hinder mitigation results.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	4.1.3
Name of Action or Project:	Pooling resources for mitigation activities
Action or Project Description:	Pool different agency resources to achieve widespread mitigation planning results.
Applicable Goal Statement:	Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.
Estimated Cost:	$1,000 - $4,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, City Council
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation plan, LEOPs, Capital Improvement plans, Comprehensive plans, Strategic plans
Progress Report	
Action Status	Continuing in Progress
Report of Progress	All jurisdictions reported that they are interested in finding ways to pool resources to accomplish mitigation projects. There has been interest in thinking outside the box on funding upgrades to low water crossing projects and tapping into different funding sources (Missouri Department of Conservation funds to protect endangered species and open streams to allow free movement of fish.)

Goal 5: Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefit of special interests.

Action 5.1.4: Encourage cities to require contractor storm water management plans in all new development – both residential and commercial properties.

Action Worksheet	
Name of Jurisdiction:	Irondale
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with non-existent storm water management plans
Hazard(s) Addressed:	Floods, Severe Storms, Severe Winter Storms
Action or Project	
Action/Project Number:	5.1.4
Name of Action or Project:	Encourage all communities to develop storm water management plans.
Action or Project Description:	Encourage all communities/jurisdictions to develop storm water management plans.
Applicable Goal Statement:	Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefits of special interests.
Estimated Cost:	$800 - $1,800
Benefits:	Losses avoided by implementing this action include property damages.
Plan for Implementation	
Responsible Organization/Department:	Local Planners, Local Governments
Action/Project Priority:	17 – Medium Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services
Local Planning Mechanisms to be Used in Implementation, if any:	City Ordinances
Progress Report	
Action Status	Continuing – no progress
Report of Progress	No updates were provided by the MPC.

Action 5.2.1: Encourage local governments to purchase properties in the floodplain as funds become available and convert that land into public space/recreation area.

Action Worksheet	
Name of Jurisdiction:	Irondale
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with floodplain properties
Hazard(s) Addressed:	Floods
Action or Project	
Action/Project Number:	5.2.1
Name of Action or Project:	Government purchase of properties in the floodplain
Action or Project Description:	Encourage local governments to purchase properties in the floodplain as funds become available and convert that land into public space/recreation area.
Applicable Goal Statement:	Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefits of special interests.
Estimated Cost:	$1,000 - $100,000
Benefits:	Losses avoided by implementing this action include property damage, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Local Government, County & City EMDs, Floodplain Managers
Action/Project Priority:	14 – Medium Priority
Timeline for Completion:	Continuous
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Floodplain Ordinance, Comprehensive Plans, Hazard Mitigation Plan
Progress Report	
Action Status	Continuing
Report of Progress	No progress

Action 5.2.2: Encourage communities to discuss zoning repetitive loss properties in the floodplain as open space.

Action Worksheet	
Name of Jurisdiction:	Irondale
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with repetitive loss properties.
Hazard(s) Addressed:	Floods
Action or Project	
Action/Project Number:	5.2.2
Name of Action or Project:	Zoning repetitive loss properties as open space.
Action or Project Description:	Encourage communities to discuss zoning repetitive loss properties in the floodplain as open space.
Applicable Goal Statement:	Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefits of special interests.
Estimated Cost:	$1,500 - $5,500
Benefits:	Losses avoided by implementing this action include property damage, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	City Government, Local Planners, City EMDs, Floodplain Managers
Action/Project Priority:	16 – Medium Priority
Timeline for Completion:	Continuous
Potential Fund Sources:	Local general revenue funds
Local Planning Mechanisms to be Used in Implementation, if any:	Floodplain ordinances, Hazard Mitigation plan, comprehensive plans, strategic plans
Progress Report	
Action Status	Continuing – no progress
Report of Progress	No action has been taken thus far.

Goal 6: Secure resources for investment in hazard mitigation.

Action 6.1.2: Structure grant proposals for road/bridge upgrades so that hazard mitigation concerns are also met.

Action Worksheet	
Name of Jurisdiction:	Irondale
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities in relation to inadequate roads/bridges
Hazard(s) Addressed:	Severe Winter Weather, Extreme Heat, Flooding
Action or Project	
Action/Project Number:	6.1.2
Name of Action or Project:	Structure grant proposals for road/bridge upgrades so that hazard mitigation concerns are also met.
Action or Project Description:	Actively seek and structure grant proposals for road/bridge upgrades to also cover hazard mitigation concerns and action items.
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	$5,000 - $5 Million
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	City Council, Road and Bridge Dept.
Action/Project Priority:	26 – High Priority
Timeline for Completion:	1-5 Years
Potential Fund Sources:	Grants
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Transportation Plan, Regional Transportation Plan
Progress Report	
Action Status	Continuing in Progress
Report of Progress	Lack of financial resources for construction/upgrades continues to be the main obstacle

Action 6.1.3: Work with state/local/federal agencies to include mitigation in all economic and community development projects.

Action Worksheet	
Name of Jurisdiction:	Irondale
Risk / Vulnerability	
Problem being Mitigated:	Lack of synergy/communication/coordination of mitigation in community development projects and integration of mitigation actions into economic and community development projects.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	6.1.3
Name of Action or Project:	Coordination with state/local/federal agencies to integrate mitigation into economic and community development projects
Action or Project Description:	Work with state/local/federal agencies to include mitigation in all economic and community development projects.
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	$2,500 - $9,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	City Council
Action/Project Priority:	28 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Capital Improvement Plans, Comprehensive Plans, Economic Development Plans, CEDS, strategic plans, land-use plans
Progress Report	
Action Status	Continuing in Progress
Report of Progress	Hazard mitigation goals and actions have been incorporated into the regional Community Economic Development Strategy (CEDS). As mitigation awareness grows, additional efforts will be made to incorporate mitigation activities into economic and community development projects.

Action 6.1.4: Provide information to jurisdictions on the benefits of budgeting for and implementing hazard mitigation projects.

Action Worksheet	
Name of Jurisdiction:	Irondale
Risk / Vulnerability	
Problem being Mitigated:	Lack of funding for mitigation projects among local jurisdictions
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	6.1.4
Name of Action or Project:	Budgeting and implementing hazard mitigation projects.
Action or Project Description:	Provide information to jurisdictions on the benefits of budgeting for and implementing hazard mitigation projects.
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	$500 - $1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, City Council
Action/Project Priority:	26 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Local general revenue funds
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Capital Improvements Plans, Comprehensive Plans, CEDS, strategic plans, LEOPs
Progress Report	
Action Status	Continuing in Progress
Report of Progress	As awareness of the importance of mitigation grows, more local jurisdictions are seeing the long-term benefits and working toward budgeting for mitigation activities.

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Action 6.2.1: Encourage cities and counties to consider implementing cost-share programs with private property owners for hazard mitigation projects that benefit the jurisdiction as a whole.

Action Worksheet	
Name of Jurisdiction:	Irondale
Risk / Vulnerability	
Problem being Mitigated:	Lack of cost-share programs with private property owners for hazard mitigations projects.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	6.2.1
Name of Action or Project:	Encourage local mitigation cost-share programs
Action or Project Description:	Encourage cities and counties to implement cost-share programs with private property owners for hazard mitigation projects that benefit the community as a whole.
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	$ unknown – dependent upon projects and interest
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	City Council
Action/Project Priority:	15 – Medium Priority
Timeline for Completion:	5 -10 years to implement and then on-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Capital Improvement Plans, Comprehensive Plans
Progress Report	
Action Status	Continuing in Progress
Report of Progress	The county and Potosi are currently implementing cost-share programs that will benefit the jurisdiction as a whole.

Action 6.3.1: Prioritize mitigation projects, based on cost-effectiveness and starting with those sites facing the greatest threat to life, health, and property.

Action Worksheet	
Name of Jurisdiction:	Irondale
Risk / Vulnerability	
Problem being Mitigated:	Lack of organization/priority of mitigation projects based on cost-effectiveness, and severity in regards to threat to life, health, and property.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	6.3.1
Name of Action or Project:	Prioritizing mitigation projects
Action or Project Description:	Prioritize mitigation projects, based on cost-effectiveness and starting with those sites facing the greatest threat to life, health and property.
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	$1,500 - $4,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, City Council
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan
Progress Report	
Action Status	Continuing in Progress
Report of Progress	Hazard mitigation projects were prioritized in the initial plan. The MPC reviewed and updated that list of prioritized items, including considering the greatest threat to life, health and property. This is an on-going activity. The list of prioritized action items should be reviewed at a minimum of every five years and following any major disaster events in the county.

Mineral Point

Goal 1: Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.

Action 1.1.3: Promote development of emergency plans by businesses and public entities by providing information on business continuity and emergency planning through local chambers of commerce and emergency management offices.

Action Worksheet	
Name of Jurisdiction:	Mineral Point
Risk / Vulnerability	
Problem being Mitigated:	Absence of emergency plans by businesses.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.1.3
Name of Action or Project:	Promote the development of emergency plans by businesses/government/schools.
Action or Project Description:	Promote development of emergency plans by businesses/government/schools.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	$4,500 - $5,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	27 – High Priority
Timeline for Completion:	1 – 5 years
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard mitigation plan, Meramec Region Community Economic Development Strategy (CEDS) – includes Chapter 8 – Economic Recovery and Resiliency Strategy
Progress Report	
Action Status	Continuing and updated – in progress
Report of Progress	During the last update of the CEDS, a chapter on economic recovery and resiliency was added which is a tool for local leaders to reduce vulnerability to natural hazards and expedite recovery public and private infrastructure. Implementation progress has been restricted due to lack of funding to develop a program to encourage and assist businesses and public entities in developing emergency plans. EMDs are encouraged to share resources available through SEMA and FEMA on emergency planning for businesses and public entities and through chambers of commerce.

Action 1.1.4: Continue to provide CERT training and encourage the development of CERT teams.

Action Worksheet	
Name of Jurisdiction:	Mineral Point
Risk / Vulnerability	
Problem being Mitigated:	Lack of CERT Teams and CERT training throughout the planning area.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.1.4
Name of Action or Project:	Continue to provide CERT training and encourage the development of CERT teams.
Action or Project Description:	Provide CERT training and encourage the development of CERT teams throughout the planning area.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$2,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	27 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	N/A
Progress Report	
Action Status	In progress and on-going
Report of Progress	There is one CERT team within the county (Richwoods), but is active.

Action 1.2.1: Actively seek funding to assist cities in obtaining early warning systems and improved communication systems and updating existing warning systems.

Action Worksheet	
Name of Jurisdiction:	Mineral Point
Risk / Vulnerability	
Problem being Mitigated:	Need to improve warning and communications systems throughout the county.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.2.1
Name of Action or Project:	Actively seek funding to assist cities in obtaining early warning systems and improved communication systems and updating existing warning systems.
Action or Project Description:	Provide information to local governments and citizens on the existing warning systems in place in Crawford County and encourage better utilization of those systems. In addition, actively search for funding to improve both warning systems and communications throughout the county.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	Unknown
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Superintendent
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going - with goal of 2020 for having 80 percent or more of the population signed up for Nixel.
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, Hazard Mitigation Plan, School Emergency Plan
Progress Report	
Action Status	Continuing– in progress
Report of Progress	Currently there are storm sirens in Washington Co., Caledonia, and Potosi. Currently the only phone based warning/messaging systems available in the county is Nixle. Kingston K-14 (BlackBoard Connect), Potosi R-III (BlackBoard Connect), and Richwoods R-VII (Textcaster) utilize phone based warning/messaging systems. In addition, the county and cities need to continue to work to improve communications systems within the county to improve county-wide as well as state-wide communications during disasters and joint response efforts.

Action 1.2.2: Promote the use of weather radios by local residents to ensure advanced warning about threatening weather.

Action Worksheet	
Name of Jurisdiction:	Mineral Point
Risk / Vulnerability	
Problem being Mitigated:	Lack of storm warning systems in rural areas of Washington County
Hazard(s) Addressed:	Severe Storms and Tornados
Action or Project	
Action/Project Number:	1.2.2
Name of Action or Project:	Promote weather radio use
Action or Project Description:	Promote the use of weather radios by local residents to ensure advanced warning about threatening weather.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$2,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	25 – High Priority
Timeline for Completion:	1-5 Years
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard mitigation plan, LEOP
Progress Report	
Action Status	Continuing in progress
Report of Progress	County includes information on weather radios in preparedness kits

Action 1.3.2: Provide information on tree trimming and dead tree removal programs to utility companies and local government.

Action Worksheet	
Name of Jurisdiction:	Mineral Point
Risk / Vulnerability	
Problem being Mitigated:	Power outages due to dead trees/over-hanging limbs
Hazard(s) Addressed:	Severe Storm (Hail/Wind), Tornado, and Severe Winter Weather
Action or Project	
Action/Project Number:	1.3.2
Name of Action or Project:	Provide information on tree trimming and dead tree removal programs to utility companies and local government.
Action or Project Description:	Jurisdictions will continue to trim dead trees and over hanging limbs to prevent power outages during severe weather.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$5,500 - $9,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damage, loss of function/displacement impacts and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Road and Bridge/Utility Departments
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, Hazard Mitigation Plan
Progress Report	
Action Status	Continuing and updated – in progress
Report of Progress	The county's road and bridge dept., along with electrical co-op will continue to trim dead trees and over hanging limbs to protect electrical lines and property.

Action 1.3.4: Establish cooling centers where residents can go during extreme heat or power outages.

Action Worksheet	
Name of Jurisdiction:	Mineral Point
Risk / Vulnerability	
Problem being Mitigated:	Lack of public access to cooling centers and areas with generators during power outages.
Hazard(s) Addressed:	Extreme Heat
Action or Project	
Action/Project Number:	1.3.4
Name of Action or Project:	Establish cooling centers where residents can go during extreme heat or power outages.
Action or Project Description:	Develop relationships with community businesses, schools, churches, to house public during extreme heat and power outages. Discuss mutual agreements for generators/funding sources.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$1,000 - $50,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, City Council
Action/Project Priority:	27 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP
Progress Report	
Action Status	Continuing in Progress
Report of Progress	Funding for generators has been a stumbling block in progress.

Action 1.3.6: Disseminate information on the importance of and funding sources for storm shelters and tornado safe rooms near areas of high population densities (large employers).

Action Worksheet	
Name of Jurisdiction:	Mineral Point
Risk / Vulnerability	
Problem being Mitigated:	Lack of storm shelters and tornado safe rooms
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.3.6
Name of Action or Project:	Disseminate information on the importance of and funding sources for storm shelters and tornado safe rooms near areas of high population densities (large employers).
Action or Project Description:	Designation of storm shelters and tornado safe rooms where large numbers of people congregate.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	Unknown
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Superintendent
Action/Project Priority:	15 – Medium
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, Hazard Mitigation Plan, School Emergency Plan
Progress Report	
Action Status	Continuing– in progress
Report of Progress	Kingston K-14 and Valley-VI both have storm shelters

Goal 2: Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.

Action 2.1.1: Provide information on self-inspection programs to critical facilities to assess earthquake and tornado resistance.

Action Worksheet	
Name of Jurisdiction:	Mineral Point
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with construction of critical facilities which may make them vulnerable to earthquakes and tornadoes
Hazard(s) Addressed:	Earthquakes, Tornados
Action or Project	
Action/Project Number:	2.1.1
Name of Action or Project:	Critical facility inspection
Action or Project Description:	Provide information on self-inspection programs to critical facilities to assess earthquake and tornado resistance.
Applicable Goal Statement:	Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.
Estimated Cost:	$1,500 – $5,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damage, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	County EMD, local emergency response agencies
Action/Project Priority:	16 – Medium Priority
Timeline for Completion:	1 – 5 years
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, capital improvement plans, hazard mitigation plan, local critical facility budgets
Progress Report	
Action Status	Continuing – in progress
Report of Progress	Kingston K-14 and Valley R-VI both have built structures to resist tornado and earthquake damage.

Action 2.1.4: Promote development of emergency plans by businesses and public entities by providing information on business continuity and emergency planning through local chambers of commerce and emergency management offices.

Action Worksheet	
Name of Jurisdiction:	Mineral Point
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities of natural hazard damages to businesses and public resources.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	2.1.4
Name of Action or Project:	Property & Infrastructure Protection
Action or Project Description:	Promote development of emergency plans by businesses and public entities by providing information on business continuity and emergency planning through local chambers of commerce and emergency management offices.
Applicable Goal Statement:	Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.
Estimated Cost:	$5,000 - $10,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMDs, County Commission, City Councils
Action/Project Priority:	25 – High Priority
Timeline for Completion:	5 years
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, Meramec Regional CEDS
Progress Report	
Action Status	In-progress and on-going
Report of Progress	Most jurisdictions have not had the resources available to complete emergency plans for their planning area. In some cases they fall under the county plan.

Action 2.2.1: Educate residents about the dangers of floodplain development and the benefits of the National Flood Insurance Program.

Action Worksheet	
Name of Jurisdiction:	Mineral Point
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with the general public not being aware of the dangers of floodplain development and benefits of the NFIP.
Hazard(s) Addressed:	Floods
Action or Project	
Action/Project Number:	2.2.1
Name of Action or Project:	Floodplain education/awareness program.
Action or Project Description:	Educate residents about the dangers of floodplain development and the benefits of the National Flood Insurance Program.
Applicable Goal Statement:	Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.
Estimated Cost:	$1,500 - $4,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damage, loss of function/displacement impacts and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	County EMD and floodplain manager
Action/Project Priority:	28 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard mitigation plan, LEOP, floodplain management ordinance
Progress Report	
Action Status	In-progress and on-going
Report of Progress	The county floodplain manager actively distributes brochures, press releases and information on floodplain management and development requirements.

Action 2.2.2: Continue to enforce flood damage prevention/floodplain management ordinances in compliance with NFIP requirements.

Action Worksheet	
Name of Jurisdiction:	Mineral Point
Risk / Vulnerability	
Problem being Mitigated:	The need to improve floodplain management enforcement procedures that will help reduce risk and vulnerability.
Hazard(s) Addressed:	Floods
Action or Project	
Action/Project Number:	2.2.2
Name of Action or Project:	Continue to enforce flood damage prevention/floodplain management ordinances in compliance with NFIP requirements.
Action or Project Description:	The city floodplain manager, with the assistance of the board of aldermen, needs to establish enforcement procedures to make sure the city stays in compliance with the city floodplain management ordinance and NFIP requirements.
Applicable Goal Statement:	Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.
Estimated Cost:	$4,500 - $5,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Floodplain Managers
Action/Project Priority:	28 – High Priority
Timeline for Completion:	1 – 5 years
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Jurisdictional Ordinances
Progress Report	
Action Status	Continuing– in progress
Report of Progress	Jurisdictions would benefit from establishing procedures for enforcing the ordinance.

Action 2.3.1: Provide information on the benefits of establishing minimum building codes to those jurisdiction that currently lack minimum building code requirements.

Action Worksheet	
Name of Jurisdiction:	Mineral Point
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities to property and communities in the event of a natural disaster due to substandard construction.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	2.3.1
Name of Action or Project:	Information/awareness program for the benefits of minimum building codes.
Action or Project Description:	Provide information on the benefits of establishing minimum building codes to those jurisdictions that currently lack minimum building code requirements.
Applicable Goal Statement:	Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.
Estimated Cost:	$3,000 - $10,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	County Commission and City Councils
Action/Project Priority:	17 – Medium Priority
Timeline for Completion:	5 years
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services
Local Planning Mechanisms to be Used in Implementation, if any:	N/A
Progress Report	
Action Status	Continuing Not Started
Report of Progress	There has been no progress in this area due to the communities not having the resources to enforce building codes.

Action 2.3.2: Have local jurisdictions review their floodplain ordinances and if not included, add language for securing hazardous materials tanks and mobile homes in floodplain areas to reduce hazards during storms and flooding.

Action Worksheet	
Name of Jurisdiction:	Mineral Point
Risk / Vulnerability	
Problem being Mitigated:	Unsecured hazardous materials tank such as propane and unsecured mobile homes pose risks during floods, severe storms and tornadoes.
Hazard(s) Addressed:	Floods, Severe Storms, and Tornados
Action or Project	
Action/Project Number:	2.3.2
Name of Action or Project:	Establishing regulations for the securing of hazardous materials tanks and mobile homes.
Action or Project Description:	Have local jurisdictions review their floodplain ordinances and if not included, add language for securing hazardous materials tanks and mobile homes in floodplain areas to reduce hazards during storms and flooding.
Applicable Goal Statement:	Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.
Estimated Cost:	$2,500 - $5,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, City Council
Action/Project Priority:	17 – Medium Priority
Timeline for Completion:	1 – 5 years
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard mitigation plan, LEOP, floodplain ordinances, building codes
Progress Report	
Action Status	Continuing – in progress
Report of Progress	No progress has been made on this action item.

Goal 3: Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.

Action 3.1.1: Distribute SEMA brochures on natural hazards and preparedness at public facilities and events.

Action Worksheet	
Name of Jurisdiction:	Mineral Point
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with lack of awareness of emergency management and best practices during hazardous events.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.1.1
Name of Action or Project:	Distribute SEMA brochures on natural hazards and preparedness at public facilities and events.
Action or Project Description:	Provide information by distributing SEMA brochures and press releases on types of hazards, best practices during a disaster (Ready in 3) and other informational documents.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities
Estimated Cost:	$1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	City EMD, local emergency response agencies, county health department
Action/Project Priority:	20 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP
Progress Report	
Action Status	Continuing in Progress
Report of Progress	The health department and some local emergency response agencies regularly distribute emergency related brochures and information at local events. The county EMD and health department also distribute press releases on hazards and how to prepare for them.

Action 3.2.2: Encourage meetings between EMD, city/county officials and SEMA to familiarize officials with mitigation planning, implementation and budgeting for mitigation projects.

Action Worksheet	
Name of Jurisdiction:	Mineral Point
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with lack of knowledge/understanding of the importance of hazard mitigation activities
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.2.2
Name of Action or Project:	Awareness/education program on hazard mitigation for local elected officials and planning organizations
Action or Project Description:	Ask SEMA mitigation specialists to present information to city councils, county commission and local planning organizations.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities
Estimated Cost:	$1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	City Council, EMD
Action/Project Priority:	28 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs, Floodplain Ordinance
Progress Report	
Action Status	Continuing in progress
Report of Progress	The Region C SEMA area coordinator conducts quarterly meetings in the region and has included hazard mitigation in those meetings.

Action 3.3.1: Re-evaluate the hazard mitigation plan, merge with other community planning and coordinate and integrate hazard mitigation activities, where appropriate, with emergency operations plans and procedures.

Action Worksheet	
Name of Jurisdiction:	Mineral Point
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with not regularly reviewing and updating the mitigation plan and incorporating mitigation activities into emergency operations plans and procedures.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.3.1
Name of Action or Project:	Re-evaluate the hazard mitigation plan and merge with other community planning activities.
Action or Project Description:	Re-evaluate the hazard mitigation plan, merge with other community planning activities and documents and incorporate hazard mitigation into the long-range planning and development activities of the county and each jurisdiction.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities
Estimated Cost:	$5,500 - $10,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, City Council, Local Planners, MPC
Action/Project Priority:	22 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOPs, hazard mitigation plan, school crisis management plans, comprehensive plans, builder's plans, capital improvement plan, economic development plan, transportation plan, land-use plan, floodplain ordinances, storm water plans/ordinances
Progress Report	
Action Status	Continuing in Progress
Report of Progress	Hazard mitigation goals and actions have been incorporated into the regional Community and Economic Development Strategy. Mitigation actions are part of the county LEOP. As more local officials become familiar with mitigation and understand how it fits within other planning activities, this action item will continue to expand.

Action 3.3.2: Implement a public awareness program about the benefits of hazard mitigation projects, both public and private, including distributing press releases by cities/county regarding adopted mitigation measures to keep public abreast of changes and/or new regulations.

Action Worksheet	
Name of Jurisdiction:	Mineral Point
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with the public's lack of knowledge in regards to hazard mitigation and the benefits of adopting mitigation measures.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.3.2
Name of Action or Project:	Awareness program on local mitigation activities.
Action or Project Description:	Distribute press releases by cities/county regarding adopted mitigation measures
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.
Estimated Cost:	$500-$1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, City Council
Action/Project Priority:	23 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, hazard mitigation plan, floodplain ordinance
Progress Report	
Action Status	Continuing in Progress
Report of Progress	The county regularly does press releases on road and bridge upgrades

Action 3.4.2: Publicize county or citywide drills.

Action Worksheet	
Name of Jurisdiction:	Mineral Point
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with the lack of knowledge in regards to the proper measures to take during hazard events.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.4.2
Name of Action or Project:	Publicize county or citywide drills.
Action or Project Description:	Publicize county or citywide drills to make the general public aware of training/exercises being conducted locally and raise awareness of emergency preparedness and what measures should be taken.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.
Estimated Cost:	$500 - $1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	21– High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOPs
Progress Report	
Action Status	Continuing in Progress
Report of Progress	This is an on-going activity. Local governments make the public aware of drills/trainings/exercises through press releases to the media and follow up articles on drills. SEMA also publicizes drills that are being done on a regional or statewide level.

Goal 4: Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.

Action 4.1.1: Schedule joint meetings with different organizations/agencies for mitigation planning.

Action Worksheet	
Name of Jurisdiction:	Mineral Point
Risk / Vulnerability	
Problem being Mitigated:	Lack of synergy/communication among organizations/agencies for mitigation related planning.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	4.1.1
Name of Action or Project:	Schedule joint meetings with different organizations/agencies for mitigation planning.
Action or Project Description:	Schedule joint meetings with different organizations/agencies for mitigation planning and continued communications amongst jurisdictions/organizations/agencies.
Applicable Goal Statement:	Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.
Estimated Cost:	$500 - $1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMDs
Action/Project Priority:	28 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP
Progress Report	
Action Status	Continuing in Progress
Report of Progress	This is an on-going activity. Region C Fire Chiefs meet regularly. The Region C SEMA area coordinator holds quarterly meetings throughout the region.. This program could benefit from a more coordinated, focused effort to bring different agencies together to discuss mitigation issues.

Action 4.1.2: Continue to encourage joint training (or drills) between agencies, public and private entities (including schools and businesses).

Action Worksheet	
Name of Jurisdiction:	Mineral Point
Risk / Vulnerability	
Problem being Mitigated:	Lack of synergy/communication/coordination among agencies, public, and private entities on disaster training and emergency drills/exercises.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	4.1.2
Name of Action or Project:	Encourage joint training/drills/exercises among all jurisdictions and local businesses.
Action or Project Description:	Continue to encourage joint training (and drills) between agencies, public and private entities (including schools/businesses).
Applicable Goal Statement:	Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.
Estimated Cost:	$1,000 - $10,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	County EMD, City EMDs, Emergency Response Agencies, School Superintendents
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOPS, School Emergency Plan
Progress Report	
Action Status	Continuing in Progress
Report of Progress	Jurisdictions, EMDs and emergency response agencies within Washington County cooperate on training and drills on a regular basis. Fire and police departments regularly train with local school districts. The Region C SEMA area coordinator works with local entities throughout the area to do at least one exercise each year that is either regional or state-wide. The Meramec Regional Emergency Planning Committee (MREPC) coordinates tabletop and full-scale exercises from time to time throughout the region.

Action 4.1.3: Pool different agency resources to achieve widespread mitigation results.

Action Worksheet	
Name of Jurisdiction:	Mineral Point
Risk / Vulnerability	
Problem being Mitigated:	Lack of resources among agencies which hinder mitigation results.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	4.1.3
Name of Action or Project:	Pooling resources for mitigation activities
Action or Project Description:	Pool different agency resources to achieve widespread mitigation planning results.
Applicable Goal Statement:	Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.
Estimated Cost:	$1,000 - $4,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, City Council
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation plan, LEOPs, Capital Improvement plans, Comprehensive plans, Strategic plans
Progress Report	
Action Status	Continuing in Progress
Report of Progress	All jurisdictions reported that they are interested in finding ways to pool resources to accomplish mitigation projects. There has been interest in thinking outside the box on funding upgrades to low water crossing projects and tapping into different funding sources (Missouri Department of Conservation funds to protect endangered species and open streams to allow free movement of fish.)

Goal 5: Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefit of special interests.

Action 5.1.4: Encourage cities to require contractor storm water management plans in all new development – both residential and commercial properties.

Action Worksheet	
Name of Jurisdiction:	Mineral Point
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with non-existent storm water management plans
Hazard(s) Addressed:	Floods, Severe Storms, Severe Winter Storms
Action or Project	
Action/Project Number:	5.1.4
Name of Action or Project:	Encourage all communities to develop storm water management plans.
Action or Project Description:	Encourage all communities/jurisdictions to develop storm water management plans.
Applicable Goal Statement:	Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefits of special interests.
Estimated Cost:	$800 - $1,800
Benefits:	Losses avoided by implementing this action include property damages.
Plan for Implementation	
Responsible Organization/Department:	Local Planners, Local Governments
Action/Project Priority:	17 – Medium Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services
Local Planning Mechanisms to be Used in Implementation, if any:	City Ordinances
Progress Report	
Action Status	Continuing – no progress
Report of Progress	No updates were provided by the MPC.

Action 5.2.1: Encourage local governments to purchase properties in the floodplain as funds become available and convert that land into public space/recreation area.

Action Worksheet	
Name of Jurisdiction:	Mineral Point
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with floodplain properties
Hazard(s) Addressed:	Floods
Action or Project	
Action/Project Number:	5.2.1
Name of Action or Project:	Government purchase of properties in the floodplain
Action or Project Description:	Encourage local governments to purchase properties in the floodplain as funds become available and convert that land into public space/recreation area.
Applicable Goal Statement:	Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefits of special interests.
Estimated Cost:	$1,000 - $100,000
Benefits:	Losses avoided by implementing this action include property damage, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Local Government, County & City EMDs, Floodplain Managers
Action/Project Priority:	14 – Medium Priority
Timeline for Completion:	Continuous
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Floodplain Ordinance, Comprehensive Plans, Hazard Mitigation Plan
Progress Report	
Action Status	Continuing
Report of Progress	No progress

Action 5.2.2: Encourage communities to discuss zoning repetitive loss properties in the floodplain as open space.

Action Worksheet	
Name of Jurisdiction:	Mineral Point
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with repetitive loss properties.
Hazard(s) Addressed:	Floods
Action or Project	
Action/Project Number:	5.2.2
Name of Action or Project:	Zoning repetitive loss properties as open space.
Action or Project Description:	Encourage communities to discuss zoning repetitive loss properties in the floodplain as open space.
Applicable Goal Statement:	Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefits of special interests.
Estimated Cost:	$1,500 - $5,500
Benefits:	Losses avoided by implementing this action include property damage, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	City Government, Local Planners, City EMDs, Floodplain Managers
Action/Project Priority:	16 – Medium Priority
Timeline for Completion:	Continuous
Potential Fund Sources:	Local general revenue funds
Local Planning Mechanisms to be Used in Implementation, if any:	Floodplain ordinances, Hazard Mitigation plan, comprehensive plans, strategic plans
Progress Report	
Action Status	Continuing – no progress
Report of Progress	No action has been taken thus far.

Goal 6: Secure resources for investment in hazard mitigation.

Action 6.1.2: Structure grant proposals for road/bridge upgrades so that hazard mitigation concerns are also met.

Action Worksheet	
Name of Jurisdiction:	Mineral Point
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities in relation to inadequate roads/bridges
Hazard(s) Addressed:	Severe Winter Weather, Extreme Heat, Flooding
Action or Project	
Action/Project Number:	6.1.2
Name of Action or Project:	Structure grant proposals for road/bridge upgrades so that hazard mitigation concerns are also met.
Action or Project Description:	Actively seek and structure grant proposals for road/bridge upgrades to also cover hazard mitigation concerns and action items.
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	$5,000 - $5 Million
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	City Council, Road and Bridge Dept.
Action/Project Priority:	26 – High Priority
Timeline for Completion:	1-5 Years
Potential Fund Sources:	Grants
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Transportation Plan, Regional Transportation Plan
Progress Report	
Action Status	Continuing in Progress
Report of Progress	Lack of financial resources for construction/upgrades continues to be the main obstacle

Action 6.1.3: Work with state/local/federal agencies to include mitigation in all economic and community development projects.

Action Worksheet	
Name of Jurisdiction:	Mineral Point
Risk / Vulnerability	
Problem being Mitigated:	Lack of synergy/communication/coordination of mitigation in community development projects and integration of mitigation actions into economic and community development projects.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	6.1.3
Name of Action or Project:	Coordination with state/local/federal agencies to integrate mitigation into economic and community development projects
Action or Project Description:	Work with state/local/federal agencies to include mitigation in all economic and community development projects.
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	$2,500 - $9,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	City Council
Action/Project Priority:	28 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Capital Improvement Plans, Comprehensive Plans, Economic Development Plans, CEDS, strategic plans, land-use plans
Progress Report	
Action Status	Continuing in Progress
Report of Progress	Hazard mitigation goals and actions have been incorporated into the regional Community Economic Development Strategy (CEDS). As mitigation awareness grows, additional efforts will be made to incorporate mitigation activities into economic and community development projects.

Action 6.1.4: Provide information to jurisdictions on the benefits of budgeting for and implementing hazard mitigation projects.

Action Worksheet	
Name of Jurisdiction:	Mineral Point
Risk / Vulnerability	
Problem being Mitigated:	Lack of funding for mitigation projects among local jurisdictions
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	6.1.4
Name of Action or Project:	Budgeting and implementing hazard mitigation projects.
Action or Project Description:	Provide information to jurisdictions on the benefits of budgeting for and implementing hazard mitigation projects.
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	$500 - $1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, City Council
Action/Project Priority:	26 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Local general revenue funds
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Capital Improvements Plans, Comprehensive Plans, CEDS, strategic plans, LEOPs
Progress Report	
Action Status	Continuing in Progress
Report of Progress	As awareness of the importance of mitigation grows, more local jurisdictions are seeing the long-term benefits and working toward budgeting for mitigation activities.

Action 6.2.1: Provide information on the benefits of local governments implementing cost-share programs with private property owners for hazard mitigation projects that benefit the community as a whole.

Action Worksheet	
Name of Jurisdiction:	Mineral Point
Risk / Vulnerability	
Problem being Mitigated:	Lack of cost-share programs with private property owners for hazard mitigations projects.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	6.2.1
Name of Action or Project:	Encourage development and implementation of mitigation cost-share programs
Action or Project Description:	Provide information on the benefits of local governments implementing cost-share programs with private property owners for hazard mitigation projects that benefit the community as a whole
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	$ unknown – dependent upon projects and interest
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	City Council
Action/Project Priority:	15 – Medium Priority
Timeline for Completion:	5 -10 years to implement and then on-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Capital Improvement Plans, Comprehensive Plans
Progress Report	
Action Status	Continuing in Progress
Report of Progress	The county and Potosi are currently implementing cost-share programs that will benefit the jurisdiction as a whole.

Action 6.3.1: Prioritize mitigation projects, based on cost-effectiveness and starting with those sites facing the greatest threat to life, health, and property.

Action Worksheet	
Name of Jurisdiction:	Mineral Point
Risk / Vulnerability	
Problem being Mitigated:	Lack of organization/priority of mitigation projects based on cost-effectiveness, and severity in regards to threat to life, health, and property.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	6.3.1
Name of Action or Project:	Prioritizing mitigation projects
Action or Project Description:	Prioritize mitigation projects, based on cost-effectiveness and starting with those sites facing the greatest threat to life, health and property.
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	$1,500 - $4,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, City Council
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan
Progress Report	
Action Status	Continuing in Progress
Report of Progress	Hazard mitigation projects were prioritized in the initial plan. The MPC reviewed and updated that list of prioritized items, including considering the greatest threat to life, health and property. This is an on-going activity. The list of prioritized action items should be reviewed at a minimum of every five years and following any major disaster events in the county.

Potosi

Goal 1: Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.

Action 1.1.3: Promote development of emergency plans by businesses and public entities by providing information on business continuity and emergency planning through local chambers of commerce and emergency management offices.

Action Worksheet	
Name of Jurisdiction:	Potosi
Risk / Vulnerability	
Problem being Mitigated:	Absence of emergency plans by businesses.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.1.3
Name of Action or Project:	Promote the development of emergency plans by businesses/government/schools.
Action or Project Description:	Promote development of emergency plans by businesses/government/schools.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	$4,500 - $5,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	27 – High Priority
Timeline for Completion:	1 – 5 years
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard mitigation plan, Meramec Region Community Economic Development Strategy (CEDS) – includes Chapter 8 – Economic Recovery and Resiliency Strategy
Progress Report	
Action Status	Continuing and updated – in progress
Report of Progress	During the last update of the CEDS, a chapter on economic recovery and resiliency was added which is a tool for local leaders to reduce vulnerability to natural hazards and expedite recovery public and private infrastructure. Implementation progress has been restricted due to lack of funding to develop a program to encourage and assist businesses and public entities in developing emergency plans. EMDs are encouraged to share resources available through SEMA and FEMA on emergency planning for businesses and public entities and through chambers of commerce.

Action 1.1.4: Continue to provide CERT training and encourage the development of CERT teams.

Action Worksheet	
Name of Jurisdiction:	Potosi
Risk / Vulnerability	
Problem being Mitigated:	Lack of CERT Teams and CERT training throughout the planning area.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.1.4
Name of Action or Project:	Continue to provide CERT training and encourage the development of CERT teams.
Action or Project Description:	Provide CERT training and encourage the development of CERT teams throughout the planning area.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$2,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	27 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	N/A
Progress Report	
Action Status	In progress and on-going
Report of Progress	There is one CERT team within the county (Richwoods), but is active.

Action 1.2.1: Actively seek funding to assist cities in obtaining early warning systems and improved communication systems and updating existing warning systems.

Action Worksheet	
Name of Jurisdiction:	Potosi
Risk / Vulnerability	
Problem being Mitigated:	Need to improve warning and communications systems throughout the county.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.2.1
Name of Action or Project:	Actively seek funding to assist cities in obtaining early warning systems and improved communication systems and updating existing warning systems.
Action or Project Description:	Provide information to local governments and citizens on the existing warning systems in place in Crawford County and encourage better utilization of those systems. In addition, actively search for funding to improve both warning systems and communications throughout the county.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	Unknown
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Superintendent
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going - with goal of 2020 for having 80 percent or more of the population signed up for Nixel.
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, Hazard Mitigation Plan, School Emergency Plan
Progress Report	
Action Status	Continuing– in progress
Report of Progress	Currently there are storm sirens in Washington Co., Caledonia, and Potosi. Currently the only phone based warning/messaging systems available in the county is Nixle. Kingston K-14 (BlackBoard Connect), Potosi R-III (BlackBoard Connect), and Richwoods R-VII (Textcaster) utilize phone based warning/messaging systems. In addition, the county and cities need to continue to work to improve communications systems within the county to improve county-wide as well as state-wide communications during disasters and joint response efforts.

Action 1.2.2: Promote the use of weather radios by local residents to ensure advanced warning about threatening weather.

Action Worksheet	
Name of Jurisdiction:	Potosi
Risk / Vulnerability	
Problem being Mitigated:	Lack of storm warning systems in rural areas of Washington County
Hazard(s) Addressed:	Severe Storms and Tornados
Action or Project	
Action/Project Number:	1.2.2
Name of Action or Project:	Promote weather radio use
Action or Project Description:	Promote the use of weather radios by local residents to ensure advanced warning about threatening weather.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$2,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	25 – High Priority
Timeline for Completion:	1-5 Years
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard mitigation plan, LEOP
Progress Report	
Action Status	Continuing in progress
Report of Progress	County includes information on weather radios in preparedness kits

Action 1.3.2: Provide information on tree trimming and dead tree removal programs to utility companies and local government.

Action Worksheet	
Name of Jurisdiction:	Potosi
Risk / Vulnerability	
Problem being Mitigated:	Power outages due to dead trees/over-hanging limbs
Hazard(s) Addressed:	Severe Storm (Hail/Wind), Tornado, and Severe Winter Weather
Action or Project	
Action/Project Number:	1.3.2
Name of Action or Project:	Provide information on tree trimming and dead tree removal programs to utility companies and local government.
Action or Project Description:	Jurisdictions will continue to trim dead trees and over hanging limbs to prevent power outages during severe weather.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$5,500 - $9,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damage, loss of function/displacement impacts and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Road and Bridge/Utility Departments
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, Hazard Mitigation Plan
Progress Report	
Action Status	Continuing and updated – in progress
Report of Progress	The cities road and bridge dept., along with utilities dept. will continue to trim dead trees and over hanging limbs to protect electrical lines and property.

Action 1.3.3: Continue to review and consider road and bridge upgrades to improve drainage and reduce flooding and the risk to residents and property.

Action Worksheet	
Name of Jurisdiction:	Potosi
Risk / Vulnerability	
Problem being Mitigated:	Risks and vulnerabilities associated with flooding
Hazard(s) Addressed:	Flooding
Action or Project	
Action/Project Number:	1.3.3
Name of Action or Project:	Continue to review and consider road and bridge upgrades to improve drainage and reduce flooding and the risk to residents and property.
Action or Project Description:	Continue to review and consider road and bridge upgrades to improve drainage and reduce flooding and the risk to residents and property.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$5,000 - $10,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damage, loss of function/displacement impacts and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Road and Bridge Department, City Council
Action/Project Priority:	21 - H
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Transportation Plan, Comprehensive Plan, Regional Transportation Plan
Progress Report	
Action Status	Revised and continuing - in progress
Report of Progress	Jurisdictions regularly consider road and bridge upgrades. CDBG funds are regularly pursued for bridge upgrades.

Action 1.3.4: Establish cooling centers where residents can go during extreme heat or power outages.

Action Worksheet	
Name of Jurisdiction:	Potosi
Risk / Vulnerability	
Problem being Mitigated:	Lack of public access to cooling centers and areas with generators during power outages.
Hazard(s) Addressed:	Extreme Heat
Action or Project	
Action/Project Number:	1.3.4
Name of Action or Project:	Establish cooling centers where residents can go during extreme heat or power outages.
Action or Project Description:	Develop relationships with community businesses, schools, churches, to house public during extreme heat and power outages. Discuss mutual agreements for generators/funding sources.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$1,000 - $50,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, City Council
Action/Project Priority:	27 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP
Progress Report	
Action Status	Continuing in Progress
Report of Progress	Funding for generators has been a stumbling block in progress.

Action 1.3.6: Disseminate information on the importance of and funding sources for storm shelters and tornado safe rooms near areas of high population densities (large employers).

Action Worksheet	
Name of Jurisdiction:	Potosi
Risk / Vulnerability	
Problem being Mitigated:	Lack of storm shelters and tornado safe rooms
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.3.6
Name of Action or Project:	Disseminate information on the importance of and funding sources for storm shelters and tornado safe rooms near areas of high population densities (large employers).
Action or Project Description:	Designation of storm shelters and tornado safe rooms where large numbers of people congregate.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	Unknown
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Superintendent
Action/Project Priority:	15 – Medium
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, Hazard Mitigation Plan, School Emergency Plan
Progress Report	
Action Status	Continuing– in progress
Report of Progress	Kingston K-14 and Valley-VI both have storm shelters

Goal 2: Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.

Action 2.1.1: Provide information on self-inspection programs to critical facilities to assess earthquake and tornado resistance.

Action Worksheet	
Name of Jurisdiction:	Potosi
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with construction of critical facilities which may make them vulnerable to earthquakes and tornadoes
Hazard(s) Addressed:	Earthquakes, Tornados
Action or Project	
Action/Project Number:	2.1.1
Name of Action or Project:	Critical facility inspection
Action or Project Description:	Provide information on self-inspection programs to critical facilities to assess earthquake and tornado resistance.
Applicable Goal Statement:	Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.
Estimated Cost:	$1,500 – $5,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damage, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	County EMD, local emergency response agencies
Action/Project Priority:	16 – Medium Priority
Timeline for Completion:	1 – 5 years
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, capital improvement plans, hazard mitigation plan, local critical facility budgets
Progress Report	
Action Status	Continuing – in progress
Report of Progress	Kingston K-14 and Valley R-VI both have built structures to resist tornado and earthquake damage.

Action 2.1.4: Promote development of emergency plans by businesses and public entities by providing information on business continuity and emergency planning through local chambers of commerce and emergency management offices.

Action Worksheet	
Name of Jurisdiction:	Potosi
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities of natural hazard damages to businesses and public resources.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	2.1.4
Name of Action or Project:	Property & Infrastructure Protection
Action or Project Description:	Promote development of emergency plans by businesses and public entities by providing information on business continuity and emergency planning through local chambers of commerce and emergency management offices.
Applicable Goal Statement:	Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.
Estimated Cost:	$5,000 - $10,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMDs, County Commission, City Councils
Action/Project Priority:	25 – High Priority
Timeline for Completion:	5 years
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, Meramec Regional CEDS
Progress Report	
Action Status	In-progress and on-going
Report of Progress	Most jurisdictions have not had the resources available to complete emergency plans for their planning area. In some cases they fall under the county plan.

Action 2.2.1: Educate residents about the dangers of floodplain development and the benefits of the National Flood Insurance Program.

Action Worksheet	
Name of Jurisdiction:	Potosi
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with the general public not being aware of the dangers of floodplain development and benefits of the NFIP.
Hazard(s) Addressed:	Floods
Action or Project	
Action/Project Number:	2.2.1
Name of Action or Project:	Floodplain education/awareness program.
Action or Project Description:	Educate residents about the dangers of floodplain development and the benefits of the National Flood Insurance Program.
Applicable Goal Statement:	Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.
Estimated Cost:	$1,500 - $4,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damage, loss of function/displacement impacts and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	County EMD and floodplain manager
Action/Project Priority:	28 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard mitigation plan, LEOP, floodplain management ordinance
Progress Report	
Action Status	In-progress and on-going
Report of Progress	The county floodplain manager actively distributes brochures, press releases and information on floodplain management and development requirements.

Action 2.2.2: Continue to enforce flood damage prevention/floodplain management ordinances in compliance with NFIP requirements.

Action Worksheet	
Name of Jurisdiction:	Potosi
Risk / Vulnerability	
Problem being Mitigated:	The need to improve floodplain management enforcement procedures that will help reduce risk and vulnerability.
Hazard(s) Addressed:	Floods
Action or Project	
Action/Project Number:	2.2.2
Name of Action or Project:	Continue to enforce flood damage prevention/floodplain management ordinances in compliance with NFIP requirements.
Action or Project Description:	The city floodplain manager, with the assistance of the board of aldermen, needs to establish enforcement procedures to make sure the city stays in compliance with the city floodplain management ordinance and NFIP requirements.
Applicable Goal Statement:	Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.
Estimated Cost:	$4,500 - $5,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Floodplain Managers
Action/Project Priority:	28 – High Priority
Timeline for Completion:	1 – 5 years
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Jurisdictional Ordinances
Progress Report	
Action Status	Continuing– in progress
Report of Progress	Jurisdictions would benefit from establishing procedures for enforcing the ordinance.

Action 2.3.1: Provide information on the benefits of establishing minimum building codes to those jurisdiction that currently lack minimum building code requirements.

Action Worksheet	
Name of Jurisdiction:	Potosi
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities to property and communities in the event of a natural disaster due to substandard construction.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	2.3.1
Name of Action or Project:	Information/awareness program for the benefits of minimum building codes.
Action or Project Description:	Provide information on the benefits of establishing minimum building codes to those jurisdictions that currently lack minimum building code requirements.
Applicable Goal Statement:	Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.
Estimated Cost:	$3,000 - $10,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	County Commission and City Councils
Action/Project Priority:	17 – Medium Priority
Timeline for Completion:	5 years
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services
Local Planning Mechanisms to be Used in Implementation, if any:	N/A
Progress Report	
Action Status	Continuing Not Started
Report of Progress	There has been no progress in this area due to the communities not having the resources to enforce building codes.

Action 2.3.2: Have local jurisdictions review their floodplain ordinances and if not included, add language for securing hazardous materials tanks and mobile homes in floodplain areas to reduce hazards during storms and flooding.

Action Worksheet	
Name of Jurisdiction:	Potosi
Risk / Vulnerability	
Problem being Mitigated:	Unsecured hazardous materials tank such as propane and unsecured mobile homes pose risks during floods, severe storms and tornadoes.
Hazard(s) Addressed:	Floods, Severe Storms, and Tornados
Action or Project	
Action/Project Number:	2.3.2
Name of Action or Project:	Establishing regulations for the securing of hazardous materials tanks and mobile homes.
Action or Project Description:	Have local jurisdictions review their floodplain ordinances and if not included, add language for securing hazardous materials tanks and mobile homes in floodplain areas to reduce hazards during storms and flooding.
Applicable Goal Statement:	Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.
Estimated Cost:	$2,500 - $5,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, City Council
Action/Project Priority:	17 – Medium Priority
Timeline for Completion:	1 – 5 years
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard mitigation plan, LEOP, floodplain ordinances, building codes
Progress Report	
Action Status	Continuing – in progress
Report of Progress	No progress has been made on this action item.

Goal 3: Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.

Action 3.1.1: Distribute SEMA brochures on natural hazards and preparedness at public facilities and events.

Action Worksheet	
Name of Jurisdiction:	Potosi
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with lack of awareness of emergency management and best practices during hazardous events.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.1.1
Name of Action or Project:	Distribute SEMA brochures on natural hazards and preparedness at public facilities and events.
Action or Project Description:	Provide information by distributing SEMA brochures and press releases on types of hazards, best practices during a disaster (Ready in 3) and other informational documents.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities
Estimated Cost:	$1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	City EMD, local emergency response agencies, county health department
Action/Project Priority:	20 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP
Progress Report	
Action Status	Continuing in Progress
Report of Progress	The health department and some local emergency response agencies regularly distribute emergency related brochures and information at local events. The county EMD and health department also distribute press releases on hazards and how to prepare for them.

Action 3.2.2: Encourage meetings between EMD, city/county officials and SEMA to familiarize officials with mitigation planning, implementation and budgeting for mitigation projects.

Action Worksheet	
Name of Jurisdiction:	Potosi
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with lack of knowledge/understanding of the importance of hazard mitigation activities
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.2.2
Name of Action or Project:	Awareness/education program on hazard mitigation for local elected officials and planning organizations
Action or Project Description:	Ask SEMA mitigation specialists to present information to city councils, county commission and local planning organizations.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities
Estimated Cost:	$1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	City Council, EMD
Action/Project Priority:	28 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs, Floodplain Ordinance
Progress Report	
Action Status	Continuing in progress
Report of Progress	The Region C SEMA area coordinator conducts quarterly meetings in the region and has included hazard mitigation in those meetings.

Action 3.3.1: Re-evaluate the hazard mitigation plan, merge with other community planning and coordinate and integrate hazard mitigation activities, where appropriate, with emergency operations plans and procedures.

Action Worksheet	
Name of Jurisdiction:	Potosi
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with not regularly reviewing and updating the mitigation plan and incorporating mitigation activities into emergency operations plans and procedures.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.3.1
Name of Action or Project:	Re-evaluate the hazard mitigation plan and merge with other community planning activities.
Action or Project Description:	Re-evaluate the hazard mitigation plan, merge with other community planning activities and documents and incorporate hazard mitigation into the long-range planning and development activities of the county and each jurisdiction.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities
Estimated Cost:	$5,500 - $10,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, City Council, Local Planners, MPC
Action/Project Priority:	22 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOPs, hazard mitigation plan, school crisis management plans, comprehensive plans, builder's plans, capital improvement plan, economic development plan, transportation plan, land-use plan, floodplain ordinances, storm water plans/ordinances
Progress Report	
Action Status	Continuing in Progress
Report of Progress	Hazard mitigation goals and actions have been incorporated into the regional Community and Economic Development Strategy. Mitigation actions are part of the county LEOP. As more local officials become familiar with mitigation and understand how it fits within other planning activities, this action item will continue to expand.

Action 3.3.2: Implement a public awareness program about the benefits of hazard mitigation projects, both public and private, including distributing press releases by cities/county regarding adopted mitigation measures to keep public abreast of changes and/or new regulations.

Action Worksheet	
Name of Jurisdiction:	Potosi
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with the public's lack of knowledge in regards to hazard mitigation and the benefits of adopting mitigation measures.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.3.2
Name of Action or Project:	Awareness program on local mitigation activities.
Action or Project Description:	Distribute press releases by cities/county regarding adopted mitigation measures
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.
Estimated Cost:	$500-$1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, City Council
Action/Project Priority:	23 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, hazard mitigation plan, floodplain ordinance
Progress Report	
Action Status	Continuing in Progress
Report of Progress	The county regularly does press releases on road and bridge upgrades

Action 3.4.2: Publicize county or citywide drills.

Action Worksheet	
Name of Jurisdiction:	Potosi
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with the lack of knowledge in regards to the proper measures to take during hazard events.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.4.2
Name of Action or Project:	Publicize county or citywide drills.
Action or Project Description:	Publicize county or citywide drills to make the general public aware of training/exercises being conducted locally and raise awareness of emergency preparedness and what measures should be taken.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.
Estimated Cost:	$500 - $1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	21– High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOPs
Progress Report	
Action Status	Continuing in Progress
Report of Progress	This is an on-going activity. Local governments make the public aware of drills/trainings/exercises through press releases to the media and follow up articles on drills. SEMA also publicizes drills that are being done on a regional or statewide level.

Goal 4: Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.

Action 4.1.1: Schedule joint meetings with different organizations/agencies for mitigation planning.

Action Worksheet	
Name of Jurisdiction:	Potosi
Risk / Vulnerability	
Problem being Mitigated:	Lack of synergy/communication among organizations/agencies for mitigation related planning.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	4.1.1
Name of Action or Project:	Schedule joint meetings with different organizations/agencies for mitigation planning.
Action or Project Description:	Schedule joint meetings with different organizations/agencies for mitigation planning and continued communications amongst jurisdictions/organizations/agencies.
Applicable Goal Statement:	Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.
Estimated Cost:	$500 - $1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMDs
Action/Project Priority:	28 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP
Progress Report	
Action Status	Continuing in Progress
Report of Progress	This is an on-going activity. Region C Fire Chiefs meet regularly. The Region C SEMA area coordinator holds quarterly meetings throughout the region.. This program could benefit from a more coordinated, focused effort to bring different agencies together to discuss mitigation issues.

Action 4.1.2: Continue to encourage joint training (or drills) between agencies, public and private entities (including schools and businesses).

Action Worksheet	
Name of Jurisdiction:	Potosi
Risk / Vulnerability	
Problem being Mitigated:	Lack of synergy/communication/coordination among agencies, public, and private entities on disaster training and emergency drills/exercises.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	4.1.2
Name of Action or Project:	Encourage joint training/drills/exercises among all jurisdictions and local businesses.
Action or Project Description:	Continue to encourage joint training (and drills) between agencies, public and private entities (including schools/businesses).
Applicable Goal Statement:	Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.
Estimated Cost:	$1,000 - $10,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	County EMD, City EMDs, Emergency Response Agencies, School Superintendents
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOPS, School Emergency Plan
Progress Report	
Action Status	Continuing in Progress
Report of Progress	Jurisdictions, EMDs and emergency response agencies within Washington County cooperate on training and drills on a regular basis. Fire and police departments regularly train with local school districts. The Region C SEMA area coordinator works with local entities throughout the area to do at least one exercise each year that is either regional or state-wide. The Meramec Regional Emergency Planning Committee (MREPC) coordinates tabletop and full-scale exercises from time to time throughout the region.

Action 4.1.3: Pool different agency resources to achieve widespread mitigation results.

Action Worksheet	
Name of Jurisdiction:	Potosi
Risk / Vulnerability	
Problem being Mitigated:	Lack of resources among agencies which hinder mitigation results.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	4.1.3
Name of Action or Project:	Pooling resources for mitigation activities
Action or Project Description:	Pool different agency resources to achieve widespread mitigation planning results.
Applicable Goal Statement:	Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.
Estimated Cost:	$1,000 - $4,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, City Council
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation plan, LEOPs, Capital Improvement plans, Comprehensive plans, Strategic plans
Progress Report	
Action Status	Continuing in Progress
Report of Progress	All jurisdictions reported that they are interested in finding ways to pool resources to accomplish mitigation projects. There has been interest in thinking outside the box on funding upgrades to low water crossing projects and tapping into different funding sources (Missouri Department of Conservation funds to protect endangered species and open streams to allow free movement of fish.)

Goal 5: Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefit of special interests.

Action 5.1.4: Encourage cities to require contractor storm water management plans in all new development – both residential and commercial properties.

Action Worksheet	
Name of Jurisdiction:	Potosi
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with non-existent storm water management plans
Hazard(s) Addressed:	Floods, Severe Storms, Severe Winter Storms
Action or Project	
Action/Project Number:	5.1.4
Name of Action or Project:	Encourage all communities to develop storm water management plans.
Action or Project Description:	Encourage all communities/jurisdictions to develop storm water management plans.
Applicable Goal Statement:	Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefits of special interests.
Estimated Cost:	$800 - $1,800
Benefits:	Losses avoided by implementing this action include property damages.
Plan for Implementation	
Responsible Organization/Department:	Local Planners, Local Governments
Action/Project Priority:	17 – Medium Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services
Local Planning Mechanisms to be Used in Implementation, if any:	City Ordinances
Progress Report	
Action Status	Continuing – no progress
Report of Progress	No updates were provided by the MPC.

Action 5.2.1: Encourage local governments to purchase properties in the floodplain as funds become available and convert that land into public space/recreation area.

Action Worksheet	
Name of Jurisdiction:	Potosi
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with floodplain properties
Hazard(s) Addressed:	Floods
Action or Project	
Action/Project Number:	5.2.1
Name of Action or Project:	Government purchase of properties in the floodplain
Action or Project Description:	Encourage local governments to purchase properties in the floodplain as funds become available and convert that land into public space/recreation area.
Applicable Goal Statement:	Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefits of special interests.
Estimated Cost:	$1,000 - $100,000
Benefits:	Losses avoided by implementing this action include property damage, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Local Government, County & City EMDs, Floodplain Managers
Action/Project Priority:	14 – Medium Priority
Timeline for Completion:	Continuous
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Floodplain Ordinance, Comprehensive Plans, Hazard Mitigation Plan
Progress Report	
Action Status	Continuing
Report of Progress	No progress

Action 5.2.2: Encourage communities to discuss zoning repetitive loss properties in the floodplain as open space.

Action Worksheet	
Name of Jurisdiction:	Potosi
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with repetitive loss properties.
Hazard(s) Addressed:	Floods
Action or Project	
Action/Project Number:	5.2.2
Name of Action or Project:	Zoning repetitive loss properties as open space.
Action or Project Description:	Encourage communities to discuss zoning repetitive loss properties in the floodplain as open space.
Applicable Goal Statement:	Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefits of special interests.
Estimated Cost:	$1,500 - $5,500
Benefits:	Losses avoided by implementing this action include property damage, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	City Government, Local Planners, City EMDs, Floodplain Managers
Action/Project Priority:	16 – Medium Priority
Timeline for Completion:	Continuous
Potential Fund Sources:	Local general revenue funds
Local Planning Mechanisms to be Used in Implementation, if any:	Floodplain ordinances, Hazard Mitigation plan, comprehensive plans, strategic plans
Progress Report	
Action Status	Continuing – no progress
Report of Progress	No action has been taken thus far.

Goal 6: Secure resources for investment in hazard mitigation.

Action 6.1.2: Structure grant proposals for road/bridge upgrades so that hazard mitigation concerns are also met.

Action Worksheet	
Name of Jurisdiction:	Potosi
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities in relation to inadequate roads/bridges
Hazard(s) Addressed:	Severe Winter Weather, Extreme Heat, Flooding
Action or Project	
Action/Project Number:	6.1.2
Name of Action or Project:	Structure grant proposals for road/bridge upgrades so that hazard mitigation concerns are also met.
Action or Project Description:	Actively seek and structure grant proposals for road/bridge upgrades to also cover hazard mitigation concerns and action items.
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	$5,000 - $5 Million
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	City Council, Road and Bridge Dept.
Action/Project Priority:	26 – High Priority
Timeline for Completion:	1-5 Years
Potential Fund Sources:	Grants
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Transportation Plan, Regional Transportation Plan
Progress Report	
Action Status	Continuing in Progress
Report of Progress	Lack of financial resources for construction/upgrades continues to be the main obstacle

Action 6.1.3: Work with state/local/federal agencies to include mitigation in all economic and community development projects.

Action Worksheet	
Name of Jurisdiction:	Potosi
Risk / Vulnerability	
Problem being Mitigated:	Lack of synergy/communication/coordination of mitigation in community development projects and integration of mitigation actions into economic and community development projects.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	6.1.3
Name of Action or Project:	Coordination with state/local/federal agencies to integrate mitigation into economic and community development projects
Action or Project Description:	Work with state/local/federal agencies to include mitigation in all economic and community development projects.
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	$2,500 - $9,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	City Council
Action/Project Priority:	28 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Capital Improvement Plans, Comprehensive Plans, Economic Development Plans, CEDS, strategic plans, land-use plans
Progress Report	
Action Status	Continuing in Progress
Report of Progress	Hazard mitigation goals and actions have been incorporated into the regional Community Economic Development Strategy (CEDS). As mitigation awareness grows, additional efforts will be made to incorporate mitigation activities into economic and community development projects.

Action 6.1.4: Provide information to jurisdictions on the benefits of budgeting for and implementing hazard mitigation projects.

Action Worksheet	
Name of Jurisdiction:	Potosi
Risk / Vulnerability	
Problem being Mitigated:	Lack of funding for mitigation projects among local jurisdictions
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	6.1.4
Name of Action or Project:	Budgeting and implementing hazard mitigation projects.
Action or Project Description:	Provide information to jurisdictions on the benefits of budgeting for and implementing hazard mitigation projects.
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	$500 - $1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, City Council
Action/Project Priority:	26 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Local general revenue funds
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Capital Improvements Plans, Comprehensive Plans, CEDS, strategic plans, LEOPs
Progress Report	
Action Status	Continuing in Progress
Report of Progress	As awareness of the importance of mitigation grows, more local jurisdictions are seeing the long-term benefits and working toward budgeting for mitigation activities.

Action 6.2.1: Provide information on the benefits of local governments implementing cost-share programs with private property owners for hazard mitigation projects that benefit the community as a whole.

Action Worksheet	
Name of Jurisdiction:	Potosi
Risk / Vulnerability	
Problem being Mitigated:	Lack of cost-share programs with private property owners for hazard mitigations projects.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	6.2.1
Name of Action or Project:	Encourage development and implementation of mitigation cost-share programs
Action or Project Description:	Provide information on the benefits of local governments implementing cost-share programs with private property owners for hazard mitigation projects that benefit the community as a whole
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	$ unknown – dependent upon projects and interest
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	City Council
Action/Project Priority:	15 – Medium Priority
Timeline for Completion:	5 -10 years to implement and then on-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Capital Improvement Plans, Comprehensive Plans
Progress Report	
Action Status	Continuing in Progress
Report of Progress	The county and Potosi are currently implementing cost-share programs that will benefit the jurisdiction as a whole.

Action 6.3.1: Prioritize mitigation projects, based on cost-effectiveness and starting with those sites facing the greatest threat to life, health, and property.

Action Worksheet	
Name of Jurisdiction:	Potosi
Risk / Vulnerability	
Problem being Mitigated:	Lack of organization/priority of mitigation projects based on cost-effectiveness, and severity in regards to threat to life, health, and property.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	6.3.1
Name of Action or Project:	Prioritizing mitigation projects
Action or Project Description:	Prioritize mitigation projects, based on cost-effectiveness and starting with those sites facing the greatest threat to life, health and property.
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	$1,500 - $4,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, City Council
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan
Progress Report	
Action Status	Continuing in Progress
Report of Progress	Hazard mitigation projects were prioritized in the initial plan. The MPC reviewed and updated that list of prioritized items, including considering the greatest threat to life, health and property. This is an on-going activity. The list of prioritized action items should be reviewed at a minimum of every five years and following any major disaster events in the county.

Kingston K-14 School District

Goal 1: Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.

Action 1.1.3: Promote development of emergency plans by businesses and public entities by providing information on business continuity and emergency planning through local chambers of commerce and emergency management offices.

Action Worksheet	
Name of Jurisdiction:	Kingston K-14
Risk / Vulnerability	
Problem being Mitigated:	Absence of emergency plans by businesses.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.1.3
Name of Action or Project:	Promote the development of emergency plans by businesses/government/schools.
Action or Project Description:	Promote development of emergency plans by businesses and public entities by providing information on business continuity and emergency planning through local chambers of commerce and emergency management offices.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	$4,500 - $5,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	27 – High Priority
Timeline for Completion:	1 – 5 years
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard mitigation plan, Meramec Region Community Economic Development Strategy (CEDS) – includes Chapter 8 – Economic Recovery and Resiliency Strategy
Progress Report	
Action Status	Continuing and updated – in progress
Report of Progress	During the last update of the CEDS, a chapter on economic recovery and resiliency was added which is a tool for local leaders to reduce vulnerability to natural hazards and expedite recovery public and private infrastructure. Implementation progress has been restricted due to lack of funding to develop a program to encourage and assist businesses and public entities in developing emergency plans. EMDs are encouraged to share resources available through SEMA and FEMA on emergency planning for businesses and public entities and through chambers of commerce.

Action 1.1.4: Continue to provide CERT training and encourage the development of CERT teams.

Action Worksheet	
Name of Jurisdiction:	Kingston K-14
Risk / Vulnerability	
Problem being Mitigated:	Lack of CERT Teams and CERT training throughout the planning area.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.1.4
Name of Action or Project:	Continue to provide CERT training and encourage the development of CERT teams.
Action or Project Description:	Provide CERT training and encourage the development of CERT teams throughout the planning area.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$2,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	27 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	N/A
Progress Report	
Action Status	In progress and on-going
Report of Progress	There is one CERT team within the county (Richwoods), but is active.

Action 1.1.5: Educate school staff on natural hazards and make sure all staff are familiar with school emergency plan including evacuation and safety procedures.

Action Worksheet	
Name of Jurisdiction:	Kingston K-14
Risk / Vulnerability	
Problem being Mitigated:	Lack of natural hazard preparedness, evacuation and safety procedures by school staff.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.1.5
Name of Action or Project:	Educate school staff on natural hazards and make sure all staff are familiar with school emergency plan including evacuation and safety procedures.
Action or Project Description:	Educate school staff on natural hazards and make sure all staff are familiar with school emergency plan including evacuation and safety procedures.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$1,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Superintendent, School Board
Action/Project Priority:	22 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, School Emergency Plan
Progress Report	
Action Status	In progress and on-going
Report of Progress	All school districts have a School Emergency Plan and regularly update them. Kingston K-14 also participates in earthquake preparedness training and drills.

Action 1.2.1: Actively seek funding to assist cities in obtaining early warning systems and improved communication systems and updating existing warning systems.

Action Worksheet	
Name of Jurisdiction:	Kingston K-14
Risk / Vulnerability	
Problem being Mitigated:	Need to improve warning and communications systems throughout the county.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.2.1
Name of Action or Project:	Actively seek funding to assist cities in obtaining early warning systems and improved communication systems and updating existing warning systems.
Action or Project Description:	Provide information to local governments and citizens on the existing warning systems in place in Crawford County and encourage better utilization of those systems. In addition, actively search for funding to improve both warning systems and communications throughout the county.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	Unknown
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Superintendent
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going - with goal of 2020 for having 80 percent or more of the population signed up for Nixel.
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, Hazard Mitigation Plan, School Emergency Plan
Progress Report	
Action Status	Continuing– in progress
Report of Progress	Currently there are storm sirens in Washington Co., Caledonia, and Potosi. Currently the only phone based warning/messaging systems available in the county is Nixle. Kingston K-14 (BlackBoard Connect), Potosi R-III (BlackBoard Connect), and Richwoods R-VII (Textcaster) utilize phone based warning/messaging systems. In addition, the county and cities need to continue to work to improve communications systems within the county to improve county-wide as well as state-wide communications during disasters and joint response efforts.

Action 1.3.6: Encourage the designation of storm shelters and the construction of tornado safe rooms in any facility that typically has large numbers of people present (such as large employers) and in every school that does not have one.

Action Worksheet	
Name of Jurisdiction:	Kingston K-14
Risk / Vulnerability	
Problem being Mitigated:	Lack of storm shelters and tornado safe rooms
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.3.6
Name of Action or Project:	Designation of storm shelters and tornado safe rooms where large numbers of people congregate.
Action or Project Description:	Designation of storm shelters and tornado safe rooms where large numbers of people congregate.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	Unknown
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Superintendent
Action/Project Priority:	15 – Medium
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, Hazard Mitigation Plan, School Emergency Plan
Progress Report	
Action Status	Continuing– in progress
Report of Progress	Kingston K-14 and Valley-VI both have storm shelters

Goal 2: Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.

Action 2.1.1: Provide information on self-inspection programs to critical facilities to assess earthquake and tornado resistance.

Action Worksheet	
Name of Jurisdiction:	Kingston K-14
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with construction of critical facilities which may make them vulnerable to earthquakes and tornadoes
Hazard(s) Addressed:	Earthquakes, Tornados
Action or Project	
Action/Project Number:	2.1.1
Name of Action or Project:	Critical facility inspection
Action or Project Description:	Provide information on self-inspection programs to critical facilities to assess earthquake and tornado resistance.
Applicable Goal Statement:	Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.
Estimated Cost:	$1,500 – $5,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damage, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	County EMD, local emergency response agencies
Action/Project Priority:	16 – Medium Priority
Timeline for Completion:	1 – 5 years
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, capital improvement plans, hazard mitigation plan, local critical facility budgets
Progress Report	
Action Status	Continuing – in progress
Report of Progress	Kingston K-14 and Valley R-VI both have built structures to resist tornado and earthquake damage.

Goal 3: Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.

Action 3.2.2: Encourage meetings between EMD, city/county officials and SEMA to familiarize officials with mitigation planning, implementation and budgeting for mitigation projects.

Action Worksheet	
Name of Jurisdiction:	Kingston K-14
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with lack of knowledge/understanding of the importance of hazard mitigation activities
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.2.2
Name of Action or Project:	Awareness/education program on hazard mitigation for local elected officials and planning organizations
Action or Project Description:	Ask SEMA mitigation specialists to present information to city councils, county commission and local planning organizations.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities
Estimated Cost:	$1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Superintendent
Action/Project Priority:	28 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs, Floodplain Ordinance
Progress Report	
Action Status	Continuing in progress
Report of Progress	The Region C SEMA area coordinator conducts quarterly meetings in the region and has included hazard mitigation in those meetings.

Action 3.3.1: Re-evaluate the hazard mitigation plan, merge with other community planning and coordinate and integrate hazard mitigation activities, where appropriate, with emergency operations plans and procedures.

Action Worksheet	
Name of Jurisdiction:	Kingston K-14
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with not regularly reviewing and updating the mitigation plan and incorporating mitigation activities into emergency operations plans and procedures.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.3.1
Name of Action or Project:	Re-evaluate the hazard mitigation plan and merge with other community planning activities.
Action or Project Description:	Re-evaluate the hazard mitigation plan, merge with other community planning activities and documents and incorporate hazard mitigation into the long-range planning and development activities of the county and each jurisdiction.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities
Estimated Cost:	$5,500 - $10,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Superintendent, School Board, MPC
Action/Project Priority:	22 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOPs, hazard mitigation plan, school crisis management plans, comprehensive plans, builder's plans, capital improvement plan, economic development plan, transportation plan, land-use plan, floodplain ordinances, storm water plans/ordinances
Progress Report	
Action Status	Continuing in Progress
Report of Progress	Hazard mitigation goals and actions have been incorporated into the regional Community and Economic Development Strategy. Mitigation actions are part of the county LEOP. As more local officials become familiar with mitigation and understand how it fits within other planning activities, this action item will continue to expand.

Action 3.3.2: Implement a public awareness program about the benefits of hazard mitigation projects, both public and private, including distributing press releases by cities/county regarding adopted mitigation measures to keep public abreast of changes and/or new regulations.

Action Worksheet	
Name of Jurisdiction:	Kingston K-14
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with the public's lack of knowledge in regards to hazard mitigation and the benefits of adopting mitigation measures.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.3.2
Name of Action or Project:	Awareness program on local mitigation activities.
Action or Project Description:	Distribute press releases by cities/county regarding adopted mitigation measures
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.
Estimated Cost:	$500-$1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Superintendent, School Board
Action/Project Priority:	23 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, hazard mitigation plan, floodplain ordinance
Progress Report	
Action Status	Continuing in Progress
Report of Progress	The county regularly does press releases on road and bridge upgrades

Action 3.4.2: Publicize county or citywide drills.

Action Worksheet	
Name of Jurisdiction:	Kingston K-14
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with the lack of knowledge in regards to the proper measures to take during hazard events.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.4.2
Name of Action or Project:	Publicize county or citywide drills.
Action or Project Description:	Publicize county or citywide drills to make the general public aware of training/exercises being conducted locally and raise awareness of emergency preparedness and what measures should be taken.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.
Estimated Cost:	$500 - $1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Superintendent
Action/Project Priority:	21– High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOPs
Progress Report	
Action Status	Continuing in Progress
Report of Progress	This is an on-going activity. Local governments make the public aware of drills/trainings/exercises through press releases to the media and follow up articles on drills. SEMA also publicizes drills that are being done on a regional or statewide level.

Goal 4: Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.

Action 4.1.1: Continue to encourage joint meetings of different organizations/agencies for mitigation planning.

Action Worksheet	
Name of Jurisdiction:	Kingston K-14
Risk / Vulnerability	
Problem being Mitigated:	Lack of synergy/communication among organizations/agencies for mitigation related planning.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	4.1.1
Name of Action or Project:	Encourage joint meetings of different organizations/agencies and continued communication on mitigation
Action or Project Description:	Continue to encourage joint meetings of different organizations/agencies for mitigation related planning.
Applicable Goal Statement:	Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.
Estimated Cost:	$500 - $1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Superintendent
Action/Project Priority:	28 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP
Progress Report	
Action Status	Continuing in Progress
Report of Progress	This is an on-going activity. Region C Fire Chiefs meet regularly. The Region C SEMA area coordinator holds quarterly meetings throughout the region.. This program could benefit from a more coordinated, focused effort to bring different agencies together to discuss mitigation issues.

Action 4.1.2: Continue to encourage joint training (or drills) between agencies, public and private entities (including schools and businesses).

Action Worksheet	
Name of Jurisdiction:	Kingston K-14
Risk / Vulnerability	
Problem being Mitigated:	Lack of synergy/communication/coordination among agencies, public, and private entities on disaster training and emergency drills/exercises.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	4.1.2
Name of Action or Project:	Encourage joint training/drills/exercises among all jurisdictions and local businesses.
Action or Project Description:	Continue to encourage joint training (and drills) between agencies, public and private entities (including schools/businesses).
Applicable Goal Statement:	Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.
Estimated Cost:	$1,000 - $10,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	County EMD, City EMDs, Emergency Response Agencies, School Superintendents
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOPS, School Emergency Plan
Progress Report	
Action Status	Continuing in Progress
Report of Progress	Jurisdictions, EMDs and emergency response agencies within Washington County cooperate on training and drills on a regular basis. Fire and police departments regularly train with local school districts. The Region C SEMA area coordinator works with local entities throughout the area to do at least one exercise each year that is either regional or state-wide. The Meramec Regional Emergency Planning Committee (MREPC) coordinates tabletop and full-scale exercises from time to time throughout the region.

Action 4.1.3: Pool different agency resources to achieve widespread mitigation results.

Action Worksheet	
Name of Jurisdiction:	Kingston K-14
Risk / Vulnerability	
Problem being Mitigated:	Lack of resources among agencies which hinder mitigation results.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	4.1.3
Name of Action or Project:	Pooling resources for mitigation activities
Action or Project Description:	Pool different agency resources to achieve widespread mitigation planning results.
Applicable Goal Statement:	Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.
Estimated Cost:	$1,000 - $4,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Superintendent, School Board
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation plan, LEOPs, Capital Improvement plans, Comprehensive plans, Strategic plans
Progress Report	
Action Status	Continuing in Progress
Report of Progress	All jurisdictions reported that they are interested in finding ways to pool resources to accomplish mitigation projects. There has been interest in thinking outside the box on funding upgrades to low water crossing projects and tapping into different funding sources (Missouri Department of Conservation funds to protect endangered species and open streams to allow free movement of fish.)

Goal 6: Secure resources for investment in hazard mitigation.

Action 6.1.4: Provide information to jurisdictions on the benefits of budgeting for and implementing hazard mitigation projects

Action Worksheet	
Name of Jurisdiction:	Kingston K-14
Risk / Vulnerability	
Problem being Mitigated:	Lack of funding for mitigation projects among local jurisdictions
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	6.1.4
Name of Action or Project:	Budgeting and implementing hazard mitigation projects.
Action or Project Description:	Provide information to jurisdictions on the benefits of budgeting for and implementing hazard mitigation projects.
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	$500 - $1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Superintendent
Action/Project Priority:	26 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Local general revenue funds
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Capital Improvements Plans, Comprehensive Plans, CEDS, strategic plans, LEOPs
Progress Report	
Action Status	Continuing in Progress
Report of Progress	As awareness of the importance of mitigation grows, more local jurisdictions are seeing the long-term benefits and working toward budgeting for mitigation activities.

Action 6.3.1: Prioritize mitigation projects, based on cost-effectiveness and starting with those sites facing the greatest threat to life, health, and property.

Action Worksheet	
Name of Jurisdiction:	Kingston K-14
Risk / Vulnerability	
Problem being Mitigated:	Lack of organization/priority of mitigation projects based on cost-effectiveness, and severity in regards to threat to life, health, and property.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	6.3.1
Name of Action or Project:	Prioritizing mitigation projects
Action or Project Description:	Prioritize mitigation projects, based on cost-effectiveness and starting with those sites facing the greatest threat to life, health and property.
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	$1,500 - $4,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Superintendent, School Board
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan
Progress Report	
Action Status	Continuing in Progress
Report of Progress	Hazard mitigation projects were prioritized in the initial plan. The MPC reviewed and updated that list of prioritized items, including considering the greatest threat to life, health and property. This is an on-going activity. The list of prioritized action items should be reviewed at a minimum of every five years and following any major disaster events in the county.

Potosi R-III School District

Goal 1: Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.

Action 1.1.3: Promote development of emergency plans by businesses and public entities by providing information on business continuity and emergency planning through local chambers of commerce and emergency management offices.

Action Worksheet	
Name of Jurisdiction:	Potosi R-III
Risk / Vulnerability	
Problem being Mitigated:	Absence of emergency plans by businesses.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.1.3
Name of Action or Project:	Promote the development of emergency plans by businesses/government/schools.
Action or Project Description:	Promote development of emergency plans by businesses and public entities by providing information on business continuity and emergency planning through local chambers of commerce and emergency management offices.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	$4,500 - $5,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	27 – High Priority
Timeline for Completion:	1 – 5 years
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard mitigation plan, Meramec Region Community Economic Development Strategy (CEDS) – includes Chapter 8 – Economic Recovery and Resiliency Strategy
Progress Report	
Action Status	Continuing and updated – in progress
Report of Progress	During the last update of the CEDS, a chapter on economic recovery and resiliency was added which is a tool for local leaders to reduce vulnerability to natural hazards and expedite recovery public and private infrastructure. Implementation progress has been restricted due to lack of funding to develop a program to encourage and assist businesses and public entities in developing emergency plans. EMDs are encouraged to share resources available through SEMA and FEMA on emergency planning for businesses and public entities and through chambers of commerce.

Action 1.1.4: Continue to provide CERT training and encourage the development of CERT teams.

Action Worksheet	
Name of Jurisdiction:	Potosi R-III
Risk / Vulnerability	
Problem being Mitigated:	Lack of CERT Teams and CERT training throughout the planning area.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.1.4
Name of Action or Project:	Continue to provide CERT training and encourage the development of CERT teams.
Action or Project Description:	Provide CERT training and encourage the development of CERT teams throughout the planning area.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$2,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	27 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	N/A
Progress Report	
Action Status	In progress and on-going
Report of Progress	There is one CERT team within the county (Richwoods), but is active.

Action 1.1.5: Educate school staff on natural hazards and make sure all staff are familiar with school emergency plan including evacuation and safety procedures.

Action Worksheet	
Name of Jurisdiction:	Potosi R-III
Risk / Vulnerability	
Problem being Mitigated:	Lack of natural hazard preparedness, evacuation and safety procedures by school staff.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.1.5
Name of Action or Project:	Educate school staff on natural hazards and make sure all staff are familiar with school emergency plan including evacuation and safety procedures.
Action or Project Description:	Educate school staff on natural hazards and make sure all staff are familiar with school emergency plan including evacuation and safety procedures.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$1,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Superintendent, School Board
Action/Project Priority:	22 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, School Emergency Plan
Progress Report	
Action Status	In progress and on-going
Report of Progress	All school districts have a School Emergency Plan and regularly update them.

Action 1.2.1: Actively seek funding to assist cities in obtaining early warning systems and improved communication systems and updating existing warning systems..

Action Worksheet	
Name of Jurisdiction:	Potosi R-III
Risk / Vulnerability	
Problem being Mitigated:	Need to improve warning and communications systems throughout the county.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.2.1
Name of Action or Project:	Actively seek funding to assist cities in obtaining early warning systems and improved communication systems and updating existing warning systems.
Action or Project Description:	Provide information to local governments and citizens on the existing warning systems in place in Crawford County and encourage better utilization of those systems. In addition, actively search for funding to improve both warning systems and communications throughout the county.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	Unknown
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Superintendent
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going - with goal of 2020 for having 80 percent or more of the population signed up for Nixel.
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, Hazard Mitigation Plan, School Emergency Plan
Progress Report	
Action Status	Continuing– in progress
Report of Progress	Currently there are storm sirens in Washington Co., Caledonia, and Potosi. Currently the only phone based warning/messaging systems available in the county is Nixle. Kingston K-14 (BlackBoard Connect), Potosi R-III (BlackBoard Connect), and Richwoods R-VII (Textcaster) utilize phone based warning/messaging systems. In addition, the county and cities need to continue to work to improve communications systems within the county to improve county-wide as well as state-wide communications during disasters and joint response efforts.

Action 1.3.6: Encourage the designation of storm shelters and the construction of tornado safe rooms in any facility that typically has large numbers of people present (such as large employers) and in every school that does not have one.

Action Worksheet	
Name of Jurisdiction:	Potosi R-III
Risk / Vulnerability	
Problem being Mitigated:	Lack of storm shelters and tornado safe rooms
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.3.6
Name of Action or Project:	Designation of storm shelters and tornado safe rooms where large numbers of people congregate.
Action or Project Description:	Designation of storm shelters and tornado safe rooms where large numbers of people congregate.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	Unknown
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Superintendent
Action/Project Priority:	15 – Medium
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, Hazard Mitigation Plan, School Emergency Plan
Progress Report	
Action Status	Continuing– in progress
Report of Progress	Kingston K-14 and Valley-VI both have storm shelters

Goal 2: Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.

Action 2.1.1: Provide information on self-inspection programs to critical facilities to assess earthquake and tornado resistance.

Action Worksheet	
Name of Jurisdiction:	Potosi R-III
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with construction of critical facilities which may make them vulnerable to earthquakes and tornadoes
Hazard(s) Addressed:	Earthquakes, Tornados
Action or Project	
Action/Project Number:	2.1.1
Name of Action or Project:	Critical facility inspection
Action or Project Description:	Provide information on self-inspection programs to critical facilities to assess earthquake and tornado resistance.
Applicable Goal Statement:	Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.
Estimated Cost:	$1,500 – $5,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damage, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	County EMD, local emergency response agencies
Action/Project Priority:	16 – Medium Priority
Timeline for Completion:	1 – 5 years
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, capital improvement plans, hazard mitigation plan, local critical facility budgets
Progress Report	
Action Status	Continuing – in progress
Report of Progress	Kingston K-14 and Valley R-VI both have built structures to resist tornado and earthquake damage.

Goal 3: Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.

Action 3.2.2: Encourage meetings between EMD, city/county officials and SEMA to familiarize officials with mitigation planning, implementation and budgeting for mitigation projects.

Action Worksheet	
Name of Jurisdiction:	Potosi R-III
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with lack of knowledge/understanding of the importance of hazard mitigation activities
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.2.2
Name of Action or Project:	Awareness/education program on hazard mitigation for local elected officials and planning organizations
Action or Project Description:	Ask SEMA mitigation specialists to present information to city councils, county commission and local planning organizations.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities
Estimated Cost:	$1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Superintendent
Action/Project Priority:	28 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs, Floodplain Ordinance
Progress Report	
Action Status	Continuing in progress
Report of Progress	The Region C SEMA area coordinator conducts quarterly meetings in the region and has included hazard mitigation in those meetings.

Action 3.3.1: Re-evaluate the hazard mitigation plan, merge with other community planning and coordinate and integrate hazard mitigation activities, where appropriate, with emergency operations plans and procedures.

Action Worksheet	
Name of Jurisdiction:	Potosi R-III
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with not regularly reviewing and updating the mitigation plan and incorporating mitigation activities into emergency operations plans and procedures.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.3.1
Name of Action or Project:	Re-evaluate the hazard mitigation plan and merge with other community planning activities.
Action or Project Description:	Re-evaluate the hazard mitigation plan, merge with other community planning activities and documents and incorporate hazard mitigation into the long-range planning and development activities of the county and each jurisdiction.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities
Estimated Cost:	$5,500 - $10,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Superintendent, School Board, MPC
Action/Project Priority:	22 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOPs, hazard mitigation plan, school crisis management plans, comprehensive plans, builder's plans, capital improvement plan, economic development plan, transportation plan, land-use plan, floodplain ordinances, storm water plans/ordinances
Progress Report	
Action Status	Continuing in Progress
Report of Progress	Hazard mitigation goals and actions have been incorporated into the regional Community and Economic Development Strategy. Mitigation actions are part of the county LEOP. As more local officials become familiar with mitigation and understand how it fits within other planning activities, this action item will continue to expand.

Action 3.3.2: Implement a public awareness program about the benefits of hazard mitigation projects, both public and private, including distributing press releases by cities/county regarding adopted mitigation measures to keep public abreast of changes and/or new regulations.

Action Worksheet	
Name of Jurisdiction:	Potosi R-III
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with the public's lack of knowledge in regards to hazard mitigation and the benefits of adopting mitigation measures.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.3.2
Name of Action or Project:	Awareness program on local mitigation activities.
Action or Project Description:	Distribute press releases by cities/county regarding adopted mitigation measures
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.
Estimated Cost:	$500-$1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Superintendent, School Board
Action/Project Priority:	23 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, hazard mitigation plan, floodplain ordinance
Progress Report	
Action Status	Continuing in Progress
Report of Progress	The county regularly does press releases on road and bridge upgrades

Action 3.4.2: Publicize county or citywide drills.

Action Worksheet	
Name of Jurisdiction:	Potosi R-III
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with the lack of knowledge in regards to the proper measures to take during hazard events.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.4.2
Name of Action or Project:	Publicize county or citywide drills.
Action or Project Description:	Publicize county or citywide drills to make the general public aware of training/exercises being conducted locally and raise awareness of emergency preparedness and what measures should be taken.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.
Estimated Cost:	$500 - $1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Superintendent
Action/Project Priority:	21– High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOPs
Progress Report	
Action Status	Continuing in Progress
Report of Progress	This is an on-going activity. Local governments make the public aware of drills/trainings/exercises through press releases to the media and follow up articles on drills. SEMA also publicizes drills that are being done on a regional or statewide level.

Goal 4: Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.

Action 4.1.1: Schedule joint meetings with different organizations/agencies for mitigation planning.

Action Worksheet	
Name of Jurisdiction:	Potosi R-III
Risk / Vulnerability	
Problem being Mitigated:	Lack of synergy/communication among organizations/agencies for mitigation related planning.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	4.1.1
Name of Action or Project:	Schedule joint meetings with different organizations/agencies for mitigation planning.
Action or Project Description:	Schedule joint meetings with different organizations/agencies for mitigation planning and continued communications amongst jurisdictions/organizations/agencies.
Applicable Goal Statement:	Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.
Estimated Cost:	$500 - $1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Superintendent
Action/Project Priority:	28 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP
Progress Report	
Action Status	Continuing in Progress
Report of Progress	This is an on-going activity. Region C Fire Chiefs meet regularly. The Region C SEMA area coordinator holds quarterly meetings throughout the region.. This program could benefit from a more coordinated, focused effort to bring different agencies together to discuss mitigation issues.

Action 4.1.2: Continue to encourage joint training (or drills) between agencies, public and private entities (including schools and businesses).

Action Worksheet	
Name of Jurisdiction:	Potosi R-III
Risk / Vulnerability	
Problem being Mitigated:	Lack of synergy/communication/coordination among agencies, public, and private entities on disaster training and emergency drills/exercises.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	4.1.2
Name of Action or Project:	Encourage joint training/drills/exercises among all jurisdictions and local businesses.
Action or Project Description:	Continue to encourage joint training (and drills) between agencies, public and private entities (including schools/businesses).
Applicable Goal Statement:	Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.
Estimated Cost:	$1,000 - $10,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	County EMD, City EMDs, Emergency Response Agencies, School Superintendents
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOPS, School Emergency Plan
Progress Report	
Action Status	Continuing in Progress
Report of Progress	Jurisdictions, EMDs and emergency response agencies within Washington County cooperate on training and drills on a regular basis. Fire and police departments regularly train with local school districts. The Region C SEMA area coordinator works with local entities throughout the area to do at least one exercise each year that is either regional or state-wide. The Meramec Regional Emergency Planning Committee (MREPC) coordinates tabletop and full-scale exercises from time to time throughout the region.

Action 4.1.3: Pool different agency resources to achieve widespread mitigation results.

Action Worksheet	
Name of Jurisdiction:	Potosi R-III
Risk / Vulnerability	
Problem being Mitigated:	Lack of resources among agencies which hinder mitigation results.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	4.1.3
Name of Action or Project:	Pooling resources for mitigation activities
Action or Project Description:	Pool different agency resources to achieve widespread mitigation planning results.
Applicable Goal Statement:	Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.
Estimated Cost:	$1,000 - $4,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Superintendent, School Board
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation plan, LEOPs, Capital Improvement plans, Comprehensive plans, Strategic plans
Progress Report	
Action Status	Continuing in Progress
Report of Progress	All jurisdictions reported that they are interested in finding ways to pool resources to accomplish mitigation projects. There has been interest in thinking outside the box on funding upgrades to low water crossing projects and tapping into different funding sources (Missouri Department of Conservation funds to protect endangered species and open streams to allow free movement of fish.)

Goal 6: Secure resources for investment in hazard mitigation.

Action 6.1.4: Provide information to jurisdictions on the benefits of budgeting for and implementing hazard mitigation projects.

Action Worksheet	
Name of Jurisdiction:	Potosi R-III
Risk / Vulnerability	
Problem being Mitigated:	Lack of funding for mitigation projects among local jurisdictions
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	6.1.4
Name of Action or Project:	Budgeting and implementing hazard mitigation projects.
Action or Project Description:	Provide information to jurisdictions on the benefits of budgeting for and implementing hazard mitigation projects.
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	$500 - $1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Superintendent
Action/Project Priority:	26 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Local general revenue funds
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Capital Improvements Plans, Comprehensive Plans, CEDS, strategic plans, LEOPs
Progress Report	
Action Status	Continuing in Progress
Report of Progress	As awareness of the importance of mitigation grows, more local jurisdictions are seeing the long-term benefits and working toward budgeting for mitigation activities.

Action 6.3.1: Prioritize mitigation projects, based on cost-effectiveness and starting with those sites facing the greatest threat to life, health, and property.

Action Worksheet	
Name of Jurisdiction:	Potosi R-III
Risk / Vulnerability	
Problem being Mitigated:	Lack of organization/priority of mitigation projects based on cost-effectiveness, and severity in regards to threat to life, health, and property.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	6.3.1
Name of Action or Project:	Prioritizing mitigation projects
Action or Project Description:	Prioritize mitigation projects, based on cost-effectiveness and starting with those sites facing the greatest threat to life, health and property.
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	$1,500 - $4,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Superintendent, School Board
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan
Progress Report	
Action Status	Continuing in Progress
Report of Progress	Hazard mitigation projects were prioritized in the initial plan. The MPC reviewed and updated that list of prioritized items, including considering the greatest threat to life, health and property. This is an on-going activity. The list of prioritized action items should be reviewed at a minimum of every five years and following any major disaster events in the county.

Richwoods R-VII School District

Goal 1: Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.

Action 1.1.3: Promote development of emergency plans by businesses and public entities by providing information on business continuity and emergency planning through local chambers of commerce and emergency management offices.

Action Worksheet	
Name of Jurisdiction:	Richwoods R-VII
Risk / Vulnerability	
Problem being Mitigated:	Absence of emergency plans by businesses.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.1.3
Name of Action or Project:	Promote the development of emergency plans by businesses/government/schools.
Action or Project Description:	Promote development of emergency plans by businesses and public entities by providing information on business continuity and emergency planning through local chambers of commerce and emergency management offices.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	$4,500 - $5,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	27 – High Priority
Timeline for Completion:	1 – 5 years
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard mitigation plan, Meramec Region Community Economic Development Strategy (CEDS) – includes Chapter 8 – Economic Recovery and Resiliency Strategy
Progress Report	
Action Status	Continuing and updated – in progress
Report of Progress	During the last update of the CEDS, a chapter on economic recovery and resiliency was added which is a tool for local leaders to reduce vulnerability to natural hazards and expedite recovery public and private infrastructure. Implementation progress has been restricted due to lack of funding to develop a program to encourage and assist businesses and public entities in developing emergency plans. EMDs are encouraged to share resources available through SEMA and FEMA on emergency planning for businesses and public entities and through chambers of commerce.

Action 1.1.4: Continue to provide CERT training and encourage the development of CERT teams.

Action Worksheet	
Name of Jurisdiction:	Richwoods R-VII
Risk / Vulnerability	
Problem being Mitigated:	Lack of CERT Teams and CERT training throughout the planning area.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.1.4
Name of Action or Project:	Continue to provide CERT training and encourage the development of CERT teams.
Action or Project Description:	Provide CERT training and encourage the development of CERT teams throughout the planning area.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$2,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	27 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	N/A
Progress Report	
Action Status	In progress and on-going
Report of Progress	There is one CERT team within the county (Richwoods), but is active.

Action 1.1.5: Educate school staff on natural hazards and make sure all staff are familiar with school emergency plan including evacuation and safety procedures.

Action Worksheet	
Name of Jurisdiction:	Richwoods R-VII
Risk / Vulnerability	
Problem being Mitigated:	Lack of natural hazard preparedness, evacuation and safety procedures by school staff.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.1.5
Name of Action or Project:	Educate school staff on natural hazards and make sure all staff are familiar with school emergency plan including evacuation and safety procedures.
Action or Project Description:	Educate school staff on natural hazards and make sure all staff are familiar with school emergency plan including evacuation and safety procedures.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$1,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Superintendent, School Board
Action/Project Priority:	22 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, School Emergency Plan
Progress Report	
Action Status	In progress and on-going
Report of Progress	All school districts have a School Emergency Plan and regularly update them.

Action 1.2.1: Actively seek funding to assist cities in obtaining early warning systems and improved communication systems and updating existing warning systems.

Action Worksheet	
Name of Jurisdiction:	Richwoods R-VII
Risk / Vulnerability	
Problem being Mitigated:	Need to improve warning and communications systems throughout the county.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.2.1
Name of Action or Project:	Actively seek funding to assist cities in obtaining early warning systems and improved communication systems and updating existing warning systems.
Action or Project Description:	Provide information to local governments and citizens on the existing warning systems in place in Crawford County and encourage better utilization of those systems. In addition, actively search for funding to improve both warning systems and communications throughout the county.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	Unknown
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Superintendent
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going - with goal of 2020 for having 80 percent or more of the population signed up for Nixel.
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, Hazard Mitigation Plan, School Emergency Plan
Progress Report	
Action Status	Continuing– in progress
Report of Progress	Currently there are storm sirens in Washington Co., Caledonia, and Potosi. Currently the only phone based warning/messaging systems available in the county is Nixle. Kingston K-14 (BlackBoard Connect), Potosi R-III (BlackBoard Connect), and Richwoods R-VII (Textcaster) utilize phone based warning/messaging systems. In addition, the county and cities need to continue to work to improve communications systems within the county to improve county-wide as well as state-wide communications during disasters and joint response efforts.

Action 1.3.6: Encourage the designation of storm shelters and the construction of tornado safe rooms in any facility that typically has large numbers of people present (such as large employers) and in every school that does not have one.

Action Worksheet	
Name of Jurisdiction:	Richwoods R-VII
Risk / Vulnerability	
Problem being Mitigated:	Lack of storm shelters and tornado safe rooms
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.3.6
Name of Action or Project:	Designation of storm shelters and tornado safe rooms where large numbers of people congregate.
Action or Project Description:	Designation of storm shelters and tornado safe rooms where large numbers of people congregate.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	Unknown
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Superintendent
Action/Project Priority:	15 – Medium
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, Hazard Mitigation Plan, School Emergency Plan
Progress Report	
Action Status	Continuing– in progress
Report of Progress	Kingston K-14 and Valley-VI both have storm shelters

Goal 2: Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.

Action 2.1.1: Provide information on self-inspection programs to critical facilities to assess earthquake and tornado resistance.

Action Worksheet	
Name of Jurisdiction:	Richwoods R-VII
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with construction of critical facilities which may make them vulnerable to earthquakes and tornadoes
Hazard(s) Addressed:	Earthquakes, Tornados
Action or Project	
Action/Project Number:	2.1.1
Name of Action or Project:	Critical facility inspection
Action or Project Description:	Provide information on self-inspection programs to critical facilities to assess earthquake and tornado resistance.
Applicable Goal Statement:	Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.
Estimated Cost:	$1,500 – $5,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damage, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	County EMD, local emergency response agencies
Action/Project Priority:	16 – Medium Priority
Timeline for Completion:	1 – 5 years
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, capital improvement plans, hazard mitigation plan, local critical facility budgets
Progress Report	
Action Status	Continuing – in progress
Report of Progress	Kingston K-14 and Valley R-VI both have built structures to resist tornado and earthquake damage.

Goal 3: Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.

Action 3.2.2: Encourage meetings between EMD, city/county officials and SEMA to familiarize officials with mitigation planning, implementation and budgeting for mitigation projects.

Action Worksheet	
Name of Jurisdiction:	Richwoods R-VII
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with lack of knowledge/understanding of the importance of hazard mitigation activities
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.2.2
Name of Action or Project:	Awareness/education program on hazard mitigation for local elected officials and planning organizations
Action or Project Description:	Ask SEMA mitigation specialists to present information to city councils, county commission and local planning organizations.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities
Estimated Cost:	$1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Superintendent
Action/Project Priority:	28 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs, Floodplain Ordinance
Progress Report	
Action Status	Continuing in progress
Report of Progress	The Region C SEMA area coordinator conducts quarterly meetings in the region and has included hazard mitigation in those meetings.

Action 3.3.1: Re-evaluate the hazard mitigation plan, merge with other community planning and coordinate and integrate hazard mitigation activities, where appropriate, with emergency operations plans and procedures.

Action Worksheet	
Name of Jurisdiction:	Richwoods R-VII
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with not regularly reviewing and updating the mitigation plan and incorporating mitigation activities into emergency operations plans and procedures.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.3.1
Name of Action or Project:	Re-evaluate the hazard mitigation plan and merge with other community planning activities.
Action or Project Description:	Re-evaluate the hazard mitigation plan, merge with other community planning activities and documents and incorporate hazard mitigation into the long-range planning and development activities of the county and each jurisdiction.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities
Estimated Cost:	$5,500 - $10,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Superintendent, School Board, MPC
Action/Project Priority:	22 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOPs, hazard mitigation plan, school crisis management plans, comprehensive plans, builder's plans, capital improvement plan, economic development plan, transportation plan, land-use plan, floodplain ordinances, storm water plans/ordinances
Progress Report	
Action Status	Continuing in Progress
Report of Progress	Hazard mitigation goals and actions have been incorporated into the regional Community and Economic Development Strategy. Mitigation actions are part of the county LEOP. As more local officials become familiar with mitigation and understand how it fits within other planning activities, this action item will continue to expand.

Action 3.3.2: Implement a public awareness program about the benefits of hazard mitigation projects, both public and private, including distributing press releases by cities/county regarding adopted mitigation measures to keep public abreast of changes and/or new regulations.

Action Worksheet	
Name of Jurisdiction:	Richwoods R-VII
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with the public's lack of knowledge in regards to hazard mitigation and the benefits of adopting mitigation measures.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.3.2
Name of Action or Project:	Awareness program on local mitigation activities.
Action or Project Description:	Distribute press releases by cities/county regarding adopted mitigation measures
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.
Estimated Cost:	$500-$1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Superintendent, School Board
Action/Project Priority:	23 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, hazard mitigation plan, floodplain ordinance
Progress Report	
Action Status	Continuing in Progress
Report of Progress	The county regularly does press releases on road and bridge upgrades

Action 3.4.2: Publicize county or citywide drills.

Action Worksheet	
Name of Jurisdiction:	Richwoods R-VII
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with the lack of knowledge in regards to the proper measures to take during hazard events.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.4.2
Name of Action or Project:	Publicize county or citywide drills.
Action or Project Description:	Publicize county or citywide drills to make the general public aware of training/exercises being conducted locally and raise awareness of emergency preparedness and what measures should be taken.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.
Estimated Cost:	$500 - $1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Superintendent
Action/Project Priority:	21– High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOPs
Progress Report	
Action Status	Continuing in Progress
Report of Progress	This is an on-going activity. Local governments make the public aware of drills/trainings/exercises through press releases to the media and follow up articles on drills. SEMA also publicizes drills that are being done on a regional or statewide level.

Goal 4: Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.

Action 4.1.1: Schedule joint meetings with different organizations/agencies for mitigation planning.

Action Worksheet	
Name of Jurisdiction:	Richwoods R-VII
Risk / Vulnerability	
Problem being Mitigated:	Lack of synergy/communication among organizations/agencies for mitigation related planning.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	4.1.1
Name of Action or Project:	Schedule joint meetings with different organizations/agencies for mitigation planning.
Action or Project Description:	Schedule joint meetings with different organizations/agencies for mitigation planning and continued communications amongst jurisdictions/organizations/agencies.
Applicable Goal Statement:	Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.
Estimated Cost:	$500 - $1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Superintendent
Action/Project Priority:	28 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP
Progress Report	
Action Status	Continuing in Progress
Report of Progress	This is an on-going activity. Region C Fire Chiefs meet regularly. The Region C SEMA area coordinator holds quarterly meetings throughout the region.. This program could benefit from a more coordinated, focused effort to bring different agencies together to discuss mitigation issues.

Action 4.1.2: Continue to encourage joint training (or drills) between agencies, public and private entities (including schools and businesses).

Action Worksheet	
Name of Jurisdiction:	Richwoods R-VII
Risk / Vulnerability	
Problem being Mitigated:	Lack of synergy/communication/coordination among agencies, public, and private entities on disaster training and emergency drills/exercises.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	4.1.2
Name of Action or Project:	Encourage joint training/drills/exercises among all jurisdictions and local businesses.
Action or Project Description:	Continue to encourage joint training (and drills) between agencies, public and private entities (including schools/businesses).
Applicable Goal Statement:	Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.
Estimated Cost:	$1,000 - $10,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	County EMD, City EMDs, Emergency Response Agencies, School Superintendents
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOPS, School Emergency Plan
Progress Report	
Action Status	Continuing in Progress
Report of Progress	Jurisdictions, EMDs and emergency response agencies within Washington County cooperate on training and drills on a regular basis. Fire and police departments regularly train with local school districts. The Region C SEMA area coordinator works with local entities throughout the area to do at least one exercise each year that is either regional or state-wide. The Meramec Regional Emergency Planning Committee (MREPC) coordinates tabletop and full-scale exercises from time to time throughout the region.

Action 4.1.3: Pool different agency resources to achieve widespread mitigation results.

Action Worksheet	
Name of Jurisdiction:	Richwoods R-VII
Risk / Vulnerability	
Problem being Mitigated:	Lack of resources among agencies which hinder mitigation results.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	4.1.3
Name of Action or Project:	Pooling resources for mitigation activities
Action or Project Description:	Pool different agency resources to achieve widespread mitigation planning results.
Applicable Goal Statement:	Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.
Estimated Cost:	$1,000 - $4,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Superintendent, School Board
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation plan, LEOPs, Capital Improvement plans, Comprehensive plans, Strategic plans
Progress Report	
Action Status	Continuing in Progress
Report of Progress	All jurisdictions reported that they are interested in finding ways to pool resources to accomplish mitigation projects. There has been interest in thinking outside the box on funding upgrades to low water crossing projects and tapping into different funding sources (Missouri Department of Conservation funds to protect endangered species and open streams to allow free movement of fish.)

Goal 6: Secure resources for investment in hazard mitigation.

Action 6.1.4: Provide information to jurisdictions on the benefits of budgeting for and implementing hazard mitigation projects.

Action Worksheet	
Name of Jurisdiction:	Richwoods R-VII
Risk / Vulnerability	
Problem being Mitigated:	Lack of funding for mitigation projects among local jurisdictions
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	6.1.4
Name of Action or Project:	Budgeting and implementing hazard mitigation projects.
Action or Project Description:	Provide information to jurisdictions on the benefits of budgeting for and implementing hazard mitigation projects.
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	$500 - $1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Superintendent
Action/Project Priority:	26 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Local general revenue funds
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Capital Improvements Plans, Comprehensive Plans, CEDS, strategic plans, LEOPs
Progress Report	
Action Status	Continuing in Progress
Report of Progress	As awareness of the importance of mitigation grows, more local jurisdictions are seeing the long-term benefits and working toward budgeting for mitigation activities.

Action 6.3.1: Prioritize mitigation projects, based on cost-effectiveness and starting with those sites facing the greatest threat to life, health, and property.

Action Worksheet	
Name of Jurisdiction:	Richwoods R-VII
Risk / Vulnerability	
Problem being Mitigated:	Lack of organization/priority of mitigation projects based on cost-effectiveness, and severity in regards to threat to life, health, and property.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	6.3.1
Name of Action or Project:	Prioritizing mitigation projects
Action or Project Description:	Prioritize mitigation projects, based on cost-effectiveness and starting with those sites facing the greatest threat to life, health and property.
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	$1,500 - $4,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Superintendent, School Board
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan
Progress Report	
Action Status	Continuing in Progress
Report of Progress	Hazard mitigation projects were prioritized in the initial plan. The MPC reviewed and updated that list of prioritized items, including considering the greatest threat to life, health and property. This is an on-going activity. The list of prioritized action items should be reviewed at a minimum of every five years and following any major disaster events in the county.

Valley R-VI School District

Goal 1: Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.

Action 1.1.3: Promote development of emergency plans by businesses and public entities by providing information on business continuity and emergency planning through local chambers of commerce and emergency management offices.

Action Worksheet	
Name of Jurisdiction:	Valley R-VI
Risk / Vulnerability	
Problem being Mitigated:	Absence of emergency plans by businesses.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.1.3
Name of Action or Project:	Promote the development of emergency plans by businesses/government/schools.
Action or Project Description:	Promote development of emergency plans by businesses and public entities by providing information on business continuity and emergency planning through local chambers of commerce and emergency management offices.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	$4,500 - $5,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	27 – High Priority
Timeline for Completion:	1 – 5 years
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard mitigation plan, Meramec Region Community Economic Development Strategy (CEDS) – includes Chapter 8 – Economic Recovery and Resiliency Strategy
Progress Report	
Action Status	Continuing and updated – in progress
Report of Progress	During the last update of the CEDS, a chapter on economic recovery and resiliency was added which is a tool for local leaders to reduce vulnerability to natural hazards and expedite recovery public and private infrastructure. Implementation progress has been restricted due to lack of funding to develop a program to encourage and assist businesses and public entities in developing emergency plans. EMDs are encouraged to share resources available through SEMA and FEMA on emergency planning for businesses and public entities and through chambers of commerce.

Action 1.1.4: Continue to provide CERT training and encourage the development of CERT teams.

Action Worksheet	
Name of Jurisdiction:	Valley R-VI
Risk / Vulnerability	
Problem being Mitigated:	Lack of CERT Teams and CERT training throughout the planning area.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.1.4
Name of Action or Project:	Continue to provide CERT training and encourage the development of CERT teams.
Action or Project Description:	Provide CERT training and encourage the development of CERT teams throughout the planning area.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$2,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD
Action/Project Priority:	27 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	N/A
Progress Report	
Action Status	In progress and on-going
Report of Progress	There is one CERT team within the county (Richwoods), but is active.

Action 1.1.5: Educate school staff on natural hazards and make sure all staff are familiar with school emergency plan including evacuation and safety procedures.

Action Worksheet	
Name of Jurisdiction:	Valley R-VI
Risk / Vulnerability	
Problem being Mitigated:	Lack of natural hazard preparedness, evacuation and safety procedures by school staff.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.1.5
Name of Action or Project:	Educate school staff on natural hazards and make sure all staff are familiar with school emergency plan including evacuation and safety procedures.
Action or Project Description:	Educate school staff on natural hazards and make sure all staff are familiar with school emergency plan including evacuation and safety procedures.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Estimated Cost:	$1,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Superintendent, School Board
Action/Project Priority:	22 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, School Emergency Plan
Progress Report	
Action Status	In progress and on-going
Report of Progress	All school districts have a School Emergency Plan and regularly update them.

Action 1.2.1: Actively seek funding to assist cities in obtaining early warning systems and improved communication systems and updating existing warning systems.

Action Worksheet	
Name of Jurisdiction:	Valley R-VI
Risk / Vulnerability	
Problem being Mitigated:	Need to improve warning and communications systems throughout the county.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.2.1
Name of Action or Project:	Actively seek funding to assist cities in obtaining early warning systems and improved communication systems and updating existing warning systems.
Action or Project Description:	Provide information to local governments and citizens on the existing warning systems in place in Crawford County and encourage better utilization of those systems. In addition, actively search for funding to improve both warning systems and communications throughout the county.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	Unknown
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Superintendent
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going - with goal of 2020 for having 80 percent or more of the population signed up for Nixel.
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, Hazard Mitigation Plan, School Emergency Plan
Progress Report	
Action Status	Continuing– in progress
Report of Progress	Currently there are storm sirens in Washington Co., Caledonia, and Potosi. Currently the only phone based warning/messaging systems available in the county is Nixle. Kingston K-14 (BlackBoard Connect), Potosi R-III (BlackBoard Connect), and Richwoods R-VII (Textcaster) utilize phone based warning/messaging systems. In addition, the county and cities need to continue to work to improve communications systems within the county to improve county-wide as well as state-wide communications during disasters and joint response efforts.

Action 1.3.6: Encourage the designation of storm shelters and the construction of tornado safe rooms in any facility that typically has large numbers of people present (such as large employers) and in every school that does not have one.

Action Worksheet	
Name of Jurisdiction:	Valley R-VI
Risk / Vulnerability	
Problem being Mitigated:	Lack of storm shelters and tornado safe rooms
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.3.6
Name of Action or Project:	Designation of storm shelters and tornado safe rooms where large numbers of people congregate.
Action or Project Description:	Designation of storm shelters and tornado safe rooms where large numbers of people congregate.
Applicable Goal Statement:	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning, and hazard mitigation activities.
Estimated Cost:	Unknown
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	EMD, Superintendent
Action/Project Priority:	15 – Medium
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, Hazard Mitigation Plan, School Emergency Plan
Progress Report	
Action Status	Continuing– in progress
Report of Progress	Kingston K-14 and Valley-VI both have storm shelters

Goal 2: Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.

Action 2.1.1: Provide information on self-inspection programs to critical facilities to assess earthquake and tornado resistance.

Action Worksheet	
Name of Jurisdiction:	Valley R-VI
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with construction of critical facilities which may make them vulnerable to earthquakes and tornadoes
Hazard(s) Addressed:	Earthquakes, Tornados
Action or Project	
Action/Project Number:	2.1.1
Name of Action or Project:	Critical facility inspection
Action or Project Description:	Provide information on self-inspection programs to critical facilities to assess earthquake and tornado resistance.
Applicable Goal Statement:	Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.
Estimated Cost:	$1,500 – $5,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damage, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	County EMD, local emergency response agencies
Action/Project Priority:	16 – Medium Priority
Timeline for Completion:	1 – 5 years
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, capital improvement plans, hazard mitigation plan, local critical facility budgets
Progress Report	
Action Status	Continuing – in progress
Report of Progress	Kingston K-14 and Valley R-VI both have built structures to resist tornado and earthquake damage.

Goal 3: Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.

Action 3.2.2: Encourage meetings between EMD, city/county officials and SEMA to familiarize officials with mitigation planning, implementation and budgeting for mitigation projects.

Action Worksheet	
Name of Jurisdiction:	Valley R-VI
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with lack of knowledge/understanding of the importance of hazard mitigation activities
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.2.2
Name of Action or Project:	Awareness/education program on hazard mitigation for local elected officials and planning organizations
Action or Project Description:	Ask SEMA mitigation specialists to present information to city councils, county commission and local planning organizations.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities
Estimated Cost:	$1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Superintendent
Action/Project Priority:	28 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOPs, Floodplain Ordinance
Progress Report	
Action Status	Continuing in progress
Report of Progress	The Region C SEMA area coordinator conducts quarterly meetings in the region and has included hazard mitigation in those meetings.

Action 3.3.1: Re-evaluate the hazard mitigation plan, merge with other community planning and coordinate and integrate hazard mitigation activities, where appropriate, with emergency operations plans and procedures.

Action Worksheet	
Name of Jurisdiction:	Valley R-VI
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with not regularly reviewing and updating the mitigation plan and incorporating mitigation activities into emergency operations plans and procedures.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.3.1
Name of Action or Project:	Re-evaluate the hazard mitigation plan and merge with other community planning activities.
Action or Project Description:	Re-evaluate the hazard mitigation plan, merge with other community planning activities and documents and incorporate hazard mitigation into the long-range planning and development activities of the county and each jurisdiction.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities
Estimated Cost:	$5,500 - $10,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Superintendent, School Board, MPC
Action/Project Priority:	22 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOPs, hazard mitigation plan, school crisis management plans, comprehensive plans, builder's plans, capital improvement plan, economic development plan, transportation plan, land-use plan, floodplain ordinances, storm water plans/ordinances
Progress Report	
Action Status	Continuing in Progress
Report of Progress	Hazard mitigation goals and actions have been incorporated into the regional Community and Economic Development Strategy. Mitigation actions are part of the county LEOP. As more local officials become familiar with mitigation and understand how it fits within other planning activities, this action item will continue to expand.

Action 3.3.2: Implement a public awareness program about the benefits of hazard mitigation projects, both public and private, including distributing press releases by cities/county regarding adopted mitigation measures to keep public abreast of changes and/or new regulations.

Action Worksheet	
Name of Jurisdiction:	Valley R-VI
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with the public's lack of knowledge in regards to hazard mitigation and the benefits of adopting mitigation measures.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.3.2
Name of Action or Project:	Awareness program on local mitigation activities.
Action or Project Description:	Distribute press releases by cities/county regarding adopted mitigation measures
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.
Estimated Cost:	$500-$1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Superintendent, School Board
Action/Project Priority:	23 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOP, hazard mitigation plan, floodplain ordinance
Progress Report	
Action Status	Continuing in Progress
Report of Progress	The county regularly does press releases on road and bridge upgrades

Action 3.4.2: Publicize county or citywide drills.

Action Worksheet	
Name of Jurisdiction:	Valley R-VI
Risk / Vulnerability	
Problem being Mitigated:	Risks/vulnerabilities associated with the lack of knowledge in regards to the proper measures to take during hazard events.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.4.2
Name of Action or Project:	Publicize county or citywide drills.
Action or Project Description:	Publicize county or citywide drills to make the general public aware of training/exercises being conducted locally and raise awareness of emergency preparedness and what measures should be taken.
Applicable Goal Statement:	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.
Estimated Cost:	$500 - $1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Superintendent
Action/Project Priority:	21– High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOPs
Progress Report	
Action Status	Continuing in Progress
Report of Progress	This is an on-going activity. Local governments make the public aware of drills/trainings/exercises through press releases to the media and follow up articles on drills. SEMA also publicizes drills that are being done on a regional or statewide level.

Goal 4: Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.

Action 4.1.1: Schedule joint meetings with different organizations/agencies for mitigation planning.

Action Worksheet	
Name of Jurisdiction:	Valley R-VI
Risk / Vulnerability	
Problem being Mitigated:	Lack of synergy/communication among organizations/agencies for mitigation related planning.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	4.1.1
Name of Action or Project:	Schedule joint meetings with different organizations/agencies for mitigation planning.
Action or Project Description:	Schedule joint meetings with different organizations/agencies for mitigation planning and continued communications amongst jurisdictions/organizations/agencies.
Applicable Goal Statement:	Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.
Estimated Cost:	$500 - $1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Superintendent
Action/Project Priority:	28 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, LEOP
Progress Report	
Action Status	Continuing in Progress
Report of Progress	This is an on-going activity. Region C Fire Chiefs meet regularly. The Region C SEMA area coordinator holds quarterly meetings throughout the region.. This program could benefit from a more coordinated, focused effort to bring different agencies together to discuss mitigation issues.

Action 4.1.2: Continue to encourage joint training (or drills) between agencies, public and private entities (including schools and businesses).

Action Worksheet	
Name of Jurisdiction:	Valley R-VI
Risk / Vulnerability	
Problem being Mitigated:	Lack of synergy/communication/coordination among agencies, public, and private entities on disaster training and emergency drills/exercises.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	4.1.2
Name of Action or Project:	Encourage joint training/drills/exercises among all jurisdictions and local businesses.
Action or Project Description:	Continue to encourage joint training (and drills) between agencies, public and private entities (including schools/businesses).
Applicable Goal Statement:	Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.
Estimated Cost:	$1,000 - $10,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	County EMD, City EMDs, Emergency Response Agencies, School Superintendents
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	LEOPS, School Emergency Plan
Progress Report	
Action Status	Continuing in Progress
Report of Progress	Jurisdictions, EMDs and emergency response agencies within Washington County cooperate on training and drills on a regular basis. Fire and police departments regularly train with local school districts. The Region C SEMA area coordinator works with local entities throughout the area to do at least one exercise each year that is either regional or state-wide. The Meramec Regional Emergency Planning Committee (MREPC) coordinates tabletop and full-scale exercises from time to time throughout the region.

Action 4.1.3: Pool different agency resources to achieve widespread mitigation results.

Action Worksheet	
Name of Jurisdiction:	Valley R-VI
Risk / Vulnerability	
Problem being Mitigated:	Lack of resources among agencies which hinder mitigation results.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	4.1.3
Name of Action or Project:	Pooling resources for mitigation activities
Action or Project Description:	Pool different agency resources to achieve widespread mitigation planning results.
Applicable Goal Statement:	Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.
Estimated Cost:	$1,000 - $4,000
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Superintendent, School Board
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, and private donations of cash, goods, or services.
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation plan, LEOPs, Capital Improvement plans, Comprehensive plans, Strategic plans
Progress Report	
Action Status	Continuing in Progress
Report of Progress	All jurisdictions reported that they are interested in finding ways to pool resources to accomplish mitigation projects. There has been interest in thinking outside the box on funding upgrades to low water crossing projects and tapping into different funding sources (Missouri Department of Conservation funds to protect endangered species and open streams to allow free movement of fish.)

Goal 6: Secure resources for investment in hazard mitigation.

Action 6.1.4: Provide information to jurisdictions on the benefits of budgeting for and implementing hazard mitigation projects.

Action Worksheet	
Name of Jurisdiction:	Valley R-VI
Risk / Vulnerability	
Problem being Mitigated:	Lack of funding for mitigation projects among local jurisdictions
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	6.1.4
Name of Action or Project:	Budgeting and implementing hazard mitigation projects.
Action or Project Description:	Provide information to jurisdictions on the benefits of budgeting for and implementing hazard mitigation projects.
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	$500 - $1,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Superintendent
Action/Project Priority:	26 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Local general revenue funds
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Capital Improvements Plans, Comprehensive Plans, CEDS, strategic plans, LEOPs
Progress Report	
Action Status	Continuing in Progress
Report of Progress	As awareness of the importance of mitigation grows, more local jurisdictions are seeing the long-term benefits and working toward budgeting for mitigation activities.

Action 6.3.1: Prioritize mitigation projects, based on cost-effectiveness and starting with those sites facing the greatest threat to life, health, and property.

Action Worksheet	
Name of Jurisdiction:	Valley R-VI
Risk / Vulnerability	
Problem being Mitigated:	Lack of organization/priority of mitigation projects based on cost-effectiveness, and severity in regards to threat to life, health, and property.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	6.3.1
Name of Action or Project:	Prioritizing mitigation projects
Action or Project Description:	Prioritize mitigation projects, based on cost-effectiveness and starting with those sites facing the greatest threat to life, health and property.
Applicable Goal Statement:	Secure resources for investment in hazard mitigation.
Estimated Cost:	$1,500 - $4,500
Benefits:	Losses avoided by implementing this action include injuries and/or casualties, property damages, loss-of-function/displacement impacts, and emergency management costs/community costs.
Plan for Implementation	
Responsible Organization/Department:	Superintendent, School Board
Action/Project Priority:	24 – High Priority
Timeline for Completion:	On-going
Potential Fund Sources:	Grants, local general revenue funds, private donations of cash, goods, or services
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan
Progress Report	
Action Status	Continuing in Progress
Report of Progress	Hazard mitigation projects were prioritized in the initial plan. The MPC reviewed and updated that list of prioritized items, including considering the greatest threat to life, health and property. This is an on-going activity. The list of prioritized action items should be reviewed at a minimum of every five years and following any major disaster events in the county.

5 PLAN MAINTENANCE PROCESS

This chapter 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

Periodic revisions and updates of the Plan are required by Missouri SEMA to ensure that the goals and objectives for Washington County are kept current. More importantly, revisions may be necessary to ensure the plan is in full compliance with Federal regulations and state statutes. This portion of the plan outlines the procedures for completing such revisions and updates.

A key component of the ongoing plan monitoring, evaluating and updating will be the Washington County Hazard Mitigation Planning Committee (MPC). In order to carry out the activities necessary for maintaining the plan, the MPC will need to remain in place and meet periodically. The coordination of this group, as indicated in the mitigation strategy, should be a responsibility of the county EMD. On-going activities of the MPC are:

- 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 on plan progress and recommended changes to the County Board of Supervisors and governing bodies of participating jurisdictions; and
- Inform and solicit input from the public.

The MPC (or other designated responsible entity) 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 (or other designated responsible entity) agrees to meet annually and after a state or federally declared hazard event, as appropriate, to monitor progress and update the mitigation strategy. The Washington County Emergency Management Director will be responsible for initiating the plan reviews and will invite members of the MPC (or other designated responsible entity) to the meeting.

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.

5.1.3 Plan Maintenance Process

Progress on the proposed actions can be monitored by evaluating changes in vulnerabilities identified in the plan. The MPC (or other designated responsible entity) 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 5-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.

In order to best evaluate any changes in vulnerability as a result of 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 (or designated responsible entity) 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 (or designated responsible entity) 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 (or designated responsible entity) deems appropriate and necessary. Changes will be approved by the Washington County Hazard Mitigation Planning Committee 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.

Where possible, plan participants, including school and special districts, will use existing plans and/or programs to implement hazard mitigation actions. Additionally, as jurisdictions review and update existing planning mechanisms, relevant action items and data from the HMP will be integrated. Those existing plans and programs were described in **Section 2.2** of this plan. Based on the capability assessments of the participating jurisdictions, communities in Washington County will continue to plan and implement programs to reduce losses to life and property from hazards. This plan builds upon the momentum developed through previous and related planning efforts and mitigation programs and recommends implementing actions, where possible, through the following plans:

- Regional Comprehensive Economic Development Strategy (CEDS) document
- General or master plans of participating jurisdictions;
- Ordinances of participating jurisdictions;
- Washington County Local Emergency Operations Plan (LEOP);
- Capital improvement plans and budgets;
- Other community plans within 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 Chapter 2 of this plan.

The MPC (or designated responsible entity) 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 (or designated responsible entity) 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 Washington County Emergency Management Director (EMD) will provide the updated Mitigation Strategy with current status of each mitigation action to the County (Boards of Supervisors or Commissions) as well as all Mayors, City Clerks, and School District Superintendents. The EMD will request that the mitigation strategy be incorporated, where appropriate, in other planning mechanisms.

Table 1.1 below lists the planning mechanisms by jurisdiction into which the Hazard Mitigation Plan will be integrated.

Table 1.1. Planning Mechanisms Identified for Integration of Hazard Mitigation Plan

Jurisdiction	Planning Mechanisms
Unincorporated Washington County	County Emergency Operations Plan County Mitigation Plan. Comprehensive Economic Development Strategy Regional Transportation Plan
Caledonia	Local Mitigation Plan Comprehensive Economic Development Strategy Regional Transportation Plan
Irondale	Local Mitigation Plan Comprehensive Economic Development Strategy Regional Transportation Plan
Mineral Point	Local Mitigation Plan Comprehensive Economic Development Strategy Regional Transportation Plan
Potosi	Comprehensive Plan Builder's Plan City Emergency Operations Plan Local Recovery Plan Local Mitigation Plan Comprehensive Economic Development Strategy Regional Transportation Plan Land-use Plan Flood Mitigation Assistance Plan Watershed Plan
Kingston K-14	Master Plan School Emergency Plan Weapons Policy
Potosi R-III	Master Plan School Emergency Plan Weapons Policy
Richwoods R-VII	Master Plan Capital Improvements Plan

Jurisdiction	Planning Mechanisms
	School Emergency Plan Weapons Policy
Valley R-VI	Capital Improvements Plan School Emergency Plan Weapons Policy

Source: Jurisdiction surveys 2017

Including hazard mitigation is now routine for any planning projects or plan updates carried out by the Meramec Regional Planning Commission (MRPC). Applicable goals and action items from hazard mitigation plans have been incorporated into the regional transportation plan as well as the Community Economic Development Strategy for the region. Both of these documents are resources for cities and counties within the eight county area and are updated on a regular basis with input from city and county representatives. This review and update process has helped city and county representatives better understand and appreciate the importance of including hazard mitigation in all applicable plans. In addition, MRPC and the hazard mitigation planning committee are also working to encourage the incorporation of hazard mitigation into the planning activities of all local governments, school districts and local entities through presentations and participation in planning activities.

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 Meramec Regional Planning Commission's 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 notice will be posted and public participation will be actively solicited, at a minimum, through available website postings and press releases to local media outlets, primarily newspapers.

6 Appendix

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B: Planning Process

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For Immediate Release

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Public meeting scheduled for Washington County Hazard Mitigation Plan update

POTOSI– City and county officials, school leaders, emergency management agencies and interested residents are invited to attend a public meeting April 17 to discuss updates to the Washington County Hazard Mitigation Plan.

The meeting will be held at 10:30 a.m. in the Washington County Ambulance District, House 1 Headquarters Facility located at 6900 Bill Gum Business Blvd., Potosi, MO 63664.

The county must have an approved hazard mitigation plan in order for Washington County schools, cities, agencies and others to access state hazard mitigation grant funds. The plan includes an assessment of natural hazards, showcases past accomplishments and sets goals and action items to reduce the impact of natural hazards in the future.

Meramec Regional Planning Commission (MRPC) is updating the plan in partnership with the Washington County Commission. Questions may be directed to MRPC Environmental Programs Specialist Ryan Dunwoody at rdunwoody@meramecregion.org or 573-265-2993.

Formed in 1969, MRPC is a voluntary council of governments serving Crawford, Dent, Gasconade, Maries, Osage, Phelps, Pulaski and Washington counties and their respective cities. A professional staff of 25, directed by the MRPC board, offers technical assistance and services, such as grant preparation and administration, housing assistance, transportation planning, environmental planning, ordinance codification, business loans and other services to member communities.

To keep up with the latest MRPC news and events, visit the MRPC website at www.meramecregion.org or on Facebook at www.facebook.com/meramecregion.

MEMORANDUM

TO: Washington County Hazard Mitigation Planning Committee

FROM: Ryan Dunwoody, MRPC Environmental Programs Specialist

DATE: March 13, 2017

SUBJECT: Hazard mitigation planning meeting April 17, 2017

MRPC has been contracted by Washington County and the State Emergency Management Agency (SEMA) to review and update the multi-jurisdictional hazard mitigation plan for Washington County, its cities and school districts. The project is being funded by state and federal dollars with matching funds from Washington County. We need your help to successfully complete this project.

The county must submit an approved, updated hazard mitigation plan to SEMA and FEMA by March, 2018 in order to continue to be eligible for hazard mitigation grant funds and certain recovery funds after a natural disaster occurs. It is in every jurisdiction's best interest to participate in the review and update of this plan. Hazard mitigation funds are used for such projects as floodplain buyouts, burying electrical lines, tornado shelters for schools, etc.

A **meeting** of the **Washington County Hazard Mitigation Planning Committee** is **scheduled** for **Monday, April 17 at 10:30 a.m.** at the **Washington Co. Ambulance District, House 1 Headquarters Facility** in **Potosi, MO**. The focus of this meeting will be to review existing goals and action items and determine if any changes need to be made. In addition, the group will need to report on what action items have been accomplished and what mitigation activities have occurred since the plan was updated five years ago. This can include activities such as improvements to roads and bridges that were prone to flooding, new programs that have reduced risk to residents and/or businesses and new tornado shelters that have been constructed in the past five years. Additionally, we request that **each jurisdiction and school district bring a filled out Hazard Mitigation Plan Questionnaire** (included). After the meeting we will answer questions and assist with filling out the questionnaire.

As the county, each city and school district will be asked to formally approve and adopt the Washington County Hazard Mitigation Plan, we strongly encourage you to participate in this committee or to send a representative who will convey your jurisdiction or department's needs for hazard mitigation as well as report on your hazard mitigation accomplishments. It is important to include representatives from emergency management offices, law enforcement, city/county officials, fire protection, road and bridge departments, utilities and public works, local health services, disaster relief volunteer services and other appropriate groups. If you are not able to attend, please send a representative from your organization. It is very important that we have good participation from all stakeholders in Washington County.

Thank you for your assistance in addressing hazard mitigation for Washington County. If you have any questions, contact me at (573) 265-2993, or via e-mail: rdunwoody@merameregion.org. I look forward to seeing you at the meeting.

RD

Enclosures

Advisory Committee Meeting
Washington County Hazard Mitigation Plan Update
AGENDA

10:30 a.m. ~ April 17, 2017
Washington County Ambulance District, House 1 Headquarters
6900 Bill Gum Business Blvd., Potosi, MO 63664

I. Welcome and Introductions – Tammy Snodgrass

II. Overview of Hazard Mitigation Planning and Washington County Hazard Mitigation Plan
Staff will provide an overview of the planning process and a brief review of the existing hazard mitigation plan

III. Discussion of Goals and Objectives and Progress Made in Five Years
Staff will lead the review of existing goals and a group discussion on what progress has been made in addressing hazard mitigation over the past five years.

IV. Discussion of Possible Changes to Goals and Action Items for Next Five Years
After reviewing the plan document and looking at what has been accomplished, the group will be asked to discuss if needs have changed and what, if any changes need to be made to goals and action items for the revised plan.

V. Integration of Other Data, Reports, Studies, Plans
What other information is available locally that could be included in the hazard mitigation plan? What other plans need to incorporate aspects of the hazard mitigation plan?

VI. Review of Disasters/Deaths/Injuries over the Past Five Years
Staff will provide data on disaster declarations for the past five years. Participants are asked to share any additional information on specific damage that occurred to infrastructure, critical infrastructure, neighborhoods, etc. Of particular interest is any information on deaths or injuries attributed to natural disasters.

VII. Setting of Date and Time for Next Meeting

VIII. Adjourn

NOTICE OF PUBLIC MEETING

Date and time of posting: **March 15, 4:00 p.m.**
Notice is hereby given that the **Washington County Hazard Mitigation Planning Committee** will meet at 10:30 a.m. on **Monday, April 17, 2017** at the Washington County Ambulance District, House 1 Headquarters Facility located at 6900 Bill Gum Business Blvd., Potosi, MO 63664.

The tentative agenda of this meeting includes:

- Welcome and Introductions
- Overview of Hazard Mitigation Planning and Washington County Hazard Mitigation Plan
- Discussion of Goals and Objectives and Progress Made in Past Five Years
- Discussion of Possible Changes to Goals and Action Items for Next Five Years
- Integration of Other Data, Reports, Studies, Plans
- Review of Disasters/Deaths/Injuries over the Past Five Years
- Setting of Date and Time for Next Meeting
- Adjourn

Representatives of the news media may obtain copies of this notice by contacting:

Ryan Dunwoody
#4 Industrial Drive
St. James, MO 65559
(573) 265-2993
rdunwoody@meramecregion.org

If you require any accommodations (i.e. qualified interpreter, large print, hearing assistance) in order to attend this meeting, please notify this office at 573-265-2993 no later than 48 hours prior to the scheduled commencement of the meeting.

Washington County Hazard Mitigation Plan Review Meeting
April 17, 2017 ~ 10:30 a.m.

email to Doris + questionnaire

Name	Representing	Email Address	Phone #	Address
Doris Coffman	EMA	coffmandoris@yahoo.com	314-520-6677	
Steve Besemer	SEMA	steve.besemer@sema.dps.mo.gov	573 645-5394	
David Sansegraw	WCMH	DSansegraw@wcmhosp.org	573-701-2028	
Nicholas Hughey	Wash Co. Health	nhughey@wcmohealth.org	573-438-2164	
John Lucas	Wash Co Ambulance	JohnwLucas@yahoo.com	573-210-3257	
TODD DAVIES	MISSOURI STATE HIGHWAY PATROL	CHRISTOPHER.DAVIES@MSHP.DPS.MO.GOV	314-330-3296	
KEVIN WRIGHT	WASHINGTON Co	JALLEN@washcomo.us	573-631-8722	
Casey Rice	Potosi PD	Casey.Rice@potosipd.org	573-210-0214	
William Board	WASH Co 911	wgoard@wcod911.org	573-438-0040	

Smecuc@potosir3.org - potosi R3

For Immediate Release

May 11, 2017

For more information contact

Ryan Dunwoody at (573) 265-2993

Second public meeting scheduled for Washington County Hazard Mitigation Plan update

POTOSI– City and county officials, school leaders, emergency management agencies and interested residents are invited to attend a second public meeting May 22 to discuss any additional updates to the Washington County Hazard Mitigation Plan.

The meeting will be held at 10:30 a.m. in the Washington County Ambulance District, House 1 Headquarters Facility located at 6900 Bill Gum Business Blvd., Potosi, MO 63664.

The focus of this meeting will be to review existing goals and action items and determine if any changes need to be made. In addition, the group will need to report on what action items have been accomplished and what mitigation activities have occurred since the plan was updated five years ago.

The county must have an approved hazard mitigation plan in order for Washington County schools, cities, agencies and others to access state hazard mitigation grant funds. The plan includes an assessment of natural hazards, showcases past accomplishments and sets goals and action items to reduce the impact of natural hazards in the future.

Meramec Regional Planning Commission (MRPC) is updating the plan in partnership with the Washington County Commission. Questions may be directed to MRPC Environmental Programs Specialist Ryan Dunwoody at rdunwoody@meramecregion.org or 573-265-2993.

Formed in 1969, MRPC is a voluntary council of governments serving Crawford, Dent, Gasconade, Maries, Osage, Phelps, Pulaski and Washington counties and their respective cities. A professional staff of 25, directed by the MRPC board, offers technical assistance and services, such as grant preparation and administration, housing assistance, transportation planning, environmental planning, ordinance codification, business loans and other services to member communities.

To keep up with the latest MRPC news and events, visit the MRPC website at www.meramecregion.org or on Facebook at www.facebook.com/meramecregion.

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MEMORANDUM

TO: Washington County Hazard Mitigation Planning Committee

FROM: Ryan Dunwoody, MRPC Environmental Programs Specialist

DATE: May 03, 2017

SUBJECT: Second Hazard Mitigation Planning Meeting May 22, 2017

MRPC has been contracted by Washington County and the State Emergency Management Agency (SEMA) to review and update the multi-jurisdictional hazard mitigation plan for Washington County, its cities and school districts. The project is being funded by state and federal dollars with matching funds from Washington County. We need your help to successfully complete this project.

The county must submit an approved, updated hazard mitigation plan to SEMA and FEMA by the end of this year in order to continue to be eligible for some hazard mitigation grants, so it is in every jurisdiction's best interest to participate in the review and update of this plan. Hazard mitigation funds are used for such projects as floodplain buyouts, burying electrical lines, tornado shelters for schools, etc.

A **second meeting** of the **Washington County Hazard Mitigation Planning Committee** is **scheduled** for **Monday, May 22 at 10:30 a.m.** at the **Washington Co. Ambulance District, House 1 Headquarters Facility** located at **6900 Bill Gum Business Blvd., Potosi, MO 63664**. The focus of this meeting will be to review existing goals and action items and determine if any changes need to be made. In addition, the group will need to report on what action items have been accomplished and what mitigation activities have occurred since the plan was updated five years ago. This can include activities such as improvements to roads and bridges that were prone to flooding, new programs that have reduced risk to residents and/or businesses and new tornado shelters that have been constructed in the past five years.

As the county, each city and school district will be asked to formally approve and adopt the Washington County Hazard Mitigation Plan, we strongly encourage you to participate in this committee or to send a representative who will convey your jurisdiction or department's needs for hazard mitigation as well as report on your hazard mitigation accomplishments. It is important to include representatives from emergency management offices, law enforcement, city/county officials, fire protection, local health services, disaster relief volunteer services and other appropriate groups. If you are not able to attend, please send a representative from your organization. It is very important that we have good participation from all stakeholders in Washington County.

Reminder: Hazard Mitigation Questionnaires are due by **May 30, 2017**. If a jurisdiction **does not submit** a filled out **questionnaire,** it will be **ineligible** to **receive hazard mitigation funds**.

Thank you for your assistance in addressing hazard mitigation for Washington County. If you have any questions, contact me at (573) 265-2993, or via e-mail: rdunwoody@merameregion.org. I look forward to seeing you at the meeting.

RD
Enclosures

Advisory Committee Meeting
Washington County Hazard Mitigation Plan Update
AGENDA
10:30 a.m. ~ May 22, 2017
Washington Co. Ambulance District, House 1 Headquarters
6900 Bill Gum Business Blvd., Potosi, MO 63664

I. Welcome and Introductions – Tammy Snodgrass

II. Overview of Hazard Mitigation Planning and Washington County Hazard Mitigation Plan
Staff will provide an overview of the planning process and a brief review of the existing hazard mitigation plan

III. Discussion of Action Items and Progress Made in Five Years
Staff will lead the review of existing action items from the plan and ask the attendees to provide information on any progress that has been made on each action item. A list of action items was distributed at the last meeting and is attached to this email.

IV. Discussion of Possible Changes to Action Items for Next Five Years
After reviewing action items and looking at what has been accomplished, the group will be asked to discuss if needs have changed and what, if any changes need to be made to goals and action items for the revised plan.

V. Prioritization of Action Items
Attendees will be asked to provide input on the prioritization of action items in the plan.

VI. Review of Disasters/Deaths/Injuries over the Past Five Years
Staff will provide data on disaster declarations for the past five years. Participants are asked to share any additional information on specific damage that occurred to infrastructure, critical infrastructure, neighborhoods, etc. Of particular interest is any information on deaths or injuries attributed to natural disasters.

VII. Setting of Date and Time for Next Meeting

VIII. Adjourn

NOTICE OF PUBLIC MEETING

Date and time of posting: **May 02, 2017 ~ 4:00 p.m.**
Notice is hereby given that the **Washington Co. Hazard Mitigation Planning Committee** will meet at 10:30 a.m. on **Monday, May 22, 2017** at the Washington Co. Ambulance District, House 1 Headquarters Facility located at 6900 Bill Gum Business Blvd., Potosi, MO 63664.

The tentative agenda of this meeting includes:

- Welcome and Introductions
- Integration of Other Data, Reports, Studies, Plans
- Discussion of Goals and Objectives and Progress Made in Past Five Years
- Review and Prioritize Action Items
- Jurisdiction and School District Questionnaire Assistance
- Adjourn

Representatives of the news media may obtain copies of this notice by contacting:

Ryan Dunwoody
#4 Industrial Drive
St. James, MO 65559
(573) 265-2993
rdunwoody@meramecregion.org

If you require any accommodations (i.e. qualified interpreter, large print, hearing assistance) in order to attend this meeting, please notify this office at 573-265-2993 no later than 48 hours prior to the scheduled commencement of the meeting.

Washington County Hazard Mitigation Plan Review Meeting
May 22, 2017 ~ 10:30 a.m.

Name	Representing	Email Address	Phone #	Address
Nick Hughey	Wash Co. Health Dept.	nhughey@wcmohealth.org	573-438-2164	520 Purcell Drive Potosi, MO 63664
Doris Coffman	Wash Co EMD	coffmandoris@y	314-520-6677	1105 E Main Potosi, MO 63664
Steve Besemer	State Emergency Management Agency	steve.besemer@sema.dps.mo.gov	573-645-5394	
Lillian Moses	Village of Caledonia	city029@centurytel.net	573-779-3874	P.O. Box 100 218 S. State Hwy 21 Caledonia, MO 63631
John W. Lucas	Caledonia	JohnwLucas@yahoo.com	573-210-3257	107 Mill St Caledonia Mo. 63631
Brad Crocker	Valley R-VI	bcrocker@valley.k12.mo.us	779-3446	# 1 Vikings Dr Caledonia MO 63631
Bethany Deal	Richwoods R-VII	bdeal@richwoods.k12.mo.us	573-678-3257	10788 State Hwy A Richwoods, MO 63071

Summary of Mitigation Programs and Action Items Developed for Washington County and All Jurisdictions

Jurisdiction	Action/Measure	Mitigation Program	Goal #	Priority	Hazard Addressed
Washington County Caledonia Irondale Mineral Point Potosi Kingston K-14 School Dist. Potosi R-III School Dist. Valley R-VI School Dist. Richwoods R-VII School Dist.	1.1.1 Implement an education program on personal emergency preparedness that teaches residents how to prepare emergency medical kits that include water, blankets, flashlights, etc. and how to shut off their home utilities in times of emergency.	Reducing Vulnerability of the People	1	High	All Hazards
Washington County Caledonia Irondale Mineral Point Potosi Kingston K-14 School Dist. Potosi R-III School Dist. Valley R-VI School Dist. Richwoods R-VII School Dist.	1.1.2 Continue to educate residents about precautions that should be taken during severe heat.			High	Extreme Heat
Washington County Caledonia Irondale Mineral Point Potosi	1.1.3 Promote the development of emergency plans by businesses/ government/schools.			High	All Hazards
Washington County Caledonia Irondale Mineral Point Potosi Kingston K-14 School Dist. Potosi R-III School Dist. Valley R-VI School Dist. Richwoods R-VII School Dist.	1.1.3 Continue to provide CERT training and encourage the development of CERT teams.			High	All Hazards

Jurisdiction	Action/Measure	Mitigation Program	Goal #	Priority	Hazard Addressed
Kingston K-14 School Dist. Potosi R-III School Dist. Valley R-VI School Dist. Richwoods R-VII School Dist.	1.1.5 Educate school staff on natural hazards and make sure all staff are familiar with school emergency plan including evacuation and safety procedures	Reducing Vulnerability of the People	1	High	All Hazards
Kingston K-14 School Dist. Potosi R-III School Dist. Valley R-VI School Dist. Richwoods R-VII School Dist.	1.1.6 Schools need to continue to conduct emergency preparedness exercises on a regular basis.			High	All Hazards
Washington County Caledonia Irondale Mineral Point Potosi Kingston K-14 School Dist. Potosi R-III School Dist. Valley R-VI School Dist. Richwoods R-VII School Dist.	1.2.1 Continue to encourage cities to obtain early warning systems and improved communications systems			High	Flood Severe Storm Tornados Severe Winter Storm
Washington County Caledonia Irondale Mineral Point Potosi	1.2.2 Continue to promote the use of weather radios by local residents to ensure advanced warning about threatening weather			High	Flood Severe Storm Tornados Severe Winter Storm
Washington County Caledonia Irondale Mineral Point Potosi	1.2.3 Partner with local radio stations to assure that appropriate warning of impending disasters is provided to all residents in the countywide listening area.			High	Flood Severe Storm Tornados Severe Winter Storm
Washington County	1.2.4 Monitor developments in data availability concerning the impact of dam failure, tornados, sinkholes, land subsidence and wildfire upon Washington County and all jurisdictions through local, state and federal agencies for use in hazard mitigation planning.			High	Dam Failure Tornados Sinkholes/ Land Subsidence Wildfire
Washington County	1.3.1 Place water height gauges and signs near low water crossings.			High	Flood

Jurisdiction	Action/Measure	Mitigation Program	Goal #	Priority	Hazard Addressed
Washington County Caledonia Irondale Mineral Point Potosi	1.3.2 Continue to encourage tree trimming and dead tree removal by utility companies and local government.				Severe Storm Tornado Severe Winter Storm
Washington County	1.3.3 Continue to review and consider road and bridge upgrades to improve drainage and reduce flooding and the risk to residents and property.	Reducing Vulnerability of the People	1	High	Earthquake Tornado
Washington County	1.3.4 Establish cooling centers where residents can go during extreme heat or power outages.			High	Flood
Washington County	1.3.5 Regularly review and update school emergency plans			High	All Hazards
Washington County	1.3.6 Encourage the designation of storm shelters and the construction of tornado safe rooms in every school that does not have one.			Medium	Severe Storm Tornado
Washington County Caledonia Irondale Mineral Point Potosi	1.3.7 Encourage the designation of storm shelters and the construction of tornado safe rooms in any facility that typically has large numbers of people present (such as large employers).			Medium	Severe Storm Tornado
Washington County Caledonia Irondale Mineral Point Potosi Kingston K-14 School Dist. Potosi R-III School Dist. Valley R-VI School Dist. Richwoods R-VII School Dist.	2.1.1 Continue to encourage a self-inspection program at critical facilities to assure that building infrastructure is earthquake and tornado resistant.	Property and Infrastructure Protection	2	Medium	Earthquake Tornado
Washington County Caledonia Irondale Mineral Point	2.1.2 Encourage businesses/government/schools to develop emergency plans.			High	All Hazards

Jurisdiction	Action/Measure	Mitigation Program	Goal #	Priority	Hazard Addressed
Potosi Kingston K-14 School Dist. Potosi R-III School Dist. Valley R-VI School Dist. Richwoods R-VII School Dist.		Property and Infrastructure Protection	2		
Washington County	2.1.3 Monitor developments in data availability concerning the impact of dam failure, tornados, sinkholes, land subsidence and wildfire upon Osage County and all jurisdictions through local, state and federal agencies for use in hazard mitigation planning.			High	Dam Failure Tornados Sinkholes/Land Subsidence Wildfire
Washington County Caledonia Irondale Mineral Point Potosi Kingston K-14 School Dist. Potosi R-III School Dist. Valley R-VI School Dist. Richwoods R-VII School Dist.	2.1.4 Continue to evaluate and update emergency operation plans.			High	All Hazards
Washington County Irondale Mineral Point Potosi	2.2.1 Educate residents about the dangers of floodplain development and the benefits of the National Flood Insurance Program.			High	Flood
Washington County Irondale Mineral Point Potosi	2.2.2 Continue to enforce flood damage prevention/floodplain management ordinances in compliance with NFIP requirements.			High	Flood
Washington County Caledonia Irondale Mineral Point	2.3.1 Encourage minimum standards for building codes in all cities.			Medium	Earthquake Flood Severe Storm Tornado Severe Winter Storm

Jurisdiction	Action/Measure	Mitigation Program	Goal #	Priority	Hazard Addressed
Washington County Caledonia Irondale Mineral Point Potosi	2.3.2 Encourage local governments to develop and implement regulations for the securing of hazardous materials tank and mobile homes to reduce hazards during flooding and high winds.	Property and Infrastructure Protection	2	Medium	All Hazards
Washington County	2.3.3 Encourage the Mark Twain National Forest to levy stricter fines for persons causing fire hazards.			High	Wildfire
Washington County Caledonia Irondale Mineral Point Potosi Kingston K-14 School Dist. Potosi R-III School Dist. Valley R-VI School Dist. Richwoods R-VII School Dist.	3.1.1 Distribute SEMA brochures on natural hazards, preparedness and NFIP at public facilities and events.	Outreach and Education	3	High	All Hazards
Washington County Caledonia Irondale Mineral Point Potosi	3.1.2 Distribute regular press releases from county and city EMD offices concerning hazards, where they strike, frequency, preparation and how to mitigate.			High	All Hazards
Washington County Caledonia Irondale Mineral Point Potosi Kingston K-14 School Dist. Potosi R-III School Dist. Valley R-VI School Dist. Richwoods R-VII School Dist.	3.2.1 Encourage local residents to purchase weather radios through press releases and brochures.			High	Extreme Heat Flood Severe Storm Tornado Severe Winter Storm
Washington County Caledonia Irondale	3.2.2 Encourage meetings between EMD, city/county officials and SEMA to familiarize officials with mitigation planning, implementation and budgeting for mitigation projects			High	All Hazards

Jurisdiction	Action/Measure	Mitigation Program	Goal #	Priority	Hazard Addressed
Mineral Point Potosi Kingston K-14 School Dist. Potosi R-III School Dist. Valley R-VI School Dist. Richwoods R-VII School Dist.		Outreach and Education	3		
Washington County Caledonia Irondale Mineral Point Potosi Kingston K-14 School Dist. Potosi R-III School Dist. Valley R-VI School Dist. Richwoods R-VII School Dist.	3.3.1 Re-evaluate the hazard mitigation plan, merge with other community planning and coordinate and integrate hazard mitigation activities, where appropriate, with emergency operations plans and procedures.			High	All Hazards
Washington County Caledonia Irondale Mineral Point Potosi Kingston K-14 School Dist. Potosi R-III School Dist. Valley R-VI School Dist. Richwoods R-VII School Dist.	3.3.2 Distribute press release by cities/county regarding adopted mitigation measures to keep public abreast of changes and/or new regulations.			High	All Hazards
Washington County Caledonia Irondale Mineral Point Potosi	3.4.1 Encourage county health department to use publicity campaigns that make residents aware of proper measures to take during times of threatening conditions (e.g. drought or heat wave).			High	All Hazards
Washington County Caledonia Irondale Mineral Point Potosi	3.4.2 Publicize county or citywide drills.			High	All Hazards

Jurisdiction	Action/Measure	Mitigation Program	Goal #	Priority	Hazard Addressed
Kingston K-14 School Dist. Potosi R-III School Dist. Valley R-VI School Dist. Richwoods R-VII School Dist.					
Washington County Caledonia Irondale Mineral Point Potosi Kingston K-14 School Dist. Potosi R-III School Dist. Valley R-VI School Dist. Richwoods R-VII School Dist.	4.1.1 Continue to encourage joint meetings of different organizations/ agencies for mitigation planning.	Communication Enhancement	4	High	All Hazards
Washington County Caledonia Irondale Mineral Point Potosi Kingston K-14 School Dist. Potosi R-III School Dist. Valley R-VI School Dist. Richwoods R-VII School Dist.	4.1.2 Continue to encourage joint training (or drills) between agencies, public and private entities (including schools and businesses).			High	All Hazards
Washington County Caledonia Irondale Mineral Point Potosi Kingston K-14 School Dist. Potosi R-III School Dist. Valley R-VI School Dist. Richwoods R-VII School Dist.	4.1.3 Pool different agency resources to achieve widespread mitigation results.			High	All Hazards
Washington County Caledonia Irondale	4.2.1 Re-evaluate the hazard mitigation plan, merge with other community planning and coordinate and integrate hazard mitigation activities, where appropriate, with			High	All Hazards

Executive Summary

Jurisdiction	Action/Measure	Mitigation Program	Goal #	Priority	Hazard Addressed
Mineral Point Potosi Kingston K-14 School Dist. Potosi R-III School Dist. Valley R-VI School Dist. Richwoods R-VII School Dist.	emergency operations plans and procedures.	Communication Enhancement	4		
Washington County Irondale Mineral Point	5.1.1 Encourage communities to budget for enhanced warning systems.	Long-Term Planning	5	High	Flood Severe Storms Tornados Severe Winter Storms
Caledonia Irondale Mineral Point Potosi	5.1.2 Encourage all communities to develop storm water management plans.			Low	Flood Severe Storms Severe Winter Storms
Washington County Caledonia Irondale Mineral Point Potosi Kingston K-14 School Dist. Potosi R-III School Dist. Valley R-VI School Dist. Richwoods R-VII School Dist.	5.1.3 Re-evaluate the hazard mitigation plan, merge with other community planning and coordinate and integrate hazard mitigation activities, where appropriate, with emergency operations plans and procedures.			High	All Hazards
Caledonia Irondale Mineral Point Potosi	5.1.4 Encourage cities to require contractor storm water management plans in all new development –both residential and commercial properties.			Medium	Flood Severe Storms Severe Winter Storms
Washington County Irondale Mineral Point Potosi	5.2.1 Encourage local governments to purchase properties in the floodplain as funds become available and convert that land into public space/recreation area.			Low	Flood
Washington County Irondale Mineral Point	5.2.2 Encourage communities to discuss zoning repetitive loss properties in the floodplain as open space.			Medium	Flood

Jurisdiction	Action/Measure	Mitigation Program	Goal #	Priority	Hazard Addressed
Potosi					
Washington County Caledonia Irondale Mineral Point Potosi Kingston K-14 School Dist. Potosi R-III School Dist. Valley R-VI School Dist. Richwoods R-VII School Dist.	6.1.1 Encourage meetings between EMD, city/county officials and SEMA to familiarize officials with mitigation planning, implementation and budgeting for mitigation projects.	Securing Resources for Mitigation Activities	6	High	All Hazards
Washington County Caledonia Irondale Mineral Point Potosi	6.1.2 Structure grant proposals for road/bridge upgrades so that hazard mitigation concerns are also met.			High	Flood
Caledonia Irondale Mineral Point Potosi	6.1.3 Work with state/local/federal agencies to include mitigation in all economic and community development projects.			High	All Hazards
Washington County Caledonia Irondale Mineral Point Potosi Kingston K-14 School Dist. Potosi R-III School Dist. Valley R-VI School Dist. Richwoods R-VII School Dist.	6.1.4 Encourage local jurisdictions to budget for mitigation projects.			High	All Hazards
Washington County Caledonia Irondale Mineral Point Potosi	6.2.1 Encourage cities and counties to consider implementing cost-share programs with private property owners for hazard mitigation projects that benefit the jurisdiction as a whole.			Medium	All Hazards

Jurisdiction	Action/Measure	Mitigation Program	Goal #	Priority	Hazard Addressed
Washington County Caledonia Irondale Mineral Point Potosi Kingston K-14 School Dist. Potosi R-III School Dist. Valley R-VI School Dist. Richwoods R-VII School Dist.	6.2.2 Implement public awareness program about the benefits of hazard mitigation projects, both public and private.	Securing Resources for Mitigation Activities	6	High	All Hazards
Washington County Caledonia Irondale Mineral Point Potosi Kingston K-14 School Dist. Potosi R-III School Dist. Valley R-VI School Dist. Richwoods R-VII School Dist.	6.3.1 Prioritize mitigation projects, based on cost-effectiveness and starting with those sites facing the greatest threat to life, health and property.			High	All Hazards

C: Adoption Resolutions

Adoption resolutions have been mailed out to the jurisdictions and will be included in the final draft submitted to FEMA.

D: Critical/Essential Facilities

The table below (**Table 6.1**) provides information for critical facilities in the planning area. Specific information includes a Hazus ID if applicable, jurisdiction, building name/owner, and address.

Table 6.1 Washington County Critical Facilities by Type and Jurisdiction

HazusID	Jurisdiction	Building Name	Address	City	State	Zip
Emergency Facilities						
	Washington Co.	Emergency Management Director	1105 Evans Avenue	Potosi	MO	63664
	Washington Co.	Washington Co. E-911	12252 N State Highway 21	Cadet	MO	63630
Fire Department Facilities						
MO000138	Belgrade	Belgrade Volunteer Fire Dept.	14126 State Hwy C	Belgrade	MO	63622
MO000715	Caledonia	Caledonia Fire Protection Dist.	155 Webster Road	Caledonia	MO	63631
	Irondale	Irondale Community Vol. Fire Dept.	107 West Pine St.	Irondale	MO	63648
MO000517	Potosi	Potosi Fire Prot. Dist., No. 1	313 East Jefferson St.	Potosi	MO	63664
	Potosi	Potosi Fire Prot. Dist., No. 2	10441 State Hwy AA	Potosi	MO	63664
	Potosi	Potosi Fire Prot. Dist., No. 3	10047 Tiff Road	Cadet	MO	63630
	Potosi	Potosi Fire Prot. Dist., No. 4	19076 North State Hwy 21	Cadet	MO	63630
	Potosi	Potosi Fire Prot. Dist., No. 5	10051 Jeff City Road	Potosi	MO	63664
MO000137	Richwoods	Richwoods Fire Prot. Dist.	10015 Turtle Road	Richwoods	MO	63071
	Sullivan	Sullivan Fire Protection District, Station 2	11890 Mine Road	Sullivan	MO	63080
Law Enforcement Facilities						
MO000137	Washington Co.	Washington Co. Sheriff	116 W High St.	Potosi	MO	63664
MO000169	Potosi	Potosi Police Dept.	1 Police Plaza	Potosi	MO	63664
	Irondale	Irondale Police Dept.	-	Irondale	MO	63648
Medical Facilities						
MO000099	Potosi	Washington Co. Memorial Hospital	300 Health Way	Potosi	MO	63664

	Washington Co.	Washington Co. Health Dept.	520 Purcell Drive	Potosi	MO	63664
HazusID	**Jurisdiction**	**Building Name**	**Address**	**City**	**State**	**Zip**
School Facilities						
	Cadet	Kingston Primary	10047 Diamond Road	Cadet	MO	63630
MO001824	Cadet	Kingston Elem.	10047 Diamond Road	Cadet	MO	63630
MO001825	Cadet	Kingston Middle	10047 Diamond Road	Cadet	MO	63630
MO001120	Cadet	Kingston High	10047 Diamond Road	Cadet	MO	63630
MO000822	Potosi	Potosi Elem.	205 State Hwy P	Potosi	MO	63664
MO000825	Potosi	Trojan Intermediate	367 Intermediate Drive	Potosi	MO	63664
MO000823	Potosi	John A. Evans Middle	303 S Lead St.	Potosi	MO	63664
MO000824	Potosi	Potosi High	1 Trojan Drive	Potosi	MO	63664
MO000173	Potosi	Citadel School	400 S Mine	Potosi	MO	63664
MO001177	Richwoods	Richwoods Elem.	10788 State Hwy A	Richwoods	MO	63071
MO001827	Caledonia	Caledonia Elem.	1 Viking Drive	Caledonia	MO	63631
MO001828	Caledonia	Valley High	1 Viking Drive	Caledonia	MO	63631

Source: Meramec Region Community Data Mining for Hazard Mitigation Planning (2014); Facilities, Missouri_SEMA, ArcGIS Online.

E: MDC Wildfire Data Search

Discovered Date	County	Station	Cause	Acres Burned
4/18/2001	Washington	Potosi Fire Protection District	Not Reported	
9/6/2002	Washington	Belgrade Volunteer Fire Department	Miscellaneous	1
11/23/2002	Washington	Belgrade Volunteer Fire Department	Arson	1
11/29/2002	Washington	Belgrade Volunteer Fire Department	Arson	
11/29/2002	Washington	Belgrade Volunteer Fire Department	Arson	22
12/2/2002	Washington	MDC REPORTING REGION - ST. LOUIS	Not Reported	
12/2/2002	Washington	MDC REPORTING REGION - ST. LOUIS	Debris	18
2/11/2003	Washington	Belgrade Volunteer Fire Department	Debris	1
3/10/2003	Washington	Richwoods Fire Protection District	Unknown	30
3/14/2003	Washington	MDC REPORTING REGION - ST. LOUIS	Debris	5
3/15/2003	Washington	Belgrade Volunteer Fire Department	Debris	4
3/16/2003	Washington	Sullivan Fire Protection District	Unknown	0.5
3/21/2003	Washington	MDC REPORTING REGION - ST. LOUIS	Unknown	1
3/24/2003	Washington	MDC REPORTING REGION - ST. LOUIS	Debris	1
3/30/2003	Washington	MDC REPORTING REGION - ST. LOUIS	Unknown	1
4/1/2003	Washington	MDC REPORTING REGION - ST. LOUIS	Arson	80
4/2/2003	Washington	MDC REPORTING REGION - ST. LOUIS	Miscellaneous	145
4/14/2003	Washington	Sullivan Fire Protection District	Debris	1
4/14/2003	Washington	Sullivan Fire Protection District	Debris	2
4/14/2003	Washington	MDC REPORTING REGION - ST. LOUIS	Debris	3
4/14/2003	Washington	Belgrade Volunteer Fire Department	Unknown	2
4/15/2003	Washington	MDC REPORTING REGION - ST. LOUIS	Smoking	46
5/5/2003	Washington	Richwoods Fire Protection District	Lightning	1
7/16/2003	Washington	Belgrade Volunteer Fire Department	Miscellaneous	1
7/24/2003	Washington	Belgrade Volunteer Fire Department	Debris	1
7/31/2003	Washington	MDC REPORTING REGION - ST. LOUIS	Miscellaneous	4

9/22/2003	Washington	Sullivan Fire Protection District	Unknown	0.5
9/22/2003	Washington	Sullivan Fire Protection District	Unknown	0.5
10/21/2003	Washington	Belgrade Volunteer Fire Department	Debris	1
10/25/2003	Washington	Richwoods Fire Protection District	Debris	2
10/25/2003	Washington	Richwoods Fire Protection District	Debris	10
11/26/2003	Washington	Richwoods Fire Protection District	Miscellaneous	1
12/21/2003	Washington	Sullivan Fire Protection District	Debris	1
12/27/2003	Washington	Sullivan Fire Protection District	Debris	0.5
1/11/2004	Washington	Potosi Fire Protection District	Debris	1
1/11/2004	Washington	Potosi Fire Protection District	Debris	5
1/11/2004	Washington	SULLIVAN FORESTRY	Debris	28
1/11/2004	Washington	Potosi Fire Protection District	Debris	
1/11/2004	Washington	Potosi Fire Protection District	Debris	25
1/15/2004	Washington	Potosi Fire Protection District	Debris	1
1/16/2004	Washington	Potosi Fire Protection District	Unknown	
1/24/2004	Washington	Potosi Fire Protection District	Debris	6
1/24/2004	Washington	Richwoods Fire Protection District	Debris	6
2/18/2004	Washington	Sullivan Fire Protection District	Unknown	5
2/18/2004	Washington	Sullivan Fire Protection District	Debris	5
2/18/2004	Washington	Potosi Fire Protection District	Debris	1
2/18/2004	Washington	Belgrade Volunteer Fire Department	Debris	7
2/20/2004	Washington	Sullivan Fire Protection District	Unknown	1
2/20/2004	Washington	Sullivan Fire Protection District	Debris	1
2/22/2004	Washington	Potosi Fire Protection District	Arson	6
2/22/2004	Washington	BISMARCK RFD	Debris	1
2/22/2004	Washington	Potosi Fire Protection District	Debris	6
2/22/2004	Washington	BISMARCK RFD	Debris	1
2/22/2004	Washington	BISMARCK RFD	Debris	1
2/25/2004	Washington	Leadwood Fire Protection District	Smoking	0.1
2/25/2004	Washington	Sullivan Fire Protection District	Unknown	1

2/27/2004	Washington	Puxico Fire Department	Debris	20
2/28/2004	Washington	Potosi Fire Protection District	Debris	
2/28/2004	Washington	Leadwood Fire Protection District	Unknown	3
2/28/2004	Washington	Sullivan Fire Protection District	Debris	1
2/28/2004	Washington	Potosi Fire Protection District	Debris	2
2/28/2004	Washington	Leadwood Fire Protection District	Debris	0.1
2/28/2004	Washington	Potosi Fire Protection District	Debris	15
2/28/2004	Washington	Potosi Fire Protection District	Debris	
2/28/2004	Washington	Potosi Fire Protection District	Unknown	
2/28/2004	Washington	Potosi Fire Protection District	Debris	
2/29/2004	Washington	Potosi Fire Protection District	Debris	20
2/29/2004	Washington	Sullivan Fire Protection District	Debris	4
2/29/2004	Washington	Potosi Fire Protection District	Debris	15
2/29/2004	Washington	Sullivan Fire Protection District	Debris	1
2/29/2004	Washington	Potosi Fire Protection District	Debris	
2/29/2004	Washington	Potosi Fire Protection District	Debris	
2/29/2004	Washington	Potosi Fire Protection District	Debris	15
3/1/2004	Washington	Potosi Fire Protection District	Debris	6
3/1/2004	Washington	Potosi Fire Protection District	Debris	
3/1/2004	Washington	Sullivan Fire Protection District	Miscellaneous	1
3/1/2004	Washington	Potosi Fire Protection District	Debris	
3/1/2004	Washington	Potosi Fire Protection District	Debris	
3/1/2004	Washington	Potosi Fire Protection District	Arson	
3/2/2004	Washington	Sullivan Fire Protection District	Miscellaneous	1
3/2/2004	Washington	Potosi Fire Protection District	Debris	5
3/3/2004	Washington	Potosi Fire Protection District	Debris	
3/5/2004	Washington	Sullivan Fire Protection District	Miscellaneous	1
3/6/2004	Washington	Potosi Fire Protection District	Debris	15
3/7/2004	Washington	Potosi Fire Protection District	Debris	1
3/7/2004	Washington	Potosi Fire Protection District	Debris	

3/7/2004	Washington	Potosi Fire Protection District	Debris	
3/8/2004	Washington	SULLIVAN FORESTRY	Debris	4
3/10/2004	Washington	Potosi Fire Protection District	Debris	
3/10/2004	Washington	Potosi Fire Protection District	Debris	
3/11/2004	Washington	Potosi Fire Protection District	Debris	
3/11/2004	Washington	SULLIVAN FORESTRY	Debris	3
3/12/2004	Washington	Potosi Fire Protection District	Unknown	
3/12/2004	Washington	Potosi Fire Protection District	Debris	
3/12/2004	Washington	Sullivan Fire Protection District	Debris	25
3/13/2004	Washington	Potosi Fire Protection District	Debris	1
3/13/2004	Washington	Sullivan Fire Protection District	Debris	25
3/13/2004	Washington	Sullivan Fire Protection District	Debris	25
3/13/2004	Washington	Belgrade Volunteer Fire Department	Debris	4
3/14/2004	Washington	Belgrade Volunteer Fire Department	Debris	
3/19/2004	Washington	Sullivan Fire Protection District	Miscellaneous	4
3/19/2004	Washington	Potosi Fire Protection District	Debris	1
3/20/2004	Washington	Belgrade Volunteer Fire Department	Unknown	1
3/20/2004	Washington	Potosi Fire Protection District	Debris	50
3/20/2004	Washington	Potosi Fire Protection District	Unknown	
3/20/2004	Washington	Belgrade Volunteer Fire Department	Unknown	1
3/20/2004	Washington	Sullivan Fire Protection District	Debris	12
3/20/2004	Washington	Potosi Fire Protection District	Debris	1
3/20/2004	Washington	Sullivan Fire Protection District	Miscellaneous	2
3/21/2004	Washington	Sullivan Fire Protection District	Debris	1
3/22/2004	Washington	Potosi Fire Protection District	Debris	2
3/22/2004	Washington	Potosi Fire Protection District	Debris	
3/22/2004	Washington	Potosi Fire Protection District	Debris	
3/22/2004	Washington	Potosi Fire Protection District	Debris	
3/22/2004	Washington	Potosi Fire Protection District	Debris	
3/22/2004	Washington	Potosi Fire Protection District	Debris	

3/24/2004	Washington	Potosi Fire Protection District	Debris	
3/24/2004	Washington	Belgrade Volunteer Fire Department	Unknown	
3/27/2004	Washington	Sullivan Fire Protection District	Miscellaneous	1
4/2/2004	Washington	Potosi Fire Protection District	Railroad	
4/2/2004	Washington	MDC REPORTING REGION - ST. LOUIS	Debris	5
4/2/2004	Washington	Potosi Fire Protection District	Debris	
4/2/2004	Washington	Potosi Fire Protection District	Not Reported	
4/2/2004	Washington	Potosi Fire Protection District	Unknown	
4/2/2004	Washington	Potosi Fire Protection District	Not Reported	
4/3/2004	Washington	Potosi Fire Protection District	Debris	1
4/3/2004	Washington	Belgrade Volunteer Fire Department	Debris	1
4/3/2004	Washington	Potosi Fire Protection District	Debris	
4/4/2004	Washington	Potosi Fire Protection District	Debris	1
4/4/2004	Washington	Potosi Fire Protection District	Debris	
4/4/2004	Washington	Belgrade Volunteer Fire Department	Miscellaneous	4
4/5/2004	Washington	Potosi Fire Protection District	Debris	
4/6/2004	Washington	Potosi Fire Protection District	Not Reported	
4/6/2004	Washington	Potosi Fire Protection District	Debris	1
4/7/2004	Washington	Potosi Fire Protection District	Not Reported	
4/7/2004	Washington	Potosi Fire Protection District	Not Reported	
4/8/2004	Washington	Potosi Fire Protection District	Debris	1
4/9/2004	Washington	Potosi Fire Protection District	Unknown	2
4/9/2004	Washington	Potosi Fire Protection District	Debris	
4/9/2004	Washington	Potosi Fire Protection District	Not Reported	
4/10/2004	Washington	Potosi Fire Protection District	Not Reported	1.5
4/10/2004	Washington	Potosi Fire Protection District	Not Reported	
4/13/2004	Washington	Potosi Fire Protection District	Debris	
4/13/2004	Washington	Potosi Fire Protection District	Debris	
4/14/2004	Washington	Potosi Fire Protection District	Debris	0.25
4/14/2004	Washington	Potosi Fire Protection District	Not Reported	

4/15/2004	Washington	Potosi Fire Protection District	Debris	4
4/15/2004	Washington	Potosi Fire Protection District	Not Reported	
4/16/2004	Washington	Potosi Fire Protection District	Not Reported	
4/16/2004	Washington	Potosi Fire Protection District	Not Reported	
4/16/2004	Washington	Potosi Fire Protection District	Not Reported	
4/16/2004	Washington	Potosi Fire Protection District	Not Reported	
4/17/2004	Washington	Potosi Fire Protection District	Debris	4
4/18/2004	Washington	Potosi Fire Protection District	Not Reported	
4/18/2004	Washington	Potosi Fire Protection District	Not Reported	
4/18/2004	Washington	Potosi Fire Protection District	Not Reported	
4/18/2004	Washington	Desloge Vounteer Fire Department	Unknown	1320
4/18/2004	Washington	Desloge Vounteer Fire Department	Debris	30
4/18/2004	Washington	Pacific Fire Protection District	Not Reported	
4/18/2004	Washington	Potosi Fire Protection District	Not Reported	
4/18/2004	Washington	Potosi Fire Protection District	Not Reported	
4/18/2004	Washington	Belgrade Volunteer Fire Department	Debris	30
4/19/2004	Washington	Potosi Fire Protection District	Not Reported	
4/21/2004	Washington	Potosi Fire Protection District	Not Reported	
4/26/2004	Washington	Potosi Fire Protection District	Debris	
4/28/2004	Washington	Potosi Fire Protection District	Debris	
4/30/2004	Washington	Potosi Fire Protection District	Debris	
5/25/2004	Washington	Potosi Fire Protection District	Debris	5
6/3/2004	Washington	Sullivan Fire Protection District	Debris	1
6/3/2004	Washington	Sullivan Fire Protection District	Miscellaneous	4
6/3/2004	Washington	Sullivan Fire Protection District	Miscellaneous	65
6/3/2004	Washington	Sullivan Fire Protection District	Debris	1
6/20/2004	Washington	Potosi Fire Protection District	Debris	
6/20/2004	Washington	Potosi Fire Protection District	Debris	1
6/23/2004	Washington	Potosi Fire Protection District	Debris	
7/10/2004	Washington	Sullivan Fire Protection District	Unknown	1

7/14/2004	Washington	Potosi Fire Protection District	Debris	
7/14/2004	Washington	Potosi Fire Protection District	Debris	1
7/19/2004	Washington	Potosi Fire Protection District	Debris	
7/19/2004	Washington	Potosi Fire Protection District	Debris	1
7/29/2004	Washington	Potosi Fire Protection District	Children	1
8/11/2004	Washington	Potosi Fire Protection District	Debris	1
9/30/2004	Washington	Belgrade Volunteer Fire Department	Equipment	2
10/4/2004	Washington	Belgrade Volunteer Fire Department	Equipment	1
10/17/2004	Washington	Belgrade Volunteer Fire Department	Debris	1
10/17/2004	Washington	Sullivan Fire Protection District	Miscellaneous	0.3
11/7/2004	Washington	Sullivan Fire Protection District	Debris	1
11/9/2004	Washington	Sullivan Fire Protection District	Debris	2
11/21/2004	Washington	Belgrade Volunteer Fire Department	Unknown	
1/8/2005	Washington	Potosi Fire Protection District	Debris	1
1/22/2005	Washington	Potosi Fire Protection District	Debris	1
1/22/2005	Washington	Potosi Fire Protection District	Equipment	1
1/24/2005	Washington	Potosi Fire Protection District	Debris	6
1/24/2005	Washington	Richwoods Fire Protection District	Miscellaneous	1
2/4/2005	Washington	Potosi Fire Protection District	Debris	2
2/5/2005	Washington	Potosi Fire Protection District	Debris	5
2/5/2005	Washington	Potosi Fire Protection District	Debris	5
2/12/2005	Washington	Potosi Fire Protection District	Debris	1
2/15/2005	Washington	Potosi Fire Protection District	Debris	4
2/17/2005	Washington	Potosi Fire Protection District	Not Reported	1
2/22/2005	Washington	Potosi Fire Protection District	Debris	1
2/25/2005	Washington	Potosi Fire Protection District	Debris	1
2/26/2005	Washington	Potosi Fire Protection District	Debris	1
2/27/2005	Washington	Belgrade Volunteer Fire Department	Unknown	6
2/27/2005	Washington	Richwoods Fire Protection District	Debris	0.5
3/5/2005	Washington	Potosi Fire Protection District	Debris	1

3/6/2005	Washington	Richwoods Fire Protection District	Debris	10
3/6/2005	Washington	Potosi Fire Protection District	Debris	200
3/6/2005	Washington	Leadwood Fire Protection District	Debris	1
3/6/2005	Washington	Potosi Fire Protection District	Debris	1
3/6/2005	Washington	Potosi Fire Protection District	Debris	2
3/6/2005	Washington	Potosi Fire Protection District	Debris	1
3/6/2005	Washington	Potosi Fire Protection District	Debris	15
3/6/2005	Washington	Potosi Fire Protection District	Debris	1
3/7/2005	Washington	ST LOUIS FORESTRY	Debris	11
3/9/2005	Washington	Richwoods Fire Protection District	Debris	40
3/10/2005	Washington	Potosi Fire Protection District	Debris	2
3/11/2005	Washington	Potosi Fire Protection District	Debris	1
3/12/2005	Washington	Potosi Fire Protection District	Unknown	1
3/12/2005	Washington	Potosi Fire Protection District	Unknown	1
3/12/2005	Washington	Potosi Fire Protection District	Debris	1
3/12/2005	Washington	Potosi Fire Protection District	Unknown	1
3/12/2005	Washington	Potosi Fire Protection District	Debris	1
3/12/2005	Washington	Richwoods Fire Protection District	Debris	40
3/12/2005	Washington	Potosi Fire Protection District	Debris	2
3/13/2005	Washington	Potosi Fire Protection District	Debris	1
3/13/2005	Washington	Potosi Fire Protection District	Debris	25
3/14/2005	Washington	Potosi Fire Protection District	Unknown	5
3/14/2005	Washington	Potosi Fire Protection District	Unknown	1
3/14/2005	Washington	Potosi Fire Protection District	Debris	5
3/14/2005	Washington	Potosi Fire Protection District	Unknown	1
3/14/2005	Washington	Potosi Fire Protection District	Unknown	2
3/16/2005	Washington	Richwoods Fire Protection District	Debris	0.5
3/17/2005	Washington	Potosi Fire Protection District	Children	1
3/17/2005	Washington	Potosi Fire Protection District	Debris	1
3/17/2005	Washington	Potosi Fire Protection District	Debris	1

3/17/2005	Washington	Potosi Fire Protection District	Debris	1
3/17/2005	Washington	Potosi Fire Protection District	Debris	1
3/18/2005	Washington	Potosi Fire Protection District	Debris	1
3/18/2005	Washington	Potosi Fire Protection District	Not Reported	30
3/19/2005	Washington	Potosi Fire Protection District	Debris	150
3/20/2005	Washington	Potosi Fire Protection District	Not Reported	10
3/20/2005	Washington	Potosi Fire Protection District	Not Reported	1
3/20/2005	Washington	Potosi Fire Protection District	Not Reported	1
3/20/2005	Washington	Potosi Fire Protection District	Not Reported	1
3/20/2005	Washington	Potosi Fire Protection District	Not Reported	3
3/21/2005	Washington	Potosi Fire Protection District	Miscellaneous	1
3/21/2005	Washington	Richwoods Fire Protection District	Miscellaneous	1
3/21/2005	Washington	Belgrade Volunteer Fire Department	Unknown	14
3/28/2005	Washington	Potosi Fire Protection District	Miscellaneous	15
3/29/2005	Washington	Potosi Fire Protection District	Debris	2
3/29/2005	Washington	Potosi Fire Protection District	Debris	4
3/30/2005	Washington	Potosi Fire Protection District	Debris	1
3/30/2005	Washington	Potosi Fire Protection District	Debris	1
3/30/2005	Washington	Potosi Fire Protection District	Debris	1
3/31/2005	Washington	Potosi Fire Protection District	Debris	75
3/31/2005	Washington	Belgrade Volunteer Fire Department	Debris	4
4/1/2005	Washington	Potosi Fire Protection District	Debris	3
4/2/2005	Washington	Potosi Fire Protection District	Debris	1
4/2/2005	Washington	Richwoods Fire Protection District	Debris	20
4/3/2005	Washington	Sullivan Fire Protection District	Debris	46
4/3/2005	Washington	Sullivan Fire Protection District	Debris	6
4/3/2005	Washington	Sullivan Fire Protection District	Debris	
4/3/2005	Washington	Sullivan Fire Protection District	Miscellaneous	2
4/3/2005	Washington	ST LOUIS FORESTRY	Debris	5
4/3/2005	Washington	Potosi Fire Protection District	Debris	1

4/3/2005	Washington	Potosi Fire Protection District	Debris	1
4/3/2005	Washington	Potosi Fire Protection District	Debris	1
4/3/2005	Washington	Potosi Fire Protection District	Debris	1
4/3/2005	Washington	Potosi Fire Protection District	Debris	1
4/3/2005	Washington	Belgrade Volunteer Fire Department	Debris	2
4/3/2005	Washington	Richwoods Fire Protection District	Debris	30
4/3/2005	Washington	ST LOUIS FORESTRY	Arson	36
4/3/2005	Washington	Potosi Fire Protection District	Debris	1
4/3/2005	Washington	Sullivan Fire Protection District	Unknown	1
4/4/2005	Washington	Richwoods Fire Protection District	Miscellaneous	0.5
4/4/2005	Washington	Potosi Fire Protection District	Debris	1
4/4/2005	Washington	ST LOUIS FORESTRY	Debris	63
4/4/2005	Washington	St Clair Fire Protection District	Unknown	70
4/4/2005	Washington	ST LOUIS FORESTRY	Debris	14
4/4/2005	Washington	Richwoods Fire Protection District	Debris	2
4/4/2005	Washington	Desloge Vounteer Fire Department	Debris	6
4/4/2005	Washington	Belgrade Volunteer Fire Department	Debris	5
4/4/2005	Washington	Belgrade Volunteer Fire Department	Unknown	2
4/4/2005	Washington	Potosi Fire Protection District	Unknown	1
4/4/2005	Washington	Richwoods Fire Protection District	Miscellaneous	10
4/4/2005	Washington	Potosi Fire Protection District	Debris	1
4/4/2005	Washington	Potosi Fire Protection District	Debris	60
4/4/2005	Washington	Potosi Fire Protection District	Debris	2
4/5/2005	Washington	Potosi Fire Protection District	Debris	4
4/5/2005	Washington	Richwoods Fire Protection District	Debris	1.5
4/6/2005	Washington	Potosi Fire Protection District	Debris	1
4/8/2005	Washington	Potosi Fire Protection District	Debris	20
4/8/2005	Washington	Potosi Fire Protection District	Miscellaneous	2
4/9/2005	Washington	Potosi Fire Protection District	Not Reported	1
4/9/2005	Washington	Quad County Fire Protection District	Debris	4

4/9/2005	Washington	Potosi Fire Protection District	Not Reported	1
4/9/2005	Washington	Potosi Fire Protection District	Not Reported	1
4/9/2005	Washington	Potosi Fire Protection District	Miscellaneous	2
4/9/2005	Washington	Potosi Fire Protection District	Not Reported	2
4/9/2005	Washington	Potosi Fire Protection District	Debris	1
4/10/2005	Washington	Potosi Fire Protection District	Not Reported	1
4/10/2005	Washington	Richwoods Fire Protection District	Smoking	1
4/10/2005	Washington	Potosi Fire Protection District	Not Reported	1
4/15/2005	Washington	Potosi Fire Protection District	Debris	4
4/16/2005	Washington	Sullivan Fire Protection District	Campfire	1
4/16/2005	Washington	Sullivan Fire Protection District	Campfire	1
4/16/2005	Washington	Potosi Fire Protection District	Not Reported	1
4/17/2005	Washington	Potosi Fire Protection District	Miscellaneous	2
4/17/2005	Washington	Potosi Fire Protection District	Debris	1
4/17/2005	Washington	Potosi Fire Protection District	Miscellaneous	2
4/17/2005	Washington	Sullivan Fire Protection District	Miscellaneous	2
4/17/2005	Washington	Sullivan Fire Protection District	Miscellaneous	1
4/18/2005	Washington	Sullivan Fire Protection District	Debris	1
4/18/2005	Washington	Belgrade Volunteer Fire Department	Unknown	2
5/7/2005	Washington	Belgrade Volunteer Fire Department	Unknown	10
6/10/2005	Washington	Belgrade Volunteer Fire Department	Unknown	1
6/13/2005	Washington	Potosi Fire Protection District	Not Reported	1
6/14/2005	Washington	Belgrade Volunteer Fire Department	Equipment	1
6/17/2005	Washington	Belgrade Volunteer Fire Department	Unknown	20
6/22/2005	Washington	Potosi Fire Protection District	Not Reported	1
6/25/2005	Washington	Potosi Fire Protection District	Unknown	1
6/26/2005	Washington	Potosi Fire Protection District	Unknown	1
6/28/2005	Washington	Belgrade Volunteer Fire Department	Equipment	4
6/28/2005	Washington	Belgrade Volunteer Fire Department	Equipment	4
6/29/2005	Washington	Potosi Fire Protection District	Miscellaneous	1

7/2/2005	Washington	Potosi Fire Protection District	Unknown	1
7/5/2005	Washington	Potosi Fire Protection District	Not Reported	1
7/10/2005	Washington	Belgrade Volunteer Fire Department	Unknown	1
7/10/2005	Washington	Potosi Fire Protection District	Debris	1
7/10/2005	Washington	Potosi Fire Protection District	Debris	1
7/26/2005	Washington	Potosi Fire Protection District	Debris	1
7/26/2005	Washington	Potosi Fire Protection District	Equipment	1
7/30/2005	Washington	Potosi Fire Protection District	Debris	1
8/1/2005	Washington	Potosi Fire Protection District	Equipment	1
8/8/2005	Washington	Potosi Fire Protection District	Equipment	1
9/11/2005	Washington	Potosi Fire Protection District	Debris	1
9/11/2005	Washington	Potosi Fire Protection District	Debris	1
9/23/2005	Washington	Potosi Fire Protection District	Debris	1
10/6/2005	Washington	Potosi Fire Protection District	Unknown	1
11/10/2005	Washington	Potosi Fire Protection District	Miscellaneous	7
11/11/2005	Washington	Potosi Fire Protection District	Not Reported	
11/11/2005	Washington	Belgrade Volunteer Fire Department	Debris	1
11/12/2005	Washington	Potosi Fire Protection District	Not Reported	100
11/12/2005	Washington	Belgrade Volunteer Fire Department	Arson	9
11/12/2005	Washington	Potosi Fire Protection District	Not Reported	1
11/12/2005	Washington	Belgrade Volunteer Fire Department	Not Reported	16
11/12/2005	Washington	Potosi Fire Protection District	Unknown	1
11/12/2005	Washington	Potosi Fire Protection District	Debris	1
11/13/2005	Washington	Sullivan Fire Protection District	Debris	5
11/13/2005	Washington	Potosi Fire Protection District	Debris	3
11/16/2005	Washington	Portageville Fire Department	Not Reported	
11/16/2005	Washington	Potosi Fire Protection District	Debris	1
11/19/2005	Washington	Potosi Fire Protection District	Debris	1
11/20/2005	Washington	Potosi Fire Protection District	Unknown	20
11/21/2005	Washington	Belgrade Volunteer Fire Department	Unknown	1

11/23/2005	Washington	Potosi Fire Protection District	Miscellaneous	2
11/24/2005	Washington	Potosi Fire Protection District	Debris	1
11/24/2005	Washington	Potosi Fire Protection District	Debris	1
11/24/2005	Washington	Belgrade Volunteer Fire Department	Smoking	1
11/24/2005	Washington	Belgrade Volunteer Fire Department	Unknown	1
11/24/2005	Washington	Belgrade Volunteer Fire Department	Unknown	2
11/24/2005	Washington	Potosi Fire Protection District	Debris	1
11/25/2005	Washington	Potosi Fire Protection District	Unknown	1
11/25/2005	Washington	Sullivan Fire Protection District	Unknown	3
11/25/2005	Washington	Potosi Fire Protection District	Debris	
11/27/2005	Washington	Belgrade Volunteer Fire Department	Miscellaneous	
12/5/2005	Washington	Potosi Fire Protection District	Unknown	1
12/18/2005	Washington	Potosi Fire Protection District	Unknown	1
1/7/2006	Washington	Potosi Fire Protection District	Unknown	7
1/8/2006	Washington	Potosi Fire Protection District	Debris	15
1/9/2006	Washington	Richwoods Fire Protection District	Debris	2
1/19/2006	Washington	Potosi Fire Protection District	Not Reported	1
1/20/2006	Washington	Potosi Fire Protection District	Unknown	1
1/24/2006	Washington	Potosi Fire Protection District	Equipment	1
1/24/2006	Washington	Potosi Fire Protection District	Unknown	3
1/24/2006	Washington	Portageville Fire Department	Equipment	1
1/24/2006	Washington	Richwoods Fire Protection District	Debris	3
1/25/2006	Washington	Richwoods Fire Protection District	Debris	3
1/26/2006	Washington	Potosi Fire Protection District	Unknown	1
1/26/2006	Washington	Potosi Fire Protection District	Debris	1
1/26/2006	Washington	Potosi Fire Protection District	Unknown	1
1/27/2006	Washington	Potosi Fire Protection District	Equipment	1
1/27/2006	Washington	Richwoods Fire Protection District	Miscellaneous	0.5
1/27/2006	Washington	Belgrade Volunteer Fire Department	Not Reported	
1/27/2006	Washington	Potosi Fire Protection District	Debris	3

1/27/2006	Washington	Potosi Fire Protection District	Unknown	
1/27/2006	Washington	Potosi Fire Protection District	Unknown	30
1/27/2006	Washington	Potosi Fire Protection District	Unknown	5
1/28/2006	Washington	Potosi Fire Protection District	Unknown	250
1/28/2006	Washington	Desloge Vounteer Fire Department	Unknown	100
1/28/2006	Washington	Leadwood Fire Protection District	Unknown	200
1/28/2006	Washington	Doe Run Fire Protection District	Debris	5
2/2/2006	Washington	Potosi Fire Protection District	Unknown	1
2/8/2006	Washington	Potosi Fire Protection District	Debris	1
2/23/2006	Washington	Sullivan Fire Protection District	Debris	1
2/23/2006	Washington	Potosi Fire Protection District	Debris	2
2/23/2006	Washington	Quad County Fire Protection District	Arson	5
2/23/2006	Washington	Potosi Fire Protection District	Debris	2
2/24/2006	Washington	Potosi Fire Protection District	Unknown	2
2/25/2006	Washington	Potosi Fire Protection District	Unknown	20
2/26/2006	Washington	Potosi Fire Protection District	Debris	1
2/26/2006	Washington	Belgrade Volunteer Fire Department	Debris	1
2/26/2006	Washington	Belgrade Volunteer Fire Department	Debris	2
2/27/2006	Washington	Potosi Fire Protection District	Unknown	1
2/27/2006	Washington	Richwoods Fire Protection District	Debris	1
2/27/2006	Washington	Potosi Fire Protection District	Unknown	75
2/27/2006	Washington	Potosi Fire Protection District	Unknown	1
2/28/2006	Washington	Potosi Fire Protection District	Unknown	55
2/28/2006	Washington	Potosi Fire Protection District	Unknown	40
3/1/2006	Washington	Potosi Fire Protection District	Unknown	1
3/2/2006	Washington	Potosi Fire Protection District	Unknown	60
3/2/2006	Washington	Leadwood Fire Protection District	Unknown	10
3/3/2006	Washington	Potosi Fire Protection District	Unknown	1
3/3/2006	Washington	Potosi Fire Protection District	Unknown	18
3/3/2006	Washington	Potosi Fire Protection District	Unknown	1

3/3/2006	Washington	Potosi Fire Protection District	Unknown	1
3/4/2006	Washington	Belgrade Volunteer Fire Department	Unknown	1
3/7/2006	Washington	Richwoods Fire Protection District	Debris	0.25
3/11/2006	Washington	Belgrade Volunteer Fire Department	Unknown	1
3/15/2006	Washington	Potosi Fire Protection District	Unknown	5
3/15/2006	Washington	Potosi Fire Protection District	Unknown	1
3/15/2006	Washington	Potosi Fire Protection District	Unknown	1
3/16/2006	Washington	Potosi Fire Protection District	Unknown	15
3/16/2006	Washington	Potosi Fire Protection District	Unknown	1
3/16/2006	Washington	Potosi Fire Protection District	Unknown	300
3/16/2006	Washington	MDC REPORTING REGION - ST. LOUIS	Debris	309
3/16/2006	Washington	Leadwood Fire Protection District	Unknown	10
3/18/2006	Washington	Potosi Fire Protection District	Unknown	1
3/18/2006	Washington	Potosi Fire Protection District	Unknown	3
3/19/2006	Washington	Potosi Fire Protection District	Debris	1
3/19/2006	Washington	Potosi Fire Protection District	Unknown	1
3/26/2006	Washington	Potosi Fire Protection District	Unknown	5
3/26/2006	Washington	Potosi Fire Protection District	Debris	1
3/31/2006	Washington	Sullivan Fire Protection District	Debris	4
3/31/2006	Washington	MDC REPORTING REGION - ST. LOUIS	Debris	4
4/1/2006	Washington	Potosi Fire Protection District	Unknown	15
4/1/2006	Washington	Potosi Fire Protection District	Unknown	5
4/4/2006	Washington	Quad County Fire Protection District	Equipment	1
4/4/2006	Washington	Belgrade Volunteer Fire Department	Equipment	1
4/5/2006	Washington	Leadwood Fire Protection District	Unknown	5
4/5/2006	Washington	Potosi Fire Protection District	Unknown	10
4/5/2006	Washington	Quad County Fire Protection District	Equipment	1
4/7/2006	Washington	Potosi Fire Protection District	Debris	1
4/7/2006	Washington	Leadwood Fire Protection District	Unknown	1
4/8/2006	Washington	Potosi Fire Protection District	Equipment	1

4/9/2006	Washington	Potosi Fire Protection District	Unknown	1
4/11/2006	Washington	Potosi Fire Protection District	Unknown	30
4/11/2006	Washington	Potosi Fire Protection District	Unknown	2
4/11/2006	Washington	Richwoods Fire Protection District	Smoking	0.1
4/12/2006	Washington	Potosi Fire Protection District	Unknown	1
4/13/2006	Washington	Potosi Fire Protection District	Debris	3
4/13/2006	Washington	Potosi Fire Protection District	Debris	3
4/13/2006	Washington	Richwoods Fire Protection District	Debris	0.25
4/13/2006	Washington	Potosi Fire Protection District	Smoking	10
4/14/2006	Washington	Sullivan Fire Protection District	Debris	1
4/14/2006	Washington	MDC REPORTING REGION - ST. LOUIS	Debris	1
4/14/2006	Washington	Potosi Fire Protection District	Unknown	1
4/15/2006	Washington	Sullivan Fire Protection District	Lightning	5
4/16/2006	Washington	Potosi Fire Protection District	Unknown	3
4/17/2006	Washington	ST LOUIS FORESTRY	Arson	25
4/17/2006	Washington	Potosi Fire Protection District	Unknown	60
4/17/2006	Washington	Richwoods Fire Protection District	Debris	30
4/18/2006	Washington	MDC REPORTING REGION - ST. LOUIS	Arson	8
4/19/2006	Washington	Richwoods Fire Protection District	Miscellaneous	0.25
4/19/2006	Washington	Sullivan Fire Protection District	Debris	1
4/19/2006	Washington	Potosi Fire Protection District	Unknown	50
4/19/2006	Washington	ST LOUIS FORESTRY	Arson	48
4/20/2006	Washington	Potosi Fire Protection District	Debris	5
4/21/2006	Washington	ST LOUIS FORESTRY	Debris	3
4/22/2006	Washington	Potosi Fire Protection District	Unknown	50
4/28/2006	Washington	Potosi Fire Protection District	Unknown	1
6/2/2006	Washington	Potosi Fire Protection District	Unknown	0.5
6/21/2006	Washington	Potosi Fire Protection District	Miscellaneous	1
7/3/2006	Washington	Belgrade Volunteer Fire Department	Unknown	1
7/4/2006	Washington	Potosi Fire Protection District	Railroad	1

7/5/2006	Washington	Belgrade Volunteer Fire Department	Unknown	1
7/5/2006	Washington	Potosi Fire Protection District	Unknown	0.25
7/7/2006	Washington	Potosi Fire Protection District	Unknown	0.5
7/16/2006	Washington	Potosi Fire Protection District	Unknown	1
7/16/2006	Washington	Potosi Fire Protection District	Debris	1
7/23/2006	Washington	Potosi Fire Protection District	Unknown	1
7/23/2006	Washington	Potosi Fire Protection District	Unknown	1
7/24/2006	Washington	Potosi Fire Protection District	Unknown	1
7/24/2006	Washington	Potosi Fire Protection District	Unknown	1
7/25/2006	Washington	Potosi Fire Protection District	Debris	1
7/29/2006	Washington	Potosi Fire Protection District	Unknown	2
7/31/2006	Washington	Sullivan Fire Protection District	Debris	0.5
8/1/2006	Washington	Potosi Fire Protection District	Unknown	5
8/2/2006	Washington	Potosi Fire Protection District	Unknown	1
8/2/2006	Washington	Potosi Fire Protection District	Unknown	1
8/5/2006	Washington	Potosi Fire Protection District	Unknown	1
8/5/2006	Washington	Potosi Fire Protection District	Unknown	15
8/5/2006	Washington	Potosi Fire Protection District	Unknown	1
8/6/2006	Washington	Leadwood Fire Protection District	Not Reported	2
8/6/2006	Washington	Potosi Fire Protection District	Unknown	1
8/6/2006	Washington	Potosi Fire Protection District	Unknown	1
8/6/2006	Washington	Potosi Fire Protection District	Unknown	1
8/7/2006	Washington	Potosi Fire Protection District	Unknown	1
8/7/2006	Washington	Richwoods Fire Protection District	Lightning	17
8/7/2006	Washington	Potosi Fire Protection District	Unknown	2
8/8/2006	Washington	Potosi Fire Protection District	Debris	1
8/12/2006	Washington	Leadwood Fire Protection District	Not Reported	2
8/12/2006	Washington	Potosi Fire Protection District	Debris	2
8/24/2006	Washington	Potosi Fire Protection District	Unknown	10
8/31/2006	Washington	Leadwood Fire Protection District	Not Reported	1

9/4/2006	Washington	Potosi Fire Protection District	Unknown	1
9/6/2006	Washington	Potosi Fire Protection District	Debris	2
9/6/2006	Washington	Potosi Fire Protection District	Unknown	1
9/15/2006	Washington	Potosi Fire Protection District	Unknown	1
9/16/2006	Washington	Leadwood Fire Protection District	Unknown	10
9/17/2006	Washington	Potosi Fire Protection District	Unknown	5
9/19/2006	Washington	Leadwood Fire Protection District	Not Reported	1
9/22/2006	Washington	Belgrade Volunteer Fire Department	Unknown	1
9/22/2006	Washington	Potosi Fire Protection District	Unknown	1
9/26/2006	Washington	Leadwood Fire Protection District	Arson	6
9/26/2006	Washington	Potosi Fire Protection District	Unknown	1
9/26/2006	Washington	Potosi Fire Protection District	Unknown	1
9/28/2006	Washington	Belgrade Volunteer Fire Department	Not Reported	1
10/3/2006	Washington	Potosi Fire Protection District	Unknown	2
10/4/2006	Washington	Potosi Fire Protection District	Unknown	1
10/7/2006	Washington	Potosi Fire Protection District	Unknown	1
10/8/2006	Washington	Richwoods Fire Protection District	Campfire	13
10/13/2006	Washington	Belgrade Volunteer Fire Department	Not Reported	1
10/13/2006	Washington	Potosi Fire Protection District	Unknown	40
10/13/2006	Washington	Belgrade Volunteer Fire Department	Debris	1
10/14/2006	Washington	Potosi Fire Protection District	Unknown	1
10/14/2006	Washington	Potosi Fire Protection District	Unknown	5
10/14/2006	Washington	Potosi Fire Protection District	Unknown	1
10/14/2006	Washington	Potosi Fire Protection District	Unknown	1
10/15/2006	Washington	Potosi Fire Protection District	Debris	1
10/15/2006	Washington	Potosi Fire Protection District	Unknown	1
10/30/2006	Washington	Potosi Fire Protection District	Unknown	1
11/4/2006	Washington	Potosi Fire Protection District	Unknown	1
11/4/2006	Washington	Belgrade Volunteer Fire Department	Unknown	1
11/5/2006	Washington	Potosi Fire Protection District	Unknown	1

11/5/2006	Washington	Belgrade Volunteer Fire Department	Miscellaneous	1
11/5/2006	Washington	Potosi Fire Protection District	Unknown	1
11/5/2006	Washington	Potosi Fire Protection District	Unknown	1
11/20/2006	Washington	Potosi Fire Protection District	Unknown	1
11/20/2006	Washington	Potosi Fire Protection District	Unknown	1
11/21/2006	Washington	Potosi Fire Protection District	Unknown	1
11/22/2006	Washington	Potosi Fire Protection District	Debris	1
11/23/2006	Washington	Potosi Fire Protection District	Debris	1
11/24/2006	Washington	Potosi Fire Protection District	Debris	2
11/24/2006	Washington	Potosi Fire Protection District	Unknown	1
11/26/2006	Washington	Potosi Fire Protection District	Debris	1
11/27/2006	Washington	Leadwood Fire Protection District	Not Reported	1
11/28/2006	Washington	Potosi Fire Protection District	Unknown	1
12/26/2006	Washington	Richwoods Fire Protection District	Debris	20
1/3/2007	Washington	Potosi Fire Protection District	Unknown	1
1/9/2007	Washington	Richwoods Fire Protection District	Arson	0.1
1/12/2007	Washington	Sullivan Fire Protection District	Unknown	6
1/28/2007	Washington	Potosi Fire Protection District	Debris	2
1/29/2007	Washington	Potosi Fire Protection District	Miscellaneous	5
1/31/2007	Washington	Potosi Fire Protection District	Debris	2
1/31/2007	Washington	Potosi Fire Protection District	Debris	1
2/6/2007	Washington	Richwoods Fire Protection District	Debris	0.1
2/6/2007	Washington	Sullivan Fire Protection District	Unknown	2
2/6/2007	Washington	Potosi Fire Protection District	Unknown	1
2/8/2007	Washington	Potosi Fire Protection District	Unknown	5
2/10/2007	Washington	Richwoods Fire Protection District	Debris	0.5
2/11/2007	Washington	Richwoods Fire Protection District	Debris	5
2/12/2007	Washington	Richwoods Fire Protection District	Debris	0.1
2/12/2007	Washington	Richwoods Fire Protection District	Debris	0.1
2/18/2007	Washington	Richwoods Fire Protection District	Arson	0.1

2/19/2007	Washington	Irondale Fire Protection Distrcit	Debris	1
2/22/2007	Washington	Potosi Fire Protection District	Debris	1
2/22/2007	Washington	Potosi Fire Protection District	Debris	3
2/23/2007	Washington	Potosi Fire Protection District	Unknown	1
3/1/2007	Washington	Potosi Fire Protection District	Unknown	2
3/4/2007	Washington	Sullivan Fire Protection District	Unknown	0.4
3/4/2007	Washington	Richwoods Fire Protection District	Debris	3
3/4/2007	Washington	Leadwood Fire Protection District	Unknown	2
3/4/2007	Washington	Potosi Fire Protection District	Debris	1
3/4/2007	Washington	Potosi Fire Protection District	Unknown	4
3/5/2007	Washington	Richwoods Fire Protection District	Debris	0.5
3/5/2007	Washington	Steelville Fire Protection District	Debris	10
3/5/2007	Washington	Potosi Fire Protection District	Unknown	4
3/5/2007	Washington	Potosi Fire Protection District	Unknown	5
3/5/2007	Washington	Potosi Fire Protection District	Unknown	15
3/5/2007	Washington	Richwoods Fire Protection District	Debris	0.1
3/5/2007	Washington	Potosi Fire Protection District	Unknown	10
3/5/2007	Washington	Sullivan Fire Protection District	Unknown	1
3/7/2007	Washington	Leadwood Fire Protection District	Unknown	2
3/7/2007	Washington	Belgrade Volunteer Fire Department	Miscellaneous	1
3/7/2007	Washington	Potosi Fire Protection District	Debris	5
3/7/2007	Washington	Sullivan Fire Protection District	Debris	1
3/7/2007	Washington	Potosi Fire Protection District	Unknown	1
3/7/2007	Washington	Potosi Fire Protection District	Unknown	1
3/7/2007	Washington	Potosi Fire Protection District	Debris	1
3/8/2007	Washington	Potosi Fire Protection District	Unknown	1
3/9/2007	Washington	Richwoods Fire Protection District	Unknown	0.1
3/10/2007	Washington	Potosi Fire Protection District	Unknown	1
3/10/2007	Washington	Potosi Fire Protection District	Debris	2
3/10/2007	Washington	Potosi Fire Protection District	Unknown	2

3/11/2007	Washington	Potosi Fire Protection District	Unknown	1
3/11/2007	Washington	Potosi Fire Protection District	Debris	2
3/11/2007	Washington	Potosi Fire Protection District	Unknown	1
3/12/2007	Washington	Leadwood Fire Protection District	Unknown	10
3/12/2007	Washington	Potosi Fire Protection District	Unknown	2
3/12/2007	Washington	Potosi Fire Protection District	Unknown	20
3/12/2007	Washington	Potosi Fire Protection District	Unknown	1
3/12/2007	Washington	Potosi Fire Protection District	Unknown	1
3/13/2007	Washington	Sullivan Fire Protection District	Unknown	0.3
3/14/2007	Washington	Richwoods Fire Protection District	Debris	0.1
3/18/2007	Washington	Potosi Fire Protection District	Unknown	1
3/18/2007	Washington	Belgrade Volunteer Fire Department	Debris	3
3/18/2007	Washington	Sullivan Fire Protection District	Unknown	0.5
3/19/2007	Washington	Potosi Fire Protection District	Unknown	1
3/21/2007	Washington	Irondale Fire Protection Distrcit	Debris	1
3/21/2007	Washington	Richwoods Fire Protection District	Equipment	30
3/21/2007	Washington	Leadwood Fire Protection District	Unknown	7
3/22/2007	Washington	Richwoods Fire Protection District	Miscellaneous	5
3/24/2007	Washington	Potosi Fire Protection District	Unknown	30
3/26/2007	Washington	Richwoods Fire Protection District	Debris	20
3/27/2007	Washington	Potosi Fire Protection District	Unknown	1
3/27/2007	Washington	Potosi Fire Protection District	Unknown	4
3/27/2007	Washington	Richwoods Fire Protection District	Debris	10
3/27/2007	Washington	Potosi Fire Protection District	Unknown	50
3/27/2007	Washington	Potosi Fire Protection District	Unknown	2
3/27/2007	Washington	MDC REPORTING REGION - ST. LOUIS	Arson	40
3/29/2007	Washington	Irondale Fire Protection Distrcit	Unknown	1
4/1/2007	Washington	Potosi Fire Protection District	Unknown	2
4/2/2007	Washington	Leadwood Fire Protection District	Unknown	5
4/2/2007	Washington	Potosi Fire Protection District	Unknown	1

4/2/2007	Washington	Potosi Fire Protection District	Unknown	5
4/2/2007	Washington	Irondale Fire Protection Distrcit	Arson	1
4/3/2007	Washington	Irondale Fire Protection Distrcit	Debris	1
4/3/2007	Washington	Potosi Fire Protection District	Unknown	1
4/5/2007	Washington	Potosi Fire Protection District	Unknown	1
4/8/2007	Washington	Potosi Fire Protection District	Unknown	2
4/8/2007	Washington	Potosi Fire Protection District	Unknown	1
4/9/2007	Washington	Potosi Fire Protection District	Unknown	2
4/10/2007	Washington	Potosi Fire Protection District	Unknown	1
4/12/2007	Washington	Potosi Fire Protection District	Unknown	1
4/19/2007	Washington	Potosi Fire Protection District	Unknown	5
4/19/2007	Washington	Leadwood Fire Protection District	Unknown	5
4/20/2007	Washington	Potosi Fire Protection District	Unknown	1
4/20/2007	Washington	Potosi Fire Protection District	Unknown	1
4/21/2007	Washington	MDC REPORTING REGION - ST. LOUIS	Miscellaneous	7
4/21/2007	Washington	Potosi Fire Protection District	Unknown	10
4/21/2007	Washington	Sullivan Fire Protection District	Debris	0.1
4/21/2007	Washington	Potosi Fire Protection District	Unknown	10
4/21/2007	Washington	Sullivan Fire Protection District	Campfire	1
4/21/2007	Washington	Potosi Fire Protection District	Unknown	3
4/22/2007	Washington	Richwoods Fire Protection District	Debris	15
4/22/2007	Washington	Potosi Fire Protection District	Unknown	1
4/23/2007	Washington	Potosi Fire Protection District	Miscellaneous	2
4/23/2007	Washington	Leadwood Fire Protection District	Unknown	2
4/23/2007	Washington	Richwoods Fire Protection District	Arson	0.25
4/24/2007	Washington	Potosi Fire Protection District	Unknown	1
4/28/2007	Washington	Leadwood Fire Protection District	Unknown	5
4/29/2007	Washington	Potosi Fire Protection District	Unknown	1
4/29/2007	Washington	Potosi Fire Protection District	Unknown	40
4/29/2007	Washington	Potosi Fire Protection District	Unknown	1

4/29/2007	Washington	Potosi Fire Protection District	Unknown	1
4/29/2007	Washington	Potosi Fire Protection District	Debris	1
4/30/2007	Washington	MDC REPORTING REGION - ST. LOUIS	Debris	4
5/14/2007	Washington	Richwoods Fire Protection District	Debris	0.25
5/24/2007	Washington	MDC REPORTING REGION - ST. LOUIS	Unknown	10
6/19/2007	Washington	Richwoods Fire Protection District	Debris	10
7/4/2007	Washington	Belgrade Volunteer Fire Department	Debris	1
7/6/2007	Washington	Potosi Fire Protection District	Unknown	2
7/14/2007	Washington	Potosi Fire Protection District	Unknown	2
7/16/2007	Washington	Potosi Fire Protection District	Unknown	1
7/21/2007	Washington	Richwoods Fire Protection District	Equipment	10
7/24/2007	Washington	Richwoods Fire Protection District	Debris	0.5
7/25/2007	Washington	Potosi Fire Protection District	Unknown	1
7/25/2007	Washington	Richwoods Fire Protection District	Unknown	0.1
8/4/2007	Washington	Potosi Fire Protection District	Unknown	1
8/8/2007	Washington	Potosi Fire Protection District	Unknown	1
8/9/2007	Washington	Potosi Fire Protection District	Unknown	1
8/10/2007	Washington	Potosi Fire Protection District	Unknown	2
8/11/2007	Washington	Potosi Fire Protection District	Debris	2
8/12/2007	Washington	Richwoods Fire Protection District	Unknown	100
8/13/2007	Washington	Potosi Fire Protection District	Unknown	20
8/13/2007	Washington	Richwoods Fire Protection District	Smoking	0.25
8/13/2007	Washington	Potosi Fire Protection District	Unknown	20
8/14/2007	Washington	BISMARCK RFD	Debris	100
8/14/2007	Washington	Potosi Fire Protection District	Unknown	20
8/14/2007	Washington	Leadwood Fire Protection District	Debris	100
8/14/2007	Washington	Potosi Fire Protection District	Unknown	100
8/14/2007	Washington	Potosi Fire Protection District	Unknown	1
8/14/2007	Washington	Leadwood Fire Protection District	Unknown	500
8/14/2007	Washington	Doe Run Fire Protection District	Debris	100

8/14/2007	Washington	Farmington Fire Department	Debris	100
8/14/2007	Washington	SULLIVAN FORESTRY	Unknown	155
8/15/2007	Washington	Richwoods Fire Protection District	Unknown	100
8/15/2007	Washington	Wolf Creek Fire Protection Association	Debris	100
8/15/2007	Washington	SULLIVAN FORESTRY	Arson	30
8/17/2007	Washington	Potosi Fire Protection District	Unknown	3
8/31/2007	Washington	Richwoods Fire Protection District	Debris	0.5
9/1/2007	Washington	Richwoods Fire Protection District	Debris	1
9/1/2007	Washington	Potosi Fire Protection District	Unknown	1
9/3/2007	Washington	Potosi Fire Protection District	Unknown	2
9/5/2007	Washington	Richwoods Fire Protection District	Debris	0.1
9/14/2007	Washington	Potosi Fire Protection District	Unknown	1
10/4/2007	Washington	Potosi Fire Protection District	Unknown	2
10/12/2007	Washington	Potosi Fire Protection District	Unknown	1
10/14/2007	Washington	Potosi Fire Protection District	Equipment	1
10/19/2007	Washington	Potosi Fire Protection District	Unknown	2
10/21/2007	Washington	Potosi Fire Protection District	Debris	1
11/3/2007	Washington	Richwoods Fire Protection District	Unknown	0.1
11/4/2007	Washington	SULLIVAN FORESTRY	Debris	20
11/4/2007	Washington	Richwoods Fire Protection District	Unknown	0.1
11/5/2007	Washington	SULLIVAN FORESTRY	Debris	5
11/5/2007	Washington	Richwoods Fire Protection District	Smoking	0.5
11/6/2007	Washington	Potosi Fire Protection District	Unknown	2
11/7/2007	Washington	Potosi Fire Protection District	Unknown	50
11/7/2007	Washington	Big River Fire Protection, Inc.	Unknown	5
11/7/2007	Washington	Steelville Fire Protection District	Unknown	15
11/10/2007	Washington	Potosi Fire Protection District	Unknown	1
11/11/2007	Washington	Richwoods Fire Protection District	Unknown	50
11/15/2007	Washington	Potosi Fire Protection District	Unknown	1
11/17/2007	Washington	Potosi Fire Protection District	Unknown	1

11/17/2007	Washington	Potosi Fire Protection District	Unknown	6
11/17/2007	Washington	Leadwood Fire Protection District	Unknown	5
11/17/2007	Washington	Leadwood Fire Protection District	Unknown	5
11/17/2007	Washington	Potosi Fire Protection District	Unknown	5
11/17/2007	Washington	Leadwood Fire Protection District	Unknown	5
11/17/2007	Washington	Potosi Fire Protection District	Unknown	1
11/17/2007	Washington	Potosi Fire Protection District	Unknown	1
11/17/2007	Washington	Potosi Fire Protection District	Unknown	4
11/17/2007	Washington	Leadwood Fire Protection District	Unknown	10
11/18/2007	Washington	Steelville Fire Protection District	Debris	25
11/19/2007	Washington	SULLIVAN FORESTRY	Unknown	40
11/20/2007	Washington	Farmington Fire Department	Smoking	3
12/1/2007	Washington	Bourbon Fire Protection District	Debris	76
1/1/2008	Washington	Sullivan Fire Protection District	Debris	1
1/4/2008	Washington	Richwoods Fire Protection District	Debris	1
1/4/2008	Washington	Sullivan Fire Protection District	Debris	3
1/6/2008	Washington	Potosi Fire Protection District	Unknown	1
1/25/2008	Washington	Potosi Fire Protection District	Unknown	1
1/26/2008	Washington	Leadwood Fire Protection District	Unknown	1
1/27/2008	Washington	Potosi Fire Protection District	Unknown	1
1/28/2008	Washington	Richwoods Fire Protection District	Arson	1
1/29/2008	Washington	Belgrade Volunteer Fire Department	Debris	0.5
1/29/2008	Washington	Leadwood Fire Protection District	Unknown	1
1/30/2008	Washington	Potosi Fire Protection District	Unknown	2
1/30/2008	Washington	Potosi Fire Protection District	Unknown	1
2/9/2008	Washington	Sullivan Fire Protection District	Unknown	0.5
2/9/2008	Washington	Potosi Fire Protection District	Unknown	3
2/20/2008	Washington	Belgrade Volunteer Fire Department	Unknown	0.1
3/11/2008	Washington	Richwoods Fire Protection District	Not Reported	1
3/11/2008	Washington	Richwoods Fire Protection District	Not Reported	1

3/12/2008	Washington	Potosi Fire Protection District	Debris	2
3/12/2008	Washington	Potosi Fire Protection District	Unknown	1
3/12/2008	Washington	Potosi Fire Protection District	Unknown	75
3/14/2008	Washington	SULLIVAN FORESTRY	Debris	5
3/17/2008	Washington	Richwoods Fire Protection District	Arson	1
3/25/2008	Washington	Potosi Fire Protection District	Unknown	1
3/25/2008	Washington	Potosi Fire Protection District	Unknown	30
3/29/2008	Washington	Richwoods Fire Protection District	Equipment	1
3/30/2008	Washington	Richwoods Fire Protection District	Equipment	1
3/30/2008	Washington	Richwoods Fire Protection District	Equipment	1
4/5/2008	Washington	Potosi Fire Protection District	Unknown	1
4/6/2008	Washington	Potosi Fire Protection District	Unknown	1
4/14/2008	Washington	Sullivan Fire Protection District	Debris	1
4/15/2008	Washington	Potosi Fire Protection District	Unknown	3
4/15/2008	Washington	Richwoods Fire Protection District	Debris	1
4/15/2008	Washington	Potosi Fire Protection District	Unknown	1
4/16/2008	Washington	Potosi Fire Protection District	Unknown	1
4/16/2008	Washington	Potosi Fire Protection District	Unknown	10
4/17/2008	Washington	Potosi Fire Protection District	Unknown	2
4/17/2008	Washington	Potosi Fire Protection District	Unknown	2
4/17/2008	Washington	Leadwood Fire Protection District	Unknown	30
4/17/2008	Washington	Leadwood Fire Protection District	Unknown	30
4/21/2008	Washington	Belgrade Volunteer Fire Department	Arson	0.1
4/21/2008	Washington	Potosi Fire Protection District	Unknown	2
4/21/2008	Washington	Richwoods Fire Protection District	Debris	1
4/22/2008	Washington	Potosi Fire Protection District	Unknown	1
4/23/2008	Washington	Potosi Fire Protection District	Unknown	5
4/29/2008	Washington	Sullivan Fire Protection District	Debris	2
4/29/2008	Washington	Potosi Fire Protection District	Unknown	3
4/29/2008	Washington	Sullivan Fire Protection District	Miscellaneous	0.1

5/5/2008	Washington	Potosi Fire Protection District	Unknown	15
5/5/2008	Washington	Potosi Fire Protection District	Unknown	5
5/21/2008	Washington	Potosi Fire Protection District	Debris	1
6/21/2008	Washington	Belgrade Volunteer Fire Department	Campfire	0.1
6/26/2008	Washington	Belgrade Volunteer Fire Department	Miscellaneous	0.25
7/6/2008	Washington	Potosi Fire Protection District	Unknown	1
7/17/2008	Washington	Potosi Fire Protection District	Unknown	1
11/2/2008	Washington	Belgrade Volunteer Fire Department	Debris	0.1
11/10/2008	Washington	Potosi Fire Protection District	Debris	1
11/13/2008	Washington	Potosi Fire Protection District	Unknown	80
11/13/2008	Washington	MDC REPORTING REGION - ST. LOUIS	Arson	60
12/7/2008	Washington	Belgrade Volunteer Fire Department	Unknown	4
12/8/2008	Washington	Potosi Fire Protection District	Unknown	3
12/8/2008	Washington	Potosi Fire Protection District	Unknown	1
12/8/2008	Washington	Potosi Fire Protection District	Unknown	1
12/8/2008	Washington	Potosi Fire Protection District	Unknown	2
12/8/2008	Washington	Belgrade Volunteer Fire Department	Unknown	0.25
12/16/2008	Washington	Belgrade Volunteer Fire Department	Debris	0.25
12/23/2008	Washington	Potosi Fire Protection District	Unknown	1
12/30/2008	Washington	Belgrade Volunteer Fire Department	Debris	4
12/30/2008	Washington	Sullivan Fire Protection District	Unknown	5
12/30/2008	Washington	Potosi Fire Protection District	Equipment	1
1/4/2009	Washington	Belgrade Volunteer Fire Department	Debris	10
1/9/2009	Washington	Richwoods Fire Protection District	Debris	1
1/14/2009	Washington	Leadwood Fire Protection District	Unknown	5
1/17/2009	Washington	Belgrade Volunteer Fire Department	Debris	0.1
1/18/2009	Washington	Belgrade Volunteer Fire Department	Debris	2
1/19/2009	Washington	Potosi Fire Protection District	Unknown	6
1/21/2009	Washington	Leadwood Fire Protection District	Unknown	50
1/21/2009	Washington	Steelville Fire Protection District	Unknown	10

1/21/2009	Washington	Potosi Fire Protection District	Unknown	6
1/21/2009	Washington	Potosi Fire Protection District	Unknown	1
1/22/2009	Washington	Sullivan Fire Protection District	Miscellaneous	2
1/22/2009	Washington	Richwoods Fire Protection District	Debris	1
1/22/2009	Washington	Richwoods Fire Protection District	Debris	1
1/22/2009	Washington	Sullivan Fire Protection District	Miscellaneous	2
1/22/2009	Washington	Potosi Fire Protection District	Unknown	100
1/22/2009	Washington	Bourbon Fire Protection District	Unknown	100
1/24/2009	Washington	Potosi Fire Protection District	Unknown	2
1/25/2009	Washington	Potosi Fire Protection District	Unknown	1
2/15/2009	Washington	Potosi Fire Protection District	Unknown	1
2/15/2009	Washington	Potosi Fire Protection District	Unknown	1
2/15/2009	Washington	Belgrade Volunteer Fire Department	Debris	5
2/16/2009	Washington	Belgrade Volunteer Fire Department	Unknown	1
2/22/2009	Washington	Potosi Fire Protection District	Miscellaneous	3
2/22/2009	Washington	Potosi Fire Protection District	Unknown	1
2/24/2009	Washington	Potosi Fire Protection District	Unknown	80
2/25/2009	Washington	Richwoods Fire Protection District	Debris	1
2/25/2009	Washington	Potosi Fire Protection District	Miscellaneous	1
2/25/2009	Washington	Potosi Fire Protection District	Unknown	2
2/25/2009	Washington	Belgrade Volunteer Fire Department	Debris	37
2/25/2009	Washington	Leadwood Fire Protection District	Unknown	2
2/25/2009	Washington	Potosi Fire Protection District	Unknown	2
2/25/2009	Washington	Potosi Fire Protection District	Miscellaneous	22
2/25/2009	Washington	Leadwood Fire Protection District	Unknown	5
2/25/2009	Washington	Steelville Fire Protection District	Debris	30
2/25/2009	Washington	MDC REPORTING REGION - ST. LOUIS	Debris	1
2/25/2009	Washington	Potosi Fire Protection District	Unknown	1
2/25/2009	Washington	Potosi Fire Protection District	Unknown	2
2/25/2009	Washington	Leadwood Fire Protection District	Unknown	1

2/25/2009	Washington	Leadwood Fire Protection District	Unknown	1
2/25/2009	Washington	Potosi Fire Protection District	Unknown	150
3/1/2009	Washington	Leadwood Fire Protection District	Unknown	1
3/2/2009	Washington	Potosi Fire Protection District	Unknown	1
3/2/2009	Washington	Potosi Fire Protection District	Unknown	1
3/2/2009	Washington	Potosi Fire Protection District	Unknown	1
3/2/2009	Washington	Potosi Fire Protection District	Unknown	1
3/4/2009	Washington	Belgrade Volunteer Fire Department	Debris	2
3/4/2009	Washington	Caledonia Fire Protection Dist.	Debris	3
3/5/2009	Washington	Sullivan Fire Protection District	Unknown	18
3/5/2009	Washington	MDC REPORTING REGION - ST. LOUIS	Debris	8
3/6/2009	Washington	Belgrade Volunteer Fire Department	Debris	10
3/7/2009	Washington	Potosi Fire Protection District	Unknown	1
3/7/2009	Washington	Potosi Fire Protection District	Unknown	1
3/7/2009	Washington	Leadwood Fire Protection District	Unknown	1
3/7/2009	Washington	Potosi Fire Protection District	Unknown	40
3/7/2009	Washington	Leadwood Fire Protection District	Unknown	10
3/7/2009	Washington	Potosi Fire Protection District	Unknown	3
3/7/2009	Washington	Leadwood Fire Protection District	Unknown	1
3/7/2009	Washington	Potosi Fire Protection District	Smoking	5
3/8/2009	Washington	Potosi Fire Protection District	Unknown	5
3/8/2009	Washington	Richwoods Fire Protection District	Unknown	1
3/8/2009	Washington	Belgrade Volunteer Fire Department	Smoking	10
3/8/2009	Washington	Richwoods Fire Protection District	Unknown	10
3/8/2009	Washington	Potosi Fire Protection District	Unknown	1
3/10/2009	Washington	Caledonia Fire Protection Dist.	Debris	1
3/10/2009	Washington	Belgrade Volunteer Fire Department	Debris	25
3/10/2009	Washington	Belgrade Volunteer Fire Department	Unknown	1
3/10/2009	Washington	Caledonia Fire Protection Dist.	Debris	30
3/13/2009	Washington	Potosi Fire Protection District	Unknown	1

3/13/2009	Washington	Belgrade Volunteer Fire Department	Debris	2
3/14/2009	Washington	Belgrade Volunteer Fire Department	Unknown	50
3/14/2009	Washington	Potosi Fire Protection District	Unknown	1
3/14/2009	Washington	Potosi Fire Protection District	Unknown	2
3/14/2009	Washington	Leadwood Fire Protection District	Unknown	1
3/14/2009	Washington	Richwoods Fire Protection District	Children	1
3/14/2009	Washington	Richwoods Fire Protection District	Debris	1
3/14/2009	Washington	Belgrade Volunteer Fire Department	Unknown	2
3/15/2009	Washington	Potosi Fire Protection District	Unknown	1
3/15/2009	Washington	Potosi Fire Protection District	Unknown	1
3/15/2009	Washington	Potosi Fire Protection District	Unknown	1
3/16/2009	Washington	Potosi Fire Protection District	Unknown	1
3/16/2009	Washington	Potosi Fire Protection District	Unknown	1
3/16/2009	Washington	Potosi Fire Protection District	Unknown	1
3/17/2009	Washington	Belgrade Volunteer Fire Department	Unknown	1
3/18/2009	Washington	Richwoods Fire Protection District	Debris	1
3/19/2009	Washington	Potosi Fire Protection District	Unknown	45
3/20/2009	Washington	Richwoods Fire Protection District	Smoking	1
3/21/2009	Washington	Belgrade Volunteer Fire Department	Debris	2
3/22/2009	Washington	Richwoods Fire Protection District	Debris	1
3/23/2009	Washington	Eureka Fire Protection District	Unknown	30
3/23/2009	Washington	Richwoods Fire Protection District	Debris	10
3/23/2009	Washington	Richwoods Fire Protection District	Debris	1
3/23/2009	Washington	SULLIVAN FORESTRY	Debris	76
3/23/2009	Washington	Potosi Fire Protection District	Unknown	1
3/23/2009	Washington	Leadwood Fire Protection District	Arson	1
3/23/2009	Washington	Potosi Fire Protection District	Unknown	1
3/23/2009	Washington	Sullivan Fire Protection District	Debris	30
3/26/2009	Washington	Leadwood Fire Protection District	Unknown	1
3/26/2009	Washington	Belgrade Volunteer Fire Department	Debris	1

3/30/2009	Washington	Potosi Fire Protection District	Unknown	12
3/31/2009	Washington	Richwoods Fire Protection District	Debris	1
4/4/2009	Washington	Potosi Fire Protection District	Miscellaneous	10
4/5/2009	Washington	SULLIVAN FORESTRY	Campfire	3
4/8/2009	Washington	SULLIVAN FORESTRY	Debris	26
4/8/2009	Washington	Potosi Fire Protection District	Miscellaneous	1
4/8/2009	Washington	Sullivan Fire Protection District	Debris	2
4/8/2009	Washington	Belgrade Volunteer Fire Department	Debris	15
4/9/2009	Washington	Leadwood Fire Protection District	Unknown	7
4/22/2009	Washington	Richwoods Fire Protection District	Debris	1
4/23/2009	Washington	Sullivan Fire Protection District	Debris	1
4/23/2009	Washington	Big River Fire Protection, Inc.	Unknown	10
4/25/2009	Washington	Leadwood Fire Protection District	Unknown	2
4/26/2009	Washington	Leadwood Fire Protection District	Unknown	20
4/26/2009	Washington	Leadwood Fire Protection District	Unknown	2
4/26/2009	Washington	SULLIVAN FORESTRY	Campfire	10
4/26/2009	Washington	Potosi Fire Protection District	Unknown	1
8/14/2009	Washington	Richwoods Fire Protection District	Debris	1
8/25/2009	Washington	Potosi Fire Protection District	Debris	1
8/25/2009	Washington	Belgrade Volunteer Fire Department	Unknown	1
9/17/2009	Washington	Potosi Fire Protection District	Unknown	7
10/10/2009	Washington	Belgrade Volunteer Fire Department	Unknown	1
11/4/2009	Washington	Richwoods Fire Protection District	Debris	1
11/4/2009	Washington	Potosi Fire Protection District	Unknown	1
11/4/2009	Washington	Sullivan Fire Protection District	Not Reported	5
11/4/2009	Washington	Potosi Fire Protection District	Unknown	5
11/5/2009	Washington	Potosi Fire Protection District	Unknown	1
11/5/2009	Washington	Belgrade Volunteer Fire Department	Unknown	1
11/5/2009	Washington	Belgrade Volunteer Fire Department	Unknown	8
11/7/2009	Washington	Potosi Fire Protection District	Unknown	1

11/7/2009	Washington	Potosi Fire Protection District	Unknown	1
11/7/2009	Washington	Sullivan Fire Protection District	Debris	5
11/8/2009	Washington	Richwoods Fire Protection District	Debris	1
11/8/2009	Washington	Potosi Fire Protection District	Unknown	1
11/8/2009	Washington	Potosi Fire Protection District	Unknown	2
11/8/2009	Washington	Richwoods Fire Protection District	Debris	1
11/8/2009	Washington	Potosi Fire Protection District	Unknown	2
11/10/2009	Washington	Potosi Fire Protection District	Unknown	1
11/11/2009	Washington	Potosi Fire Protection District	Unknown	1
11/12/2009	Washington	Potosi Fire Protection District	Unknown	1
11/13/2009	Washington	Potosi Fire Protection District	Unknown	1
11/30/2009	Washington	Potosi Fire Protection District	Unknown	1
12/7/2009	Washington	Richwoods Fire Protection District	Debris	1
12/18/2009	Washington	Belgrade Volunteer Fire Department	Unknown	1
2/26/2010	Washington	Potosi Fire Protection District	Unknown	2
2/27/2010	Washington	Sullivan Fire Protection District	Debris	0.3
2/27/2010	Washington	BISMARCK RFD	Unknown	20
2/27/2010	Washington	Desloge Vounteer Fire Department	Unknown	100
2/27/2010	Washington	Leadwood Fire Protection District	Unknown	50
2/27/2010	Washington	Potosi Fire Protection District	Unknown	68
3/5/2010	Washington	Potosi Fire Protection District	Unknown	4
3/6/2010	Washington	Potosi Fire Protection District	Unknown	1
3/6/2010	Washington	Caledonia Fire Protection Dist.	Unknown	90
3/6/2010	Washington	Potosi Fire Protection District	Unknown	90
3/6/2010	Washington	Caledonia Fire Protection Dist.	Unknown	5
3/6/2010	Washington	Potosi Fire Protection District	Unknown	1
3/6/2010	Washington	Potosi Fire Protection District	Unknown	1
3/6/2010	Washington	Belgrade Volunteer Fire Department	Unknown	25
3/6/2010	Washington	Belgrade Volunteer Fire Department	Unknown	3
3/7/2010	Washington	Potosi Fire Protection District	Unknown	1

3/7/2010	Washington	Potosi Fire Protection District	Unknown	1
3/7/2010	Washington	Potosi Fire Protection District	Unknown	1
3/7/2010	Washington	Potosi Fire Protection District	Unknown	1
3/7/2010	Washington	Potosi Fire Protection District	Unknown	1
3/8/2010	Washington	Potosi Fire Protection District	Unknown	2
3/8/2010	Washington	Sullivan Fire Protection District	Debris	15
3/8/2010	Washington	Potosi Fire Protection District	Unknown	1
3/19/2010	Washington	Richwoods Fire Protection District	Debris	3
3/19/2010	Washington	Caledonia Fire Protection Dist.	Debris	3
3/19/2010	Washington	Desoto Rural Fire Protection District	Unknown	5
3/19/2010	Washington	Belgrade Volunteer Fire Department	Unknown	1
3/19/2010	Washington	Richwoods Fire Protection District	Debris	3
3/22/2010	Washington	Potosi Fire Protection District	Debris	2
3/23/2010	Washington	Potosi Fire Protection District	Unknown	2
3/23/2010	Washington	Richwoods Fire Protection District	Debris	5
3/23/2010	Washington	Richwoods Fire Protection District	Debris	2
3/23/2010	Washington	Potosi Fire Protection District	Unknown	20
3/24/2010	Washington	Potosi Fire Protection District	Unknown	20
3/24/2010	Washington	Potosi Fire Protection District	Unknown	5
3/30/2010	Washington	Potosi Fire Protection District	Unknown	1
3/30/2010	Washington	Belgrade Volunteer Fire Department	Unknown	2
3/30/2010	Washington	Caledonia Fire Protection Dist.	Debris	1
3/31/2010	Washington	Potosi Fire Protection District	Unknown	3
3/31/2010	Washington	Sullivan Fire Protection District	Unknown	1
3/31/2010	Washington	Potosi Fire Protection District	Unknown	1
3/31/2010	Washington	SULLIVAN FORESTRY	Debris	107
3/31/2010	Washington	Potosi Fire Protection District	Unknown	107
3/31/2010	Washington	BISMARCK RFD	Unknown	5
3/31/2010	Washington	Potosi Fire Protection District	Debris	10
3/31/2010	Washington	Caledonia Fire Protection Dist.	Debris	1

3/31/2010	Washington	Caledonia Fire Protection Dist.	Unknown	100
3/31/2010	Washington	Potosi Fire Protection District	Unknown	2
4/1/2010	Washington	Potosi Fire Protection District	Unknown	1
4/1/2010	Washington	Belgrade Volunteer Fire Department	Unknown	175
4/1/2010	Washington	SULLIVAN FORESTRY	Unknown	0.5
4/3/2010	Washington	Potosi Fire Protection District	Unknown	1
4/4/2010	Washington	Potosi Fire Protection District	Unknown	1
4/4/2010	Washington	Potosi Fire Protection District	Unknown	2
4/5/2010	Washington	Potosi Fire Protection District	Unknown	50
4/5/2010	Washington	Sullivan Fire Protection District	Debris	5
4/6/2010	Washington	Potosi Fire Protection District	Unknown	3
4/7/2010	Washington	Potosi Fire Protection District	Unknown	1
4/9/2010	Washington	Potosi Fire Protection District	Unknown	1
4/10/2010	Washington	Potosi Fire Protection District	Unknown	20
4/10/2010	Washington	Leadwood Fire Protection District	Unknown	20
4/10/2010	Washington	Leadwood Fire Protection District	Unknown	10
4/10/2010	Washington	Desoto Rural Fire Protection District	Unknown	10
4/10/2010	Washington	Potosi Fire Protection District	Unknown	45
4/10/2010	Washington	Potosi Fire Protection District	Unknown	1
4/10/2010	Washington	Desoto Rural Fire Protection District	Unknown	5
4/10/2010	Washington	Desoto Rural Fire Protection District	Unknown	25
4/10/2010	Washington	Richwoods Fire Protection District	Debris	10
4/10/2010	Washington	Potosi Fire Protection District	Unknown	5
4/10/2010	Washington	Caledonia Fire Protection Dist.	Equipment	1
4/10/2010	Washington	Potosi Fire Protection District	Unknown	2
4/10/2010	Washington	Potosi Fire Protection District	Unknown	4
4/10/2010	Washington	Potosi Fire Protection District	Unknown	3
4/10/2010	Washington	Potosi Fire Protection District	Unknown	10
4/11/2010	Washington	Steelville Fire Protection District	Unknown	150
4/11/2010	Washington	Potosi Fire Protection District	Unknown	30

4/11/2010	Washington	Sullivan Fire Protection District	Campfire	0.05
4/11/2010	Washington	Leadwood Fire Protection District	Unknown	10
4/12/2010	Washington	Potosi Fire Protection District	Unknown	1
4/12/2010	Washington	Potosi Fire Protection District	Unknown	3
4/13/2010	Washington	Potosi Fire Protection District	Unknown	2
4/13/2010	Washington	Potosi Fire Protection District	Miscellaneous	1
4/13/2010	Washington	Leadwood Fire Protection District	Unknown	50
4/13/2010	Washington	Belgrade Volunteer Fire Department	Unknown	3
4/13/2010	Washington	Potosi Fire Protection District	Unknown	1
4/13/2010	Washington	Caledonia Fire Protection Dist.	Unknown	50
4/13/2010	Washington	BISMARCK RFD	Unknown	5
4/15/2010	Washington	Potosi Fire Protection District	Unknown	27
4/15/2010	Washington	Desloge Vounteer Fire Department	Arson	50
4/15/2010	Washington	Richwoods Fire Protection District	Debris	0.5
4/17/2010	Washington	Potosi Fire Protection District	Unknown	1
4/18/2010	Washington	Sullivan Fire Protection District	Unknown	0.5
4/20/2010	Washington	BISMARCK RFD	Unknown	1
4/20/2010	Washington	Richwoods Fire Protection District	Unknown	1
5/8/2010	Washington	Caledonia Fire Protection Dist.	Debris	1
5/8/2010	Washington	Belgrade Volunteer Fire Department	Unknown	1
5/9/2010	Washington	Caledonia Fire Protection Dist.	Arson	1
5/9/2010	Washington	Belgrade Volunteer Fire Department	Unknown	1
7/3/2010	Washington	Caledonia Fire Protection Dist.	Unknown	1
7/3/2010	Washington	Belgrade Volunteer Fire Department	Unknown	1
8/9/2010	Washington	Belgrade Volunteer Fire Department	Unknown	1
8/9/2010	Washington	Quad County Fire Protection District	Unknown	4
8/28/2010	Washington	Caledonia Fire Protection Dist.	Unknown	1
8/28/2010	Washington	Belgrade Volunteer Fire Department	Campfire	2
8/29/2010	Washington	Belgrade Volunteer Fire Department	Unknown	8
8/29/2010	Washington	Caledonia Fire Protection Dist.	Unknown	3

8/31/2010	Washington	Richwoods Fire Protection District	Unknown	0.1
10/5/2010	Washington	Potosi Fire Protection District	Debris	1
10/15/2010	Washington	Potosi Fire Protection District	Unknown	1
10/20/2010	Washington	Sullivan Fire Protection District	Debris	15
10/20/2010	Washington	Leadwood Fire Protection District	Unknown	2
10/20/2010	Washington	Potosi Fire Protection District	Miscellaneous	3
10/20/2010	Washington	Big River Fire Protection, Inc.	Not Reported	3
10/22/2010	Washington	Richwoods Fire Protection District	Unknown	50
10/22/2010	Washington	Desoto Rural Fire Protection District	Unknown	25
10/22/2010	Washington	Richwoods Fire Protection District	Unknown	0.1
10/23/2010	Washington	Sullivan Fire Protection District	Debris	7
10/23/2010	Washington	Potosi Fire Protection District	Unknown	5
10/23/2010	Washington	Potosi Fire Protection District	Unknown	1
10/23/2010	Washington	Desoto Rural Fire Protection District	Unknown	5
10/23/2010	Washington	Desoto Rural Fire Protection District	Unknown	5
10/23/2010	Washington	Richwoods Fire Protection District	Unknown	10
10/23/2010	Washington	Sullivan Fire Protection District	Unknown	0.01
10/23/2010	Washington	Richwoods Fire Protection District	Debris	0.1
10/23/2010	Washington	Potosi Fire Protection District	Unknown	4
10/23/2010	Washington	Richwoods Fire Protection District	Debris	100
10/24/2010	Washington	Desoto Rural Fire Protection District	Miscellaneous	10
10/24/2010	Washington	Richwoods Fire Protection District	Debris	450
10/24/2010	Washington	FARMINGTON FORESTRY	Arson	100
10/24/2010	Washington	Big River Fire Protection, Inc.	Unknown	100
10/24/2010	Washington	Richwoods Fire Protection District	Unknown	0.1
10/24/2010	Washington	Potosi Fire Protection District	Unknown	5
10/24/2010	Washington	Leadwood Fire Protection District	Unknown	1
10/24/2010	Washington	Desoto Rural Fire Protection District	Unknown	25
10/24/2010	Washington	Leadwood Fire Protection District	Unknown	25
10/25/2010	Washington	Richwoods Fire Protection District	Miscellaneous	0.1

10/25/2010	Washington	Potosi Fire Protection District	Unknown	7
10/25/2010	Washington	Richwoods Fire Protection District	Debris	0.1
10/26/2010	Washington	Potosi Fire Protection District	Unknown	1
10/27/2010	Washington	Potosi Fire Protection District	Unknown	1
10/28/2010	Washington	Potosi Fire Protection District	Miscellaneous	1
10/29/2010	Washington	Potosi Fire Protection District	Unknown	15
10/29/2010	Washington	Potosi Fire Protection District	Unknown	2
10/29/2010	Washington	Leadwood Fire Protection District	Unknown	3
10/30/2010	Washington	Potosi Fire Protection District	Unknown	1
10/30/2010	Washington	Richwoods Fire Protection District	Debris	2
10/30/2010	Washington	Sullivan Fire Protection District	Not Reported	0.05
10/30/2010	Washington	Potosi Fire Protection District	Unknown	1
10/31/2010	Washington	Leadwood Fire Protection District	Unknown	0.1
10/31/2010	Washington	Sullivan Fire Protection District	Debris	1
10/31/2010	Washington	BISMARCK RFD	Unknown	100
11/1/2010	Washington	Potosi Fire Protection District	Unknown	2
11/1/2010	Washington	Potosi Fire Protection District	Unknown	1
11/1/2010	Washington	Potosi Fire Protection District	Unknown	1
11/1/2010	Washington	Potosi Fire Protection District	Unknown	1
11/2/2010	Washington	Sullivan Fire Protection District	Unknown	3
11/3/2010	Washington	Potosi Fire Protection District	Unknown	15
11/3/2010	Washington	Potosi Fire Protection District	Unknown	1
11/3/2010	Washington	Desoto Rural Fire Protection District	Unknown	10
11/5/2010	Washington	Richwoods Fire Protection District	Equipment	1.5
11/6/2010	Washington	Richwoods Fire Protection District	Miscellaneous	5
11/6/2010	Washington	Richwoods Fire Protection District	Debris	5
11/6/2010	Washington	Bourbon Fire Protection District	Unknown	6
11/6/2010	Washington	Desoto Rural Fire Protection District	Unknown	5
11/7/2010	Washington	SULLIVAN FORESTRY	Debris	15
11/7/2010	Washington	Potosi Fire Protection District	Unknown	3

11/7/2010	Washington	Richwoods Fire Protection District	Debris	0.1
11/7/2010	Washington	Caledonia Fire Protection Dist.	Unknown	20
11/7/2010	Washington	Leadwood Fire Protection District	Unknown	30
11/7/2010	Washington	Belgrade Volunteer Fire Department	Unknown	6
11/7/2010	Washington	Desloge Vounteer Fire Department	Unknown	25
11/8/2010	Washington	Big River Fire Protection, Inc.	Smoking	5
11/8/2010	Washington	Potosi Fire Protection District	Unknown	1
11/8/2010	Washington	Richwoods Fire Protection District	Unknown	2
11/8/2010	Washington	SULLIVAN FORESTRY	Smoking	3.6
11/8/2010	Washington	Potosi Fire Protection District	Unknown	1
11/8/2010	Washington	Richwoods Fire Protection District	Debris	0.1
11/8/2010	Washington	Potosi Fire Protection District	Unknown	1
11/8/2010	Washington	Richwoods Fire Protection District	Debris	0.1
11/8/2010	Washington	Richwoods Fire Protection District	Debris	0.1
11/8/2010	Washington	Potosi Fire Protection District	Unknown	6
11/8/2010	Washington	Desoto Rural Fire Protection District	Unknown	10
11/9/2010	Washington	BISMARCK RFD	Unknown	75
11/9/2010	Washington	Belgrade Volunteer Fire Department	Debris	20
11/9/2010	Washington	Richwoods Fire Protection District	Unknown	5
11/9/2010	Washington	Potosi Fire Protection District	Unknown	3
11/9/2010	Washington	Leadwood Fire Protection District	Arson	2
11/9/2010	Washington	Richwoods Fire Protection District	Debris	0.5
11/9/2010	Washington	Caledonia Fire Protection Dist.	Unknown	15
11/9/2010	Washington	Desoto Rural Fire Protection District	Unknown	10
11/10/2010	Washington	Leadwood Fire Protection District	Miscellaneous	6
11/10/2010	Washington	Richwoods Fire Protection District	Debris	3
11/10/2010	Washington	SULLIVAN FORESTRY	Arson	1
11/10/2010	Washington	Richwoods Fire Protection District	Unknown	1
11/10/2010	Washington	Potosi Fire Protection District	Unknown	40
11/10/2010	Washington	Desoto Rural Fire Protection District	Unknown	10

11/10/2010	Washington	Leadwood Fire Protection District	Unknown	
11/11/2010	Washington	Richwoods Fire Protection District	Debris	0.1
11/11/2010	Washington	Sullivan Fire Protection District	Unknown	0.5
11/11/2010	Washington	Potosi Fire Protection District	Unknown	3
11/12/2010	Washington	Potosi Fire Protection District	Unknown	10
11/12/2010	Washington	Potosi Fire Protection District	Unknown	25
11/12/2010	Washington	Richwoods Fire Protection District	Debris	20
11/12/2010	Washington	Big River Fire Protection, Inc.	Debris	3
11/14/2010	Washington	Richwoods Fire Protection District	Debris	0.1
11/15/2010	Washington	Potosi Fire Protection District	Unknown	2
11/22/2010	Washington	Potosi Fire Protection District	Unknown	2
12/2/2010	Washington	Potosi Fire Protection District	Miscellaneous	1
12/4/2010	Washington	Richwoods Fire Protection District	Unknown	0.25
12/10/2010	Washington	Belgrade Volunteer Fire Department	Not Reported	1
1/5/2011	Washington	Richwoods Fire Protection District	Debris	0.1
1/6/2011	Washington	Potosi Fire Protection District	Unknown	3.5
1/6/2011	Washington	SULLIVAN FORESTRY	Unknown	3.5
1/7/2011	Washington	Richwoods Fire Protection District	Debris	2
1/29/2011	Washington	Richwoods Fire Protection District	Debris	1
1/30/2011	Washington	Belgrade Volunteer Fire Department	Debris	1
1/30/2011	Washington	Belgrade Volunteer Fire Department	Debris	1
2/1/2011	Washington	Belgrade Volunteer Fire Department	Miscellaneous	3
2/16/2011	Washington	Potosi Fire Protection District	Unknown	1
2/17/2011	Washington	Richwoods Fire Protection District	Smoking	0.5
2/17/2011	Washington	Desoto Rural Fire Protection District	Miscellaneous	2
2/18/2011	Washington	Potosi Fire Protection District	Unknown	2
3/1/2011	Washington	Potosi Fire Protection District	Unknown	1
3/12/2011	Washington	Potosi Fire Protection District	Debris	1
3/12/2011	Washington	Potosi Fire Protection District	Unknown	1
3/12/2011	Washington	Leadwood Fire Protection District	Unknown	0.1

3/13/2011	Washington	Potosi Fire Protection District	Debris	3
3/13/2011	Washington	Leadwood Fire Protection District	Unknown	0.1
3/13/2011	Washington	Potosi Fire Protection District	Unknown	2
3/13/2011	Washington	Potosi Fire Protection District	Unknown	8
3/13/2011	Washington	Desloge Vounteer Fire Department	Unknown	7
3/20/2011	Washington	Potosi Fire Protection District	Unknown	1
3/22/2011	Washington	Leadwood Fire Protection District	Unknown	0.4
3/22/2011	Washington	Potosi Fire Protection District	Unknown	1
3/23/2011	Washington	Potosi Fire Protection District	Unknown	350
3/23/2011	Washington	Leadwood Fire Protection District	Unknown	500
3/23/2011	Washington	Park Hills Fire Department	Debris	350
3/23/2011	Washington	Desoto Rural Fire Protection District	Miscellaneous	30
3/23/2011	Washington	Park Hills Fire Department	Debris	30
3/23/2011	Washington	Desoto Rural Fire Protection District	Miscellaneous	300
3/23/2011	Washington	Potosi Fire Protection District	Miscellaneous	30
3/23/2011	Washington	Desoto Rural Fire Protection District	Miscellaneous	1000
3/23/2011	Washington	Richwoods Fire Protection District	Unknown	50
3/23/2011	Washington	Leadwood Fire Protection District	Arson	400
3/23/2011	Washington	Hillsboro Fire Protection District	Unknown	100
3/23/2011	Washington	Potosi Fire Protection District	Debris	30
3/24/2011	Washington	SULLIVAN FORESTRY	Debris	30
4/3/2011	Washington	Richwoods Fire Protection District	Unknown	0.1
4/4/2011	Washington	Richwoods Fire Protection District	Unknown	30
4/6/2011	Washington	Potosi Fire Protection District	Unknown	60
4/6/2011	Washington	Richwoods Fire Protection District	Unknown	0.1
4/6/2011	Washington	Desoto Rural Fire Protection District	Miscellaneous	100
4/7/2011	Washington	Leadwood Fire Protection District	Unknown	1
4/7/2011	Washington	Richwoods Fire Protection District	Debris	13
4/9/2011	Washington	Richwoods Fire Protection District	Debris	1
5/7/2011	Washington	Richwoods Fire Protection District	Unknown	0.3

7/17/2011	Washington	Sullivan Fire Protection District	Debris	0.01
9/30/2011	Washington	Richwoods Fire Protection District	Debris	6
9/30/2011	Washington	Desoto Rural Fire Protection District	Unknown	1
10/5/2011	Washington	Potosi Fire Protection District	Unknown	1
10/7/2011	Washington	Richwoods Fire Protection District	Unknown	0.2
10/11/2011	Washington	Potosi Fire Protection District	Unknown	1
10/15/2011	Washington	Potosi Fire Protection District	Unknown	10
10/15/2011	Washington	Leadwood Fire Protection District	Unknown	1.5
10/15/2011	Washington	Richwoods Fire Protection District	Unknown	0.1
10/16/2011	Washington	Potosi Fire Protection District	Unknown	20
10/25/2011	Washington	Leadwood Fire Protection District	Unknown	25
10/25/2011	Washington	Desloge Vounteer Fire Department	Unknown	10
10/27/2011	Washington	Richwoods Fire Protection District	Debris	0.5
11/1/2011	Washington	Richwoods Fire Protection District	Debris	85
11/1/2011	Washington	Richwoods Fire Protection District	Unknown	85
11/1/2011	Washington	Desoto Rural Fire Protection District	Unknown	68
11/2/2011	Washington	Richwoods Fire Protection District	Debris	85
11/12/2011	Washington	Sullivan Fire Protection District	Unknown	3
11/13/2011	Washington	Potosi Fire Protection District	Unknown	1
11/13/2011	Washington	Potosi Fire Protection District	Unknown	40
11/19/2011	Washington	Potosi Fire Protection District	Unknown	2
12/30/2011	Washington	Potosi Fire Protection District	Unknown	3
12/31/2011	Washington	Potosi Fire Protection District	Unknown	1
1/2/2012	Washington	Belgrade Volunteer Fire Department	Not Reported	1
1/7/2012	Washington	Richwoods Fire Protection District	Debris	10
1/7/2012	Washington	Leadwood Fire Protection District	Unknown	0.1
1/9/2012	Washington	Desoto Rural Fire Protection District	Equipment	1
1/9/2012	Washington	Richwoods Fire Protection District	Debris	1
1/29/2012	Washington	Sullivan Fire Protection District	Debris	2
1/30/2012	Washington	Potosi Fire Protection District	Debris	1

1/31/2012	Washington	Potosi Fire Protection District	Debris	1
2/1/2012	Washington	Potosi Fire Protection District	Unknown	3
2/2/2012	Washington	Potosi Fire Protection District	Unknown	1
2/20/2012	Washington	Potosi Fire Protection District	Unknown	7
2/26/2012	Washington	Potosi Fire Protection District	Unknown	3
2/26/2012	Washington	Richwoods Fire Protection District	Debris	1
2/27/2012	Washington	Potosi Fire Protection District	Unknown	1
2/27/2012	Washington	Richwoods Fire Protection District	Debris	1
2/27/2012	Washington	Richwoods Fire Protection District	Debris	1
2/29/2012	Washington	Potosi Fire Protection District	Unknown	1
3/1/2012	Washington	Richwoods Fire Protection District	Debris	20
3/1/2012	Washington	Belgrade Volunteer Fire Department	Debris	1
3/1/2012	Washington	Potosi Fire Protection District	Debris	2
3/5/2012	Washington	Potosi Fire Protection District	Debris	1
3/5/2012	Washington	Potosi Fire Protection District	Debris	1
3/6/2012	Washington	Belgrade Volunteer Fire Department	Unknown	2
3/6/2012	Washington	Leadwood Fire Protection District	Unknown	5
3/6/2012	Washington	Potosi Fire Protection District	Unknown	4
3/6/2012	Washington	Potosi Fire Protection District	Debris	2
3/6/2012	Washington	Belgrade Volunteer Fire Department	Equipment	325
3/6/2012	Washington	Quad County Fire Protection District	Unknown	300
3/6/2012	Washington	SULLIVAN FORESTRY	Debris	26
3/6/2012	Washington	Desoto Rural Fire Protection District	Unknown	1000
3/6/2012	Washington	Quad County Fire Protection District	Unknown	35
3/6/2012	Washington	Park Hills Fire Department	Unknown	20
3/6/2012	Washington	Potosi Fire Protection District	Unknown	4
3/6/2012	Washington	Leadwood Fire Protection District	Unknown	2.5
3/6/2012	Washington	Steelville Fire Protection District	Unknown	500
3/6/2012	Washington	Mapaville Fire Prot. Dist.	Unknown	1000
3/6/2012	Washington	Richwoods Fire Protection District	Unknown	100

3/6/2012	Washington	Potosi Fire Protection District	Debris	5
3/6/2012	Washington	Desoto Rural Fire Protection District	Miscellaneous	5
3/6/2012	Washington	Desloge Vounteer Fire Department	Unknown	1000
3/6/2012	Washington	Leadwood Fire Protection District	Unknown	1000
3/6/2012	Washington	Ste. Genevieve Volunteer Fire Department	Unknown	100
3/6/2012	Washington	Richwoods Fire Protection District	Unknown	0.1
3/6/2012	Washington	Potosi Fire Protection District	Unknown	26
3/6/2012	Washington	Potosi Fire Protection District	Debris	5
3/7/2012	Washington	Potosi Fire Protection District	Unknown	20
3/7/2012	Washington	Potosi Fire Protection District	Unknown	1
3/7/2012	Washington	Potosi Fire Protection District	Unknown	1
3/7/2012	Washington	Hillsboro Fire Protection District	Unknown	450
3/10/2012	Washington	Potosi Fire Protection District	Unknown	1
3/10/2012	Washington	Leadwood Fire Protection District	Debris	6
3/10/2012	Washington	Potosi Fire Protection District	Debris	2
3/13/2012	Washington	Richwoods Fire Protection District	Debris	5
3/13/2012	Washington	Potosi Fire Protection District	Unknown	1
3/13/2012	Washington	Belgrade Volunteer Fire Department	Debris	1
3/13/2012	Washington	Potosi Fire Protection District	Unknown	35
3/14/2012	Washington	Potosi Fire Protection District	Unknown	1
3/20/2012	Washington	Potosi Fire Protection District	Unknown	5
3/20/2012	Washington	Belgrade Volunteer Fire Department	Unknown	1
3/24/2012	Washington	Potosi Fire Protection District	Unknown	8
3/27/2012	Washington	Richwoods Fire Protection District	Unknown	0.2
3/27/2012	Washington	Richwoods Fire Protection District	Unknown	0.1
3/29/2012	Washington	Potosi Fire Protection District	Unknown	1
4/2/2012	Washington	Richwoods Fire Protection District	Debris	5
4/11/2012	Washington	Belgrade Volunteer Fire Department	Unknown	3
4/19/2012	Washington	Potosi Fire Protection District	Unknown	1
5/24/2012	Washington	Belgrade Volunteer Fire Department	Equipment	2

5/27/2012	Washington	Richwoods Fire Protection District	Debris	5
6/19/2012	Washington	Potosi Fire Protection District	Miscellaneous	1
6/20/2012	Washington	Potosi Fire Protection District	Unknown	4
6/22/2012	Washington	Belgrade Volunteer Fire Department	Unknown	3
6/22/2012	Washington	Potosi Fire Protection District	Unknown	15
6/25/2012	Washington	Potosi Fire Protection District	Unknown	1
6/27/2012	Washington	Richwoods Fire Protection District	Equipment	1
6/27/2012	Washington	Desoto Rural Fire Protection District	Debris	0.25
6/28/2012	Washington	Potosi Fire Protection District	Debris	1
6/28/2012	Washington	Potosi Fire Protection District	Debris	1
6/29/2012	Washington	Richwoods Fire Protection District	Smoking	0.1
7/4/2012	Washington	Desoto Rural Fire Protection District	Unknown	3
7/4/2012	Washington	Richwoods Fire Protection District	Unknown	5
7/4/2012	Washington	SULLIVAN FORESTRY	Debris	2
7/5/2012	Washington	Belgrade Volunteer Fire Department	Unknown	1
7/10/2012	Washington	Potosi Fire Protection District	Unknown	2
7/10/2012	Washington	Irondale Fire Protection Distrcit	Debris	10
7/10/2012	Washington	Leadwood Fire Protection District	Unknown	5
7/10/2012	Washington	Leadwood Fire Protection District	Unknown	5
7/11/2012	Washington	Leadwood Fire Protection District	Unknown	10
7/11/2012	Washington	Desoto Rural Fire Protection District	Unknown	7
7/11/2012	Washington	Potosi Fire Protection District	Debris	10
7/11/2012	Washington	Irondale Fire Protection Distrcit	Debris	20
7/13/2012	Washington	Irondale Fire Protection Distrcit	Equipment	1
7/13/2012	Washington	Potosi Fire Protection District	Unknown	1
7/13/2012	Washington	Sullivan Fire Protection District	Debris	0.75
7/18/2012	Washington	Potosi Fire Protection District	Unknown	1
7/18/2012	Washington	Potosi Fire Protection District	Unknown	1
7/19/2012	Washington	Irondale Fire Protection Distrcit	Debris	10
7/21/2012	Washington	Sullivan Fire Protection District	Debris	0.5

7/22/2012	Washington	Sullivan Fire Protection District	Unknown	0.01
7/23/2012	Washington	Potosi Fire Protection District	Unknown	10
7/23/2012	Washington	Richwoods Fire Protection District	Debris	10
7/24/2012	Washington	Irondale Fire Protection Distrcit	Unknown	1
7/24/2012	Washington	Irondale Fire Protection Distrcit	Arson	3
7/25/2012	Washington	Belgrade Volunteer Fire Department	Smoking	23
7/25/2012	Washington	Irondale Fire Protection Distrcit	Arson	20
7/27/2012	Washington	Richwoods Fire Protection District	Equipment	10
7/27/2012	Washington	Richwoods Fire Protection District	Equipment	2
7/27/2012	Washington	Richwoods Fire Protection District	Equipment	20
7/27/2012	Washington	Desoto Rural Fire Protection District	Unknown	12
7/27/2012	Washington	Irondale Fire Protection Distrcit	Equipment	15
7/27/2012	Washington	Richwoods Fire Protection District	Equipment	0.5
7/27/2012	Washington	Richwoods Fire Protection District	Debris	0.1
7/27/2012	Washington	Richwoods Fire Protection District	Debris	0.1
8/1/2012	Washington	Sullivan Fire Protection District	Unknown	0.5
8/4/2012	Washington	Belgrade Volunteer Fire Department	Unknown	1
8/6/2012	Washington	Potosi Fire Protection District	Unknown	12
8/8/2012	Washington	Richwoods Fire Protection District	Unknown	5
8/15/2012	Washington	Potosi Fire Protection District	Unknown	1
8/18/2012	Washington	Richwoods Fire Protection District	Smoking	0.25
8/19/2012	Washington	Sullivan Fire Protection District	Equipment	0.05
8/21/2012	Washington	Richwoods Fire Protection District	Debris	0.5
8/22/2012	Washington	Potosi Fire Protection District	Debris	1
8/22/2012	Washington	Potosi Fire Protection District	Unknown	1
8/22/2012	Washington	Irondale Fire Protection Distrcit	Debris	2
8/22/2012	Washington	Potosi Fire Protection District	Unknown	1
8/23/2012	Washington	Potosi Fire Protection District	Unknown	2
8/24/2012	Washington	Potosi Fire Protection District	Unknown	1
8/24/2012	Washington	Potosi Fire Protection District	Debris	1

8/24/2012	Washington	Potosi Fire Protection District	Debris	2
8/30/2012	Washington	Potosi Fire Protection District	Unknown	6
9/1/2012	Washington	Richwoods Fire Protection District	Debris	5
9/7/2012	Washington	Belgrade Volunteer Fire Department	Lightning	2
9/21/2012	Washington	Richwoods Fire Protection District	Debris	0.25
9/25/2012	Washington	Richwoods Fire Protection District	Lightning	0.1
10/2/2012	Washington	Richwoods Fire Protection District	Debris	0.25
11/10/2012	Washington	Potosi Fire Protection District	Unknown	1
11/10/2012	Washington	Potosi Fire Protection District	Unknown	1
11/10/2012	Washington	Richwoods Fire Protection District	Debris	4
11/20/2012	Washington	Richwoods Fire Protection District	Debris	0.1
12/4/2012	Washington	Richwoods Fire Protection District	Arson	0.2
1/19/2013	Washington	Sullivan Fire Protection District	Debris	3
2/6/2013	Washington	Quad County Fire Protection District	Unknown	40
3/14/2013	Washington	Richwoods Fire Protection District	Unknown	0.25
4/1/2013	Washington	Potosi Fire Protection District	Unknown	2
4/1/2013	Washington	Potosi Fire Protection District	Unknown	2
4/4/2013	Washington	Potosi Fire Protection District	Unknown	1.5
4/4/2013	Washington	Potosi Fire Protection District	Debris	8
4/5/2013	Washington	Sullivan Fire Protection District	Debris	3
4/5/2013	Washington	Potosi Fire Protection District	Unknown	1
4/5/2013	Washington	Potosi Fire Protection District	Unknown	1
4/5/2013	Washington	Potosi Fire Protection District	Unknown	2
4/6/2013	Washington	Richwoods Fire Protection District	Debris	100
4/6/2013	Washington	SULLIVAN FORESTRY	Unknown	77.5
4/6/2013	Washington	Potosi Fire Protection District	Unknown	1
4/7/2013	Washington	Sullivan Fire Protection District	Debris	0.5
4/7/2013	Washington	Sullivan Fire Protection District	Debris	3
4/14/2013	Washington	Richwoods Fire Protection District	Debris	5
4/14/2013	Washington	Desoto Rural Fire Protection District	Unknown	1

4/20/2013	Washington	Potosi Fire Protection District	Unknown	5
4/20/2013	Washington	Sullivan Fire Protection District	Equipment	1.1
4/22/2013	Washington	Potosi Fire Protection District	Unknown	3
4/22/2013	Washington	Leadwood Fire Protection District	Debris	2
4/22/2013	Washington	Sullivan Fire Protection District	Debris	6
4/22/2013	Washington	Richwoods Fire Protection District	Debris	3
4/29/2013	Washington	Potosi Fire Protection District	Unknown	1
5/11/2013	Washington	Potosi Fire Protection District	Unknown	1
6/3/2013	Washington	Richwoods Fire Protection District	Unknown	0.1
8/1/2013	Washington	Potosi Fire Protection District	Unknown	1
8/21/2013	Washington	Richwoods Fire Protection District	Debris	0.5
9/4/2013	Washington	Potosi Fire Protection District	Unknown	1
9/14/2013	Washington	Potosi Fire Protection District	Debris	3
9/22/2013	Washington	Potosi Fire Protection District	Unknown	1
10/11/2013	Washington	Richwoods Fire Protection District	Debris	0.5
10/17/2013	Washington	Richwoods Fire Protection District	Debris	0.1
11/9/2013	Washington	Richwoods Fire Protection District	Debris	0.01
11/11/2013	Washington	Richwoods Fire Protection District	Debris	2
11/14/2013	Washington	Sullivan Fire Protection District	Debris	2
11/14/2013	Washington	Potosi Fire Protection District	Unknown	4
11/15/2013	Washington	Sullivan Fire Protection District	Debris	75
11/17/2013	Washington	Desoto Rural Fire Protection District	Unknown	15
11/17/2013	Washington	Terre Du Lac Fire	Unknown	100
11/17/2013	Washington	Lake Timberline Vol. Fire Dept	Debris	6
11/17/2013	Washington	Richwoods Fire Protection District	Unknown	15
11/17/2013	Washington	Leadwood Fire Protection District	Unknown	30
11/17/2013	Washington	Potosi Fire Protection District	Unknown	10
11/18/2013	Washington	Potosi Fire Protection District	Unknown	2.5
11/18/2013	Washington	Potosi Fire Protection District		1
11/18/2013	Washington	Potosi Fire Protection District	Unknown	3

11/27/2013	Washington	Potosi Fire Protection District	Unknown	1
11/27/2013	Washington	Potosi Fire Protection District	Unknown	4
11/28/2013	Washington	Potosi Fire Protection District	Unknown	1
11/28/2013	Washington	Potosi Fire Protection District	Unknown	1
11/29/2013	Washington	Potosi Fire Protection District	Unknown	1
11/29/2013	Washington	Potosi Fire Protection District	Unknown	1
12/2/2013	Washington	Richwoods Fire Protection District	Equipment	0.1
12/28/2013	Washington	Potosi Fire Protection District	Unknown	1
12/28/2013	Washington	Richwoods Fire Protection District	Debris	0.25
12/28/2013	Washington	Potosi Fire Protection District	Debris	1
12/31/2013	Washington	Potosi Fire Protection District	Unknown	2
12/31/2013	Washington	Potosi Fire Protection District	Unknown	2
1/13/2014	Washington	Richwoods Fire Protection District	Debris	1
1/20/2014	Washington	Richwoods Fire Protection District	Debris	0.25
1/20/2014	Washington	Potosi Fire Protection District	Unknown	1
1/22/2014	Washington	Quad County Fire Protection District	Unknown	1
1/24/2014	Washington	Potosi Fire Protection District	Unknown	2
1/25/2014	Washington	Belgrade Volunteer Fire Department	Unknown	1
1/25/2014	Washington	Potosi Fire Protection District	Unknown	3.5
1/25/2014	Washington	Desloge Vounteer Fire Department	Unknown	5
1/25/2014	Washington	Potosi Fire Protection District	Unknown	2
1/25/2014	Washington	Potosi Fire Protection District	Debris	1
1/25/2014	Washington	Belgrade Volunteer Fire Department	Unknown	1
1/26/2014	Washington	Potosi Fire Protection District	Unknown	1
1/26/2014	Washington	Sullivan Fire Protection District	Debris	0.25
1/26/2014	Washington	Potosi Fire Protection District	Unknown	2
1/26/2014	Washington	Richwoods Fire Protection District	Equipment	10
1/26/2014	Washington	Potosi Fire Protection District	Unknown	10
1/26/2014	Washington	Steelville Fire Protection District	Debris	10
1/26/2014	Washington	Steelville Fire Protection District	Debris	10

1/26/2014	Washington	Potosi Fire Protection District	Unknown	1
1/26/2014	Washington	Richwoods Fire Protection District	Equipment	0.1
1/26/2014	Washington	Richwoods Fire Protection District	Debris	1
1/26/2014	Washington	Potosi Fire Protection District	Unknown	10
1/28/2014	Washington	Belgrade Volunteer Fire Department	Unknown	1
1/29/2014	Washington	Potosi Fire Protection District	Unknown	1
1/29/2014	Washington	Potosi Fire Protection District	Unknown	1
1/29/2014	Washington	Terre Du Lac Fire	Unknown	0.5
1/30/2014	Washington	Terre Du Lac Fire	Unknown	10
1/30/2014	Washington	Desoto Rural Fire Protection District	Unknown	5
1/30/2014	Washington	Belgrade Volunteer Fire Department	Unknown	1
1/30/2014	Washington	Potosi Fire Protection District	Unknown	7
1/30/2014	Washington	Belgrade Volunteer Fire Department	Debris	8
1/30/2014	Washington	Desloge Vounteer Fire Department	Unknown	50
2/19/2014	Washington	Potosi Fire Protection District	Unknown	1
2/21/2014	Washington	Potosi Fire Protection District	Unknown	3
2/22/2014	Washington	Potosi Fire Protection District	Unknown	1
2/22/2014	Washington	Potosi Fire Protection District	Unknown	2
2/22/2014	Washington	Potosi Fire Protection District	Unknown	2
2/22/2014	Washington	Potosi Fire Protection District	Unknown	2
2/22/2014	Washington	Belgrade Volunteer Fire Department	Unknown	3
2/22/2014	Washington	Belgrade Volunteer Fire Department	Unknown	4
2/22/2014	Washington	Belgrade Volunteer Fire Department	Debris	3
2/22/2014	Washington	Potosi Fire Protection District	Unknown	1
2/22/2014	Washington	Potosi Fire Protection District	Unknown	1
2/25/2014	Washington	Potosi Fire Protection District	Unknown	1
2/25/2014	Washington	Richwoods Fire Protection District	Arson	0.25
2/28/2014	Washington	Potosi Fire Protection District	Unknown	1
2/28/2014	Washington	Potosi Fire Protection District	Unknown	1
2/28/2014	Washington	Desoto Rural Fire Protection District	Equipment	5

2/28/2014	Washington	Richwoods Fire Protection District	Unknown	3.5
3/10/2014	Washington	Potosi Fire Protection District	Debris	1.5
3/11/2014	Washington	Desoto Rural Fire Protection District	Unknown	5
3/11/2014	Washington	Richwoods Fire Protection District	Smoking	20
3/11/2014	Washington	Potosi Fire Protection District	Unknown	1
3/11/2014	Washington	Potosi Fire Protection District	Unknown	10
3/11/2014	Washington	Richwoods Fire Protection District	Unknown	3
3/11/2014	Washington	Desoto Rural Fire Protection District	Unknown	1
3/12/2014	Washington	Richwoods Fire Protection District	Debris	0.25
3/13/2014	Washington	Sullivan Fire Protection District	Debris	2.3
3/13/2014	Washington	Potosi Fire Protection District	Unknown	1
3/13/2014	Washington	Potosi Fire Protection District	Unknown	1
3/15/2014	Washington	Richwoods Fire Protection District	Debris	2
3/15/2014	Washington	Potosi Fire Protection District	Unknown	3
3/15/2014	Washington	Desoto Rural Fire Protection District	Unknown	90
3/15/2014	Washington	Potosi Fire Protection District	Unknown	150
3/15/2014	Washington	Richwoods Fire Protection District	Unknown	150
3/15/2014	Washington	Terre Du Lac Fire	Unknown	100
3/15/2014	Washington	Park Hills Fire Department	Unknown	50
3/15/2014	Washington	Ste. Genevieve Volunteer Fire Department	Unknown	100
3/15/2014	Washington	Richwoods Fire Protection District	Unknown	
3/15/2014	Washington	Sullivan Fire Protection District	Unknown	0.5
3/15/2014	Washington	Potosi Fire Protection District	Unknown	5
3/15/2014	Washington	Mapaville Fire Prot. Dist.	Unknown	100
3/20/2014	Washington	Sullivan Fire Protection District	Unknown	1.5
3/20/2014	Washington	Potosi Fire Protection District	Unknown	1
3/20/2014	Washington	Potosi Fire Protection District	Unknown	1
3/20/2014	Washington	Potosi Fire Protection District	Unknown	5
3/20/2014	Washington	Richwoods Fire Protection District	Debris	2.5
3/20/2014	Washington	Potosi Fire Protection District	Unknown	1

3/21/2014	Washington	Potosi Fire Protection District	Unknown	4
3/21/2014	Washington	Terre Du Lac Fire	Unknown	1
3/21/2014	Washington	Richwoods Fire Protection District	Unknown	1
3/21/2014	Washington	Desoto Rural Fire Protection District	Debris	3
3/21/2014	Washington	Potosi Fire Protection District	Unknown	2
3/21/2014	Washington	Terre Du Lac Fire	Unknown	5
3/21/2014	Washington	Potosi Fire Protection District	Unknown	2
3/21/2014	Washington	Potosi Fire Protection District	Unknown	2
3/21/2014	Washington	Richwoods Fire Protection District	Unknown	1
3/21/2014	Washington	Potosi Fire Protection District	Unknown	2
3/21/2014	Washington	Terre Du Lac Fire	Unknown	2
3/22/2014	Washington	Potosi Fire Protection District	Unknown	2
3/23/2014	Washington	Terre Du Lac Fire	Debris	0.5
3/23/2014	Washington	Potosi Fire Protection District	Unknown	1
3/30/2014	Washington	Potosi Fire Protection District	Unknown	5
3/30/2014	Washington	Sullivan Fire Protection District	Debris	0.25
3/30/2014	Washington	Quad County Fire Protection District	Unknown	150
3/30/2014	Washington	Potosi Fire Protection District	Unknown	1
3/31/2014	Washington	Sullivan Fire Protection District	Equipment	2
4/6/2014	Washington	Potosi Fire Protection District	Unknown	1.5
4/9/2014	Washington	Richwoods Fire Protection District	Equipment	0.25
4/10/2014	Washington	Potosi Fire Protection District	Unknown	60
4/12/2014	Washington	Potosi Fire Protection District	Unknown	0.5
4/12/2014	Washington	Potosi Fire Protection District	Unknown	0.25
4/16/2014	Washington	Sullivan Fire Protection District	Debris	3
4/17/2014	Washington	Potosi Fire Protection District	Unknown	1
4/18/2014	Washington	Desoto Rural Fire Protection District	Unknown	5
4/18/2014	Washington	Potosi Fire Protection District	Unknown	2
4/19/2014	Washington	Potosi Fire Protection District	Unknown	10
4/19/2014	Washington	Richwoods Fire Protection District	Debris	1

4/19/2014	Washington	Potosi Fire Protection District	Unknown	20
4/19/2014	Washington	Potosi Fire Protection District	Unknown	1
4/20/2014	Washington	Potosi Fire Protection District	Unknown	2
4/23/2014	Washington	Potosi Fire Protection District	Unknown	1
4/24/2014	Washington	Potosi Fire Protection District	Unknown	1
4/24/2014	Washington	Potosi Fire Protection District	Unknown	1
4/30/2014	Washington	Richwoods Fire Protection District	Debris	0.1
5/6/2014	Washington	Sullivan Fire Protection District	Debris	5
5/7/2014	Washington	Potosi Fire Protection District	Unknown	1
5/8/2014	Washington	Potosi Fire Protection District	Unknown	1
7/16/2014	Washington	Sullivan Fire Protection District	Unknown	5
7/19/2014	Washington	Richwoods Fire Protection District	Arson	0.1
8/4/2014	Washington	Potosi Fire Protection District	Unknown	0.25
9/13/2014	Washington	Belgrade Volunteer Fire Department	Unknown	1
9/19/2014	Washington	Belgrade Volunteer Fire Department	Unknown	1
9/20/2014	Washington	Richwoods Fire Protection District	Equipment	0.5
11/4/2014	Washington	Richwoods Fire Protection District	Unknown	3
11/30/2014	Washington	Richwoods Fire Protection District	Debris	1
1/10/2015	Washington	Richwoods Fire Protection District	Unknown	
1/23/2015	Washington	Potosi Fire Protection District	Unknown	1
1/23/2015	Washington	Potosi Fire Protection District	Unknown	1
1/24/2015	Washington	Potosi Fire Protection District	Unknown	10
1/24/2015	Washington	Leadwood Fire Protection District	Unknown	18
1/24/2015	Washington	Potosi Fire Protection District	Unknown	2
1/24/2015	Washington	Richwoods Fire Protection District	Unknown	10
2/7/2015	Washington	Potosi Fire Protection District	Unknown	8
2/8/2015	Washington	Potosi Fire Protection District	Unknown	10
2/8/2015	Washington	Potosi Fire Protection District	Unknown	3
3/7/2015	Washington	Richwoods Fire Protection District	Debris	5
3/11/2015	Washington	Potosi Fire Protection District	Unknown	1.5

3/12/2015	Washington	Potosi Fire Protection District	Unknown	1
3/12/2015	Washington	Potosi Fire Protection District	Unknown	1
3/15/2015	Washington	Richwoods Fire Protection District	Unknown	
3/15/2015	Washington	Potosi Fire Protection District	Unknown	2
3/15/2015	Washington	Potosi Fire Protection District	Unknown	1
3/16/2015	Washington	Potosi Fire Protection District	Unknown	10
3/16/2015	Washington	Richwoods Fire Protection District	Unknown	
3/16/2015	Washington	Desoto Rural Fire Protection District	Unknown	10
3/16/2015	Washington	Leadwood Fire Protection District	Miscellaneous	0.05
3/16/2015	Washington	Sullivan Fire Protection District	Debris	2
3/16/2015	Washington	Steelville Fire Protection District	Debris	2
3/16/2015	Washington	Potosi Fire Protection District	Unknown	6
3/21/2015	Washington	Potosi Fire Protection District	Unknown	3
3/21/2015	Washington	Potosi Fire Protection District	Unknown	0.5
3/22/2015	Washington	Desloge Vounteer Fire Department	Equipment	2
3/23/2015	Washington	Potosi Fire Protection District	Unknown	0.25
3/23/2015	Washington	Potosi Fire Protection District	Unknown	0.5
3/30/2015	Washington	Desoto Rural Fire Protection District	Miscellaneous	1
3/30/2015	Washington	Desloge Vounteer Fire Department	Unknown	10
3/30/2015	Washington	Richwoods Fire Protection District	Debris	0.5
3/30/2015	Washington	Richwoods Fire Protection District	Debris	2
3/31/2015	Washington	Richwoods Fire Protection District	Unknown	1
3/31/2015	Washington	Terre Du Lac Fire	Unknown	3
4/1/2015	Washington	Richwoods Fire Protection District	Equipment	1
4/12/2015	Washington	Potosi Fire Protection District	Unknown	1.5
4/30/2015	Washington	Sullivan Fire Protection District	Debris	1
5/17/2015	Washington	Richwoods Fire Protection District	Unknown	0.25
7/4/2015	Washington	Richwoods Fire Protection District	Debris	
9/5/2015	Washington	Potosi Fire Protection District	Unknown	1
9/6/2015	Washington	Potosi Fire Protection District	Unknown	1

9/24/2015	Washington	Potosi Fire Protection District		1.5
9/24/2015	Washington	Potosi Fire Protection District	Debris	0.5
10/11/2015	Washington	Potosi Fire Protection District	Unknown	0.5
10/11/2015	Washington	Potosi Fire Protection District	Unknown	4
10/19/2015	Washington	Potosi Fire Protection District	Unknown	2
10/19/2015	Washington	Potosi Fire Protection District	Unknown	2
10/19/2015	Washington	Terre Du Lac Fire	Unknown	15
10/20/2015	Washington	Potosi Fire Protection District	Unknown	8
10/20/2015	Washington	Terre Du Lac Fire	Unknown	30
10/20/2015	Washington	Potosi Fire Protection District	Unknown	2
10/20/2015	Washington	Potosi Fire Protection District	Unknown	1
10/20/2015	Washington	Richwoods Fire Protection District	Equipment	2
10/20/2015	Washington	Richwoods Fire Protection District	Debris	0.5
10/21/2015	Washington	Richwoods Fire Protection District	Equipment	2
10/22/2015	Washington	Richwoods Fire Protection District	Debris	1
10/24/2015	Washington	Belgrade Volunteer Fire Department	Unknown	2.5
10/25/2015	Washington	Richwoods Fire Protection District	Debris	2
10/30/2015	Washington	Belgrade Volunteer Fire Department	Debris	3
11/10/2015	Washington	Belgrade Volunteer Fire Department	Unknown	2
11/12/2015	Washington	Belgrade Volunteer Fire Department	Debris	4
11/13/2015	Washington	Potosi Fire Protection District	Unknown	1.5
11/14/2015	Washington	Potosi Fire Protection District	Unknown	1.5
11/15/2015	Washington	Terre Du Lac Fire	Unknown	20
11/15/2015	Washington	Richwoods Fire Protection District	Unknown	
11/15/2015	Washington	Park Hills Fire Department	Unknown	20
11/15/2015	Washington	Richwoods Fire Protection District	Unknown	
11/15/2015	Washington	Richwoods Fire Protection District	Unknown	
11/15/2015	Washington	Belgrade Volunteer Fire Department	Unknown	50
11/15/2015	Washington	Richwoods Fire Protection District	Unknown	6
11/15/2015	Washington	Potosi Fire Protection District	Unknown	10

12/10/2015	Washington	Potosi Fire Protection District	Unknown	0.5
1/6/2016	Washington	Irondale Fire Protection Distrcit	Unknown	1
1/11/2016	Washington	Irondale Fire Protection Distrcit	Unknown	3
1/21/2016	Washington	Richwoods Fire Protection District	Debris	0.01
1/24/2016	Washington	Irondale Fire Protection Distrcit	Not Reported	1
1/27/2016	Washington	Irondale Fire Protection Distrcit	Not Reported	4
1/27/2016	Washington	Irondale Fire Protection Distrcit	Debris	3.5
1/27/2016	Washington	Leadwood Fire Protection District	Unknown	21
1/28/2016	Washington	Potosi Fire Protection District	Unknown	2
1/28/2016	Washington	Potosi Fire Protection District	Unknown	2
1/28/2016	Washington	Potosi Fire Protection District	Unknown	2
1/28/2016	Washington	Irondale Fire Protection Distrcit	Not Reported	1
1/28/2016	Washington	Richwoods Fire Protection District	Unknown	5
1/29/2016	Washington	Richwoods Fire Protection District	Unknown	0.01
1/29/2016	Washington	Potosi Fire Protection District	Unknown	1
1/29/2016	Washington	Irondale Fire Protection Distrcit	Not Reported	5
1/29/2016	Washington	Potosi Fire Protection District	Unknown	1
1/30/2016	Washington	Richwoods Fire Protection District	Debris	3
1/30/2016	Washington	Richwoods Fire Protection District	Debris	2
1/30/2016	Washington	Richwoods Fire Protection District	Unknown	0.01
1/31/2016	Washington	Potosi Fire Protection District	Unknown	1
2/1/2016	Washington	Richwoods Fire Protection District	Debris	6
2/6/2016	Washington	Potosi Fire Protection District	Unknown	11
2/6/2016	Washington	Potosi Fire Protection District	Unknown	1.5
2/6/2016	Washington	Desoto Rural Fire Protection District	Debris	2
2/6/2016	Washington	Richwoods Fire Protection District	Debris	1
2/7/2016	Washington	Irondale Fire Protection Distrcit	Not Reported	3
2/7/2016	Washington	Richwoods Fire Protection District	Unknown	0.01
2/7/2016	Washington	Potosi Fire Protection District	Unknown	2.5
2/18/2016	Washington	Irondale Fire Protection Distrcit	Not Reported	1

2/19/2016	Washington	Irondale Fire Protection Distrcit	Not Reported	1
2/19/2016	Washington	Potosi Fire Protection District		1
2/19/2016	Washington	Leadwood Fire Protection District	Unknown	25
2/19/2016	Washington	Richwoods Fire Protection District	Unknown	0.01
2/19/2016	Washington	Potosi Fire Protection District	Unknown	1
2/20/2016	Washington	Potosi Fire Protection District	Unknown	0.5
2/20/2016	Washington	Potosi Fire Protection District	Unknown	0.5
2/20/2016	Washington	Leadwood Fire Protection District	Unknown	12
2/20/2016	Washington	Irondale Fire Protection Distrcit	Not Reported	1
2/20/2016	Washington	Potosi Fire Protection District	Unknown	60
2/20/2016	Washington	Richwoods Fire Protection District	Unknown	20
2/20/2016	Washington	Desloge Vounteer Fire Department	Unknown	100
2/20/2016	Washington	Park Hills Fire Department	Unknown	50
2/20/2016	Washington	Richwoods Fire Protection District	Unknown	0.01
2/20/2016	Washington	Potosi Fire Protection District	Unknown	30
2/21/2016	Washington	Irondale Fire Protection Distrcit	Not Reported	1
2/21/2016	Washington	Leadwood Fire Protection District	Unknown	3
2/21/2016	Washington	Potosi Fire Protection District	Unknown	1.5
2/22/2016	Washington	Irondale Fire Protection Distrcit	Not Reported	4
2/22/2016	Washington	Leadwood Fire Protection District	Unknown	2
2/22/2016	Washington	Potosi Fire Protection District	Unknown	2
2/23/2016	Washington	Irondale Fire Protection Distrcit	Not Reported	1
2/27/2016	Washington	Irondale Fire Protection Distrcit	Not Reported	1
2/27/2016	Washington	Potosi Fire Protection District	Unknown	1
2/27/2016	Washington	Irondale Fire Protection Distrcit	Not Reported	1
2/27/2016	Washington	Richwoods Fire Protection District	Debris	1
2/28/2016	Washington	Irondale Fire Protection Distrcit	Not Reported	2
2/28/2016	Washington	Irondale Fire Protection Distrcit	Not Reported	1
3/5/2016	Washington	Irondale Fire Protection Distrcit	Not Reported	1
3/5/2016	Washington	Potosi Fire Protection District	Unknown	6

3/5/2016	Washington	Irondale Fire Protection Distrcit	Not Reported	1
3/5/2016	Washington	Richwoods Fire Protection District	Unknown	4
3/6/2016	Washington	Potosi Fire Protection District	Unknown	1
3/6/2016	Washington	Potosi Fire Protection District	Unknown	1
3/6/2016	Washington	Potosi Fire Protection District	Unknown	1
3/8/2016	Washington	Irondale Fire Protection Distrcit	Not Reported	3
3/15/2016	Washington	Richwoods Fire Protection District	Unknown	0.1
3/17/2016	Washington	Richwoods Fire Protection District	Smoking	50
3/17/2016	Washington	Mapaville Fire Prot. Dist.	Unknown	0.1
3/17/2016	Washington	Sullivan Fire Protection District	Debris	0.25
3/17/2016	Washington	Potosi Fire Protection District	Unknown	10
3/17/2016	Washington	Richwoods Fire Protection District	Unknown	1
3/17/2016	Washington	Park Hills Fire Department	Unknown	10
3/17/2016	Washington	Desoto Rural Fire Protection District	Unknown	50
3/18/2016	Washington	Richwoods Fire Protection District	Debris	5
3/18/2016	Washington	Hillsboro Fire Protection District	Unknown	15
3/18/2016	Washington	Leadwood Fire Protection District	Unknown	31
3/19/2016	Washington	Leadwood Fire Protection District	Unknown	6
3/19/2016	Washington	Leadwood Fire Protection District	Unknown	36
3/21/2016	Washington	Richwoods Fire Protection District	Miscellaneous	1
3/22/2016	Washington	Potosi Fire Protection District	Unknown	15
3/23/2016	Washington	Potosi Fire Protection District	Unknown	1
3/24/2016	Washington	BISMARCK RFD	Unknown	1
3/26/2016	Washington	Richwoods Fire Protection District	Debris	1
3/26/2016	Washington	Irondale Fire Protection Distrcit	Unknown	10
3/29/2016	Washington	Richwoods Fire Protection District	Debris	1
3/29/2016	Washington	Richwoods Fire Protection District	Debris	20
4/1/2016	Washington	Richwoods Fire Protection District	Equipment	1
4/2/2016	Washington	Potosi Fire Protection District	Unknown	20
4/3/2016	Washington	Potosi Fire Protection District	Unknown	1

4/3/2016	Washington	Potosi Fire Protection District	Unknown	1
4/3/2016	Washington	Irondale Fire Protection Distrcit	Unknown	1
4/4/2016	Washington	Desoto Rural Fire Protection District	Unknown	36
4/4/2016	Washington	Richwoods Fire Protection District	Debris	20
4/4/2016	Washington	Irondale Fire Protection Distrcit	Unknown	3
4/4/2016	Washington	Desoto Rural Fire Protection District	Unknown	36
4/4/2016	Washington	Potosi Fire Protection District	Unknown	800
4/4/2016	Washington	Potosi Fire Protection District	Unknown	5
4/4/2016	Washington	Potosi Fire Protection District	Unknown	20
4/12/2016	Washington	Irondale Fire Protection Distrcit	Unknown	1
4/12/2016	Washington	Richwoods Fire Protection District	Unknown	1
4/13/2016	Washington	Potosi Fire Protection District	Unknown	2
4/14/2016	Washington	Potosi Fire Protection District	Unknown	4
4/14/2016	Washington	Richwoods Fire Protection District	Unknown	2
4/14/2016	Washington	Potosi Fire Protection District	Unknown	2
4/14/2016	Washington	Irondale Fire Protection Distrcit	Unknown	10
4/14/2016	Washington	Steelville Fire Protection District	Unknown	6
4/17/2016	Washington	Irondale Fire Protection Distrcit	Unknown	1
4/18/2016	Washington	Potosi Fire Protection District	Unknown	2
4/18/2016	Washington	Richwoods Fire Protection District	Debris	5
4/23/2016	Washington	Potosi Fire Protection District	Unknown	1
4/24/2016	Washington	Richwoods Fire Protection District	Unknown	0.1
4/25/2016	Washington	Richwoods Fire Protection District	Debris	2
5/6/2016	Washington	Irondale Fire Protection Distrcit	Unknown	1
5/7/2016	Washington	Potosi Fire Protection District	Unknown	2
5/8/2016	Washington	Richwoods Fire Protection District	Unknown	0.1
6/23/2016	Washington	Richwoods Fire Protection District	Debris	0.1
8/11/2016	Washington	Irondale Fire Protection Distrcit	Unknown	1
11/8/2016	Washington	BISMARCK RFD	Debris	1
11/10/2016	Washington	Potosi Fire Protection District	Unknown	3

11/13/2016	Washington	Potosi Fire Protection District	Unknown	2
11/17/2016	Washington	Potosi Fire Protection District	Unknown	1
11/21/2016	Washington	Potosi Fire Protection District	Unknown	6
11/25/2016	Washington	Richwoods Fire Protection District	Arson	0.1
12/29/2016	Washington	Richwoods Fire Protection District	Debris	0.5
12/29/2016	Washington	Potosi Fire Protection District	Unknown	14
12/31/2016	Washington	Sullivan Fire Protection District	Unknown	5
12/31/2016	Washington	Sullivan Fire Protection District	Unknown	1
1/21/2017	Washington	Potosi Fire Protection District	Unknown	10
1/30/2017	Washington	Potosi Fire Protection District	Debris	5
1/30/2017	Washington	Desoto Rural Fire Protection District	Unknown	4
1/31/2017	Washington	Desoto Rural Fire Protection District	Equipment	0.5
2/1/2017	Washington	Potosi Fire Protection District	Unknown	15
2/4/2017	Washington	Desoto Rural Fire Protection District	Unknown	2
2/5/2017	Washington	Potosi Fire Protection District	Unknown	3
2/10/2017	Washington	Potosi Fire Protection District	Unknown	1
2/11/2017	Washington	Potosi Fire Protection District	Unknown	1
2/13/2017	Washington	Potosi Fire Protection District	Unknown	10
2/13/2017	Washington	Potosi Fire Protection District	Unknown	1
2/16/2017	Washington	Potosi Fire Protection District	Unknown	20
2/16/2017	Washington	Leadwood Fire Protection District	Unknown	15
2/16/2017	Washington	Leadwood Fire Protection District	Unknown	15
2/17/2017	Washington	Potosi Fire Protection District	Unknown	1
2/17/2017	Washington	Potosi Fire Protection District	Unknown	1
2/17/2017	Washington	Hillsboro Fire Protection District	Unknown	10
2/17/2017	Washington	Potosi Fire Protection District	Unknown	2
2/17/2017	Washington	Desoto Rural Fire Protection District	Unknown	10
2/17/2017	Washington	Potosi Fire Protection District	Unknown	15
2/19/2017	Washington	Potosi Fire Protection District	Unknown	2
3/3/2017	Washington	Potosi Fire Protection District	Unknown	1

3/9/2017	Washington	Potosi Fire Protection District	Unknown	2
3/9/2017	Washington	Potosi Fire Protection District	Unknown	15
3/10/2017	Washington	Potosi Fire Protection District	Unknown	1
3/18/2017	Washington	Potosi Fire Protection District	Unknown	1
3/18/2017	Washington	Potosi Fire Protection District	Unknown	3
3/19/2017	Washington	Desoto Rural Fire Protection District	Debris	1
3/23/2017	Washington	Potosi Fire Protection District	Unknown	1
3/23/2017	Washington	Potosi Fire Protection District	Unknown	3
3/24/2017	Washington	Sullivan Fire Protection District	Debris	0.5
3/24/2017	Washington	Potosi Fire Protection District	Unknown	10
4/9/2017	Washington	Potosi Fire Protection District	Unknown	2
4/12/2017	Washington	Potosi Fire Protection District	Unknown	1.5
4/14/2017	Washington	Potosi Fire Protection District	Unknown	3
4/15/2017	Washington	Potosi Fire Protection District	Unknown	1
4/15/2017	Washington	Potosi Fire Protection District	Unknown	1
4/24/2017	Washington	Potosi Fire Protection District	Unknown	12
7/2/2017	Washington	Potosi Fire Protection District	Unknown	1
7/9/2017	Washington	Potosi Fire Protection District	Unknown	1
7/30/2017	Washington	Potosi Fire Protection District	Unknown	2
9/21/2017	Washington	Potosi Fire Protection District	Unknown	1
9/24/2017	Washington	Potosi Fire Protection District	Unknown	1
9/29/2017	Washington	Desoto Rural Fire Protection District	Debris	
10/2/2017	Washington	Potosi Fire Protection District	Unknown	3
10/14/2017	Washington	Sullivan Fire Protection District	Debris	3
11/23/2017	Washington	Desoto Rural Fire Protection District	Miscellaneous	7
11/24/2017	Washington	Potosi Fire Protection District	Unknown	1.5
11/24/2017	Washington	Potosi Fire Protection District	Unknown	1.5
11/28/2017	Washington	Desloge Vounteer Fire Department	Unknown	16
11/28/2017	Washington	Potosi Fire Protection District	Unknown	1
11/28/2017	Washington	Desoto Rural Fire Protection District	Unknown	10

12/5/2017	Washington	Desoto Rural Fire Protection District	Unknown	2
12/11/2017	Washington	Potosi Fire Protection District	Unknown	2
12/11/2017	Washington	Potosi Fire Protection District	Unknown	1
12/15/2017	Washington	Potosi Fire Protection District	Unknown	1
12/16/2017	Washington	Sullivan Fire Protection District	Debris	10
12/16/2017	Washington	Sullivan Fire Protection District	Debris	0.25
12/16/2017	Washington	Sullivan Fire Protection District	Debris	0.25
12/18/2017	Washington	Desoto Rural Fire Protection District	Unknown	0.5
12/20/2017	Washington	Potosi Fire Protection District	Unknown	1
12/20/2017	Washington	Potosi Fire Protection District	Unknown	2