STONE COUNTY

Multi-Jurisdictional Natural Hazard Mitigation Plan

March 1, 2018

U.S. Department of Homeland Security
FEMA Region VII
11224 Holmes Road
Kansas City, MO 64131

FEMA

March 1, 2018

Mr. Ernie Rhodes, Director
State Emergency Management Agency
P. O. Box 116
Jefferson City, Missouri 65102

Subject: Review of the Stone County, Missouri Hazard Mitigation Plan

Dear Mr. Rhodes:

The purpose of this letter is to provide the status of the above referenced Local Hazard Mitigation Plan, pursuant to the requirements of 44 CFR Part 201 - Mitigation Planning and the Local Multi-Hazard Mitigation Planning Guidance. The Local Hazard Mitigation Plan Review Tool documents the Region's review and compliance with all required elements of 44 CFR Part 201.6, as well as identifies the jurisdictions participating in the planning process. FEMA's approval will be for a period of five years effective starting with the approval date indicated below.

Prior to the expiration of the plan the community will be required to review and revise their plan to reflect changes in development, progress in local mitigation efforts, and changes in priorities, and resubmit it for approval in order to continue to be eligible for mitigation project grant funding.

Plan Name	Date Submitted	Date Approved	Date of Plan Adoption	Date of Plan Expiration	Review Status
Stone County	January 30, 2018	March 1, 2018	October 3, 2017	March 1, 2023	Approved

If you have any questions or concerns, please contact Joe Chandler, Planning Team Lead, at (816) 283-7071.

Sincerely,

Michael Scott
Mitigation Division Director

Stone County Hazard Mitigation Planning Committee

Jurisdictional Representatives

Name	Title	Department	Jurisdiction/ Agency/ Organization
Dennis Wood	Presiding Commissioner	County Commission	Stone County
Mark Maples	Northern County Commissioner	County Commission	Stone County
Hank Smythe	Southern County Commissioner	County Commission	Stone County
Thomas Martin	Director- County Emergency Manager	Emergency Management	Stone County
Gary Lewis	Assistant Director	Emergency Management	Stone County
Ryan Martin	Assistant Director	Emergency Management	Stone County
Pam Barnett	Administrator	Health Department	Stone County
Chris Thornton	EPHS	Health Department	Stone County
Scott Williams	Executive Director	Emergency Services	Stone County
Howard Lynn Hilburn	Floodplain Administrator	Floodplain	Stone County
Tim Gideon	Chief Deputy	Sheriff's Office	Stone County
Kristi Stephens	Treasurer	Finance	Stone County
Jerry Harman	City Administrator	Administration	City of Kimberling City
Dean Bickford	City Emergency Manager	Emergency Management	City of Kimberling City
Kenny Smith	City Administrator	Administration	City of Branson West
Steve Dalton	Police Chief	Police Department	City of Branson West
Steve Seaton	Mayor	Board of Aldermen	City of Hurley
Chris Daugherty	City Clerk	Administration	City of Hurley
Beth Murphy	City Clerk	Administration	City of Crane
John Elmore	Police Chief	Police Department	City of Crane
Rose Warriner	City Clerk	Administration	City of Reeds Spring
Jenny Dye	Court Clerk/Acting City Clerk	Administration	City of Reeds Spring
Lisa Chambers	City Clerk	Administration	City of Galena
John Coones	Mayor	Board of Aldermen	City of Galena
Carmen Malloy	Collector	Administration	City of Galena
Jennifer Fliflet	City Clerk	Administration	Village of Coney Island
Allison Murphy Pope	Superintendent	Administration	Hurley R-I Schools
Amy Chamberlain	Assistant Superintendent	Administration	Hurley R-I Schools
Steven Verheyen	Director of Operations	Administration	Reeds Spring R-IV Schools
Keith Wolven	Fire Chief	Administration	Southern Stone County Fire
Tom Cooksey	Firefighter	Personnel	Southern Stone County Fire

Stakeholder Representatives

Name	Title	Department	Agency/Organization
Lloyd Carr	President	Leadership	Kimberling Area Amateur Radio Club
Brad Harrison	EMS Supervisor	EMS	Mercy EMS- Stone County
Sheila Thomas	President/CEO	Administration	Table Rock Lake Chamber of Commerce

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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. Stone County and participating jurisdictions and school/special districts developed this multi-jurisdictional local hazard mitigation plan update to reduce future losses from hazard events to the County and its communities and school/special districts. The plan is an update of a plan that was approved on May 17, 2013. The plan and the update were prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 to result in eligibility for the Federal Emergency Management Agency (FEMA) Hazard Mitigation Assistance Grant Programs.

The Stone County Multi-Hazard Mitigation Plan is a multi-jurisdictional plan that covers the following 11 jurisdictions that participated in the planning process:

- Stone County
- City of Branson West
- City of Crane
- City of Galena
- City of Hurley
- City of Kimberling City
- City of Reeds Spring
- Village of Coney Island
- Hurley R-I School District
- Reeds Spring R-IV
- Southern Stone County Fire District

Local jurisdictions that were invited, but did not participate in the Plan include:

- City of Blue Eye
- Village of Indian Point
- Village of McCord Bend
- Blue Eye R-V School District
- Crane R-III School District
- Galena R-II School District

When the future five-year update is developed for this plan, those that did not participate in this update, will be invited again to participate.

Stone County and the entities listed above developed a Multi-Jurisdictional Hazard Mitigation Plan that was approved by FEMA on May 17, 2013 (hereafter referred to as the *2013 Hazard Mitigation Plan*). This current planning effort serves to update that previously approved plan.

The plan update process followed a methodology prescribed by FEMA, which began with the formation of a Mitigation Planning Committee (MPC) comprised of representatives from Stone County and participating jurisdictions. The MPC updated the risk assessment that identified and profiled hazards that pose a risk to Stone County and analyzed jurisdictional vulnerability to these hazards. The MPC also examined the capabilities in place to mitigate the hazard

damages, with emphasis on changes that have occurred since the previously approved plan was adopted. 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/lightning/high winds, and tornadoes are among the hazards that historically have had a significant impact.

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

1. Protect lives and livelihoods of all citizens.
2. Reduce the potential impact of natural disasters to property, infrastructure and the local economy.
3. Ensure and enhance continued operation of government, emergency functions and critical infrastructure in a disaster.

To advance 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, background information, ideas for implementation, responsible agency, timeline, cost estimate, potential funding sources, and more.

PREREQUISITES

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/special districts. The documentation of each adoption is included in Appendix D, and a model resolution is included on the following page.

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

- Stone County
- City of Branson West
- City of Crane
- City of Galena
- City of Hurley
- City of Kimberling City
- City of Reeds Spring
- Village of Coney Island
- Hurley R-I School District
- Reeds Spring R-IV
- Southern Stone County Fire District

Model Resolution

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

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

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

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

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

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

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

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

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

ADOPTED by a vote of__in favor and___against, and___abstaining, this_day of _____,_____.

By (Sig): _____
Print name: _____

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

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

1 INTRODUCTION AND PLANNING PROCESS

1 INTRODUCTION AND PLANNING PROCESS 1.1
Purpose *1.1*
1.1 Background and Scope *1.1*
1.2 Plan Organization *1.2*
1.3 Planning Process *1.3*
1.4.1 Multi-JurisdictionalParticipation 1.5
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PURPOSE

Hazard Mitigation is the process of preparing for and taking action in order to reduce the long-term risk of natural disasters to financial and human consequences. Mitigation actions may be implemented prior to, during, or after a hazard event; however, it has been demonstrated that hazard mitigation is most effective when based on long-term inclusive, comprehensive plan that is developed before a disaster has occurred (http://www.fema.gov/what-mitigation).

By participating in the planning process and meeting the necessary requirements to do so, communities, school districts, and other special district jurisdictions become eligible to apply for mitigation grant funding. FEMA has implemented the various hazard mitigation provisions through the Code of Federal Regulations (CFR) at 44 CFR Part 201. The CFR provisions set forth the mitigation plan requirements for local and tribal governments as a condition of receiving FEMA hazard mitigation assistance. Local governments, schools, or other publicly funded districts that do not participate or adopt a hazard mitigation plan will not be eligible to apply for grants as stated under 44 CFR §201.6. Section 322 of the Robert T. Stafford Relief and Emergency Assistance Act (P.L. 93-288), as amended by the Disaster Mitigation Act of 2000 (DMA) (P.L. 106-390), provides for States, Tribes and local governments to undertake a risk-based approach to reducing risks to natural hazards through mitigation planning.

1.1 BACKGROUND AND SCOPE

As required by 44 CFR §201.6(d)(3), a local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts and changes in priorities, and resubmit it for approval every five (5) years in order to continue to be eligible for mitigation project grant funding. The 2017 Stone County Multi-Jurisdictional Natural Hazard Mitigation Plan, from here on referred to as the Plan, is a revision of the previous five-year update approved on May 17, 2013.

The Plan is a major rewrite of the 2013 Plan and reflects changes in priorities and development, and the continued commitment of local governments to mitigate the impact of natural hazards in Stone County. Local jurisdictions that participated in the 2013 Plan and are continuing participation in the 2017 Plan include:

- Stone County
- City of Branson West

- City of Crane
- City of Galena
- City of Hurley
- City of Kimberling City
- City of Reeds Spring
- Village of Coney Island
- Hurley R-I School District
- Reeds Spring R-IV

Local jurisdictions that did not participate in the 2013 plan, but did in the 2017 update include:

- Southern Stone County Fire District

Local jurisdictions that were invited, but did not participate in the Plan include:

- City of Blue Eye
- Village of Indian Point
- Village of McCord Bend
- Blue Eye R-V School District
- Crane R-III School District
- Galena R-II School District

All jurisdictions received letter and email communications notifying representatives of upcoming meetings and participation requirements. Additionally, the County EMD called many community contacts to encourage participation. Jurisdictions listed above were not represented during the planning process and did not meet the minimum participant requirements.

This mitigation plan is the representation of participating jurisdictions' commitment to reduce risks from natural hazards, serving as a guide for decision makers as they commit resources to reducing the effects of natural hazards. Information in the plan will be used to help guide and coordinate mitigation activities and decisions for local land use policy in the future.

1.2 PLAN ORGANIZATION

The Plan is organized into five chapters. The 2013 Plan included a chapter dedicated to local jurisdiction capabilities. This information has been incorporated into the Planning Area Profile and Capabilities Chapter. The format of the Plan was changed to conform to the local hazard mitigation plan outline template released by the Missouri State Emergency Management Agency (SEMA) in September, 2017. The Plan chapter include:

- 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

Table 1.1 summarizes the changes made in The Plan by chapter.

Table 1.1. Changes Made in Plan Update

Plan Chapter	Summary of Changes Made
Introduction	• General Format Changes
Profile & Capabilities	• General Format Changes • Added Geological and Karst features map • Critical features moved to Ch. 3 • Added table showing Unemployment, Poverty, education, and language percentages • Historic Sites and endangered species list moved to Ch. 3. • Added table showing FEMA HMA grants approved and still pending in the county. • Expanded jurisdictional Profiles and Mitigation Capabilities section.
Risk Assessment	• General format updates • Expanded introduction section • Added Assets at Risk of exposure to current population and structures • Added Critical Facilities inventory of all included jurisdictions • Added inventory of parks, historical sites, and endangered species. • Added table for agricultural-related jobs and information and Major employers • Added Land Use Development section for development since previous plan and future land use expected. • Added climate change impact to specific hazards • Expanded Community profiles for each jurisdiction.
Mitigation Strategy	• General format updates • Updated mitigation actions development process • Included actions eliminated and reason for removal • Updated progress made towards mitigation goals from earlier plan • Discussed funding sources, lead agencies and status of continuing, revised and new actions
Plan Maintenance	• General format updates • Updated the responsibilities for plan monitoring, evaluation, and implementation.

1.3 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 Southwest Missouri Council of Governments (SMCOG) was contracted to facilitate the plan development process. SMCOG staff met with the Stone County EMD during an initial scoping meeting to develop contact information for the area stakeholders and local jurisdiction representatives to establish the Mitigation Planning Committee (MPC). Meeting locations and schedules were discussed, and the most effective way to inform and include the public was determined. Also discussed was previous plan maintenance and any updates made since 2013. It was determined that the document had not been officially updated, but previously identified actions had been discussed at select LEPC meetings.

The planning process included the kick-off meeting and four subsequent MPC meetings. SMCOG staff were responsible for producing the draft and the final plan update in a FEMA-approvable document, and coordinating with the SEMA and FEMA plan reviews.
Specific information about agenda items for the MPC meetings are presented in Section 1.4.2. SMCOG also assisted in soliciting public involvement in the planning process, partially by

providing process information to interested jurisdictions. The MPC meetings on July 25, August 15, September 26, October 24, and November 14 were sent via press release to Branson Tri-Lakes News, Crane Chronicle, and Stone County Gazette, the newspapers of widest distribution in the County. Meeting dates and items to be discussed for all meetings, including the kick-off meeting on July 25, 2017, were posted on the SMCOG website in advance. Drafts of the Plan were also posted on the website for public comment during the drafting of the Plan and prior to the Plan being submitted for approval. Appendix B provides documentation of the planning process including public involvement solicitations and meeting notices.

The preliminary draft of the plan was posted on the SMCOG website for public review and comment on December 15, 2017. A public notice was published in the Crane Chronicle, and Branson Tri-Lakes News seeking public input on the draft plan. A final draft of the Plan was posted on the SMCOG website on January 24, 2018 before the Plan was submitted for SEMA/FEMA approval. On both occasions a press release was sent to the Branson Tri-Lakes News, Crane Chronicle, and Stone County Gazette notifying news outlets that the Plan was available for public comment. Input from city and county officials was solicited through distribution of drafts of plan elements for discussion and review at scheduled meetings and other communications with individual community representatives and elected officials.

Neighboring jurisdictions were notified via email and letters, a notification was sent to adjacent county Emergency Management Directors, Chambers of Commerce, local and regional agencies, such as; OACAC, Health Departments, and the University of Missouri Extension office. A complete listing of neighboring agencies invited to participate in the planning process and what meetings they were invited to attend is included in Appendix B.

Table 1.2 shows the MPC members and entities they represent, along with their titles. This includes representatives from local jurisdictions, stakeholders, and school districts.

Table 1.2. Jurisdictional Representatives - Stone County Mitigation Planning Committee

Name	Title	Department	Jurisdiction/ Agency/ Organization
Dennis Wood	Presiding Commissioner	County Commission	Stone County
Mark Maples	Northern County Commissioner	County Commission	Stone County
Hank Smythe	Southern County Commissioner	County Commission	Stone County
Thomas Martin	Director- County Emergency Manager	Emergency Management	Stone County
Gary Lewis	Assistant Director	Emergency Management	Stone County
Ryan Martin	Assistant Director	Emergency Management	Stone County
Pam Barnett	Administrator	Health Department	Stone County
Chris Thornton	EPHS	Health Department	Stone County
Scott Williams	Executive Director	Emergency Services	Stone County
Howard Lynn Hilburn	Floodplain Administrator	Floodplain	Stone County
Tim Gideon	Chief Deputy	Sheriff's Office	Stone County
Kristi Stephens	Treasurer	Finance	Stone County
Jerry Harman	City Administrator	Administration	City of Kimberling City
Dean Bickford	City Emergency Manager	Emergency Management	City of Kimberling City
Kenny Smith	City Administrator	Administration	City of Branson West
Steve Dalton	Police Chief	Police Department	City of Branson West
Steve Seaton	Mayor	Board of Aldermen	City of Hurley
Chris Daugherty	City Clerk	Administration	City of Hurley
Beth Murphy	City Clerk	Administration	City of Crane
John Elmore	Police Chief	Police Department	City of Crane

Rose Warriner	City Clerk	Administration	City of Reeds Spring
Jenny Dye	Court Clerk/Acting City Clerk	Administration	City of Reeds Spring
Lisa Chambers	City Clerk	Administration	City of Galena
John Coones	Mayor	Board of Aldermen	City of Galena
Carmen Malloy	Collector	Administration	City of Galena
Jennifer Fliflet	City Clerk	Administration	Village of Coney Island
Allison Murphy Pope	Superintendent	Administration	Hurley R-I Schools
Amy Chamberlain	Assistant Superintendent	Administration	Hurley R-I Schools
Steven Verheyen	Director of Operations	Administration	Reeds Spring R-IV Schools
Keith Wolven	Fire Chief	Administration	Southern Stone County Fire
Tom Cooksey	Firefighter	Personnel	Southern Stone County Fire
Stakeholders			
Lloyd Carr	President	Leadership	Kimberling Area Amateur
Brad Harrison	EMS Supervisor	EMS	Mercy EMS- Stone County
Sheila Thomas	President/CEO	Administration	Table Rock Lake Chamber

1.4.1 Multi-Jurisdictional Participation

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

The Plan serves as a written document of the planning process. Active participation of local jurisdiction representatives and stakeholders in the hazard mitigation planning process is essential if the Plan is to have value. To be eligible for mitigation funding, local governments must adopt the FEMA-approved update of the Plan. The participation of the local government stakeholders in the planning process is considered critical to successful implementation of this plan. Each jurisdiction that is seeking approval for the Plan must have its governing body adopt the updated plan, regardless of the degree of modifications. SMCOG collaborated with the local governments in Stone County to assure participation in the planning process and the development of a plan that represents the needs and interests of Stone County and its local jurisdictions. Appendix D contains resolutions for jurisdictions adopting the Plan.

County Commissioners, incorporated communities, public school and special districts, and various other stakeholders in mitigation planning were invited to a kick-off meeting for the Plan update on July 25, 2017. At this meeting it was explained that the Disaster Mitigation Act (DMA) requires each jurisdiction participating in the planning process officially adopt the plan. The criteria for participation that each jurisdiction must meet in order to be considered a "participant" in the Plan was established at this meeting and include the following:

- Participation in at least two (2) MPC meetings, by either direct participation or authorized representation;
- Each participating jurisdiction must provide to the MPC sufficient information to support plan development by completion and return of a Data Collection Questionnaire;
- Provide documentation to show time donated to the planning effort;
- All participants formally adopt the mitigation plan prior to submittal to SEMA and FEMA for final approval.

In order to be included in the plan as a participating jurisdiction, each jurisdiction was required to send a representative to a minimum of two (2) meetings, completion of data collection

questionnaires, complete in-kind time documentation (if applicable), and formally adopt the plan as minimum requirements. Jurisdictions that met the minimum requirements are considered to have satisfactory participated in the planning process. In addition to public outreach solicited through SMCOG, each participating jurisdiction was strongly encouraged to seek public input at an open public meeting or through various forms of input solicitation.

Table 1.3 shows the representation of each participating jurisdiction at the planning meetings and the provision of responses to the Data Collection Questionnaire. All jurisdictions participating in the Plan either reviewed or commented on the draft Plan, participated in the update/development of mitigation actions, documented the donation of time, and passed an adoption resolution. Meeting sign-in sheets are located in Appendix B.

Table 1.3. Jurisdictional Participation in Planning Process

Jurisdiction	Kick-off Meeting	Meeting #2	Meeting #3	Meeting #4	Meeting #5	Data Collection Questionnaire Response	Documented Donated Time	Adoption Resolution
Stone	x	x	x	x	x	x	x	x
Branson	x	x		x		x	x	x
Crane	x	x		x		x	x	x
Coney Island			x	x		x	x	x
Galena			x	x	x	x	x	x
Hurley			x	x	x	x	x	x
Kimberling City	x	x	x	x	x	x	x	x
Reeds Spring	x				x	x	X	x
Hurley R-I	x		x	x		x	x	x
Reeds Spring R-VI		x			x	x	X	x
Southern Stone County Fire Protection District	x	x	x	x		x	x	x

1.4.2 The Planning Steps

FEMA's Local Mitigation Planning Handbook (March 1, 2013), Local Mitigation Plan Review Guide (October 1, 2011), and Integrating Hazard Mitigation into Local Planning: Case Studies and Tools for Community Officials (March 1, 2013) were used as the sources for developing the Plan update process. The development of the plan followed the 10-step planning process adapted from FEMA's Community Rating System (CRS) and Flood Mitigation Assistance programs. The 10-step process allows the Plan to meet funding eligibility requirements of the Hazard Mitigation Grant Program, Pre-Disaster Mitigation Program, Community Rating System, and Flood Mitigation Assistance Program. Table 1.4 shows how the CRS process

aligns with the Nine Task Process outlined in the 2013 Local Mitigation Planning Handbook.

Following **Table 1.4** is a summary of how SMCOG staff used the Nine Task Process to develop the update to the Plan

Table 1.4. County Mitigation 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)(1)
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)(ii); and 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)

In May 2017, SMCOG entered into cooperative agreements with SEMA and Stone County to prepare this multi-jurisdictional plan for public entities in Stone County. Discussions on the development of the Stone County Multi-Jurisdictional Natural Hazard Mitigation Plan began on June 19, 2017 with an introductory scoping meeting attended by SMCOG staff and the County Emergency Management Director. This meeting was conducted to discuss the timeline for developing the hazard mitigation plan, the planning process, identification of stakeholders and community organizations to include in the planning process and a date for the kick-off meeting for July 25, 2017 to initiate participation of jurisdictions and public entities in the planning process. The Emergency Management Director (EMD) and SMCOG staff identified prospective participant representatives and stakeholders and a contact list was prepared for mailing an invitation letter to the kick-off meeting. The list of invitees included local elected officials, municipal government staff, county government staff, emergency services personnel, public school administrators, members from health and social services organizations, utility providers, Missouri University Extension staff, EMDs from adjacent counties, and volunteer organizations. A complete list of invitees is in Appendix B.

The MPC met on several occasions from July through November 2017 to collaborate on the development of the Plan update. Participants assisted in data collection; reviewed and revised the Plan's goals and mitigation strategies; and provided reviews and comments on the Plan throughout the update process. Communication with MPC members occurred throughout the planning process through phone calls, letters, and email correspondence in addition to

committee meetings. **Table 1.5** shows the meeting schedule and items discussed for MPC meetings.

Table 1.5. Schedule of MPC Meetings

Meeting	Topic	Date
Informational Scoping Meeting	• Discussion of the general process of updating the Hazard Mitigation Plan • Prepared planning committee members and reviewed contact list • Planned future dates for the planning committee • Discussed communication with the public, stakeholders, city officials, and other jurisdictions to make aware of hazard mitigation meetings • Discussed previous plan maintenance and established procedure for future plan maintenance	June 19, 2017
Kick-off Meeting	• Introduction to Hazard Mitigation • Overview of the planning process • Overview of participation requirements • Future meeting dates	July 25, 2017
Planning Meeting #2	• Participation Requirements • The Planning Process- Recap • Risk Assessment- natural hazard previous occurrences, severity, vulnerability, etc. • Mitigation Strategies Preview • Future Meeting Dates	August 15, 2017
Planning Meeting #3	• Participation Requirements • The Planning Process- Recap • Mitigation Strategies: Goals and Actions – reviewed previous actions and recommended revisions • Future Meeting Dates	September 26, 2017
Planning Meeting #4	• Update on progress of plan document • Participation Requirements • The Planning Process- Recap • Mitigation Strategies: Goals and Actions prioritization- STAPLEE scoring and Action work sheet completion • Public participation reminders and draft plan comments	October 24, 2017
Planning Meeting #5	• Update on progress of plan document • Local plan participation • Planning process overview • Discussion regarding action tracking and Action Tracker website • Funding and implementation mechanisms • Plan adoption and maintenance	November 14, 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.

Options for soliciting public input on the Plan were discussed at the MPC kick-Off Meeting held on July 25, 2017. SMCOG staff explained the importance of public involvement during the planning process. It was determined that SMCOG staff would advertise MPC meetings through press releases to the Branson Tri-Lakes News, Crane Chronicle, and Stone County Gazette. In addition, meeting dates and invitations were posted on the SMCOG website along with drafts of the Plan for public comment during the drafting stage and prior to submission of the Plan to SEMA for approval. Press releases were sent to local news publications when the drafts of the Plan were posted to the SMCOG website for public comment during the drafting stage on December 15, 2017. A final draft of the Plan was posted on the SMCOG website on January 24, 2018 prior to being submitted to SEMA for approval. Copies of affidavits of publication for legal notices, Screen captures of the SMCOG website, and copies of press releases are included in Appendix B.

It was also discussed at the kick-off meeting that informal solicitation of public input would be sought by members of the MPC through announcements at gatherings and other public meetings, such as board of alderman and local emergency planning committee meetings. This plan for public involvement did not result in any public comment on the Plan. Several participating jurisdictions discussed the plan at public meetings, but no substantial edits or input was collected. The reasons for lack of public comment may be due, in part, to lack of effectiveness of legal notices and web postings which would be viewed by a limited number of people, as well as the complexity of local hazard mitigation plans.

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.

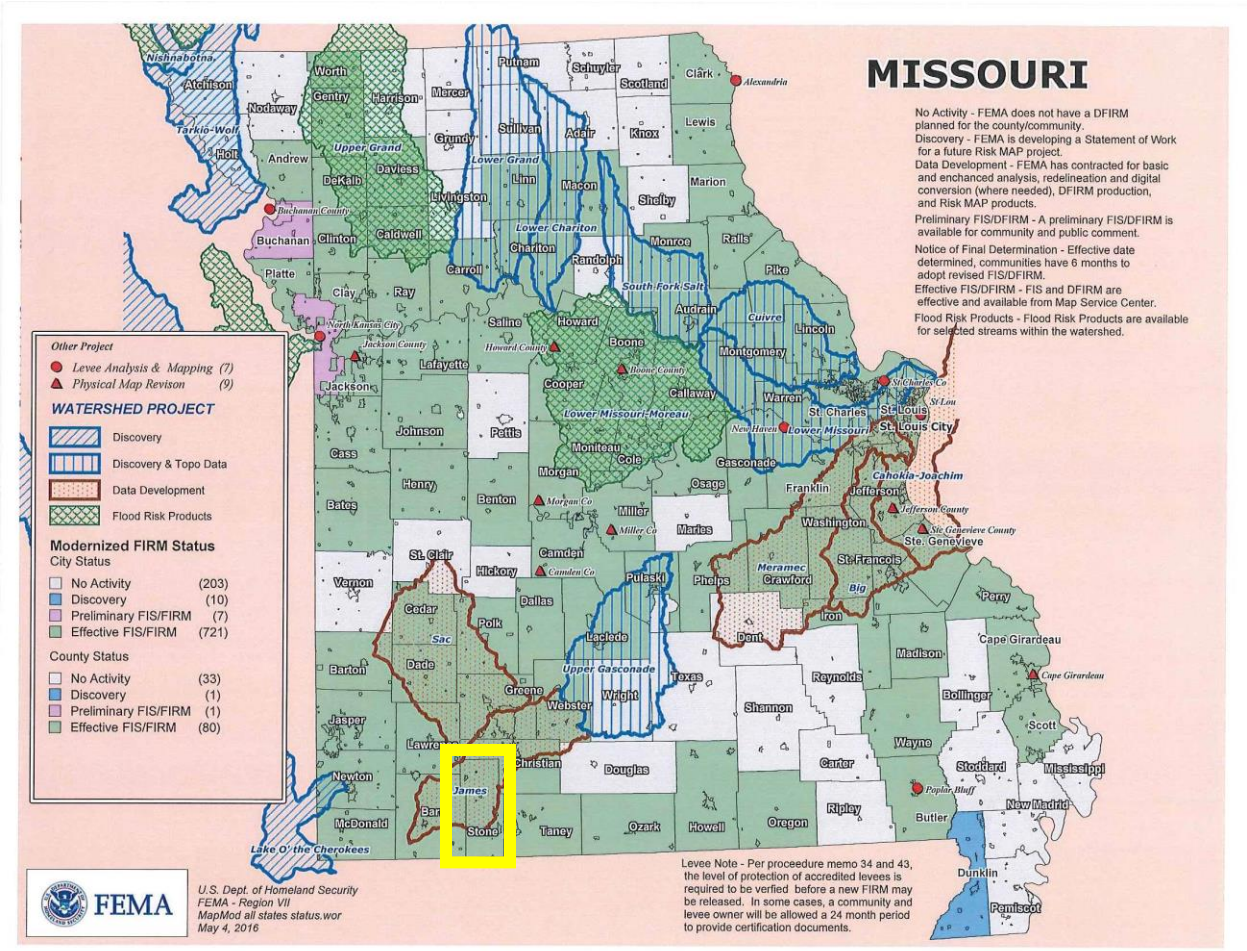
As stated in Section 1.4, neighboring communities, businesses, and other non-profit interests were notified via email and letters, a notification was sent to adjacent county Emergency Management Directors, Chambers of Commerce, local and regional agencies, such as; OACAC, Health Departments, American Red Cross, and the University of Missouri Extension office. A complete listing of agencies invited to participate in the planning process and what meetings they were invited to attend is included in Appendix B.

Coordination with FEMA Risk MAP Project

There was no coordination with FEMA RiskMAP projects during the update of this plan, as the project kicked off in early November 2017 and the plan update process was coming to an end.

Figure 1.1 displays locations of RiskMAP deployed watersheds and current projects in Missouri. Stone County is outlined in yellow.

Figure 1.1. Map of RiskMAP projects



Integration of Other Data, Reports, Studies, and Plans

A significant amount of information presented in the Plan has been updated and revised based on the review and incorporation of existing plans, studies, reports and technical information. Appendix A contains a listing of references to plans, studies, reports and technical information to incorporate into hazard profiles, risk assessment, profile and capability sections. A few examples of information incorporated from the review of existing plans, etc. include:

- Stone County Emergency Operations Plan
- 2013 Missouri State Hazard Mitigation Plan
- State Department of Natural Resources (DNR) dam information, the National Inventory of Dams (NID), dam inspection reports,
- Missouri Department of Conservation (MDC) wildfire statistics
- Wildland/Urban Interface and Intermix areas from the SILVIS Lab - Department of Forest Ecology and Management - University of Wisconsin

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

At the second MPC meeting on August 15, 2017, profiles of identified hazards from the 2013 Plan were presented. Storm event data from the National Centers for Environmental Information (NCEI) for the five year period since the adoption of the 2013 Plan were included in the hazard profiles. The presentation incorporated data from studies, reports, and technical information available through internet research. During the process of identifying hazards the MPC reviewed:

- Previous disaster declarations in the county
- Hazards in the most recent State Hazard Mitigation Plan
- Hazards identified in the previously approved hazard mitigation plan.

The MPC was asked to prioritize the identified hazards based on probability of occurrence, human impact, and property impact. Additional information about the conclusions drawn at this meeting can be found in the Risk Assessment chapter of the Plan

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

Identified assets in the planning area include population, structures, critical facilities and infrastructure, and other important assets that may be at risk to hazards. The inventory of assets for each jurisdiction was derived from parcel data from the Stone County Assessor, the Stone County Structures dataset, and local jurisdiction data collection questionnaires. Potential losses to existing development were estimated based on hazard event scenarios. In most cases the county assessor's appraised improved values were used to estimate structure losses in impacted areas for structure occupancy types. The methodology for estimating losses varies by hazard. Loss estimates are included in each hazard profile of the Risk Assessment chapter.

Step 6: Set Goals (Handbook Task 6)

The MPC conducted a discussion session during their third meeting on September 26, 2017 to review and update the Plan goals. The MPC also reviewed the goals from current surrounding county plans.

In the 2013 Plan, the organization of the actions included broad goals and a set of objectives linking the actions to the goals. The MPC opted to keep the goals from the 2013 Plan and eliminate the objective statements, moving forward with broad goals and specific mitigation actions. Objectives seemed to add a layer of complication and potential confusion. During this update process, the intent was to provide a usable set of actions that each jurisdiction was able to work towards partial or full implementation, and objectives seemed unnecessary.

The Plan update goals and objectives are as follows:

Goal 1 - Protect lives and livelihoods of all citizens.
Goal 2: Reduces risk of flood damage to properties and infrastructure.

Goal 3: Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.

Step 7: Review Possible Mitigation Actions and Activities

The focus of the MPC meeting on September 26, 2017 was an update of the mitigation actions and discuss new actions. For a comprehensive range of mitigation actions to consider, the MPC reviewed the following information during the meeting:

- A list of actions proposed in the previous mitigation plan and discussing each individually regarding progress made and continued relevance
- Input during meetings
- Responses to Data Collection Questionnaires- where jurisdictions had reported progress made on previous actions
- Key issues from the risk assessments, including the Problem Statements concluding each hazard profile and vulnerability analysis,

Jurisdiction representatives on the MPC were encouraged to review the details of the risk assessment vulnerability analysis specific to their jurisdiction, and the previously identified mitigations actions prior to the meeting. Representatives were provided a link to the FEMA 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 meeting, some new actions were proposed by the committee, and several actions were reworded. Much of the discussion surrounded making actions SMART: specific, measurable, achievable, relevant, and time-bound. SMCOG staff provided some recommended altered language for some items, and general discussion by the MPC provided some significant changes to many actions and to which jurisdictions actions were relevant.

Step 8: Draft an Action Plan

Prior to the fourth MPC meeting on October 24, 2017, representatives were provided with pre-populated STAPLEE scoring sheets each action item identified for their jurisdiction. Representatives were encourage to work on the sheets prior to the meeting, but also in groups and with general discussion during the fourth MPC meeting. The method was used to develop a priority score for proposed actions. This meeting also included action worksheets to clarify what department or position would be responsible for implementing the action, potential funding sources, timeline, and local planning mechanisms for implementation. The action plans are listed for each jurisdiction in the Mitigation Strategy

chapter. During the meeting, SMCOG staff provided an overview of scoring criteria and example action worksheets.

Step 9: Adopt the Plan (Handbook Task 8)

The final meeting on November 14, 2017 provided a wrap-up and opportunity to answer any questions pertaining to plan adoption. The final plan must be approved by the governing body of each jurisdiction by resolution to be eligible for hazard mitigation assistance. Adoption resolutions are included in Appendix D.

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

At the final MPC meeting on November 14, 2017, SMCOG staff discussed the FEMA action tracker site for assistance in implementing mitigation actions. The MPC also discussed potential funding sources for mitigation projects, and the process for reviewing and monitoring the plan. Stone County Emergency Management also discussed ensuring an annual review of the plan was conducted by the LEPC and MPC members. The overall strategy has been updated and is presented in the Plan Maintenance chapter.

2 PLANNING AREA PROFILE AND CAPABILITIES

2 PLANNING AREA PROFILE AND CAPABILITIES 2.1

2.1 *Stone County Profile 2.2*

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2.2 *Jurisdictional Profiles and Mitigation Capabilities 2.10*

2.2.1 Unincorporated Stone County 2.10
2.2.2 City of Branson West 2.13
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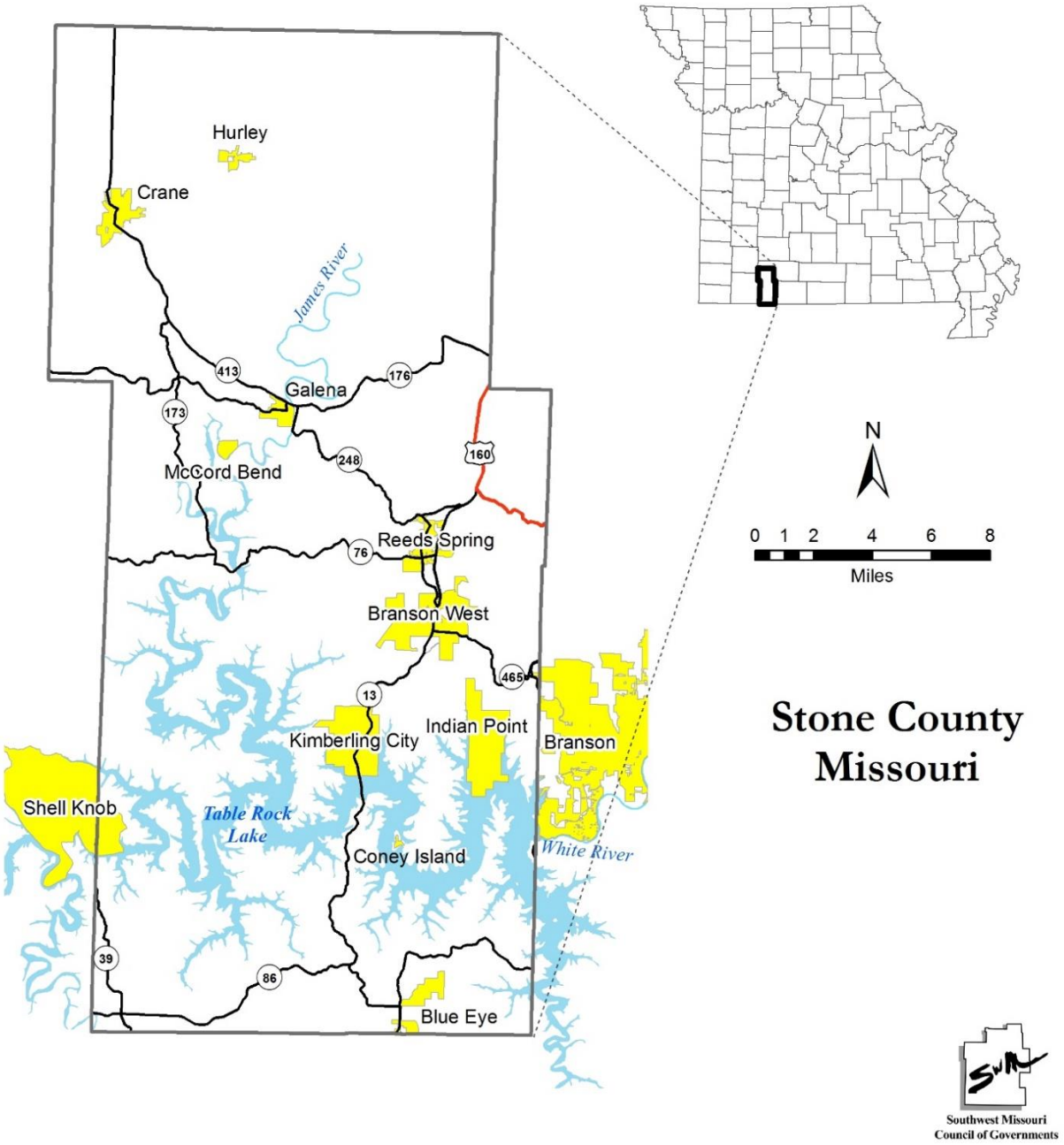
2.1 Stone County Profile

Stone County is bordered by Barry, Lawrence, Christian, and Taney Counties in southwest Missouri and Carroll County in northwest Arkansas.

Figure 2.1 is a map of Stone County that includes the cities, villages, and places. The inset on the map shows Stone County's location in southwest Missouri.

Figure 2.1. Map of Stone County



The American Community Survey, estimates the 2015 population of Stone County as 31,325. This is a decrease of 2.7 percent in comparison to the 2010 census population of 32,202. This decrease contrasts with the growth experienced by the state of Missouri and the United States as a whole over the same time period, which were 0.9 and 2.5 percent respectively.

The median household income (MHI) for Stone County was $40,510 according to 2015 estimates, well below the state and national medians of $48,173 and $53,889. The percent change in MHI experienced by Stone County was a 2 percent decrease since 2010, lower than both the state and national growths of 4.1 and 3.8 percent.

In Stone County, the median home value was $153,100. This is higher than the state of Missouri as a whole ($138,400), and lower than the entire United States ($178,600).

2.1.2 Geography, Geology and Topography

Stone County includes 464 square miles of land and 47 square miles of water located in southwest Missouri. Most residents, about 88.7 percent, live in rural areas. The county has only two municipalities with populations over 1,000: Crane and Kimberling City. Both communities experienced population growth since 2010. Crane experienced a significant increase of 560 people from 2010 to 2015, a 38.3 percent increase.

Stone County is located on the Ozarks Plateau of the Interior Highlands physiographic province. The county lies within the Springfield Plateau and the Salem Plateau divisions of the Ozarks Plateau. The extreme northwest and northeast corners of the county are located on the Springfield Plateau, while the vast majority is located on the Salem Plateau. The Springfield Plateau is characterized as a prairie-like, gently rolling plain. The Salem Plateau is typified by steep ridges and bluffs bordering rivers, streams and deep drainage channels. The Eureka Springs Escarpment, a northeasterly running narrow belt of hills, separates the Springfield and Salem plateaus.

The topographic landscape exhibits features of karst, including sinkholes, losing streams, springs and caves. Karst features are found throughout the county, with larger concentrations located near Blue Eye, Reeds Spring, and in the northern half of the county. Numerous springs and caves are found in the county, several of which were focal points of historical settlement in the county and today contribute to the tourism economy. One such community is Reeds Spring, first settled in the late 1800s near a spring that is the city's namesake.

One of the main water features in Stone County is the James River, which flows in a winding fashion from the northeastern corner of the county toward the southwest, until it is impounded in Table Rock Lake, the dominant water feature in the county. Indian Point, McCord Bend, Coney Island and Kimberling City are bounded by Table Rock Lake. The lake was created from the impoundment of the White River upon completion of the Table Rock Dam in 1958. Created for hydroelectric power generation and flood control, Table Rock Lake covers 43,100 surface acres, most of which is located in Missouri. Today, the lake is a major catalyst to Stone County's economic growth, attracting both residents and visitors.

Figure 2.2 is a map of the watershed boundaries in Stone County, Missouri.

Figure 2.2. Watershed Boundaries in Stone County, Missouri

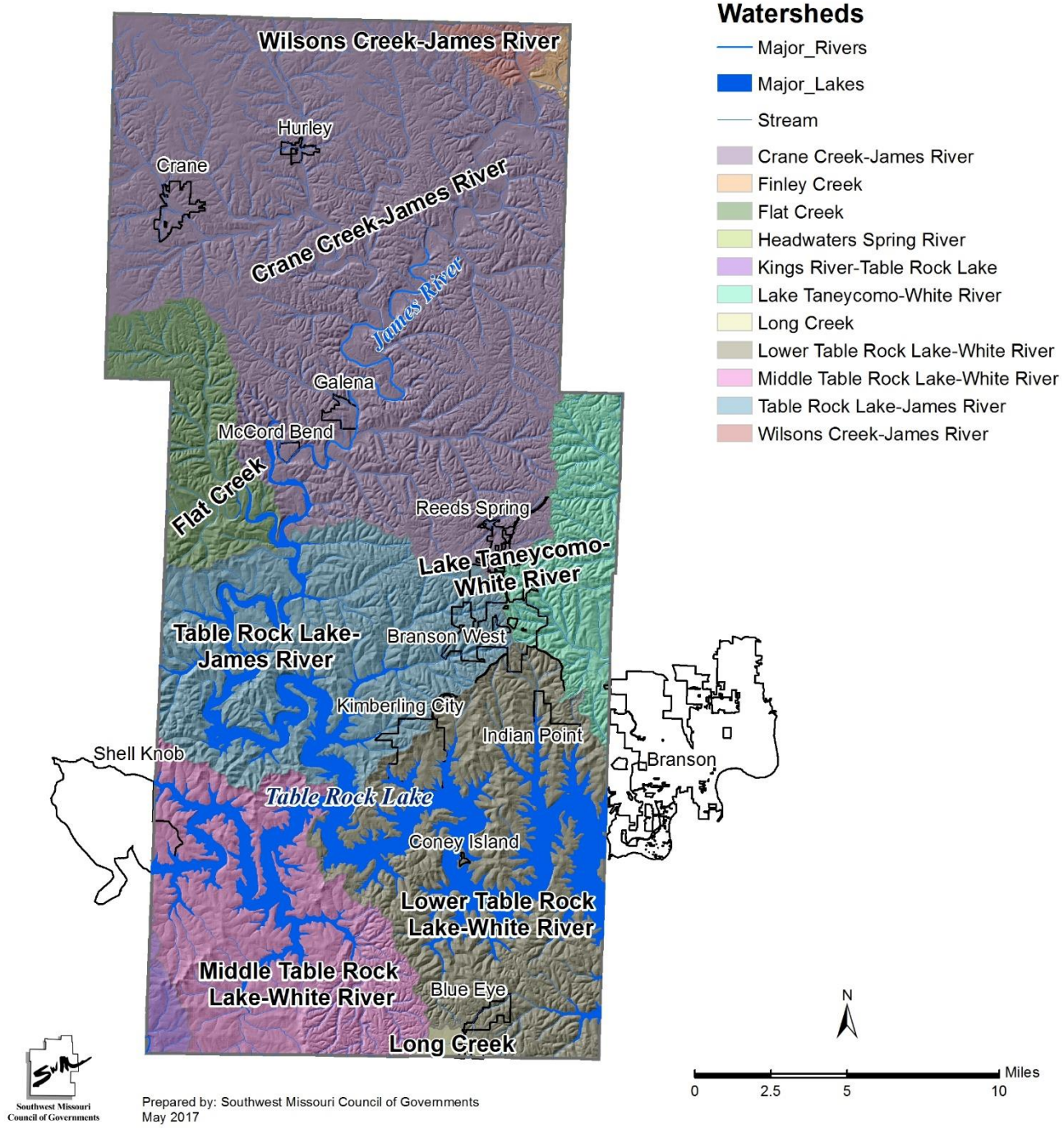
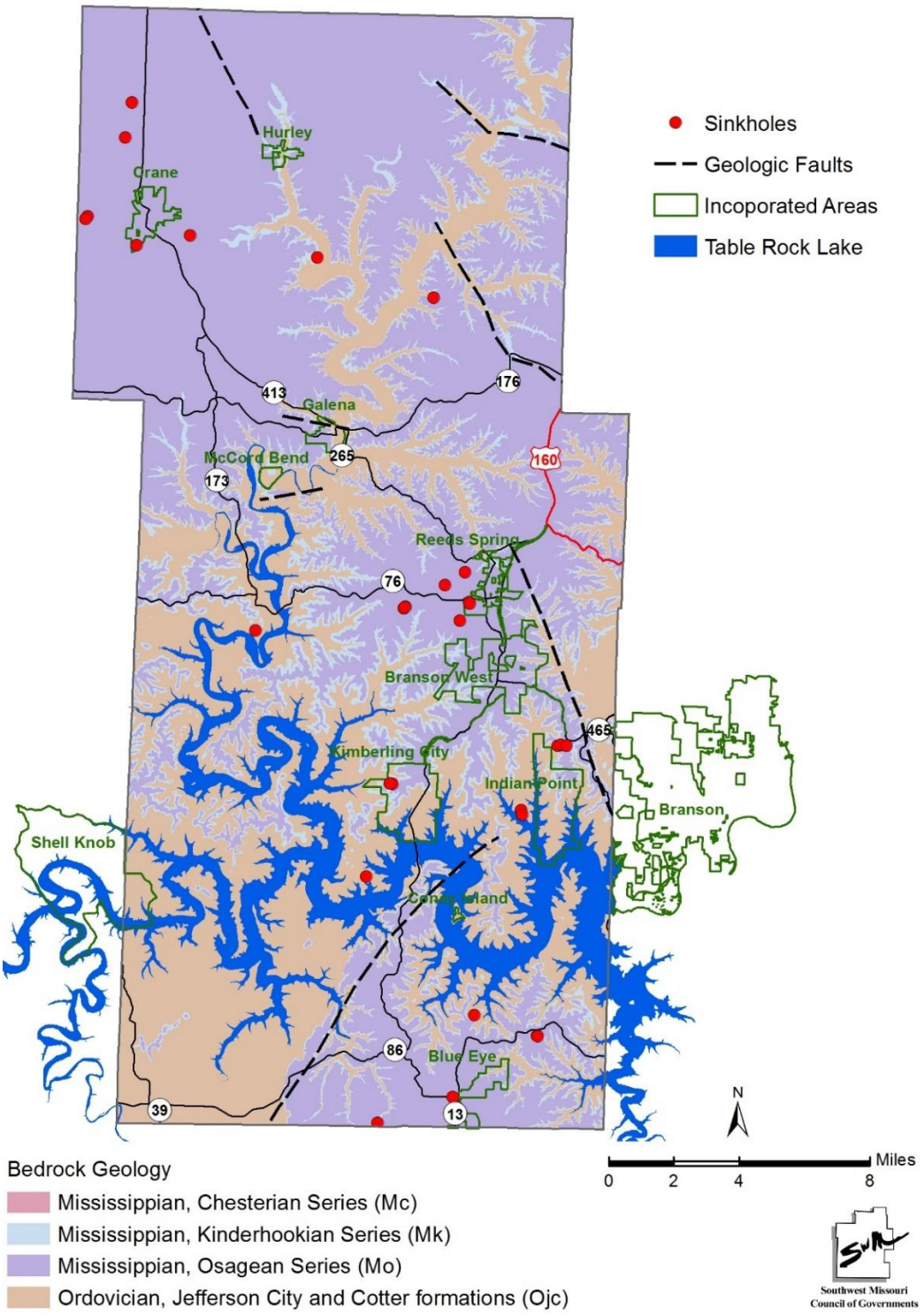


Figure 2.3 is a map showing known sinkholes, fault lines, streams, and waterbodies in Stone County.

Figure 2.3. Geologic Features in Stone County



2.1.3 Climate

Stone County has a continental climate with cool winters and hot summers. Based on information from the High Plains Regional Climate Center, Galena, MO has an average annual temperature of 57.3 degrees Fahrenheit. The average high in July is 84.1 degrees Fahrenheit and the average low in January is 13.1 degrees Fahrenheit. It averages 43.21 inches of precipitation, with snow accounting for 6.5 inches annually.

2.1.4 Population/Demographics

Table 2.1 provides the total county population and the populations for each city, village, and the unincorporated county for 2010 and 2015 with the number and percentage change. In terms of percent change, unincorporated Stone County and the communities of Branson West, Reeds Spring, Coney Island, and McCord Bend experienced a decrease in population, losing 7.4%, 9.2%, .9%, 9.3%, and 5.7% respectively. It is estimated that the unincorporated population of the county is 23,392 people. Crane and Blue Eye have seen the most growth since 2010, increasing by 38.3% and 31.7% respectively. In terms of sheer magnitude Crane grew the most, adding 560 people from 2010 to 2015.

Table 2.1. Stone County Population 2010-2015 by Community

Jurisdiction	2010 Population	2015 Population	2010-2015 # Change	2010-2015 % Change
Stone County	32,202	31,325	-877	-2.7%
City of Branson West	478	434	-44	-9.2%
City of Crane	1,462	2,022	560	38.3%
City of Galena	440	556	116	26.4%
City of Hurley	178	220	42	23.6%
City of Kimberling City	2,400	2,687	287	12.0%
City of Reeds Spring	913	905	-8	-0.9%
Village of Blue Eye	167	220	53	31.7%
Village of Coney Island	75	68	-7	-9.3%
Village of Indian Point	528	541	13	2.5%
Village of McCord Bend	297	280	-17	-5.7%
Unincorporated	25,264	23,392	-1872	-7.4%

Source: U.S. Bureau of the Census, Decennial Census, American Community Survey 5-Year Estimates 2011-2015

Stone County contains 20,522 housing units, 7,686 of which are vacant, at an average household size of 2.42, which is lower than the national average and about the same as the state average.

Stone County's most at-risk populations vary in composition from state and national averages. Children under 5 in the county, comprising 4.0 percent of the total population, is lower than state and national averages of 6.2 and 6.3 percent, respectively. The county has a significantly higher elderly population, or those above the age of 65, at 34.6 percent of the population, compared to 14.9 percent for Missouri and 14.1 percent for the nation. In addition, Stone County's median age is approximately 13 and 14 years older than the state and national medians, respectively. Table 2.2 provides the number of Stone County residents within specific age groups and a comparison of percentages with the state of Missouri and the United States

Table 2.2. Stone County Population Age Composition, Missouri, United States Comparison

Age Group	# of People	Percent	Missouri Percent	United States Percent
Persons under 5 years old	1,255	4.0%	6.2%	6.3%
Persons 5 to 9 years old	1,381	4.4%	6.5%	6.5%
Persons 10 to 14 years old	1,914	6.1%	6.5%	6.5%
Persons 15 to 19 years old	1,663	5.3%	6.7%	6.7%
Persons 20 to 24 years old	1,318	4.2%	7.1%	7.1%
Persons 25 to 34 years old	2,447	7.8%	13.2%	13.5%
Persons 35 to 44 years old	3,138	10%	12.1%	12.8%
Persons 45 to 54 years old	4,361	13.9%	13.9%	13.9%
Persons 55 to 59 years old	1,694	5.4%	6.9%	6.6%
Persons 60 to 64 years old	1,945	6.2%	6.0%	5.8%
Persons 65 to 74 years old	5,208	16.6%	8.3%	7.9%
Persons 75 to 84 years old	2,479	7.9%	4.6%	4.3%
Persons 85 and older	3,169	10.1%	2.0%	1.9%
Total	31,325	-	-	-
Median Age	51.3	-	38.2	37.6

Source: U.S. Bureau of the Census, 2011-2015 American Community Survey 5-Year Estimates.

The University of South Carolina developed an index to evaluate and rank the ability to respond to, cope with, recover from, and adapt to disasters. The index synthesizes 29 socioeconomic variables which research literature suggests contribute to reduction in a community's ability to prepare for, respond to, and recover from hazards. SoVI ® data sources include primarily those from the United States Census Bureau.

The index is a comparative metric that facilitates the examination of the differences in social vulnerability among counties. SoVI® is a valuable tool for policy makers and practitioners. It graphically illustrates the geographic variation in social vulnerability. It shows where there is uneven capacity for preparedness and response and where resources might be used most effectively to reduce the pre-existing vulnerability. SoVI® also is useful as an indicator in determining the differential recovery from disasters.

Stone County's SoVI ® score is 2.650000095, placing it in the 87.3rd percentile when compared to the rest of the nation. This score means that 87.3 percent of the nation is more resilient to hazards and disasters. The main determinants of the score are qualities of the population based on race and class, wealth, elderly residents, Hispanic ethnicity, special needs individuals, Native American ethnicity, and the service industry employment.

Table 2.3 provides additional demographic and economic indicators for Stone County and incorporated communities compared to the state of Missouri and the United States. The county as a whole had slightly higher percentage of unemployed and families living below the poverty level than the state of Missouri or the United States. In terms of education, the percentage of population in the county that were high school graduates was less than both Missouri and the United States. The percentage of the county population that spoke a language other than English in the home was considerably lower than both Missouri and the United States.

Table 2.3. Unemployment, Poverty, Education, and Language Percentage Demographics, Stone County, Missouri

Jurisdiction	Total in Labor Force	Percent of Population Unemployed	Percent of Families Below the Poverty Level	Percentage of Population (High School graduate)	Percentage of Population (Bachelor's degree or higher)	Percentage of population (spoken language other than English)
Stone County	13,459	10.8	10.8	86.1	16.3	1.9
Branson West	205	5.4	5.6	85	15.4	21.4
Crane	790	10.5	13.3	77.5	8.8	4.0
Galena	198	4.5	33.8	71.9	6.6	0.6
Hurley	71	4.2	26.2	73.9	2.2	0
Kimberling City	1,192	11.9	7.2	93.4	24.3	1.7
Reeds Spring	429	7.9	15.7	88.2	10.3	2.6
Blue Eye	129	0	15.5	76.4	10.6	0.9
Coney Island	19	26.3	0	92.5	19.4	1.5
Indian Point	283	7.1	8.8	89.8	23.2	1.6
McCord Bend	101	13.9	47.8	68.6	5.8	1.9
Missouri	3,034,524	7.5	11.1	88.4	27.1	6
United States	158,897,824	8.3	11.3	86.7	29.8	21

Source: U.S. Census, 2011-2015 American Community Survey, 5-year Estimates.

2.1.5 History

Stone County officially became a county on February 10, 1851 and was named after Judge J.W. Stone of Taney County, Missouri. Jamestown was chosen as the county seat but was renamed Galena around 1852-53 (Bucher, Willis & Ratliff, 1995, p. 1-4). The act creating Stone County stated that it should be attached to Taney County for the purposes of representation in the General Assembly. It was a common practice in Missouri to attach new counties to another for such purposes.

Early settlers in Stone County were farmers and its economy was based on crop and livestock production. Corn, wheat and sorghum were important to the early economy, as was tomatoes, with over 2,500 farmers producing tomatoes for the 38 canneries in operation in Stone County by 1925. Timber cutting for lumber and railroad ties was also important to the county's early economy. The City of Reeds Spring was once known as the "tie-hacking capitol of the world." Although the lumber industry eventually declined and the tomato canning industry ended by the 1950s, cattle production continues in the county, and hay is the most import crop (Gregg, 2004, p. 13).

The construction of Table Rock Dam on the White River in 1958, and the creation of Table Rock Lake, brought a new era of development and changing economy to Stone County. Today, tourism is one of the most important industries, bringing visitors to the many outdoor recreation opportunities of Table Rock Lake and other attractions in the county.

2.1.6 Occupations

Occupation information for the Stone County labor force comes from the American Community Survey 5-year estimates 2011 - 2015. Management, Business, Science, and Arts Occupations includes education and healthcare practitioner and technician occupations among others. Service Occupation includes healthcare support and protective services, such as firefighters and law enforcement in addition to food preparation and personal care services. The other occupation

classifications are well defined. **Table 2.4** contains occupation statistics for the incorporated cities and the county as a whole.

Indian Point and Reeds Spring have the highest percentages of management, business, science, and arts occupations while Coney Island has the highest percentage of service occupations. Percentages of sales and office occupations are highest in Hurley and Kimberling City while McCord Bend and Kimberling City have the highest in natural resources, construction, and maintenance occupations. Production, transportation, and material moving occupations account for the fewest occupations in Stone County overall, and the lowest in most of the municipalities.

Table 2.4. Occupation Statistics, Stone 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
Stone County	26.9%	21.5%	25.7%	15.1%	10.9%
Branson West	19.6%	43.8%	25.8%	4.6%	6.2%
Crane	18.6%	19.8%	31.2%	13.3%	17.1%
Galena	15.9%	34.4%	32.8%	8.5%	8.5%
Hurley	16.2%	23.5%	39.7%	5.9%	14.7%
Kimberling City	21.0%	19.3%	34.7%	15.9%	9.0%
Reeds Spring	25.8%	27.8%	25.1%	8.9%	12.4%
Blue Eye	24.0%	24.8%	24.0%	9.3%	17.8%
Coney Island	0.0%	71.4%	28.6%	0.0%	0.0%
Indian Point	27.0%	30.8%	25.1%	11.4%	5.7%
McCord Bend	11.5%	33.3%	3.4%	32.2%	19.5%

Source: U.S. Census, 2011-2015 American Community Survey, 5-year Estimates.

2.1.7 Agriculture

According to the United States Department of Agriculture (USDA) 2012 Agricultural Census, there were 601 farms covering 118,015 acres in Stone County. The average farm size was 196 acres, which was less than the average farm size in Missouri at 285 acres, with an average market value of $34,493,000 of agricultural products sold. Of the total, about 11% was from crop sales while the other 89% came from livestock, poultry, and their products. Broilers and other meat-type chickens were the largest type of farm activity with 896,253 head of broilers and other meat-type chickens. Stone County is ranked 86 in Missouri for total value of agricultural products sold. In addition, 57.7% of principal operators reported a primary occupation of something other than farming. In a 2016 USDA study, 16.5% of the workforce worked in agriculture-related and agribusiness jobs.

2.1.8 FEMA Hazard Mitigation Assistance Grants in Planning Area

Based on FEMA's data of Hazard Mitigation Assistance Grant awards, there have been no HMA Grants awarded to Stone County or any jurisdictions within its boundaries.

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 Stone County

Stone County's jurisdiction includes all unincorporated areas within the county boundaries. Stone County is classified as a third class county in Missouri. The governing body of Stone County is the county commission. The Commission consists of a presiding commissioner, a northern commissioner, and a southern commissioner.

The County's elected governing body; the Board of County Commissioners directs the general administration of County Government. The Commission sets broad operating policies and establishes budgets as mandated by State law. The County enters into contracts with other public agencies to ensure the smooth flow of services including law enforcement, construction and maintenance of public roads and bridges, and the operations of county offices, equipment and services. The departments/staff of the County government include:

- County Assessor
- Board of Commissioners
- County Collector
- County Clerk
- Emergency Management
- Planning & Zoning
- Recorder of Deeds
- Sheriff
- Soil and Water
- County Treasurer

Mitigation Initiatives/Capabilities include:

- County Emergency Plan
- Flood Mitigation Assistance Plan
- Floodplain Ordinance

The County Emergency Management Department (EMD) coordinates with local government officials and cooperating private organizations to: 1) prevent avoidable disasters and reduce the vulnerability of the residents to any disaster that may strike; 2) establish capabilities for protecting citizens from the effects of disasters; 3) respond effectively to the actual occurrence of disasters; and 4) provide for recovery in the aftermath of any emergency involving extensive damage within the county. The EMD is responsible for the development and maintenance of the Local Emergency Operations Plan.

Table 2.6 provides information on the County's mitigation capabilities based on the Data Collection Questionnaire.

Table 2.5. Unincorporated Stone County Mitigation Capabilities

Capability	Status Including Date of Document or Policy
Comprehensive Plan	Yes; 2013
Builder's Plan	No
Capital Improvement Plan	No
Local Emergency Plan	No
County Emergency Plan	Yes; 2016
Local Recovery Plan	No
County Recovery Plan	No
Local Mitigation Plan	No
County Mitigation Plan	Yes; 2013
Local Mitigation Plan (PDM)	No
County Mitigation Plan (PDM)	No
Economic Development Plan	No
Transportation Plan	No
Land-use Plan	Yes
Flood Mitigation Assistance (FMA) Plan	Yes
Watershed Plan	No
Firewise or other fire mitigation plan	No
School Mitigation Plan	No
Critical Facilities Plan (Mitigation/Response/Recovery)	No
Policies/Ordinance	**Status Including Date of Document or Policy**
Zoning Ordinance	Yes
Building Code	Yes
Floodplain Ordinance	Yes
Subdivision Ordinance	No
Tree Trimming Ordinance	No
Nuisance Ordinance	No
Storm Water Ordinance	No
Drainage Ordinance	No
Capability	**Status Including Date of Document or Policy**
Site Plan Review Requirements	No
Historic Preservation Ordinance	No
Landscape Ordinance	No
Debris Management Plan	No
Program	**Status Including Date of Document or Policy**
Zoning/Land Use Restrictions	Yes
Codes Building Site/Design	Yes
National Flood Insurance Program (NFIP) Participant	Yes
NFIP Community Rating System (CRS) Participating Community	N/A
Hazard Awareness Program	No
National Weather Service (NWS) Storm Ready	No
Building Code Effectiveness Grading (BCEGs)	No
ISO Fire Rating	Yes – each fire district has its own
Economic Development Program	No
Land Use Program	No
Public Education/Awareness	No
Property Acquisition	No
Planning/Zoning Boards	Yes
Stream Maintenance Program	No
Tree Trimming Program	No
Engineering Studies for Streams (Local/County/Regional)	No
Mutual Aid Agreements	Yes
Studies/Reports/Maps	**Status Including Date of Document or Policy**
Hazard Analysis/Risk Assessment (Local)	No
Hazard Analysis/Risk Assessment (County)	No
Flood Insurance Maps	Yes

FEMA Flood Insurance Study (Detailed)	No
Evacuation Route Map	Yes
Critical Facilities Inventory	No
Vulnerable Population Inventory	No
Land Use Map	No
Staff/Department	**Status Including Date of Document or Policy**
Building Code Official	Yes
Building Inspector	Yes
Mapping Specialist (GIS)	Yes
Engineer	No
Development Planner	No
Public Works Official	No
Emergency Management Coordinator	Yes
NFIP Floodplain Administrator	Yes
Bomb and/or Arson Squad	No
Emergency Response Team	Yes
Hazardous Materials Expert	Yes
Local Emergency Planning Committee	Yes
County Emergency Management Commission	Yes
Sanitation Department	No
Transportation Department	No
Economic Development Department	No
Housing Department	Yes
Planning Consultant	No
Regional Planning Agencies	Yes – Southwest Missouri Council of Governments
Historic Preservation	Yes
Non-Governmental Organizations (NGOs)	**Status Including Date of Document or Policy**
American Red Cross	No
Salvation Army	No
Veterans Groups	Yes
Environmental Organization	Yes
Homeowner Associations	Yes
Neighborhood Associations	Yes
Chamber of Commerce	Yes
Community Organizations (Lions, Kiwanis, etc.	Yes
Local Funding Availability	**Status Including Date of Document or Policy**
Ability to apply for Community Development Block Grants	Yes
Ability to fund projects through Capital Improvements funding	Yes
Authority to levy taxes for a specific purpose	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	Yes
Ability to incur debt through private activities	No
Ability to withhold spending in hazard prone areas	No

Source: Data Collection Questionnaire

2.2.2 City of Branson West

Branson West is located on the eastern edge of Stone County. It has a Mayor/Council form of government, with four (4) members on the Council. Since the 2010 Census, Branson West has seen a slight decrease in population of about 9 percent. Specific mitigation capabilities include:

- Comprehensive Plan
- Land Use Plan
- Building Code
- Storm Water Ordinance
- Building Code Inspector

Branson West has a high percentage of people who speak a language other than English, at 21.4 percent. The City is one of the better-off jurisdictions as compared to others in Stone County, in terms of poverty, unemployment, and educational attainment. Branson West has only a small percentage of housing units built before 1939, at 4.1 percent.

Table 2.6 provides information on Branson West's mitigation capabilities based on the Data Collection Questionnaire.

Table 2.6. City of Branson West Mitigation Capabilities

Capability	Status Including Date of Document or Policy
Comprehensive Plan	Yes: 2002
Builder's Plan	No
Capital Improvement Plan	No
Local Emergency Plan	No
County Emergency Plan	No
Local Recovery Plan	No
County Recovery Plan	No
Local Mitigation Plan	Yes: 2013
County Mitigation Plan	Yes: 2013
Local Mitigation Plan (PDM)	No
County Mitigation Plan (PDM)	No
Economic Development Plan	No
Transportation Plan	Yes: 2004
Land-use Plan	Yes: 2002
Flood Mitigation Assistance (FMA) Plan	No
Watershed Plan	No
Firewise or other fire mitigation plan	No
School Mitigation Plan	No
Critical Facilities Plan (Mitigation/Response/Recovery)	No
Policies/Ordinance	**Status Including Date of Document or Policy**
Zoning Ordinance	Yes
Building Code	Yes: 2012 IBC
Floodplain Ordinance	No
Subdivision Ordinance	Yes
Tree Trimming Ordinance	No
Nuisance Ordinance	Yes
Storm Water Ordinance	Yes
Drainage Ordinance	Yes
Capability	**Status Including Date of Document or Policy**
Site Plan Review Requirements	Yes
Historic Preservation Ordinance	No
Landscape Ordinance	Yes
Debris Management Plan	No
Program	**Status Including Date of Document or Policy**
Zoning/Land Use Restrictions	Yes

Codes Building Site/Design	Yes
National Flood Insurance Program (NFIP) Participant	No
NFIP Community Rating System (CRS) Participating Community	No
Hazard Awareness Program	No
National Weather Service (NWS) Storm Ready	No
Building Code Effectiveness Grading (BCEGs)	No
ISO Fire Rating	No
Economic Development Program	Yes
Land Use Program	Yes
Public Education/Awareness	No
Property Acquisition	No
Planning/Zoning Boards	Yes
Stream Maintenance Program	No
Tree Trimming Program	No
Engineering Studies for Streams (Local/County/Regional)	No
Mutual Aid Agreements	No
Studies/Reports/Maps	**Status Including Date of Document or Policy**
Hazard Analysis/Risk Assessment (Local)	No
Hazard Analysis/Risk Assessment (County)	No
Flood Insurance Maps	No
FEMA Flood Insurance Study (Detailed)	No
Evacuation Route Map	No
Critical Facilities Inventory	No
Vulnerable Population Inventory	No
Land Use Map	Yes
Staff/Department	**Status Including Date of Document or Policy**
Building Code Official	Yes
Building Inspector	Yes
Mapping Specialist (GIS)	No
Engineer	Yes
Development Planner	No
Public Works Official	Yes
Emergency Management Coordinator	No
NFIP Floodplain Administrator	No
Bomb and/or Arson Squad	No
Emergency Response Team	No
Hazardous Materials Expert	No
Local Emergency Planning Committee	No
County Emergency Management Commission	Yes
Sanitation Department	No
Transportation Department	No
Economic Development Department	No
Housing Department	No
Planning Consultant	No
Regional Planning Agencies	Yes: Southwest Missouri Council of Governments
Historic Preservation	No
Non-Governmental Organizations (NGOs)	**Status Including Date of Document or Policy**
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.	No
Local Funding Availability	**Status Including Date of Document or Policy**
Ability to apply for Community Development Block Grants	No
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	No
Ability to incur debt through private activities	No
Ability to withhold spending in hazard prone areas	No

Source: Data Collection Questionnaire

2.2.3 City of Crane

The City of Crane is located in the northwest portion of Stone County, and has a Mayor/Board of Aldermen form of government, with four (4) Aldermen. According to 2015 ACS estimates, the City of Crane has seen its population increase significantly, by 38.3 percent. Specific mitigation capabilities include:

- Local Emergency Plan
- Local Recovery Plan
- Local Mitigation Plan
- Land Use Plan
- Floodplain Ordinance

Crane has moderate levels of unemployment and poverty, with 10.5 percent and 13.3 percent respectively. The City also has among the lowest educational attainment in the county and among the highest percentage of housing units built before 1939 in Stone County, at 17.3 percent.

Table 2.7 provides information on Crane's mitigation capabilities based on the Data Collection Questionnaire.

Table 2.7. City of Crane Mitigation Capabilities

Capability	**Status Including Date of Document or Policy**
Comprehensive Plan	Yes: 1972
Builder's Plan	Yes: 2017
Capital Improvement Plan	No
Local Emergency Plan	Yes
County Emergency Plan	No
Local Recovery Plan	Yes
County Recovery Plan	No
Local Mitigation Plan	Yes
County Mitigation Plan	Yes
Local Mitigation Plan (PDM)	No
County Mitigation Plan (PDM)	No
Economic Development Plan	No
Transportation Plan	No
Land-use Plan	Yes: 2017
Flood Mitigation Assistance (FMA) Plan	No
Watershed Plan	No
Firewise or other fire mitigation plan	No
School Mitigation Plan	No
Critical Facilities Plan (Mitigation/Response/Recovery)	No
Policies/Ordinance	**Status Including Date of Document or Policy**
Zoning Ordinance	Yes
Building Code	No
Floodplain Ordinance	Yes: 2010
Subdivision Ordinance	Yes: 2017
Tree Trimming Ordinance	No
Nuisance Ordinance	Yes
Storm Water Ordinance	No
Drainage Ordinance	No
Capability	**Status Including Date of Document or Policy**

Site Plan Review Requirements	No
Historic Preservation Ordinance	No
Landscape Ordinance	No
Debris Management Plan	Yes
Program	**Status Including Date of Document or Policy**
Zoning/Land Use Restrictions	Yes
Codes Building Site/Design	Yes
National Flood Insurance Program (NFIP) Participant	Yes
NFIP Community Rating System (CRS) Participating Community	N/A
Hazard Awareness Program	No
National Weather Service (NWS) Storm Ready	No
Building Code Effectiveness Grading (BCEGs)	No
ISO Fire Rating	6
Economic Development Program	Yes
Land Use Program	No
Public Education/Awareness	No
Property Acquisition	No
Planning/Zoning Boards	Yes
Stream Maintenance Program	No
Tree Trimming Program	No
Engineering Studies for Streams (Local/County/Regional)	No
Mutual Aid Agreements	Yes
Studies/Reports/Maps	**Status Including Date of Document or Policy**
Hazard Analysis/Risk Assessment (Local)	No
Hazard Analysis/Risk Assessment (County)	No
Flood Insurance Maps	No
FEMA Flood Insurance Study (Detailed)	No
Evacuation Route Map	No
Critical Facilities Inventory	No
Vulnerable Population Inventory	No
Land Use Map	Yes
Staff/Department	**Status Including Date of Document or Policy**
Building Code Official	No
Building Inspector	No
Mapping Specialist (GIS)	No
Engineer	Yes: Contracted
Development Planner	No
Public Works Official	Yes
Emergency Management Coordinator	No
NFIP Floodplain Administrator	Yes
Bomb and/or Arson Squad	No
Emergency Response Team	Yes: Police & Fire
Hazardous Materials Expert	No
Local Emergency Planning Committee	No
County Emergency Management Commission	No
Sanitation Department	No
Transportation Department	No
Economic Development Department	No
Housing Department	No
Planning Consultant	No
Regional Planning Agencies	Yes: Southwest Missouri Council of Governments
Historic Preservation	No
Non-Governmental Organizations (NGOs)	**Status Including Date of Document or Policy**
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.	No
Local Funding Availability	**Status Including Date of Document or Policy**

Ability to apply for Community Development Block Grants	Yes
Ability to fund projects through Capital Improvements funding	Yes
Authority to levy taxes for a specific purpose	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

2.2.4 City of Galena

The City of Galena is located in the central portion of Stone County, on the James River. It has a Mayor/City Council form of government, with four (4) council members. Galena is the County seat of Stone County. According to 2015 ACS estimates, Galena has seen its population increase significantly, by 26.4 percent. Specific mitigation capabilities include:

- Emergency Management
- NFIP Participant
- Ability to apply for mitigation funds
- One (1) outdoor warning siren

Although unemployment is low in Galena (4.5%), the poverty level is high, at 33.8 percent. Galena is also one of the least educated in the county and has the largest percentage of housing units built before 1939 in Stone County, at 22.7 percent.

Table 2.8 provides information on Galena's mitigation capabilities based on the Data Collection Questionnaire.

Table 2.8. City of Galena Mitigation Capabilities

Capability	Status Including Date of Document or Policy
Comprehensive Plan	No
Builder's Plan	No
Capital Improvement Plan	No
Local Emergency Plan	No
County Emergency Plan	No
Local Recovery Plan	No
County Recovery Plan	No
Local Mitigation Plan	No
County Mitigation Plan	Yes: 2013
Local Mitigation Plan (PDM)	No
County Mitigation Plan (PDM)	No
Economic Development Plan	No
Transportation Plan	No
Land-use Plan	No
Flood Mitigation Assistance (FMA) Plan	No
Watershed Plan	No
Firewise or other fire mitigation plan	No
School Mitigation Plan	No
Critical Facilities Plan (Mitigation/Response/Recovery)	No
Policies/Ordinance	**Status Including Date of Document or Policy**
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
Capability	**Status Including Date of Document or Policy**
Site Plan Review Requirements	No
Historic Preservation Ordinance	No
Landscape Ordinance	No
Iowa Wetlands and Riparian Areas Conservation Plan	No
Debris Management Plan	No
Program	**Status Including Date of Document or Policy**
Zoning/Land Use Restrictions	No
Codes Building Site/Design	No
National Flood Insurance Program (NFIP) Participant	Yes
NFIP Community Rating System (CRS) Participating Community	N/A
Hazard Awareness Program	No
National Weather Service (NWS) Storm Ready	No
Building Code Effectiveness Grading (BCEGs)	No
ISO Fire Rating	No
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 (Local/County/Regional)	No
Mutual Aid Agreements	No
Studies/Reports/Maps	**Status Including Date of Document or Policy**
Hazard Analysis/Risk Assessment (Local)	No
Hazard Analysis/Risk Assessment (County)	No
Flood Insurance Maps	No
FEMA Flood Insurance Study (Detailed)	No
Evacuation Route Map	No
Critical Facilities Inventory	No
Vulnerable Population Inventory	No
Land Use Map	No
Staff/Department	**Status Including Date of Document or Policy**
Building Code Official	No
Building Inspector	No
Mapping Specialist (GIS)	No
Engineer	No
Development Planner	No
Public Works Official	Yes
Emergency Management Coordinator	Yes
NFIP Floodplain Administrator	Yes
Bomb and/or Arson Squad	No
Emergency Response Team	No
Hazardous Materials Expert	No
Local Emergency Planning Committee	No
County Emergency Management Commission	No
Sanitation Department	No
Transportation Department	No
Economic Development Department	No
Housing Department	No
Planning Consultant	No
Regional Planning Agencies	No
Historic Preservation	No
Non-Governmental Organizations (NGOs)	**Status Including Date of Document or Policy**
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.	No
Local Funding Availability	**Status Including Date of Document or Policy**
Ability to apply for Community Development Block Grants	Yes
Ability to fund projects through Capital Improvements funding	Yes
Authority to levy taxes for a specific purpose	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

2.2.5 City of Hurley

The City of Hurley is located in the northern portion of Stone County on Missouri Route A. It has a Mayor/Board of Aldermen form of government with four (4) Aldermen. According to 2015 ACS estimates, Hurley has seen its population increase significantly, by 23.6 percent. Specific mitigation capabilities include:

- Local Emergency Operations Plan
- One (1) outdoor warning siren
- Building Code
- NFIP Participation

Hurley has average unemployment and poverty rates for Stone County, but has the least educated population, with only 2.2 percent of its residents with at least a Bachelor's Degree. Hurley also has one of the highest percentages of housing units built before 1939 in Stone County, at 18.2 percent.

Table 2.9 provides information on Hurley's mitigation capabilities based on the Data Collection Questionnaire.

Table 2.9. City of Hurley Mitigation Capabilities

Capability	Status Including Date of Document or Policy
Comprehensive Plan	No
Builder's Plan	No
Capital Improvement Plan	No
Local Emergency Plan	Yes: 2006
County Emergency Plan	No
Local Recovery Plan	No
County Recovery Plan	No
Local Mitigation Plan	No
County Mitigation Plan	No
Local Mitigation Plan (PDM)	No
County Mitigation Plan (PDM)	No
Economic Development Plan	No
Transportation Plan	No
Land-use Plan	No
Flood Mitigation Assistance (FMA) Plan	No
Watershed Plan	No
Firewise or other fire mitigation plan	No

School Mitigation Plan	No
Critical Facilities Plan (Mitigation/Response/Recovery)	No
Policies/Ordinance	**Status Including Date of Document or Policy**
Zoning Ordinance	No
Building Code	Yes: 2000 IBC
Floodplain Ordinance	Yes: 2012
Subdivision Ordinance	No
Tree Trimming Ordinance	No
Nuisance Ordinance	No
Storm Water Ordinance	No
Drainage Ordinance	No
Capability	**Status Including Date of Document or Policy**
Site Plan Review Requirements	No
Historic Preservation Ordinance	No
Landscape Ordinance	No
Iowa Wetlands and Riparian Areas Conservation Plan	No
Debris Management Plan	No
Program	**Status Including Date of Document or Policy**
Zoning/Land Use Restrictions	No
Codes Building Site/Design	No
National Flood Insurance Program (NFIP) Participant	Yes
NFIP Community Rating System (CRS) Participating Community	N/A
Hazard Awareness Program	No
National Weather Service (NWS) Storm Ready	No
Building Code Effectiveness Grading (BCEGs)	No
ISO Fire Rating	N/A
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 (Local/County/Regional)	No
Mutual Aid Agreements	No
Studies/Reports/Maps	**Status Including Date of Document or Policy**
Hazard Analysis/Risk Assessment (Local)	No
Hazard Analysis/Risk Assessment (County)	No
Flood Insurance Maps	No
FEMA Flood Insurance Study (Detailed)	No
Evacuation Route Map	No
Critical Facilities Inventory	No
Vulnerable Population Inventory	No
Land Use Map	No
Staff/Department	**Status Including Date of Document or Policy**
Building Code Official	No
Building Inspector	No
Mapping Specialist (GIS)	No
Engineer	No
Development Planner	No
Public Works Official	No
Emergency Management Coordinator	No
NFIP Floodplain Administrator	Yes: City Clerk, part time
Bomb and/or Arson Squad	No
Emergency Response Team	No
Hazardous Materials Expert	No
Local Emergency Planning Committee	No
County Emergency Management Commission	No
Sanitation Department	No
Transportation Department	No

Economic Development Department	No
Housing Department	No
Planning Consultant	No
Regional Planning Agencies	No
Historic Preservation	No
Non-Governmental Organizations (NGOs)	**Status Including Date of Document or Policy**
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.	No
Local Funding Availability	**Status Including Date of Document or Policy**
Ability to apply for Community Development Block Grants	Yes
Ability to fund projects through Capital Improvements funding	N/A
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

2.2.6 City of Kimberling City

Kimberling City is located in central Stone County, on the northern shore of Table Rock Lake. It has a Mayor and Board of Aldermen, with 4 members (2 elected from each of the two wards). Kimberling City's current mitigation capabilities include:

- Three (3) Storm Sirens
- Local Emergency Operations Plan
- Floodplain Ordinance
- Building Codes

Kimberling City's population is disproportionately elderly; just over 30% of its residents are over the age of 65. The city has seen moderate population growth, increasing by 12% since 2010.

Table 2.10 provides information on Kimberling City's mitigation capabilities based on the Data Collection Questionnaire.

Table 2.10. City of Kimberling City Mitigation Capabilities

Capability	Status Including Date of Document or Policy
Comprehensive Plan	To be adopted Feb 6, 2018, Bill # 635, Resolution # 446
Builder's Plan	Yes
Capital Improvement Plan	Yes
Local Emergency Plan	Yes
County Emergency Plan	Yes
Local Recovery Plan	Yes
County Recovery Plan	Yes
Local Mitigation Plan	No
County Mitigation Plan	Yes: 2013
Local Mitigation Plan (PDM)	No
County Mitigation Plan (PDM)	No
Economic Development Plan	No

Transportation Plan	Yes
Land-use Plan	Included in new comp. plan
Flood Mitigation Assistance (FMA) Plan	Yes
Watershed Plan	No
Firewise or other fire mitigation plan	No
School Mitigation Plan	No
Critical Facilities Plan (Mitigation/Response/Recovery)	No
Policies/Ordinance	**Status Including Date of Document or Policy**
Zoning Ordinance	Yes
Building Code	Yes; 2006
Floodplain Ordinance	Yes; 2010
Subdivision Ordinance	Yes
Tree Trimming Ordinance	No
Nuisance Ordinance	Yes
Storm Water Ordinance	Yes
Drainage Ordinance	Yes
Capability	**Status Including Date of Document or Policy**
Site Plan Review Requirements	Yes
Historic Preservation Ordinance	No
Landscape Ordinance	No
Debris Management Plan	No
Program	**Status Including Date of Document or Policy**
Zoning/Land Use Restrictions	Yes
Codes Building Site/Design	Yes
National Flood Insurance Program (NFIP) Participant	Yes
NFIP Community Rating System (CRS) Participating Community	No
Hazard Awareness Program	No
National Weather Service (NWS) Storm Ready	Yes
Building Code Effectiveness Grading (BCEGs)	Yes; 9 (2012)
ISO Fire Rating	No
Economic Development Program	Yes
Land Use Program	No
Public Education/Awareness	Yes
Property Acquisition	Yes
Planning/Zoning Boards	Yes
Stream Maintenance Program	No
Tree Trimming Program	No
Engineering Studies for Streams (Local/County/Regional)	No
Mutual Aid Agreements	No
Studies/Reports/Maps	**Status Including Date of Document or Policy**
Hazard Analysis/Risk Assessment (Local)	No
Hazard Analysis/Risk Assessment (County)	Yes
Flood Insurance Maps	Yes
FEMA Flood Insurance Study (Detailed)	No
Evacuation Route Map	No
Critical Facilities Inventory	Yes
Vulnerable Population Inventory	No
Land Use Map	Yes
Staff/Department	**Status Including Date of Document or Policy**
Building Code Official	No
Building Inspector	Yes
Mapping Specialist (GIS)	No
Engineer	Yes; contracted
Development Planner	No
Public Works Official	Yes
Emergency Management Coordinator	Yes
NFIP Floodplain Administrator	Yes
Bomb and/or Arson Squad	No
Emergency Response Team	No
Hazardous Materials Expert	No
Local Emergency Planning Committee	No
County Emergency Management Commission	Yes

Sanitation Department	No
Transportation Department	No
Economic Development Department	No – have committee appointed by Mayor
Housing Department	No
Planning Consultant	No
Regional Planning Agencies	Yes
Historic Preservation	No
Non-Governmental Organizations (NGOs)	**Status Including Date of Document or Policy**
American Red Cross	No
Salvation Army	No
Veterans Groups	Yes
Environmental Organization	No
Homeowner Associations	Yes
Neighborhood Associations	Yes
Chamber of Commerce	Yes
Community Organizations (Lions, Kiwanis, etc.	Yes
Local Funding Availability	**Status Including Date of Document or Policy**
Ability to apply for Community Development Block Grants	Yes
Ability to fund projects through Capital Improvements funding	Yes
Authority to levy taxes for a specific purpose	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

2.2.7 City of Reeds Spring

Reeds Spring is located in the eastern part of Stone County, just north of Branson West and the intersection of several state routes, including 13. The city has a Mayor and Board of Aldermen form of government. Current mitigation capabilities include:

- Building Code
- NFIP Participant
- Mutual Aid Agreements

Since 2010, Reeds Spring's population has decreased slightly, by 0.9%.

Table 2.11 provides information on Reeds Spring's mitigation capabilities based on the Data Collection Questionnaire.

Table 2.11. City of Reeds Spring Mitigation Capabilities

Capability	Status Including Date of Document or Policy
Comprehensive Plan	No
Builder's Plan	No
Capital Improvement Plan	No
Local Emergency Plan	No
County Emergency Plan	Yes
Local Recovery Plan	No
County Recovery Plan	No
Local Mitigation Plan	No
County Mitigation Plan	Yes
Local Mitigation Plan (PDM)	No
County Mitigation Plan (PDM)	No
Economic Development Plan	No
Transportation Plan	No

Land-use Plan	No
Flood Mitigation Assistance (FMA) Plan	No
Watershed Plan	No
Firewise or other fire mitigation plan	No
School Mitigation Plan	No
Critical Facilities Plan (Mitigation/Response/Recovery)	No
Policies/Ordinance	**Status Including Date of Document or Policy**
Zoning Ordinance	Yes
Building Code	Yes; IMC 2009
Floodplain Ordinance	Yes
Subdivision Ordinance	No
Tree Trimming Ordinance	No
Nuisance Ordinance	Yes
Storm Water Ordinance	No
Drainage Ordinance	No
Capability	**Status Including Date of Document or Policy**
Site Plan Review Requirements	Yes
Historic Preservation Ordinance	No
Landscape Ordinance	No
Debris Management Plan	No
Program	**Status Including Date of Document or Policy**
Zoning/Land Use Restrictions	No
Codes Building Site/Design	Yes; IMC 2009
National Flood Insurance Program (NFIP) Participant	Yes
NFIP Community Rating System (CRS) Participating Community	No
Hazard Awareness Program	No
National Weather Service (NWS) Storm Ready	No
Building Code Effectiveness Grading (BCEGs)	No
ISO Fire Rating	No
Economic Development Program	No
Land Use Program	No
Public Education/Awareness	No
Property Acquisition	No
Planning/Zoning Boards	Yes
Stream Maintenance Program	No
Tree Trimming Program	No
Engineering Studies for Streams (Local/County/Regional)	No
Mutual Aid Agreements	Yes
Studies/Reports/Maps	**Status Including Date of Document or Policy**
Hazard Analysis/Risk Assessment (Local)	No
Hazard Analysis/Risk Assessment (County)	Yes
Flood Insurance Maps	No
FEMA Flood Insurance Study (Detailed)	No
Evacuation Route Map	No
Critical Facilities Inventory	No
Vulnerable Population Inventory	No
Land Use Map	No
Staff/Department	**Status Including Date of Document or Policy**
Building Code Official	Yes
Building Inspector	Yes
Mapping Specialist (GIS)	No
Engineer	Yes
Development Planner	No
Public Works Official	Yes
Emergency Management Coordinator	Yes
NFIP Floodplain Administrator	Yes
Bomb and/or Arson Squad	No
Emergency Response Team	No
Hazardous Materials Expert	Yes
Local Emergency Planning Committee	No
County Emergency Management Commission	Yes
Sanitation Department	No

Transportation Department	No
Economic Development Department	No
Housing Department	No
Planning Consultant	No
Regional Planning Agencies	No
Historic Preservation	No
Non-Governmental Organizations (NGOs)	**Status Including Date of Document or Policy**
American Red Cross	No
Salvation Army	No
Veterans Groups	No
Environmental Organization	No
Homeowner Associations	Yes
Neighborhood Associations	Yes
Chamber of Commerce	No
Community Organizations (Lions, Kiwanis, etc.	No
Local Funding Availability	**Status Including Date of Document or Policy**
Ability to apply for Community Development Block Grants	Yes
Ability to fund projects through Capital Improvements funding	Yes
Authority to levy taxes for a specific purpose	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

2.2.8 Village of Coney Island

The Village of Coney Island is located in southeastern part of the County, on the Shore of Table Rock Lake. The Village has a Board of Trustees with a Chairman, Clerk, and 3 Trustees. Because of the small size of the Village, it has few mitigation capabilities. A few are listed below:

- Flood Mitigation Assistance Plan
- Drainage Ordinance
- Emergency Management Coordinator

Table 2.12 provides information on Coney Island's mitigation capabilities based on the Data Collection Questionnaire.

Table 2.12. Village of Coney Island Mitigation Capabilities

Capability	Status Including Date of Document or Policy
Comprehensive Plan	No
Builder's Plan	No
Capital Improvement Plan	No
Local Emergency Plan	No
County Emergency Plan	No
Local Recovery Plan	No
County Recovery Plan	No
Local Mitigation Plan	No
County Mitigation Plan	Yes
Local Mitigation Plan (PDM)	No
County Mitigation Plan (PDM)	No
Economic Development Plan	No
Transportation Plan	No
Land-use Plan	No
Flood Mitigation Assistance (FMA) Plan	No
Watershed Plan	Yes
Firewise or other fire mitigation plan	No

School Mitigation Plan	No
Critical Facilities Plan (Mitigation/Response/Recovery)	No
Policies/Ordinance	**Status Including Date of Document or Policy**
Zoning Ordinance	No
Building Code	No
Floodplain Ordinance	No
Subdivision Ordinance	No
Tree Trimming Ordinance	Yes
Nuisance Ordinance	Yes; 1995
Storm Water Ordinance	No
Drainage Ordinance	Yes
Capability	**Status Including Date of Document or Policy**
Site Plan Review Requirements	No
Historic Preservation Ordinance	No
Landscape Ordinance	No
Debris Management Plan	No
Program	**Status Including Date of Document or Policy**
Zoning/Land Use Restrictions	No
Codes Building Site/Design	No
National Flood Insurance Program (NFIP) Participant	No
NFIP Community Rating System (CRS) Participating Community	No
Hazard Awareness Program	No
National Weather Service (NWS) Storm Ready	No
Building Code Effectiveness Grading (BCEGs)	No
ISO Fire Rating	No
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 (Local/County/Regional)	No
Mutual Aid Agreements	No
Studies/Reports/Maps	**Status Including Date of Document or Policy**
Hazard Analysis/Risk Assessment (Local)	No
Hazard Analysis/Risk Assessment (County)	No
Flood Insurance Maps	No
FEMA Flood Insurance Study (Detailed)	No
Evacuation Route Map	No
Critical Facilities Inventory	No
Vulnerable Population Inventory	No
Land Use Map	No
Staff/Department	**Status Including Date of Document or Policy**
Building Code Official	No
Building Inspector	No
Mapping Specialist (GIS)	No
Engineer	No
Development Planner	No
Public Works Official	No
Emergency Management Coordinator	Yes
NFIP Floodplain Administrator	No
Bomb and/or Arson Squad	No
Emergency Response Team	No
Hazardous Materials Expert	No
Local Emergency Planning Committee	No
County Emergency Management Commission	No
Sanitation Department	No
Transportation Department	No
Economic Development Department	No
Housing Department	No
Planning Consultant	No

Regional Planning Agencies	Yes: Southwest Missouri Council of Governments
Historic Preservation	No
Non-Governmental Organizations (NGOs)	**Status Including Date of Document or Policy**
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.	No
Local Funding Availability	**Status Including Date of Document or Policy**
Ability to apply for Community Development Block Grants	No
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	No
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

Table 2.13. Mitigation Capabilities Summary Table

CAPABILITIES	Uninc. Stone County	City of Branson West	City of Crane	City of Galena	City of Hurley	City of Kimberling City	City of Reeds Spring	Village of Coney Island
Capability								
Comprehensive Plan	Yes	Yes	Yes	No	No	To be adopted	No	No
Builder's Plan	No	No	Yes	No	No	Yes	No	No
Capital Improvement Plan	No	No	No	No	No	Yes	No	No
Local Emergency Plan	No	No	Yes	No	Yes	Yes	No	No
County Emergency Plan	Yes	No	No	No	No	Yes	Yes	No
Local Recovery Plan	No	No	Yes	No	No	Yes	No	No
County Recovery Plan	No	No	No	No	No	Yes	Yes	No
Local Mitigation Plan	No	Yes	Yes	No	No	No	No	No
County Mitigation Plan	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Local Mitigation Plan (PDM)	No	No	No	No	No	No	No	No
County Mitigation Plan (PDM)	No	No	No	No	No	No	No	No
Economic Development Plan	No	No	No	No	No	No	No	No
Transportation Plan	No	Yes	No	No	No	Yes	No	No
Land-use Plan	Yes	Yes	Yes	No	No	No	No	No
Flood Mitigation Assistance (FMA) Plan	Yes	No	No	No	No	Yes	No	No
Watershed Plan	No	No	No	No	No	No	No	Yes
Firewise or other fire mitigation plan	No	No	No	No	No	No	No	No
School Mitigation Plan	No	No	No	No	No	No	No	No
Critical Facilities Plan (Mitigation/Response/Recovery)	No	No	No	No	No	No	No	No
Policies/Ordinance								
Zoning Ordinance	Yes	Yes	Yes	No	No	Yes	Yes	No
Building Code	Yes	Yes	No	No	Yes	Yes	Yes	No
Floodplain Ordinance	Yes	No	Yes	Yes	Yes	Yes	Yes	No
Subdivision Ordinance	No	Yes	Yes	No	No	Yes	No	No
Tree Trimming Ordinance	No	No	No	No	No	No	No	Yes
Nuisance Ordinance	No	Yes	Yes	Yes	No	Yes	Yes	Yes
Storm Water Ordinance	No	Yes	No	No	No	Yes	No	No
Drainage Ordinance	No	Yes	No	No	No	Yes	No	Yes
Capability								
Site Plan Review Requirements	No	Yes	No	No	No	Yes	Yes	No
Historic Preservation Ordinance	No	No	No	No	No	No	No	No
Landscape Ordinance	No	Yes	No	No	No	No	No	No
Debris Management Plan	No	No	Yes	No	No	No	No	No
Program								
Zoning/Land Use Restrictions	Yes	Yes	Yes	No	No	Yes	No	No
Codes Building Site/Design	No	Yes	Yes	No	No	Yes	Yes	No

CAPABILITIES	Uninc. Stone County	City of Branson West	City of Crane	City of Galena	City of Hurley	City of Kimberling City	City of Reeds Spring	Village of Coney Island
National Flood Insurance Program (NFIP) Participant	Yes	No	Yes	Yes	Yes	Yes	Yes	No
NFIP Community Rating System (CRS) Participating Community	N/A	No	N/A	N/A	N/A	No	No	No
Hazard Awareness Program	No	No	No	No	No	No	No	No
National Weather Service (NWS) Storm Ready	No	No	No	No	No	Yes	No	No
Building Code Effectiveness Grading (BCEGs)	No	No	No	No	No	Yes	No	No
ISO Fire Rating	Yes	No	6	No	N/A	No	No	No
Economic Development Program	No	Yes	Yes	No	No	Yes	No	No
Land Use Program	No	Yes	No	No	No	In new comp. plan	No	No
Public Education/Awareness	No	No	No	No	No	Yes	No	No
Property Acquisition	No	No	No	No	No	Yes	No	No
Planning/Zoning Boards	Yes	Yes	Yes	No	No	Yes	Yes	No
Stream Maintenance Program	No	No	No	No	No	No	No	No
Tree Trimming Program	No	No	No	No	No	No	No	No
Engineering Studies for Streams (Local/County/Regional)	No	No	No	No	No	No	No	No
Mutual Aid Agreements	Yes	No	Yes	No	No	No	Yes	No
Studies/Reports/Maps								
Hazard Analysis/Risk Assessment (Local)	No	No	No	No	No	No	No	No
Hazard Analysis/Risk Assessment (County)	No	No	No	No	No	Yes	Yes	No
Flood Insurance Maps	No	No	No	No	No	Yes	No	No
FEMA Flood Insurance Study (Detailed)	No	No	No	No	No	No	No	No
Evacuation Route Map	Yes	No	No	No	No	No	No	No
Critical Facilities Inventory	No	No	No	No	No	Yes	No	No
Vulnerable Population Inventory	No	No	No	No	No	No	No	No
Land Use Map	No	Yes	Yes	No	No	Yes	No	No
Staff/Department								
Building Code Official	Yes	Yes	No	No	No	No	Yes	No
Building Inspector	Yes	Yes	No	No	No	Yes	Yes	No
Mapping Specialist (GIS)	Yes	No	No	No	No	No	No	No
Engineer	No	Yes	Yes	No	No	Yes	Yes	No
Development Planner	No	No	No	No	No	No	No	No
Public Works Official	No	Yes	Yes	Yes	No	Yes	Yes	No
Emergency Management Coordinator	Yes	No	No	Yes	No	Yes	Yes	Yes
NFIP Floodplain Administrator	Yes	No	Yes	Yes	Yes	Yes	Yes	No
Bomb and/or Arson Squad	No	No	No	No	No	No	No	No
Emergency Response Team	Yes	No	Yes	No	No	No	No	No
Hazardous Materials Expert	Yes	No	No	No	No	No	Yes	No
Local Emergency Planning Committee	Yes	No	No	No	No	No	No	No
County Emergency Management Commission	Yes	Yes	No	No	No	Yes	Yes	No
Sanitation Department	No	No	No	No	No	No	No	No

CAPABILITIES	Uninc. Stone County	City of Branson West	City of Crane	City of Galena	City of Hurley	City of Kimberling City	City of Reeds Spring	Village of Coney Island
Transportation Department	No	No	No	No	No	No	No	No
Economic Development Department	No	No	No	No	No	No-committee appointed by Mayor	No	No
Housing Department	Yes	No	No	No	No	No	No	No
Planning Consultant	No	No	No	No	No	No	No	No
Regional Planning Agencies	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Historic Preservation	Yes	No	No	No	No	No	No	No
Non-Governmental Organizations (NGOs)								
American Red Cross	No	No	No	No	No	No	No	No
Salvation Army	No	No	No	No	No	No	No	No
Veterans Groups	Yes	Yes	No	No	No	Yes	No	No
Environmental Organization	Yes	No	No	No	No	No	No	No
Homeowner Associations	Yes	No	No	No	No	Yes	Yes	No
Neighborhood Associations	Yes	No	No	No	No	Yes	Yes	No
Chamber of Commerce	Yes	Yes	No	No	No	Yes	No	No
Community Organizations (Lions, Kiwanis, etc.	Yes	No	No	No	No	Yes	No	No
Local Funding Availability								
Ability to apply for Community Development Block Grants	Yes	No	Yes	Yes	Yes	Yes	Yes	No
Ability to fund projects through Capital Improvements funding	Yes	Yes	Yes	Yes	N/A	Yes	Yes	No
Authority to levy taxes for a specific purpose	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Fees for water, sewer, gas, or electric services	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Impact fees for new development	No	Yes	No	Yes	No	Yes	Yes	No
Ability to incur debt through general obligation bonds	Yes	Yes	Yes	Yes	Yes	Yes	Yes	No
Ability to incur debt through special tax bonds	Yes	No	No	Yes	No	Yes	Yes	No
Ability to incur debt through private activities	No	No	No	Yes	No	Yes	No	No
Ability to withhold spending in hazard prone areas	No	No	No	No	No	No	No	No

Source: Data Collection Questionnaires, date

2.2.9 Southern Stone County Fire

The Fire District is comprised of approximately 280 square miles of the southern part of Stone County. Southern Stone has responsibility over the largest part of Table Rock Lake.

The district's mission statement is "to promote life safety and reduce human suffering to the citizens and visitors of the Southern Stone County Fire Protection District. To achieve this goal through public education and fire prevention programs. We shall seek to minimize the results of fire, medical or rescue emergencies and disasters in this District. To understand that each fire fighter is valuable and to maximize each person's potential. To serve our District with professionalism, excellence and devotion to duty. To strive for the future, never forgetting the past."

The District is governed by a five-person board of directors. The directors oversee the operation and management of the fire district. The Fire Chief runs the operational aspect of the district, but the board ensures he has all the available tools to do the job. In addition to the District Headquarters in Branson West, the District has 15 fire stations.

District positions include:

- Fire Chief
- Assistant Fire Chief
- Fire Marshal
- Deputy Chief Training
- Battalion Chiefs
- Fire Inspector
- Office Manager
- Statistician
- Service Technician

Past or ongoing projects or programs designed to reduce disaster losses, and mitigation-related capabilities include:

- Public Fire Safety Programs
- ISO Fire Rating
- Mutual Aid Agreements

2.2.10 Public School District Profiles and Mitigation Capabilities

This section provides general information about participating school districts in the plan. There are five school districts with facilities in Stone County; however, only Hurley R-I and Reeds Spring R-IV participated in this plan update. Several school districts extend into Stone County from surrounding counties, but no facilities are located in Stone County. **Figure 2.4** is a map of school district boundaries in Stone County.

Figure 2.4. Stone County School Districts

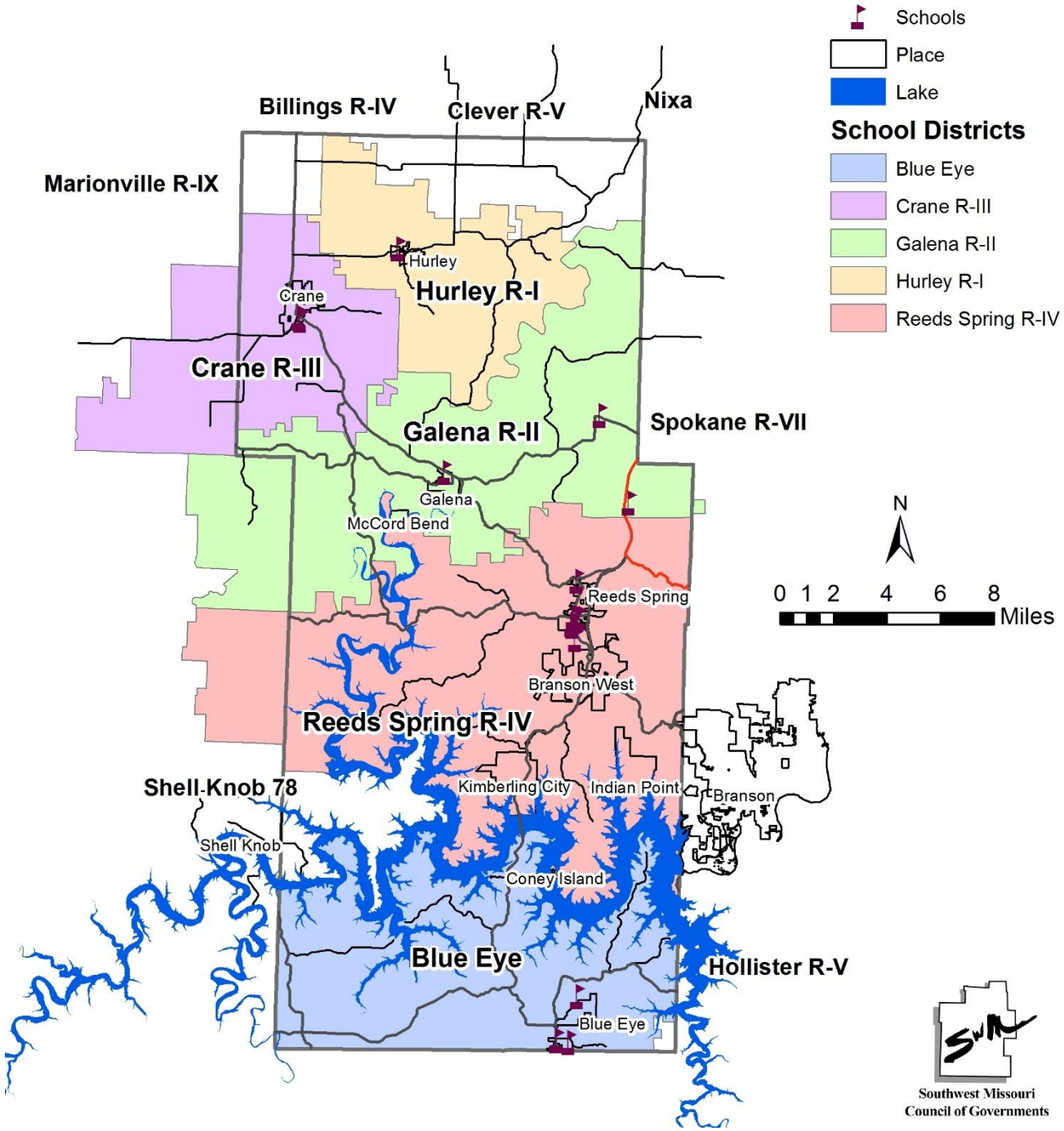


Table 2.14. School District Buildings and Enrollment Data, 2017

District Name	Building Name	Building Enrolment
Hurley R-I	Hurley High	126
Hurley R-I	Hurley Elementary	93
Reeds Spring R-IV	Reeds Spring High	629
Reeds Spring R-IV	Reeds Spring Middle	261
Reeds Spring R-IV	Reeds Spring Primary	324
Reeds Spring R-IV	Reeds Spring Elementary	379
Reeds Spring R-IV	Reeds Spring Intermediate	268

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

Table 2.15. Summary of Mitigation Capabilities Stone County School Districts

Capability	Hurley R-I	Reeds Spring R-IV
Planning Elements		
Master Plan/ Date	No	Yes; 2016
Capital Improvement Plan/Date	No	No
School Emergency Plan / Date	No	Yes; 2017
Weapons Policy/Date	No	Yes; 2006
Personnel Resources		
Full-Time Building Official (Principal)	No	Yes
Emergency Manager	No	Yes
Grant Writer	No	No
Public Information Officer	No	Yes
Financial Resources		
Capital Improvements Project Funding	No	Yes
Local Funds	No	Yes
General Obligation Bonds	No	Yes
Special Tax Bonds	No	No
Private Activities/Donations	Yes	No
State and Federal Funds/Grants	Yes	Yes
Other		
Public Education Programs	No	No
Privately or Self- Insured?	N/A	N/A
Fire Evacuation Training	No	Yes
Tornado Sheltering Exercises	No	Yes
Public Address/Emergency Alert System	Yes	Yes
NOAA Weather Radios	Yes	Yes
Lock-Down Security Training	No	No
Mitigation Programs	Yes	Yes
Tornado Shelter/Saferoom	Yes	Yes
Campus Police	No	Yes

Source: Data Collection Questionnaires, 2017

3 RISK ASSESSMENT

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Vulnerability....3.105
Problem Statement....3.106

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 Stone County, 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 Stone County 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 is an update of the previous Stone County Hazard Mitigation Plan adopted in May of 2013. According to the U.S. Census Bureau July 1, 2016 population estimate, the population of Stone County fell to 31,047, down from 32,202 at the time of the 2010 decennial census. The population has decreased by approximately 921 people since the Stone County Hazard Mitigation Plan was adopted in 2013. According to the building permit data from the U.S. Census Bureau, 669 single family residences and 8 multi-family structures with 19 units have been added to the building stock from 2011 to 2016. The estimated construction cost of these new structures was $177,463,209.

Stone County is a third class county in Missouri. According to the Missouri Revised Statutes (MORS 48.020), "All counties having an assessed valuation of less than the assessed valuation necessary for that county to be in the second classification shall automatically be in the third classification."

This chapter is divided into four main parts:

- **Section 3.1 Hazard Identification** identifies the hazards that threaten Stone County and provides a factual basis for elimination of hazards from further consideration;

- **Section 3.2 Assets at Risk** provides Stone County'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 Stone County. For each hazard, there are three sections: 1) Hazard Profile provides a general description and discusses the threat to Stone County, 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 Plan profiles all natural hazards that can affect Stone County. The natural hazards that can affect the county have been identified in the 2013 Stone County Plan and the 2013 Missouri State Plan. Natural hazards are naturally occurring climatological, hydrological or geologic events that have a negative effect on people and the built environment. Natural hazards identified include:

- Dam Failure
- Drought
- Earthquake
- Extreme Heat
- Wildfire
- Riverine and Flash Flood
- Land Subsidence/ Sinkholes
- Severe Thunderstorm/ High Winds/ Lightning/ Hail
- Tornado
- Winter Weather/ Snow/ Ice/ Severe Cold

No new natural hazards have been identified since the adoption of the previous plan. The 2013 Missouri State Plan also addresses human-caused, and technological hazards; however, these will not be included in this plan update.

3.1.1 Review of Existing Mitigation Plans

The MPC reviewed the hazards identified in the previously approved plan, as well as the hazards identified in the state plan at the August 15th, 2017 meeting. The hazards identified in the 2013 Stone County Plan are identified in the 2013 Missouri State Plan. The State Plan also includes levee failure as well as structural and urban fire in addition to wildfire. Human-caused and technological hazards identified in the State Plan include:

- CBRNE Attack
- Civil Disorder
- Cyber Disruption
- Hazardous Materials
- Mass Transportation Accidents
- Nuclear Power Plants
- Public Health Emergencies/Environmental Issues
- Special Events
- Terrorism
- Utility Interruptions and System Failures

In Missouri, local plans customarily include only natural hazards, as only natural hazards are required by federal regulations to be included. It was determined to include only natural hazards. The MPC agreed that human-caused and technological hazards are addressed in a Regional Homeland

Security Oversight Committee (RHSOC) Threat and Hazard Identification Risk Assessment (THIRA) and that including only natural hazards would meet the needs of local entities participating in the plan update.

Levee failure was omitted due to the fact that the National Levee Database, maintained by the U.S. Army Corps of Engineers (USACE), shows no federal levees located in the Stone County and planning committee research revealed no records of levees within Stone County. Although it is likely that levees exist, such as low-head agricultural levees, no records indicate that that a breach or overtopping of these levees would impact property other than that of the levee owner. Damage to residential structures is unlikely. Therefore, these hazards are not included in this risk assessment for Stone County. Landslides occur in all 50 states; however, this hazard is not likely to have much of a notable impact on Stone County due to soil profile, geology, and climate factors. In addition, the risk of coastal storms, hurricanes, tsunamis, avalanche, and volcanic activity does not exist in Stone County due to the county's location in the central United States.

3.1.2 Review Disaster Declaration History

From 1990 to present, Stone County has experienced severe storms, tornadoes, flooding, straight-line winds, and severe winter storms. All of these natural hazard events triggered federal disaster declarations. Federal and/or state declarations may be granted when the severity and magnitude of an event surpasses the ability of the local government to respond and recover. Disaster assistance is supplemental and sequential. When the local government's capacity has been surpassed, a state disaster declaration may be issued, allowing for the provision of state assistance. If the disaster is so severe that both the local and state governments' capacities are exceeded; a federal emergency or disaster declaration may be issued allowing for the provision of federal assistance.

FEMA also issues emergency declarations, which are more limited in scope and do not include the long-term federal recovery programs of major disaster declarations. Determinations for declaration type are based on scale and type of damages and institutions or industrial sectors affected. The Robert T. Stafford Disaster Relief and Emergency Assistance Act, (PL 100-707) requires that all requests for a declaration by the President must be made by the governor of the affected state. State and federal officials conduct a Preliminary Damage Assessment (PDA) to show that the disaster is of such severity and magnitude that effective response is beyond state and local capabilities. Based on the governor's request, the president may declare that a major disaster or emergency exists, thus activating federal programs to assist in the response and recovery effort. Not all programs are activated for every disaster. Some declarations will provide only individual assistance or public assistance, while others provide both. FEMA also issues emergency declarations, which are more limited in scope and do not include the long-term federal recovery programs of major disaster declarations. Determinations for declaration type are based on scale and type of damages and institutions or industrial sectors affected.
(https://www.fema.gov/disaster-declaration-process)

Since 1990, Stone County has experienced fifteen (15) hazard events that triggered federal disaster declarations. The most recent occurred on June 2, 2017. Flooding was included in 13 out of 15 events that triggered a FEMA disaster declaration. Ten declarations also included tornados. Nine of these declarations triggered both individual and public assistance.

Table 3.1 lists the federal FEMA disaster declarations that included Stone County from 1990 to 2017.

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

Disaster Number	Description	Declaration Date	Individual Assistance (IA) Public Assistance (PA)
4317	Severe Storms, Tornadoes, Straight-line Winds, Flooding	June 2, 2017	Individual & Public Assistance
4250	Severe Storms, Tornadoes, Straight-line Winds, Flooding	January 21, 2016	Individual & Public Assistance
4238	Severe Storms, Tornadoes, Straight-line Winds, Flooding	August 7, 2015	Public Assistance
1980	Severe Storms, Tornadoes, Flooding	May 9, 2011	Individual & Public Assistance
1847	Severe Storms, Tornadoes, Flooding	June 19, 2009	Public Assistance
1822	Severe Winter Storms	February 17, 2009	Public Assistance
1809	Severe Storms, Tornado, Flooding	November 13, 2008	Individual & Public Assistance
1773	Severe Storms, Flooding	June 25, 2008	Individual & Public Assistance
1749	Severe Storms, Flooding	March 19, 2008	Individual & Public Assistance
1742	Severe Storms, Tornadoes, Straight-line Winds, Flooding	February 5, 2008	Public Assistance
1676	Severe Winter Storms, Flooding	January 15, 2007	Public Assistance
1463	Severe Storms, Tornadoes, Flooding	May 6, 2003	Individual Assistance
1412	Severe Storms, Tornadoes	May 6, 2002	Individual & Public Assistance
1054	Severe Storm, Tornadoes, Hail, Flooding	June 2, 1995	Individual & Public Assistance
995	Flooding, Severe Storm	July 9, 1993	Individual & Public Assistance

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

3.1.3 Research Additional Sources

A variety of sources were researched for data on natural hazards. Primary sources included FEMA, SEMA, National Centers for Environmental Information (NCEI) and National Oceanic and Atmospheric Administration (NOAA). The U.S. Geological Survey (USGS) and the Center for Earthquake Research and Information (CERI) were major sources for earthquake information. The Missouri Department of Natural Resources (MDNR) Dam Safety Division provided information concerning dams and the Missouri Department of Conservation (MDC). Other information sources included county officials; existing city, county, regional and state plans; and information from local officials. The additional sources of data on locations and past impacts of hazards in Stone County include:

- Missouri Hazard Mitigation Plans (2010 and 2013)
- Stone County Multi-Jurisdictional Natural Hazard Mitigation Plan (2013)
- 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
- National Fire Incident Reporting System (NFIRS)
- National Oceanic and Atmospheric Administration's (NOAA) National Centers for Environmental Information (NCEI);
- 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

The only centralized source of data for many of the weather-related hazards is the National Oceanic and Atmospheric Administration's (NOAA) National Centers for Environmental Information (NCEI). Although it is usually the best and most current source, there are limitations to the data which should be noted. The NCEI 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 NCEI 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 NCEI should be cautious as the NWS does not guarantee the accuracy or validity of the information.

The NCEI 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 September 2017, 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.

- Tornado: From 1950 through 1954, only tornado events were recorded.
- 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.
- All Event Types (48 from Directive 10-1605): From 1996 to present, 48 event types are recorded as defined in NWS Directive 10-1605.

It should be noted that injuries and deaths caused by a storm event are reported on an area-wide basis. The death or injury listed in connection with that county weather event search did not necessarily occur in that county.

3.1.4 Hazards Identified

The natural hazards that can possibly, or have affected Stone County, are profiled in alphabetical order. All hazards do not affect every jurisdiction participating in the Plan. **Table 3.2** provides a summary of the jurisdictions that may be affected by each hazard. An “x” in the table indicates that jurisdictions are affected by the hazard, and a "-" indicates the hazard is not applicable to that jurisdiction.

Table 3.2. Hazards Identified for Each Jurisdiction

Jurisdiction	Dam Failure	Drought	Earthquake	Extreme Heat	Fires (Structural/Urban/Wild)	Flooding (River and Flash)	Land Subsidence/Sinkholes	Severe Winter Weather	Thunderstorm/Lightning/Hail/ High Wind	Tornado
Stone County	x	x	x	x	x	x	x	x	x	x
Branson West	-	x	x	x	x	x	-	x	x	x
Crane	-	x	x	x	x	x	x	x	x	x
Galena	x	x	x	x	x	x	-	x	x	x
Hurley	-	x	x	x	x	x	-	x	x	x
Kimberling City	-	x	x	x	x	x	x	x	x	x
Reeds Spring	-	x	x	x	x	x	x	x	x	x
Blue Eye	-	x	x	x	x	x	x	x	x	x
Coney Island	-	x	x	x	x	x	-	x	x	x
Indian Point	--	x	x	x	x	x	-	x	x	x
McCord Bend	x	x	x	x	x	x	-	x	x	x
Schools and Special Districts										
Hurley R-I School District	-	-	x	x	x	x	-	x	x	x
Reeds Spring R-VI School District	-	-	x	x	x	x	x	x	x	x
Southern Stone County Fire	-	x	x	x	x	x	x	x	x	x

3.1.5 Multi-Jurisdictional Risk Assessment

The risk assessment assesses each participating jurisdiction's vulnerability to each hazard that can affect Stone County. Many of the hazards identified in the risk assessment have the same probability of occurrence throughout the County. The hazards that vary across the County in terms of risk include dam failure, flash flood, grass or wildland fire, river flood, and sinkholes/land subsidence. These differences are detailed in each hazard profile under geographic location and vulnerability.

Stone County has a continental climate with mild winters and hot summers. The Cities of Crane and Kimberling City are the most urbanized, experiencing more construction and development than most other portions of the county. Naturally, the urbanized areas of Stone County have a greater density of important assets, which are more vulnerable to weather-related hazards. These communities plan to continue to grow and expand City boundaries, which will increase vulnerability to natural hazards. This increase in vulnerability, however, can be mitigated through updated building codes and code enforcement, as well as land use planning.

Agricultural uses are primarily located in rural, unincorporated Stone County. These areas are especially vulnerable to hail damages or drought.

These capabilities and resources to mitigate the impact of natural hazards vary across jurisdictions in Stone County. These differences will be discussed in greater detail in the vulnerability sections of each hazard.

3.2 Assets at Risk

This section assesses Stone County population, structures, critical facilities and infrastructure, and other important assets that may be at risk to hazards. The inventory of assets for each jurisdiction were derived from parcel data from the Stone County Assessor, the Stone County Structures dataset downloaded from Missouri Spatial Data information Service (MSDIS), and local jurisdiction data collection questionnaires.

3.2.1 Total Exposure of Population and Structures

Unincorporated County and Incorporated Cities

In the following three tables, population data is based on 2015 Census Bureau data. Building counts were based on Missouri GIS data and building exposure values are based on parcel data provided by the Stone County Assessor. Contents exposure values were calculated by factoring a multiplier to the building exposure values based on usage type. The multipliers were derived from the HAZUS MH 2.1 and are defined below in **Table 3.3**. Land values have been purposely excluded from consideration because land remains following disasters, and subsequent market devaluations are frequently short term and difficult to quantify. Another reason for excluding land values is that state and federal disaster assistance programs generally do not address loss of land (other than crop insurance). In addition, government-owned properties are usually taxed differently or not at all, and so

may not be an accurate representation of true value. Note that public school district assets and special districts assets are included in the total exposure tables assets by community and county.

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

Table 3.3. Maximum Population and Building Exposure by Jurisdiction-

Jurisdiction	2015 Population	Building Count	Building Exposure ($)	Contents Exposure ($)	Total Exposure ($)
City of Branson West	434	303	$39,035,000	$32,622,050	$71,657,050
City of Crane	2,022	1,102	$35,434,800	$21,336,100	$56,770,900
City of Galena	556	436	$11,163,400	$6,399,400	$17,562,800
City of Hurley	220	218	$5,445,000	$2,832,300	$8,277,300
City of Kimberling City	2,687	1,647	$154,862,604	$89,391,104	$244,253,708
City of Reeds Spring	905	665	$33,225,600	$19,073,350	$52,298,950
Village of Blue Eye	220	164	$22,464,600	$12,916,150	$35,380,750
Village of Coney Island	68	165	$6,290,500	$3,274,150	$9,564,650
Village of Indian Point	541	1,090	$156,627,500	$100,305,050	$256,932,550
Village of McCord Bend	280	312	$2,521,500	$1,260,750	$3,782,250
Unincorporated	23,392	35,378	$1,557,633,196	$835,118,696	$2,392,751,892
Totals	**31,325**	**41,480**	**$2,024,703,700**	**$1,124,529,100**	**$3,149,232,800**

Sources: Population, 2015 American Community Survey; Building Count and Building Exposure, Missouri GIS Database; Stone County Parcel Data.
Contents Exposure derived by applying multiplier to Building Exposure based on HAZUS MH 2.1 standard contents multipliers per usage type as follows: Residential (50%), Commercial (100%), Agricultural (100%). For purposes of these calculations, government, school, and utility were calculated at the commercial contents rate.

Table 3.4. Building Values/Exposure by Usage Type

Jurisdiction	Residential	Commercial	Agricultural	Total
City of Branson West	$12,825,900	$26,157,800	$51,300	$39,035,000
City of Crane	$28,197,400	$7,147,100	$90,300	$35,434,800
City of Galena	$9,528,000	$1,607,000	$28,400	$11,163,400
City of Hurley	$5,225,400	$153,900	$65,700	$5,445,000
City of Kimberling City	$130,943,000	$23,906,204	$13,400	$154,862,604
City of Reeds Spring	$28,304,500	$4,820,800	$100,300	$33,225,600
Village of Blue Eye	$19,096,900	$3,288,700	$79,000	$22,464,600
Village of Coney Island	$6,032,700	$257,800	$0	$6,290,500
Village of Indian Point	$112,644,900	$43,974,900	$7,700	$156,627,500
Village of McCord Bend	$2,521,500	$0	$0	$2,521,500
Unincorporated	$1,445,029,000.00	$96,973,496.00	$15,630,700.00	$1,557,633,196.00
Totals	**$1,800,349,200**	**$208,287,700**	**$16,066,800**	**$2,024,703,700**

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

Table 3.5. Building Counts by Usage Type

Jurisdiction	Residential Counts	Commercial Counts	Agricultural Counts	Building General Counts	Total
City of Branson West	127	43	16	117	303
City of Crane	501	84	22	495	1,102
City of Galena	166	17	55	198	436
City of Hurley	76	4	25	113	218
City of Kimberling City	1080	70	3	494	1,647
City of Reeds Spring	388	49	19	209	665
Village of Blue Eye	53	6	19	86	164
Village of Coney Island	82	0	0	83	165
Village of Indian Point	593	33	9	455	1,090
Village of McCord Bend	130	0	10	172	312
Unincorporated	14,652	351	6,648	13,727	35,378
Totals	**17,848**	**657**	**6,826**	**16,149**	**41,480**

Source: Missouri GIS Database, http://sema.dps.mo.gov/programs/mitigation_management.php; Public School Districts and Special Districts. *Building General Counts include any structures that don't fall into the Residential, Commercial, or Agricultural categories. This ranges from industrial buildings, to churches, to outbuildings, to docks.

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

Table 3.6. Population and Building Exposure by Jurisdiction-Public School Districts

Public School District	Enrollment	Building Count	Building Exposure ($)	Contents Exposure ($)	Total Exposure ($)
Hurley R-I	219	2	$10,000,000	$2,800,000	$12,800,000
Reeds Spring R-IV	1231	5	$32,466,766	$8,929,448	$41,396,214

Source: http://mcds.dese.mo.gov/quickfacts/Pages/District-and-School-Information.aspx., select the file for the most recent year called "20xx Building Enrollment PK-12", filter the spreadsheet by selecting only the public school districts in the planning area. The Building Exposure, Contents Exposure, and Total Exposure amounts come from the completed Data Collection Questionnaires from Public School Districts. In general, the school districts obtain this information from their insurance coverage amounts.

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 facilities, which may be designated as essential, high potential loss, and transportation/lifeline facilities to identified hazards. Critical Facilities are those facilities essential in providing utility or direction either during the response to an emergency or during the recovery operation. Definitions of each of these types of facilities are provided below.

- Essential Facility: Those facilities that if damaged, would have devastating impacts on disaster response and/or recovery. Examples includes: hospitals, medical facilities, police, and fire stations.
- High Potential Loss Facilities: Those facilities that would have a high loss or impact on the community. Examples includes: power plants, hazardous materials sites, schools, day care centers, nursing homes, and main government buildings.
- Transportation and lifeline facilities: Those facilities and infrastructure critical to transportation, communications, and necessary utilities. Examples include: railroads, airports, water treatment facilities, natural gas facilities, pipelines, and communication facilities.

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

- HAZUS 4.0

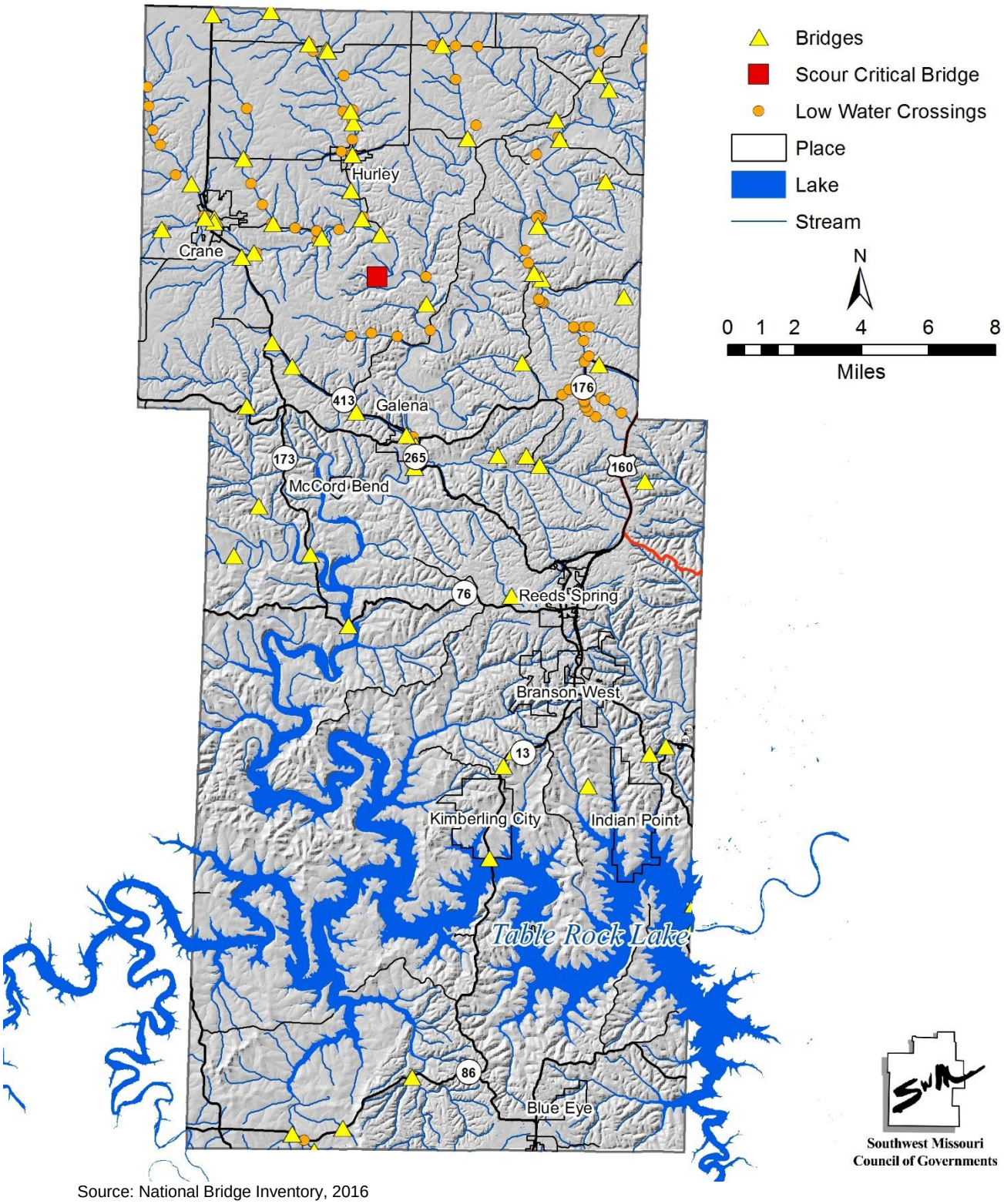
Table 3.7. Inventory of Critical/Essential Facilities and Infrastructure by Jurisdiction

Jurisdiction	Airport Facility	Bus Facility	Childcare Facility	Communications Tower	Electric Power Facility	Emergency Operations	Fire Service	Government	Housing	Shelters	Highway Bridge	Hospital/Health Care	Military	Natural Gas Facility	Nursing Homes	Police Station	Potable Water Facility	Rail	Sanitary Pump Stations	School Facilities	Stormwater Pump Stations	Tier II Chemical Facility	Wastewater Facility	Total
City of Branson West	1						4	1				1				1							1	9
City of Crane				1	1		2	1			2	2			1	1	1	1		1			1	15
City of Galena							1	1				1								2			1	6
City of Hurley			1				1	1												2			1	6
City of Kimberling City				1				1			1					1	1		14				1	21
City of Reeds Spring							1	1												7			1	10
Village of Coney Island																	1							1
Stone County	1		5	1		1	15				10			1	3							1		38
Totals	**2**	**0**	**6**	**3**	**1**	**1**	**24**	**6**	**0**	**0**	**13**	**4**	**0**	**1**	**4**	**3**	**3**	**1**	**14**	**12**	**0**	**1**	**6**	**105**

Source: Data Collection Questionnaires, HAZUS 4.0

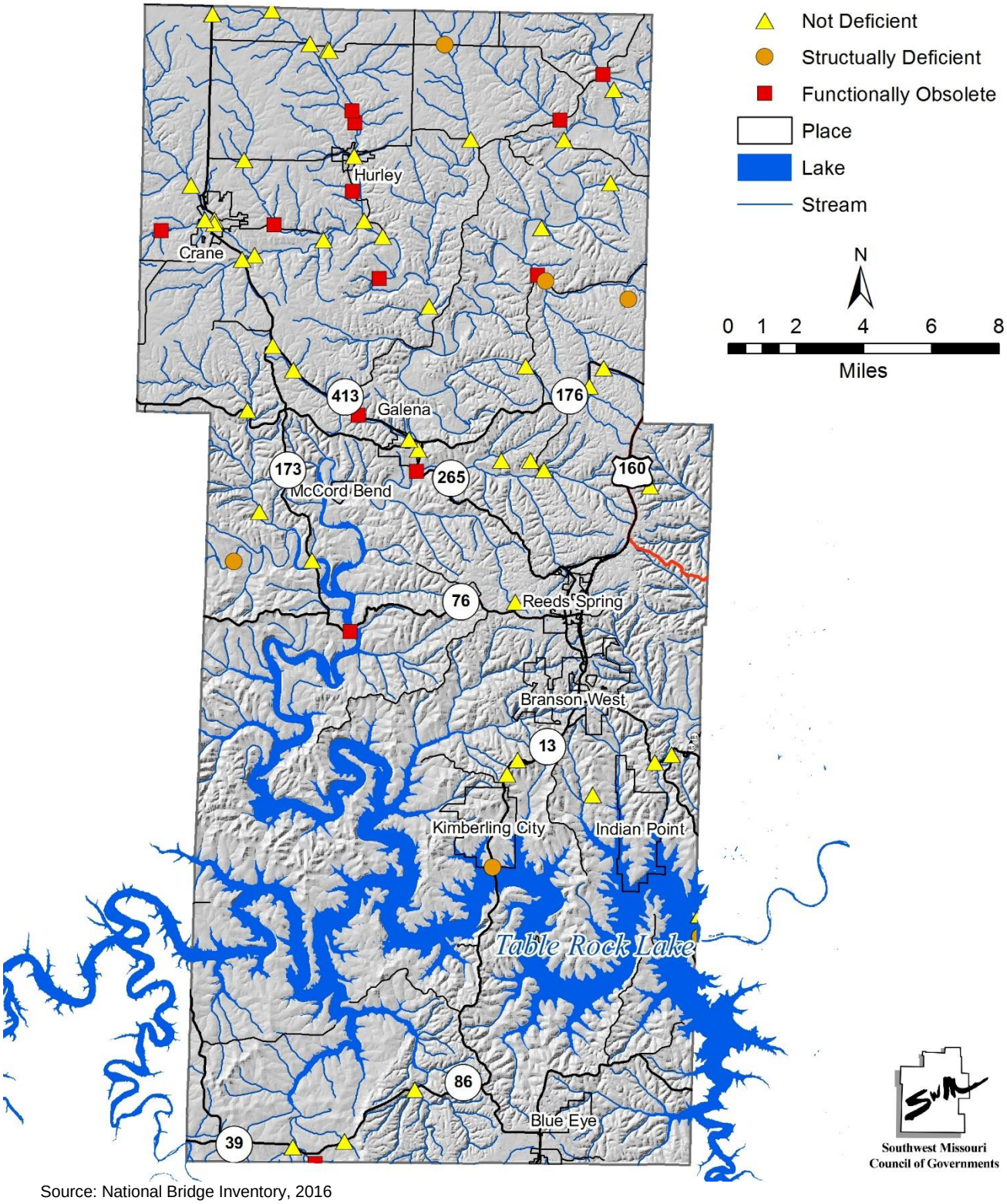
Figure 3.1 is a map that shows the locations of bridges in the planning area included in the National Bridge Inventory data set. The NBI data contains a “scour index”, which is a number indicating the vulnerability of a bridge to scour during a flood. Bridges with a scour index between 1 and 3 are considered “scour critical”, or a bridge with a foundation determined to be unstable for the observed or evaluated scour condition. According to this information, there is one scour critical bridge identified in Stone County. Included on the map is local low water crossing locations within the county.

Figure 3.1. **Stone County Bridges and Low Water Crossings**



Source: National Bridge Inventory, 2016

Figure 3.2. **Structurally Deficient Bridges**



Source: National Bridge Inventory, 2016

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 3.8** shows Federally Threatened, Endangered, Proposed and Candidate Species in the Stone County.

Table 3.8. Threatened and Endangered Species in Stone County

Common Name	Scientific Name	Status
Gray Bat	Myotis grisescens	Endangered
Indiana Bat	Myotis sodalis	Endangered
Northern Long-Eared Bat	Myotis septentrionalis	Threatened
Ozark Big-Eared Bat	Corynorhinus townsendii ingens	Endangered
Ozark Cavefish	Amblyopsis rosae	Threatened
Neosho Mucket	Lampsilis rafinesqueana	Endangered
Rabbitsfoot	Quadrula cylindrica cylindrica	Threatened
Virginia Sneezeweed	Helenium virginicum	Threatened

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

Natural Resources: The Missouri Department of Conservation (MDC) provides a database of lands the MDC owns, leases, or manages for public use. **Table 3.9** provides the names and locations of parks and conservation areas in the Stone County.

Table 3.9. Parks in Stone County

Area Name	Address	City
Ashe Juniper Natural Area	California Ln	Blue Eye
Ralph Cox Memorial Access	Off MO 413	Galena
Hayes Spring Conservation Area	Off Aa-110	Hurley
Ruth and Paul Henning Conservation Area	Off MO 76	Branson West
Holland State Forest	Off V-20 C	Galena
Hooten Town Access	The Loop Rd	Crane
Jessie Hollow Conservation Area	Tilden Rd	Galena

H. L. Kerr Access	2194 Horse Creek Rd	Galena
Pilot Knob Conservation Area	Off MO 39	Shell Knob
Wire Road Conservation Area	Off Old Wire Rd	Crane

Source: http://mdc7.mdc.mo.gov/applications/moatlas/AreaList.aspx

Park Name	Address	City
Crane City Park	107 Myrna Lewers Parkway	Crane
Crane Public Pool	102 Maud Street	Crane
Y Bridge Park	103 Y Bridge Blvd	Galena
Joe Bald Park	Boat Dock Circle	Stone County
Mill Creek Park	1236 State Highway RB	Lampe
Aunts Creek Park	State Highway OO	Reeds Spring
Indian Point Park	3125 Indian Point Rd	Indian Point

Source: Google Maps

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.

Properties in Stone County that are on the National Register of Historic Places are listed in **Table 3.10.**

Table 3.10. Stone County Properties on the National Register of Historic Places

Property	Address	City	Date Listed
Morrill, Levi, Post Office and Homestead	2.5 mi. E of MO 76 and MO 13 intersection	Reeds Spring	4/03/79
Southwest Missouri Prehistoric Rock Shelter and Cave Sites Discontiguous Archaeological District	Address Restricted	n/a	10/24/91
Stone County Courthouse	Public Sq.	Galena	11/14/80
Y Bridge	Jct. of MO 43 and 13, across the James River	Galena	5/23/91

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

Table 3.11 lists some of the major employers in Stone County.

Table 3.11. Major Non-Government Employers in Stone County

Employer Name	Main Locations	Product or Service	Employees
Silver Dollar City	Indian Point	Entertainment	1,500
Branson West Rehab	Reeds Spring	Healthcare	300
Reeds Spring R-IV Schools	Reeds Spring	Education	300
Walmart Supercenter	Branson West	Shopping/Retail	135
Crane R-III Schools	Crane	Education	107
Tablerock Healthcare	Stone County	Healthcare	300
Port of Kimberling Resort	Kimberling City	Hospitality	50

Source: Data Collection Questionnaires; local Economic Development Commissions

Table 3.12 provides a summary of agriculture in Stone County.

Table 3.12. Agriculture in Stone County

Category	2007	2012	Percent Change
Number of Farms	753	601	-20%
Land in Farms	121,792 acres	118,015 acres	-3%
Average Size of Farms	162 acres	196 acres	+21%
Market Value of Products Sold			
Crop Sales	N/A	$3,672,000	N/A
Livestock Sales	N/A	$30,821,000	N/A
Total	$25,320,000	$34,493,000	+36%
Average Per Farm	$33,625	$57,393	+71%
Government Payments	$149,000	$368,000	+147%
Average Per Farm Receiving Payments	$3,397	$6,132	+81%

Source: USDA Census of Agriculture: https://www.agcensus.usda.gov/Publications/2012/Online_Resources/County_Profiles/Missouri

3.3 Land Use and Development

3.3.1 Development Since Previous Plan Update

Stone County has experienced population decline since 2010, decreasing in population by about 2.7% from 2010 to 2015. Most of this loss is from rural areas however, and several of the incorporated communities have seen population growth since 2010.

Table 3.13 provides the population growth statistics for all cities and villages in Stone County, as well as the county as a whole.

Table 3.13. County Population Growth, 2010-2015

Jurisdiction	2010 Population	2015 Population	2010-2015 # Change	2010-2015 % Change
Stone County	32,202	31,325	-877	-2.7%
City of Branson West	478	434	-44	-9.2%
City of Crane	1,462	2,022	560	38.3%
City of Galena	440	556	116	26.4%
City of Hurley	178	220	42	23.6%
City of Kimberling City	2,400	2,687	287	12.0%
City of Reeds Spring	913	905	-8	-0.9%
Village of Blue Eye	167	220	53	31.7%
Village of Coney Island	75	68	-7	-9.3%
Village of Indian Point	528	541	13	2.5%
Village of McCord Bend	297	280	-17	-5.7%
Unincorporated	25,264	23,392	-1872	-7.4%

Source: U.S. Bureau of the Census, Decennial Census, American Community Survey 2011-2015; Population Statistics are for entire

incorporated areas as reported by the Census bureau

Population growth or decline is generally accompanied by increases or decreases in the number of housing units. Increases in population add to the built environment and increase risk and exposure to hazard events. For Branson West and Reeds Spring, this held true, but it didn't for Coney Island or McCord Bend, which both gained housing units while losing population.

Table 3.14 provides the change in numbers of housing units in the planning area from 2010 to 2015. The totals for 2015 were taken from the American Community Survey 2011-2015 5-year estimates. It should be noted that there is a margin of error associated with these values.

Table 3.14. Change in Housing Units, 2010-2015

Jurisdiction	Housing Units 2010	Housing Units 2015	2010-2015 # Change	2010-2015 % Change
Stone County	20,373	20,522	149	0.7%
City of Branson West	215	204	-11	-5.1%
City of Crane	663	740	77	11.6%
City of Galena	239	254	15	6.3%
City of Hurley	79	81	2	2.5%
City of Kimberling City	1,431	1,515	84	5.9%
City of Reeds Spring	453	401	-52	-11.5%
Village of Blue Eye	205	240	35	17.1%
Village of Coney Island	96	107	11	11.5%
Village of Indian Point	716	729	13	1.8%
Village of McCord Bend	155	170	15	9.7%

Source: U.S. Bureau of the Census, 2010 Census, 2015 American Community Survey, 5-year estimates; Population Statistics are for entire incorporated areas as reported by the U.S. Census Bureau

Figures 3.3 and **3.4** are population density maps depicting census block population at the time of the 2000 and 2010 census, respectively. Each dot on the maps represents 60 people. The maps display much of the population as small groups of people.

Figure 3.3. **Stone County Dot Density by Census Block, 2000**

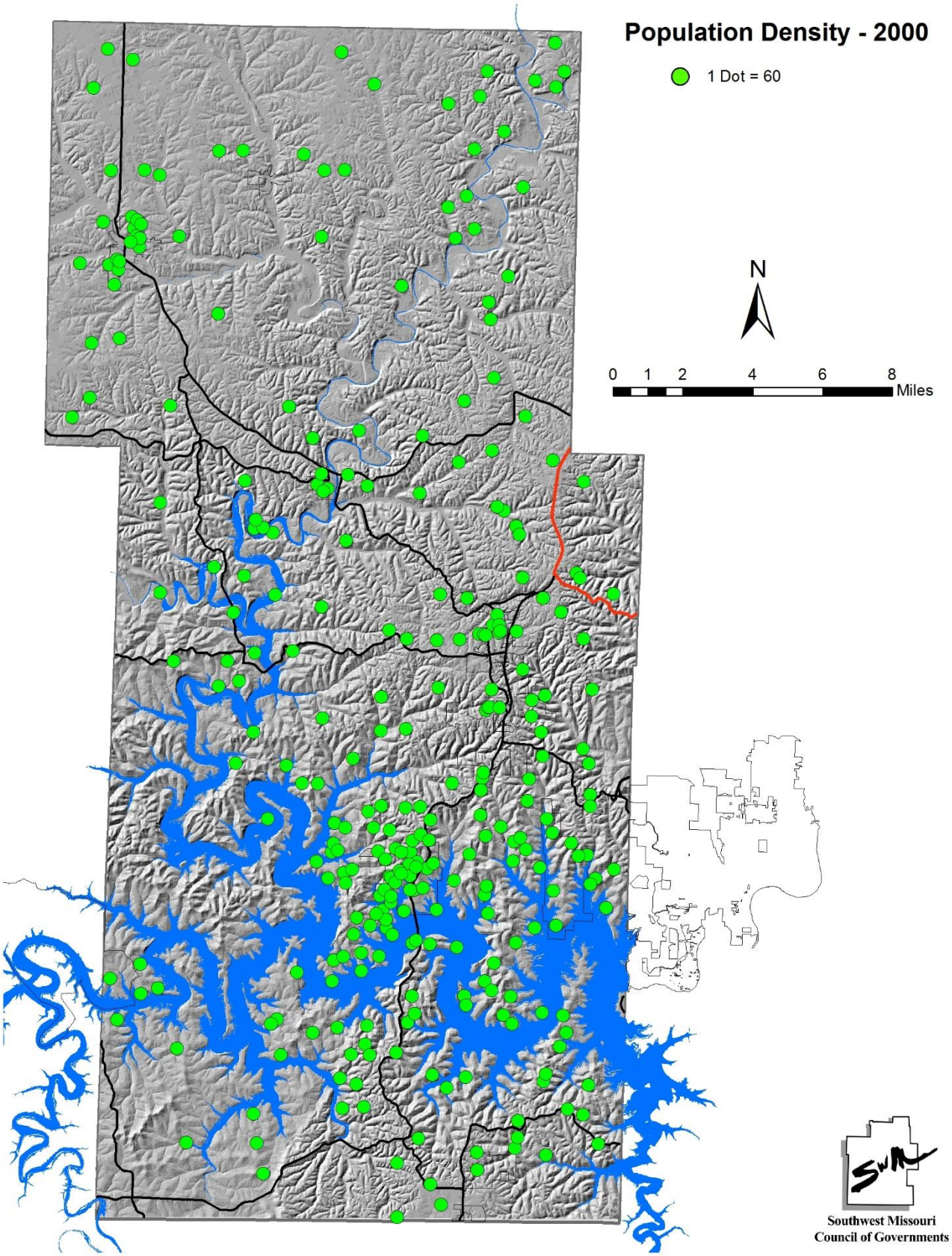
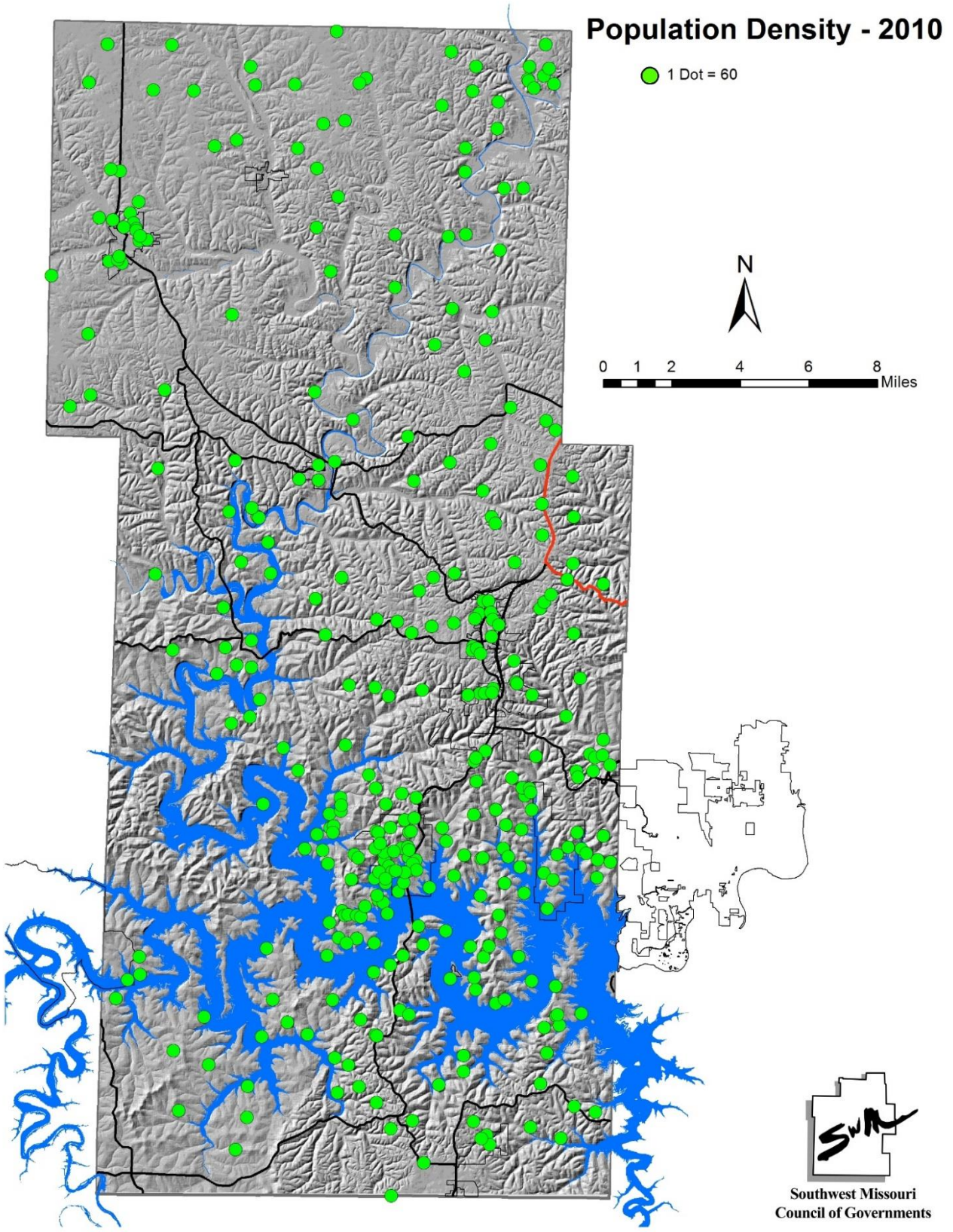


Figure 3.4. **Stone County Dot Density by Census Block, 2010**



Stone County communities have, overall, have experienced varying degrees of growth and decline since the previous plan update. The cities of Crane, Hurley, Kimberling City, and Galena have experienced most of the estimated growth, while Branson West, Reeds Spring, and unincorporated Stone County has seen more decline. A summary of each jurisdiction is provided below.

City of Branson West
Branson West has had no new development since the previous plan update. The community has overall remained stagnant, or seen a slightly decrease in population and structures over the past five years.

City of Crane
Crane has, according to U.S. Census data, experienced some growth over the past several years. However, there was no reported significant residential, commercial, or industrial development since the previous plan update.

City of Galena
Galena has experienced very little change since the previous plan update. No new development has occurred in the last five years.

City of Hurley
Hurley has experienced mostly residential growth since the previous plan update. Since 2013, ten residential building permits were issued, six of which were for mobile homes. No new development occurred in the floodplain.

City of Kimberling City
Kimberling City has experienced some growth since the previous plan update. Being the largest population center in the county and the lake resort location, Kimberling City draws more development than many of the other areas in Stone County. No development occurred in the 100 year floodplain.

City of Reeds Spring
Reeds Spring experienced no development since the previous plan update. U.S. Census estimates indicate that Reeds Spring may have lost population and seen a reduced number of structures in the community.

Village of Coney Island
The Village of Coney Island experienced little to no development since the previous plan update. No new development information was provided.

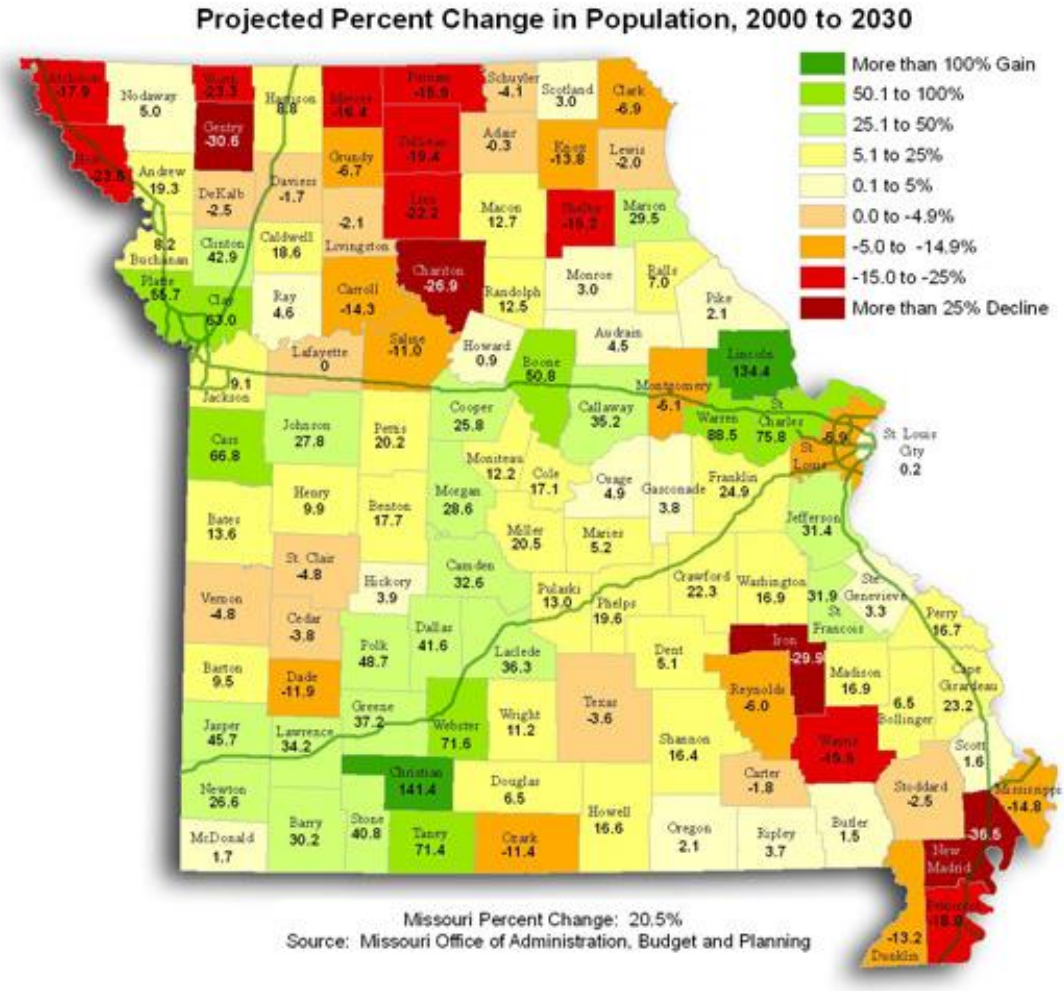
3.3.2 Future Land Use and Development

Stone County is expected to see growth over the next decade. While the county as a whole is estimated to have lost population since 2010, the Missouri Office of Administration, Budget, and Planning has projected that Stone County will see a 40.8% population increased by 2030. Figure 3.5 shows the expected population change for each county in the state of Missouri. Stone County, as well as all adjacent Missouri Counties expect to see increased population.

The Stone County comprehensive plan was updated in October 2013. The preservation of Stone County's natural environment is identified as a priority and the plan specifically states minimizing

adverse flood impact should be considered when reviewing site plan proposals. The plan states that continued development, especially pertaining to tourism and lake visitors, is expected but does not include a future land use map. It is unclear where development is expected to occur, but it could be inferred that much will be focused near Table Rock Lake and along major transportation corridors connecting to the Branson and Springfield areas.

Figure 3.5. **Projected Population Change, 2000 to 2030**



The remaining discussion in this section provides future growth and development information, where available, relative to each participating jurisdiction. Much of the information included is from the community data collection questionnaires, or where incomplete questionnaires were returned presumptions were made for future development based on past development trends.

City of Branson West

Branson West expects to see some new facilities and development over the next five years, but did not provide details regarding what or where. The city does have a comprehensive plan, but it has not been updated since 2002. Population estimates have Branson West's population decreasing since 2010, but it is likely that there may be some minor development occur and a slight population increase in the next five years based on tourism traffic.

City of Crane

Crane does not expect to see significant growth over the next five years. The city does have a comprehensive plan, but it has not been updated since 1972. It is possible that Crane will see some growth along the primary transportation corridors of 413/265 and BB. There are no City facilities or infrastructure planned for construction in the next five years.

City of Galena

While the U.S. Census estimates that Galena has seen a slight increase in population in the last five years, the City does not expect to see substantial growth in the next five years. Galena does not have a comprehensive plan or any land use regulation that would assist in controlling growth.

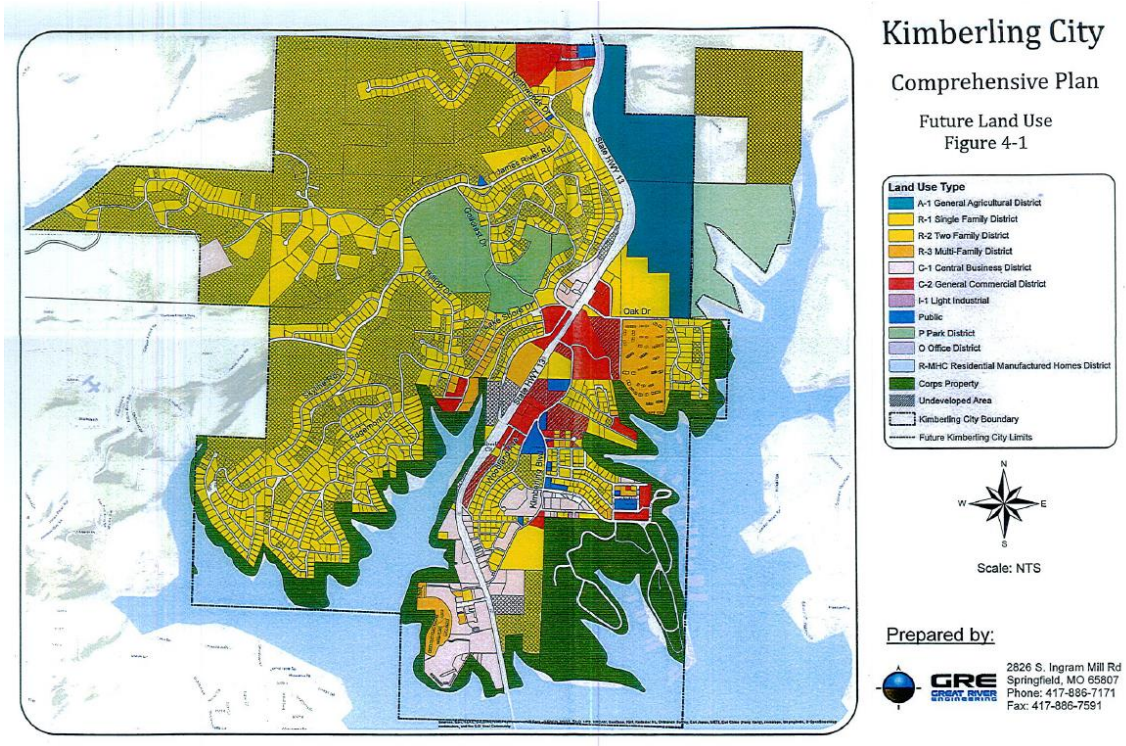
City of Hurley

Hurley has seen limited residential growth in the past five years, and does not expect any significant development in the next five years. The majority of new residential permits have been mobile homes, so it could be inferred that much of any future development in the next five years may also be mobile homes. Hurley does not have a comprehensive plan and land use regulations, but does not anticipate any development in the floodplain or any new City facilities.

City of Kimberling City

Kimberling City does not anticipate any extensive development or growth in the next five years. No new development is expected in the floodplain and no new City facilities are planned. Kimberling City just finished the updating of a comprehensive plan, which identifies protecting and preserving the environment as a goal. Additionally, as shown in Figure 3.6, much of the property immediately adjacent to the lake and at high risk for flooding damage belongs to the Army Corps of Engineers. Kimberling City has a floodplain ordinance and plans to actively enforce in the future.

Figure 3.6. **Kimberling City Future Land Use Map**



City of Reeds Spring
Reeds Spring does not anticipate growth in the next five years. The City does not have a current comprehensive plan or land-use regulations. The community does not expect any new development in the floodplain or any new municipal facilities.

Village of Coney Island
The Village of Coney Island has not experienced much growth, and does plan to have any new development in the next five years. The Village does not have a comprehensive plan or guiding land use regulations.

School District's Future Development

Hurley R-I Schools
District enrollment is expected to increase just slightly in the next five years. Hurley R-I does have safe rooms, but administration needs to review FEMA standards to determine if they are compliant. The district does not plan to construct or remodel any facilities in the next five years.

Reeds Spring R-IV Schools
Reeds Spring School's enrollment has decreased at roughly 1% each year in recent years, but the district expects to flatten out in the next five years. The district recently completed a $22 million dollar middle school with a gymnasium, choir and band room, and 880 seat auditorium that are underground. The gymnasium has hurricane doors capable of sustaining 250 mile per hour straight line winds. It is wired for a generator to run equipment in order to serve food and manage utilities. All RSSD facilities are now natural gas. The district hopes to construct a multi-purpose building in 2019-2020 separate from the high school stadium.

Special District's Future Development

Southern Stone County Fire District
The Southern Stone County Fire District does not anticipate expanding district boundaries or adding any new district facilities in the next five years.

3.4 Hazard Profiles, Vulnerability, and Problem Statements

Each hazard will be analyzed individually in a hazard profile. 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.

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 Stone County. 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 Stone County. 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 years with recorded events by the number of total 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, a statement of the average number of events annually will be included.

Vulnerability Assessments

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

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

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

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

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

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

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

The vulnerability assessments in the Stone 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.

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

Vulnerability Overview

Potential Losses to Existing Development: includes the types and numbers, of buildings, critical facilities, etc.

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

Hazard Summary by Jurisdiction: For hazard risks that vary by jurisdiction, this section will provide an overview of the variation and the factual basis for that variation. For example, a community that has adopted more recent building codes and constructed safe rooms would be less vulnerable to the impact of tornados.

Problem Statements

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

3.4.1 Dam Failure

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/

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. Flooding, earthquakes, blockages, landslides, lack of maintenance, improper operation and poor construction can all cause a dam to fail. When a dam failure occurs, an enormous amount of water is suddenly released, destroying infrastructure and flooding the area downstream of the dam. Dams can fail for many reasons. The most common are as follows:

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

According to the State Plan, Missouri had some 5,423 recorded dams in 2013, the largest number of man-made dams of any state in the country. Missouri's topography allows lakes to be built easily and inexpensively, which accounts for the high number of dams. Despite the large number of dams, there are only 682 (about 13 percent) state regulated dams, with an additional 66 federally regulated dams. Federal dams in Missouri are primarily regulated by two federal agencies; the U.S. Army Corps of Engineers (USACE), and the U.S. Department of Agriculture Forest Service. The remaining 4,495 dams are unregulated.

Dams that fall under state regulation are non-federally regulated dams that are more than 35 feet in height. Most nonfederal dams are privately owned structures built either for agricultural, water supply or recreational use. The Department of Natural Resources (MDNR) Water Resources Center maintains the Dam and Reservoir Safety Program in Missouri. The program ensures that dams over 35 feet in height are safely constructed, operated, and maintained pursuant to Chapter 236 of Revised Statutes of Missouri.

The Department of Natural Resources provides information about regulated and unregulated dams in Missouri. The information includes details of the dam dimensions, date of construction, approximate reservoir volume, contributing drainage basin area and hazard classification. In addition, USACE maintains the National Inventory of Dams (NID). The information in the NID database matches the list from the MDNR website with some additional details for dams in Stone County. Although both agencies provide a hazard classification for dams, the dam classification systems differ.

The Missouri Dam and Reservoir Safety Council Rules and Regulations uses three classes of downstream environmental zone used when considering permits. The downstream environment zone is the area below the dam that would become inundated should the dam fail. Inundation is defined as water two feet or more over the submerged ground outside of the stream channel. These classes are based on the number of structures and types of development contained within the inundation area as presented in **Table 3.15**. The downstream environment zone classification is also used to prescribe the frequency of inspection.

Table 3.15. MDNR Dam Hazard Classification Definitions

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

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

Dams in the NID are classified according to hazard potential, an indicator of the consequences of dam failure. A dam's hazard potential classification, presented in **Table 3.16**, does not indicate its condition. Dams assigned the high hazard potential classification are those where failure will potentially result in loss of human life. Significant hazard potential are those dams where failure results in no probable loss of human life but can cause economic loss. Dams assigned the low hazard potential classification are those where failure or results in no probable loss of human life and low economic or environmental losses. Losses are principally limited to the owner's property.

Table 3.16. NID Dam Hazard Classification Definitions

Hazard Class	Definition
Low Hazard	Failure results in only minimal property damage.
Significant Hazard	Failure could possibly result in the loss of life and appreciable property damage.
High Hazard	If the dam were to fail, lives would be lost and extensive property damage could result.

Source: National Inventory of Dams

There is not a direct correlation between the State Hazard classification and the NID classifications. However, most dams that are in the State's Classes I and II are considered NID High Hazard Dams.

Geographic Location

Dams in Planning Area

There is only one recorded dam in Stone County in both the MDNR and NID databases. It is classified as a high hazard dam.

Information about the dam is presented in **Table 3.17.** The table indicates if there is an Emergency Action Plan (EAP) in place, height, last inspection date, nearest downstream city, "as the crow flies" distance to the nearest downstream city, and normal storage of water impounded by the dam in acre feet. An acre foot is defined as the volume of one acre of surface area to the depth of one foot.

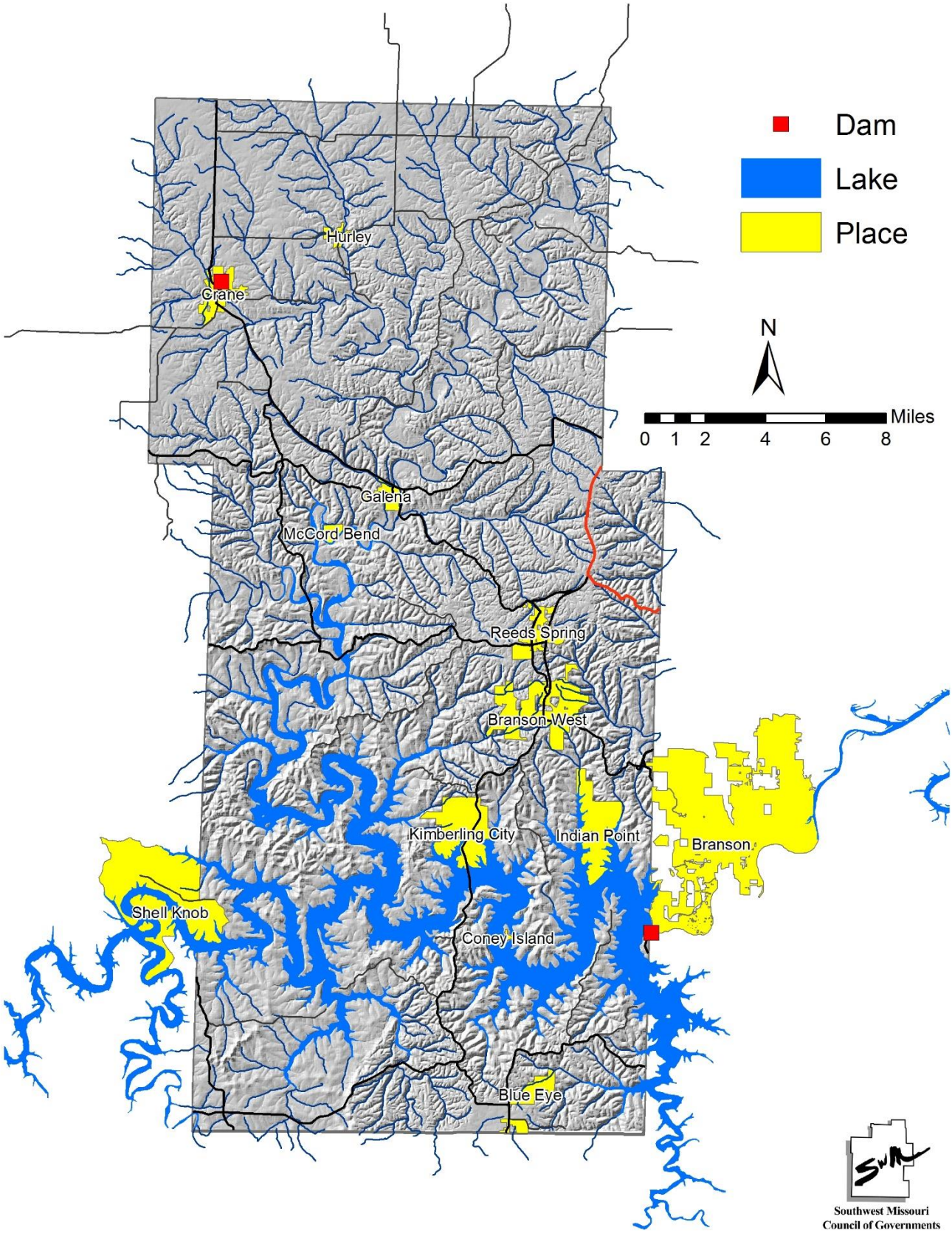
Table 3.17. Dams in Stone County

Dam Name	Emergency Action Plan (EAP)AP	Dam Height (Ft)	Normal Storage (Acre-Ft)	Last Inspection Date	River	Nearest Downstream City	Distance To Nearest City (Miles)	Dam Owner
Crane Structure #1	n/a	49	72	07/08/2014	Tr-Crane Creek	Crane	0	City of Crane

Sources: Missouri Department of Natural Resources, http://dnr.mo.gov/env/wrc/dam-safety/statemap.htm and National Inventory of Dams, http://nid.usace.army.mil/cm_apex/f?p=838:12 By the end of 2015, the Missouri DNR anticipates having Emergency Action Plans, including inundation maps for all state-regulated Class 1 and Class 2 dams. Contact the DNR Dam and Reservoir Safety Program at 800-361-4827 to request the inundation maps for your county to show geographic locations at risk, extent of failure and to perform GIS analysis of those assets at risk to dam failure.

Figure 3.7 provides the locations of NID high hazard dams located in Stone County. Inundation maps for dams were unable to be acquired, making exact dam breach inundation areas unknown.

Figure 3.7. **Dam Locations in Stone County.**

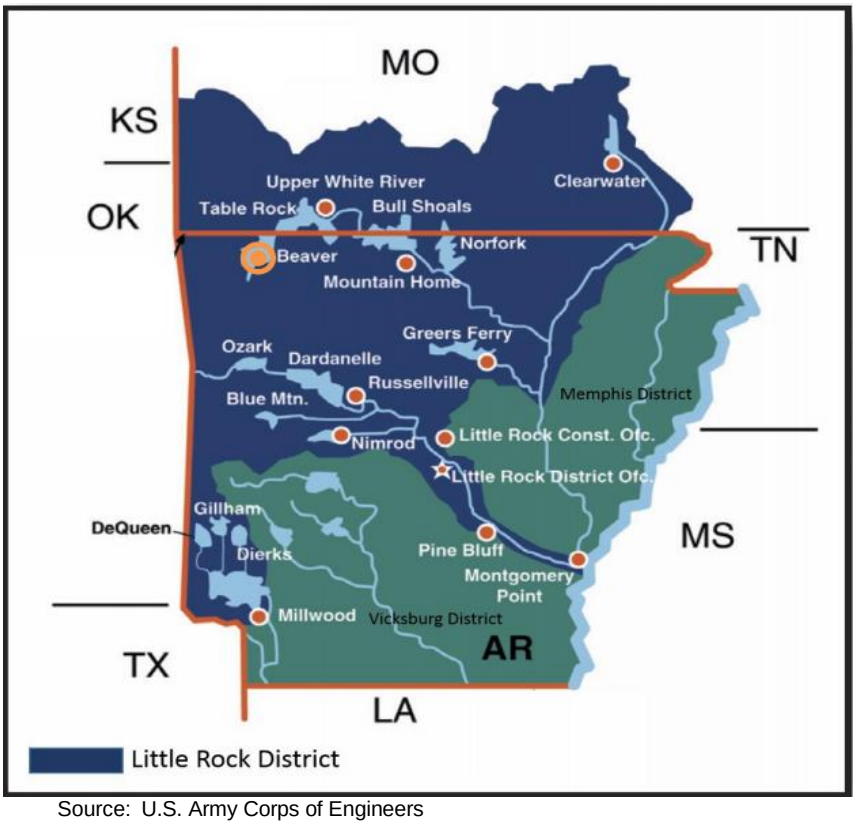


Source: U.S. Army Corps of Engineers, Missouri Department of Natural Resources

Upstream Dams Outside Stone County

The Beaver Dam in Arkansas on Beaver Lake is upstream from Table Rock Lake. A failure of this dam could impact incorporated parts of Stone County. **Figure 3.8** shows the location of Beaver Dam.

Figure 3.8. **Upstream Dams Outside Stone County**



Source: U.S. Army Corps of Engineers

The Lake Springfield Dam is another upstream dam outside of Stone County that could have an effect on the County in the event of a failure.

Severity/Magnitude/Extent

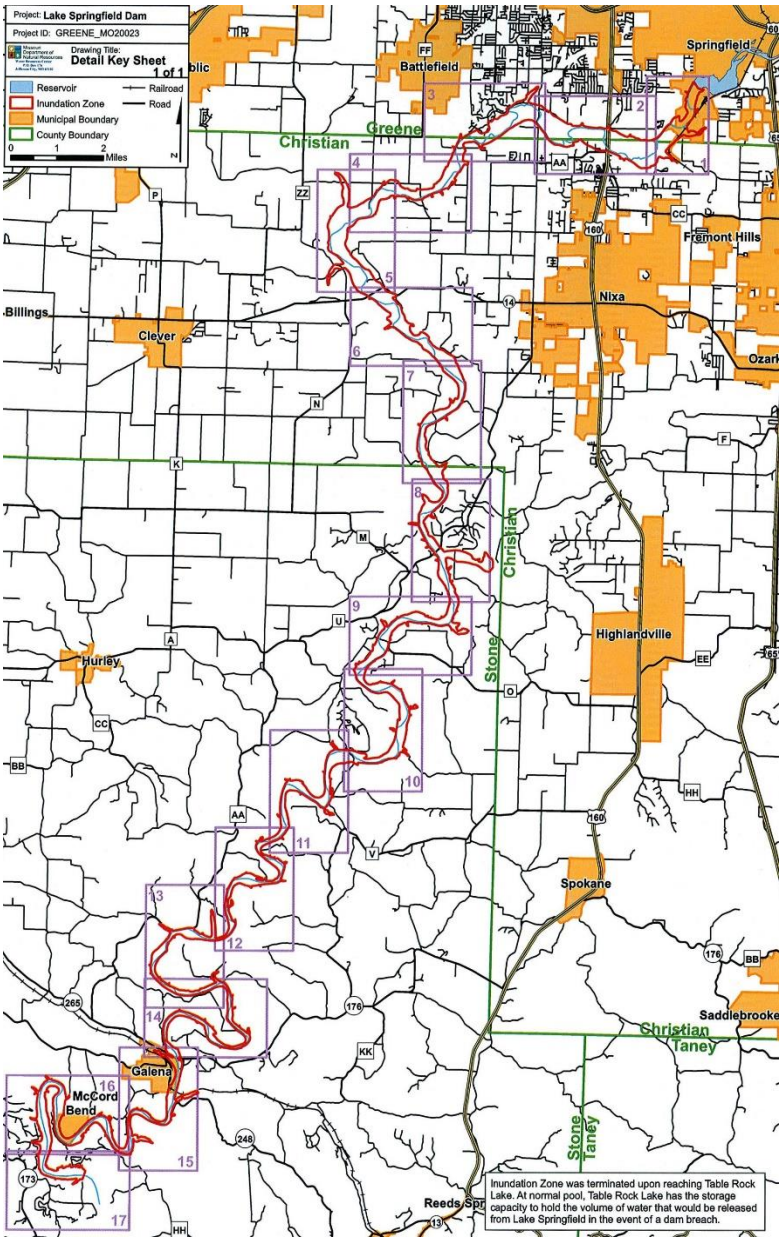
The severity/magnitude of dam failure would be similar in some cases to the impacts associated with flood events (see the flood hazard vulnerability analysis and discussion). Based on the hazard class definitions, failure of any of the High Hazard/Class I dams could result in a serious threat of loss 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. Note that for this reason, dam failures could flood areas outside of mapped flood hazards.

The only dam located in Stone County; the 39-foot Southwest RC&D #1 dam in Crane is rated as a "high hazard" dam. Completed in 1973, this earthen dam was built for flood control and storm water management. The dam lies upstream from the Crane business district. All other dams whose failure could impact the county are rated as high hazard dams as well.

This dam rarely accumulates any water; many local citizens say that it always has been dry. However, should this dam fail completely and holding water, several businesses and homes would be affected in varying degrees of damage. The business district would bear the most damage. The damage would lessen as the water flowed east and west from the central business district. Flood waters would then flow mainly south into Crane Creek.

Although not within the county, the Lake Springfield Dam on the James River upstream in Greene County presents a hazard for many communities and unincorporated parts of Stone County. Lake Springfield Dam is owned and maintained by City Utilities of Springfield. The dam was constructed in 1956 and is inspected by the Missouri Department of Natural Resources every two years. DNR has prepared a breach analysis for this dam which includes the inundation area presented in **Figure 3.9**. The inundation area would roughly contain the 100 year floodplain along the James River before terminating at Table Rock Lake which has the storage capacity to absorb breach overflow.

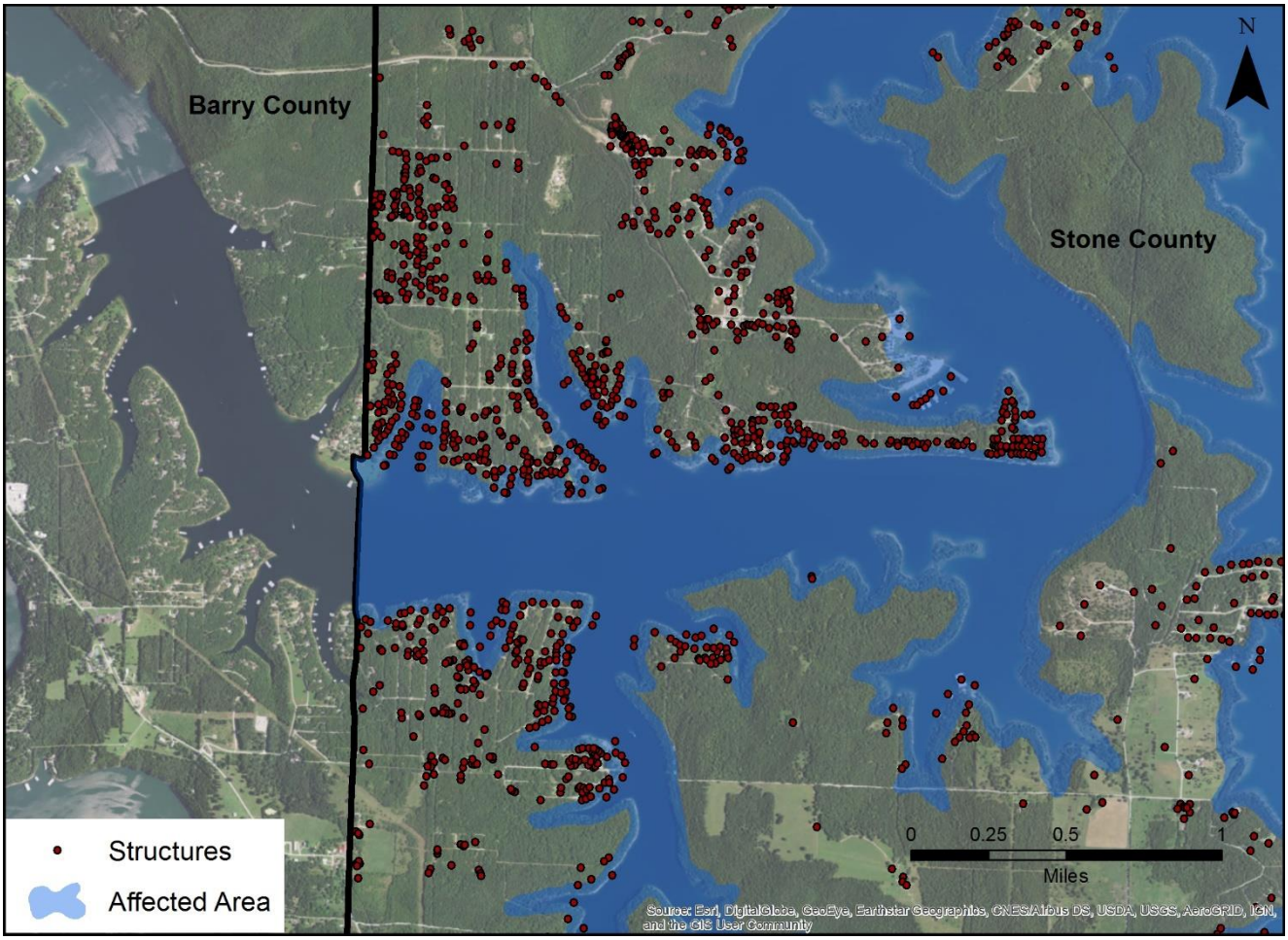
Figure 3.9. **Lake Springfield Dam Inundation Zone**



Source: Missouri DNR

The greatest danger to Stone County from dam failure is Beaver Dam, located in northwest Arkansas. The uncontrolled release of water through Beaver Dam would affect Stone County and Table Rock Lake, which are located downstream. Table Rock Lake would contain the overflow from Beaver Lake, but there could be limited damage to dock properties along the shoreline. An inundation map was unable to be obtained for Beaver Dam. However, **Figure 3.10** displays a potential downstream impact area in Stone County in the event of dam failure. The area was determined by placing a 100-foot buffer around the 100-year floodplain in western Stone County, the area that would be most affected by a failure of Beaver Dam.

Figure 3.10. **Beaver Dam Potential Impact Area**



Previous Occurrences

Dam failures in the United States have resulted in death, injuries and billions of dollars in property damage. Dam failure events in Missouri include dams in Lawrenceton in 1968, Washington County in 1975, Fredericktown in 1977, a near failure in Franklin County in 1978, and Lesterville in 2005. There has not been a reported incident of dam failure in Stone County thus far.

The most recent example of a dam failure in Missouri happened in 2005, when the stone retaining wall around a huge mountaintop reservoir around the town of Lesterville collapsed before daybreak, releasing a billion-gallon torrent of water that swept away at least two homes and several vehicles and critically injured three children, according to authorities. After the breach opened up, within minutes the 50-acre reservoir had emptied itself out with terrifying effect, turning the surrounding area into a landscape of flattened trees and clay-covered grass and temporally evacuating the city of Lesterville. (National Weather Service)

Probability of Future Occurrence

The age and ownership of dams are the most significant factors affecting risk of dam failure. The likelihood of a dam failure is always possible. However, the risk of dam failure is considered unlikely

for the federally maintained dams that could affect Stone County.

According to Stanford University's National Performance of Dams Program, between 1975 and 2001 there were 17 dam failures in Missouri. These data translate into a 65% probability that there will be a dam failure in any given year statewide. However, with over 5,000 dams across the state the probability that a dam failure would occur at Crane RC&D Dam #1 is very low; therefore, it is unlikely that an event of this type will happen in the county.

Vulnerability

Vulnerability Overview

Vulnerability to dam failure in Stone County is limited to structures and critical infrastructure located within dam inundation zones. The only High Hazard Dam in Stone County, Crane RC&D Dam #1, poses little threat to the county, as it rarely ever holds water. A greater threat to the County would be the failure of larger dams outside of the County, specifically Springfield Lake Dam in Greene County, MO, and Beaver Dam in Arkansas. A failure of either dam would likely flood areas of Stone County and damage structures and infrastructure within or near the 100-year floodplain. A failure of Beaver Dam would largely be contained by Table Rock Dam, but the docks and houses near the shore could be damaged.

Potential Losses to Existing Development:

In the absence of GIS layers to go along with the inundation map for Lake Springfield Dam, and the absence of an inundation map for Beaver Dam, estimates of the exposure to a failure was done based on the parcels within 50 feet of the 100-year floodplain for Lake Springfield Dam, and 100 feet of the 100-year floodplain for Beaver Dam. The difference is due to difference in size of the two, dams. **Table 3.18** shows potential impact estimates for both dams.

Table 3.18. Stone County Dam Failure Potential Exposure

Jurisdiction	Residential	Commercial	Agricultural	Total Exposure
Lake Springfield Dam				
Galena	$674,400	$9,500	$3,500	$687,400
McCord Bend	$122,200	$0	$0	$122,200
Stone County	$5,249,600	$103,700	$821,300	$6,174,600
Total	**$6,046,200**	**$113,200**	**$824,800**	**$6,984,200**
Beaver Lake Dam				
Stone County Total	**$8,007,200**	**$0**	**$317,100**	**$8,324,300**

Source: Stone County Assessor Data

Impact of Previous and Future Development

It is possible that future development will occur downstream of high hazard dams within the county. Any new development within the inundation area would increase the exposure to a possible dam failure event.

Hazard Summary by Jurisdiction

The communities of Galena and McCord Bend would be the most affected by a dam failure event. Flooding from a failure of Lake Springfield Dam could cause the James River to rise to historic levels, which would affect both jurisdictions.

Problem Statement

Overall, dam failure is a relatively low risk to Stone County and incorporated communities. Regular inspections and maintenance of dams may reduce likelihood of an event occurring. Although the probability of a dam failure in the county is low, the potential for damage remains.

Residents and communities downstream from large dams, primarily Beaver Dam and Lake Springfield Dam, should be familiar with the dam emergency action plans, if available. Emergency plans written for dams include procedures for notification and coordination with local law enforcement and other governmental agencies, information on the potential inundation areas, plans for warnings and evacuation, and procedures for making emergency repairs. It would be advantageous for jurisdictions to work closely with dam operators and participate in dam emergency exercises.

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 State Plan, which are as follows.

- Meteorological drought is defined in terms of the basis of the degree of dryness (in comparison to some "normal" or average amount) and the duration of the dry period. A meteorological drought must be considered as region-specific since the atmospheric conditions that result in deficiencies of precipitation are highly variable from region to region.

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

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

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

Geographic Location

Droughts are a regional phenomenon and affect the entire county with little variability from place to place. However, drought most directly impacts the agricultural sector, so areas within the county where there is extensive agricultural land use can experience significant impacts. The major agricultural activity in the county is livestock which accounts for 89% of sales. Due to the density of livestock in the region, an extreme drought can have a devastating effect.

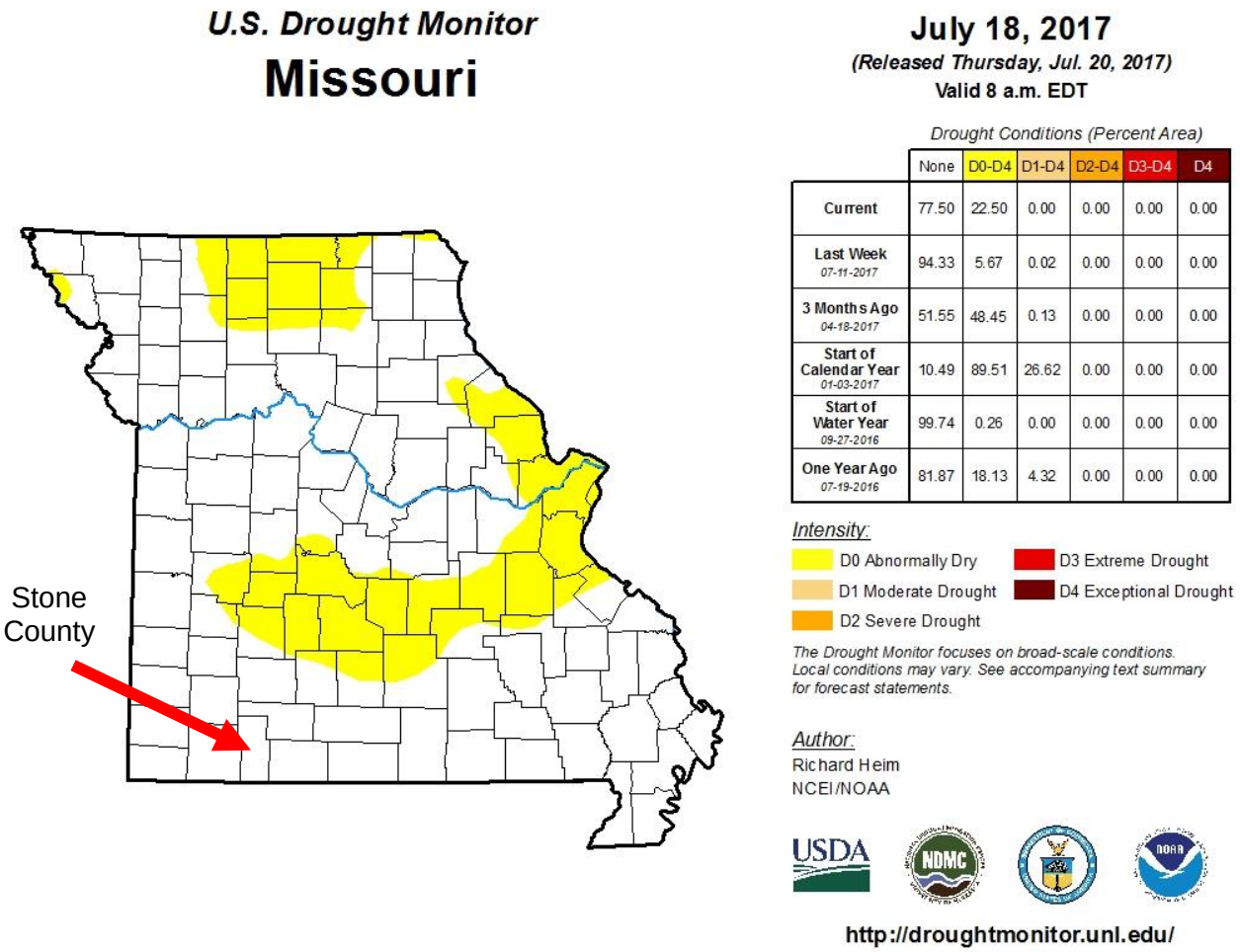
Severity/Magnitude/Extent

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.

Figure 3.11 is a recent map from the U.S. Drought Monitor and an example of the size of the

geographic area that could be in drought at any given moment in time. The map is only a snapshot of conditions at a given time and indicates the severity of drought conditions.

Figure 3.11. **U.S. Drought Monitor Map of Missouri on July 18, 2017**



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

The most commonly used indicator of drought and drought severity is the Palmer Drought Severity Index (PDSI), jointly published by the NOAA and the United States Department of Agriculture. 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.

According to the MDNR Missouri Drought Plan revised in 2002, Missouri's Drought Response System is divided into four phases based on Palmer index values:

- **Phase I: Advisory Phase**—Requires a drought monitoring and assessment system to provide enough lead time for state and local planners to take appropriate action;

- **Phase II: Drought Alert**—When the PDSI reads -1.0 to -2.0, and stream flows, reservoir levels, and groundwater levels are below normal over a several month period, or when the Drought Assessment Committee (DAC) determines that Phase II conditions exist based on other drought determination methods;

- **Phase III: Conservation Phase**—When the PDSI reads -2.0 to -4.0, and stream flows, reservoir levels, and groundwater levels continue to decline, along with forecasts indicating an extended period of below-normal precipitation, or when the DAC determines that Phase III conditions exist based on other drought determination models;

- **Phase IV: Drought Emergency**—When the PDSI is lower than -4.0, or when the DAC determines that Phase IV conditions exist based on other drought determination methods.

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.

Incorporated communities in Stone County rely on both wells and surface water for water supply. Drought can easily have an impact on communities who rely on surface water. The impact of drought on deeper public wells would not be significant unless the drought was of such severity to reduce groundwater levels.

As it pertains to drought impact on agricultural lands, the USDA's Risk Management Agency provides insured crop loss payments in the county as a result of drought from 1948 to the present. From 2001 through 2017, these records indicate that there was $0 in crop insurance payments during this time in Stone County.

Previous Occurrences

The NCEI storm events database includes 19 events occurring in Stone County from 1997 through 2017. Many of these were multiple reports from persistent drought events that lasted several months. The NCEI reports indicate that there were five distinct drought periods during the 26 year timeframe. **Table 3.19** provides a summary of these events.

Table 3.19. Previous Drought Occurrences 1997-2017

Drought Year	Duration	Property Damage	Crop Damage
1999	October	$0	$20,000
2000	August - September	$0	$0
2006	January - April	$0	$0

2011	July - November	$0	$5,000,000
2012-2013	June - January	$0	$760,000

Source: NOAA Storm Events Database https://www.ncdc.noaa.gov/stormevents/

Probability of Future Occurrence

Over the 20-year record period, Stone County was in a drought for 19 months. There are a total of 240 months in the record period. Based on the number of months of drought and the total number of months in the record period there is a 7.92% probability of drought occurrence in the county in any given month. Although drought is not predictable, long-range outlooks and predicted impacts of climate change could indicate an increased chance of drought persistence and severity.

Vulnerability

Vulnerability Overview

The agriculture sector is particularly vulnerable to drought. Periods of dry weather can reduce stock ponds and force the early sale of livestock. Crop production can be disrupted and vegetative diseases can spread reducing yields. Cities that operate water wells can experience water shortages during persistent drought periods like the six month drought period in 2012/2013. Those that rely on private wells are likely be impacted by reductions in the groundwater supply. Waste water treatment facilities may also be impacted, as it could limit the ability to discharge due to lower water levels and produce dangerous or unlawful levels of contaminants.

Potential Losses to Existing Development

According to data from the USDA Risk Management Agency, there was $0 in insured crop loss payments in Stone County in the years of 2001 through 2016. However, according to NCEI data there were substantial crop losses incurred in 2011. Perhaps the losses did not result in USDA crop insurance payments, thus allowing for a discrepancy. Based on past losses, there is potential that future droughts could result in crop losses. There are no anticipated structural losses, loss of life, or injuries associated with this hazard.

Impact of Previous and Future Development

Increases in acreage planted with crops would add to exposure to drought-related agricultural losses. In addition, increases in population result in increased demand for treated water and increase waste water discharge, adding additional strain on water systems.

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.

The Natural Resources Defense Council developed a new water supply sustainability index. The risk

to water sustainability is based on the following criteria:

- Projected water demand as a share of available precipitation
- Groundwater use as a share of projected available precipitation
- Susceptibility to drought
- Projected increase in freshwater withdrawals
- Projected increase in summer water deficit

The risk to water sustainability for counties meeting two of the criteria are classified as “moderate,” while those meeting three of the criteria are classified as “high,” and those meeting four or more are classified as “extreme.” Counties meeting less than two criteria are considered to have low risk to water sustainability. According to the Natural Resources Defense Council, without climate change the water supply sustainability index for Stone County is low. With climate change, the water supply sustainability index increases to moderate (NRDC).

Hazard Summary by Jurisdiction

Although the probability of drought is the same for the entire county, farming and livestock enterprises in the unincorporated parts of the county would feel the greatest impact. Although communities with wells are susceptible to water shortages due to groundwater reduction, other communities with no source are more at risk to extreme water shortages in the event of a drought. School districts would be the least impacted by drought; however, those districts in communities with single source wells or none at all may experience water shortages prior to those in larger communities. Special districts such as the Southern Stone County Fire District would feel impacts in the form of increased risk for wildfire and reduced fire-fighting water sources. Low water levels could also limit the amount of effluent from waste water treatment plants.

Problem Statement

Although drought most likely will not cause structural damage, the impact is greatest on the agriculture sector and if persistent enough, could cause reductions in groundwater and water shortages in communities that provide potable water services. Potential actions to mitigate the impact of drought would be for communities to develop public information campaigns regarding water conservation techniques and measures, and provide notification mechanisms for community members to know when drought conditions may occur. Some methods may include restrict the use of public water resources for non-essential usage, such as landscaping, washing cars, filling swimming pools, etc. during extreme drought periods. School and special districts can also implement water conservation measures at all district facilities as well.

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.

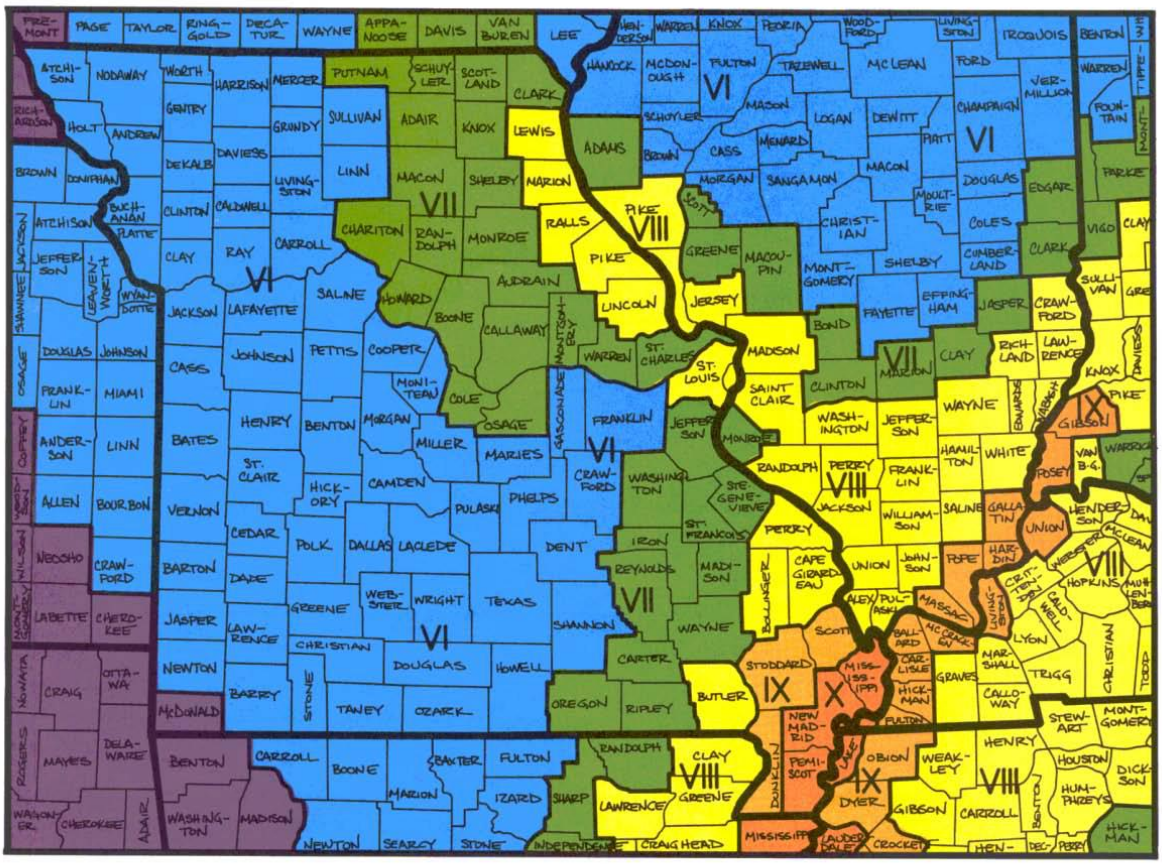
The subterranean faults were formed many millions of years ago on or near the surface of the earth. Subsequent to that time, these ancient faults subsided, while the areas adjacent were pushed up. As this fault zone (also known as a rift) lowered, sediments filled in the lower areas. Under pressure, the sediments hardened into limestones, sandstones, and shales – thus burying the rifts. The pressures on the North American plate and the movements along the San Andreas Fault by the Pacific plate have reactivated the buried rift(s) in the Mississippi embayment. This rift system is called the Reelfoot Rift and underlies the New Madrid Seismic Zone (Braile et al., 1986).

Geographic Location

The greatest hazard from earthquakes in Stone County comes from the New Madrid Seismic Zone situated in the boot heel area of southeast Missouri. The potential of high magnitude earthquakes occurring along the New Madrid fault presents risk that does not vary across Stone County. The Nemaha uplift in central Kansas is also prone to seismic activity; however, the center of the Humbolt fault zone near the Nemaha Uplift is approximately 200 to 220 miles west of Stone County and produces lower magnitude seismic events.

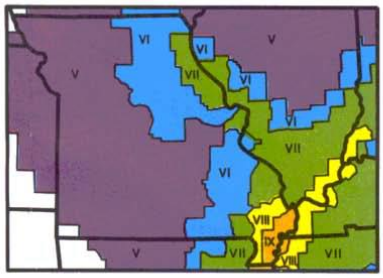
Figure 3.12 shows the highest projected Modified Mercalli intensities by county from a potential magnitude 7.6 earthquake whose epicenter could be anywhere along the length of the New Madrid Seismic Zone. The secondary maps in Figure 3.12 show the same regional intensities for 6.7 and 8.6 earthquakes, respectively. Stone County is located in zone VI from a potential magnitude 7.6 earthquake along the New Madrid fault. Residents would feel movement, there could be minimal damage to structures, and dishes and glassware would likely be broken.

Figure 3.12. **Impact Zones for Earthquake Along the New Madrid Fault**



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

6.7

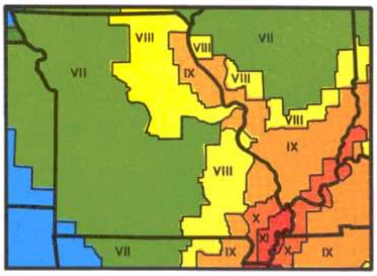


This map shows the highest projected Modified Mercalli intensities by county from a potential magnitude – 6.7 earthquake whose epicenter could be anywhere along the length of the New Madrid seismic zone.

7.6

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

8.6

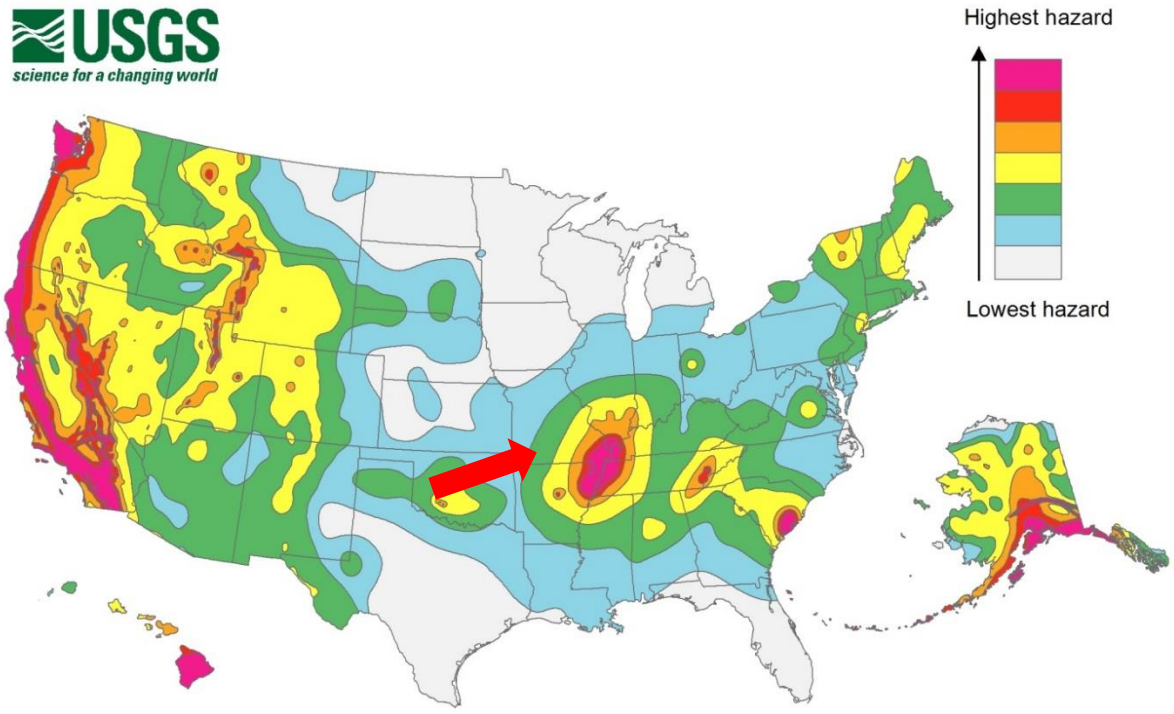


Source: SEMA, http://sema.dps.mo.gov/docs/EQ_Map.pdf

The 2014 USGS National Seismic Hazard Maps display earthquake ground motions for various probability levels across the United States and are applied in seismic provisions of building codes, insurance rate structures, risk assessments, and other public policy. The updated maps represent an assessment of the best available science in earthquake hazards and incorporate new findings on earthquake ground shaking, faults, seismicity, and geodesy. The USGS National Seismic Hazard Mapping Project developed these maps by incorporating information on potential earthquakes and associated ground shaking obtained from interaction in science and engineering workshops involving hundreds of participants, review by several science organizations and State surveys, and advice from expert panels and a Steering Committee.

Figure 3.13 is a USGS map illustrating seismicity in the United States. A red arrow showing the location of Stone County has been inserted on the map.

Figure 3.13. **United States Seismic Hazard Map**



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

Severity/Magnitude/Extent

The extent or severity of earthquakes is generally measured in two ways: 1) the Richter Magnitude Scale is a measure of earthquake magnitude; and 2) the Modified Mercalli Intensity Scale is a measure of earthquake severity. The two scales are defined 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. For example, comparing a 5.3 and a 6.3 earthquake shows that the 6.3 quake is ten times bigger in magnitude. Each whole number increase in magnitude represents a tenfold increase in measured amplitude because of the logarithm. Each whole number step in the magnitude scale represents a release of approximately 31 times more energy.

Modified Mercalli Intensity Scale

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

Table 3.20. Modified Mercalli Intensity Scale

Intensity Level	Description
I	People do not feel any 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, frames and structures creak; Liquids in open vessels are slightly disturbed; Parked cars rocked.
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, glassware and 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, and spires; Damage is slight to moderate in well-built buildings; Numerous windows are broken; Weak chimneys break at rooflines; 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 may shift on foundations; Tall structures such as towers and might chimneys twist and fall; Temporary or permanent changes in springs and wells; Sand and mud is ejected.
IX	Most buildings suffer damage; Houses not bolted down move off their foundations; Some underground pipes are broken; The ground cracks conspicuously; Reservoirs suffer damage.
X	Well-built wooden structures destroyed; most masonry and frame structures destroyed, including foundations; Rails bent; Dams seriously damaged; Cracks open in pavement.
XI	Few, if any masonry structures remain standing; Large well-built bridges destroyed; Rails bent greatly; Buried pipelines are rendered completely useless. Water mixed with sand and mud ejected in large amounts.

XII	Damage total, nearly all works of construction damaged greatly or destroyed; Objects thrown into the air; Large amounts of rock may move; The ground moves in waves or ripples.

Source: http://sema.dps.mo.gov/docs/EQ_Map.pdf

Previous Occurrences

There is no historical record of an earthquake occurrence within Stone County. The southeastern portion of Missouri is most susceptible to earthquakes because it overlies the New Madrid Seismic Zone. Earthquake hazards in the western part of the State also exist because of the historical earthquakes in eastern Kansas and Nebraska. No area of Missouri is immune from the danger of earthquakes. Minor, but potentially damaging, earthquakes can occur anywhere in the state (SEMA, 2013).

Probability of Future Occurrence

Without a historical record for earthquakes in Stone County it is not possible to calculate a precise probability of earthquake occurrence. The Center for Earthquake Research and Information (CERI) at the University of Memphis has computed conditional probabilities of a magnitude 6.0 earthquake in the New Madrid seismic zone. According to a fact sheet prepared by SEMA in 2003, the probability for a magnitude 6.0 to 7.5 or greater earthquake along the New Madrid Fault is 25 to 40 percent over the next 50 years. At the 25% level, the likelihood of an earthquake happening in a given year is 1.0%. At the 40% level, the likelihood of an earthquake happening in a given year is 1.6%. The previous map in Figure 3.12 indicates the potential severity for Stone County of a 6.7, 7.6, and 8.6 magnitude earthquake anywhere along the New Madrid fault.

Vulnerability

Vulnerability Overview

Ground shaking is the most damaging effect from earthquakes. Ground shaking will impact all structures and critical infrastructure such as roads and electrical transmission systems. The greatest and most impactful earthquake risk to Stone County is the New Madrid fault in the boot-heel region of Missouri. A 7.6 magnitude earthquake would result in poorly built buildings damaged slightly; considerable quantities of dishes, glassware and windows are broken; people having trouble walking; pictures falling off walls; objects falling from shelves; plaster in walls cracking; and furniture overturned. Damage to structures will occur but will vary on the quality of construction. In addition, some underground utilities may be damaged. Some injuries may occur but fatalities are unlikely.

Potential Losses to Existing Development

Potential losses to existing development include the total exposure for all communities listed in **Table 3.3** and **Table 3.6** in the Assets at Risk section of this chapter. The total exposure of each jurisdiction was used to estimate losses due to a 7.6 earthquake along the New Madrid Fault. A damage factor of 0.5% was applied to each jurisdiction's total building and contents based on the expected impact for Zone VI on the modified Mercalli scale. **Table 3.21** depicts the estimated losses in each jurisdiction based on total exposure and a 0.5% damage factor.

Table 3.21. Estimated Potential Earthquake Losses

Jurisdiction	Potential Earthquake Losses
Branson West	$358,285
Crane	$283,855
Galena	$87,814
Hurley	$41,387
Kimberling City	$1,221,269
Reeds Spring	$261,495
Blue Eye	$176,904
Coney Island	$47,823
Indian Point	$1,284,663
McCord Bend	$18,911
Stone County	$11,963,759

Impact of Previous and Future Development

Development that may have been constructed without adherence to building codes may be at a greater risk of damage during an event. Future development is not expected to increase the risk other than contributing to the overall exposure of what could become damaged as a result of an event.

Hazard Summary by Jurisdiction

Earthquake intensity is not likely to vary greatly throughout the county; the risk of occurrence is the same throughout. However, damages will differ where there are variations in the county based on percentage of structures built prior to 1939. For example, if one community has a higher percentage of residences built prior to 1939 than the other jurisdictions, that community is likely to experience higher damages. **Table 3.22** with the number and percentage of housing units built in 1939 or earlier.

Table 3.22. Percent of Housing Units Built in 1939 or Earlier

Jurisdiction	Built 1939 or earlier #	Built 1939 or earlier %
Stone County	637	3.1%
Branson West	5	2.5%
Crane	147	19.9%
Galena	38	26.8%
Hurley	15	18.5%
Kimberling City	0	0%
Reeds Spring	46	11.5%
Blue Eye	9	3.8%
Coney Island	0	0%
Indian Point	2	0.3%
McCord Bend	1	0.6%

Source: U.S. Census Bureau; 2011-2015 American Community Survey 5-Year Estimates

Problem Statement

Based on likely damage from a 7.6 magnitude earthquake along the New Madrid fault, older poorly built structures will suffer slight damage. The City of Galena has the highest percentage of houses

built before 1939, with the City of Crane having the second highest percentage. These jurisdictions would likely experience the most damage to structures. Potential damages to future development can be mitigated by adopting and enforcing at least IBC 2012 building codes. Unincorporated Stone County, and a few incorporated communities in Stone County have building codes. Updating and enforcing building codes throughout Stone County would mitigate the impact on future development from an earthquake event.

3.4.4 Extreme Heat

Hazard Profile

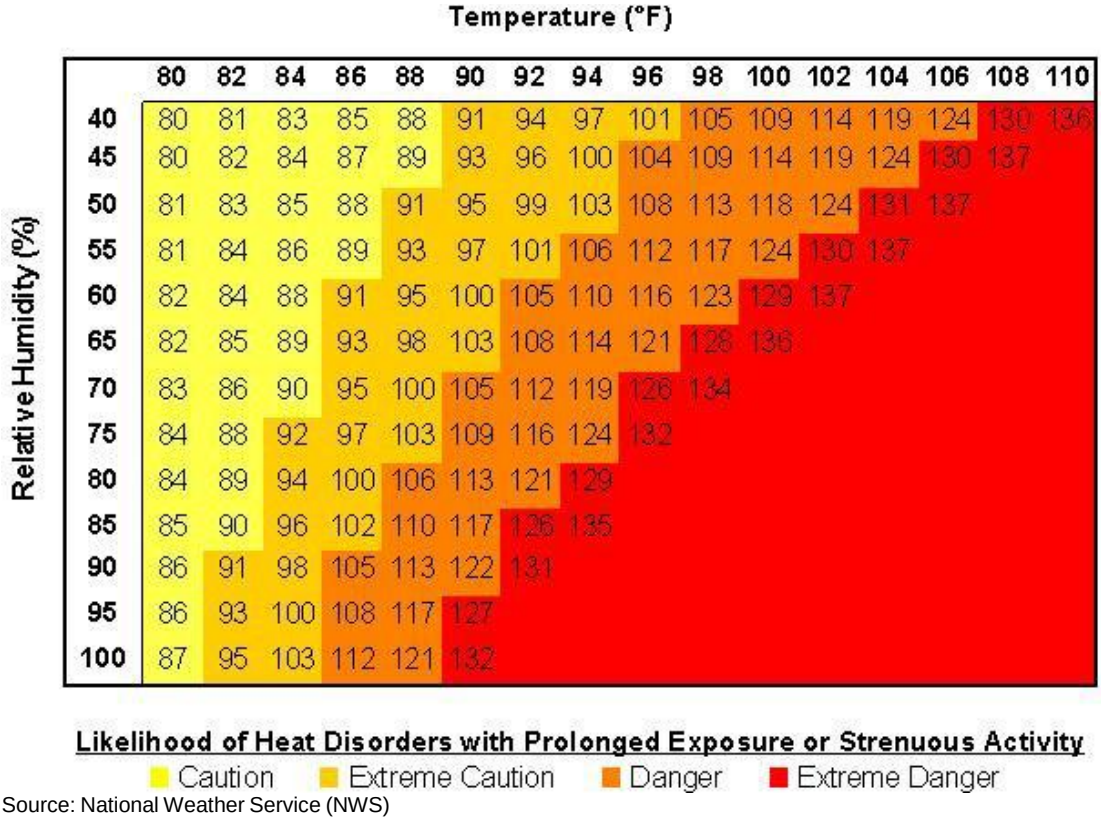
Some specific sources for this hazard are:

- National Centers for Environmental Information, 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. 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 3.144** uses both of these factors to produce a guide for the apparent temperature or relative intensity of heat conditions.

Figure 3.14. **Heat Index (HI) Chart**



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

Geographic Location

Extreme heat is an area-wide hazard event, and the risk of extreme heat does not vary across Stone County.

Severity/Magnitude/Extent

Extreme heat can cause stress to crops and animals. According to USDA Risk Management Agency, losses to insurable crops during the 10-year time period from 2007 to 2016 were $0. Extreme heat can also strain electricity delivery infrastructure overloaded during peak use of air conditioning during extreme heat events. Another type of infrastructure damage from extreme heat is road damage. When asphalt is exposed to prolonged extreme heat, it can cause buckling of asphalt-paved roads, driveways, and parking lots.

From 1988-2011, there were 3,496 fatalities in the U.S. attributed to summer heat. This translates to an annual national average of 146 deaths. During the same period, 0 deaths were recorded in Stone County, according to NCEI data. Officials from Kimberling City thought that there may have been a heat-related death in 2016, but there is no official record. The National Weather Service stated that among natural hazards, no other natural disaster—not lightning, hurricanes, tornadoes, floods, or earthquakes—causes more deaths.

Those at greatest risk for heat-related illness include infants and children up to five years of age,

people 65 years of age and older, people who are overweight, and people who are ill or on certain medications. However, even young and healthy individuals are susceptible if they participate in strenuous physical activities during hot weather. In agricultural areas, the exposure of farm workers, as well as livestock, to extreme temperatures is a major concern.

Table 3.22 lists typical symptoms and health impacts due to exposure to extreme heat.

Table 3.22 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.

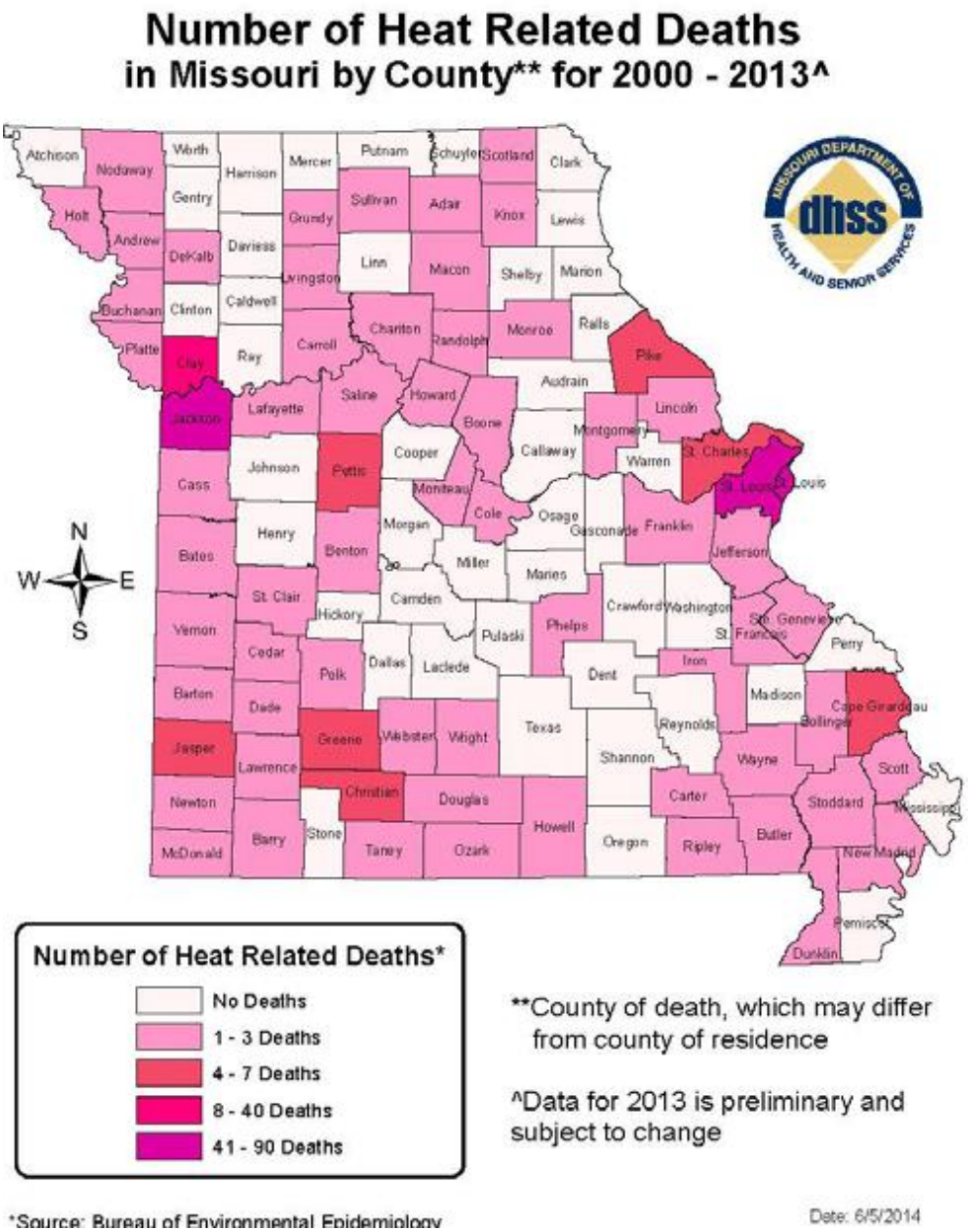
Previous Occurrences

There were nine (9) recorded extreme heat events recorded in the National Centers for Environmental Information (NCEI) database from 1998 to 2017 for Stone County. There were zero deaths and no injuries or property and crop damage associated with these events in the NCEI data for Stone County. The event narratives describe fatalities that occurred during regional multi-county heat events for other nearby counties. Extreme heat events in Stone County were recorded in consecutive months in four separate years from 1998 to 2017. The months for each year are summarized as follows:

- **1999** – July & August
- **2000** – August & September
- **2001** – July & August
- **2012** – June, July & August

Figure 3.15 is a map created by The Missouri Department of Health and Senior Services (DHSS) for heat related fatalities by county. The map indicates that there have been zero heat related fatalities in Stone County from 2000 to 2013.

Figure 3.15. **Heat Related Deaths in Missouri 2000 - 2013**



Probability of Future Occurrence

Since there were four years with extreme heat events in a 20-year span, the probability that an extreme heat event will occur in Stone County in any given year is 20%, or once every four years.

The events recorded in the NCEI database describe prolonged periods were temperatures rose above at least 90° for at least 12 consecutive days. Heat advisories and warnings are issued for shorter periods of extreme heat nearly every year and may not meet the threshold for consecutive days in the NCEI database.

Vulnerability

Vulnerability Overview

High humidity, which often accompanies heat in Missouri, can make the effects of heat even more harmful. 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. Consequently, the persistence of a heat wave increases the threat to public health. The people most at risk are children under five years of age and adults over the age of 65 as well as people who work outdoors. The agriculture sector can also suffer crop loss during periods of extreme heat. Extreme heat may also cause buckling of roads.

Potential Losses to Existing Development

Based on information in the 2013 Plan and DHSS, no heat related deaths occurred in Stone County between 2000 and 2013. Based on NCEI data, there have been zero heat related deaths in the past twenty years.

Impact of Previous and Future Development

Population growth can result in increases in the age-groups that are most vulnerable to extreme heat. Population growth also increases the strain on electricity infrastructure, as more electricity is needed to accommodate the growing population. Crane and Kimberling City have the largest populations under 5 years of age and over 65. Stone County, as a whole, has experienced population growth in the last 15 years and may continue to increase in the future.

Impact of Climate Change

With rising global temperatures, it is likely that extreme heat events may become more frequent or more severe. This hazard should be monitored over the upcoming years and any new or increased impacts on Stone County communities will be referenced in future plan updates.

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 Stone County with populations more vulnerable to extreme heat, demographic data was obtained from the 2015 American Community Survey 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 3.23 below summarizes vulnerable populations in Stone County 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 3.23. County Population Under Age 5 and Over Age 65, 2010 Census Data

Jurisdiction	Population Under 5 years	Population 65 years and over
Stone County	1,255	8,283
City of Branson West	22	92
City of Crane	158	307

City of Galena	42	96
City of Hurley	20	24
City of Kimberling City	156	868
City of Reeds Spring	66	151
Village of Blue Eye	6	46
Village of Coney Island	0	43
Village of Indian Point	39	160
Village of McCord Bend	11	50

Source: U.S. Census Bureau, 2011-2015 American Community Survey 5-Year Estimates includes entire population of each city or county

All schools in the planning area have proper air-conditioning and all follow proper procedures in the event of extreme heat. However, daycare and eldercare facilities may be at risk of heat related injuries if facilities are not properly cooled.

Problem Statement

Older and younger segments of the population are more vulnerable to the impact of extreme heat. In addition people living below the poverty level may be more vulnerable during periods of extreme heat due to a lack of air conditioning or utilities in their homes. Institutionalized populations, such as those living in nursing homes, become more vulnerable to extreme heat due to power outages.

To help reduce the risk of death, heating and cooling centers should be promoted and known to the public, especially to those who have young children or are over the age of 65. Partnering with local community organizations to continue to donate fans and offer weatherization programs would mitigate the impact on vulnerable populations in the county.

3.4.5 Wildfire

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;University of Wisconsin Slivis Lab, http://silvis.forest.wisc.edu/maps/wui_main

Hazard Profile

Hazard Description

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.

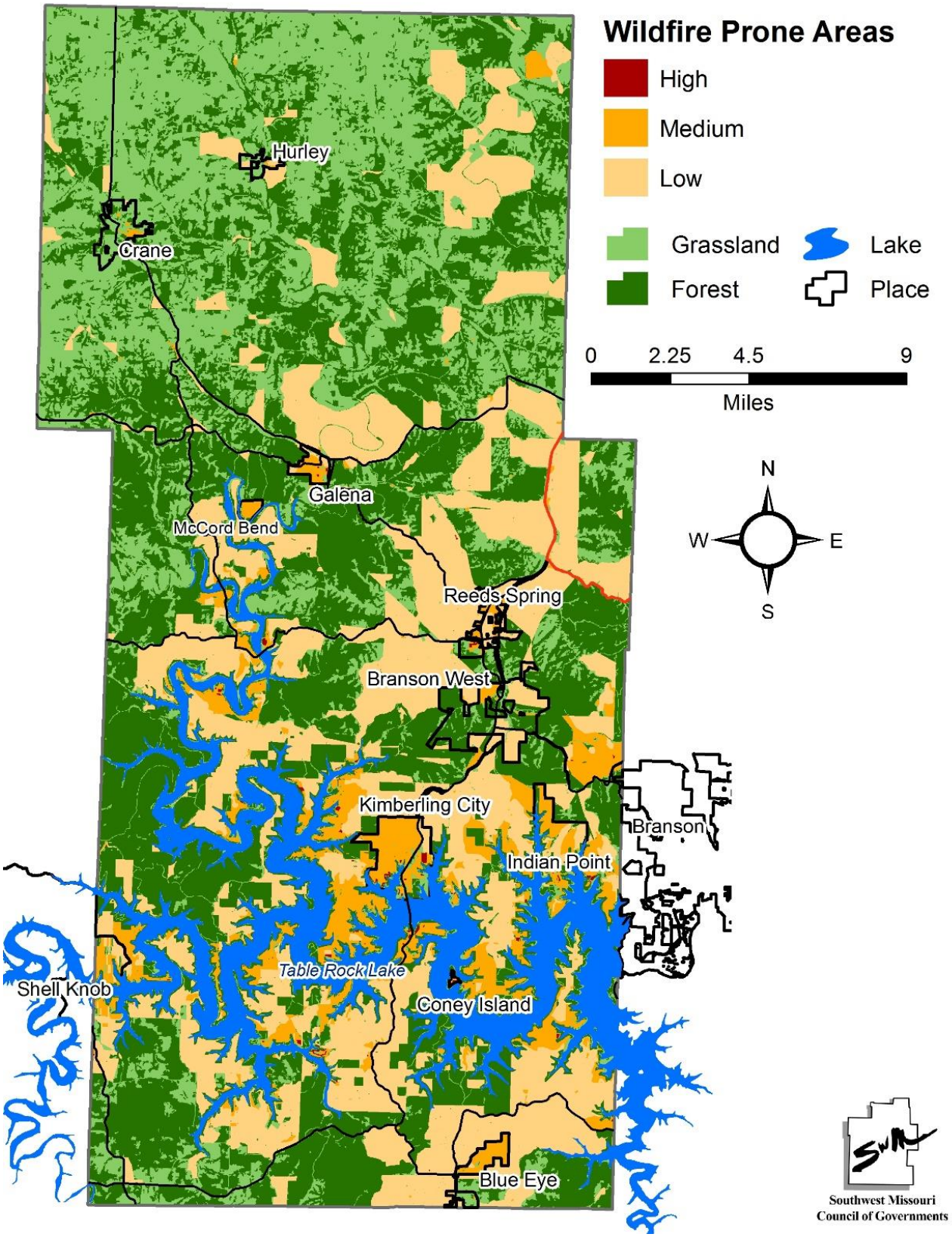
The Forestry Division of the Missouri Department of Conservation (MDC) is responsible for protecting privately owned and state-owned forests and grasslands from wildfires. To accomplish this task, eight forestry regions have been established in Missouri for fire suppression. The Forestry Division works 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 wildland fires depend largely on weather conditions. Spring in Missouri is usually characterized by low humidity and high winds. These conditions result in higher fire danger. In addition, due to the recent lack of moisture throughout many areas of the state, conditions are likely to increase the risk of wildfires. Drought conditions can also hamper firefighting efforts, as decreasing water supplies may not prove adequate for firefighting. It is common for rural residents burn their garden spots, brush piles, and other areas in the spring. Some landowners also believe it is necessary to burn their forests in the spring to promote grass growth, kill ticks, and reduce brush. Therefore, spring months are the most dangerous for wildfires. The second most critical period of the year is fall. Depending on the weather conditions, a sizeable number of fires may occur between mid-October and late November.

Geographic Location

Damages due to wildfires would be higher in communities with more wildland–urban interface (WUI) areas. The term refers to the zone of transition between unoccupied land and human development and needs to be defined in the plan. Within the WUI, there are two specific areas identified: 1) Interface and 2) Intermix. The interface areas are those areas that abut wildland vegetation and the Intermix areas are those areas that intermingle with wildland areas. Each of the communities in Stone County have some risk of wildfire; Kimberling City and Indian point have the largest areas of wildfire prone area. **Figure 3.16** shows the Wildland/Urban Intermix in Stone County.

Figure 3.16. **Stone County Wildland Intermix and Wildfire Prone Areas**



Source: Silvis Labs, University of Wisconsin

Severity/Magnitude/Extent

Wildfires damage the environment, killing some plants and occasionally animals. Firefighters have been injured or killed, and structures can be damaged or destroyed. The loss of plants can heighten the risk of soil erosion and landslides. Although Missouri wildfires are not the size and intensity of those in the Western United States, they could impact recreation and tourism in and near the fires.

Wildland fires in Missouri have been mostly a result of human activity rather than lightning or some other natural event. Wildfires in Missouri are usually surface fires, burning the dead leaves on the ground or dried grasses. They do sometimes "torch" or "crown" out in certain dense evergreen stands like eastern red cedar and shortleaf pine. However, Missouri does not have the extensive stands of evergreens found in the western US that fuel the large fire storms seen on television news stories.

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

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

Previous Occurrences

According to MDC Wildfire Data, there have been 424 wildfires reported in Stone County from 2008 to July 2017. A total of 5129.89 acres were burned as a result of these reported wildfires. In addition, 8 buildings were destroyed which include residential, commercial, and outbuildings. 10 buildings were damaged and 184 were threatened by wildfires. **Table 3.24** contains MDC wildfire statistics by year.

Table 3.24. Stone County Wildfires 2008-2017

Year	Number of Wildfires	Buildings Destroyed	Buildings Damaged	Buildings Threatened	Acres Burned
2008	29	2	0	3	132.1
2009	72	0	0	9	850.5
2010	39	0	2	13	334
2011	67	0	0	12	375.18
2012	74	5	7	61	1588.1
2013	23	0	0	3	128.1
2014	34	0	0	9	661.66
2015	29	0	0	3	204.5
2016	47	1	1	62	757.75
2017*	11	0	0	9	98
Total	**425**	**8**	**10**	**184**	**5129.89**

Source: Missouri Department of Conservation, http://mdc7.mdc.mo.gov/applications/FireReporting/Report.aspx
* = Through July 10th, 2017

No schools or special districts in Stone County reported any fire incidents that impacted their facilities.

Probability of Future Occurrence

There were a total of 424 reported wildfires from 2008 to 2017, with several events in each year. This means that there is a 100% probability of wildfire events in Stone County in any given year, with an average of 42.4 events on average per year.

Vulnerability

Vulnerability Overview

Wildfires occur throughout wooded and open vegetation areas of Missouri. They can occur any time of the year, but mostly occur during long, dry hot spells. Any small fire, if not quickly detected and suppressed, can get out of control. Most wildfires are caused by human carelessness or negligence. However, some are precipitated by lightning strikes and in rare instances, spontaneous combustion. Structures and people in WUI areas in the county and cities are more vulnerable to the impact of wildfires due to the level of fuel mixed with structures.

Potential Losses to Existing Development

Almost two buildings, on average, are destroyed or damaged annually by wildfires in Stone County. 18.4 structures are threatened per year and about 513 acres of land are burned on average, annually.

Impact of Previous and Future Development

It is anticipated that there will be, while limited, some future development in WUI areas throughout unincorporated areas of the county. Future growth in WUI areas of the county will increase the risk and exposure to wildfires. It is expected that any WUI development in cities will be mitigated by development regulations reducing the risk to wildfire hazard.

Hazard Summary by Jurisdiction

Table 3.25 summarizes the structure exposure for Stone County and cities. Structure counts and exposure values were derived by overlaying parcel data from the Stone County Assessor with the WUI data. The exposure amount indicates the dollar amount of assets at risk and the variability of vulnerability from place to place.

Table 3.25. Wildfire Structure Exposure by Jurisdiction

Jurisdiction	Residential	Commercial	Agriculture	Exposure ($)
Branson West	146	57	5	$30,015,500
Crane	46	3	1	$1,710,900
Galena	203	18	8	$10,172,900
Hurley	31	5	12	$1,602,400
Kimberling City	1224	98	2	$139,956,800
Reeds Spring	399	52	18	$32,576,700
Blue Eye	133	23	6	$14,321,300

Coney Island	96	4	0	$5,633,700
Indian Point	1016	69	3	$141,379,600
McCord Bend	133	0	0	$2,521,500
Unincorporated County	12,285	426	714	$1,261,336,000
Stone County Total	**15,712**	**755**	**769**	**$1,641,227,300**

Source: Stone County Parcel Data; University of Wisconsin SILVIS Lab WUI Data

Problem Statement

Wildfire occurrences are a frequent occurrence within Stone County. These events can destroy, damage, and threaten structures in hazard prone areas. Populations and structures in WUI areas of the county have an increased risk to wildfires due to the level of fuel mixed with structures. **Table 3.24** indicates that of the jurisdictions in Stone County, Kimberling City and Indian Point have the highest risk of wildfires. Cities that have adopted landscape ordinances can include fire safe landscape design requirements in these areas.

The unincorporated part of the county has the highest risk and exposure to wildfires. County officials and the Southern Stone County fire department can promote fire resistant construction materials and landscape design techniques to mitigate the risk to wildfire in future development. Information about these materials and techniques are included in the MDC publication, *Living with Wildfire*. Including this information in education and awareness programs for the public may potentially mitigate wildfire damage in the county.

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 Centers for Environmental Information, Storm Events Database, http://www.ncdc.noaa.gov/stormevents/
- USDA Risk Management Agency, Insurance Claims, http://www.rma.usda.gov/data/cause.htm

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 3.4.1. 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 Stone County.

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 Special Flood Hazard Areas (SFHAs) where the 100-year floodplain has been mapped. Areas along the James River, especially the communities of McCord Bend and Galena, experience the greatest impact to riverine floods and flash floods. According to

the NCEI storm event data from 1998 through July 2017, there were 20 flood events and 70 flash flood events recorded in the county. These events are typically regional in nature; however flash floods are can be contained to one specific area specifically portions of highways or roads. **Figures 3.17** through **3.27** are mapped SFHAs for communities and unincorporated areas in Stone County.

Figure 3.17. **Stone County SFHAs with Critical Facilities**

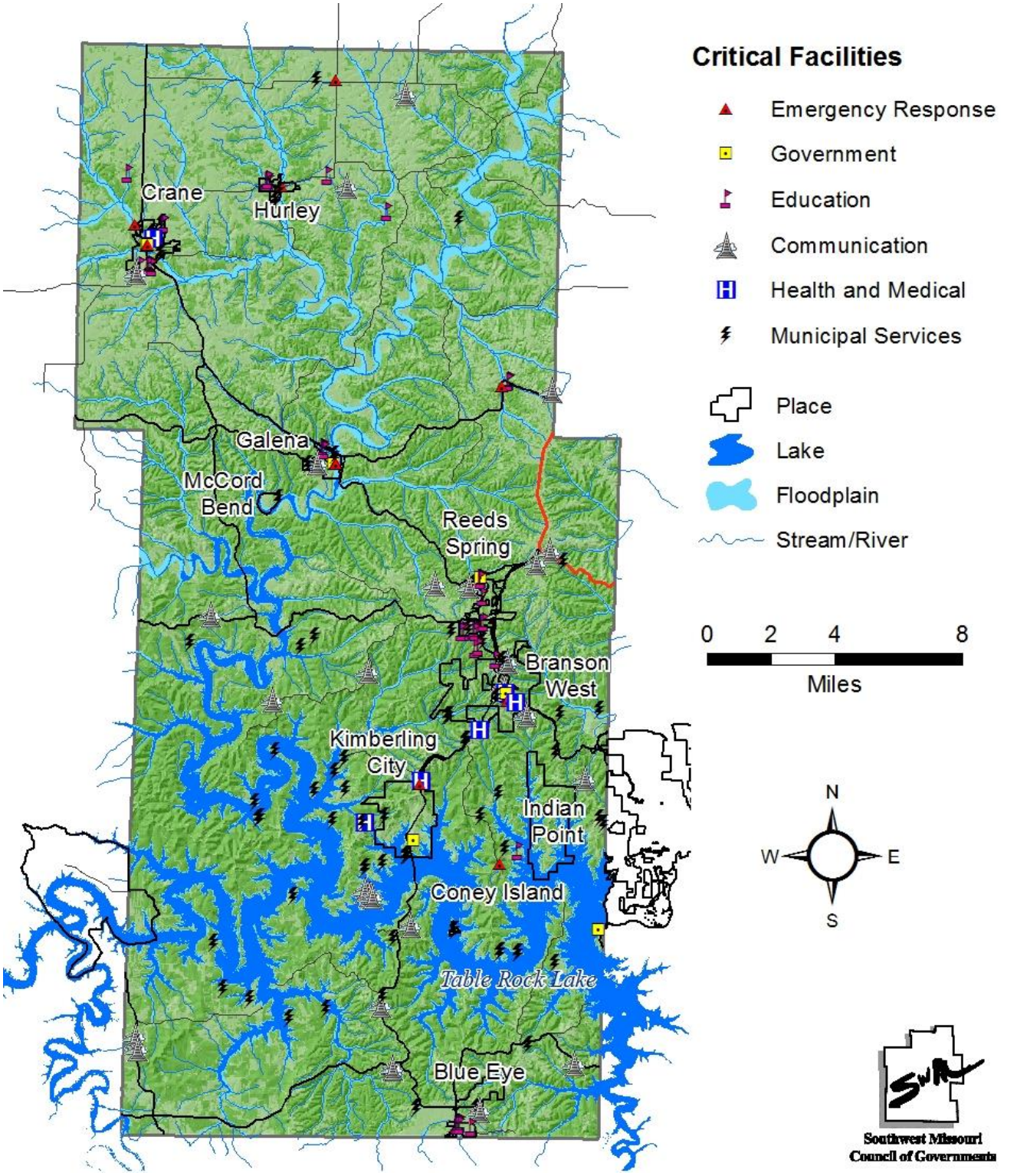


Figure 3.18. **City of Branson West SFHAs with Critical Facilities**

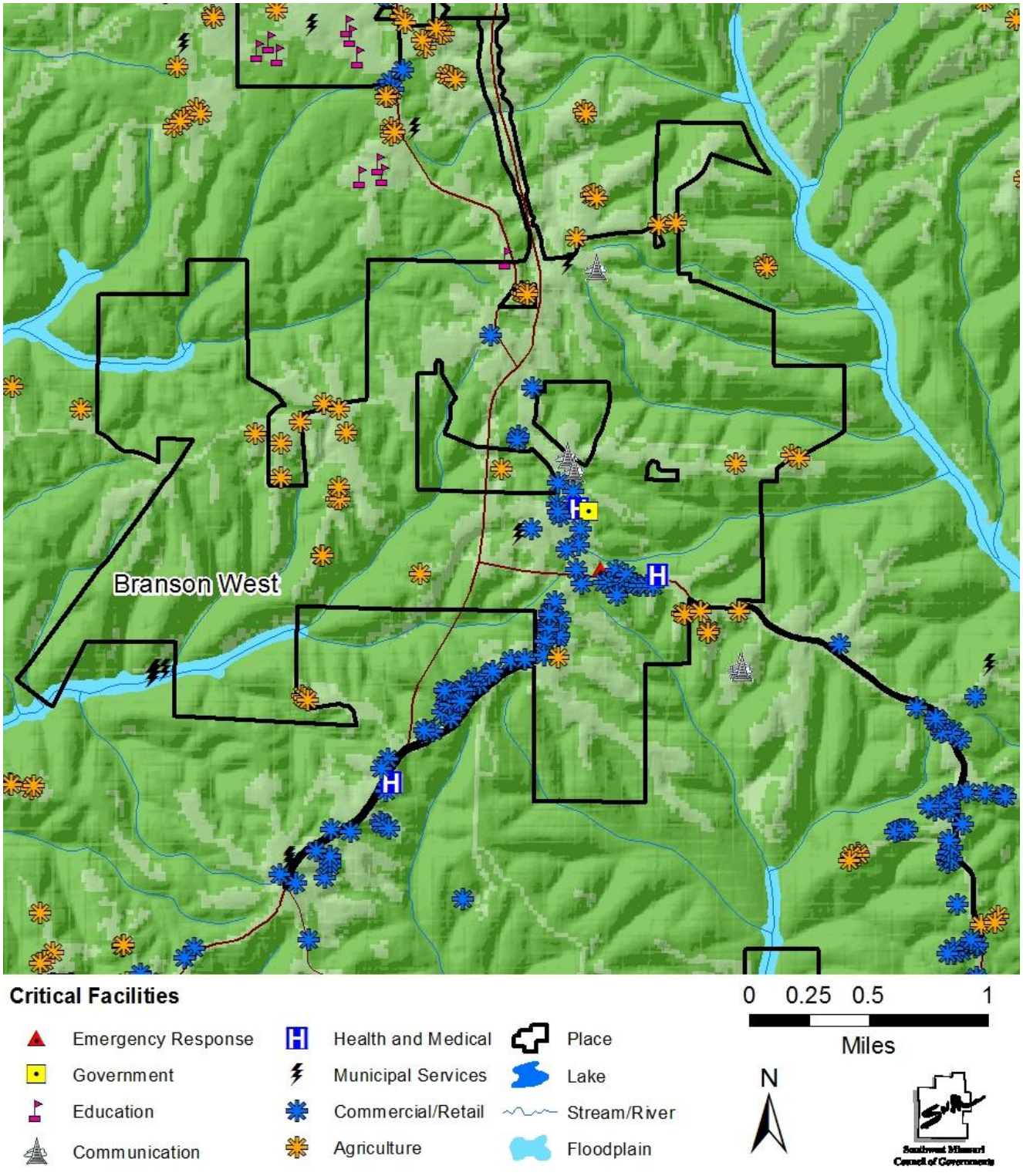


Figure 3.19. **City of Crane SFHAs with Critical Facilities**

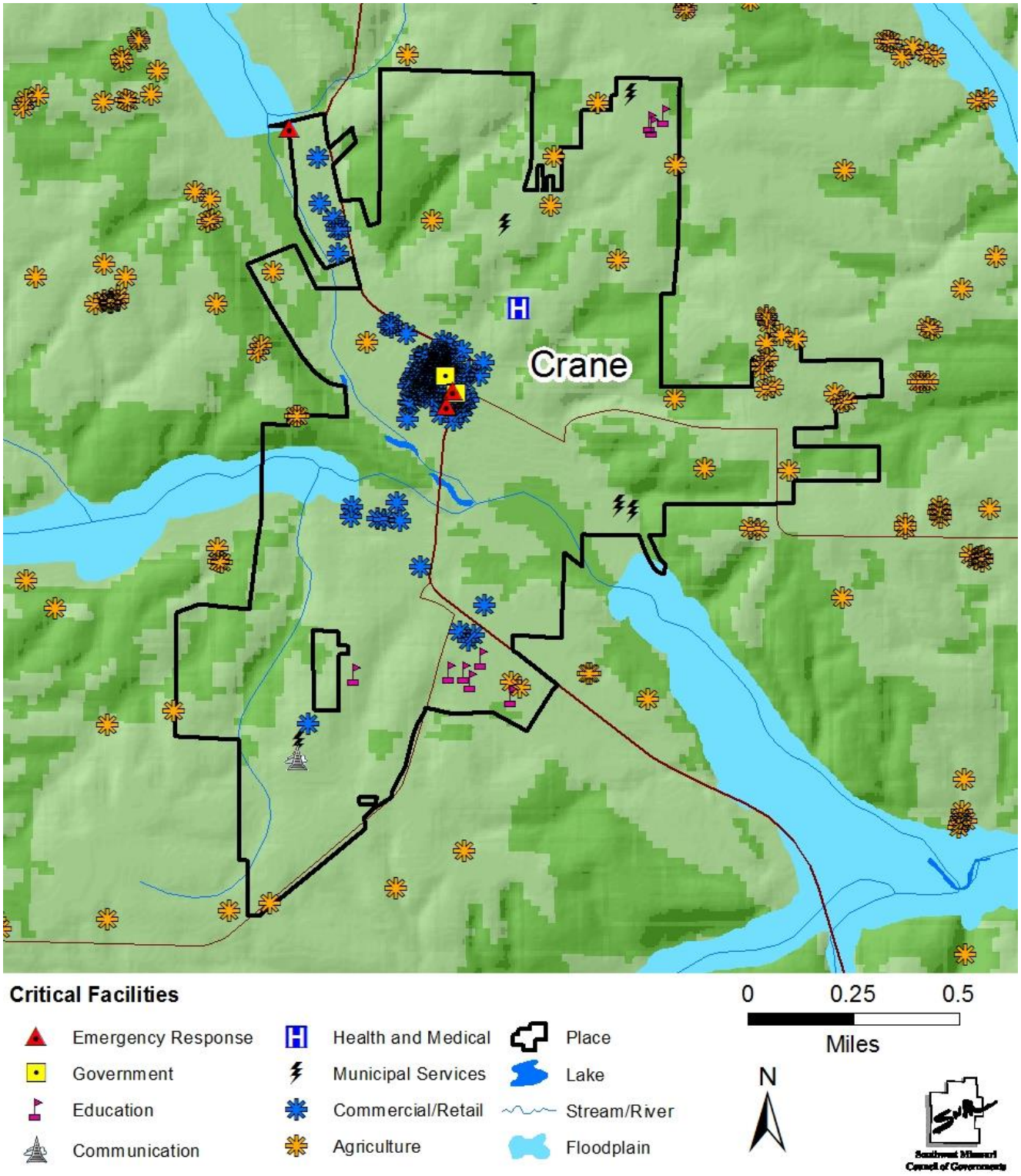


Figure 3.20. **City of Galena SFHAs with Critical Facilities**

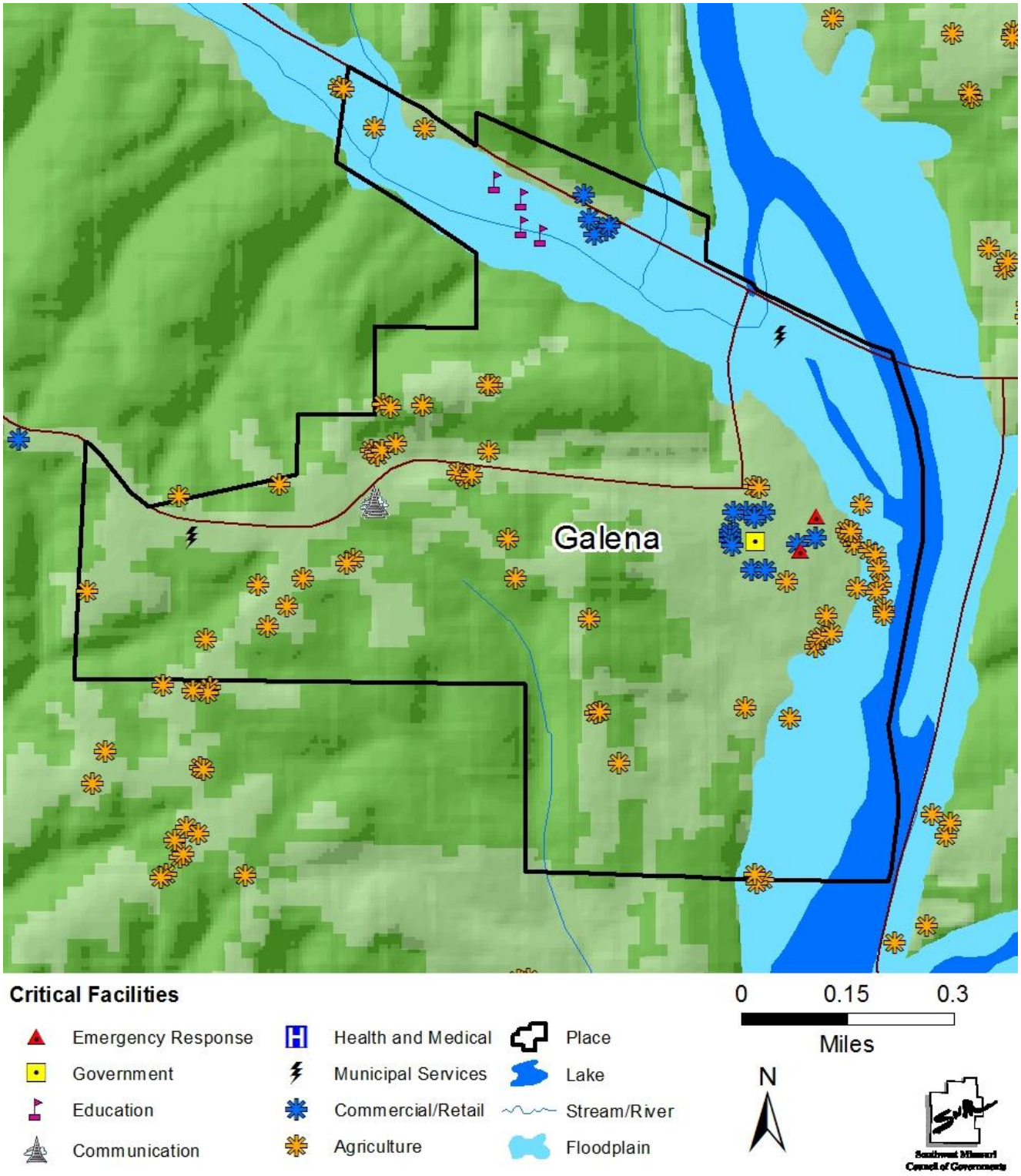


Figure 3.21. **City of Hurley SFHAs with Critical Facilities**

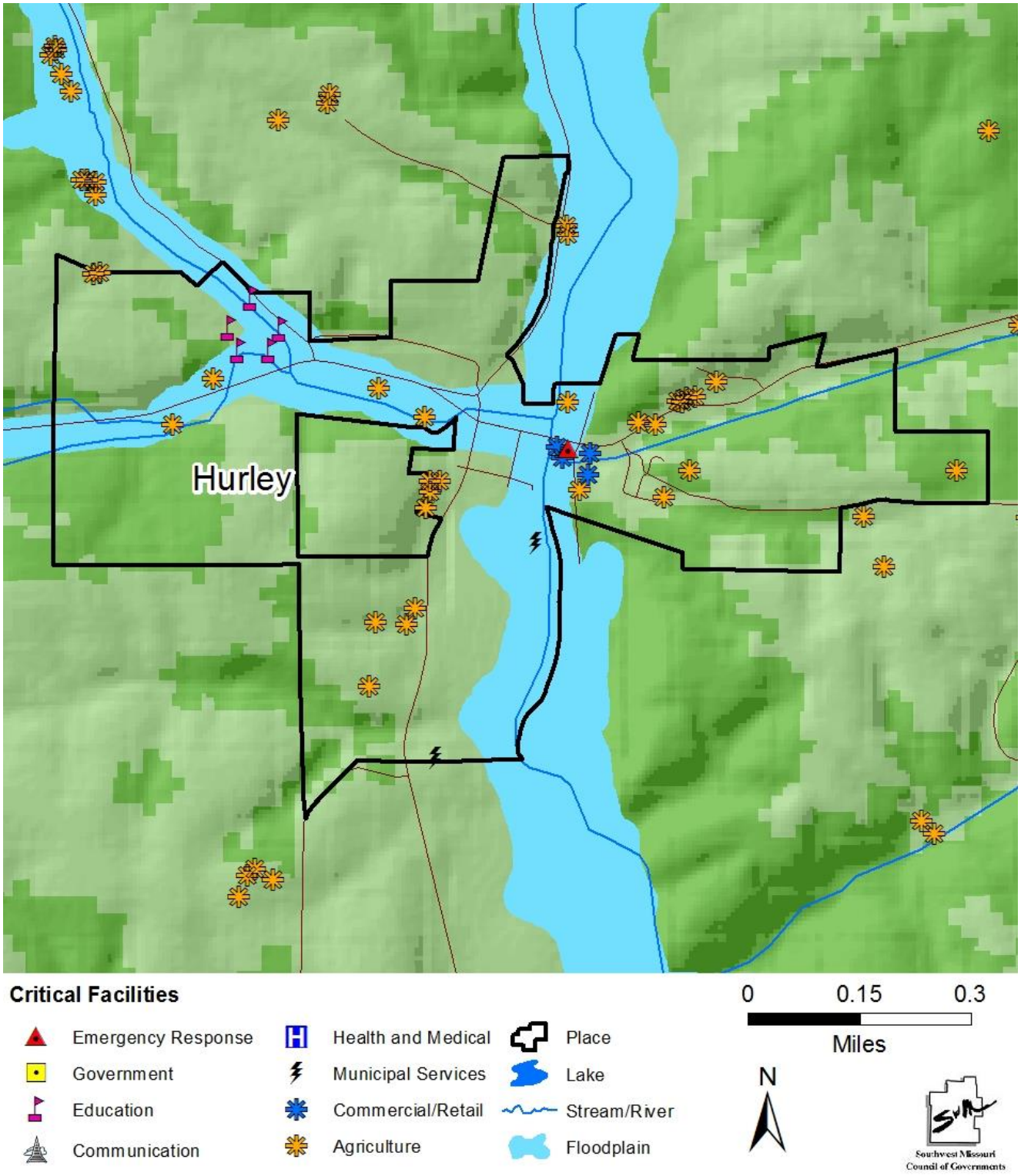


Figure 3.22. **City of Kimberling City SFHAs with Critical Facilities**

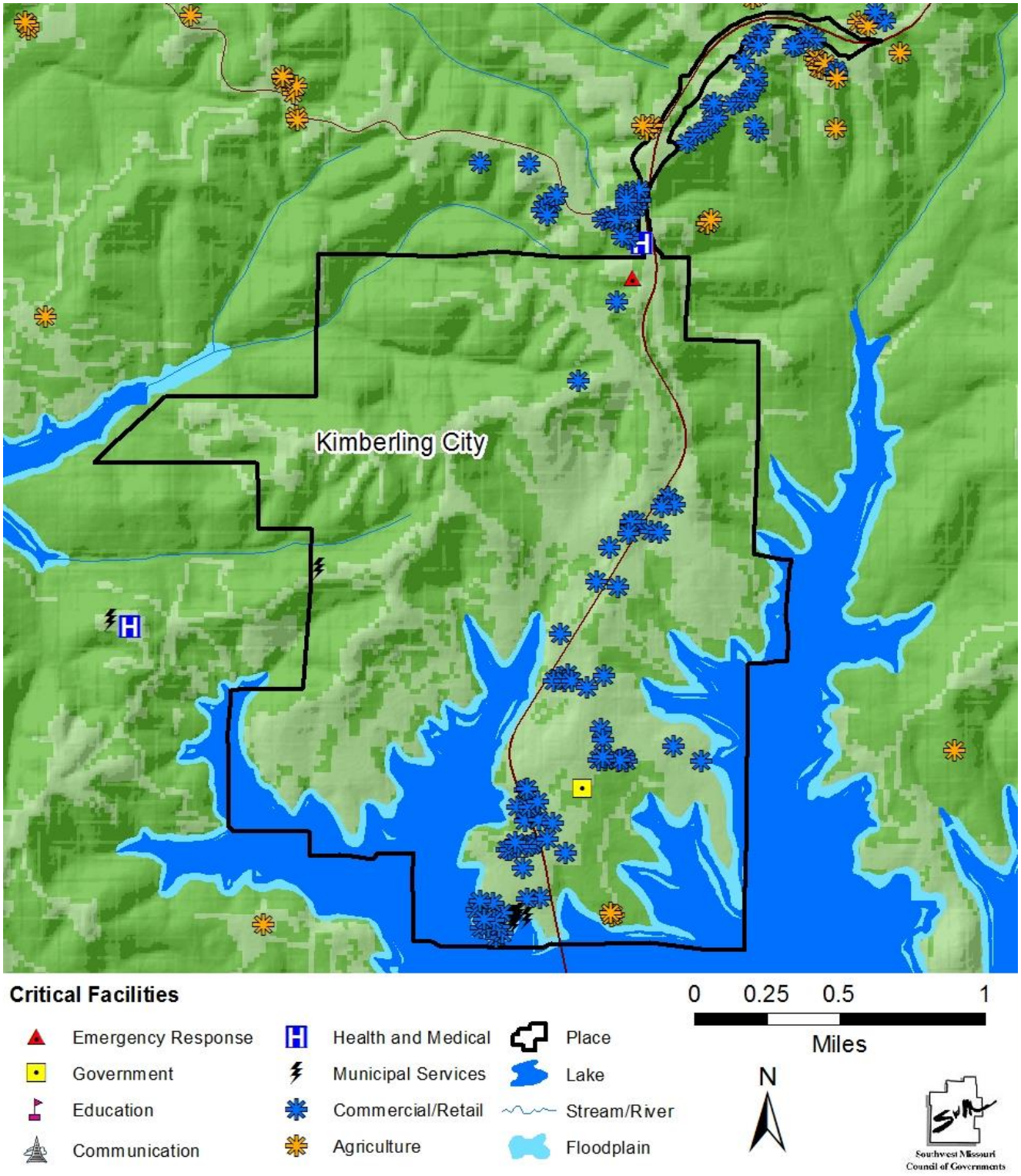


Figure 3.23. **City of Reeds Spring SFHAs with Critical Facilities**

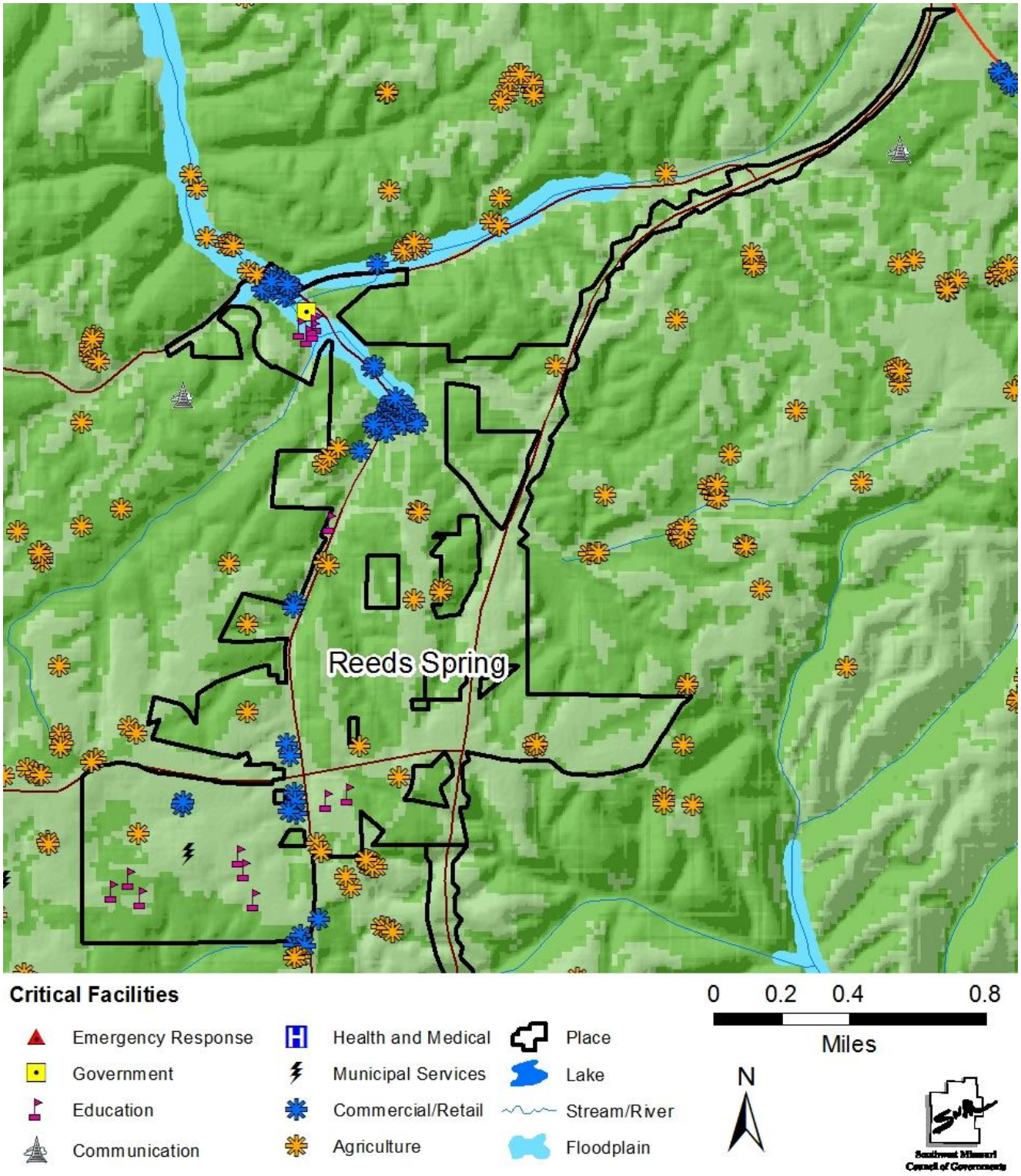


Figure 3.24. **Village of Blue Eye SFHAs with Critical Facilities**

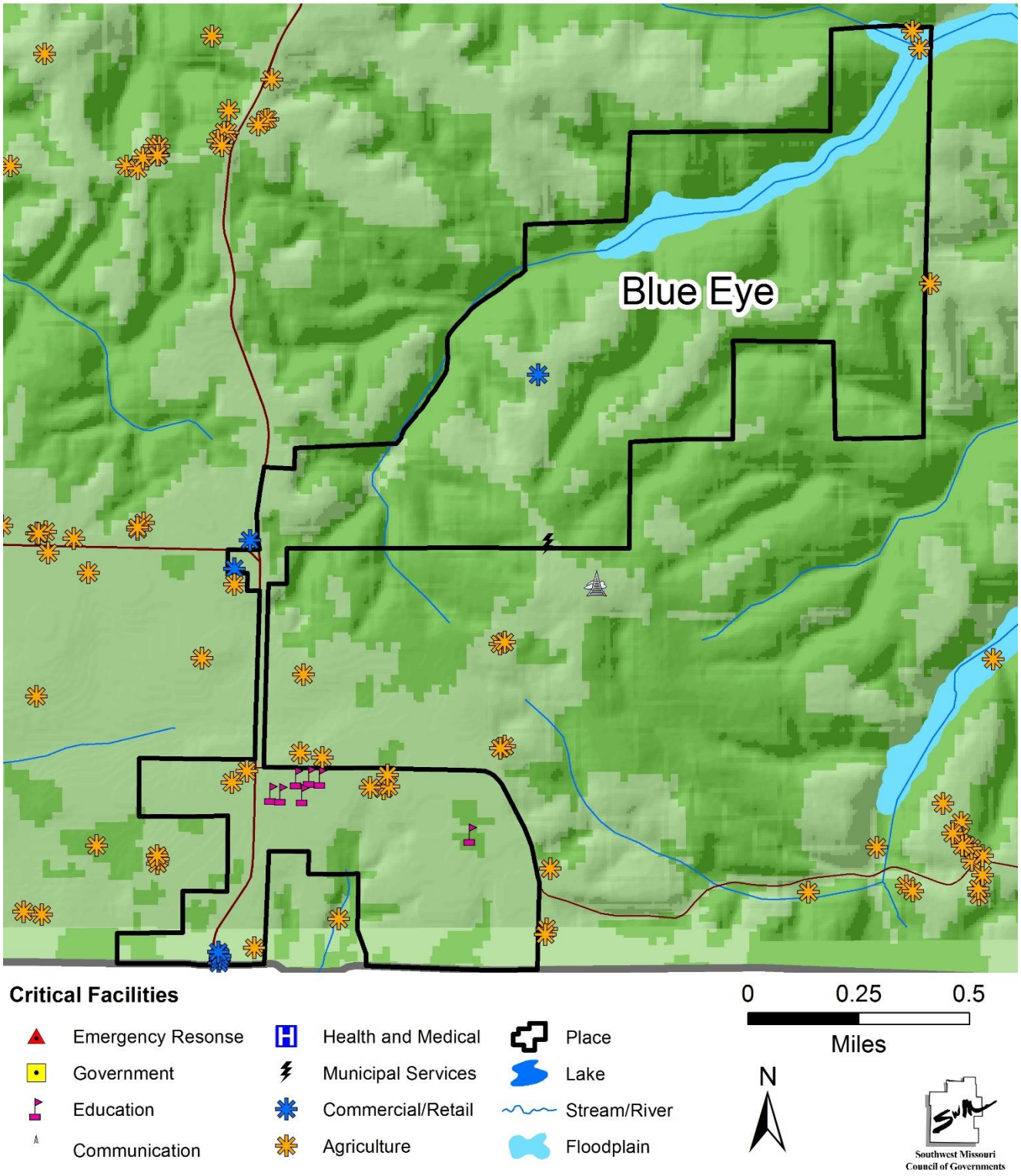


Figure 3.25. **Village of Coney Island SFHAs with Critical Facilities**

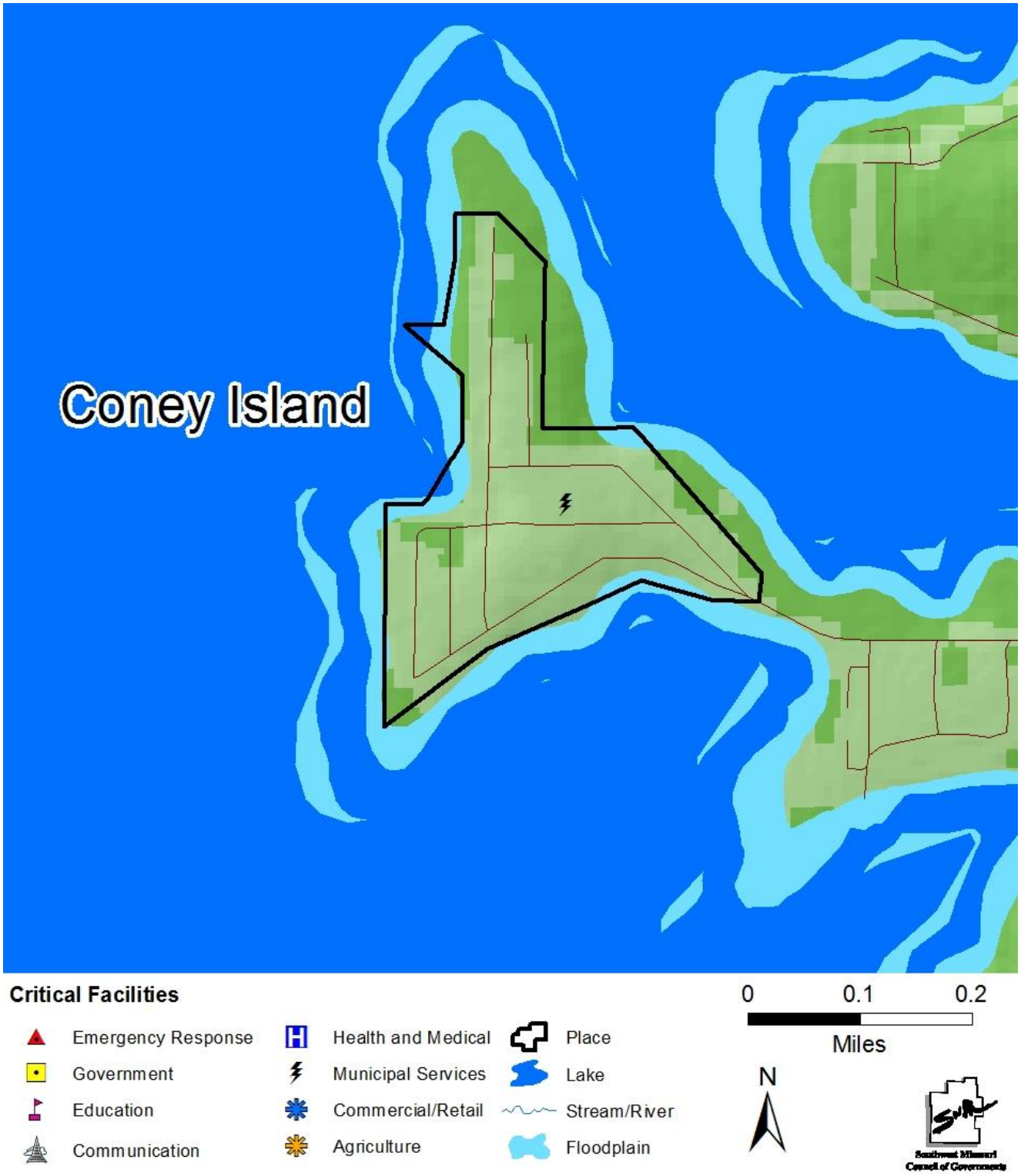


Figure 3.26. **Village of Indian Point SFHAs with Critical Facilities**

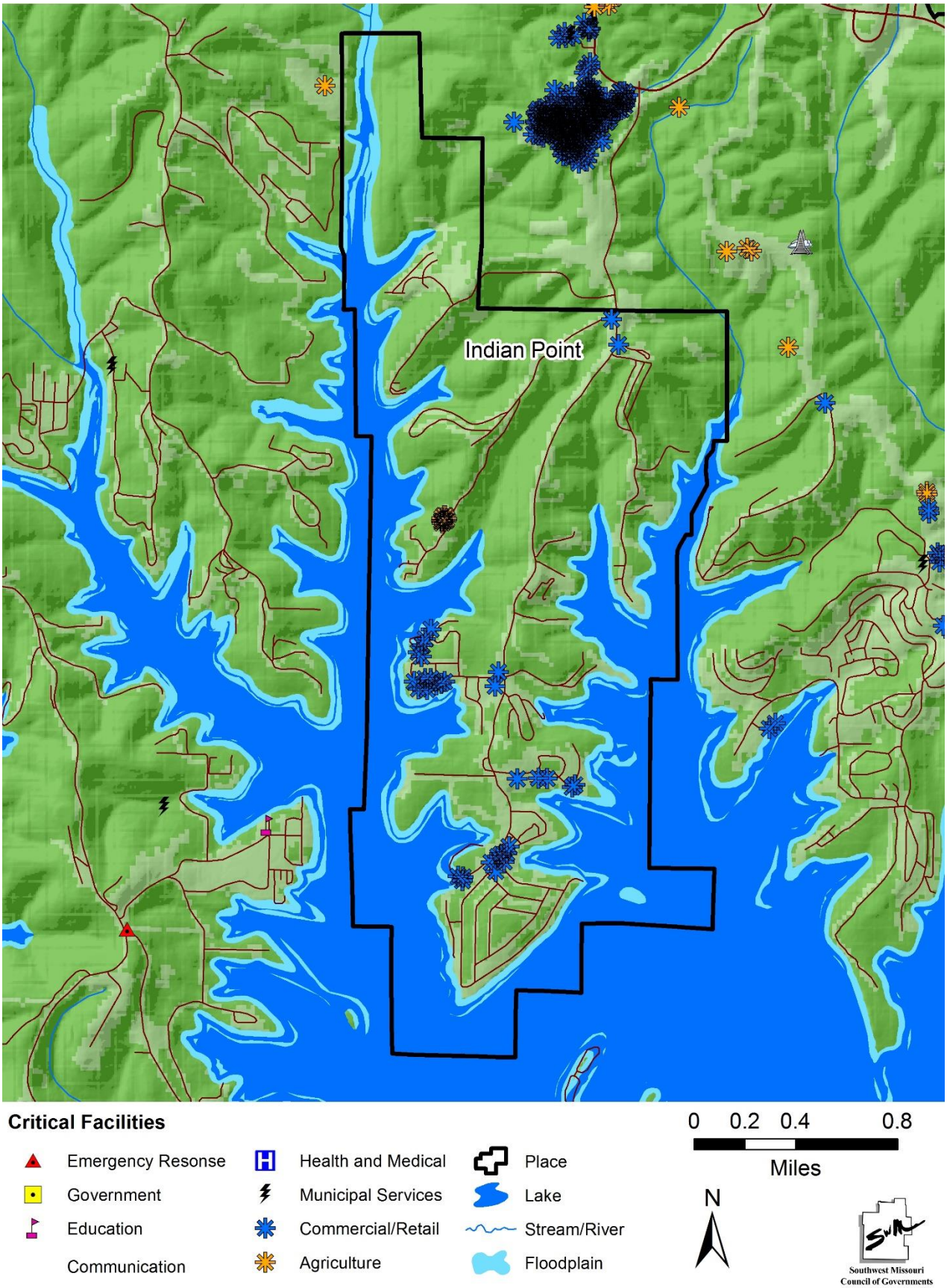
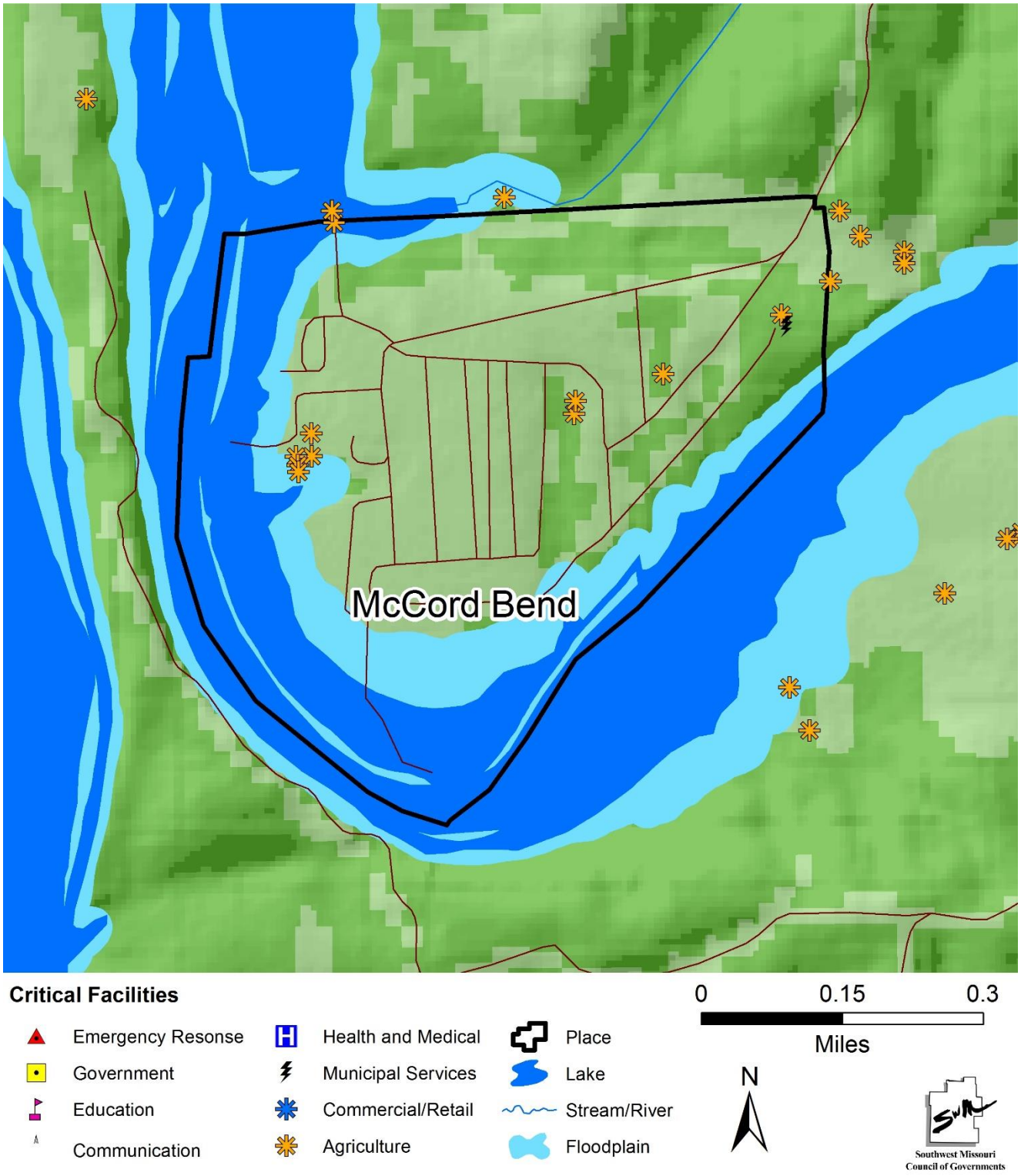


Figure 3.27. **Village of McCord Bend SFHAs with Critical Facilities**



Flash flooding events pose the most pervasive hazard of the two flood types in the county due to permeability of soils, slopes, increasing urban development and extensive network of streams and rivers. Sustained rainfall or downpours at the rate of one inch per hour have caused street flooding in incorporated areas and made a significant number of low water crossings impassible. Flash flooding occurs in the floodplain while low-lying areas in all jurisdictions are susceptible to flash floods outside the 100-year floodplain. They also occur in areas without adequate drainage to carry away the amount of water that falls during intense rainfall events. A review of the NCEI storm event database determined which jurisdictions are most prone to flooding and flash flooding from 1998 to July 2017 are listed in **Table 3.26** and **Table 3.27.**

Table 3.26. Stone County NCEI Flood Events by Location, 1998-2017*

Location	# of Events
Unincorporated Stone County	**11**
Low water crossings, rivers, streams countywide (2/24/2001), (12/16/2001), (5/7/2002), (5/17/2002), (4/22/2004), (1/12/2005)	
Table Rock Lake (5/12/2002)	
Numerous roads countywide (1/4/2005)	
Bass Hollow Road (4/24/2011)	
Route O along Tory Creek and Route U along James River (6/19/2015)	
City of Crane	**2**
General Flooding (3/19/2008)	
City Park Road (4/24/2011)	
City of Hurley	**3**
Several streets (4/24/2011)	
Route A near Spring Creek (1/29/2013)	
Route A, Highway CC, and Route BB at Crane and Spring Creek (4/3/2015)	
City of Galena	**1**
20 homes near James River (12/28/2015)	
City of Reeds Spring	**3**
Railey Creek Road (4/24/2011), (4/21/2017)	
Railey Creek near Highway 413 (11/17/2015)	

Source: National Centers for Environmental Information

* = Through July, 2017

The NCEI storm event data lists flash flood events according to the nearest community or place. Most of these events cover larger areas than the smaller geographic areas reported in the data. Some specific locations are listed within the narratives for flash flood events. Where specific roads and locations are listed they are provided in the table. Although some events may not be inside the corporate limits of the community identified in the narrative, they are in such proximity that the community named would be the most affected by impassible roads. It is safe to assume that numerous low water crossings would be impacted by heavy rains that exacerbate flash flooding across the county. In addition, multiple records are related to the same event and vice versa.

Table 3.27. Stone County NCEI Flash Flood Events by Location, 1998-2017*

Location	# of Events
Unincorporated Stone County	**25**
Numerous low water crossings countywide (1/4/1998), (3/19/1998), (5/24/2000), (2/24/2001)	
Northern part of the county (5/4/1999), (5/28/2002), (1/7/2008)	
Roads and highways countywide (6/17/2000), (1/4/2005)	
Highway M (4/24/2007)	
Intersection of 176 and 13; Bass Hollow Road (5/15/2007)	
Roads near Abesville (6/30/2007)	
Highway 413 north of Crane (9/6/2007)	
Areas along James River and Railey Creek (3/17/2008), (9/14/2008)	
Highway 413 between Crane and Galena (10/8/2009)	
Railey Creek Road (3/25/2010), (7/1/2015)	
Jasmine Road east of Highway K (9/1/2010)	
Highway O (4/22/2011)	
Several roads in the southern part of the county (8/5/2013)	
Highway 176 in Abesville (4/1/2015)	
Highway 176 near Highway 160 (7/1/2015)	
Low water crossing on Holt Woods Road near Dogwood Tree Road (7/5/2015)	
Cabin Road (8/7/2015)	
Near Ponce De Leon Baptist Church (8/7/2015)	
Table Rock Lake (4/10/2008)	
City of Branson West	**1**
Highway 76 and Notch Lane (7/9/2015)	
City of Crane	**7**
Small streams and creeks (11/1/2004)	
Roundhouse Road and Grisham Ford Road (5/26/2006)	
Various streets (8/24/2007)	
Roundhouse Road and Wire Road (9/8/2007), (7/9/2015)	
Roadhouse Road (3/25/2010)	
Highway 413 south of Crane (4/3/2015)	
City of Galena	**9**
Numerous roads and low water crossings (4/23/2004), (6/28/2008)	
Flat Creek (1/12/2005)	
Highway 413 (5/10/2006), (10/8/2009), (3/25/2010)	
Highway 413 and Highway 176 (6/8/2007)	
Route AA (4/25/2011)	
Highway 413 near James River (12/26/2015)	
Along the James River (4/30/2017)	
City of Hurley	**2**
Highway A (7/9/2015)	
Twilight Drive at Dry Crane Creek (7/27/2016)	
City of Reeds Spring	**11**
Highway 13 along Railey Creek (5/9/1998)	
Several roads (6/30/2003), (4/25/2011), (7/7/2015)	
Holtwood Road and Railey Creek Road (4/23/2004)	
Highway 413 at Railey Creek (7/3/2008)	

Highway 76 and Highway Y (3/25/2010)	
Rock Church Road between Highway 413 and Highway HH (3/25/2010)	
Railey Creek Road (4/24/2011)	
Main Street (8/9/2013)	
Highway 248 and Highway 265 (7/7/2015)	
Downtown evacuated (4/29/2017)	
Village of Blue Eye	**3**
Highway 13 and Highway 86 along Brush Creek (8/8/2013)	
Peace In The Valley Road (8/8/2013)	
Intersection of State Highway EE and Brush Creek Road (7/9/2015)	

Source: National Centers for Environmental Information

* = Through July, 2017

Severity/Magnitude/Extent

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

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

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

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

National Flood Insurance Program (NFIP) Participation

Table 3.28 provides details on NFIP participation for the communities in Stone County. **Table 3.29** shows the number of policies in force, amount of insurance in force, number of closed losses, and total payments for each jurisdiction, where applicable. The time period represented by the data for closed losses is from January 1, 1978 through July 10, 2017

Table 3.28. NFIP Participation in Stone County

Community ID#	Community Name	NFIP Participant (Y/N)	Current Effective Map Date	Regular- Emergency Program Entry Date
290431	Stone County	Y	5/20/2010	3/19/1997

	Branson West			
290430	Crane	Y	5/20/210	7/16/1980
290431	Galena	Y	5/20/210	5/20/2010
290495A	Hurley	Y	5/20/2010	9/26/2012
290432	Kimberling City	Y	5/20/2010	4/15/1979
290433	Reeds Spring	Y	5/20/2010	9/18/1985
	Blue Eye			
295431	Coney Island	N	5/20/2010	
295432	Indian Point	N	5/20/2010	
295433	McCord Bend	Y	5/20/2010	6/15/2017

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

Table 3.29. NFIP Policy and Claim Statistics as of July 10, 2017

Community Name	Policies in Force	Insurance in Force	Closed Losses	Total Payments
Stone County	65	$13,772,900	25	$812,964.41
Crane	2	$71,300	0	$0
Galena	9	$1,130,200	5	$166,430.71
Hurley	1	$50,000	0	$0
Kimberling City	3	$980,000	0	$0
Reeds Spring	8	$731,000	11	$295,366.33

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

Galena and Reed Spring are the only two communities with insurance payments with 5 closed losses with total payments of $166,430.71 and 11 closed losses with total payments of $295,366.33, respectively. The unincorporated areas of Stone County also had many insurance payment. Over 25 closed losses, the county received $812,964.41 in total payments

Repetitive Loss/Severe Repetitive Loss Properties

Repetitive Loss Properties are those properties with at least two flood insurance payments of $5,000 or more in a 10-year period.

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 the Flood Insurance Administration, jurisdictions in Stone County have a combined total of 14 repetitive or severe repetitive loss properties. Thirteen of the 14 properties are residential and one is commercial.

Table 3.30 provides a summary of the repetitive loss properties in Stone County and incorporated jurisdictions.

Table 3.30. Stone County Repetitive Loss Properties

Jurisdiction	# of Properties	Building Payments	Content Payments	Total Payments	Average Payment	# of Losses
Stone County	7	$544,167.42	$ 107,103.52	$ 651,270.94	$ 38,310.06	17
City of Galena	4	$ 305,572.82	$ 699.03	$ 306,271.85	$ 38,283.98	8
Reeds Spring	3	$ 346,908.90	$ 40,800.00	$ 387,708.90	$ 48,463.61	8

Source: Flood Insurance Administration as of August 29, 2017

Previous Occurrences

According to the NCEI storm event data, there were 63 flash flood events recorded in Stone County from 1998 to 2017. Ten of these events resulted in property damage. The most recent damaging event occurred in April of 2017 when several rounds of severe thunderstorms occurred across southwest Missouri. Stone County was included in the presidential disaster declaration 4250 during major flooding across the state in December 2015 and Emergency declaration 4317 in June 2017. Numerous roads, bridges, and low water crossings were damaged. **Table 3.31** summarizes flash flood events by year from 1998 to 2017 in Stone County. The most damaging year was during 2008 flooding in March and June which affected numerous residents and businesses county-wide.

Table 3.31. NCEI Stone County Flash Flood Events Summary, 1998 to 2017*

Year	# of Events	# of Deaths	# of Injuries	Property Damages	Crop Damages
1998	3	0	0	$0	$0
1999	1	0	0	$0	$0
2000	2	0	0	$0	$0
2001	1	0	0	$0	$0
2002	1	0	0	$0	$0
2003	1	0	0	$0	$0
2004	3	0	0	$0	$0
2005	3	0	0	$0	$0
2006	2	0	0	$0	$0
2007	7	0	0	$0	$0
2008	6	0	0	$8,100,000	$0
2009	2	0	0	$0	$0
2010	6	0	0	$0	$0
2011	4	0	0	$4,000,000	$0
2013	4	0	0	$50,000	$0
2015	16	0	0	$2,510,000	$0
2016	1	0	0	$0	$0
2017*	2	0	0	$2,000,000	$0
Total	**63**	**0**	**0**	**$16,660,000**	**$0**

Source: NCEI, data accessed July, 2017
* = Through July 2017

Table 3.32 summarizes riverine flood events by year from 1998 to 2017 in Stone County.

Table 3.32. NCEI Stone County Riverine Flood Events Summary, 1998 to 2017*

Year	# of Events	# of Deaths	# of Injuries	Property Damages	Crop Damages
2001	2	0	0	$0	$0

2002	3	0	0	$350,000	$0
2004	1	0	0	$0	$0
2005	3	0	0	$0	$0
2008	1	0	0	$0	$0
2011	4	0	0	$0	$0
2013	1	0	0	$0	$0
2015	6	0	0	$1,550,000	$0
2017*	1	0	0	$0	$0
Total	**22**	**0**	**0**	**$1,900,000**	**$0**

Source: NCEI, data accessed July, 2017
* = Through July 2017

Probability of Future Occurrence

There have been a total of 85 reported flood events in Stone County from 1998 to 2017 in the NCEI storm event database. Of those, 63 were flash floods. In this 20 year period, there were only two years, 2012 and 2014, with no reported flash flood events. This means that there is a 90% probability that there will be a flash flood in any given year, with an average of 3.5 per year. Of the 63 events, 10 resulted in property damages totaling $16,660,000, or $1,666,000 per damaging event. During the same time period there were 22 riverine flood events reported in the county. These were spread out over 9 years, giving a 45% probability for a riverine flood in any given year 2.4 events on average per year. Three of the 19 events resulted in $1,900,000, or $633,333 per damaging event.

Vulnerability

Vulnerability Overview

Flooding has been included in most of the presidential disaster declarations that have included Stone County. Periods of heavy rain falling at the rate of one inch per hour floods low water crossings throughout the county, making many roads impassable. This creates a severe threat to motorists that attempt to drive through flood waters over the roadway. Riverine flooding occurs less frequently than flash flooding and there are repetitive loss properties in the county; however, property damage is still likely to occur to non-SRL properties. Low lying areas outside of the floodplain may also be frequently flooded. Flooding of streets has been reported in several of the communities and many highways are frequently being flooded. Highway 413 has experienced the most flooding and flash flooding. Other susceptible roads include Route A, Highway 76 and Highway 176. The communities of Galena, Hurley, and Reeds Spring all have school district facilities in SFHAs in Stone County, and there are a number of wastewater facilities within the floodplain

.

Potential Losses to Existing Development

Flood loss estimates were developed by selecting all parcels located within 100 feet of the 100-year floodplain to compile building counts by type for each participating municipality and the unincorporated parts of Stone County. It is important to note that this method created building counts for areas outside the 100-year floodplain, but in an effort to depict potential losses from flash flooding, those parcels were included. The summed valuations for all parcels within 100 feet of the 100-year floodplain would be more prone to flash flooding due to the proximity to the natural drainage features in the area.

Potential flood losses by building type by jurisdiction are presented in **Table 3.33.**

Table 3.33. Potential Flood Losses for Building Types by Jurisdiction

Jurisdiction	Residential	Commercial	Agricultural	Total
Branson West	1	0	0	1
Crane	1	0	0	1
Galena	20	7	3	30
Hurley	36	4	5	45
Kimberling City	51	9	0	60
Reeds Spring	40	19	0	59
Blue Eye	3	1	0	4
Coney Island	6	2	0	8
Indian Point	28	4	0	32
McCord Bend	18	0	0	18
Unincorporated County	1,359	44	162	1,565
Stone County Total	**1,563**	**90**	**170**	**1,823**

Source: Stone County Parcel Data; Missouri Structures Data

Table 3.34 provides the total exposure for structures and contents by building type and jurisdiction. Losses were estimated by applying a 5% damage factor to total exposure.

Table 3.34. Total Flood Exposure and Estimated Losses by Jurisdiction

Jurisdiction	Residential	Commercial	Agricultural	Estimated Exposure	Estimated Loss
Branson West	$12,200	$0	$0	$12,200	$610
Crane	$63,000	$0	$0	$63,000	$3,150
Galena	$2,892,700	$773,400	$14,200	$3,680,300	$184,015
Hurley	$3,309,500	$66,600	$8,500	$3,384,600	$169,230
Kimberling City	$4,741,600	$2,265,500	$0	$7,007,100	$350,355
Reeds Spring	$1,378,600	$590,100	$0	$1,968,700	$98,435
Blue Eye	$134,800	$668,700	$0	$803,500	$40,175
Coney Island	$248,600	$152,000	$0	$400,600	$20,030
Indian Point	$2,476,100	$2,675,800	$0	$5,151,900	$257,595
McCord Bend	$401,000	$0	$0	$401,000	$20,050
Unincorporated County	$128,932,600	$13,515,800	$1,058,100	$143,506,500	$7,175,325
Stone County Total	**$144,590,700**	**$20,707,900**	**$1,080,800**	**$166,379,400**	**$8,318,970**

Source: Stone County Parcel Data; Missouri Structures Data

The communities of Galena, Hurley, and Reeds Spring have critical facilities within the floodplain.

Impact of Previous and Future Development

Future development could impact flash and riverine flooding in Stone County. Development in low-lying areas near rivers and streams or where interior drainage systems are not adequate to provide

drainage during heavy rainfall events will be at risk to flash flooding. Future development would also increase impervious surfaces causing additional water run-off and drainage problems during heavy rainfall events.

Hazard Summary by Jurisdiction

All local governments in the county are at risk to flood hazards; however, as demonstrated in **Table 3.33** exposure of assets near SFHAs varies among jurisdictions. It should be noted that all of these communities can be impacted by flooding of major roads and low water crossings in the areas proximate to their corporate limits. Several incorporated areas in the county are susceptible to street flooding during periods of heavy rain as evidenced by the previous occurrences by location in **Table 3.26** and **3.27**. The greatest impact of flooding is in the unincorporated part of the county. Stone County is part of the NFIP program, so it is able to regulate development in the floodplains. Due to the topography and many streams in the county, numerous low water crossings are damaged and create a significant hazard to public safety during flood events.

Problem Statement

Floods are frequent events and have been listed in all but two of the presidential disaster declarations that have included Stone County. Stone County is a participant in the NFIP along with the jurisdictions of Crane, Galena, Hurley, Kimberling City, Reeds Spring, and McCord Bend. These communities have passed floodplain management ordinances and have the ability to substantially regulate development in the floodplain. Participation in the NFIP enables residents to purchase flood insurance. Street flooding in incorporated areas can be addressed through storm water management projects and enforcing storm water management regulations.

Several million dollars in property damage has resulted in the numerous flood events in the past two decades. To reduce the damage of floods to infrastructure and human life, several strategies can be implemented, such as hazard awareness programs and waterway maintenance. Projects involving the improvements to river/stream embankments can also reduce flooding to surrounding areas. The enforcement of NFIP ordinances, and the purchase and demolition, elevation, or flood proofing of structures and critical facilities in the floodplain would also minimize the impact of flooding.

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.

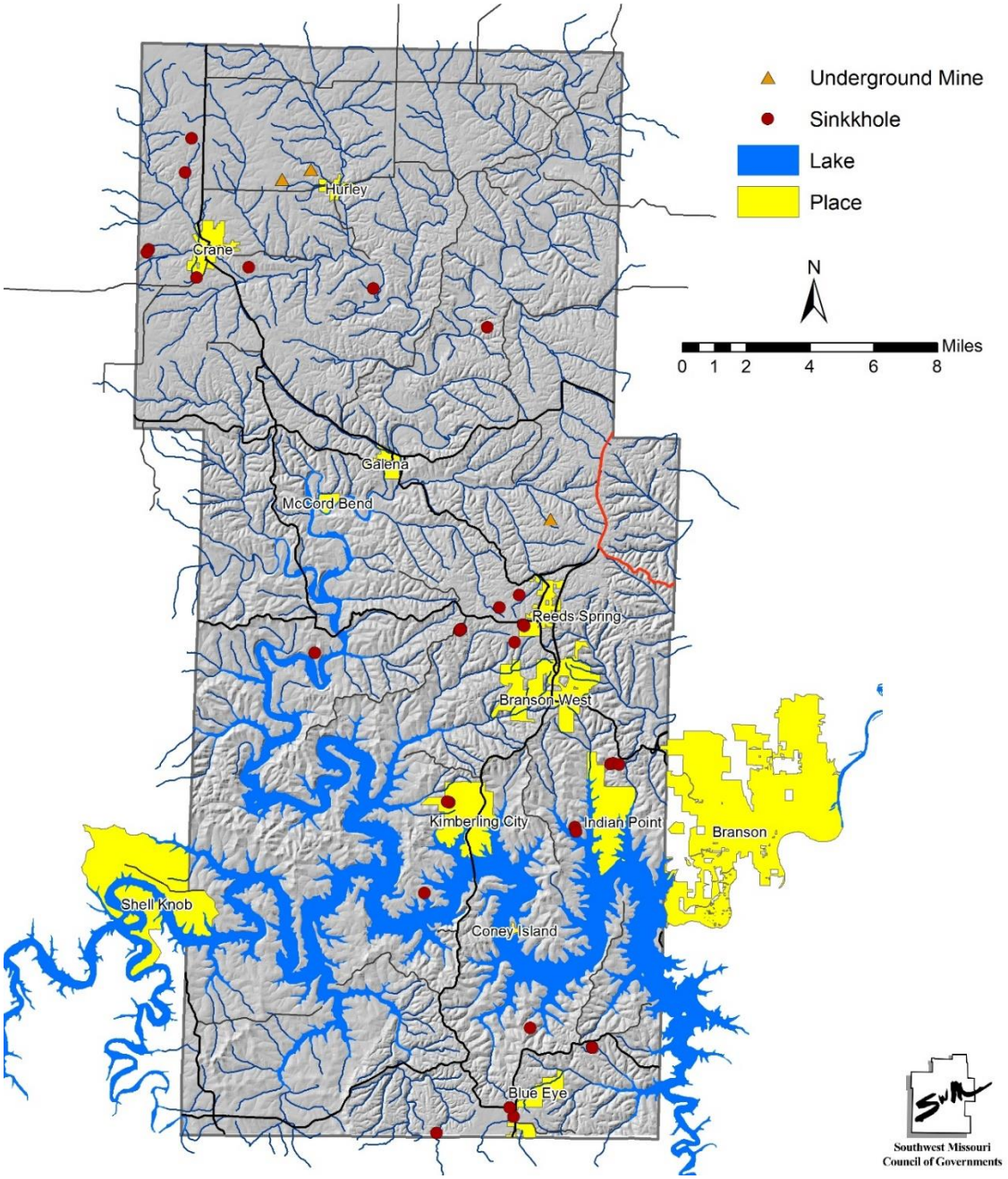
According to the U.S. Geological Survey (USGS), the most damage from sinkholes tends to occur in Florida, Texas, Alabama, Missouri, Kentucky, Tennessee, and Pennsylvania. Fifty-nine percent of Missouri is underlain by thick, carbonate rock that makes Missouri vulnerable to sinkholes. Sinkholes occur 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 is shape like shallow bowls or saucers whereas other have vertical walls. Some hold water and form natural ponds.

According to Missouri Department of Natural Resources, Inventory of Mines, Occurrences, and Prospects database, there are 57 mines in Stone County. Twenty one (21) are past producers and are no longer in use. Zinc and lead have been historically the most common commodity mined; however, the mines currently in operation mine limestone and sand & gravel.

Geographic Location

The greatest concentrations of sinkholes in Stone County are in the southern and central areas, near Blue Eye and Reeds Spring. **Figure 3.28** shows the location of sinkholes and underground mines in Stone County.

Figure 3.28. **Sinkholes and underground mines in Stone 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.

http://www.foundation-repair-guide.com/expansive-soil.html
http://www.ehow.com/list_6880295_properties-expansive-soils.html

Previous Occurrences

Sinkholes are a regular occurrence in Missouri, but rarely are events of any significance. Sinkhole incidents are not officially recorded, and no occurrences of a sinkhole incident have been recorded in local news.

Probability of Future Occurrence

Sinkhole incidents are not tracked, thus it is nearly impossible to calculate a future probability of occurrence. However, due to the number of known mines and sinkholes in Stone County, it is likely that there will be an occurrence at some point in the future.

Vulnerability

Vulnerability Overview

Sinkholes in Missouri are a common feature where limestone and dolomite outcrop. Dolomite is a rock similar to limestone with magnesium as an additional element along with the calcium normally present in the minerals that form the rocks. While some sinkholes may be considered a slow changing nuisance; other more sudden, catastrophic collapses can destroy property, delay construction projects, contaminate ground water resources, and damage underground utilities. The entire county is underlain with limestone and dolomite bedrock.

Potential Losses to Existing Development

Sinkhole loss estimates were established using GIS processes and appraised valuations. A sinkhole point shapefile acquired from MDNR was used to generate a half-mile buffer around each feature. The buffer layer was designated as the hazard prone areas for sinkholes. The map layer of the sinkhole hazard prone areas was used as an overlay on the parcel data to generate the loss estimates from this hazard by jurisdiction. **Table 3.35** provides the building count by type and by jurisdiction based on the results of the sinkhole analysis. **Table 3.36** provides a dollar amount for total exposure by jurisdiction and estimated losses. To calculate the losses a damage factor of 0.5% was applied to the total exposure.

Table 3.35. Sinkhole Exposure by Building Type by Jurisdiction

Jurisdiction	Residential	Commercial	Agriculture	Building Count
Blue Eye	18	1	6	25
Crane	57	1	1	106
Kimberling City	111	0	0	125
Reeds Spring	104	8	2	152
Unincorporated County	749	188	243	1807
Total	**1,039**	**198**	**252**	**2,215**

Source: Missouri GIS Database

Table 3.36. Total Sinkhole Exposure and Estimated Losses by Jurisdiction

Jurisdiction	Residential	Commercial	Agriculture	Estimated Exposure	Estimated Loss
Blue Eye	$4,487,100	$183,700	$38,200	$4,709,000	$23,545
Crane	$2,613,800	$826,600	$50,900	$3,491,300	$17,457
Kimberling City	$18,511,900	$72,500	$19,600	$18,604,000	$93,020
Reeds Spring	$14,582,200	$2,380,100	$16,100	$16,978,400	$84,892
Unincorporated County	$63,717,000	$10,175,500	$1,731,500	$75,624,000	$378,120
Total	**$103,912,000**	**$13,638,400**	**$1,856,300**	**$119,406,700**	**$597,034**

Source: Missouri GIS Database, Stone County Parcel Data

Blue Eye R-V and Reeds Springs R-IV School Districts have school facilities within the half-mile sinkhole buffer. Additionally, there is a wastewater treatment plant near Blue Eye that is within the half-mile sinkhole buffer.

Impact of Previous and Future Development

Future development over abandoned mines and in areas of known risk to sinkhole formation in Stone County will increase vulnerability to this hazard. Population and development in these areas will increase exposure to sinkhole occurrence. There are currently no regulations prohibiting construction over or near known sinkholes. Future development may also change storm runoff patterns and cause expansion or formation of sinkholes.

Hazard Summary by Jurisdiction

The risk of sinkhole damage for individual communities and school districts is limited to the amount of exposure of buildings and infrastructure. Some parts of the county are more at risk for potential sinkhole formations such as the central part of the county near Reeds Spring. The jurisdictions of Blue Eye, Crane, Kimberling City, Reeds Spring, Blue Eye R-V school district, and Reeds Spring R-IV school district have structures at risk of sinkholes; much of the unincorporated county is also at risk.

Problem Statement

It is likely that more sinkholes will occur as development increases within the county. Sinkholes can be remediated with fill material. Once a sinkhole has been remediated, building should be prohibited at the site. Existing sinkholes can expand if surface runoff erodes the edges of the sinkhole. Storm water runoff should be diverted away from known sinkholes. Jurisdictions may adopt regulations prohibiting construction at least 30 feet from known sinkholes. Information about identifying potential sinkhole formation and promoting Missouri FAIR plan sinkhole insurance can be included in public outreach and hazard awareness programs. Undeveloped land that is in a sinkhole risk area can be used for park space or other recreational purposes.

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;
- NCEI 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 (discussed separately in **Section 3.4.6**) and tornadoes (discussed separately in **Section 3.4.9**).

High Winds

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

Lightning

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

Hail

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

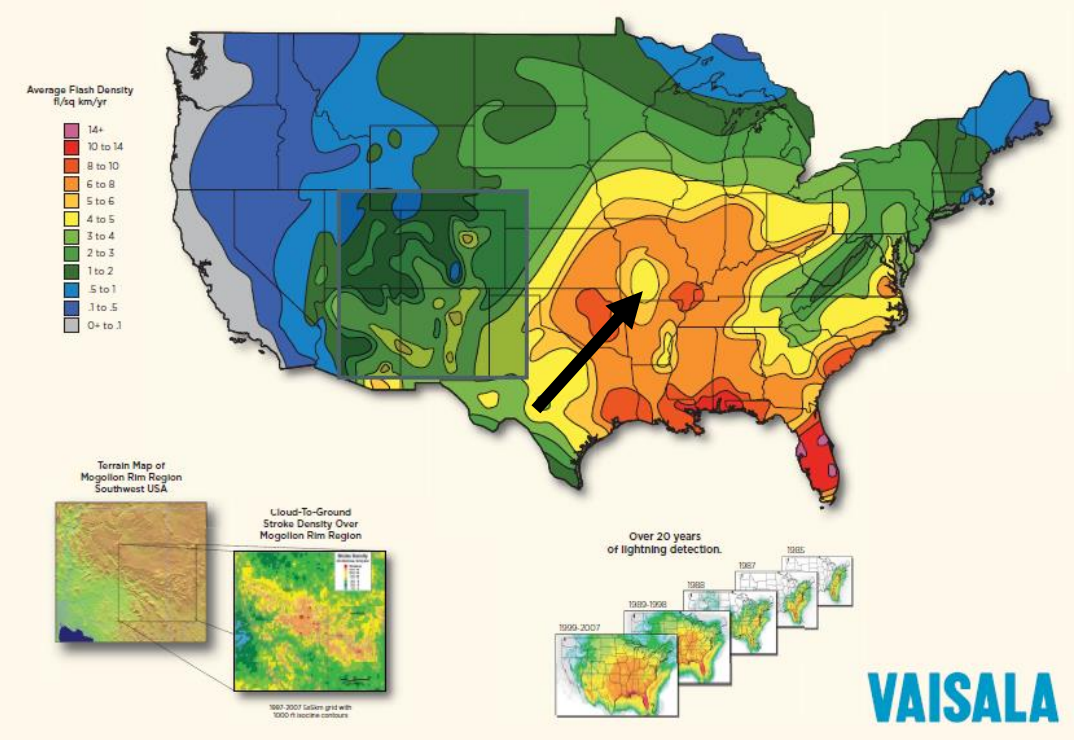
At the time when the updraft can no longer support the hailstone, it will fall down to the earth. For example, a ¼" diameter or pea sized hail requires updrafts of 24 miles per hour, while a 2 ¾" diameter or baseball sized hail requires an updraft of 81 miles per hour. According to the NOAA, the largest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

Geographic Location

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

Figure 3.29 shows lightning frequency in the United States. Marked with a black arrow, Stone County is located in an area with an average flash density of 4 to 5.

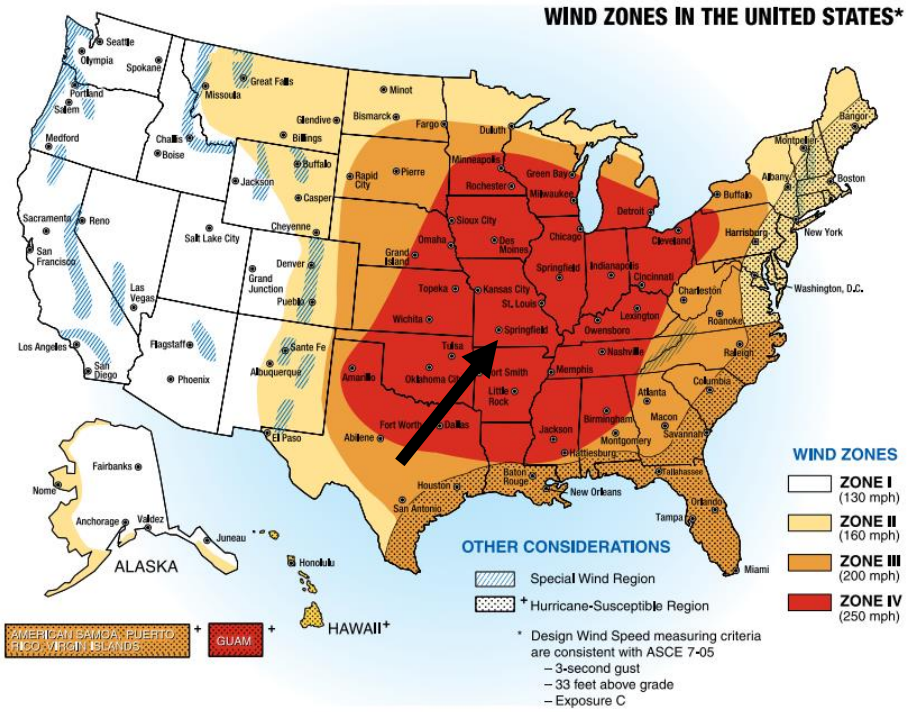
Figure 3.29. **Location and Frequency of Lightning in Missouri**



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

Figure 3.30 shows wind zones in the United States. Stone County is marked with a black arrow and lies in Zone IV, the zone with the highest possible wind speeds in the country.

Figure 3.30. **Wind Zones in the United States**



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

Severity/Magnitude/Extent

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

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

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

Based on information provided by the Tornado and Storm Research Organization (TORRO), **Table 3.377** below describes typical damage impacts of the various sizes of hail.

Table 3.37. Tornado and Storm Research Organization Hailstorm Intensity Scale

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

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

While, agriculture is strong in the unincorporated portions of Stone County, there are no recorded past crop damages as indicated by crop insurance claims since 1998.

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

Previous Occurrences

Thunderstorm Winds

There were 104 thunderstorm wind events reported to the NCEI from 1998-2017 in Stone County. There were 42 events with reported damages. The total damages from these events include one injury and $3,650,000 in property damages, with average loss per damaging event totaling $86,904.

Table 3.38 provides information about damaging thunderstorm wind events in the county.

Table 3.38. NCEI Reported Events with Damages from Thunderstorm Winds, 1998-2017*

Location	# of Events	Deaths	Injuries	Property Damage	Crop Damage
Unincorporated County	39	0	1	$2,940,313	$0
Crane	15	0	0	$546,000	$0
Galena	6	0	0	$1,000	$0
Hurley	6	0	0	$11,000	$0
Kimberling City	21	0	0	$2,687,00	$0
Reeds Spring	10	0	0	$125,000	$0
Blue Eye	7	0	0	$24,000	$0
Total	**104**	**0**	**1**	**$3,650,000**	**$0**

Source: NCEI Storm Data
* = Through July 2017

Hail

There were 174 hail events reported to the NCEI from 1998 – 2017 in Stone County. Two events recorded the highest magnitude events where hailstones reached a diameter of 3 inches. No reported damages occurred during these events. There were four events with reported damages. The most significant and costly event occurred in May 1998 when hail caused $50,000 in property damage.

Table 3.39 provides information about damaging hail events in the county.

Table 3.39. NCEI Reported Damaging Events from Hail, 1998-2017*

Location	Date	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Blue eye	5/9/1998	1.75	0	0	$50,000	$0
Kimberling City	5/9/1998	1.75	0	0	$10,000	$0
Crane	8/20/2011	2.5	0	0	$10,000	$0
Unincorporated County	6/5/2014	2	0	0	$5,000	$0
Total			**0**	**0**	**$75,000**	**$0**

Source: NCEI Storm Data
* = Through July 2017

High Winds

There were four high wind events reported in Stone County to the NCEI from 1998-2017. One event had no damages occur. There were three events with reported damages, but no reported crop damage. These are wind events not associated with a thunderstorm.

Table 3.40 provides information about damaging high wind events in the county.

Table 3.40. NCEI Reported Events and Damages from High Winds, 1997-2017*

Location	Date	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
Unincorporated County	9/14/2008	60 mph	0	0	$0	$0
Unincorporated County	2/20/2014	57 mph	0	0	$10,000	$0
Unincorporated County	2/20/2014	64 mph	0	0	$25,000	$0
Unincorporated County	11/11/2015	60 mph	0	0	$10,000	$0
Total			**0**	**0**	**$45,000**	**$0**

Source: NCEI Storm Data
* = Through July 2017

Lightning

Limitations to the use of NCEI reported lightning events include the fact that only lightning events that result in fatality, injury and/or property and crop damage are in the NCEI. There were four events recorded in Stone County in the NCEI data from 1998-2017. These events resulted in $390,000 in property damage and no injuries or fatalities.

Table 3.41 provides information about damaging lightning events in the county.

Table 3.41. NCEI Reported Events and Damages from Lightning, 1998-2017*

Location	Date	Deaths	Injuries	Property Damage	Crop Damage
Unincorporated County	5/13/2010	0	0	$20,000	$0
Unincorporated County	5/25/2010	0	0	$60,000	$0
Blue Eye	5/25/2011	0	0	$10,000	$0
Unincorporated County	3/25/2015	0	0	$300,000	$0
Total		**0**	**0**	**$390,000**	**$0**

Source: NCEI Storm Data
* = Through July 2017

Probability of Future Occurrence

Thunderstorm Winds

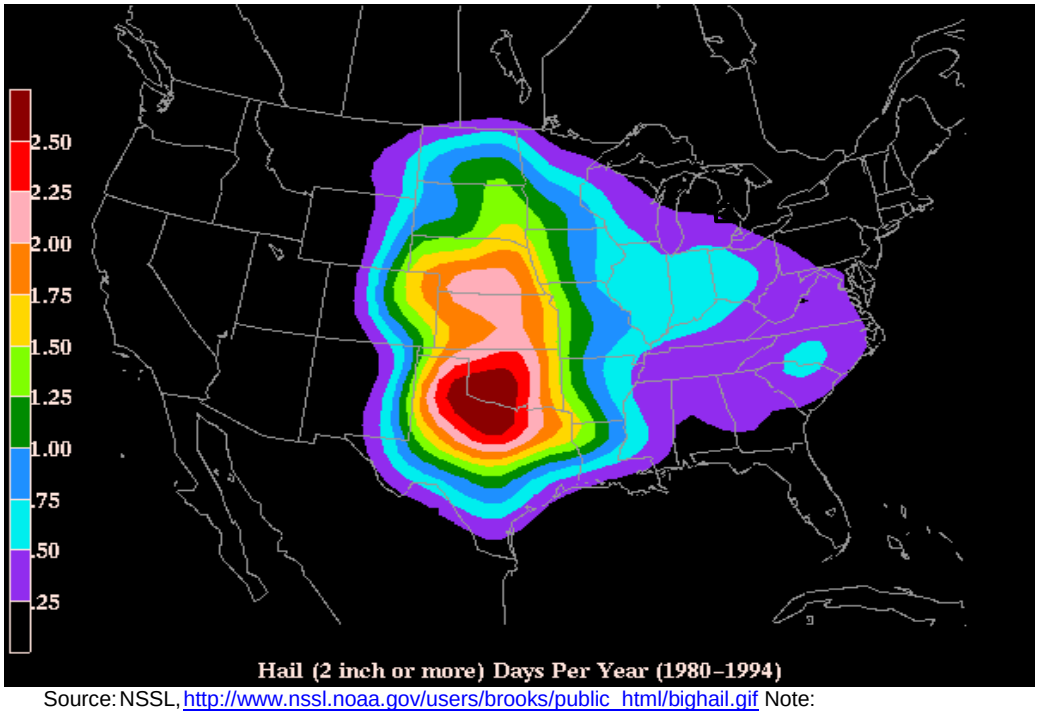
There were 104 thunderstorm wind events in Stone County over the 20 year period reported to the NCEI from 1998-2017. This is an average of about 5 (5.2) thunderstorm wind occurrences each year. There were 42 events that resulted in 1 injury and $3,650,000 in property damage. This is an average of 2.3 damaging events per year with $182,500 of annualized losses.

Hail

There have been 174 recorded hail events over the 20 year period from 1998-2017. This is an average of almost 9 (8.7) hail events in any given year with a 100% probability rate. There were four events that resulted in $75,000 in property damage. This equates to one damaging event every five years with average losses of $15,000 per damaging event.

Figure 3.31 is 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. Stone County is bisected by the green and blue zones on the map meaning that the county should experience hail greater than 2" in diameter one to 1.25 days per year.

Figure 3.31. **Annual Hailstorm Probability (2'' diameter or larger), U 1980- 1994**



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

High Winds

There were four high wind events reported to the NCEI in the 20 year period from 1998-2017. This means there is a 20% probability of a high wind event in any given year. Three of the events were damaging, causing $45,000 in property damage. The three events give a 15% probability of a

damaging event in any given year.

Lightning

There were four lightning events reported to the NCEI from 1998-2017, but they caused $390,000 in property damage. This means that there is a 20% probability of a lightning event occurring in any given year, with an average loss of $97,500 per damaging event. It should be noted that these are only events that result in fatality, injury, or property/crop damage.

Vulnerability

Vulnerability Overview

Thunderstorms, high wind, hail, and lightning pose varying risk for jurisdictions in Stone County. Downbursts resulting from thunderstorms can be just as damaging as an EF-1 tornado. Thunderstorm winds have resulted in one injury and zero deaths in Stone County along with $3,650,000 in property damage. Poorly built structures, barns, outbuildings are more vulnerable to the impact of high winds during thunderstorms. Both high winds and hail can damage roofs. Hail can also damage crops and dent cars and trucks. Total hail damage recorded in the NCEI database from 1998 – 2017 has been $75,000. One hail event accounted for $50,000 in damages. Lightning can cause wildfires and structural fires, damage electrical utilities causing power outages, and sometimes fatalities.

Potential Losses to Existing Development

The average annual loss determined from historical losses for thunderstorms, high wind, hail and lightning are indicators of the potential losses to existing development. Thunderstorm wind events in the county have damaged critical facilities, schools, local governments, and private property. Potential annual losses throughout Stone County are: Thunderstorm - $182,500; Hail - $3,750. Potential annual losses from high winds and lightning are not calculable, but should be expected to occur and cause damages in the future.

Previous and Future Development

Growth in Stone County is occurring at a slow rate, with Crane currently seeing the most growth in terms of population and housing built. Additional development in these areas results in the exposure of more households and businesses vulnerable to damages from high winds, hail, and lightning.

Hazard Summary by Jurisdiction

Although thunderstorms/high winds/lightning/hail events are area-wide, communities with a greater percentage of structures built prior to 1939 are considered to be more vulnerable to the impact of high wind and hail damage. Stone County has four jurisdictions with at least 10%, Crane, Galena, Hurley, and Reeds Spring. Galena is the only one with more than 25%, at 26.8%. New construction and population growth would increase the exposure and risk to this hazard; however, the communities in Stone County with building codes will assist in mitigating the effects of strong storms.

School district facilities are at risk to the damages of thunderstorms, high wind, hail and lightning. Ancillary buildings at all school districts such as storage facilities will continue to be at risk; however, risk to student populations has been decreased in both Hurley and Reeds Spring school districts with safe spaces and safe rooms.

Problem Statement

Poorly built structures, barns, and outbuildings are more vulnerable to the impact of high winds during thunderstorms. High winds can topple utility poles and lead to power outages. Both high winds and hail can damage roofs. Hail can also damage crops and dent cars and trucks. People are also at risk to injury and death during high wind events. Crop insurance mitigates the risk to farmers and the agriculture sector within the county. Lightning events have caused structural fires and can strike electrical utilities leading to power outages.

The risk of property damage, injury, and death in the county can be mitigated by identifying safe refuge areas in public buildings, nursing homes and other facilities that house vulnerable populations that do not have a safe room. The purchasing and installation of NOAA weather radios in schools, government buildings and public areas may assist in providing early warning to allow for public to seek shelter during high wind events. Education and hazard awareness programs in public schools would also increase public safety in the event of severe thunderstorm events.

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 Centers for Environmental Information, 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

There are no specific likely locations for future occurrences as the threat from this hazard is county-wide.

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 (see **Table 3.4242**) 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 3.42. Enhanced F Scale for Tornado Damage

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

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

The wind speeds for the EF scale and damage descriptions are based on information on the NOAA Storm Prediction Center as listed in **Table 3.4343**. 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. Information on the Enhanced Fujita Scale's damage indicators and degrees or damage is located online at www.spc.noaa.gov/efscale/ef-scale.html.

Table 3.43. 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
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

In the 23 year period from 1994 to present, there have been 17 tornadoes recorded in Stone County with EF/F Scale ratings ranging from EF0 to EF2 in magnitude. EF0/F0 has been the most frequent EF/F scale magnitude, with 8 events. They collectively accounted for $12,350,000 in property damage.

Seven EF1/F1 tornados have occurred in Stone County in the last 23 years. The first occurred in Kimberling City, causing $1,000,000 in damage. The tornado briefly touched down one mile north of Kimberling City. It caused a steel roof from a boat and marina shop to be removed, plus several large boats inside were damaged or destroyed.

The most destructive tornado to occur in Stone County in the past 23 years occurred on February 29, 2012 when an EF2 tornado ripped through eastern Stone County and continued on into Taney County. The tornado began near the Kimberling City and lifted in central Taney County. The tornado damaged 30 homes, a hotel, 4 boat docks, and almost 150 boats, sinking one. The tornado caused 10 injuries as it traveled through mostly unincorporated Stone County. The total property damage from the tornado was $5,500,000.

There are limitations to the use of NCEI 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 NCEI. 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 3.44** that includes NCEI reported tornado events and damages since 1994 in Stone County.

Table 3.44. Recorded Tornadoes in Stone County , 1994 – Present

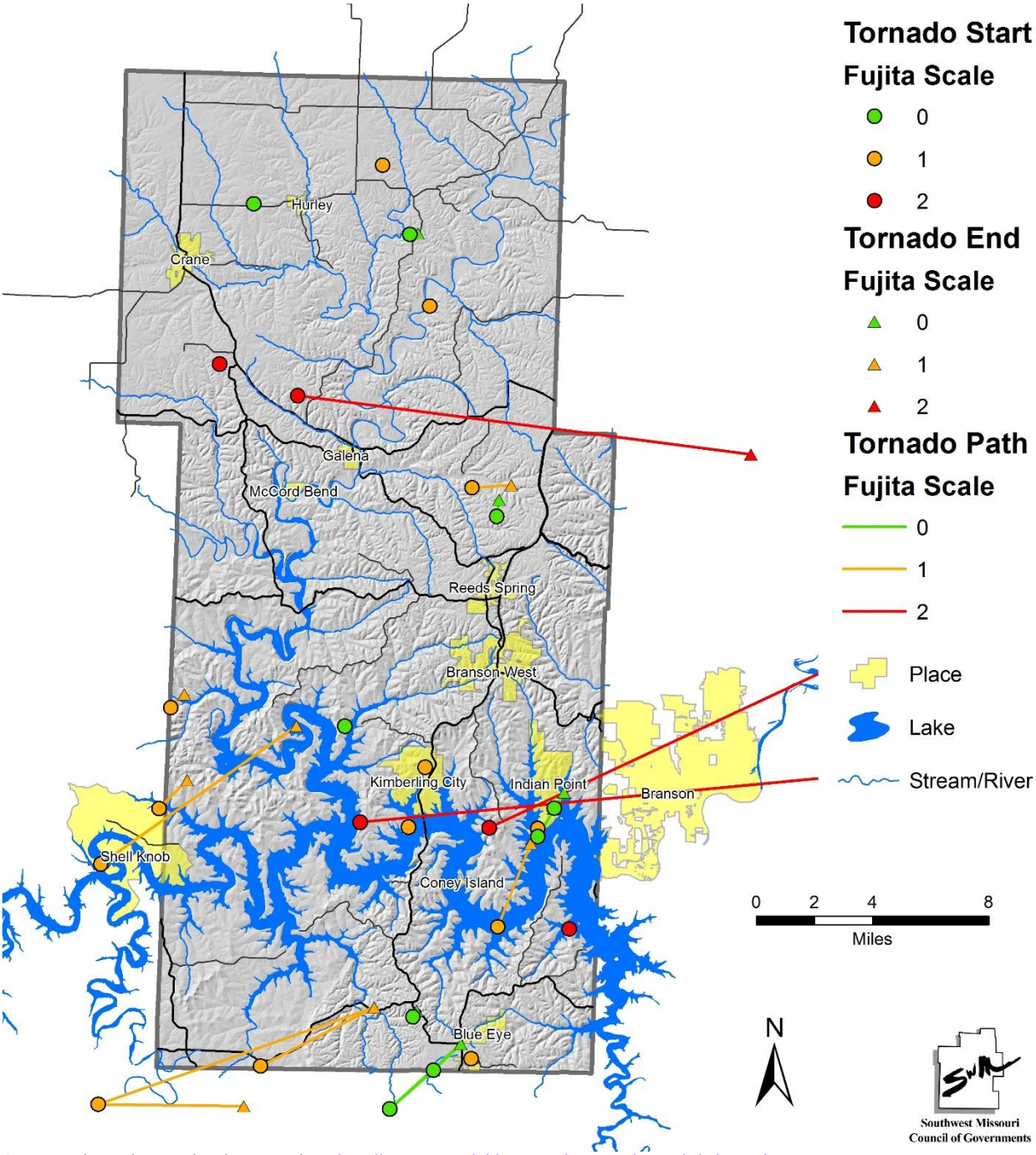
Date	Beginning Location	Ending Location	Length (miles)	Width (yards)	F/EF Rating	Death	Injury	Property Damage	Crop Damages
04/15/2001	Kimberling City	Kimberling City	0.1	100	F1	0	0	$1,000,000	$0
03/12/2006	Lampe	Lampe	5	75	F1	0	0	$0	$0
10/02/2007	Notch	Notch	0.1	25	EF0	0	0	$10,000	$0
01/08/2008	Elsey	Galena	7.19	200	EF1	0	0	$2,000,000	$0
05/13/2010	Hurley	Hurley	0.3	50	EF0	0	0	$10,000	$0
12/30/2010	Blue Eye	Blue Eye	0.25	30	EF0	0	0	$50,000	$0
12/30/2010	Lampe	Notch	3.15	300	EF1	0	0	$2,000,000	$0
12/31/2010	Notch	Notch	1.75	75	EF0	0	0	$750,000	$0
12/31/2010	Blue Eye	Blue Eye	2.25	50	EF0	0	0	$15,000	$0
05/22/2011	Elsey	Tauria	10.95	200	EF2	0	0	$1,000,000	$0

02/29/2012	Kimberling City	Notch	7.75	400	EF2	0	10	$5,500,000	$0
05/20/2013	Viola	Viola	0.89	200	EF0	0	0	$0	$0
05/20/2013	Tauria	Tauria	1.35	100	EF1	0	0	$0	$0
05/20/3013	Reeds Spring	Tauria	0.58	100	EF0	0	0	$0	$0
10/13/2014	Blue Eye	Blue Eye	0..09	75	EF1	0	0	$5,000	$0
03/23/2016	Cape Fair	Cape Fair	0.66	200	EF1	0	0	$0	$0
4/26/2017	Viola	Viola	1.79	100	EF0	0	0	$10,000	$0
Total						**0**	**10**	**$12,350,000**	**$0**

Source: National Centers for Environmental Information, http://www.ncdc.noaa.gov/stormevents/

Figure 3.32 shows historic tornado events in Stone County.

Figure 3.32. **Stone County Map of Historic Tornado Events**



Source: Missouri Tornado History Project, http://www.tornadohistoryproject.com/tornado/Missouri

There are no records in the USDA Risk Management Agency Database that refer to crop damages as a result of tornadoes in the last 20 years.

Probability of Future Occurrence

Since 1993, or the past 25 years, there have been 17 tornado events recorded by the NCEI. That is an annual probability of a tornado event of 0.68, or a 68% chance that there will be a tornado event

in any given year. Of the events, 12 caused damage, giving an annual probability of a damaging event of 0.48, or a 48% chance that there will be a damaging event in any given year.

Vulnerability

Vulnerability Overview

Stone County is located in a region of the U.S. with high frequency of dangerous and destructive tornadoes referred to as "Tornado Alley" as is the entire state. **Figure 3.33** illustrates areas where dangerous tornadoes historically have occurred.

Figure 3.33. **Tornado Alley in the U.S.**

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

The 2013 State Plan used a methodology to the vulnerability of each county in the state to determine each county's vulnerability to tornadoes. While this approach attempts to prioritize tornado vulnerable counties, it does not identify any particular geographic patterns to tornado risk. The state's analysis combined annualized losses and frequency of occurrence to determine the greatest likelihood of being impacted by a tornado. The state's vulnerability rating ranged from very high, high, and moderate. The vulnerability rating for Stone County was rated at high risk.

Potential Losses to Existing Development

During the 23 year period from 1994 to 2017, a total of $12,350,000 in property losses equates to $536,956 in average annual losses. The most common tornado events recorded in the county are F0 and F1 magnitude events. Eight of the 17 tornado events on record have been F0 magnitude. There were also seven F1, and two F2 magnitude tornadoes recorded in the NCEI data. Potential losses for each jurisdiction were estimated based on the total exposure with applied damage factor

of 1%. **Table 3.45** provides estimates for total losses by jurisdiction.

Table 3.45. Estimated Potential Tornado Losses by Jurisdiction

Jurisdiction	Total Exposure ($)
Stone County	$2,392,751,892
City of Branson West	$71,657,050
City of Crane	$56,770,900
City of Galena	$17,562,800
City of Hurley	$8,277,300
City of Kimberling City	$244,253,708
City of Reeds Spring	$52,298,950
Village of Blue Eye	$35,380,750
Village of Coney Island	$9,564,650
Village of Indian Point	$256,932,550
Village of McCord Bend	$3,782,250

Previous and Future Development

Development across the county and within incorporated jurisdictions increases the potential for losses. During the 23 year period, the average annual losses countywide were $536,956. This indicates the potential future losses if the current development were to remain, with no additional development. Future development and population increases will increase exposure to damage. It is anticipated that several communities will experience additional new development, but many use building codes which may help reduce the risk of building damage.

Hazard Summary by Jurisdiction

Although tornado events are area-wide hazard, communities with a greater percentage of structures built prior to 1939 are considered to be more vulnerable to the impact of high wind and hail damage. Refer to **Section 3.4.8** for discussion of jurisdictions with homes built before 1939.

Problem Statement

Tornados 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. Significant tornado events in Stone County have resulted in 10 injuries and $12,350,000 in property damage over the last 23 years. Stone County is rated at a high risk in the 2013 State Hazard Mitigation Plan.

The risk of property damage, injury, and death in the county can be mitigation by the construction of FEMA safe rooms in new schools, daycares, and nursing homes. Additionally, encouraging the purchase and installation of NOAA weather radios, and promoting local severe weather alert applications for mobile communications can provide early warnings for severe weather which could result in lives saved. For communities that do not have the capacity to construct FEMA safe rooms, simply identifying and creating plans that identify strong, safe places in schools, large facilities, and other establishments serving the public may help in mitigating impacts of tornados.

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 Centers for Environmental Information, Storm Events Database, http://www.ncdc.noaa.gov/stormevents/

Hazard Profile

Hazard Description

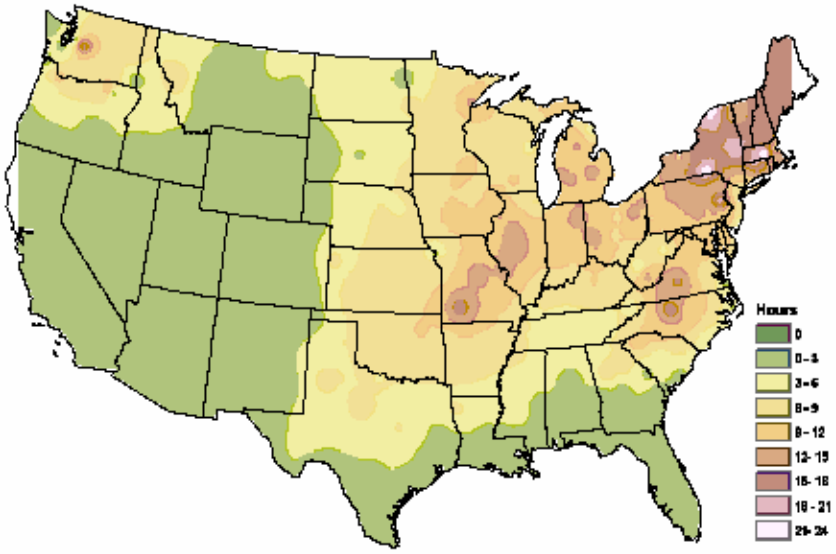
A major winter storm can last for several days and be accompanied by high winds, freezing rain or sleet, heavy snowfall, and cold temperatures. The National Weather Service describes different types of winter storm events as follows.

- **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

The entire county is vulnerable to heavy snow, ice, extreme cold temperatures and freezing rain. **Figure 3.34** depicts the average number of hours per year with freezing rain. Stone County is located in a zone that can expect 18 – 21 hours of freezing rain per year.

Figure 3.34. **NWS Statewide Average Number of Hours per Year with Freezing Rain**



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

Severity/Magnitude/Extent

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

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

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

Also at risk are 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

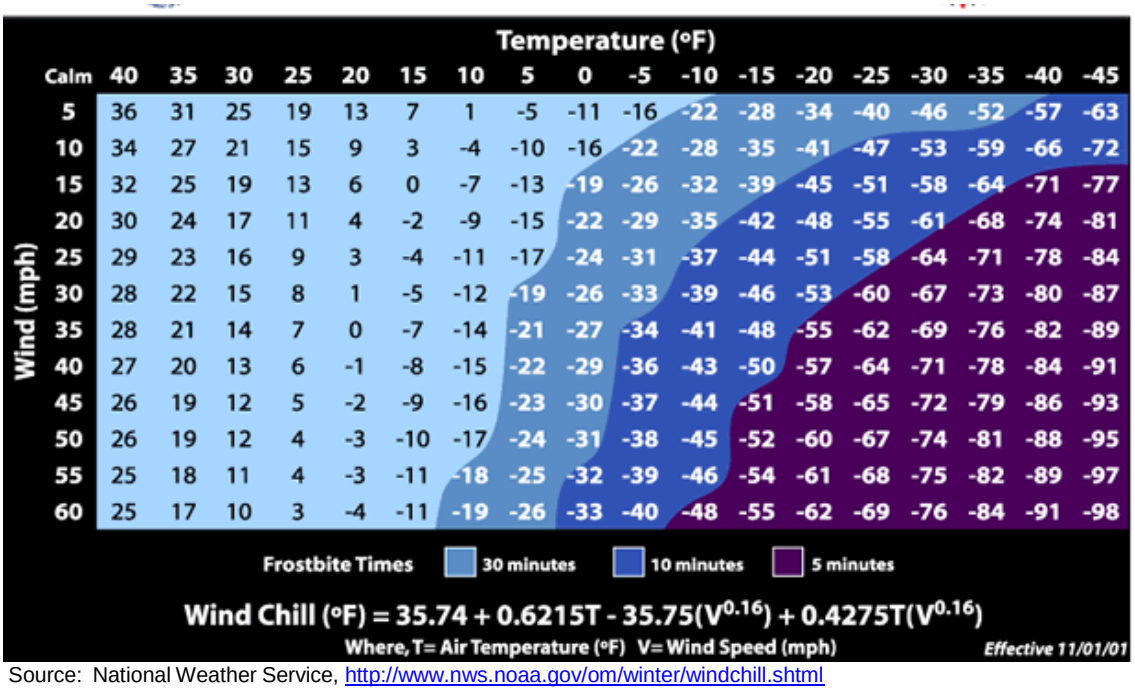
limbs fall. Businesses experience loss of income as a result of closure during power outages. In general heavy winter storms increase wear and tear on roadways though the cost of such damages is difficult to determine. Businesses can experience loss of income as a result of closure during winter storms.

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

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

Wind can greatly amplify the impact of cold ambient air temperatures. Provided by the National Weather Service**, Figure 3.35** below shows the relationship of wind speed to apparent temperature and typical time periods for the onset of frostbite.

Figure 3.35. **Wind Chill Chart**



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

Previous Occurrences

There were 29 recorded events in the NCEI database for Blizzard, Extreme Cold/Wind Chill, Frost/Freeze, Heavy Snow, Ice Storm, Sleet, and Winter Storm in Stone County from 1998 - 2017. **Table 3.46** includes the number of occurrences of these Winter Weather events. **Table 3.47**

includes the two weather events that caused damage, with event narratives listed following the table.

Table 3.46. NCEI Stone County Winter Weather Events Summary, 1998-2017*

Type of Event	Number of Occurrences	# of Deaths	# of Injuries	Property Damages	Crop Damages
Severe Cold	2	0	0	$0	$10,000
Frost/Freeze	1	0	0	$0	$2,110,000
Heavy Snow	0	0	0	$0	$0
Ice Storm	4	0	0	$50,000	$0
Winter Storm	22	0	0	$30,000	$0

Source: NCEI * = Through July, 2017

Table 3.47. NCEI Stone County Winter Weather Damaging Events, 1998-2017*

Type of Event	Date	# of Deaths	# of Injuries	Property Damages	Crop Damages
Winter Storm	1/1/1999	0	0	$20,000	$0
Winter Storm	3/13/1999	0	0	$10,000	$0
Severe Cold	12/12/2000	0	0	$0	$10,000
Frost/Freeze	4/7/2007	0	0	$0	$2,110,000
Ice Storm	1/26/2009	0	0	$50,000	$0
Total		0	0	**$80,000**	**$2,120,000**

Source: NCEI * = Through July, 2017

Winter Storm 1999

A band of snow and sleet (in addition to the ice) fell from southwest to central Missouri. Three to six inch amounts occurred in southwest Missouri in the Springfield, Galena, Ozark, and Buffalo areas. Property damages in Stone County amounted to $20,000.

Winter Storm 1999

A winter storm produced an area of 3 to as much as 16 inches of snow over a portion of southwest and south central Missouri. The hardest hit areas, where 14 to 16 inches of snow was reported, were in an area from Pineville and Neosho to Springfield then east to the Houston and Cabool areas. This storm caused $10,000 in property damages.

Severe Cold 2000

Abnormally cold air moved into the Ozarks by the middle of December as the main jet stream carved out a deep trough of low pressure over the eastern 2/3's of the nation. This pattern continued through the early part of January. The combination of deep snow cover and an abnormally strong arctic air mass kept temperatures 10 to 20 degrees below normal. The severe cold caused numerous water mains to brake, roof leakage, and hazardous roadways due to ice and snow. In addition, hay supplies rapidly decreased as persistent ice and snow covered fields. Snow cover and cold conditions also made it difficult for farmers and ranchers to feed their animals, which had an adverse effect on livestock and newly born calves. Several calves died due to the severe stress of the cold and low supply of hay, especially in southwest Missouri. Stone County had $10,000 in crop damage from this event.

Frost/Freeze 2007

Unusually warm conditions during the month of March caused early season growth in vegetation across the Missouri Ozarks. Hay along with the wheat crop had begun to mature. During the nights of April 7th through the 9th, temperatures dropped into the upper teens to mid-20s, causing a hard freeze on matured vegetation. The wheat crop suffered approximately 90% damage. Hay crops along with fescue seed also sustained major damage. Total crop losses for Stone County were estimated at $2,110,000.

Ice Storm 2009

A significant accumulation of freezing rain, sleet and snow resulted in treacherous travel conditions and scattered power outages. As many as 2,500 residences lost power. A boat dock collapsed due to the weight of freezing rain and sleet damaging twenty boats. Ice accretion of near one quarter to three quarters of an inch was followed by 3 to 5 inches of sleet and snow. This storm caused $50,000 in property damages in Stone County.

Probability of Future Occurrence

The probability for all of the different types of winter weather are included as one probability, since one storm generally includes multiple types of events. There were 29 severe winter weather events in Stone County from 1997 to 2017. This equates to a 100% probability of occurrence in any given year.

Vulnerability

Vulnerability Overview

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. People over 65 and those living in poverty have an increased risk of hypothermia and frostbite due to extreme cold and wind chill.

In the 2013 State Plan, seven factors were considered in determining overall severe winter storm vulnerability as follows: housing density, likelihood of occurrence, building exposure, crop exposure, average annual property loss ratio, average annual crop insurance claims and social vulnerability. The state ranked each of these criteria using a scale from one to five, one being lowest and five being the highest, to rank each county's vulnerability to severe winter weather. Stone County received a vulnerability rating for each criteria as follows: Housing Density Rating: medium-low, Likelihood rating: low, Property Loss Ratio Rating: medium-low, Crop Exposure Rating: low, Social Vulnerability Index: medium-high. This equates to an overall vulnerability rating of medium-low.

Potential Losses to Existing Development

During the 20 year period from 1998 to 2017, a total of $80,000 in property damage equates to $4,000 in average annual losses countywide.

Previous and Future Development

Increased development and any resulting increase in population will increase exposure to damage from severe winter weather. Future commercial development can expect functional downtime and decreased revenues during periods of severe winter weather. Future construction of facilities that will serve vulnerable populations will need to be prepared for extreme weather conditions. Road construction in the county will increase the need for snow removal and salt to keep transportation lifelines open during periods of severe winter weather. Any increase in agriculture crop production will also increase the risk of exposure.

Hazard Summary by Jurisdiction

Severe winter weather can cause power outages and put structures at risk to fires when individuals in homes resort to fuel heaters. The risk of extreme cold deaths and frostbite varies among segments of the populations. People over 65 and those living below the poverty level have an increased vulnerability to severe winter weather. **Table 3.48** includes information on populations over 65 and the percent living below the poverty level by jurisdiction.

Table 3.48. Population over 65 and Percent Living Below the Poverty Level by Jurisdiction

Jurisdiction	% of Families Living Below Poverty Level	Population over 65
Stone County	10.8	8,283
City of Branson West	5.6	92
City of Crane	13.3	307
City of Galena	33.8	96
City of Hurley	26.2	24
City of Kimberling City	7.2	868
City of Reeds Spring	15.7	151
Village of Blue Eye	15.5	46
Village of Coney Island	0	43
Village of Indian Point	8.8	160
Village of McCord Bend	47.8	50

Source: Census.gov; 2011-2015 ACS 5-year Estimates

Problem Statement

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. People over 65 and those living in poverty have an increased risk of hypothermia and frostbite due to extreme cold and wind chill.

Organizing outreach to at-risk populations, including establishing and promoting accessible heating and cooling centers can help reduce the potential exposure to harsh winter weather. Additionally, identifying debris disposal and burning locations can assist in facilitating recovery efforts after a significant winter storm or ice incident.

4 MITIGATION STRATEGY 4.1

4.1 Goals 4.1

4.2 Identification and Analysis of Mitigation Actions 4.2

4.3 Implementation of Mitigation Actions 4.6

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 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 Stone County's existing hazard mitigation plan approved by FEMA on May 17, 2013. Therefore, the goals from the 2013 Stone 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 third 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. The MPC also reviewed the goals from current surrounding county plans.

Discussion of the previously approved goals involved determining the application of the goals to today and validity of the language used. It was determined that the goals still applied and so, were unchanged for this plan update. In the 2013 Plan, the organization of the actions included broad goals and a set of objectives linking the actions to the goals. The MPC opted to keep the goals from the 2013 Plan and eliminate the objective statements, moving forward with broad goals and specific mitigation actions. Objectives seemed to add a layer of complication and

potential confusion. During this update process, the intent was to provide a usable set of actions that each jurisdiction was able to work towards partial or full implementation, and objectives seemed unnecessary.

The Plan update goals and objectives are as follows:

Goal 1: Protect the lives and livelihoods of all citizens.

Goal 2: Reduce the potential impact of natural disasters to property, infrastructure, and the local economy.

Goal 3: Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.

4.2 Identification and Analysis of Mitigation Actions

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

During the second MPC meeting, the results of the risk assessment update were provided to the MPC members for review and the key issues were identified for specific hazards. Changes in risk since adoption of the previously approved plan were discussed. During the third meeting, MPC members were provided with lists of previous mitigation actions and potential new actions that might apply based on the risk assessment. Actions from the previous plan included completed actions, on-going actions, and actions upon which progress had not been made. The MPC discussed SEMA's identified funding priorities and the types of mitigation actions generally recognized by FEMA.

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

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

- A list of actions proposed in the previous mitigation plan, the current State Plan, and approved plans in surrounding counties,
- Key issues from the risk assessments, including the Problem Statements concluding each hazard profile and vulnerability analysis,
- State priorities established for Hazard Mitigation Assistance grants, and
- Public input during meetings, responses to Data Collection Questionnaires, and other efforts to involve the public in the plan development process.

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

range of potential mitigation actions for reducing risk to natural hazards and disasters.

The MPC reviewed the actions from the previously approved plan for progress made since the plan had been adopted, using worksheets included in Appendix B of this plan. As part of the community questionnaire, the list of actions for each jurisdiction was provided to the MPC representative along with the worksheets. Each jurisdiction was instructed to provide information regarding the "Action Status" with one of the following status choices:

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

Based on the status updates, there were 4 completed actions, 44 deleted actions, and 175 continuing actions.

Table 4.1 provides a summary of the action statuses for each jurisdiction:

Table 4.1. Action Status Summary

Jurisdiction	Completed Actions	Deleted Actions	Continuing Actions
Stone County		1.2.2, 2.1.3, 2.2.1, 3.1.3, 3.2.1, 3.3.1	1.1.1, 1.1.2, 1.1.3, 1.1.4, 1.2.3, 1.2.4, 1.3.1, 1.3.2, 1.3.3, 1.3.4, 1.3.5, 1.3.6, 2.1.1, 2.1.2, 2.2.3, 3.1.1, 3.1.2, 3.2.2, 3.2.3, 3.3.2, 3.3.3, 3.3.4
City of Branson West	2.1.4	1.2.2, 2.1.3, 3.2.1, 3.3.1	1.1.1, 1.1.2, 1.1.3, 1.1.4, 1.2.3, 1.2.4, 1.3.1, 1.3.2, 1.3.3, 1.3.4, 1.3.5, 1.3.6, 2.1.1, 2.1.2, 2.2.2, 3.1.1, 3.1.2, 3.2.2, 3.2.3, 3.3.2, 3.3.3, 3.3.4
City of Crane	3.2.1, 3.2.3, 3.3.1	1.2.2, 2.1.3, 3.2.1, 3.3.1	1.1.1, 1.1.2, 1.1.3, 1.1.4, 1.2.1, 1.2.3, 1.2.4, 1.3.1, 1.3.2, 1.3.3, 1.3.4, 1.3.5, 1.3.6, 2.1.1, 2.1.2, 2.1.4, 2.2.2, 2.2.3, 3.1.1, 3.1.2, 3.2.2, 3.3.2, 3.3.3, 3.3.4
City of Galena		1.2.2, 2.1.3, 3.2.1, 3.3.1	1.1.1, 1.1.2, 1.1.3, 1.1.4, 1.2.1, 1.2.3, 1.2.4, 1.3.1, 1.3.2, 1.3.3, 1.3.4, 1.3.5, 1.3.6, 2.1.1, 2.1.2, 2.1.4, 2.2.2, 2.2.3, 3.1.1, 3.1.2, 3.2.2, 3.2.3, 3.3.2, 3.3.3, 3.3.4
City of Hurley		1.1.3, 1.1.4, 1.2.2, 1.3.1, 1.3.3, 1.3.5, 1.3.6, 2.1.2, 2.1.3, 3.1.1, 3.2.1, 3.3.1, 3.3.3, 3.3.4	1.1.1, 1.1.2, 1.2.1, 1.2.3, 1.2.4, 1.3.2, 1.3.4, 2.1.1, 2.1.4, 2.2.2, 2.2.3, 3.1.2, 3.2.2, 3.2.3, 3.3.2
City of Kimberling City		1.2.2, 2.1.3, 3.2.1, 3.3.1	1.1.1, 1.1.2, 1.1.3, 1.1.4, 1.2.1, 1.2.3, 1.2.4, 1.3.1, 1.3.2, 1.3.3, 1.3.4, 1.3.5, 1.3.6, 2.1.1, 2.1.2, 2.1.4, 2.2.2, 2.2.3, 3.1.1, 3.1.2, 3.2.2, 3.2.3, 3.3.2, 3.3.3, 3.3.4
City of Reeds Spring		1.2.2, 2.1.3, 3.2.1, 3.3.1	1.1.1, 1.1.2, 1.1.3, 1.1.4, 1.2.3, 1.2.4, 1.3.1, 1.3.2, 1.3.3, 1.3.4, 1.3.5, 1.3.6, 2.1.1, 2.1.2, 2.1.4,

			2.2.2, 2.2.3, 3.1.1, 3.1.2, 3.2.2, 3.2.3, 3.3.2, 3.3.3, 3.3.4
Hurley R-I		1.2.2, 2.1.3	1.1.1, 1.1.5, 1.2.4, 1.3.2, 1.3.5, 2.1.2, 3.1.1, 3.2.2, 3.3.2
Reeds Spring R-VI		1.2.2, 2.1.3	1.1.1, 1.1.5, 1.2.4, 1.3.2, 1.3.5, 2.1.2, 3.1.1, 3.2.2, 3.3.2

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

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

Completed Actions	**Completion Details (date, amount, funding source)**
Branson West 2.1.4	Wastewater treatment system resiliency plans are already in place
Crane 3.2.1	Burn restriction are in place; fire department has a sign
Crane 3.2.3	Public Works consistently mows & cuts vegetation from easements and right of ways
Crane 3.3.1	Crane Creek has been identified as an alternate water source
Deleted Actions	**Reason for Deletion**
Stone 1.2.2	Not feasible
Stone 2.1.3	Not feasible
Stone 2.2.1	Not relevant
Stone 3.1.3	Not relevant
Stone 3.2.1	Not relevant; responsibility of the fire districts
Stone 3.3.1	Not relevant; responsibility of the fire districts
Branson West 1.2.2	Not feasible
Branson West 2.1.3	Not feasible
Branson West 3.2.1	Not relevant; responsibility of the fire districts
Branson West 3.3.1	Not relevant; responsibility of the fire districts
Crane 1.2.2	Not feasible
Crane 2.1.3	Not feasible
Crane 3.2.1	Not relevant; responsibility of the fire districts
Crane 3.3.1	Not relevant; responsibility of the fire districts
Galena 1.2.2	Not feasible
Galena 2.1.3	Not feasible
Galena 3.2.1	Not relevant; responsibility of the fire districts
Galena 3.3.1	Not relevant; responsibility of the fire districts
Hurley 1.1.3	Not feasible
Hurley 1.1.4	Not feasible
Hurley 1.2.2	Not feasible
Hurley 1.3.1	Not feasible
Hurley 1.3.3	Not feasible
Hurley 1.3.5	No local organizations
Hurley 1.3.6	Not feasible
Hurley 2.1.2	Not feasible
Hurley 2.1.3	Not feasible, no local interest
Hurley 3.1.1	Not relevant
Hurley 3.2.1	Not relevant; responsibility of the fire districts
Hurley 3.3.1	Not relevant; responsibility of the fire districts
Hurley 3.3.3	Not feasible
Hurley 3.3.4	Not feasible
Kimberling City 1.2.2	Not feasible
Kimberling City 2.1.3	Not feasible
Kimberling City 3.2.1	Not relevant; responsibility of the fire districts
Kimberling City 3.3.1	Not relevant; responsibility of the fire districts
Reeds Spring 1.2.2	Not feasible
Reeds Spring 2.1.3	Not feasible
Reeds Spring 3.2.1	Not relevant; responsibility of the fire districts
Reeds Spring 3.3.1	Not relevant; responsibility of the fire districts
Hurley R-I 1.2.2	Not feasible

Hurley R-I 2.1.3	Not feasible
Reeds Spring R-VI 1.2.2	Not feasible
Reeds Spring R-VI 2.1.3	Not feasible

Source: Previously approved County Hazard Mitigation Plan; Data Collection Questionnaires.

Many jurisdictions found that actions were still relevant and would be ongoing. Many of the continuing actions were re-worded for the 2017 update and are noted as “revised, continuing” on the action sheets. Many of the actions determined to need deleted were due to limited resources or the actions being misidentified as applying to that jurisdiction in the previous plan update.

The actions listed in **Tables 4.1** and **4.2** are numbered according to the 2013 Plan and are not consistent with the new numbering in this plan.

4.3 Implementation of Mitigation Actions

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

Jurisdictional MPC members were encouraged to meet with others in their community to finalize the actions to be submitted for the updated mitigation strategy. 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 used worksheets to assign scores. The worksheets posed questions based on the STAPLEE elements as well as the potential mitigation effectiveness of each action. Scores were based on the responses to the questions as follows:

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

The following questions were asked for each proposed action.

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

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

The final scores are listed below in the analysis of each action. The worksheets are attached to this plan as Appendix B. The STAPLEE final score for each action, absent other considerations, such as a localized need for a project, determined the priority. Low priority action items were those that had a total score of between 0 and 24. Moderate priority actions were those scoring between 25 and 29. High priority actions scored 30 or above. A blank STAPLEE worksheet is shown in **Figure 4.1**.

Figure 4.1. Blank STAPLEE Worksheet

XXXXXX COUNTY
MULTI-JURISDICTIONAL
LOCAL HAZARD MITIGATION PLAN

Action Title:	**Jurisdiction:**
Action ID:	

STAPLEE Criteria	Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0	Score
S: Is it Socially acceptable?		
T: Is it Technically feasible and potentially successful?		
A: Does the jurisdiction have the administrative capacity to execute this action?		
P: Is it Politically acceptable?		
L: Is there Legal authority to implement?		
E: Is it Economically beneficial?		
E: Will the project have either a neutral or positive impact on the natural environment? (score a 3 if positive impact, 2 if neutral impact)		
Will historic structures be saved or protected?		
Could it be implemented quickly?		
STAPLEE Score		

Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives would be saved.	
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	
Mitigation Effectiveness Score		

Total Score (STAPLEE Score + Mitigation Effectiveness Score): _____

Priority Level: ☐ High (30+ points) ☐ Medium (25-29 points) ☐ Low (less than 25 points)

Completed by (name/title/phone #): _____

In addition to the STAPLEE cost benefit review prioritization, at the fourth MPC meeting, an implementation plan for each action was discussed. An action worksheet was used to develop the implementation plan. The action worksheet format is shown in **Table 4.3.**

Table 4.3. Table 4.3 Mitigation Action Worksheet

Action Worksheet	
Name of Jurisdiction:	
Risk / Vulnerability	
Problem being Mitigated:	Provide a brief description of the problem that the action will address
Hazard(s) Addressed:	List the hazard or hazards that will be addressed by this action
Action or Project	
Action/Project Number:	Insert a unique action number for this action for future tracking purposes. This can be a combination of the jurisdiction name, followed by the goal number and action number (i.e. Joplin1.1)
Name of Action or Project:	
Action or Project Description:	Describe the action or project.
Applicable Goal Statement:	Choose the goal statement that applies to this action
Estimated Cost:	Provide an estimate of the cost to implement this action. This can be accomplished with a range of estimated costs.
Benefits:	Provide a narrative describing the losses that will be avoided by implementing this action. If dollar amounts of avoided losses are known, include them as well.
Plan for Implementation	
Responsible Organization/Department:	Which organization will be responsible for tracking this action? Be specific to include the specific department or position within a department.
Action/Project Priority:	Include the STAPLEE score and Priority (H, M, L)
Timeline for Completion:	How many months/years to complete.
Potential Fund Sources:	List specific funding sources that may be used to pay for the implementation of the action.
Local Planning Mechanisms to be Used in Implementation:	
Progress Report	
Action Status	Indicate status as New, Continuing Not Started, or Continuing in Progress)
Report of Progress	

The following section organizes the actions for each jurisdiction participating in the Plan, the goal statement that each action falls under, and the completed worksheet for each new and continuing mitigation action.

Goal 1: Protect lives and livelihoods of all citizens.

Action Worksheet	
Name of Jurisdiction:	Stone County
Risk / Vulnerability	
Problem being Mitigated:	Public awareness of hazard vulnerability and mitigation measures.
Hazard(s) Addressed:	Tornado, Severe Storm, Winter Weather, Flooding, Drought, Extreme Heat
Action or Project	
Action/Project Number:	1.1
Name of Action or Project:	Awareness Program
Action or Project Description:	Partner with traditional media and the National Weather Service to publish and/or broadcast information on severe weather hazards.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$0-$100
Benefits:	Reduction in loss of life, injury, and property during hazard events.
Plan for Implementation	
Responsible Organization/Department:	Emergency Management
Action/Project Priority:	STAPLEE score: 37 Priority: High
Timeline for Completion:	1-5 years; ongoing
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	EOP
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Stone County
Risk / Vulnerability	
Problem being Mitigated:	Public awareness of hazard vulnerability and mitigation measures.
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	1.2
Name of Action or Project:	Disaster Preparation
Action or Project Description:	Provide a link to disaster preparation resources such as Ready in 3 or Ready.gov on local government, health department, public schools, chambers of commerce, and community organization websites.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$0
Benefits:	Reduction in loss of life, injury, and property during hazard events.
Plan for Implementation	
Responsible Organization/Department:	Emergency Management, Partner Agencies
Action/Project Priority:	STAPLEE score: 27 Priority: Medium
Timeline for Completion:	1 month
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	EOP
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Stone County
Risk / Vulnerability	
Problem being Mitigated:	Public awareness to hazards.
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	1.3
Name of Action or Project:	Mitigation awareness
Action or Project Description:	Use social media to raise awareness of mitigation and preparedness activities.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$0-$100
Benefits:	Reduction in loss of life, injury, and property during hazard events.
Plan for Implementation	
Responsible Organization/Department:	Emergency Management, Health Department
Action/Project Priority:	STAPLEE score: 30 Priority: High
Timeline for Completion:	1-5 years; ongoing
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	
Progress Report	
Action Status	New
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Stone County
Risk / Vulnerability	
Problem being Mitigated:	Lack of public involvement in mitigation activities
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	1.5
Name of Action or Project:	Citizen Preparedness
Action or Project Description:	Promote participation in citizen preparedness activities, such as: MOCERT1, Neighborhood Watch, Amateur Radio, and Community Heroes Reserve Medical Corps.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$0-$500
Benefits:	Increase citizen awareness of mitigation activities
Plan for Implementation	
Responsible Organization/Department:	Emergency Management
Action/Project Priority:	STAPLEE score: 34 Priority: High
Timeline for Completion:	1-5 years; ongoing
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	EOP, LEPC
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Stone County
Risk / Vulnerability	
Problem being Mitigated:	Lack of communication during hazard events
Hazard(s) Addressed:	Tornado, Severe Storm, Flood, Severe Winter Weather, Extreme Heat, Wildfire
Action or Project	
Action/Project Number:	1.8
Name of Action or Project:	NOAA Radios
Action or Project Description:	Promote the use of NOAA all-hazard radios with S.A.M.E. technology to all residents, businesses and government entities.
Applicable Goal Statement:	Protect the lives and livelihoods of all citizens.
Estimated Cost:	$0-$1,000
Benefits:	Improves communication during hazard events
Plan for Implementation	
Responsible Organization/Department:	Emergency Management
Action/Project Priority:	STAPLEE score: 34 Priority: High
Timeline for Completion:	1-5 years; ongoing
Potential Fund Sources:	General funds, private funds, HMGP
Local Planning Mechanisms to be Used in Implementation:	
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Stone County
Risk / Vulnerability	
Problem being Mitigated:	Lack of communication during hazard events
Hazard(s) Addressed:	Tornado, Severe Storm, Flood, Severe Winter Weather, Extreme Heat
Action or Project	
Action/Project Number:	1.9
Name of Action or Project:	Mobile Hazard Alert
Action or Project Description:	Promote local severe weather alert applications for mobile communications devices.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$0-$500
Benefits:	Improves communication during hazard events.
Plan for Implementation	
Responsible Organization/Department:	Emergency Management; County Commission
Action/Project Priority:	STAPLEE score: 31 Priority: High
Timeline for Completion:	1-5 years; ongoing
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	EOP
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Stone County
Risk / Vulnerability	
Problem being Mitigated:	Exposure of vulnerable populations to hazards
Hazard(s) Addressed:	Tornado
Action or Project	
Action/Project Number:	1.10
Name of Action or Project:	New Safe Rooms
Action or Project Description:	Encourage construction of community safe rooms in areas of population concentration and facilities that serve vulnerable populations.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$10,000- $100,000
Benefits:	Protects vulnerable populations from hazards.
Plan for Implementation	
Responsible Organization/Department:	Emergency Management; Planning and Zoning
Action/Project Priority:	STAPLEE score: 28 Priority: Medium
Timeline for Completion:	1-5 years
Potential Fund Sources:	HMGP, PDM
Local Planning Mechanisms to be Used in Implementation:	
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Stone County
Risk / Vulnerability	
Problem being Mitigated:	Exposure of the public to hazard events.
Hazard(s) Addressed:	Tornado
Action or Project	
Action/Project Number:	1.11
Name of Action or Project:	Safe Place Awareness
Action or Project Description:	Create and update tornado/severe storm plans including best identified available refuge areas (these do not, or may not, comply with FEMA Publication 361 for Safe Rooms) in schools, large facilities, and other establishments serving the public.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$100 - $1,000
Benefits:	Improved public safety during hazard events.
Plan for Implementation	
Responsible Organization/Department:	Emergency Management
Action/Project Priority:	STAPLEE score: 29 Priority: Medium
Timeline for Completion:	1-5 years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	EOP
Progress Report	
Action Status	Continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Stone County
Risk / Vulnerability	
Problem being Mitigated:	Exposure to extreme heat or winter weather
Hazard(s) Addressed:	Extreme Heat, Winter Weather
Action or Project	
Action/Project Number:	1.12
Name of Action or Project:	Heating and Cooling Areas
Action or Project Description:	Identify and designate heating and cooling refuge areas in community buildings and make these locations available to the public in the event of extreme temperatures.
Applicable Goal Statement:	Protect the lives and livelihoods of all citizens.
Estimated Cost:	$100 - $1,000
Benefits:	Improved public safety during hazard events.
Plan for Implementation	
Responsible Organization/Department:	Emergency Management
Action/Project Priority:	STAPLEE score: 26 Priority: Medium
Timeline for Completion:	1-3 years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	EOP
Progress Report	
Action Status	Continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Stone County
Risk / Vulnerability	
Problem being Mitigated:	Lack of safe rooms
Hazard(s) Addressed:	Tornado
Action or Project	
Action/Project Number:	1.13
Name of Action or Project:	FEMA Publications
Action or Project Description:	Provide direction to appropriate FEMA publications pertaining to the building of safe rooms.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$0
Benefits:	Improves education on safe room construction
Plan for Implementation	
Responsible Organization/Department:	Emergency Management; Planning and Zoning
Action/Project Priority:	STAPLEE score: 29 Priority: Medium
Timeline for Completion:	1-5 years; ongoing
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Stone County
Risk / Vulnerability	
Problem being Mitigated:	Exposure of the public to weather risks.
Hazard(s) Addressed:	Winter Weather, Extreme Heat
Action or Project	
Action/Project Number:	1.14
Name of Action or Project:	Community Programs
Action or Project Description:	Encourage local community organizations to continue and augment programs to provide fans, air conditioners, and winter weatherization for those at risk.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens
Estimated Cost:	$0 - $100
Benefits:	Protects vulnerable populations from hazard events.
Plan for Implementation	
Responsible Organization/Department:	Emergency Management
Action/Project Priority:	STAPLEE score: 30 Priority: High
Timeline for Completion:	1-5 years; ongoing
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Stone County
Risk / Vulnerability	
Problem being Mitigated:	Exposure to public during hazard events.
Hazard(s) Addressed:	Tornado
Action or Project	
Action/Project Number:	1.15
Name of Action or Project:	Safe Place Regulations
Action or Project Description:	Encourage the adoption of regulations requiring all new manufactured housing developments provide safe rooms or refuge areas (these do not or may not comply with FEMA Publication 361 for safe rooms checklist).
Applicable Goal Statement:	Protect lives and livelihoods of all citizens
Estimated Cost:	$100-$500
Benefits:	Improves public safety during hazard events.
Plan for Implementation	
Responsible Organization/Department:	Emergency Management, Planning and Zoning, County Commission
Action/Project Priority:	STAPLEE score: 32 Priority: High
Timeline for Completion:	1-5 years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Comprehensive Plan; Zoning Ordinance
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Goal 2: Reduce the potential impact of natural disasters to property, infrastructure, and the local economy.

Action Worksheet	
Name of Jurisdiction:	Stone County
Risk / Vulnerability	
Problem being Mitigated:	Lack of service to critical facilities
Hazard(s) Addressed:	Tornado, Severe Storm, Flooding, Winter Weather, Extreme Heat, Earthquake
Action or Project	
Action/Project Number:	2.2
Name of Action or Project:	Utility Maintenance
Action or Project Description:	Encourage electric utilities providers to maintain looped distribution service and other redundancies to critical facilities and/or communications infrastructure.
Applicable Goal Statement:	Reduce the potential impact of natural disasters to property, infrastructure, and the local economy.
Estimated Cost:	$0-$1,000
Benefits:	Protect utilities from natural hazards.
Plan for Implementation	
Responsible Organization/Department:	Emergency Management, County Commission
Action/Project Priority:	STAPLEE score: 29 Priority: Medium
Timeline for Completion:	1-5 years; ongoing
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	EOP
Progress Report	
Action Status	Continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Stone County
Risk / Vulnerability	
Problem being Mitigated:	Preparedness of dam failure event
Hazard(s) Addressed:	Dam Failure
Action or Project	
Action/Project Number:	2.4
Name of Action or Project:	Dam Emergency Partnership
Action or Project Description:	Partner with and participate in dam emergency planning and exercises.
Applicable Goal Statement:	Reduce the potential impact of natural disasters to property, infrastructure, and the local economy.
Estimated Cost:	$0-$500
Benefits:	Helps the county be prepared if a dam failure event were to occur.
Plan for Implementation	
Responsible Organization/Department:	Emergency Management
Action/Project Priority:	STAPLEE score: 40 Priority: High
Timeline for Completion:	1-5 years; ongoing
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	EOP
Progress Report	
Action Status	New

Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Stone County
Risk / Vulnerability	
Problem being Mitigated:	Exposure of structures to flooding.
Hazard(s) Addressed:	Flooding
Action or Project	
Action/Project Number:	2.6
Name of Action or Project:	NFIP Requirement Enforcement
Action or Project Description:	The NFIP communities of Stone County, Crane, Galena, Hurley, Kimberling City, and Reeds Spring will enforce floodplain management requirements, including regulating all new and substantially improved construction in the Special Flood Hazard Areas (SPFAs).
Applicable Goal Statement:	Reduce the potential impact of natural disasters to property, infrastructure, and the local economy.
Estimated Cost:	$0-$500
Benefits:	Mitigates the damage to structures in flooding events.
Plan for Implementation	
Responsible Organization/Department:	Floodplain Manager; Planning and Zoning
Action/Project Priority:	STAPLEE score: 34 Priority: High
Timeline for Completion:	1-5 years; ongoing
Potential Fund Sources:	General Funds; fees
Local Planning Mechanisms to be Used in Implementation:	Floodplain Ordinance; Zoning Ordinance; Building Codes
Progress Report	
Action Status	Continuing
Report of Progress	

Goal 3: Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.

Action Worksheet	
Name of Jurisdiction:	Stone County
Risk / Vulnerability	
Problem being Mitigated:	Lack of training for municipal officials.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.1
Name of Action or Project:	NIMS Training
Action or Project Description:	Promote and provide NIMS training and/or information for all elected officials, public administrators, school administrators, and community stakeholders.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.
Estimated Cost:	$0-$500
Benefits:	Training for officials will improve response to hazard events.
Plan for Implementation	
Responsible Organization/Department:	Emergency Management; County Commission
Action/Project Priority:	STAPLEE score: 33 Priority: High
Timeline for Completion:	1-5 years; ongoing

Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	EOP
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Stone County
Risk / Vulnerability	
Problem being Mitigated:	Poor 911 addressing makes emergency response difficult
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.2
Name of Action or Project:	911 Addressing
Action or Project Description:	Educate on importance of, or enforce if applicable, the importance of highly visible 911 addressing for residences and businesses.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.
Estimated Cost:	$0-$1,000
Benefits:	Improved emergency response during and after hazard events.
Plan for Implementation	
Responsible Organization/Department:	Emergency Management; Sheriff; County Commission
Action/Project Priority:	STAPLEE score: 31 Priority: High
Timeline for Completion:	1-5 years; ongoing
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Stone County
Risk / Vulnerability	
Problem being Mitigated:	Encroachment of vegetation
Hazard(s) Addressed:	Tornado, Severe Storm, Winter Weather
Action or Project	
Action/Project Number:	3.5
Name of Action or Project:	Vegetation Maintenance
Action or Project Description:	Enhance strategies and coordinate with utility providers to manage encroachment of vegetation in easements and rights-of-way.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.
Estimated Cost:	$0-$500
Benefits:	Decreased utility loss in the event of a hazard.
Plan for Implementation	
Responsible Organization/Department:	Emergency Management, Planning and Zoning, County Commission, Road Districts
Action/Project Priority:	STAPLEE score: 33 Priority: High

Timeline for Completion:	1-3 years; ongoing
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Stone County
Risk / Vulnerability	
Problem being Mitigated:	Lack of funding for hazard mitigation projects.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.7
Name of Action or Project:	Funding Identification
Action or Project Description:	Monitor and identify funding from state and federal programs for hazard mitigation activities.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.
Estimated Cost:	$0
Benefits:	Increased opportunities for funding for hazard mitigation projects.
Plan for Implementation	
Responsible Organization/Department:	Emergency Management
Action/Project Priority:	STAPLEE score: 40 Priority: High
Timeline for Completion:	1-5 years; ongoing
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Stone County
Risk / Vulnerability	
Problem being Mitigated:	Poor coordination on infrastructure development can lead to damages.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.8
Name of Action or Project:	Reduction In Property Damage
Action or Project Description:	Utilize collaborative planning and compatible regulatory controls between the county and incorporated communities to promote infrastructure development practices that reduce the potential for property damage from natural hazards.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.
Estimated Cost:	$0-$500
Benefits:	Better infrastructure development will decrease damage during hazards.
Plan for Implementation	
Responsible Organization/Department:	Planning and Zoning; County Commission

Action/Project Priority:	STAPLEE score: 31 Priority: High
Timeline for Completion:	1-5 years; ongoing
Potential Fund Sources:	HMGP: General Funds
Local Planning Mechanisms to be Used in Implementation:	Comprehensive Plan, EOP, Land-use Plan
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Stone County
Risk / Vulnerability	
Problem being Mitigated:	Lack of data for decision making and facilities management.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.9
Name of Action or Project:	GIS Development
Action or Project Description:	Continue development of Geographic Information Systems (GIS) to further identify, analyze and map hazard prone areas to enhance decision making and facilities management for agencies and stakeholders.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical facilities in a disaster.
Estimated Cost:	$500-$5,000
Benefits:	More and better data will help mitigation related decision making.
Plan for Implementation	
Responsible Organization/Department:	Emergency Management; GIS Mapping Specialist
Action/Project Priority:	STAPLEE score: 36 Priority: High
Timeline for Completion:	1-5 years; ongoing
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	GIS
Progress Report	
Action Status	Continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Stone County
Risk / Vulnerability	
Problem being Mitigated:	Lack of sharing and resource request tracking during hazards.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.10
Name of Action or Project:	WebEOC
Action or Project Description:	Participate in WebEOC.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical facilities in a disaster.
Estimated Cost:	$0-$500
Benefits:	Allows jurisdictions to work together during hazards.
Plan for Implementation	
Responsible Organization/Department:	Emergency Management
Action/Project Priority:	STAPLEE score: 43 Priority: High

Timeline for Completion:	1-5 years; ongoing
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	EOP
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Goal 1: Protect lives and livelihoods of all citizens.

Action Worksheet	
Name of Jurisdiction:	Branson West
Risk / Vulnerability	
Problem being Mitigated:	Public awareness of hazard vulnerability and mitigation measures.
Hazard(s) Addressed:	Tornado, Severe Storm, Winter Weather, Flooding, Drought, Extreme Heat
Action or Project	
Action/Project Number:	1.1
Name of Action or Project:	Awareness Program
Action or Project Description:	Partner with traditional media and the National Weather Service to publish and/or broadcast information on severe weather hazards.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$500-$1000
Benefits:	Reduction in loss of life, injury, and property during hazard events.
Plan for Implementation	
Responsible Organization/Department:	City Hall/ Administration
Action/Project Priority:	STAPLEE score: 28 Priority: M
Timeline for Completion:	3-6 Months
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Local Mitigation Plan
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Branson West
Risk / Vulnerability	
Problem being Mitigated:	Lack of public involvement in mitigation activities
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	1.5
Name of Action or Project:	Citizen Preparedness
Action or Project Description:	Promote participation in citizen preparedness activities, such as: MOCERT1, Neighborhood Watch, Amateur Radio, and Community Heroes Reserve Medical Corps.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$500
Benefits:	Increase citizen awareness of mitigation activities
Plan for Implementation	
Responsible Organization/Department:	City Committee members
Action/Project Priority:	STAPLEE score: 25 Priority: L

Timeline for Completion:	1 Year
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Local Mitigation Plan
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Branson West
Risk / Vulnerability	
Problem being Mitigated:	Lack of communication during hazard events
Hazard(s) Addressed:	Tornado, Severe Storm, Flood, Severe Winter Weather, Extreme Heat
Action or Project	
Action/Project Number:	1.9
Name of Action or Project:	Mobile Hazard Alert
Action or Project Description:	Promote local severe weather alert applications for mobile communications devices.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$500
Benefits:	Improves communication during hazard events.
Plan for Implementation	
Responsible Organization/Department:	City Hall
Action/Project Priority:	STAPLEE score: 29 Priority: M
Timeline for Completion:	Ongoing
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Local Mitigation Plan
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Branson West
Risk / Vulnerability	
Problem being Mitigated:	Exposure of vulnerable populations to hazards
Hazard(s) Addressed:	Tornado
Action or Project	
Action/Project Number:	1.10
Name of Action or Project:	New Safe Rooms
Action or Project Description:	Encourage construction of community safe rooms in areas of population concentration and facilities that serve vulnerable populations.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$2,000-$3,000
Benefits:	Protects vulnerable populations from hazards.
Plan for Implementation	
Responsible Organization/Department:	Building Department
Action/Project Priority:	STAPLEE score: 27 Priority: M
Timeline for Completion:	1-2 Years
Potential Fund Sources:	General Funds

Local Planning Mechanisms to be Used in Implementation:	Local Mitigation Plan; Building Code; Zoning Code
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Branson West
Risk / Vulnerability	
Problem being Mitigated:	Lack of safe rooms
Hazard(s) Addressed:	Tornado
Action or Project	
Action/Project Number:	1.13
Name of Action or Project:	FEMA Publications
Action or Project Description:	Provide direction to appropriate FEMA publications pertaining to the building of safe rooms.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$1,000-$2,000
Benefits:	Improves education on safe room construction
Plan for Implementation	
Responsible Organization/Department:	Building Department
Action/Project Priority:	STAPLEE score: 25 Priority: M
Timeline for Completion:	1 Year
Potential Fund Sources:	Building Department Funds
Local Planning Mechanisms to be Used in Implementation:	Building Codes
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Branson West
Risk / Vulnerability	
Problem being Mitigated:	Exposure of the public to weather risks.
Hazard(s) Addressed:	Winter Weather, Extreme Heat
Action or Project	
Action/Project Number:	1.14
Name of Action or Project:	Community Programs
Action or Project Description:	Encourage local community organizations to continue and augment programs to provide fans, air conditioners, and winter weatherization for those at risk.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens
Estimated Cost:	No additional cost
Benefits:	Protects vulnerable populations from hazard events.
Plan for Implementation	
Responsible Organization/Department:	City Hall
Action/Project Priority:	STAPLEE score: 26 Priority: M
Timeline for Completion:	1 Year
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Local Mitigation Plan

Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Branson West
Risk / Vulnerability	
Problem being Mitigated:	Exposure to public during hazard events.
Hazard(s) Addressed:	Tornado
Action or Project	
Action/Project Number:	1.15
Name of Action or Project:	Safe Place Regulations
Action or Project Description:	Encourage the adoption of regulations requiring all new manufactured housing developments provide safe rooms or refuge areas (these do not or may not comply with FEMA Publication 361 for safe rooms checklist).
Applicable Goal Statement:	Protect lives and livelihoods of all citizens
Estimated Cost:	$1,000-$2,000
Benefits:	Improves public safety during hazard events.
Plan for Implementation	
Responsible Organization/Department:	Building Department
Action/Project Priority:	STAPLEE score: 28 Priority: M
Timeline for Completion:	1 Year
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Building Codes
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Goal 2: Reduce the potential impact of natural disasters to property, infrastructure, and the local economy.

Action Worksheet	
Name of Jurisdiction:	Branson West
Risk / Vulnerability	
Problem being Mitigated:	Flood damage to properties and infrastructure
Hazard(s) Addressed:	Flooding
Action or Project	
Action/Project Number:	2.1
Name of Action or Project:	Flood Mitigation
Action or Project Description:	Acquire, elevate, or flood-proof properties and critical infrastructure within flood hazard areas where feasible.
Applicable Goal Statement:	Reduce the potential impact of natural disasters to property, infrastructure and local economy.
Estimated Cost:	$10,000
Benefits:	Reduces risk of flood damage to properties and infrastructure.
Plan for Implementation	
Responsible Organization/Department:	Public Works
Action/Project Priority:	STAPLEE score: 31 Priority: H
Timeline for Completion:	2 Years
Potential Fund Sources:	HMGP; PDM; Capital Improvement Fund

Local Planning Mechanisms to be Used in Implementation:	Local Mitigation Plan; Zoning Ordinance
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Branson West
Risk / Vulnerability	
Problem being Mitigated:	Lack of service to critical facilities
Hazard(s) Addressed:	Tornado, Severe Storm, Flooding, Winter Weather, Extreme Heat, Earthquake
Action or Project	
Action/Project Number:	2.2
Name of Action or Project:	Utility Maintenance
Action or Project Description:	Encourage electric utilities providers to maintain looped distribution service and other redundancies to critical facilities and/or communications infrastructure.
Applicable Goal Statement:	Reduce the potential impact of natural disasters to property, infrastructure, and the local economy.
Estimated Cost:	No additional cost
Benefits:	Protect utilities from natural hazards.
Plan for Implementation	
Responsible Organization/Department:	City Hall
Action/Project Priority:	STAPLEE score: 28 Priority: M
Timeline for Completion:	1 Year
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Local Mitigation Plan
Progress Report	
Action Status	Continuing
Report of Progress	

Goal 3: Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.

Action Worksheet	
Name of Jurisdiction:	Branson West
Risk / Vulnerability	
Problem being Mitigated:	Lack of training for municipal officials.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.1
Name of Action or Project:	NIMS Training
Action or Project Description:	Promote and provide NIMS training and/or information for all elected officials, public administrators, school administrators, and community stakeholders.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.
Estimated Cost:	$500
Benefits:	Training for officials will improve response to hazard events.
Plan for Implementation	
Responsible Organization/Department:	City Hall
Action/Project Priority:	STAPLEE score: 33 Priority: H

Timeline for Completion:	1 Year
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Local Mitigation Plan
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Branson West
Risk / Vulnerability	
Problem being Mitigated:	Lack of hazard mitigation principles in city and county plans.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.4
Name of Action or Project:	Hazard Mitigation Integration
Action or Project Description:	Integrate hazard mitigation into comprehensive and long range plans, capital improvement programs, zoning ordinances, subdivision, storm water management regulations, emergency operations plans, etc.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.
Estimated Cost:	$2,000-$5,000
Benefits:	Plans will have included hazard mitigation principles, improving resilience to hazard events.
Plan for Implementation	
Responsible Organization/Department:	City Hall
Action/Project Priority:	STAPLEE score: 35 Priority: H
Timeline for Completion:	1-2 Years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Local Mitigation Plan; Comprehensive Plan; Land-use Plan
Progress Report	
Action Status	Continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Branson West
Risk / Vulnerability	
Problem being Mitigated:	Encroachment of vegetation
Hazard(s) Addressed:	Tornado, Severe Storm, Winter Weather
Action or Project	
Action/Project Number:	3.5
Name of Action or Project:	Vegetation Maintenance
Action or Project Description:	Enhance strategies and coordinate with utility providers to manage encroachment of vegetation in easements and rights-of-way.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.
Estimated Cost:	$500
Benefits:	Decreased utility loss in the event of a hazard.
Plan for Implementation	
Responsible	Public Works

Organization/Department:	
Action/Project Priority:	STAPLEE score: 30 Priority: H
Timeline for Completion:	1 Year
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Local Mitigation Plan
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Branson West
Risk / Vulnerability	
Problem being Mitigated:	Lack of data for decision making and facilities management.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.9
Name of Action or Project:	GIS Development
Action or Project Description:	Continue development of Geographic Information Systems (GIS) to further identify, analyze and map hazard prone areas to enhance decision making and facilities management for agencies and stakeholders.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical facilities in a disaster.
Estimated Cost:	$10,000
Benefits:	More and better data will help mitigation related decision making.
Plan for Implementation	
Responsible Organization/Department:	Unknown; Administration; Engineering Firm
Action/Project Priority:	STAPLEE score: 38 Priority: H
Timeline for Completion:	1-2 Years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Local Mitigation Plan
Progress Report	
Action Status	Continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Branson West
Risk / Vulnerability	
Problem being Mitigated:	Lack of sharing and resource request tracking during hazards.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.10
Name of Action or Project:	WebEOC
Action or Project Description:	Participate in WebEOC.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical facilities in a disaster.
Estimated Cost:	$500
Benefits:	Allows jurisdictions to work together during hazards.
Plan for Implementation	
Responsible	City Hall

Organization/Department:	
Action/Project Priority:	STAPLEE score: 35 Priority: H
Timeline for Completion:	1-2 Years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Local Mitigation Plan
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Goal 1: Protect lives and livelihoods of all citizens.

Action Worksheet	
Name of Jurisdiction:	Crane
Risk / Vulnerability	
Problem being Mitigated:	Public awareness of hazard vulnerability and mitigation measures.
Hazard(s) Addressed:	Tornado, Severe Storm, Winter Weather, Flooding, Drought, Extreme Heat
Action or Project	
Action/Project Number:	1.1
Name of Action or Project:	Awareness Program
Action or Project Description:	Partner with traditional media and the National Weather Service to publish and/or broadcast information on severe weather hazards.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$5,000
Benefits:	Reduction in loss of life, injury, and property during hazard events.
Plan for Implementation	
Responsible Organization/Department:	Fire & Police
Action/Project Priority:	STAPLEE score: 38 Priority: H
Timeline for Completion:	1 Year
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Local Mitigation Plan; EOP
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Crane
Risk / Vulnerability	
Problem being Mitigated:	Public awareness of hazard vulnerability and mitigation measures.
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	1.2
Name of Action or Project:	Disaster Preparation
Action or Project Description:	Provide a link to disaster preparation resources such as Ready in 3 or Ready.gov on local government, health department, public schools, chambers of commerce, and community organization websites.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$100
Benefits:	Reduction in loss of life, injury, and property during hazard events.
Plan for Implementation	
Responsible	Administration

Organization/Department:	
Action/Project Priority:	STAPLEE score: 38 Priority: H
Timeline for Completion:	1 Year
Potential Fund Sources:	General Fund
Local Planning Mechanisms to be Used in Implementation:	Local Mitigation Plan; EOP
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Crane
Risk / Vulnerability	
Problem being Mitigated:	Public awareness to hazards.
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	1.3
Name of Action or Project:	Mitigation awareness
Action or Project Description:	Use social media to raise awareness of mitigation and preparedness activities.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$100
Benefits:	Reduction in loss of life, injury, and property during hazard events.
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 35 Priority: H
Timeline for Completion:	1 Month
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Local Mitigation Plan
Progress Report	
Action Status	New
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Crane
Risk / Vulnerability	
Problem being Mitigated:	Building loss in wildfire events.
Hazard(s) Addressed:	Wildfire
Action or Project	
Action/Project Number:	1.4
Name of Action or Project:	Fire-Resistant Construction
Action or Project Description:	Increase public awareness of the use of non-combustible materials for new construction, and fire resistant landscaping techniques and planting materials in wildfire hazard areas.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$100
Benefits:	Reduction of property loss during wildfires.
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 35 Priority: H

Timeline for Completion:	1 Month
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Local Mitigation Plan
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Crane
Risk / Vulnerability	
Problem being Mitigated:	Lack of public involvement in mitigation activities
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	1.5
Name of Action or Project:	Citizen Preparedness
Action or Project Description:	Promote participation in citizen preparedness activities, such as: MOCERT1, Neighborhood Watch, Amateur Radio, and Community Heroes Reserve Medical Corps.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$100
Benefits:	Increase citizen awareness of mitigation activities
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 31 Priority: H
Timeline for Completion:	3 Months
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Local Mitigation Plan; EOP
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Crane
Risk / Vulnerability	
Problem being Mitigated:	Upkeep of sirens.
Hazard(s) Addressed:	Tornado, Severe Storm
Action or Project	
Action/Project Number:	1.7
Name of Action or Project:	Warning Siren Maintenance
Action or Project Description:	Maintain outdoor warning sirens in public areas.
Applicable Goal Statement:	Protect the lives and livelihoods of all citizens.
Estimated Cost:	$5,000
Benefits:	Warns the public during hazard events
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 34 Priority: H
Timeline for Completion:	1 Year
Potential Fund Sources:	General Funds; HMGP

Local Planning Mechanisms to be Used in Implementation:	Local Mitigation Plan
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Crane
Risk / Vulnerability	
Problem being Mitigated:	Lack of communication during hazard events
Hazard(s) Addressed:	Tornado, Severe Storm, Flood, Severe Winter Weather, Extreme Heat, Wildfire
Action or Project	
Action/Project Number:	1.8
Name of Action or Project:	NOAA Radios
Action or Project Description:	Promote the use of NOAA all-hazard radios with S.A.M.E. technology to all residents, businesses and government entities.
Applicable Goal Statement:	Protect the lives and livelihoods of all citizens.
Estimated Cost:	No additional cost
Benefits:	Improves communication during hazard events
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 34 Priority: H
Timeline for Completion:	3 Months
Potential Fund Sources:	General Funds; HMGP
Local Planning Mechanisms to be Used in Implementation:	Local Mitigation Plan
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Crane
Risk / Vulnerability	
Problem being Mitigated:	Lack of communication during hazard events
Hazard(s) Addressed:	Tornado, Severe Storm, Flood, Severe Winter Weather, Extreme Heat
Action or Project	
Action/Project Number:	1.9
Name of Action or Project:	Mobile Hazard Alert
Action or Project Description:	Promote local severe weather alert applications for mobile communications devices.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	No additional cost
Benefits:	Improves communication during hazard events.
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 29 Priority: M
Timeline for Completion:	3 Months
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Local Mitigation Plan

Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Crane
Risk / Vulnerability	
Problem being Mitigated:	Exposure of vulnerable populations to hazards
Hazard(s) Addressed:	Tornado
Action or Project	
Action/Project Number:	1.10
Name of Action or Project:	New Safe Rooms
Action or Project Description:	Encourage construction of community safe rooms in areas of population concentration and facilities that serve vulnerable populations.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$500
Benefits:	Protects vulnerable populations from hazards.
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 24 Priority: L
Timeline for Completion:	Ongoing
Potential Fund Sources:	General Funds; HMGP: PDM
Local Planning Mechanisms to be Used in Implementation:	Local Mitigation Plan; Comprehensive Plan; Zoning Ordinance
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Crane
Risk / Vulnerability	
Problem being Mitigated:	Exposure of the public to hazard events.
Hazard(s) Addressed:	Tornado
Action or Project	
Action/Project Number:	1.11
Name of Action or Project:	Safe Place Awareness
Action or Project Description:	Create and update tornado/severe storm plans including best identified available refuge areas (these do not, or may not, comply with FEMA Publication 361 for Safe Rooms) in schools, large facilities, and other establishments serving the public.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$500
Benefits:	Improved public safety during hazard events.
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 36 Priority: M
Timeline for Completion:	1-5 Years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Local Mitigation Plan

Progress Report	
Action Status	Continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Crane
Risk / Vulnerability	
Problem being Mitigated:	Exposure to extreme heat or winter weather
Hazard(s) Addressed:	Extreme Heat, Winter Weather
Action or Project	
Action/Project Number:	1.12
Name of Action or Project:	Heating and Cooling Areas
Action or Project Description:	Identify and designate heating and cooling refuge areas in community buildings and make these locations available to the public in the event of extreme temperatures.
Applicable Goal Statement:	Protect the lives and livelihoods of all citizens.
Estimated Cost:	No additional cost
Benefits:	Improved public safety during hazard events.
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 29 Priority: M
Timeline for Completion:	3 Months
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Local Mitigation Plan; EOP
Progress Report	
Action Status	Continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Crane
Risk / Vulnerability	
Problem being Mitigated:	Lack of safe rooms
Hazard(s) Addressed:	Tornado
Action or Project	
Action/Project Number:	1.13
Name of Action or Project:	FEMA Publications
Action or Project Description:	Provide direction to appropriate FEMA publications pertaining to the building of safe rooms.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	No additional cost
Benefits:	Improves education on safe room construction
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 28 Priority: M
Timeline for Completion:	6 Months
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Local Mitigation Plan
Progress Report	

Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Crane
Risk / Vulnerability	
Problem being Mitigated:	Exposure of the public to weather risks.
Hazard(s) Addressed:	Winter Weather, Extreme Heat
Action or Project	
Action/Project Number:	1.14
Name of Action or Project:	Community Programs
Action or Project Description:	Encourage local community organizations to continue and augment programs to provide fans, air conditioners, and winter weatherization for those at risk.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens
Estimated Cost:	$5,000-$10,000
Benefits:	Protects vulnerable populations from hazard events.
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 29 Priority: M
Timeline for Completion:	Ongoing
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Local Mitigation Plan
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Crane
Risk / Vulnerability	
Problem being Mitigated:	Exposure to public during hazard events.
Hazard(s) Addressed:	Tornado
Action or Project	
Action/Project Number:	1.15
Name of Action or Project:	Safe Place Regulations
Action or Project Description:	Encourage the adoption of regulations requiring all new manufactured housing developments provide safe rooms or refuge areas (these do not or may not comply with FEMA Publication 361 for safe rooms checklist).
Applicable Goal Statement:	Protect lives and livelihoods of all citizens
Estimated Cost:	No additional cost
Benefits:	Improves public safety during hazard events.
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 32 Priority: H
Timeline for Completion:	1 Year
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Local Mitigation Plan; Comprehensive Plan; Zoning Ordinance
Progress Report	
Action Status	Revised, continuing

Report of Progress	City has new planning and zoning regulations

Goal 2: Reduce the potential impact of natural disasters to property, infrastructure, and the local economy.

Action Worksheet	
Name of Jurisdiction:	Crane
Risk / Vulnerability	
Problem being Mitigated:	Resiliency of wastewater treatment facilities.
Hazard(s) Addressed:	Flooding, Drought
Action or Project	
Action/Project Number:	2.3
Name of Action or Project:	Wastewater Treatment Maintenance
Action or Project Description:	Take necessary steps to ensure resiliency for wastewater treatment systems during flood and drought events.
Applicable Goal Statement:	Reduce potential impact of natural disasters to property, infrastructure, and the local economy.
Estimated Cost:	No additional cost
Benefits:	Helps reduce the impact and extent of flooding
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 25 Priority: M
Timeline for Completion:	1 Year
Potential Fund Sources:	General Funds: HMGP: PDM
Local Planning Mechanisms to be Used in Implementation:	Local Mitigation Plan
Progress Report	
Action Status	Revised, continuing
Report of Progress	Wastewater system maintenance is ongoing

Action Worksheet	
Name of Jurisdiction:	Crane
Risk / Vulnerability	
Problem being Mitigated:	Exposure of structures to flooding.
Hazard(s) Addressed:	Flooding
Action or Project	
Action/Project Number:	2.6
Name of Action or Project:	NFIP Requirement Enforcement
Action or Project Description:	The NFIP communities of Stone County, Crane, Galena, Hurley, Kimberling City, and Reeds Spring will enforce floodplain management requirements, including regulating all new and substantially improved construction in the Special Flood Hazard Areas (SPFAs).
Applicable Goal Statement:	Reduce the potential impact of natural disasters to property, infrastructure, and the local economy.
Estimated Cost:	No additional cost
Benefits:	Mitigates the damage to structures in flooding events.
Plan for Implementation	
Responsible Organization/Department:	Administration/P&Z
Action/Project Priority:	STAPLEE score: 24 Priority: L
Timeline for Completion:	Ongoing
Potential Fund Sources:	General Funds

Local Planning Mechanisms to be Used in Implementation:	Local Mitigation Plan; Floodplain Ordinance; Zoning Ordinance
Progress Report	
Action Status	Continuing
Report of Progress	

Goal 3: Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.

Action Worksheet	
Name of Jurisdiction:	Crane
Risk / Vulnerability	
Problem being Mitigated:	Lack of hazard mitigation principles in city and county plans.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.4
Name of Action or Project:	Hazard Mitigation Integration
Action or Project Description:	Integrate hazard mitigation into comprehensive and long range plans, capital improvement programs, zoning ordinances, subdivision, storm water management regulations, emergency operations plans, etc.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.
Estimated Cost:	No additional cost
Benefits:	Plans will have included hazard mitigation principles, improving resilience to hazard events.
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 36 Priority: M
Timeline for Completion:	Ongoing
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Local Mitigation Plan; Comprehensive Plan; Zoning Ordinance
Progress Report	
Action Status	Continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Crane
Risk / Vulnerability	
Problem being Mitigated:	Lack of funding for hazard mitigation projects.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.7
Name of Action or Project:	Funding Identification
Action or Project Description:	Monitor and identify funding from state and federal programs for hazard mitigation activities.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.
Estimated Cost:	No additional cost
Benefits:	Increased opportunities for funding for hazard mitigation projects.
Plan for Implementation	
Responsible	Administration

Organization/Department:	
Action/Project Priority:	STAPLEE score: 31 Priority: H
Timeline for Completion:	Ongoing
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Local Mitigation Plan
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Crane
Risk / Vulnerability	
Problem being Mitigated:	Poor coordination on infrastructure development can lead to damages.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.8
Name of Action or Project:	Reduction In Property Damage
Action or Project Description:	Utilize collaborative planning and compatible regulatory controls between the county and incorporated communities to promote infrastructure development practices that reduce the potential for property damage from natural hazards.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.
Estimated Cost:	$26,000
Benefits:	Better infrastructure development will decrease damage during hazards.
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 28 Priority: M
Timeline for Completion:	1 Year
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Local Mitigation Plan; Comprehensive Plan; Zoning Ordinance
Progress Report	
Action Status	Revised, continuing
Report of Progress	Currently working on mitigation of lift station

Action Worksheet	
Name of Jurisdiction:	Crane
Risk / Vulnerability	
Problem being Mitigated:	Lack of data for decision making and facilities management.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.9
Name of Action or Project:	GIS Development
Action or Project Description:	Continue development of Geographic Information Systems (GIS) to further identify, analyze and map hazard prone areas to enhance decision making and facilities management for agencies and stakeholders.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical facilities in a disaster.
Estimated Cost:	$100
Benefits:	More and better data will help mitigation related decision making.
Plan for Implementation	

Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 27 Priority: M
Timeline for Completion:	5 Years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Local Mitigation Plan
Progress Report	
Action Status	Continuing
Report of Progress	

Goal 1: Protect lives and livelihoods of all citizens.

Action Worksheet	
Name of Jurisdiction:	Village of Coney Island
Risk / Vulnerability	
Problem being Mitigated:	Public awareness of hazard vulnerability and mitigation measures.
Hazard(s) Addressed:	Tornado, Severe Storm, Winter Weather, Flooding, Drought, Extreme Heat
Action or Project	
Action/Project Number:	1.1
Name of Action or Project:	Awareness Program
Action or Project Description:	Partner with traditional media and the National Weather Service to publish and/or broadcast information on severe weather hazards.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$0-40
Benefits:	Reduction in loss of life, injury, and property during hazard events.
Plan for Implementation	
Responsible Organization/Department:	Village Clerk
Action/Project Priority:	STAPLEE score: 39 Priority: H
Timeline for Completion:	1 – 2 years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Communication with media and National Weather Service
Progress Report	
Action Status	New
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	Village of Coney Island
Risk / Vulnerability	
Problem being Mitigated:	Public awareness of hazard vulnerability and mitigation measures.
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	1.2
Name of Action or Project:	Disaster Preparation
Action or Project Description:	Provide a link to disaster preparation resources such as Ready in 3 or Ready.gov on local government, health department, public schools, chambers of commerce, and community organization websites.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$0 - $40
Benefits:	Reduction in loss of life, injury, and property during hazard events.
Plan for Implementation	

Responsible Organization/Department:	Village Clerk
Action/Project Priority:	STAPLEE score: 39 Priority: High
Timeline for Completion:	1 – 2 years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	
Progress Report	
Action Status	New
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	Village of Coney Island
Risk / Vulnerability	
Problem being Mitigated:	Public awareness to hazards.
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	1.3
Name of Action or Project:	Mitigation awareness
Action or Project Description:	Use social media to raise awareness of mitigation and preparedness activities.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$0-$40
Benefits:	Reduction in loss of life, injury, and property during hazard events.
Plan for Implementation	
Responsible Organization/Department:	Board of Trustees; Village Clerk
Action/Project Priority:	STAPLEE score: 39 Priority: High
Timeline for Completion:	1 -2 years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	N/A
Progress Report	
Action Status	New
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	Village of Coney Island
Risk / Vulnerability	
Problem being Mitigated:	Building loss in wildfire events.
Hazard(s) Addressed:	Wildfire
Action or Project	
Action/Project Number:	1.4
Name of Action or Project:	Fire-Resistant Construction
Action or Project Description:	Increase public awareness of the use of non-combustible materials for new construction, and fire resistant landscaping techniques and planting materials in wildfire hazard areas.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$0 - $40
Benefits:	Reduction of property loss during wildfires.
Plan for Implementation	
Responsible Organization/Department:	Board of Trustees: Village Clerk

Action/Project Priority:	STAPLEE score: 35 Priority: High
Timeline for Completion:	1 – 2 years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	N/A
Progress Report	
Action Status	New
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	Village of Coney Island
Risk / Vulnerability	
Problem being Mitigated:	Lack of public involvement in mitigation activities
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	1.5
Name of Action or Project:	Citizen Preparedness
Action or Project Description:	Promote participation in citizen preparedness activities, such as: MOCERT1, Neighborhood Watch, Amateur Radio, and Community Heroes Reserve Medical Corps.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$0 - $40
Benefits:	Increase citizen awareness of mitigation activities
Plan for Implementation	
Responsible Organization/Department:	Board of Trustees; Village Clerk
Action/Project Priority:	STAPLEE score: 30 Priority: High
Timeline for Completion:	1 – 3 years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	N/A
Progress Report	
Action Status	New
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	Coney Island
Risk / Vulnerability	
Problem being Mitigated:	Lack of communication during hazard events
Hazard(s) Addressed:	Tornado, Severe Storm, Flood, Severe Winter Weather, Extreme Heat, Wildfire
Action or Project	
Action/Project Number:	1.8
Name of Action or Project:	NOAA Radios
Action or Project Description:	Promote the use of NOAA all-hazard radios with S.A.M.E. technology to all residents, businesses and government entities.
Applicable Goal Statement:	Protect the lives and livelihoods of all citizens.
Estimated Cost:	$500
Benefits:	Improves communication during hazard events
Plan for Implementation	
Responsible Organization/Department:	Board of Trustees; Village Clerk
Action/Project Priority:	STAPLEE score: 27 Priority: Medium

Timeline for Completion:	1 – 3 years
Potential Fund Sources:	General Funds; HMGP
Local Planning Mechanisms to be Used in Implementation:	N/A
Progress Report	
Action Status	New
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	Village of Coney Island
Risk / Vulnerability	
Problem being Mitigated:	Lack of communication during hazard events
Hazard(s) Addressed:	Tornado, Severe Storm, Flood, Severe Winter Weather, Extreme Heat
Action or Project	
Action/Project Number:	1.9
Name of Action or Project:	Mobile Hazard Alert
Action or Project Description:	Promote local severe weather alert applications for mobile communications devices.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$0 - $40
Benefits:	Improves communication during hazard events.
Plan for Implementation	
Responsible Organization/Department:	Board of Trustees; Village Clerk
Action/Project Priority:	STAPLEE score: 30 Priority: High
Timeline for Completion:	1 – 2 years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	N/A
Progress Report	
Action Status	New
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	Village of Coney Island
Risk / Vulnerability	
Problem being Mitigated:	Exposure of vulnerable populations to hazards
Hazard(s) Addressed:	Tornado
Action or Project	
Action/Project Number:	1.10
Name of Action or Project:	New Safe Rooms
Action or Project Description:	Encourage construction of community safe rooms in areas of population concentration and facilities that serve vulnerable populations.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$0 - $40
Benefits:	Protects vulnerable populations from hazards.
Plan for Implementation	
Responsible Organization/Department:	Board of Trustees; Village Clerk
Action/Project Priority:	STAPLEE score: 32 Priority: High
Timeline for Completion:	1 – 2 years
Potential Fund Sources:	HMGP, PDM

Local Planning Mechanisms to be Used in Implementation:	N/A
Progress Report	
Action Status	New
Report of Progress	N/A

Goal 2: Reduce the potential impact of natural disasters to property, infrastructure, and the local economy.

Action Worksheet	
Name of Jurisdiction:	Village of Coney Island
Risk / Vulnerability	
Problem being Mitigated:	Flood damage to properties and infrastructure
Hazard(s) Addressed:	Flooding
Action or Project	
Action/Project Number:	2.1
Name of Action or Project:	Flood Mitigation
Action or Project Description:	Acquire, elevate, or flood-proof properties and critical infrastructure within flood hazard areas where feasible.
Applicable Goal Statement:	Reduce the potential impact of natural disasters to property, infrastructure and local economy.
Estimated Cost:	$2,000 - $3,000
Benefits:	Reduces risk of flood damage to properties and infrastructure.
Plan for Implementation	
Responsible Organization/Department:	Board of Trustees; Private Contractor
Action/Project Priority:	STAPLEE score: 38 Priority: High
Timeline for Completion:	2 – 3 years
Potential Fund Sources:	HMGP, PDM
Local Planning Mechanisms to be Used in Implementation:	N/A
Progress Report	
Action Status	New
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	Village of Coney Island
Risk / Vulnerability	
Problem being Mitigated:	Lack of service to critical facilities
Hazard(s) Addressed:	Tornado, Severe Storm, Flooding, Winter Weather, Extreme Heat, Earthquake
Action or Project	
Action/Project Number:	2.2
Name of Action or Project:	Utility Maintenance
Action or Project Description:	Encourage electric utilities providers to maintain looped distribution service and other redundancies to critical facilities and/or communications infrastructure.
Applicable Goal Statement:	Reduce the potential impact of natural disasters to property, infrastructure, and the local economy.
Estimated Cost:	$0 - $40
Benefits:	Protect utilities from natural hazards.
Plan for Implementation	
Responsible Organization/Department:	Board of Trustees
Action/Project Priority:	STAPLEE score: 35 Priority: High

Timeline for Completion:	3 – 5 years
Potential Fund Sources:	General funds
Local Planning Mechanisms to be Used in Implementation:	N/A
Progress Report	
Action Status	New
Report of Progress	N/A

Goal 3: Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.

Action Worksheet	
Name of Jurisdiction:	Village of Coney Island
Risk / Vulnerability	
Problem being Mitigated:	Lack of training for municipal officials.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.1
Name of Action or Project:	NIMS Training
Action or Project Description:	Promote and provide NIMS training and/or information for all elected officials, public administrators, school administrators, and community stakeholders.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.
Estimated Cost:	$0 - $40
Benefits:	Training for officials will improve response to hazard events.
Plan for Implementation	
Responsible Organization/Department:	Village Clerk
Action/Project Priority:	STAPLEE score: 26 Priority: Medium
Timeline for Completion:	4 – 5 years
Potential Fund Sources:	General funds
Local Planning Mechanisms to be Used in Implementation:	N/A
Progress Report	
Action Status	New
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	Village of Coney Island
Risk / Vulnerability	
Problem being Mitigated:	Poor 911 addressing makes emergency response difficult
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.2
Name of Action or Project:	911 Addressing
Action or Project Description:	Educate on importance of, or enforce if applicable, the importance of highly visible 911 addressing for residences and businesses.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.
Estimated Cost:	$100 - $200
Benefits:	Improved emergency response during and after hazard events.
Plan for Implementation	

Responsible Organization/Department:	Board of Trustees; Village Clerk
Action/Project Priority:	STAPLEE score: 27 Priority: High
Timeline for Completion:	4 – 5 years
Potential Fund Sources:	General funds
Local Planning Mechanisms to be Used in Implementation:	N/A
Progress Report	
Action Status	New
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	Village of Coney Island
Risk / Vulnerability	
Problem being Mitigated:	Lack of hazard mitigation principles in city and county plans.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.4
Name of Action or Project:	Hazard Mitigation Integration
Action or Project Description:	Integrate hazard mitigation into comprehensive and long range plans, capital improvement programs, zoning ordinances, subdivision, storm water management regulations, emergency operations plans, etc.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.
Estimated Cost:	$2,000 - $3,000
Benefits:	Plans will have included hazard mitigation principles, improving resilience to hazard events.
Plan for Implementation	
Responsible Organization/Department:	Board of Trustees; Village Clerk
Action/Project Priority:	STAPLEE score: 26 Priority: Medium
Timeline for Completion:	4 – 5 years
Potential Fund Sources:	HMGP and PDM
Local Planning Mechanisms to be Used in Implementation:	N/A
Progress Report	
Action Status	New
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	Village of Coney Island
Risk / Vulnerability	
Problem being Mitigated:	Encroachment of vegetation
Hazard(s) Addressed:	Tornado, Severe Storm, Winter Weather
Action or Project	
Action/Project Number:	3.5
Name of Action or Project:	Vegetation Maintenance
Action or Project Description:	Enhance strategies and coordinate with utility providers to manage encroachment of vegetation in easements and rights-of-way.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.
Estimated Cost:	$500 - $1,000

Benefits:	Decreased utility loss in the event of a hazard.
Plan for Implementation	
Responsible Organization/Department:	Village Clerk
Action/Project Priority:	STAPLEE score: 34 Priority: High
Timeline for Completion:	3 – 4 years
Potential Fund Sources:	HMGP and PDM
Local Planning Mechanisms to be Used in Implementation:	N/A
Progress Report	
Action Status	New
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	Village of Coney Island
Risk / Vulnerability	
Problem being Mitigated:	Lack of funding for hazard mitigation projects.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.7
Name of Action or Project:	Funding Identification
Action or Project Description:	Monitor and identify funding from state and federal programs for hazard mitigation activities.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.
Estimated Cost:	$0 - $100
Benefits:	Increased opportunities for funding for hazard mitigation projects.
Plan for Implementation	
Responsible Organization/Department:	Village Clerk
Action/Project Priority:	STAPLEE score: 26 Priority: Medium
Timeline for Completion:	4 – 5 years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	N/A
Progress Report	
Action Status	New
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	Village of Coney Island
Risk / Vulnerability	
Problem being Mitigated:	Poor coordination on infrastructure development can lead to damages.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.8
Name of Action or Project:	Reduction In Property Damage
Action or Project Description:	Utilize collaborative planning and compatible regulatory controls between the county and incorporated communities to promote infrastructure development practices that reduce the potential for property damage from natural hazards.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.

Estimated Cost:	$100 - $500
Benefits:	Better infrastructure development will decrease damage during hazards.
Plan for Implementation	
Responsible Organization/Department:	Village Clerk
Action/Project Priority:	STAPLEE score: 26 Priority: Medium
Timeline for Completion:	1 – 2 years
Potential Fund Sources:	HMGP, general
Local Planning Mechanisms to be Used in Implementation:	N/A
Progress Report	
Action Status	New
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	Village of Coney Island
Risk / Vulnerability	
Problem being Mitigated:	Lack of sharing and resource request tracking during hazards.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.10
Name of Action or Project:	WebEOC
Action or Project Description:	Participate in WebEOC.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical facilities in a disaster.
Estimated Cost:	$100 - $300
Benefits:	Allows jurisdictions to work together during hazards.
Plan for Implementation	
Responsible Organization/Department:	Village Clerk
Action/Project Priority:	STAPLEE score: 27 Priority: Medium
Timeline for Completion:	4 – 5 years
Potential Fund Sources:	HMGP, General Funds
Local Planning Mechanisms to be Used in Implementation:	N/A
Progress Report	
Action Status	New
Report of Progress	N/A

Goal 1: Protect lives and livelihoods of all citizens.

Action Worksheet	
Name of Jurisdiction:	City of Galena
Risk / Vulnerability	
Problem being Mitigated:	Public awareness of hazard vulnerability and mitigation measures.
Hazard(s) Addressed:	Tornado, Severe Storm, Winter Weather, Flooding, Drought, Extreme Heat
Action or Project	
Action/Project Number:	1.1
Name of Action or Project:	Awareness Program
Action or Project Description:	Partner with traditional media and the National Weather Service to publish and/or broadcast information on severe weather hazards.

Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$0-$500
Benefits:	Reduction in loss of life, injury, and property during hazard events.
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 30 Priority: High
Timeline for Completion:	0-12 Months
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process
Progress Report	
Action Status	Revised, continuing
Report of Progress	N/A

Action Worksheet

Name of Jurisdiction:	City of Galena
Risk / Vulnerability	
Problem being Mitigated:	Public awareness of hazard vulnerability and mitigation measures.
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	1.2
Name of Action or Project:	Disaster Preparation
Action or Project Description:	Provide a link to disaster preparation resources such as Ready in 3 or Ready.gov on local government, health department, public schools, chambers of commerce, and community organization websites.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$0-$50
Benefits:	Reduction in loss of life, injury, and property during hazard events.
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 33 Priority: High
Timeline for Completion:	0-12 Months
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process
Progress Report	
Action Status	Revised, continuing
Report of Progress	N/A

Action Worksheet

Name of Jurisdiction:	City of Galena
Risk / Vulnerability	
Problem being Mitigated:	Public awareness to hazards.
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	1.3
Name of Action or Project:	Mitigation awareness
Action or Project Description:	Use social media to raise awareness of mitigation and preparedness activities.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$0-$50
Benefits:	Reduction in loss of life, injury, and property during hazard events.
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 42 Priority: High
Timeline for Completion:	0-12 Months
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process
Progress Report	
Action Status	New
Report of Progress	N/A

Action Worksheet

Name of Jurisdiction:	City of Galena
Risk / Vulnerability	
Problem being Mitigated:	Upkeep of sirens.
Hazard(s) Addressed:	Tornado, Severe Storm
Action or Project	
Action/Project Number:	1.7
Name of Action or Project:	NOAA Radios
Action or Project Description:	Maintain outdoor warning sirens in public areas.
Applicable Goal Statement:	Protect the lives and livelihoods of all citizens.
Estimated Cost:	$500
Benefits:	Warns the public during hazard events
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 46 Priority: High
Timeline for Completion:	0-12 Months
Potential Fund Sources:	General Funds

Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process
Progress Report	
Action Status	New
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	City of Galena
Risk / Vulnerability	
Problem being Mitigated:	Lack of communication during hazard events
Hazard(s) Addressed:	Tornado, Severe Storm, Flood, Severe Winter Weather, Extreme Heat, Wildfire
Action or Project	
Action/Project Number:	1.8
Name of Action or Project:	NOAA Radios
Action or Project Description:	Promote the use of NOAA all-hazard radios with S.A.M.E. technology to all residents, businesses and government entities.
Applicable Goal Statement:	Protect the lives and livelihoods of all citizens.
Estimated Cost:	$0-$500
Benefits:	Improves communication during hazard events
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 26 Priority: Medium
Timeline for Completion:	0-12 Months
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process
Progress Report	
Action Status	Revised, continuing
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	City of Galena
Risk / Vulnerability	
Problem being Mitigated:	Exposure of vulnerable populations to hazards
Hazard(s) Addressed:	Tornado
Action or Project	
Action/Project Number:	1.10
Name of Action or Project:	New Safe Rooms
Action or Project Description:	Encourage construction of community safe rooms in areas of population concentration and facilities that serve vulnerable populations.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$500-$10,000

Benefits:	Protects vulnerable populations from hazards.
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 37 Priority: High
Timeline for Completion:	1-5 years
Potential Fund Sources:	HMGP
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process
Progress Report	
Action Status	Revised, continuing
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	City of Galena
Risk / Vulnerability	
Problem being Mitigated:	Exposure of the public to hazard events.
Hazard(s) Addressed:	Tornado
Action or Project	
Action/Project Number:	1.11
Name of Action or Project:	Safe Place Awareness
Action or Project Description:	Create and update tornado/severe storm plans including best identified available refuge areas (these do not, or may not, comply with FEMA Publication 361 for Safe Rooms) in schools, large facilities, and other establishments serving the public.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$500-$10,000
Benefits:	Improved public safety during hazard events.
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 26 Priority: Medium
Timeline for Completion:	0-12 Months
Potential Fund Sources:	HMGP
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process
Progress Report	
Action Status	Continuing
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	City of Galena
Risk / Vulnerability	
Problem being Mitigated:	Exposure to extreme heat or winter weather
Hazard(s) Addressed:	Extreme Heat, Winter Weather
Action or Project	
Action/Project Number:	1.12
Name of Action or Project:	Heating and Cooling Areas
Action or Project Description:	Identify and designate heating and cooling refuge areas in community buildings and make these locations available to the public in the event of extreme temperatures.
Applicable Goal Statement:	Protect the lives and livelihoods of all citizens.
Estimated Cost:	$100-$1,000
Benefits:	Improved public safety during hazard events.
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 27 Priority: Medium
Timeline for Completion:	1-3 years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process
Progress Report	
Action Status	Continuing
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	City of Galena
Risk / Vulnerability	
Problem being Mitigated:	Lack of safe rooms
Hazard(s) Addressed:	Tornado
Action or Project	
Action/Project Number:	1.13
Name of Action or Project:	FEMA Publications
Action or Project Description:	Provide direction to appropriate FEMA publications pertaining to the building of safe rooms.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$0-$500
Benefits:	Improves education on safe room construction
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 32 Priority: High

Timeline for Completion:	1-12 Months
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process
Progress Report	
Action Status	Revised, continuing
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	City of Galena
Risk / Vulnerability	
Problem being Mitigated:	
Hazard(s) Addressed:	Winter Weather, Extreme Heat
Action or Project	
Action/Project Number:	1.14
Name of Action or Project:	Community Programs
Action or Project Description:	Encourage local community organizations to continue and augment programs to provide fans, air conditioners, and winter weatherization for those at risk.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens
Estimated Cost:	$100-$5,000
Benefits:	Protects vulnerable populations from hazard events.
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 30 Priority: High
Timeline for Completion:	1-5 years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process
Progress Report	
Action Status	Revised, continuing
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	City of Galena
Risk / Vulnerability	
Problem being Mitigated:	Exposure to public during hazard events.
Hazard(s) Addressed:	Tornado
Action or Project	
Action/Project Number:	1.15
Name of Action or Project:	Safe Place Regulations
	Encourage the adoption of regulations requiring all new manufactured

Action or Project Description:	housing developments provide safe rooms or refuge areas (these do not or may not comply with FEMA Publication 361 for safe rooms checklist).
Applicable Goal Statement:	Protect lives and livelihoods of all citizens
Estimated Cost:	$0-$500
Benefits:	Improves public safety during hazard events.
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 28 Priority: Medium
Timeline for Completion:	1-5 years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process
Progress Report	
Action Status	Revised, continuing
Report of Progress	N/A

Goal 2: Reduce the potential impact of natural disasters to property, infrastructure, and the local economy.

Action Worksheet	
Name of Jurisdiction:	City of Galena
Risk / Vulnerability	
Problem being Mitigated:	Flood damage to properties and infrastructure
Hazard(s) Addressed:	Flooding
Action or Project	
Action/Project Number:	2.1
Name of Action or Project:	Flood Mitigation
Action or Project Description:	Acquire, elevate, or flood-proof properties and critical infrastructure within flood hazard areas where feasible.
Applicable Goal Statement:	Reduce the potential impact of natural disasters to property, infrastructure and local economy.
Estimated Cost:	$50,000+
Benefits:	Reduces risk of flood damage to properties and infrastructure.
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 28 Priority: Medium
Timeline for Completion:	1-5 years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process

Progress Report	
Action Status	Revised, continuing
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	City of Galena
Risk / Vulnerability	
Problem being Mitigated:	Resiliency of wastewater treatment facilities.
Hazard(s) Addressed:	Flooding, Drought
Action or Project	
Action/Project Number:	2.3
Name of Action or Project:	Wastewater Treatment Maintenance
Action or Project Description:	Take necessary steps to ensure resiliency for wastewater treatment systems during flood and drought events.
Applicable Goal Statement:	Reduce potential impact of natural disasters to property, infrastructure, and the local economy.
Estimated Cost:	$0-$500
Benefits:	Helps reduce the impact and extent of flooding
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 39 Priority: High
Timeline for Completion:	0-24 Months
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process
Progress Report	
Action Status	Revised, continuing
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	Galena
Risk/Vulnerability	
Problem being Mitigated	Exposure of structures to flooding
Hazard(s) Addressed:	Flooding
Action or Project	
Action/Project Number	2.6
Name of Action or Project:	NFIP Requirement Enforcement
Action or Project Description:	The NFIP communities of Stone County, Crane, Galena, Hurley, Kimberling City, and Reeds Spring will enforce floodplain management requirements, including regulating all new and substantially improved construction in the Special Flood Hazard Areas (SPFAs).
Applicable Goal Statement	Reduce the potential impact of natural disasters to property, infrastructure, and the local economy.
Estimated Cost	$0-$5,000
Benefits:	Mitigates the damage to structures in flooding events

Plan for Implementation	
Responsible Organization/Department	Administration
Action/Project Priority	STAPLEE score: 20 Priority: Low
Timeline for Completion:	1-5 years; ongoing
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation	Annual Budget Process
Progress Report	
Action Status	Continuing
Report of Progress	N/A

Goal 3: Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.

Action Worksheet	
Name of Jurisdiction:	City of Galena
Risk / Vulnerability	
Problem being Mitigated:	Lack of training for municipal officials.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.1
Name of Action or Project:	NIMS Training
Action or Project Description:	Promote and provide NIMS training and/or information for all elected officials, public administrators, school administrators, and community stakeholders.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.
Estimated Cost:	$0-$500
Benefits:	Training for officials will improve response to hazard events.
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 26 Priority: Medium
Timeline for Completion:	1-3 years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process
Progress Report	
Action Status	Revised, continuing
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	City of Galena

Risk / Vulnerability	
Problem being Mitigated:	Poor 911 addressing makes emergency response difficult
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.2
Name of Action or Project:	911 Addressing
Action or Project Description:	Educate on importance of, or enforce if applicable, the importance of highly visible 911 addressing for residences and businesses.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.
Estimated Cost:	$0-$500
Benefits:	Improved emergency response during and after hazard events.
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 26 Priority: Medium
Timeline for Completion:	Ongoing with new building permits
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process
Progress Report	
Action Status	Revised, continuing
Report of Progress	N/A

Action Worksheet

Name of Jurisdiction:	City of Galena
Risk / Vulnerability	
Problem being Mitigated:	Lack of hazard mitigation principles in city and county plans.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.4
Name of Action or Project:	Hazard Mitigation Integration
Action or Project Description:	Integrate hazard mitigation into comprehensive and long range plans, capital improvement programs, zoning ordinances, subdivision, storm water management regulations, emergency operations plans, etc.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.
Estimated Cost:	$0-$1000
Benefits:	Plans will have included hazard mitigation principles, improving resilience to hazard events.
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 28 Priority: Medium
Timeline for Completion:	1-5 years

Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process
Progress Report	
Action Status	Continuing
Report of Progress	N/A

Action Worksheet

Name of Jurisdiction:	City of Galena
Risk / Vulnerability	
Problem being Mitigated:	Lack of funding for hazard mitigation projects.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.7
Name of Action or Project:	Funding Identification
Action or Project Description:	Monitor and identify funding from state and federal programs for hazard mitigation activities.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.
Estimated Cost:	$0-$100
Benefits:	Increased opportunities for funding for hazard mitigation projects.
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 44 Priority: High
Timeline for Completion:	0-2 years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process
Progress Report	
Action Status	Revised, continuing
Report of Progress	N/A

Action Worksheet

Name of Jurisdiction:	City of Galena
Risk / Vulnerability	
Problem being Mitigated:	Poor coordination on infrastructure development can lead to damages.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.8
Name of Action or Project:	Reduction In Property Damage
	Utilize collaborative planning and compatible regulatory controls between

Action or Project Description:	the county and incorporated communities to promote infrastructure development practices that reduce the potential for property damage from natural hazards.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.
Estimated Cost:	$100-$1,000
Benefits:	Better infrastructure development will decrease damage during hazards.
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 26 Priority: Medium
Timeline for Completion:	1-5 years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process
Progress Report	
Action Status	Revised, continuing
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	City of Galena
Risk / Vulnerability	
Problem being Mitigated:	Lack of data for decision making and facilities management.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.9
Name of Action or Project:	GIS Development
Action or Project Description:	Continue development of Geographic Information Systems (GIS) to further identify, analyze and map hazard prone areas to enhance decision making and facilities management for agencies and stakeholders.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical facilities in a disaster.
Estimated Cost:	$100-$1000
Benefits:	More and better data will help mitigation related decision making.
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 26 Priority: Medium
Timeline for Completion:	1-5 years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process
Progress Report	

Action Status	Continuing
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	City of Galena
Risk / Vulnerability	
Problem being Mitigated:	Lack of sharing and resource request tracking during hazards.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.10
Name of Action or Project:	WebEOC
Action or Project Description:	Participate in WebEOC.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical facilities in a disaster.
Estimated Cost:	$0-$500
Benefits:	Allows jurisdictions to work together during hazards.
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 28 Priority: Medium
Timeline for Completion:	1-5 years; Ongoing
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process
Progress Report	
Action Status	Revised, continuing
Report of Progress	N/A

Goal 1: Protect lives and livelihoods of all citizens.

Action Worksheet	
Name of Jurisdiction:	Hurley
Risk / Vulnerability	
Problem being Mitigated:	Public awareness of hazard vulnerability and mitigation measures.
Hazard(s) Addressed:	Tornado, Severe Storm, Winter Weather, Flooding, Drought, Extreme Heat
Action or Project	
Action/Project Number:	1.1
Name of Action or Project:	Awareness Program
Action or Project Description:	Partner with traditional media and the National Weather Service to publish and/or broadcast information on severe weather hazards.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$500
Benefits:	Reduction in loss of life, injury, and property during hazard events.
Plan for Implementation	

Responsible Organization/Department:	City Clerk
Action/Project Priority:	STAPLEE score: 36 Priority: High
Timeline for Completion:	0-12 Months
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Local Emergency Plan
Progress Report	
Action Status	Revised, continuing
Report of Progress	None

Action Worksheet	
Name of Jurisdiction:	Hurley
Risk / Vulnerability	
Problem being Mitigated:	Public awareness of hazard vulnerability and mitigation measures.
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	1.2
Name of Action or Project:	Disaster Preparation
Action or Project Description:	Provide a link to disaster preparation resources such as Ready in 3 or Ready.gov on local government, health department, public schools, chambers of commerce, and community organization websites.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$200
Benefits:	Reduction in loss of life, injury, and property during hazard events.
Plan for Implementation	
Responsible Organization/Department:	City Clerk
Action/Project Priority:	STAPLEE score: 36 Priority: High
Timeline for Completion:	0-12 Months
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Local Emergency Plan
Progress Report	
Action Status	Revised, continuing
Report of Progress	None

Action Worksheet	
Name of Jurisdiction:	Hurley
Risk / Vulnerability	
Problem being Mitigated:	Public awareness to hazards.
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	1.3
Name of Action or Project:	Mitigation awareness
Action or Project Description:	Use social media to raise awareness of mitigation and preparedness activities.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$200
Benefits:	Reduction in loss of life, injury, and property during hazard events.
Plan for Implementation	
Responsible Organization/Department:	City Clerk

Action/Project Priority:	STAPLEE score: 36 Priority: High
Timeline for Completion:	0-12 Months
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Local Emergency Plan
Progress Report	
Action Status	New
Report of Progress	None

Action Worksheet	
Name of Jurisdiction:	Hurley
Risk / Vulnerability	
Problem being Mitigated:	Upkeep of sirens.
Hazard(s) Addressed:	Tornado, Severe Storm
Action or Project	
Action/Project Number:	1.7
Name of Action or Project:	Warning Siren Maintenance
Action or Project Description:	Maintain outdoor warning sirens in public areas.
Applicable Goal Statement:	Protect the lives and livelihoods of all citizens.
Estimated Cost:	$500
Benefits:	Warns the public during hazard events
Plan for Implementation	
Responsible Organization/Department:	Hurley Fire Protection District
Action/Project Priority:	STAPLEE score: 36 Priority: High
Timeline for Completion:	0-12 Months
Potential Fund Sources:	General Fire Dept. Funds
Local Planning Mechanisms to be Used in Implementation:	Local Emergency Plan
Progress Report	
Action Status	Revised, continuing
Report of Progress	Ongoing

Action Worksheet	
Name of Jurisdiction:	Hurley
Risk / Vulnerability	
Problem being Mitigated:	Lack of communication during hazard events
Hazard(s) Addressed:	Tornado, Severe Storm, Flood, Severe Winter Weather, Extreme Heat, Wildfire
Action or Project	
Action/Project Number:	1.8
Name of Action or Project:	NOAA Radios
Action or Project Description:	Promote the use of NOAA all-hazard radios with S.A.M.E. technology to all residents, businesses and government entities.
Applicable Goal Statement:	Protect the lives and livelihoods of all citizens.
Estimated Cost:	$200
Benefits:	Improves communication during hazard events
Plan for Implementation	
Responsible Organization/Department:	City Clerk
Action/Project Priority:	STAPLEE score: 36 Priority: High
Timeline for Completion:	0-12 Months
Potential Fund Sources:	General Funds; H MGP

Local Planning Mechanisms to be Used in Implementation:	Local Emergency Plan
Progress Report	
Action Status	Revised, continuing
Report of Progress	None

Action Worksheet	
Name of Jurisdiction:	Hurley
Risk / Vulnerability	
Problem being Mitigated:	Lack of communication during hazard events
Hazard(s) Addressed:	Tornado, Severe Storm, Flood, Severe Winter Weather, Extreme Heat
Action or Project	
Action/Project Number:	1.9
Name of Action or Project:	Mobile Hazard Alert
Action or Project Description:	Promote local severe weather alert applications for mobile communications devices.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$100
Benefits:	Improves communication during hazard events.
Plan for Implementation	
Responsible Organization/Department:	City Hall
Action/Project Priority:	STAPLEE score: 36 Priority: High
Timeline for Completion:	0-3 Months
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Local Emergency Plan
Progress Report	
Action Status	Revised, continuing
Report of Progress	None

Action Worksheet	
Name of Jurisdiction:	Hurley
Risk / Vulnerability	
Problem being Mitigated:	Exposure of the public to hazard events.
Hazard(s) Addressed:	Tornado
Action or Project	
Action/Project Number:	1.11
Name of Action or Project:	Safe Place Awareness
Action or Project Description:	Create and update tornado/severe storm plans including best identified available refuge areas (these do not, or may not, comply with FEMA Publication 361 for Safe Rooms) in schools, large facilities, and other establishments serving the public.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$0-$200
Benefits:	Improved public safety during hazard events.
Plan for Implementation	
Responsible Organization/Department:	City Clerk
Action/Project Priority:	STAPLEE score: 36 Priority: High
Timeline for Completion:	0-12 months
Potential Fund Sources:	General Funds

Local Planning Mechanisms to be Used in Implementation:	
Progress Report	
Action Status	Continuing
Report of Progress	Staff were not aware of any program until recently

Action Worksheet	
Name of Jurisdiction:	Hurley
Risk / Vulnerability	
Problem being Mitigated:	Lack of safe rooms
Hazard(s) Addressed:	Tornado
Action or Project	
Action/Project Number:	1.13
Name of Action or Project:	FEMA Publications
Action or Project Description:	Provide direction to appropriate FEMA publications pertaining to the building of safe rooms.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$0-$100
Benefits:	Improves education on safe room construction
Plan for Implementation	
Responsible Organization/Department:	City Clerk
Action/Project Priority:	STAPLEE score: 36 Priority: High
Timeline for Completion:	1-12 months
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Goal 2: Reduce the potential impact of natural disasters to property, infrastructure, and the local economy.

Action Worksheet	
Name of Jurisdiction:	Hurley
Risk / Vulnerability	
Problem being Mitigated:	Resiliency of wastewater treatment facilities.
Hazard(s) Addressed:	Flooding, Drought
Action or Project	
Action/Project Number:	2.3
Name of Action or Project:	Wastewater Treatment Maintenance
Action or Project Description:	Take necessary steps to ensure resiliency for wastewater treatment systems during flood and drought events.
Applicable Goal Statement:	Reduce potential impact of natural disasters to property, infrastructure, and the local economy.
Estimated Cost:	$0-$5,000
Benefits:	Helps reduce the impact and extent of flooding
Plan for Implementation	
Responsible Organization/Department:	City Clerk
Action/Project Priority:	STAPLEE score: 39 Priority: High
Timeline for Completion:	0-24 months

Potential Fund Sources:	Sewer funds; HMGP
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Hurley
Risk / Vulnerability	
Problem being Mitigated:	Exposure of structures to flooding
Hazard(s) Addressed:	Flooding
Action or Project	
Action/Project Number:	2.6
Name of Action or Project:	NFIP Requirement Enforcement
Action or Project Description:	The NFIP communities of Stone County, Crane, Galena, Hurley, Kimberling City, and Reeds Spring will enforce floodplain management requirements, including regulating all new and substantially improved construction in the Special Flood Hazard Area (SPFAs)
Applicable Goal Statement:	Protect the lives and livelihood of all citizens.
Estimated Cost:	$0-$5,000
Benefits:	Mitigates the damage to structures in flooding events
Plan for Implementation	
Responsible Organization/Department:	City Clerk
Action/Project Priority:	STAPLEE score: 18 Priority: Low
Timeline for Completion:	1-5 years; ongoing
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Floodplain Ordinance
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Goal 3: Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.

Action Worksheet	
Name of Jurisdiction:	Hurley
Risk / Vulnerability	
Problem being Mitigated:	Poor 911 addressing makes emergency response difficult
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.2
Name of Action or Project:	911 Addressing
Action or Project Description:	Educate on importance of, or enforce if applicable, the importance of highly visible 911 addressing for residences and businesses.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.
Estimated Cost:	$0-$100

Benefits:	Improved emergency response during and after hazard events.
Plan for Implementation	
Responsible Organization/Department:	City Hall
Action/Project Priority:	STAPLEE score: 37 Priority: High
Timeline for Completion:	Ongoing with new building permits
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Hurley
Risk / Vulnerability	
Problem being Mitigated:	Encroachment of vegetation
Hazard(s) Addressed:	Tornado, Severe Storm, Winter Weather
Action or Project	
Action/Project Number:	3.5
Name of Action or Project:	Vegetation Maintenance
Action or Project Description:	Enhance strategies and coordinate with utility providers to manage encroachment of vegetation in easements and rights-of-way.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.
Estimated Cost:	$500-$1,000
Benefits:	Decreased utility loss in the event of a hazard.
Plan for Implementation	
Responsible Organization/Department:	City Hall
Action/Project Priority:	STAPLEE score: 36 Priority: High
Timeline for Completion:	1-5 years; ongoing
Potential Fund Sources:	Street Funds
Local Planning Mechanisms to be Used in Implementation:	
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Hurley
Risk / Vulnerability	
Problem being Mitigated:	Lack of funding for hazard mitigation projects.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.7
Name of Action or Project:	Funding Identification
Action or Project Description:	Monitor and identify funding from state and federal programs for hazard mitigation activities.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.
Estimated Cost:	$0-$1,000

Benefits:	Increased opportunities for funding for hazard mitigation projects.
Plan for Implementation	
Responsible Organization/Department:	City Hall
Action/Project Priority:	STAPLEE score: 31 Priority: High
Timeline for Completion:	0-2 years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Hurley
Risk / Vulnerability	
Problem being Mitigated:	Lack of sharing and resource request tracking during hazards.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.10
Name of Action or Project:	WebEOC
Action or Project Description:	Participate in WebEOC.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical facilities in a disaster.
Estimated Cost:	$0-$500
Benefits:	Allows jurisdictions to work together during hazards.
Plan for Implementation	
Responsible Organization/Department:	City Hall: City Clerk
Action/Project Priority:	STAPLEE score: 31 Priority: High
Timeline for Completion:	1-5 years; Ongoing
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Local EOP
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Goal 1: Protect lives and livelihoods of all citizens.

Action Worksheet	
Name of Jurisdiction:	Kimberling City
Risk / Vulnerability	
Problem being Mitigated:	Public awareness of hazard vulnerability and mitigation measures.
Hazard(s) Addressed:	Tornado, Severe Storm, Winter Weather, Flooding, Drought, Extreme Heat
Action or Project	
Action/Project Number:	1.1
Name of Action or Project:	Awareness Program
Action or Project Description:	Partner with traditional media and the National Weather Service to publish and/or broadcast information on severe weather hazards.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$300

Benefits:	Reduction in loss of life, injury, and property during hazard events.
Plan for Implementation	
Responsible Organization/Department:	City Administration
Action/Project Priority:	STAPLEE score: 28 Priority: Medium
Timeline for Completion:	6 months
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Budget Process
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Kimberling City
Risk / Vulnerability	
Problem being Mitigated:	Public awareness of hazard vulnerability and mitigation measures.
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	1.2
Name of Action or Project:	Disaster Preparation
Action or Project Description:	Provide a link to disaster preparation resources such as Ready in 3 or Ready.gov on local government, health department, public schools, chambers of commerce, and community organization websites.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$200
Benefits:	Reduction in loss of life, injury, and property during hazard events.
Plan for Implementation	
Responsible Organization/Department:	City Administration
Action/Project Priority:	STAPLEE score: 32 Priority: High
Timeline for Completion:	2 months
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Budget Process
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Kimberling City
Risk / Vulnerability	
Problem being Mitigated:	Public awareness to hazards.
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	1.3
Name of Action or Project:	Mitigation awareness
Action or Project Description:	Use social media to raise awareness of mitigation and preparedness activities.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$200
Benefits:	Reduction in loss of life, injury, and property during hazard events.
Plan for Implementation	

Responsible Organization/Department:	City Administration
Action/Project Priority:	STAPLEE score: 28 Priority: Medium
Timeline for Completion:	1 year
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Budget Process
Progress Report	
Action Status	New
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Kimberling City
Risk / Vulnerability	
Problem being Mitigated:	Building loss in wildfire events.
Hazard(s) Addressed:	Wildfire
Action or Project	
Action/Project Number:	1.4
Name of Action or Project:	Fire-Resistant Construction
Action or Project Description:	Increase public awareness of the use of non-combustible materials for new construction, and fire resistant landscaping techniques and planting materials in wildfire hazard areas.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$1,500
Benefits:	Reduction of property loss during wildfires.
Plan for Implementation	
Responsible Organization/Department:	City Administration; Building Inspection
Action/Project Priority:	STAPLEE score: 28 Priority: Medium
Timeline for Completion:	1 year
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Budget Process; Building Code
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Kimberling City
Risk / Vulnerability	
Problem being Mitigated:	Lack of public involvement in mitigation activities
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	1.5
Name of Action or Project:	Citizen Preparedness
Action or Project Description:	Promote participation in citizen preparedness activities, such as: MOCERT1, Neighborhood Watch, Amateur Radio, and Community Heroes Reserve Medical Corps.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$500

Benefits:	Increase citizen awareness of mitigation activities
Plan for Implementation	
Responsible Organization/Department:	City Administration; Public Safety
Action/Project Priority:	STAPLEE score: 28 Priority: Medium
Timeline for Completion:	6 months
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Budget process; EOP
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Kimberling City
Risk / Vulnerability	
Problem being Mitigated:	Upkeep of sirens.
Hazard(s) Addressed:	Tornado, Severe Storm
Action or Project	
Action/Project Number:	1.7
Name of Action or Project:	Warning Siren Maintenance
Action or Project Description:	Maintain outdoor warning sirens in public areas.
Applicable Goal Statement:	Protect the lives and livelihoods of all citizens.
Estimated Cost:	$4,000
Benefits:	Warns the public during hazard events
Plan for Implementation	
Responsible Organization/Department:	City Administration
Action/Project Priority:	STAPLEE score: 33 Priority: High
Timeline for Completion:	6 months - ongoing
Potential Fund Sources:	Emergency Management Fund
Local Planning Mechanisms to be Used in Implementation, if any:	Budget Process; EOP; Capital Improvement Plan
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Kimberling City
Risk / Vulnerability	
Problem being Mitigated:	Lack of communication during hazard events
Hazard(s) Addressed:	Tornado, Severe Storm, Flood, Severe Winter Weather, Extreme Heat, Wildfire
Action or Project	
Action/Project Number:	1.8
Name of Action or Project:	NOAA Radios
Action or Project Description:	Promote the use of NOAA all-hazard radios with S.A.M.E. technology to all residents, businesses and government entities.
Applicable Goal Statement:	Protect the lives and livelihoods of all citizens.
Estimated Cost:	$500
Benefits:	Improves communication during hazard events
Plan for Implementation	

Responsible Organization/Department:	City Administration
Action/Project Priority:	STAPLEE score: 27 Priority: Medium
Timeline for Completion:	1 year
Potential Fund Sources:	General Fund
Local Planning Mechanisms to be Used in Implementation:	Budget Process
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Kimberling City
Risk / Vulnerability	
Problem being Mitigated:	Exposure of vulnerable populations to hazards
Hazard(s) Addressed:	Tornado
Action or Project	
Action/Project Number:	1.10
Name of Action or Project:	New Safe Rooms
Action or Project Description:	Encourage construction of community safe rooms in areas of population concentration and facilities that serve vulnerable populations.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$1,000
Benefits:	Protects vulnerable populations from hazards.
Plan for Implementation	
Responsible Organization/Department:	City Administration
Action/Project Priority:	STAPLEE score: 30 Priority: High
Timeline for Completion:	2 years
Potential Fund Sources:	HMGP; PDM; General Funds
Local Planning Mechanisms to be Used in Implementation:	Budget Process; Building Code
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Kimberling City
Risk / Vulnerability	
Problem being Mitigated:	Exposure of the public to hazard events.
Hazard(s) Addressed:	Tornado
Action or Project	
Action/Project Number:	1.11
Name of Action or Project:	Safe Place Awareness
Action or Project Description:	Create and update tornado/severe storm plans including best identified available refuge areas (these do not, or may not, comply with FEMA Publication 361 for Safe Rooms) in schools, large facilities, and other establishments serving the public.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$1,000
Benefits:	Improved public safety during hazard events.
Plan for Implementation	
Responsible	City Administration

Organization/Department:	
Action/Project Priority:	STAPLEE score: 25 Priority: Medium
Timeline for Completion:	1 year
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	EOP
Progress Report	
Action Status	Continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Kimberling City
Risk / Vulnerability	
Problem being Mitigated:	Exposure to extreme heat or winter weather
Hazard(s) Addressed:	Extreme Heat, Winter Weather
Action or Project	
Action/Project Number:	1.12
Name of Action or Project:	Heating and Cooling Areas
Action or Project Description:	Identify and designate heating and cooling refuge areas in community buildings and make these locations available to the public in the event of extreme temperatures.
Applicable Goal Statement:	Protect the lives and livelihoods of all citizens.
Estimated Cost:	$1,000
Benefits:	Improved public safety during hazard events.
Plan for Implementation	
Responsible Organization/Department:	City Administration
Action/Project Priority:	STAPLEE score: 28 Priority: Medium
Timeline for Completion:	1 year
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	EOP
Progress Report	
Action Status	Continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Kimberling City
Risk / Vulnerability	
Problem being Mitigated:	Lack of safe rooms
Hazard(s) Addressed:	Tornado
Action or Project	
Action/Project Number:	1.13
Name of Action or Project:	FEMA Publications
Action or Project Description:	Provide direction to appropriate FEMA publications pertaining to the building of safe rooms.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$500
Benefits:	Improves education on safe room construction
Plan for Implementation	
Responsible Organization/Department:	City Administration; Building Inspector
Action/Project Priority:	STAPLEE score: 28 Priority: Medium

Timeline for Completion:	6 months
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	EOP
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Goal 2: Reduce the potential impact of natural disasters to property, infrastructure, and the local economy.

Action Worksheet	
Name of Jurisdiction:	Kimberling City
Risk / Vulnerability	
Problem being Mitigated:	Lack of service to critical facilities
Hazard(s) Addressed:	Tornado, Severe Storm, Flooding, Winter Weather, Extreme Heat, Earthquake
Action or Project	
Action/Project Number:	2.2
Name of Action or Project:	Utility Maintenance
Action or Project Description:	Encourage electric utilities providers to maintain looped distribution service and other redundancies to critical facilities and/or communications infrastructure.
Applicable Goal Statement:	Reduce the potential impact of natural disasters to property, infrastructure, and the local economy.
Estimated Cost:	$1,000
Benefits:	Protect utilities from natural hazards.
Plan for Implementation	
Responsible Organization/Department:	City Administration
Action/Project Priority:	STAPLEE score: 26 Priority: Medium
Timeline for Completion:	1 year
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	EOP
Progress Report	
Action Status	Continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Kimberling City
Risk / Vulnerability	
Problem being Mitigated:	Resiliency of wastewater treatment facilities.
Hazard(s) Addressed:	Flooding, Drought
Action or Project	
Action/Project Number:	2.3
Name of Action or Project:	Wastewater Treatment Maintenance
Action or Project Description:	Take necessary steps to ensure resiliency for wastewater treatment systems during flood and drought events.
Applicable Goal Statement:	Reduces risk of flood damage to properties and infrastructure.
Estimated Cost:	$20,000
Benefits:	Helps reduce the impact and extent of flooding
Plan for Implementation	
Responsible	City Administration; Waste Water Operations

Organization/Department:	
Action/Project Priority:	STAPLEE score: 33 Priority: High
Timeline for Completion:	1 year
Potential Fund Sources:	HMGP; DNR; USDA; City Wastewater Reserve Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Budget Process, EOP, Capital Improvement Plan
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Kimberling City
Risk / Vulnerability	
Problem being Mitigated:	Exposure of structures to flooding.
Hazard(s) Addressed:	Flooding
Action or Project	
Action/Project Number:	2.6
Name of Action or Project:	NFIP Requirement Enforcement
Action or Project Description:	The NFIP communities of Stone County, Crane, Galena, Hurley, Kimberling City, and Reeds Spring will enforce floodplain management requirements, including regulating all new and substantially improved construction in the Special Flood Hazard Areas (SPFAs).
Applicable Goal Statement:	Reduces risk of flood damage to properties and infrastructure.
Estimated Cost:	$1,000
Benefits:	Mitigates the damage to structures in flooding events.
Plan for Implementation	
Responsible Organization/Department:	City Administration
Action/Project Priority:	STAPLEE score: 29 Priority: Medium
Timeline for Completion:	1 Month; ongoing
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Budget Process; EOP
Progress Report	
Action Status	Continuing
Report of Progress	

Goal 3: Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.

Action Worksheet	
Name of Jurisdiction:	Kimberling City
Risk / Vulnerability	
Problem being Mitigated:	Lack of training for municipal officials.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.1
Name of Action or Project:	NIMS Training
Action or Project Description:	Promote and provide NIMS training and/or information for all elected officials, public administrators, school administrators, and community stakeholders.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.

Estimated Cost:	$500
Benefits:	Training for officials will improve response to hazard events.
Plan for Implementation	
Responsible Organization/Department:	City Administration
Action/Project Priority:	STAPLEE score:27 Priority: Medium
Timeline for Completion:	2 years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Budget Process; EOP
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Kimberling City
Risk / Vulnerability	
Problem being Mitigated:	Poor 911 addressing makes emergency response difficult
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.2
Name of Action or Project:	911 Addressing
Action or Project Description:	Educate on importance of, or enforce if applicable, the importance of highly visible 911 addressing for residences and businesses.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.
Estimated Cost:	$1,000
Benefits:	Improved emergency response during and after hazard events.
Plan for Implementation	
Responsible Organization/Department:	City Administration
Action/Project Priority:	STAPLEE score: 27 Priority: Medium
Timeline for Completion:	1 year
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Budget Process; EOP
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Kimberling City
Risk / Vulnerability	
Problem being Mitigated:	Lack of hazard mitigation principles in city and county plans.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.4
Name of Action or Project:	Hazard Mitigation Integration
Action or Project Description:	Integrate hazard mitigation into comprehensive and long range plans, capital improvement programs, zoning ordinances, subdivision, storm water management regulations, emergency operations plans, etc.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions,

	and critical infrastructure in a disaster.
Estimated Cost:	$15,000
Benefits:	Plans will have included hazard mitigation principles, improving resilience to hazard events.
Plan for Implementation	
Responsible Organization/Department:	City Administration
Action/Project Priority:	STAPLEE score: 32 Priority: High
Timeline for Completion:	3 years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Budget Process; EOP: Comprehensive Plan
Progress Report	
Action Status	Continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Kimberling City
Risk / Vulnerability	
Problem being Mitigated:	Encroachment of vegetation
Hazard(s) Addressed:	Tornado, Severe Storm, Winter Weather
Action or Project	
Action/Project Number:	3.5
Name of Action or Project:	Vegetation Maintenance
Action or Project Description:	Enhance strategies and coordinate with utility providers to manage encroachment of vegetation in easements and rights-of-way.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.
Estimated Cost:	$2,000
Benefits:	Decreased utility loss in the event of a hazard.
Plan for Implementation	
Responsible Organization/Department:	City Administration
Action/Project Priority:	STAPLEE score: 25 Priority: Medium
Timeline for Completion:	1 year
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Budget Process
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Kimberling City
Risk / Vulnerability	
Problem being Mitigated:	Lack of funding for hazard mitigation projects.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.7
Name of Action or Project:	Funding Identification
Action or Project Description:	Monitor and identify funding from state and federal programs for hazard mitigation activities.

Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.
Estimated Cost:	$2,000
Benefits:	Increased opportunities for funding for hazard mitigation projects.
Plan for Implementation	
Responsible Organization/Department:	City Administration
Action/Project Priority:	STAPLEE score: 25 Priority: Medium
Timeline for Completion:	6 months; ongoing
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Budget Process; EOP; Capital Improvement Plan
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Kimberling City
Risk / Vulnerability	
Problem being Mitigated:	Poor coordination on infrastructure development can lead to damages.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.8
Name of Action or Project:	Reduction In Property Damage
Action or Project Description:	Utilize collaborative planning and compatible regulatory controls between the county and incorporated communities to promote infrastructure development practices that reduce the potential for property damage from natural hazards.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.
Estimated Cost:	$5,000
Benefits:	Better infrastructure development will decrease damage during hazards.
Plan for Implementation	
Responsible Organization/Department:	City Administration
Action/Project Priority:	STAPLEE score: 27 Priority: Medium
Timeline for Completion:	3 years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Budget Process; EOP
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Kimberling City
Risk / Vulnerability	
Problem being Mitigated:	Lack of data for decision making and facilities management.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.9
Name of Action or Project:	GIS Development
	Continue development of Geographic Information Systems (GIS) to further

Action or Project Description:	identify, analyze and map hazard prone areas to enhance decision making and facilities management for agencies and stakeholders.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical facilities in a disaster.
Estimated Cost:	$5,000
Benefits:	More and better data will help mitigation related decision making.
Plan for Implementation	
Responsible Organization/Department:	City Administration; Consultant
Action/Project Priority:	STAPLEE score: 26 Priority: Medium
Timeline for Completion:	2 years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Budget Process; EOP; Capital Improvement Plan
Progress Report	
Action Status	Continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Kimberling City
Risk / Vulnerability	
Problem being Mitigated:	Lack of sharing and resource request tracking during hazards.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.10
Name of Action or Project:	WebEOC
Action or Project Description:	Participate in WebEOC.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical facilities in a disaster.
Estimated Cost:	$500
Benefits:	Allows jurisdictions to work together during hazards.
Plan for Implementation	
Responsible Organization/Department:	City Administration; Emergency Management
Action/Project Priority:	STAPLEE score: 26 Priority: Medium
Timeline for Completion:	6 months
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Budget Process; EOP
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Goal 1: Protect lives and livelihoods of all citizens.

Action Worksheet	
Name of Jurisdiction:	Reeds Spring
Risk / Vulnerability	
Problem being Mitigated:	Public awareness of hazard vulnerability and mitigation measures.
Hazard(s) Addressed:	Tornado, Severe Storm, Winter Weather, Flooding, Drought, Extreme Heat
Action or Project	
Action/Project Number:	1.1
Name of Action or Project:	Awareness Program

Action or Project Description:	Partner with traditional media and the National Weather Service to publish and/or broadcast information on severe weather hazards.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$0-$500
Benefits:	Reduction in loss of life, injury, and property during hazard events.
Plan for Implementation	
Responsible Organization/Department:	City Clerk, Emergency Management
Action/Project Priority:	STAPLEE score:35 Priority: High
Timeline for Completion:	1-5 years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	County EOP, Annual Budget Process
Progress Report	
Action Status	Revised, continuing
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	Reeds Spring
Risk / Vulnerability	
Problem being Mitigated:	Public awareness of hazard vulnerability and mitigation measures.
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	1.2
Name of Action or Project:	Disaster Preparation
Action or Project Description:	Provide a link to disaster preparation resources such as Ready in 3 or Ready.gov on local government, health department, public schools, chambers of commerce, and community organization websites.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$0
Benefits:	Reduction in loss of life, injury, and property during hazard events.
Plan for Implementation	
Responsible Organization/Department:	City Clerk
Action/Project Priority:	STAPLEE score: 38 Priority: High
Timeline for Completion:	1 year
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	County EOP, Website
Progress Report	
Action Status	Revised, continuing
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	Reeds Spring
Risk / Vulnerability	
Problem being Mitigated:	Public awareness to hazards.
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	1.3
Name of Action or Project:	Mitigation awareness
Action or Project Description:	Use social media to raise awareness of mitigation and preparedness activities.

Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$0
Benefits:	Reduction in loss of life, injury, and property during hazard events.
Plan for Implementation	
Responsible Organization/Department:	City Clerk; Public Safety
Action/Project Priority:	STAPLEE score: 37 Priority: High
Timeline for Completion:	1 year
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	County EOP; Annual Budget Process
Progress Report	
Action Status	New
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	Reeds Spring
Risk / Vulnerability	
Problem being Mitigated:	Building loss in wildfire events.
Hazard(s) Addressed:	Wildfire
Action or Project	
Action/Project Number:	1.4
Name of Action or Project:	Fire-Resistant Construction
Action or Project Description:	Increase public awareness of the use of non-combustible materials for new construction, and fire resistant landscaping techniques and planting materials in wildfire hazard areas.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$100-$500
Benefits:	Reduction of property loss during wildfires.
Plan for Implementation	
Responsible Organization/Department:	City Clerk, Building Official
Action/Project Priority:	STAPLEE score: 35 Priority: High
Timeline for Completion:	1-5 years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Building Code; Annual Budget Process
Progress Report	
Action Status	Revised, continuing
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	Reeds Spring
Risk / Vulnerability	
Problem being Mitigated:	Lack of public involvement in mitigation activities
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	1.5
Name of Action or Project:	Citizen Preparedness
Action or Project Description:	Promote participation in citizen preparedness activities, such as: MOCERT1, Neighborhood Watch, Amateur Radio, and Community Heroes Reserve Medical Corps.

Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$0-$500
Benefits:	Increase citizen awareness of mitigation activities
Plan for Implementation	
Responsible Organization/Department:	City Council; Emergency Management/ Public Safety
Action/Project Priority:	STAPLEE score: 34 Priority: High
Timeline for Completion:	1-5 years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	County EOP; Annual Budget Process
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Reeds Spring
Risk / Vulnerability	
Problem being Mitigated:	Lack of communication during hazard events
Hazard(s) Addressed:	Tornado, Severe Storm, Flood, Severe Winter Weather, Extreme Heat, Wildfire
Action or Project	
Action/Project Number:	1.8
Name of Action or Project:	NOAA Radios
Action or Project Description:	Promote the use of NOAA all-hazard radios with S.A.M.E. technology to all residents, businesses and government entities.
Applicable Goal Statement:	Protect the lives and livelihoods of all citizens.
Estimated Cost:	$0-$500
Benefits:	Improves communication during hazard events
Plan for Implementation	
Responsible Organization/Department:	City Clerk; Emergency Management/ Public Safety
Action/Project Priority:	STAPLEE score: 34 Priority: High
Timeline for Completion:	1-5 years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	County EOP; Annual Budget Process
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Reeds Spring
Risk / Vulnerability	
Problem being Mitigated:	Lack of communication during hazard events
Hazard(s) Addressed:	Tornado, Severe Storm, Flood, Severe Winter Weather, Extreme Heat
Action or Project	
Action/Project Number:	1.9
Name of Action or Project:	Mobile Hazard Alert
Action or Project Description:	Promote local severe weather alert applications for mobile communications devices.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$0-$500
Benefits:	Improves communication during hazard events.

Plan for Implementation	
Responsible Organization/Department:	City Clerk; Emergency Management/ Public Safety
Action/Project Priority:	STAPLEE score: 29 Priority: Medium
Timeline for Completion:	1 year
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	County EOP; Annual Budget Process
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Reeds Spring
Risk / Vulnerability	
Problem being Mitigated:	Exposure of vulnerable populations to hazards
Hazard(s) Addressed:	Tornado
Action or Project	
Action/Project Number:	1.10
Name of Action or Project:	New Safe Rooms
Action or Project Description:	Encourage construction of community safe rooms in areas of population concentration and facilities that serve vulnerable populations.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$500- $10,000
Benefits:	Protects vulnerable populations from hazards.
Plan for Implementation	
Responsible Organization/Department:	City Council, City Clerk, Building Department/ Building Official
Action/Project Priority:	STAPLEE score: 26 Priority: Medium
Timeline for Completion:	1- 5 years
Potential Fund Sources:	HMGP, PDM, General Funds
Local Planning Mechanisms to be Used in Implementation:	Building Code; Annual Budget Process
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Reeds Spring
Risk / Vulnerability	
Problem being Mitigated:	Exposure of the public to hazard events.
Hazard(s) Addressed:	Tornado
Action or Project	
Action/Project Number:	1.11
Name of Action or Project:	Safe Place Awareness
Action or Project Description:	Create and update tornado/severe storm plans including best identified available refuge areas (these do not, or may not, comply with FEMA Publication 361 for Safe Rooms) in schools, large facilities, and other establishments serving the public.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$500-$1,000

Benefits:	Improved public safety during hazard events.
Plan for Implementation	
Responsible Organization/Department:	City Clerk; Emergency Management/ Public Safety
Action/Project Priority:	STAPLEE score: 30 Priority: High
Timeline for Completion:	1-5 years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	County EOP, Annual Budget Process
Progress Report	
Action Status	Continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Reeds Spring
Risk / Vulnerability	
Problem being Mitigated:	Lack of safe rooms
Hazard(s) Addressed:	Tornado
Action or Project	
Action/Project Number:	1.13
Name of Action or Project:	FEMA Publications
Action or Project Description:	Provide direction to appropriate FEMA publications pertaining to the building of safe rooms.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$0-$500
Benefits:	Improves education on safe room construction
Plan for Implementation	
Responsible Organization/Department:	City Clerk; Building Department
Action/Project Priority:	STAPLEE score: 28 Priority: Medium
Timeline for Completion:	6 months – 2 years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Building Code; Annual Budget Process
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Reeds Spring
Risk / Vulnerability	
Problem being Mitigated:	Exposure of the public to weather risks.
Hazard(s) Addressed:	Winter Weather, Extreme Heat
Action or Project	
Action/Project Number:	1.14
Name of Action or Project:	Community Programs
Action or Project Description:	Encourage local community organizations to continue and augment programs to provide fans, air conditioners, and winter weatherization for those at risk.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens
Estimated Cost:	$100- $5,000
Benefits:	Protects vulnerable populations from hazard events.
Plan for Implementation	

Responsible Organization/Department:	City Clerk; Emergency Management/ Public Safety
Action/Project Priority:	STAPLEE score: 29 Priority: Medium
Timeline for Completion:	1-5 years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Annual Budget Process
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Reeds Spring
Risk / Vulnerability	
Problem being Mitigated:	Exposure to public during hazard events.
Hazard(s) Addressed:	Tornado
Action or Project	
Action/Project Number:	1.15
Name of Action or Project:	Safe Place Regulations
Action or Project Description:	Encourage the adoption of regulations requiring all new manufactured housing developments provide safe rooms or refuge areas (these do not or may not comply with FEMA Publication 361 for safe rooms checklist).
Applicable Goal Statement:	Protect lives and livelihoods of all citizens
Estimated Cost:	$0- $500
Benefits:	Improves public safety during hazard events.
Plan for Implementation	
Responsible Organization/Department:	City Council; City Clerk; Building Department
Action/Project Priority:	STAPLEE score: 30 Priority: High
Timeline for Completion:	1-5 years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Annual Budget Process
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Goal 2: Reduce the potential impact of natural disasters to property, infrastructure, and the local economy.

Action Worksheet	
Name of Jurisdiction:	Reeds Spring
Risk / Vulnerability	
Problem being Mitigated:	Flood damage to properties and infrastructure
Hazard(s) Addressed:	Flooding
Action or Project	
Action/Project Number:	2.1
Name of Action or Project:	Flood Mitigation
Action or Project Description:	Acquire, elevate, or flood-proof properties and critical infrastructure within flood hazard areas where feasible.
Applicable Goal Statement:	Reduce the potential impact of natural disasters to property, infrastructure and local economy.
Estimated Cost:	$50,000 +

Benefits:	Reduces risk of flood damage to properties and infrastructure.
Plan for Implementation	
Responsible Organization/Department:	City Council
Action/Project Priority:	STAPLEE score: 30 Priority: High
Timeline for Completion:	1-5 years
Potential Fund Sources:	HMGP; PDM; FMA; CDBG: General Funds
Local Planning Mechanisms to be Used in Implementation:	County EOP; Floodplain Ordinance; Annual Budget Process
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Reeds Spring
Risk / Vulnerability	
Problem being Mitigated:	Lack of service to critical facilities
Hazard(s) Addressed:	Tornado, Severe Storm, Flooding, Winter Weather, Extreme Heat, Earthquake
Action or Project	
Action/Project Number:	2.2
Name of Action or Project:	Utility Maintenance
Action or Project Description:	Encourage electric utilities providers to maintain looped distribution service and other redundancies to critical facilities and/or communications infrastructure.
Applicable Goal Statement:	Reduce the potential impact of natural disasters to property, infrastructure, and the local economy.
Estimated Cost:	$0-$500
Benefits:	Protect utilities from natural hazards.
Plan for Implementation	
Responsible Organization/Department:	City Clerk; Public Works Official; Emergency Management/ Public Safety
Action/Project Priority:	STAPLEE score: 27 Priority: Medium
Timeline for Completion:	1-5 years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	County EOP; Annual Budget Process
Progress Report	
Action Status	Continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Reeds Spring
Risk / Vulnerability	
Problem being Mitigated:	Exposure of structures to flooding.
Hazard(s) Addressed:	Flooding
Action or Project	
Action/Project Number:	2.6
Name of Action or Project:	NFIP Requirement Enforcement
Action or Project Description:	The NFIP communities of Stone County, Crane, Galena, Hurley, Kimberling City, and Reeds Spring will enforce floodplain management requirements, including regulating all new and substantially improved construction in the Special Flood Hazard Areas (SPFAs).
Applicable Goal Statement:	Reduce the potential impact of natural disasters to property, infrastructure, and the local economy**.**

Estimated Cost:	$0-$1,000
Benefits:	Mitigates the damage to structures in flooding events.
Plan for Implementation	
Responsible Organization/Department:	City Clerk; Floodplain Manager; Planning & Zoning
Action/Project Priority:	STAPLEE score: 30 Priority: High
Timeline for Completion:	1-5 years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Floodplain Ordinance; Zoning Code
Progress Report	
Action Status	Continuing
Report of Progress	

Goal 3: Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.

Action Worksheet	
Name of Jurisdiction:	Reeds Spring
Risk / Vulnerability	
Problem being Mitigated:	Lack of training for municipal officials.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.1
Name of Action or Project:	NIMS Training
Action or Project Description:	Promote and provide NIMS training and/or information for all elected officials, public administrators, school administrators, and community stakeholders.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.
Estimated Cost:	$0-$500
Benefits:	Training for officials will improve response to hazard events.
Plan for Implementation	
Responsible Organization/Department:	City Council; City Clerk; Emergency Management/ Public Safety
Action/Project Priority:	STAPLEE score: 27 Priority: Medium
Timeline for Completion:	1-3 years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	County EOP; Annual Budget Process
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Reeds Spring
Risk / Vulnerability	
Problem being Mitigated:	Poor 911 addressing makes emergency response difficult
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.2
Name of Action or Project:	911 Addressing
Action or Project Description:	Educate on importance of, or enforce if applicable, the importance of highly visible 911 addressing for residences and businesses.

Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.
Estimated Cost:	$0-$500
Benefits:	Improved emergency response during and after hazard events.
Plan for Implementation	
Responsible Organization/Department:	City Clerk; Building Department; Public Safety
Action/Project Priority:	STAPLEE score: 27 Priority: Medium
Timeline for Completion:	1-5 years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Reeds Spring
Risk / Vulnerability	
Problem being Mitigated:	Lack of hazard mitigation principles in city and county plans.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.4
Name of Action or Project:	Hazard Mitigation Integration
Action or Project Description:	Integrate hazard mitigation into comprehensive and long range plans, capital improvement programs, zoning ordinances, subdivision, storm water management regulations, emergency operations plans, etc.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.
Estimated Cost:	$0-$1,000
Benefits:	Plans will have included hazard mitigation principles, improving resilience to hazard events.
Plan for Implementation	
Responsible Organization/Department:	City Council; City Clerk;
Action/Project Priority:	STAPLEE score: 30 Priority: High
Timeline for Completion:	1-5 years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Site Plan Requirements; Zoning Ordinance
Progress Report	
Action Status	Continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Reeds Spring
Risk / Vulnerability	
Problem being Mitigated:	Encroachment of vegetation
Hazard(s) Addressed:	Tornado, Severe Storm, Winter Weather
Action or Project	
Action/Project Number:	3.5
Name of Action or Project:	Vegetation Maintenance

Action or Project Description:	Enhance strategies and coordinate with utility providers to manage encroachment of vegetation in easements and rights-of-way.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.
Estimated Cost:	$0-$500
Benefits:	Decreased utility loss in the event of a hazard.
Plan for Implementation	
Responsible Organization/Department:	City Clerk; Public Works Official
Action/Project Priority:	STAPLEE score: 26 Priority: Medium
Timeline for Completion:	1-5 years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Reeds Spring
Risk / Vulnerability	
Problem being Mitigated:	Lack of funding for hazard mitigation projects.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.7
Name of Action or Project:	Funding Identification
Action or Project Description:	Monitor and identify funding from state and federal programs for hazard mitigation activities.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.
Estimated Cost:	$0-$100
Benefits:	Increased opportunities for funding for hazard mitigation projects.
Plan for Implementation	
Responsible Organization/Department:	City Clerk; Emergency Management/ Public Safety
Action/Project Priority:	STAPLEE score: 31 Priority: High
Timeline for Completion:	1-5 years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Action Worksheet	
Name of Jurisdiction:	Reeds Spring
Risk / Vulnerability	
Problem being Mitigated:	Poor coordination on infrastructure development can lead to damages.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.8
Name of Action or Project:	Reduction In Property Damage

Action or Project Description:	Utilize collaborative planning and compatible regulatory controls between the county and incorporated communities to promote infrastructure development practices that reduce the potential for property damage from natural hazards.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.
Estimated Cost:	$100-$1,000
Benefits:	Better infrastructure development will decrease damage during hazards.
Plan for Implementation	
Responsible Organization/Department:	City Clerk
Action/Project Priority:	STAPLEE score: 26 Priority: Medium
Timeline for Completion:	1-5 years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation:	Site Plan Requirements; Zoning Code
Progress Report	
Action Status	Revised, continuing
Report of Progress	

Goal 1: Protect lives and livelihoods of all citizens.

Action Worksheet	
Name of Jurisdiction:	Hurley R-I
Risk / Vulnerability	
Problem being Mitigated:	Public awareness of hazard vulnerability and mitigation measures.
Hazard(s) Addressed:	Tornado, Severe Storm, Winter Weather, Flooding, Drought, Extreme Heat
Action or Project	
Action/Project Number:	1.1
Name of Action or Project:	Awareness Program
Action or Project Description:	Partner with traditional media and the National Weather Service to publish and/or broadcast information on severe weather hazards.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	Cost in part of internet/website fees: $5,628 annually
Benefits:	Reduction in loss of life, injury, and property during hazard events.
Plan for Implementation	
Responsible Organization/Department:	District and building administrators, IT personnel
Action/Project Priority:	STAPLEE score: 40 Priority: High
Timeline for Completion:	12 months
Potential Fund Sources:	School funds
Local Planning Mechanisms to be Used in Implementation:	Long-term strategic plan
Progress Report	
Action Status	Revised, continuing
Report of Progress	A new website, hurleytigers.org has been purchased but isn't setup yet. School messaging is purchased and adding contact numbers daily. Social media updates are ongoing.

Action Worksheet	
Name of Jurisdiction:	Hurley R-I
Risk / Vulnerability	
Problem being Mitigated:	Public awareness of hazard vulnerability and mitigation measures.
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	1.2
Name of Action or Project:	Disaster Preparation
Action or Project Description:	Provide a link to disaster preparation resources such as Ready in 3 or Ready.gov on local government, health department, public schools, chambers of commerce, and community organization websites.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	Cost in part of internet/website fees: $5,628 annually
Benefits:	Reduction in loss of life, injury, and property during hazard events.
Plan for Implementation	
Responsible Organization/Department:	District and building administrators, IT personnel.
Action/Project Priority:	STAPLEE score: 40 Priority: High
Timeline for Completion:	12 months
Potential Fund Sources:	School funds from local tax dollars
Local Planning Mechanisms to be Used in Implementation:	Long-term strategic plan
Progress Report	
Action Status	Revised, continuing
Report of Progress	Schools funds

Action Worksheet	
Name of Jurisdiction:	Hurley R-I
Risk / Vulnerability	
Problem being Mitigated:	Public awareness to hazards.
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	1.3
Name of Action or Project:	Mitigation awareness
Action or Project Description:	Use social media to raise awareness of mitigation and preparedness activities.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$1,500 technology stipend + internet/website fees $5,628 annually.
Benefits:	Reduction in loss of life, injury, and property during hazard events.
Plan for Implementation	
Responsible Organization/Department:	Hurley School District personnel
Action/Project Priority:	STAPLEE score: 42 Priority: High
Timeline for Completion:	Ongoing, 2 years
Potential Fund Sources:	Local and state tax dollars
Local Planning Mechanisms to be Used in Implementation:	National Weather Service and government websites. Annual budget process.
Progress Report	
Action Status	New
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	Hurley R-I
Risk / Vulnerability	
Problem being Mitigated:	Lack of public involvement in mitigation activities
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	1.5
Name of Action or Project:	Citizen Preparedness
Action or Project Description:	Promote participation in citizen preparedness activities, such as: MOCERT1, Neighborhood Watch, Amateur Radio, and Community Heroes Reserve Medical Corps.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	Cost in part of internet/website fees: $5,628 annually
Benefits:	Increase citizen awareness of mitigation activities
Plan for Implementation	
Responsible Organization/Department:	Teachers and administration
Action/Project Priority:	STAPLEE score: 38 Priority: High
Timeline for Completion:	1 year
Potential Fund Sources:	Local tax dollars or grants
Local Planning Mechanisms to be Used in Implementation:	Annual budget process
Progress Report	
Action Status	Revised, continuing
Report of Progress	This is done annually with parent distributions, guest speakers, and advisory classes.

Action Worksheet	
Name of Jurisdiction:	Hurley R-I
Risk / Vulnerability	
Problem being Mitigated:	Lack of public involvement in mitigation activities
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	1.6
Name of Action or Project:	Hazard Mitigation Educational Programs
Action or Project Description:	Promote natural hazard mitigation educational programs in school communications and curriculum, where feasible.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	Curriculum development $1,000
Benefits:	Reduction in life, injury, and property during hazard events.
Plan for Implementation	
Responsible Organization/Department:	Board of Education, administration, teachers, and curriculum department
Action/Project Priority:	STAPLEE score: 41 Priority: High
Timeline for Completion:	2-3 years
Potential Fund Sources:	Grant funding and local/state tax dollars
Local Planning Mechanisms to be Used in Implementation:	Annual budget
Progress Report	
Action Status	Revised, continuing
Report of Progress	No progress has been made. A curriculum team would need to be hired and paid to create this.

Action Worksheet	
Name of Jurisdiction:	Hurley R-I
Risk / Vulnerability	
Problem being Mitigated:	Lack of communication during hazard events
Hazard(s) Addressed:	Tornado, Severe Storm, Flood, Severe Winter Weather, Extreme Heat
Action or Project	
Action/Project Number:	1.9
Name of Action or Project:	Mobile Hazard Alert
Action or Project Description:	Promote local severe weather alert applications for mobile communications devices.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	Cost in part of internet/website fees: $5,628 annually + $2,000 for school messenger
Benefits:	Improves communication during hazard events.
Plan for Implementation	
Responsible Organization/Department:	Hurley Administration
Action/Project Priority:	STAPLEE score: 37 Priority: High
Timeline for Completion:	1-2 years
Potential Fund Sources:	Grant or tax dollars
Local Planning Mechanisms to be Used in Implementation:	Annual budget
Progress Report	
Action Status	Revised, continuing
Report of Progress	School Messenger is in place for this.

Action Worksheet	
Name of Jurisdiction:	Hurley R-I
Risk / Vulnerability	
Problem being Mitigated:	Exposure of the public to hazard events.
Hazard(s) Addressed:	Tornado
Action or Project	
Action/Project Number:	1.11
Name of Action or Project:	Safe Place Awareness
Action or Project Description:	Create and update tornado/severe storm plans including best identified available refuge areas (these do not, or may not, comply with FEMA Publication 361 for Safe Rooms) in schools, large facilities, and other establishments serving the public.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$1,500
Benefits:	Improved public safety during hazard events.
Plan for Implementation	
Responsible Organization/Department:	Principals
Action/Project Priority:	STAPLEE score: 46 Priority: High
Timeline for Completion:	Annually
Potential Fund Sources:	Tax dollars for staff salaries and annual fees.
Local Planning Mechanisms to be Used in Implementation:	Annual budget
Progress Report	
Action Status	Continuing
Report of Progress	Currently in place and updated annually.

Action Worksheet	
Name of Jurisdiction:	Hurley R-I
Risk / Vulnerability	
Problem being Mitigated:	Extreme temperatures threaten vulnerable populations
Hazard(s) Addressed:	Winter Weather, Extreme Heat
Action or Project	
Action/Project Number:	1.14
Name of Action or Project:	Community Programs
Action or Project Description:	Encourage local community organizations to continue and augment programs to provide fans, air conditioners, and winter weatherization for those at risk.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens
Estimated Cost:	Stipend for club sponsors - $9,000
Benefits:	Protects vulnerable populations from hazard events.
Plan for Implementation	
Responsible Organization/Department:	Student Activity Clubs
Action/Project Priority:	STAPLEE score: 34 Priority: High
Timeline for Completion:	12-18 months
Potential Fund Sources:	Annual Budget
Local Planning Mechanisms to be Used in Implementation:	Volunteers and/or local/state tax dollars paid in club/activity sponsor stipends.
Progress Report	
Action Status	Revised, continuing
Report of Progress	Ongoing process that is utilized annually.

Goal 3: Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.

Action Worksheet	
Name of Jurisdiction:	Hurley R-I
Risk / Vulnerability	
Problem being Mitigated:	Lack of training for municipal officials.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.1
Name of Action or Project:	NIMS Training
Action or Project Description:	Promote and provide NIMS training and/or information for all elected officials, public administrators, school administrators, and community stakeholders.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.
Estimated Cost:	$2,000 for staff to update and train
Benefits:	Training for officials will improve response to hazard events.
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 39 Priority: High
Timeline for Completion:	Ongoing. Need 6-9 months to update training material.
Potential Fund Sources:	Local funds, grants, and free resource
Local Planning Mechanisms to be Used in Implementation:	Annual budget and annual training schedules
Progress Report	
Action Status	Revised, continuing
Report of Progress	Training must be updates to meet new standards. Training will be ongoing,

Action Worksheet	
Name of Jurisdiction:	Hurley R-I
Risk / Vulnerability	
Problem being Mitigated:	Lack of hazard mitigation principles in city and county plans.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.4
Name of Action or Project:	Hazard Mitigation Integration
Action or Project Description:	Integrate hazard mitigation into comprehensive and long range plans, capital improvement programs, zoning ordinances, subdivision, storm water management regulations, emergency operations plans, etc.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.
Estimated Cost:	$3,000
Benefits:	Plans will have included hazard mitigation principles, improving resilience to hazard events.
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 31 Priority: High
Timeline for Completion:	1-3 years
Potential Fund Sources:	Local/state tax dollars
Local Planning Mechanisms to	Long-term strategic plan, meeting attendance, annual budget.

be Used in Implementation:	
Progress Report	
Action Status	Continuing
Report of Progress	Updated Annually

Action Worksheet	
Name of Jurisdiction:	Hurley R-I
Risk / Vulnerability	
Problem being Mitigated:	Lack of funding for hazard mitigation projects.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.7
Name of Action or Project:	Funding Identification
Action or Project Description:	Monitor and identify funding from state and federal programs for hazard mitigation activities.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.
Estimated Cost:	Staff to search grant - $5,000. Grant writer - $5,000
Benefits:	Increased opportunities for funding for hazard mitigation projects.
Plan for Implementation	
Responsible Organization/Department:	Administration and grant writer
Action/Project Priority:	STAPLEE score: 39 Priority: High
Timeline for Completion:	1-3 years
Potential Fund Sources:	Grants, private donations, local tax dollars
Local Planning Mechanisms to be Used in Implementation:	Long-term strategic plan, annual budget
Progress Report	
Action Status	Revised, continuing
Report of Progress	Ongoing

Action Worksheet	
Name of Jurisdiction:	Hurley R-I
Risk / Vulnerability	
Problem being Mitigated:	Lack of sharing and resource request tracking during hazards.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.10
Name of Action or Project:	WebEOC
Action or Project Description:	Participate in WebEOC.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical facilities in a disaster.
Estimated Cost:	$2,000 – staff stipend to man the information
Benefits:	Allows jurisdictions to work together during hazards.
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 40 Priority: High
Timeline for Completion:	Ongoing
Potential Fund Sources:	Local/state tax dollars
Local Planning Mechanisms to be Used in Implementation:	Strategic Plan, Emergency Preparedness Plan
Progress Report	

	Revised, continuing

Action Worksheet	
Name of Jurisdiction:	Reeds Spring R-VI
Risk / Vulnerability	
Problem being Mitigated:	Public awareness of hazard vulnerability and mitigation measures.
Hazard(s) Addressed:	Tornado, Severe Storm, Winter Weather, Flooding, Drought, Extreme Heat
Action or Project	
Action/Project Number:	1.1
Name of Action or Project:	Awareness Program
Action or Project Description:	Partner with traditional media and the National Weather Service to publish and/or broadcast information on severe weather hazards.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	Apart of existing staff cost
Benefits:	Reduction in loss of life, injury, and property during hazard events.
Plan for Implementation	
Responsible Organization/Department:	Director of Operations
Action/Project Priority:	STAPLEE score: 33 Priority: High
Timeline for Completion:	Currently in place
Potential Fund Sources:	None needed. Part of job responsibility.
Local Planning Mechanisms to be Used in Implementation:	N/A
Action Status	Revised, continuing
Report of Progress	N/A
	Assign access and annual participation

Goal 1: Protect lives and livelihoods of all citizens.

Action Worksheet	
Name of Jurisdiction:	Reeds Spring R-VI
Risk / Vulnerability	
Problem being Mitigated:	Public awareness of hazard vulnerability and mitigation measures.
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	1.2
Name of Action or Project:	Disaster Preparation
Action or Project Description:	Provide a link to disaster preparation resources such as Ready in 3 or Ready.gov on local government, health department, public schools, chambers of commerce, and community organization websites.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	Apart of existing staff cost.
Benefits:	Reduction in loss of life, injury, and property during hazard events.
Plan for Implementation	
Responsible Organization/Department:	RSSD Technology Department
Action/Project Priority:	STAPLEE score: 33 Priority: High
Timeline for Completion:	1 Month
Potential Fund Sources:	Part of existing job responsibility.
Local Planning Mechanisms to be Used in Implementation:	N/A
Progress Report	

Action Status	Revised, continuing
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	Reeds Spring R-VI
Risk / Vulnerability	
Problem being Mitigated:	Public awareness to hazards.
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	1.3
Name of Action or Project:	Mitigation awareness
Action or Project Description:	Use social media to raise awareness of mitigation and preparedness activities.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$24
Benefits:	Reduction in loss of life, injury, and property during hazard events.
Plan for Implementation	
Responsible Organization/Department:	RSSD Director of Communications
Action/Project Priority:	STAPLEE score: 33 Priority: High
Timeline for Completion:	1 Month
Potential Fund Sources:	Part of existing job responsibility.
Local Planning Mechanisms to be Used in Implementation:	N/A
Progress Report	
Action Status	New
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	Reeds Spring R-VI
Risk / Vulnerability	
Problem being Mitigated:	Lack of public involvement in mitigation activities
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	1.6
Name of Action or Project:	Hazard Mitigation Educational Programs
Action or Project Description:	Promote natural hazard mitigation educational programs in school communications and curriculum, where feasible.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$1,000
Benefits:	Reduction in life, injury, and property during hazard events.
Plan for Implementation	
Responsible Organization/Department:	Board of Education, Administration
Action/Project Priority:	STAPLEE score: 36 Priority: High
Timeline for Completion:	2 years
Potential Fund Sources:	Grants, General fund
Local Planning Mechanisms to be Used in Implementation:	N/A
Progress Report	
Action Status	Revised, continuing
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	Reeds Spring R-VI
Risk / Vulnerability	
Problem being Mitigated:	Lack of communication during hazard events
Hazard(s) Addressed:	Tornado, Severe Storm, Flood, Severe Winter Weather, Extreme Heat
Action or Project	
Action/Project Number:	1.9
Name of Action or Project:	Mobile Hazard Alert
Action or Project Description:	Promote local severe weather alert applications for mobile communications devices.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$25
Benefits:	Improves communication during hazard events.
Plan for Implementation	
Responsible Organization/Department:	RSSO Director of Communications
Action/Project Priority:	STAPLEE score: 36 Priority: High
Timeline for Completion:	1 Month
Potential Fund Sources:	Part of existing job responsibility.
Local Planning Mechanisms to be Used in Implementation:	N/A
Progress Report	
Action Status	Revised, continuing
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	Reeds Spring R-VI
Risk / Vulnerability	
Problem being Mitigated:	Exposure of the public to hazard events.
Hazard(s) Addressed:	Tornado
Action or Project	
Action/Project Number:	1.11
Name of Action or Project:	Safe Place Awareness
Action or Project Description:	Create and update tornado/severe storm plans including best identified available refuge areas (these do not, or may not, comply with FEMA Publication 361 for Safe Rooms) in schools, large facilities, and other establishments serving the public.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	None, currently in place.
Benefits:	Improved public safety during hazard events.
Plan for Implementation	
Responsible Organization/Department:	RSSO Director of Operations and Stone County Fire
Action/Project Priority:	STAPLEE score: 39 Priority: High
Timeline for Completion:	Done annually
Potential Fund Sources:	Part of existing job responsibility
Local Planning Mechanisms to be Used in Implementation:	N/A
Progress Report	
Action Status	Continuing

Report of Progress	N/A

Goal 2: Reduce the potential impact of natural disasters to property, infrastructure, and the local economy.

Action Worksheet	
Name of Jurisdiction:	Reeds Spring R-VI
Risk / Vulnerability	
Problem being Mitigated:	Lack of service to critical facilities.
Hazard(s) Addressed:	Tornado, Severe Storm, Flooding, Winter Weather, Extreme Heat, Earthquake
Action or Project	
Action/Project Number:	2.2
Name of Action or Project:	Utility Maintenance
Action or Project Description:	Encourage electric utilities providers to maintain looped distribution service and other redundancies to critical facilities and/or communications infrastructure.
Applicable Goal Statement:	Reduce the potential impact of natural disasters to property, infrastructure, and the local economy.
Estimated Cost:	$15,000
Benefits:	Protect utilities from natural hazards.
Plan for Implementation	
Responsible Organization/Department:	RSSO, Director of Operations
Action/Project Priority:	STAPLEE score: 29 Priority: Medium
Timeline for Completion:	8 Months
Potential Fund Sources:	Tax Dollars
Local Planning Mechanisms to be Used in Implementation:	N/A
Progress Report	
Action Status	Continuing
Report of Progress	N/A

Goal 3: Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.

Action Worksheet	
Name of Jurisdiction:	Reeds Spring R-VI
Risk / Vulnerability	
Problem being Mitigated:	Lack of training for municipal officials.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.1
Name of Action or Project:	NIMS Training
Action or Project Description:	Promote and provide NIMS training and/or information for all elected officials, public administrators, school administrators, and community stakeholders.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.
Estimated Cost:	No cost
Benefits:	Training for officials will improve response to hazard events.
Plan for Implementation	
Responsible Organization/Department:	RSSO Director of Operations, SRO's
Action/Project Priority:	STAPLEE score: 31 Priority: High

Timeline for Completion:	1 year
Potential Fund Sources:	Part of existing job responsibility
Local Planning Mechanisms to be Used in Implementation:	N/A
Progress Report	
Action Status	Revised, continuing
Report of Progress	N/A

Goal 1: Protect lives and livelihoods of all citizens.

Action Worksheet	
Name of Jurisdiction:	Southern Stone County Fire District
Risk / Vulnerability	
Problem being Mitigated:	Public awareness of hazard vulnerability and mitigation measures.
Hazard(s) Addressed:	Tornado, Severe Storm, Winter Weather, Flooding, Drought, Extreme Heat
Action or Project	
Action/Project Number:	1.1
Name of Action or Project:	Awareness Program
Action or Project Description:	Partner with traditional media and the National Weather Service to publish and/or broadcast information on severe weather hazards.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$0-500
Benefits:	Reduction in loss of life, injury, and property during hazard events.
Plan for Implementation	
Responsible Organization/Department:	Stone County Emergency Management
Action/Project Priority:	STAPLEE score: 36 Priority: High
Timeline for Completion:	6 months
Potential Fund Sources:	NWS
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process
Progress Report	
Action Status	Revised, continuing
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	Southern Stone County Fire District
Risk / Vulnerability	
Problem being Mitigated:	Public awareness of hazard vulnerability and mitigation measures.
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	1.2
Name of Action or Project:	Disaster Preparation
Action or Project Description:	Provide a link to disaster preparation resources such as Ready in 3 or Ready.gov on local government, health department, public schools, chambers of commerce, and community organization websites.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$0-50

Benefits:	Reduction in loss of life, injury, and property during hazard events.
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 37 Priority: High
Timeline for Completion:	Can be accomplished immediately
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation, if any:	SSCFPD tech
Progress Report	
Action Status	Revised, continuing
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	Southern Stone County Fire District
Risk / Vulnerability	
Problem being Mitigated:	Public awareness to hazards.
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	1.3
Name of Action or Project:	Mitigation awareness
Action or Project Description:	Use social media to raise awareness of mitigation and preparedness activities.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$50-100
Benefits:	Reduction in loss of life, injury, and property during hazard events.
Plan for Implementation	
Responsible Organization/Department:	Social Media tech, PIO.
Action/Project Priority:	STAPLEE score: 31 Priority: High
Timeline for Completion:	1-6 months
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Annual budget
Progress Report	
Action Status	New
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	Southern Stone County Fire District
Risk / Vulnerability	
Problem being Mitigated:	Lack of public involvement in mitigation activities
Hazard(s) Addressed:	All hazards
Action or Project	
Action/Project Number:	1.5
Name of Action or Project:	Citizen Preparedness

Action or Project Description:	Promote participation in citizen preparedness activities, such as: MOCERT1, Neighborhood Watch, Amateur Radio, and Community Heroes Reserve Medical Corps.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$500-1500
Benefits:	Increase citizen awareness of mitigation activities
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 27 Priority: Medium
Timeline for Completion:	6-18 months
Potential Fund Sources:	LEPC
Local Planning Mechanisms to be Used in Implementation, if any:	LEPC
Progress Report	
Action Status	Revised, continuing
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	Southern Stone County Fire District
Risk / Vulnerability	
Problem being Mitigated:	Lack of communication during hazard events
Hazard(s) Addressed:	Tornado, Severe Storm, Flood, Severe Winter Weather, Extreme Heat
Action or Project	
Action/Project Number:	1.9
Name of Action or Project:	Mobile Hazard Alert
Action or Project Description:	Promote local severe weather alert applications for mobile communications devices.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$50-1500
Benefits:	Improves communication during hazard events.
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 32 Priority: High
Timeline for Completion:	6- 12 months
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process
Progress Report	
Action Status	Revised, continuing
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	Southern Stone County Fire District
Risk / Vulnerability	
Problem being Mitigated:	Exposure of the public to hazard events.
Hazard(s) Addressed:	Tornado
Action or Project	
Action/Project Number:	1.11
Name of Action or Project:	Safe Place Awareness
Action or Project Description:	Create and update tornado/severe storm plans including best identified available refuge areas (these do not, or may not, comply with FEMA Publication 361 for Safe Rooms) in schools, large facilities, and other establishments serving the public.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens.
Estimated Cost:	$100-$1,000
Benefits:	Improved public safety during hazard events.
Plan for Implementation	
Responsible Organization/Department:	SC Emergency Management
Action/Project Priority:	STAPLEE score: 32 Priority: High
Timeline for Completion:	12- 24 months
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation, if any:	LEPC
Progress Report	
Action Status	Continuing
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	Southern Stone County Fire District
Risk / Vulnerability	
Problem being Mitigated:	
Hazard(s) Addressed:	Winter Weather, Extreme Heat
Action or Project	
Action/Project Number:	1.14
Name of Action or Project:	Community Programs
Action or Project Description:	Encourage local community organizations to continue and augment programs to provide fans, air conditioners, and winter weatherization for those at risk.
Applicable Goal Statement:	Protect lives and livelihoods of all citizens
Estimated Cost:	$100-$5,000
Benefits:	Protects vulnerable populations from hazard events.
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 27 Priority: Medium

Timeline for Completion:	1-5 years
Potential Fund Sources:	Christian Associates, OACAC, DHSS
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process
Progress Report	
Action Status	Revised, continuing
Report of Progress	N/A

Goal 2: Reduce the potential impact of natural disasters to property, infrastructure, and the local economy.

Action Worksheet	
Name of Jurisdiction:	Southern Stone County Fire District
Risk / Vulnerability	
Problem being Mitigated:	Lack of service to critical facilities.
Hazard(s) Addressed:	Tornado, Severe Storm, Flooding, Winter Weather, Extreme Heat, Earthquake
Action or Project	
Action/Project Number:	2.2
Name of Action or Project:	Utility Maintenance
Action or Project Description:	Encourage electric utilities providers to maintain looped distribution service and other redundancies to critical facilities and/or communications infrastructure.
Applicable Goal Statement:	Reduce the potential impact of natural disasters to property, infrastructure, and the local economy.
Estimated Cost:	$0-$500
Benefits:	Protect utilities from natural hazards.
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 25 Priority: Medium
Timeline for Completion:	1-5 years
Potential Fund Sources:	Local utility companies
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process
Progress Report	
Action Status	Continuing
Report of Progress	N/A

Goal 3: Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.

Action Worksheet	
Name of Jurisdiction:	Southern Stone County Fire District

Risk / Vulnerability	
Problem being Mitigated:	Lack of training for municipal officials.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.1
Name of Action or Project:	NIMS Training
Action or Project Description:	Promote and provide NIMS training and/or information for all elected officials, public administrators, school administrators, and community stakeholders.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.
Estimated Cost:	$50-1000
Benefits:	Training for officials will improve response to hazard events.
Plan for Implementation	
Responsible Organization/Department:	SSCFPD/Training Division
Action/Project Priority:	STAPLEE score:31 Priority: High
Timeline for Completion:	6-18 Months
Potential Fund Sources:	Training funds
Local Planning Mechanisms to be Used in Implementation, if any:	LEPC
Progress Report	
Action Status	Revised, continuing
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	Southern Stone County Fire District
Risk / Vulnerability	
Problem being Mitigated:	Lack of education on the spread of wildfires.
Hazard(s) Addressed:	Wildfire
Action or Project	
Action/Project Number:	3.3
Name of Action or Project:	Wildfire Education
Action or Project Description:	Educate on conditions and post burn advisors during time of weather conducive to the spread of wildfire.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.
Estimated Cost:	$50-1000
Benefits:	Education will improve the public's safety.
Plan for Implementation	
Responsible Organization/Department:	SSCFPD, Fire Chief
Action/Project Priority:	STAPLEE score: 40 Priority: High
Timeline for Completion:	0-12 months
Potential Fund Sources:	MDOC
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process
Progress Report	
Action Status	Revised, continuing

Report of Progress	Is currently in use. SSCFPD and some other local fire agencies, post wildfire conditions. SSCFPD also utilizes a controlled burn plan with SCES,(Dispatch) and issues advisories.

Action Worksheet	
Name of Jurisdiction:	Southern Stone County Fire District
Risk / Vulnerability	
Problem being Mitigated:	Lack of hazard mitigation principles in city and county plans.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.4
Name of Action or Project:	Hazard Mitigation Integration
Action or Project Description:	Integrate hazard mitigation into comprehensive and long range plans, capital improvement programs, zoning ordinances, subdivision, storm water management regulations, emergency operations plans, etc.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.
Estimated Cost:	$0-$1,000
Benefits:	Plans will have included hazard mitigation principles, improving resilience to hazard events.
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 32 Priority: High
Timeline for Completion:	5+ years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process
Progress Report	
Action Status	Continuing
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	Southern Stone County Fire District
Risk / Vulnerability	
Problem being Mitigated:	Firefighting water sources running out during wildfires.
Hazard(s) Addressed:	Wildfire
Action or Project	
Action/Project Number:	3.6
Name of Action or Project:	Water Inventory
Action or Project Description:	Inventory alternative firefighting water sources.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.
Estimated Cost:	$500-$1000
Benefits:	Response teams will be better equipped to fight wildfires.
Plan for Implementation	
Responsible	Administration; Each fire dept./district

Organization/Department:	
Action/Project Priority:	STAPLEE score: 32 Priority: High
Timeline for Completion:	2 years
Potential Fund Sources:	MDOC
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process
Progress Report	
Action Status	Revised, continuing
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	Southern Stone County Fire District
Risk / Vulnerability	
Problem being Mitigated:	Lack of funding for hazard mitigation projects.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.7
Name of Action or Project:	Funding Identification
Action or Project Description:	Monitor and identify funding from state and federal programs for hazard mitigation activities.
Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical infrastructure in a disaster.
Estimated Cost:	$50- 10,000
Benefits:	Increased opportunities for funding for hazard mitigation projects.
Plan for Implementation	
Responsible Organization/Department:	Administration
Action/Project Priority:	STAPLEE score: 30 Priority: High
Timeline for Completion:	5 years
Potential Fund Sources:	General Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process
Progress Report	
Action Status	Revised, continuing
Report of Progress	N/A

Action Worksheet	
Name of Jurisdiction:	Southern Stone County Fire District
Risk / Vulnerability	
Problem being Mitigated:	Lack of sharing and resource request tracking during hazards.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	3.10
Name of Action or Project:	WebEOC
Action or Project Description:	Participate in WebEOC.

Applicable Goal Statement:	Ensure and enhance continued operation of government, emergency functions, and critical facilities in a disaster.
Estimated Cost:	$50-2000
Benefits:	Allows jurisdictions to work together during hazards.
Plan for Implementation	
Responsible Organization/Department:	SC Emergency Management
Action/Project Priority:	STAPLEE score: 32 Priority: High
Timeline for Completion:	12 months
Potential Fund Sources:	LEPC
Local Planning Mechanisms to be Used in Implementation, if any:	LEPC
Progress Report	
Action Status	Revised, continuing
Report of Progress	N/A

5 PLAN MAINTENANCE PROCESS

5 PLAN MAINTENANCE PROCESS 5.1

5.1 Monitoring, Evaluating, and Updating the Plan 5.1

5.1.1 Responsibility for Plan Maintenance 5.1

5.1.2 Plan Maintenance Schedule 5.2

5.1.3 Plan Maintenance Process 5.2

5.2 Incorporation into Existing Planning Mechanisms 5.3

5.3 Continued Public Involvement 5.5

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

The Mitigation Planning Committee (MPC) has served as an advisory body during the plan update process, but is not a standing committee. Many MPC representatives and stakeholders are also represented on the Local Emergency Planning Committee (LEPC), as well as several other committees and groups in Stone County. The LEPC is overseen by the County Emergency Management Director, thus this group will be responsible for overseeing the plan monitoring, evaluation and maintenance. However, it will be up to the County Commission, Office of Emergency Management, and the local jurisdictions to carry out the goals and actions outlined. Maintenance will involve agreement of the participating jurisdictions, including schools and special districts, to:

- 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.

5.1.2 Plan Maintenance Schedule

The EMD will facilitate annual meetings and after a state or federally declared hazard event as appropriate to monitor progress and update the mitigation strategy. The Stone County EMD will be responsible for initiating the plan reviews, which may occur during a regularly scheduled LEPC meeting, and will invite additional members of the MPC to attend.

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 will be monitored by evaluating changes in vulnerabilities identified in the plan. During the annual meeting, members of the MPC and expanded LEPC group will 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 committee 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 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 deemed appropriate and necessary. Changes will be approved by the Stone County Commission and the governing boards of the other participating jurisdictions.

5.2 Incorporation into Existing Planning Mechanisms

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

Where possible, plan participants, including school and special districts, will use existing plans and/or programs to implement hazard mitigation actions. 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 Stone 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:

- General or master plans of participating jurisdictions;
- Ordinances of participating jurisdictions;
- Stone County Emergency Operations Plan;
- Capital improvement plans and budgets;
- 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.

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

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

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

Table 5.1 Planning Mechanisms Identified for Integration of Hazard Mitigation Plan

Jurisdiction	Planning Mechanisms	Integration Process for Previous Plan	Integration Process for Current Plan
Unincorporated Stone County	Comprehensive Plan, Emergency Operations Plan, Land-use Plan, Flood Mitigation Assistance (FMA) plan, Zoning Ordinance, Building Code, Floodplain Ordinance	N/A	Emergency Operations Plan, Local Emergency Planning Committee, Comprehensive Plan, Zoning Ordinance, Floodplain Ordinance, Building Codes, Land-use Plan
City of Branson West	Comprehensive Plan, Transportation Plan, Local Mitigation Plan, Land-use Plan Zoning Ordinance, Building Code, Subdivision Ordinance, Nuisance Ordinance, Storm Water Ordinance, Drainage Ordinance	N/A	Local Mitigation Plan, Building Code, Zoning Ordinance, Comprehensive Plan, Land-use Plan
City of Crane	Comprehensive Plan, Builder's Plan, Local Emergency Operations Plan, Land-use Plan, Zoning Ordinance, Floodplain Ordinance, Subdivision Ordinance, Nuisance Ordinance	N/A	Local Mitigation Plan, Emergency Operations Plan, Comprehensive Plan, Zoning Ordinance Floodplain Ordinance
City of Galena	Nuisance Ordinance	N/A	Annual Budget Process
City of Hurley	Local Emergency Operations Plan, Building Code, Floodplain Ordinance	N/A	Emergency Operations Plan, Floodplain Ordinance
City of Kimberling City	Builder's Plan Capital Improvement Plan, Local Emergency Operations Plan, Flood Mitigation Assistance (FMA) Plan, Zoning Ordinance, Building Code,	N/A	Budget Process, Building Code, Emergency Operations Plans, Capital Improvement Plan, Comprehensive Plan,

	Floodplain Ordinance, Subdivision Ordinance, Nuisance Ordinance, Storm Water Ordinance		
City of Reeds Spring	County Emergency Operations Plan, Zoning Ordinance, Building Code, Nuisance Ordinance, Site Plan Review	N/A	Emergency Operations Plan, Budget Process, Building Code, Floodplain Ordinance, Zoning Ordinance, Site Plan Requirements,
Village of Coney Island	Flood Mitigation Assistance (FMA) Plan, Watershed Plan, Nuisance Ordinance,	N/A	N/A
Hurley R-I School District	Strategic Plan	N/A	Long-term Strategic Plan, Annual Budget Process, Emergency Preparedness Plan
Reeds Spring R-IV	Master Plan, Emergency Plan, Weapons Policy, Capital Improvements	N/A	Annual Budget Process
Southern Stone County Fire District	Public Fire Safety Programs	N/A	Annual Budget Process, SSCFPD, LEPC

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 Stone County website following each annual review of the mitigation plan.

When reconvening for the next five-year update, the EMD will coordinate with all stakeholders participating in the planning process and reconvene the MPC. 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.