

CONTRIBUTORS

Clark County Hazard Mitigation Planning Committee

Jurisdictional Representatives

Name		Title	Department	Jurisdiction/Agency/Organiz
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Henry	Dienst	Commissioner	Administration	Clark County
Gary	Webster	Commissioner	Administration	Clark County
Ron	Gates	Mayor	Administration	Alexandria
Ritchie	Kratch	Superintendent	Administration	Clark County R-1
Jerry	Webber	Mayor	Administration	Kahoka
Buddy	Kattlemann	Presiding Commissioner	Administration	Clark County
Kathy	Alvis	City Clerk	Administration	Wayland
Nathan	Bartlett	Chief	Administration	Wayland
Jim	Sherwood	Asst. EMD	Administration	Kahoka
Dale	Clark	Mayor	Administration	Revere
Edward	Nye	Mayor	Administration	Luray
Tammy	Hammond	Mayor Pro Term	Administration	Wyaconda

Stakeholder Representatives

Name		Title	Department	Agency/Organization
Larry	Sexton	LEPC Chairman	Emergency Response	Clark County LEPC
Jim	Engles	President	Emergency Response	Revere Fire
Delbert	Irvin	Chief	Emergency Response	Revere Fire
Eveletta	Sutterfield	RN Administrator	Administration	Clark County Health Dept
Randy	Alvis	Chairman	Emergency Response	Wayland Fire
Paul	Brotherton	Citizen	Administration	Clark County

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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. Clark 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 districts. The plan is an update of a plan that was approved on March 2014. 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 Clark County Multi-Hazard Mitigation Plan is a multi-jurisdictional plan that covers the following jurisdictions that participated in the planning process:

- Unincorporated Clark County
- City of Kahoka
- City of Wayland
- City of Wyaconda
- City of Alexandria
- Village of Luray
- City of Revere
- Clark County R-1 School District

Clark County and the entities listed above developed a Multi-Jurisdictional Hazard Mitigation Plan that was approved by FEMA on March 2014 (hereafter referred to as the *March 2014 Hazard Mitigation Plan*). This current planning effort serves to update that previously approved plan.

The plan update process followed a methodology in accordance with FEMA guidance, which began with the formation of a Mitigation Planning Committee (MPC) comprised of representatives from Clark County and participating jurisdictions. The MPC updated the risk assessment that identified and profiled hazards that pose a risk to Clark 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 updated goals for reducing risk from hazards. The goals are listed below:

1. Public Awareness- Using a variety of communication avenues to increase the citizens awareness of and to promote education about the natural hazards that they may face, their vulnerability to these hazards, and how to lessen the effect of future natural hazards.
2. Strengthen communication and coordination between local governments, emergency personnel, public agencies, and citizens to mitigate the effects of future natural hazards.

3. Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties; on natural resources; on infrastructure; and on the local economy.

To advance the identified goals, the MPC developed recommended mitigation actions, as summarized in the table on the following pages. 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. These additional details are provided in Chapter 4.

Table 0.1 Mitigation Action Matrix

#	Action	Priority	Goals Addressed	Hazards Addressed	Address Current Development	Address Future Development	Continued Compliance with NFIP
Clark County 2020.1	Continue Clark County's participation and good standing in the National Flood Insurance Program.	High	3	Flooding			Yes
Clark County 2020.2	Flood Mitigation	High	3	Flooding	Yes	Yes	
Clark County 2020.3	Early Warning Sirens	Medium	3	All Hazards	Yes		
Clark County 2020.4	Maintain Transportation Infrastructure	High	3	Flooding, Severe Thunderstorms, Winter Weather	Yes		
Clark County 2020.5	Response to Pandemic	Medium	2	Pandemic	Yes	Yes	
Clark County 2020.6	Safe Room and Storm Shelters	High	3	Tornado, Severe Thunderstorms	Yes		
Clark County 2020.7	Generator for Shelter(s)	High	3	Extreme Temperatures, Severe Thunderstorms, Severe Winter Weather, Tornado	Yes		
City of Kahoka 2020.1	Generator for Shelter(s)	High	3	Extreme Temperatures, Severe Thunderstorms, Severe Winter Weather, Tornado	Yes		
City of Kahoka 2020.2	Emergency Operations Center	Low	3	All Hazards	Yes		
City of Kahoka 2020.3	Maintain Transportation Infrastructure	High	3	Flooding, Severe Thunderstorms, Winter Weather	Yes		

City of Kahoka 2020.4	Early Warning Sirens	Medium	3	All Hazards	Yes		
City of Kahoka 2020.5	Continue City of Kahoka's participation and good standing in the National Flood Insurance Program.	High	3	Flooding			Yes
City of Wayland 2020.1	Early Warning Siren	High	3	All Hazards	Yes		
City of Wayland 2020.2	Maintain Transportation Infrastructure	High	3	Flooding, Severe Thunderstorms, Winter Weather	Yes		
City of Wayland 2020.3	Safe Rooms and Shelters	High	3	Tornado, Severe Thunderstorms	Yes		
City of Wayland 2020.4	Continue City of Wayland's participation and good standing in the National Flood Insurance Program.	High	3	Flooding			Yes
City of Wyaconda 2020.1	Early Warning Sirens	High	3	All Hazards	Yes		
City of Wyaconda 2020.2	Maintain Transportation Infrastructure	High	3	Flooding, Severe Thunderstorms, Winter Weather	Yes		
City of Wyaconda 2020.3	Safe Rooms and Shelters	High	3	Tornado, Severe Thunderstorms	Yes		
City of Wyaconda 2020.4	Continue City of Wyaconda's participation and good standing in the National Flood Insurance Program.	High	3				Yes
City of Alexandria 2020.1	Levee Doors	High	3	Flooding	Yes		
City of Alexandria 2020.2	Early Warning Siren	High	3	All Hazards	Yes		
City of Alexandria 2020.3	Maintain Transportation Infrastructure	High	3	Flooding, Severe Thunderstorms, Winter Weather	Yes		
City of Alexandria 2020.4	Safe Rooms and Shelters	High	3	Tornado, Severe Thunderstorms	Yes		

City of Alexandria 2020.5	Continue Alexandria's participation and good standing in the National Flood Insurance Program	High	3	Flooding			Yes
Village of Luray 2020.1	Early Warning Siren	High	3	All Hazards	Yes		
Village of Luray 2020.2	Maintain Transportation Infrastructure	High	3	Flooding, Severe Thunderstorms, Winter Weather	Yes		
Village of Luray 2020.3	Safe Rooms and Storm Shelters	High	3	Tornado, Severe Thunderstorms	Yes		
Village of Luray 2020.4	Continue Village of Luray's participation and good standing in the National Flood Insurance Program.	High	3	Flooding			Yes
City of Revere 2020.1	Early Warning Sirens	High	3	All Hazards	Yes		
City of Revere 2020.2	Maintain Transportation Infrastructure	High	3	Flooding, Severe Thunderstorms, Winter Weather	Yes		
City of Revere 2020.3	Safe Rooms and Storm Shelters	High	3	Tornado, Severe Thunderstorms	Yes		
City of Revere 2020.4	Continue City of Revere's participation and good standing in the National Flood Insurance Program.	High	3				Yes
Clark County R-1 2020.1	Safe Rooms	High	3	Tornado, Severe Thunderstorms, Earthquake	Yes		
Clark County R-1	Intercom System	Medium	3	Tornado, Severe Thunderstorms, Earthquake	Yes		

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 jurisdictions listed in the Executive Summary participated in the development of this plan and have adopted the multi-jurisdictional plan.

- Unincorporated Clark County
- City of Kahoka
- City of Wayland
- City of Wyaconda
- City of Alexandria
- Village of Luray
- City of Revere
- Clark County R-1 School District

Model Resolution

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

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

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

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

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

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

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

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

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

ADOPTED by a vote of _____ in favor and ____ against, and __ abstaining, this _____ day of _____, _____.

By (Sig): _____
Print name: _____

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

APPROVED AS TO FORM:
By (Sig.) _____

1 INTRODUCTION AND PLANNING PROCESS

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1.1 PURPOSE

Hazard mitigation is “any actions taken to reduce or eliminate the long-term risk to human life and property from natural hazards”. We understand that hazard events will continue to occur, and at their worst can result in death and destruction of property and infrastructure. The work done to minimize the impact of hazard events to life and property is called hazard mitigation. Clark County and the participating jurisdictions and school districts developed this multijurisdictional local hazard mitigation plan update to reduce future losses from hazards.

- The County of Clark, City of Kahoka, City of Wayland, City of Wyaconda, City of Alexandria, Village of Luray, City of Revere, and Clark County R-1 School District adopted the Plan as a prerequisite for mitigation grant eligibility pursuant to the Disaster Mitigation Act of 2000 (Public Law 106-390) and the implementing regulations set forth by the Interim Final Rule published in the *Federal Register* on February 26, 2002, (44 CFR §201.6) and finalized on December 4, 2013. (Hereafter, these requirements and regulations will be referred to collectively as the Disaster Mitigation Act or DMA). The regulations established the requirements for local hazard mitigation plans are in the Robert T. Stafford Disaster Relief and Emergency Act (Public Law 93-288).

1.2 BACKGROUND AND SCOPE

This plan is a 5-year update of the plan that was approved in March of 2014. The plan and update were prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 to result in the eligibility for the Federal Emergency Management Agency (FEMA) Hazard Mitigation Assistance Grant Programs.

- Following is a list of participants in both the previous plan as well as the current update; County of Clark, City of Kahoka, City of Wayland, City of Wyaconda, City of Alexandria, Village of Luray, City of Revere, and Clark County R-1 School District.

In addition to securing grant funding eligibility, the plan is useful for incorporating hazard mitigation planning and principals into other documents, such as zoning regulations and land use plans.

1.3 PLAN ORGANIZATION

The current update document involved review, evaluation and amendment of the existing Plan. It addresses the same natural hazards that were addressed in the original Plan.

Following is a breakdown of the organization of the 2019 Clark County Hazard Mitigation Plan update:

- 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 shows each chapter and the changes summarized in the Update.

Table 1.1. Changes Made in Plan Update

Plan Section	Summary of Updates
Chapter 1	Updated members of the Mitigation Planning Committee and participating jurisdictions formally adopted the MPC
Chapter 2	Planning Area Profile and Capabilities- All Census and economic demographic data updated.
Chapter 3	Risk Assessment- All hazard event data was updated and new risk and vulnerability analysis were performed using new data.
Chapter 4	Mitigation Strategy- A large number of actions were discarded from the previous plan and can be found on Table 4.1
Chapter 5	Plan Implementation and Maintenance- The plan maintenance process was revamped and detailed to include annual and as needed plan review meetings.

1.4 PLANNING PROCESS

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

Clark County, Missouri contracted with the Northeast Missouri Regional Planning Commission to facilitate the update of the multi-jurisdictional, local hazard mitigation plan. In fulfillment of this role, the RPC:

- Assist in establishing a Mitigation Planning Committee (MPC) as defined by the Disaster Mitigation Act (DMA),
- Find out if the MPC established for the previously approved plan was a standing committee that met in the interim, and set forth any changes in the MPC membership and procedures since adoption of the previous plan,
- Assess whether there was adherence to the process set forth in the previously approved plan for maintenance (example, did the MPC meet regularly as specified in the previously approved plan), and explain how adherence occurred, and/or why it did not occur,
- Ensure the updated plan meets the DMA requirements as established by federal regulations and follows the most current planning guidance of the Federal Emergency Management Agency (FEMA),
- Facilitate the entire plan development process,
- Identify the data that MPC participants could provide and conduct the research and documentation necessary to augment that data,
- Assist in soliciting public input,
- Produce the draft and final plan update in a FEMA-approvable document and coordinate the Missouri State Emergency Management Agency (SEMA) and (FEMA) plan reviews.

Table 1.2. Jurisdictional Representatives of Clark County Mitigation Planning Committee

Name		Title	Department	Jurisdiction/Agency /Organization
Buddy	Kattlemann	Presiding Commissioner	Administration	County of Clark
Henry	Dienst	Eastern District Commissioner	Administration	County of Clark
Gary	Webster	Western District Commissioner	Administration	County of Clark
Jerry	Webber	Mayor	Administration	City of Kahoka
Ron	Gates	Mayor	Administration	City of Alexandria
Ritchie	Kracht	Superintendent	Administration	Clark County R-1 School Dist.
Chris	Blomgren	Emergency Management	Emergency	County of Clark/City of Kahoka
Kathy	Alvis	City Clerk	Administration	City of Wayland
Larry	Sexton	LEPC Chairman	Emergency	County of Clark
Tammy	Hammond	Mayor Pro Term	Administration	City of Wyaconda
Edward	Nye	Mayor	Administration	Village of Luray
Dale	Clark	Mayor	Administration	City of Revere

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.

Hazard mitigation is defined as “sustained action taken to reduce or eliminate the long-term risk to human life and property from hazards” and its purpose is to lessen the negative impact of a disaster on community’s economic, social and environmental well-being.

Outreach programs that increase the public’s awareness of hazard risks, projects to protect critical facilities and the removal of structures from flood hazard areas are all examples of mitigation actions. Local mitigation actions and concepts can also be incorporated into land use plans and building codes.

Local governments have the responsibility to protect the health, safety and welfare of their citizens. Proactive mitigation policies and actions help reduce risk and create safer, more disaster-resilient communities. Mitigation is an investment in a community’s future safety and sustainability by facilitating:

- The protection of public safety and prevention of loss of life and injury
- The reduction of harm to existing and future development
- The prevention of damage to a community’s unique assets

The importance of active public participation in such an endeavor is obvious, but can be difficult to obtain in reality. Nowhere is difficulty more apparent than in small rural communities like those in Northeast Missouri. The County of Clark participated in all elements of the planning process,

Local government jurisdictions and the school district were invited to participate in the planning process via email and in many cases follow up phone calls and personal visits. (Appendix A-public documentation). Committee members were placed on a contact list featuring email and contact information. They were also directed to the Regional Planning Commissions webpage.

Jurisdictions that were presented with a multi-jurisdictional plan are required to participate in the planning process and formally adopt the plan. The County of Clark, City of Kahoka, City of Wayland, City of Alexandria, Clark County R-1 School District, City of Revere, Village of Luray and City of Wyaconda participated in the plan update by meeting minimal requirements as described in the next paragraph. Each participating jurisdiction has formally adopted the mitigation plan.

Minimum participation requirements included:

- Designation of a representative to serve on the MPC;
- Provision of sufficient information to support plan development by completion and return of Data Collection Questionnaires and validating/correcting critical facility inventories;

- When applicable provide progress reports on mitigation actions from the previously approved plan and identify additional mitigation actions for the plan;
- Eliminate from further consideration those actions from the previously approved plan that were not implemented because they were impractical, inappropriate, not cost-effective, or were otherwise not feasible;
- Review and comment on plan drafts;
- Provide documentation to show time donated to the planning effort (if a FEMA planning grant was awarded to the County); and
- Formally adopt the mitigation plan prior to submittal to SEMA and FEMA for final approval.

The County of Clark, City of Kahoka, City of Wayland, City of Alexandria, City of Revere, City of Wyaconda, Village of Luray, and Clark County R-1 School District met the participation requirements.

Table 1.3. Jurisdictional Participation in Planning Process

Jurisdiction	Kick-off Meeting	No Meeting #2	No Meeting #3	Data Collection Questionnaire Response	Update/Develop Mitigation Actions
County of Clark	X			X	Yes
City of Kahoka	X			X	Yes
City of Wayland	X			X	Yes
City of Wyaconda	No			X	Yes
City of Alexandria	X			X	Yes
Village of Luray	No			X	Yes
City of Revere	X			X	Yes
Clark County R-1 School Dist.	X			X	Yes

1.4.2 The Planning Steps

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, and 4)

In February 2018 RPC staff met with the Clark County Commissioners to begin the planning process. In March 2019 staff from the RPC organized the Kickoff meeting that was held on March 19, 2019. Local jurisdictions were notified by email and letter of the Kickoff meeting and personal phone calls were made to promote attendance at the Kickoff meeting. Agenda for Kickoff meeting is included in Appendix B as well as the minutes for the Kickoff meeting. After the Kickoff meeting jurisdictions unable to attend the meeting was contacted and asked to attend the next meeting. Following meetings #2 and #3 were delayed and decided to move forward with interacting the jurisdiction individually with the inability to get the entire MPC to meet as a group.

Table 1.5. Schedule of MPC Meetings

Meeting	Topic	Date
Informational Meeting	Met directly with local jurisdictions and follow up phone calls to discuss the planning process and importance of participation.	01/1/2019 – 3/1/2019
Kick-off Meeting	Purpose, process, planning area, building the team, participation, requirements, public outreach, data collection questionnaires, discussion of hazards, risk	3/5/2019
Planning Meeting #2	Purpose, discussion of hazards, risk assessment, determine/update	6/1/2019 – 10/1/2019
Planning Meeting #3	Review of the draft plan, discussion of plan update process, plan maintenance, discussion of adoption resolutions, Submission to SEMA/FEMA	11/1/2020 – 3/30/202

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

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

The Kickoff Meeting's agenda is included in Appendix B which includes discussion, minutes, 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. 1.8

signature sheet and copies of the handouts. As stated in the minutes, the participants felt a survey tool would not be effective and chose to solicit public involvement at the local level as they would be the key contacts for obtaining public comment. Public notice was posted on the NEMO RPC website, a notice was posted in all of the City Hall's in the participating jurisdictions.

No public comments were received which is characteristic for the area. The public in Clark County typically does not become active in planning activities such as plan development or updates.

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.

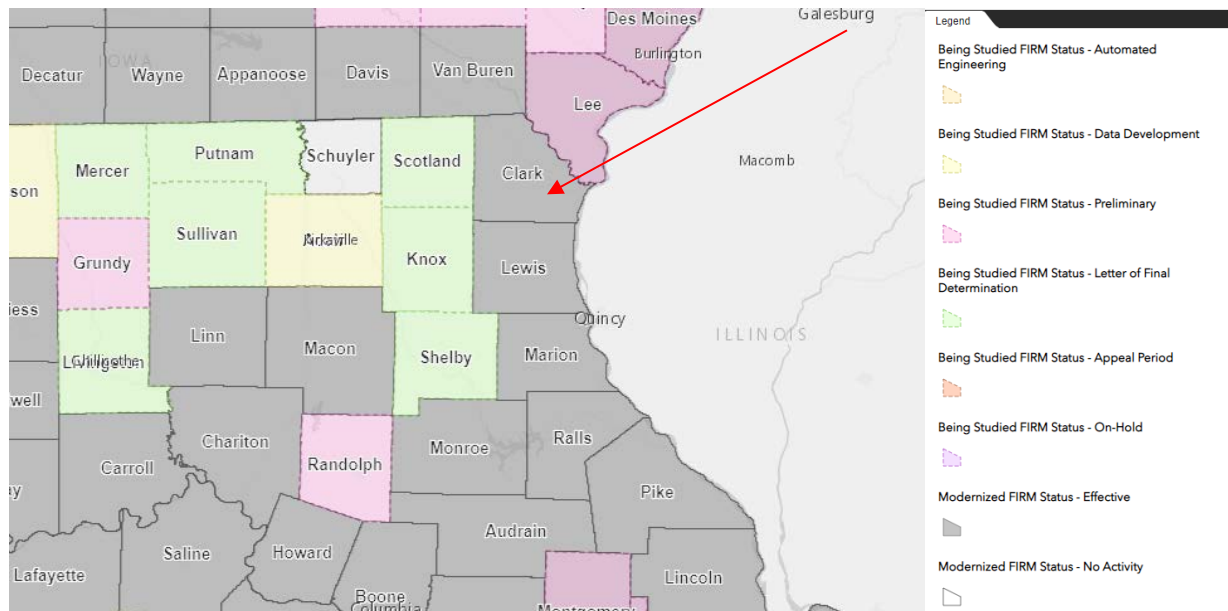
The Clark County stakeholders were sent an invitation to attend the second planning meeting and a separate email was sent seeking their input. Stakeholders invited to participate include, police departments, fire departments, nursing homes, economic developer, Missouri Department of Natural Resources, Missouri Department of Transportation, water districts, and ambulance districts. Neighboring communities were informed of the Clark County plan update and were invited to attend or offer input to the plan as they saw fit. No comments were received from the stakeholders during the planning process.

Coordination with FEMA Risk MAP Project

Clark County current Modernized Firm Status is "Effective as of September 1, 2019.

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

Figure 1.1. RiskMAP Study Status Map



Integration of Other Data, Reports, Studies, and Plans

Other documents critical to the formation to the plan included the Flood Insurance Studies (FIS), Flood Insurance Rate Maps (FIRMs), State Department of Natural Resources (DNR) dam information, the National Inventory of Dams (NID), dam inspection reports, state fire reports, Wildland/Urban Interface and Intermix areas from the SILVIS Lab - Department of Forest Ecology and Management - University of Wisconsin, local comprehensive plans, economic development plans, US Department of Agriculture's (USDA) Risk Management Agency Crop Insurance Statistics, and local budgets.

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

At the March 5, 2019 meeting MPC profiled their hazards which was accomplished by reviewing:

- 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 results of this process can be reviewed in Section 3 of this document. Data Collection Questionnaires from the previous plan update were disseminated to jurisdictions in attendance. Participants were requested to review and update the Questionnaires and submit to the RPC no later than May 1, 2019. An email and face to face meeting with those not in attendance but considered potential planning team members were sent requesting completion of the Data Collection Questionnaire.

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

Assets were identified with demographic data from the US Census, Census of Agriculture, GIS Structure data, Data Collection Questionnaires and information from the RPC.

All loss estimates could not be provided due to lack of information provided by participating Jurisdictions. MPC members could not ascertain the value of buildings in the community, thus the information was not provided.

Step 6: Set Goals (Handbook Task 6)

The MPC reviewed the goals from the previously approved plan at the September 10, 2018 meeting and amended and consolidated the previous goals.

1. Public Awareness- Using a variety of communications avenues to increase the citizens awareness of and promote education about the natural hazards that they may face, their vulnerability to these hazards, and how to lessen the effect of future natural hazards.
2. Strengthen communication and coordination between local governments, emergency personnel, public agencies, and citizens to mitigate the effect of future natural hazards.
3. Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties; on natural resources; on infrastructure; and on the local economy.

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

As part of the in person and phone meetings, members were asked to review the mitigation strategy from the previously approved plan and note changes and update as it pertains to their individual jurisdictions. Committee members were requested to address progress (or lack thereof) on previously identified actions in the previously approved plan. MPC members were encouraged to continue forward only those actions that substantively address long-term mitigation solutions to the risks identified in the risk assessment.

There were virtually no changes to any of the risk's assessment in the plan. The MPC used the STAPLEE method to analyze and prioritize proposed actions.

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

Proposed actions were provided by MPC members and rated using the STAPLEE methodology. These actions were reviewed for concurrence by the MPC during the final review of the draft plan.

Step 9: Adopt the Plan
(Handbook Task 8)

After the majority of the draft plan was composed, adoption resolution examples were given to the jurisdictional representatives and requested for adoption by whatever means their jurisdictions utilize for such activities.

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

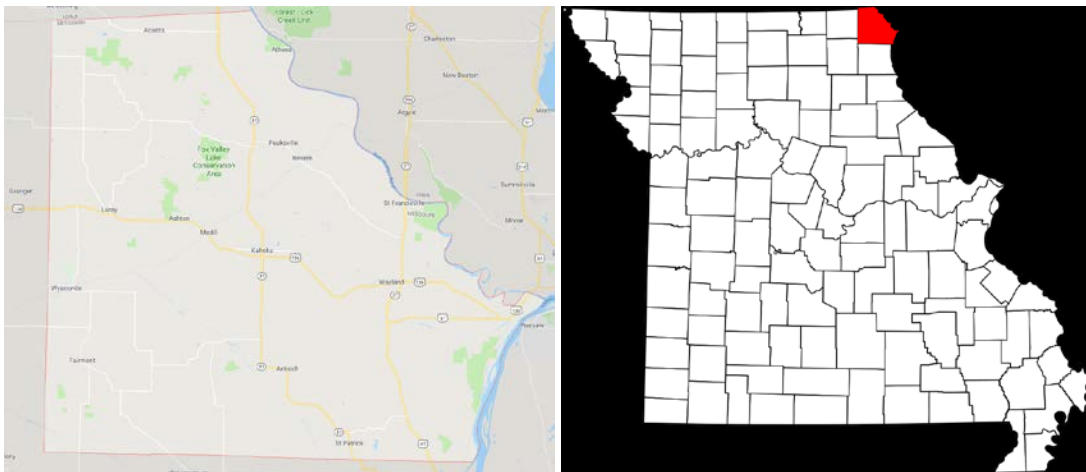
Part of the plan draft development included an outline of plan maintenance (Chapter 5) and was discussed and accepted by the MPC members in face to face and phone meetings. This process includes reviews annually and in the wake of any significant hazard event, as well as provisions for the five-year update process.

2 PLANNING AREA PROFILE AND CAPABILITIES

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2.1 CLARK COUNTY PLANNING AREA PROFILE

Figure 2.1. Map of Clark County



According to the US Census, the population estimate for Clark County as of July 1, 2018 is 6,842 persons compared to the 2010 Census population of 7,139; a decrease of 4.34% in the seven-year period. This decrease in population falls far behind the growth estimate for the State of Missouri for the same time period (1.6%) and of the Nation at 4.1%. According to the 2015 American Community Survey Estimates, Clark County has experienced 8.3% decrease in population since the 2000 Census.

The Clark County median household income from the 2000 US Census is \$29,457, as of the 2010 US Census is \$38,133 this is an approximate a 29.45% increase. This percent of growth falls just higher than the growth estimate for the Nation for the same time period (28.3%) and higher than the State of Missouri at 27%.

2.2.1 Geography, Geology and Topography

Clark County has a total of 511.9 square miles of land and approximately 4.59 square miles is water.

The County is a mix of residents living in unincorporated and incorporated areas. Kahoka is the largest community with a population of 2,078, Wayland has 533 residents, Wyaconda is home to 227 residents, Alexandria has 159 residents, Luray has 99 residents, while Revere has 79 residents according to the 2010 US Census. The remaining population of 3,785 resides in unincorporated areas of the County. The county has maintained its population with only a slight decrease in population.

2.2.2 Climate

Clark County has an annual average of 39 inches of rainfall and 29 inches of snow per year. Clark County averages 199 sunny days per year with the national average being 205 days. Annual average high is 87 degrees and the average annual low is 15 degrees.

2.2.3 Population/Demographics

Table 2.1. Clark County Population 2000-2010 by Jurisdiction

Jurisdiction	2000 Population	2010 Population	# Change (2000-2010)	% Change (2000-2010)
Clark County Total	7,416	7,139	-277	-3.73%
Kahoka	2,241	2,078	-163	-7.27%
Wayland	425	533	+108	+25.41%
Wyaconda	310	227	-83	-26.77%
Alexandria	166	159	-7	-4.21%
Luray	102	99	-3	-2.94%
Revere	121	79	-42	-34.7%

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

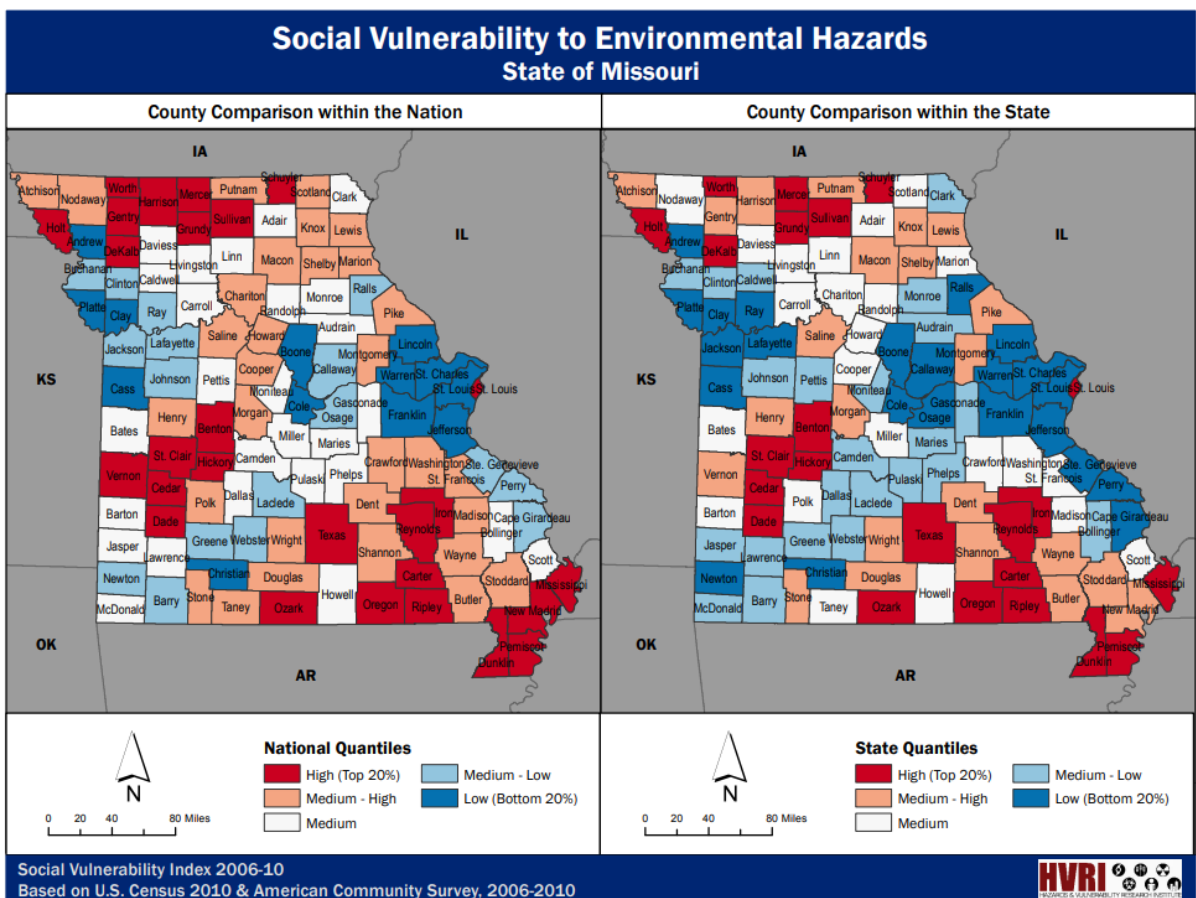
According to 2010 Census data 6.9% of the County's population was under the age of 5 (492). This percentage aligns closely with the nation at 6.5% and the State at 6.5%. Clark County has a population of 1,261 (17.7%) residents who are over the age of 65. At the National level 13.0% of residents are 65 and over; while 14.0% of Missourians are over the age of 65. The median age of residents in the County is 42.3 with the highest percentage of residents falling between the ages of 45-49. The median age of residents of the US is 37.2 with 37.9 being the median age of residents of Missouri.

There are 2,933 total occupied households in the County. The average household size is 2.40 compared to that of the Nation at 2.58 and the State at 2.45. Of the County's occupied households, 872 had children under the age of 18 (29.7%) and 29.6% occupied with individuals 65 and over. Racial makeup of the County is predominately white (98.2%) with (0.6%) being of Hispanic descent.

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.

According to the SoVI Score for Monroe County, they have a medium social vulnerability to environmental hazards compared to the nation and a medium-low social vulnerability when compared to the state of Missouri.

Figure 2.2. SoVI for Clark County



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

Table 2.2. Unemployment, Poverty, Education, and Language Percentage Demographics, Clark 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 with spoken language other than English
Clark County	3,327	2.8%	10.0%	85.4%	13.2%	5.1%
Kahoka	1051	5.9%	12.1%	86%	12.7%	.7%
Wayland	183	15.3%	.8%	72.4%	5.0%	.4%
Wyaconda	102	2%	19.4%	79.2%	4.8%	0%
Luray	38	18.4%	0%	85.7%	8.2%	0%
Alexandria	59	3.4%	25%	86.7%	0%	.9%
Revere	28	0%	29.4%	96.2%	0%	0%

Source: U.S. Census, 2017 American Community Survey, 5-year Estimates.

2.2.4 History

Clark County is located in the very northeast corner of the State of Missouri in the United States of America. The county seat is the City of Kahoka. The county was organized on December 16, 1836 and named for William Clark, leader of the Lewis and Clark expedition and later Governor of Missouri Territory. Missouri folklorist Margot Ford McMillen wrote that early settlers were attracted to Clark County's good and inexpensive agricultural land. One section was called "Bit Nation" because land was sold there for just twelve and one-half cents ("one bit" of a Spanish dollar) an acre.

Today the incorporated cities of Kahoka, Wayland, Wyaconda, Luray, Alexandria, and Revere lie within the boundaries of Clark County. There is in addition several unincorporated small villages within the county and those location can be found on the Clark County base map.

Schools of Clark County

Clark County R-1 School District

2.2.5 Occupations

Table 2.3 provides occupation statistics for the incorporated cities and the county as a whole.

Table 2.3. Occupation Statistics, Clark 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
Clark County	867	426	566	435	841
City of Kahoka	183	218	186	101	314
City of Wayland	45	43	46	44	64
City of Wyaconda	8	10	7	25	25
City of Alexandria	5	8	3	5	21
Village of Luray	0	2	14	3	13
City of Revere	2	0	5	8	6

Source: U.S. Census, 2017 American Community Survey, 5-year Estimates

2.2.6 Agriculture

Clark County has a total of 673 farms with the total acreage of 241,121 acres. The average farm size is 358 acres which is higher than the state average of 285 acres. The top crops for Clark County are Soybeans with 59,576 acres and Corn with 46,706 acres. The average value of product sold per farm was \$107,064.

2.2.7 FEMA Hazard Mitigation Assistance (HMA) Grants in Planning Area

Table 2.4. FEMA HMA Grants in County from 1993-2019

Disaster Declaration	Project Type	Sub-Grantee	Date Approved	Project Total
995	Acquisition of Private Real Property	Clark County	5/6/1994	\$205,520.00
995	Acquisition of Private Real Property	City of Alexandria	3/31/1994	\$931,412.00
Total				\$1,136,932.00

Source: Federal Emergency Management Agency, September 1, 2019

2.2.8 FEMA Public Assistance (PA) Grants in Planning Area

Table 2.5. FEMA PA Grants in County from 1993-2018

Disaster #	Application Title	Applicant ID	Damage Category	Project Size	Project Amt.
1412	EARTH DAM DAMAGES	045-UCHJY-00	Water Control Facilities	Small	\$28,750.00
1412	EMERGENCY PROTECTIVE MEASURES	045-UCHJY-00	Protective Measures	Small	\$4,393.03
1412	ROAD/CULVERT WASHOUTS	045-99045-00	Roads and Bridges	Large	\$88,186.14
1412	BRIDGE DAMAGED	045-99045-00	Roads and Bridges	Small	\$16,803.15
1412	HEAVY RAINS	045-99045-00	Roads and Bridges	Small	\$18,140.89
1773	BOAT LAUNCH / ROAD WASHOUT - REVISED 08/04/08	045-00604-00	Recreational or Other	Small	\$7,563.54
1773	EMERGENCY PUMPING ON A USACE LEVEE, (WITHOUT A SIGNED COOPERATION AGREEMENT)	045-00604-00	Protective Measures	Small	\$10,212.00
1773	DONATED RESOURCES	045-00604-00	Protective Measures	Small	\$613.67
1773	EMERGENCY WORK ON A USACE LEVEE, (NOT INCLUDING EMERGENCY PUMPING)	045-00604-00	Protective Measures	Small	\$43,188.00
1773	PA PILOT - DEBRIS REMOVAL	045-UVDF7-00	Debris Removal	Small	\$13,768.28
1773	PA PILOT - DEBRIS REMOVAL - REVISED 9/16/08	045-00604-00	Debris Removal	Small	\$1,841.00
1773	DONATED RESOURCES	045-UVDF7-00	Protective Measures	Small	\$749.95
1773	EMERGENCY PROTECTIVE MEASURES ON USACE LEVEE	045-UVDF7-00	Protective Measures	Small	\$3,975.00
1773	ROAD WASHOUT (REVISED 8-23-08)	045-UVDF7-00	Roads and Bridges	Small	\$7,832.14
1773	ROAD WASHOUT	045-UVDF7-00	Roads and Bridges	Small	\$18,034.02
1773	EMERGENCY PROTECTIVE MEASURES	045-UCHJY-00	Protective Measures	Large	\$137,682.50
1773	CULVERT DAMAGES	045-99045-00	Roads and Bridges	Small	\$21,257.46

1773	CULVERT DAMAGE	045-99045-00	Roads and Bridges	Small	\$23,755.20
1773	ROAD WASHOUT	045-99045-00	Roads and Bridges	Small	\$26,376.31
1773	ROAD WASHOUT	045-99045-00	Roads and Bridges	Small	\$11,096.65
1773	DEBRIS FROM A USACE LEVEE	045-U5PNB-00	Debris Removal	Small	\$28,300.00
1773	ROAD / CULVERT WASHOUT	045-99045-00	Roads and Bridges	Small	\$32,338.56
1773	ROAD / CULVERT WASHOUT	045-99045-00	Roads and Bridges	Small	\$14,323.58
1773	DONATED RESOURCES	045-UCHJY-00	Protective Measures	Small	\$17,715.08
1773	ROAD WASHOUT	045-99045-00	Roads and Bridges	Small	\$16,595.72
1773	ROAD WASHOUT	045-99045-00	Roads and Bridges	Small	\$17,754.19
1773	EMERGENCY PROTECTIVE MEASURES	045-99045-00	Protective Measures	Small	\$2,071.83
1773	ROAD WASHOUT	045-99045-00	Roads and Bridges	Small	\$18,908.17
1773	ROAD WASHOUT	045-99045-00	Roads and Bridges	Small	\$17,287.20
1773	LEVEE ROAD WASHOUT	045-99045-00	Roads and Bridges	Small	\$59,973.46
1773	ROAD WASHOUT	045-99045-00	Roads and Bridges	Small	\$10,055.30
1773	EMERGENCY PROTECTIVE MEASURES	045-UCHJY-00	Protective Measures	Small	\$20,000.00
1773	EMERGENCY PROTECTIVE MEASURES	045-UCHJY-00	Protective Measures	Large	\$115,882.17
1773	DEBRIS FROM A USACE LEVEE	045-UCHJY-00	Debris Removal	Small	\$44,975.00
1773	DONATED RESOURCE - CORRECTION	045-99045-00	Protective Measures	Small	\$276.24
1773	DONATED RESOURCE - CORRECTION	045-00604-00	Protective Measures	Small	\$7,120.00
1809	Clark County DM006	045-99045-00	Roads and Bridges	Small	\$3,871.17
1809	Clark County - DM005	045-99045-00	Debris Removal	Small	\$9,004.31
1809	Gravel Roads DM003	045-99045-00	Roads and Bridges	Small	\$4,947.62
1809	Bridge Erosion-DM007	045-99045-00	Roads and Bridges	Small	\$1,177.09
1809	Roads-DM002	045-99045-00	Roads and Bridges	Small	\$6,005.29
1934	CLJL01-1934-Wayland Special Road District	045-UVDF7-00	Roads and Bridges	Small	\$2,532.42
1934	CLJL04-1934-Clark County	045-99045-00	Roads and Bridges	Small	\$10,067.37
1934	CLJL02 1934 Wayland Special Road District	045-UVDF7-00	Roads and Bridges	Small	\$49,809.00
1934	ALEX002-1934- Alexandria	045-00604-00	Debris Removal	Small	\$2,972.00
1934	CLRKET3-1934-Clark County	045-99045-00	Roads and Bridges	Small	\$34,275.12
1934	CLTS03-1934-Clark County	045-99045-00	Roads and Bridges	Small	\$7,791.11
1934	ALEX001-1934- Alexandria	045-00604-00	Protective Measures	Small	\$12,328.00
1934	CLMP001-1934-Clark County	045-99045-00	Roads and Bridges	Small	\$36,550.55
1934	ALEX004-1934- Alexandria	045-00604-00	Roads and Bridges	Small	\$1,804.80
1934	CLTS02-1934-Clark County	045-99045-00	Roads and Bridges	Small	\$6,565.40
1934	CLMP005-1934-Clark County	045-99045-00	Roads and Bridges	Small	\$11,580.58
1934	CLMP002-Graveled surfce roadways	045-99045-00	Roads and Bridges	Small	\$8,181.34
1934	CLJL05-1934-Clark County	045-99045-00	Roads and Bridges	Small	\$27,116.69
1934	ALEX003-Donated Resources	045-00604-00	Protective Measures	Small	\$2,204.76
1934	CLTS01-1934-Clark County	045-99045-00	Roads and Bridges	Small	\$6,453.21
1934	CLJL03-1934-Clark County	045-99045-00	Roads and Bridges	Small	\$3,616.99
1934	CLMP004-1934-Clark County	045-99045-00	Roads and Bridges	Small	\$13,383.35
1934	CLMP003-1934-Clark County	045-99045-00	Roads and Bridges	Small	\$11,118.11
1934	CLJL06- Road Aggregate	045-99045-00	Roads and Bridges	Small	\$27,496.42

1934	DCS14 - Emergency Protective Measures	045-U5PNB-00	Protective Measures	Large	\$91,404.00
1934	DCS06-Emergency Protective Measures	045-UCHJY-00	Protective Measures	Large	\$178,465.53
1934	DCS07-Debris Removal	045-UCHJY-00	Debris Removal	Small	\$3,041.80
1934	CLTS05- Clark County Road CR 173	045-99045-00	Roads and Bridges	Small	\$11,122.89
1934	CLLW03- Road	045-99045-00	Roads and Bridges	Small	\$9,600.00
1934	CLMP006- Gravel surfaced roadways	045-99045-00	Roads and Bridges	Small	\$41,060.03
1934	CLLW02- Low water Crossing	045-99045-00	Roads and Bridges	Small	\$23,500.00
1934	CLLW01- Low Water Crossing	045-99045-00	Roads and Bridges	Small	\$18,000.00
1934	CLTS04- Roads, Ditches & Embankments	045-99045-00	Roads and Bridges	Small	\$18,414.23
1934	DCS15 - Donated Resources	045-U5PNB-00	Protective Measures	Small	\$2,177.50
1934	CL-MP1 - Bridge abutment wing slopes	045-99045-00	Roads and Bridges	Small	\$8,042.00
1961	CCSDB01-Snow Removal	045-00F0E-00	Protective Measures	Small	\$1,457.50
1961	CCSDB02-Donated Resources Snow Removal	045-00F0E-00	Protective Measures	Small	\$1,447.12
1961	CC-B01 - Emergency Protective Measures - 48 Hour	045-99045-00	Protective Measures	Small	\$17,510.76
1961	COKB01-Snow Removal	045-37790-00	Protective Measures	Small	\$7,294.41
1961	CC-E02 - Graders	045-99045-00	Public Buildings	Small	\$1,000.00
1961	CC-B02-Donated Resources Snow Removal	045-99045-00	Protective Measures	Small	\$1,605.84
4130	CCCC02C - Clark County Culvert	045-99045-00	Roads and Bridges	Small	\$36,552.53
4130	CCCC01C - Road and Culvert Repair	045-99045-00	Roads and Bridges	Small	\$43,619.61
4238	MMS113C - Roads - Clark (County)	045-99045-00	Roads and Bridges	Small	\$12,775.94
4238	MMS106C - Roads - Clark (County)	045-99045-00	Roads and Bridges	Small	\$10,410.19
4238	MMS115C - Roads - Clark (County)	045-99045-00	Roads and Bridges	Small	\$13,049.05
4238	MMS114C - Roads - Clark (County)	045-99045-00	Roads and Bridges	Small	\$12,842.67
4238	MMS128C - Roads - Clark (County)	045-99045-00	Roads and Bridges	Small	\$10,732.32
4238	RLY001A - Debris Removal	045-99045-00	Debris Removal	Small	\$11,971.30
4238	MMS037C - Roads - Clark (County)	045-99045-00	Roads and Bridges	Small	\$29,045.49
4238	MMS126C - Roads - Clark (County)	045-99045-00	Roads and Bridges	Small	\$14,097.38
Total:					\$1,838,888.94

Source: Federal Emergency Management Agency, September 1, 2019

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 and ongoing mitigation capabilities 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 Clark County

By Missouri State Statute (Section 48.020.1) Clark County is defined as a 3rd Class County, meaning it's assessed valuation is less than six hundred million dollars. The County seat is located in Kahoka.

Clark county has six cities and villages (City of Kahoka, City of Wayland, City of Wyaconda, Village of Luray, City of Alexandria, and the Village of Revere). The county government provides services such as law enforcement, judicial services, land records, tax collection, property assessment, administration of elections, construction and maintenance of roads and bridges.

The County is governed by an elected board of Commissioners composed of a Presiding Commissioner, Eastern District Commissioner, and Western District Commissioner. Other positions within Clark County include:

- County Assessor
- County Prosecuting Attorney
- County Public Administrator
- County Recorder
- County Sheriff
- County Collector of Revenue
- Emergency Management
- Circuit Clerk
- County Coroner
- County Treasurer
- County Road and Bridge Supervisor

Mitigation Initiatives/Capabilities

The County of Clark as well as the City of Kahoka have an Emergency Management Director (EMD). The EMD plans and directs disaster responses or crisis management activities, provides disaster preparedness training and prepares emergency plans and procedures for natural disasters.

Table 26. Unincorporated Clark County Mitigation Capabilities

Capabilities	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	No
Builder's Plan	No
Capital Improvement Plan	No
City Emergency Operations Plan	No
County Emergency Operations Plan	Yes-2018
Local Recovery Plan	No
County Recovery Plan	No
City Mitigation Plan	No
County Mitigation Plan	No
Debris Management Plan	Yes-2018
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	
Zoning Ordinance	No
Building Code	No
Floodplain Ordinance	Yes-2012
Subdivision Ordinance	No
Tree Trimming Ordinance	No
Nuisance Ordinance	No
Stormwater Ordinance	No
Drainage Ordinance	No
Site Plan Review Requirements	No
Historic Preservation Ordinance	No
Landscape Ordinance	No
Program	
Zoning/Land Use Restrictions	No
Codes Building Site/Design	No
Hazard Awareness Program	No
National Flood Insurance Program (NFIP)	Yes
NFIP Community Rating System (CRS) program	No
National Weather Service (NWS) Storm Ready	No
Firewise Community Certification	No
Building Code Effectiveness Grading (BCEGs)	No
ISO Fire Rating	Varies by district

Capabilities	Status Including Date of Document or Policy
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)	N/A
Mutual Aid Agreements	Yes
Studies/Reports/Maps	
Hazard Analysis/Risk Assessment (Local)	N/A
Hazard Analysis/Risk Assessment (County)	N/A
Flood Insurance Maps	Yes
FEMA Flood Insurance Study (Detailed)	No
Evacuation Route Map	No
Critical Facilities Inventory	No
Vulnerable Population Inventory	No
Land Use Map	No
Staff/Department	
Building Code Official	N/A
Building Inspector	N/A
Mapping Specialist (GIS)	N/A
Engineer	N/A
Development Planner	No
Public Works Official	N/A
Emergency Management Director	Yes
NFIP Floodplain Administrator	Yes
Emergency Response Team	No
Hazardous Materials Expert	No
Local Emergency Planning Committee	Yes
County Emergency Management Commission	No
Sanitation Department	No
Transportation Department	No
Economic Development Department	No
Housing Department	No
Historic Preservation	No
Non-Governmental Organizations (NGOs)	
American Red Cross	Yes
Salvation Army	No
Veterans Groups	Yes
Local Environmental Organization	No
Homeowner Associations	No
Neighborhood Associations	No
Chamber of Commerce	Yes
Community Organizations (Lions, Kiwanis, etc.)	No

Capabilities	Status Including Date of Document or Policy
Local Funding Availability	
Apply for Community Development Block	Yes
Fund projects through Capital	Yes
Authority to levy taxes for a specific purpose	N/A
Fees for water, sewer, gas, or electric services	N/A
Impact fees for new development	N/A
Ability to incur debt through general obligation bonds	N/A
Ability to incur debt through special tax bonds	N/A
Ability to incur debt through private activities	N/A
Withhold spending in hazard prone areas	N/A

Source: Data Collection Questionnaire, 4/23/2019

2.2.2 City of Kahoka

The City of Kahoka was platted in 1858 and named for the Cahokia Tribe of the Iliniwek or Illinois Confederacy. Kahoka is located in the central part of Clark County and the city has a total area of 1.6 square miles.

As of the census of 2010, there were 2,078 people, 883 households, and 521 families living in the city. The population density was 1,323.6 inhabitants per square mile (511.0/km²). There were 1,001 housing units at an average density of 637.6 per square mile (246.2/km²). The racial makeup of the city was 98.5% white, 0.2% African American, 0.1% Native American, 0.2% Asian, 0.1% from other races, and 0.8% from two or more races Hispanic or Latino of any race were 0.7% of the population.

There were 883 households of which 30.2% had children under the age of 18 living with them, 43.0% were married couples living together, 10.5% had a female householder with no husband present, 5.4% had a male householder with no wife present, and 41.0% were non-families. 36.0% of all households were made up of individuals and 18.6% had someone living alone who was 65 years of age or older. The average household size was 2.25 and the average family size was 2.92.

The median age in the city was 39.9 years. 23.7% of residents were under the age of 18; 8.5% were between the ages of 18 and 24; 23.1% were from 25 to 44; 23.6% were from 45 to 64; and 21% were 65 years of age or older. The gender makeup of the city was 46.5% male and 53.5% female.

Table 2.7. City of Kahoka Mitigation Capabilities

Capability	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	NO
Builder's Plan	NO
Capital Improvement Plan	NO
Local Emergency Plan	IN DEVELOPMENT
County Emergency Plan	NA
Local Recovery Plan	NO
County Recovery Plan	NA
Local Mitigation Plan	NO
County Mitigation Plan	Yes
Economic Development Plan	NO
Transportation Plan	NA

Capability	Status Including Date of Document or Policy
Land-use Plan	NO
Flood Mitigation Assistance (FMA) Plan	NA
Watershed Plan	NO
Firewise or other fire mitigation plan	NO
School Mitigation Plan	NO
Critical Facilities Plan (Mitigation/Response/Recovery)	IN PROCESS
Policies/Ordinance	
Zoning Ordinance	NO
Building Code	YES
Floodplain Ordinance	YES
Subdivision Ordinance	NO
Tree Trimming Ordinance	NO
Nuisance Ordinance	YES
Storm Water Ordinance	NO
Drainage Ordinance	NO
Capability	
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	
Zoning/Land Use Restrictions	NO
Codes Building Site/Design	NO
National Flood Insurance Program (NFIP) Participant	YES
NFIP Community Rating System (CRS) Participating Community	NA
Hazard Awareness Program	NO
National Weather Service (NWS) Storm Ready	NO
Building Code Effectiveness Grading (BCEGs)	NO
ISO Fire Rating	6.9
Economic Development Program	NO
Land Use Program	NO
Public Education/Awareness	NO
Property Acquisition	NO
Planning/Zoning Boards	NO
Stream Maintenance Program	NO
Tree Trimming Program	NO
Engineering Studies for Streams (Local/County/Regional)	NO
Mutual Aid Agreements	YES
Studies/Reports/Maps	
Hazard Analysis/Risk Assessment (Local)	YES
Hazard Analysis/Risk Assessment (County)	NA
Flood Insurance Maps	YES
FEMA Flood Insurance Study (Detailed)	NO
Evacuation Route Map	NO
Critical Facilities Inventory	NO
Vulnerable Population Inventory	NO
Land Use Map	NO
Staff/Department	
Building Code Official	YES
Building Inspector	YES
Mapping Specialist (GIS)	NO
Engineer	NO
Development Planner	NO
Public Works Official	NO
Emergency Management Coordinator	YES

Capability	Status Including Date of Document or Policy
NFIP Floodplain Administrator	YES
Emergency Response Team	NO
Hazardous Materials Expert	NO
Local Emergency Planning Committee	YES
County Emergency Management Commission	NO
Sanitation Department	YES
Transportation Department	YES
Economic Development Department	NO
Housing Department	NO
Historic Preservation	NO
Non-Governmental Organizations (NGOs)	
American Red Cross	NO
Salvation Army	NO
Veterans Groups	YES
Environmental Organization	NO
Homeowner Associations	NO
Neighborhood Associations	NO
Chamber of Commerce	YES
Community Organizations (Lions, Kiwanis, etc.)	YES
Local Funding Availability	
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	YES

Source: Data Collection Questionnaire, 3/14/2019

2.2.3 City of Wayland

Wayland was laid out in 1880. The city was named for Jerre Wayland, a pioneer settler. A post office called Wayland has been in operation since 1874.

Sickles Tavern was listed on the National Register of Historic Places in 1986.

According to the United States Census Bureau, the city has a total area of 0.67 square miles, all land.

As of the census^[2] of 2010, there were 533 people, 233 households, and 138 families living in the city. The population density was 795.5 inhabitants per square mile (307.1/km²). There were 249 housing units at an average density of 371.6 per square mile (143.5/km²). The racial makeup of the city was 98.5% White, 0.2% African American, 0.4% Asian, 0.2% from other races, and 0.8% from two or more races. Hispanic or Latino of any race were 0.6% of the population.

There were 233 households of which 29.2% had children under the age of 18 living with them, 43.3% were married couples living together, 7.7% had a female householder with no husband present, 8.2% had a male householder with no wife present, and 40.8% were non-families. 35.2% of all households were made up of individuals and 13.3% had someone living alone who was 65 years of age or older. The average household size was 2.29 and the average family size was 2.92.

The median age in the city was 38.9 years. 24.6% of residents were under the age of 18; 7.9% were between the ages of 18 and 24; 23.6% were from 25 to 44; 27.9% were from 45 to 64; and 15.9% were 65 years of age or older. The gender makeup of the city was 48.6% male and 51.4% female.

Table 2.8. Wayland Mitigation Capabilities

Capability	Status Including Date of Document or Policy
Planning Capabilities	
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	Yes
County Mitigation Plan	Yes
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	
Zoning Ordinance	No
Building Code	No
Floodplain Ordinance	Yes
Subdivision Ordinance	No
Tree Trimming Ordinance	No
Nuisance Ordinance	No
Storm Water Ordinance	No
Drainage Ordinance	No
Capability	
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	
Zoning/Land Use Restrictions	No
Codes Building Site/Design	No
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	6.9
Economic Development Program	No
Land Use Program	No
Public Education/Awareness	No
Property Acquisition	No
Planning/Zoning Boards	No
Stream Maintenance Program	No
Tree Trimming Program	No
Engineering Studies for Streams (Local/County/Regional)	No
Mutual Aid Agreements	Yes
Studies/Reports/Maps	
Hazard Analysis/Risk Assessment (Local)	No
Hazard Analysis/Risk Assessment (County)	No

Capability	Status Including Date of Document or Policy
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	
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	Yes
Emergency Response Team	No
Hazardous Materials Expert	No
Local Emergency Planning Committee	Yes
County Emergency Management Commission	No
Sanitation Department	No
Transportation Department	No
Economic Development Department	No
Housing Department	No
Historic Preservation	No
Non-Governmental Organizations (NGOs)	
American Red Cross	No
Salvation Army	No
Veterans Groups	Yes
Environmental Organization	No
Homeowner Associations	No
Neighborhood Associations	No
Chamber of Commerce	Yes
Community Organizations (Lions, Kiwanis, etc.)	Yes
Local Funding Availability	
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	No
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 Questionnaire

2.2.4 City of Wyaconda

Wyaconda is a city in Clark County, Missouri, United States. The population was 227 at the 2010 census. The city was organized in 1888 and is named after a Siouan name for God or the Great Spirit. The first land purchased from the Santa Fe and Land Co. was in 1888.

According to the United States Census Bureau, the city has a total area of 0.64 square miles, all land.

At the 2010 census, there were 227 people, 108 households and 63 families in the city. The population density was 354.7 inhabitants per square mile (137.0/km²). There were 140 housing

units at an average density of 218.8 per square mile (84.5/km²). The racial makeup of the city was 98.2% White and 1.8% from two or more races.

There were 108 households of which 27.8% had children under the age of 18 living with them, 43.5% were married couples living together, 9.3% had a female householder with no husband present, 5.6% had a male householder with no wife present, and 41.7% were non-families. 38.0% of all households were made up of individuals and 16.6% had someone living alone who was 65 years of age or older. The average household size was 2.10 and the average family size was 2.76.

The median age was 43.5 years. 24.2% of residents were under the age of 18; 4.7% were between the ages of 18 and 24; 22.1% were from 25 to 44; 30.4% were from 45 to 64; and 18.5% were 65 years of age or older. The population was 49.3% male and 50.7% female.

Table 2.9. Wyaconda Mitigation Capabilities

Capability	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	NO
Builder's Plan	NO
Capital Improvement Plan	NO
Local Emergency Plan	NO
County Emergency Plan	NA
Local Recovery Plan	NO
County Recovery Plan	NA
Local Mitigation Plan	NO
County Mitigation Plan	Yes
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)	IN PROCESS
Policies/Ordinance	
Zoning Ordinance	NO
Building Code	NO
Floodplain Ordinance	Yes
Subdivision Ordinance	NO
Tree Trimming Ordinance	NO
Nuisance Ordinance	NO
Storm Water Ordinance	NO
Drainage Ordinance	NO
Capability	
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	
Zoning/Land Use Restrictions	NO
Codes Building Site/Design	NO
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	6.9

Capability	Status Including Date of Document or Policy
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	YES
Studies/Reports/Maps	
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	
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	Yes
Emergency Response Team	NO
Hazardous Materials Expert	NO
Local Emergency Planning Committee	YES
County Emergency Management Commission	NO
Sanitation Department	NO
Transportation Department	NO
Economic Development Department	NO
Housing Department	NO
Historic Preservation	NO
Non-Governmental Organizations (NGOs)	
American Red Cross	NO
Salvation Army	NO
Veterans Groups	YES
Environmental Organization	NO
Homeowner Associations	NO
Neighborhood Associations	NO
Chamber of Commerce	YES
Community Organizations (Lions, Kiwanis, etc.)	YES
Local Funding Availability	
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	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 Questionnaire

2.2.5 City of Alexandria

Alexandria was founded in the 1830s. The community was named after John Alexander, the proprietor of a nearby ferry. A post office called Alexandria has been in operation since 1840.

According to the United States Census Bureau, the city has a total area of 0.39 square miles (1.01 km²), of which 0.38 square miles (0.98 km²) is land and 0.01 square miles (0.03 km²) is water. Located along the Mississippi River, Alexandria is prone to flooding, with large swaths of the area submerged during the Great Flood of 1993.

As of the census of 2010, there were 159 people, 67 households, and 45 families living in the city. The population density was 418.4 inhabitants per square mile (161.5/km²). There were 77 housing units at an average density of 202.6 per square mile (78.2/km²). The racial makeup of the city was 96.9% White, 0.6% African American, and 2.5% from two or more races.

There were 67 households of which 31.3% had children under the age of 18 living with them, 50.7% were married couples living together, 13.4% had a female householder with no husband present, 3.0% had a male householder with no wife present, and 32.8% were non-families. 28.4% of all households were made up of individuals and 7.5% had someone living alone who was 65 years of age or older. The average household size was 2.37 and the average family size was 2.93.

The median age in the city was 41.5 years. 24.5% of residents were under the age of 18; 5% were between the ages of 18 and 24; 26.4% were from 25 to 44; 32% were from 45 to 64; and 11.9% were 65 years of age or older. The gender makeup of the city was 54.1% male and 45.9% female.

Table 2.10. Alexandria Mitigation Capabilities

Capability	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	NO
Builder's Plan	No
Capital Improvement Plan	No
Local Emergency Plan	No
County Emergency Plan	NA
Local Recovery Plan	NO
County Recovery Plan	NA
Local Mitigation Plan	NO
County Mitigation Plan	Yes
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	NA
Critical Facilities Plan (Mitigation/Response/Recovery)	NO
Policies/Ordinance	
Zoning Ordinance	NO
Building Code	NO
Floodplain Ordinance	Yes
Subdivision Ordinance	NO
Tree Trimming Ordinance	NO
Nuisance Ordinance	YES
Storm Water Ordinance	NO
Drainage Ordinance	NO
Capability	
Site Plan Review Requirements	NO

Capability	Status Including Date of Document or Policy
Historic Preservation Ordinance	NO
Landscape Ordinance	NO
Iowa Wetlands and Riparian Areas Conservation Plan	NO
Debris Management Plan	NO
Program	
Zoning/Land Use Restrictions	NO
Codes Building Site/Design	NO
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	6.9
Economic Development Program	NO
Land Use Program	NO
Public Education/Awareness	NO
Property Acquisition	NO
Planning/Zoning Boards	NO
Stream Maintenance Program	NO
Tree Trimming Program	NO
Engineering Studies for Streams (Local/County/Regional)	NO
Mutual Aid Agreements	Yes
Studies/Reports/Maps	
Hazard Analysis/Risk Assessment (Local)	NO
Hazard Analysis/Risk Assessment (County)	NA
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	
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	YES
Emergency Response Team	NO
Hazardous Materials Expert	NO
Local Emergency Planning Committee	YES
County Emergency Management Commission	NO
Sanitation Department	NO
Transportation Department	NO
Economic Development Department	NO
Housing Department	NO
Historic Preservation	NO
Non-Governmental Organizations (NGOs)	
American Red Cross	NO
Salvation Army	NO
Veterans Groups	Yes
Environmental Organization	NO
Homeowner Associations	NO
Neighborhood Associations	NO
Chamber of Commerce	NO

Capability	Status Including Date of Document or Policy
Community Organizations (Lions, Kiwanis, etc.	NO
Local Funding Availability	
Ability to apply for Community Development Block Grants	YES
Ability to fund projects through Capital Improvements funding	NO
Authority to levy taxes for a specific purpose	NO
Fees for water, sewer, gas, or electric services	NO
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 Questionnaire

2.2.6 Village of Luray

Luray was platted in 1837. The source of the name Luray is obscure; according to the State Historical Society of Missouri, most likely it is Native American in origin. A post office called Luray has been in operation since 1841. After 170 years in operation, the Luray office closed on November 4, 2011.

According to the United States Census Bureau, the village has a total area of 0.20 square miles (0.52 km²), all land.

As of the census of 2010, there were 99 people, 37 households, and 22 families residing in the village. The population density was 495.0 inhabitants per square mile (191.1/km²). There were 39 housing units at an average density of 195.0 per square mile (75.3/km²). The racial makeup of the village was 99.0% White and 1.0% African American.

There were 37 households of which 37.8% had children under the age of 18 living with them, 54.1% were married couples living together, 5.4% had a male householder with no wife present, and 40.5% were non-families. 35.1% of all households were made up of individuals and 10.8% had someone living alone who was 65 years of age or older. The average household size was 2.68 and the average family size was 3.27.

The median age in the village was 35.1 years. 33.3% of residents were under the age of 18; 5.1% were between the ages of 18 and 24; 32.4% were from 25 to 44; 20.4% were from 45 to 64; and 9.1% were 65 years of age or older. The gender makeup of the village was 54.5% male and 45.5% female.

Table 2.11. Luray Mitigation Capabilities

Capability	Status Including Date of Document or Policy
Planning Capabilities	
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
Economic Development Plan	NO
Transportation Plan	NO

Capability	Status Including Date of Document or Policy
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)	IN PROCESS
Policies/Ordinance	
Zoning Ordinance	NO
Building Code	NO
Floodplain Ordinance	Yes
Subdivision Ordinance	NO
Tree Trimming Ordinance	NO
Nuisance Ordinance	NO
Storm Water Ordinance	NO
Drainage Ordinance	NO
Capability	
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	
Zoning/Land Use Restrictions	NO
Codes Building Site/Design	NO
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	6.9
Economic Development Program	NO
Land Use Program	NO
Public Education/Awareness	NO
Property Acquisition	NO
Planning/Zoning Boards	NO
Stream Maintenance Program	NO
Tree Trimming Program	NO
Engineering Studies for Streams (Local/County/Regional)	NO
Mutual Aid Agreements	YES
Studies/Reports/Maps	
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	
Building Code Official	NO
Building Inspector	NO
Mapping Specialist (GIS)	NO
Engineer	NO
Development Planner	NO
Public Works Official	NO
Emergency Management Coordinator	YES

Capability	Status Including Date of Document or Policy
NFIP Floodplain Administrator	Yes
Emergency Response Team	NO
Hazardous Materials Expert	NO
Local Emergency Planning Committee	YES
County Emergency Management Commission	NO
Sanitation Department	NO
Transportation Department	NO
Economic Development Department	NO
Housing Department	NO
Historic Preservation	NO
Non-Governmental Organizations (NGOs)	
American Red Cross	NO
Salvation Army	NO
Veterans Groups	YES
Environmental Organization	NO
Homeowner Associations	NO
Neighborhood Associations	NO
Chamber of Commerce	YES
Community Organizations (Lions, Kiwanis, etc.)	YES
Local Funding Availability	
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	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 Questionnaire

2.2.7 City of Revere

Revere is a village in Clark County, Missouri, United States. The population was 79 at the 2010 census, at which time it was a town and has a total area of .19 square miles, all land.

Founded on October 22, 1887 by the Santa Fe Railroad, Revere was "probably named in honor of Paul Revere." During the period prior to 1900, Revere flourished as an intermediate stop for the railroad.

In 1898, J.H. Talbott of Luray started the Revere Current, a weekly newspaper that consisted of five pages of world and local news including advertisements, train schedule and local markets. Circulation closed on July 18, 1901 when Talbott left for law school.

Located at the former site of the Revere Methodist Church, Ar-Del Park was dedicated on May 30, 1946 as a memorial to Revere natives John Arnold Wallace and Delmar Brown, who died serving their country during World War II. A large boulder with a plaque dedicated to all Clark County veterans is located in the park.

Revere was a town into the 2000s, but became a village after a change in state law: a 2009 law provided for the conversion of all towns with fewer than five hundred residents into villages. On July 26, 2011 the United States Postal Service announced plans to consider closing the Revere post office as part of a nationwide restructuring plan. On May 9, 2012 it was announced that a new strategy would preserve the nation's smallest post offices, reversing the earlier plan.

Table 2.12. Revere Mitigation Capabilities

Capability	Status Including Date of Document or Policy
Planning Capabilities	
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
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)	IN PROCESS
Policies/Ordinance	
Zoning Ordinance	NO
Building Code	NO
Floodplain Ordinance	Yes
Subdivision Ordinance	NO
Tree Trimming Ordinance	NO
Nuisance Ordinance	NO
Storm Water Ordinance	NO
Drainage Ordinance	NO
Capability	
Site Plan Review Requirements	NO
Historic Preservation Ordinance	NO
Landscape Ordinance	NO
Iowa Wetlands and Riparian Areas Conservation Plan	NO
Debris Management Plan	YES
Program	
Zoning/Land Use Restrictions	NO
Codes Building Site/Design	NO
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	6.9
Economic Development Program	NO
Land Use Program	NO
Public Education/Awareness	NO
Property Acquisition	NO
Planning/Zoning Boards	NO
Stream Maintenance Program	NO
Tree Trimming Program	NO
Engineering Studies for Streams (Local/County/Regional)	NO
Mutual Aid Agreements	YES
Studies/Reports/Maps	
Hazard Analysis/Risk Assessment (Local)	NO
Hazard Analysis/Risk Assessment (County)	NO

Capability	Status Including Date of Document or Policy
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	
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	Yes
Emergency Response Team	NO
Hazardous Materials Expert	NO
Local Emergency Planning Committee	YES
County Emergency Management Commission	NO
Sanitation Department	NO
Transportation Department	NO
Economic Development Department	NO
Housing Department	NO
Historic Preservation	NO
Non-Governmental Organizations (NGOs)	
American Red Cross	NO
Salvation Army	NO
Veterans Groups	YES
Environmental Organization	NO
Homeowner Associations	NO
Neighborhood Associations	NO
Chamber of Commerce	YES
Community Organizations (Lions, Kiwanis, etc.	YES
Local Funding Availability	
Ability to apply for Community Development Block Grants	YES
Ability to fund projects through Capital Improvements funding	NO
Authority to levy taxes for a specific purpose	YES
Fees for water, sewer, gas, or electric services	YES
Impact fees for new development	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 Questionnaire

2.2.8 Summary of Jurisdictional Capabilities

Table 2.13. Mitigation Capabilities Summary Table

CAPABILITIES	Unicorp. Clark Co.	City of Kahoka	City of Wayland	City of Wyaconda	City of Alexandria	Village of Luray	City of Revere
Planning Capabilities							
Comprehensive Plan	N	N	N	N	N	N	N
Builder's Plan	N	N	N	N	N	N	N
Capital Improvement Plan	N	N	N	N	N	N	N
Local Emergency Plan	N	In Dev.	N	N	N	N	N
County Emergency Plan	Yes	NA	N	Yes	NA	N	N
Local Recovery Plan	N	N	N	N	N	N	N
County Recovery Plan	N	Na	N	Na	Na	N	N
Local Mitigation Plan	N	N	N	N	N	N	N
County Mitigation Plan	Y	Y	Y	Y	Y	Y	Y
Local Mitigation Plan (PDM)	N	N	N	N	N	N	N
County Mitigation Plan (PDM)	N	Na	N	N	N	N	N
Debris Management Plan	Y	Y	N	N	N	N	Y
Economic Development Plan	N	N	N	N	N	N	N
Transportation Plan	N	Na	N	N	N	N	N
Land-use Plan	N	N	N	N	N	N	N
Flood Mitigation Assistance (FMA) Plan	N	Na	N	N	N	N	N
Watershed Plan	N	N	N	N	N	N	N
Firewise or other fire mitigation plan	N	N	N	N	N	N	N
School Mitigation Plan	N	N	N	N	Na	N	N
Critical Facilities Plan (Mitigation/Response/Recovery)	No	IN PROCESS	N	IN PROCESS	No	IN PROCESS	IN PROCESS
Policies/Ordinance							
Zoning Ordinance	N	N	N	N	N	N	N
Building Code	N	Y	N	N	N	N	N
Floodplain Ordinance	Y	Y	Y	Y	Y	Y	Y
Subdivision Ordinance	N	N	N	N	N	N	N
Tree Trimming Ordinance	N	N	N	N	N	N	N
Nuisance Ordinance	N	Y	N	N	Y	N	N
Storm Water Ordinance	N	N	N	N	N	N	N
Drainage Ordinance	N	N	N	N	N	N	N
Site Plan Review Requirements	N	N	N	N	N	N	N
Historic Preservation Ordinance	N	N	N	N	N	N	N
Landscape Ordinance	N	N	N	N	N	N	N
Iowa Wetlands and Riparian Areas Conservation Plan	N	N	N	N	N	N	N
Program							
Zoning/Land Use Restrictions	N	N	N	N	N	N	N
Codes Building Site/Design	N	N	N	N	N	N	N
National Flood Insurance Program (NFIP) Participant	N	Y	Y	Y	Y	Y	Y
NFIP Community Rating System (CRS) Participating Community	N	Na	N	N	N	N	N
Hazard Awareness Program	N	N	N	N	N	N	N
National Weather Service (NWS) Storm Ready	N	N	N	N	N	N	N
Building Code Effectiveness Grading (BCEGs)	N	N	N	N	N	N	N

CAPABILITIES	Unicorp. Clark Co.	City of Kahoka	City of Wayland	City of Wyaconda	City of Alexandria	Village of Luray	City of Revere
ISO Fire Rating	Varies	6.9	6.9	6.9	6.9	6.9	6.9
Economic Development Program	N	N	N	N	N	N	N
Land Use Program	N	N	N	N	N	N	N
Public Education/Awareness	N	N	N	N	N	N	N
Property Acquisition	N	N	N	N	N	N	N
Planning/Zoning Boards	N	N	N	N	N	N	N
Stream Maintenance Program	N	N	N	N	N	N	N
Tree Trimming Program	N	N	N	N	N	N	N
Engineering Studies for Streams (Local/County/Regional)	Na	N	N	N	N	N	N
Mutual Aid Agreements	Y	Y	Y	Y	Y	Y	Y
Studies/Reports/Maps							
Hazard Analysis/Risk Assessment (Local)	Na	Y	N	N	N	N	N
Hazard Analysis/Risk Assessment (County)	Na	Na	N	N	N	N	N
Flood Insurance Maps	Yes	Y	N	N	N	N	N
FEMA Flood Insurance Study (Detailed)	N	N	N	N	N	N	N
Evacuation Route Map	N	N	N	N	N	N	N
Critical Facilities Inventory	N	N	N	N	N	N	N
Vulnerable Population Inventory	N	N	N	N	N	N	N
Land Use Map	N	N	N	N	N	N	N
Staff/Department							
Building Code Official	Na	Y	N	N	N	N	N
Building Inspector	Na	Y	N	N	N	N	N
Mapping Specialist (GIS)	Na	N	N	N	N	N	N
Engineer	Na	N	N	N	N	N	N
Development Planner	N	N	N	N	N	N	N
Public Works Official	Na	N	N	N	N	N	N
Emergency Management Coordinator	Y	Y	Y	Y	Y	Y	Y
NFIP Floodplain Administrator	Y	Y	Y	Y	Y	Y	Y
Emergency Response Team	N	N	N	N	N	N	N
Hazardous Materials Expert	N	N	N	N	N	N	N
Local Emergency Planning Committee	Y	Y	Y	Y	Y	Y	Y
County Emergency Management Commission	N	N	N	N	N	N	N
Sanitation Department	N	Y	N	N	N	N	N
Transportation Department	N	Y	N	N	N	N	N
Economic Development Department	N	N	N	N	N	N	N
Housing Department	N	N	N	N	N	N	N
Historic Preservation	N	N	N	N	N	N	N
Non-Governmental Organizations (NGOs)							
American Red Cross	Y	N	N	N	N	N	N
Salvation Army	N	N	N	N	N	N	N
Veterans Groups	Y	Y	Y	Y	Y	Y	Y
Environmental Organization	N	N	N	N	N	N	N
Homeowner Associations	N	N	N	N	N	N	N
Neighborhood Associations	N	N	N	N	N	N	N
Chamber of Commerce	Y	Y	Y	Y	N	Y	Y

CAPABILITIES	Unicorp. Clark Co.	City of Kahoka	City of Wayland	City of Wyaconda	City of Alexandria	Village of Luray	City of Revere
Community Organizations (Lions, Kiwanis, etc.	Y	Y	Y	Y	N	Y	Y

Financial Resources							
Apply for Community Development Block Grants	Y	Y	Y	Y	Y	Y	Y
Fund projects through Capital Improvements funding	Y	Y	Y	Y	N	Y	N
Authority to levy taxes for specific purposes	Na	Y	Y	Y	N	Y	Y
Fees for water, sewer, gas, or electric services	Na	Y	N	Y	N	Y	Y
Impact fees for new development	Na	N	N	N	N	N	N
Incur debt through general obligation bonds	Na	Y	Y	N	N	N	N
Incur debt through special tax bonds	Na	Y	Y	N	N	N	N
Incur debt through private activities	Na	N	N	N	N	N	N
Withhold spending in hazard prone areas	Na	Y	N	N	N	N	N

Source: Data Collection Questionnaire

2.2.9 Public School District Profiles and Mitigation Capabilities

Clark Co. R-I (023-101)

Phone: 660-727-2377
 Fax: 660-727-2035
 E-mail: rkracht@clarkcounty.k12.mo.us

County-District Code: 023-101
 County: Clark

Congressional District: 06
 House District: 4
 Senate District: 18

427 W Chestnut
 427 W. Chestnut
 Kahoka, MO 63445-1139

Supervisory Area: I
 MSIP: Accredited

Assessed Valuation: \$97,259,820
 Tax Levy: \$3.5000

	Schools	Cert. Staff	Enrollment (Prior Year)		Total
			Residents	Non-Res.	
Elementary Schools	3	55	552	0	552
Middle Schools	1	27	243	0	243
Jr. High Schools	0	0	0	0	0
High Schools	1	40	279	0	279
Total	5	122	1,074	0	1,074

Name	Title	Yrs in District
Mr. Brad Sprague	Pres. of Bd.	
Mrs. Wendy H Johnson	Secy. of Bd.	
Dr. Ritchie Kracht	Supt.	16
Mrs. Wendy Johnson	Secy. To Supt.	6
Mr. Jason R Church	Dir. Activities	25
Mrs. Melissa Schutte	Bkpr.	1
Mrs. Megan Wendling	Dir. Spec. Serv.	24
Mrs. Megan Wendling	Dir. Pat	24
Mrs. Martha Irvin	Dir. Food Serv.	4
Mrs. Erin Hopp	Coord. A+	9
Mrs. Megan Wendling	Prof. Dev. Chairperson	

Clark Co. High (1050)

680 E Main Kahoka, MO 63445-1747
 Phone: 660-727-2205 Fax: 660-727-2245

Grade Span: 09-12

Principal: Mr. Jason Harper (24 years in district)
 E-mail: JHARPER@CLARKCOUNTY.K12.MO.US

Clark Co. Middle (3000)

384 N Jefferson Kahoka, MO 63445-1338
 Phone: 660-727-3319 Fax:660-727-3363

Grade Span: 06-08

Principal: Mr. Jason Church (25 years in district)
 E-mail: JCHURCH@CLARKCOUNTY.K12.MO.US

Black Hawk Elem. (4040)

751 W Chestnut Kahoka, MO 63445-1320
 Phone: 660-727-3318 Fax:660-727-8017

Grade Span: K-05

Principal: Mrs. Betsy Parrish (1 year in district)
 E-mail: bparrish@clarkcounty.k12.mo.us

Running Fox Elem. (4060)

27192 US Highway 61 Alexandria, MO 63430-9752
 Phone: 660-754-6766 Fax:660-754-6725

Grade Span: K-05

Principal: Mrs. Katrina Nixon (13 years in district)
 E-mail: knixon@clarkcounty.k12.mo.us

Early Childhood Center (7500)

566 E Commercial 566 E Commercial Kahoka, MO 63445-1400
 Phone: 660-727-3327 Fax:660-727-2035

Grade Span: PK-PK

Principal: Mrs. Megan Wendling (24 years in district)
 E-mail: mwendling@clarkcouunty.k12.mo.us

Table 2.14. Clark County R-1 School District Buildings and Enrollment Data, 10/1/2019

District Name	Building Name	Building Enrolment
Clark County R-1	Black Hawk Elementary	370
Clark County R-1	Clark County High	279
Clark County R-1	Clark County Middle	243
Clark County R-1	Early Childhood Center	95
Clark County R-1	Running Fox Elementary	87

Source: <http://mcids.dese.mo.gov/quickfacts/Pages/District-and-School-Information.aspx>, 10/1/2019

Table 2.15. Summary of Mitigation Capabilities- Clark County R-1 School District

Capability	Clark County R-1
Planning Elements	
Master Plan/ Date	Yes 7/1/2018
Capital Improvement Plan/Date	Yes 7/1/2018
School Emergency Plan / Date	Yes 8/1/2018
Weapons Policy/Date	Yes 8/1/2018
Personnel Resources	
Full-Time Building Official (Principal)	Yes
Emergency Manager	Yes
Grant Writer	No
Public Information Officer	Yes

Financial Resources	
Capital Improvements Project Funding	Yes
Local Funds	Yes
General Obligation Bonds	Yes
Special Tax Bonds	Yes
Private Activities/Donations	Yes
State and Federal Funds/Grants	Yes
Other	
Public Education Programs	Yes
Privately or Self- Insured?	Private
Fire Evacuation Training	Yes
Tornado Sheltering Exercises	Yes
Public Address/Emergency Alert System	Yes
NOAA Weather Radios	Yes
Lock-Down Security Training	Yes
Mitigation Programs	Yes
Tornado Shelter/Saferoom	Yes
Campus Police	No

Source: Data Collection Questionnaire

3 RISK ASSESSMENT

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

Changes in this version:

The risk assessment in this plan consolidates, updates and streamlines content from the 2014 approved plan. Content has been restructured to cover a broad range of emerging hazards, vulnerabilities, and risk issues. Significant changes have been made that include standardized terminology, new GIS-based ranking methodology which assesses hazard risk by jurisdiction and review of local risk assessments, land use planning and development.

This chapter is divided into four main parts:

- **Section 3.1 Hazard Identification** identifies the hazards that threaten the planning area and provides a factual basis for elimination of hazards from further consideration;
- **Section 3.2 Assets at Risk** provides the planning area's total exposure to natural hazards, considering critical facilities and other community assets at risk;
- **Section 3.3 Land Use and Development** discusses development that has occurred since the last plan update and any increased or decreased risk that resulted. This section also discusses areas of planned future development and any implications on risk/vulnerability;
- **Section 3.4 Hazard Profiles and Vulnerability Analysis** provides more detailed information about the hazards impacting the planning area. For each hazard, there are three sections: 1) Hazard Profile provides a general description and discusses the threat to the planning area, the geographic location at risk, potential Strength/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

Natural hazards can be complex, occurring with a wide range of intensities. Some events are instantaneous and offer no window of warning, such as earthquakes. Some offer a short warning in which to alert the public to take actions, such as tornadoes or severe thunderstorms. Others occur less frequently and are typically more expensive, with some warning time to allow the public time to prepare, such as flooding.

Each year there are increases in human-caused incidents, which can be just as devastating as natural disasters. For the purpose of this plan “human-caused hazards” are technological hazards and terrorism. These are distinct from natural hazards primarily in that they originate from human activity. In contrast, while the risks presented by natural hazards may be increased or decreased as a result of human activity, they are not inherently human-induced. The term “technological hazards” refers to the origins of incidents that can arise from human activities such as the manufacture, transportation, storage, and use of hazardous materials. For the sake of simplicity, this guide assumes that technological emergencies are accidental and that their consequences are unintended.

3.1.1 Review of Existing Mitigation Plans

The MPC previously developed a multi-jurisdiction Hazard Mitigation Plan dated March 2014 and Clark County, Kahoka, Wayland, Wyaconda, Alexandria, Luray, Revere, and Clark County R-1 School District participated in the multi-jurisdictional county-wide plan. The 2014 Hazard Mitigation Plan was consulted in development of the risk assessment and information included and updated where appropriate.

The MPC decided to include only natural hazards, as only natural hazards are required by federal regulations to be included. The human-caused and technological hazards were eliminated from further analysis due to these hazards are not necessary for plans to meet the requirements of the Disaster Mitigation Act of 2000.

3.1.2 Review Disaster Declaration History

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.

Table 3.1. FEMA Disaster Declarations that included Clark County, Missouri, 1965-Present

Disaster Number	Description	Declaration Date Incident Period	Individual Assistance (IA) Public Assistance (PA)
198	Flooding	6/14/1965	NA
372	Heavy Rains, Tornadoes, Flooding	4/19/1973	NA
439	Severe Storms, Flooding	6/10/1974	NA
3017	Drought	9/24/1976	NA
3071	Ice Jam and Flooding	3/12/1979	-
779	Severe Storms, Flooding	10/14/1986	-
995	Flooding, Severe Storm	7/9/1993	-
1054	Severe Storm, Tornadoes, Hail, Flooding	6/2/1995	-
1412	Severe Storms, Tornadoes	5/6/2002	PA
1403	Ice Storm	2/6/2002	PA
1463	Severe Storms, Tornadoes, Flooding	5/6/2003	IA,PA
3232	Hurricane	9/10/2005	PA
3281	Severe Winter Storms	12/12/2007	-
1809	Severe Storms, Flooding, Tornado	11/13/2008	IA,PA
1773	Severe Storms and Flooding	6/25/2008	IA, PA
3303	Severe Winter Storm	1/30/2009	-
1934	Severe Storms, Flooding, and Tornadoes	8/17/2010	PA
3325	Flooding	6/30/2011	-
3317	Severe Winter Storm	2/03/2001	-
1961	Severe Winter Storm and Snowstorm	3/23/2011	PA
4130	Severe Storms, Straight-line Winds Tornadoes, and Flooding	7/19/2013	PA
4238	Severe Storms, Tornadoes, Straight-line Winds, Flooding	8/7/2015	PA
3374	Severe Storms, Tornadoes, Straight-line Winds, Flooding	2/2/2016	-

Source: Federal Emergency Management Agency,
<https://www.fema.gov/data-visualization-summary-disaster-declarations-and-grants>

3.1.3 Research Additional Sources

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

- Missouri Hazard Mitigation Plans (2010, 2013, and 2018)
- Previously approved planning area Hazard Mitigation Plan (March 2014)
- Federal Emergency Management Agency (FEMA)
- Missouri Department of Natural Resources
- National Drought Mitigation Center Drought Reporter
- US Department of Agriculture's (USDA) Risk Management Agency Crop Insurance Statistics
- National Agricultural Statistics Service (Agriculture production/losses)
- Data Collection Questionnaires completed by each jurisdiction
- State of Missouri GIS data
- Environmental Protection Agency
- Flood Insurance Administration
- Hazards US (Hazus)
- Missouri Department of Transportation
- Missouri Division of Fire Marshal Safety
- Missouri Public Service Commission
- National Fire Incident Reporting System (NFIRS)
- National Oceanic and Atmospheric Administration's (NOAA) National 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 (you should state that you will give citations to the sources in the body of the plan)

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

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

Note that injuries and deaths caused by a storm event are reported on an area-wide basis. When reviewing a table resulting from an NCEI search by county, the death or injury listed in connection with that county search did not necessarily occur in that county.

3.1.4 Hazards Identified

Table 3.2. Hazards Identified for Each Jurisdiction

Jurisdiction	Dam Failure	Drought	Earthquake	Extreme Temperatures	Wildfire (Structural/Urban/Wild)	Flooding (River and Flash)	Land Subsidence/Sinkholes	Levee Failure	Severe Winter Weather	Thunderstorm/Lightning/Hail/ High Wind	Tornado	Pandemic
Clark County	X	X	X	X	X	X	X	X	X	X	X	X
City of Kahoka	X	X	X	X	X	X	X	-	X	X	X	X
City of Alexandria	X	X	X	X	X	X	X	X	X	X	X	X
Village of Luray	X	X	X	X	X	X	X	-	X	X	X	X
City of Revere	X	X	X	X	X	X	X	X	X	X	X	X
City of Wayland	X	X	X	X	X	X	X	X	X	X	X	X
City of Wyaconda	X	X	X	X	X	X	X	X	X	X	X	X
Schools and Special Districts												
Clark County R-1 School District	-	X	X	X	X	-	-	-	X	X	X	X

3.1.5 Multi-Jurisdictional Risk Assessment

For this multi-jurisdictional plan, the risks are assessed for each jurisdiction where they deviate from the risks facing the entire planning area. The planning area is fairly uniform in terms of climate and topography as well as building construction characteristics. Accordingly, the geographic areas of occurrence for weather-related hazards do not vary greatly across the planning area for most hazards. Kahoka is slightly more urbanized within the planning area and has more assets that are vulnerable to the weather-related hazards and varied development trends impact the future vulnerability. Similarly, more rural areas have more assets (crops/livestock) that are vulnerable to animal/plant/crop disease. These differences are discussed in greater detail in the vulnerability section of each hazard.

The hazards that vary across the planning area in terms of risk include dam failure, flash flood, grass or wildland fire, levee failure, river flood, flash flood, and sinkholes/land subsidence. The differences in hazards is explained in each hazard profile under a separate heading.

3.2 ASSETS AT RISK

This section assesses the population, structures, critical facilities and infrastructure, and other important assets in the planning area that may be at risk to natural hazards. Table 3.3 shows the total population, building count, estimated value of buildings, estimated value of contents and estimated total exposure to parcels by jurisdiction.

Missouri Mitigation Viewer

With the 2018 Hazard Mitigation Plan Update, SEMA now provides online access to risk assessment data and associated mapping for the 114 counties in the State, including the independent City of St. Louis. Through the web-based Missouri Hazard Mitigation Viewer, local planners or other interested parties can obtain all State Plan datasets.

The Missouri Hazard Mitigation Viewer includes a Map Viewer with a legend of clearly labeled features, a north arrow, a base map that is either aerial imagery or a street map, risk assessment data symbolized the same as in the 2018 State Plan for easy reference, search and query capabilities, ability to zoom to county level data and capability to download PDF format maps. The Missouri Hazard Mitigation Viewer can be found at this link:

- <http://bit.ly/MoHazardMitigationPlanViewer2018>
- <https://drive.google.com/file/d/1bPkc0jgF9ofwQLnTL9N0u-oPFWi9hkst/view> - User Guide

Assets at Risk available from the Mitigation Viewer include:

- State Owned Facilities
- State Leased Facilities
- Department of Higher Education Facilities
- State Owned Bridges

3.2.1 Total Exposure of Population and Structures

Unincorporated County and Incorporated Cities

In the following three tables, population data is based on 2010 Census Bureau data. Building counts and building exposure values are based on parcel data provided by the State of Missouri Geographic Information Systems (GIS) database which can be found at the following website, http://sema.dps.mo.gov/programs/mitigation_management.php. Contents exposure values were calculated by factoring a multiplier to the building exposure values based on usage type. The multipliers were derived from the Hazus 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). It should be noted that the total valuation of buildings is based on county assessors' data which may not be current. In addition, government-owned properties are usually taxed differently or not at all, and so may not be an accurate representation of true value. Note that public school district assets and special districts assets are included in the total exposure tables 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 county and each incorporated city. For multi-county communities, the population and building data may include data on assets located outside the planning area. **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, industrial, and agricultural).

Table 3.3. Maximum Population and Building Exposure by Jurisdiction

Jurisdiction	2010 Population	Building Count	Building Exposure (\$)	Contents Exposure (\$)	Total Exposure (\$)
Kahoka	2,078	907	\$134,561	\$81,854	\$216,416
Wayland	533	174	\$20,990	\$10,894	\$31,884
Wyaconda	227	124	\$13,583	\$11,806	\$25,389
Alexandria	159	64	\$9,140	\$5,189	\$14,329
Luray	99	44	\$2,307	\$1,322	\$3,629
Revere	79	69	\$8,255	\$4,572	\$12,827
Clark County	7,139	8,681	\$262,810	\$130,018	\$392,828
Totals:		10,063	\$451,646	\$245,655	\$697,302

Source: U.S. Bureau of the Census, 2010 U.S. Census; Building Count and Building Exposure, Missouri GIS Database from SEMA Mitigation Management; Contents Exposure derived by applying multiplier to Building Exposure based on Hazus MH 2.1 standard contents multipliers per usage type as follows: Residential (50%), Commercial (100%), Industrial (150%), Agricultural (100%). For purposes of these calculations, government, school, and utility were calculated at the commercial contents rate.

Table 3.4. Building Values/Exposure by Usage Type

Jurisdiction	Residential	Commercial	Industrial	Agricultural	Total
Kahoka	\$98,100	\$28,279	\$2,137	\$98	\$128,614
Wayland	\$20,079	\$195	\$0	\$56	\$20,330
Wyaconda	\$7,171	\$1,950	\$3,740	\$62	\$12,923
Alexandria	\$7,888	\$585	\$0	\$7	\$8,480
Luray	\$1,864	\$390	\$0	\$53	\$2,307
Revere	\$7,315	\$585	\$0	\$25	\$7,925
Unincorporated Clark County	\$230,622	\$11,701	\$2,004	\$12,698	\$257,025
Totals	\$373,039	\$43,685	\$7,881	\$12,999	\$437,604

Source: Missouri GIS Database, SEMA Mitigation Management Section

Table 3.5. Building Counts by Usage Type

Jurisdiction	Residential Counts	Commercial Counts	Industrial Counts	Agricultural Counts	Total
Kahoka	684	145	16	54	899
Wayland	140	1	0	31	172
Wyaconda	50	10	28	34	122
Alexandria	55	3	0	4	62
Luray	13	2	0	29	44
Revere	51	3	0	14	68
Unincorporated Clark County	1,608	145	15	6,993	8,761
Totals	2,601	309	59	7,159	10,128

Source: Missouri GIS Database, SEMA Mitigation Management Section; Public School Districts and Special Districts

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

Public School District	Enrolment	Building Count	Building Exposure (\$)	Contents Exposure (\$)	Total Exposure (\$)
Clark County R-1 School District	1,074	16	\$33,132,901.00	\$8,818,054.00	\$41,950,955.00

Source: <http://mcids.dese.mo.gov/quickfacts/Pages/District-and-School-Information.aspx>, select the file for the most recent year called "2018 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, essential, high potential loss and transportation/lifeline facilities to identified hazards. Definitions of each of these types of facilities are provided below.

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

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

- 2018 Missouri State Hazard Mitigation Plan and Hazard Mitigation Viewer
<http://bit.ly/MoHazardMitigationPlanViewer2018>
- Northeast Missouri Regional Planning Commission list of critical facility inventory.
- Hazus contains an inventory of critical facilities that can be exported for each jurisdiction. The Homeland Security Infrastructure Protection Program (HSIPP) is another source. But access may be restricted

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 Kahoka	1	0	10	2	1	1	2	2	4	6	0	2	0	1	1	2	0	11	1	4	0	9	1	49
City of Wayland	0	0	2	2	0	0	1	1	2	1	2	0	0	0	0	0	1	0	1	0	0	4	1	18
City of Wyaconda	0	0	1	1	0	0	1	1	1	1	0	1	0	0	0	0	0	1	0	0	0	2	0	9
City of Alexandria	0	0	0	1	0	0	1	1	0	0	1	0	0	0	0	0	0	1	0	1	0	2	0	7
Village of Luray	0	0	1	2	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	3
City of Revere	0	0	1	1	0	0	1	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	4
Totals	1	0	15	9	1	1	6	5	7	9	3	3	0	1	1	2	1	14	2	5	0	17	2	90

Source: Data Collection Questionnaires; County EMP, NEMO RPC Inventory List

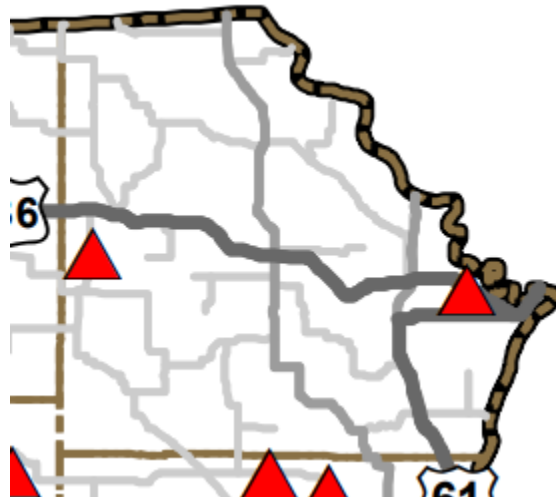
Bridges: This term refers to one of the database elements in the National Bridge Inventory. This element is quantified using a “scour index”, which is a number indicating the vulnerability of a bridge to scour during a flood. Bridges with a scour index between 1 and 3 are considered “scour critical”, or a bridge with a foundation determined to be unstable for the observed or evaluated scour condition. A map from Transportation for America is not currently working. MoDot was contacted and provided a map of structurally deficient bridges in Clark County.

Figure 3.1. Clark County Bridges

Missouri								
County	Bridge Counts				Bridge Area (Square Meters)			
	All	Good	Fair	Poor	All	Good	Fair	Poor
CLARK (045)	180	92	75	13	58,484	37,624	17,362	3,499

Source: <http://www.fhwa.dot.gov/bridge/nbi/no10/county.cfm>

Figure 3.2. Clark County Structurally Deficient Bridges



County	Feature	Route	Log Mile	Detour Length	Year Built	Lanes On	ADT	Item 41-Status	Length	Width
CLARK	DRAIN DTCH	US 136 E	251.53524	16.12	1968	2	3077	A - OPEN NO RESTRICTIONS	86	45.92
CLARK	S WYACONDA RVR	RT A S	2.58912	19.84	1930	2	293	P - POSTED FOR LOAD	205	20.92

Source: <https://www.modot.org/Bridges>

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.

Table 3.8 shows Federally Threatened, Endangered, Proposed and Candidate Species in the county.

Table 3.8. Threatened and Endangered Species in Clark County

Common Name	Scientific Name	Status
Gray Bat	Myotis Grisescens	Endangered
Indiana Bat	Myotis Sodalis	Endangered
Northern Long-eared Bat	Myotis Septentrionalis	Threatened
Pallid Sturgeon	Scaphirhynchus Albus	Endangered
Higgins Eye(perlymussel)	Lampslis Higginsii	Endangered
Sheepnose Mussel	Plethobasus Cyphus	Endangered

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

Natural Resources: **Table 3.9** provides the names and location of parks and conservation areas in the planning area owned by Missouri Department of Conservation.

Table 3.9. Parks in Clark County

Park / Conservation Area	Address	City
Nixon Branch Tract (Clark CA)	9 miles north of Kahoka on Hwy 81, then 1.5 miles west on gravel road 26	Kahoka
Bear Creek Tract (Clark CA)	3.5 miles south of Wyaconda on Route A, then 1.75 miles south on gravel road 230	Wyaconda
Fort Pike Access	In St. Francisville, take River Road one block east from Route B to access entrance.	St. Francisville
Fox Valley Lake CA	From Kahoka, take Hwy 81 north 4.75 miles, then Route NN west 2.5 miles to the area.	Kahoka
Frost Island CA	From Wayland, take Hwy 27 north 4 miles, then on gravel road 198 east 1 miles.	Wayland
Heath (Charlie) Mem. CA	From Kahoka, take Hwy 163 west, then Route K north 8 miles.	Kahoka
Neeper CA	From Kahoka, take Hwy 81 south 6 miles, then take gravel road 257 west 2 miles to the area.	Kahoka
Rose Pond CA	From Wayland, take Hwy 27/61 south 7 miles, then route F east 2.5 miles, then Route P north 2 miles, then on gravel road 317 west .25 miles, then on gravel road 304 north .5 miles.	Wayland
Willam E. Crawford C.A.	From Hwy C near Revere, take County Road 102 north and follow it east. The road number will change to 103. Continue east. County Road 103 will turn to the NW. Just before CR103 breaks over a very steep hill, take the service road to the north that leads to the parking lot on Crawford CA. This turn onto the service road is approximately 4 miles from the Hwy C turn-off.	Revere
Omak A Hak Park	Corner of W. College St. and N. Cleveland St.	Kahoka
Kahoka City Square Park	Bounded by W. Commercial, N. Morgan, W. Main, and N. Washington St.	Kahoka
Luray City Park	Bounded by Washington St, Lusley St, Main St, and Quarles St.	Luray
Egley Park	Bounded by Taylor St, N. Main St, Henrietta St, and an alley on South end.	Wayland

Source: <http://mdc7.mdc.mo.gov/applications/moatlas/AreaList.aspx?txtUserID=guest&txtAreaNm=s>

The best source for park information is usually county and community websites.

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

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

Property	Address	City	Date Listed
Clark County Courthouse	101 E. Court St.	Kahoka	9/8/1983
Hiller, Colonel Hiram M., House	570 N. Washington	Kahoka	7/21/1986
Montgomery Opera House	201-209 W. Commercial St.	Kahoka	10/20/1988
Shrine of St. Patrick Church	Erin Circle	St. Patrick	2/27/2007
Sickles Tavern	NW of Wayland on MO B	Wayland	10/22/1979

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

Economic Resources: Table 3.11 provides major non-government employers in the planning area.

Table 3.11. Major Non-Government Employers in Clark County

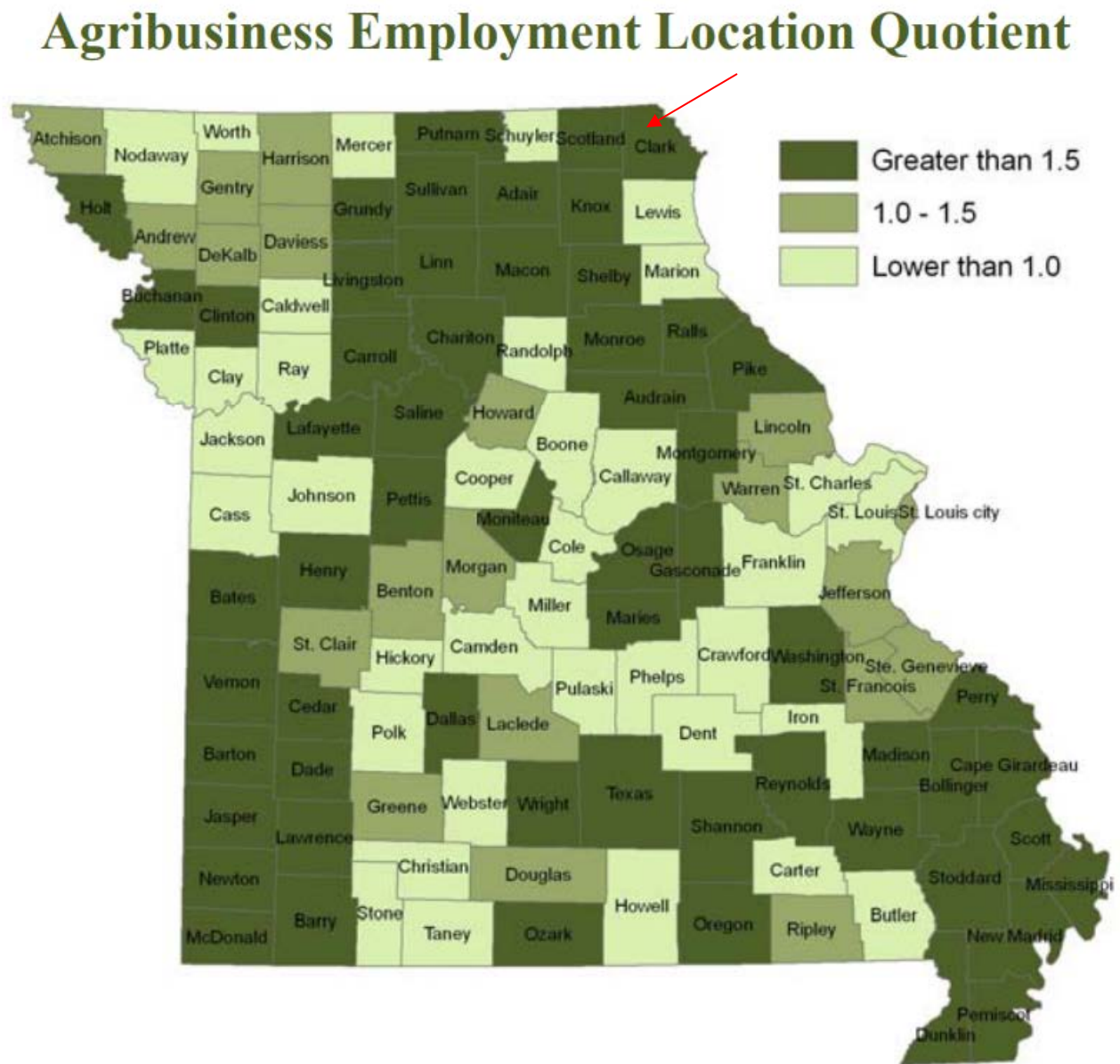
Employer Name	Main Locations	Product or Service	Employees
KPF Foundry	809 E. Maple, Kahoka	Manufacturing	50
Gregory Container	1385 Industrial Dr, Kahoka	Manufacturing	50
Dadants	275 N Myrtle, Kahoka	Manufacturing	50
IMI	Hwy 136, Kahoka	Farm Implement	20
Ball Volvo	Hwy 136, Kahoka	Semi/Semi Service	30

Source: Data Collection Questionnaires; local Economic Development Commissions

Agriculture-Related Jobs in Clark County

Agriculture plays an important role in Clark County economy, As described in **Figure 3.3**, Clark County is greater than 1.5 in Agribusiness Employment.

Figure 3.3. Agribusiness Employment Location Quotient



Source: https://www.missourieconomy.org/pdfs/missouri_farms_and_agribusiness.pdf

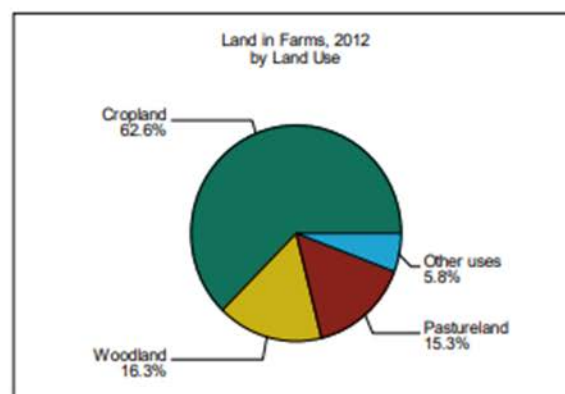
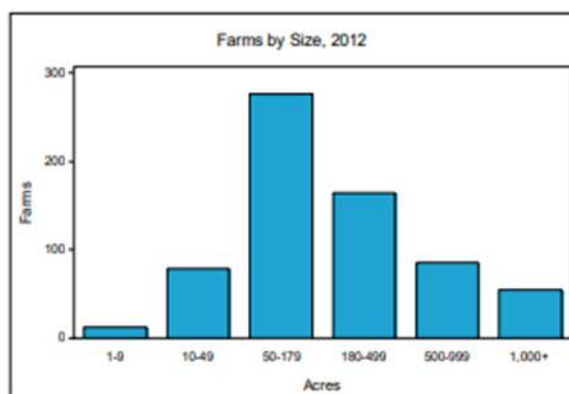
Figure 3.4. 2012 Census of Agriculture, Clark County



Clark County Missouri



	2012	2007	% change
Number of Farms	673	709	- 5
Land in Farms	241,121 acres	262,937 acres	- 8
Average Size of Farm	358 acres	371 acres	- 4
Market Value of Products Sold	\$72,054,000	\$54,436,000	+ 32
Crop Sales \$51,825,000 (72 percent)			
Livestock Sales \$20,229,000 (28 percent)			
Average Per Farm	\$107,064	\$76,779	+ 39
Government Payments	\$4,399,000	\$3,600,000	+ 22
Average Per Farm Receiving Payments	\$8,087	\$6,845	+ 18



Item	Clark	Item	Clark
Farms number	673	Hired farm labor farms	116
Land in farms acres	241,121	workers	209
Average size of farm acres	358	\$1,000 payroll	1,463
Median size of farm acres	159		
Estimated market value of land and buildings:		Farms with-	
Average per farm dollars	950,794	1 worker farms	58
Average per acre dollars	2,654	workers	58
Estimated market value of all machinery and		2 workers farms	32
equipment \$1,000	69,363	workers	64
Average per farm dollars	103,065		
Farms by size:		3 or 4 workers farms	25
1 to 9 acres farms	12	workers	(D)
10 to 49 acres farms	79	5 to 9 workers farms	1
50 to 179 acres farms	277	workers	(D)
180 to 499 acres farms	165	10 workers or more farms	-
500 to 999 acres farms	85	workers	-
1,000 acres or more farms	55		
Total cropland farms	603	Workers by days worked:	
Harvested cropland acres	150,888	150 days or more farms	64
..... farms	421	workers	(D)
Irrigated land farms	11	Farms with-	
..... acres	3,179	1 worker farms	40
Market value of agricultural products sold (see text) \$1,000	72,054	workers	40
Average per farm dollars	107,064	2 workers farms	22
Crops, including nursery and greenhouse crops \$1,000	51,825	workers	44
Livestock, poultry, and their products \$1,000	20,229		
Farms by value of sales:		3 or 4 workers farms	2
Less than \$2,500 farms	267	workers	(D)
\$2,500 to \$4,999 farms	40	5 to 9 workers farms	-
\$5,000 to \$9,999 farms	53	workers	-
\$10,000 to \$24,999 farms	80	10 workers or more farms	-
\$25,000 to \$49,999 farms	55	workers	-
\$50,000 to \$99,999 farms	59		
\$100,000 or more farms	119	Less than 150 days farms	71
Government payments farms	544	workers	(D)
Total income from farm-related sources,		Farms with-	
gross before taxes and expenses (see text) farms	360	1 worker farms	46
..... \$1,000	6,903	workers	46
Total farm production expenses \$1,000	59,109	2 workers farms	9
Average per farm dollars	87,829	workers	18
Net cash farm income of operation (see text) farms	673		
Average per farm dollars	24,247	3 or 4 workers farms	15
Principal operator by primary occupation:		workers	(D)
Farming number	275	5 to 9 workers farms	1
Other number	398	workers	(D)
Principal operator by days worked off farm:		10 workers or more farms	-
Any number	417	workers	-
200 days or more number	295	Reported only workers working	
Livestock and poultry:		150 days or more farms	45
Cattle and calves inventory farms	250	workers	65
Beef cows number	23,668	\$1,000 payroll	853
Milk cows farms	212		
Cattle and calves sold number	7,380	Reported only workers working	
Hogs and pigs inventory farms	11	less than 150 days farms	52
Hogs and pigs sold number	35	workers	95
Sheep and lambs inventory farms	224	\$1,000 payroll	264
Layers inventory (see text) number	18,480		
Broilers and other meat-type chickens sold farms	14	Reported both - workers working 150	
Selected crops harvested:		days or more and workers	
Corn for grain farms	355	working less than 150 days farms	19
Corn for silage or greenchop acres	14	150 days or more, workers	26
Wheat for grain, all farms	(D)	less than 150 days, workers	23
Winter wheat for grain acres	18	\$1,000 payroll	345
Spring wheat for grain farms	885		
..... acres	32	Total migrant workers (see text) farms	-
..... farms	1,910	workers	-
..... number	3	Migrant farm labor on farms with hired labor farms	-
..... bushels	36	workers	-
..... acres	225	Migrant farm labor on farms reporting only	
..... bushels	46,706	contract labor farms	-
..... acres	3,473,664	workers	-
..... tons	22	Unpaid workers (see text) farms	220
..... farms	688	workers	509
..... acres	8,391		
..... farms	59		
..... acres	3,282		
..... bushels	194,720		
..... farms	59		
..... acres	3,282		
..... bushels	194,720		
..... farms	-		
..... acres	-		
..... bushels	-		

Source: https://www.nass.usda.gov/Publications/AgCensus/2012/Full_Report/Volume_1_Chapter_2_County_Level/

3.3 LAND USE AND DEVELOPMENT

3.3.1 Development Since Previous Plan Update

Table 3.12. County Population Growth, 2010-2017

Jurisdiction	Total Population 2010	Total Population 2017	2010-2017 # Change	2000-2017 % Change
Clark County	7,139	6,807	-332	-4.87%
Kahoka	2,078	2,061	-17	-0.82%
Wayland	533	584	51	+9.56%
Wyaconda	227	169	-58	-34.31%
Alexandria	159	112	-47	-41.96%
Luray	99	79	-20	-25.31%
Revere	79	69	-10	-14.49%

Source: U.S. Bureau of the Census, Decennial Census, Annual Population Estimates, American Community Survey 5-year Estimates; 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. The cities of Kahoka, Wayland and Revere all showed an increase in housing with Wyaconda, Alexandria, and Luray reflecting a decline. Overall there has been an increase in housing in Clark County of 1.17% as shown in **Table 3.13**.

Table 3.13. Change in Housing Units, 2010-2017

Jurisdiction	Housing Units 2010	Housing Units 2017	2010-2017 # Change	2000-2017 % Change
Clark County	3,473	3,495	+22	+0.63%
Kahoka	1,001	1,007	+6	+0.59%
Wayland	249	288	+39	+15.66%
Wyaconda	140	136	-4	-2.94%
Alexandria	77	66	-11	-16.66%
Luray	39	36	-3	-8.33%
Revere	41	51	+10	+24.39%

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

Population growth or decline is generally accompanied by increase or decreases in the number of housing units. U.S. Census information is compiled every 10 years, with the last Census completed in 2010 estimates were used for the above data. According to American Fact Finder estimates show that in 2017 Population is expected to decline. Vulnerability to hazards will be affected based on population, and where new housing units have been built. Due to city ordinances, vulnerability is not expected to increase as ordinances for new builds have been set in place to protect citizens.

3.3.2 Future Land Use and Development

School District's Future Development

There are no anticipated future development plans for other schools within the planning area.

Special District's Future Development

There are no anticipated future development plans for special districts within the planning area.

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, strength/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

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

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

Geographic Location: This section describes the geographic areas in the planning area that are affected by the hazard. 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.

Strength/Magnitude/Extent: This includes information about the strength, 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. This section should also include information on the typical or expected strength/magnitude/extent of the hazard in the planning area. Strength, magnitude, and extent can also include the speed of onset and the duration of hazard events. Describing the strength/magnitude/extent of a hazard is not the same as describing its potential impacts on a community. Strength/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. Tables are a good way to convey this data. Include events for the previous 20 years if available for hazards that are random in occurrence, such as tornadoes. Hazard events that occur more often such as severe thunderstorms can include data for the previous 10 years. Use judgment for retrieval of enough data on which to base a solid probability calculation. Some hazard events occur many times annually and retrieving data for all events can become cumbersome. When this is the case, searches can be limited by criteria such as magnitude (for example, an NCEI search for hail could be limited to events with hail sizes of 2.0" and above). Be sure to include updated data that includes previous events since the last plan update.

Probability of Future Occurrence: The frequency of recorded past events is used to estimate the likelihood of future occurrences. Probability can be determined by dividing the number of recorded events by the number of years of available data and multiplying by 100. This gives the percent chance of the event happening in any given year. For events occurring more than once annually, the probability should be reported as 100% in any given year, with a statement of the average number of events annually. For hazards such as drought that may have gradual onset and extended duration, probability can be based on the number of months in drought in a given time-period and expressed as the probability for any given month to be in drought.

Changing Future Conditions Considerations: In addition to the probability of future occurrence, changing future conditions should also be considered, including the effects of long-term changes in weather patterns and climate on the identified hazards. NOAA has a new tool that can provide useful information for this purpose.

NOAA Climate Explorer, <https://toolkit.climate.gov/tools/climate-explorer>

Vulnerability Assessments

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 should be based on the best available data. The vulnerability assessments can also be based on data that was collected for the 2018 State Hazard Mitigation Plan Update. With the 2018 Hazard Mitigation Plan Update, SEMA is pleased to provide online access to the risk assessment data and associated mapping for the 114 counties in the State, including the independent City of St. Louis. Through the web-based Missouri Hazard Mitigation Viewer, local planners or other interested parties can obtain all State Plan datasets. This effort removes from local mitigation planners a barrier to performing all the needed local risk assessments by providing the data developed during the 2018 State Plan.

The Missouri Hazard Mitigation Viewer includes a Map Viewer with a legend of clearly labeled features, a north arrow, a base map that is either aerial imagery or a street map, risk assessment data symbolized the same as in the 2018 State Plan for easy reference, search and query capabilities, ability to zoom to county level data and capability to download PDF format maps. The Missouri Hazard Mitigation Viewer can be found at this link: <http://bit.ly/MoHazardMitigationPlanViewer2018>.

The vulnerability assessments in the Clark County Plan will also be based on:

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

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

- **Vulnerability Overview:**
- **Potential Losses to Existing Development:** For each participating jurisdiction, the plan describes the potential impacts of the hazard. Impact means the consequences of effect of the hazard on the jurisdiction and its assets. Assets are determined by the community and include, for example, people, structures, facilities, systems, capabilities, and/or activities that have value to the community. For example, impacts could be described by referencing historical disaster impacts and/or an estimate of potential future losses.
- **Previous and Future Development:** This section includes information on how changes in development have impacted the community's vulnerability to this hazard and describes how changes in development in known hazard prone areas since the previous plan have increased or decreased the community's vulnerability.
- **Hazard Summary by Jurisdiction:** This section includes information on how changes in development have impacted the community's vulnerability to this hazard and describes how changes in development in known hazard prone areas since the previous plan have increased or decreased the community's vulnerability.
- **Problem Statements**

3.4.1 Flooding (Riverine and Flash)

Hazard Profile

Hazard Description

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

Flooding caused by dam and levee failure is discussed in **Section 3.42** and **Section 3.43** respectively. It will not be addressed in this section.

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

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

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

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

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

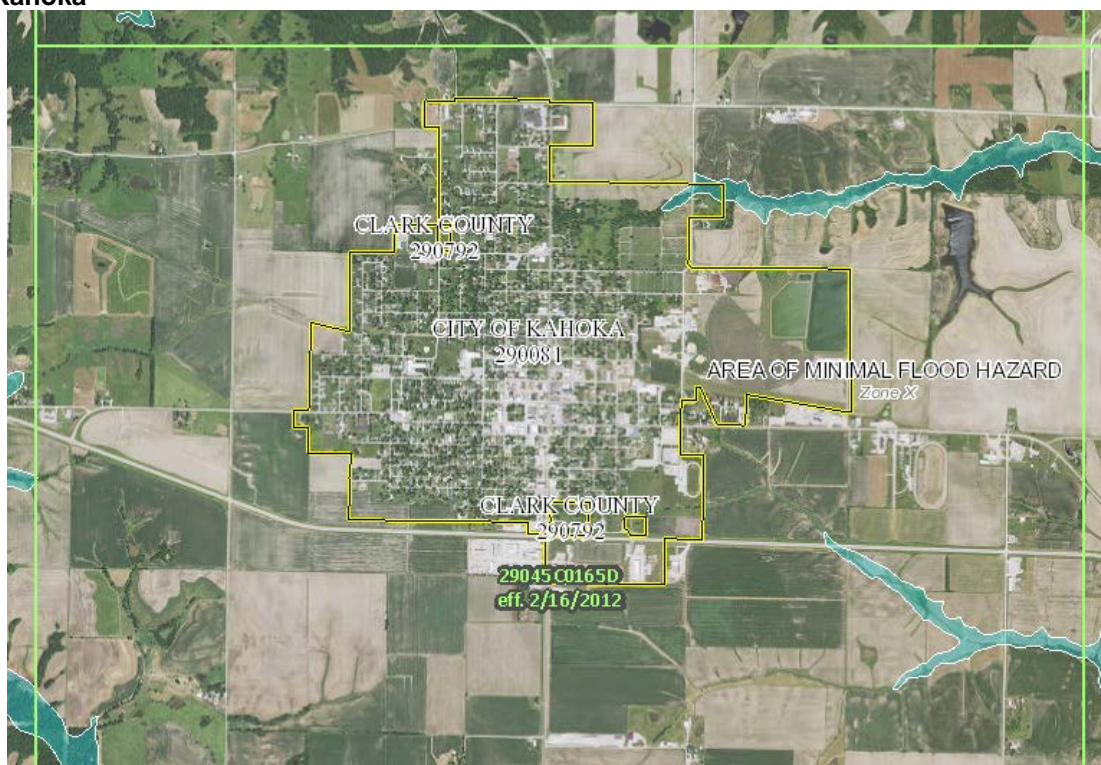
Although flash floods are somewhat unpredictable, there are factors that can point to the likelihood of flash floods occurring. Weather surveillance radar is being used to improve monitoring capabilities of intense rainfall. This, along with knowledge of the watershed characteristics, modeling techniques,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

Geographic Location

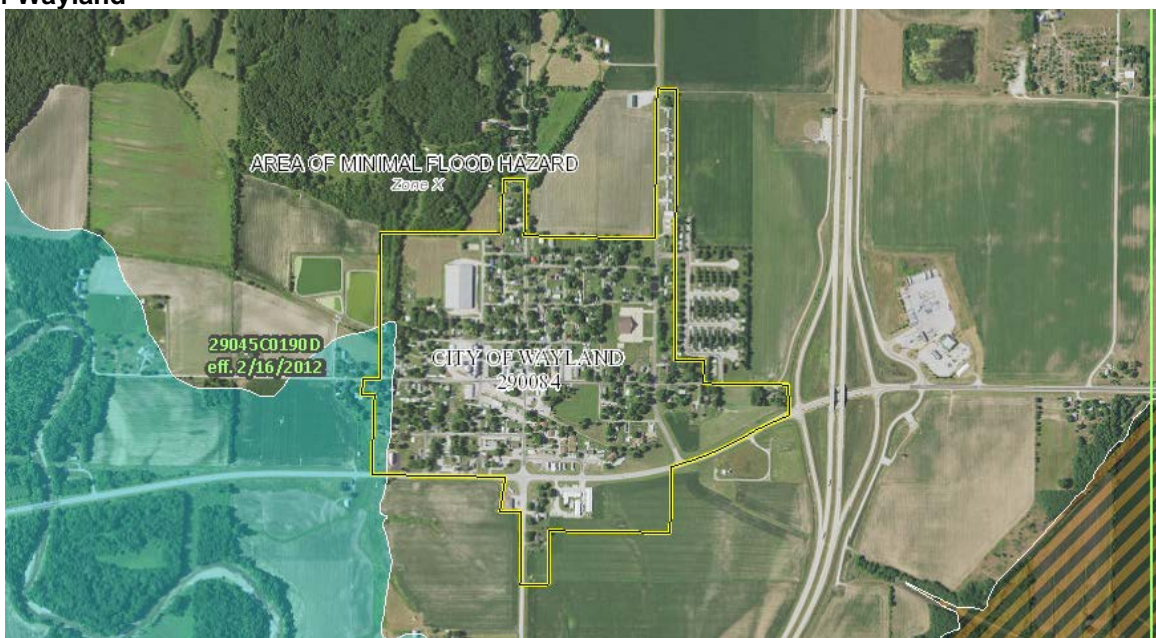
Riverine flooding is most likely to occur in SFHAs (Special Flood Hazard Areas). Below is a FIRM for participating cities within Clark County

Figure 3.5. DFIRM for Cities of Clark County

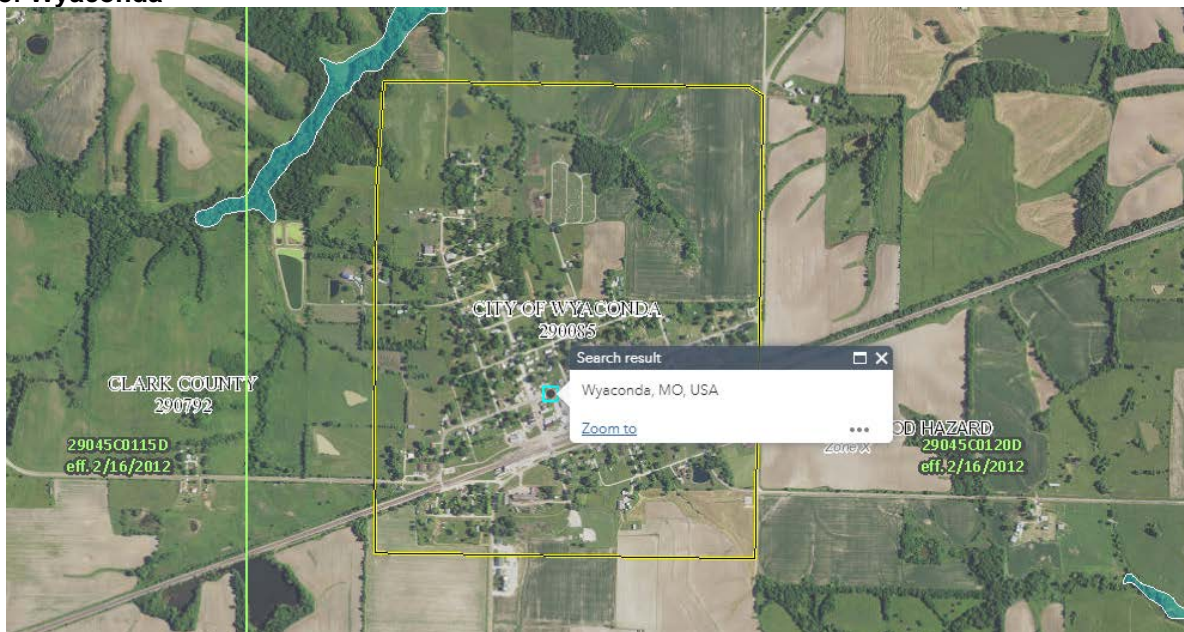
City of Kahoka



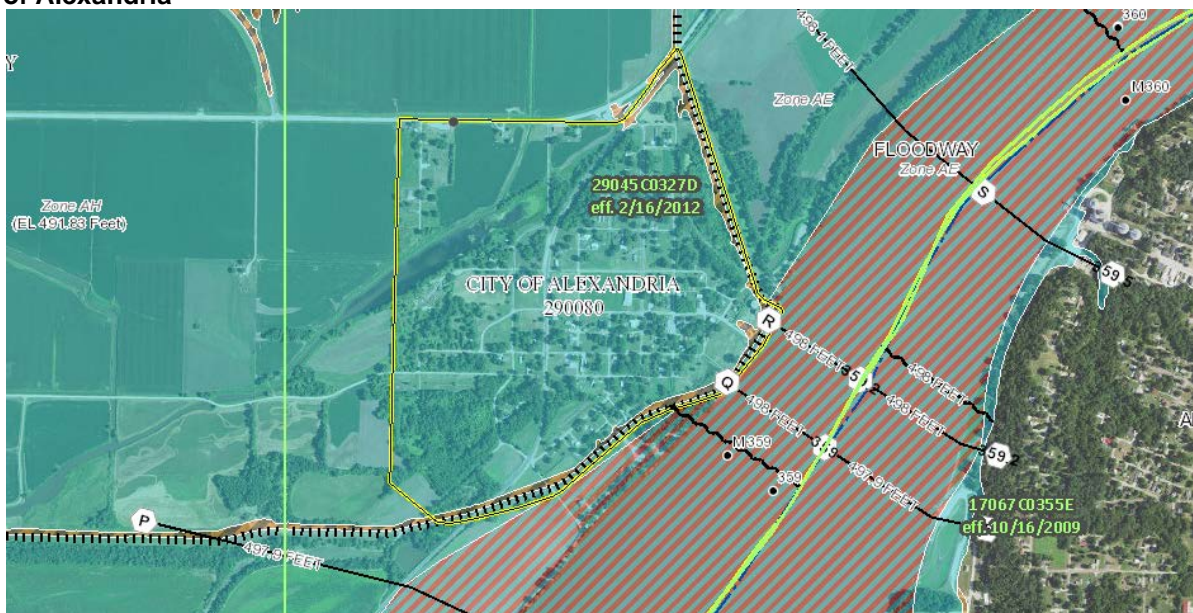
City of Wayland



City of Wyaconda



City of Alexandria



Village of Luray



City of Revere



Clark County R-1 School Dist.



Source: <https://msc.fema.gov/portal/home>

Table 3.14. Clark County NCEI Flood Events by Location, 1998-2018

Location	# of Events
Unincorporated Clark County	24
-Unincorporated County (Clark(Zone))- 6 flood events	
-Unincorporated County (Antioch)- 1 flood events	
-Unincorporated County (St. Francisville)- 1 flood events	
-Unincorporated County (Gregory Landing)- 2 flood events	
-Unincorporated County (Anson)- 14 flood events	
Kahoka	1
Alexandria	6
Wayland	2
Revere	1

Source: National Centers for Environmental Information, July 1, 2019

Flash flooding occurs in SFHAs and those locations in the planning area that are low-lying. They also occur in areas without adequate drainage to carry away the amount of water that falls during intense rainfall events. NCEI database was used to determine which jurisdictions are most prone to flash flooding during a 20-year time period. **Table 3.15** shows the number of flash flood events by location recorded in NCEI for the 20-year period.

Table 3.15. Clark County NCEI Flash Flood Events by Location, 1998-2018

Location	# of Events
Unincorporated Clark County	20
-Unincorporated County (West Portion)- 1 flood events	
-Unincorporated County (County Wide)- 1 flood events	

-Unincorporated County (Chambersburg)- 2 flood events	
-Unincorporated County (St Patrick)- 2 flood events	
-Unincorporated County (Anson)- 10 flood events	
-Unincorporated County (North Portion)- 1 flood events	
-Unincorporated County (Winchester)- 1 flood events	
-Unincorporated County (Clark City)- 1 flood events	
-Unincorporated County (Peaksville)- 1 flood events	
Kahoka	7
Wayland	2
Wyaconda	3
Luray	2
Revere	1

Source: National Centers for Environmental Information, July 1, 2019

Strength/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 communities downstream sufficient time to take protective measures, such as sandbagging and evacuations. Nevertheless, floods exact a heavy toll in terms of human suffering and losses to public and private property. By contrast, flash flood events in recent years have caused a higher number of deaths and major property damage in many areas of Missouri.

According to the U.S. Geological Survey, two critical factors affect flooding due to rainfall: rainfall duration and rainfall intensity – the rate at which it rains. These factors contribute to a flood's height, water velocity and other properties that reveal its magnitude.

National Flood Insurance Program (NFIP) Participation

Clark County plus the cities of Alexandria, Kahoka, Revere, Wayland, and Wyaconda all participate in the NFIP. The Village of Luray does not participate. As described in **Table 3.16** all jurisdictions have an effective map date of 02/16/2012 except for the City of Revere and Village of Luray. The jurisdictions will benefit from an updated map of their perspective area, to date a new map has not been requested. Flood prone areas will be monitored by the flood administration, and the community can assist by reporting flood activity to their local jurisdictions.

Table 3.16. NFIP Participation in Clark County

Community ID #	Community Name	NFIP Participant (Y/N/Sanctioned)	Current Effective Map Date	Regular-Emergency Program Entry Date
290080	City of Alexandria	Yes	02/16/2012	05/02/1977
290081	City of Kahoka	Yes	02/16/2012	08/02/1984
290083	City of Revere	Yes	-	08/04/1983
290084	City of Wayland	Yes	02/16/2012	09/04/1986
290085	City of Wyaconda	Yes	02/16/2012	09/0/1984
290792	Clark County	Yes	02/16/2012	02/01/1997
-	Village of Luray	No	-	-

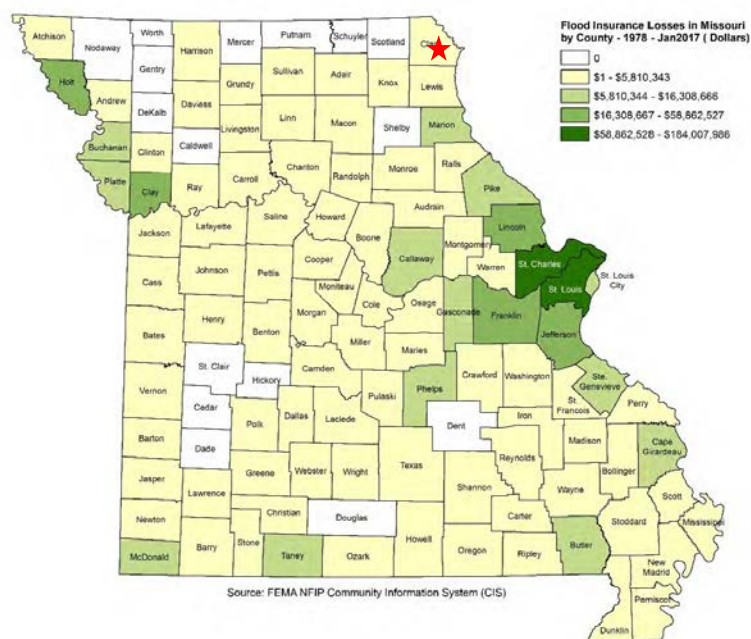
Source: NFIP Community Status Book, 07/09/2019; BureauNet, <http://www.fema.gov/national-flood-insurance-program/national-flood-insurance-program-community-status-book>; M= No elevation determined – all Zone A, C, and X: NSFHA = No Special Flood Hazard Area; E=Emergency Program

Table 3.17. NFIP Policy and Claim Statistics as of Date

Community Name	Policies in Force	Insurance in Force	Closed Losses	Total Payments
City of Alexandria	38	5,691,000	45	1,503,878
City of Wayland	1	70,000	-	217

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 1978 to 09/30/2018.

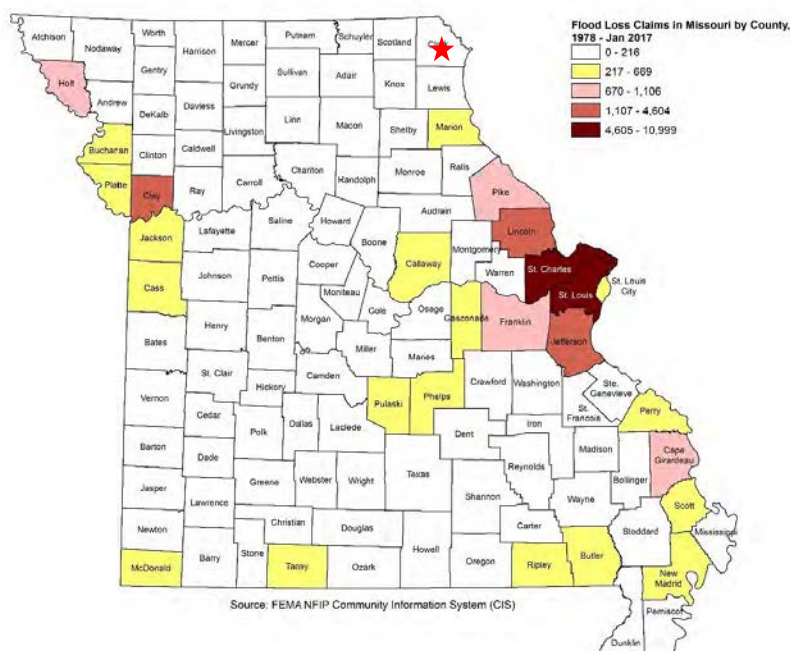
Figure 3.6. Map of Dollars Paid Historically for Flood Insurance Losses in Missouri by County, 1978 – January 2017



Source: 2018 Missouri State Hazard Mitigation Plan, *Red Star Shows Clark County

Figure 3.6 shows that during the period of 1978-January 2017, Clark County received between \$1 and \$5,810,343 in Flood insurance.

Figure 3.7. Flood Loss Claims in Missouri by County, 1978-January 2017



Source: 2018 Missouri State Hazard Mitigation Plan, *Red Star Shows Clark County

Figure 3.7 demonstrates that between the period of 1978 and January 2017, Clark County had

between 0-216 Flood Loss Claims.

Repetitive Loss/Severe Repetitive Loss Properties

Repetitive Loss Properties are those properties with at least two flood insurance payments of \$1,000 or more in a 10-year period. According to the Flood Insurance Administration, jurisdictions included in the planning area have a combined total of 3 repetitive loss properties. As of 9/26/2019, 0 properties have been mitigated, leaving 3 un-mitigated repetitive loss properties.

Table 3.18. Clark County Repetitive Loss Properties

Jurisdiction	# of Properties	Type of Property	# Mitigated	Building Payments	Content Payments	Total Payments	Average Payment	# of Losses
Alexandria	1	Other Non-Res	0	\$6,871.17	0	\$6,871.17	\$3,435.59	2
Clark County (Unic.)	2	Other Non-Res	0	\$257,429.68	\$17,114.99	\$274,544.67	\$68,636.17	4

Source: Flood Insurance Administration as of 9/26/2019

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.

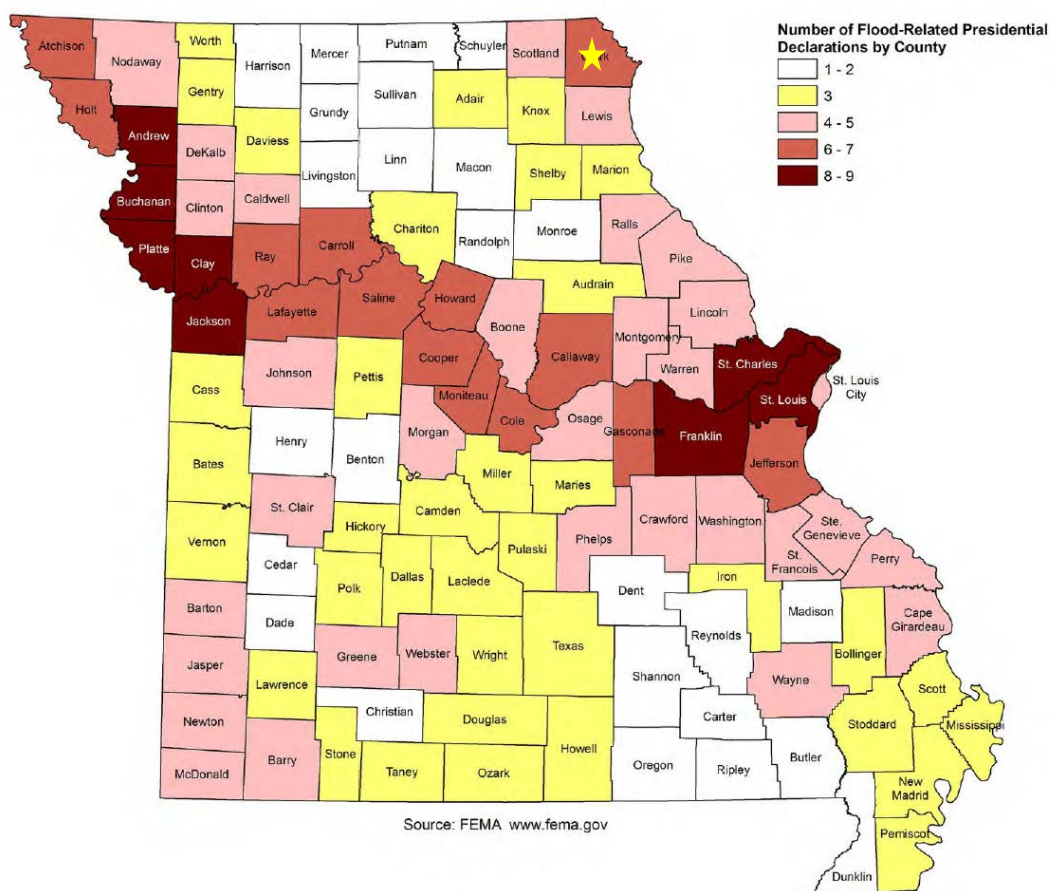
According to the 2018 Missouri State Hazard Mitigation Plan, there are no Severe Repetitive Loss properties in Clark County.

Previous Occurrences

Table 3.19. Disaster Declarations Resulting from Flooding

Declaration Date	Disaster #	Incident Type	Counties Declared	Type of Assistance
06/10/1974	DR-439	Severe Storms, Flooding	Clark	-
10/14/1986	DR-779	Severe Storms, Flooding	Clark	-
07/09/1993	Dr-995	Flooding, Severe Storms	Clark	-

Figure 3.8. Number of Flood-Related Presidential Declarations by County



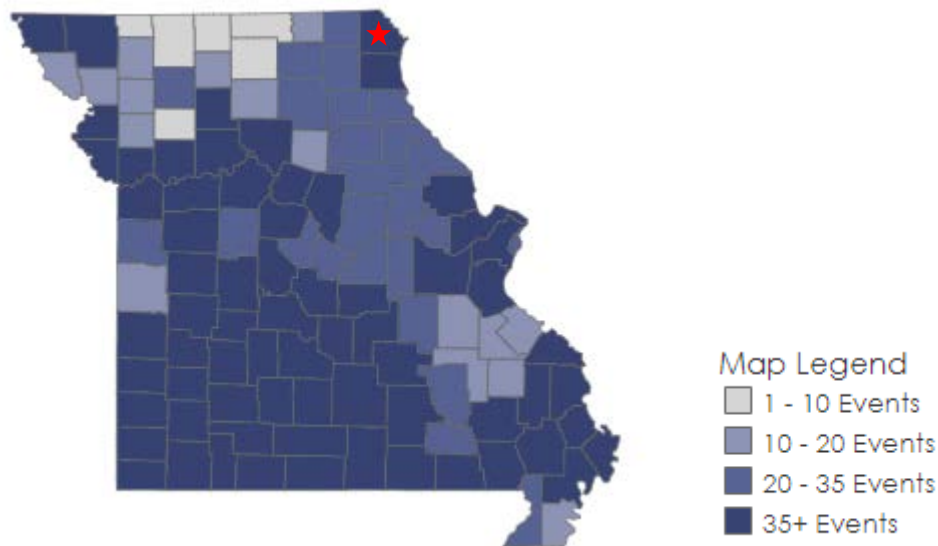
Source: 2018 Missouri State Hazard Mitigation Plan, *Yellow star shows Clark County

Table 3.20. NCEI Clark County Flash Flood Events Summary, 1998 to 2018

Year	# of Events	# of Deaths	# of Injuries	Property Damages	Crop Damages
1999	1	0	0	0	0
2001	1	0	0	0	0
2002	4	0	0	0	0
2003	6	0	0	495.00K	70.00K
2004	2	0	0	60.00K	8.00K
2007	1	0	0	0	0
2008	1	0	0	0	0
2009	3	0	0	0	0
2010	9	0	0	620.00K	0
2011	4	0	0	30.00K	0
2012	1	0	0	0	0
2015	2	0	0	0	0

Source: NCEI, data accessed 7/1/2019

Figure 3.9. Historical Flood Impact



Source: <https://www.fema.gov/data-visualization-floods-data-visualization> *Red star shows Clark County

The FEMA Data Visualization Tool as shown above in **Figure 3.9**, Clark County had 35+ events of flood impact.

Table 3.21. NCEI County A Riverine Flood Events Summary, 1998 to 2018

Year	# of Events	# of Deaths	# of Injuries	Property Damages	Crop Damages
2001	4	0	0	0	0
2002	1	0	0	0	0
2004	3	0	0	0	0
2008	3	0	0	500.00K	500.00K
2010	13	0	0	2.750M	0
2011	5	0	0	875.00K	0
2013	4	0	0	0	0
2014	1	1	0	0	0

Source: NCEI, 7/1/2019

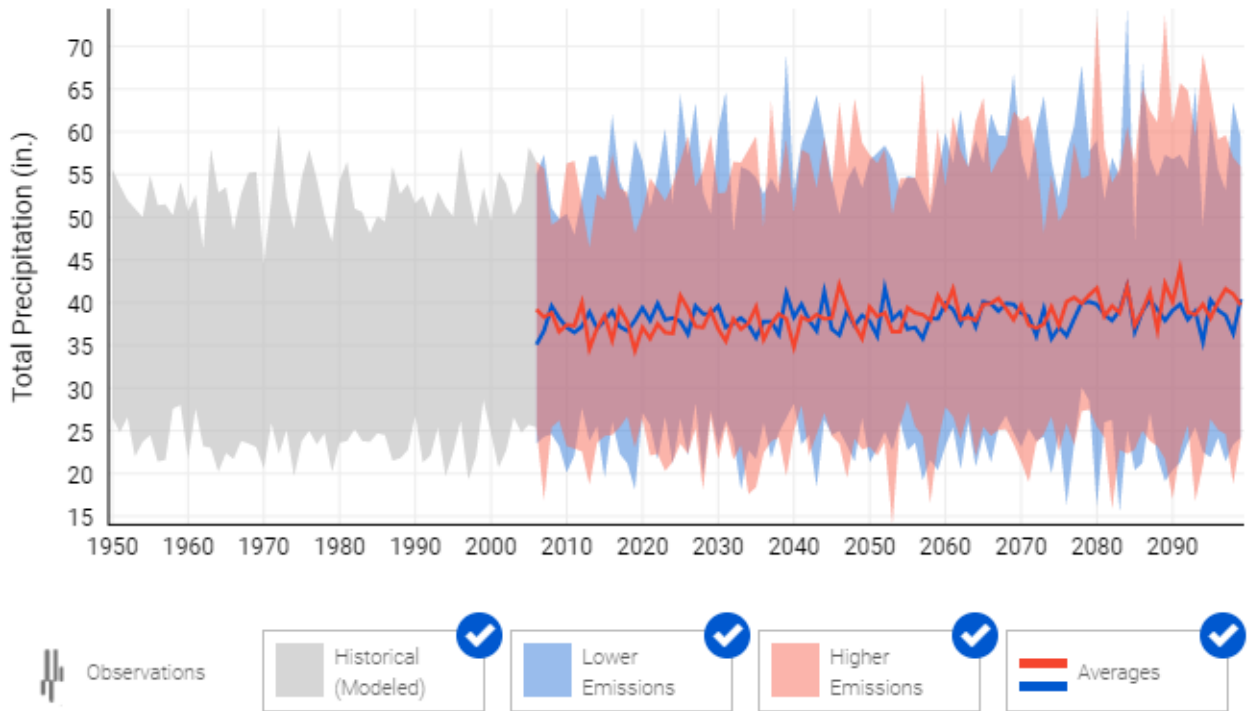
Probability of Future Occurrence

With the history of flooding in the planning area, it is likely that flooding of various levels will occur. The probability of flash flood event occurring in the planning area in any given year is 100% with the average amount of flash flooding events at 1.7. The probability of flood events happening in the planning area is also 100% with the average number of events per year at 1.7 also.

Changing Future Conditions Consideration

According to the National Climate Assessment, extreme rainfall events and flooding have increased during the last century, and these trends are expected to continue.

Figure 3.10. U.S. Climate Resilience Toolkit- Annual Total Precipitation for Clark County

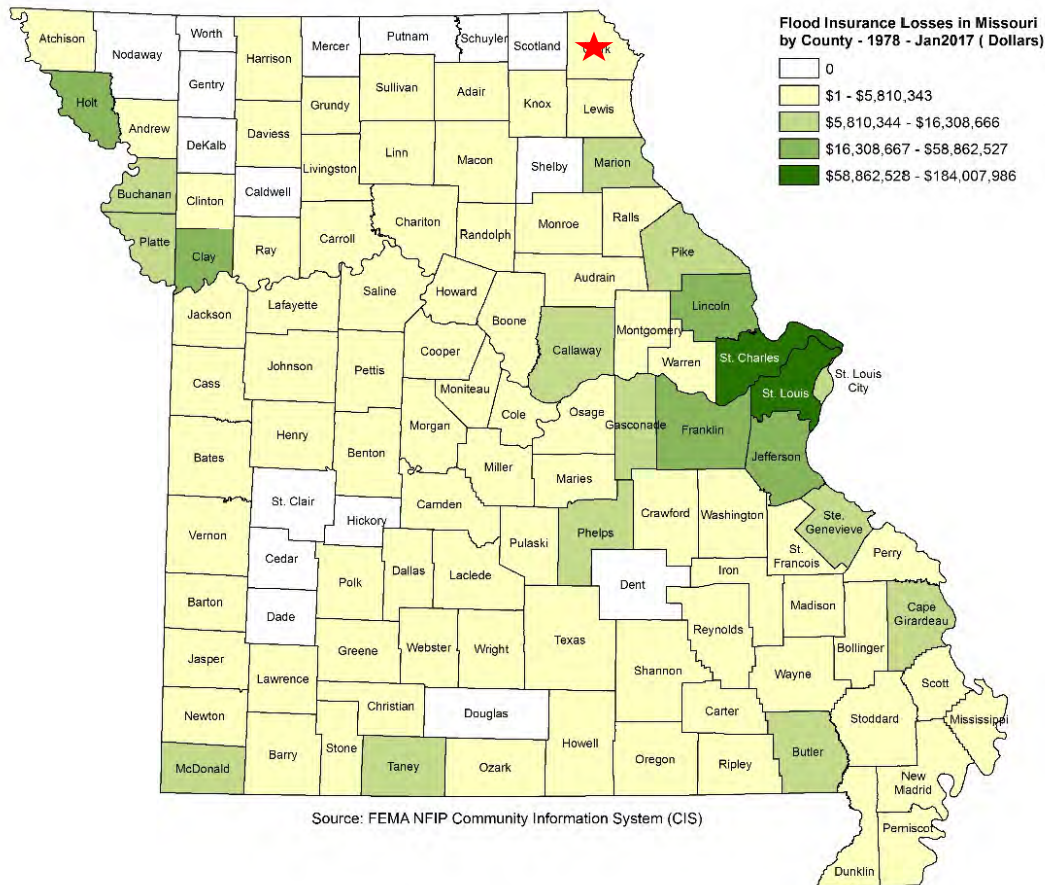


Source: US Climate Resilience Toolkit; <https://toolkit.climate.gov/tools/climate-explorer>

Vulnerability

Vulnerability Overview

Figure 3.11. Map of Dollars Paid Historically for Flood Insurance Losses in Missouri by County, 1978-January 2017



Source: 2018 Missouri State Hazard Mitigation Plan, *Red star indicates Clark County

According to the 2018 Missouri State Hazard Mitigation Plan, Clark County ranged at the lower end of Flood Insurance Losses between \$1-\$5,810,343.

The 2018 Missouri State Hazard Mitigation Plan demonstrates Clark County's loss ratio at 1.14%. This ratio represents a total direct building loss and income loss.

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.

Potential Losses to Existing Development

Using the data obtained from Flood Insurance Administration the City of Alexandria has a history of repetitive loss, and is the most vulnerable to have another event occur.

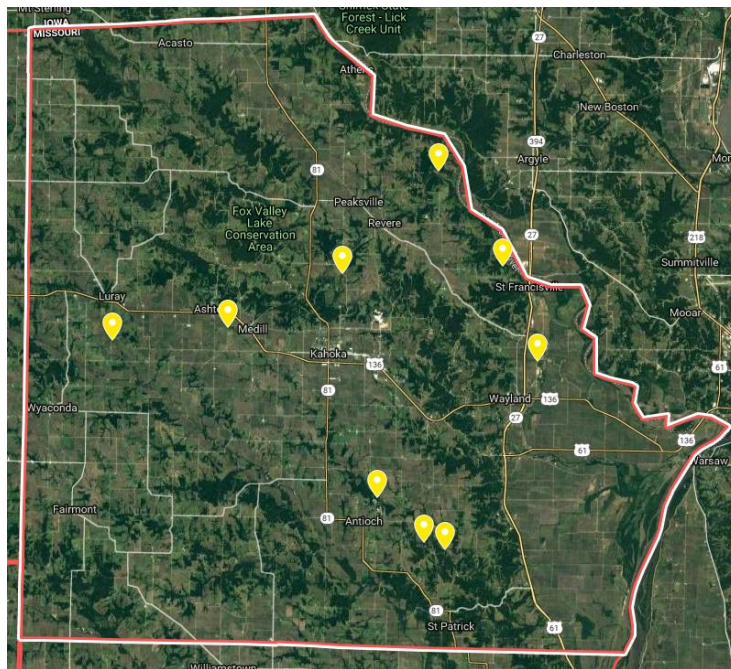
Impact of Previous and Future Development

Any future development in floodplains would increase risk in those areas. For the 7 communities participating in the National Flood Insurance Program, enforcement of the floodplain management regulations will ensure mitigation of future construction in those areas. However, even if structures are mitigated, evacuation may be necessary due to rising waters. In addition, floods that exceed mitigated levels may still cause damages.

Hazard Summary by Jurisdiction

Vulnerability to flooding varies by jurisdiction as each community has a different layout, as described above the City of Alexandria has a history of repetitive loss and would be more vulnerable to another loss in the future. The floodplain maps in the Geographic Location section depict the flood area in each jurisdiction. Table 3.13 reflects the NCEI Flash Flood Events in Unincorporated Clark County at 20 events, Kahoka at 7, Wyaconda at 3, Wayland and Luray at 2 and Revere at 1 event with a total of 33 events in the planning area.

Figure 3.12. Low Water Crossings in Clark County



Source: https://www.google.com/maps/d/u/0/edit?mid=1D9tsENileFCyZnLDhc8sgT4D_Stl45lw&ll=40.311624879266844%2C-91.64619281880834&z=14

Problem Statement

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

3.4.2 Levee Failure

Some sources of data for this hazard include:

- National Levee Database, <http://nld.usace.army.mil/egis/f?p=471:1:0::NO>
- FEMA Map Service Center for Flood Insurance Rate Maps and Flood Insurance Studies, msc.fema.gov/portal
- <https://www.fema.gov/fema-levee-resources-library>

Hazard Profile

Hazard Description

Levees are earth embankments constructed along rivers and coastlines to protect adjacent lands from flooding. Floodwalls are concrete structures, often components of levee systems, designed for urban areas where there is insufficient room for earthen levees. When levees and floodwalls and their appurtenant structures are stressed beyond their capabilities to withstand floods, levee failure can result in injuries and loss of life, as well as damages to property, the environment, and the economy.

Levees can be small agricultural levees that protect farmland from high-frequency flooding. Levees can also be larger, designed to protect people and property in larger urban areas from less frequent flooding events such as the 100-year and 500-year flood levels. For purposes of this discussion, levee failure will refer to both overtopping and breach as defined in FEMA's Publication "So You Live Behind a Levee"

(<http://mrcc.isws.illinois.edu/1913Flood/awareness/materials/SoYouLiveBehindLevee.pdf>).

Following are the FEMA publication descriptions of different kinds of levee failure.

Overtopping: When a Flood Is Too Big

Overtopping occurs when floodwaters exceed the height of a levee and flow over its crown. As the water passes over the top, it may erode the levee, worsening the flooding and potentially causing an opening, or breach, in the levee.

Breaching: When a Levee Gives Way

A levee breach occurs when part of a levee gives way, creating an opening through which floodwaters may pass. A breach may occur gradually or suddenly. The most dangerous breaches happen quickly during periods of high water. The resulting torrent can quickly swamp a large area behind the failed levee with little or no warning.

Earthen levees can be damaged in several ways. For instance, strong river currents and waves can erode the surface. Debris and ice carried by floodwaters—and even large objects such as boats or barges—can collide with and gouge the levee. Trees growing on a levee can blow over, leaving a hole where the root wad and soil used to be. Burrowing animals can create holes that enable water to pass through a levee. If severe enough, any of these situations can lead to a zone of weakness that could cause a levee breach. In seismically active areas, earthquakes and ground shaking can cause a loss of soil strength, weakening a levee and possibly resulting in failure. Seismic activity can also cause levees to slide or slump, both of which can lead to failure.

Geographic Location

Missouri is a state with many levees. Currently, there is no single comprehensive inventory of levee systems in the state. Levees have been constructed across the state by public entities and private entities with varying levels of protection, inspection oversight, and maintenance. The lack of a comprehensive levee inventory is not unique to Missouri.

There are two concurrent nation-wide levee inventory development efforts, one led by the United

State Army Corps of Engineers (USACE) and one led by Federal Emergency Management Agency (FEMA). The National Levee Database (NLD), developed by USACE, captures all USACE related levee projects, regardless of design levels of protection. The Midterm Levee Inventory (MLI), developed by FEMA, captures all levee data (USACE and non-USACE) but primarily focuses on levees that provide 1% annual-chance flood protection on FEMA Flood Insurance Rate Maps (FIRMs).

It is likely that agricultural levees and other non-regulated levees within the planning area exist that are not inventoried or inspected. These levees that are not designed to provide protection from the 1-percent annual chance flood would overtop or fail in the 1-percent annual chance flood scenario. Therefore, any associated losses would be taken into account in the loss estimates provided in the Flood Hazard Section.

According to the USACE, there are seven USACE maintained levees within Clark County. Detailed levee data can be found in **TABLE 3.22**. Leveed areas can be seen in **Figure 3.13**. According to the maps, there are no schools or special district assets located in said protected areas

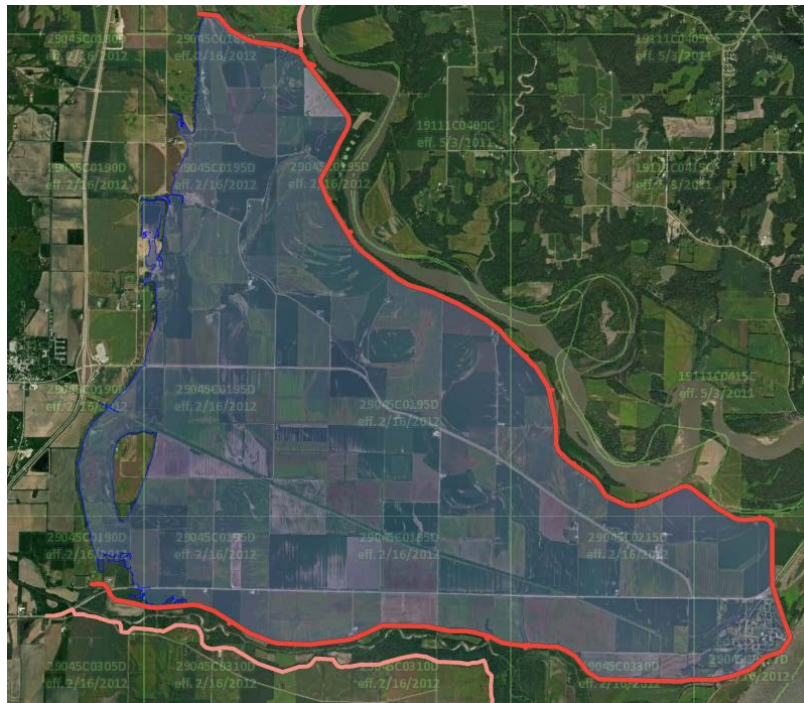
Table 3.22. Clark County Levees

County	System Name/ Sponsor	Length (Miles)	Inspection Date	Leveed Area Type	Leveed Area Square Miles
Clark	Des Moines and Mississippi Levee District No 1	31.67	11/08/2017	Agricultural/ Community	17.88
Clark	Des Moines River 1	3.43	-	Agricultural	1.70
Clark/ Lewis	Gregory Drainage & Levee District	23.59	11/07/2017	Agricultural	14.27
Clark	Mississippi-Fox D&LD No. 2 (Lower Middle Unit[Southwest])	2.42	11/04/2016	Agricultural	.63
Clark	Mississippi-Fox D&LD No. 2 (Lower Middle Unit[Southeast])	19.28	11/04/2016	Agricultural	6.48
Clark	Mississippi-Fox D&LD No. 2 (Lower Middle Unit[West])	6.65	11/04/2016	Agricultural	2.67
Clark	Mississippi-Fox D&LD No. 2 (Lower Middle Unit[North])	9.18	11/04/2016	Agricultural	3.91

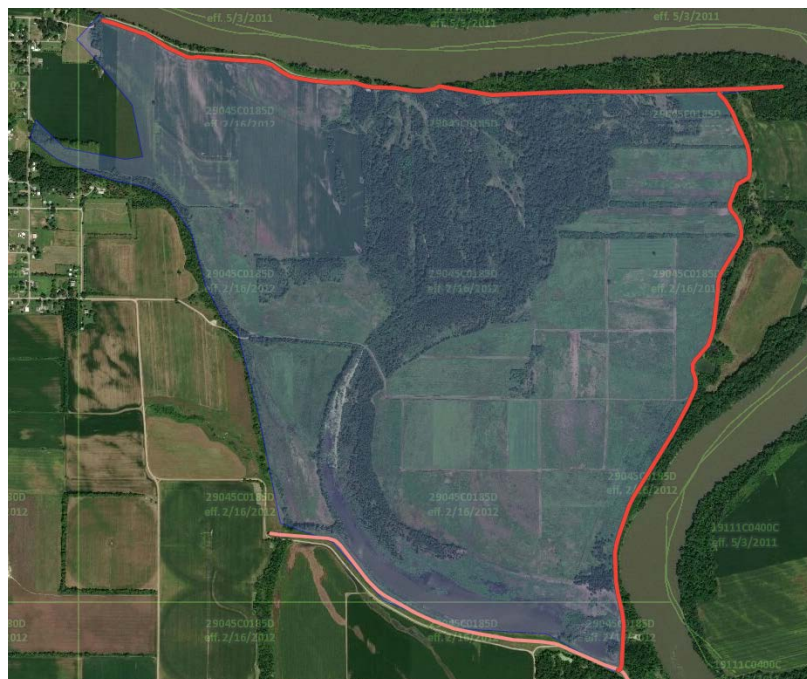
Source: <http://nld.usace.army.mil/egis/f?p=471:1:0::NO>

Figure 3.13 County Levees Shown on DFIRM as Providing Protection from the 1-Percent Annual Chance Flood

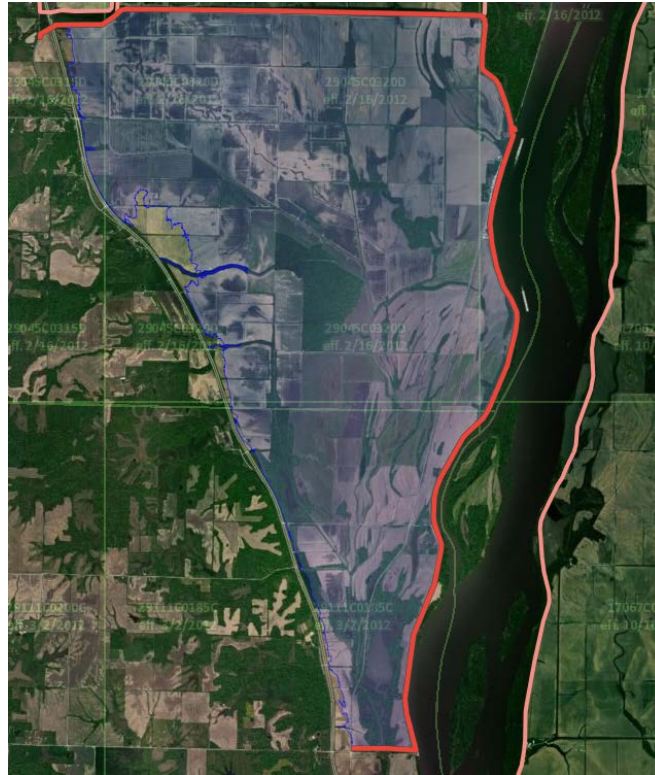
Des Moines and Mississippi Levee District No.1



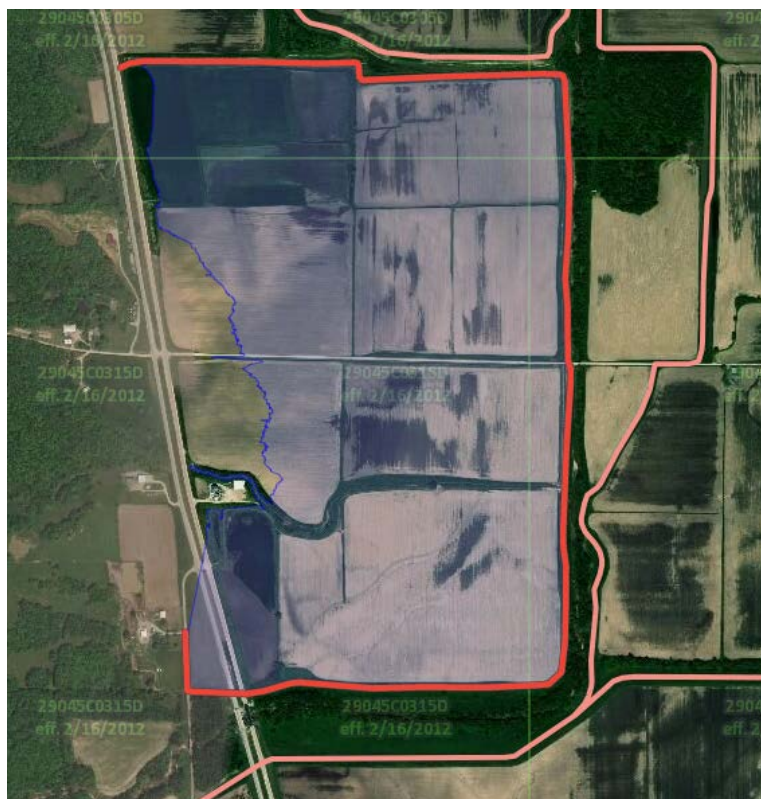
Des Moines River 1



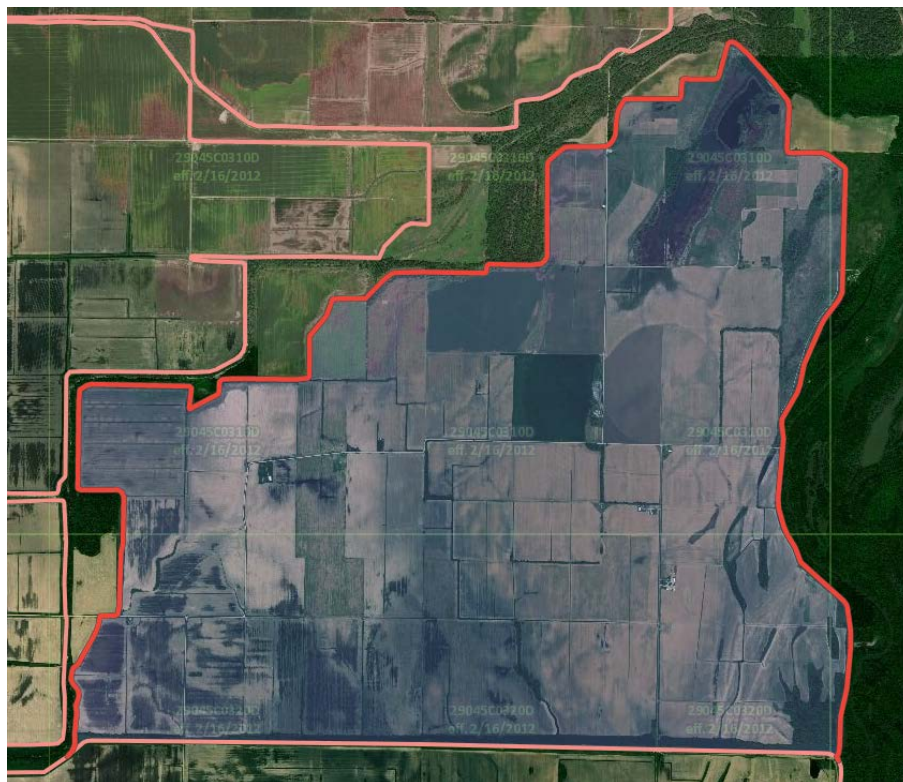
Gregory Drainage & Levee District



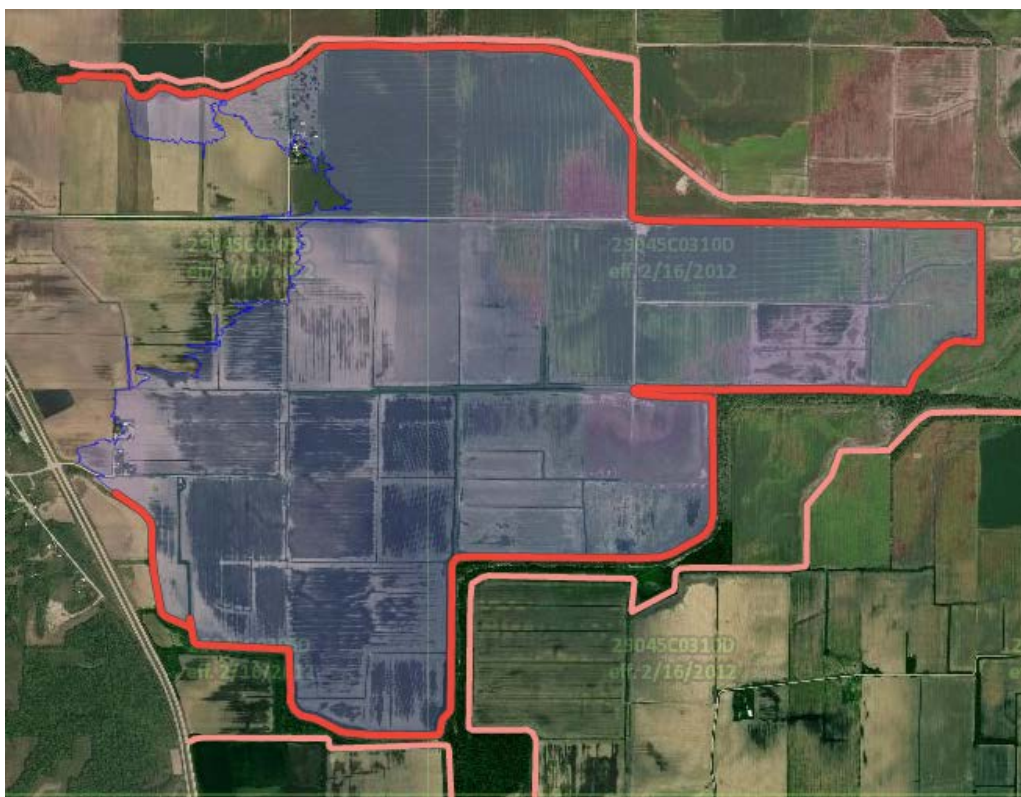
Mississippi-Fox D&LD No. 2 (Lower Middle Unit [South West])



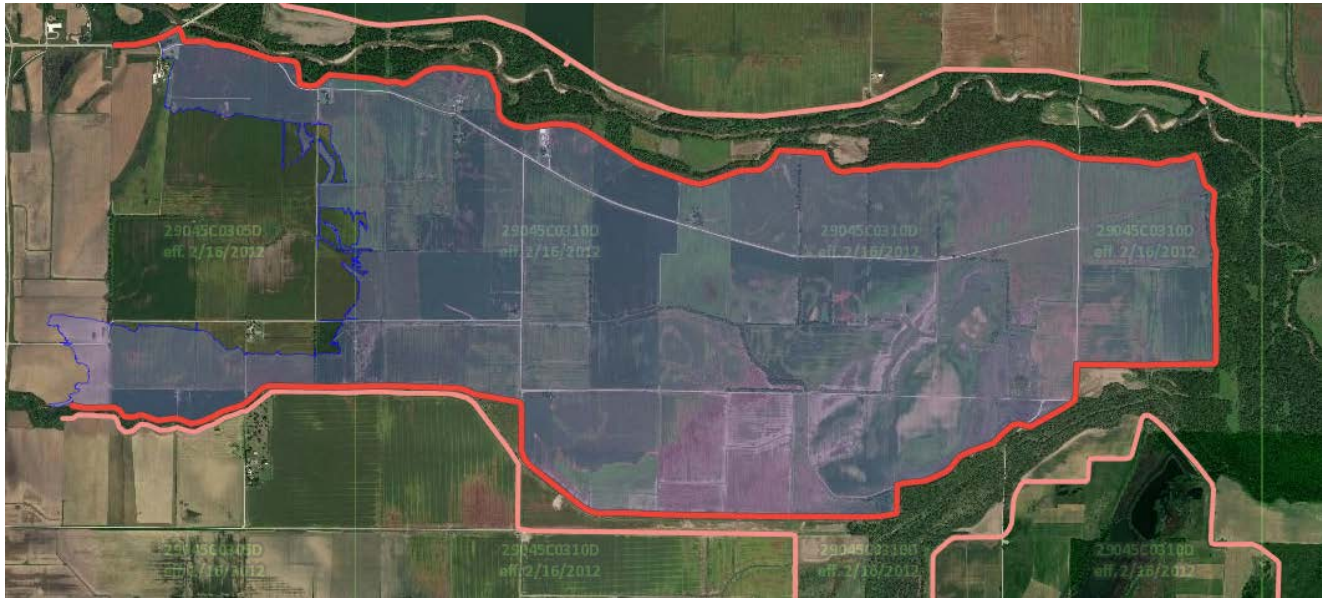
Mississippi-Fox D&LD No. 2 (Lower Middle Unit [South East])



Mississippi-Fox D&LD No. 2 (Lower Middle Unit [West])



Mississippi-Fox D&LD No. 2 (Lower Middle Unit [North])



Source: <https://levees.sec.usace.army.mil/#/levees/system> Date: 7/1/2019

Strength/Magnitude/Extent

Levee failure is typically an additional or secondary impact of another disaster such as flooding or earthquake. The main difference between levee failure and losses associated with riverine flooding is magnitude. Levee failure often occurs during a flood event, causing destruction in addition to what would have been caused by flooding alone. In addition, there would be an increased potential for loss of life due to the speed of onset and greater depth, extent, and velocity of flooding due to levee breach.

As previously mentioned, agricultural levees and levees that are not designed to provide flood protection from at least the 1-percent annual chance flood likely do exist in the planning area. However, none of these levees are shown on the Preliminary DFIRM, nor are they enrolled in the USACE Levee Safety Program. As a result, an inventory of these types of levees is not available for analysis. Additionally, since these types of levees do not provide protection from the 1-percent annual chance flood, losses associated with overtopping or failure are captured in the Flood Section of this plan.

Previous Occurrences

1993 Flooding:

- **Des Moines and Mississippi Levee District No. 1:** As a result of the 1993 flood event, the levee system was overtopped and breached in three locations, sustained loss of section and erosion damages, and pump station building and pump damages. The breaches were repaired using fill from a dredged sand stockpile and hydraulic sand fill from the Mississippi River and the loss of section and erosion damages were repaired using fill from dredged sand stockpiles. The pump station buildings and pumps were rebuilt, replaced, and reconditioned as needed, with the 2 buildings located at the landside levee toe rebuilt, the 2 pumps in the westerly building removed and replaced with 1 pump, and the 1 pump in the easterly building reconditioned.
- **Gregory Drainage & Levee District:** The Gregory Levee and Drainage District incurred significant damage from the summer floods of 1993. Repairs of extensive breaches and overtopped clay and sand levee reaches involved replacing clay and sand fill embankment

material with all sand fill. Modifications and repairs to the pump station also occurred, including reconditioning and replacement of pumps, piping, valves, fittings, right angle gear drives, electrical equipment, and other ancillary equipment associated with the pump station.

- **Mississippi-Fox D&LD No. 2:** The levee system at Mississippi-Fox Drainage & Levee District No. 2 was overtopped on July 1, 1993. The water level exceeded the top of the levee by more than 10 feet. No repairs were required in this section.

2001 Flooding:

- **Gregory Drainage & Levee District:** The Gregory Levee and Drainage District incurred significant foreshore erosion from the flooding events of April through June 2001. Repairs included foreshore reconstruction and riprap replacement. PL 84-99 repairs for the flood of 2001 were completed by January 2002.
- **Mississippi-Fox D&LD No. 2:** A high snowfall in Minnesota and Wisconsin, combined with a rapid spring melt, caused flooding along the Mississippi River. The gage at Gregory Landing (RM 352.9) crested on May 15, 2001 at 24.04 feet (496.74 NGVD); flood stage is 15.0 feet. On May 12, flow from Honey Creek started to overtop a reach in the Upper Levee with Mississippi River stages at approximately 22.6 feet at the Gregory Landing gage. Sandbags were used to raise the levee along reaches of the Upper, Upper Middle, and Lower Levees. On May 14, overtopping of the sandbags resumed in these areas. During that night, heavy rainfall occurred in the Fox River watershed, causing flash flooding, and on May 15 Honey Creek overtopped a reach of the Upper Levee, Upper Middle Levee, and Lower Levee. The overtopping was significant and caused the levee system to breach in three areas. Breaching of the levee system was caused by high stages on the tributaries, which were aggravated by high stages on Mississippi River. The frequency of the flood was approximately 100 years. The Mississippi River exceeded flood stage for approximately 8 weeks (April to June 2001). The selected repair alternative included all work necessary to protect the Levee District from further damage and to restore land for crops to pre-disaster or equivalent condition. This was accomplished by returning the levee system to its pre-flood alignment, grade, and cross-section. The work involved filling and reshaping the areas damaged by wave action / overtopping and repairing two impellers, 10 bearings, and two shafts at the pump station in the Lower Levee. All repair work maintained the original alignment of the levee.

2008 Flooding:

- **Gregory Drainage & Levee District:** Eight levee breaches occurred during the Flood of 2008, comprising a total length of approximately 5110 feet. The upper three breaches were created by incoming flows towards the interior of the levee district as evidenced by the large scour holes that were measured to be as much as 17 to 22 feet deep and extended several hundred feet landward of the levee centerline. One of the upper breaches occurred at the railroad closure which is located at the downstream end of the Fox River reach. The sponsor reported that immediately prior to this area breaching; the levee materials were observed to be washing through rock that had previously been placed by the Railroad to support their track structure after a similar breach occurred in 1993. At the time that the 2008 damage survey was conducted, the Railroad had again built up a rock section to support a 200 ft section of track that was washed out during the 2008 breach. Overtopping due to the exit of floodwaters, caused the remaining five breaches and other moderate damage, extending approximately 1 to 4 feet into the clay core. This damage was documented at several locations along downstream sections of the levee near Station 465+00. By contrast, the scour holes in these downstream breach areas were less than 3 to 5 feet deep, and sand materials from the levee and push-up were washed toward the river. The "push-up" consisted of using embankment material from the landside of the levee and/or berms to raise the height of the levee at

the crown to prevent overtopping.

During the flood fight, push-up had been placed along the entire Main Stem and Fox River sections of the levee system. As a result, none of the landside seepage berms identified in the O&M manual could be discerned and the vulnerable landside levee slopes had experienced varying degrees of wave wash along the entire length of both reaches.

As part of the 2008 flood recovery efforts, the railroad closure structure was relocated. This work included constructing a set-back levee on a new alignment, and building a new panel closure.

Probability of Future Occurrence

According to the USACE, there has been 3 levee breaches in the last 20 years. This information was utilized to determine the annual average percent probability of levee failure. The probability of levee failure in Clark County per year is 15% (3 event/20 years x 100 = 15%).

Changing Future Conditions Considerations

The impact of changing future conditions on levee failure will most likely be related to changes in precipitation and flood likelihood. Climate Change projections suggest that precipitation may increase and occur in more extreme events, which may increase risk of flooding, putting stress on levees and increasing likelihood of levee failure. Furthermore, aging levee infrastructure and a lack of regular maintenance (including checking for seepage and removing trees, roots and other vegetation that can weaken a levee) coupled with more extreme weather events may increase risk of future levee failure. Refer to **Figure 3.10**.

Vulnerability

Vulnerability Overview

Areas with the most vulnerability

The USACE regularly inspects levees within its Levee Safety Program to monitor their overall condition, identify deficiencies, verify that maintenance is taking place, determine eligibility for federal rehabilitation assistance (in accordance with P.L. 84-99), and provide information about the levees on which the public relies. Inspection information also contributes to effective risk assessments and supports levee accreditation decisions for the National Flood Insurance Program administered by the Federal Emergency Management Agency (FEMA).

The USACE now conducts two types of levee inspections. Routine Inspection is a visual inspection to verify and rate levee system operation and maintenance. It is typically conducted each year for all levees in the USACE Levee Safety Program. Periodic Inspection is a comprehensive inspection led by a professional engineer and conducted by a USACE multidisciplinary team that includes the levee sponsor. The USACE typically conducts this inspection every five years on the federally authorized levees in the USACE Levee Safety Program.

Both Routine and Periodic Inspections result in a rating for operation and maintenance. Each levee segment receives an overall segment inspection rating of Acceptable, Minimally Acceptable, or Unacceptable. **Figure 3.14** below defines the three ratings.

Figure 3.14 Definitions of the Three Levee System Ratings

Levee System Inspection Ratings	
Acceptable	All inspection items are rated as Acceptable.
Minimally Acceptable	One or more levee segment inspection items are rated as Minimally Acceptable or one or more items are rated as Unacceptable and an engineering determination concludes that the Unacceptable inspection items would not prevent the segment/system from performing as intended during the next flood event.
Unacceptable	One or more levee segment inspection items are rated as Unacceptable and would prevent the segment/system from performing as intended, or a serious deficiency noted in past inspections (previous Unacceptable items in a Minimally Acceptable overall rating) has not been corrected within the established timeframe, not to exceed two years.

According to the USACE, no levees in the planning area received a rating of unacceptable.

Potential Losses to Existing Development

The City of Alexandria is protected by the Des Moines and Mississippi Levee District No. 1. Total structures that are protected by this levee are estimated at 230 with a property value estimated at \$72.3 million. It is also estimated that 501 people are at risk in this levee district zone. As seen in **Figure 3.15** the entire City of Alexandria falls in the 1% annual chance of flood hazard zone. Alexandria is the only development that falls in the 1% annual chance of flood zone with the 6 other levees protecting agricultural ground and minimal structures.

Figure 3.15. DFIRM overlay of City of Alexandria



Source: <https://levees.sec.usace.army.mil/#/levees/system>

Impact of Previous and Future Development

Future development in leveed areas would increase the vulnerability for potential losses. Therefore, development in these areas should be avoided.

Hazard Summary by Jurisdiction

The City of Alexandria falls in a levee protected area with 6 critical facilities that could become inundated with flooding. The facilities include a Communications Tower, Fire Service, Government Building, Highway Bridge, Rail, and two Tier 2 Chemical Facilities. There are no school or special districts located in the 1% annual chance of flood zone.

Problem Statement

The risk of levee failure is usually a secondary effect of flooding or some other natural disaster. The Eastern portion of the county is directly affected by flooding of the Mississippi River and consequential levee failures. Cropland production is decreased, transportation systems effected and the economy as a whole suffers. There is a lack of participation in hazard mitigation planning by property owners, businesses, and occupants of flood-prone areas, and outreach could be improved so they better understand the consequences of living in these areas. As well, transportation systems along highway 61 is highly susceptible to flooding due to levee failure, and are typically closed when an event occurs. During the event of levee failure, potential loss would be similar to that of flooding.

3.4.3 Dam Failure

Hazard Profile

Hazard Description

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

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

Data from dams in Clark County has been collected from two sources; a listing by the Missouri Department of Natural Resources (MoDNR) and the National Inventory of Dams (NID). Each has its own system of classifying dams. For the purpose of planning, the NID information was used. Neither the MoDNR nor the NID hazard potential classification references the condition of the dam.

Table 3.23. MoDNR Dam Hazard Classification Definitions

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

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

Table 3.24. NID Dam Hazard Classification Definitions

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

Source: National Inventory of Dams

Geographic Location

Dams Located Within the Planning Area

Table 3.25. High, Significant, and Low Hazard Dams in the Clark County Planning Area

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	Hazard Potential
Stevenson Dam	-	29.3	27	-	Burnt Shirt Branch	Luray	9	Stevenson Farms	Low
Herring Lake Dam	-	25	67	-	TR-Fox River	Luray	8.5	Emerson Herring	Low
Daniels Dam	-	31	19	9/30/2005	TR-Des Moines	Revere	6	Gene Daniels	Low
Krouse Dam	-	33	30	-	Wolf Branch	Luray	7	Junior Krouse	Low
Sommers Dam	-	31	39	-	TR-Fox River	Luray	6	Floyd Sommers	Low
Andrews Dam	-	29	19	9/30/2005	TR-Fox River	Revere	5.5	Kevin Andrews	Low
Seaver Lake Dam	-	30	80	-	TR- Little Fox River	Luray	6.5	Frank Seaver	Low
Raup Dam	-	33	38	-	TR- Little Fox River	Luray	5.5	Ron Raup	Low
Raup Dam 2	-	32.2	47	-	Pilcher Branch	Luray	5	Ron Raup	Low
Cochenour Lake Dam	-	19	106	-	TR-North Wyaconda River	Luray	4	Frank Cochenour	Low
Conrad Dam	-	33	26	-	Fox River	Revere	3	Conrad Brothers LTD	Low
Fox Valley Dam	Yes	52	4,347	12/7/2018	Fox Creek	Revere	4	Mo Dept. of Conserv.	High
Des Moines River Farm Dam	-	31	31	-	TR-Des Moines River	St. Francisville	1.5	Des Moines River Farm Partners	Low
Ed Riney Dam	-	35	19	9/1/2001	TR-Des Moines River	St. Francisville	1	Ed Riney	Low

Sowers Dam	-	24	60	-	TR-Weaver Br. Des Moines River	St. Francisville	1.5	Kenny Sowers	Low
Wood Dam	-	29	40	-	TR-Fox River	Wayland	3	David Wood	Low
Winter-Wood Dam	-	30	64	-	TR-Fox River	Wayland	3	F M Winters	Low
Fox River Farm Lake Dam	-	33.7	500	-	Singleton Branch	Kahoka	3.5	Maureen Hammond	Significant
Gutting Lake Dam	-	28	30	-	TR-Fox River	Kahoka	1	Harlan & Bernice Buford	Low
Alber Lake Dam	-	25	27	-	TR-Fox River	Kahoka	.5	C L Alber	Low
Hiller Lake Dam	-	30	32	-	TR-Fox River	Kahoka	1	Craig Hiller	Low
Phillips Dam	-	32	17	-	Trib to Little Fox River	Kahoka	1.5	Mid America Dairy Co.	Low
Seyb Dam	-	34	40	-	Little Fox River	Kahoka	3	George Seyb	Low
Seyb Lake Dam	-	25	80	-	TR-Little Fox River	Kahoka	3	Lambert Seyb	Low
Small Dam	-	30	62	9/30/2006	TR-N. Wyaconda River	Wyaconda	3.5	Aaron Small	Low
Priebe Dam	-	29	48	-	TR-South Wyaconda River	Wyaconda	1	Gene Priebe	Low
Wyaconda City Dam	-	32	120	10/5/1978	TR-South Wyaconda River	Wyaconda	.5	City of Wyaconda	High
Robertson Lake Dam	-	20	107	-	TR-Musko BR	Wyaconda	.5	James B Robertson	Low
Bear Creek Watershed Dam LTS-62	-	25	41	-	TR-Bear Creek	Wyaconda	2	Fred Peterson	Low
Wilson Dam	-	26.6	20	-	Wyaconda River	Wyaconda	5	Danny Wilson	Low
Tim Redding Dam	-	27	54	11/1/2008	TR-Wyaconda River	Wyaconda	5	Tim Redding	Low
Brotherton Lake Dam	-	25	54	-	TR-Wyaconda River	Wyaconda	6	Lewis Brotherton	Low

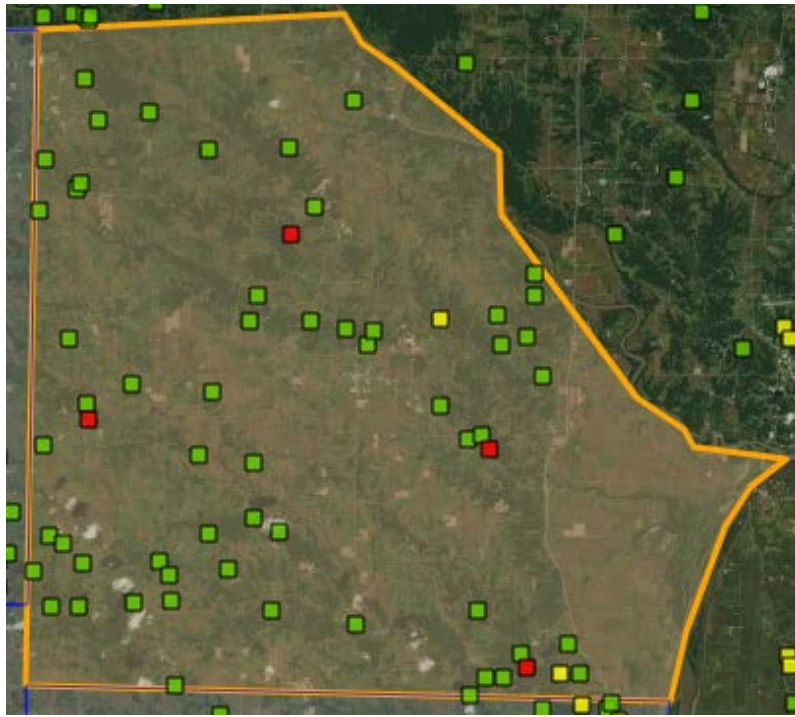
Trump Lake Dam	-	34	346	-	Fox River	Kahoka	2	Gary Trump	Low
Glades Lake Dam	-	25	67	-	TR-Mississippi River	Wayland	1	Glades Equipment Co.	Low
Hickory Hills Lake Dam	-	33	88	-	TR-Fox River	Wayland	2	John L. McAndrews	Low
Shaffer Lake Dam	-	30	112	-	TR-Fox River	Wayland	2	Delbert Shaffer	Low
Ludwick Lake Dam	-	25	67	-	TR-Fox River	Wayland	1.5	WC Ludwick	High
Bear Creek Watershed Dam F-20	-	25	142	-	TR-Bear Creek	Fairmont	1	Bear Creek WRSD Subdistr	Low
Bear Creek Watershed Dam LTS-7	-	24	68	-	Bear Creek	Fairmont	.5	Barbara Anderson	Low
Bear Creek Watershed Dam LTS-17	-	26	41	-	TR-Bear Creek	Fairmont	1	Paul Drillion	Low
Bear Creek Watershed Dam G-21	-	26	65	-	TR-Bear Creek	Fairmont	.5	Bear Cr. WRSD Subdistrict	Low
Ebeline Lake Dam	-	25	40	-	TR-Little Wyaconda River	Fairmont	3	Robert Ebeline	Low
Evans Dam	-	28	34	-	TR-Little Wyaconda River	Fairmont	3	Gilford Evans	Low
Evans Lake Dam	-	25	67	9/12/1990	TR-Little Wyaconda River	Fairmont	3.5	Neil Evans	Low
Bear Creek Watershed Dam LTS-41	-	27	48	-	TR-Bear Creek	Fairmont	2.5	Everett Grindle	Low
Bear Creek Watershed Dam X-7A	-	30	1000	-	TR-Bear Creek	Fairmont	2.5	Bear CR WRSD Subdistrict	Low
Fields Dam	-	28	26	-	Bear Creek	Williamstown	2	Guy Fields Trust	Low
Selway Dam	-	29	21	9/30/2006	TR-Forree Branch	Fairmont	4.5	Neva Selway	Low
Pezley Lake Dam	No	36	792	7/1/2013	TR-Wyaconda River	Fairmont	5	Chris Peasly	Low
Shannon Dam	-	29	55	9/30/2006	TR-Wyaconda River	Fairmont	5.5	Randy Shannon	Low

Brewer Lake Dam	-	25	80	-	TR-Little Wyaconda River	Fairmont	4	Edward Brewer	Low
Fishback Lake Dam	-	25	94	-	TR-Little Wyaconda River	Fairmont	6	Hillborn Fishback	Low
Kline Dam	-	27.1	45	-	TR-Little Wyaconda River	St. Patrick	4	Dillion Kleine	Low
Rossi Lake Dam	-	24	128	-	TR-Honey Creek	St. Patrick	3	TJ Rossi	Low
Buschling Lake Dam	-	30	96	-	TR-Wyaconda River	St. Patrick	.5	Richard Buschling	Low
Leroy Dam	-	33	22	9/30/2006	TR-Wyaconda River	St. Patrick	.2	Peter Leroy	Low
Stevens Dam	-	30.9	20	-	Buck Run	St. Patrick	.4	Mark Stevens	Low
Melton Dam	-	28	34	-	Buck Run	St. Patrick	1.25	Larry Melton	Low
Lake of the Oaks Dam	-	34.4	2,141	8/13/1990	TR-Buck Run Cr	St. Patrick	1.4	Ben Knapp	High
Buck & Doe Run Watershed Dam 32	-	30	52	-	TR-Buck Run Cr	St. Patrick	4	Buck & Doe CR WRSD Subdistrict	Low
Buck-Doe Run WTRSHED Structure #2	No	48	1,008	12/7/2016	Buck Run Cr	St. Patrick	3	Clark Co. Soil & Water District	Significant
Buck & Doe Watershed Dam 33	-	31	68	-	TR-Buck Run Cr	St. Patrick	4	Buck & Doe CR WRSD Subdistrict	Low

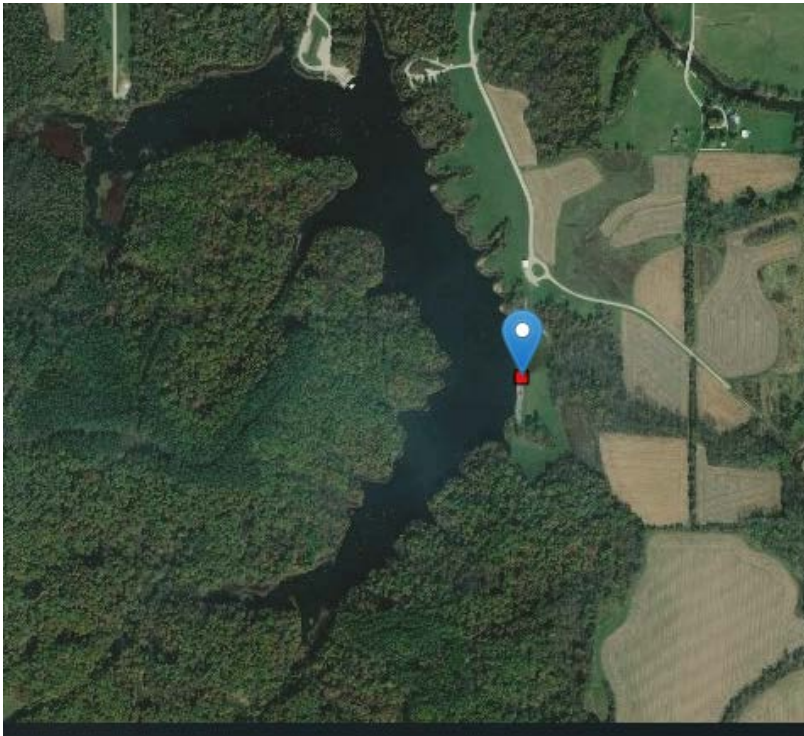
Sources: Missouri Department of Natural Resources, <https://dnr.mo.gov/geology/wrc/dam-safety/damsinmissouri.htm> and National Inventory of Dams, http://nid.usace.army.mil/cm_apex/f?p=838:12.

Figure 3.16. High Hazard Dam Locations in Clark and Areas Impacted in the Event of Breach.

Clark County Dams (high hazard = red)



Fox Valley Dam



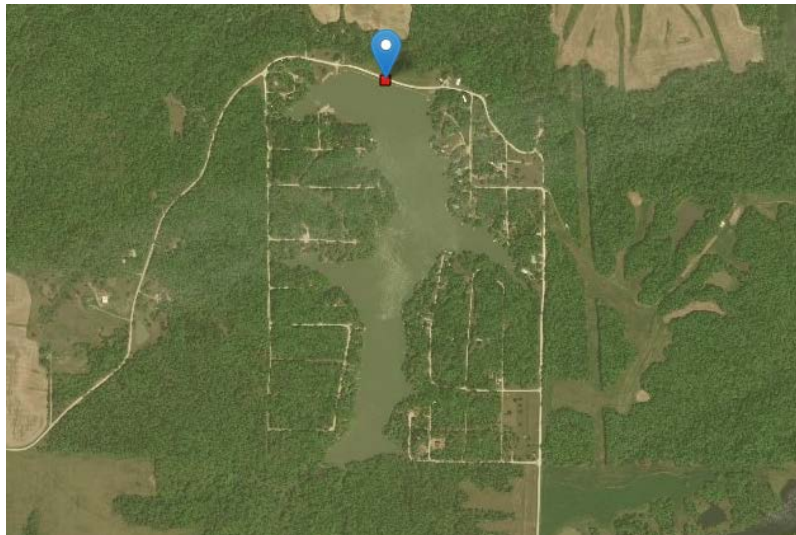
Wyaconda City Dam



Ludwick Lake Dam



Lake of the Oaks Dam

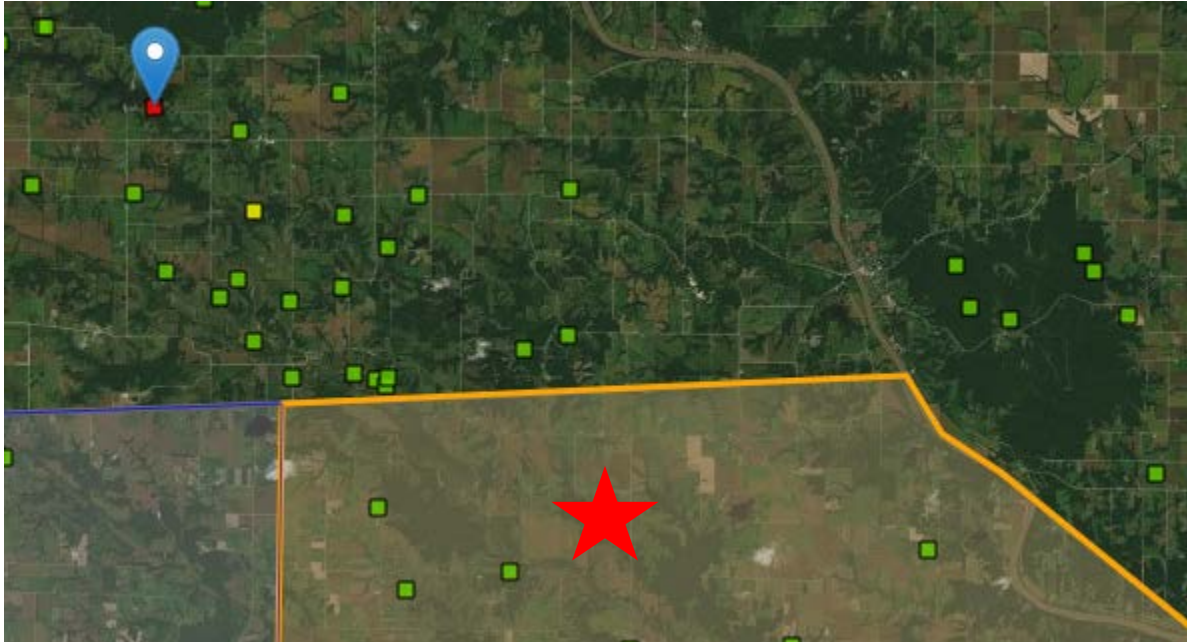


Source: U.S. Army Corps of Engineers

Upstream Dams Outside the Planning Area

According to the Missouri Department of Natural Resources, Missouri Geological Survey, Water Resources Center, there are no regulated high hazard dams that would flow into Clark County from surrounding counties during a failure event. However, there are many dams upstream with the closest High Hazard Dam being within 6 miles of the Clark County line. **Figure 3.17** shows all dams near the planning area and highlights the High Hazard Dam.

Figure 3.17. Upstream Dams Outside Clark County



Source: U.S. Army Corps of Engineers, *Star denotes Clark County

Strength/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 dams could result in a serious threat of loss of human life, serious damage to residential, industrial or commercial areas, public utilities, public buildings, or major transportation facilities. Catastrophic failure of any high hazard dams has the potential to result in greater destruction due to the potential speed of onset and greater depth, extent, and velocity of flooding. Worst case scenario would be a catastrophic failure at any of the high hazard class dams designated in Table 3.23.

Previous Occurrences

To determine previous occurrences of dam failure within the Clark County planning area, previously approved county hazard mitigation plan, the 2018 Missouri State Hazard Mitigation Plan, and the Stanford University's National Performance of Dams Program (<http://npdp.stanford.edu>) were consulted. No record of dam failure within Clark County boundaries were found.

Probability of Future Occurrence

Since it is unknown which dams, if any might fail at any given time, determining the probability of future occurrence is not possible. In addition, dam failure within the county has not occurred according to available data. Dam failure probability is listed as no data available (NDA).

Changing Future Conditions Considerations

The impact of changing future conditions on levee failure will most likely be related to changes in precipitation and flood likelihood. Climate Change projections suggest that precipitation may increase and occur in more extreme events, which may increase risk of flooding, putting stress on dams and increasing likelihood of dam failure. Furthermore, aging dam infrastructure and a lack of regular maintenance coupled with more extreme weather events may increase risk of future dam failure. Refer to **Figure 3.10**.

Vulnerability

Vulnerability Overview

Data was obtained from the 2018 Missouri State Hazard Mitigation Plan for the vulnerability analysis of dam failure for Clark County. There are however data limitations regarding dams unregulated by the State of Missouri due to height requirements. These limitations hinder vulnerability analysis; nonetheless, failure potential still exists. **Table 3.26** provides vulnerability analysis data for the failure of State-regulated dams in Missouri.

Table 3.26. Vulnerability Analysis for Failure of State-Regulated Dams in Missouri

County	Class 1	Class 2	Class 3	Total:	Estimated # of Buildings Vulnerable	Average Exposure Value per Structure (\$)	Estimated Total Potential Building Exposure (\$)	Estimated Total Population Exposure
Clark	1	0	2	3	2	627,680	1,255,361	0

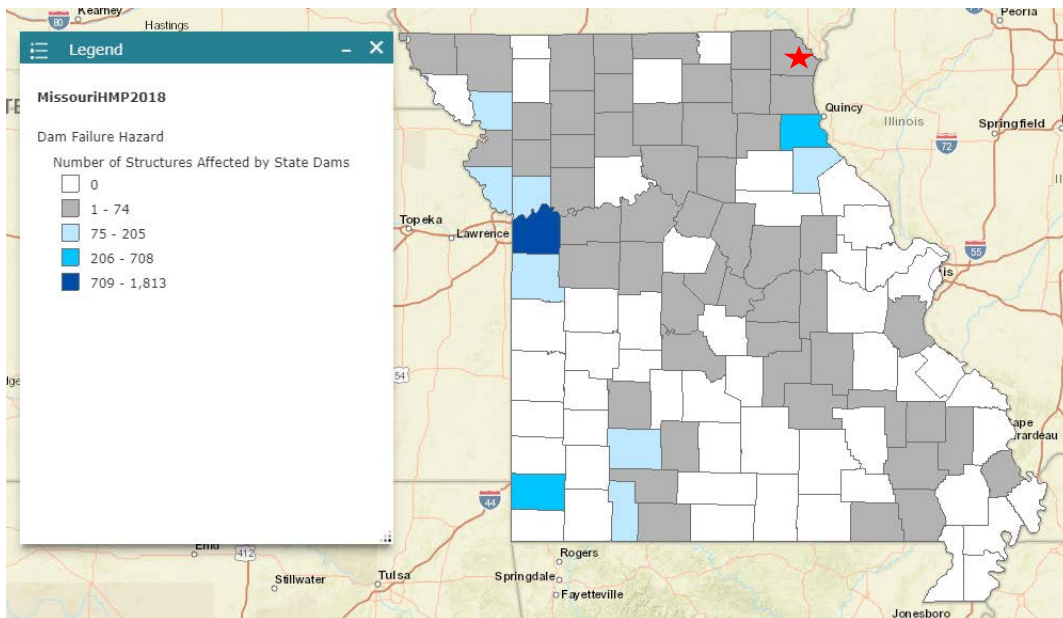
For the vulnerability analysis of State regulated dams, the State developed the following assumptions for overview:

- **Class 1:** 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 2:** The area downstream from the dam that would be affected by inundation contains one (1) to nine (9) 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 3:** The area downstream from the dam that would be affected by inundation does not contain any of the structures identified for Class 1 or Class 2 dams. Inspection of these dams

must occur once every five years.

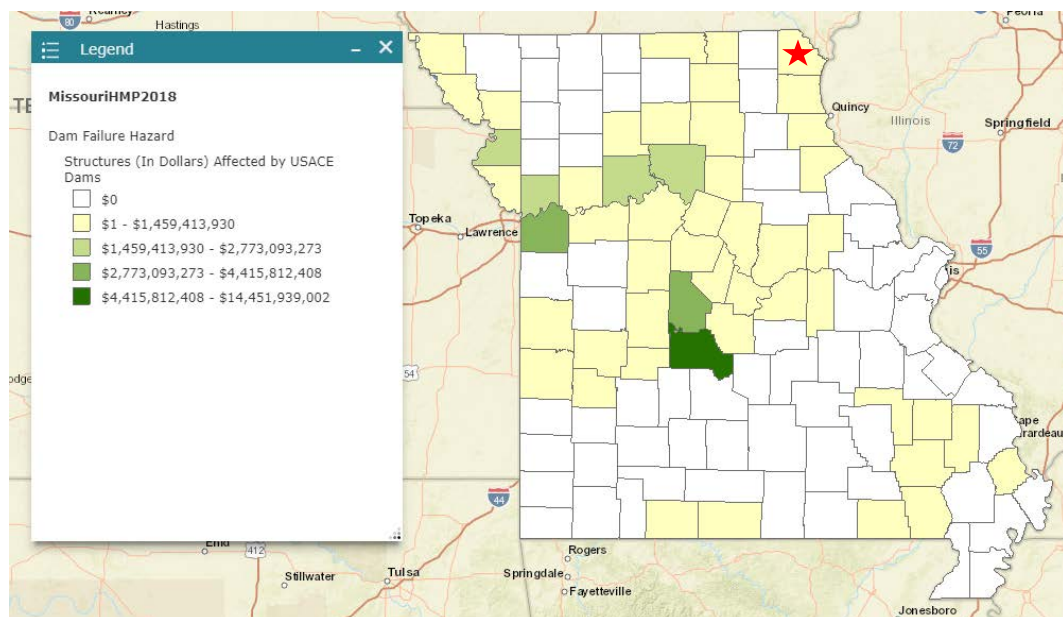
According to the 2018 Missouri State Hazard Mitigation Plan, there is an estimated 2 buildings vulnerable to the failure of Fox Valley Dam (**Figure 3.18**). **Figure 3.19** and **Figure 3.20** depict the total estimated building losses and population exposure by county, respectively. The estimated total potential building exposure is \$1,255,361. The estimated population exposure to failure of Fox Valley Dam is 0.

Figure 3.18. Estimated Number of Buildings Vulnerable to Failure of State-Regulated Dams



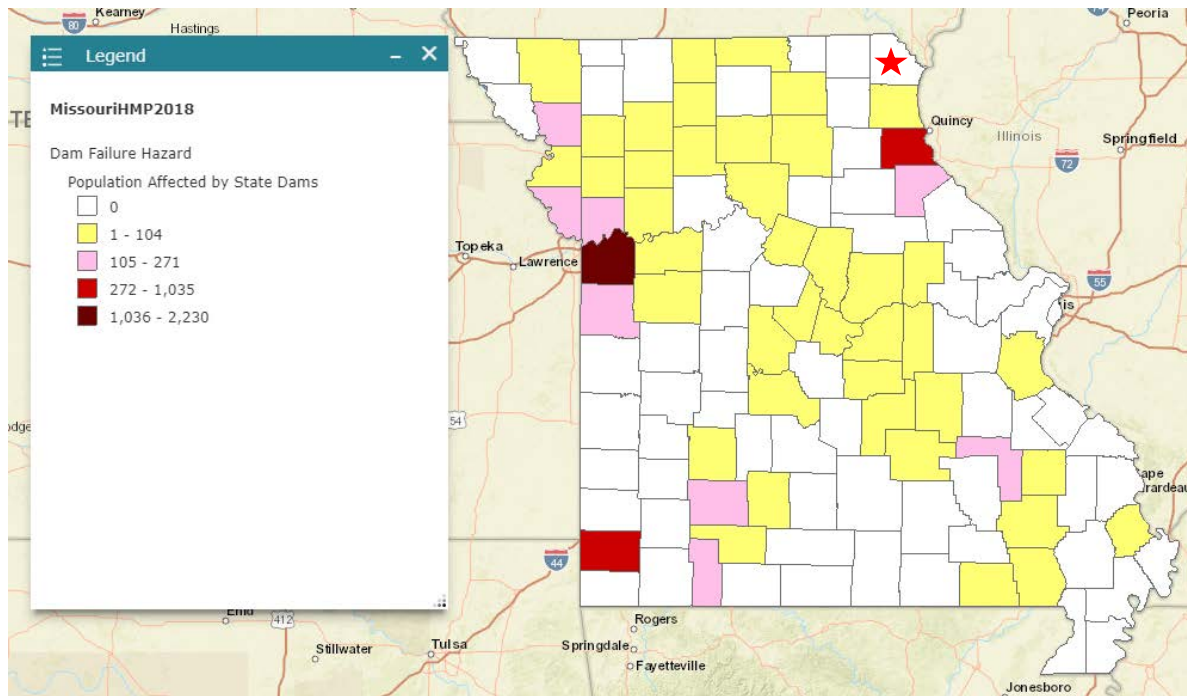
Source: 2018 Missouri State Hazard Mitigation Plan *Red Star indicates Clark County

Figure 3.19. Estimated Building Losses from Failure of State-Regulated Dams



Source: 2018 Missouri State Hazard Mitigation Plan *Red Star Indicates Clark County

Figure 3.20. Estimated Population Exposure to Failure of State-Regulated Dams



Source: 2018 Missouri State Hazard Mitigation Plan *Red Star Indicates Clark County

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

The worst-case dam failure at any high hazard dam in the county could lead to serious loss to road infrastructure, commercial and residential structures, and human life. However, all high hazard dams located within the Clark County planning area are rural in nature.

Impact of Previous and Future Development

Future development within the county that has potential to be influenced by dam failure includes any areas downstream of dam within the 100-year floodplain.

Hazard Summary by Jurisdiction

Variations in vulnerability across the planning area depend upon multiple variables. Nonetheless, Clark County R-1 School District and special districts do not have assets located in dam breach inundation areas. Between the 3 state regulated dams there is a total building loss exposure of \$1,255,361 and an estimated population exposure of 0.

Problem Statement

In summary, the hazard risk for dam failure in Clark County ranges between high and low, dependent upon the dam. If a dam does fail, the expected impacts could vary from negligible to critical, and could potentially affect road infrastructure, residential structures, commercial buildings, public structures, and human life. It is recommended to encourage land use management practices to decrease the potential for damage from a dam collapse; including the discouragement of development in areas with the potential for sustaining damage from a dam failure. Installation of

education programs to inform the public of dam safety measures and preparedness activities would be beneficial. In addition, the availability of training programs to encourage land owners how to properly inspect their dams, and develop emergency action plans would be advantageous.

3.4.4 Earthquakes

Hazard Profile

Hazard Description

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

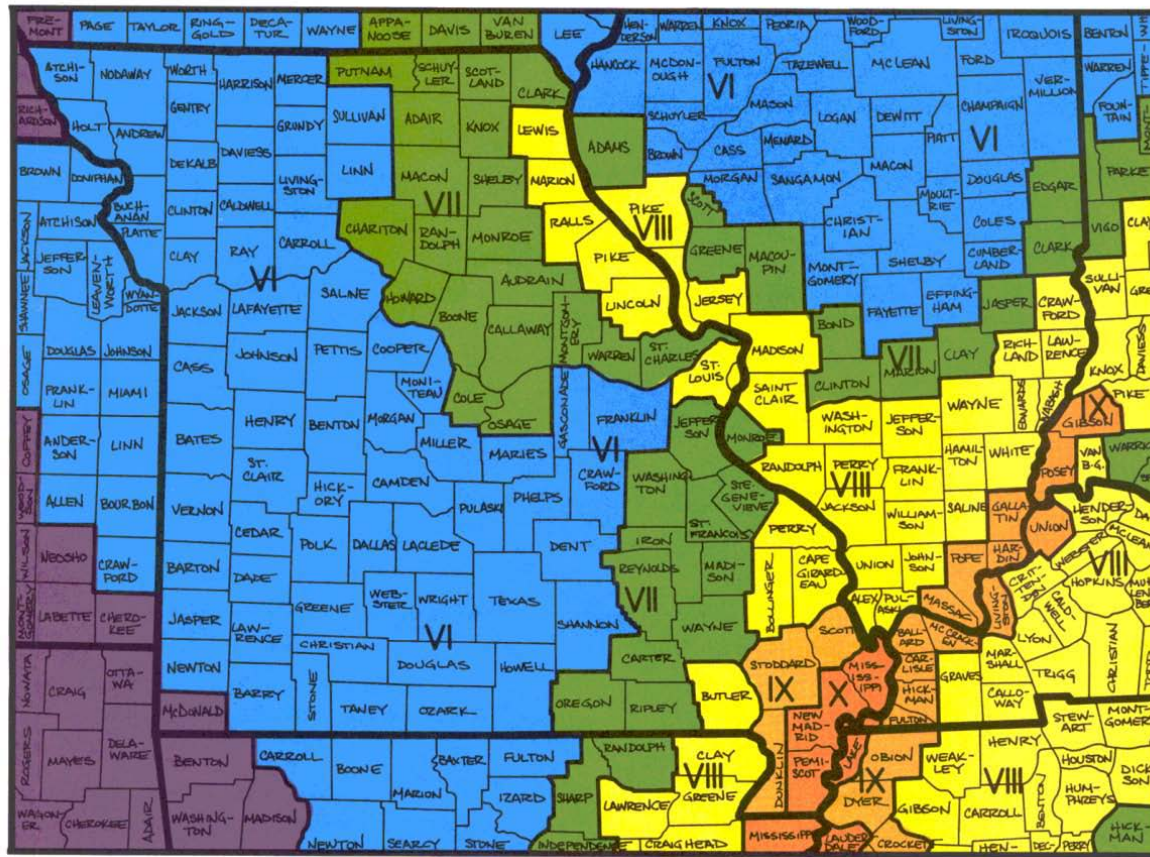
Some earthquakes occur in the middle of plates, as is the case for seismic zones in the Midwestern United States. The most seismically active area in the Midwest is the New Madrid Seismic Zone. The possibility of the occurrence of a catastrophic earthquake in the central and Eastern United States is real as evidenced by history. The impacts of significant earthquakes affect large areas, terminating public services and systems needed to aid the suffering and displaced. As with hurricanes, mass relocation may be necessary, but the residents who are suffering from the earthquake can neither leave the heavily impacted areas nor receive aid or even communication in the aftermath of a significant event.

Geographic Location

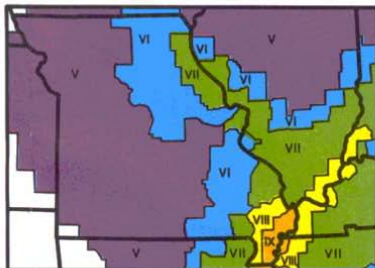
Seismic activity on the New Madrid Seismic Zone of Southeastern Missouri is very significant both historically and at present. On December 16, 1811 and January 23 and February 7 of 1812, three earthquakes struck the central U.S. with magnitudes estimated to be 7.5-8.0. These earthquakes caused violent ground cracking and volcano-like eruptions of sediment (sand blows) over an area of >10,500 km², and uplift of a 50 km by 23 km zone (the Lake County uplift). The shaking was felt over a total area of over 10 million km² (the largest felt area of any historical earthquake). Of all the historical earthquakes that have the U.S., an 1811- style event would do the most damage if it recurred today. If an 1811 earthquake occurred in Clark County the earthquake intensity would not vary within the county. Damage would be to buildings of good design and construction, slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures and some chimneys broken.

The following SEMA map (Figure 3.21) 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 below figure indicates Clark County and the affects that could be felt from the earthquake.

Figure 3.21. Impact Zones for Earthquake Along the New Madrid Fault

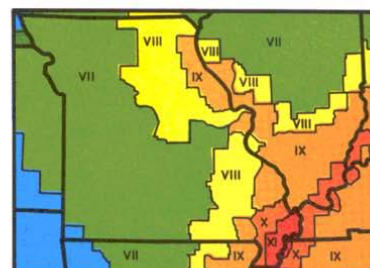


This map shows the highest projected Modified Mercalli intensities by county from a potential magnitude - 7.6 earthquake whose epicenter could be anywhere along the length of the New Madrid seismic zone.



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.

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.



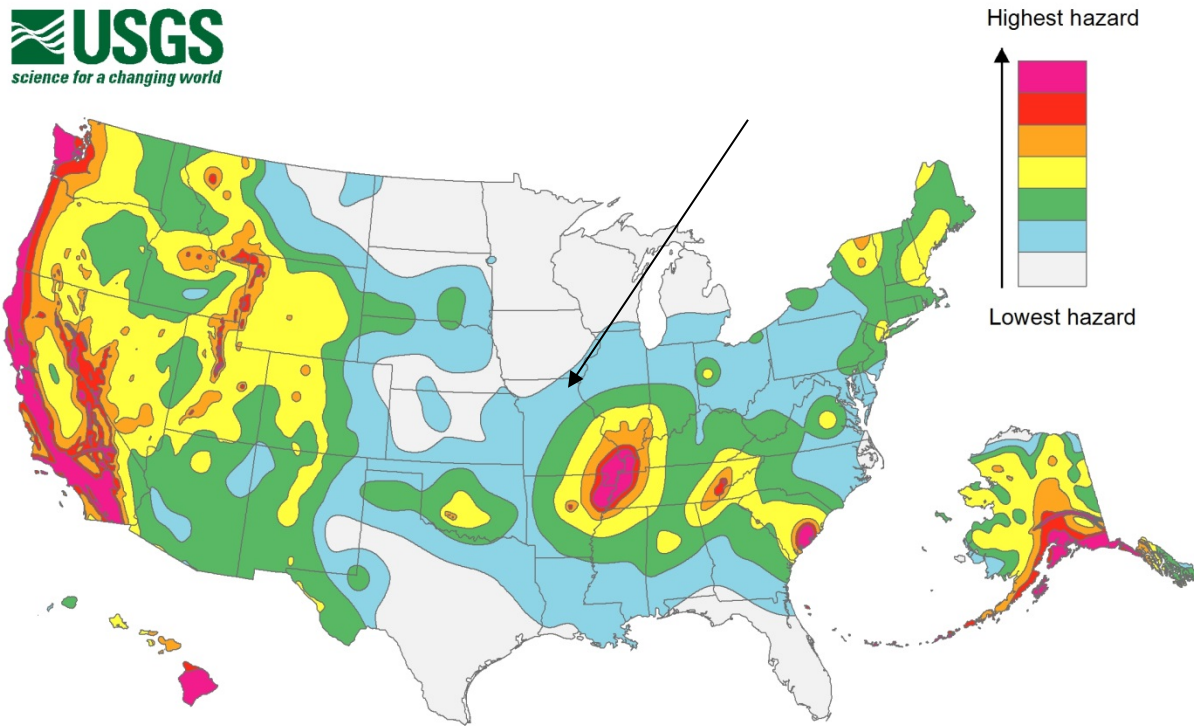
Source: https://sema.dps.mo.gov/docs/EQ_Map.pdf

Figure 3.22. Projected Earthquake Intensities

MODIFIED MERCALLI INTENSITY SCALE

- | | |
|--|--|
| <p>I People do not feel any Earth movement.</p> <p>II A few people might notice movement.</p> <p>III Many people indoors feel movement. Hanging objects swing.</p> <p>IV Most people indoors feel movement. Dishes, windows, and doors rattle. Walls and frames of structures creak. Liquids in open vessels are slightly disturbed. Parked cars rock.</p> <p>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.</p> <p>VI Everyone feels movement. Poorly built buildings are damaged slightly. Considerable quantities of dishes and glassware, and some windows are broken. People have trouble walking. Pictures fall off walls. Objects fall from shelves. Plaster in walls might crack. Some furniture is overturned. Small bells in churches, chapels and schools ring.</p> <p>VII People have difficulty standing. Considerable damage in poorly built or badly designed buildings, adobe houses, old walls, spires and others. Damage is slight to moderate in well-built buildings. Numerous windows are broken. Weak chimneys break at roof lines. Cornices from towers and high buildings fall. Loose bricks fall from buildings. Heavy furniture is overturned and damaged. Some sand and gravel stream banks cave in.</p> <p>VIII Drivers have trouble steering. Poorly built structures suffer severe damage. Ordinary substantial buildings partially collapse. Damage slight in structures especially built to withstand earthquakes. Tree branches break. Houses not bolted down might shift on their foundations. Tall structures such as towers and chimneys might twist and fall. Temporary or permanent changes in springs and wells. Sand and mud is ejected in small amounts.</p> | <p>IX Most buildings suffer damage. Houses that are not bolted down move off their foundations. Some underground pipes are broken. The ground cracks conspicuously. Reservoirs suffer severe damage.</p> <p>X Well-built wooden structures are severely damaged and some destroyed. Most masonry and frame structures are destroyed, including their foundations. Some bridges are destroyed. Dams are seriously damaged. Large landslides occur. Water is thrown on the banks of canals, rivers, and lakes. Railroad tracks are bent slightly. Cracks are opened in cement pavements and asphalt road surfaces.</p> <p>XI Few if any masonry structures remain standing. Large, well-built bridges are destroyed. Wood frame structures are severely damaged, especially near epicenters. Buried pipelines are rendered completely useless. Railroad tracks are badly bent. Water mixed with sand, and mud is ejected in large amounts.</p> <p>XII Damage is total, and nearly all works of construction are damaged greatly or destroyed. Objects are thrown into the air. The ground moves in waves or ripples. Large amounts of rock may move. Lakes are dammed, waterfalls formed and rivers are deflected.</p> |
|--|--|
- Intensity is a numerical index describing the effects of an earthquake on the surface of the Earth, on man, and on structures built by man. The intensities shown in these maps are the highest likely under the most adverse geologic conditions. There will actually be a range in intensities within any small area such as a town or county, with the highest intensity generally occurring at only a few sites. Earthquakes of all three magnitudes represented in these maps occurred during the 1811 - 1812 "New Madrid earthquakes." The isoseismal patterns shown here, however, were simulated based on actual patterns of somewhat smaller but damaging earthquakes that occurred in the New Madrid seismic zone in 1843 and 1895.
- Prepared and distributed by
THE MISSOURI STATE
EMERGENCY MANAGEMENT AGENCY
P.O. BOX 116
JEFFERSON CITY, MO 65102
Telephone: 573-526-9100

Figure 3.23. United States Seismic Hazard Map



Source: United States Geological Survey at
https://earthquake.usgs.gov/hazards/hazmaps/conterminous/2014/images/HazardMap2014_lg.jpg
*Arrow Indicates Clark County Location

Strength/Magnitude/Extent

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

Richter Magnitude Scale

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

Modified Mercalli Intensity Scale

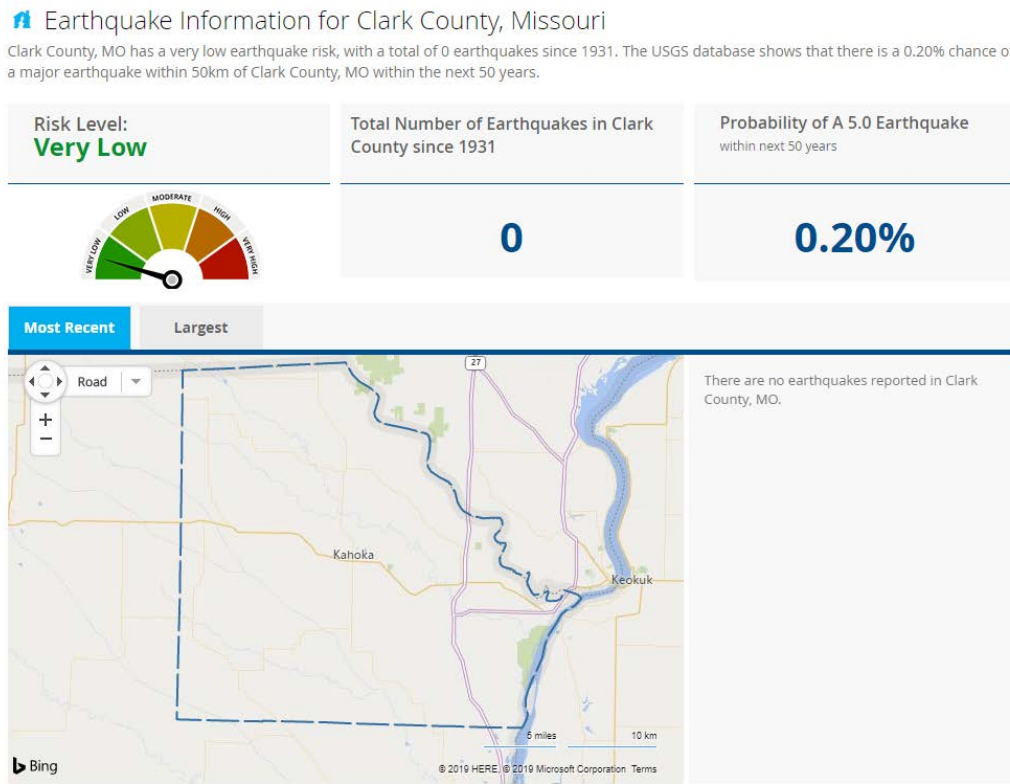
The intensity of an earthquake is measured by the effect of the earthquake on the earth's surface. The intensity scale is based on the responses to the quake, such as people awakening, movement of

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

Previous Occurrences

There has been 0 Earthquakes reported in Clark County since 1931.

Figure 3.24. Probability of Earthquake in Clark County

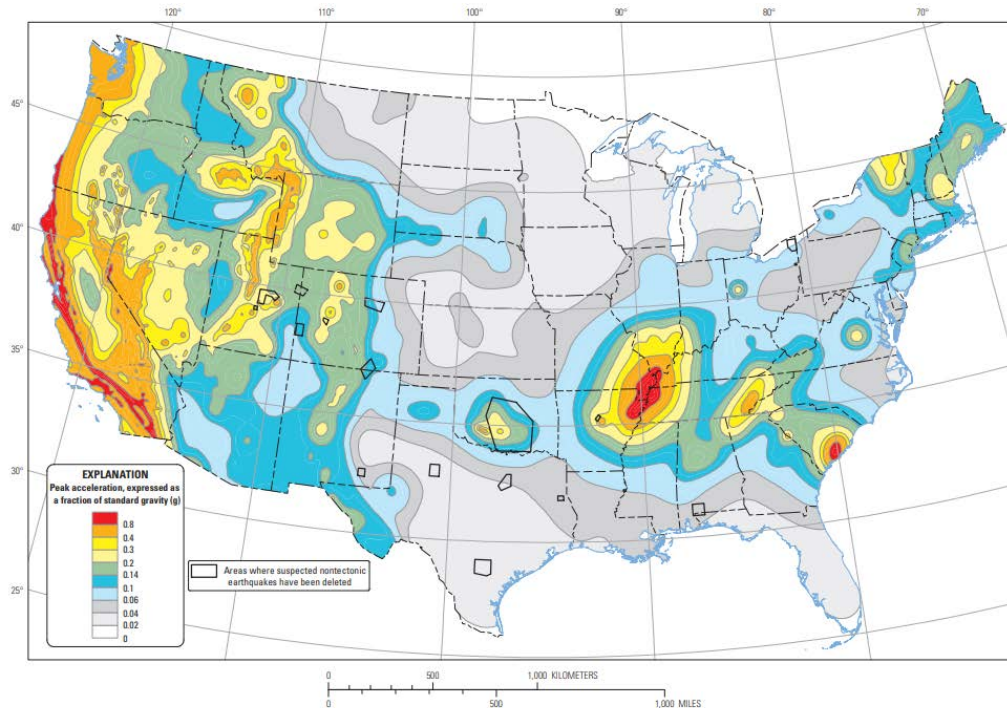


Source: <https://www.homefacts.com/earthquakes/Missouri/Clark-County.html>

Probability of Future Occurrence

As described in **Figure 3.24** Clark County, MO has a very low earthquake risk, with a total of 0 earthquakes since 1931. The USGS database shows that there is a .20% chance of a major earthquake within 50km of Clark County, MO in the next 50 years.

Figure 3.25. Two-Percent Probability of Exceedance in 50 years Map of Peak Ground Acceleration



Two-percent probability of exceedance in 50 years map of peak ground acceleration

Source: <https://earthquake.usgs.gov/static/lfs/nshm/conterminous/2014/2014pga2pct.pdf>

Changing Future Conditions Considerations

Scientists are beginning to believe there may be a connection between changing climate conditions and earthquakes. Changing ice caps and sea-level redistribute weight over fault lines, which could potentially have an influence on earthquake occurrences. However, currently no studies quantify the relationship to a high level of detail, so recent earthquakes should not be linked with climate change. While not conclusive, early research suggests that more intense earthquakes and tsunamis may eventually be added to the adverse consequences that are caused by changing future conditions.

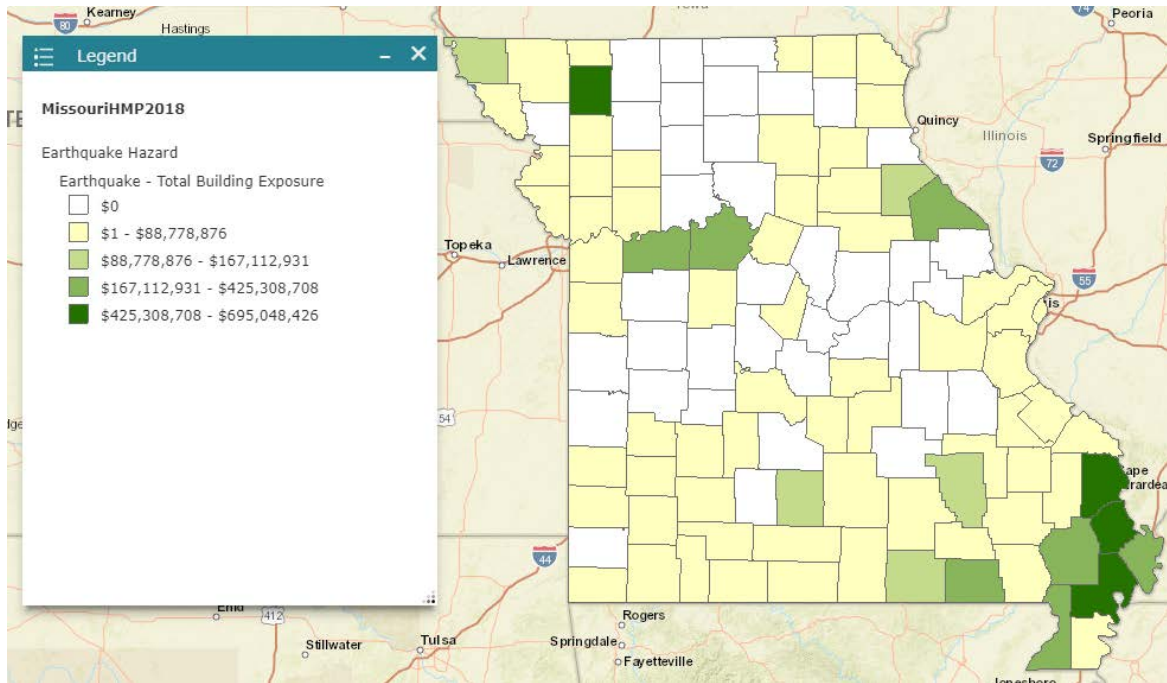
Vulnerability

Vulnerability Overview

According to the data obtained from the 2018 State Plan, Clark County was listed as N/A for Hazard Ranking.

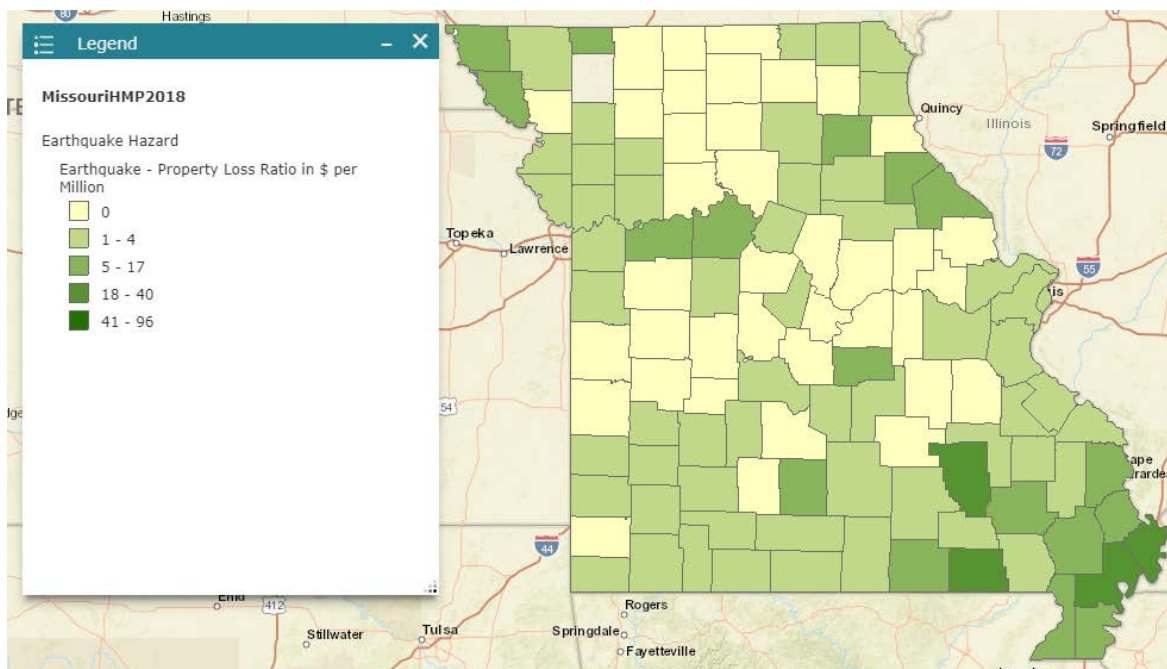
The State of Earthquake Coverage Report states that the average premium for earthquake coverage in Clark County during 2017 was \$59 with the average premium \$110k-\$140k coverage at \$36.

Figure 3.27. Earthquake Total Building Exposure



Source: Missouri 2018 State Hazard Mitigation Plan

Figure 3.28. Total Property Loss Ratio in \$ per Million



Source: Missouri 2018 State Hazard Mitigation Plan

Impact of Previous and Future Development

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

Hazard Summary by Jurisdiction

Since the earthquake intensity is not likely to vary greatly throughout the planning area, the risk will be the same throughout. However, damages could differ if there are structural variations in the planning 3.45 area-built environment. For example, if one community has a higher percentage of residences built prior to 1939 than the other participants, that community is likely to experience higher damages.

Problem Statement

Although Clark County is not located in an area that will likely see catastrophic damage from an earthquake, the County will be impacted by the loss of communications, transportation, the disruption of roads, rail and pipelines, water transportation, and the area will see a significant amount of refugees fleeing from Southern Missouri if a quake hits that area. Education is minimal for earthquakes do to the low likely hood of impact. There is one Emergency Management Director for the County that knows where all the generators and emergency buildings are. Not all citizens utilize social media and texting. An emergency plan for earthquakes needs to be made available to all residents and stated what would happen in the event of an earthquake with details for communications and transportation. Downtown building owners need to know plan in case damage is done to their building. Residents need to be made aware of where the generators and emergency buildings are located. Utilization of social media and texting needs to be encouraged.

3.4.5 Land Subsidence/Sinkholes

Hazard Profile

Hazard Description

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

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

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

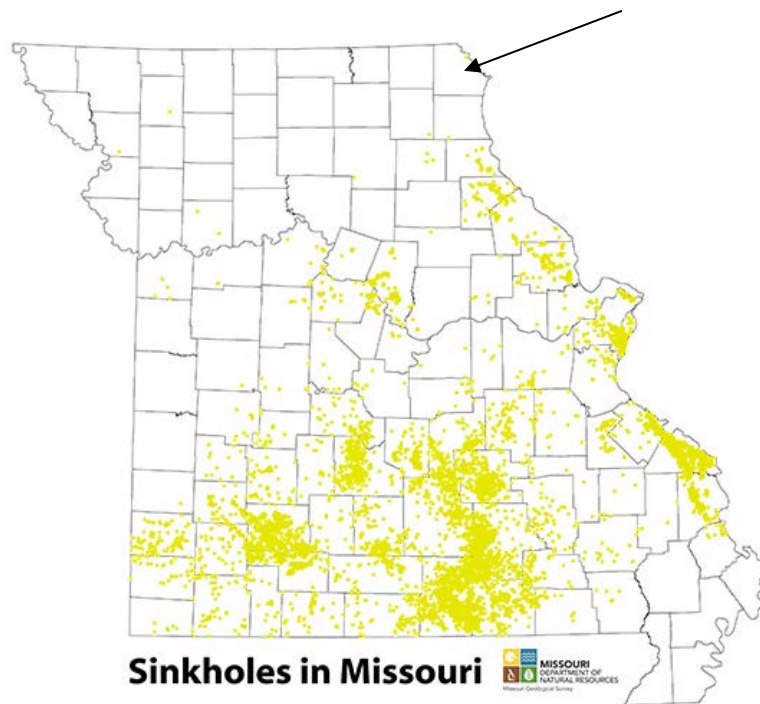
According to the U.S. Geological Survey (USGS), the most damage from sinkholes tends to occur in Florida, Texas, Alabama, Missouri, Kentucky, Tennessee, and Pennsylvania. Fifty-nine percent of Missouri is underlain by thick, carbonate rock that makes Missouri vulnerable to sinkholes. Sinkholes occur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

According to the 2018 Missouri State Hazard Mitigation Plan, there are 43 mines and 0 sinkholes in Clark County.

Geographic Location

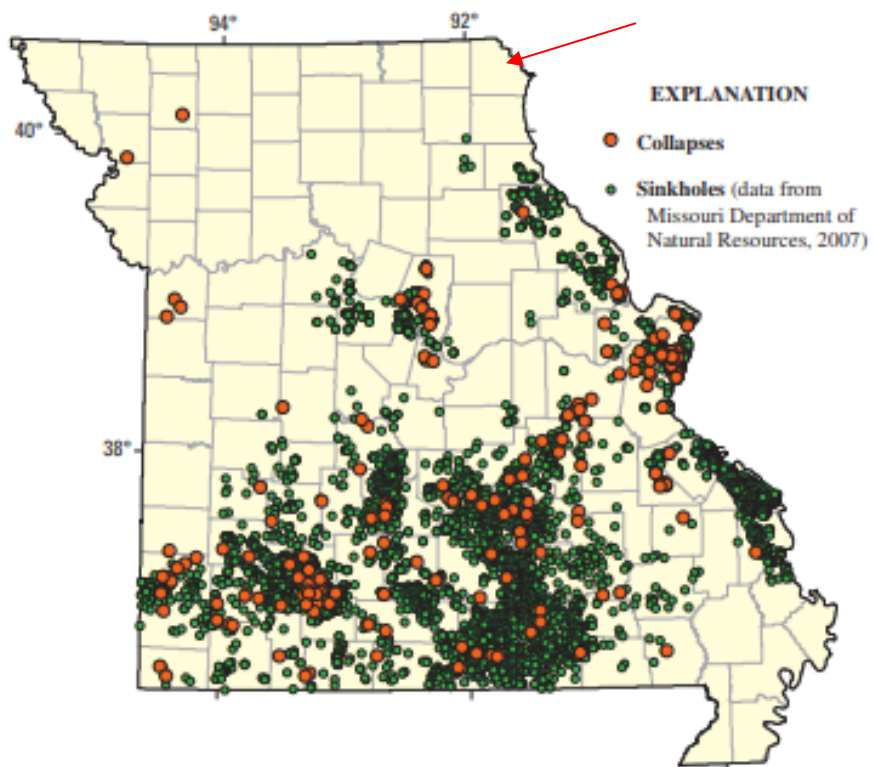
There are 0 areas of the Clark County planning area that are more susceptible to sinkhole formation than others.

Figure 3.29. Sinkholes in Missouri



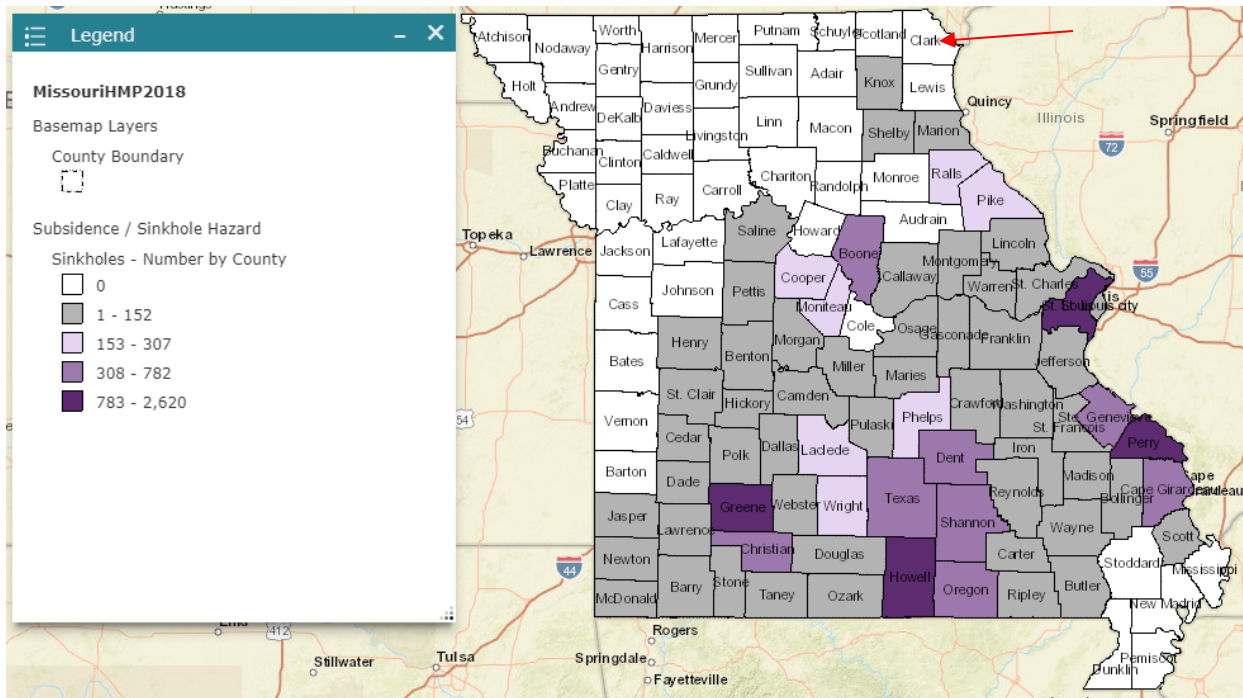
Source: <https://dnr.mo.gov/geology/geosrv/envgeo/images/sinkholesinmissouri.jpg>

Figure 3.30. Sinkholes in Missouri



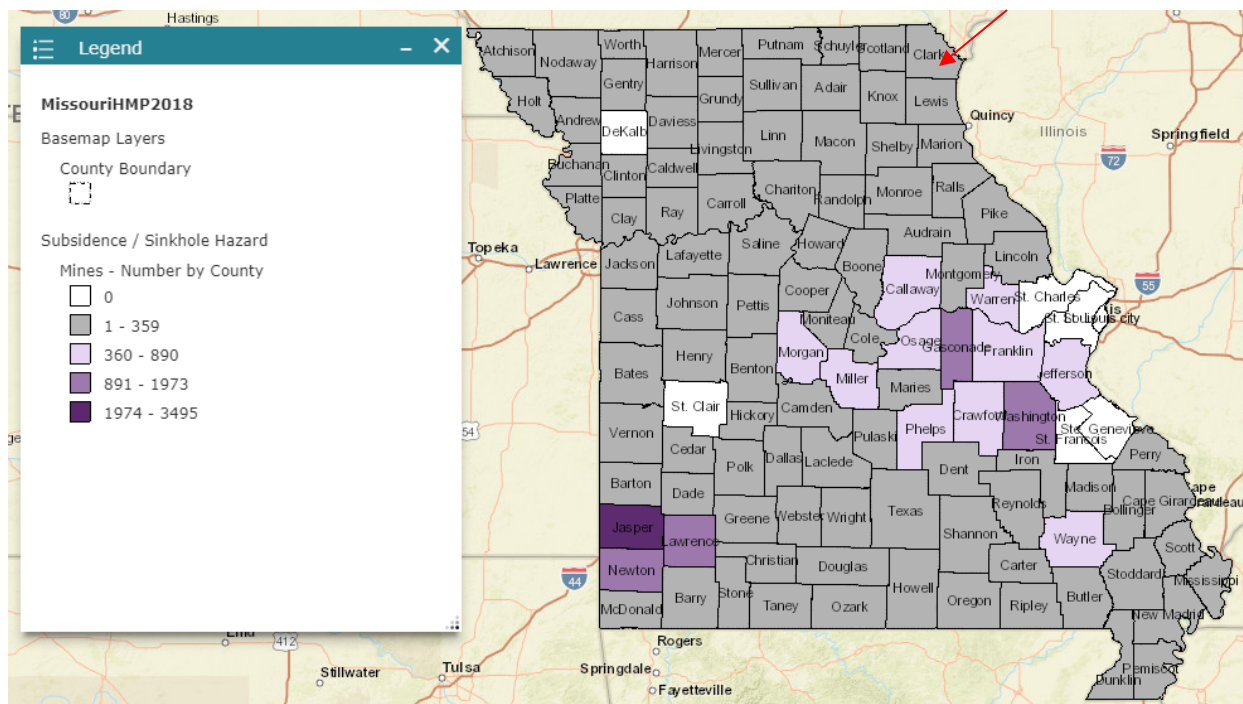
Source: <https://pubs.usgs.gov/fs/2007/3060/pdf/FS2007-3060.pdf>

Figure 3.31. Sinkholes in Missouri per County



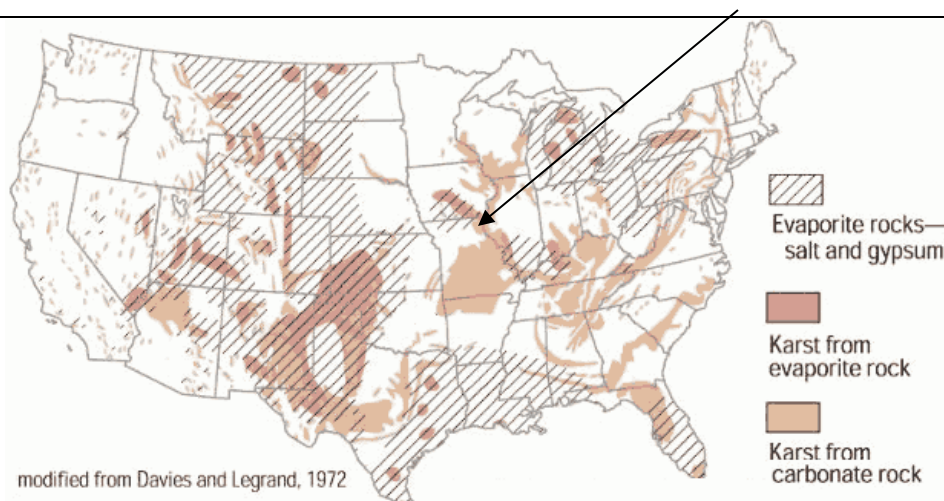
Source: 2018 Missouri State Hazard Mitigation Plan

Figure 3.32. Mines in Missouri per County



Source: 2018 Missouri State Hazard Mitigation Plan

Figure 3.33. Karst in Missouri



Source: <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>

Strength/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.

Previous Occurrences

As noted in the 2018 State Plan, sinkholes are a regular occurrence in Missouri, but rarely are the events of any significance. Clark County has had no sinkholes and the likeliness of a future occurrence would be considered negligible.

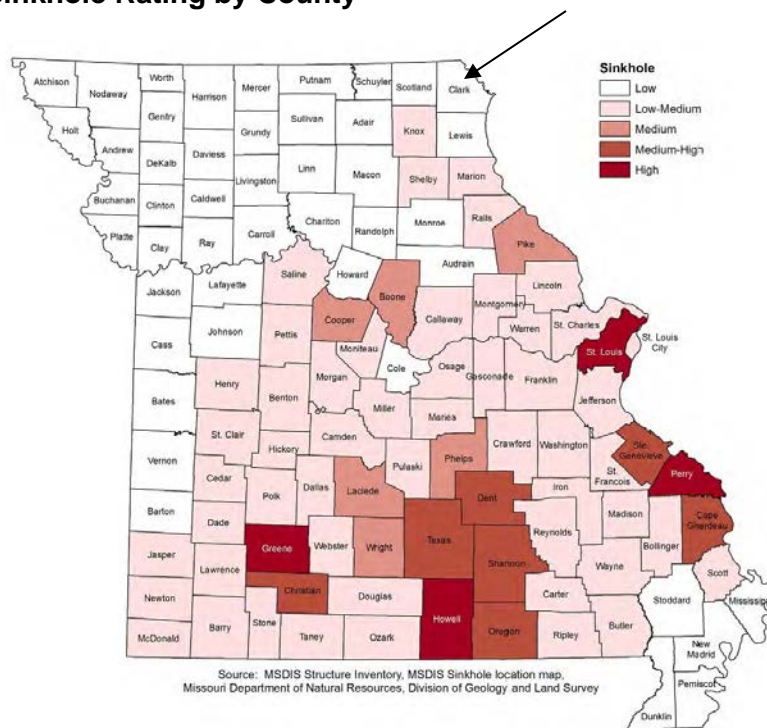
Probability of Future Occurrence

Figure 3.34. Sinkhole Rating Values

Factor	1 (Low)	2 (Low-medium)	3 (Medium)	4 (Medium-high)	5 (High)
Sinkholes per county	0	1 – 200	201 – 400	401 – 800	801+
Mines per county	0 - 100	101 - 250	251 – 500	501 – 750	751 +

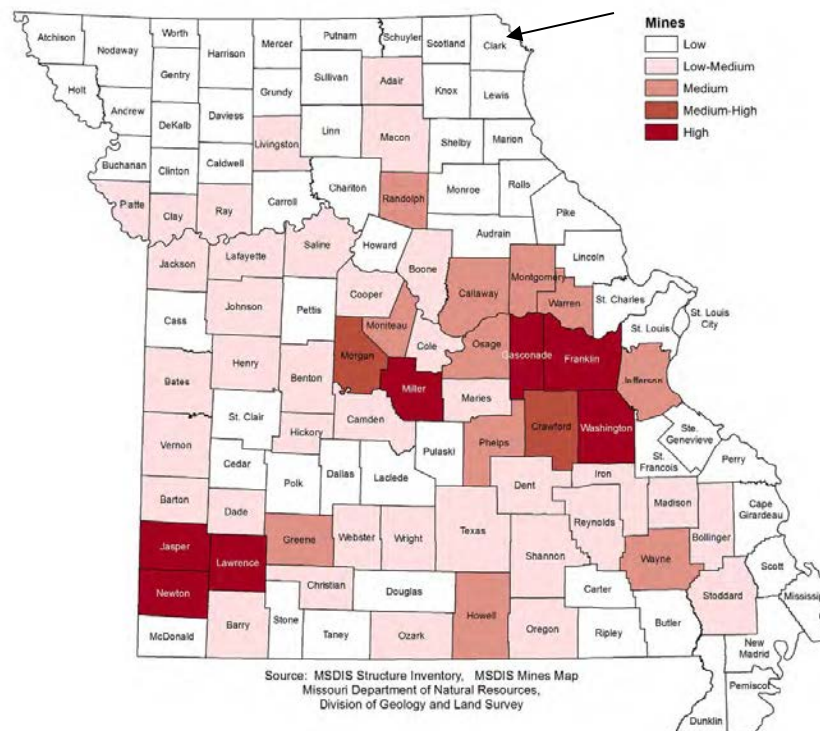
Source: 2018 Missouri State Hazard Mitigation Plan

Figure 3.35. Sinkhole Rating by County



Source: 2019 Missouri State Hazard Mitigation Plan

Figure 3.36. Mine Rating Value by County



Source: 2019 Missouri State Hazard Mitigation Plan

There are no records of previous dates in the planning area, the probabilities cannot be calculated due to limited information. As represented in the figures above, the sinkholes and mines located in Clark County have been rated low risk.

Changing Future Conditions Considerations

According to the 2018 Missouri State Hazard Mitigation Plan, direct effects from changing climate conditions such as an increase in droughts could contribute to an increase in sinkholes. These changes raise the likelihood of extreme weather, meaning the torrential rain and flooding conditions which often lead to the exposure of sinkholes are likely to become increasingly common. Certain events such as a heavy precipitation following a period of drought can trigger a sinkhole due to low levels of groundwater combined with a heavy influx of rain.

Vulnerability

Vulnerability Overview

Sinkholes in the planning area are not common occurrence due to the composition of the land. While some sinkholes may be considered a slow changing nuisance; other more sudden, catastrophic collapses can destroy property, delay construction projects and contaminate ground water resources. The Missouri Department of Natural Resources shows no sinkholes for the planning area.

Potential Losses to Existing Development

The potential impact of sinkholes on existing structures is difficult to determine due to the lack of data on historic damages caused by sinkholes and the mapping of potential sinkholes is difficult if not impossible to predict where a sinkhole will collapse and how significant the collapse will be. Because sinkhole collapse is not predictable and previous events have occurred in the rural area there is not significant data to estimate the future losses due to a sinkhole.

Impact of Previous and Future Development

As more development occurs on unmapped rural areas the vulnerability to the hazard will increase; however, sinkholes are unpredictable and the development in rural areas is difficult to limit due to the lack of occurrence. There are currently no sinkholes in the planning area, and Clark County participating jurisdictions have no plans to limit construction due to sinkholes.

Hazard Summary by Jurisdiction

The risk for the development is uniform throughout the planning area and has not affected one jurisdiction specifically.

Problem Statement

Sinkholes can occur at any time and without warning and vary by size. There can be a disruption of transportation services and not residents in the dangerous areas are not educated on what to do if a sinkhole occurs. Education needs to occur on the danger areas of a sinkhole occurring and what to do if a sinkhole does occur.

3.4.6 Drought

Hazard Profile

Hazard Description

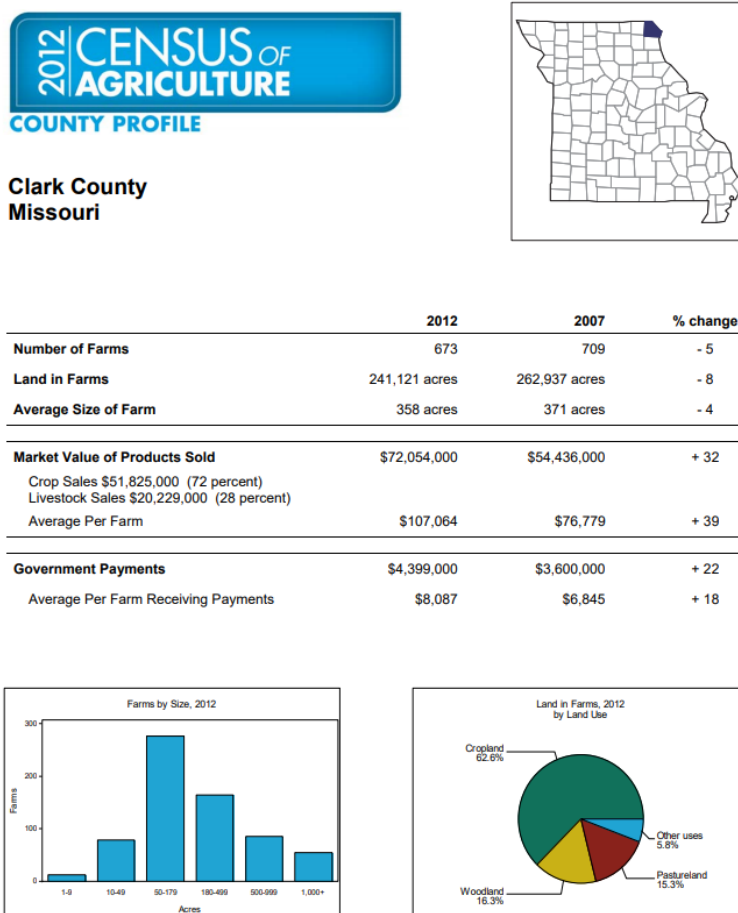
Drought is generally defined as a condition of moisture levels significantly below normal for an extended period of time over a large area that adversely affects plants, animal life, and humans. A drought period can last for months, years, or even decades. There are four types of drought conditions relevant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

- Meteorological drought is defined in terms of the basis of the degree of dryness (in comparison to some “normal” or average amount) and the duration of the dry period. A meteorological drought must be considered as region-specific since the atmospheric conditions that result in deficiencies of precipitation are highly variable from region to region.
- Hydrological drought is associated with the effects of periods of precipitation (including snowfall) shortfalls on surface or subsurface water supply (e.g., streamflow, reservoir and lake levels, ground water). The frequency and severity of hydrological drought is often defined on a watershed or river basin scale. Although all droughts originate with a deficiency of precipitation, hydrologists are more concerned with how this deficiency plays out through the hydrologic system. Hydrological droughts are usually out of phase with or lag the occurrence of meteorological and agricultural droughts. It takes longer for precipitation deficiencies to show up in components of the hydrological system such as soil moisture, streamflow, and ground water and reservoir levels. As a result, these impacts also are out of phase with impacts in other economic sectors.
- Agricultural drought focus is on soil moisture deficiencies, differences between actual and potential evaporation, reduced ground water or reservoir levels, etc. Plant demand for water depends on prevailing weather conditions, biological characteristics of the specific plant, its stage of growth, and the physical and biological properties of the soil.
- Socioeconomic drought refers to when physical water shortage begins to affect people.

Geographic Location

Droughts are regional in nature. All areas of the United States are vulnerable to the risk of drought and extreme heat. Droughts can be widespread or localized events. The extent of the droughts varies both in terms of the extent of the heat and range of precipitation. The severity of a drought depends on locations, duration, and geographical extent. Additionally, drought severity depends on the water supply, usage demands made by human activities, vegetation and agricultural operations. Drought brings several different problems that must be addressed. The quality and quantity of crops, livestock and other agricultural assets will be affected during a drought. Drought can adversely impact forested areas leading to an increased potential for extremely destructive forest and woodland fires that could threaten residential, commercial, and recreational structures. According to the 2012 Census of Agriculture, Clark County consisted of 241,121 acres of farm land, Crop sales generate 72% while livestock generates 28% of market value of products sold. A drought would directly impact livestock production and the agriculture economy in Clark County.

Figure 3.37. Census of Agriculture in Clark County



Source: https://www.nass.usda.gov/Publications/AqCensus/2012/Online_Resources/County_Profiles/Missouri/cp29045.pdf

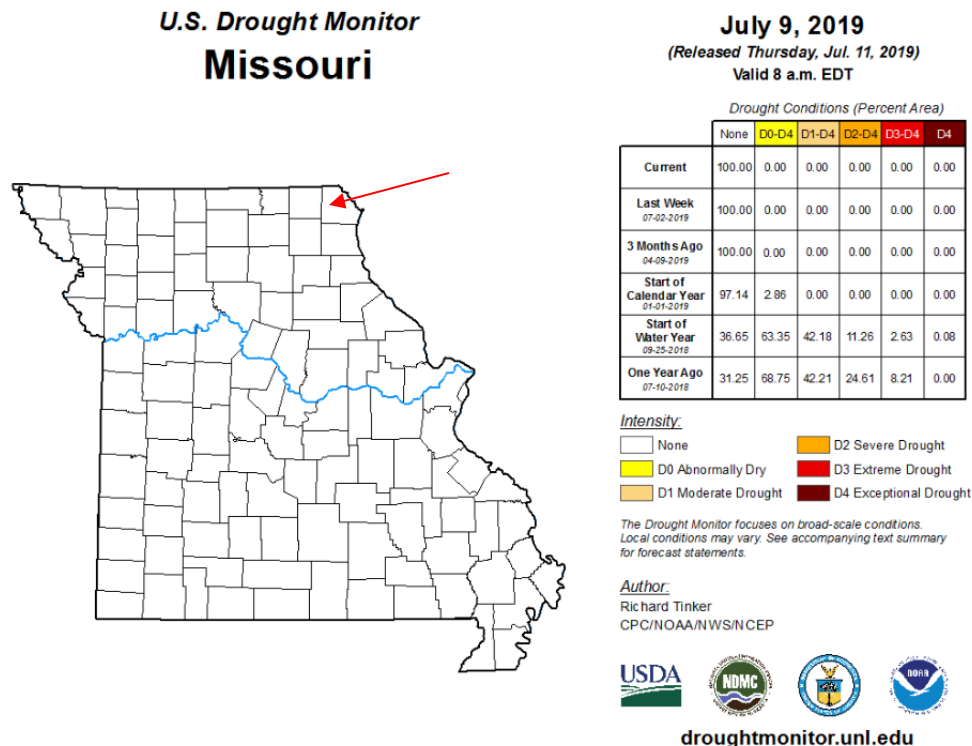
Strength/Magnitude/Extent

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

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

— precipitation and temperature. The Palmer Index has proven most effective in identifying long-term drought of more than several months. However, the Palmer Index has been less effective in determining conditions over a matter of weeks. It uses a “0” as normal, and drought is shown in terms of negative numbers; for example, negative 2 is moderate drought, negative 3 is severe drought, and negative 4 is extreme drought. Palmer’s algorithm also is used to describe wet spells, using corresponding positive numbers. Palmer also developed a formula for standardizing drought calculations for each individual location based on the variability of precipitation and temperature at that location. The Palmer index can therefore be applied to any site for which sufficient precipitation and temperature data is available. The participating communities use water from a water source other than a well. The communities may face difficulties during a drought that will not be as severe as a community utilizing only well waters.

Figure 3.38. U.S. Drought Monitor Map of Missouri on Date



Source: U.S. Drought Monitor, <https://droughtmonitor.unl.edu/Maps/MapArchive.aspx>

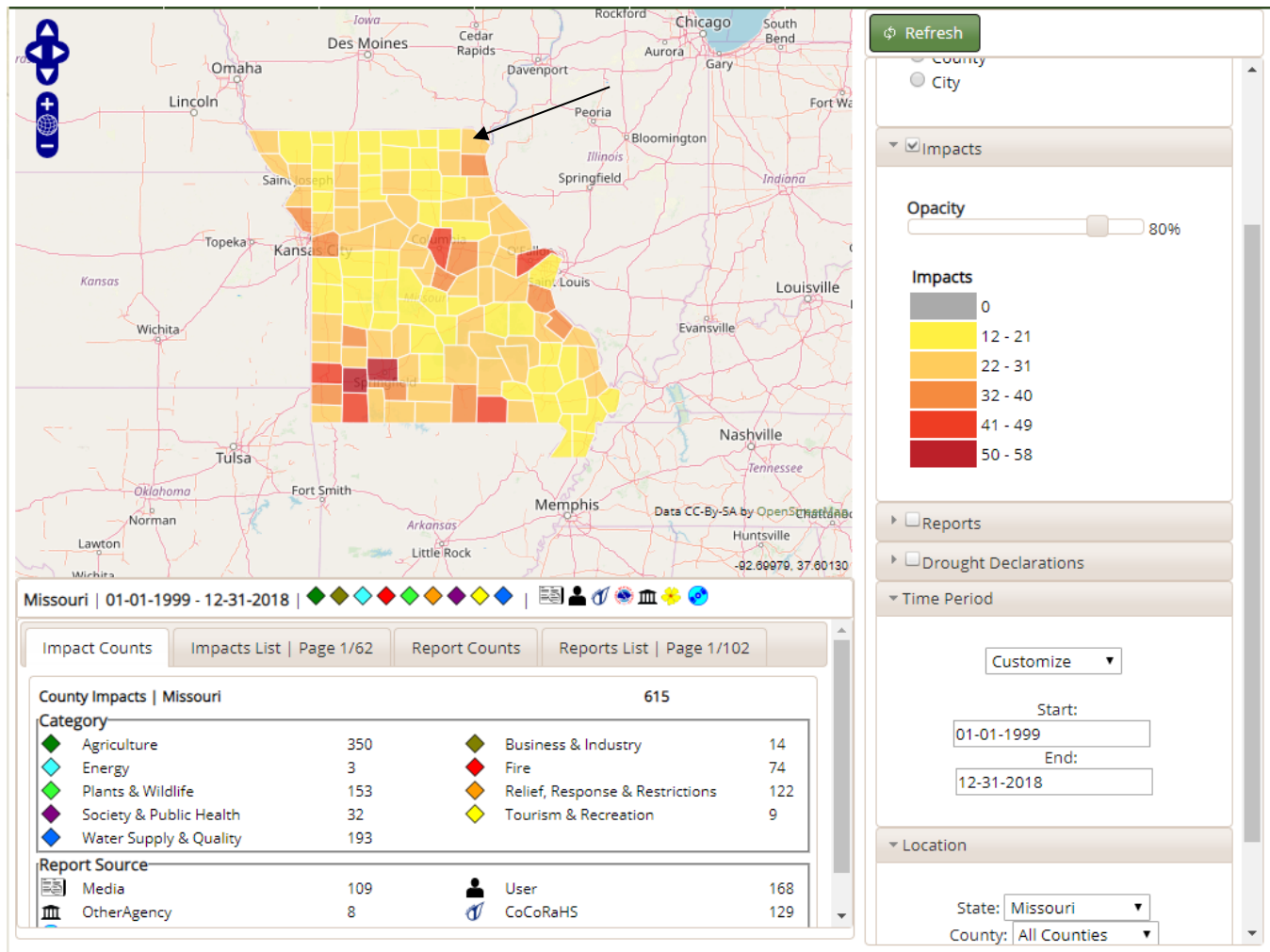
Previous Occurrences

Drought occurs periodically in Missouri with the most severe and costly in historical times occurring in 2012. Although droughts are not the spectacular weather events that floods, blizzards or tornadoes can be, historically they produce more economic damage to the State than all other weather events combined.

Table 3.27. USDA Risk Management Insurance Payment Due to Drought in Clark County

Drought Year	Insurance Payment
2009	\$0.00
2010	\$19,406.00
2011	\$3,288,268.60
2012	\$15,268,466.50
2013	\$3,200,551.00
2014	\$3,733.00
2015	\$0.00
2016	\$43,258.00
2017	\$389,664.30
2018	\$2,127,358.05

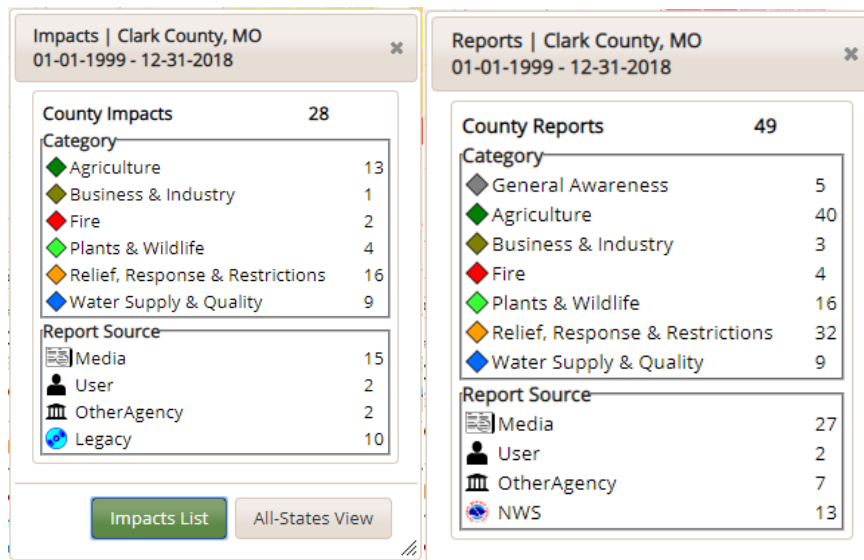
Figure 3.39. Clark County Drought Impact July 2008 – July 2018



Source: <https://droughtreporter.unl.edu/map/>

According to the National Drought Mitigation Center's Drought Impact Reporter, during the 20-year period from January 1999 to December 2018, Clark County had 28 drought impacts and 48 reports.

Figure 3.40. Drought Impact and Reports for Clark County



Probability of Future Occurrence

According to the 2018 State Plan Audrain County has a Medium-High total rating for droughts. Clark County is very likely to experience droughts in the future with a 10/72% chance of a severe drought.

Table 3.28. Vulnerability of Clark County to Drought

County	SOVI Index Rating	USDA RMA Total Drought Crop Claims	Average Annualized Crop Claims	USDA Claims Rating	2012 Crop Exposure	Crop Exposure Rating	Likelihood of Severe Drought (%)	Drought Occurrence Rating	Total Rating	Total Rating (Text) Drought
Clark	2	\$22,275,063	\$2,475,007	4	\$51,825,000	3	10.72	5	14	Medium-High

Source: 2018 Missouri State Hazard Mitigation Plan

Table 3.29. Ranges for Drought Vulnerability Factor Ratings

Factors Considered	Low (1)	Low-medium (2)	Medium (3)	Medium-high-4	High (5)
Social Vulnerability Index	1	2	3	4	5
Crop Exposure Ratio Rating	\$886,000 - \$10,669,000	\$10,669,001 - \$33,252,000	\$33,252,001 - \$73,277,000	\$73,277,001 - \$155,369,000	\$155,369,001 - \$256,080,000
Annualized USDA Crop Claims Paid	< \$340,000	\$670,000-\$669,999	\$670,000-\$999,999	\$1M-\$1,299,999	> \$1,300,000
Likelihood of Occurrence of severe or extreme drought	1-1.9%	2-3.9%	4-5.9%	6-8.9%	9-10.72%
Total Drought Vulnerability Rating	7-8	9-10	11-12	13-14	15-17

Source: 2018 Missouri State Hazard Mitigation Plan

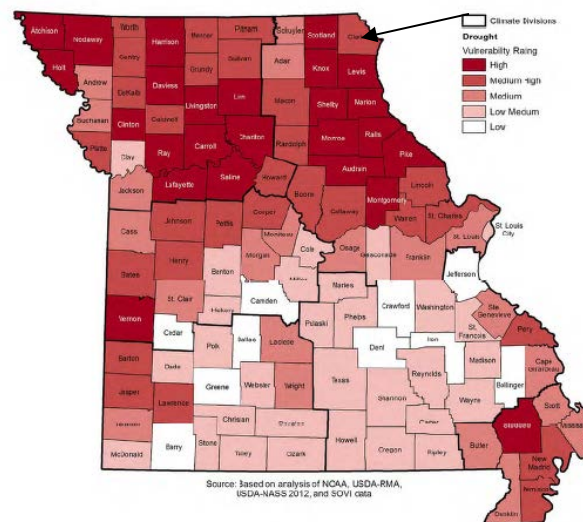
Changing Future Conditions Considerations

The number of heavy rainfall events is predicted to increase, yet researchers currently expect little change in total rainfall amounts, indicating that the periods between heavy rainfalls will be marked by an increasing number of dry days. Higher temperatures and increased evapotranspiration increase the likelihood of a drought. This could lead to agricultural drought and suppressed crop yields.

Vulnerability

Vulnerability Overview

Figure 3.41. Missouri Drought Vulnerability by County



Source: 2018 Missouri State Hazard Mitigation Plan

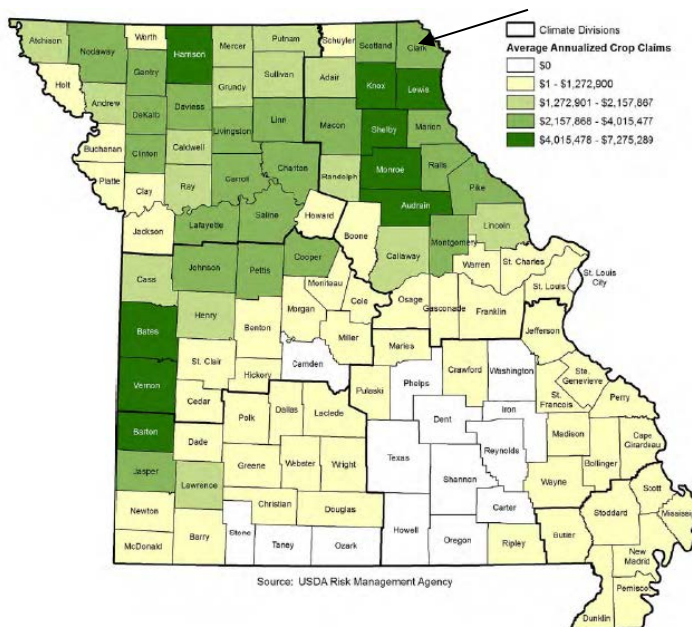
According to the analysis from the 2018 State Plan, Clark County is a Medium-High vulnerability county for drought.

Potential Losses to Existing Development

The National Drought Monitor Center at the University of Nebraska at Lincoln summarized the potential impacts 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.

Impact of Previous and Future Development

Figure 3.42. Annualized Drought Crop Insurance Claims Paid from 2007-2016



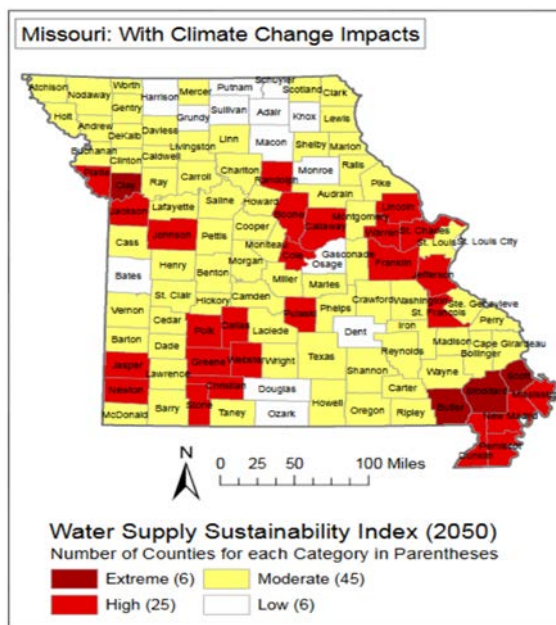
Source: 2018 Missouri State Hazard Mitigation Plan

Future development will remain vulnerable to drought. Typically, some urban and rural areas are more susceptible than others. For example, urban areas are subject to water shortages during periods of drought. Excessive demands of the populated area place a limit on water resources. In rural areas, crops and livestock may suffer from extended periods of heat and drought. As the size of farms increase more crops will be exposed to drought-related agricultural losses. Dry conditions can lead to the ignition of wildfires that could threaten residential, commercial and recreational areas.

Changing Future Conditions Considerations

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.

Figure 3.43. Missouri Water Supply Sustainability Index (2050)



Hazard Summary by Jurisdiction

The entire planning area will be affected by drought to some degree. The unincorporated agricultural areas of Clark County are the most vulnerable to drought while the drought condition will also affect the cities except the magnitude would be less severe with only lawns and local gardens to be impacted. In addition, damage to crops, produce, livestock, soils and building foundations could be weakened due to the shrinking and expanding soil.

Problem Statement

Clark County is at a Medium-High risk for severe drought which is an extra strain on the water supply system. Possible solutions include the development of agreements with neighboring communities for a secondary water source and review of local ordinance/regulation for inclusion of water-use restrictions during periods of drought.

3.4.7 Extreme Temperatures

Hazard Profile

Hazard Description

Extreme temperature events, both hot and cold, can impact human health and mortality, natural ecosystems, agriculture and other economic sectors. 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 3.44** uses both of these factors to produce a guide for the apparent temperature or relative intensity of heat conditions.

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.

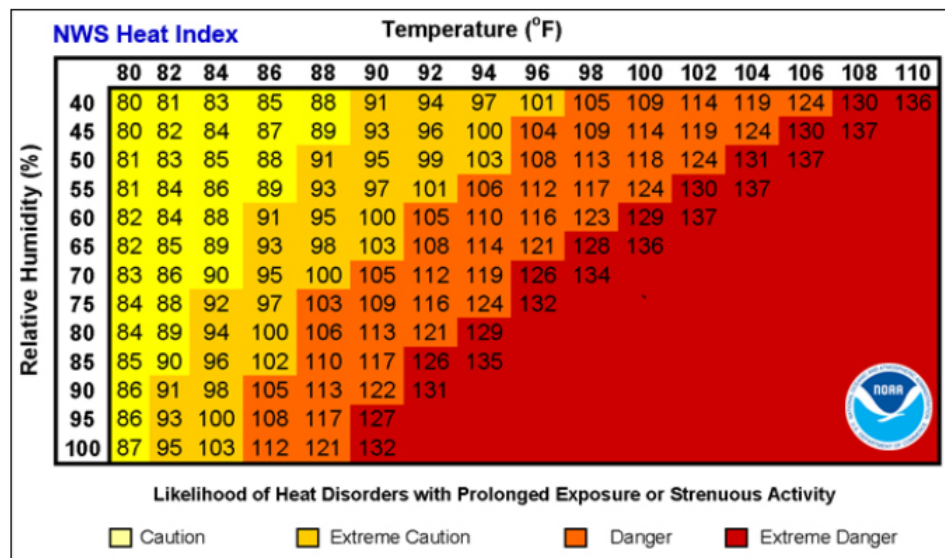
Geographic Location

The entire planning area is subject to extreme heat and all participating jurisdictions are affected.

Strength/Magnitude/Extent

The National Weather Service (NWS) 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.

Figure 3.44. Heat Index (HI) Chart

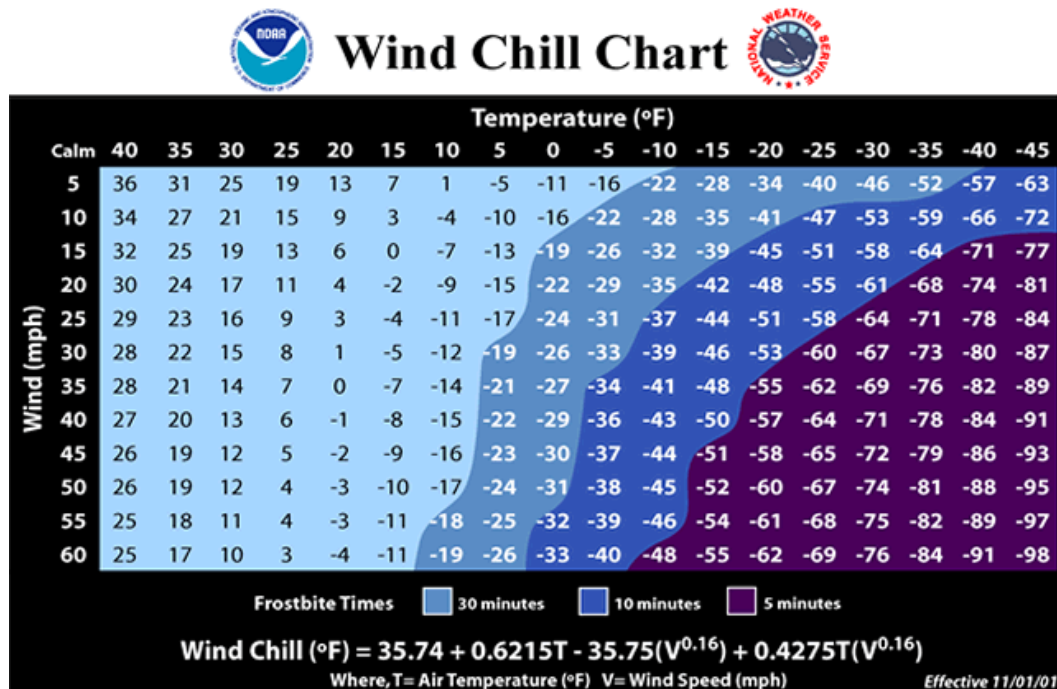


Source: National Weather Service (NWS); <https://www.weather.gov/safety/heat-index>

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.

The NWS Wind Chill Temperature (WCT) index uses advances in science, technology, and computer modeling to provide an accurate, understandable, and useful formula for calculating the dangers from winter winds and freezing temperatures. The figure below presents wind chill temperatures which are based on the rate of heat loss from exposed skin caused by wind and cold. As the wind increases, it draws heat from the body, driving down skin temperature and eventually the internal body temperature.

Figure 3.45. Wind Chill Chart

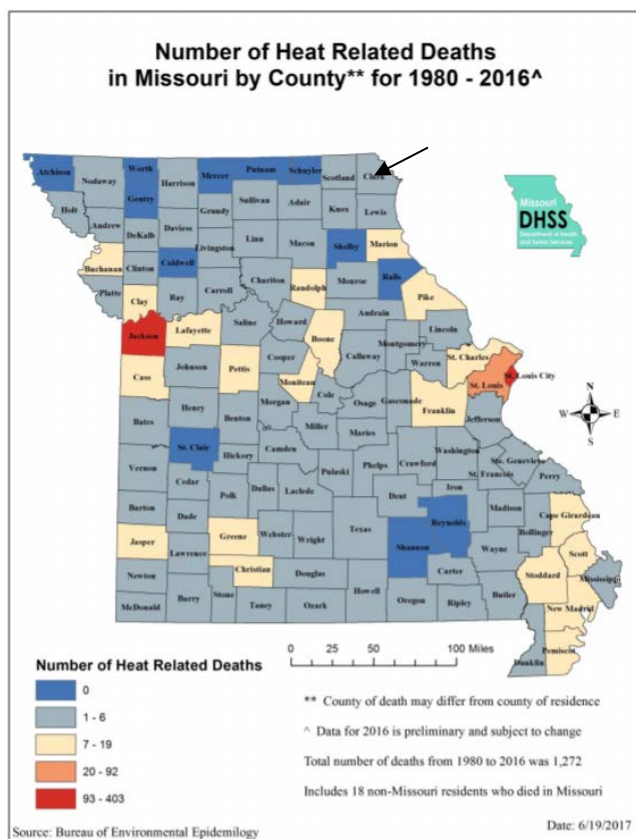


Source: <https://www.weather.gov/safety/cold-wind-chill-chart>

Previous Occurrences

The recorded events in the National Centers for Environmental Information (NCEI) there have been 3 recorded extreme heat event with 0 deaths from 1999-2018. Additional research was conducted through Google and Yahoo and no deaths were revealed. The NCEI database showed record of 6 events of extreme cold/wind chill from 1999-2018, with 0 deaths or injuries associated with these events. Below in **Figure 3.46** the Bureau of Environmental Epidemiology states that Clark County has had between 1-6 deaths from excessive heat between 1980 and 2016. Those numbers could not be corroborated with the NOAA database or further internet searches.

Figure 3.46. Heat Related Deaths in Missouri 1980 - 2016



Source: <https://health.mo.gov/living/healthcondiseases/hyperthermia/pdf/stat-report.pdf>

Table 3.30. Agricultural Claims Due to Extreme Temperature/Heat

2009	-
2010	-
2011	\$356,707.00
2012	\$509.52
2013	\$513,409.00
2014	-
2015	-
2016	\$1,434.00
2017	\$8,950.00
2018	\$2,216.00
Total	\$883,225.52

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 2009 to 2018 were \$883,225.52. 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 the planning area, according to NCEI data. The National Weather Service stated that among natural hazards, no other natural disaster—not lightning, hurricanes, tornadoes, floods, or earthquakes—causes more deaths.

Probability of Future Occurrence

NCEI, dating back to 1999 indicated 3 events of extreme heat in the 20-year period. Based on the historical data there is a 15% chance extreme heat can occur any given year in the Clark County Planning area. The probability was determined by taking the number of years with an extreme heat event (3) and divided by the number of years (20) data was obtained for. During the same 20-year period there were 6 events of extreme cold/wind chill. Based on the historical data there is a 30% chance extreme cold/wind chill can occur in any given year. The probability was determined by taking the number of years with extreme cold/wind chill event (6) divided by the number of years (20) data was obtained.

Changing Future Conditions Considerations

According to the 2018 Missouri State Plan, average annual temperatures are projected to most likely exceed historical record levels by the middle of the 21st century. The impacts of extreme heat events are experienced most acutely by the elderly and other vulnerable populations. High temperatures are exacerbated in urban environments, a phenomenon known as the urban heat island effect, which in turn tend to have higher concentrations of vulnerable populations. Higher demand for electricity as people attempts to keep cool amplifies stress on power systems and may lead to an increase in the number of power outages. Atmospheric concentrations of ozone occur at higher air temperatures, resulting in poorer air quality, while harmful algal blooms flourish in warmer water temperatures, resulting in poorer water quality.

Vulnerability

Vulnerability Overview

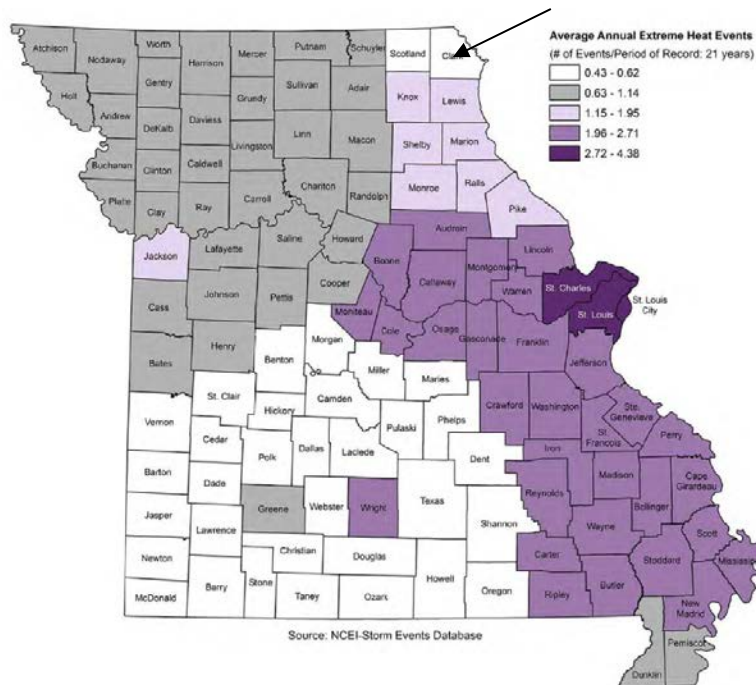
Those at greatest risk for heat-related illness include infants and children up to five years of age, people 65 years of age and older, people who are overweight, and people who are ill or on certain medications. However, even young and healthy individuals are susceptible if they participate in strenuous 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 3.31. 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

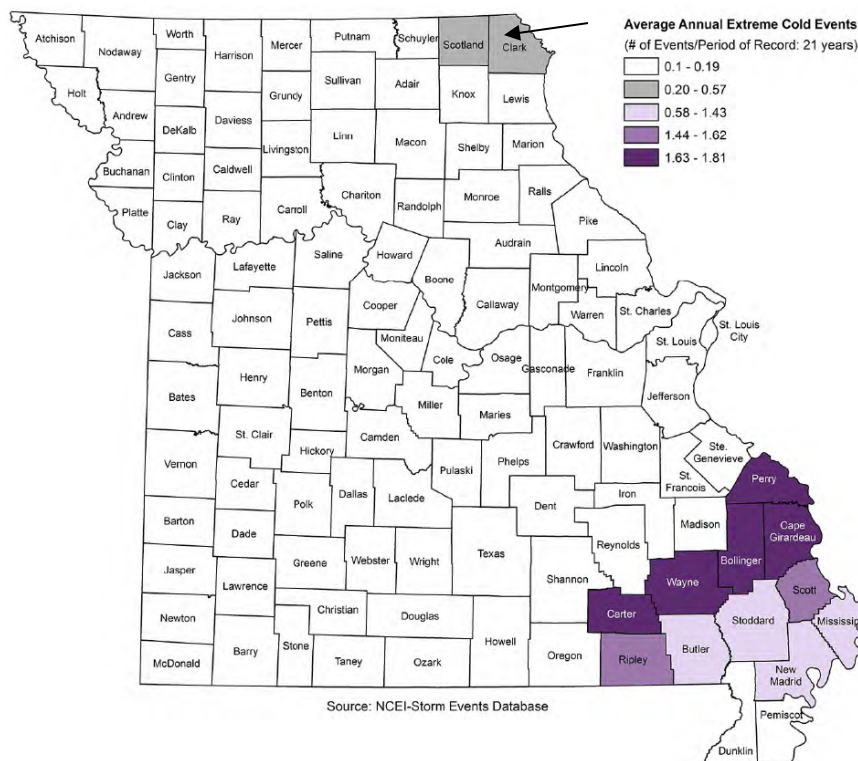
Source: National Weather Service Heat Index Program, www.weather.gov/os/heat/index.shtml

Figure 3.47. Average Annual Occurrence for Extreme Heat



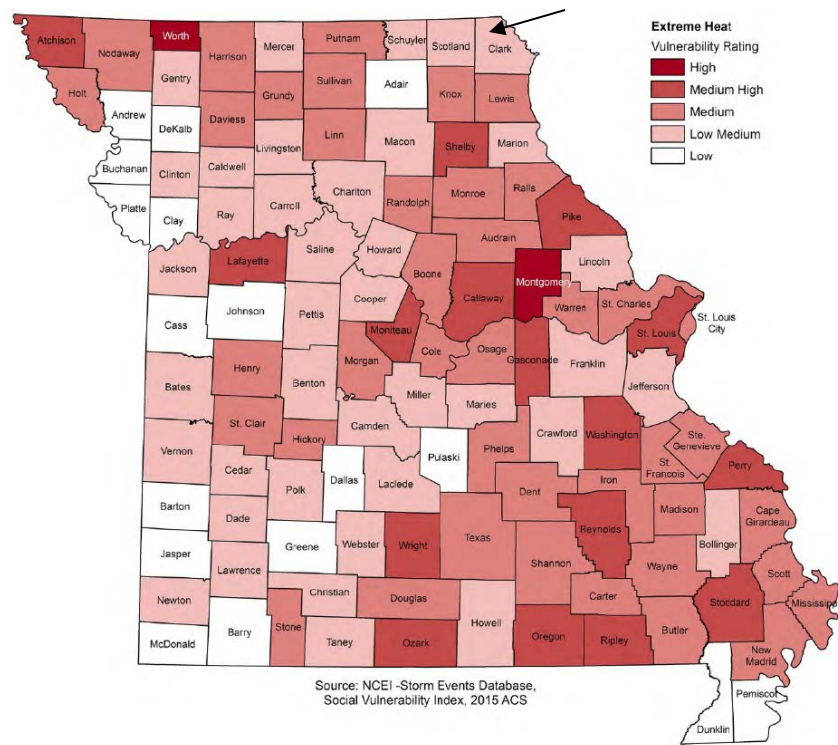
Source: 2018 Missouri State Hazard Mitigation Plan

Figure 3.48. Average Annual Occurrence for Extreme Cold/Wind Chill



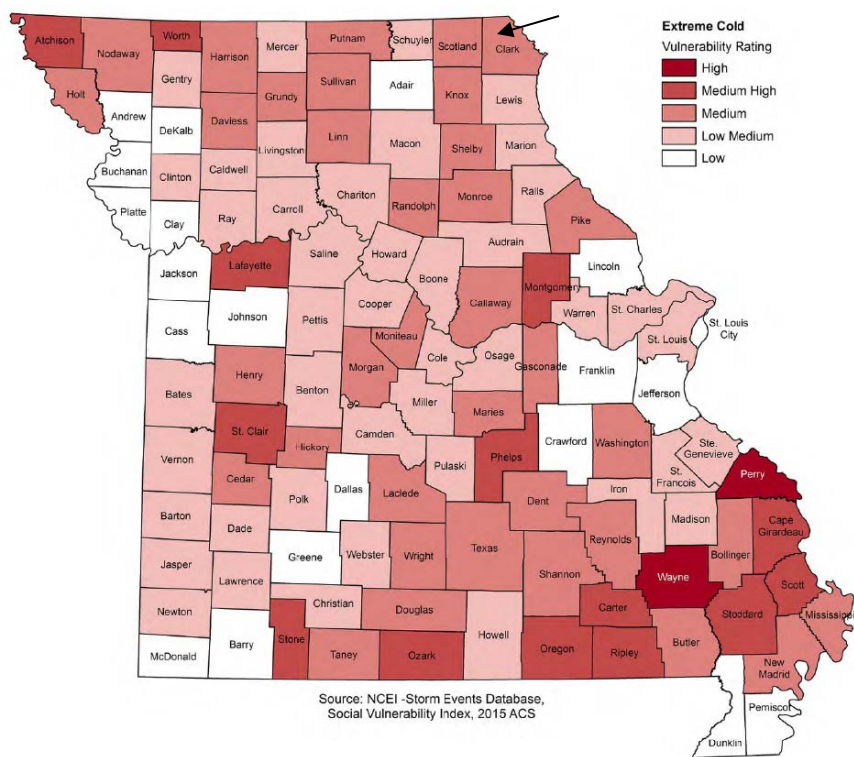
Source: 2018 Missouri State Hazard Mitigation Plan

Figure 3.49. Vulnerability Summary for Extreme Heat



Source: 2018 Missouri State Hazard Mitigation Plan

Figure 3.50. Vulnerability Summary for Extreme Cold



Source: 2018 Missouri State Hazard Mitigation Plan

Potential Losses to Existing Development

During the ten-year period from 2009-2018 there was a total of \$883,225.52 in crop insurance claims paid as a result of losses to extreme temperatures. The anticipated loss in any given year can be expected to be the annual average of \$88,322.55. Illness and loss of life are still the biggest concerns with extreme heat.

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.

According to the 2013-2017 American Community Survey 5-year estimates, Clark County have a decrease in population under 5 years and a decrease in population of 65 years and over.

Hazard Summary by Jurisdiction

Those at greatest risk for heat-related illness and deaths include children up to five years of age, people 65 years of age and older, people who are overweight, and people who are ill or on certain medications. To determine jurisdictions within the planning area with populations more vulnerable to extreme heat, demographic data was obtained from the 2010 census on population percentages in each jurisdiction comprised of those under age 5 and over age 65. Data was not available for overweight individuals and those on medications vulnerable to extreme heat. **Table 3.32** below summarizes vulnerable populations in the participating jurisdictions. Note that school and special districts are not included in the table because students and those working for the special districts are not customarily in these age groups.

Table 3.32. Clark County Population Under Age 5 and Over Age 65, 2010 Census Data

Jurisdiction	Population Under 5 years	Percent Under 5 year	Population 65 years and over	Percent 65 years and over
Clark County	492	6.89%	1,261	17.66%
City of Kahoka	152	7.31%	436	20.98%
City of Alexandria	11	6.28%	19	11.94%
City of Revere	5	6.32%	11	13.92%
City of Wayland	51	9.56%	85	15.94%
City of Wyaconda	18	7.92%	42	18.50%
Village of Luray	8	8.08%	9	9.09%

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

All schools in Clark County have air conditioning which does not put school age children at risk during extreme temperatures.

Problem Statement

Clark County has a growing population of residents over 65 years based on the 2000 and 2010 census data. They are at a greater risk for extreme-temperature related illnesses, injuries, and death. Possible solutions include organizing outreach to the vulnerable elderly populations, including establishing and promoting accessible heating or cooling centers in the community and creating a database in coordination with the Health Department to track those individuals at high risk.

3.4.8 Severe Thunderstorms Including High Winds, Hail, and Lightning

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 3.4.1** and tornadoes (discussed separately in **Section 3.4.10**).

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

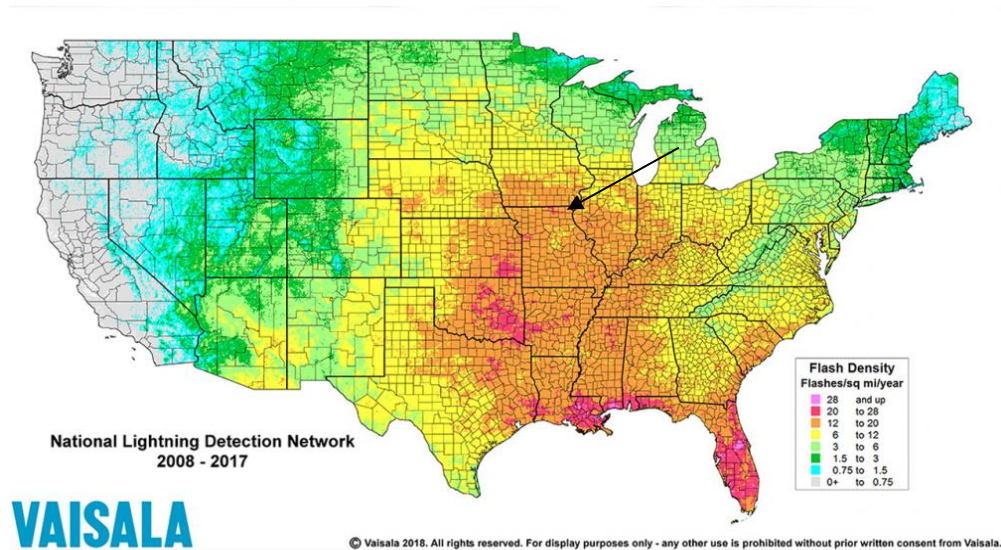
According to the National Oceanic and Atmospheric Administration (NOAA), hail is precipitation that is formed when thunderstorm updrafts carry raindrops upward into extremely cold atmosphere causing them to freeze. The raindrops form into small frozen droplets. They continue to grow as they come into 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

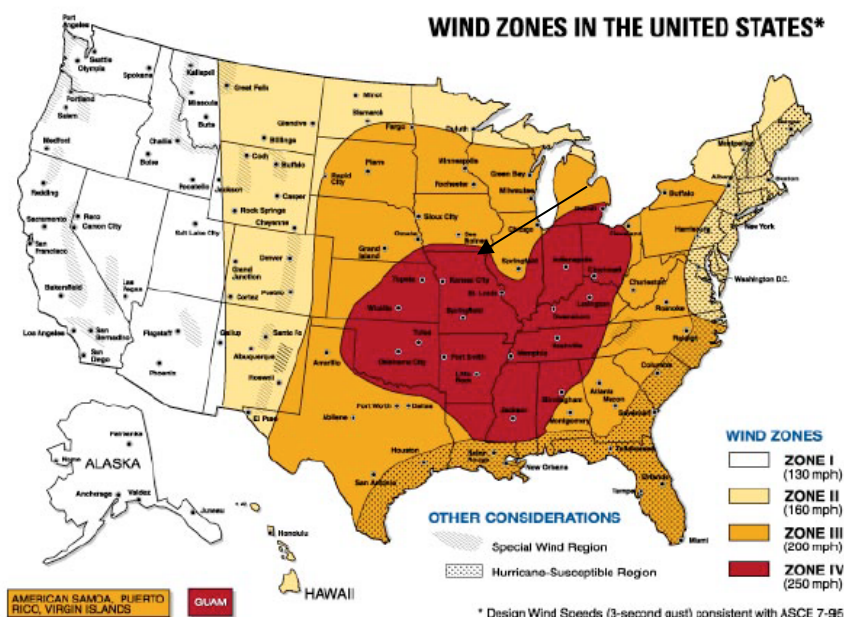
Discuss the fact that thunderstorms/high winds/hail/lightning events are an area-wide hazard that can happen anywhere in the county. Although these events occur similarly throughout the planning area, they are more frequently reported in more urbanized areas. In addition, damages are more likely to occur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

Figure 3.51. Location and Frequency of Lightning in Missouri



Source: National Weather Service, <http://www.vaisala.com/en/products/thunderstormandlightningdetectionsystems/Pages/NLDN.aspx>.
Note: indicate location of planning area with a colored square or arrow.

Figure 3.52. Wind Zones in the United States



Source: FEMA 320, Taking Shelter from the Storm, 3rd edition, https://www.fema.gov/pdf/library/ism2_s1.pdf

Strength/Magnitude/Extent

Based on information provided by the Tornado and Storm Research Organization (TORRO), **Table 3.33** below describes typical damage impacts of the various sizes of hail.

Table 3.33. 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.

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

The table below (**Table 3.34** through **Table 3.36**) summarize past crop damages as indicated by crop insurance claims. The table illustrate the magnitude of the impact on the planning area's agricultural economy. According to the information obtained from the Risk Management Agency website from 2009-2018 a total of \$12,449.00 was paid out in crop insurance due to high winds, \$174,217.88 was paid out due to Hail and, \$64,941.00 was paid out due to Lightning.

Table 3.34. Crop Insurance Claims Paid in Clark County from High Winds, [2009-2018]

Crop Year	Crop Name	Cause of Loss Description	Insurance Paid
2014	Corn	Wind/Excess Wind	\$11,815.00
2017	Corn	Wind/Excess Wind	\$634.00
Total			12,449.00

Source: USDA Risk Management Agency, Insurance Claims, <https://www.rma.usda.gov/data/cause>

Table 3.35. Crop Insurance Claims Paid in Clark County from Lightning, [2009-2018].

Crop Year	Crop Name	Cause of Loss Description	Insurance Paid
2014	Wheat	Other-Lightning	\$1487.00
2011	Corn	Other-Lightning	\$40,669.00
2011	Soybeans	Other-Lightning	\$22,785
Total			\$64,941.00

USDA Risk Management Agency, Insurance Claims, <https://www.rma.usda.gov/data/cause>

Table 3.36. Crop Insurance Claims Paid in Clark County from Hail, [2009-2018].

Crop Year	Crop Name	Cause of Loss Description	Insurance Paid
2011	Wheat	Hail	\$3,682.88
2011	Corn	Hail	\$26,005.00

2011	Soybeans	Hail	\$36,192.00
2012	Wheat	Hail	\$4,250.00
2012	Corn	Hail	\$46,796.00
2017	Wheat	Hail	\$190.00
2017	Corn	Hail	\$52,652.00
2017	Soybeans	Hail	\$4,450.00
Total			\$174,217.88

USDA Risk Management Agency, Insurance Claims, <https://www.rma.usda.gov/data/cause>

Probability of Future Occurrence

High Winds

Based on National Centers for Environmental Information there has been 1 High Wind event in Clark County from 1999-2018. Based on this data the probability that a High Wind event would happen in the planning area in any given year is 5%.

Lightning

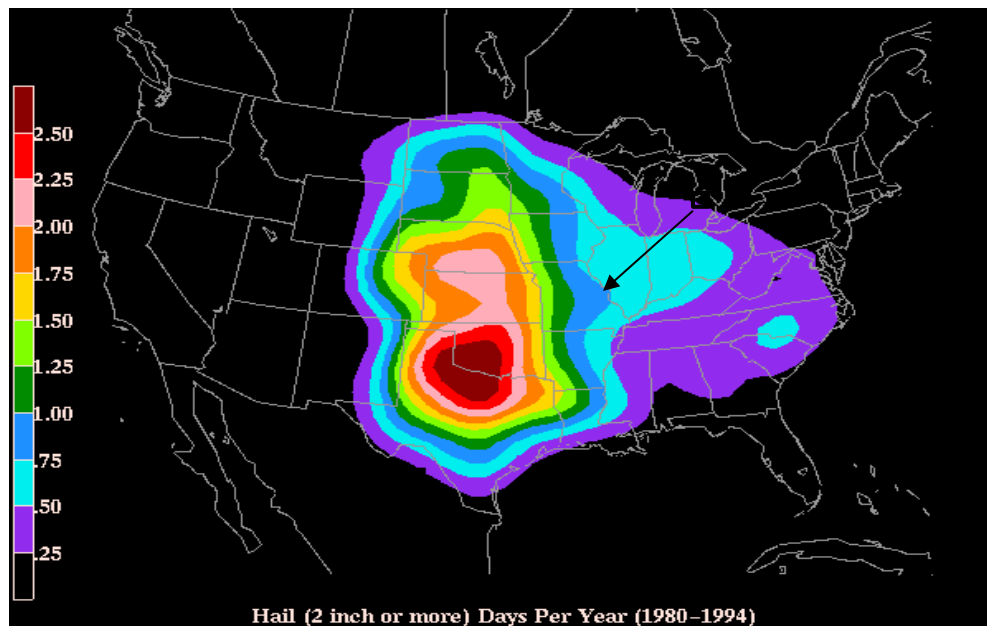
Based on National Centers for Environmental Information there has been 2 Lightning events in Clark County from 1999-2018. Based on this data the probability that a Lightning event would happen in the planning area in any given year is 10%.

Hail

Based on National Centers for Environmental Information there has been 37 Hail events in Clark County from 1999-2018. On average there are 1.85 Hail events per year in the planning area giving it a probability for Hail in any given year of 100%.

Figure 3.53 is 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. Clark County is located in the region to receive .50 and .75 hailstorm annually.

Figure 3.53. Annual Hailstorm Probability (2" diameter or larger), U 1980- 1994



Source: NSSL, http://www.nssl.noaa.gov/users/brooks/public_html/bighail.gif Note:
Arrow denotes approximate location of Clark County

Changing Future Conditions Considerations

According to the 2018 Missouri State Plan, predicted increases in temperature could help create atmospheric conditions that are fertile breeding grounds for severe thunderstorms and tornadoes in Missouri. Possible impacts include an increased risk to life and property in both the public and private sectors. Public utilities and manufactured housing developments will be especially prone to damages. Jurisdictions already affected should be prepared for more of these events, and should thus prioritize mitigation actions such as construction of safe rooms for vulnerable populations, retrofitting and/or hardening existing structures, improving warning systems and public education, and reinforcing utilities and additional critical infrastructure.

Vulnerability

Vulnerability Overview

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.

Potential Losses to Existing Development

Most damages occur to electronic equipment located inside buildings, but structural damage can also occur when a lightning strike causes a building fire. Communications equipment and warning transmitters and receivers can also be knocked out by lightning strikes. There has not been any fatalities or injuries due to lightning in Clark County during the 20-year period reviewed. There have been several insurance claims due to wind, lightning and hail due to loss of property.

Hail

There were 8 reported crop insurance claims for a 10-year period. The USDA RMA data does not depict 8 individual claims, but rather summarizes the total for each crop type/cause of loss. This amount does not take in account most buildings and structures that are privately insured thus insurance would help the building owner recover from hail damage.

High Winds

During the 10-year period reviewed there were 2 reports of damage contributed to high winds. The USDA RMA data does not depict 2 individual claims, but rather summarizes the total for each crop type/cause of loss. This amount does not take in account most buildings and structures that are privately insured thus insurance would help the building owner recover from high wind damage.

Lightning

There were 3 reported crop insurance claims for a 10-year period. The USDA RMA data does not depict 3 individual claims, but rather summarizes the total for each crop type/cause of loss. This amount does not take in account most buildings and structures that are privately insured thus insurance would help the building owner recover from lightning damage.

Previous and Future Development

With a decline in population from the 2000 to the 2010 census it is difficult to determine the future impacts. Anticipated development in each jurisdiction will result in increase exposure. Likewise, increased development of residential structures will increase jurisdiction's vulnerability to damages from severe thunderstorms/high winds/lightning/hail.

Hazard Summary by Jurisdiction

Thunderstorms/high winds/ lightning/hail events are area-wide, NCEI data did not seem to indicate that any particular community had higher losses as compared to another.

Problem Statement

Thunderstorms can damage power lines with the high winds or fallen debris such as tree limbs. Not everyone in the county utilizes social media, texting or have access to a weather radio, communities would benefit from updated sirens. Possible solutions include review of local ordinance and building codes to address high winds and/or construction techniques to include structural bracing, straps and clips, or anchor bolts.

3.4.9 Severe Winter Weather

Hazard Profile

Hazard Description

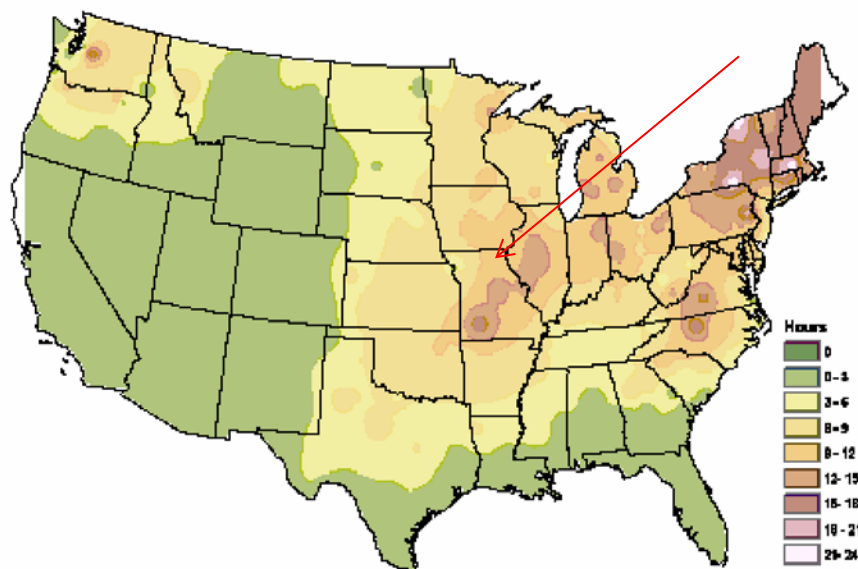
A major winter storm can last for several days and be accompanied by high winds, freezing rain or sleet, heavy snowfall, and cold temperatures. The National Weather Service describes different types of winter storm events as follows.

- **Blizzard**—Winds of 35 miles per hour or more with snow and blowing snow reducing visibility to less than $\frac{1}{4}$ 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 planning area of Clark County is vulnerable to heavy snow, extreme temperatures and freezing rain. (Figure 3.54) shows the entire planning area (approximated by arrow) is in the orange-shaded area that receives 9-12 hours of freezing rain per year.

Figure 3.54. 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>

Strength/Magnitude/Extent

Severe winter storms include heavy snowfall, ice, and strong winds which can push the wind chill well below zero degrees in the planning area.

For severe weather conditions, the National Weather Service issues some or all of the following products as conditions warrant across the State of Missouri. NWS local offices in Missouri may collaborate with local partners to determine when an alert should be issued for a local area.

- Winter Weather Advisory — Winter weather conditions are expected to cause significant inconveniences and may be hazardous. If caution is exercised, these situations should not become life threatening. Often the greatest hazard is to motorists.
- Winter Storm Watch — Severe winter conditions, such as heavy snow and/or ice are possible within the next day or two.
- Winter Storm Warning — Severe winter conditions have begun or are about to begin.
- Blizzard Warning — Snow and strong winds will combine to produce a blinding snow (near zero visibility), deep drifts, and life-threatening wind chill.
- Ice Storm Warning -- Dangerous accumulations of ice are expected with generally over one quarter inch of ice on exposed surfaces. Travel is impacted, and widespread downed trees and power lines often result.
- Wind Chill Advisory -- Combination of low temperatures and strong winds will result in wind chill readings of -20 degrees F or lower.
- Wind Chill Warning -- Wind chill temperatures of -35 degrees F or lower are expected. This is a life-threatening situation.

Previous Occurrences

Table 3.37 includes NCEI reported events and damages for the past 20 years. Events include blizzard, cold/wind chill, extreme cold/wind chill, heavy snow, ice storm, sleet, winter storm, and winter weather.

Table 3.37. NCEI Clark County Winter Weather Events Summary, [1999-2018]

Type of Event	Inclusive Dates	Magnitude	# of Injuries	Property Damages	Crop Damages
Blizzard	12/09/2009	-	0	0	0
Blizzard	02/01/2011	-	0	0	0
Blizzard	11/25/2018	-	0	0	0
Cold/Wind Chill	12/01/2000	-	0	0	0
Extreme Cold	12/16/2000	-	0	0	0
Extreme Cold	12/21/2000	-	0	0	0
Extreme Cold	12/23/2000	-	0	0	0
Extreme Cold	02/02/2007	-	0	0	0
Extreme Cold	01/14/2009	-	0	0	0
Extreme Cold	01/05/2014	-	0	0	0
Heavy Snow	01/01/1999	-	0	0	0
Heavy Snow	12/01/2000	-	0	0	0
Heavy Snow	12/13/2000	-	0	0	0
Heavy Snow	12/18/2000	-	0	0	0
Heavy Snow	12/20/2000	-	0	0	0
Heavy Snow	12/28/2000	-	0	0	0
Heavy Snow	01/26/2001	-	0	0	0
Heavy Snow	03/15/2001	-	0	0	0

Ice Storm	12/15/2000	-	0	0	0
Ice Storm	01/28/2001	-	0	0	0
Ice Storm	01/04/2005	-	0	\$10,000	0
Ice Storm	01/20/2006	-	0	\$5,000	0
Ice Storm	01/12/2007	-	0	0	0
Ice Storm	02/24/2007	-	0	0	0
Ice Storm	12/01/2007	-	0	0	0
Ice Storm	12/10/2007	-	0	0	0
Ice Storm	12/18/2008	-	0	0	0
Winter Storm	03/08/1999	-	0	0	0
Winter Storm	12/15/1999	-	0	0	0
Winter Storm	12/16/1999	-	0	0	0
Winter Storm	12/19/1999	-	0	0	0
Winter Storm	01/03/2000	-	0	0	0
Winter Storm	01/17/2000	-	0	0	0
Winter Storm	01/29/2000	-	0	0	0
Winter Storm	02/17/2000	-	0	0	0
Winter Storm	12/10/2000	-	0	0	0
Winter Storm	01/30/2002	-	0	0	0
Winter Storm	01/15/2003	-	0	0	0
Winter Storm	02/14/2003	-	0	0	0
Winter Storm	11/30/2006	-	0	0	0
Winter Storm	12/01/2006	-	0	0	0
Winter Storm	12/07/2009	-	0	0	0
Winter Storm	01/06/2010	-	0	0	0
Winter Storm	02/21/2010	-	0	0	0
Winter Storm	12/20/2012	-	0	0	0
Winter Storm	02/21/2013	-	0	0	0
Winter Storm	12/13/2013	-	0	0	0
Winter Storm	02/01/2014	-	0	0	0
Winter Storm	02/04/2014	-	0	0	0
Winter Storm	12/28/2015	-	0	0	0
Winter Weather	01/13/2001	-	0	0	0
Winter Weather	02/07/2001	-	0	0	0
Winter Weather	12/08/2005	-	0	0	0
Winter Weather	02/16/2006	-	0	\$500	0
Winter Weather	03/21/2006	-	0	\$2,000	0
Winter Weather	01/20/2007	-	0	0	0
Winter Weather	02/12/2007	-	0	0	0
Winter Weather	02/16/2007	-	0	0	0
Winter Weather	12/06/2007	-	0	0	0
Winter Weather	12/15/2007	-	0	0	0
Winter Weather	12/22/2007	-	0	0	0
Winter Weather	12/28/2007	-	0	0	0
Winter Weather	12/31/2007	-	0	0	0
Winter Weather	1/29/2008	-	0	0	0
Winter Weather	02/01/2008	-	0	0	0
Winter Weather	02/06/2008	-	0	0	0
Winter Weather	02/17/2008	-	0	0	0
Winter Weather	02/25/2008	-	0	0	0
Winter Weather	02/28/2008	-	0	0	0
Winter Weather	11/29/2008	-	0	0	0
Winter Weather	12/16/2008	-	0	0	0
Winter Weather	02/20/2009	-	0	0	0
Winter Weather	12/25/2009	-	0	0	0
Winter Weather	01/25/2010	-	0	0	0
Winter Weather	02/08/2010	-	0	0	0
Winter Weather	03/20/2010	-	0	0	0
Winter Weather	12/11/2010	-	0	0	0
Winter Weather	12/24/2010	-	0	0	0
Winter Weather	01/10/2011	-	0	0	0
Winter Weather	01/17/2011	-	0	0	0

Winter Weather	02/24/2011	-	0	0	0
Winter Weather	02/27/2011	-	0	0	0
Winter Weather	01/11/2012	-	0	0	0
Winter Weather	01/27/2013	-	0	0	0
Winter Weather	03/24/2013	-	0	0	0
Winter Weather	12/21/2013	-	0	0	0
Winter Weather	01/04/2014	-	0	0	0
Winter Weather	02/17/2014	-	0	0	0
Winter Weather	03/01/2014	-	0	0	0
Winter Weather	11/15/2014	-	0	0	0
Winter Weather	02/01/2015	-	0	0	0
Winter Weather	02/04/2015	-	0	0	0
Winter Weather	12/24/2017	-	0	0	0
Winter Weather	04/01/2018	-	0	0	0

Source: NCEI, data accessed [2009-2018]

Table 3.38. Presidential Disaster Declarations for Winter Storms

Disaster Number	Description	Declaration Date Incident Period	Individual Assistance (IA) Public Assistance (PA)
3071	Ice Jam and Flooding	3/12/1979	-
1403	Ice Storm	2/6/2002	PA
3281	Severe Winter Storms	12/12/2007	-
3303	Severe Winter Storm	1/30/2009	-
3317	Severe Winter Storm	2/03/2001	-
1961	Severe Winter Storm and Snowstorm	3/23/2011	PA

Table 3.39 shows the USDA's Risk Management Agency payments for insured crop losses in the planning area as a result of cold conditions and snow for the past 10 years.

Table 3.39. Crop Insurance Claims Paid in Clark County as a Result of Cold Conditions and Snow [2009-2018]

Crop Year	Crop Name	Cause of Loss Description	Insurance Paid (\$)
2009	Wheat	Cold/Wet Weather	\$13,227
2009	Corn	Frost	\$93,255
2009	Corn	Freeze	\$10,967
2009	Corn	Cold/Wet Weather	\$6,860
2009	Soybeans	Frost	\$55,009
2009	Soybeans	Freeze	\$15,455
2009	Soybeans	Cold/Wet Weather	\$3,842
2010	Wheat	Cold Winter	\$11,207
2010	Corn	Cold/Wet Weather	\$55,774
2010	Soybeans	Cold/Wet Weather	\$2,796
2011	Wheat	Cold Winter	\$7,381
2011	Corn	Cold Winter	\$1,154
2011	Corn	Cold/Wet Weather	\$308,243
2011	Soybeans	Frost	\$18,311
2011	Soybeans	Freeze	\$17,141

2011	Soybeans	Cold/Wet Weather	\$18,625
2012	Corn	Cold/Wet Weather	\$17,314
2012	Soybeans	Cold/Wet Weather	\$2,039
2013	Wheat	Cold/Wet Weather	\$4,695
2013	Corn	Cold/Wet Weather	\$2,942
2014	Wheat	Frost	\$2,470
2014	Wheat	Cold Winter	\$288,309
2014	Wheat	Cold/Wet Weather	\$13,670
2014	Corn	Cold/Wet Weather	\$22,200
2014	Soybeans	Cold/Wet Weather	\$3,930
2015	Wheat	Cold Winter	\$38,044
2016	Wheat	Cold Winter	\$1,385
2016	Corn	Cold/Wet Weather	\$4,732
2016	Soybeans	Cold/Wet Weather	\$7,835
2017	Corn	Cold/Wet Weather	\$10,421
2018	Soybeans	Cold/Wet Weather	\$75,617

Source: USDA Risk Management Agency, <https://www.rma.usda.gov/data/cause>

Probability of Future Occurrence

The entire planning area is vulnerable to the effects of winter storm/blizzard, ice storms, winter 3.106 weather, cold/wind chill and heavy snow. All effects of winters tend to make driving more treacherous and can impact the response of emergency vehicles. The probability of utility and infrastructure failure increases during winter weather due to the freezing rain accumulation on utility poles and power lines. Elderly populations are considered particularly vulnerable to the impact of winter weather.

Blizzard

There were 3 reported blizzard events in Clark County from the period of 1999-2018. The probability of a blizzard occurring in the planning area in any given year is 15% (3 events / 20 years).

Cold/Wind Chill

There was 1 reported Cold/Wind Chill event in Clark County from the period of 1999-2018. The probability of a Cold/Wind Chill event in the planning area in any given year is 5% (1 event / 20 years).

Extreme Cold

There were 6 reported Extreme Cold events in Clark County from the period of 1999-2018. The probability of an Extreme Cold even in the planning area in any given year is 30% (6 events / 20 years).

Heavy Snow

There were 8 reported Heavy Snow events in Clark County from the period of 1999-2018. The probability of a Heavy Snow event in the planning area in any given year is 40% (8 events / 20 years).

Ice Storm

There were 9 reported Ice Storm events in Clark County from the period of 1999-2018. The probability of an Ice Storm event in the planning area in any given year is 45% (9 events / 20 years).

Winter Storm

There were 23 reported Winter Storm events in Clark County from the period of 1999-2018. The

probability of a Winter Storm event in the planning area is 100% with an average annual occurrence of 1.15 events.

Winter Weather

There were 46 Winter Weather events in Clark County from the period of 1999-2018. The probability of a Winter Weather event in the planning area is 100% with an average annual occurrence of 2.3 events.

Changing Future Conditions Considerations

According to the 2018 Missouri State Plan, a shorter overall winter season and fewer days of extreme cold may have both positive and negative indirect impacts. Warmer winter temperatures may result in changing distributions of native plant and animal species and/or an increase in pests and non-native species. Warmer winter temperatures will result in a reduction of lake ice cover. Reduced lake ice cover impacts aquatic ecosystems by raising water temperatures. Water temperature is linked to dissolved oxygen levels and many other environmental parameters that affect fish, plant, and other animal populations. A lack of ice cover also leaves lakes exposed to wind and evaporation during a time of year when they are normally protected. As both temperature and precipitation increase during the winter months, freezing rain will be more likely. Additional wintertime precipitation in any form will contribute to saturation and increase the risk and/or severity of spring flooding. A greater proportion of wintertime precipitation may fall as rain rather than snow.

Vulnerability

Vulnerability Overview

The method used to determine vulnerability to severe winter weather across Missouri was statistical analysis of data from several sources: National Centers for Environmental Information (NCEI) storm events data (1996 to December 31, 2016), HAZUS Building Exposure Value data, housing density data from the U.S. Census (2015 ACS), and the calculated Social Vulnerability Index for Missouri Counties from the Hazards and Vulnerability Research Institute in the Department of Geography at the University of South Carolina. From the statistical data collected, five factors were considered in determining overall vulnerability to severe winter weather as follows: housing density, building exposure, social vulnerability, likelihood of occurrence, and average annual property loss. Based on natural breaks in the statistical data, a rating value of 1 through 5 was assigned to each factor. These rating values correspond to the following descriptive terms: 1) Low 2) Low-medium 3) Medium 4) Medium-high 5) High

Table 3.40. Ranges for Severe Winter Weather Vulnerability Factor Rating

Factors Considered	Low (1)	Low Medium (2)	Medium (3)	Medium High (4)	High (5)
Common Factors					
Housing Density (# per sq. mile)	4.11-44.23	44.24-134.91	134.92-259.98	259.99-862.69	862.70-2836.23
Building Exposure (\$)	\$269,532-\$3,224,641	\$3,224,642-\$8,792,829	\$8,792,830-\$22,249,768	\$22,249,769-\$46,880,213	\$46,880,214-\$138,887,850
Social Vulnerability	1	2	3	4	5
Likelihood of Occurrence (# of events/ yrs. of data)	1.05-1.43	1.44-1.76	1.77-2.10	2.11-2.67	2.68-4.57
Average Annual Property Loss (annual property loss/ yrs. Of data)	\$0-\$143,095.24	\$143,095.25-\$406,666.67	\$406,666.68-\$1,191,000.95	\$1,191,000.96-\$3,184,761.90	\$3,184,761.91-\$5,861,666.67

Source: 2018 Missouri Hazard Mitigation Plan

Table 3.41. Ranges for Severe Winter Weather Combined Vulnerability Rating

	Low (1)	Low-medium (2)	Medium (3)	Medium-high-4	High (5)
Severe Winter Weather Combined Vulnerability	7-8	8-10	10-12	12-15	15-22

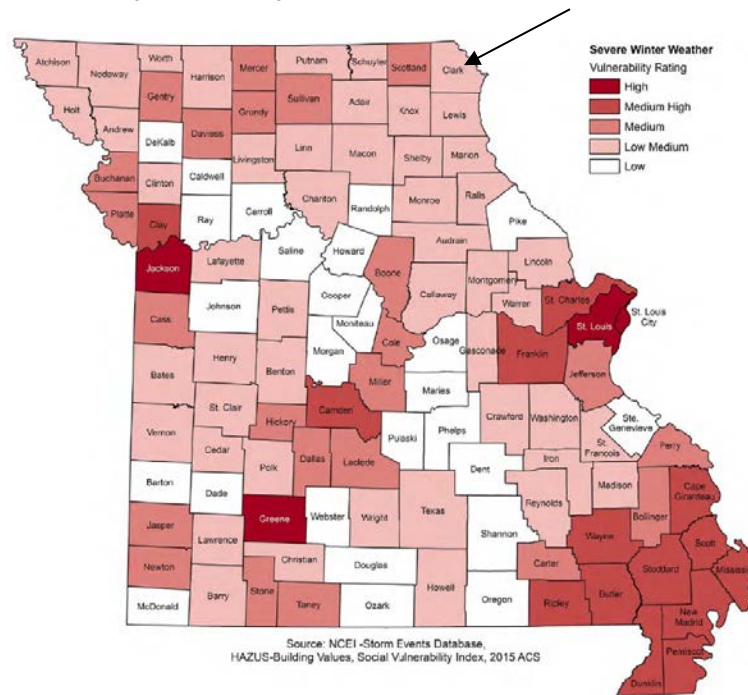
Source: 2018 Missouri Hazard Mitigation Plan

Table 3.42. Housing Density, Building Exposure, and SOVI Data by County

County	Total Building Exposure (Hazes)	Building Exposure Rating	Housing Density	Housing Density Rating	SOVI Ranking	SOVI Rating
Clark	\$709,999,000	1	6.84	1	Medium Low	2

Source: 2018 Missouri Hazard Mitigation Plan

Figure 3.55. Vulnerability Summary for Severe Winter Weather



Source: 2018 Missouri Hazard Mitigation Plan

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.

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.

Potential Losses to Existing Development

The next severe winter storm will most likely close schools and businesses for multiple days, and make roadways hazardous for travel. Heavy ice accumulation may damage electrical infrastructures

causing prolonged power outages for large portions of the region. In addition, freezing temperatures make water lines vulnerable to freeze/thaw. Fallen tree limbs also pose a threat to various structures/infrastructures across the county.

Previous and Future Development

Future development could potentially increase vulnerability to this hazard by increasing demand on the utilities and increasing the exposure of infrastructure networks.

Hazard Summary by Jurisdiction

Although crop loss as a result of severe winter storm occurs more in the unincorporated portions of the planning area, the density of vulnerable populations is higher in the urban areas of the planning areas. It is considered that the magnitude of this hazard is relatively equal. The factors of probability, warning time, and duration are also equal across the planning area. Therefore, the conclusion is the hazard does not substantially vary by jurisdiction.

Problem Statement

Clark County is expected to experience at least one severe winter weather events annually; the county has a low-medium vulnerability rating. Jurisdictions should enhance their weather monitoring to be better prepared for severe weather hazards. If jurisdictions monitor winter weather, they can dispatch road crews to prepare for the hazard. County and city crews can also trim trees along power lines to minimize the potential for outages due to snow and ice. Citizens should also be educated about the benefits of being proactive to alleviate property damage as well as preparing for power outages. Education needs to occur to ensure all residents are aware of the shelters in the County, residents are educated on emergency supplies to have and the utilization of social media and texting increases.

3.4.10 Tornado

Hazard Profile

Hazard Description

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. The unique geography of the central United States allows for the development of thunderstorms that spawn tornadoes. The jet stream, which is a high-velocity stream of air, determines which area of the central United States will be prone to tornado development. The jet stream normally 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.

Tornadoes spawn from the largest thunderstorms. The associated cumulonimbus clouds can reach heights of up to 55,000 feet above ground level and are commonly formed when Gulf air is warmed by solar heating. The moist, warm air is overridden by the dry cool air provided by the jet stream. This cold air presses down on the warm air, preventing it from rising, but only temporarily. Soon, the warm air forces its way through the cool air and the cool air moves downward past the rising warm air. This air movement, along with the deflection of the earth’s surface, can cause the air masses to start rotating. This rotational movement around the location of the breakthrough forms a vortex, or funnel. If the newly created funnel stays in the sky, it is referred to as a funnel cloud. However, if it touches the ground, the funnel officially becomes a tornado.

A typical tornado can be described as a funnel-shaped cloud that is “anchored” to a cloud, usually a cumulonimbus that is also in contact with the earth’s surface. 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

Tornados can occur in the entire planning area and no area is immune from tornado suffering.

Strength/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 3.43**) 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 3.43. 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 3.44**. 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 of damage is located online at www.spc.noaa.gov/efscale/ef-scale.html.

Table 3.44. 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

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 3.45. Recorded Tornadoes in Clark County, 1993 – Present

Date	Beginning Location	Ending Location	Length (miles)	Width (yards)	F/EF Rating	Death	Injury	Property Damage	Crop Damages
5/13/1995	0 Arbela	4NE Luray	8	200	F2	0	3	630k	0
4/7/1998	1SW Wayland	1S Wayland	2.5	50	F1	0	0	50K	0
6/14/1998	1SE Wyaconda	1SE Wyaconda	.2	25	F0	0	0	0	0
6/14/1998	1E Luray	1E Luray	.2	25	F0	0	0	0	0
6/14/1998	6SSW Kahoka	5SSW Kahoka	1	50	F0	0	0	0	0
6/14/1998	1SW St Patrick	1SW St. Patrick	1	50	F0	0	0	0	0
5/10/2003	2WNW Fairmont	1S Medill	10.7	100	F0	0	0	250K	0
3/12/2006	3W Luray	3W Luray	.5	8	F0	0	0	.5K	0
4/25/2012	2E Luray	2SE Luray	2	50	EF1	0	0	0	0
12/4/2017	3WSW Wayland	3NW Alexandria	6.9	50	EF2	0	1	100K	4K
	Total							\$1,030,500	\$4,000

Source: National Centers for Environmental Information, <http://www.NCEI.noaa.gov/stormevents/>

Figure 3.56. Clark County Map of Historic Tornado Events



Probability of Future Occurrence

Changing Future Conditions Considerations

Vulnerability

Clark County is located in a region of the U.S. with high frequency of dangerous and destructive tornadoes referred to as “Tornado Alley” (**Figure 3.57**) illustrating areas where dangerous tornadoes historically have occurred.

Figure 3.57. Tornado Alley in the U.S.



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

Table 3.46. Ranges for Tornado Vulnerability Factor Ratings

Factors Considered	Low (1)	Low-medium (2)	Medium (3)	Medium-High (4)	High (5)
Common Factors					
Building Exposure (\$)	\$269,532-\$3,224,641	\$3,224,642-\$8,792,829	\$8,792,830-\$22,249,768	\$22,249,769-\$46,880,213	\$46,880,214-\$138,887,850
Population Density (#per sq. mile)	4.11-44.23	44.24-134.91	134.92-259.98	259.99-862.69	862.70-2,836.23
Social Vulnerability	1	2	3	4	5
Percent Mobile Homes	0.2-4.5%	4.51-8.8%	8.81-14%	14.01-21.2%	21.21-33.2%
Likelihood of Occurrence (# of events/ yrs. of data)	0.119 - 0.208	0.209 - 0.313	0.314 - 0.417	0.418 - 0.552	0.553 - 0.791
Total Annualized Property Loss (\$ / yrs. of data)	\$974 - \$281,874	\$281,875 - \$991,825	\$991,826 - \$2,099,000	\$2,099,001 - \$5,047,474	\$5,047,475 - \$42,467,109

Source: 2018 Missouri Hazard Mitigation Plan

Table 3.47. Ranges for Tornado Combined Vulnerability Rating

	Low (1)	Low-medium (2)	Medium (3)	Medium-High (4)	High (5)
Tornado Combined Vulnerability	7-10	11-12	13-14	15-16	17-21

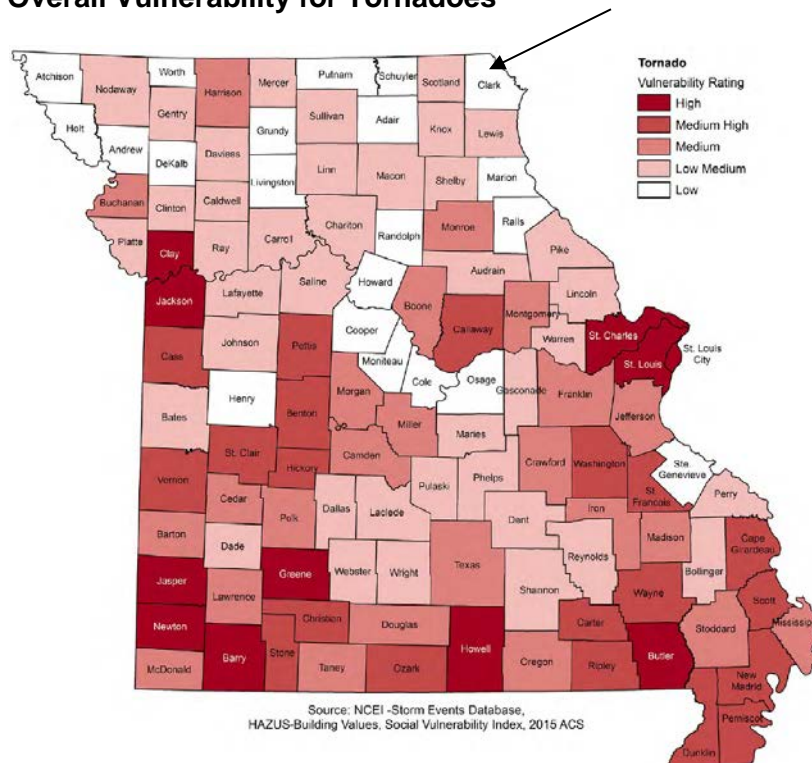
Source: 2018 Missouri Hazard Mitigation Plan

Table 3.48. Building Exposure, Population Density, SOVI, and Mobile Home Data for Clark County

County	Total Building Exposure (Hazus)	Exposure Rating	Population Density	Population Rating	SOVI Index Ranking	SOVI Rating	Percent Mobile Homes	Mobile Home Rating
Clark	\$709,999,000	1	13.48	1	Medium Low	2	16.2	4

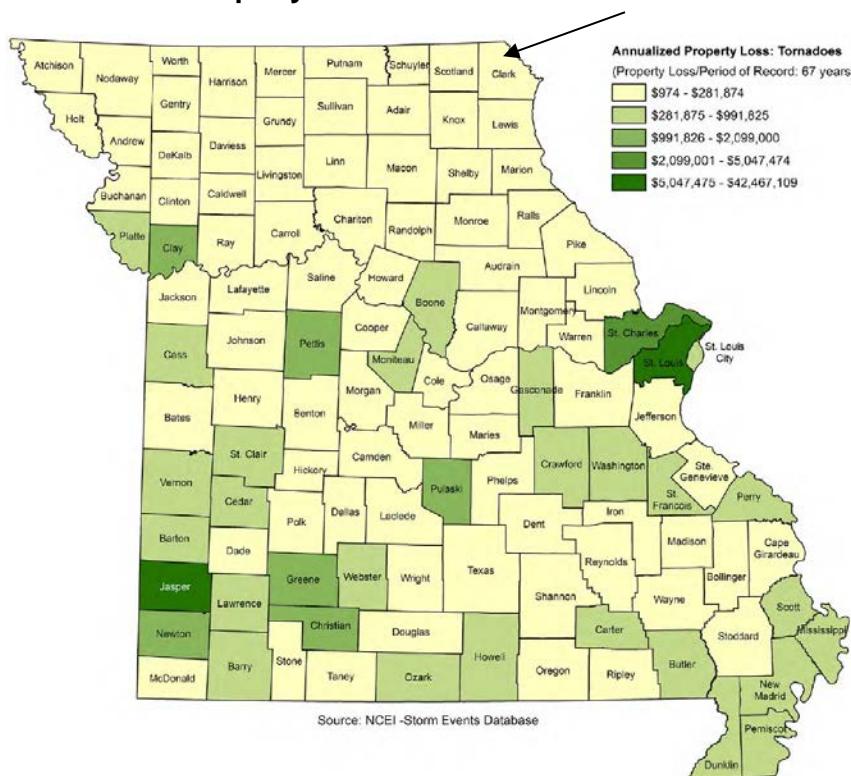
Source: 2018 Missouri Hazard Mitigation Plan

Figure 3.58. Overall Vulnerability for Tornadoes



Source: 2018 Missouri Hazard Mitigation Plan

Figure 3.59. Annualized Property Loss for Tornadoes



Source: 2018 Missouri Hazard Mitigation Plan

Potential Losses to Existing Development

The annualized damage for Clark County due to tornadoes is \$51,578 (previous 67 years). With this information we can estimate that each year there will be approximately \$769.82 in loss to existing development. Additionally, the largest recorded tornado in the planning area has been an EF-2. Utilizing this information, we can infer that there is potential for another tornado of equivalence.

Previous and Future Development

Vulnerability to tornadoes is anticipated to remain the same. Future development for public buildings such as schools, government offices, as well as buildings with high occupancy and campgrounds should consider including a tornado safe room to protect occupants in the event of a tornado.

Hazard Summary by Jurisdiction

As previously stated, a tornado event could occur anywhere in the planning area. However, some jurisdictions would suffer heavier damages because of the age of housing or high concentration of mobile homes. Furthermore, data was obtained from the U.S. Census Bureau for the number of mobile homes in Clark County. From the information provided in **Table 3.49**, Alexandria, Revere and Wayland have the highest percentage of mobile homes in their communities. Unincorporated Clark county and Kahoka have the highest number total of mobile homes.

Table 3.49. Percentage of Mobile Homes in Clark County, 2017

Jurisdiction	Number of Mobile Homes	Percentage of Mobile Homes
Unincorporated Clark County	486	16.7%
City of Kahoka	127	14.3%
City of Wayland	59	24.6%
City of Wyaconda	11	12%
City of Alexandria	21	38.2%
Village of Luray	7	19.4%
City of Revere	9	27.3%

Problem Statement

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

3.4.11 Wildfire

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.

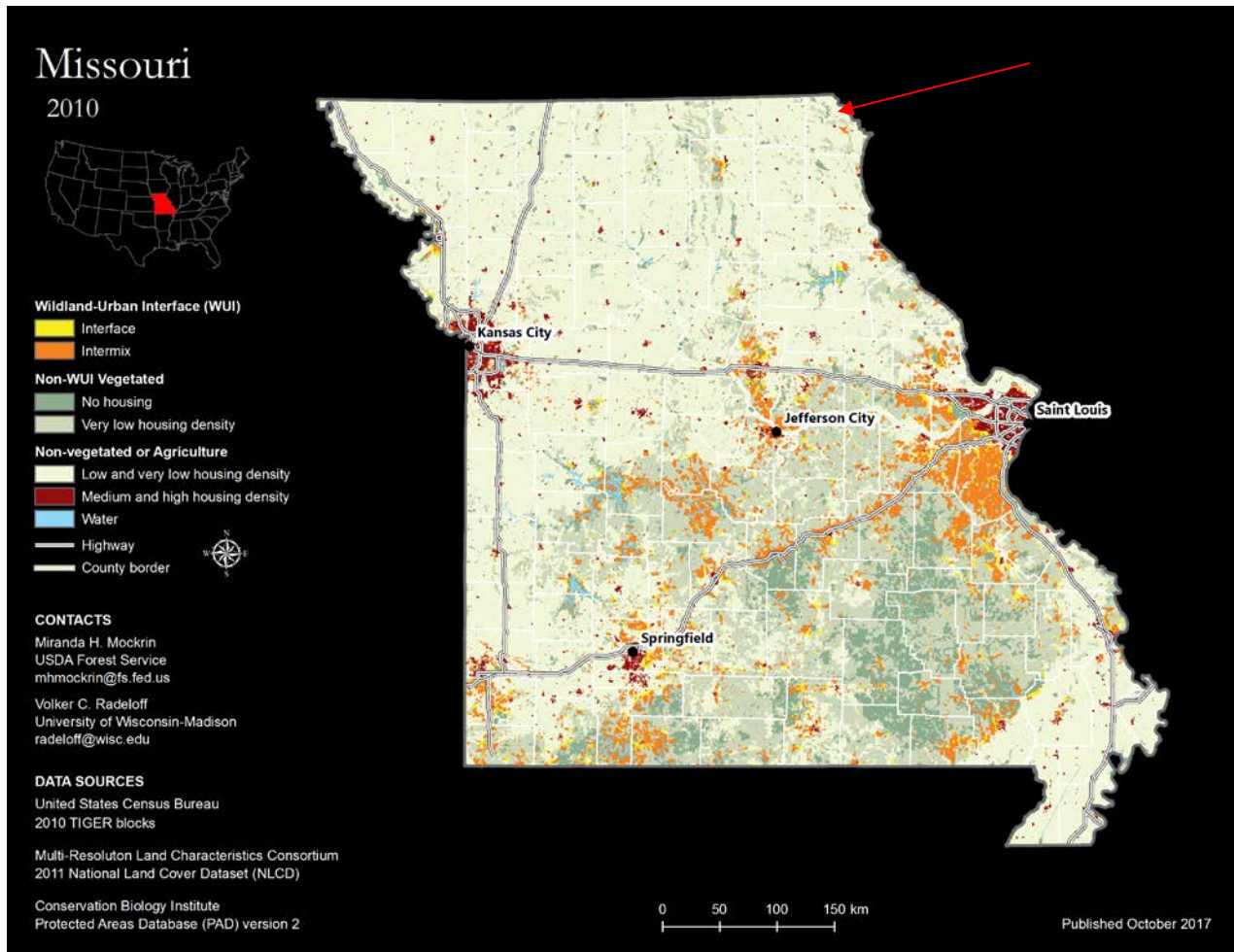
The Forestry Division of the Missouri Department of Conservation (MDC) is responsible for protecting privately owned and state-owned forests and grasslands from wildfires. To accomplish this task, eight forestry regions have been established in Missouri for fire suppression. The Forestry Division works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

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.

Figure 3.60. 2010 Missouri Wildland Urban Interface



Source: http://silvis.forest.wisc.edu/GeoData/WUI_cp12/maps/gifs/black/Missouri_WUI_cp12_black_2010.gif

Strength/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.

Include information about the severity of damages from notable planning area structural fires and wildland fires. If no information is available, state this in the plan.

Previous Occurrences

According to the Missouri Division of Fire Safety (MDFS) Website as well as the Missouri Department of Conservation Wildfire Data Search there were 210 reported wildfires in Clark County from 2004-2016. In total, these 210 fires burned 1,296 acres. During the twelve-year reporting period the largest cause of fire was debris.

At this time no information is available from school districts and special districts about previous fire events and the damages resulting from them.

Probability of Future Occurrence

Wildfires in the planning area are most likely to occur every year with very little resulting damage. The wildfires occur in the unincorporated areas and are limited to undeveloped land. The jurisdictions and school districts are largely surrounded by undeveloped land but have not been affected by wildfires. In years of significant drought or excessive heat the potential for a wildfire in planning area increases.

Vulnerability

Vulnerability Overview

According to the 2018 Missouri State Hazard Mitigation Plan, Higher temperatures and changes in rainfall are unlikely to substantially reduce forest cover in Missouri, although the composition of trees in the forests may change. More droughts would reduce forest productivity, and changing future conditions are also likely to increase the damage from insects and diseases. But longer growing seasons and increased carbon dioxide concentrations could more than offset the losses from those factors. Forests cover about one-third of the state, dominated by oak and hickory trees. As the climate changes, the abundance of pines in Missouri's forests is likely to increase, while the population of hickory trees is likely to decrease. Higher temperatures will also reduce the number of 3.121 days prescribed burning can be performed. Reduction of prescribed burning will allow for growth of understory vegetation – providing fuel for destructive wildfires. Drought is also anticipated to increase in frequency and intensity during summer months under projected future scenarios. Drought can lead to dead or dying vegetation and landscaping material close to structures which creates fodder for wildfires within both the urban and rural settings.

Potential Losses to Existing Development

Figure 3.61. Estimated Numbers and Values of Structures and Population Vulnerable to Wildfire in Clark County

County	Number of Structures	Value of Structures	Population
Clark	512	\$215,222,025	706
Agriculture	230	\$166,200,556	
Commercial	3	\$1,598,250	
Residential	279	\$47,423,220	

Source: 2018 Missouri Hazard Mitigation Plan

Figure 3.62. Wildfire Potential Loss Estimates

County	Total WUI Acreage	Total Structure Value Within WUI	Average Value/Acre within WUI	Average Annual Acreage Burned	Potential Loss
Clark	6,141.73	\$215,222,025	\$35,043	100	\$3,504,258

Source: 2018 Missouri Hazard Mitigation Plan

According to the 2018 Missouri State Hazard Mitigation Plan, Clark County is estimated to have on average 100 acres burned with a potential loss of \$3,504,258.

Impact of Previous and Future Development

Future and previous development in the wildland-urban interface would increase vulnerability to the hazard.

Hazard Summary by Jurisdiction

The rural jurisdictions in the planning area are all surrounded by undeveloped agricultural land and face the possibility of a wildfire. The school districts are located in a rural area and do not face danger of wildfire due to barriers in place around the school. As long as drought conditions are not seriously inflamed, future wildfires in Clark County should have a negligible adverse impact on the community, as it would affect a small percentage of the population. Nonetheless, homes and businesses located in unincorporated areas are at higher risk from wildfires due to proximity to wood and distance from fire services. Variations in both structural/urban and wildfires are not able to be determined at this time due to lack of data. However, both fire types are expected to occur on an annual basis across the county.

Problem Statement

Residents do not comply with burn bans, education is not available for the levels of burn bans, many residents lack education in fire safety and not all residents utilize social media and texting. Education needs to occur on the dangers associated with not complying with the burn bans, more education for fire safety and encourage utilization of social media and texting. Due to Clark County's med-high drought rating, they may be more susceptible to fires.

3.4.12 Pandemic

Hazard Profile

Hazard Description

According to the Center for Disease Control, a pandemic is a global outbreak of disease. Pandemics happen when a new virus emerges to infect people and can spread between people sustainably. Because there is little to no pre-existing immunity against the new virus, it spreads worldwide.

Geographic Location

All of Clark County is susceptible to a pandemic outbreak due to its main characteristic of being on a global level.

Strength/Magnitude/Extent

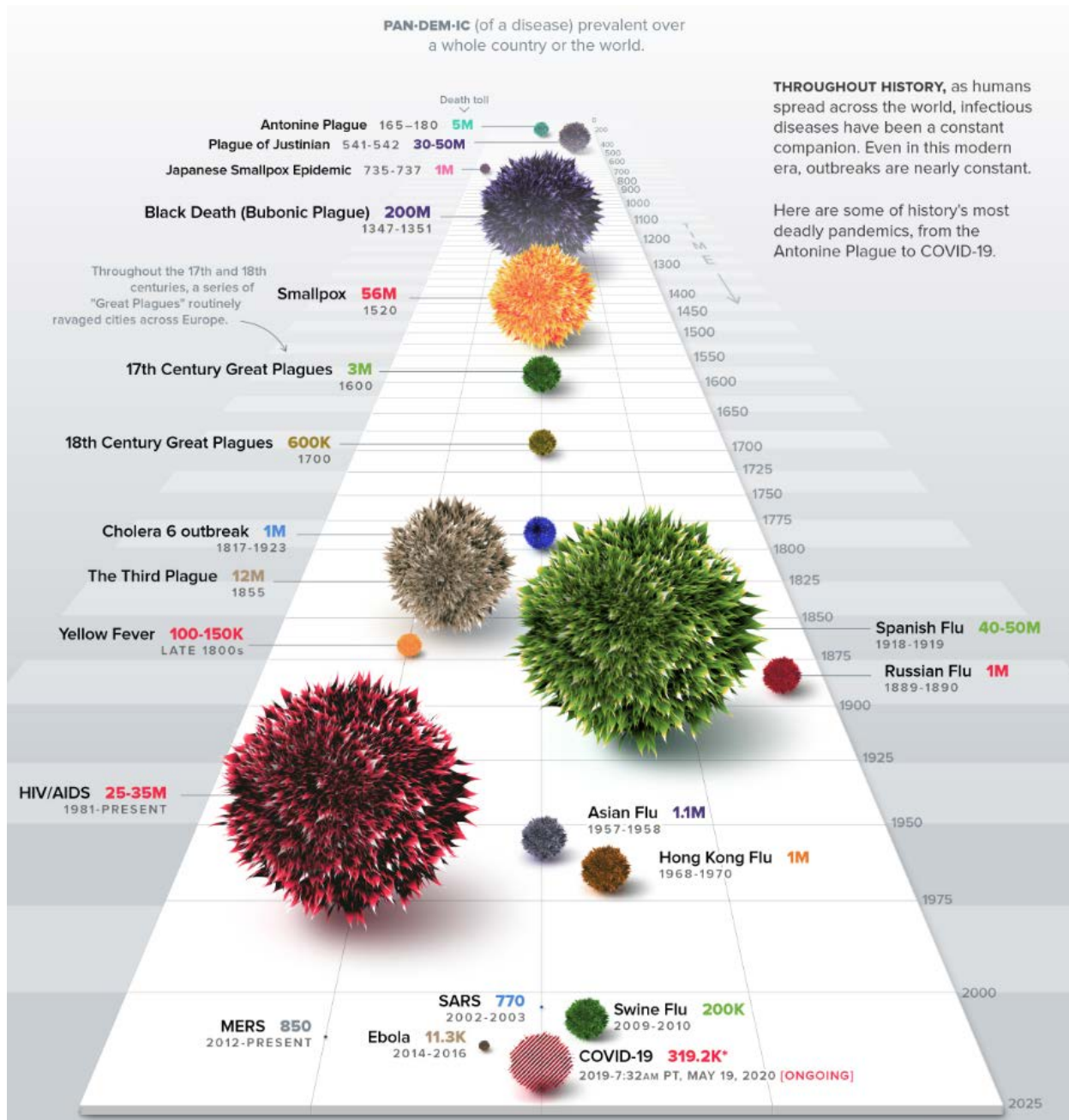
Risk depends on characteristics of the virus, including how well it spreads between people; the severity of resulting illness; and the medical or other measures available to control the impact of the virus (for example, vaccines or medications that can treat the illness) and the relative success of these. In the absence of vaccine or treatment medications, nonpharmaceutical interventions become the most important response strategy. These are community interventions that can reduce the impact of disease.

Previous Occurrences

The planning area, in addition to others across the globe, is currently in the midst of a pandemic. The virus that causes COVID-19 is infecting people and spreading easily from person-to-person. On March 11, 2020 the COVID-19 outbreak was characterized as a pandemic by the World Health Organization. According to the Center for Disease Control, this is the first pandemic known to be caused by a new coronavirus. In the past century, there have been four pandemics caused by the emergence of new influenza viruses. As a result, most research and guidance around pandemics is specific to influenza, but the same premises can be applied to the current COVID-19 pandemic. Pandemics of respiratory disease follow a certain progression outlined in a “Pandemic Intervals Framework.” Pandemics begin with an investigation phase, followed by recognition, initiation, and acceleration phases. The peak of illnesses occurs at the end of the acceleration phase, which is followed by a deceleration phase, during which there is a decrease in illnesses. Different countries can be in different phases of the pandemic at any point in time and different parts of the same country can also be in different phases of a pandemic.

As humans have spread across the world, so have infectious diseases. Even in this modern era, outbreaks are nearly constant, though not every outbreak reaches pandemic level. **Figure 3.63** below outlines the history of pandemics dating back to 165.

Figure 3.63. History of Pandemics



Source: <https://www.visualcapitalist.com/history-of-pandemics-deadliest/>

Probability of Future Occurrence

The threat of pandemics in the planning area, and across the globe, remains a concern.

Changing Future Conditions Considerations

Climate change and weather patterns are widely thought to have direct impacts on the probability and severity of future pandemic outbreaks. Habitat loss due to climate is bringing animals that can transmit

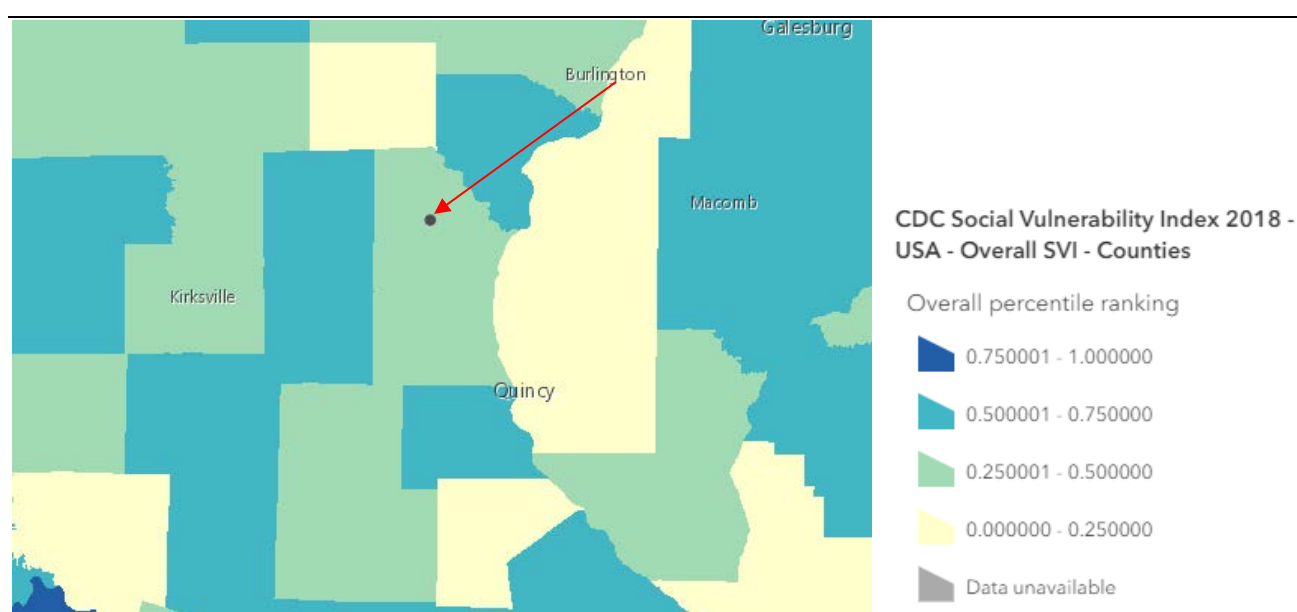
disease in contact with humans more often. Floods can enhance the spread of infectious agents like insects, bacteria, and viruses. Increasing temperatures and humidity affect the development, survival and spread of not only pathogens, but also their hosts (often animals).

Vulnerability

Vulnerability Overview

Each jurisdiction and its population, businesses, and school districts are vulnerable to a pandemic outbreak. Due to a high elderly population throughout the planning area, an outbreak of an infectious or viral disease could have major impacts on the communities and the assets each possess.

Figure 3.64. Social Vulnerability Rating in the United States



Source: https://livingatlas.arcgis.com/policy/browse/?loc=-90.825_40.309_8&col=88f17b4580e846609f92c9f75a9d9eee_2c8fdc6267e4439e968837020e7618f3_48638a1be455429287d67569850139_10.02a82293e2dd475391cb3699b5e82d61_d89c527f2e6b4d658db0948ea9d49cd9_48a70b524601428ba297e3106b751401_be559110b5c34591b1a767fbb807bcbf_e0427fbc472f4a45b7d94d182a5e9591_142e65436bed4063973380feae6ed248&viz=2c8fdc6267e4439e968837020e7618f3&hs=1 (Red Arrow Denotes Clark County)

Potential Losses to Existing Development

During a pandemic, COVID-19 for example, people have been ordered to stay home, schools adjourned the remainder of the year, restaurants and bars are forced to close their doors. It is very likely the livelihood of the population and some of the planning area's most beloved assets and businesses will not be able to recover the pandemic due to extreme economic loss and health threats.

Impact of Previous and Future Development

Pandemics create unprecedented disruption for global health and the development of communities. Urbanization in the developing world is bringing more and more rural residents into denser neighborhoods, while population increases are putting greater pressure on the environment. In conjunction, air traffic nearly doubled in the past decade. These macro trends are having major impacts

on the spread of infectious disease.

Hazard Summary by Jurisdiction

The planning area is largely rural and many have a sense of “safeness” when it comes to an infectious or viral pandemic, in the sense that most of the population can securely distance themselves from one another, whereas larger cities do not have that luxury. Unfortunately, pandemics happen on a global level and no community is immune.

Problem Statement

In order to keep transmission rates low during a pandemic outbreak, residents need to safely distance themselves as best as possible and follow the numerous Center for Disease Control guidelines. Due to the lack of accessibility to ongoing public health information and broadband connectivity, it is especially challenging to inform residents about current and upcoming pandemic updates. It is an issue in rural America to convey the severity of pandemic outbreaks and provide preparedness instruction because social media, website posts, podcasts, etc. are not an option for every resident in the planning area.

4 MITIGATION STRATEGY

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	4.5

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

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

- **Mitigation Goals** are general guidelines that explain what you want to achieve. Goals are long-term policy statements and global visions that support the mitigation strategy. The goals address the risk of hazards identified in the plan.
- **Mitigation Actions** are specific actions, projects, activities, or processes taken to reduce or eliminate long-term risk to people and property from hazards and their impacts. Implementing mitigation actions helps achieve the plan’s mission and goals.

4.1 Goals

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

This planning effort is an update to Clark Counties’ existing hazard mitigation plan approved by FEMA in March 2014. Therefore, the goals from the 2014 Clark 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 planning meeting to review and update the plan goals. To ensure that the goals developed for this update were comprehensive and supported State goals, the 2018 State Hazard Mitigation Plan goals were reviewed. The MPC also reviewed the goals from current surrounding county plans.

Goal 1: Public Awareness- Using a variety of communications avenues to increase the citizens awareness of and promote education about the natural hazards that they may face, their vulnerability to these hazards, and how to lessen the effect of future natural hazards.

Goal 2: Strengthen communication and coordination between local governments, emergency personnel, public agencies, and citizens to mitigate the effect of future natural hazards.

Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties; on natural resources; on infrastructure; and on the local economy.

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 MPC Planning 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. 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 included problem statements in the plan update at the end of each hazard profile. 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.

During the planning meeting the mitigation strategy was reviewed. For a comprehensive range of mitigation actions to consider, the MPC reviewed the following information during the planning meeting:

- 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 HMA grants, and
- Public input during meetings, responses to data collection questionnaires, and other efforts to involve the public in the plan development process.

For the Planning Meeting, 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. During the Planning Meeting a list of actions for each jurisdiction was provided to that jurisdiction's 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;
- Ongoing, with a description of the progress made to date; or
- Not Yet Started, with a discussion of the reasons for lack of progress.

Additionally, the future inclusion of each mitigation action in the plan update was identified as either keep, delete, or modify. Based on the status updates, all action items were determined to be ongoing and everyday activities and deleted.

Table 4.1. Action Status Summary

Jurisdiction	Completed Actions	Continuing Actions (ongoing or modify)	Deleted Actions
Clark County	0	0	35
City of Kahoka	0	0	24
City of Wayland	0	0	24
City of Wyaconda	0	0	26
City of Alexandria	0	0	31
Village of Luray	0	0	26
City of Revere	0	0	26

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

Deleted Actions	Reason for Deletion
Education program on emergency preparedness (turning off utilities, preparing emergency survival kits that include water, blankets, flashlights, etc). (All Jurisdictions)	This activity was determined to be an everyday/ongoing activity.
Encourage cities to obtain early warning systems and improved communications systems. (Alexandria, Wyaconda, Luray, Revere)	This activity was determined to be an everyday/ongoing activity.
Promote use of weather radios by local residents and schools to ensure advanced warning about threatening weather. (all jurisdictions)	This activity was determined to be an everyday/ongoing activity.
Partner with local radio stations to ensure that appropriate warning is provided to county residents of impending disasters. (all jurisdictions)	This activity was determined to be an everyday/ongoing activity.
Implement tree trimming programs, dead tree removal programs. (all jurisdictions)	This activity was determined to be an everyday/ongoing activity.
Examine potential road and bridge upgrades that would reduce danger to residents during occurrences of natural disasters. (All Jurisdictions)	This activity was determined to be an everyday/ongoing activity.
Encourage a self-inspection program at critical facilities to assure that the building infrastructure is earthquake, flood, and tornado resistant. (All Jurisdictions)	This activity was determined to be an everyday/ongoing activity.
Encourage businesses to develop emergency plans. (All Jurisdictions)	This activity was determined to be an everyday/ongoing activity.
Educate residents about the dangers of floodplain development and the benefits of the National Flood Insurance Program. (Clark County, Alexandria)	This activity was determined to be an everyday/ongoing activity.
Encourage minimum standards for building codes in all cities. (all jurisdictions)	This activity was determined to be an everyday/ongoing activity.

Encourage local governments to develop and implement regulations for securing of hazardous material tanks and mobile homes to reduce hazards during flooding and high winds. (all jurisdictions)	This activity was determined to be an everyday/ongoing activity
Regular press releases from county and city EMD offices concerning hazards, where they strike, frequency and preparation. (Clark County)	This activity was determined to be an everyday/ongoing activity
Encourage local residents to purchase weather radios through press releases and brochures. (all jurisdictions)	This activity was determined to be an everyday/ongoing activity
Ask SEMA mitigation specialist to present information to city councils, county commission, schools and the Northeast Missouri Regional Planning Commission. (Clark County)	This activity was determined to be an everyday/ongoing activity. NEMO RPC communicates SEMA information.
Cities/County should continually re-evaluate hazard mitigation plan and merge with other community planning. (All Jurisdictions)	This activity was determined to be an everyday/ongoing activity.
Press releases by cities/county regarding adopted mitigation measure to keep public abreast of changes and or new regulations. (All Jurisdictions)	This activity was determined to be an everyday/ongoing activity.
Encourage county health department and local American Red Cross chapter to use publicity campaigns that make residents aware of proper measures to take during times of threatening conditions. (Clark County)	This activity was determined to be an everyday/ongoing activity.
Publicize county or citywide drills. (all Jurisdictions)	This activity was determined to be an everyday/ongoing activity.
Encourage joint meetings of different organizations/agencies for mitigation planning. (all jurisdictions.)	This activity was determined to be an everyday/ongoing activity
Joint training (or drills) between agencies, public & private entities (including schools/businesses). (All Jurisdictions)	This activity was determined to be an everyday/ongoing activity
Pool different agency resources to achieve widespread mitigation planning results. (All Jurisdictions)	This activity was determined to be an everyday/ongoing activity
Encourage meetings between EMD, city/county, and SEMA to familiarize officials with mitigation planning, implementation, and budgeting. (All Jurisdictions)	This activity was determined to be an everyday/ongoing activity
Encourage communities to budget for enhanced warning systems. (Clark County, Alexandria, Wyaconda, Luray, Revere)	This activity was determined to be an everyday/ongoing activity
Encourage communities to develop stormwater management plans. (All Jurisdictions)	This activity was determined to be an everyday/ongoing activity
Coordinate and integrate hazard mitigation activities, where appropriate, with emergency operations plans and procedures. (Clark County)	This activity was determined to be an everyday/ongoing activity
Encourage cities to require storm water management plans for all new development—both residential and commercial properties. (All Jurisdictions)	This activity was determined to be an everyday/ongoing activity
Encourage local government to purchase properties in the floodplain as funds become available and convert that land into public space/recreation area. (Alexandria)	This activity was determined to be an everyday/ongoing activity
Encourage communities to discuss zoning repetitive loss properties in the floodplain as open space. (Alexandria)	This activity was determined to be an everyday/ongoing activity
Work with SEMA Region I coordinator to learn about new mitigation funding opportunities. (Clark County)	This activity was determined to be an everyday/ongoing activity

Work with state/local/federal agencies to include mitigation in all economic and community development projects. (All Jurisdictions)	This activity was determined to be an everyday/ongoing activity
Structure grant proposals for road/bridge upgrades so that hazard mitigation concerns are also met. (Clark County)	This activity was determined to be an everyday/ongoing activity
Encourage local governments and schools to budget for mitigation projects. (All Jurisdictions)	This activity was determined to be an everyday/ongoing activity
Encourage jurisdictions to implement cost-share programs with property owners for mitigation projects that benefit the community as a whole. (All Jurisdictions)	This activity was determined to be an everyday/ongoing activity
Implement public awareness program about the benefits of hazard mitigation projects, both public and private. (All Jurisdictions)	This activity was determined to be an everyday/ongoing activity
Prioritize mitigation projects, based on cost-effectiveness, and sites facing the greatest threat to life, health and property. (All Jurisdictions)	This activity was determined to be an everyday/ongoing activity
Jurisdictions will continue to require permits for new building in the floodplain and also to comply with all federal laws. (Clark County, Alexandria)	This activity was determined to be an everyday/ongoing activity
New maps are coming out in 2011 and with new maps there will be ordinances adopted to reflect the new mapping standards. (Clark County, Alexandria)	This activity was determined to be an everyday/ongoing activity

Source: Previously approved County Hazard Mitigation 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. Throughout the MPC consideration and discussion, emphasis was placed on the importance of a benefit-cost analysis in determining project priority. The Disaster Mitigation Act requires benefit-cost review as the primary method by which mitigation projects should be prioritized. The MPC decided to pursue implementation according to when and where damage occurs, available funding, political will, jurisdictional priority, and priorities identified in the 2018 Missouri State Hazard Mitigation Plan. The benefit/cost review at the planning stage primarily consisted of a qualitative analysis and was not the detailed process required grant funding application. For each action, the plan sets forth a narrative describing the types of benefits that could be realized from action implementation. The cost was estimated as closely as possible, with further refinement to be supplied as project development occurs.

The plan must indicate if the prioritization process and/or methodology have changed since the previous plan's adoption. If the process has changed, describe how it changed and why it changed. If the prioritization process and methodology have not changed, state this here in the plan with a description. Actions should be prioritized independently for EACH jurisdiction. For example, if two communities each have an action to acquire floodprone properties, these should be evaluated independently based on each jurisdiction's capabilities.

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

jurisdictions 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 points
Definitely NO = 0 points

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 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

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

<input type="checkbox"/> High Priority (30+ points)	<input type="checkbox"/> Medium Priority (25 - 29 points)	<input type="checkbox"/> Low Priority (<25 points)
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Completed by
(Name, Title, Phone Number)

ACTION WORKSHEET: Example

Action Worksheet	
Name of Jurisdiction:	
Risk / Vulnerability	
Hazard(s) Addressed:	List the hazard or hazards that will be addressed by this action
Problem being Mitigated:	Provide a brief description of the problem that the action will address. Utilize the problem statement developed in the risk assessment.
Action or Project	
Applicable Goal Statement:	Choose the goal statement that applies to this action
Action/Project Number:	Insert a unique action number for this action for future tracking purposes. This can be a combination of the jurisdiction name, followed by the goal number and action number (i.e. Joplin1.1)
Name of Action or Project:	
Mitigation Category:	Prevention; Structure and Infrastructure Projects; Natural Systems Protection; Education and Outreach; Emergency Services
Action or Project Description:	Describe the action or project.
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, if any:	
Progress Report	
Action Status:	Indicate status as New, Continuing Not Started, or Continuing in Progress)
Report of Progress:	For Continuing actions only, indicate the report on progress. If the action is not started, indicate any barriers encountered to initiate the action. If the action is in progress, indicate the activity that has occurred to date.

Action Worksheet	
Name of Jurisdiction:	Clark County
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding
Problem being Mitigated:	Continue to participate in the NFIP
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	Clark County 2020.1
Name of Action or Project:	NFIP Participation
Mitigation Category:	Natural Systems Protection, Structure and Infrastructure Projects, Emergency Services, Education and Outreach
Action or Project Description:	Continue Clark County's participation and good standing in the National Flood Insurance Program.
Estimated Cost:	NA
Benefits:	Protection of life and reduction of damages due to accessibility to citizens in times of need.
Plan for Implementation	
Responsible Organization/Department:	County Commission / EMD
Action/Project Priority:	High Priority
Timeline for Completion:	1 Year
Potential Fund Sources:	County Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Floodplain Ordinance
Progress Report	
Action Status:	NEW
Report of Progress:	NEW Project

Action Worksheet	
Name of Jurisdiction:	Clark County
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding
Problem being Mitigated:	Flooding Throughout the County
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	Clark County 2020.2
Name of Action or Project:	Flood Mitigation
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Implement flood mitigation activities to eliminate effects on Clark County residents.
Estimated Cost:	\$1,000,000
Benefits:	Mitigation actions will limit the future harm to structures and lives in the County.
Plan for Implementation	
Responsible Organization/Department:	County Commission / EMD
Action/Project Priority:	High Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Floodplain Ordinance
Progress Report	
Action Status:	NEW
Report of Progress:	NEW Project

Action Worksheet	
Name of Jurisdiction:	Clark County
Risk / Vulnerability	
Hazard(s) Addressed:	All Hazards
Problem being Mitigated:	Early Warning Sirens
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	Clark County 2020.3
Name of Action or Project:	Install/Upgrade Warning Sirens
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Installation or upgrade of warning sirens in areas of the County needing a siren or one upgraded.
Estimated Cost:	\$75,000
Benefits:	Mitigation actions will limit the future harm to structures and lives in the County.
Plan for Implementation	
Responsible Organization/Department:	County EMD
Action/Project Priority:	Medium Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds
Local Planning Mechanisms to be Used in Implementation, if any:	NA
Progress Report	
Action Status:	NEW
Report of Progress:	NEW Project

Action Worksheet	
Name of Jurisdiction:	Clark County
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding, Severe Thunderstorms, Winter Weather
Problem being Mitigated:	Protecting lives from natural hazards
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	Clark County 2020.4
Name of Action or Project:	Maintain Transportation Infrastructure
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Project will make necessary improvements to roads, culverts, low water crossings, road elevations, bank stabilizations, bridges and the general transportation infrastructure throughout the city.
Estimated Cost:	\$750,000
Benefits:	The project protects citizens from harm due to damaged transportation infrastructure.
Plan for Implementation	
Responsible Organization/Department:	County Commission / EMD
Action/Project Priority:	High Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds
Local Planning Mechanisms to be Used in Implementation, if any:	NA
Progress Report	
Action Status:	NEW
Report of Progress:	NEW Project

Action Worksheet	
Name of Jurisdiction:	Clark County
Risk / Vulnerability	
Hazard(s) Addressed:	Pandemic
Problem being Mitigated:	Protecting lives from pandemic outbreaks.
Action or Project	
Applicable Goal Statement:	Goal 2: Strengthen communication and coordination between local governments, emergency personnel, public agencies, and citizens to mitigate the effect of future natural hazards
Action/Project Number:	Clark County 2020.5
Name of Action or Project:	Response to Pandemic
Mitigation Category:	Emergency Services, Prevention, Public Education
Action or Project Description:	Project will provide necessary resources for the response to pandemic outbreaks.
Estimated Cost:	\$500,000
Benefits:	The project protects citizens from harm due to pandemic outbreaks.
Plan for Implementation	
Responsible Organization/Department:	County Commission / EMD
Action/Project Priority:	Medium Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds
Local Planning Mechanisms to be Used in Implementation, if any:	NA
Progress Report	
Action Status:	NEW
Report of Progress:	NEW Project

Action Worksheet	
Name of Jurisdiction:	Clark County
Risk / Vulnerability	
Hazard(s) Addressed:	Tornado, Severe Thunderstorms
Problem being Mitigated:	Lack of shelter for residents.
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	Clark County 2020.6
Name of Action or Project:	Safe Rooms and Storm Shelters
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Build safe rooms and establish local ordinances requiring community storm shelters within sizable mobile home parks and subdivisions.
Estimated Cost:	\$1,000,000
Benefits:	The project protects citizens from harm due to tornados or severe thunderstorms.
Plan for Implementation	
Responsible Organization/Department:	County Commission / EMD
Action/Project Priority:	High Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds
Local Planning Mechanisms to be Used in Implementation, if any:	NA
Progress Report	
Action Status:	NEW
Report of Progress:	NEW Project

Action Worksheet	
Name of Jurisdiction:	Clark County
Risk / Vulnerability	
Hazard(s) Addressed:	Extreme Temperature, Severe Thunderstorm, Severe Winter Weather, Tornado
Problem being Mitigated:	Generator for Shelter(s)
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	Clark County 2020.7
Name of Action or Project:	Generator for Shelter(s)
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Obtain a generator for shelters as funds become available.
Estimated Cost:	\$65,000
Benefits:	Generator will allow for continued use of shelters for service to citizens in the event of an outage, this would be beneficial during any hazard.
Plan for Implementation	
Responsible Organization/Department:	County Commission / EMD
Action/Project Priority:	High Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds / RHSOC
Local Planning Mechanisms to be Used in Implementation, if any:	NA
Progress Report	
Action Status:	NEW
Report of Progress:	NEW Project

Action Worksheet	
Name of Jurisdiction:	City of Kahoka
Risk / Vulnerability	
Hazard(s) Addressed:	Extreme Temperature, Severe Thunderstorm, Severe Winter Weather, Tornado
Problem being Mitigated:	Lack of Generator for Shelter(s)
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	City of Kahoka 2020.1
Name of Action or Project:	Generator for Shelter(s)
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Obtain a generator for shelters as funds become available.
Estimated Cost:	\$30,000
Benefits:	Generator will allow for continued use of shelters for service to citizens in the event of an outage, this would be beneficial during any hazard.
Plan for Implementation	
Responsible Organization/Department:	City Clerk / EMD
Action/Project Priority:	High Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds / RHSOC
Local Planning Mechanisms to be Used in Implementation, if any:	NA
Progress Report	
Action Status:	NEW
Report of Progress:	NEW Project

Action Worksheet	
Name of Jurisdiction:	City of Kahoka
Risk / Vulnerability	
Hazard(s) Addressed:	All Hazards
Problem being Mitigated:	Need for central emergency operation center in the event of disaster.
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	City of Kahoka 2020.2
Name of Action or Project:	Emergency Operations Center
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services, Response
Action or Project Description:	Obtain equipment to establish an emergency operations center.
Estimated Cost:	\$20,000
Benefits:	An established EOC allows a designated area to be utilized for emergency situations.
Plan for Implementation	
Responsible Organization/Department:	City Clerk / EMD
Action/Project Priority:	Low Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds
Local Planning Mechanisms to be Used in Implementation, if any:	NA
Progress Report	
Action Status:	NEW
Report of Progress:	NEW Project

Action Worksheet	
Name of Jurisdiction:	City of Kahoka
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding, Severe Thunderstorms, Winter Storms
Problem being Mitigated:	Protecting lives from natural hazards
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	City of Kahoka 2020.3
Name of Action or Project:	Maintain Transportation Infrastructure
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services, Response
Action or Project Description:	Project will make necessary improvements to roads, culverts, low water crossings, road elevations, bank stabilizations, bridges and the general transportation infrastructure throughout the City.
Estimated Cost:	\$400,000
Benefits:	The project protects citizens from harm due to damaged transportation infrastructures.
Plan for Implementation	
Responsible Organization/Department:	City Clerk
Action/Project Priority:	High Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds
Local Planning Mechanisms to be Used in Implementation, if any:	NA
Progress Report	
Action Status:	NEW
Report of Progress:	NEW Project

Action Worksheet	
Name of Jurisdiction:	City of Kahoka
Risk / Vulnerability	
Hazard(s) Addressed:	All Hazards
Problem being Mitigated:	Early Warning Siren
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	City of Kahoka 2020.4
Name of Action or Project:	Installation/Upgrade Sirens
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Installation or the upgrade of warning sirens in areas of the City needing a siren or the siren upgraded.
Estimated Cost:	\$25,000
Benefits:	With adequate time for warning of storms, residents are able to seek cover to help minimize the loss of life.
Plan for Implementation	
Responsible Organization/Department:	City Clerk
Action/Project Priority:	Medium Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds
Local Planning Mechanisms to be Used in Implementation, if any:	NA
Progress Report	
Action Status:	NEW
Report of Progress:	NEW Project

Action Worksheet	
Name of Jurisdiction:	City of Kahoka
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding
Problem being Mitigated:	Continue to participate in the NFIP
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	City of Kahoka 2020.5
Name of Action or Project:	NFIP Participation
Mitigation Category:	Natural Systems Protection, Structure and Infrastructure Projects, Emergency Services, Education and Outreach
Action or Project Description:	Continue City of Kahoka's participation and good standing in the National Flood Insurance Program.
Estimated Cost:	NA
Benefits:	Protection of life and reduction of damages due to accessibility to citizens in times of need.
Plan for Implementation	
Responsible Organization/Department:	City Clerk / EMD
Action/Project Priority:	High Priority
Timeline for Completion:	1 Year
Potential Fund Sources:	City Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Floodplain Ordinance
Progress Report	
Action Status:	NEW
Report of Progress:	NEW Project

Action Worksheet	
Name of Jurisdiction:	City of Wayland
Risk / Vulnerability	
Hazard(s) Addressed:	All Hazards
Problem being Mitigated:	Early Warning Siren
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	City of Wayland 2020.1
Name of Action or Project:	Installation/Upgrade Sirens
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Installation or the upgrade of warning sirens in areas of the City needing a siren or the siren upgraded.
Estimated Cost:	\$25,000
Benefits:	With adequate time for warning of storms, residents are able to seek cover to help minimize the loss of life.
Plan for Implementation	
Responsible Organization/Department:	City Clerk
Action/Project Priority:	High Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds
Local Planning Mechanisms to be Used in Implementation, if any:	NA
Progress Report	
Action Status:	NEW
Report of Progress:	NEW Project

Action Worksheet	
Name of Jurisdiction:	City of Wayland
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding, Severe Thunderstorms, Winter Storms
Problem being Mitigated:	Protecting lives from natural hazards
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	City of Wayland 2020.2
Name of Action or Project:	Maintain Transportation Infrastructure
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services, Response
Action or Project Description:	Project will make necessary improvements to roads, culverts, low water crossings, road elevations, bank stabilizations, bridges and the general transportation infrastructure throughout the City.
Estimated Cost:	\$400,000
Benefits:	The project protects citizens from harm due to damaged transportation infrastructures.
Plan for Implementation	
Responsible Organization/Department:	City Clerk
Action/Project Priority:	High Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds
Local Planning Mechanisms to be Used in Implementation, if any:	NA
Progress Report	
Action Status:	NEW
Report of Progress:	NEW Project

Action Worksheet	
Name of Jurisdiction:	City of Wayland
Risk / Vulnerability	
Hazard(s) Addressed:	Tornado, Severe Thunderstorms
Problem being Mitigated:	Lack of shelter for residents.
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	City of Wayland 2020.3
Name of Action or Project:	Safe Rooms and Storm Shelters
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Build safe rooms and establish local ordinances requiring community storm shelters within sizable mobile home parks and subdivisions.
Estimated Cost:	\$800,000
Benefits:	The project protects citizens from harm due to tornados or severe thunderstorms.
Plan for Implementation	
Responsible Organization/Department:	City Clerk / EMD
Action/Project Priority:	High Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds
Local Planning Mechanisms to be Used in Implementation, if any:	NA
Progress Report	
Action Status:	NEW
Report of Progress:	NEW Project

Action Worksheet	
Name of Jurisdiction:	City of Wayland
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding
Problem being Mitigated:	Continue to participate in the NFIP
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	City of Wayland 2020.4
Name of Action or Project:	NFIP Participation
Mitigation Category:	Natural Systems Protection, Structure and Infrastructure Projects, Emergency Services, Education and Outreach
Action or Project Description:	Continue City of Wayland's participation and good standing in the National Flood Insurance Program.
Estimated Cost:	NA
Benefits:	Protection of life and reduction of damages due to accessibility to citizens in times of need.
Plan for Implementation	
Responsible Organization/Department:	City Clerk / EMD
Action/Project Priority:	High Priority
Timeline for Completion:	1 Year
Potential Fund Sources:	City Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Floodplain Ordinance
Progress Report	
Action Status:	NEW
Report of Progress:	NEW Project

Action Worksheet	
Name of Jurisdiction:	City of Wyaconda
Risk / Vulnerability	
Hazard(s) Addressed:	All Hazards
Problem being Mitigated:	Early Warning Siren
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	City of Wyaconda 2020.1
Name of Action or Project:	Installation/Upgrade Sirens
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Installation or the upgrade of warning sirens in areas of the City needing a siren or the siren upgraded.
Estimated Cost:	\$25,000
Benefits:	With adequate time for warning of storms, residents are able to seek cover to help minimize the loss of life.
Plan for Implementation	
Responsible Organization/Department:	City Clerk
Action/Project Priority:	High Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds
Local Planning Mechanisms to be Used in Implementation, if any:	NA
Progress Report	
Action Status:	NEW
Report of Progress:	NEW Project

Action Worksheet	
Name of Jurisdiction:	City of Wyaconda
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding, Severe Thunderstorms, Winter Storms
Problem being Mitigated:	Protecting lives from natural hazards
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	City of Wyaconda 2020.2
Name of Action or Project:	Maintain Transportation Infrastructure
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services, Response
Action or Project Description:	Project will make necessary improvements to roads, culverts, low water crossings, road elevations, bank stabilizations, bridges and the general transportation infrastructure throughout the City.
Estimated Cost:	\$300,000
Benefits:	The project protects citizens from harm due to damaged transportation infrastructures.
Plan for Implementation	
Responsible Organization/Department:	City Clerk
Action/Project Priority:	High Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds
Local Planning Mechanisms to be Used in Implementation, if any:	NA
Progress Report	
Action Status:	NEW
Report of Progress:	NEW Project

Action Worksheet	
Name of Jurisdiction:	City of Wyaconda
Risk / Vulnerability	
Hazard(s) Addressed:	Tornado, Severe Thunderstorms
Problem being Mitigated:	Lack of shelter for residents.
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	City of Wyaconda 2020.3
Name of Action or Project:	Safe Rooms and Storm Shelters
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Build safe rooms and establish local ordinances requiring community storm shelters within sizable mobile home parks and subdivisions.
Estimated Cost:	\$800,000
Benefits:	The project protects citizens from harm due to tornados or severe thunderstorms.
Plan for Implementation	
Responsible Organization/Department:	City Clerk
Action/Project Priority:	High Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds
Local Planning Mechanisms to be Used in Implementation, if any:	NA
Progress Report	
Action Status:	NEW
Report of Progress:	NEW Project

Action Worksheet	
Name of Jurisdiction:	City of Wyaconda
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding
Problem being Mitigated:	Continue to participate in the NFIP
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	City of Wyaconda 2020.4
Name of Action or Project:	NFIP Participation
Mitigation Category:	Natural Systems Protection, Structure and Infrastructure Projects, Emergency Services, Education and Outreach
Action or Project Description:	Continue City of Wyaconda's participation and good standing in the National Flood Insurance Program.
Estimated Cost:	NA
Benefits:	Protection of life and reduction of damages due to accessibility to citizens in times of need.
Plan for Implementation	
Responsible Organization/Department:	City Clerk / EMD
Action/Project Priority:	High Priority
Timeline for Completion:	1 Year
Potential Fund Sources:	City Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Floodplain Ordinance
Progress Report	
Action Status:	NEW
Report of Progress:	NEW Project

Action Worksheet	
Name of Jurisdiction:	City of Alexandria
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding
Problem being Mitigated:	Levee breach at roadways
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	City of Alexandria 2020.1
Name of Action or Project:	Levee Doors
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Installation of pass through levee doors at 3 locations around Alexandria.
Estimated Cost:	\$1,000,000
Benefits:	Reduce the risk of levee breach when the roadway is closed on HWY 61
Plan for Implementation	
Responsible Organization/Department:	City Clerk
Action/Project Priority:	High Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds
Local Planning Mechanisms to be Used in Implementation, if any:	NA
Progress Report	
Action Status:	NEW
Report of Progress:	NEW Project

Action Worksheet	
Name of Jurisdiction:	City of Alexandria
Risk / Vulnerability	
Hazard(s) Addressed:	All Hazards
Problem being Mitigated:	Early Warning Siren
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	City of Alexandria 2020.2
Name of Action or Project:	Installation/Upgrade Sirens
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Installation or the upgrade of warning sirens in areas of the City needing a siren or the siren upgraded.
Estimated Cost:	\$25,000
Benefits:	With adequate time for warning of storms, residents are able to seek cover to help minimize the loss of life.
Plan for Implementation	
Responsible Organization/Department:	City Clerk
Action/Project Priority:	High Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds
Local Planning Mechanisms to be Used in Implementation, if any:	NA
Progress Report	
Action Status:	NEW
Report of Progress:	NEW Project

Action Worksheet	
Name of Jurisdiction:	City of Alexandria
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding, Severe Thunderstorms, Winter Storms
Problem being Mitigated:	Protecting lives from natural hazards
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	City of Alexandria 2020.3
Name of Action or Project:	Maintain Transportation Infrastructure
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services, Response
Action or Project Description:	Project will make necessary improvements to roads, culverts, low water crossings, road elevations, bank stabilizations, bridges and the general transportation infrastructure throughout the City.
Estimated Cost:	\$300,000
Benefits:	The project protects citizens from harm due to damaged transportation infrastructures.
Plan for Implementation	
Responsible Organization/Department:	City Clerk
Action/Project Priority:	High Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds
Local Planning Mechanisms to be Used in Implementation, if any:	NA
Progress Report	
Action Status:	NEW
Report of Progress:	NEW Project

Action Worksheet	
Name of Jurisdiction:	City of Alexandria
Risk / Vulnerability	
Hazard(s) Addressed:	Tornado, Severe Thunderstorms
Problem being Mitigated:	Lack of shelter for residents.
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	City of Alexandria 2020.4
Name of Action or Project:	Safe Rooms and Storm Shelters
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Build safe rooms and establish local ordinances requiring community storm shelters within sizable mobile home parks and subdivisions.
Estimated Cost:	\$800,000
Benefits:	The project protects citizens from harm due to tornados or severe thunderstorms.
Plan for Implementation	
Responsible Organization/Department:	City Clerk
Action/Project Priority:	High Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds
Local Planning Mechanisms to be Used in Implementation, if any:	NA
Progress Report	
Action Status:	NEW
Report of Progress:	NEW Project

Action Worksheet	
Name of Jurisdiction:	City of Alexandria
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding
Problem being Mitigated:	Continue to participate in the NFIP
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	City of Alexandria 2020.5
Name of Action or Project:	NFIP Participation
Mitigation Category:	Natural Systems Protection, Structure and Infrastructure Projects, Emergency Services, Education and Outreach
Action or Project Description:	Continue City of Alexandria's participation and good standing in the National Flood Insurance Program.
Estimated Cost:	NA
Benefits:	Protection of life and reduction of damages due to accessibility to citizens in times of need.
Plan for Implementation	
Responsible Organization/Department:	City Clerk
Action/Project Priority:	High Priority
Timeline for Completion:	1 Year
Potential Fund Sources:	County Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Floodplain Ordinance
Progress Report	
Action Status:	NEW
Report of Progress:	NEW Project

Action Worksheet	
Name of Jurisdiction:	Village of Luray
Risk / Vulnerability	
Hazard(s) Addressed:	All Hazards
Problem being Mitigated:	Early Warning Siren
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	Village of Luray 2020.1
Name of Action or Project:	Installation/Upgrade Sirens
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Installation or the upgrade of warning sirens in areas of the City needing a siren or the siren upgraded.
Estimated Cost:	\$25,000
Benefits:	With adequate time for warning of storms, residents are able to seek cover to help minimize the loss of life.
Plan for Implementation	
Responsible Organization/Department:	City Clerk
Action/Project Priority:	High Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds
Local Planning Mechanisms to be Used in Implementation, if any:	NA
Progress Report	
Action Status:	NEW
Report of Progress:	NEW Project

Action Worksheet	
Name of Jurisdiction:	Village of Luray
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding, Severe Thunderstorms, Winter Storms
Problem being Mitigated:	Protecting lives from natural hazards
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	Village of Luray 2020.2
Name of Action or Project:	Maintain Transportation Infrastructure
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services, Response
Action or Project Description:	Project will make necessary improvements to roads, culverts, low water crossings, road elevations, bank stabilizations, bridges and the general transportation infrastructure throughout the City.
Estimated Cost:	\$300,000
Benefits:	The project protects citizens from harm due to damaged transportation infrastructures.
Plan for Implementation	
Responsible Organization/Department:	City Clerk
Action/Project Priority:	High Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds
Local Planning Mechanisms to be Used in Implementation, if any:	NA
Progress Report	
Action Status:	NEW
Report of Progress:	NEW Project

Action Worksheet	
Name of Jurisdiction:	Village of Luray
Risk / Vulnerability	
Hazard(s) Addressed:	Tornado, Severe Thunderstorms
Problem being Mitigated:	Lack of shelter for residents.
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	Village of Luray 2020.3
Name of Action or Project:	Safe Rooms and Storm Shelters
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Build safe rooms and establish local ordinances requiring community storm shelters within sizable mobile home parks and subdivisions.
Estimated Cost:	\$800,000
Benefits:	The project protects citizens from harm due to tornados or severe thunderstorms.
Plan for Implementation	
Responsible Organization/Department:	City Clerk
Action/Project Priority:	High Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds
Local Planning Mechanisms to be Used in Implementation, if any:	NA
Progress Report	
Action Status:	NEW
Report of Progress:	NEW Project

Action Worksheet	
Name of Jurisdiction:	Village of Luray
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding
Problem being Mitigated:	Continue to participate in the NFIP
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	Village of Luray 2020.4
Name of Action or Project:	NFIP Participation
Mitigation Category:	Natural Systems Protection, Structure and Infrastructure Projects, Emergency Services, Education and Outreach
Action or Project Description:	Continue Village of Luray's participation and good standing in the National Flood Insurance Program.
Estimated Cost:	NA
Benefits:	Protection of life and reduction of damages due to accessibility to citizens in times of need.
Plan for Implementation	
Responsible Organization/Department:	Village Clerk / EMD
Action/Project Priority:	High Priority
Timeline for Completion:	1 Year
Potential Fund Sources:	Village Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Floodplain Ordinance
Progress Report	
Action Status:	NEW
Report of Progress:	NEW Project

Action Worksheet	
Name of Jurisdiction:	City of Revere
Risk / Vulnerability	
Hazard(s) Addressed:	All Hazards
Problem being Mitigated:	Early Warning Siren
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	City of Revere 2020.1
Name of Action or Project:	Installation/Upgrade Sirens
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Installation or the upgrade of warning sirens in areas of the City needing a siren or the siren upgraded.
Estimated Cost:	\$25,000
Benefits:	With adequate time for warning of storms, residents are able to seek cover to help minimize the loss of life.
Plan for Implementation	
Responsible Organization/Department:	City Clerk
Action/Project Priority:	High Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds
Local Planning Mechanisms to be Used in Implementation, if any:	NA
Progress Report	
Action Status:	NEW
Report of Progress:	NEW Project

Action Worksheet	
Name of Jurisdiction:	City of Revere
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding, Severe Thunderstorms, Winter Storms
Problem being Mitigated:	Protecting lives from natural hazards
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	City of Revere 2020.2
Name of Action or Project:	Maintain Transportation Infrastructure
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services, Response
Action or Project Description:	Project will make necessary improvements to roads, culverts, low water crossings, road elevations, bank stabilizations, bridges and the general transportation infrastructure throughout the City.
Estimated Cost:	\$200,000
Benefits:	The project protects citizens from harm due to damaged transportation infrastructures.
Plan for Implementation	
Responsible Organization/Department:	City Clerk
Action/Project Priority:	High Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds
Local Planning Mechanisms to be Used in Implementation, if any:	NA
Progress Report	
Action Status:	NEW
Report of Progress:	NEW Project

Action Worksheet	
Name of Jurisdiction:	City of Revere
Risk / Vulnerability	
Hazard(s) Addressed:	Tornado, Severe Thunderstorms
Problem being Mitigated:	Lack of shelter for residents.
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	City of Revere 2020.3
Name of Action or Project:	Safe Rooms and Storm Shelters
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Build safe rooms and establish local ordinances requiring community storm shelters within sizable mobile home parks and subdivisions.
Estimated Cost:	\$800,000
Benefits:	The project protects citizens from harm due to tornados or severe thunderstorms.
Plan for Implementation	
Responsible Organization/Department:	City Clerk
Action/Project Priority:	High Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds
Local Planning Mechanisms to be Used in Implementation, if any:	NA
Progress Report	
Action Status:	NEW
Report of Progress:	NEW Project

Action Worksheet	
Name of Jurisdiction:	City of Revere
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding
Problem being Mitigated:	Continue to participate in the NFIP
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	City of Revere 2020.4
Name of Action or Project:	NFIP Participation
Mitigation Category:	Natural Systems Protection, Structure and Infrastructure Projects, Emergency Services, Education and Outreach
Action or Project Description:	Continue City of Revere's participation and good standing in the National Flood Insurance Program.
Estimated Cost:	NA
Benefits:	Protection of life and reduction of damages due to accessibility to citizens in times of need.
Plan for Implementation	
Responsible Organization/Department:	City Clerk / EMD
Action/Project Priority:	High Priority
Timeline for Completion:	1 Year
Potential Fund Sources:	City Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Floodplain Ordinance
Progress Report	
Action Status:	NEW
Report of Progress:	NEW Project

Action Worksheet	
Name of Jurisdiction:	Clark County R-1
Risk / Vulnerability	
Hazard(s) Addressed:	Tornado, Severe Thunderstorms, Earthquake
Problem being Mitigated:	Lack of shelter for students and employees of the district.
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	Clark County R-1 2020.1
Name of Action or Project:	Safe Rooms
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Build safe rooms
Estimated Cost:	\$1,000,000
Benefits:	Protect human lives.
Plan for Implementation	
Responsible Organization/Department:	Clark County R-1 Superintendent
Action/Project Priority:	High Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds
Local Planning Mechanisms to be Used in Implementation, if any:	NA
Progress Report	
Action Status:	NEW
Report of Progress:	NEW Project

Action Worksheet	
Name of Jurisdiction:	Clark County R-1
Risk / Vulnerability	
Hazard(s) Addressed:	Tornado, Severe Thunderstorms, Earthquake
Problem being Mitigated:	Lack of intercom system throughout entire school.
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	Clark County R-1 2020.2
Name of Action or Project:	Intercom System
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services, Outreach
Action or Project Description:	Upgrade intercom system.
Estimated Cost:	\$150,000
Benefits:	Protect human lives.
Plan for Implementation	
Responsible Organization/Department:	Clark County R-1 Superintendent
Action/Project Priority:	Medium Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds
Local Planning Mechanisms to be Used in Implementation, if any:	NA
Progress Report	
Action Status:	NEW
Report of Progress:	NEW Project

5 PLAN MAINTENANCE PROCESS

5 PLAN MAINTENANCE PROCESS5.1

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 5.1

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

5.1.2 Plan Maintenance Schedule

The MPC agrees to meet annually and after a state or federally declared hazard event as appropriate to monitor progress and update the mitigation strategy. The Clark County Emergency Management Director will be responsible for initiating the plan reviews and will invite members of the MPC (or other designated responsible entity) to the meeting.

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

5.1.3 Plan Maintenance Process

Progress on the proposed actions can be monitored by evaluating changes in vulnerabilities identified in the plan. The MPC during the annual meeting should review changes in vulnerability identified as follows:

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

Future 5-year updates to this plan will include the following activities:

- Consideration of changes in vulnerability due to action implementation,
- Documentation of success stories where mitigation efforts have proven effective,
- Documentation of unsuccessful mitigation actions and why the actions were not effective,
- Documentation of previously overlooked hazard events that may have occurred since the previous plan approval,
- Incorporation of new data or studies with information on hazard risks,
- Incorporation of new capabilities or changes in capabilities,
- Incorporation of growth data and changes to inventories, and
- Incorporation of ideas for new actions and changes in action prioritization.

In order to best evaluate any changes in vulnerability as a result of plan implementation, the participating jurisdictions will adopt the following process:

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

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

For the most part the participating jurisdictions did not incorporate the previously approved mitigation plan into other planning mechanism due to other plans already being approved.

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 of this plan. Based on the capability assessments of the participating jurisdictions, communities in Clark 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;
- Clark County's Emergency Operations Plan;
- Capital improvement plans and budgets;
- Other community plans within the County, such as water conservation plans, storm water management plans, and parks and recreation plans;
- School and Special District Plans and budgets; and
- Other plans and policies outlined in the capability assessment sections for each jurisdiction in Chapter 2 of this plan.

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

Additionally, after the annual review of the Hazard Mitigation Plan, the Clark County Emergency Management Director will provide the updated Mitigation Strategy with current status of each mitigation action to the County (Boards of Supervisors or Commissions) as well as all Mayors, City Clerks, and School District Superintendents^{10(a)}. The Emergency Manager Director will request that the mitigation strategy be incorporated, where appropriate, in other planning mechanisms.

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

Table 5.1. Planning Mechanisms Identified for Integration of Hazard Mitigation Plan

Jurisdiction	Planning Mechanisms		
Unincorporated Clark County	County Road and Bridge Plan	Road and Bridge Department attended all planning meetings and identified actions relating to transportation infrastructure were included in annual update to Comprehensive Plan	Road and Bridge Department attended all planning meetings and identified actions relating to transportation infrastructure were included in annual update to Comprehensive Plan
City of Kahoka	Local Budget	The previous plan was not Integrated into previous budgets due to the items not applicable to being added in previous plans.	The Hazard Mitigation Plan will be integrated into future budgets by consulting the plan during the planning process.
City of Wayland	Local Budget	The previous plan was not Integrated into previous budgets due to the items not applicable to being added in previous plans.	The Hazard Mitigation Plan will be integrated into future budgets by consulting the plan during the planning process.
City of Wyaconda	Local Budget	The previous plan was not Integrated into previous budgets due to the items not applicable to being added in previous plans.	The Hazard Mitigation Plan will be integrated into future budgets by consulting the plan during the planning process.
City of Alexandria	Local Budget	The previous plan was not Integrated into previous budgets due to the items not applicable to being added in previous plans.	The Hazard Mitigation Plan will be integrated into future budgets by consulting the plan during the planning process.
Village of Luray	Local Budget	The previous plan was not Integrated into previous budgets due to the items not applicable to being added in previous plans.	The Hazard Mitigation Plan will be integrated into future budgets by consulting the plan during the planning process.
City of Revere	Local Budget	The previous plan was not Integrated into previous budgets due to the items not applicable to being added in previous plans.	The Hazard Mitigation Plan will be integrated into future budgets by consulting the plan during the planning process.
Clark County R-1	Building Plan	The previous plan was not Integrated into previous budgets due to the items not applicable to being added in previous plans.	The Hazard Mitigation Plan will be integrated into future budgets by consulting the plan during the planning process.

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 Clark County website following each annual review of the mitigation plan and will solicit comments from the public based on the annual review. When the MPC reconvenes for the five-year update, it will coordinate with all stakeholders participating in the planning process. Included in this group will be those who joined the MPC after the initial effort, to update and revise the plan. Public notice will be posted and public participation will be actively solicited, at a minimum, through available website postings and press releases to local media outlets, primarily newspapers.

Appendix A
Adoption Resolutions

Clark County, Missouri RESOLUTION NO. 2020-5-05

A RESOLUTION OF THE CLARK COUNTY, MISSOURI ADOPTING THE CLARK COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN AND THE EFFORT TO BECOME A DISASTER RESISTANCE COMMUNITY.

WHEREAS the CLARK COUNTY recognizes the threat that natural hazards pose to people and property within the CLARK COUNTY; and

WHEREAS the CLARK COUNTY has participated in the preparation of a multi-jurisdictional local hazard mitigation plan, hereby known as the CLARK COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN, hereafter referred to as the *Plan*, in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS the CLARK COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in CLARK COUNTY from the impacts of future hazards and disasters; and

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

WHEREAS adoption by CLARK COUNTY demonstrates their commitment to hazard mitigation and achieving the goals outlined in the *Plan*.

NOW THEREFORE, BE IT RESOLVED BY THE COUNTY COMMISSIONERS OF CLARK COUNTY, in the State of Missouri, THAT:

CLARK COUNTY HEREBY adopts the CLARK COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN.

ADOPTED by CLARK COUNTY COMMISSION, this 5 day of May, 2020



Buddy Kattelmann, Presiding Commissioner


Henty Dienst, Eastern District Commissioner


Gary Webster, Western District Commissioner



ATTEST:


Kelly Waples, County Clerk

Clark County R1 SCHOOL DISTRICT, Missouri RESOLUTION NO. ____

A RESOLUTION OF THE CLARK COUNTY R1 SCHOOL DISTRICT, MISSOURI ADOPTING THE CLARK COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN AND THE EFFORT TO BECOME A DISASTER RESISTANCE COMMUNITY.

WHEREAS the **CLARK COUNTY R1 SCHOOL DISTRICT** recognizes the threat that natural hazards pose to people and property within the **CLARK COUNTY R1 SCHOOL DISTRICT**; and

WHEREAS the **CLARK COUNTY R1 SCHOOL DISTRICT** has participated in the preparation of a multi-jurisdictional local hazard mitigation plan, hereby known as the **CLARK COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN**, hereafter referred to as the *Plan*, in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS the **CLARK COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN** identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in **CLARK COUNTY R1 SCHOOL DISTRICT** from the impacts of future hazards and disasters; and

WHEREAS **CLARK COUNTY R1 SCHOOL DISTRICT** recognizes that land use policies have a major impact on whether people and property are exposed to natural hazards, the **CLARK COUNTY R1 SCHOOL DISTRICT** will endeavor to integrate the *Plan* into the comprehensive planning process; and

WHEREAS adoption by **CLARK COUNTY R1 SCHOOL DISTRICT** demonstrates their commitment to hazard mitigation and achieving the goals outlined in the *Plan*.

NOW THEREFORE, BE IT RESOLVED BY THE SCHOOL BOARD OF CLARK COUNTY R1 SCHOOL DISTRICT, in the State of Missouri, THAT: In accordance with CLARK COUNTY R1 SCHOOL DISTRICT School Board Policy, HEREBY adopts the **CLARK COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN**.

ADOPTED by a vote of 6 in favor and 0 against and 0 abstaining, this 14 day of May, 2020.

Brod Sprague

, Board President

ATTEST:

Wendy Johnson

, Board Secretary

CITY OF KAHOKA, Missouri RESOLUTION NO. __

A RESOLUTION OF THE CITY OF KAHOKA, MISSOURI ADOPTING THE CLARK COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN AND THE EFFORT TO BECOME A DISASTER RESISTANCE COMMUNITY.

WHEREAS the **CITY OF KAHOKA** recognizes the threat that natural hazards pose to people and property within the **CITY OF KAHOKA**; and

WHEREAS the **CITY OF KAHOKA** has participated in the preparation of a multi-jurisdictional local hazard mitigation plan, hereby known as the **CLARK COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN**, hereafter referred to as the *Plan*, in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS the **CLARK COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN** identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the **CITY OF KAHOKA** from the impacts of future hazards and disasters; and

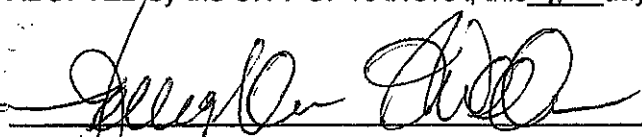
WHEREAS the **CITY OF KAHOKA** recognizes that land use policies have a major impact on whether people and property are exposed to natural hazards, the **CITY OF KAHOKA** will endeavor to integrate the *Plan* into the comprehensive planning process; and

WHEREAS adoption by the **CITY OF KAHOKA** demonstrates their commitment to hazard mitigation and achieving the goals outlined in the *Plan*.

NOW THEREFORE, BE IT RESOLVED BY THE **CITY OF KAHOKA**, in the State of Missouri, THAT:

THE CITY OF KAHOKA HEREBY adopts the CLARK COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN.

ADOPTED by the CITY OF KAHOKA, this 11 day of May, 2020.


Jerry Webber, Mayor

ATTEST:


Sandie Hopp, City Clerk

CITY OF REVERE, Missouri RESOLUTION NO. ____

A RESOLUTION OF THE CITY OF REVERE, MISSOURI ADOPTING THE CLARK COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN AND THE EFFORT TO BECOME A DISASTER RESISTANCE COMMUNITY.

WHEREAS the **CITY OF REVERE** recognizes the threat that natural hazards pose to people and property within the **CITY OF REVERE**; and

WHEREAS the **CITY OF REVERE** has participated in the preparation of a multi-jurisdictional local hazard mitigation plan, hereby known as the **CLARK COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN**, hereafter referred to as the *Plan*, in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS the **CLARK COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN** identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the **CITY OF REVERE** from the impacts of future hazards and disasters; and

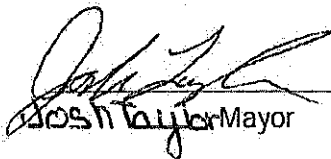
WHEREAS the **CITY OF REVERE** recognizes that land use policies have a major impact on whether people and property are exposed to natural hazards, the **CITY OF REVERE** will endeavor to integrate the *Plan* into the comprehensive planning process; and

WHEREAS adoption by the **CITY OF REVERE** demonstrates their commitment to hazard mitigation and achieving the goals outlined in the *Plan*.

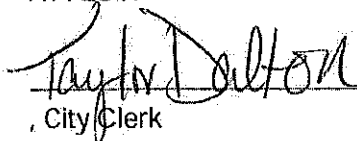
NOW THEREFORE, BE IT RESOLVED BY THE **CITY OF REVERE**, in the State of Missouri, THAT:

THE **CITY OF REVERE** HEREBY adopts the **CLARK COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN**.

ADOPTED by the CITY OF REVERE, this 18 day of JUNE 2020


Josh Taylor Mayor

ATTEST:


Taylor Dalton
City Clerk

CITY OF WYACONDA, Missouri RESOLUTION NO. _____

A RESOLUTION OF THE CITY OF WYACONDA, MISSOURI ADOPTING THE CLARK COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN AND THE EFFORT TO BECOME A DISASTER RESISTANCE COMMUNITY.

WHEREAS the CITY OF WYACONDA recognizes the threat that natural hazards pose to people and property within the CITY OF WYACONDA; and

WHEREAS the CITY OF WYACONDA has participated in the preparation of a multi-jurisdictional local hazard mitigation plan, hereby known as the CLARK COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN, hereafter referred to as the *Plan*, in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS the CLARK COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the CITY OF WYACONDA from the impacts of future hazards and disasters; and

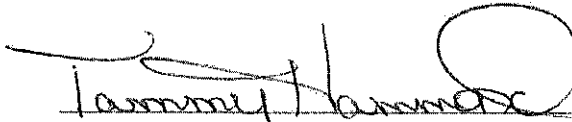
WHEREAS the CITY OF WYACONDA recognizes that land use policies have a major impact on whether people and property are exposed to natural hazards, the CITY OF WYACONDA will endeavor to integrate the *Plan* into the comprehensive planning process; and

WHEREAS adoption by the CITY OF WYACONDA demonstrates their commitment to hazard mitigation and achieving the goals outlined in the *Plan*.

NOW THEREFORE, BE IT RESOLVED BY THE CITY OF WYACONDA, in the State of Missouri, THAT:


THE CITY OF WYACONDA HEREBY adopts the CLARK COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN.

ADOPTED by the CITY OF WYACONDA, this 12th day of May 2020

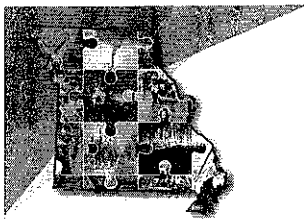


Tammy Hammond, Mayor Pro Tem

ATTEST:



Laura Hines, City Clerk



SEMA Mitigation Management LOCAL MITIGATION PLAN FORMAT GUIDANCE KICKOFF MEETING INVITATION FOR JURISDICTIONS

Subject: Clark County Multi-Jurisdictional Hazard Mitigation Plan Update

On behalf of Clark County, you are invited to the first of three planning meetings to update the Clark County Multi-Jurisdictional Hazard Mitigation Plan.

Clark County Multi-Jurisdictional Hazard Mitigation Plan Update

Kickoff Meeting

March 19, 2019

Meeting Time: 6:00PM

Place: Kahoka City Fire Department

Address: 282 W Exchange St, Kahoka, MO 63445

Clark County is beginning the process to update the Clark County Multi-Jurisdictional Hazard Mitigation Plan to better protect the people and property of Clark County from the effects of natural hazard events. The existing plan was approved by FEMA in March 2014. The plan update will be prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 (Public Law 106-390) and the implementing regulations. These regulations establish the requirements that hazard mitigation plans must meet in order for Clark County and the participating jurisdictions, to be eligible for certain federal disaster assistance and hazard mitigation funding under the Robert T. Stafford Disaster Relief and Emergency Act (Public Law 93-288). Because Clark County is subject to many kinds of hazards, access to these federal programs is vital.

What is a Hazard Mitigation Plan?

A hazard mitigation plan is the result of a planning process which identifies policies and actions that can be implemented over the long term to reduce the risk and future losses resulting from hazard events. The Clark County Multi-Jurisdictional Hazard Mitigation Plan Update will address a comprehensive list of natural hazards likely to impact the County. The identified mitigation policies and actions will be based on an assessment of hazards, vulnerabilities, and risks.

The hazard mitigation planning process is also heavily dependent on the participation of representatives from local government agencies and departments, the public, and other stakeholder groups. A Hazard Mitigation Planning Committee will be formed to support this project and will include representatives from the County, cities, school districts, private-non-profit entities, business partners, academic institutions, and other local, state, and federal agencies acting in or serving Clark County.

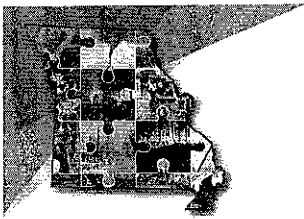
What is My Role in the Planning Process?

The Northeast Missouri Regional Planning Commission has taken the lead in updating this plan. The point of contact is Derek Weber, Executive Director. To successfully complete this project and ensure your organization is eligible for FEMA hazard mitigation assistance funding, we need your participation and input. Jurisdictions (including county and city governments and public-school districts) that do not participate in an approved Hazard Mitigation Plan are **NOT eligible** to apply for FEMA's Hazard Mitigation Assistance grants. Participation in the planning process will include:

- Attending and contributing in the planning committee meetings;
- Providing requested data (as available);
- Reviewing and providing comments on plan drafts;
- Advertising, coordinating, and participating in the public input process; and
- Coordinating the formal adoption of the plan.

What can I expect for the planning committee meetings?

In the coming months, the Northeast Missouri Regional Planning Commission will facilitate three planning meetings, as briefly described below. Detailed agendas and information on the context of each meeting or activities performed within each meeting will be provided during the planning process.



SEMA Mitigation Management

LOCAL MITIGATION PLAN FORMAT GUIDANCE

KICKOFF MEETING INVITATION FOR JURISDICTIONS

- **Project Kick-off Meeting.** This meeting will initialize work with the planning committee including presentation of the federal planning requirements, participation requirements of planning committee members, and the proposed project work plan and schedule. A plan for public involvement and coordination with other agencies and departments will also be discussed at this initial meeting, especially regarding external agencies, such as state and federal agencies that may have significant interests (property, critical assets and infrastructure) in the County or that have information to help support the planning process.
- **Risk Assessment Meeting.** This meeting will include presentation of the risk assessment results and review/development of mitigation goals.
- **Mitigation Strategy Meeting.** This meeting will include updating of existing mitigation actions and identification and development of new mitigation strategies based upon the risk assessment.

Additional Resources

The following links provide additional information on hazard mitigation and the planning process.

- **Clark County Multi-Jurisdictional Hazard Mitigation Plan, March 2014**
http://www.nemorpc.org/wp-content/uploads/2019/02/Clark-County-Hazard-Mitigation-Plan-02_2014-rd.pdf
- **The requirements and procedures for state, tribal and local mitigation plans as presented in the Code of Federal Regulations (CFR) at Title 44, Chapter 1, Part 201**
<https://www.fema.gov/hazard-mitigation-planning-laws-regulations-policies>
- **Frequently Asked Questions regarding hazard mitigation planning**
<https://www.fema.gov/hazard-mitigation-planning-frequently-asked-questions>

Clark County requests your assistance in forwarding this invitation to others in your jurisdiction. Appropriate participants in the planning committee include, but are not limited to: emergency responders, county clerks, city clerks, elected officials, public works directors, floodplain managers, stormwater managers, county and city planners, economic development directors, GIS staff, business partners, private-non-profit representatives, school principals, school facilities directors, and school superintendents.

Please confirm your attendance or provide contact information for your designated alternate by responding to Derek Weber at (660)465-7281 Ext. 1 or derekweber@nemorpc.org.

Thank you,

Derek Weber
Executive Director
Northeast Missouri Regional Planning Commission

Clark County
Multi-Jurisdictional Hazard Mitigation Plan Update
Kickoff Planning Meeting
March 19, 2019
6:00PM

Agenda

Welcome/Introductions Derek Weber, Executive Director
Northeast Missouri RPC

Hazard Mitigation Planning Purpose

Grant Programs Linked to Approved Plan

Planning Tasks / Multi-jurisdictional Approach

Participation Requirements

Data Collection Questionnaires

Discussion of Hazards

Critical Facilities

Next Steps in the Planning Process

SAVE THE DATE:

Meeting #2- May 14, 2019 / 4:30PM

Kahoka Fire Dept, 282 West Exchange St, Kahoka, MO 63445

Meeting #3- July 16, 2019 / 4:30PM

Kahoka Fire Dept, 282 West Exchange St, Kahoka, MO 63445






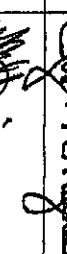




CLARK COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN UPDATE KICKOFF MEETING—SIGN-IN SHEET

Project: Clark County, Missouri Multi-jurisdictional Hazard Mitigation Plan Update

Meeting Date/Time: Kickoff Meeting
March 19, 2019 at 6:00PM

Facilitator: Derek Weber, Executive Director
Northeast Missouri Regional Planning Commission

Place/Room: Kahoka Fire Dept, 282 West Exchange St, Kahoka, MO 63445

Name	Title	Department/Agency	Email	Phone	Signature
Chris Blomberg	Kahoka Chief of Police		CLARK COUNTY, MO. IN @ gmail.com	660 342 3962	
Paul Brotherton	RPC/POC EXB&ED			660 344-7800	
Larry Sexton	LEPC Chairman			660-341-5566	
Heaven Dent	Commissioner Clark Co		h.dent@clarkcountymissouri.org	660 391/6045	
GARY WEBSTER	CLARK CO. Comm.		gwebster33@comcast.net	660/341/1800	
Jim Endres	President	Revere Fire City of Revere		660 942-2950	
Delbert Irwin	Chief	Revere Fire	delbertirwin@comcast.net	660-346-3533	
Ben Harty	Mayor	CITY ALEXANDRIA		660 341/1700	
Ruthie Kracht	Superintendent	Clark Co. School	kracht@clarkcountymissouri.org	660-727-2377	
Johnny Davis	City Clerk	Wayland	jdavis@waylandmo.org	660-754-6100	

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

Project:	Clark County, Missouri Multi-jurisdictional Hazard Mitigation Plan Update	Meeting Date/Time:	Kickoff Meeting March 19, 2019 at 6:00PM
Facilitator:	Derek Weber, Executive Director Northeast Missouri Regional Planning Commission	Place/Room:	Kahoka Fire Dept, 282 West Exchange St, Kahoka, MO 63445

Name	Title	Department/Agency	Email	Phone	Signature
Nathan Bartholomew	Chief	Waverland Fire		660-216-8128	<i>Nathan Bartholomew</i>
Randy Alvis	Board Chairman	Waverland Fire	r.alvis@kdmall.com	39-470-2228	<i>Randy Alvis</i>
Evelyn Sutterfield	TN. Administrator	Clark County Health Department	Evelyn.Sutterfield@mo.gov	660-727-2552	<i>Evelyn Sutterfield</i>
Jim Sherwood	Asst. EMD		sherwood.jim@mo.gov	660-727-2309	<i>Jim Sherwood</i>
Jeff Alton	Region A Coordinator	CITY OF CLARK	jeff.alton@mo.gov	660-777-7777	<i>Jeff Alton</i>
Jeff Alton	Region A Coordinator	SEMA-Region A	jeff.alton@sema.org	573-644-3819	<i>Jeff Alton</i>
J.D. Stonecipher	Disaster Preparedness Specialist	American Red Cross	j.d.stonecipher@redcross.org	217-930-7204	<i>J.D. Stonecipher</i>
Buddy KATELEMAN	Resident Commission	County	Julie.Kateleman@gmail.com	660-341-4486	<i>Buddy KATELEMAN</i>

To **Clark County Hazard Mitigation Planning Committee**
From **Derek Weber, Executive Director**
Northeast Missouri Regional Planning Commission
Tel / E-mail **(660)465-7281 Ext.1 / derekweber@nemorpc.org**
Date **March 19, 2019**
Subject **Minutes from Clark County Hazard Mitigation Planning Kickoff Meeting**
held on March 19, 2019

This document is a record of attendance and a summary of the issues discussed during the above meeting. The presentation began with an introduction on the purpose of hazard mitigation planning, grant programs linked to an approved plan, and the benefits of a multi-jurisdictional approach. The hazard mitigation planning process was reviewed to include requirements for participation and public involvement and the use of data collection questionnaires. The planning committee participated in a discussion of the hazards that have the potential to impact Clark County, including preliminary research on each hazard. The sources for compiling a GIS layer of critical facilities were also discussed and additional sources identified by planning committee members were noted. The meeting concluded with a discussion of the next steps in the planning process. The meeting was held at the Kahoka Fire Dept. at 282 W. Exchange St., Kahoka, MO 63445 from 6:00PM to 8:00PM.

Attendees

Name	Title	Department	Jurisdiction
Chris Blomgren	County EMD		Clark County
Paul Brotherton	Citizen		Clark County
Larry Sexton	LEPC Chair		Clark County
Henry Dienst	Commissioner		Clark County
Gary Webster	Commissioner		Clark County
Jim Engles	President	Revere Fire	Revere
Delbert Irvin	Chief	Revere Fire	Revere
Ron Gates	Mayor		Alexandria
Ritchie Kratch	Superintendent		Clark County R-1
Kathy Alvis	Clerk		Wayland
Nathan Bartlett	Chief	Wayland Fire	Wayland
Randy Alvis	Chairman	Wayland Fire	Wayland
Evelenna Sutterfield	R.N.	Clark County Health Dept.	Clark County
Jim Sherwood	Asst. EMD		Kahoka
Jerry Webber	Mayor		Kahoka
Buddy Kattlemann	Commissioner		Clark County

Introductions

Derek Weber, Executive Director of Northeast Missouri Regional Planning Commission began the meeting by welcoming and thanking the attendees for coming and having all attendees introduce themselves and the jurisdiction or entity they were representing.

Hazard Mitigation Planning Purpose

Derek Weber, Executive Director with Northeast Missouri Regional Planning Commission presented information on the purpose of Hazard Mitigation Planning and the Disaster Mitigation Act of 2000. The

attendees were reminded this is an update of the Clark County Hazard Mitigation Plan, previously approved in March 2014. The current plan expires in March 2019.

Grant Programs Linked to Approved Plan

Derek Weber briefly discussed the FEMA Hazard Mitigation Assistance grants that require participation in an approved Hazard Mitigation Plan for jurisdictions to be eligible to apply. These include: Hazard Mitigation Grant Program, Pre-Disaster Mitigation Program, and Flood Mitigation Assistance Program

Participation Requirements

Derek Weber also described the role of the HMPC. Each jurisdiction participating in development of the plan must meet the following minimum requirements:

1. Designate a representative to serve on the Clark County HMPC
2. Provide data for and assist in the development of the updated risk assessment that describes how various hazards impact your jurisdiction,
3. Provide data to describe current capabilities,
4. Develop/update mitigation actions (at least one) specific to your jurisdiction,
5. Review comments on plan drafts as requested,
6. Provide documentation to show time donated to the planning effort (if a FEMA planning grant was awarded to the county); and
7. Formally adopt the mitigation plan.

Jurisdictions that choose not to participate in development of a FEMA-approved mitigation plan **will not** be eligible applicants for FEMA Hazard Mitigation Assistance Grants.

Data Collection Questionnaires

Representatives from local governments and school districts were provided with hard copies of Data Collection Questionnaires. The Data Collection Questionnaire is designed to collect information on existing capabilities within each jurisdiction to implement mitigation initiatives as well as collect information on previous hazard events. The questionnaires are different for local units of government and schools. The Data Collection Questionnaires were reviewed as a group and then meeting participants were given time to review the forms individually and note any questions about the forms.

The deadline for submittal of the Data Collection Guides is April 1, 2019

Update Mitigation Goals

Derek Weber facilitated a discussion of the mitigation goals. Common categories of mitigation goals were presented along with past plan goals.

The previous goals were reviewed and they were updated to the following:

1. Public Awareness- Using a variety of communications avenues to increase the citizens awareness of and promote education about the natural hazards that they may face, their

- vulnerability to these hazards, and how to lessen the effect of future natural hazards.
2. Strengthen communication and coordination between local governments, emergency personnel, public agencies, and citizens to mitigate the effect of future natural hazards.
 3. Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties; on natural resources; on infrastructure; and on the local economy.

Mitigation Action Updates

The planning committee members were informed they would be contacted to review previous mitigation actions and how they wanted to proceed with the mitigation actions. Each jurisdiction is required to have at least one mitigation action item.

When reviewing past plan all the action items were determined to be redundant and everyday tasks rather than actual projects that would mitigate future hazards.

Next Steps

Attendees were asked to complete their jurisdiction's Data Collection Questionnaire and critical facility list and send back by March 19, 2019.

Multi-Jurisdictional Hazard Mitigation Plan

Data Collection Questionnaire

For Local Governments

County: CLARK

Jurisdiction: CLARK County

Return by: _____

Please complete this data collection questionnaire as accurately and completely as possible as this information will appear in the mitigation plan. A data collection questionnaire must be completed for each "jurisdiction" that wishes to be included in the plan. According to FEMA's definition a jurisdiction is any local government, including counties, municipalities, cities, towns, school districts, special districts, councils of government, and tribal organizations. Any of these entities as well as publicly funded colleges and universities that do not participate in the planning process **will not** be eligible applicants for FEMA mitigation funding programs. Please note: School Districts and other Educational Institutions should complete the Data Collection Questionnaire indicated "For School Districts and Educational Institutions".

Prepared by: Buddy KATTELMANN

Phone: 660-727-8241

Email: julie.kattelmann@gmail.com

Date: 4/23/19

Please return questionnaires by mail, email, or fax to:

Name: Derek Weber, Executive Director NEMO RPC

Address: 121 S. Cecil St, Memphis, MO 63555

Email: derekweber@nemorpc.org

Fax: (660)465-7163

CAPABILITY ASSESSMENT & INCORPORATION OF EXISTING PLANS, STUDIES, REPORTS AND TECHNICAL INFORMATION

The purpose of this section is to collect information to document existing capabilities as well as determine existing plans, studies, reports, and technical information that may need to be incorporated in the mitigation plan. Although some of this information may have been captured in your previous mitigation plan, it is important to ensure this information is current in the plan update

Please indicate which of the following your jurisdiction has in place. For elements that do not pertain to your type of public entity, please indicate with "N/A". If applicable, please provide a completion date for the element. If your jurisdiction does not have a particular element, and a higher level of government has the authority pertaining to your jurisdiction, please indicate this in the comments column. If your jurisdiction has any of the **underlined and bolded** elements, please provide a copy of the document to the contact listed on the front and indicate method in the comments column (i.e. available on the web, will email or mail).

Element	Yes, No, N/A	Comments and/or Weblink
Planning Capabilities		
<u>Comprehensive Plan</u>	Date:	
Builder's Plan	Date:	
Capital Improvement Plan	Date:	
City Emergency Operations Plan	Date:	
County Emergency Operations Plan	Date: 12/31/2019	
Local Recovery Plan	Date:	
County Recovery Plan	Date:	
City Mitigation Plan	Date:	
County Mitigation Plan	Date:	
Debris Management Plan	Date: 12/31/2019	
<u>Economic Development Plan</u>	Date:	
Transportation Plan	Date:	
Land-use Plan	Date:	
Flood Mitigation Assistance (FMA) Plan	Date:	
<u>Watershed Plan</u>	Date:	
Firewise or other fire mitigation plan	Date:	
Critical Facilities Plan (Mitigation/Response/Recovery)	Date:	

Element	Yes, No, N/A	Comments and/or Weblink
Policies/Ordinance		
Zoning Ordinance		
Building Code	Version:	
Floodplain Ordinance	Date: FEB. 16, 2012	60.3 (d)
Subdivision Ordinance		
Tree Trimming Ordinance		
Nuisance Ordinance		
Stormwater Ordinance		
Drainage Ordinance		
Site Plan Review Requirements		
Historic Preservation Ordinance		
Landscape Ordinance		
Program		
Zoning/Land Use Restrictions		
Codes Building Site/Design		
Hazard Awareness Program		
National Flood Insurance Program (NFIP)		
NFIP Community Rating System (CRS) program		If so, what is your current level rating?
National Weather Service (NWS) Storm Ready Certification		
Firewise Community Certification		
Building Code Effectiveness Grading (BCEGs)		
ISO Fire Rating	Rating:	VARIES BY DISTRICT (6)
Economic Development Program		
Land Use Program		
Public Education/Awareness		
Property Acquisition		
Planning/Zoning Boards		
Stream Maintenance Program		
Tree Trimming Program		
Engineering Studies for Streams (Local/County/Regional)		

Element	Yes, No, N/A	Comments and/or Weblink
Mutual Aid Agreements	YES	
Studies/Reports/Maps		
<u>Hazard Analysis/Risk Assessment (City)</u>		
<u>Hazard Analysis/Risk Assessment (County)</u>		
Evacuation Route Map		
<u>Critical Facilities Inventory</u>		
<u>Vulnerable Population Inventory</u>		
<u>Land Use Map</u>		
Staff/Department		Full Time or Part Time?
Building Code Official		
Building Inspector		
Mapping Specialist (GIS)		
Engineer		
Development Planner		
Public Works Official		
Emergency Management Coordinator	YES	PT - CONTRACT
NFIP Floodplain Administrator		
Emergency Response Team		
Hazardous Materials Expert		
Local Emergency Planning Committee	YES	PT - VOLUNTEER
County Emergency Management Commission		
Sanitation Department		
Transportation Department		
Economic Development Department		
Housing Department		
Historic Preservation		
Non-Governmental Organizations (NGOs)	Is there a local chapter? Yes or No	
American Red Cross	YES	
Salvation Army		
Veterans Groups	YES	

Element	Yes, No, N/A	Comments and/or Weblink
Local Environmental Organization		
Homeowner Associations		
Neighborhood Associations		
Chamber of Commerce	YES	
Community Organizations (Lions, Kiwanis, etc.		
Financial Resources		Is your jurisdiction able to? Yes or No
Apply for Community Development Block Grants		YES
Fund projects thru Capital Improvements funding		YES
Authority to levy taxes for specific purposes		
Fees for water, sewer, gas, or electric services		
Impact fees for new development		
Incur debt through general obligation bonds		
Incur debt through special tax bonds		
Incur debt through private activities		
Withhold spending in hazard prone areas		

For plan updates, the plan maintenance process outlined in your previous plan requires all participating jurisdictions to incorporate the requirements of the mitigation plan into other planning mechanisms, when appropriate. A key element of effective implementation of mitigation is for the mitigation plan to be incorporated in existing authorities, policies, programs, and resources. Next to each applicable planning mechanism, indicate how your jurisdiction incorporated the previous mitigation plan. If no incorporation has occurred, please explain, including background information detailing any challenges preventing incorporation.

Planning Capabilities	Method of Incorporation Since Previous Plan or Challenges Preventing Incorporation
Comprehensive Plan	
Builder's Plan	
Capital Improvement Plan	
Local Recovery Plan	
County Recovery Plan	
Debris Management Plan	
Economic Development Plan	
Transportation Plan	
Land-use Plan	
Watershed Plan	
Firewise or other Fire Mitigation Plan such as Community Wildfire Protection Plan	

Additional Questions

1. How is your government structure organized? (Commission, Mayor/City Council, how many members)

COMMISSION - 3 MEMBERS

2. List any past or ongoing public education or information programs, such as for responsible water use, fire safety, household preparedness, or environmental education.

FIRE SAFETY - HEAD START

- SCOUTS

PREPAREDNESS - MONTHLY NEWS PAPER COLUMN

3. List any other past or ongoing projects or programs designed to reduce disaster losses, these may include projects to protect critical facilities. Be sure to include pending or approved projects submitted for FEMA mitigation grants.

4. Describe any hazard-related concerns or issues regarding the vulnerability of special needs populations, such as the elderly, disabled, low-income, or migrant farm workers.

LIMITED TRANSPORTATION FOR VULNERABLE POPULATIONS (WHEELCHAIRS)

UNTRAINED SHELTERS

LARGE LOW INCOME POPULATION

5. How many outdoor warning sirens are in your community? TWO

How are they activated (indicate responsible department/personnel)?

CITY

6. Does your community utilize any other warning systems such as Cable Override, Reverse 911, etc? If so, please describe. NO

7. Does your community have designated public tornado shelters/saferooms? If so, are they constructed in accordance with FEMA standards?

YES - UNKNOWN

Please provide address locations:

ST PAUL UNITED CHURCH OF CHRIST

ST MICHAEL'S CATHOLIC CHURCH

1ST BAPTIST CHURCH

FREEDOM IN CHRIST

C.A.R.E. BUILDING

1ST CHRISTIAN CHURCH

ALEXANDRIA CITY HALL

ST FRANCISVILLE CHURCH

LURAY BAPTIST

ANSON COMMUNITY CHURCH

WYKONDA CHRISTIAN CHURCH

PAKEVILLE CHRISTIAN CHURCH

WAYLAND METHODIST

ALL CLARK Co
SCHOOLS

8. List residential, commercial and industrial development in your jurisdiction since last plan update.

ADDITIONAL GROW BINS / GROW COMPLEXES

ADDITIONAL MOG CONFINEMENTS

INCREASE IN RURAL HOUSING

9. Describe development trends and expected growth areas. Is any new development expected to occur in the 100-year floodplain? Is any new development expected to occur in any other known hazard areas? If possible, please provide a map indicating potential/planned growth areas.

EXPECTED GROWTH ALONG LETTERED STATE HIGHWAYS & IN PARKWAY
WAYLAND

10. Are any new facilities or infrastructure planned for construction during the next five years? If so, please provide facility name and purpose along with proposed locations, if known.

11. Please list major employers in your jurisdiction with an estimated number of employees.

CLARK CO SCHOOL

CLARK CO NURSING HOME

CLARK COUNTY

12. Please list Mitigation Planning Committee members who served during the development of the previously approved plan. Was the process set forth for monitoring the implementation of the previously approved mitigation plan adhered to? Did the Committee meet as was specified in the previously approved plan? Why or why not?

13. Describe your jurisdiction's participation in the NFIP. Include information about how compliance with the NFIP is enforced locally.

VULNERABILITY ASSESSMENT

The purpose of this worksheet is to assess the vulnerable buildings, populations, critical facilities, infrastructure, and other important assets in your community by using the best available data to complete the table. Use the table on the next page to compile a detailed inventory of specific assets at risk including critical facilities and infrastructure; natural, cultural, and historical assets; and economic assets. In the natural hazard column of the asset inventory table, indicate (by assigned abbreviation) which of the following hazards the asset is vulnerable to:

Natural Hazards	
Flooding (Major & Flash) - RF	Drought - D
Levee Failure - LF	Extreme Temperature - ET
Dam Failure - DF	Severe Thunderstorm (incl. winds, hail, lightning) - ST
Earthquake - EQ	Severe Winter Weather (incl. snow, ice, severe cold) - SWW
Land Subsidence / Sinkholes - LSS	Tornadoes - T
	Wildfire - WF

Critical Facilities and Infrastructure

A critical facility may be defined as one that is essential in providing utility or direction either during the response to an emergency or during the recovery operation. FEMA's HAZUS-MH loss estimation software uses the following three categories of critical assets. 'Essential facilities' are those that if damaged would have devastating impacts on disaster response and/or recovery. 'High potential loss facilities' are those that would have a high loss or impact on the community. Transportation and lifeline facilities are third category of critical assets; examples are provided below.

Essential Facilities

Hospitals and other medical facilities
Police stations
Fire station
Emergency Operations Centers

High Potential Loss Facilities

Power plants
Dams/levees
Military installations
Hazardous material sites
Schools
Shelters
Day care centers
Nursing homes
Main government buildings

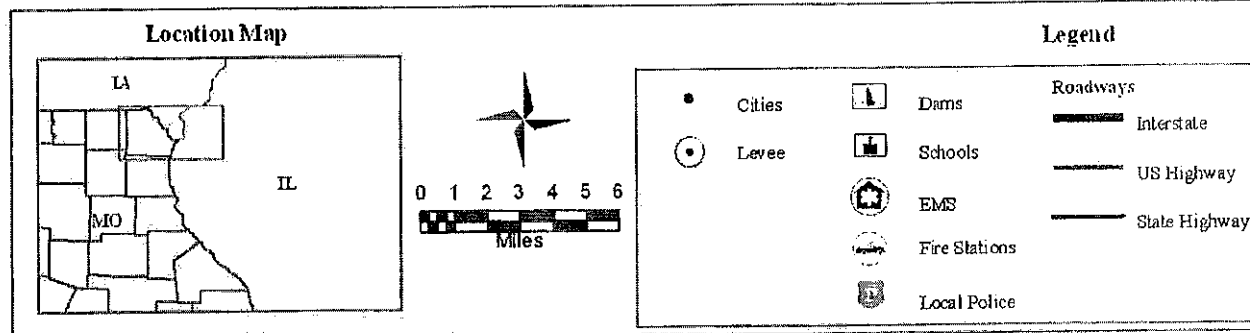
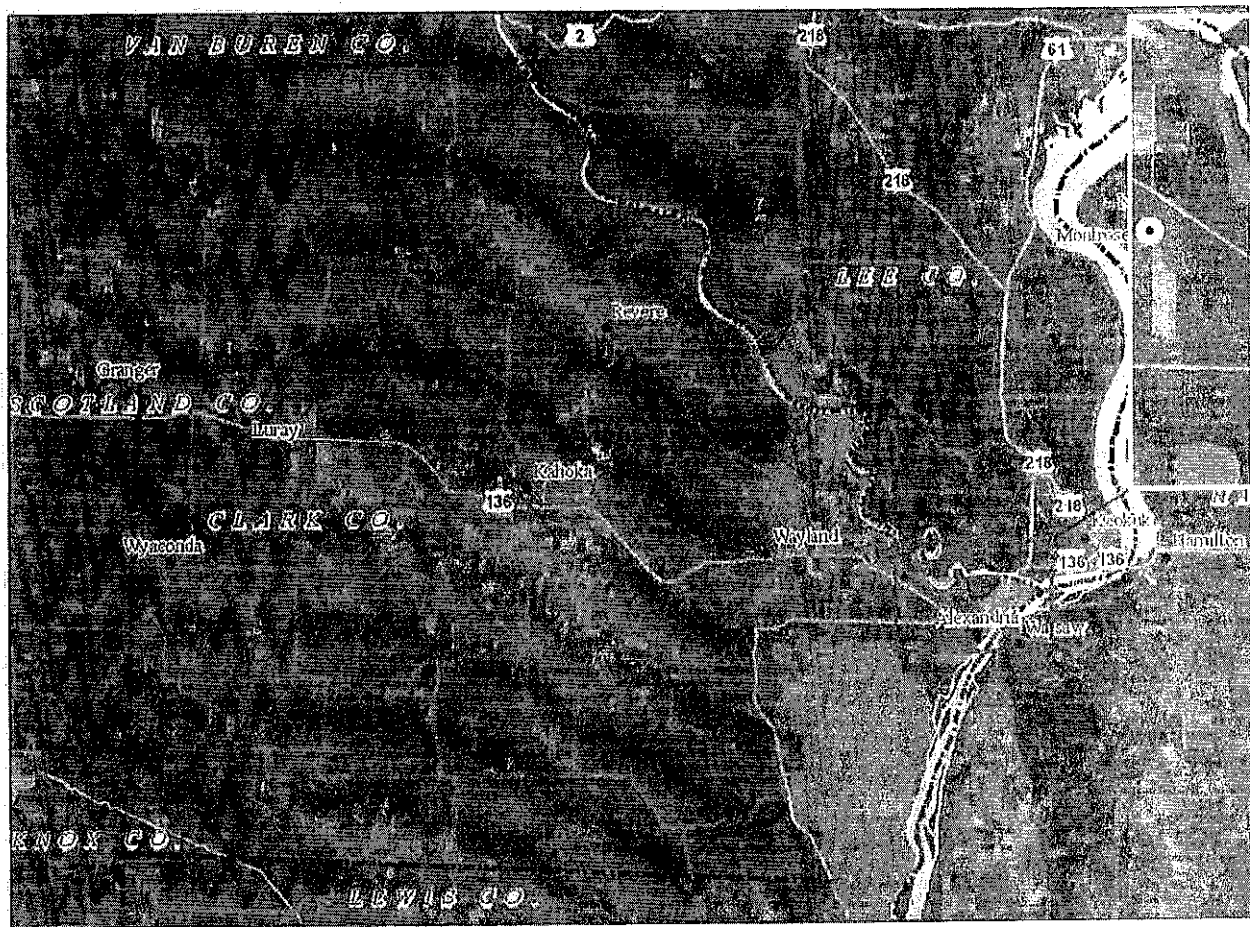
Transportation and Lifeline

Highways, bridges, and tunnels
Railroads and facilities
Bus facilities
Airports
Water treatment facilities
Natural gas facilities and pipelines
Oil facilities and pipelines
Communications facilities

Economic Assets

Economic assets at risk may include major employers or primary economic sectors, such as agriculture, whose losses or inoperability would have severe impacts on the community and its ability to recover from disaster.

Imagery Derived Assessment as of 06/19 Clark County, Missouri



Event Number	1	2	3	4	5
Jurisdiction 1	Alexandria	Clark County	Clark County	Alexandria	Wayland
Jurisdiction 2	Clark County			Clark County	Clark County
Type of Event	Flood	Winter Weather	Tornado	Flood	Tornado
Nature of Event	High snowmelt & Rain	Snow/Wind Chill	Tornado	Rain	Tornado
Magnitude of Event (Catastrophic, Significant, Minimal, None)	Significant	Minimal	M	Minimal	Minimal
Location	Hwy 61, N of Alexandria	Countywide	NW Corner of County	Hwy 61, N of Alexandria	Wayland & SW of Wayland
Date	3/17/2019	2/6/2019	6/19/2019	10/2/2018	11/24/2017
Injuries	None	None	1	None	1
Deaths	None	None	None	None	None
Personal Property Damage (Catastrophic, Significant, Minimal, None)	Minimal	Minimal	Minimal	Minimal	Minimal
Commercial Property Damage (Catastrophic, Significant, Minimal, None)	Significant	None	None	Minimal	Minimal
Infrastructure Damage (Catastrophic, Significant, Minimal, None)	Significant	Minimal	None	Minimal	Minimal
Crop Damage (Catastrophic, Significant, Minimal, None)	Catastrophic	None	Minimal	Significant	Minimal
Business/Economic Impact (Catastrophic, Significant, Minimal, None)	Significant	None	Minimal	Significant	Minimal
Road/School/Other Closure	Road	Road/School	None	Road	None
Other Damage	Levy, roads, equipment	Road due to accidents/Plow	Tree & powerline	Road	Trees, personal property
Insured Losses	Unknown	Unknown	Unknown	Unknown	Unknown
Federal Funding	None	None	None	None	None
State Funding	None	None	None	None	None

Event Number	6	7	8	9	10
Jurisdiction 1					
Jurisdiction 2					
Type of Event					
Nature of Event					
Magnitude of Event (Catastrophic, Significant, Minimal, None)					
Location					
Date					
Injuries					
Deaths					
Personal Property Damage (Catastrophic, Significant, Minimal, None)					
Commercial Property Damage (Catastrophic, Significant, Minimal, None)					
Infrastructure Damage (Catastrophic, Significant, Minimal, None)					
Crop Damage (Catastrophic, Significant, Minimal, None)					
Business/Economic Impact (Catastrophic, Significant, Minimal, None)					
Road/School/Other Closure					
Other Damage					
Insured Losses					
Federal Funding					
State Funding					

HISTORIC HAZARD EVENTS

Please fill out the sheet on the next page for each significant hazard event that affected **Your Jurisdiction**. **Make as many copies as necessary to record all events** and complete with as much detail as possible. This includes all events associated with the hazards listed below that have caused previous damage in your jurisdiction. It is especially important to capture events that either were not included in the previous Hazard Mitigation Plan or occurred since the plan was completed. Attach supporting documentation, photocopies of newspaper articles, or other original sources.

Jurisdiction	
Type of event	
Nature and magnitude of event	
Location	
Date of event	
Injuries	
Deaths	
Property damage	
Infrastructure damage	
Crop damage	
Business/economic impacts	
Road/school/other closures	
Other damage	
Insured losses	
Federal/state disaster relief funding	
Source of information	
Comments	

HISTORIC HAZARD EVENTS (continued)

Please fill out the sheet on the next page for each significant hazard event that affected **Your Jurisdiction**. **Make as many copies as necessary to record all events** and complete with as much detail as possible. This includes all events associated with the hazards listed below that have caused previous damage in your jurisdiction. It is especially important to capture events that either were not included in the previous Hazard Mitigation Plan or occurred since the plan was completed. Attach supporting documentation, photocopies of newspaper articles, or other original sources.

Jurisdiction	
Type of event	
Nature and magnitude of event	
Location	
Date of event	
Injuries	
Deaths	
Property damage	
Infrastructure damage	
Crop damage	
Business/economic impacts	
Road/school/other closures	
Other damage	
Insured losses	
Federal/state disaster relief funding	
Source of information	
Comments	

Multi-Jurisdictional Hazard Mitigation Plan

Data Collection Questionnaire

For Local Governments

County: Clark County _____

Jurisdiction: City of Kahoka _____

Return by: _____

Please complete this data collection questionnaire as accurately and completely as possible as this information will appear in the mitigation plan. A data collection questionnaire must be completed for each "jurisdiction" that wishes to be included in the plan. According to FEMA's definition a jurisdiction is any local government, including counties, municipalities, cities, towns, school districts, special districts, councils of government, and tribal organizations. Any of these entities as well as publicly funded colleges and universities that do not participate in the planning process **will not** be eligible applicants for FEMA mitigation funding programs. Please note: School Districts and other Educational Institutions should complete the Data Collection Questionnaire indicated "For School Districts and Educational Institutions".

Prepared by: Christopher Blomgren _____

Phone: 660-342-3962 _____

Email: clarkclarkcounty.mo.em@gmail.com _____

Date: _____

Please return questionnaires by mail, email, or fax to:

Name: Derek Weber, Executive Director NEMO RPC

Address: 121 S. Cecil St, Memphis, MO 63555

Email: derekweber@nemorpc.org

Fax: (660)465-7163

March 14
S. Weber

CAPABILITY ASSESSMENT & INCORPORATION OF EXISTING PLANS, STUDIES, REPORTS AND TECHNICAL INFORMATION

The purpose of this section is to collect information to document existing capabilities as well as determine existing plans, studies, reports, and technical information that may need to be incorporated in the mitigation plan. Although some of this information may have been captured in your previous mitigation plan, it is important to ensure this information is current in the plan update

Please indicate which of the following your jurisdiction has in place. For elements that do not pertain to your type of public entity, please indicate with "N/A". If applicable, please provide a completion date for the element. If your jurisdiction does not have a particular element, and a higher level of government has the authority pertaining to your jurisdiction, please indicate this in the comments column. If your jurisdiction has any of the underlined and bolded elements, please provide a copy of the document to the contact listed on the front and indicate method in the comments column (i.e. available on the web, will email or mail).

Element	Yes, No, N/A	Comments and/or Weblink
Planning Capabilities		
<u>Comprehensive Plan</u>	Date:	
Builder's Plan	Date:	
Capital Improvement Plan	Date:	
City Emergency Operations Plan	Date: 1/1/2020	In development
County Emergency Operations Plan	Date: 1/1/2019	Updated and approved
Local Recovery Plan	Date:	
County Recovery Plan	Date:	
City Mitigation Plan	Date: 5/1/2014	County wide plan
County Mitigation Plan	Date: 5/1/2014	Under review now
Debris Management Plan	Date: 1/1/2019	Utilizes the County Plan
<u>Economic Development Plan</u>	Date:	
Transportation Plan	Date:	
Land-use Plan	Date:	
Flood Mitigation Assistance (FMA) Plan	Date:	
<u>Watershed Plan</u>	Date:	
Firewise or other fire mitigation plan	Date:	
Critical Facilities Plan (Mitigation/Response/Recovery)	Date: 12/31/2020	In process

Element	Yes, No, N/A	Comments and/or Weblink
Policies/Ordinance		
Zoning Ordinance		
Building Code	Version: #1, 3/15	
Floodplain Ordinance	Date:	
Subdivision Ordinance		
Tree Trimming Ordinance		
Nuisance Ordinance	Yes	
Stormwater Ordinance		
Drainage Ordinance		
Site Plan Review Requirements		
Historic Preservation Ordinance		
Landscape Ordinance		
Program		
Zoning/Land Use Restrictions		
Codes Building Site/Design		
Hazard Awareness Program		
National Flood Insurance Program (NFIP)	Yes	
NFIP Community Rating System (CRS) program		If so, what is your current level rating?
National Weather Service (NWS) Storm Ready Certification		
Firewise Community Certification		
Building Code Effectiveness Grading (BCEGs)		
ISO Fire Rating	Rating: 6.9	
Economic Development Program		
Land Use Program		
Public Education/Awareness		
Property Acquisition		
Planning/Zoning Boards		
Stream Maintenance Program		
Tree Trimming Program		
Engineering Studies for Streams (Local/County/Regional)		

Element	Yes, No, N/A	Comments and/or Weblink
Mutual Aid Agreements	Yes	
Studies/Reports/Maps		
<u>Hazard Analysis/Risk Assessment (City)</u>	Yes	Regional THIRA
<u>Hazard Analysis/Risk Assessment (County)</u>	Yes	Regional THIRA
Evacuation Route Map		
<u>Critical Facilities Inventory</u>		
<u>Vulnerable Population Inventory</u>		
<u>Land Use Map</u>		
Staff/Department		Full Time or Part Time?
Building Code Official	John Williams	Yes
Building Inspector	Bill Conger	Yes
Mapping Specialist (GIS)		
Engineer		
Development Planner		
Public Works Official		
Emergency Management Coordinator	Yes	
NFIP Floodplain Administrator		
Emergency Response Team		
Hazardous Materials Expert		
Local Emergency Planning Committee	Yes	
County Emergency Management Commission	No	
Sanitation Department		
Transportation Department		
Economic Development Department		
Housing Department		
Historic Preservation		
Non-Governmental Organizations (NGOs)	Is there a local chapter? Yes or No	
American Red Cross	No	Local Chapter is out of Quincy, IL
Salvation Army	No	
Veterans Groups	Yes	

Element	Yes, No, N/A	Comments and/or Weblink
Local Environmental Organization		
Homeowner Associations	No	
Neighborhood Associations	No	
Chamber of Commerce	Yes	
Community Organizations (Lions, Kiwanis, etc.)	Yes	
Financial Resources		Is your jurisdiction able to? Yes or No
Apply for Community Development Block Grants		Yes
Fund projects thru Capital Improvements funding		
Authority to levy taxes for specific purposes		Yes
Fees for water, sewer, gas, or electric services		Yes
Impact fees for new development		
Incur debt through general obligation bonds		
Incur debt through special tax bonds		
Incur debt through private activities		
Withhold spending in hazard prone areas		

For plan updates, the plan maintenance process outlined in your previous plan requires all participating jurisdictions to incorporate the requirements of the mitigation plan into other planning mechanisms, when appropriate. A key element of effective implementation of mitigation is for the mitigation plan to be incorporated in existing authorities, policies, programs, and resources. Next to each applicable planning mechanism, indicate how your jurisdiction incorporated the previous mitigation plan. If no incorporation has occurred, please explain, including background information detailing any challenges preventing incorporation.

Planning Capabilities	Method of Incorporation Since Previous Plan or Challenges Preventing Incorporation
Comprehensive Plan	
Builder's Plan	
Capital Improvement Plan	
Local Recovery Plan	
County Recovery Plan	
Debris Management Plan	
Economic Development Plan	
Transportation Plan	
Land-use Plan	
Watershed Plan	
Firewise or other Fire Mitigation Plan such as Community Wildfire Protection Plan	

Additional Questions

1. How is your government structure organized? (Commission, Mayor/City Council, how many members)

Mayor -

City Council - 4 members

Clerk, Treasurer and Collector

Police Chief

Fire Chief

D, Public Works

2. List any past or ongoing public education or information programs, such as for responsible water use, fire safety, household preparedness, or environmental education.

Annual fire safety in school system

Public awareness with first responder agencies

3. List any other past or ongoing projects or programs designed to reduce disaster losses, these may include projects to protect critical facilities. Be sure to include pending or approved projects submitted for FEMA mitigation grants.

Recurrent grant work on blight mitigation, improving emergency response facilities, augmenting emergency communications and improving first responder equipment and training.

Coordination with outside agencies and conducting training and exercises.

4. Describe any hazard-related concerns or issues regarding the vulnerability of special needs populations, such as the elderly, disabled, low-income, or migrant farm workers.

Evacuation and sheltering concerns of a large low-income/elderly population (4 low income apartment groups & Nursing home)

Mass notification of vulnerable populations

5. How many outdoor warning sirens are in your community?

How are they activated (indicate responsible department/personnel)?

Activated by dispatch in accordance with Fire Chief, City Hall, Police Chief or Sheriff

6. Does your community utilize any other warning systems such as Cable Override, Reverse 911, etc? If so, please describe.

No

7. Does your community have designated public tornado shelters/saferooms? If so, are they constructed in accordance with FEMA standards?

Yes, Unknown

Please provide address locations:

8. List residential, commercial and industrial development in your jurisdiction since last plan update.

Waka Family Center, Dollar General Building, Kakeka State Bank Branch, Indian Pride Center, Service place, Crosswood estates Apartment complex, Green Valley Seed, Prairie Land hand, Stiles Supply, 705 W Cedar, 756 N Washington, 506 1/2 E Main, 530 N Montgomery, 610 N Hart St, Side 1+2, 535 W Clark Ste #1+2, 1108 N Johnson & 1055 East Ave

Supplies

9. Describe development trends and expected growth areas. Is any new development expected to occur in the 100-year floodplain? Is any new development expected to occur in any other known hazard areas? If possible, please provide a map indicating potential/planned growth areas.

No specific development and growth trends are noted. No new development in 100-year floodplain. No new development in specific hazard area.

10. Are any new facilities or infrastructure planned for construction during the next five years? If so, please provide facility name and purpose along with proposed locations, if known.

New business development along 136 on the southern edge of city limits (Dollar General and Nicks Farm & Home). Ongoing ag related development, no location specified.

11. Please list major employers in your jurisdiction with an estimated number of employees.

Clark County School District - 100

Clark County Nursing Home - 70

Green Valley Seed - 25

Clark County - 50

City of Kahoka - 20

Ball Volvo - 30

KPF Steel Foundry - 50

Dadant & Sons - 50

Gregory Container - 50

12. Please list Mitigation Planning Committee members who served during the development of the previously approved plan. Was the process set forth for monitoring the implementation of the previously approved mitigation plan adhered to? Did the Committee meet as was specified in the previously approved plan? Why or why not?

13. Describe your jurisdiction's participation in the NFIP. Include information about how compliance with the NFIP is enforced locally.

VULNERABILITY ASSESSMENT

The purpose of this worksheet is to assess the vulnerable buildings, populations, critical facilities, infrastructure, and other important assets in your community by using the best available data to complete the table. Use the table on the next page to compile a detailed inventory of specific assets at risk including critical facilities and infrastructure; natural, cultural, and historical assets; and economic assets. In the natural hazard column of the asset inventory table, indicate (by assigned abbreviation) which of the following hazards the asset is vulnerable to:

Natural Hazards	
Flooding (Major & Flash) – RF	Drought - D
Levee Failure – LF	Extreme Temperature - ET
Dam Failure – DF	Severe Thunderstorm (incl. winds, hail, lightning) - ST
Earthquake – EQ	Severe Winter Weather (incl. snow, ice, severe cold) - SWW
Land Subsidence / Sinkholes - LSS	Tornadoes - T
	Wildfire - WF

Critical Facilities and Infrastructure

A critical facility may be defined as one that is essential in providing utility or direction either during the response to an emergency or during the recovery operation. FEMA's HAZUS-MH loss estimation software uses the following three categories of critical assets. 'Essential facilities' are those that if damaged would have devastating impacts on disaster response and/or recovery. 'High potential loss facilities' are those that would have a high loss or impact on the community. Transportation and lifeline facilities are third category of critical assets; examples are provided below.

Essential Facilities

Hospitals and other medical facilities
Police stations
Fire station
Emergency Operations Centers

High Potential Loss Facilities

Power plants
Dams/levees
Military installations
Hazardous material sites
Schools
Shelters
Day care centers
Nursing homes
Main government buildings

Transportation and Lifeline

Highways, bridges, and tunnels
Railroads and facilities
Bus facilities
Airports
Water treatment facilities
Natural gas facilities and pipelines
Oil facilities and pipelines
Communications facilities

Economic Assets

Economic assets at risk may include major employers or primary economic sectors, such as agriculture, whose losses or inoperability would have severe impacts on the community and its ability to recover from disaster.

Asset Inventory

Please list critical facilities and other community assets, the square feet, values, and occupancy/capacity. If not applicable, enter "N/A". In the last column, use the codes from the previous page to indicate hazards to which the asset is vulnerable. Add as many rows as needed. If this information is available in GIS format, please provide.

Critical Facilities

Name of Asset	Address	Area (sq ft.)	Replacement Value (Insured) (\$)	Contents Value (\$)	Occupancy/ Capacity (#)	Natural Hazards
<u>Essential Facilities such as hospitals and other medical facilities, police and fire stations, Emergency Operations Centers</u>						
Kahoka Police	255 S Washington Kahoka, MO		350K	250K	10	RF, EQ, ST, SWW, T
Kahoka Fire	282 W Exchange St Kahoka, MO		550K	1.5M	75	RF, EQ, ST, SWW, T
<u>High Potential Loss Facilities such as power plants, dams/levees, military installations, hazardous materials sites, shelters, day care centers, nursing homes, main government buildings (Do not include schools—they will be reported by the school districts)</u>						

Name of Asset	Address	Area (sq.ft.)	Replacement Value (Insured) (\$)	Contents Value (\$)	Occupancy/ Capacity (#)	Natural Hazards
Kahoka power Plant	255 S Washington Kahoka, MO		5.5M		0	RF, EQ, T, SWW, ST
Kahoka Water Treatment	500 Vine St Kahoka, MO		6.5M			RF, EQ, T, SWW, ST
City Hall	250 N Morgan Kahoka, MO		350K			RF, EQ, T, SWW, ST
Daycare 1	Throughout City					RF, EQ, T, SWW, ST
Daycare 2	Throughout City					RF, EQ, T, SWW, ST
Daycare 3	Throughout City					RF, EQ, T, SWW, ST
Daycare 4	Throughout City					RF, EQ, T, SWW, ST
Daycare 5	Throughout City					RF, EQ, T, SWW, ST
Clark County Nursing Home	1260 N Johnson Kahoka, MO		7.5M		90 residents + 40 staff	RF, EQ, T, SWW, ST
Transportation and Lifelines such as highways, bridges, and tunnels, railroads and facilities, bus facilities, airports, water treatment facilities, natural gas facilities and pipelines, oil facilities, oil facilities and pipelines, communications facilities						
Highway 136	S of Kahoka					RF, EQ, T
BNSF Overpass	N of Kahoka					RF, EQ, T

*If replacement cost data is not available, use the best available data (assessed valuation or other method for estimating cost) and explain any data deficiencies.

Economic Assets (Major Employers, etc)

Asset	Address	Product/ Service	Value (if known)	Number of Employees	Hazards
KPF Foundry	809 E Maple Kahoka, MO	Steel Casting		50	Product & Chemicals
Gregory Container	1385 Industrial Drive Kahoka, MO	Welding containers		50	
Dadants	275 N Myrtle Kahoka, MO	Candles/wax		50	Highly flammable
IMI	Highway 136 Kahoka, MO	Farm Implements		20	Chemicals
Ball Volvo	Highway 136 Kahoka, MO	Semi/semi service		30	

HISTORIC HAZARD EVENTS

Please fill out the sheet on the next page for each significant hazard event that affected **Your Jurisdiction**. **Make as many copies as necessary to record all events** and complete with as much detail as possible. This includes all events associated with the hazards listed below that have caused previous damage in your jurisdiction. It is especially important to capture events that either were not included in the previous Hazard Mitigation Plan or occurred since the plan was completed. Attach supporting documentation, photocopies of newspaper articles, or other original sources.

Jurisdiction	
Type of event	
Nature and magnitude of event	
Location	
Date of event	
Injuries	
Deaths	
Property damage	
Infrastructure damage	
Crop damage	
Business/economic impacts	
Road/school/other closures	
Other damage	
Insured losses	
Federal/state disaster relief funding	
Source of information	
Comments	

HISTORIC HAZARD EVENTS (continued)

Please fill out the sheet on the next page for each significant hazard event that affected **Your Jurisdiction**. **Make as many copies as necessary to record all events** and complete with as much detail as possible. This includes all events associated with the hazards listed below that have caused previous damage in your jurisdiction. It is especially important to capture events that either were not included in the previous Hazard Mitigation Plan or occurred since the plan was completed. Attach supporting documentation, photocopies of newspaper articles, or other original sources.

Jurisdiction	Kanoka
Type of event	wind
Nature and magnitude of event	
Location	
Date of event	
Injuries	
Deaths	
Property damage	
Infrastructure damage	
Crop damage	
Business/economic impacts	
Road/school/other closures	
Other damage	
Insured losses	
Federal/state disaster relief funding	
Source of information	
Comments	

Multi-Jurisdictional Hazard Mitigation Plan

Data Collection Questionnaire

For Local Governments

County: Clark

Jurisdiction: City of Wayland

Return by: _____

Please complete this data collection questionnaire as accurately and completely as possible as this information will appear in the mitigation plan. A data collection questionnaire must be completed for each "jurisdiction" that wishes to be included in the plan. According to FEMA's definition a jurisdiction is any local government, including counties, municipalities, cities, towns, school districts, special districts, councils of government, and tribal organizations. Any of these entities as well as publicly funded colleges and universities that do not participate in the planning process **will not** be eligible applicants for FEMA mitigation funding programs. Please note: School Districts and other Educational Institutions should complete the Data Collection Questionnaire indicated "For School Districts and Educational Institutions".

Prepared by: _____

Phone: 660-754-6132

Email: waylan01@centurytel.net

Date: MARCH 21 2019

Please return questionnaires by mail, email, or fax to:

Name: Derek Weber, Executive Director NEMO RPC

Address: 121 S. Cecil St, Memphis, MO 63555

Email: derekweber@nemorpc.org

Fax: (660)465-7163

CAPABILITY ASSESSMENT & INCORPORATION OF EXISTING PLANS, STUDIES, REPORTS AND TECHNICAL INFORMATION

The purpose of this section is to collect information to document existing capabilities as well as determine existing plans, studies, reports, and technical information that may need to be incorporated in the mitigation plan. Although some of this information may have been captured in your previous mitigation plan, it is important to ensure this information is current in the plan update

Please indicate which of the following your jurisdiction has in place. For elements that do not pertain to your type of public entity, please indicate with "N/A". If applicable, please provide a completion date for the element. If your jurisdiction does not have a particular element, and a higher level of government has the authority pertaining to your jurisdiction, please indicate this in the comments column. If your jurisdiction has any of the **underlined and bolded** elements, please provide a copy of the document to the contact listed on the front and indicate method in the comments column (i.e. available on the web, will email or mail).

Element	Yes, No, N/A	Comments and/or Weblink
Planning Capabilities		
<u>Comprehensive Plan</u>	Date:	
Builder's Plan	Date:	
Capital Improvement Plan	Date:	
City Emergency Operations Plan	Date: 8/15/2019	Uses County Plan
County Emergency Operations Plan	Date: 1/1/2019	Updated and approved
Local Recovery Plan	Date:	
County Recovery Plan	Date:	
City Mitigation Plan	Date: 5/1/2014	County wide plan
County Mitigation Plan	Date: 5/1/2014	Under review now
Debris Management Plan	Date: 1/1/2019	Utilizes the County Plan
<u>Economic Development Plan</u>	Date:	
Transportation Plan	Date:	
Land-use Plan	Date:	
Flood Mitigation Assistance (FMA) Plan	Date:	
<u>Watershed Plan</u>	Date:	
Firewise or other fire mitigation plan	Date:	
Critical Facilities Plan (Mitigation/Response/Recovery)	Date: 09/15/2019	In process

Element	Yes, No, N/A	Comments and/or Weblink
Policies/Ordinance		
Zoning Ordinance		
Building Code	Version:	
Floodplain Ordinance	Date:	
Subdivision Ordinance		
Tree Trimming Ordinance		
Nuisance Ordinance		
Stormwater Ordinance		
Drainage Ordinance		
Site Plan Review Requirements		
Historic Preservation Ordinance		
Landscape Ordinance		
Program		
Zoning/Land Use Restrictions		
Codes Building Site/Design		
Hazard Awareness Program		
National Flood Insurance Program (NFIP)	Yes	
NFIP Community Rating System (CRS) program		If so, what is your current level rating?
National Weather Service (NWS) Storm Ready Certification		
Firewise Community Certification		
Building Code Effectiveness Grading (BCEGs)		
ISO Fire Rating	Rating: 6.9x	
Economic Development Program		
Land Use Program		
Public Education/Awareness		
Property Acquisition		
Planning/Zoning Boards		
Stream Maintenance Program		
Tree Trimming Program		
Engineering Studies for Streams (Local/County/Regional)		

Element	Yes, No, N/A	Comments and/or Weblink
Mutual Aid Agreements	Yes	
Studies/Reports/Maps		
<u>Hazard Analysis/Risk Assessment (City)</u>	Yes	Regional THIRA
<u>Hazard Analysis/Risk Assessment (County)</u>	Yes	Regional THIRA
Evacuation Route Map		
<u>Critical Facilities Inventory</u>		
<u>Vulnerable Population Inventory</u>		
<u>Land Use Map</u>		
Staff/Department		Full Time or Part Time?
Building Code Official		
Building Inspector		
Mapping Specialist (GIS)		
Engineer		
Development Planner		
Public Works Official		
Emergency Management Coordinator	County	
NFIP Floodplain Administrator		
Emergency Response Team		
Hazardous Materials Expert		
Local Emergency Planning Committee	Yes	
County Emergency Management Commission	No	
Sanitation Department		
Transportation Department		
Economic Development Department		
Housing Department		
Historic Preservation		
Non-Governmental Organizations (NGOs)	Is there a local chapter? Yes or No	
American Red Cross	No	Local Chapter is out of Quincy, IL
Salvation Army	No	
Veterans Groups	Yes	

Element	Yes, No, N/A	Comments and/or Weblink
Local Environmental Organization		
Homeowner Associations	No	
Neighborhood Associations	No	
Chamber of Commerce	Yes	
Community Organizations (Lions, Kiwanis, etc.	Yes	
Financial Resources		Is your jurisdiction able to? Yes or No
Apply for Community Development Block Grants		Yes
Fund projects thru Capital Improvements funding		
Authority to levy taxes for specific purposes		Yes
Fees for water, sewer, gas, or electric services		Yes
Impact fees for new development		
Incur debt through general obligation bonds		
Incur debt through special tax bonds		
Incur debt through private activities		
Withhold spending in hazard prone areas		

For plan updates, the plan maintenance process outlined in your previous plan requires all participating jurisdictions to incorporate the requirements of the mitigation plan into other planning mechanisms, when appropriate. A key element of effective implementation of mitigation is for the mitigation plan to be incorporated in existing authorities, policies, programs, and resources. Next to each applicable planning mechanism, indicate how your jurisdiction incorporated the previous mitigation plan. If no incorporation has occurred, please explain, including background information detailing any challenges preventing incorporation.

Planning Capabilities	Method of Incorporation Since Previous Plan or Challenges Preventing Incorporation
Comprehensive Plan	
Builder's Plan	
Capital Improvement Plan	
Local Recovery Plan	
County Recovery Plan	
Debris Management Plan	
Economic Development Plan	
Transportation Plan	
Land-use Plan	
Watershed Plan	
Firewise or other Fire Mitigation Plan such as Community Wildfire Protection Plan	

Additional Questions

1. How is your government structure organized? (Commission, Mayor/City Council, how many members)
Mayor -
City Council – 4 members
Clerk

2. List any past or ongoing public education or information programs, such as for responsible water use, fire safety, household preparedness, or environmental education.
Public awareness with first responder agencies

3. List any other past or ongoing projects or programs designed to reduce disaster losses, these may include projects to protect critical facilities. Be sure to include pending or approved projects submitted for FEMA mitigation grants.
Recurrent grant work on blight mitigation,
Coordination with outside agencies and conducting training and exercises.

4. Describe any hazard-related concerns or issues regarding the vulnerability of special needs populations, such as the elderly, disabled, low-income, or migrant farm workers.
Evacuation and sheltering concerns of a large low-income/elderly population
Mass notification of vulnerable populations

5. How many outdoor warning sirens are in your community?
None

How are they activated (indicate responsible department/personnel)?
NA

6. Does your community utilize any other warning systems such as Cable Override, Reverse 911, etc? If so, please describe.
No

7. Does your community have designated public tornado shelters/saferooms? If so, are they constructed in accordance with FEMA standards?
No

Please provide address locations:

8. List residential, commercial and industrial development in your jurisdiction since last plan update.

9. Describe development trends and expected growth areas. Is any new development expected to occur in the 100-year floodplain? Is any new development expected to occur in any other known hazard areas? If possible, please provide a map indicating potential/planned growth areas.

No specific development and growth trends are noted. No new development in 100-year floodplain. No new development in specific hazard area.

10. Are any new facilities or infrastructure planned for construction during the next five years? If so, please provide facility name and purpose along with proposed locations, if known.
New business development along 136 on the southern edge of city limits (Dollar General and Nicks Farm & Home). Ongoing ag related development, no location specified.

11. Please list major employers in your jurisdiction with an estimated number of employees.
Commuter/Farm Community

12. Please list Mitigation Planning Committee members who served during the development of the previously approved plan. Was the process set forth for monitoring the implementation of the previously approved mitigation plan adhered to? Did the Committee meet as was specified in the previously approved plan? Why or why not?

No previous membership

13. Describe your jurisdiction's participation in the NFIP. Include information about how compliance with the NFIP is enforced locally.
Member, no active compliance measures

VULNERABILITY ASSESSMENT

The purpose of this worksheet is to assess the vulnerable buildings, populations, critical facilities, infrastructure, and other important assets in your community by using the best available data to complete the table. Use the table on the next page to compile a detailed inventory of specific assets at risk including critical facilities and infrastructure; natural, cultural, and historical assets; and economic assets. In the natural hazard column of the asset inventory table, indicate (by assigned abbreviation) which of the following hazards the asset is vulnerable to:

Natural Hazards	
Flooding (Major & Flash) – RF	Drought - D
Levee Failure – LF	Extreme Temperature - ET
Dam Failure – DF	Severe Thunderstorm (incl. winds, hail, lightning) - ST
Earthquake – EQ	Severe Winter Weather (incl. snow, ice, severe cold) - SWW
Land Subsidence / Sinkholes - LSS	Tornadoes - T
	Wildfire - WF

Critical Facilities and Infrastructure

A critical facility may be defined as one that is essential in providing utility or direction either during the response to an emergency or during the recovery operation. FEMA's HAZUS-MH loss estimation software uses the following three categories of critical assets. 'Essential facilities' are those that if damaged would have devastating impacts on disaster response and/or recovery. 'High potential loss facilities' are those that would have a high loss or impact on the community. Transportation and lifeline facilities are third category of critical assets; examples are provided below.

Essential Facilities

Hospitals and other
medical facilities
Police stations
Fire station
Emergency Operations
Centers

High Potential Loss Facilities

Power plants
Dams/levees
Military installations
Hazardous material sites
Schools
Shelters
Day care centers
Nursing homes
Main government buildings

Transportation and Lifeline

Highways, bridges, and tunnels
Railroads and facilities
Bus facilities
Airports
Water treatment facilities
Natural gas facilities and
pipelines
Oil facilities and pipelines
Communications facilities

Economic Assets

Economic assets at risk may include major employers or primary economic sectors, such as agriculture, whose losses or inoperability would have severe impacts on the community and its ability to recover from disaster.

Asset Inventory

Please list critical facilities and other community assets, the square feet, values, and occupancy/capacity. If not applicable, enter "N/A". In the last column, use the codes from the previous page to indicate hazards to which the asset is vulnerable. Add as many rows as needed. If this information is available in GIS format, please provide.

Critical Facilities

Name of Asset	Address	Area (sq.ft.)	Replacement Value (Insured) (\$)	Contents Value (\$)	Occupancy/ Capacity (#)	Natural Hazards
Essential Facilities such as hospitals and other medical facilities, police and fire stations, Emergency Operations Centers						
High Potential Loss Facilities such as power plants, dams/levees, military installations, hazardous materials sites, shelters, day care centers, nursing homes, main government buildings (Do not include schools—they will be reported by the school districts)						

Name of Asset	Address	Area (sq.ft.)	Replacement Value (Insured) (\$)	Contents Value (\$)	Occupancy/ Capacity (#)	Natural Hazards
City Hall	250 N Morgan Luray, MO		350K			RF, EQ, T, SWW, ST
Daycare 1	Throughout City					RF, EQ, T, SWW, ST
Daycare 2	Throughout City					RF, EQ, T, SWW, ST
Transportation and Lifelines such as highways, bridges, and tunnels; railroads and facilities, bus facilities, airports, water treatment facilities, natural gas facilities and pipelines, oil facilities, oil facilities and pipelines, communications facilities						
Highway 136						RF, EQ, T

*If replacement cost data is not available, use the best available data (assessed valuation or other method for estimating cost) and explain any data deficiencies.

Economic Assets (Major Employers, etc)

Asset	Address	Product/ Service	Value (if known)	Number of Employees	Hazards

HISTORIC HAZARD EVENTS

Please fill out the sheet on the next page for each significant hazard event that affected **Your Jurisdiction**. **Make as many copies as necessary to record all events** and complete with as much detail as possible. This includes all events associated with the hazards listed below that have caused previous damage in your jurisdiction. It is especially important to capture events that either were not included in the previous Hazard Mitigation Plan or occurred since the plan was completed. Attach supporting documentation, photocopies of newspaper articles, or other original sources.

Jurisdiction	
Type of event	
Nature and magnitude of event	
Location	
Date of event	
Injuries	
Deaths	
Property damage	
Infrastructure damage	
Crop damage	
Business/economic impacts	
Road/school/other closures	
Other damage	
Insured losses	
Federal/state disaster relief funding	
Source of information	
Comments	

HISTORIC HAZARD EVENTS (continued)

Please fill out the sheet on the next page for each significant hazard event that affected **Your Jurisdiction**. **Make as many copies as necessary to record all events** and complete with as much detail as possible. This includes all events associated with the hazards listed below that have caused previous damage in your jurisdiction. It is especially important to capture events that either were not included in the previous Hazard Mitigation Plan or occurred since the plan was completed. Attach supporting documentation, photocopies of newspaper articles, or other original sources.

Jurisdiction	
Type of event	
Nature and magnitude of event	
Location	
Date of event	
Injuries	
Deaths	
Property damage	
Infrastructure damage	
Crop damage	
Business/economic impacts	
Road/school/other closures	
Other damage	
Insured losses	
Federal/state disaster relief funding	
Source of information	
Comments	

Multi-Jurisdictional Hazard Mitigation Plan
Data Collection Questionnaire
For Local Governments

County: Clark County _____

Jurisdiction: City of Wyaconda _____

Return by: _____

Please complete this data collection questionnaire as accurately and completely as possible as this information will appear in the mitigation plan. A data collection questionnaire must be completed for each "jurisdiction" that wishes to be included in the plan. According to FEMA's definition a jurisdiction is any local government, including counties, municipalities, cities, towns, school districts, special districts, councils of government, and tribal organizations. Any of these entities as well as publicly funded colleges and universities that do not participate in the planning process **will not** be eligible applicants for FEMA mitigation funding programs. Please note: School Districts and other Educational Institutions should complete the Data Collection Questionnaire indicated "For School Districts and Educational Institutions".

Prepared by: Christopher Blomgren _____

Phone: 660-342-3962 _____

Email: clarkclarkcounty.mo.em@gmail.com _____

Date: _____

Please return questionnaires by mail, email, or fax to:

Name: Derek Weber, Executive Director NEMO RPC

Address: 121 S. Cecil St, Memphis, MO 63555

Email: derekweber@nemorpc.org

Fax: (660)465-7163

CAPABILITY ASSESSMENT & INCORPORATION OF EXISTING PLANS, STUDIES, REPORTS AND TECHNICAL INFORMATION

The purpose of this section is to collect information to document existing capabilities as well as determine existing plans, studies, reports, and technical information that may need to be incorporated in the mitigation plan. Although some of this information may have been captured in your previous mitigation plan, it is important to ensure this information is current in the plan update

Please indicate which of the following your jurisdiction has in place. For elements that do not pertain to your type of public entity, please indicate with "N/A". If applicable, please provide a completion date for the element. If your jurisdiction does not have a particular element, and a higher level of government has the authority pertaining to your jurisdiction, please indicate this in the comments column. If your jurisdiction has any of the **underlined and bolded** elements, please provide a copy of the document to the contact listed on the front and indicate method in the comments column (i.e. available on the web, will email or mail).

Element	Yes, No, N/A	Comments and/or Weblink
Planning Capabilities		
<u>Comprehensive Plan</u>	Date:	
Builder's Plan	Date:	
Capital Improvement Plan	Date:	
City Emergency Operations Plan	Date: 8/15/2019	Uses County Plan
County Emergency Operations Plan	Date: 1/1/2019	Updated and approved
Local Recovery Plan	Date:	
County Recovery Plan	Date:	
City Mitigation Plan	Date: 5/1/2014	County wide plan
County Mitigation Plan	Date: 5/1/2014	Under review now
Debris Management Plan	Date: 1/1/2019	Utilizes the County Plan
<u>Economic Development Plan</u>	Date:	
Transportation Plan	Date:	
Land-use Plan	Date:	
Flood Mitigation Assistance (FMA) Plan	Date:	
<u>Watershed Plan</u>	Date:	
Firewise or other fire mitigation plan	Date:	
Critical Facilities Plan (Mitigation/Response/Recovery)	Date: 09/15/2019	In process

Element	Yes, No, N/A	Comments and/or Weblink
Policies/Ordinance		
Zoning Ordinance		
Building Code	Version:	
Floodplain Ordinance	Date:	
Subdivision Ordinance		
Tree Trimming Ordinance		
Nuisance Ordinance		
Stormwater Ordinance		
Drainage Ordinance		
Site Plan Review Requirements		
Historic Preservation Ordinance		
Landscape Ordinance		
Program		
Zoning/Land Use Restrictions		
Codes Building Site/Design		
Hazard Awareness Program		
National Flood Insurance Program (NFIP)	Yes	
NFIP Community Rating System (CRS) program		If so, what is your current level rating?
National Weather Service (NWS) Storm Ready Certification		
Firewise Community Certification		
Building Code Effectiveness Grading (BCEGs)		
ISO Fire Rating	Rating: 6.9x	
Economic Development Program		
Land Use Program		
Public Education/Awareness		
Property Acquisition		
Planning/Zoning Boards		
Stream Maintenance Program		
Tree Trimming Program		
<u>Engineering Studies for Streams (Local/County/Regional)</u>		

Element	Yes, No, N/A	Comments and/or Weblink
Mutual Aid Agreements	Yes	
Studies/Reports/Maps		
<u>Hazard Analysis/Risk Assessment (City)</u>	Yes	Regional THIRA
<u>Hazard Analysis/Risk Assessment (County)</u>	Yes	Regional THIRA
Evacuation Route Map		
<u>Critical Facilities Inventory</u>		
<u>Vulnerable Population Inventory</u>		
<u>Land Use Map</u>		
Staff/Department		Full Time or Part Time?
Building Code Official		
Building Inspector		
Mapping Specialist (GIS)		
Engineer		
Development Planner		
Public Works Official		
Emergency Management Coordinator	County	
NFIP Floodplain Administrator		
Emergency Response Team		
Hazardous Materials Expert		
Local Emergency Planning Committee	Yes	
County Emergency Management Commission	No	
Sanitation Department		
Transportation Department		
Economic Development Department		
Housing Department		
Historic Preservation		
Non-Governmental Organizations (NGOs)	Is there a local chapter? Yes or No	
American Red Cross	No	Local Chapter is out of Quincy, IL
Salvation Army	No	
Veterans Groups	Yes	

Element	Yes, No, N/A	Comments and/or Weblink
Local Environmental Organization		
Homeowner Associations	No	
Neighborhood Associations	No	
Chamber of Commerce	Yes	
Community Organizations (Lions, Kiwanis, etc.)	Yes	
Financial Resources		Is your jurisdiction able to? Yes or No
Apply for Community Development Block Grants		Yes
Fund projects thru Capital Improvements funding		
Authority to levy taxes for specific purposes		Yes
Fees for water, sewer, gas, or electric services		Yes
Impact fees for new development		
Incur debt through general obligation bonds		
Incur debt through special tax bonds		
Incur debt through private activities		
Withhold spending in hazard prone areas		

For plan updates, the plan maintenance process outlined in your previous plan requires all participating jurisdictions to incorporate the requirements of the mitigation plan into other planning mechanisms, when appropriate. A key element of effective implementation of mitigation is for the mitigation plan to be incorporated in existing authorities, policies, programs, and resources. Next to each applicable planning mechanism, indicate how your jurisdiction incorporated the previous mitigation plan. If no incorporation has occurred, please explain, including background information detailing any challenges preventing incorporation.

Planning Capabilities	Method of Incorporation Since Previous Plan or Challenges Preventing Incorporation
Comprehensive Plan	
Builder's Plan	
Capital Improvement Plan	
Local Recovery Plan	
County Recovery Plan	
Debris Management Plan	
Economic Development Plan	
Transportation Plan	
Land-use Plan	
Watershed Plan	
Firewise or other Fire Mitigation Plan such as Community Wildfire Protection Plan	

Additional Questions

1. How is your government structure organized? (Commission, Mayor/City Council, how many members)
Mayor -
City Council – 4 members
Clerk

2. List any past or ongoing public education or information programs, such as for responsible water use, fire safety, household preparedness, or environmental education.
Public awareness with first responder agencies

3. List any other past or ongoing projects or programs designed to reduce disaster losses, these may include projects to protect critical facilities. Be sure to include pending or approved projects submitted for FEMA mitigation grants.
Recurrent grant work on blight mitigation,
Coordination with outside agencies and conducting training and exercises.

4. Describe any hazard-related concerns or issues regarding the vulnerability of special needs populations, such as the elderly, disabled, low-income, or migrant farm workers.
Evacuation and sheltering concerns of a large low-income/elderly population
Mass notification of vulnerable populations

5. How many outdoor warning sirens are in your community?
None

How are they activated (indicate responsible department/personnel)?
NA

6. Does your community utilize any other warning systems such as Cable Override, Reverse 911, etc? If so, please describe.
No

7. Does your community have designated public tornado shelters/saferooms? If so, are they constructed in accordance with FEMA standards?
No

Please provide address locations:

8. List residential, commercial and industrial development in your jurisdiction since last plan update.

9. Describe development trends and expected growth areas. Is any new development expected to occur in the 100-year floodplain? Is any new development expected to occur in any other known hazard areas? If possible, please provide a map indicating potential/planned growth areas.

No specific development and growth trends are noted. No new development in 100-year floodplain. No new development in specific hazard area.

10. Are any new facilities or infrastructure planned for construction during the next five years? If so, please provide facility name and purpose along with proposed locations, if known.

New business development along 136 on the southern edge of city limits (Dollar General and Nicks Farm & Home). Ongoing ag related development, no location specified.

11. Please list major employers in your jurisdiction with an estimated number of employees.

Commuter/Farm Community

12. Please list Mitigation Planning Committee members who served during the development of the previously approved plan. Was the process set forth for monitoring the implementation of the previously approved mitigation plan adhered to? Did the Committee meet as was specified in the previously approved plan? Why or why not?

No previous membership

13. Describe your jurisdiction's participation in the NFIP. Include information about how compliance with the NFIP is enforced locally.

Member, no active compliance measures

VULNERABILITY ASSESSMENT

The purpose of this worksheet is to assess the vulnerable buildings, populations, critical facilities, infrastructure, and other important assets in your community by using the best available data to complete the table. Use the table on the next page to compile a detailed inventory of specific assets at risk including critical facilities and infrastructure; natural, cultural, and historical assets; and economic assets. In the natural hazard column of the asset inventory table, indicate (by assigned abbreviation) which of the following hazards the asset is vulnerable to:

Natural Hazards	
Flooding (Major & Flash) – RF	Drought - D
Levee Failure – LF	Extreme Temperature - ET
Dam Failure – DF	Severe Thunderstorm (incl. winds, hail, lightning) - ST
Earthquake – EQ	Severe Winter Weather (incl. snow, ice, severe cold) - SWW
Land Subsidence / Sinkholes - LSS	Tornadoes - T
	Wildfire - WF

Critical Facilities and Infrastructure

A critical facility may be defined as one that is essential in providing utility or direction either during the response to an emergency or during the recovery operation. FEMA's HAZUS-MH loss estimation software uses the following three categories of critical assets. 'Essential facilities' are those that if damaged would have devastating impacts on disaster response and/or recovery. 'High potential loss facilities' are those that would have a high loss or impact on the community. Transportation and lifeline facilities are third category of critical assets; examples are provided below.

Essential Facilities

Hospitals and other
medical facilities
Police stations
Fire station
Emergency Operations
Centers

High Potential Loss Facilities

Power plants
Dams/levees
Military installations
Hazardous material sites
Schools
Shelters
Day care centers
Nursing homes
Main government buildings

Transportation and Lifeline

Highways, bridges, and tunnels
Railroads and facilities
Bus facilities
Airports
Water treatment facilities
Natural gas facilities and
pipelines
Oil facilities and pipelines
Communications facilities

Economic Assets

Economic assets at risk may include major employers or primary economic sectors, such as agriculture, whose losses or inoperability would have severe impacts on the community and its ability to recover from disaster.

Asset Inventory

Please list critical facilities and other community assets, the square feet, values, and occupancy/capacity. If not applicable, enter "N/A". In the last column, use the codes from the previous page to indicate hazards to which the asset is vulnerable. Add as many rows as needed. If this information is available in GIS format, please provide.

Critical Facilities

Name of Asset	Address	Area (sq.ft.)	Replacement Value (Insured) (\$)	Contents Value (\$)	Occupancy/ Capacity (#)	Natural Hazards
<u>Essential Facilities</u> such as hospitals and other medical facilities, police and fire stations, Emergency Operations Centers						
<u>High Potential Loss Facilities</u> such as power plants, dams/levees, military installations, hazardous materials sites, shelters, day care centers, nursing homes, main government buildings (Do not include schools—they will be reported by the school districts)						

Name of Asset	Address	Area (sq.ft.)	Replacement Value (Insured) (\$)	Contents Value (\$)	Occupancy/ Capacity (#)	Natural Hazards
City Hall	250 N Morgan Wyaconda, MO		350K			RF, EQ, T, SWW, ST
Daycare 1	Throughout City					RF, EQ, T, SWW, ST
Daycare 2	Throughout City					RF, EQ, T, SWW, ST
Transportation and Lifelines such as highways, bridges, and tunnels, railroads and facilities, bus facilities, airports, water treatment facilities, natural gas facilities and pipelines, oil facilities, oil facilities and pipelines, communications facilities						
BNSF Railroad						RF, EQ, T

*If replacement cost data is not available, use the best available data (assessed valuation or other method for estimating cost) and explain any data deficiencies.

Economic Assets (Major Employers, etc)

Asset	Address	Product/ Service	Value (if known)	Number of Employees	Hazards

HISTORIC HAZARD EVENTS

Please fill out the sheet on the next page for each significant hazard event that affected **Your Jurisdiction**. **Make as many copies as necessary to record all events** and complete with as much detail as possible. This includes all events associated with the hazards listed below that have caused previous damage in your jurisdiction. It is especially important to capture events that either were not included in the previous Hazard Mitigation Plan or occurred since the plan was completed. Attach supporting documentation, photocopies of newspaper articles, or other original sources.

Jurisdiction	
Type of event	
Nature and magnitude of event	
Location	
Date of event	
Injuries	
Deaths	
Property damage	
Infrastructure damage	
Crop damage	
Business/economic impacts	
Road/school/other closures	
Other damage	
Insured losses	
Federal/state disaster relief funding	
Source of information	
Comments	

HISTORIC HAZARD EVENTS (continued)

Please fill out the sheet on the next page for each significant hazard event that affected **Your Jurisdiction**. **Make as many copies as necessary to record all events** and complete with as much detail as possible. This includes all events associated with the hazards listed below that have caused previous damage in your jurisdiction. It is especially important to capture events that either were not included in the previous Hazard Mitigation Plan or occurred since the plan was completed. Attach supporting documentation, photocopies of newspaper articles, or other original sources.

Jurisdiction	
Type of event	
Nature and magnitude of event	
Location	
Date of event	
Injuries	
Deaths	
Property damage	
Infrastructure damage	
Crop damage	
Business/economic impacts	
Road/school/other closures	
Other damage	
Insured losses	
Federal/state disaster relief funding	
Source of information	
Comments	

ASSESSMENT OF PREVIOUSLY PROPOSED ACTIONS

Jurisdiction: City of Wyaconda

The contractor/plan development facilitator has provided a list of actions proposed in the previously approved plan for each jurisdiction. Use the worksheet below to evaluate whether each action is still current, feasible, desirable, and/or creates benefit that outweighs the cost.

The worksheet should include information on the status of the action and progress made in implementation, if any. This includes:

- For **completed actions** provide a description of the implementation process. This may be a success story you would like to publicize in your community.
- Some of the actions might have been **ongoing** in nature, such public information and education programs. When this is the case, indicate what activity has occurred during the previous five years, and indicate if this program is still viable enough that it should be carried on into the future.
- If **no progress** has been made in the implementation of a given action, discuss why. Note that implementation is not a requirement. However, if no progress has been made, perhaps this is an action that would be appropriate to delete in the updated plan.

During review of the previously approved actions, consider whether any new actions should be proposed. Perhaps damages from a recent hazard event have indicated the need for new approaches to protect property and life. Review the problem statements from the updated plan for ideas. Also review the FEMA publication *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards (January 2013)*.

#	Action	Status		Description of Implementation Activities or Reasons for Lack of Progress	Keep – ✓ Delete – X Modify – M
		Complete	Ongoing	No Progress	

#	Action	Status			Description of Implementation Activities or Reasons for Lack of Progress	Keep – ✓ Delete – X Modify – M
		Complete	Ongoing	No Progress		

Multi-Jurisdictional Hazard Mitigation Plan

Data Collection Questionnaire

For Local Governments

2019 01 2019

County: CLARK

Jurisdiction: ALEXANDRIA

Return by: MAYOR RONALD GATES

Please complete this data collection questionnaire as accurately and completely as possible as this information will appear in the mitigation plan. A data collection questionnaire must be completed for each "jurisdiction" that wishes to be included in the plan. According to FEMA's definition a jurisdiction is any local government, including counties, municipalities, cities, towns, school districts, special districts, councils of government, and tribal organizations. Any of these entities as well as publicly funded colleges and universities that do not participate in the planning process **will not** be eligible applicants for FEMA mitigation funding programs. Please note: School Districts and other Educational Institutions should complete the Data Collection Questionnaire indicated "For School Districts and Educational Institutions".

Prepared by: RONALD GATES

Phone: 660-341-1700

Email: _____

Date: 3-28-19

Please return questionnaires by mail, email, or fax to:

Name: Derek Weber, Executive Director NEMO RPC

Address: 121 S. Cecil St, Memphis, MO 63555

Email: derekweber@nemorpc.org

Fax: (660)465-7163

CAPABILITY ASSESSMENT & INCORPORATION OF EXISTING PLANS, STUDIES, REPORTS AND TECHNICAL INFORMATION

The purpose of this section is to collect information to document existing capabilities as well as determine existing plans, studies, reports, and technical information that may need to be incorporated in the mitigation plan. Although some of this information may have been captured in your previous mitigation plan, it is important to ensure this information is current in the plan update

Please indicate which of the following your jurisdiction has in place. For elements that do not pertain to your type of public entity, please indicate with "N/A". If applicable, please provide a completion date for the element. If your jurisdiction does not have a particular element, and a higher level of government has the authority pertaining to your jurisdiction, please indicate this in the comments column. If your jurisdiction has any of the **underlined and bolded** elements, please provide a copy of the document to the contact listed on the front and indicate method in the comments column (i.e. available on the web, will email or mail).

Element	Yes, No, N/A	Comments and/or Weblink
Planning Capabilities		
<u>Comprehensive Plan</u>	Date:	
Builder's Plan	Date:	
Capital Improvement Plan	Date:	
City Emergency Operations Plan	Date:	
County Emergency Operations Plan	Date:	
Local Recovery Plan	Date:	
County Recovery Plan	Date:	
City Mitigation Plan	Date:	
County Mitigation Plan	Date:	
Debris Management Plan	Date:	
<u>Economic Development Plan</u>	Date:	
Transportation Plan	Date:	
Land-use Plan	Date:	
Flood Mitigation Assistance (FMA) Plan	Date:	
<u>Watershed Plan</u>	Date:	
Firewise or other fire mitigation plan	Date:	
Critical Facilities Plan (Mitigation/Response/Recovery)	Date:	

Element	Yes, No, N/A	Comments and/or Weblink
Policies/Ordinance		
Zoning Ordinance	NO	
Building Code	Version: NO	
Floodplain Ordinance	Date: NO	
Subdivision Ordinance	NO	
Tree Trimming Ordinance	NO	
Nuisance Ordinance	YES	
Stormwater Ordinance	NO	
Drainage Ordinance	NO	
Site Plan Review Requirements	NO	
Historic Preservation Ordinance	NO	
Landscape Ordinance	NO	
Program		
Zoning/Land Use Restrictions	NO	
Codes Building Site/Design	NO	
Hazard Awareness Program	NO	
National Flood Insurance Program (NFIP)	YES	
NFIP Community Rating System (CRS) program	NO	If so, what is your current level rating?
National Weather Service (NWS) Storm Ready Certification	NO	
Firewise Community Certification	NO	
Building Code Effectiveness Grading (BCEGs)	NO	
ISO Fire Rating	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	

Element	Yes, No, N/A	Comments and/or Weblink
Mutual Aid Agreements	NO	
Studies/Reports/Maps		
<u>Hazard Analysis/Risk Assessment (City)</u>	NO	
<u>Hazard Analysis/Risk Assessment (County)</u>	NO	
Evacuation Route Map	NO	
<u>Critical Facilities Inventory</u>	NO	
<u>Vulnerable Population Inventory</u>	NO	
<u>Land Use Map</u>		
Staff/Department		Full Time or Part Time?
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	PART TIME
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	
Historic Preservation	NO	
Non-Governmental Organizations (NGOs)	Is there a local chapter? Yes or No	
American Red Cross	NO	
Salvation Army	NO	
Veterans Groups	NO	

Element	Yes, No, N/A	Comments and/or Weblink
Local Environmental Organization	NO	
Homeowner Associations	NO	
Neighborhood Associations	NO	
Chamber of Commerce	NO	
Community Organizations (Lions, Kiwanis, etc.)	NO	
Financial Resources		Is your jurisdiction able to? Yes or No
Apply for Community Development Block Grants	NO	
Fund projects thru Capital Improvements funding	NO	
Authority to levy taxes for specific purposes	NO	
Fees for water, sewer, gas, or electric services	NO	
Impact fees for new development	NO	
Incur debt through general obligation bonds	NO	
Incur debt through special tax bonds	NO	
Incur debt through private activities	NO	
Withhold spending in hazard prone areas	NO	

For plan updates, the plan maintenance process outlined in your previous plan requires all participating jurisdictions to incorporate the requirements of the mitigation plan into other planning mechanisms, when appropriate. A key element of effective implementation of mitigation is for the mitigation plan to be incorporated in existing authorities, policies, programs, and resources. Next to each applicable planning mechanism, indicate how your jurisdiction incorporated the previous mitigation plan. If no incorporation has occurred, please explain, including background information detailing any challenges preventing incorporation.

Planning Capabilities	Method of Incorporation Since Previous Plan or Challenges Preventing Incorporation
Comprehensive Plan	
Builder's Plan	
Capital Improvement Plan	
Local Recovery Plan	
County Recovery Plan	
Debris Management Plan	
Economic Development Plan	
Transportation Plan	
Land-use Plan	
Watershed Plan	
Firewise or other Fire Mitigation Plan such as Community Wildfire Protection Plan	

Additional Questions

1. How is your government structure organized? (Commission, Mayor/City Council, how many members)

MAYOR 1 ALDEMAN 4 SECRETARY 1

2. List any past or ongoing public education or information programs, such as for responsible water use, fire safety, household preparedness, or environmental education.

NONE

3. List any other past or ongoing projects or programs designed to reduce disaster losses, these may include projects to protect critical facilities. Be sure to include pending or approved projects submitted for FEMA mitigation grants.

NONE

4. Describe any hazard-related concerns or issues regarding the vulnerability of special needs populations, such as the elderly, disabled, low-income, or migrant farm workers.

NONE

5. How many outdoor warning sirens are in your community?

ONE

How are they activated (indicate responsible department/personnel)?

FIRE DEPARTMENT

6. Does your community utilize any other warning systems such as Cable Override, Reverse 911, etc? If so, please describe.

NONE

7. Does your community have designated public tornado shelters/saferooms? If so, are they constructed in accordance with FEMA standards?

NONE

Please provide address locations:

8. List residential, commercial and industrial development in your jurisdiction since last plan update.

None

9. Describe development trends and expected growth areas. Is any new development expected to occur in the 100-year floodplain? Is any new development expected to occur in any other known hazard areas? If possible, please provide a map indicating potential/planned growth areas.

None

10. Are any new facilities or infrastructure planned for construction during the next five years? If so, please provide facility name and purpose along with proposed locations, if known.

NO

11. Please list major employers in your jurisdiction with an estimated number of employees.

None

12. Please list Mitigation Planning Committee members who served during the development of the previously approved plan. Was the process set forth for monitoring the implementation of the previously approved mitigation plan adhered to? Did the Committee meet as was specified in the previously approved plan? Why or why not?

N/A

13. Describe your jurisdiction's participation in the NFIP. Include information about how compliance with the NFIP is enforced locally.

N/A

VULNERABILITY ASSESSMENT

The purpose of this worksheet is to assess the vulnerable buildings, populations, critical facilities, infrastructure, and other important assets in your community by using the best available data to complete the table. Use the table on the next page to compile a detailed inventory of specific assets at risk including critical facilities and infrastructure; natural, cultural, and historical assets; and economic assets. In the natural hazard column of the asset inventory table, indicate (by assigned abbreviation) which of the following hazards the asset is vulnerable to:

Natural Hazards	
Flooding (Major & Flash) - RF	Drought - D
Levee Failure - LF	Extreme Temperature - ET
Dam Failure - DF	Severe Thunderstorm (incl. winds, hail, lightning) - ST
Earthquake - EQ	Severe Winter Weather (incl. snow, ice, severe cold) - SWW
Land Subsidence / Sinkholes - LSS	Tornadoes - T
	Wildfire - WF

Critical Facilities and Infrastructure

A critical facility may be defined as one that is essential in providing utility or direction either during the response to an emergency or during the recovery operation. FEMA's HAZUS-MH loss estimation software uses the following three categories of critical assets. 'Essential facilities' are those that if damaged would have devastating impacts on disaster response and/or recovery. 'High potential loss facilities' are those that would have a high loss or impact on the community. Transportation and lifeline facilities are third category of critical assets; examples are provided below.

Essential Facilities

Hospitals and other
medical facilities
Police stations
Fire station
Emergency Operations
Centers

High Potential Loss Facilities

Power plants
Dams/levees
Military installations
Hazardous material sites
Schools
Shelters
Day care centers
Nursing homes
Main government buildings

Transportation and Lifeline

Highways, bridges, and tunnels
Railroads and facilities
Bus facilities
Airports
Water treatment facilities
Natural gas facilities and
pipelines
Oil facilities and pipelines
Communications facilities

Economic Assets

Economic assets at risk may include major employers or primary economic sectors, such as agriculture, whose losses or inoperability would have severe impacts on the community and its ability to recover from disaster.

Asset Inventory

Please list critical facilities and other community assets, the square feet, values, and occupancy/capacity. If not applicable, enter "N/A"). In the last column, use the codes from the previous page to indicate hazards to which the asset is vulnerable. Add as many rows as needed. If this information is available in GIS format, please provide.

Critical Facilities

[illegible]

HISTORIC HAZARD EVENTS

Please fill out the sheet on the next page for each significant hazard event that affected **Your Jurisdiction**. **Make as many copies as necessary to record all events** and complete with as much detail as possible. This includes all events associated with the hazards listed below that have caused previous damage in your jurisdiction. It is especially important to capture events that either were not included in the previous Hazard Mitigation Plan or occurred since the plan was completed. Attach supporting documentation, photocopies of newspaper articles, or other original sources.

Jurisdiction	
Type of event	
Nature and magnitude of event	
Location	
Date of event	
Injuries	
Deaths	
Property damage	
Infrastructure damage	
Crop damage	
Business/economic impacts	
Road/school/other closures	
Other damage	
Insured losses	
Federal/state disaster relief funding	
Source of information	
Comments	

HISTORIC HAZARD EVENTS (continued)

Please fill out the sheet on the next page for each significant hazard event that affected **Your Jurisdiction**. **Make as many copies as necessary to record all events** and complete with as much detail as possible. This includes all events associated with the hazards listed below that have caused previous damage in your jurisdiction. It is especially important to capture events that either were not included in the previous Hazard Mitigation Plan or occurred since the plan was completed. Attach supporting documentation, photocopies of newspaper articles, or other original sources.

Jurisdiction	
Type of event	
Nature and magnitude of event	
Location	
Date of event	
Injuries	
Deaths	
Property damage	
Infrastructure damage	
Crop damage	
Business/economic impacts	
Road/school/other closures	
Other damage	
Insured losses	
Federal/state disaster relief funding	
Source of information	
Comments	

Multi-Jurisdictional Hazard Mitigation Plan
Data Collection Questionnaire
For Local Governments

County: Clark County _____

Jurisdiction: City of Revere _____

Return by: _____

Please complete this data collection questionnaire as accurately and completely as possible as this information will appear in the mitigation plan. A data collection questionnaire must be completed for each "jurisdiction" that wishes to be included in the plan. According to FEMA's definition a jurisdiction is any local government, including counties, municipalities, cities, towns, school districts, special districts, councils of government, and tribal organizations. Any of these entities as well as publicly funded colleges and universities that do not participate in the planning process **will not** be eligible applicants for FEMA mitigation funding programs. Please note: School Districts and other Educational Institutions should complete the Data Collection Questionnaire indicated "For School Districts and Educational Institutions".

Prepared by: Christopher Blomgren _____

Phone: 660-342-3962 _____

Email: clarkclarkcounty.mo.em@gmail.com _____

Date: _____

Please return questionnaires by mail, email, or fax to:

Name: Derek Weber, Executive Director NEMO RPC

Address: 121 S. Cecil St, Memphis, MO 63555

Email: derekweber@nemorpc.org

Fax: (660)465-7163

CAPABILITY ASSESSMENT & INCORPORATION OF EXISTING PLANS, STUDIES, REPORTS AND TECHNICAL INFORMATION

The purpose of this section is to collect information to document existing capabilities as well as determine existing plans, studies, reports, and technical information that may need to be incorporated in the mitigation plan. Although some of this information may have been captured in your previous mitigation plan, it is important to ensure this information is current in the plan update

Please indicate which of the following your jurisdiction has in place. For elements that do not pertain to your type of public entity, please indicate with "N/A". If applicable, please provide a completion date for the element. If your jurisdiction does not have a particular element, and a higher level of government has the authority pertaining to your jurisdiction, please indicate this in the comments column. If your jurisdiction has any of the **underlined and bolded** elements, please provide a copy of the document to the contact listed on the front and indicate method in the comments column (i.e. available on the web, will email or mail).

Element	Yes, No, N/A	Comments and/or Weblink
Planning Capabilities		
<u>Comprehensive Plan</u>	Date:	
Builder's Plan	Date:	
Capital Improvement Plan	Date:	
City Emergency Operations Plan	Date: 8/15/2019	Uses County Plan
County Emergency Operations Plan	Date: 1/1/2019	Updated and approved
Local Recovery Plan	Date:	
County Recovery Plan	Date:	
City Mitigation Plan	Date: 5/1/2014	County wide plan
County Mitigation Plan	Date: 5/1/2014	Under review now
Debris Management Plan	Date: 1/1/2019	Utilizes the County Plan
<u>Economic Development Plan</u>	Date:	
Transportation Plan	Date:	
Land-use Plan	Date:	
Flood Mitigation Assistance (FMA) Plan	Date:	
<u>Watershed Plan</u>	Date:	
Firewise or other fire mitigation plan	Date:	
Critical Facilities Plan (Mitigation/Response/Recovery)	Date: 09/15/2019	In process

Element	Yes, No, N/A	Comments and/or Weblink
Policies/Ordinance		
Zoning Ordinance		
Building Code	Version:	
Floodplain Ordinance	Date:	
Subdivision Ordinance		
Tree Trimming Ordinance		
Nuisance Ordinance		
Stormwater Ordinance		
Drainage Ordinance		
Site Plan Review Requirements		
Historic Preservation Ordinance		
Landscape Ordinance		
Program		
Zoning/Land Use Restrictions		
Codes Building Site/Design		
Hazard Awareness Program		
National Flood Insurance Program (NFIP)	Yes	
NFIP Community Rating System (CRS) program		If so, what is your current level rating?
National Weather Service (NWS) Storm Ready Certification		
Firewise Community Certification		
Building Code Effectiveness Grading (BCEGs)		
ISO Fire Rating	Rating: 6.9x	
Economic Development Program		
Land Use Program		
Public Education/Awareness		
Property Acquisition		
Planning/Zoning Boards		
Stream Maintenance Program		
Tree Trimming Program		
<u>Engineering Studies for Streams (Local/County/Regional)</u>		

Element	Yes, No, N/A	Comments and/or Weblink
Mutual Aid Agreements	Yes	
Studies/Reports/Maps		
<u>Hazard Analysis/Risk Assessment (City)</u>	Yes	Regional THIRA
<u>Hazard Analysis/Risk Assessment (County)</u>	Yes	Regional THIRA
Evacuation Route Map		
<u>Critical Facilities Inventory</u>		
<u>Vulnerable Population Inventory</u>		
<u>Land Use Map</u>		
Staff/Department		Full Time or Part Time?
Building Code Official		
Building Inspector		
Mapping Specialist (GIS)		
Engineer		
Development Planner		
Public Works Official		
Emergency Management Coordinator	County	
NFIP Floodplain Administrator		
Emergency Response Team		
Hazardous Materials Expert		
Local Emergency Planning Committee	Yes	
County Emergency Management Commission	No	
Sanitation Department		
Transportation Department		
Economic Development Department		
Housing Department		
Historic Preservation		
Non-Governmental Organizations (NGOs)	Is there a local chapter? Yes or No	
American Red Cross	No	Local Chapter is out of Quincy, IL
Salvation Army	No	
Veterans Groups	Yes	

Element	Yes, No, N/A	Comments and/or Weblink
Local Environmental Organization		
Homeowner Associations	No	
Neighborhood Associations	No	
Chamber of Commerce	Yes	
Community Organizations (Lions, Kiwanis, etc.	Yes	
Financial Resources		Is your jurisdiction able to? Yes or No
Apply for Community Development Block Grants		Yes
Fund projects thru Capital Improvements funding		
Authority to levy taxes for specific purposes		Yes
Fees for water, sewer, gas, or electric services		Yes
Impact fees for new development		
Incur debt through general obligation bonds		
Incur debt through special tax bonds		
Incur debt through private activities		
Withhold spending in hazard prone areas		

For plan updates, the plan maintenance process outlined in your previous plan requires all participating jurisdictions to incorporate the requirements of the mitigation plan into other planning mechanisms, when appropriate. A key element of effective implementation of mitigation is for the mitigation plan to be incorporated in existing authorities, policies, programs, and resources. Next to each applicable planning mechanism, indicate how your jurisdiction incorporated the previous mitigation plan. If no incorporation has occurred, please explain, including background information detailing any challenges preventing incorporation.

Planning Capabilities	Method of Incorporation Since Previous Plan or Challenges Preventing Incorporation
Comprehensive Plan	
Builder's Plan	
Capital Improvement Plan	
Local Recovery Plan	
County Recovery Plan	
Debris Management Plan	
Economic Development Plan	
Transportation Plan	
Land-use Plan	
Watershed Plan	
Firewise or other Fire Mitigation Plan such as Community Wildfire Protection Plan	

Additional Questions

1. How is your government structure organized? (Commission, Mayor/City Council, how many members)
Mayor -
City Council – 4 members
Clerk

2. List any past or ongoing public education or information programs, such as for responsible water use, fire safety, household preparedness, or environmental education.
Public awareness with first responder agencies

3. List any other past or ongoing projects or programs designed to reduce disaster losses, these may include projects to protect critical facilities. Be sure to include pending or approved projects submitted for FEMA mitigation grants.
Recurrent grant work on blight mitigation,
Coordination with outside agencies and conducting training and exercises.

4. Describe any hazard-related concerns or issues regarding the vulnerability of special needs populations, such as the elderly, disabled, low-income, or migrant farm workers.
Evacuation and sheltering concerns of a large low-income/elderly population
Mass notification of vulnerable populations

5. How many outdoor warning sirens are in your community?
None

How are they activated (indicate responsible department/personnel)?
NA

6. Does your community utilize any other warning systems such as Cable Override, Reverse 911, etc? If so, please describe.
No

7. Does your community have designated public tornado shelters/saferooms? If so, are they constructed in accordance with FEMA standards?
No

Please provide address locations:

8. List residential, commercial and industrial development in your jurisdiction since last plan update.

9. Describe development trends and expected growth areas. Is any new development expected to occur in the 100-year floodplain? Is any new development expected to occur in any other known hazard areas? If possible, please provide a map indicating potential/planned growth areas.

No specific development and growth trends are noted. No new development in 100-year floodplain. No new development in specific hazard area.

10. Are any new facilities or infrastructure planned for construction during the next five years? If so, please provide facility name and purpose along with proposed locations, if known.

New business development along 136 on the southern edge of city limits (Dollar General and Nicks Farm & Home). Ongoing ag related development, no location specified.

11. Please list major employers in your jurisdiction with an estimated number of employees.

Commuter/Farm Community

12. Please list Mitigation Planning Committee members who served during the development of the previously approved plan. Was the process set forth for monitoring the implementation of the previously approved mitigation plan adhered to? Did the Committee meet as was specified in the previously approved plan? Why or why not?

No previous membership

13. Describe your jurisdiction's participation in the NFIP. Include information about how compliance with the NFIP is enforced locally.

Member, no active compliance measures

VULNERABILITY ASSESSMENT

The purpose of this worksheet is to assess the vulnerable buildings, populations, critical facilities, infrastructure, and other important assets in your community by using the best available data to complete the table. Use the table on the next page to compile a detailed inventory of specific assets at risk including critical facilities and infrastructure; natural, cultural, and historical assets; and economic assets. In the natural hazard column of the asset inventory table, indicate (by assigned abbreviation) which of the following hazards the asset is vulnerable to:

Natural Hazards	
Flooding (Major & Flash) – RF	Drought - D
Levee Failure – LF	Extreme Temperature - ET
Dam Failure – DF	Severe Thunderstorm (incl. winds, hail, lightning) - ST
Earthquake – EQ	Severe Winter Weather (incl. snow, ice, severe cold) - SWW
Land Subsidence / Sinkholes - LSS	Tornadoes - T
	Wildfire - WF

Critical Facilities and Infrastructure

A critical facility may be defined as one that is essential in providing utility or direction either during the response to an emergency or during the recovery operation. FEMA's HAZUS-MH loss estimation software uses the following three categories of critical assets. 'Essential facilities' are those that if damaged would have devastating impacts on disaster response and/or recovery. 'High potential loss facilities' are those that would have a high loss or impact on the community. Transportation and lifeline facilities are third category of critical assets; examples are provided below.

Essential Facilities

Hospitals and other
medical facilities
Police stations
Fire station
Emergency Operations
Centers

High Potential Loss Facilities

Power plants
Dams/levees
Military installations
Hazardous material sites
Schools
Shelters
Day care centers
Nursing homes
Main government buildings

Transportation and Lifeline

Highways, bridges, and tunnels
Railroads and facilities
Bus facilities
Airports
Water treatment facilities
Natural gas facilities and
pipelines
Oil facilities and pipelines
Communications facilities

Economic Assets

Economic assets at risk may include major employers or primary economic sectors, such as agriculture, whose losses or inoperability would have severe impacts on the community and its ability to recover from disaster.

Asset Inventory

Please list critical facilities and other community assets, the square feet, values, and occupancy/capacity. If not applicable, enter "N/A". In the last column, use the codes from the previous page to indicate hazards to which the asset is vulnerable. Add as many rows as needed. If this information is available in GIS format, please provide.

Critical Facilities

Name of Asset	Address	Area (sq.ft.)	Replacement Value (Insured) (\$)	Contents Value (\$)	Occupancy/ Capacity (#)	Natural Hazards
<u>Essential Facilities</u> such as hospitals and other medical facilities, police and fire stations, Emergency Operations Centers						
<u>High Potential Loss Facilities</u> such as power plants, dams/levees, military installations, hazardous materials sites, shelters, day care centers, nursing homes, main government buildings (Do not include schools—they will be reported by the school districts)						

Name of Asset	Address	Area (sq. ft.)	Replacement Value (Insured) (\$)	Contents Value (\$)	Occupancy/ Capacity (#)	Natural Hazards
City Hall	250 N Morgan Revere, MO		350K			RF, EQ, T, SWW, ST
Daycare 1	Throughout City					RF, EQ, T, SWW, ST
Daycare 2	Throughout City					RF, EQ, T, SWW, ST
Transportation and Lifelines such as highways, bridges, and tunnels; railroads and facilities, bus facilities, airports, water treatment facilities, natural gas facilities and pipelines, oil facilities, oil facilities and pipelines, communications facilities						
Highway 81						RF, EQ, T

*If replacement cost data is not available, use the best available data (assessed valuation or other method for estimating cost) and explain any data deficiencies.

Economic Assets (Major Employers, etc)

Asset	Address	Product/ Service	Value (if known)	Number of Employees	Hazards

HISTORIC HAZARD EVENTS

Please fill out the sheet on the next page for each significant hazard event that affected **Your Jurisdiction**. **Make as many copies as necessary to record all events** and complete with as much detail as possible. This includes all events associated with the hazards listed below that have caused previous damage in your jurisdiction. It is especially important to capture events that either were not included in the previous Hazard Mitigation Plan or occurred since the plan was completed. Attach supporting documentation, photocopies of newspaper articles, or other original sources.

Jurisdiction	
Type of event	
Nature and magnitude of event	
Location	
Date of event	
Injuries	
Deaths	
Property damage	
Infrastructure damage	
Crop damage	
Business/economic impacts	
Road/school/other closures	
Other damage	
Insured losses	
Federal/state disaster relief funding	
Source of information	
Comments	

HISTORIC HAZARD EVENTS (continued)

Please fill out the sheet on the next page for each significant hazard event that affected **Your Jurisdiction**. **Make as many copies as necessary to record all events** and complete with as much detail as possible. This includes all events associated with the hazards listed below that have caused previous damage in your jurisdiction. It is especially important to capture events that either were not included in the previous Hazard Mitigation Plan or occurred since the plan was completed. Attach supporting documentation, photocopies of newspaper articles, or other original sources.

Jurisdiction	
Type of event	
Nature and magnitude of event	
Location	
Date of event	
Injuries	
Deaths	
Property damage	
Infrastructure damage	
Crop damage	
Business/economic impacts	
Road/school/other closures	
Other damage	
Insured losses	
Federal/state disaster relief funding	
Source of information	
Comments	

Multi-Jurisdictional Hazard Mitigation Plan
Data Collection Questionnaire
For Local Governments

County: Clark County _____

Jurisdiction: City of Luray _____

Return by: _____

Please complete this data collection questionnaire as accurately and completely as possible as this information will appear in the mitigation plan. A data collection questionnaire must be completed for each "jurisdiction" that wishes to be included in the plan. According to FEMA's definition a jurisdiction is any local government, including counties, municipalities, cities, towns, school districts, special districts, councils of government, and tribal organizations. Any of these entities as well as publicly funded colleges and universities that do not participate in the planning process **will not** be eligible applicants for FEMA mitigation funding programs. Please note: School Districts and other Educational Institutions should complete the Data Collection Questionnaire indicated "For School Districts and Educational Institutions".

Prepared by: Christopher Blomgren _____

Phone: 660-342-3962 _____

Email: clarkclarkcounty.mo.em@gmail.com _____

Date: _____

Please return questionnaires by mail, email, or fax to:

Name: Derek Weber, Executive Director NEMO RPC

Address: 121 S. Cecil St, Memphis, MO 63555

Email: derekweber@nemorpc.org

Fax: (660)465-7163

CAPABILITY ASSESSMENT & INCORPORATION OF EXISTING PLANS, STUDIES, REPORTS AND TECHNICAL INFORMATION

The purpose of this section is to collect information to document existing capabilities as well as determine existing plans, studies, reports, and technical information that may need to be incorporated in the mitigation plan. Although some of this information may have been captured in your previous mitigation plan, it is important to ensure this information is current in the plan update

Please indicate which of the following your jurisdiction has in place. For elements that do not pertain to your type of public entity, please indicate with "N/A". If applicable, please provide a completion date for the element. If your jurisdiction does not have a particular element, and a higher level of government has the authority pertaining to your jurisdiction, please indicate this in the comments column. If your jurisdiction has any of the **underlined and bolded** elements, please provide a copy of the document to the contact listed on the front and indicate method in the comments column (i.e. available on the web, will email or mail).

Element	Yes, No, N/A	Comments and/or Weblink
Planning Capabilities		
<u>Comprehensive Plan</u>	Date:	
Builder's Plan	Date:	
Capital Improvement Plan	Date:	
City Emergency Operations Plan	Date: 8/15/2019	Uses County Plan
County Emergency Operations Plan	Date: 1/1/2019	Updated and approved
Local Recovery Plan	Date:	
County Recovery Plan	Date:	
City Mitigation Plan	Date: 5/1/2014	County wide plan
County Mitigation Plan	Date: 5/1/2014	Under review now
Debris Management Plan	Date: 1/1/2019	Utilizes the County Plan
<u>Economic Development Plan</u>	Date:	
Transportation Plan	Date:	
Land-use Plan	Date:	
Flood Mitigation Assistance (FMA) Plan	Date:	
<u>Watershed Plan</u>	Date:	
Firewise or other fire mitigation plan	Date:	
Critical Facilities Plan (Mitigation/Response/Recovery)	Date: 09/15/2019	In process

Element	Yes, No, N/A	Comments and/or Weblink
Policies/Ordinance		
Zoning Ordinance		
Building Code	Version:	
Floodplain Ordinance	Date:	
Subdivision Ordinance		
Tree Trimming Ordinance		
Nuisance Ordinance		
Stormwater Ordinance		
Drainage Ordinance		
Site Plan Review Requirements		
Historic Preservation Ordinance		
Landscape Ordinance		
Program		
Zoning/Land Use Restrictions		
Codes Building Site/Design		
Hazard Awareness Program		
National Flood Insurance Program (NFIP)	Yes	
NFIP Community Rating System (CRS) program		If so, what is your current level rating?
National Weather Service (NWS) Storm Ready Certification		
Firewise Community Certification		
Building Code Effectiveness Grading (BCEGs)		
ISO Fire Rating	Rating: 6.9x	
Economic Development Program		
Land Use Program		
Public Education/Awareness		
Property Acquisition		
Planning/Zoning Boards		
Stream Maintenance Program		
Tree Trimming Program		
<u>Engineering Studies for Streams (Local/County/Regional)</u>		

Element	Yes, No, N/A	Comments and/or Weblink
Mutual Aid Agreements	Yes	
Studies/Reports/Maps		
<u>Hazard Analysis/Risk Assessment (City)</u>	Yes	Regional THIRA
<u>Hazard Analysis/Risk Assessment (County)</u>	Yes	Regional THIRA
Evacuation Route Map		
<u>Critical Facilities Inventory</u>		
<u>Vulnerable Population Inventory</u>		
<u>Land Use Map</u>		
Staff/Department		Full Time or Part Time?
Building Code Official		
Building Inspector		
Mapping Specialist (GIS)		
Engineer		
Development Planner		
Public Works Official		
Emergency Management Coordinator	County	
NFIP Floodplain Administrator		
Emergency Response Team		
Hazardous Materials Expert		
Local Emergency Planning Committee	Yes	
County Emergency Management Commission	No	
Sanitation Department		
Transportation Department		
Economic Development Department		
Housing Department		
Historic Preservation		
Non-Governmental Organizations (NGOs)	Is there a local chapter? Yes or No	
American Red Cross	No	Local Chapter is out of Quincy, IL
Salvation Army	No	
Veterans Groups	Yes	

Element	Yes, No, N/A	Comments and/or Weblink
Local Environmental Organization		
Homeowner Associations	No	
Neighborhood Associations	No	
Chamber of Commerce	Yes	
Community Organizations (Lions, Kiwanis, etc.	Yes	
Financial Resources		Is your jurisdiction able to? Yes or No
Apply for Community Development Block Grants		Yes
Fund projects thru Capital Improvements funding		
Authority to levy taxes for specific purposes		Yes
Fees for water, sewer, gas, or electric services		Yes
Impact fees for new development		
Incur debt through general obligation bonds		
Incur debt through special tax bonds		
Incur debt through private activities		
Withhold spending in hazard prone areas		

For plan updates, the plan maintenance process outlined in your previous plan requires all participating jurisdictions to incorporate the requirements of the mitigation plan into other planning mechanisms, when appropriate. A key element of effective implementation of mitigation is for the mitigation plan to be incorporated in existing authorities, policies, programs, and resources. Next to each applicable planning mechanism, indicate how your jurisdiction incorporated the previous mitigation plan. If no incorporation has occurred, please explain, including background information detailing any challenges preventing incorporation.

Planning Capabilities	Method of Incorporation Since Previous Plan or Challenges Preventing Incorporation
Comprehensive Plan	
Builder's Plan	
Capital Improvement Plan	
Local Recovery Plan	
County Recovery Plan	
Debris Management Plan	
Economic Development Plan	
Transportation Plan	
Land-use Plan	
Watershed Plan	
Firewise or other Fire Mitigation Plan such as Community Wildfire Protection Plan	

Additional Questions

1. How is your government structure organized? (Commission, Mayor/City Council, how many members)
Mayor -
City Council – 4 members
Clerk

2. List any past or ongoing public education or information programs, such as for responsible water use, fire safety, household preparedness, or environmental education.
Public awareness with first responder agencies

3. List any other past or ongoing projects or programs designed to reduce disaster losses, these may include projects to protect critical facilities. Be sure to include pending or approved projects submitted for FEMA mitigation grants.
Recurrent grant work on blight mitigation,
Coordination with outside agencies and conducting training and exercises.

4. Describe any hazard-related concerns or issues regarding the vulnerability of special needs populations, such as the elderly, disabled, low-income, or migrant farm workers.
Evacuation and sheltering concerns of a large low-income/elderly population
Mass notification of vulnerable populations

5. How many outdoor warning sirens are in your community?
None

How are they activated (indicate responsible department/personnel)?
NA

6. Does your community utilize any other warning systems such as Cable Override, Reverse 911, etc? If so, please describe.
No

7. Does your community have designated public tornado shelters/saferooms? If so, are they constructed in accordance with FEMA standards?
No

Please provide address locations:

8. List residential, commercial and industrial development in your jurisdiction since last plan update.

9. Describe development trends and expected growth areas. Is any new development expected to occur in the 100-year floodplain? Is any new development expected to occur in any other known hazard areas? If possible, please provide a map indicating potential/planned growth areas.

No specific development and growth trends are noted. No new development in 100-year floodplain. No new development in specific hazard area.

10. Are any new facilities or infrastructure planned for construction during the next five years? If so, please provide facility name and purpose along with proposed locations, if known.

New business development along 136 on the southern edge of city limits (Dollar General and Nicks Farm & Home). Ongoing ag related development, no location specified.

11. Please list major employers in your jurisdiction with an estimated number of employees.

Commuter/Farm Community

12. Please list Mitigation Planning Committee members who served during the development of the previously approved plan. Was the process set forth for monitoring the implementation of the previously approved mitigation plan adhered to? Did the Committee meet as was specified in the previously approved plan? Why or why not?

No previous membership

13. Describe your jurisdiction's participation in the NFIP. Include information about how compliance with the NFIP is enforced locally.

Member, no active compliance measures

VULNERABILITY ASSESSMENT

The purpose of this worksheet is to assess the vulnerable buildings, populations, critical facilities, infrastructure, and other important assets in your community by using the best available data to complete the table. Use the table on the next page to compile a detailed inventory of specific assets at risk including critical facilities and infrastructure; natural, cultural, and historical assets; and economic assets. In the natural hazard column of the asset inventory table, indicate (by assigned abbreviation) which of the following hazards the asset is vulnerable to:

Natural Hazards	
Flooding (Major & Flash) – RF	Drought - D
Levee Failure – LF	Extreme Temperature - ET
Dam Failure – DF	Severe Thunderstorm (incl. winds, hail, lightning) - ST
Earthquake – EQ	Severe Winter Weather (incl. snow, ice, severe cold) - SWW
Land Subsidence / Sinkholes - LSS	Tornadoes - T
	Wildfire - WF

Critical Facilities and Infrastructure

A critical facility may be defined as one that is essential in providing utility or direction either during the response to an emergency or during the recovery operation. FEMA's HAZUS-MH loss estimation software uses the following three categories of critical assets. 'Essential facilities' are those that if damaged would have devastating impacts on disaster response and/or recovery. 'High potential loss facilities' are those that would have a high loss or impact on the community. Transportation and lifeline facilities are third category of critical assets; examples are provided below.

Essential Facilities

Hospitals and other
medical facilities
Police stations
Fire station
Emergency Operations
Centers

High Potential Loss Facilities

Power plants
Dams/levees
Military installations
Hazardous material sites
Schools
Shelters
Day care centers
Nursing homes
Main government buildings

Transportation and Lifeline

Highways, bridges, and tunnels
Railroads and facilities
Bus facilities
Airports
Water treatment facilities
Natural gas facilities and
pipelines
Oil facilities and pipelines
Communications facilities

Economic Assets

Economic assets at risk may include major employers or primary economic sectors, such as agriculture, whose losses or inoperability would have severe impacts on the community and its ability to recover from disaster.

Asset Inventory

Please list critical facilities and other community assets, the square feet, values, and occupancy/capacity. If not applicable, enter "N/A". In the last column, use the codes from the previous page to indicate hazards to which the asset is vulnerable. Add as many rows as needed. If this information is available in GIS format, please provide.

Critical Facilities

Name of Asset	Address	Area (sq ft.)	Replacement Value (Insured) (\$)	Contents Value (\$)	Occupancy/ Capacity (#)	Natural Hazards
<u>Essential Facilities</u> such as hospitals and other medical facilities, police and fire stations, Emergency Operations Centers						
<u>High Potential Loss Facilities</u> such as power plants, dams/levees, military installations, hazardous materials sites, shelters, day care centers, nursing homes, main government buildings (Do not include schools—they will be reported by the school districts)						

Name of Asset	Address	Area (sq.ft.)	Replacement Value (Insured) (\$)	Contents Value (\$)	Occupancy/ Capacity (#)	Natural Hazards
City Hall	250 N Morgan Luray, MO		350K			RF, EQ, T, SWW, ST
Daycare 1	Throughout City					RF, EQ, T, SWW, ST
Daycare 2	Throughout City					RF, EQ, T, SWW, ST
Transportation and Lifelines such as highways, bridges, and tunnels; railroads and facilities, bus facilities, airports, water treatment facilities, natural gas facilities and pipelines, oil facilities, oil facilities and pipelines, communications facilities						
Highway 136						RF, EQ, T

*If replacement cost data is not available, use the best available data (assessed valuation or other method for estimating cost) and explain any data deficiencies.

Economic Assets (Major Employers, etc)

Asset	Address	Product/ Service	Value (if known)	Number of Employees	Hazards

HISTORIC HAZARD EVENTS

Please fill out the sheet on the next page for each significant hazard event that affected **Your Jurisdiction**. **Make as many copies as necessary to record all events** and complete with as much detail as possible. This includes all events associated with the hazards listed below that have caused previous damage in your jurisdiction. It is especially important to capture events that either were not included in the previous Hazard Mitigation Plan or occurred since the plan was completed. Attach supporting documentation, photocopies of newspaper articles, or other original sources.

Jurisdiction	
Type of event	
Nature and magnitude of event	
Location	
Date of event	
Injuries	
Deaths	
Property damage	
Infrastructure damage	
Crop damage	
Business/economic impacts	
Road/school/other closures	
Other damage	
Insured losses	
Federal/state disaster relief funding	
Source of information	
Comments	

HISTORIC HAZARD EVENTS (continued)

Please fill out the sheet on the next page for each significant hazard event that affected **Your Jurisdiction**. **Make as many copies as necessary to record all events** and complete with as much detail as possible. This includes all events associated with the hazards listed below that have caused previous damage in your jurisdiction. It is especially important to capture events that either were not included in the previous Hazard Mitigation Plan or occurred since the plan was completed. Attach supporting documentation, photocopies of newspaper articles, or other original sources.

Jurisdiction	
Type of event	
Nature and magnitude of event	
Location	
Date of event	
Injuries	
Deaths	
Property damage	
Infrastructure damage	
Crop damage	
Business/economic impacts	
Road/school/other closures	
Other damage	
Insured losses	
Federal/state disaster relief funding	
Source of information	
Comments	

Multi-Jurisdictional Hazard Mitigation Plan

Data Collection Questionnaire

For School Districts and Educational Institutions

County: Clark County

School District /
Educational Institution Name: Clark County R-1

Return by: _____

Please complete this data collection questionnaire as accurately and completely as possible as this information will appear in the mitigation plan. A data collection questionnaire must be completed for each "jurisdiction" that wishes to be included in the plan. According to FEMA's definition a jurisdiction is any local government, including counties, municipalities, cities, towns, school districts, special districts, councils of government, and tribal organizations. Any of these entities as well as publicly funded colleges and universities that do not participate in the planning process **will not** be eligible applicants for FEMA mitigation funding programs.

Prepared by: Ritchie Kracht

Phone: 660-727-2377

Email: rkracht@clarkcounty.k12.mo.us

Date: 3/19/19

Please return questionnaires by mail, email, or fax to:

Name: Derek Weber, Executive Director, NEMO RPC

Address: 121 S. Cecil St, Memphis, MO 63555

Email: derekweber@nemorpc.org

Fax: (660)465-7163

CAPABILITY ASSESSMENT & INCORPORATION OF EXISTING PLANS, STUDIES, REPORTS AND TECHNICAL INFORMATION

The purpose of this section is to collect information to document existing capabilities as well as determine existing plans, studies, reports, and technical information that may need to be incorporated in the mitigation plan.

Please indicate which of the following your school district / institution has in place. For elements that do not pertain to you, please indicate with "N/A". If applicable, please provide a completion date for the element. If your school district / institution has any of the **underlined and bolded** elements, please provide a copy of the document to the contact indicated on the front of this questionnaire and indicate method in the comments column (i.e. available on the web, will email or mail).

Planning Elements	Yes/No	Date of Latest Version	Comments
Master Plan	Yes	7/1/18	
Capital Improvement Plan	Yes	7/1/18	
<u>School Emergency Plan</u>			
Shelter in place protocols	Yes	8/1/18	
Evacuation protocols			
Weapons Policy	Yes	8/1/18	

Administrative/Technical

Identify the technical and personnel resources responsible for activities related to hazard mitigation/loss prevention within your school district / institution.

Personnel Resources	Yes/No	Department/Position	Comments
Full-time building official (i.e. Principal)	Yes	Building Principals	
Emergency Manager	Yes	Superintendent	
Grant Writer	NO		
Public Information Officer	Yes	Superintendent	

Financial Resources

Identify whether your school district /institution has access to or is eligible to use the following financial resources for hazard mitigation.

Financial Resources	Accessible/Eligible to Use (Y/N)	Comments
Capital improvements project funding	Y	
Local funds	Y	
General obligation bonds	Y	
Special tax bonds	Y	
Private activities/donations	Y	
State and federal funds	Y	

Additional Capabilities Questions

1. Are your buildings equipped with a public address (PA) system or other emergency alert system? Please describe.

Yes, All rooms have phones with PA capabilities

2. Does your school buildings' have NOAA Weather Radios?

Yes

3. List any past or ongoing projects or programs designed to reduce disaster losses, these may include projects to protect facilities or provide education regarding hazards that could occur.

*Built tornado shelter in new Indian Pride Learning Center
Completed Jan. 2019*

4. List any other past or ongoing projects or programs designed to reduce disaster losses, these may include projects to protect critical facilities.

None

5. Do any of your buildings have designated tornado shelters or "saferooms"? If so, are they constructed in accordance with FEMA standards?

Indian Pride Learning Center with FEMA Standards

6. Did your school district / institution make any additions to buildings or construction new buildings since the last plan update (2010)? Please list the buildings and the improvement.

New Indian Pride Learning Center Completed 2019

7. Does your school district / institution plan to remodel or construct any buildings in the next 5 years? If so, please list the building or proposed building and planned improvements. Are any planned construction activities in known hazard areas?

No plans

8. What percentage is your projected enrollment expected to increase or decrease in the next five years?

0% Should remain steady

9. Do you have your own campus police? Please explain your police department or who you rely on for security needs.

No

VULNERABILITY ASSESSMENT

Asset Inventory

The purpose of this worksheet is to assist in the assessment of the vulnerable populations and facilities owned by your school district / institution. Use the table below to compile a detailed inventory of specific assets at risk. In the natural hazard column of the asset inventory table, indicate (by assigned abbreviation) which of the following hazards the asset is vulnerable to:

Natural Hazards	
Flooding (Major & Flash) - RF	Drought - D
Levee Failure - LF	Extreme Temperature - ET
Dam Failure - DF	Severe Thunderstorm (incl. winds, hail, lightning) - ST
Earthquake - EQ	Severe Winter Weather (incl. snow, ice, severe cold) - SWW
Land Subsidence / Sinkholes - LSS	Tornadoes - T
Drought - D	Wildfire - WF

Please list buildings owned by your school district / institution including the square feet, values, and occupancy/capacity. If not applicable or not available, enter "N/A". Add as many rows as needed. **If you have this data in GIS formats, or other formats, please provide in lieu of this.**

Name of Asset	Address	Area (sq.ft.)	Replacement Value (Insured) (\$)	Contents Value (\$)	Occupancy/ Capacity (#)	Natural Hazards
High School	680 E. Main St.	58,298	8,100,420	2,147,184	450	EQ, ST, SWW, T
Middle School	384 N. Jefferson St.	43,571	7,355,695	1,186,971	350	
Running Fox Elem.	27192 US HWY 61 Alexandria	19,654	3,805,139	906,530	220	
Black Hawk Elem.	751 W. Chestnut St.	40,639	6,906,334	1,453,606	525	
IndianBride Learning Center	495 W. Chestnut St.	22,000	3,900,000	700,000	200	
Bus Barn	163 E. Main St.	4630	263,649	86,205	50	✓
Central Office	427 W. Chestnut St.	2,000	168,253	35,925	50	

All Buildings in Lakota 63445 except Running Fox which⁴ is Alexandria 63430

Name of Asset	Address	Area (sq.ft.)	Replacement Value (Insured) (\$)	Contents Value (\$)	Occupancy/ Capacity (#)	Natural Hazards
Fitness Center	680 E. Main St.	6,000	428,388	735,467	100	Some as 10/11/11
Maintenance Building	566 E. Commercial	3,600	493,988	475,100	100	Side
Football Press Box	680 E. Main St.	1,080	123,888	11,862	20	
Football Locker Room	680 E. Main St.	4,900	688,289	684,862	100	
Ag building	680 E. Main St.	7,680	768,846	359,228	100	
Greenhouse	680 E. Main St.	2,000	80,000	20,000	25	
Refrigeration	751 W. Chestnut St.	326	27,234	7,184	2	
Storage #2	384 N. Jefferson St.	489	15,157	1,436	10	
Storage #3	680 E. Main St.	1,080	7621	7,184	10	✓

HISTORIC HAZARD EVENTS

Please fill out one sheet for each significant hazard event that affected **your school district / institution** with as much detail as possible. This includes all hazard events listed on the Vulnerability Assessment page that have caused previous damage. Attach supporting documentation, photocopies of newspaper articles, or other original sources.

Type of event	<i>Lightening Strikes : Minor Wind damage : hail</i>
Nature and magnitude of event	
Location	
Date of event	
Injuries	
Deaths	
Property damage	
Infrastructure damage	
Crop damage	
Business/economic impacts	
Road/school/other closures	
Other damage	
Insured losses	
Federal/state disaster relief funding	
Source of information	
Comments	

HISTORIC HAZARD EVENTS (continued)

Please fill out one sheet for each significant hazard event that affected **your school district /institution** with as much detail as possible. This includes all hazard events listed on the Vulnerability Assessment page that have caused previous damage. Attach supporting documentation, photocopies of newspaper articles, or other original sources.

Type of event	
Nature and magnitude of event	
Location	
Date of event	
Injuries	
Deaths	
Property damage	
Infrastructure damage	
Crop damage	
Business/economic impacts	
Road/school/other closures	
Other damage	
Insured losses	
Federal/state disaster relief funding	
Source of information	
Comments	