BUTLER COUNTY HAZARD MITIGATION PLAN

2023

Prepared By:
Ozark Foothills Regional Planning Commission
3019 Fair Street
Poplar Bluff, MO 63901

Approved by FEMA:

CONTRIBUTORS

Butler County Hazard Mitigation Planning Committee

Jurisdictional Representatives

Name	Title	Department	Jurisdiction/Agency/Organizati
Vince Lampe	Presiding Commissioner	County Commission	Butler County
Dennis Legrand	Western District Commissioner	County Commission	Butler County
Butch Anderson	Eastern District Commissioner	County Commission	Butler County
Steve Davis	Mayor	City Administration	City of Poplar Bluff
Justin Parks	Mayor	City Administration	City of Qulin
Carlee Decker	Clerk	City Administration	City of Qulin
Scott Dill	Superintendent	District Administration	Poplar Bluff R-1 School District
Rob Brown	Superintendent	District Administration	Twin Rivers R-X School District
Seth McBroom	Principal	District Administration	Twin Rivers R-X School District
Debra Parish	Superintendent	District Administration	Neelyville R-IV School District

Stakeholder Representatives

Name	Title	Department	Agency/Organization
Robbie Myers	Emergency Manager	Emergency Management	Butler County
James Sisk	Floodplain Manager	Emergency Management	Butler County
James Sisk	City Planner	City Administration	City of Poplar Bluff
Chuck Stratton	Director of Public Safety	Education	Three Rivers College
Emily Goodin	Director	Public Health	Butler County Health Center
Steve Halter	Director	Economic Development	Greater Poplar Bluff Area Chamber of Commerce
Crystal Jones	Executive Director	Economic Development	Ozark Foothills Regional Planning Commission
Bob Fredwell	Fire Chief	Public Safety	Butler County Fire Department
Mike Moffitt/Ralph Stucker	Fire Chief	Public Safety	Poplar Bluff Fire Department
Kori Gowen	Health Educator	Public Health	Butler County Health Center
Chelsae Cordia	Mitigation Planner	Economic Development	Ozark Foothills Regional Planning Commission

The table above lists stakeholders that participated in the plan update in some way. Stakeholders invited to participate in the planning process, but who did not participate are listed within Step 3 of the planning process description in Chapter 1.

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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. Butler County and participating jurisdictions and school/special districts developed this multi-jurisdictional local hazard mitigation plan update to reduce future losses from hazard events to the County and its communities and school/special districts. The plan is an update of a plan that was approved in 2017. 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 Butler County Multi-Hazard Mitigation Plan is a multi-jurisdictional plan that covers the following jurisdictions that participated in the planning process:

- Unincorporated Butler County
- City of Poplar Bluff
- City of Qulin
- Poplar Bluff R-1 School District
- Twin Rivers R-X School District
- Neelyville R-IV School District

The cities of Neelyville and Fisk were invited to participate in the planning process but did not meet the established requirements for official participation. When the future five-year update is developed for this plan, these communities again will be invited to participate.

Butler County and the entities listed above developed a Multi-Jurisdictional Hazard Mitigation Plan that was approved by FEMA in August 2012 (hereafter referred to as the *2012 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 Butler County and participating jurisdictions. The MPC updated the risk assessment that identified and profiled hazards that pose a risk to Butler 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. Implement mitigation actions that improve the protection of human life, health, and safety from the adverse effects of disasters;
2. Implement mitigation actions that improve the continuity of government and essential services from the adverse effects of disasters;
3. Implement mitigation actions that improve the protection of public and private property from the adverse effects of disasters; and,
4. Implement mitigation actions that improve the protection of community tranquility from the adverse effects of disasters.

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 I. Mitigation Action Matrix

#	Action	Jurisdiction	Priority	Goals Addressed (see page v)	Hazards Addressed	Address Current Development	Address Future Development	Continued Compliance with NFIP
	Prevention Public Education							
1.1	Provide heat illness education to the public	Butler County	High (34)	#1	Extreme Heat			
1.2	Provide earthquake education & increase awareness	Butler County	High (34)	#1	Earthquake			
1.2	Provide earthquake education & increase awareness	Poplar Bluff R-I School District		#1	Earthquake			
1.2	Provide earthquake education & increase awareness	Twin Rivers R-X School District		#1	Earthquake			
1.2	Provide earthquake education & increase awareness	Three Rivers College	()	#1	Earthquake			
1.3	Implement earthquake drills	Neelyville R-IV School District		#1	Earthquake			
1.4	Implement tornado drills	Butler County	High (32)	#1	Tornado			
1.4	Implement tornado drills	Neelyville R-IV School District	High (34)	#1	Tornado			
1.5	Increase tornado awareness & provide education	Poplar Bluff R-I School District		#1	Tornado			

#	Action	Jurisdiction	Priority	Goals Addressed (see page v)	Hazards Addressed	Address Current Development	Address Future Development	Continued Compliance with NFIP
1.5	Increase tornado awareness & provide education	Twin Rivers R-X School District		#1	Tornado			
1.5	Increase tornado awareness & provide education	Three Rivers College	()	#1	Tornado			
1.6	Smoke detector installation education	Butler County	High (33)	#1	Wildfire			
3.1	Provide fire safety education to the public	City of Poplar Bluff	()	#1	Wildfire			
3.2	Implement fire drills	Poplar Bluff R-I School District		#1	All Hazards			
3.2	Implement fire drills	Twin Rivers R-X School District		#1	All Hazards			
3.2	Implement fire drills	Three Rivers College	()	#1	All Hazards			
3.3	Map sinkholes	Butler County	High (36)	#3	Sinkholes		X	
2.1	Establish alternate transportation routes	Butler County	High (34)	#1	Flood			
2.1	Establish alternate transportation routes for school buses	Poplar Bluff R-I School District		#1	Flood			

#	Action	Jurisdiction	Priority	Goals Addressed (see page v)	Hazards Addressed	Address Current Development	Address Future Development	Continued Compliance with NFIP
2.1	Establish alternate transportation routes for school buses	Twin Rivers R-X School District		#1	Flood			
	Structure and Infrastructure Projects							
2.2	Prioritize work on low water crossings vulnerable to floods	Butler County	High (40)	#3	Flood	X		
2.3	Explore/install lightning protection	Butler County	High (39)	#3	Thunderstorm	X		
3.4	Repair levees along the Black River	Butler County	High (41)	#3	Flood	X	X	
3.5	Clean debris out of the Black River	Butler County	High (37)	#3	Flood	X		
3.6	Ditch clean-out & construction	Butler County	High (38)	#3	Flood	X	X	
3.6	Ditch clean-out & construction	City of Poplar Bluff		#3	Flood	X	X	
3.6	Clean out drainage ditches	City of Qulin		#3	Flood	X	X	
2.4	Trim trees near overhead power lines	City of Poplar Bluff	()	#1	Thunderstorm & Sever Winter Weather	X		
2.5	Seek funding for water/sewer improvements	Butler County	High (31)	#1	Drought	X	X	
2.5	Improve city water supply & treatment infrastructure	City of Qulin		#1	Drought	X	X	
2.5	Upgrade water treatment system	City of Poplar Bluff	()	#1	Flood	X	X	

#	Action	Jurisdiction	Priority	Goals Addressed (see page v)	Hazards Addressed	Address Current Development	Address Future Development	Continued Compliance with NFIP
2.6	Ensure back-up wells are installed	Butler County	High (34)	#1	Drought			
1.7	Construct a tornado safe room	Poplar Bluff R-I School District		#1	Tornado			
1.7	Construct a tornado safe room	Twin Rivers R-X School District	()	#1	Tornado			
1.7	Construct a tornado safe room	Three Rivers College	()	#1	Tornado			
3.7	Purchase properties & relocate residents	Butler County	High (38)	#3	Flood	X	X	
3.7	Purchase properties & relocate residents	City of Poplar Bluff	()	#3	Flood	X	X	
	Natural Systems Protection							
3.8	Adopt/enforce floodplain management requirements, including regulating new construction in Special Flood Hazard Areas	Butler County	High (47)	#4	Flood		X	X
3.8	Adopt/enforce floodplain management requirements, including regulating new construction in Special Flood Hazard Areas	City of Poplar Bluff		#4	Flood		X	X
3.8	Adopt/enforce floodplain management requirements, including regulating new construction in Special Flood Hazard Areas	City of Qulin	()	#4	Flood		X	X
4.1	Explore CRS institution	Butler County	High (32)	#4	Flood	X	X	X
	Emergency Services							

#	Action	Jurisdiction	Priority	Goals Addressed (see page v)	Hazards Addressed	Address Current Development	Address Future Development	Continued Compliance with NFIP
2.7	Provide education to VFD, EMA, Health Dept., EMS, law enforcement, & weather spotters	Butler County	High (40)	#2	All			
2.8	Seek funding for generators	Butler County	High (33)	#2	All			
	Education and Outreach							
4.2	Integrate mitigation actions into other planning documents/mechanisms	Butler County	Medium (27)	#3	All	X	X	
4.2	Integrate mitigation actions into other planning documents/mechanisms	City of Qulin		#3	All	X	X	
4.2	Integrate mitigation actions into other planning documents/mechanisms	City of Poplar Bluff		#3	All	X	X	
4.2	Integrate mitigation actions into other planning documents/mechanisms	Neelyville R-IV School District		#3	All	X	X	
4.2	Integrate mitigation actions into other planning documents/mechanisms	Poplar Bluff R-I School District		All	All			
4.2	Integrate mitigation actions into other planning documents/mechanisms	Twin Rivers R-X School District		All	All			
4.2	Integrate mitigation actions into other planning documents/mechanisms	Three Rivers College		All	All			
1.8	Construct a vulnerable populations database	Butler County	High (32)	#1	All			
4.3	Maintain StormReady certification	Butler County	High (32)	All	Thunderstorm	X		

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 E, 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.

Model Resolution

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

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

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

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

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

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

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

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

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

ADOPTED by a vote of_____in favor and__against, and__abstaining, this_____day of _____,_____.

By (Sig): _____
Print name: _____

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

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

1 INTRODUCTION AND PLANNING PROCESS

1.1 PURPOSE

Hazard mitigation is the effort to reduce loss of life and property by lessening the impact of natural disasters. For hazard mitigation to be effective, mitigation actions must be taken prior to disaster, thereby reducing negative impacts to people and property. The purpose of this plan is for the jurisdictions and special districts of Ripley County to proactively identify their extent of exposure to natural hazards as well as attainable goals and specific actions designed to minimize harm to people and property following a disaster. Furthermore, the exercise of mitigation planning results in a document—such as the current document— which outlines strategies for the implementation of prioritized mitigation actions.

The Robert T. Stafford Disaster Relief and Emergency Act (Public Law 93-288), which was later amended by The Disaster Mitigation Act of 2000 (Public Law 106-390), and implementation regulations set forth by the Interim Final Rule published in the Federal Register on February 26, 2002 (44 CFR §201.6) and finalized on October 31, 2007 establish the requirements for local hazard mitigation plans. (Hereafter, the amended law and implementing regulations will be referred to collectively as the Disaster Mitigation Act or DMA). The DMA sets forth the requirement for jurisdictions and special districts to adopt a hazard mitigation plan to be eligible to receive federal hazard mitigation grant funding. On October 1, 2002, FEMA published a change to the Interim Final Rule at 67 FR 61512, extending the effective date for state and local hazard mitigation plan adoption requirements to November 1, 2004. Since this date, participation within and adoption of a FEMA-approved hazard mitigation plan has been required for state, municipalities, and special districts to receive non-emergency Stafford Act assistance including hazard mitigation grant funding.

Following tornado and flooding disasters declared during the spring of 2002 (DR-1412), the Missouri State Emergency Management Agency (SEMA) received flood acquisition and demolition proposals from twentythree communities throughout the state. Fortunately, SEMA assisted some of the communities with federal mitigation grant funding provided by the Federal Emergency Management Agency (FEMA). While communities like these remain eligible for federal disaster public assistance and individual assistance, they are no longer eligible for mitigation assistance unless they have participated within the development of and adopted a FEMA-approved hazard mitigation plan. For nearly 1,000 municipalities and 114 counties in Missouri, mitigation plans are required. All Missouri jurisdictions that participate in the development of the hazard mitigation plan and adopt the completed plan are eligible to receive

federal mitigation grant funding. Any jurisdictions that do not participate in the development or adoption of the plan are ineligible for such mitigation funding.

To assist jurisdictions and special districts in creating or updating their hazard mitigation plan, FEMA has created guidance documents. These documents, specifically FEMA's *Local Mitigation Planning Handbook, March 2013* and FEMA's *Local Mitigation Plan Review Guide, October 1, 2011*, were consulted by Butler County and its participating jurisdictions during the update of its 2022 Butler County Hazard Mitigation Plan.

The Community Rating System (CRS) is a voluntary program for which communities participating within the National Flood Insurance Program (NFIP) are eligible. The CRS provides a range of flood insurance premium reductions (0% to 45%) for certain properties located within participating communities. In this way, the program encourages communities to implement floodplain management practices beyond those required by the NFIP. Buildings located within certain flood zones of a CRS-participating community are eligible for flood insurance premium discounts depending upon the community CRS-assigned "class." The community's class may range from "10" to "0" with a class of "0" providing the most flood mitigation benefit. The table below shows the CRS classes and associated insurance premium discounts. A description of the types of properties eligible for flood insurance premium discounts can be found within Table 1 of the FEMA CRS community listing document located at https://www.fema.gov/media-library-data/1476294162726 4795edc7fe5cde0c997bc4389d1265bd/CRS_List_of_Communites_10_01_2016.pdf. Unfortunately, as of the update of this plan, neither Butler County, nor its municipalities participated within the CRS.

1.2 BACKGROUND AND SCOPE

This plan is an update to the Butler County Hazard Mitigation Plan that was approved in August 2017. The plans are required to be updated every five years to remain valid and ensure the plan is addressing current trends and needs of the participating jurisdictions.

The 2017 Butler County Hazard Mitigation and this update were both prepared by the Ozark Foothills Regional Planning Commission (OFRPC). The OFRPC, a member of the Missouri Association of Councils of Government MACOG) was created in 1967. The commission serves the five-county region of Butler, Carter, Reynolds, Ripley and Wayne Counties, as well as all municipalities within those five counties.

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

In the 2017 Butler County Hazard Mitigation Plan, the following jurisdictions participated within and adopted the plan:

- Butler County
- City of Poplar Bluff
- City of Fisk
- City of Qulin
- City of Neelyville

- Poplar Bluff R-1 School District
- Twin Rivers R-X School District

1.3 PLAN ORGANIZATION

This plan update is organized into five chapters and an assembly of appendices. Following is a list of the chapters and their respective titles:

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

Table 1.1 shows each chapter and summarizes the changes made in the update.

Table 1.1. Changes Made in Plan Update

Plan Section	Summary of Updates
Chapter 1 - Introduction and Planning Process	Updated members of the Mitigation Planning Committee (MPC) and participating jurisdictions formally adopted the MPC.
Chapter 2 - Planning Area Profile and Capabilities	Completed a vulnerability analysis for each jurisdiction
Chapter 3 - Risk Assessment	Rearranged hazard order per state preference.
Chapter 4 - Mitigation Strategy	The numbering system for the mitigation actions was reconstructed.
Chapter 5 - Plan Implementation and Maintenance	Updated MPC meetings for evaluating and updating the plan to quarterly.

1.4 PLANNING PROCESS

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

The county's regional planning commission – Ozark Foothills Regional Planning Commission (RPC) – was contracted by Butler County to facilitate update of the county's 2022 hazard mitigation plan update. In this role, the RPC conducted the following actions:

- Assisted in establishing a Mitigation Planning Committee (MPC) as defined by the Disaster Mitigation Act (DMA),
- Determined 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,
- Assessed 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,
- Ensured 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),
- Facilitated the entire plan development process,
- Identified the data that MPC participants could provide and conduct the research and documentation necessary to augment that data,
- Assisted in soliciting public input,
- Produced the draft and final plan update in a FEMA-approvable document and coordinate the Missouri State Emergency Management Agency (SEMA) and (FEMA) plan reviews.

Adherence to the plan maintenance process established in 2016 did not occur due to a lack of funding for a process facilitator. All participating jurisdictions listed within the table actively and directly participated within the plan update process. The governing bodies of all participating jurisdictions formally adopted the updated planning document. **Table 1.2** lists the MPC members and the entities they represent, along with their titles.

Table 1.2. Jurisdictional Representatives of Butler County Mitigation Planning Committee

Name	Title	Department	Jurisdiction/Agency /Organization
Robbie Myers	Emergency Management Director	Emergency Mngt	Butler County
James Sisk	City Planner	City Administration	City of Poplar Bluff
Justin Parks	Mayor	City Administration	City of Qulin
Scott Dill	Superintendent	Education	Poplar Bluff R-1 School District
Seth McBroom	Principal	Education	Twin Rivers R-X School District
Debra Parish	Superintendent	Education	Neelyville R-IV School District
Chuck Stratton	Director of Public Safety & Special Projects	Education	Three Rivers Community College

Table 1.3 below lists all members of the MPC and notes each member's expertise in the six mitigation categories (Prevention, Property Protection, Natural Resource Protection, Emergency Services, Structural Flood Control Projects and Public Information).

Table 1.3. MPC Capability with Six Mitigation Categories[1(b)]

Community Department/Office	Preventive Measures	Structure and Infrastructure Projects		Natural Resource Protection	Public Information	Emergency Services
		Property Protection	Structural Flood Control Projects			
Emergency Management	✓			✓	✓	✓
County Floodplain Manager		✓	✓			
City Planner	✓	✓	✓	✓	✓	
City Council		✓	✓	✓	✓	
Management	✓	✓			✓	
Management	✓	✓			✓	
Management	✓	✓			✓	
Transportation						✓
Health Information	✓				✓	✓
Healthcare	✓				✓	✓
Road and Bridge	✓			✓	✓	✓

1.4.1 Multi-Jurisdictional Participation

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

The Ozark Foothills Regional Planning Commission (OFRPC), on behalf of Butler County, invited all cities, school districts, special districts, transportation, healthcare, and private nonprofit entities in the planning area to participate in this update of the Butler County Multijurisdictional Hazard Mitigation Plan. DMA 2000 requires that jurisdictions represented by a multi-jurisdictional plan participate in the planning process and formally adopt the plan. Each participating jurisdiction was required to meet plan participation requirements as defined by the MPC at the beginning of the planning process. Minimum participation requirements were defined as follows:

- Designation of a representative from each participating jurisdiction to serve on the MPC;
- Participation in a minimum number of specified meetings, including centralized, planning area wide MPC meetings, by either direct participation or authorized representation;
- Each participating jurisdiction must provide to the MPC sufficient information to support plan development by completion and return of Data Collection Questionnaires and validating/correcting critical facility inventories;
- If the plan is an update, provide progress reports on mitigation actions from the previously approved plan and identify additional mitigation actions for the plan;
- For plan updates, eliminate from further consideration those actions from the previously approved plan that were not implemented because they were impractical, inappropriate, not cost-effective, or were otherwise not feasible;

- Review and comment on plan drafts;
- Actively solicit input from the public, local officials, and other interested parties about the planning process and provide an opportunity for them to comment on the plan;
- Provide documentation to show time donated to the planning effort (if a FEMA planning grant was awarded to the County); and
- All participants should formally adopt the mitigation plan prior to submittal to SEMA and FEMA for final approval.

Written invitations were mailed to all persons attending the Initial Coordination Meeting as well as to those agencies and stakeholders identified during the Initial Coordination Meeting. Reminders of the Project Kick-Off Meeting and the importance of the planning effort were emailed to invitees prior to the date of the meeting. Reminder text notifications were also sent to the MPC members. Meeting documentation can be located within Appendix C.

The Initial Coordination Meeting was held on April 28, 2021, at the Ozark Foothills Regional Planning Commission conference room. Written invitations were mailed to all persons attending the Initial Coordination Meeting as well as to those agencies and stakeholders identified during the Initial Coordination Meeting. A copy of the invitation letter and meeting sign-in sheets are included within Appendix C of this document. During the Project Kick-Off Meeting, those in attendance offered suggestions of additional stakeholders who were invited to participate within the planning process. The focus of the meeting was establishment of participation requirements, identification of hazards, as well as introduction of the Data Collection Questionnaire and the critical facilities inventory. Reminders of the Project Kick-Off Meeting and the importance of the planning effort were emailed to invitees prior to the date of the meeting. Reminder text notifications were also sent to the MPC members.

The first planning meeting was held on June 7, 2021 in the board room of the Poplar Bluff R-1 School District's Central Office Building. A virtual attendance meeting option was offered. Finalization of project goals, review of public comment via community surveys, identification of jurisdictional capabilities and jurisdictional risk assessments were the focus of the meeting. Meeting minutes can also be located within Appendix C.

The second planning meeting was held on July 20, 2021 in the conference room of the Greater Poplar Bluff Area Chamber of Commerce. All members of the MPC and previously identified stakeholders were invited to the meeting via written letter followed by email reminders. The focus of this meeting was to review and refine 2017s Risk Assessment. A virtual attendance meeting option was offered. All meeting documentation—invitation letters, meeting minutes, and sign-in sheets—can be located within Appendix C.

The final planning meeting was held on June 15, 2022 in the conference room of Ozark Foothills Regional Planning Commission. The topic of the meeting was to review the completed Risk Assessment and update and identification of jurisdiction-specific mitigation actions. All members of the MPC and previously identified stakeholders were invited to the meeting via written letter followed by email reminders. A virtual attendance meeting option was offered. All meeting documentation—invitation letters, meeting minutes, and sign-in sheets—can be located within Appendix C.

The cities of Neelyville and Fisk were the two jurisdictions which did not meet the plan

update participation requirements as established by the MPC. Both cities failed to respond to meeting announcements and reminders. Furthermore, the Data Collection Questionnaire was not completed and mitigation actions for the cities were neither updated, nor identified. All jurisdictions were notified in writing and via email of all meetings. Numerous written attempts were made to collect the cities' Data Collection Questionnaire. Members of the MPC actively participated within the planning process. These planning partners possess the expertise to develop the plan, and their organizations have the authority to implement the developed mitigation strategy. Per the See FEMA guide Local Mitigation Planning Handbook March 2013 ("Handbook"), active leadership from elected officials with an interest in improving safety and disaster resiliency ensures the planning process has visibility and encourages stakeholder participation.

The following jurisdictions met all participation requirements:

- Butler County
- City of Poplar Bluff
- City of Qulin
- Poplar Bluff R-1 School District
- Twin Rivers R-X School District
- Neelyville R-IV School District
- Three Rivers Community College.

Public input was solicited via word-of-mouth, as well as through a public survey distributed via social media and in-person. Due to the rural nature of the jurisdictions, their lack of resources, and the conduct of the planning effort in the midst of a global pandemic, public participation in the planning process, though solicited, was hampered. None of the participating jurisdictions have the resources needed to fund a full-time public information/marketing officer. Furthermore, broadband and internet connectivity within the planning area is either significantly limited or nonexistent, consequently, limiting the reach of the public survey.

Table 1.4 below shows participation of each jurisdiction at the planning meetings, the provision of responses to the Data Collection Questionnaire including the active critical facility validation, and the update/development of mitigation actions. As stated above, meeting sign-in sheets are located within Appendix C.

Table 1.4. Jurisdictional Participation in Planning Process

Jurisdiction	Meeting #1	Meeting #2	Meeting #3	Data Collection Questionnaire Response	Update/Develop Mitigation Actions
Butler County	X	X	X	X	X
City of Poplar Bluff	X	X	X	X	X
City of Qulin	X	X	X	X	X
City of Fisk					
City of Neelyville					
Poplar Bluff R-1 School	X	X	X	X	X
Twin Rivers R-X School	X	X	X	X	X
Neelyville R-IV School	X	X	X	X	X
Three Rivers Community College	X	X	X	X	X

1.4.2 The Planning Steps

Data for this plan was created through a series of public meetings held within Butler County. The planning process for the *2022 Butler County Hazard Mitigation Plan* began during the spring of 2021, with presentations to elected officials, community members, and other interested parties. These individuals were invited to attend planning meetings, with a special effort to invite participants representing various business and service interests throughout Butler County communities. Participants were asked to identify critical infrastructure, ranking the likelihood of disaster occurrence, perform a risk assessment based on these factors, and determine/update appropriate mitigation strategies for each individual disaster. This data was recorded and assimilated into the current plan update by staff of the Ozark Foothills Regional Planning Commission.

Background and statistical data for this plan were collected from a variety of sources, including Data Collection Questionnaires, the United States Census Bureau, the United States Geological Survey, the United States Army Corps of Engineers, the Missouri Department of Natural Resources, the Missouri Department of Conservation, the Center for Agricultural, Resources and Environmental Systems at the University of Missouri-Columbia, and the National Climatic Data Center. The Missouri State Hazard Mitigation Plan was last updated in 2018 and provided information regarding tornado, earthquake, and flood hazards affecting Butler County.

The most recent flood insurance study for Butler County was completed in 2019 with production of a new DFIRM. Flood hazard data from the 2006 HAZUS-MH loss run for Butler County was incorporated into the plan providing updated information on vulnerable structures, shelter requirements, and loss estimates. Other sources of information including Comprehensive Plans, Zoning Ordinances, Building Codes, and local Storm Water Regulations were reviewed for applicability to the plan.

Development of the current plan update followed the 10-step planning process adapted from

FEMA's Community Rating System (CRS) and Flood Mitigation Assistance programs. This 10-step process allows the plan to meet funding eligibility requirements of the Hazard Mitigation Grant Program, Pre-Disaster Mitigation Program, and Flood Mitigation Assistance Program, as well as qualify for points under Activity 510 for Mitigation Plans, within the Community Rating System. The following table shows how the CRS process aligns with the Nine Task Process outlined in the 2013 Local Mitigation Planning Handbook.

Table 1.5. 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)

The chief officers of Butler County, the City of Poplar Bluff, the City of Qulin, and the three public school districts were invited via written letter and follow-up phone calls and email messages to the Initial Coordination Meeting held on April 28, 2021 in the conference room of Ozark Foothills Regional Planning Commission. Those in attendance are listed upon the attendance roster found in Appendix C of this document. During the Initial Coordination Meeting, additional potential MPC members and key stakeholders were identified by the attendees. In addition, the plan's purpose was outlined, a tentative plan update schedule was set, and the general process methodology was discussed, as well as information to be included on the public community survey.

The first planning meeting was held on June 7, 2021 in the Poplar Bluff R-1 School District's board room. Written invitations were mailed to all persons attending the Initial Coordination Meeting as well as to those agencies and stakeholders identified during the Initial Coordination

Meeting. A copy of the invitation letter and meeting sign-in sheets are included within Appendix C of this document. During the first planning meeting, those in attendance offered suggestions of additional stakeholders who were invited to participate within the planning process. The focus of the meeting was establishment of participation requirements, identification of hazards, as well as introduction/distribution of the Data Collection Questionnaires and discussion of the critical facilities inventory. Reminders of the first planning meeting and the importance of the planning effort were emailed to invitees prior to the date of the meeting. Reminder email notifications were also sent to the MPC members.

Throughout the planning process, MPC members communicated via socially-distanced face to-face meetings, virtual meetings, phone interviews, and email correspondence*.*

Table 1.6. Schedule of MPC Meetings

Meeting	Topic	Date
Informational Meeting	Overview of hazard mitigation provided, plan purpose/requirement/process outline explained, jurisdictions named a representative to the MPC, future meeting location was selected, public input solicitation was discussed, additional MPC members and stakeholders were identified, community survey material discussed	April 28, 2021
Kick-off Meeting (Planning Meeting #1)	Hazards were reviewed and identified, previous disaster declarations were discussed, data collection questionnaires were distributed, public feedback methodologies and other data sources were identified.	June 7, 2021
Planning Meeting #2	2017 plan goals reviewed, updated 2022 plan goals established, jurisdictional capabilities determined, completed risk assessment reviewed and refined	July 20, 2021
Planning Meeting #3	Refined Risk Assessment reviewed by MPC, 2017 county plan actions reviewed, updated goals established utilizing STAPLEE, plan for maintenance of plan established	June 15, 2022

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 Organizational Planning meeting was held on April 28, 2021 at the Ozark Regional Planning Commission's conference room in Poplar Bluff. Attendees discussed and finalized the seemingly most effective way to solicit and collect public input amid a global pandemic. A survey prepared by the process facilitator was provided to the group and all agreed to share the survey with their respective contacts. An online version of the survey was created using SurveyMonkey. The link to this online survey was shared electronically through emails, on Facebook sites, and on local websites. A copy of the survey and the results are included in Appendix D. Sixty-seven responses were received and reviewed during the First Planning Meeting on June 7, 2021 at the Poplar Bluff R-1 School District's board room. Five comments were received from survey and were as follows:

- “Take into account the existing levees which have performed well. Recognize the levees which might need improvement. Keep us up to date with the best early warning systems for tornadoes.”
- “Just some thoughts about potential hazards I’ve noticed in my area and in my home. Old homes (>100 years old) built with outdated material seem to have water underneath them. I know this is because my basement lightly floods after a storm. I dread it. It creates toxic mold, and it is too costly to repair correctly. Additionally, homeowners with in-ground pools that cannot afford a cover essentially create a hazard. I think a homeowner weatherization program or assistance would be a tremendous help.”
- “After lots of snow, ice, and flooding, county roads are in need of fixing lots of holes.”
- “Community awareness as to what has already been done and what resources are already available. I’m especially concerned about how to get live-saving medications during a disaster.”
- “Annual training on earthquake prep.”

The first and fifth suggested action was taken into consideration by the MPC and included within the updated plan as a mitigation action.

The hazards ranked by respondents as most likely to occur are listed as follows from most likely to occur to least likely to occur:

1. Thunderstorm/Lightening/High Wind/Hail
2. Extreme Heat
3. Winter Weather/Snow/Ice/Extreme Cold (Tied with No. 4)
4. Flooding (Tied with No. 3)
5. Tornado
6. Drought
7. Earthquake
8. Levee Failure
9. Sinkholes
10. Wildfire

The hazards ranked by respondents as most likely to result in damage (i.e. potential magnitude) are listed as follows from most likely to occur to least likely to occur:

1. Tornado
2. Flooding
3. Earthquake
4. Winter Weather/Snow/Ice/Extreme Cold
5. Thunderstorm/Lightening/High Winds/Hail
6. Extreme Heat
7. Drought
8. Levee Failure
9. Fires
10. Dam Failure

Throughout the planning process, public input was solicited in a variety of ways. A public survey was designed and disseminated via the internet using survey monkey. The electronic

survey was advertised via direct email contact and s regional Facebook page. The survey was also printed in hard copy and distributed during the June meeting of the county's regional planning commission. Analysis of the survey results indicates that the public's perception of natural hazards—with regard to both frequency and magnitude aligned strongly with the perceptions of MPC members.

The planning process and update status was discussed at four public meetings held during April 2021, June 2021, July 2021, and June 2022. The agendas of each meeting were advertised publicly. During each meeting discussion, public input was requested and a point of contact provided.

There were no reports of damages made by the public during the planning process. All applicable public input was incorporated into the plan either directly through the creation of specific mitigation actions, or by quotation of the comment within this section.

The final public comment opportunity—prior to plan approval—was held during the month of January 2023. The completed plan draft was posted on a regional website located at www.ofrpc.org and advertised via social media and word-of-mouth. During the month of January 2023, Butler County and its three incorporated cities, included information regarding the plan draft and its adoption upon their official commission/council meeting agendas. Comments from the pubic were encouraged and could be made either by telephone, email, or in written form to the Butler County Commission. A hard copy was located at the Butler County Clerk's office for review by those members of the pubic lacking access computer/internet access. The deadline for the receipt of public comment was January 31, 2023.

All documentation of public input solicitations is included within Appendix D.

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.

During the planning process, stakeholders must be given the opportunity to be involved[3(b)]. Stakeholders include the following:

- Neighboring communities
- Local and regional agencies involved in hazard mitigation activities
- Agencies with the authority to regulate development
- Businesses

- Academia
- Other private and non-profit interests

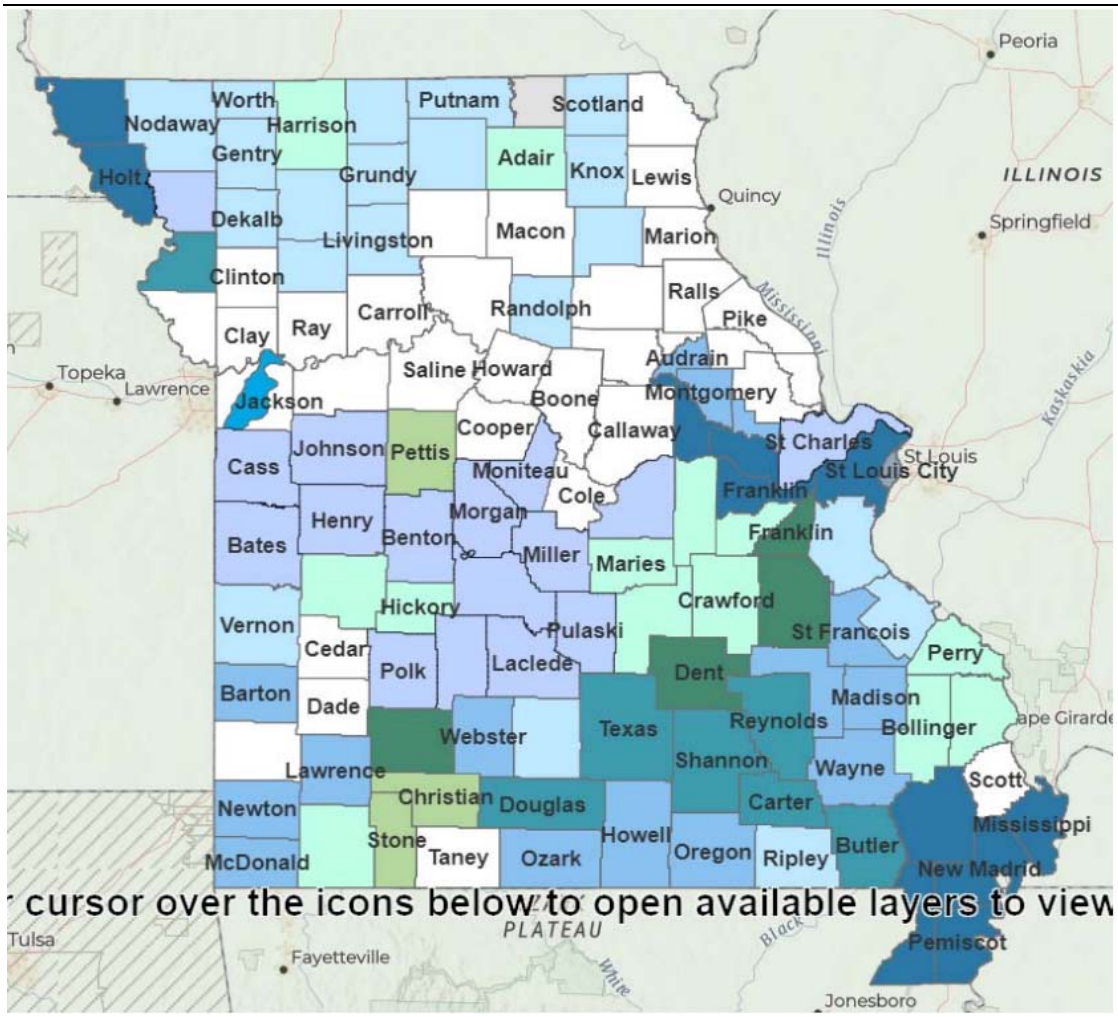
The persons listed below were stakeholders identified by the MPC as having goals and/or interests which may interface with hazard mitigation in the planning area. All were invited via written letter to participate within the plan update process and were directly asked to comment on the plan draft. A copy of the invitation and plan draft review request letters can be found within Appendix C and Appendix D of this document. Stakeholders that actively participated within the plan update process are included in the table in the “Contributors” Section of the Executive Summary. Planning Process Stakeholders are, as follows:

- Robbie Myers, Butler County Emergency Manager
- Emily Goodin, Director, Butler County Health Center
- Steve Halter, Director, Greater Poplar Bluff Area Chamber of Commerce
- Karen Crook, Director, Butler County Caring Communities
- Ralph Stucker, Fire Chief, Poplar Bluff Fire Department
- Bob Fredwell, Fire Chief, Butler County Fire Department
- Crystal Jones, Ozark Foothills Regional Planning Commission

Coordination with FEMA Risk MAP Project

FEMA has established the Risk Mapping, Assessment and Planning (Risk MAP) program to identify flood risk and promote informed planning and development practices that reduce the risk of property damage due to flooding. There are no RiskMAP projects currently underway in Butler County. Figure 1.1 below shows locations of RiskMAP projects throughout Missouri. Butler County is located in the southeastern corner of the state along the Arkansas state line. Those counties indicated by the dark teal color (as Butler County) should be interpreted as “RiskMAP Complete Effective.” The three Missouri counties surrounding Ripley County are classified as ”Field Survey” regarding RiskMAP project status. The DFIRM released November 1, 2019 was used as the best available data to inform the flood risk assessment (Section 3 of this document) for the planning area.

Figure 1.1. RiskMAP Study Status



Integration of Other Data, Reports, Studies, and Plans

Contact was made with the U.S. Geological Survey to obtain data needed for the flood risk assessment—specifically the surface area of water located within the county. USGS was unfamiliar with the measure and unable to provide the data. Data was collected from a variety of sources (e.g. FEMA, the U.S. Census Bureau, etc.) for which no representatives attended planning meetings.

The *2018 State of Missouri Hazard Mitigation Plan* was consulted numerous times for a variety of technical data—specifically when completing the risk assessment portion of the plan update. Specific sources of technical data included, Butler County's 2019 Flood Insurance Rate Map (FIRM), the Missouri Department of Natural Resources, the Missouri Department of Conservation, the National Inventory of Dams (NID), SILVIS

Lab— Department of Forest Ecology and Management within the University of Wisconsin, National Centers for Environmental Information of the National Oceanic and Atmospheric Administration, and the USDA Risk Management Agency's Crop Insurance Statistics.

Relevant information from the above-listed sources was reviewed by the planner as appropriate and included within the updated planning document. Data was either manually entered by the planner, or "copied and pasted" from the online data source to the document. Sources for each data insertion were cited where appropriate.

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

During the first planning meeting held on June 7, 2022, at the Poplar Bluff R-1 School District's board room, information was presented to the MPC that identified and profiled the natural hazards to be potentially included within the plan update. As a part of this discussion previous disaster declarations were discussed with local input provided by members of details related to those declarations. The hazards included in the 2018 State Plan were also presented to the MPC, along with the hazards identified in the 2017 Butler County Hazard Mitigation Plan.

Data Collection Questionnaires were distributed to the jurisdictional representatives during the first planning meeting. The purpose and importance of the questionnaires were discussed, as well as the intention of inserting the collected information to conduct a jurisdiction-specific risk assessment.

During the second planning meeting, data provided within the Data Collection Questionnaires was reviewed and identified for incorporation within the plan update. It was further determined that each participating jurisdiction was required to incorporate the final updated hazard mitigation plan into future plans. In addition to the questionnaires, the MPC discussed the previous plan's Risk Assessment, and other sources from which data could be pulled for use in the plan update. These additional data sources included internet searches, GIS analysis, local newspaper articles, local "historians", and local officials from the jurisdictions. The risk assessment found within Section 3 of this plan update provides additional detail on conclusions drawn from the Data.

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

A variety of sources were used to identify local assets. The 2018 state plan was reviewed along with U.S. Census Data, GIS data, HAZUS data, and the completed Data Collection Questionnaires distributed to all jurisdictions. Once assets were identified, losses were estimated utilizing information in the 2018 state plan, as well as other available data such as dam inundation maps and prior loss history for events. Section 2 of this plan provides area profiles and information regarding each jurisdiction's capabilities. This section includes information on the participating jurisdictions' regulatory, personnel, fiscal, and technical capabilities. The information was collected through a review of local ordinances, staff members, and annual budgets. Completed Data Collection Questionnaires were also consulted to complete the jurisdiction-specific capability analysis. Chapter 3 of this plan includes a discussion of jurisdiction-specific vulnerabilities relative to each hazard identified

in the plan. The data used for the vulnerability estimates were taken from the 2018 State Plan as it was the best and most recent data source available.

Step 6: Set Goals
(Handbook Task 6)

No changes were made to the plan goals or priorities. The MPC reviewed the goals of the previous (2017) plan during the First Planning Meeting and finalized the goals for the current plan update during the second planning meeting held on July 20, 2021. Minutes of the meetings are included within Appendix C of this document. The identified goals are listed within Chapter 4.

The goals for the updated were established as follows:

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

The record-breaking riverine flood event of 2017 emphasized the importance of goal #2—implementing mitigation actions that will ensure the continuity of essential and government services following a disaster. During the flood event, many residents throughout the county were forced to evacuate their homes, with many residential structures receiving damages. The extensive direct losses to the communities, much of this occurring in lower income areas, significantly hampered recovery efforts.

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

The third planning meeting occurred on June 15, 2022, at the Ozark Foothills Regional Planning Commission in Poplar Bluff. At this meeting, MPC members reviewed the mitigation strategies from the 2017 county plan and proposed new and updated strategies. Each jurisdiction—particularly those who did not participate within the 2017 planning process—was required to identify at least one mitigation action. Members were asked to consider actions that substantially addressed long-term risks identified within the risk assessment in Section 3 of the updated plan.

During this final planning meeting, each jurisdiction representative reported upon progress made by their jurisdiction upon the previously proposed mitigation actions. MPC members analyzed each action, the progress (of lack thereof) made with regard to each action since 2017, and either, continued, deleted or modified the action for the 2022 plan update. It was determined by representatives of Butler County that due to an earthquake occurring in late 2021, an emphasis should be placed on earthquake preparedness education. No mitigation actions were identified during a RiskMAP project.

The FEMA publication Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards (January 2013) that was used as a reference in the development of action projects. Participants were encouraged to focus on long-term mitigation solutions and that consideration was given to the potential cost of each project in relation to the anticipated future cost savings. The MPC used a modified STAPLEE method to prioritize the mitigation actions included within Section 4 of this plan update. The STAPLEE worksheet used for the analysis is included within this section.

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

The action worksheets, including the plan for implementation, submitted by each jurisdiction for the updated Mitigation Strategy are included in Chapter 4.

Step 9: Adopt the Plan
(Handbook Task 8)

The 2022 *Butler County Hazard Mitigation Plan* was adopted by the Butler County Commission on January 9, 2023. Adoption by the City of Poplar Bluff occurred during February 2023, and the City of Qulin on January 10, 2023. Adoption by the Poplar Bluff R-I, Twin Rivers R-X, and Neelyville R-IV School Districts, as well as the Three Rivers Community College followed shortly thereafter. The executed adoption resolutions have been attached to this plan update within Appendix E.

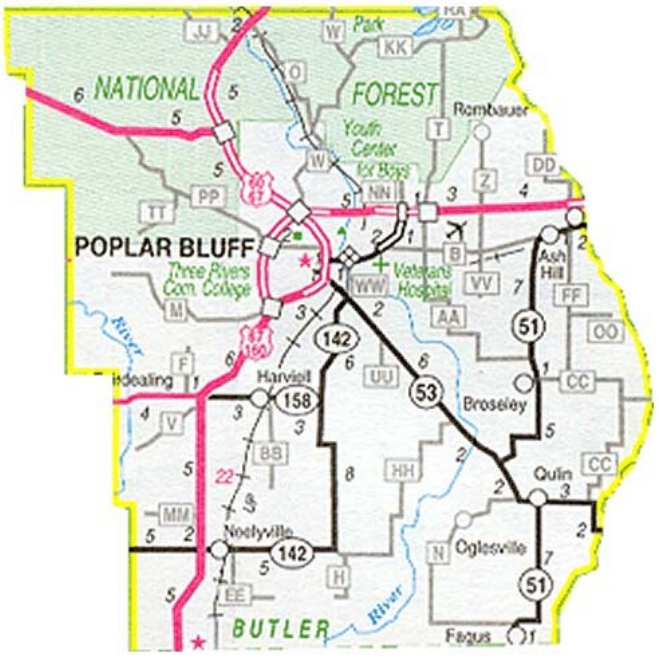
Step 10: Implement, Evaluate, and Revise the Plan
(Handbook Tasks 7 & 9)

At the third and final planning meeting on June 15, 2022, the MPC developed and agree upon an overall strategy for plan implementation and plan maintenance. Section 5 provides additional information on plan maintenance and monitoring as determined by the MPC for five years following plan approval.

2 PLANNING AREA PROFILE AND CAPABILITIES

2.1 BUTLER COUNTY PLANNING AREA PROFILE

Figure 2.1. Map of Butler County



The population of Butler County, as reported in the 2020 United States Census, was 42,130, a growth of 1,263 from the 2000 US Census that was reported as 40,867. In reviewing this census

data, Butler County, as much of rural America, saw a much lower rate of growth than both the State of Missouri and the country as a whole from 2000 through 2020. Butler County grew at a rate of 3.1%, compared to Missouri's growth rate of approximately 9.7% and the growth rate for the United States of America reported 16.6%, more than five times the rate of Butler County's growth rate.

Butler County is also a county with a very-low median household income (MHI), as compared to the State of Missouri and the United States. The 2020 American Community Survey 5-Year Estimates (ACS) reports that the MHI for Butler County is $42,227, a 55% increase from the 2000 Census MHI of $27,228. The ACS also reports that the MHI in Missouri has grown at 51% from 2000 through 2020, from $37,934 to $57,290 respectively. The United States MHI grew 49% during the same time period. Even though the MHI grew at a higher percentage rate than either the state of national MHI, Butler County residents exist on 75% of the income of their fellow Missourians and 69% of their fellow Americans.

Housing values reflect even more wealth disparities between the planning area and rest of the state and nation. Per the 2000 Decennial Census, Butler County's median housing value was $49,100, but increased to $116,400 per the 2020 American Community Survey. For the same time periods, the State of Missouri and the United States reported $89,900/$163,600 and $119,600/$217,500, respectively. The increases in median housing value from 2000 to 2020 amounted to 137% for Butler County, 82% for Missouri, and 45% for the United States.

2.1.1 Geography, Geology and Topography

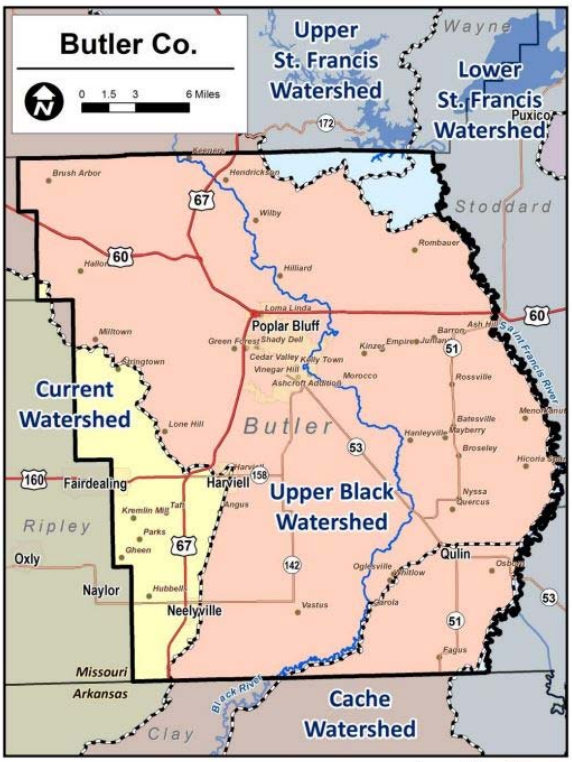
Butler County consists of 698 square miles or 446,720 acres. According to the U.S. Census of Agriculture, Butler County has approximately 202,267 acres of harvested land, 12,270 acres of deciduous upland mixed oak forest, 67,471 acres of non-native, cool season grasslands, and 11,564 acres of deciduous seasonally flooded river front forest. A portion of the Mark Twain National Forest is in the northern portion of the county.

As a rural county with no planning or zoning, single family residences and mobile homes are sprawled throughout the county, usually tucked away in the dense forested areas and accessible by county-maintained gravel roads. There are only four incorporated cities within the county limits. The City of Poplar Bluff is the largest incorporated city in Butler County with a population of 17,023 as reported in the 2010 US Census. Poplar Bluff also serves as the county seat. The other incorporated cities in Butler County include the City of Fisk with a reported population of 342 persons according to the 2010 Census, the City of Neelyville with a population of 483, and the City of Qulin with a population of 458 persons. There are other, smaller, unincorporated communities within the county that include Broseley, Fagus, and Rombauer among others.

Butler County's geology includes Tertiary- and Quaternary- Age Materials and Ordovician-Age Bedrock. Butler County's topography consists of half Highly Dissected Plateaus and Flat Lowlands.

The County has two main rivers running through it; the Black River and the St. Francis River, as well as several creeks and drainage ditches throughout the county. According to the United States Environmental Protection Agency, there are four (4) watersheds that cross Butler County, the Upper Black River, Current River, Lower St. Francis Watershed, and Upper St. Francis Watershed. A map of the watersheds is shown below in Figure 2.2 below.

Figure 2.2. Butler County, Missouri Watershed Map



Source: Missouri Department of Natural Resources

2.1.2 Climate

According to the National Weather Service (NWS) the average annual precipitation is 46.8 inches, higher than the United States average of 37 inches. It is reported that of these 46.8 inches of precipitation, 10 inches of that is snowfall annually. The average US city gets 25 inches of snow per year. The number of days with any measurable precipitation is 97 annually.

On average, there are 216 sunny days per year in Butler County. The month with the highest average temperature is July with an average of 92 degrees. The month with the lowest average temperature is January with an average low of 34 degrees. The High Plains Regional Climate Center provides monthly climate averages based on data collected from 1981-2010. According to this data the Maximum average monthly temperature in Butler County occurs in July at 90.51 degrees with the Minimum average monthly temperature occurring in January at 22.26 degrees. The month that averages the highest precipitation is November with 4.97 inches and the month with the lowest precipitation average is August with 3.17 inches.

2.1.3 Population/Demographics

The following table (Table 2.1) provides the populations for each city and the unincorporated county for 2000, 2010, and 2020. The unincorporated area population can be estimated by subtracting the populations of the incorporated areas from the overall county population.

Table 2.1. Butler County Population 2000-2010 by Jurisdiction

Jurisdiction	2000 Population	2010 Population	2020 Population	# Change (2010-2020)	% Change (2010-2020)
Butler County	40,867	42,794	42,130	-664	-1.6%
Poplar Bluff	16,651	17,023	16,225	-798	-1%
Qulin	467	458	460	2	0.5%

Source: U.S. Bureau of the Census, Decennial Census, annual population estimates/ 5-Year American Community Survey 2020;
*population includes the portions of these cities in adjacent counties

Based on the latest American Community Survey 5-year estimates, approximately 6.2% of Butler County's population is under age 5 and 19.3% of the population is over age 65. There are 16,358 households in Butler County. Comparatively, for the State of Missouri, 5.8% of residents are under age 5, and 17.6% are over age 65. Nationally, 5.7% of residents are under age 5, while 16.8% are 65 or older.

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

The SoVI Score for Butler County is reported as 2.349999905, which ranks as one of the most 20 vulnerable counties in the state. The score also places Butler County in the top 20% of vulnerable counties throughout the country, 84.6%. As can be seen from this score, Butler County is a vulnerable county as it relates to preparing, responding, and recovering from hazards.

In the table below (Table 2.2), further demographic data is provided to present a better picture of the local population in comparison the State of Missouri and the United States as a whole. As can be seen from this data, the residents are poorer and less educated than residents across the state and the nation.

Table 2.2. Unemployment, Poverty, Education, and Language Percentage Demographics, Butler 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
Butler County	53.7%	3%	21.2%	84%	13%	2.1%
Poplar Bluff	49.9%	3.9%	26.6%	82.4%	11.5%	3.5%
Qulin	34%	23.8%	30.6%	68.4%	10%	0%
State	62.6%	2.8%	12.1%	90.6%	29.9%	6.3%
Nation	62.1%	10.2%	13.4%	90%	21%	20%

Source: U.S. Census, **2020** American Community Survey, 5-year Estimates.

2.1.4 History

Butler County is in southeastern portion of Missouri, bounded on the north by Wayne County; on the

east by Stoddard and Dunklin Counties; on the south by the State of Arkansas; and on the west by Ripley and Carter Counties (see Appendix B for Base Map of Butler County).

Prior to the advent of early settlers in what is now Butler County it was one of the great hunting grounds of the Indians and the early French hunters. For many years after the settlers began cultivation of the soil the Indians remained in camps along the Big Black River. The first person to become a permanent settler in the section now comprising Butler County was Solomon Kittrell, a Kentuckian, who located near Cane Creek and opened a trading post. He was the first storekeeper in the county, and hauled his goods from Cape Girardeau by oxen.

The county was organized from a part of Wayne County by a legislative act approved February 27, 1849. It was named in honor of William O. Butler. At that time nearly all its land belonged to the government. The majority of the settlers had no title, other than that acquired by settlement, to the tracts upon which they lived.

There were many skirmishes between the Union and Confederates in the county during the Civil War. Many depredations were committed by lawless bands, which burned and plundered houses, stole stock, captured and, in a few instances, killed citizens. Terror reigned within the county limits, and many residents left it. At the close of the war only four families resided in Poplar Bluff. For some years after peace was declared organized bands of robbers made raids into the county, terrorizing citizens and stealing stock.

In 1869, a school was established at Poplar Bluff by the Butler County Educational Society. The first paper published in the county was the "Black River News", started in 1869 by G. L. Poplin and G. T. Bartlett. Source: Deed's History of Butler County, Missouri.

Over the past 100 years, Butler County has seen a steady increase in population. However, in 1940 the county saw a 3.8 percent increase in population, the largest gain in the 100 years. The county did experience a couple of decades (1960 & 1970) of population loss, but these were extremely small percentages.

2.1.5 Occupations

The table below shows occupation statistics for the incorporated cities and the county, as a whole and allows comparisons between communities.

Table 2.3. Occupation Statistics, Butler 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
Butler County	29.5%	20.2%	24%	7.9%	18.5%
Poplar Bluff	24.5%	25%	26.5%	5.1%	18.9%
Qulin	4.7%	28.9%	20.3%	15.6%	30.5%
Fisk	13.5%	18.4%	28.6%	15.1%	24.3%
Neelyville	26.9%	28.1%	16.9%	10.6%	17.5%

Source: U.S. Census, 2020 American Community Survey, 5-year Estimates.

2.1.6 Agriculture

Agriculture plays an important role in the economy of Butler County. On the eastern side of the county, the flat, fertile soil is used for row crop farming. Moving west, the land becomes less conducive to row crop farming due to the Ozark Mountains and livestock farming is prominent. According to the United States Department of Agriculture 2017 Census of Agriculture, there are 441 farms in Butler County and 241,767 acres of land in farms. The market value of the agricultural products sold that were produced in Butler County is $112,826,000, with 99% of that total stemming from crop sales and 1% from livestock.

The most recent data available from the USDA's Census of Agriculture were 2017 figures. This data reported that there were 27,899 acres of corn grown in the county. The Census also reveals that there were 11,528 acres of wheat grown in the county, and 360 acres of sorghum, 47,448 acres of rice, and 9,651 acres of land used for all hay and all haylage, grass silage, and greenchop.

As you travel west through the county, the landscape becomes more rolling hills and the popularity of hay farming and livestock farming becomes more popular. USDA reports that approximately 92,700 acres in the county is used for livestock farm land. The livestock raised in Butler County is primarily cattle with smaller numbers of hogs, sheep, and chickens. The Census of Agriculture reports that there were 273 farms with cattle and calves inventory that totaled 18,641 head. This figure includes beef cattle which was the majority at 246 farms, and milk cows that made up on seven of the total cattle farms. It is also reported that there are five hog farms, three sheep and/or lamb farms, and there are reportedly 42 chicken farms in the county.

2.1.7 FEMA Mitigation Assistance Grants in Planning Area

Previous FEMA mitigation grants—including Hazard Mitigation Assistance (HMA) Grants, Flood Mitigation Assistance (FMA) Grants, and Pre-Disaster Mitigation (PDM) Grants—awarded to jurisdictions within the planning area since 1993 total $11,693,587, with $8,768,990 provided as federal funds. The table below outlines the eight mitigation assistance grants received by jurisdictions within the planning area during this timeframe.

Table 2.4. FEMA HMA Grants in Butler County, Missouri: 1993-2022

Disaster Declaration	Project Type	Sub-Grantee	Date Approved	Project Total
1403	Acquisition/Demo	Poplar Bluff	1/9/2003	$1,647,669
1676	Acquisition/Demo	Poplar Bluff	9/17/2008	$599,557
1980	Saferoom	Three Rivers College	11/25/2013	$2,758,296
1822	Saferoom	Three Rivers College	2/22/2012	$3,382,873
1980	Saferoom	Poplar Bluff R-1 School District	1/29/2013	$1,406,823
1980	Saferoom	Neelyville R-IV School District	2/14/2013	$171,477
N/A (FMA)	Acquisition/Demo	City of Poplar Bluff	6/2/2006	125,290
N/A (PDM)	Saferoom	Poplar Bluff R-1 School District	9/28/2007	1,601,602
Total				**$11,693,587**

Source: Federal Emergency Management Agency, 2022

2.1.8 FEMA Public Assistance (PA) Grants in Planning Area

The table below lists the Public Assistance Grants classified as large and awarded to jurisdictions within Butler County since 1993. There have been 227 awards—both large and small—made within the planning area in the past years. The 227 awards totaled $8,169,311.

Table 2.5. FEMA Large PA Grants in Butler County, Missouri: 1993-2022

Disaster Declaration	Project Type	Applicant	Project Total
4317	Roads and Bridges	Butler County	$130,002
4317	Roads and Bridges	Butler County	$123,640
4317	Roads and Bridges	Butler County	$157,454
4317	Roads and Bridges	Butler County	$176,646
4317	Water Control Facilities	Butler County Drainage District #7	$255,544
1412	Roads and Bridges	Butler County	$95,768
1412	Debris Removal	Butler County	$361,310
1412	Debris Removal	Butler County	$64,229
1412	Protective Measures	Butler County	$116,944
1749	Roads and Bridges	Butler County	$107,825
1822	Protective Measures	City of Poplar Bluff	$282,458
1822	Debris Removal	City of Poplar Bluff	$74,233
1822	Protective Measures	Butler County	$84,056
1822	Public Utilities	City of Poplar Bluff	$554,953
1822	Public Utilities	City of Poplar Bluff	$103,171
1822	Debris Removal	Butler County	$218,155
1822	Debris Removal	City of Poplar Bluff	$751,189
1822	Debris Removal	City of Poplar Bluff	$281,702
1822	Public Utilities	City of Poplar Bluff	$130,900
1980	Roads and Bridges	Butler County	$86,328
1980	Roads and Bridges	Butler County	$181,431
1980	Roads and Bridges	Butler County	$83,221
1980	Roads and Bridges	Butler County	$84,056
1980	Roads and Bridges	Butler County	$68,585
1980	Roads and Bridges	Butler County	$70,807

1980	Roads and Bridges	Butler County	$70,939
1980	Roads and Bridges	Butler County	$81,396
1980	Roads and Bridges	Butler County	$84,565
1980	Debris Removal	Butler County Drainage District #7	$0

Source: Federal Emergency Management Agency, https://www.fema.gov/openfema-dataset-public-assistance-funded-projects-details-v1, 2022

2.2 JURISDICTIONAL PROFILES AND MITIGATION CAPABILITIES[3, 7, AND 8]

This section includes individual profiles for each participating jurisdiction. It also includes a discussion of previous mitigation initiatives in the planning area. 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. The non-participating jurisdictions include City of Fisk and City of Neelyville.

2.2.1 Unincorporated Butler County

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

The County Commission meets three times per week in the Courthouse located in the county seat of Poplar Bluff on Monday, Wednesday and Friday mornings from 9:00am-12:00pm and at other times in special session as needed. The County Clerk is also present for these meetings and serves as the Chief Financial Officer of the Commission.

The following is a list of county officials as of August 11, 2022:

- Presiding County Commissioner, Vince Lampe
- Associate Commissioner East District, Don Anderson
- Associate Commissioner West District, Dennis LeGrand
- County Clerk, Tonyi Deffendal
- Recorder, Debby Lundstrom
- Assessor, Chris Rickman
- Collector, Emily Clark-Parks
- Treasurer, Tammy Marler
- Prosecuting Attorney, Kacey Proctor
- Public Administrator, Jeff Darnell
- Circuit Clerk, Cindi Bowman
- Sheriff, Mark Dobbs
- Coroner, Jim Akers
- Emergency Management Director, Robbie Myers

Mitigation Initiatives/Capabilities

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

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

Butler County utilizes its elected prosecuting attorney for legal direction and services. Its Highway Department supervisor is responsible for overseeing the county's transportation infrastructure, which consists primarily of gravel-surfaced roadways. The county funds a sheriff's department, which is responsible for maintaining order and enforcing law within the county and operating a detention center. Butler County's fire protection is provided by volunteer fire departments including the Butler County Volunteer Fire Department and the Qulin Volunteer Fire Department. The county's emergency management director also functions as the county floodplain manager. Butler County, just as all of its neighboring counties, has established no planning and zoning committee or land use designations within the balance of the county.

Butler County participates with in the Ozark Foothills Local Emergency Planning District (LEPD), and is, consequently, included within the district's Local Emergency Operations Plan. The data found in the table below, **Table 2.6**, is based upon data reported by the county within its Data Collection Questionnaire.

Table 2.6. Unincorporated Butler County Mitigation Capabilities

Capabilities	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	None
Builder's Plan	None
Capital Improvement Plan	None
County Emergency Operations Plan	None
Local Emergency Plan	Ozark Foothills Local Emergency Operations Plan
Local Recovery Plan	None
County Recovery Plan	None
Local Mitigation Plan	None
County Mitigation Plan	August 2017
Debris Management Plan	None
Economic Development Plan	Ozark Foothills Comprehensive Economic Development Strategy, 2013
Transportation Plan	Ozark Foothills Regional Transportation Plan, June 2021 Public Transit Human-Service Transportation Plan, June 2018
Land-use Plan	None

Flood Mitigation Assistance (FMA) Plan	None
Watershed Plan	None
Firewise or other fire mitigation plan	None
School Mitigation Plan	None
Critical Facilities Plan (Mitigation/Response/Recovery)	None
Policies/Ordinance	
Zoning Ordinance	None
Building Code	None
Floodplain Ordinance	Yes, 9/9/1998
Subdivision Ordinance	None
Tree Trimming Ordinance	None
Nuisance Ordinance	None
Stormwater Ordinance	None
Drainage Ordinance	None
Site Plan Review Requirements	None
Historic Preservation Ordinance	None
Landscape Ordinance	None
Seismic Construction Ordinance	None
Program	
Zoning/Land Use Restrictions	None
Codes Building Site/Design	None
Hazard Awareness Program	None
National Flood Insurance Program (NFIP)	Yes, 1/17/1986
NFIP Community Rating System (CRS) program	None
National Weather Service (NWS) Storm Ready	Yes
Firewise Community Certification	None
Building Code Effectiveness Grading (BCEGs)	None
ISO Fire Rating	Yes, varies among fire department service areas

Capabilities	Status Including Date of Document or Policy
Economic Development Program	None
Land Use Program	None
Public Education/Awareness	Yes, EMA, Health Department, Fire Department
Property Acquisition	None
Planning/Zoning Boards	None
Stream Maintenance Program	None
Tree Trimming Program	None
Engineering Studies for Streams (Local/County/Regional)	Yes, 2022
Mutual Aid Agreements	Yes
Studies/Reports/Maps	
Hazard Analysis/Risk Assessment (Local)	None
Hazard Analysis/Risk Assessment (County)	None
Flood Insurance Maps	Yes, 1/17/1986, Community No. 290830
FEMA Flood Insurance Study (Detailed)	None
Evacuation Route Map	None
Critical Facilities Inventory	None
Vulnerable Population Inventory	None
Land Use Map	None
Staff/Department	
Building Code Official	None
Building Inspector	None
Mapping Specialist (GIS)	None
Engineer	None
Development Planner	None
Public Works Official	None
Emergency Management Director	Yes
NFIP Floodplain Administrator	Yes
Emergency Response Team	None
Hazardous Materials Expert	None
Local Emergency Planning Committee	Ozark Foothills LEPC
County Emergency Management Commission	None
Sanitation Department	None
Transportation Department	County Highway Department
Economic Development Department	None(Greater Poplar Bluff Area Chamber of Commerce)
Housing Department	None
Historic Preservation	None
Non-Governmental Organizations (NGOs)	
American Red Cross	Southeast Missouri Chapter of Red Cross
Salvation Army	Yes
Veterans Groups	VFW and American Legion
Local Environmental Organization	Nature Conservancy
Homeowner Associations	None
Neighborhood Associations	None
Chamber of Commerce	Greater Poplar Bluff Area Chamber of Commerce
Community Organizations (Lions, Kiwanis, etc.	Rotary, Kiwanis, Lions, Altrusa

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	Yes
Fees for water, sewer, gas, or electric services	Yes (Via public water supply districts)
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
Withhold spending in hazard prone areas	No

Source: Data Collection Questionnaire, 2022

2.2.2 City of Poplar Bluff

The City of Poplar Bluff is located in the central portion of Butler County, is the largest incorporated place, and serves as the county seat of Butler County, Missouri. The city is overseen by a city manager and a city council that includes five council positions elected by designated wards and two elected at-large. From the seven council members, they elect a mayor that leads all meetings of the council and executes legal documents on behalf of the city. A city clerk and assistant to the clerk assist the council and city manager in the management of the city budget and operations.

The City of Poplar Bluff contracts with a local attorney for legal direction and services. Its public works director is responsible for overseeing the city's municipal water, wastewater systems and electric utilities. The City has a separate parks department and director that manages all city parks and city sponsored recreational activities. The city also funds a police department, which is responsible for maintaining order and enforcing local ordinances, as well as a fire department. The city's planning and zoning committee meets regularly to ensure the city's established zones and land use designations are maintained. The City of Poplar Bluff and the unincorporated areas adjacent to the city limits have seen the most residential, commercial or industrial development. Major developments that have occurred since the last plan update include the area commonly known as Eight Points Development located on Oak Grove Road. The development includes a new 250 bed regional hospital, the Poplar Bluff Regional Medical Center. The area also includes an expansion of the local high school and several retail stores. Other development in the city has included the expansion of Oak Grove Road from two-lanes to four-lanes with a turning lane and the construction of Shelby Road, a four-lane city street. Both roads were constructed as part of a newly created Regional Transportation Development District (TDD). Future infrastructure projects included with this TDD is an extension of Shelby Road to connect into Missouri State Highway 53 on the south side of town. This roadway will alleviate some traffic congestion on Westwood Boulevard, the main corridor through Poplar Bluff. Other commercial development has included some office and retail spaces under construction during the summer of 2017 on the newly constructed Shelby Road and updates to existing retail shopping centers and new construction of retail and food service buildings in existing commercial areas. There has also been some limited residential development including a new apartment complex that is completed and a recently approved, but not yet constructed low-income housing complex that will include 48 units.

The largest employers located within the City of Poplar Bluff include the Poplar Bluff R-I School District, the Poplar Bluff Regional Medical Center, Briggs and Stratton Corporation, V.A. Medical Center, Gates Corporation, Wal Mart Stores, and Three Rivers College.

The City of Poplar Bluff participates with in the Ozark Foothills Local Emergency Planning District (LEPD). Consequently, the city is included within the district's Local Emergency Operations Plan. The city has completed the acquisition and demolition of multiple residential and commercial properties, and is currently demolishing multiple residential structures within city limits. Two outdoor warning sirens comprise the public warning siren system. The data found in the table below, **Table 2.7**, is based upon data reported by the city upon its Data Collection Questionnaire.

The loss of power among vulnerable and special needs populations residing in units without emergency backup power systems is of particular concern to the current city administration. The Butler County Health Department works to maintain a database that includes this vulnerable population, maintaining this information is addressed in the Actions section of this plan update. The information found within **Table 2.7**, below, is based on the Data Collection Questionnaire distributed to and collected from the City of Poplar Bluff, Missouri.

Table 2.7. Poplar Bluff Mitigation Capabilities

Capability	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	Yes, 2008
Builder's Plan	None
Capital Improvement Plan	Yes, 2016
Local Emergency Plan	Yes, 2012
County Emergency Plan	N/A
Local Recovery Plan	None
County Recovery Plan	N/A
Local Mitigation Plan	Yes, 2017
County Mitigation Plan	N/A
Local Mitigation Plan (PDM)	None
County Mitigation Plan (PDM)	N/A
Economic Development Plan	Yes, 2008
Transportation Plan	Ozark Foothills Regional Transportation Plan, June 2021 Public Transit Human-Service Transportation Plan, June 2018
Land-use Plan	Yes, Planning and Zoning regulations
Flood Mitigation Assistance (FMA) Plan	None
Watershed Plan	None
Firewise or other fire mitigation plan	None
School Mitigation Plan	None
Critical Facilities Plan (Mitigation/Response/Recovery)	None
Policies/Ordinance	
Zoning Ordinance	Yes, 1972
Building Code	Yes, IBC 2012
Floodplain Ordinance	Yes, 2010
Subdivision Ordinance	Yes
Tree Trimming Ordinance	Yes, Poplar Bluff Municipal Utilities
Nuisance Ordinance	Yes
Storm Water Ordinance	Yes, 2003
Drainage Ordinance	None
Seismic Construction Ordinance	None
Capability	
Site Plan Review Requirements	Yes
Historic Preservation Ordinance	Yes
Landscape Ordinance	None
Iowa Wetlands and Riparian Areas Conservation Plan	None
Debris Management Plan	None
Program	
Zoning/Land Use Restrictions	Yes
Codes Building Site/Design	Yes
National Flood Insurance Program (NFIP) Participant	Yes
NFIP Community Rating System (CRS) Participating Community	No
Hazard Awareness Program	Yes
National Weather Service (NWS) Storm Ready	None
Building Code Effectiveness Grading (BCEGs)	None
ISO Fire Rating	Yes, Class 4
Economic Development Program	Yes, Greater Poplar Bluff Area Chamber of Commerce
Land Use Program	Yes
Public Education/Awareness	Yes
Property Acquisition	None
Planning/Zoning Boards	Yes
Stream Maintenance Program	Yes

Capability	Status Including Date of Document or Policy
Tree Trimming Program	Yes, through PB Municipal Utilities
Engineering Studies for Streams (Local/County/Regional)	None
Mutual Aid Agreements	Yes
Studies/Reports/Maps	
Hazard Analysis/Risk Assessment (Local)	Yes, September 2016
Hazard Analysis/Risk Assessment (County)	N/A
Flood Insurance Maps	Yes, 11/2010
FEMA Flood Insurance Study (Detailed)	Yes
Evacuation Route Map	None
Critical Facilities Inventory	None
Vulnerable Population Inventory	None
Land Use Map	Yes
Staff/Department	
Building Code Official	Yes
Building Inspector	Yes
Mapping Specialist (GIS)	None
Engineer	None
Development Planner	Yes
Public Works Official	Yes
Emergency Management Coordinator	Yes
NFIP Floodplain Administrator	Yes
Emergency Response Team	Yes
Hazardous Materials Expert	Yes
Local Emergency Planning Committee	Yes
County Emergency Management Commission	None
Sanitation Department	Yes
Transportation Department	Yes
Economic Development Department	Yes
Housing Department	Yes
Historic Preservation	Yes
Non-Governmental Organizations (NGOs)	
American Red Cross	Yes
Salvation Army	Yes
Veterans Groups	Yes
Environmental Organization	Yes
Homeowner Associations	Yes
Neighborhood Associations	Yes
Chamber of Commerce	Yes
Community Organizations (Lions, Kiwanis, etc.	Yes
Local Funding Availability	
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	None
Ability to incur debt through general obligation bonds	Yes
Ability to incur debt through special tax bonds	Yes
Ability to incur debt through private activities	Yes
Ability to withhold spending in hazard prone areas	None

Source: Data Collection Questionnaire, 2022

2.2.3 City of Qulin

The City of Qulin is located in the eastern portion of Butler County. The city is overseen by a mayor and city council that includes four council positions elected by designated wards and the mayor

elected by all voters. A city clerk assists the council and mayor in the management of the city budget and operations. The City of Qulin contracts with a local attorney for legal direction and services. Its public works director is responsible for overseeing the city's municipal water and wastewater systems. The city relies on the Butler County Sheriff's Department for law enforcement and the Qulin Volunteer Fire Department provides fire protection services.

The City of Qulin participates with in the Ozark Foothills Local Emergency Planning District (LEPD). Consequently, the city is included within the district's Local Emergency Operations Plan. One outdoor warning siren comprises the public warning siren system. The data found in the table below, **Table 2.8**, is based upon data reported by the city upon its Data Collection Questionnaire.

Table 2.8 Qulin Mitigation Capabilities

Capability	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	None
Builder's Plan	None
Capital Improvement Plan	None
Local Emergency Plan	Yes
County Emergency Plan	N/A
Local Recovery Plan	None
County Recovery Plan	N/A
Local Mitigation Plan	Yes, 2017
County Mitigation Plan	N/A
Local Mitigation Plan (PDM)	None
County Mitigation Plan (PDM)	N/A
Economic Development Plan	Yes, 2008
Transportation Plan	Ozark Foothills Regional Transportation Plan, June 2021 Public Transit Human-Service Transportation Plan, June 2018
Land-use Plan	None
Flood Mitigation Assistance (FMA) Plan	None
Watershed Plan	None
Firewise or other fire mitigation plan	None
School Mitigation Plan	None
Critical Facilities Plan (Mitigation/Response/Recovery)	None
Policies/Ordinance	
Zoning Ordinance	None
Building Code	None
Floodplain Ordinance	Yes, 2010
Subdivision Ordinance	None
Tree Trimming Ordinance	None
Nuisance Ordinance	None
Storm Water Ordinance	Yes, 2003
Drainage Ordinance	None
Seismic Construction Ordinance	None
Capability	
Site Plan Review Requirements	None
Historic Preservation Ordinance	None
Landscape Ordinance	None
Iowa Wetlands and Riparian Areas Conservation Plan	None
Debris Management Plan	None
Program	
Zoning/Land Use Restrictions	No
Codes Building Site/Design	No
National Flood Insurance Program (NFIP) Participant	Yes

Capability	Status Including Date of Document or Policy
NFIP Community Rating System (CRS) Participating Community	None
Hazard Awareness Program	None
National Weather Service (NWS) Storm Ready	None
Building Code Effectiveness Grading (BCEGs)	None
ISO Fire Rating	Yes, Class 4
Economic Development Program	Yes, Greater Poplar Bluff Area Chamber of Commerce
Land Use Program	None
Public Education/Awareness	None
Property Acquisition	None
Planning/Zoning Boards	None
Stream Maintenance Program	None
Tree Trimming Program	Yes, through Ozark Border Electric Coop

Engineering Studies for Streams (Local/County/Regional)	None
Mutual Aid Agreements	Yes
Studies/Reports/Maps	
Hazard Analysis/Risk Assessment (Local)	None
Hazard Analysis/Risk Assessment (County)	N/A
Flood Insurance Maps	Yes, 11/2010
FEMA Flood Insurance Study (Detailed)	Yes
Evacuation Route Map	None
Critical Facilities Inventory	None
Vulnerable Population Inventory	None
Land Use Map	None
Staff/Department	
Building Code Official	None
Building Inspector	None
Mapping Specialist (GIS)	None
Engineer	None
Development Planner	None
Public Works Official	None
Emergency Management Coordinator	Yes – County Emergency Manager
NFIP Floodplain Administrator	Yes – County Floodplain Administrator
Emergency Response Team	None
Hazardous Materials Expert	None
Local Emergency Planning Committee	Yes – Regional
County Emergency Management Commission	Yes
Sanitation Department	Yes
Transportation Department	None
Economic Development Department	None
Housing Department	None
Historic Preservation	None
Non-Governmental Organizations (NGOs)	
American Red Cross	Yes
Salvation Army	Yes
Veterans Groups	Yes
Environmental Organization	None
Homeowner Associations	None
Neighborhood Associations	None
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	None
Ability to incur debt through general obligation bonds	Yes
Ability to incur debt through special tax bonds	Yes
Ability to incur debt through private activities	Yes
Ability to withhold spending in hazard prone areas	None

Source: Data Collection Questionnaire, 2022

2.2.4 Summary of Jurisdictional Capabilities[3, 7, and 8]

Table 2.8. Mitigation Capabilities Summary Table

CAPABILITIES	Butler County	City of Poplar Bluff	City of Qulin
Planning Capabilities			
Comprehensive Plan	No	Yes	No
Builder's Plan	No	No	No
Capital Improvement Plan	No	Yes	No
Local Emergency Plan	N/A	Yes	Yes
County Emergency Plan	Yes	N/A	N/A
Local Recovery Plan	No	No	No
County Recovery Plan	No	N/A	N/A
Local Mitigation Plan	N/A	Yes	Yes
County Mitigation Plan	Yes	N/A	N/A
Local Mitigation Plan (PDM)	N/A	No	No
County Mitigation Plan (PDM)	No	N/A	N/A
Debris Management Plan	No	No	No
Economic Development Plan	Yes	Yes	Yes
Transportation Plan	Yes	Yes	Yes
Land-use Plan	No	No	No
Flood Mitigation Assistance (FMA) Plan	No	No	No
Watershed Plan	No	No	No
Firewise or other fire mitigation plan	No	No	No
School Mitigation Plan	No	No	No
Critical Facilities Plan (Mitigation/Response/Recovery)	No	No	No
Policies/Ordinance			
Zoning Ordinance	No	Yes	No
Building Code	No	Yes	No
Floodplain Ordinance	Yes	Yes	Yes
Subdivision Ordinance	No	Yes	No
Tree Trimming Ordinance	No	Yes	No
Nuisance Ordinance	No	Yes	No
Storm Water Ordinance	No	Yes	Yes
Drainage Ordinance	No	No	No
Site Plan Review Requirements	No	Yes	No
Historic Preservation Ordinance	No	Yes	No
Landscape Ordinance	No	No	No
Seismic Construction Ordinance	No	No	No
Program			
Zoning/Land Use Restrictions	No	Yes	No
Codes Building Site/Design	No	Yes	No
National Flood Insurance Program (NFIP) Participant	Yes	Yes	Yes
NFIP Community Rating System (CRS) Participating Community	No	No	No
Hazard Awareness Program	No	Yes	No
National Weather Service (NWS) Storm Ready	Yes	No	No
Building Code Effectiveness Grading (BCEGs)	No	No	No
ISO Fire Rating	Yes	Yes	Yes

CAPABILITIES	Butler County	City of Poplar Bluff	City of Qulin
Economic Development Program	No	Yes	Yes
Land Use Program	No	Yes	No
Public Education/Awareness	Yes	Yes	No
Property Acquisition	No	No	No
Planning/Zoning Boards	No	Yes	No
Stream Maintenance Program	No	Yes	No
Tree Trimming Program	No	Yes	Yes
Engineering Studies for Streams (Local/County/Regional)	Yes	No	No
Mutual Aid Agreements	Yes	Yes	Yes
Studies/Reports/Maps			
Hazard Analysis/Risk Assessment (Local)	No	Yes	No
Hazard Analysis/Risk Assessment (County)	No	N/A	N/A
Flood Insurance Maps	Yes	Yes	Yes
FEMA Flood Insurance Study (Detailed)	Yes	Yes	Yes
Evacuation Route Map	No	No	No
Critical Facilities Inventory	No	No	No
Vulnerable Population Inventory	No	No	No
Land Use Map	No	Yes	No
Staff/Department			
Building Code Official	No	Yes	No
Building Inspector	No	Yes	No
Mapping Specialist (GIS)	No	No	No
Engineer	No	No	No
Development Planner	No	Yes	No
Public Works Official	No	Yes	No
Emergency Management Coordinator	Yes	Yes	Yes
NFIP Floodplain Administrator	Yes	Yes	Yes
Emergency Response Team	No	Yes	No
Hazardous Materials Expert	No	Yes	No
Local Emergency Planning Committee	Yes	Yes	Yes
County Emergency Management Commission	No	No	Yes
Sanitation Department	No	Yes	Yes
Transportation Department	Yes	Yes	No
Economic Development Department	No	Yes	No
Housing Department	No	Yes	No
Historic Preservation	No	Yes	No
Non-Governmental Organizations (NGOs)			
American Red Cross	Yes	Yes	Yes
Salvation Army	Yes	Yes	Yes
Veterans Groups	Yes	Yes	Yes
Environmental Organization	Yes	Yes	No
Homeowner Associations	No	Yes	No
Neighborhood Associations	No	Yes	No
Chamber of Commerce	Yes	Yes	Yes

CAPABILITIES	Butler County	City of Poplar Bluff	City of Qulin
Community Organizations (Lions, Kiwanis, etc.	Yes	Yes	Yes
Financial Resources			
Apply for Community Development Block Grants	Yes	Yes	Yes
Fund projects through Capital Improvements funding	Yes	Yes	Yes
Authority to levy taxes for specific purposes	Yes	Yes	Yes
Fees for water, sewer, gas, or electric services	Yes	Yes	Yes
Impact fees for new development	No	No	No
Incur debt through general obligation bonds	Yes	Yes	Yes
Incur debt through special tax bonds	Yes	Yes	Yes
Incur debt through private activities	Yes	Yes	Yes
Withhold spending in hazard prone areas	No	No	No

Source: Data Collection Questionnaire, 2020

2.2.5. Special District

There are four separately organized public water supply districts within Butler County that are organized as special districts providing water distribution to approximately 12,630 households and businesses in the unincorporated areas of Butler County.

There exist no past or ongoing projects or programs designed to reduce disaster losses. Mitigation-related capabilities applicable to the PWSD include the following:

- executing mutual aid agreements with neighboring water districts;
- inventorying district-owned critical facilities and infrastructure;
- retaining the services of a resident engineer;
- developing and fostering a continued relationship with the County's Emergency Management Director;
- consulting with the regional planning commission to explore funding opportunities; and,
- ensure annually that adequate fees are collected for water services

Table 2.9 below provides details on each of the four PWSD's. This data was provided by the Missouri Department of Natural Resources.

Table 2.9. Butler County Public Water Supply Districts Service Details

Water System Name	Year Organized	Population Served	Service Connections	Supply Capacity (Million Gallons)	Daily Used (Million Gallons)	Finished Water Storage(Million Gallons)
Butler County PWSD #1	1969	8,000	3,050	0.2450	0.9570	0.2000
Butler County PWSD #104	2004	25	1	Unknown	Unknown	Unknown
Butler County PWSD #2	1969	1,603	641	0.2880	0.0750	0.7500
Butler County PWSD #3	1972	3,000	1,250	0.6264	0.2167	0.2500

2.2.6 Public School District Profiles and Mitigation Capabilities

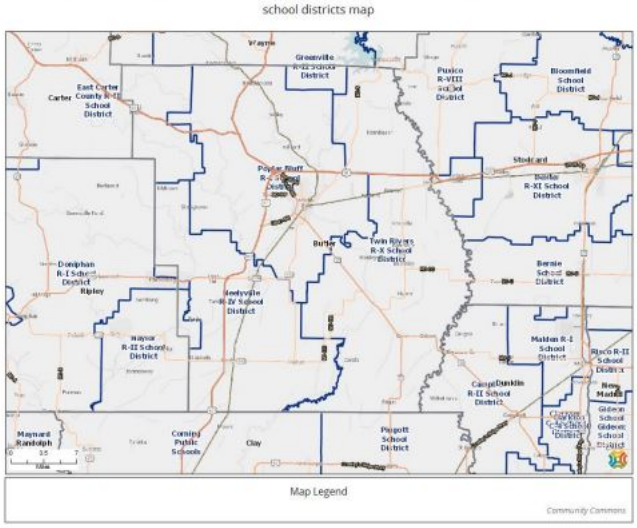
There are three public school districts located in and serving Butler County, Missouri. All districts participated in the Hazard Mitigation Planning Process. Butler County's school districts are:

- Poplar Bluff R-1 School District
- Twin Rivers R-X School District
- Neelyville R-IV School District

In addition to the public K-12 districts in the county, Three Rivers Community College (TRC) participated and adopted the plan. TRC is a public two-year college, with its main campus located in Poplar Bluff, Missouri. TRC's taxing district include the counties of Butler, Cater, Ripley, and Wayne in

Southeast Missouri.

Figure 2.3, Map of School Districts within Butler County, Missouri



Source: Community Commons

All school districts in Butler County, Missouri are accredited as “A” districts by the Missouri School Improvement Program 5 as mandated by Missouri Law and regulations of the State Board of Education. The Poplar Bluff R-I School District has constructed two tornado safe rooms per FEMA standards as of the writing of this plan update, one safe room on the campus of O’Neal Elementary School and one on the campus of the Poplar Bluff Junior High School.

The Poplar Bluff R-I School District maintains 14 properties in total, which include two FEMA-Certified tornado safe rooms and one reinforced safe room, and has assets valued at $121,479,037. The Poplar Bluff R-I School District completed major renovations, construction, and rearrangement of its campuses in the 2016-2017 school year. Since the 2017 HMP update, Poplar Bluff R-1 has completed construction of the Early Childhood Center, which attaches to the Kindergarten Center. The district remodeled the Mark Twain facility to serve as its Alternative School. Other capital improvements underway include the demolition of an outbuilding, formerly classrooms, at the Poplar Bluff Junior High School. Construction of a new activities facility will occur in its place. Also in process is the addition of a new Culinary Arts facility at the Technical Career Center, partially funded by Missouri’s CDBG program, a new FEMA building at Eugene Field Elementary, and the renovation of a historic property in Downtown Poplar Bluff which will house the district’s administrative offices upon completion.

Twin Rivers R-X School District has completed the addition of a baseball/softball practice facility, a storage building, and an ag building since the last HMP update. The district currently does not have a FEMA building or a tornado safe room and is planning to apply for funding for a tornado safe room on their high school campus located in the unincorporated community of Broseley, Missouri.

Neelyville R-IV has completed construction of a new high school administrative building since the last plan update.

Three Rivers Community College (TRC), the only community college in Southeast Missouri, is located within the city limits of Poplar Bluff. The campus of TRC has seen dramatic growth since the last update. One building on campus has undergone major renovations – The Westover Administration Building. Also completed was construction of the Libla Sports Complex, a 3,000 seat, 60,000 square

foot gymnasium that also includes a tornado safe room. Other infrastructure improvements have recently occurred, including improved parking and sidewalks throughout the campus.

Table 2.10. Butler County School District Buildings and Enrollment Data, August 2022

District Name	Building Name	Building Enrolment
Poplar Bluff R-1 School District	Poplar Bluff High School	1,526
Poplar Bluff R-1 School District	Poplar Bluff Technical Career Center	321
Poplar Bluff R-1 School District	Poplar Bluff Junior High School	802
Poplar Bluff R-1 School District	Poplar Bluff Middle School	1,008
Poplar Bluff R-1 School District	O'Neal Elementary School	338
Poplar Bluff R-1 School District	Oak Grove Elementary School	305
Poplar Bluff R-1 School District	Eugene Field Elementary School	287
Poplar Bluff R-1 School District	Lake Road Elementary School	333
Poplar Bluff R-1 School District	Poplar Bluff Kindergarten Center	381
Poplar Bluff R-1 School District	Poplar Bluff Early Childhood	305
Twin Rivers R-X School District	Twin Rivers High School	247
Twin Rivers R-X School District	Qulin Middle School	132
Twin Rivers R-X School District	Qulin Elementary School	124
Twin Rivers R-X School District	Fisk Elementary School	345
Neelyville R-IV School District	Neelyville High School	268
Neelyville R-IV School District	Neelyville Elementary	198
Neelyville R-IV School District	Hillview Elementary	159

Source: http://mcds.dese.mo.gov/quickfacts/Pages/District-and-School-Information.aspx, 2022

Table 2.11. Summary of Mitigation Capabilities- Poplar Bluff R-1, Twin Rivers R-X, and Neelyville R-IV School Districts

Capability	Poplar Bluff R-1	Twin Rivers R-X	Neelyville R-IV
Planning Elements			
Master Plan/ Date	Yes, FY 20-21	Unknown	No
Capital Improvement Plan/Date	Yes, FY 20-21	Unknown	No
School Emergency Plan / Date	Yes, FY 20-21	Yes	Yes, 2021
Weapons Policy/Date	Yes, FY 20-21	Yes	Yes
Personnel Resources			
Full-Time Building Official (Principal)	Yes	Yes	Yes
Emergency Manager	No	Yes	No
Grant Writer	No	No	No
Public Information Officer	Yes	Yes	Yes
Financial Resources			
Capital Improvements Project Funding	Yes	No	Yes
Local Funds	Yes	Yes	Yes
General Obligation Bonds	No	No	No
Special Tax Bonds	No	No	No
Private Activities/Donations	Yes	No	Yes
State and Federal Funds/Grants	Yes	Yes	Yes
Other			
Public Education Programs	Yes	Yes	Yes
Privately or Self-Insured?	Self-Insured	Unknown	Unknown
Fire Evacuation Training	Yes	Yes	Yes
Tornado Sheltering Exercises	Yes	Yes	Yes

Public Address/Emergency Alert System	Yes	Yes	Yes
NOAA Weather Radios	Yes	Yes	Partial
Lock-Down Security Training	Yes	Yes	Yes
Mitigation Programs	Yes	Yes	Yes
Tornado Shelter/Saferoom	Yes	No	No
Campus Police	Yes	Yes	No

Source: Data Collection Questionnaire, 2022

3 RISK ASSESSMENT

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

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

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.

The previous Butler County Hazard Mitigation Plan was approved in 2017. Since that time, there have been a variety of changes and development within the unincorporated areas of the county and within the city limits of the City of Poplar Bluff that were addressed Section 2. In reviewing the results of the 2020 Census, Butler County had a minimal population decrease of 664 persons since the census count in 2012. This number reflects the most recent count available. There have been no areas annexed by the cities of Fisk, Neelyville, Poplar Bluff, or Qulin since the last plan update. Officials report the construction of a low-income veterans' housing complex in the City of Poplar Bluff. Additionally, there have been small subdivisions developed outside the city limits. However, these areas are adjacent to already existing residential neighborhoods.

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:
    - 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;
    - Vulnerability Assessment further defines and quantifies populations, buildings, critical facilities and other community/schoo/special district assets at risk to natural hazards; and,
    - Problem Statement briefly summarizes the problem and develops possible solutions.

3.1 HAZARD IDENTIFICATION

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

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

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

3.1.1 Review of Existing Mitigation Plans

The planning committee reviewed the hazards identified in the 2017 Butler County Hazard Mitigation Plan. In the 2017 plan, there were eleven natural hazards identified:

- Dam Failure
- Drought
- Earthquakes
- Extreme Heat
- Fires
- Flooding
- Land Subsidence/Sinkholes
- Levee Failure
- Thunderstorms/High Winds/Lightening/Hail
- Tornado
- Winter Weather/Snow/Ice/Severe Cold

The planning committee reviewed these hazards and compared them to the known historical hazards that have impacted jurisdictions in Butler County. After this review, the committee determined the 2017 list is sufficient and made no changes. The committee decided to keep the hazards listed alphabetically, as this manner of presentation was presented in 2017, because it provides clean, list representation of the identified natural hazards. The updated plan will review and analyze the following natural hazards in the order listed below:

- Flood
- Levee Failure
- Dam Failure
- Earthquakes
- Land Subsidence/Sinkholes
- Droughts
- Extreme Temperatures
- Thunderstorm/High Winds/Lightening/Hail
- Severe Winter Weather
- Tornado

- Wildfire

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

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

- Hurricane and other Tropical Storm-Related Phenomena
- Tsunami
- Volcano and Other Volcanic-Related Phenomena
- Arid and Semi-Arid Related Phenomena

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

The planning committee discussed including man-made hazards in the Butler County Plan. As only natural hazards are required by FEMA regulations, the committee decided to only include and focus only on these identified natural hazards.

3.1.2 Review Disaster Declaration History

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

The Stafford Act provides for two types of disaster declarations: emergency declarations and major disaster declarations. All declarations discussed within this plan are emergency declarations. Emergency declarations authorize the President to provide supplemental disaster assistance. A major disaster declaration provides for a wide range of federal assistance programs for individuals and public infrastructure for both emergency and permanent repairs. Individual assistance includes assistance to individuals and households for things such as crisis counseling, case management, unemployment assistance, legal services, and supplemental nutrition assistance programs. Public assistance provides assistance to states, tribes, and local governments for things such as debris removal, emergency protective measures, roads and bridges, water control facilities, buildings and equipment, utilities, and park, recreational, and other facilities.

FEMA also issues emergency declarations, which are more limited in scope and do not include the long-term federal recovery programs of major disaster declarations. Determinations for declaration type are based on scale and type of damages and institutions or industrial sectors affected. The following table, (Table 3.1) is a list of all federal disaster declarations issued from 1990-2022 that covered Butler County. The table lists the disaster number, a short description of the date of the declaration, the period of the incident, and the amounts of Individual Assistance (IA) and Public

Assistance (PA).

Table 3.1 FEMA Disaster Declarations that Included Butler County, Missouri, 1990 - Present

Disaster Number	Description	Declaration Date Incident Period	Individual Assistance (IA) Public Assistance (PA)
DR-1006	Severe storms, tornadoes, and flooding	12/01/1993 11/13/1993-11/19/1993	Unknown
DR-1412	Severe storms and Tornadoes	05/06/2002 04/24/2002-06/10/2002	IA: $0 PA: $35,299,778
DR-1749	Severe storms and flooding	03/19/2008 03/17/2008-05/09/2008	IA: $13,924227 PA: $26,045,575
DR-1809	Severe storms, flooding, and tornadoes	11/13/2008 09/11/2008-09/24/2008	IA: $6,869,984 PA: $8,529,243
DR-1822	Severe winter storm	02/17/2009 01/26/2009-01/28/2009	IA: $0 PA: $135,849,619
DR-1847	Severe storms, tornadoes, and flooding	06/19/2009 05/08/2009-05/16/2009	IA: $5,417,824 PA: $27,072,335
DR-1980	Severe storms, tornadoes, and flooding	05/09/2011 04/19/2011-06/06/2011	IA: $37,115,640 PA: $173,882,614
DR-4317	Severe storms, tornadoes, straight-line winds, and flooding	06/02/2017 04/28/2017-05/11/2017	IA: $11,985,910 PA: $63,778
DR-4552	Severe storms, tornadoes, straight-line winds, and flooding	07/09/2020 05/03/2020-05/04/2020	IA: $0 PA: $7,431,398

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

3.1.3 Research Additional Sources

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

- Missouri Hazard Mitigation Plans (2018)
- 2017 Butler County Natural Hazard Mitigation Plan
- Federal Emergency Management Agency (FEMA)
- Missouri Department of Natural Resources
- National Drought Mitigation Center Drought Reporter
- US Department of Agriculture, 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)

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.

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

It is important to note that not all hazards impact every jurisdiction. The following table provides a summary of the jurisdictions impacted by each hazard. An “x” indicates the jurisdiction is impacted by the hazard, and an "-" indicates the hazard is not applicable to that jurisdiction. If there are variations in the assessed hazard risk for hazards that usually are area-wide in risk, such as thunderstorms, the rationale for that variation is included using footnotes at the bottom of the page.

Table 3.2 Hazards Identified for Each Jurisdiction

Jurisdiction	Dam Failure	Drought	Earthquake	Extreme Temperatures	Flooding (River and Flash)	Land Subsidence/Sinkholes	Levee Failure	Severe Winter Weather	Thunderstorm/Lightning/Hail/High Wind	Tornado	Wildfire
Butler County	x	x	x	x	x	x	x	x	x	x	x
City of Poplar Bluff	x	x	x	x	x	x	x	x	x	x	x
City of Qulin	-	x	x	x	x	x	x	x	x	x	x
Poplar Bluff R-1 School District	-	-	X	-	X	X	-	X	X	X	-
Neelyville R-1 School District	-	-	X	-	X	X	-	X	X	X	-
Twin Rivers R-X School District	-	-	X	-	X	X	-	X	X	X	-
Three Rivers Community College	-	-	x	-	x	x	-	x	x	x	-

3.1.5 Multi-Jurisdictional Risk Assessment

Following is a multi-jurisdictional hazard profile for Butler County, Missouri, and all jurisdictions within the boundaries of Butler County. The data used to compile this assessment can be found throughout the body of Section 3, as well as the tables included in this section. This plan is an update of the Butler County Natural Hazard Mitigation Plan approved in 2017. The data and information included reflect changes and updates since that time.

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

Butler County is fairly uniform in terms of climate; Temperatures and precipitation are relatively consistent throughout the county. There are some variations in topography across the county. The southeastern corner of Butler County is lowlands used for row crop farming, such as soybeans, rice, and corn. Traveling west across the county, the terrain changes to the foothills of the Ozark Mountains and large areas of the Mark Twain National Forest. These differences in topography and land use lead to a difference in assets, such as the agricultural assets of crops in the southeast to the livestock assets which can be found in the western area of the county. These differences and the impact of hazards will be discussed in more detail throughout the hazard profiles.

Butler County is sparsely populated with only four incorporated communities: City of Fisk, City of Neelyville; City of Poplar Bluff; and City of Qulin. Outside of these incorporated cities, there are a few small, unincorporated areas, such as Broseley, Harviell, Fagus, and Rombauer. Throughout the county, building structures are relatively consistent. Residential homes are mainly predominantly wooden structures. There also are a large number of mobile homes scattered throughout the county. The vulnerability of these areas will be discussed in more detail with each hazard profile.

Additionally, there are more variations across the county that will be discussed in greater detail throughout the hazard profiles. These variations include: The location of dams and the potential impact on certain areas; Flooding and its impact on various areas of the county; and sinkholes, which currently only present on the western side of the county.

3.2 ASSETS AT RISK

This section assesses the planning area population, structures, critical facilities, infrastructure, and other important assets that may be at risk to hazards. There have been limited changes to the planning areas since the approval of the 2017 Butler County plan. Although there has been a slight population decrease of 664 persons, much of this decrease was seen scattered throughout the unincorporated county and not concentrated in a specific area.

3.2.1 Total Exposure of Population and Structures

Unincorporated County and Incorporated Cities

In the following three tables, population data is based on 2020 Census Bureau data. Building counts and building exposure values are based on parcel data developed by the State of Missouri Geographic Information Systems (GIS) database. This data, organized by County, is available on Google Drive through the link provided on the previous page. 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 **Tables 3.3-3.5**.

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	2020 Annual Population Estimate	Building Count	Building Exposure ($)	Contents Exposure ($)	Total Exposure ($)
City of Poplar Bluff	16,225	8,500	1,326,173	848,748	2,174,921
City of Qulin	460	259	36,307	22,969	3,155,177
Unincorporated Butler County	25,275	11,716	1,934,381	1,220,796	3,155,177
Totals	42,130	20,893	3,379,825	1,220,796	4,600,621

Source: U.S. Bureau of the Census, 2020 Decennial Census Count; 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
City of Poplar Bluff	1,035,943	253,590	44,370	10,270	1,326,173
City of Qulin	27,871	6,725	1,195	516	36,307
Unincorporated Butler County	1,491,010	364,999	63,841	14,531	1,934,381
Totals	2,604,836	637,624	111,551	25,814	3,379,825

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
City of Poplar Bluff	8,038	346	81	35	8,500

City of Qulin	244	9	2	4	259
Unincorporated Butler County	11,034	499	110	73	11,716
Totals	19,709	871	197	116	20,893

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

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

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

Public School District	Enrolment	Building Count	Building Exposure ($)	Contents Exposure ($)	Total Exposure ($)
Poplar Bluff R-1 School District	4,866	68	99,532,367	21,946,670	121,479,037
Twin Rivers R-X School District	862	21	24,867,844	3,868,679	28,736,523
Neelyville R-IV School District	604	Unknown	Unknown	Unknown	Unknown

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

Three Rivers Community College (TRC) is one of 14 public two-year colleges located within Missouri. The number of students enrolled at TRC in 2022 was 2,623—falling consistently since 2017 during which 3,226 students were enrolled. The total drop in the college's enrollment in the past five years has equaled 18.7%. The college has a primary campus located in Poplar Bluff and numerous satellite facilities spread throughout its -county service area. Per data found at https://dhewd.mo.gov/data/statsum/index.php#ENRDEM, in 2014, of the college's 4,201 full and part-time students, 1,887 (44.9%) attended classes in person on-campus. This year was the most recent data available as provided by the Missouri Department of Higher Education and Workforce Development.

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
- Poplar Bluff Area Chamber of Commerce
- Discussion with members of the Mitigation Planning Committee
- City Clerks
- Chemical Facilities (Tier II Facilities) information (if included in the list of hazards identified by the participants) can be obtained by contacting the county LEPC. The LEPC will then request information (name, address, purpose for asking, etc.) and then provide the information. In order to find out who the LEPC contact is for your planning areas, see https://sema.dps.mo.gov/docs/programs/executive/MERC/LEPC_Manual/LEPC-addresses.pdf
- 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 Poplar Bluff	1	1	8		1	1	3	7	5	2	2	4	1	1	4	1	1	1	1	9	1	0	1	56
City of Qulin	0	0	0		0	0	1	1	1	0	0	0	0	0	0	1	1	0	1	2	0	0	1	9
Butler County	1	0	4		14	1	4	3	1	0	4	0	0	1	2	1	3	0	2	1	0	0	2	43
Totals	1	1	13		15	2	10	13	7	2	6	5	1	2	6	4	7	2	6	14	1	0	6	124

Source: Missouri 2018 State Hazard Mitigation Plan and Hazard Mitigation Viewer; Data Collection Questionnaires; Hazus, etc.

According to the National Bridge Inventory, there are 227 bridges location within Butler County. Of these 227 bridges, 105 have been identified as structurally deficient and 14 are functionally obsolete. Included in this total number of bridges is one bridge that is scour critical. The term “scour critical” refers to one of the database elements in the National Bridge Inventory. This element is quantified using a “scour index”, which is a number indicating the vulnerability of a bridge to scour during a flood. Bridges with a scour index between 1 and 3 are considered “scour critical”, or a bridge with a foundation determined to be unstable for the observed or evaluated scour condition. The Butler County bridge identified as scour critical is located on Missouri Highway 53 over Drainage Ditch No.1, southeast of Poplar Bluff.

Figure 3.1. Butler County Scour Critical Bridges

Source: Missouri 2018 State Hazard Mitigation Plan

3.2.3 Other Assets

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

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

Threatened and Endangered Species: Federally Threatened, Endangered, Proposed and Candidate Species in the county.

Table 3.8. Threatened and Endangered Species in Butler County

Common Name	Scientific Name	Status
Indiana Bat	Myotis sodalis	Endangered
Northern Long-Eared Bat	Myotis septentrionalis	Threatened
Curtis' Pearly Mussel	Epioblasma triquetra	Endangered
Gray Bat	Myotis grisescens	Endangered
Monarch Butterfly	Danaus plexippus	Candidate
Eastern Prairie Fringed Orchid	Platanthera leucophaea	Threatened
St. Francis River Crayfish	Faxonius quadruncus	Proposed Threatened
Big Creek Crayfish	Faxonius peruncus	Proposed Threatened
Pink Mucket	Lampsillis abrupta	Endangered
Pondberry	Lindera melissifolia	Endangered
Ozark Hellbender	Cryptobranchus alleganiensis bishopi	Endangered
Snuffbox Mussel	Epioblasma triquetra	Endangered
Rabbitsfoot	Quadrula cylindrica cylindrica	Threatened

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

Natural Resources: The Missouri Department of Conservation (MDC) provides a database of lands the MDC owns, leases, or manages for public use

Table 3.9. Parks in Butler County

Park / Conservation Area	Address	City
Allred Lake NA	Butler County Road 2601	Neelyville
Big Cane CA	Butler County Road 276	Neelyville
Coon Island CA	Butler County Road 244	Poplar Bluff
Corkwood CA	Highway 142	Neelyville
Dan River Access	Butler County Road 611	Poplar Bluff
Fisk Access	Highway 51	Fisk
Harviell Access	Butler County Road 321	Poplar Bluff
Hilliard Access	Route W	Poplar Bluff
James Clark Access	Butler County Road 573	Fisk
Hendrickson Access (Mark Twain NF)	Highway 67 North	Poplar Bluff
Otter Slough CA	Stoddard County Road 675	Fisk

Poplar Bluff CA	Butler County Road 553	Poplar Bluff
Ringo Ford Access	Highway 160	Neelyville
Sportsman's Park Access (Poplar Bluff)	Highway 60	Poplar Bluff
Stephen J. Sun CA	Butler County Road 544	Poplar Bluff
University Forest CA	Route W	Poplar Bluff
Wilhelmina CA	Route DD	Qulin
Fisk City Park	Garfield Street	Fisk
Kramer Memorial Park	Park Street	Neelyville
Bacon Park	Highland Drive	Poplar Bluff
Hendrickson Park	Davis Street	Poplar Bluff
Mini Rotary Park	Apple Street	Poplar Bluff
Hillcrest Park	2nd Street	Poplar Bluff
Link Park	D Street	Poplar Bluff
Black River Park	Barnhart Road	Poplar Bluff
Ray Clinton Park	Park Avenue	Poplar Bluff
Whiteley Park	Highway 53	Poplar Bluff
Ozark Ridge Public Golf Course	Cravens Road	Poplar Bluff
Qulin Lions Park	5th Street	Qulin

Source: http://mdc7.mdc.mo.gov/applications/moatlas/AreaList.aspx?txtUserID=guest&txtAreaNm=s ; Poplar Bluff Chamber of Commerce Visitor's Guide

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.

The following table lists all properties in Butler County that are on the National Register of Historic Places.

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

Property	Address	City	Date Listed
Butler County Courthouse	100 N. Main Street	Poplar Bluff	1994
Greer, Alfred W., House	955 Kinzer Street	Poplar Bluff	1998
Hargrove Pivot Bridge	CR 159	Poplar Bluff	1985
Koehler Fortified Archaeological Site	Address Restricted		1970
Cynthia-Kinzer Historic District	900-1000 blocks of Cynthia and Kinzer; 918-924 Maud; and 838-842 Kinzer streets	Poplar Bluff	2015
Garfield Historic District	914-916, 915, and 921 Garfield Street	Poplar Bluff	2017
Mark Twain School	1012 N. Main Street	Poplar Bluff	1998
Little Black River Archaeological District	Address Restricted		1975
Moore-Dalton House	421 N. Main Street	Poplar Bluff	1994
Moore, J. Herbert, House	445 N. 11th Street	Poplar Bluff	1998
Moore, Thomas, House	435 Lester Street	Poplar Bluff	1998
North Main Street Historic District	4000 block of N. Main Street	Poplar Bluff	2011
Phillips, John Archibald, House	522 Cherry Street	Poplar Bluff	1998
Poplar Bluff Commercial Historic District	South Broadway from Cedar to Vine Street, and Vine from Fifth Street to South Broadway.	Poplar Bluff	1994
Poplar Bluff Public Library	318 N. Main Street	Poplar Bluff	1994

Rodgers Theatre Building	204-224 N. Broadway	Poplar Bluff	2001
South Sixth Street Historic District	205-225-303 S. Sixth Street	Poplar Bluff	1998
St. Louis Iron Mountain and Southern Railroad Depot	400 S. Main Street	Poplar Bluff	1994
St. Louis – San Francisco Railroad Depot	303 Moran Street	Poplar Bluff	1994
Wheatley Public School	921 Garfield Street	Poplar Bluff	1998
Wilborn-Steinberg Site	Address Restricted		1972
Williams-Gierth House	848 Vine Street	Poplar Bluff	2012
Williamson-Kennedy School	614 Lindsay Street	Poplar Bluff	1998
Wright-Dalton-Bell-Anchor Department Store Building	201-205 S. Main Street	Poplar Bluff	2006
Zehe Building	203 Poplar Street	Poplar Bluff	1994

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

Economic Resources: The table below shows major non-government employers in the planning area.

Table 3.11. Major Non-Government Employers in Butler County

Employer Name	Main Locations	Product or Service	Employees
Poplar Bluff Regional Medical Center	Poplar Bluff	Healthcare	1,400
Briggs and Stratton	Poplar Bluff	Manufacturing	953
Poplar Bluff R-1 Schools	Poplar Bluff	School District	754
Briggs & Stratton	Poplar Bluff	Manufacturing	721
John J. Pershing VA Medical Center	Poplar Bluff	Healthcare	684
Gates Corporation	Poplar Bluff	Manufacturing	500
Three Rivers College	Poplar Bluff	Education	385
Mid-Continent Steel and Wire	Poplar Bluff	Manufacturing	376
Wal-Mart	Poplar Bluff	Retail	362

Source: Greater Poplar Bluff Area Chamber of Commerce

Agriculture

Agriculture plays an important role in the economy of Butler County. On the eastern side of the county, the flat, fertile soil is used for row crop farming. Moving west, the land becomes less conducive to row crop farming due to the Ozark Mountains and livestock farming is prominent. According to the United States Department of Agriculture 2017 Census of Agriculture, there are 441 farms in Butler County and 241,767 acres of land in farms. The market value of the agricultural products sold that were produced in Butler County is $112,826,000, with 99% of that total stemming from crop sales and 1% from livestock. The table below (Table 3.12) provides an overview of agricultural employment in Butler County.

Table 3.12. Agriculture-Related Jobs in Butler County

Hired (Paid) Farm Labor	Corresponding Numerical Data
Farms	154
Workers	420
Payroll	$6,653,000
Unpaid Farm Labor	**Corresponding Numerical Data**
Farms	188
Workers	437

Source: USDA 2017 Census of Agriculture

3.3 LAND USE AND DEVELOPMENT

3.3.1 Development Since Previous Plan Update

Between 2010 and 2020, the United States reports that Butler County's population decreased by 2% or 664 persons. By comparing the population changes of the four incorporated cities of Fisk, Neelyville, Poplar Bluff, and Qulin with the population changes in unincorporated areas of the County, it can be seen the majority of the decrease has occurred in the cities. The table below provides the population change statistics for participating cities and unincorporated areas of Butler County. (Please note the Cities of Fisk and Neelyville did not participate within this plan update and, consequently, are not listed within the below table.)

Table 3.13. County Population Growth, 2010-2020

Jurisdiction	Total Population 2010	Total Population 2020	2010-2020 # Change	2010-2020 % Change
Butler County – Total Population	42,794	42,130	-664	-1.6%
City of Poplar Bluff	17,023	16,225	-798	-4.7%
City of Qulin	458	460	2	0.5%
Unincorporated Areas of Butler County	24,488	24,815	327	1.4%

Source: U.S. Bureau of the Census, Decennial Census

Population growth or decline is generally accompanied by increases or decreases in the number of housing units. The table below below provides the change in numbers of housing units in the planning area from 2010 to 2020.

Table 3.14. Change in Housing Units, 2010-2020

Jurisdiction	Housing Units 2010	Housing Units 2020	2010-2020 # Change	2010-2020 % Change
Butler County	19,731	19,858	127	0.7%
City of Poplar Bluff	8,038	8,108	70	0.9 %
City of Qulin	244	318	74	23.3%

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; Censusreporter.org

According to the U.S. Bureau of the Census, Decennial Census, Butler County's population decreased by 664 persons or 1.6 percent from 2010-2020. In reviewing further data regarding this decrease, a portion is a result of natural decrease which is defined as occurring when the death rate for an area is higher than birth rates. Butler County had 186 more deaths than births between 2010 and 2020.A second component of the population decline is net migration, which is the difference between the number of people that moved out of the County compared to the number of people that moved into the county. During this 10-year period, the net migration for Butler County is estimated at 478 persons.

As demonstrated in the population disbursement, which shows the bulk of the population living in the unincorporated areas of Butler County, most residential development has occurred within these unincorporated areas, primarily surrounding the City of Poplar Bluff. Commercial development has followed similar patterns and can seen within the Poplar Bluff city limits. The majority of residential development consists of small subdivisions scattered throughout the County. Most of this development is located within close proximity to the City of Poplar Bluff, primarily to the west and north. Poplar Bluff is the regional hub for employment, shopping, and medical care in Butler County.

City of Poplar Bluff

The City of Poplar Bluff saw a decrease of 798 residents between 2010 and 2020. This differs from the prior decade when the City's population increased by 372 between 2000 and 2010. The City has seen the development of new residential areas and new multifamily housing units within city limits in the past five years. A new strip mall was constructed and opened along PP Highway which features new retail space, as well as office space and store fronts on Oak Grove Road and new manufacturing employers were added in the Industrial Park. In 2019, a new overpass opened near the Poplar Bluff Industrial Park, allowing better large vehicle access for manufacturers.
The City follows a comprehensive plan that was adopted in 2008. Local government consists of a city council which hires a city manager to oversee day-to-day operations. The City also employs a full-time planner who oversees planning and zoning ordinances.

City of Qulin

The City of Qulin saw an increase of two residents between 2010 and 2020. This remains consistent with data from 2000 through 2010 showing an increase of nine residents. There has been no annexation and no significant housing developments within the City and no land use or zoning regulations exist in this small, farming community. There has been little new commercial development in Qulin in recent years.

3.3.2 Future Land Use and Development

As demonstrated in the population disbursement, which shows the bulk of the population living in the unincorporated areas of Butler County, most future residential development will continue to occur within these unincorporated areas, primarily surrounding the City of Poplar Bluff. Future commercial development will be seen within the Poplar Bluff city limits. The majority of residential development will be comprised of small subdivisions scattered throughout the County and economic development will focus on manufacturing and retail. Most development will occur primarily to the western and northern areas of Poplar Bluff and nearby.

City of Poplar Bluff

City leaders anticipate residential growth and continued economic growth at similar rates in the coming years. Currently, a new manufacturing facility is under construction in the industrial park. It is anticipated to open within the next two years.

City of Qulin

There has been little new commercial development in Qulin in recent years and no future growth or significant development is anticipated.

School District's Future Development

The Poplar Bluff R-1 School District completed an addition to the current Kindergarten Center in 2020 which houses the Early Childhood Program. The district's future plans are to demolish an old, dilapidated building on the Junior High's campus and construct a Student Activity Center in its place. Additionally, the district plans to build a Culinary Arts facility adjacent to the Technical Career Center which will allow the current program to relocate to this location. The district also is in the midst of remodeling a historic building in Downtown Poplar Bluff which it plans to use as its Central Office Building. It is anticipated relocation to the new Central Office will occur in 2023. The relocation of the Culinary Arts Program and Central Office, which currently are located in the same building in central Poplar Bluff, will create empty office space for the district to use for additional endeavors. There are no clear-cut plans at this time for the future use of this building, but plans are underway.

The Twin Rivers R-X School district has elementary campuses located in Fisk and Qulin with the high school located in the unincorporated community of Broseley. Within the past five years, the district has completed basic structural updates, including new roofs, parking lot paving, and upgrades to the heating and air units on some campuses. The school district anticipates continuing with similar improvements in the future, and no major construction is yet planned.

The Neelyville R-IV School District has elementary campuses located at Hillview and in the city limits of Neelyville, along with the middle and high school campuses. Hillview is the only campus not located within city limits. Within the past five years, the district has maintained its facilities, and added features such as an outdoor classroom for students at Hillview. No major construction has occurred and future plans do not anticipate major changes to the structural integrity of the district.

Three Rivers College is located in Poplar Bluff. Within the past five years, the college has completed several projects, including the reconfiguration of and additions to its sidewalks and parking lots. Renovation of one building was completed and a new sports complex featuring a basketball arena was completed and opened in 2019. Aside from small-scale remodels and updates, future plans do not anticipate additional large-scale projects.

Special District's Future Development

The special district's located in Butler County are limited to four public water districts: Butler County Public Water Supply District (PWSD) No. 1, 2, and 3; and Wayne-Butler County PWSD No. 4, which serves customers in Wayne and Butler counties. Table 3.15. below provides details of the districts.

Table 3.15. Butler County Public Water Supply Districts

Name	Population Served	Service Connections	Supply Capacity	Average Daily Consumption	Finished Water Storage
PWSD No. 1	11,000	4,534	2,901,000	976,000	1,090,000
PWSD No. 2	1,500	519	648,000	93,000	150,000
PWSD No. 3	2,600	1,017	576,000	227,000	437,000
PWSD No. 4	1,200	674	Unknown	240,000	220,000

Source: Missouri Department of Natural Resources, Census of Missouri Public Water Supply Systems, 2022

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

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

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

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

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

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

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

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

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

Following the hazard profile for each hazard will be the vulnerability assessment. The vulnerability assessment further defines and quantifies populations, buildings, critical facilities, and other community assets at risk to damages from natural hazards. The vulnerability assessments 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 Update.

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 Butler 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** (including types and numbers, of buildings, critical facilities, etc.)
- **Previous and Future Development**
- **Hazard Summary by Jurisdiction**

Problem Statements

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

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 3.4.2. and Section 3.4.3. 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. Butler County has two significant rivers that are primarily responsible for riverine flooding. Black River and the St. Francis River are the causes of riverine flooding most often. In fact, riverine flooding is one of the more common natural hazards that occur in Butler County. The riverine flooding history below was gathered from the National Centers for Environmental Information (NCEI) for a 20-year period of January 1, 2002 through December 31, 2021. In reviewing SFHA and data collection questionnaires, there are no school district assets located within any SFHA's. Table 3.16. shows Butler County riverine flood event history.

Table 3.16. Butler County NCEI Flood Events by Location, 2002-2022

Location	# of Events
Unincorporated County	17
-Unincorporated County (Unspecified) – 4 flood events	
-Unincorporated County (Ash Hill) – 1 flood events	
-Unincorporated County (Fagus) – 1 flood events	
-Unincorporated County (Harviell) –1 flood events	
-Unincorporated County (Hendrickson) – 1 flood events	
-Unincorporated County (Hillard) – 2 flood events	
-Unincorporated County (Lone Hill) – 2 flood events	
-Unincorporated County (Mengo) – 1 flood events	
-Unincorporated County (Rombauer) – 1 flood events	
-Unincorporated County (Stringtown) – 3 flood events	
City of Fisk – 4 flood events	4
City of Neelyville – 1 flood events	1
City of Poplar Bluff – 27 flood events	27
Total Flood Events	49

Source: National Centers for Environmental Information, March 31, 2022

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. The City of Poplar Bluff is the most susceptible to flash flooding incidents. Inside city limits, there are more streets and impervious areas that often lead to instances of flash flooding. Areas such as streets, sidewalks, parking lots, and driveways prevent rainwater from being absorbed by the ground and create runoff of water that can lead to flash flooding, especially in low-lying areas

of the city. In reviewing the incidents reported by the NCDC database for the 20-year period of January 1, 2002 through December 31, 2021, there were 40 flash flood events in the county and 18 of those reported impacted Poplar Bluff. (**Table 3.3)** Provides the number of flash flood events by location recorded in NCEI for the 20-year period.

Table 3.17. Butler County NCEI Flash Flood Events by Location, 2002-2022

Location	# of Events
Unincorporated County	19
-Unincorporated County (Broseley) – 2 flood events	
-Unincorporated County (Countywide) – 4 flood events	
-Unincorporated County (Fagus) – 1 flood event	
-Unincorporated County (Harviell) – 1 flood event	
-Unincorporated County (Hendrickson) – 3 flood events	
-Unincorporated County (Hillard) – 2 flood events	
-Unincorporated County (Lone Hill) – 2 flood events	
-Unincorporated County (Rombauer) – 1 flood event	
-Unincorporated County (Southwest Portion) – 1 flood event	
-Unincorporated County (Stringtown) – 2 flood event	
City of Fisk – 1 flood event	1
City of Neelyville – 1 flood event	1
City of Poplar Bluff – 18 flood events	18
City of Qulin – 1 flood event	1
Total Incidents	40

Source: National Centers for Environmental Information, 4/5/2022

Strength/Magnitude/Extent

Missouri has a long and active history of flooding over the past century, according to the 2018 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.

During flood events, floodwaters can interact with hazardous materials. Hazardous materials stored in large containers could break loose or puncture as a result of flood activity. One example of a hazardous material in a large container that would be at risk during a flood event is a bulk propane tank. When a bulk propane tank becomes compromised, 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 mosquitos and other entomology concerns) may be necessary.

When roads and bridges are inundated with water, damages can occur as the water scours materials around bridge abutments and gravel roads. This is of particular concern for two bridges on Route 142 in Butler County: the Little Black River bridge and the Harris Creek bridge. Floodwaters can also cause erosion undermining roadbeds. In some instances, steep slopes which are saturated with water may cause mud or rockslides 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 cleanup for home and business owners, as well as present a health hazard.

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

The table below provides details on NFIP participation for the communities in the planning area. Table 3.19 provides information regarding the number of policies in force, amount of insurance in force, number of closed losses, and total payments for each jurisdiction, where applicable as of April 5, 2022.

Table 3.18. NFIP Participation in Butler County

Community ID #	Community Name	NFIP Participant (Y/N/Sanctioned)	Current Effective Map Date	Regular-Emergency Program Entry Date
290044	Butler County	Y	11/26/2010	04/03/1985
290045	City of Fisk	Y	11/26/2010	09/16/1981
290046	City of Neelyville	Y	11/26/2010	05/05/1981
290047	City of Poplar Bluff	Y	11/26/2010	02/04/1981
290048	City of Qulin	Y	11/26/2010	10/15/1981

Source: NFIP Community Status Book, 4/5/2022; 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 3.19. NFIP Policy and Claim Statistics as of April 5, 2022

Community Name	Policies in Force	Insurance in Force	Closed Losses	Total Payments
Butler County	329	$42,704,400	269	$6,562,361
City of Fisk	14	$884,700	1	$9,486
City of Neelyville	4	$457,700	2	$6,174
City of Poplar Bluff	78	$18,839,800	128	$2,999,927
City of Qulin	4	$393,700	6	$51,288

Source: NFIP Community Status Book, [04/05/2022]; 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 July 1, 1978, to January 1, 2017.

The unincorporated areas of Butler County had the most closed losses with 269 total payments for those claims of $6,562,361. The City of Poplar Bluff had a high rate of closed losses at 128, with total payments of $2,999,927. These records are based on a timeframe of January 1,1978 through July 31, 2017.

Repetitive Loss/Severe Repetitive Loss Properties

Repetitive Loss (RL) 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 72 repetitive loss properties. As of April 12, 2022, no RL properties have been mitigated, leaving 72 un-mitigated repetitive loss properties.

The following table **(Table 3.20.)** provides a summary of the repetitive loss properties in the planning area.

Table 3.20. Butler County Repetitive Loss Properties

Jurisdiction	# of Properties	Building Payments	Content Payments	Total Payments	Average Payment	# of Losses
Butler County	56	$3,527,362	$765,404	$4,292,766	$31,564	136
City of Fisk	0	$0	$0	$0	$0	0
City of Neelyville	0	$0	$0	$0	$0	0
City of Poplar Bluff	15	$523,510	$1,273,632	$1,797,632	$51,347	35
City of Qulin	1	$24,946	$1,356	$26,302	$13,151	2

Source: Flood Insurance Administration as of April 12, 2022

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.

There are 72 validated SRL properties in Butler County, of these, 56 are located in Unincorporated Butler County, 15 are located within the city limits of Poplar Bluff, and one is located within the city limits of Qulin. There have been more than 173 losses claimed over these 72 properties.

Previous Occurrences

Following is a list of Presidential Flooding Disaster Declarations that included the planning area, and the related impact.

- DR-4552 – Declared 7/9/2020 for the incident period of 5/3/2020 through 5/4/2020 for tornadoes, straight-line winds, and flooding.
- DR-4317 – Declared 06/02/2017 for the incidents period of 4/28/2017 through 5/11/2017 for severe storms, tornadoes, straight-line winds, and flooding.
- DR-1980 – Declared 5/9/2011 for the incident period of 4/19/2011 through 6/6/2011 for severe storms, tornadoes, and flooding.
- DR-1847 – Declared 6/19/2009 for the incident period of 5/8/2009 through 5/16/2009 for severe storms, tornadoes, and flooding.
- DR-1809 – Declared 11/13/2008 for the incident period of 9/11/2008 through 9/24/2008 for severe storms, flooding, and tornadoes.
- DR-1749 – Declared 3/19/2008 for the incident period of 3/17/2008 through 5/9/2008 for severe storms and flooding.
- DR-1006 – Declared 12/1/1993 for the incident period of 11/13/1993 through 11/19/1993 for flooding, severe storms, and tornadoes.

NCEI information for the last 20 years for both flash and river flooding is presented in the tables below (**Table 3.21. and Table 3.22.**).

Table 3.21. NCEI Butler County Flash Flood Events Summary, 2002 to 2022

Year	# of Events	# of Deaths	# of Injuries	Property Damages $	Crop Damages $
2002	5	0	0	40,000	0
2003	2	0	0	0	0
2004	2	0	0	4,000	0
2005	0	0	0	0	0
2006	1	0	0	250,000	0
2007	2	0	0	75,000	0
2008	5	0	0	40,000	0
2009	2	0	0	0	0
2010	2	0	0	60,000	0
2011	3	0	0	100,000	0
2012	1	0	0	10,000	0
2013	1	0	1	90,000	0
2014	1	0	0	200,000	0
2015	3	1	0	23,000	0
2016	2	0	0	4,000	0
2017	2	0	0	35,000	0
2018	1	0	0	25,000	0
2019	1	0	0	0	0
2020	1	0	0	0	0
2021	3	0	0	0	0

Source: NCEI, data accessed [4/7/2022]

Table 3.22. NCEI Butler County Riverine Flood Events Summary, 2002 to 2022

Year	# of Events	# of Deaths	# of Injuries	Property Damages $	Crop Damages $
2002	3	0	0	36,000	0
2003	0	0	0	0	0
2004	0	0	0	0	0
2005	0	0	0	0	0
2006	2	0	0	0	0
2007	2	0	0	5,000	0
2008	6	0	0	4,530,000	0
2009	6	3	1	130,000	0
2010	0	0	0	0	0
2011	7	0	0	5,800,000	0
2012	0	0	0	0	0
2013	3	0	0	20,000	0
2014	1	0	0	0	0
2015	4	0	0	2,000	0
2016	4	1	0	175,000	0
2017	3	2	0	2,670,000	120,000
2018	2	0	0	0	0
2019	2	0	0	0	0
2020	3	0	0	0	0
2021	1	0	0	0	0

Source: NCEI, 4/7/2022

Probability of Future Occurrence

The most recent 20-year historical data presented above indicates there is a more than 100 percent chance of a flash flood occurring in future years, with the current 20-year average at 2 per year. This data also indicates a more than 100 percent chance of future riverine flood events each year, with the current 20-year average at nearly 2.5 flood events per year.

Changing Future Conditions Considerations

If departure from normal with respect to increased precipitation intensity continues, frequency of floods in Missouri is likely to increase as well. Over the last half century, average annual precipitation in most of the Midwest has increased by 5 to 10 percent. But rainfall during the four wettest days of the year has increased about 35 percent, and the amount of water flowing in most streams during the worst flood of the year has increased by more than 20 percent. It is likely (66-100% probability) that the frequency of heavy precipitation or the proportion of total rainfall from heavy falls will increase in the 21st century across the globe. More specifically, it is “very likely” (90- 100% probability) that most areas of the United States will exhibit an increase of at least 5% in the maximum 5-day precipitation by late 21st century. As the number of heavy rain events increase, more flooding and pooling water can be expected.

Flooding occasionally threatens navigation and riverfront communities; and, greater river flows could increase these threats. In April and May 2011, a combination of heavy rainfall and melting snow caused a flood that closed the Mississippi River to navigation, threatened Caruthersville, and prompted evacuation of Cairo, Illinois, due to concerns that its flood protection levees might fail. The expected increases in rainfall frequency and intensity are likely to put additional stress on natural hydrological systems and community stormwater systems.

Heavier snowfalls in the winter will lead to intensified spring flooding, and groundwater levels will remain high even in non-floodplain areas. Such changes in climate patterns can lead to the development of compounding events that interact to create extreme conditions. Flooding caused by high groundwater levels typically recedes more slowly than riverine flooding, slowing the response and recovery process. Groundwater-fed rivers and streams are also likely to experience heightened flooding when groundwater levels are high.

Jurisdictions updating or installing stormwater management systems should consider potentially larger future discharge amounts when sizing culverts and drainage ways; storage capacity can also be increased by building retention basins to hold excess stormwater. Communities already prone to flooding should be prepared for a potential increase in facility closures and/or damages, as well as an increase in public demand for flood response and assistance.

Natural features that experience repeated flooding may manifest changes in the form of stream bank instability and changing shoreline, floodplain, and wetland boundaries. Communities may wish to plan for the potential loss of cropland and damage to both private property and public infrastructure such as bridges.

The environmental impacts of flooding include erosion, surface and groundwater contamination, and reduced water quality. The threat of more frequent flood events may thus be a concern particularly for communities who depend on lakes, rivers, or trout streams for tourism. Too, rural communities may experience increases in well contamination and road washouts, while more populated and developed areas may be particularly vulnerable to flash flooding as heavy rain events quickly overwhelm the ability of a more impermeable environment to absorb excess stormwater.

Vulnerability

Vulnerability Overview

The vulnerability overview for Butler County comes primarily from HAZUS data included in the 2018 Missouri State Hazard Mitigation Plan. HAZUS uses GIS technology to estimate the impacts of disasters. HAZUS-MH produces a flood polygon and flood depth grid that represents the base flood level. Butler County utilizes HAZUS flood data as part of its planning process. The 2018 State Hazard

Mitigation Plan includes Level 2 HAZUS flood analysis for all 114 Missouri counties. This data is paired with DFIRM depth grids and enhanced building inventory.

DFIRM data is available for Butler County, and impact estimates in counties where DFIRM data was integrated typically increases the losses when compared to counties where only HAZUS-generated flood-data was utilized. The damaged building counts generated by HAZUS are susceptible to rounding errors and are likely the weakest output of the model due to the use of HAZUS census blocks for analysis.

As discussed in Section 3.2.2., the term “scour critical” refers to one of the database elements in the National Bridge Inventory. This element is quantified using a “scour index”, which is a number indicating the vulnerability of a bridge to scour during a flood. Bridges with a scour index between 1 and 3 are considered “scour critical”, or a bridge with a foundation determined to be unstable for the observed or evaluated scour condition.

Potential Losses to Existing Development

In reviewing the data presented in the 2018 state hazard mitigation plan, information is presented detailing potential loss estimates at risk to a 100-year-flood. Included in the data is building loss, loss ratio, and displaced populations. The data used for Butler County estimates the following losses:

- Structural Loss: $115,978,000
- Contents Loss: $121,024,000
- Inventory Loss: $3,868,000
- Total Direct Loss: $240,870,000
- Total Income Loss: $726,000
- Loss Ratio of the County: 2.8%
- Displaced People: 5,012
- Shelter Needs: 2,819

In reviewing available data and through discussions with local school districts, it was determined there are no school district assets located in flood plains, and no prior flood damage reports from the schools. In discussions with county personnel and local residents, there has been no flood damage to any critical facilities in the Butler County.

Impact of Previous and Future Development

Butler County anticipates minimal future development in flood zones and the impact of flooding is not anticipated to noticeably increase. Areas of risk are considered to be residential homes located in flood prone areas. This is especially true for areas along the banks of the Black River or St. Francis River. This development typically occurs in the unincorporated areas of Butler County.

The development of large, impervious areas, such as areas of commercial development or large subdivisions, is anticipated primarily within the city limits of Poplar Bluff. The City of Poplar Bluff administers a stormwater management program through the city’s planning department. The purpose of the program is to lessen or avoid hazards to people or property caused by uncontrolled stormwater runoff or by obstructions to drainage. Development projects within the City of Poplar Bluff require the planning department to approve a site-specific stormwater management plan and a permit prior to commencing development activity.

Hazard Summary by Jurisdiction

Vulnerability varies greatly across the county. To the eastern side and the southern portion of the county, there is potential for flooding from the Black River and St. Francis River. This area includes

the cities of Fisk, Neelyville, Poplar Bluff, Qulin, and all unincorporated areas east of Poplar Bluff. Much of this area is farmland and there are not large concentrations of population or potential for large damages. The center of the county, around Poplar Bluff, is also vulnerable to flood activity. Poplar Bluff sits on the bank of the Black River and much of the city's flooding occurs along these banks, impacting the eastern and southern portions of the city. The maps included below provide a pictorial reference to the areas of Butler County most vulnerable to flooding. Table 3.16. presents information that flooding is most common in the unincorporated areas and in the City of Poplar Bluff. There were 49 incidents of flooding reported in the last 20 years: 17 in the county; 4 in Fisk; 1 in Neelyville; 27 in Poplar Bluff; and 0 in Qulin. Although no school district assets are vulnerable to riverine flooding, flooding often impacts students' ability to get to school. When flooding occurs, there are occasions where school must be cancelled due to road closures and water over the roads in certain areas. For instance, the Poplar Bluff R-1 School District superintendent stated that when it floods, the bus drivers know which students they will not be able to reach. As discussed later in this section, several members of the HMPC see a great need for mapping of alternate routes for flooding that are clearly marked.

In reviewing data questionnaires from all participating jurisdictions, including the Butler County, City of Poplar Bluff, City of Qulin, City of Fisk, City of Neelyville, the Poplar Bluff R-1 School District, Neelyville R-IV School District, Twin Rivers R-X School District, and Three Rivers College, there do not appear to be any critical facilities located within the flood plain. There is also no recorded damage to critical facilities within the county from a flood event.

Problem Statement

Butler County is crisscrossed by numerous streams and rivers and is often susceptible to flash and riverine flood events. Both types of flooding have resulted in damages to businesses and residences in the county and within the City of Poplar Bluff. The HMPC recognizes flooding as one of the most common hazards to strike the county and cause damage to local businesses and residents. As such, the HMPC included actions in this plan to mitigate future losses:

- Ditch cleanout and new ditch construction
- Flood buyouts
- Maps and established evacuation routes
- Enhancements to the City of Poplar Bluff water supply and treatment
- Review and update floodplain management plans
- Continue NFIP participation for all jurisdictions and pursue CFM certification for designation floodplain managers
- Inventory all low-water crossings and prioritize those that need improvements
- Make improvements to stormwater drainage systems, specifically within the City of Poplar Bluff

3.4.2 Levee Failure

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.

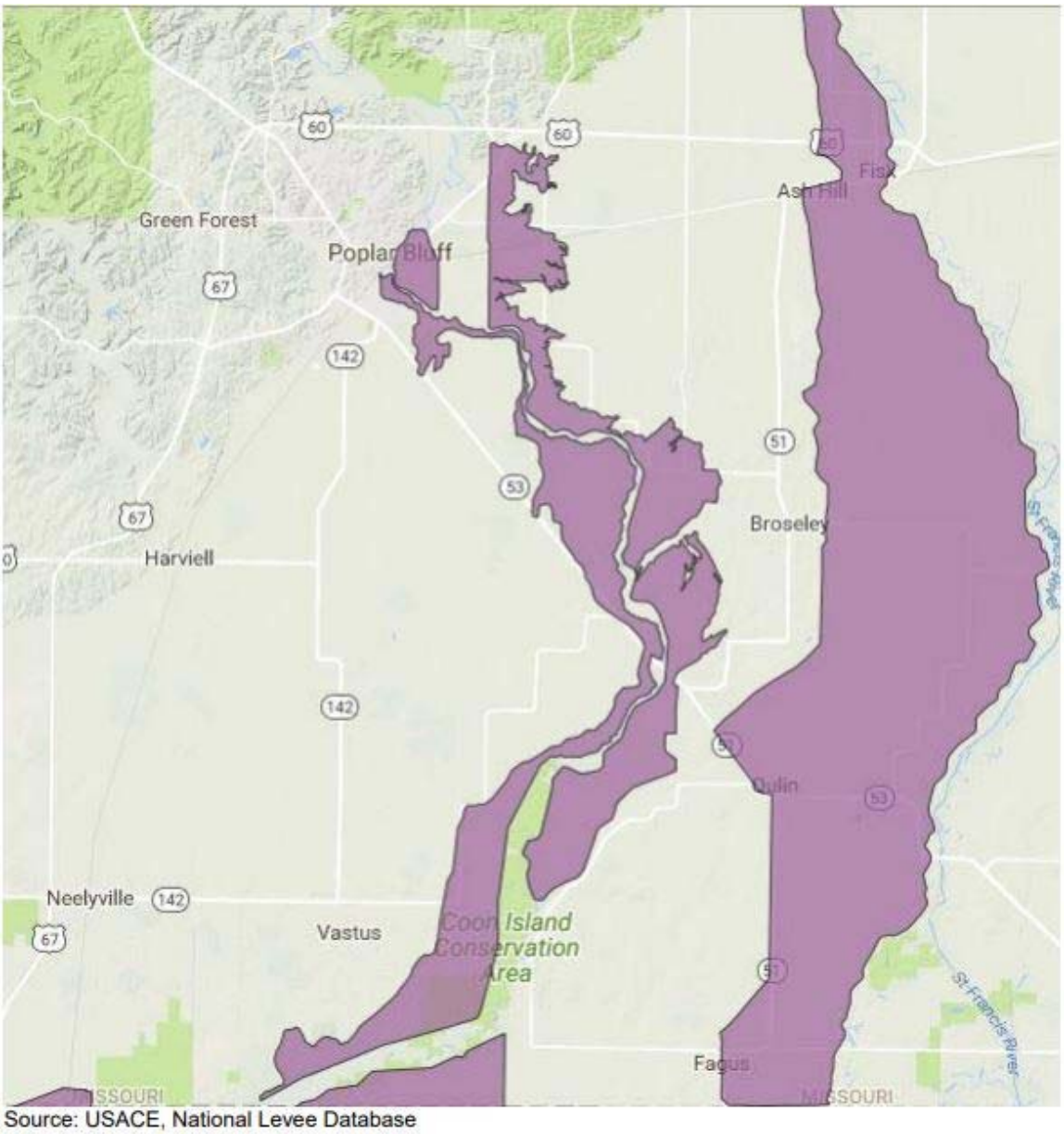
In reviewing data from the *2018 Missouri State Hazard Mitigation Plan*, the US Army Corps of Engineers, FEMA, and local community leaders, the following levees have been identified in Butler County:

- Reorganized Butler County Drainage District No. 7
- Butler County Drainage District No. 12
- 3 Privately Owned Levees

According to the *2018 Missouri State Hazard Mitigation Plan*, there are 182 levee systems in the USACE Levee Safety Program and there are 28 levee systems that received an unacceptable rating from routine maintenance inspections. Two of those levee systems are: the Reorganized Buter County Drainage District No. 7, that was built to protect unincorporated areas of southern Butler County from the Black River and the other is a private levee. An unacceptable rating means that the levee has one or more deficient conditions that can be reasonably foreseen to precent the levee from functioning as designed. The eastern side of the City of Poplar Bluff is the only incorporated community protected by a levee, the remaining areas that are provided protection by levees are unincorporated areas of Butler County. The levees are located along both the Black River, that bisects the county, and the St. Francis River, that forms the eastern border of the county.

The following map (**Figure 3.2.**) shows the areas protected from the 1-percent annual chance flood and was created using the USACE National Levee Database online mapping tool. The shaded areas are protected by levees.

Figure 3.2. Butler County Areas Protected By Levees



Source: USACE, National Levee Database

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

In researching data from the 2013 and 2018 Missouri State Hazard Mitigation Plans and the National Climatic Data Center (NCDC), there have been four occurrences of levee failure, breaches, or overtopping from 2007 – 2022. The first incident during this time period occurred in March 2008. According to the NCDC, record flooding occurred on the Black River with the gage measuring a crest of 22.15 feet on March 19, breaking the previous record of 21.68 feet recorded in December 1982. At least five levee breaches were reported in Butler County along the Black River.

The second reported incident occurred in April 2011, as the Black River crested at 21.41 feet at Poplar Bluff, the third highest crest on record. The levee from Poplar Bluff to Qulin was overtopped in more than three dozen places and at least one breach was reported just outside of the Poplar Bluff city limits.

The third reported incident occurred in August 2016 as heavy rains led to 10 to 17 inches of rainfall over the area. A levee breach was reported near Butler County Road 202 near Qulin. The Black River crest was recorded as 20.28 feet at Poplar Bluff, and the flood stage is 16 feet.

The most recent levee failure occurred in May 2017 along the Black River. On May 1, 2017 the river crested at 21.96 feet, only inches below the record crest of 22.15 feet. One levee breach was reported near Butler County Road 608, requiring 8 houses to be evacuated. The levee spanning from Poplar Bluff to Qulin was overtopped in more than a dozen locations and the levee protecting Poplar Bluff residents and its downtown area was overtopped in two locations. Two deaths were reported resulting from flood waters during this event.

Probability of Future Occurrence

Flooding is the natural hazard most experienced by residents of Butler County. This hazard results in increased pressures on the levee systems located along the banks of the Black River that extend from Poplar Bluff southward to the Arkansas state line. During the 15-year time period, from 2007 – 2022, there were four documented incidents when flood waters led to breaks and overtopping of levee systems. Using this data, 4 incidents in 15 years, the probability of a future levee break or overtop incident is calculated as 27% in any given year of a levee incident (4 events/15 years). Certain data limitations exist within Missouri which limit the reliability of forecasting future events, such as the lack of a centralized levee database in the state. Another limitation is the number of private levees within Butler County.

Changing Future Conditions Considerations

According to the 2018 Missouri State Hazard Mitigation Plan, 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.

Vulnerability

Vulnerability Overview

In reviewing the 2018 Missouri State Hazard Mitigation Plan, Table 3.43., on page 3.141., it states that Butler County contains 98 industrial structures with a replacement cost of approximately $84,892,382.77, and 5,210 residential structures with a replacement cost of approximately $956,503,420.60. An estimated 13,077 people are affected by this risk.

In reviewing mapping data of the county, it is determined that there are no school district owned facilities located in the areas protected by levees. Through reviewing map data and speaking with local officials, it is also determined that there are no structures owned by local county or city governments that are in areas protected by levees. The only exception would be some county roads and city streets in Poplar Bluff, Qulin, and Fisk.

Figure 3.3. 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.

Potential Losses to Existing Development

In reviewing the 2018 Missouri State Hazard Mitigation Plan, Table 3.43., on page 3.141., it states that Butler County contains 98 industrial structures with a replacement cost of approximately $84,892,382.77, and 5,210 residential structures with a replacement cost of approximately $956,503,420.60. An estimated 13,077 people are affected by this risk.

Impact of Previous and Future Development

Due to floodplain ordinances and the recognized dangers of flooding in Butler County, there is no anticipated future development in areas protected by levees. Most of the area currently protected by levees is utilized as farmland.

Hazard Summary by Jurisdiction

The communities with areas protected by levees include unincorporated Butler County, the eastside of Poplar Bluff, portions of the cities of Qulin and Fisk. There are no school district or special district assets located in levee protected areas.

Problem Statement

- The local struggle related to levees has been a failure to maintain the levees and the main channel of the Black River properly and adequately. Butler County is working with the local levee districts that are responsible for the levee system, along with the US Army Corps of Engineers to improve the levees in the county. This includes removing debris from the Black River that is leading to increased pressure on the levee systems during flood events.

3.4.3 Dam Failure

Hazard Profile

Hazard Description

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

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

Table 3.23. MoDNR Dam Hazard Classification Definitions

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

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

Table 3.24. NID Dam Hazard Classification Definitions

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

Source: National Inventory of Dams

Geographic Location

Dams Located Within the Planning Area

There are twenty-seven (27) dam locations within Butler County, according to the Missouri Department of Natural Resources and the National Inventory of Dams. None of these 27 dams are regulated dams. One (1) of the dams has been identified as Class I as defined by the Missouri Department of Natural Resources, eight (8) classified as Class 2, and eighteen (18) classified as

Class 3. **Table 3.25.** provides a listing with the names, locations, and other pertinent information for all high hazard dams in the planning area.

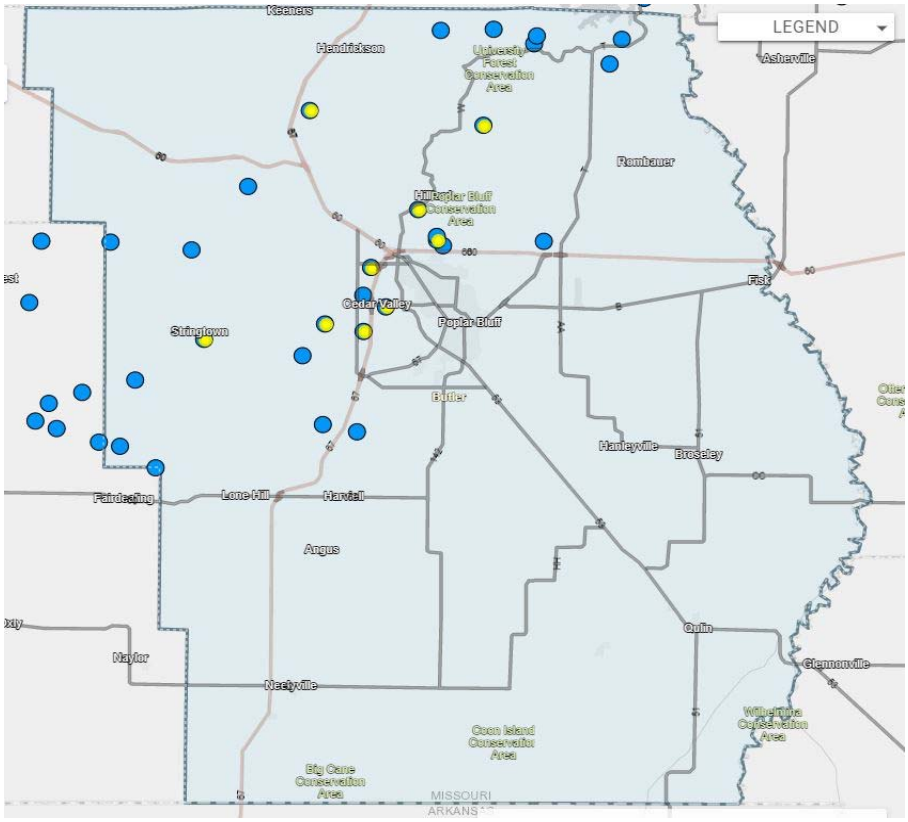
Table 3.25. High Hazard Dams in the Butler County Planning Area

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
Hewlett Lake Dam	No	25	40	N/A	Pike Creek	Poplar Bluff	1	Mrs. OM Hewlett
Kelley Lake Dam	No	25	107	N/A	Black Creek	Poplar Bluff	3	James W. Kelley
Lake Lockloma Dam	No	15	209	N/A	Black River	Poplar Bluff	6	Lockloma Rec Area
Lake Shore Acres Dam	No	20	86	N/A	Pike Creek	Poplar Bluff	2	Bud Holloway
Mason Memorial Dam	No	28	180	N/A	Aldridge Creek	Poplar Bluff	12	Willard McWilliams
Oak Brier Estates Dam	No	27	101	N/A	West Prong Indian Creek	Poplar Bluff	Unknown	Ron Little
Resnik Lake Dam	No	20	86	N/A	Dolly Branch	Naylor	12	Syl Resnick
Rolling Hills Estates Lake Dam	No	25	67	7/17/1980	Kenner Spring Branch	Harviell	7	Bob Sutton
Tomaro Oaks Dam	No	15	321	N/A	Black River	Poplar Bluff	5	Dr. William Traxel

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

The following map provides the location of all high hazard dams in Butler County. The map, provided by the National Inventory of Dams, displays the location of all 27 dams in the county with the high-hazard designees in yellow. Nine of Butler County's 27 dams are considered high-hazard by the Army Corps of Engineers. There are no dams in the planning area that would impact incorporated areas or concentrations of population in the event of a dam breach or failure. The vulnerability assessment on the following page swill discuss in greater detail the assets which would be impacted by dam failure.

Figure 3.4 NID High Hazard Dam Locations in Butler County



Source: National Inventory of Dams

Upstream Dams Outside Butler County

In the opinion of Butler County emergency management officials, one manmade impoundment (Wappapello Lake) poses a potential threat to residents. Although this U.S. Army Corps- maintained property is located in Wayne County, its inundation area covers the majority, if not all, of the eastern half of Butler County. The Wappapello Dam is located along the St. Francis River and is nearly 420-feet high. Its reservoir holds 31,000 acre-feet of water within the conservation pool and 63,000 acre-feet within the recreation pool, with a total storage capacity of 613,300 acre-feet. Should the dam fail, a number of persons residing the eastern boundary of Butler County would be affected with damages lessening southward.

Another dam of real concern to county officials is Clearwater Lake dam, also located in Wayne County, and boasting 1,630 surface acres of lake. This property is maintained by the U.S. Army Corps and restricts flow along the Black River. Should this structure fail, the northwestern and north central portions of Butler County could be affected. According to the *Missouri State of Missouri Hazard Mitigation Plan, 2007 Edition*, if the Clearwater Lake dam were to fail, such an event could result in 369 deaths and $200 million in property damage. It is important to note, there are no recorded significant dam failures listed for Butler County, Missouri, according to the Water Resources Program of the Missouri Department of Natural Resources.

Strength/Magnitude/Extent

The probability severity of a future dam failure event in Butler County depends primarily upon two variables – The size and location of the dam in question. As previously stated, there are 27 unregulated dams located in Butler County all of varying sizes. Should any one of these structures

fail, resulting damages could range from negligible to critical depending upon both the dam's location and size.

It can be stated that the strength/magnitude of dam failure would be similar in some cases to flood events (see the flood hazard vulnerability analysis and discussion). The strength/magnitude/extent of dam failure is related to the volume of water behind the dam as well as the potential speed of onset, depth, and velocity. Note that for this reason, dam failures could flood areas outside of mapped flood hazards.

For example, many dams in the county are smaller impoundments, located on private property. Should any one of these structures fail, damages to property would most likely be negligible. Yet, the Wappapello Lake Dam and the Clearwater Lake Dam, both located in Wayne County, would inundate sections of Butler County if either were to fail.

Of the dams located in Butler County, the Missouri Department of Natural Resources shows none as holding more than 500 acre-feet of water, while only one is shown to hold between 100 and 500 acre-feet. The remaining 26 hold less than 100 acre-feet of water. Based solely upon this data with consideration of threats resulting from the Wappapello Lake and Clearwater Lake dams, severity classifications ranging from limited to catastrophic can be assigned to future incidents.

According to the 2018 state hazard mitigation plan, there are no buildings in the county vulnerable to a dam failure. The estimated total population that is vulnerable to a dam failure is 45 persons. The state plan also specifies that 71 Butler County residents could be exposed to the failure of a state-regulated dam.

Inundation maps do not exist for any of the dams located within Butler County as no dam in the county is higher than 35 feet. Consequently, the Dam and Reservoir Safety Program of the Missouri Department of Natural Resources does not regulate any of the dams located within the planning area.

It should be mentioned, however, that four dams located in neighboring Ripley County—to the west—do pose a potential, though limited, threat to the unincorporated portion of the planning area. Inundation areas—as identified by the Missouri Department of Natural Resources—for the following four dams include rural sparsely populated land area located within the western portion of Butler County:

- Upper Little Black A-7 Dam
- Upper Little Black D-8 Dam
- Upper Little Black D-2 Dam
- Upper Little Black A-2 Dam.

The Upper Little Black A-7 dam inundation area includes five structures identified via aerial imagery and accessed via Mambo Lane and Butler County Road 456, as well as Butler County Road 462. Per the inundation map, the structures are located one and one-half to two and one-half hours downstream of the Upper Little Black A-7 Dam. No other identified inundation area includes residential or commercial structures, thereby, posing a negligible threat to the unincorporated portion of the planning area.

Previous Occurrences

According to the Missouri Department of Natural Resources, the 2014 and 2018 Missouri State Hazard Mitigation Plan, and through interviews with local officials, there have been no reported dam failures in Butler County.

Probability of Future Occurrence

According to all available data sources, there have been no recorded dam failures in Butler County, therefore a probability calculation is not possible.

Changing Future Conditions Considerations

Studies have been conducted to investigate the impact of climate change scenarios on dam safety, according to the 2018 Missouri State Hazard Mitigation Plan. Dam failure is already tied to flooding and the increased pressure flooding places on dams. The impacts of changing future conditions on dam failure will most likely be those related to changes in precipitation and flood likelihood. Changing future conditions 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. The safety of dams for the future climate can be based on an evaluation of changes in design floods and the freeboard available to accommodate an increase in flood levels. The results from the studies indicate that the design floods with the corresponding outflow floods and flood water levels will increase in the future, and this increase will affect the safety of the dams in the future. Studies concluded that the total hydrological failure probability of a dam will increase in the future climate and that the extent and depth of flood waters will increase by the future dam break scenario.

Vulnerability

Vulnerability Overview

According to the Missouri Department of Natural Resources (MDNR), there are 31 dams in Butler County and none are regulated by the state or by the USACE. Of these 31 dams, 27 have been assigned Hazard Classifications by MDNR. There is one dam classified as Hazard Class 1, eight as Hazard Class II, and 18 as Hazard Class III. The National Inventory of Dams also classifies nine of the dams in Butler County as high hazard. There are no school district facilities or critical facilities that are located within the inundation area of any dam in Butler County. Dams fail on an individual basis, meaning that when one dam fails, not all dams fail. Any vulnerability will be limited to those persons and structures located within the inundation zone of the failed dam. Therefore, vulnerability of the county to one dam failing is minimal.

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

According to the 2018 Missouri State Hazard Mitigation Plan, there are no buildings vulnerable to a dam failure in Butler County. There are 71 persons estimated to be exposed to a potential failure of a state regulated dam upstream from Butler County. It should be noted that dam failures are generally isolated incidents and do not often occur in conjunction with failure at additional dam sites. Since it is unknown which dams, if any, might fail at any given time, this analysis provides for a countywide view of dam failure. It is nearly certain that not all state regulated dams would fail simultaneously. These estimates should be viewed in light of these considerations.

There are no incorporated places or school districts that are within the inundation zones of any dams in Butler County. Additionally, from reviewing the available inundation maps, there are no other critical facilities located in the inundation zones.

Impact of Previous and Future Development

Butler County is rural in nature and is sparsely populated. There has been little to no development within the inundation areas of any of the dams in the county, and no future development is

anticipated.

Hazard Summary by Jurisdiction

The only jurisdiction vulnerable to a dam failure is the unincorporated county. None of the incorporated towns, school districts, or water districts in Butler County are vulnerable to damage caused by dam failure.

Problem Statement

As stated above, there are no dams in Butler County that are state regulated. The rural nature and sparse population of Butler County significantly reduces potential impact of a dam failure.

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.

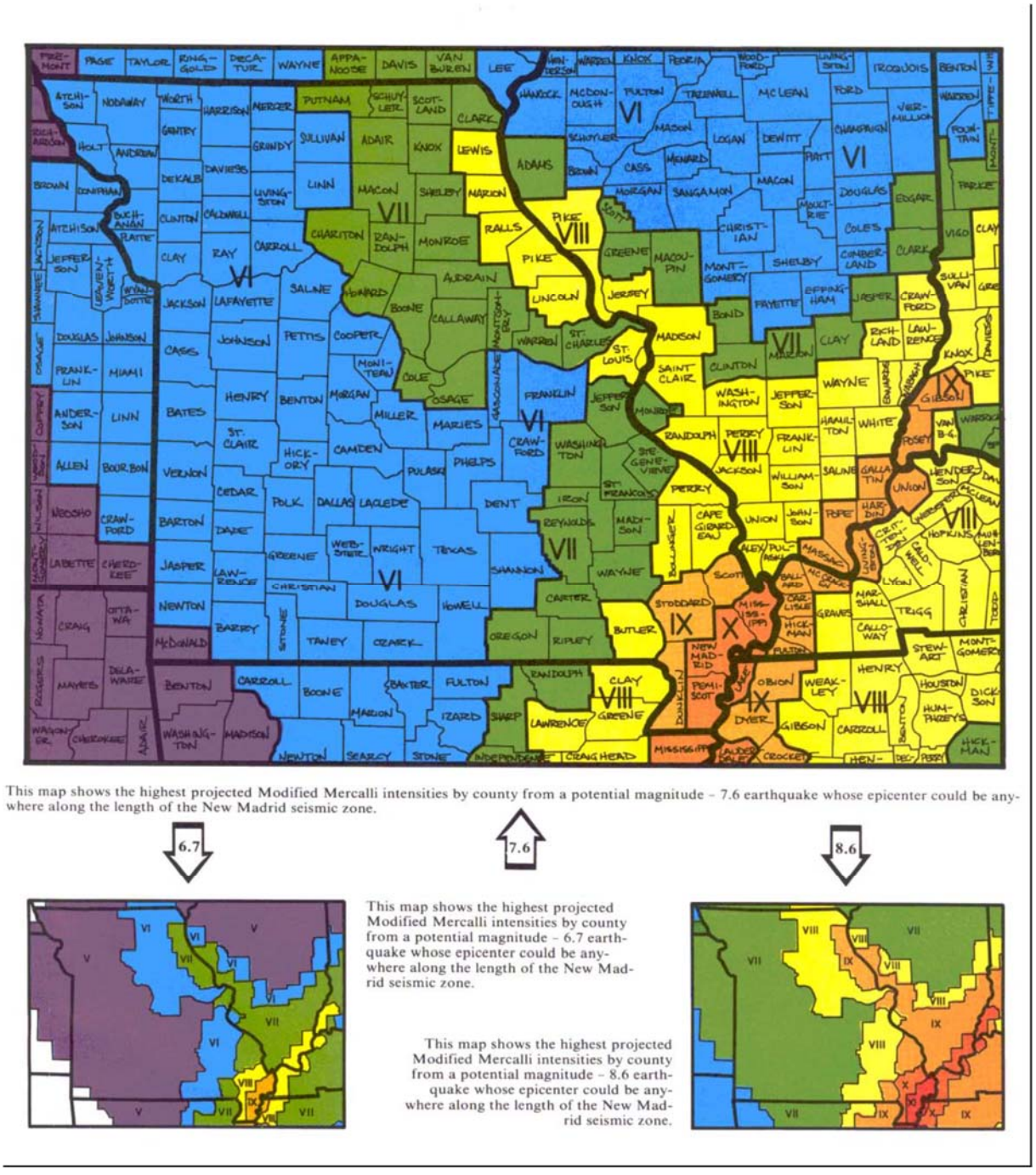
In the United States, there are several thousand earthquakes annually. The state of California experiences the most damaging earthquakes, while Alaska experiences the highest number of earthquakes. However, an article published by the United States Geological Survey states that earthquakes occurring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

Geographic Location

The New Madrid Seismic Zone (NMSZ) is comprised of several thrust faults that stretch from Marked Tree, Ark., to Cairo, Ill. Although Butler County is on the western edge of the NMSZ, the effects of a large quake will impact the entire county indiscriminately. All jurisdictions are expected to experience the same intensity across the planning area.

Southeast Missouri, including Butler County, is most susceptible to earthquakes because it overlies the NMSZ. The county is at risk to strong ground movements and has a high potential for soil liquefaction due to the presence of loose, sandy, consolidated sediments and a high water table. The immediate vicinity of the Ozarks is also at risk from the earthquakes in the NMSZ because, as in the bootheel, subsurface conditions of the Mississippi and Missouri River valleys tend to amplify earthquakes.

Figure 3.4. Impact Zones for Earthquake Along the New Madrid Fault



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

6.7

7.6

8.6

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 3.5. Projected Earthquake Intensities

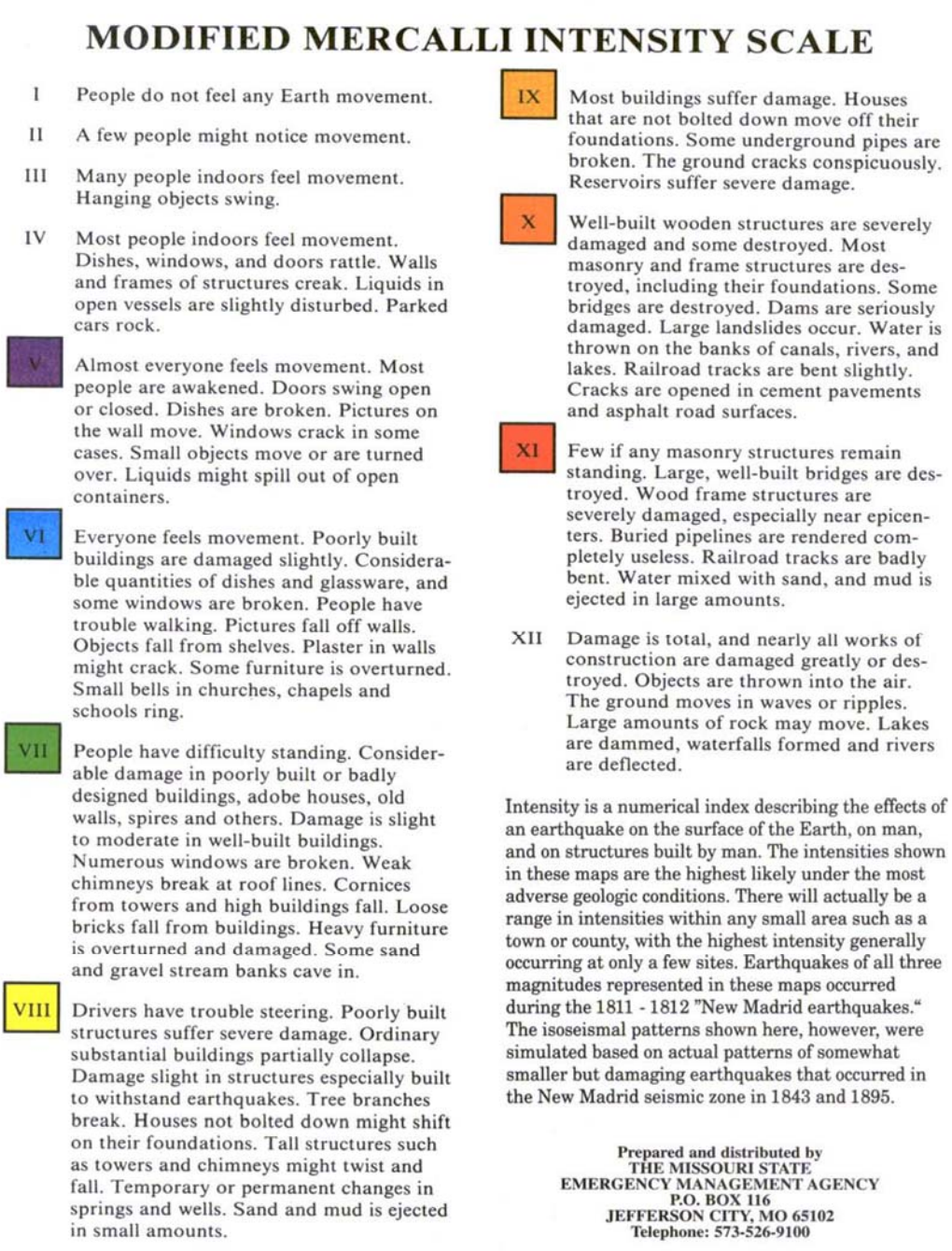
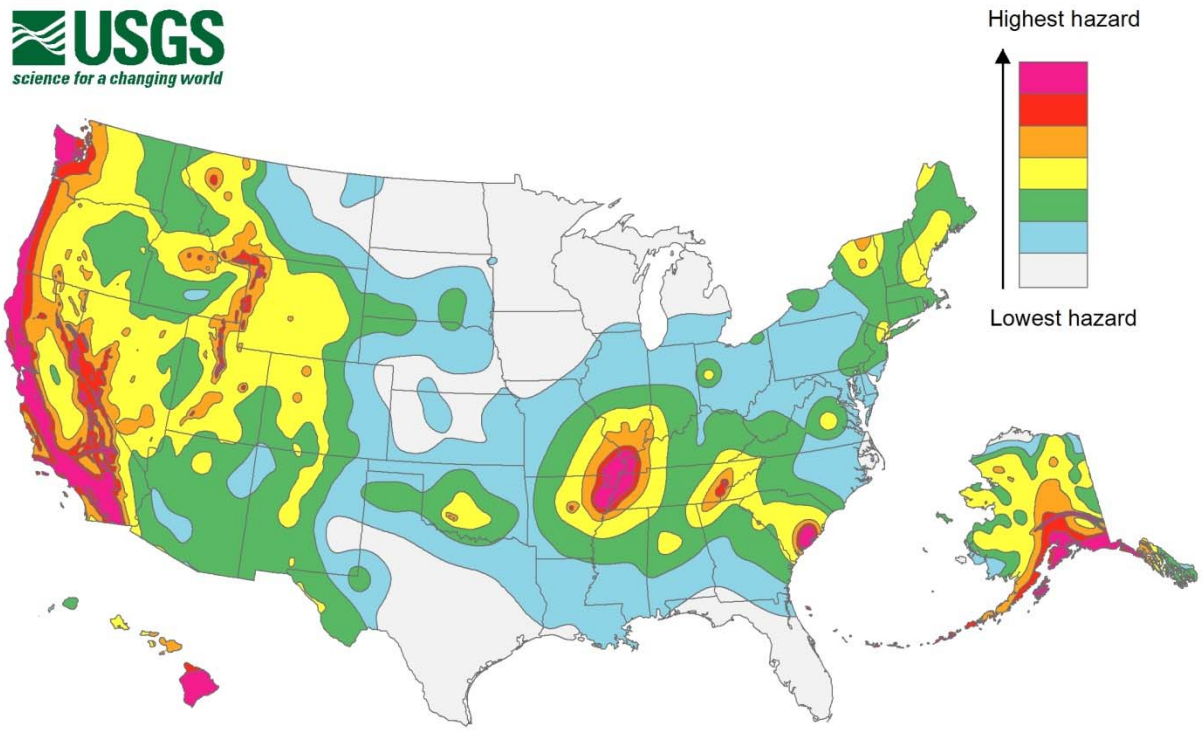


Figure 3.6. United States Seismic Hazard Map



Source: United States Geological Survey at
https://earthquake.usgs.gov/hazards/hazmaps/conterminous/2014/images/HazardMap2014_lg.jpg

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

Butler County has experienced 2 earthquakes since 1931, according to HomeFacts.com. Just past midnight on April 30, 1992, a magnitude 3.6 earthquake occurred with a depth of 5.0 kilometers. At 10:06 p.m. on May 21, 2012, a second earthquake occurred with a magnitude of 2.9 and a depth of 10.10 kilometers. It is important to note that in November 2021, a magnitude 4.3 earthquake occurred within 30 miles of Butler County. Residents within the planning area reported feeling the effects of the quake.

Probability of Future Occurrence

Butler County has an approximately 2 percent chance of experiencing an earthquake each year, based on prior occurrences. The United States Geological Survey database states there is a 7.27 percent chance of a major earthquake occurring within 50 kilometers of Butler County in the next 50 years. Fifty kilometers is approximately 30 miles.

Changing Future Conditions Considerations

According to the 2018 Missouri State Hazard Mitigation Plan, 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

Potential Losses to Existing Development

The Hazus building inventory counts are based on the 2010 census data adjusted to 2014 numbers using the Dun & Bradstreet Business Population Report. Inventory values reflect 2014 valuations, based on RSMeans (a supplier of construction cost information) replacement costs. Population counts are 2010 estimates from the U.S. Census Bureau. The information and data for this vulnerability overview and potential loss estimation were gathered from the 2018 Missouri State Hazard Mitigation Plan (*Missouri State Hazard Mitigation Plan*).

The updated annualized loss scenario presented here shows the economic losses to buildings annualized over eight earthquake return periods (100, 200, 500, 750, 1,500, 2,000, and 2,500 years). HAZUS defines annualized loss as the expected value of loss in any one year. The software develops annualized loss estimates by aggregating the losses and their exceedance probabilities from the eight return periods. Annualized loss is the maximum potential annual dollar loss resulting from various return periods averaged on a “per year” basis.

Reported in Table 3.6 of the *2018 Missouri State Hazard Mitigation Plan*, titled, “HAZUS-MH Earthquake Loss Estimation: Annualized Loss Scenario,” Butler County’s total annualized loss would be $2,554,000, with a Per Capita Loss of $59.70 and a Loss Ratio of $616 million. Butler County is

one of ten counties with the highest loss ratio due to its proximity to the New Madrid Seismic Zone. Counties located near the New Madrid area are likely to have considerable portions of the building inventory damaged during an earthquake.

An event with a 2% probability of exceedance in 50 years, was done to model a worst-case scenario. This scenario is equivalent to the 2,500-year earthquake scenario in HAZUS-MH. The methodology is based on probabilistic seismic hazard shaking grids developed by the U.S. Geological Survey (USGS) for the National Seismic Hazard Maps that are included with HAZUS-MH (updated in 2014). The USGS maps provide estimates of peak ground acceleration and spectral acceleration at periods of 0.3 second and 1.0 second, respectively, which have a 2% probability of exceedance in the next 50 years. The International Building Code uses this level of ground shaking for building design in seismic areas. This scenario used a 7.7 driving magnitude in HAZUS-MH, which is the magnitude used for typical New Madrid fault planning scenarios in Missouri. While the 2% probability of exceedance in the next 50 years ground motion maps incorporate the shaking potential from all faults in/around Missouri, the most severe shaking is predominately generated by the New Madrid Fault.

As reported in Table 3.63 of the *2018 Missouri State Hazard Mitigation Plan*, titled, "HAZUS-MH Earthquake Loss Estimation 2% Probability of Exceedance in 50 Years Scenario Direct Economic Losses Results Summary by County," the cost of structural damage in Butler County would amount to $217,447,000, with non-structural damage costing $744,680,000. Contents and inventory damage are estimated at $301,535,000. Total economic loss to buildings in Butler County is projected at $159,262,000. The loss ratio for the county is estimated at 23.22 percent, or 8th statewide.

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 in the event of an earthquake.

Hazard Summary by Jurisdiction

Deeper sediment layers above the bedrock layer provide a greater quantity of soft soil conducive to the traveling and amplification of seismic waves. During an earthquake event, areas with soft soils experience larger and stronger (amplified) earthquake waves than areas with a shallower sediment soil layer. Knowing this, it can be concluded that earthquake intensity will vary throughout the planning area. The southeastern portion of the county with its deep sandy sediment layers is likely to experience greater ground shaking than the northwestern portion of the county with its shallower sediment layers.

Furthermore, it should be noted that the City of Poplar Bluff's historic downtown district, however, is more vulnerable to risk due to the concentration of aged buildings. Located in this area is the Butler County Courthouse, constructed in 1889, and several two and three-story buildings near the courthouse which were constructed in the 1920s and 1930s. Additionally, there are other buildings in Poplar Bluff that hold higher risk than other parts of the county. These include the Poplar Bluff Housing Authority's Twin Towers Senior Housing Complex, the John J. Pershing Veterans Administration Hospital, and Poplar Bluff Regional Medical Center. Buildings occupied by school districts within the planning area were constructed post-1939, with most having been constructed in the 1960s and more recently.

Problem Statement

Butler County is located in close proximity to the New Madrid Seismic Zone and is near enough that substantial damage would result in the event of a severe earthquake. The estimated loss data provided above demonstrates the level of loss the county would experience. In both presented scenarios, Butler County ranks in the top ten counties in the state with regard to loss ratio.

The primary area of Butler County with a higher potential for damage compared to the rest of the county is Poplar Bluff. This is due to both the soil substructure and the concentration of population and existing development. Buildings with higher risk levels include all those located in Historic Downtown Poplar Bluff, which includes the Butler County Courthouse, as well as the Poplar Bluff Housing Authority's Twin Towers Senior Housing Complex, the John J. Pershing Veterans Administration Hospital, and Poplar Bluff Regional Medical Center. The greatest concern of the Mitigation Planning Committee (MPS) is the lives of residents. To address this concern, the MPC identified the continuation of participation in earthquake awareness events as a mitigation action within this plan update.

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.

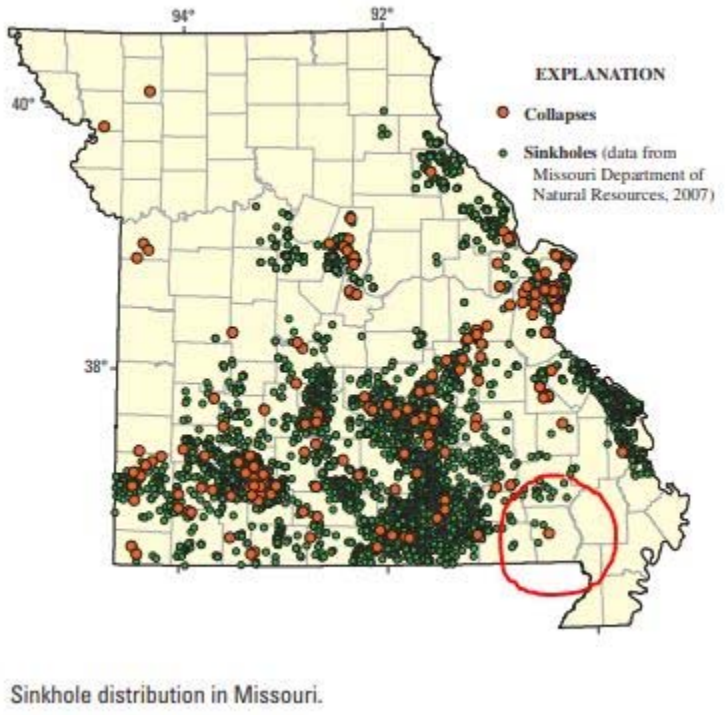
In the case of sinkholes, the rock below the surface is rock that has been dissolving by circulating groundwater. As the rock dissolves, spaces and caverns form, and ultimately the land above the spaces collapse. In Missouri, sinkhole problems are usually a result of surface materials above openings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

Geographic Location

According to the 2018 Missouri State Hazard Mitigation Plan, there are three documented sinkholes in Butler County, all of which are located in the northwestern portion of the county in parts of the Mark Twain National Forest. Figure 3.7. below provides a map of the locations in Butler County, which is circled in red.

Figure 3.7. Sinkholes Located in Butler County



Sinkhole distribution in Missouri.

Source: Missouri Department of Natural Resources

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.

The 2018 state plan included only seven documented sinkhole, "notable events." The plan stated sinkholes are common to Missouri and the probability is high that they will continue to occur in the future. To date, Missouri sinkholes have not had major impacts on development, nor have they caused serious damage.

Previous Occurrences

Sinkholes are a regular occurrence in Missouri, but rarely are the events of any significance. There have been no damage reports resulting from sinkholes in Butler County.

Probability of Future Occurrence

Because sinkholes are common to the State of Missouri, the development of more in the future is high, however the severity is low. The map above shows the general location of Butler County's three documented sinkholes. It is possible others exist, but have not yet been identified.

Changing Future Conditions Considerations

Direct effects from changing climate conditions such as an increase in droughts and 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 3.227 3 Risk Assessment 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

While sinkholes are a common feature in Missouri, Butler County only has three which have been documented. The northeastern area of the county is the most vulnerable area due to the karst topography of that part of the county. This area is mainly covered in Mark Twain National Forest and will not be developed in the foreseeable future. The vulnerability to Butler County is low due to these factors.

Potential Losses to Existing Development

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

Impact of Previous and Future Development

Butler County's sinkholes are located in rural parts of the county. The location of the planning area's designated sinkholes is extremely remote and is an area which is at risk for sinkhole formation. There is no anticipated development near existing sinkholes, as they are predominantly located in the Mark Twain National Forest, which is restricted from future development due to its designation as a national forest. Butler County has no history of sinkhole event occurrences. Therefore, it is anticipated there will be no impact to future development due to the existence of sinkholes.

Hazard Summary by Jurisdiction

The only area of Butler County that is at a higher risk for sinkhole formation is the northeastern corner of the county. This area is mostly designated national forest and will continue to exist as undeveloped land. Three identified sinkholes exist in the Mark Twain National Forest. No residents or structures are at risk of injury or loss through a sinkhole event in Butler County.

Problem Statement

The risk for damages due to sinkhole events is limited and unlikely. The Mitigation Planning Committee feels that better mapping of existing sinkholes will make future planning more accurate.

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 over a large area that adversely affects plants, animal life, and humans. A drought period can last for months, years, or even decades. There are four types of drought conditions relevant to Missouri, according to the State Plan, which are as follows.

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

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

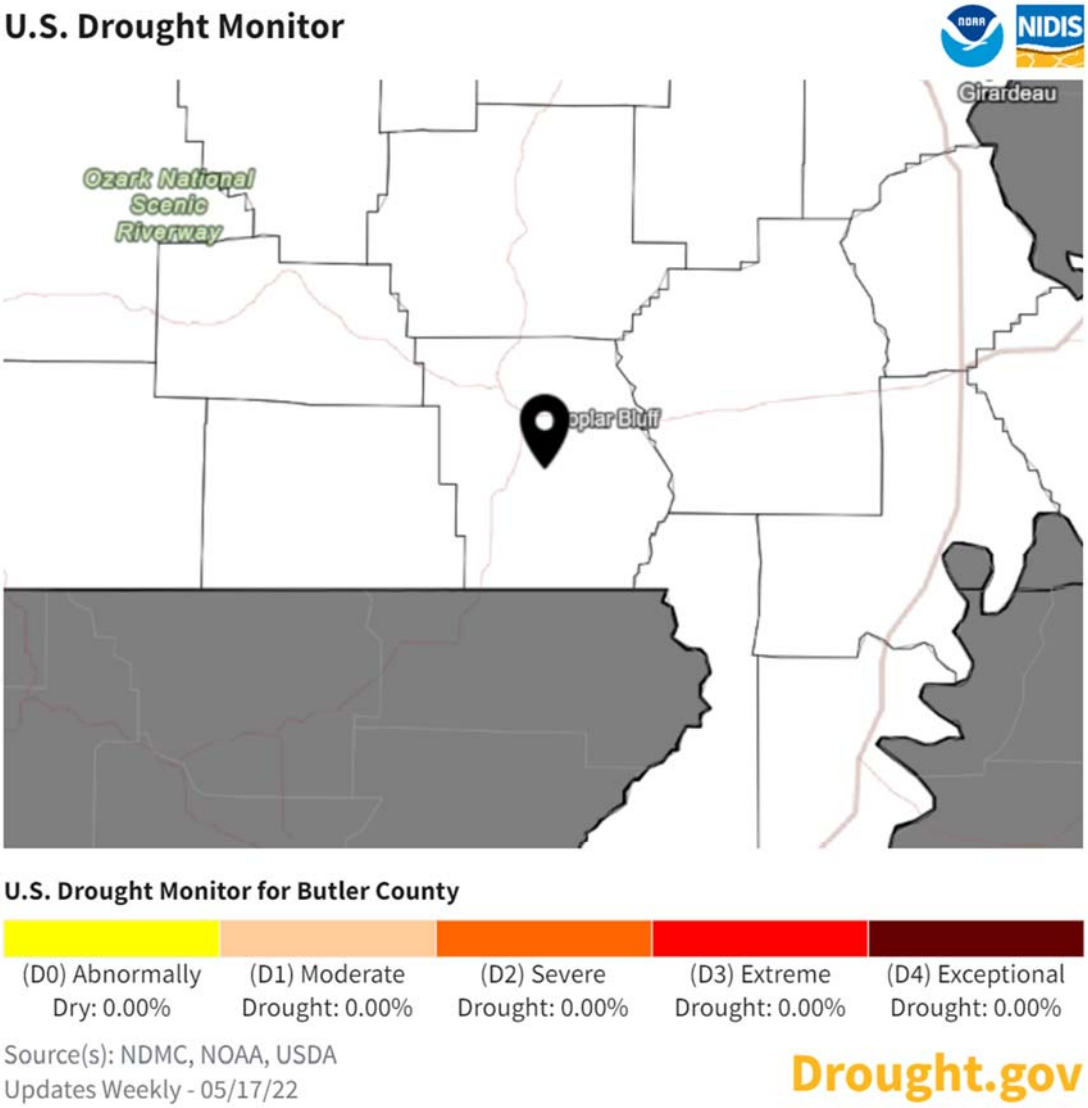
- Agricultural drought focus is on soil moisture deficiencies, differences between actual and potential evaporation, reduced ground water or reservoir levels, etc. Plant demand for water depends on prevailing weather conditions, biological characteristics of the specific plant, its stage of growth, and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

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

Geographic Location

The entire planning area of Butler County is vulnerable to the effects of drought. Although all jurisdictions in the county are at risk, droughts more directly impact the agricultural sector. According to the United States Department of Agriculture, Ag Census 2017, there are 441 farms in Butler County totaling 241,767 acres. The majority of row crop farming, which includes rice, soybeans, and corn, is found in the flat, fertile soils of the eastern section of the county. This cropland makes up slightly more than half of all farmland in Butler County with approximately 75% irrigated. The remaining farmland is used for livestock, primarily consisting of cattle.

Figure 3.8. U.S. Drought Monitor Map of Missouri on Date



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

Strength/Magnitude/Extent

The National Drought Monitor Center at the University of Nebraska - 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 loss 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 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 head, dust, and stress can all contribute to increased mortality rates.

The US Drought Monitor map presented above for the week beginning on May 17, 2022, is updated every Tuesday and features drought conditions. The maps are produced jointly by the National Oceanic and Atmospheric Administration, the US Department of Agriculture, and the National Drought Mitigation Center at the University of Nebraska – Lincoln. The map is a composite index that includes the measurements of climatic, hydrological, and soil conditions, as well as reported impacts and observations from more than 350 contributors around the country.

According to the 2018 Missouri State Hazard Mitigation Plan, most of the southern portions of Missouri, which includes Butler County, are less susceptible to problems caused by prolonged periods without rain because of abundant groundwater resources in the region. Even with decreased stream flows or lowered reservoir levels, groundwater is still a viable resource in southern Missouri. Row-crop farming is not extensive; therefore, agricultural needs aren't as great as in other parts of the State. The only exception is in the southwestern and southeastern areas where irrigation is used

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.

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

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

These types of observations provide more immediate indicators of dryness, yet are more limited than the Palmer Drought Severity Index in that they provide more localized data rather than regional data. Most likely, the best assessment of drought is a combination of both the Palmer Index and the above bulleted indicators.

There are eight publicly owned and operated water supply districts in Butler County: Butler County PWSD No. 1; Butler County PWSD No. 104; Butler County PWSD No. 2; Butler County PWSD No. 3; City of Fisk; City of Neelyville; City of Poplar Bluff; and City of Qulin. Residents that live outside of these service areas rely on private wells for their water supply. The City of Poplar Bluff uses the Black River as its primary water source. The other water supply districts utilize ground wells for water supply.

Previous Occurrences

Butler County's crop loss payments due to drought between January 1, 2017 and December 31, 2021 totaled $310,058.38, with the biggest loss impacting soybeans. In 2018, soybean loss resulting from drought totaled $142,872.18. Table 3.26. below provides detailed information.

Table 3.26. Total Insurance Payments Due to Crop Loss Caused by Drought in Butler County 2017-2021

	2017	2018	2019	2020	2021	Total
Wheat	$13,259.20	$0	$0	$0	$3,191	**$16,450.20**
Soybeans	$42,924	$142,872.18	$7,844	$3,942	$570	**$198,152.18**
Corn	$0	$92,837	$0	$2,619	$0	**$95,456**
Total	**$56,183.20**	**$235,709.18**	**$7,844**	**$6,561**	**$3,761**	**$310,058.38**

Source: USDA Risk Management Agency

Summaries of recent droughts, since 2012, in Missouri are noted in the following table from various sources including the 2017 Butler County Hazard Mitigation Plan and NOAA documents.

Table 3.27. Droughts Since 2012 in Butler County

Date	Description
May 18, 2012 – May 31, 2012	One of the warmest and driest Mays on record worsened the rare spring drought over Southeast Missouri. At Cape Girardeau, spring of 2012 was the driest spring on record. Only 5.25 inches of rain fell from March through May. The month of May was the second driest on record. Only 0.79 inch fell at Cape Girardeau in May. By the end of May, the drought was severe in the extreme southeast Missouri counties of New Madrid and Mississippi. Moderate drought conditions existed elsewhere to the south of the Perryville area. Soils continued to dry out and topsoil moisture deficits began to be reported. Pasture land rapidly deteriorated. Stream flows were running below the normal by the end of the month.
June 1, 2012 – June 30, 2012	The spring drought worsened considerably across Southeast Missouri as summer arrived. By the end of June, all of Southeast Missouri, except for the Perryville and Van Buren areas, was upgraded to extreme drought. Severe drought spread across the remainder of Southeast Missouri. Soil moisture deficits continued to increase. By the end of June, 80 to 100 percent of the region's topsoil moisture was reported as short or very short, and 70 to 95 percent of the subsoil moisture was reported as short or very short. Many crops were showing stress. A majority of the corn and soybeans were listed in fair to poor condition. Increasing amounts of livestock and pasture were showing stress. The percentage of pastures rated as poor or very poor was growing. Ponds across the region were drying in parts of Southeast Missouri, including Bollinger, Cape Girardeau, New Madrid, and Scott counties. A number of cities also imposed bans on burning, including Dexter, Bloomfield, Doniphan, Charleston, East Prairie, and Scott City. In the Mark Twain National Forest, open fires were prohibited due to high fire danger. Stream flows were running below normal. At Cape Girardeau, total rainfall for June was 1.37 inches, which is less than half the normal amount of 3.41 inches. The drought began in May and continued into July.
July 1, 2012 – July 31, 2012	The drought, which began in May, worsened considerably across Southeast Missouri as summer progressed. By the end of July, all of Southeast Missouri was upgraded to extreme to exceptional drought. The exceptional drought conditions were along and south of a line from Poplar Bluff to Jackson, including Cape Girardeau. The remainder of Southeast Missouri was classified as having extreme drought conditions. Soil moisture deficits continued to increase. By the end of July, 90 to 100 percent of the region's topsoil and subsoil moisture was reported as short or very short. Many crops were showing stress, and the situation became fire for many farmers. A majority of the corn and soybeans were listed in poor to very poor condition. Increasing amounts of livestock and pasture were showing stress. The percentage of pastures rated as poor or very poor continued to

	grow. Ponds across the region were dry or drying quickly. Even with the isolated rainfall from thunderstorms, fire danger remained high. Bans on outdoor burning were in place for most of Southeast Missouri, including Carter, Bollinger, Cape Girardeau, Mississippi, New Madrid, Ripley, Stoddard, and Scott counties. Additionally, numerous individual towns and villages issued burn bans. Fourth of July fireworks shows were cancelled or banned in many places. Stream flows were running below normal. At Cape Girardeau, total rainfall for July was 2.24 inches, which was 1.12 inches below normal. The drought began in May and continued into August.
Aug. 1, 2012 – Aug. 31, 2012	The drought, which began in May, reached its most extreme stage by early August. Through the month of August, all of Southeast Missouri was in extreme to exceptional drought. The exceptional drought conditions were along and south of a line from Doniphan to Jackson. The remainder of Southeast Missouri was in extreme drought conditions. Soil moisture deficits remained very high. Throughout August, 80 to 100 percent of the region's topsoil and subsoil moisture was reported as short or very short. Many crops were heavily damaged, and numerous counties were declared natural disaster areas. Corn crops were a partial or complete loss. Soybeans were faring somewhat better. The percentage of pastures rated as poor or very poor held steady from July. Some small trees and shrubs were killed. Ponds across the region were dry or drying quickly. Even with the isolated rainfall from thunderstorms, fire danger remained high. Bans on outdoor burning were in place for numerous counties in Southeast Missouri. Stream flows were running normal to below normal. At the Cape Girardeau airport, 1.44 inches of rain fell in August, which was only about half of normal. Rainfall for the year-to-date was 14.27 inches, which was 16.58 inches below normal. The drought began in May and continued into September.
Sept. 1, 2012 – Sept. 30, 2012	Significant improvement in drought conditions occurred during the month of September. Heavy rain from the remnants of Hurricane Isaac at the start of the month was a notable factor. The extreme to exceptional summer drought gave way to only moderate drought from Cape Girardeau north and west, including Perryville. The area of extreme drought conditions shrank to include only New Madrid and Mississippi counties in the southeast corner of the state. All other areas of southeast Missouri improved to severe drought conditions by month's end. Soil moisture deficits decreased greatly. By the end of September, soil moisture was near normal. Most of the corn crop was either harvested or plowed under and corn crop losses were expected to be very high. Estimates on soybean crop losses were not yet available. Numerous counties were declared natural disaster areas earlier in the growing season. Pastures improved, but a majority of them remained in poor or very condition. Fire danger decreased significantly, and all bans on outdoor burning were lifted. Stream flows were running about normal. At the Cape Girardeau airport, 6.20 inches of rain fell in September, which was about three inches above normal. The drought began in May and continued into October.
Oct. 1, 2012 – Oct. 31, 2012	Slight improvement in long-term drought conditions was observed during the month of October. While the more active fall weather pattern resulted in more frontal passages in October, most locations still reported below normal precipitation for the month. The drought officially ended in Perry County. The small area of extreme drought conditions that had been near the Bootheel area improved to severe drought. By the end of the month, areas south and west of a line from Cape Girardeau to Greenville were in severe drought. The remainder of the drought area was classified as moderate. The main impact of the long-term drought was on farm ponds used for irrigating fields or raising livestock. Soil moisture was near normal. The soybean crop was harvested, but soybean crop loss estimates were not yet available. Some pastures remained in poor or very poor condition, but many of them improved to adequate condition. Stream flows were running about normal. At Cape Girardeau, October rainfall was 2.58 inches, which was about an inch-and-a-quarter below normal. The year-to-date rainfall deficit hovered around 13 inches. The drought began in May and continued into November in most areas.
Nov. 10, 2012 – Nov. 30, 2012	There was slight improvement in long-term drought conditions during the month of November. Rainfall was below normal during the month, but this deficit was partially offset by low evaporation rates caused by unseasonably cool air. The drought officially ended along and north of a line from Marble Hill to Cape Girardeau. The area of severe drought improved to moderate drought. By the end of the month, areas south and west of a line from Cape Girardeau to Marble Hill were in moderate drought. The main impact of the long-term drought was on farm ponds used for irrigating fields or raising livestock. Soil moisture was near normal. Some pastures remained in poor or very poor condition, but many of them improved to adequate condition. Stream flows were running about normal. At Cape Girardeau, November rainfall was 1.32 inches, which was 3.12 inches below normal. The year-to-date rainfall deficit hovered around 18 inches. The drought began in May and continued into December in most areas.
Dec. 1, 2012 – Dec. 31, 2012	There was no appreciable change in long-term drought conditions during the month of December. Rainfall was below normal during the month of December, but this deficit was partially offset by low evaporation rates from colder winter weather. Moderate drought conditions persisted throughout the month south and west of a line from Cape Girardeau to Marble Hill. Impacts were very few, since the growing season was over for most crops. Farm ponds used for irrigating livestock remained low. At the Cape Girardeau and Poplar Bluff airports, December monthly rainfall was two to two and one-half inches below normal. The drought began in May and continued in January.
Jan. 1, 2013 – Jan. 31, 2013	The drought, which began in May 2012, officially ended across the remainder of Southern Missouri. Water supplies returned to normal.
Nov. 1, 2016 – Nov.	Severe drought conditions spread into extreme Southeast Missouri, southeast of a line from Cape Girardeau to

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

Probability of Future Occurrence

The ten incidents reported above span a search of data of the past ten years, or 120 months. During this 120-month timeframe, Butler County experienced drought conditions for ten months. Therefore, if the total number of months in which drought conditions were experienced is divided by the total number of months (10/120), there is an 8% probability of drought in Butler County. This approximation is in line with reports noted in the 2018 Missouri State Hazard Mitigation Plan, which predicts counties located south of the Missouri River are in drought conditions 5.87-8% of the time. Although drought is not predictable, long-range outlooks and predicted impacts of climate change could indicate an increased chance of drought.

Changing Future Conditions Considerations

Severe drought, a natural part of Missouri's climate, is a risk to this agriculture-dependent state. Future increases in evaporation rates due to higher temperatures may increase the intensity of naturally-occurring droughts. Although springtime in Missouri is likely to be wetter, summer droughts are likely to be more severe. Higher evaporation and lower summer rainfall are likely to reduce river flows. The drought of 2012 narrowed navigation channels, forced lock closures, and caused dozens of barges to run aground on the Mississippi River along the Missouri shoreline. The resulting impact on navigation cost the region more than $275 million. The drought of 2012–2013 also threatened municipal and industrial water users along the Missouri River. 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 drought. This could lead to agricultural drought and suppressed crop yields.

Vulnerability

Vulnerability Overview

According to **Table 3.27**. in the 2018 Missouri State Hazard Mitigation Plan, the United States Department of Agriculture's Risk Management Agency, using data from 2007 through 2012, qualifies Butler County's drought vulnerability at a "medium." During this time frame, $403,870 in Total Drought Crop Claims were filed and the likelihood of a severe drought was 7.86 percent.

Additionally, the Missouri State Drought Plan states Southeast Missouri has very little drought susceptibility due to its natural environment. It is a region underlain by sands and gravel (alluvial deposits). Surface and groundwater resources are generally adequate for domestic, municipal, and agricultural needs.

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.

Potential crop losses in Butler County are anticipated to be low based on historical data, such as that presented above. The total annualized crop insurance claims/drought damage between 2007 and 2012 in Butler County was $44,874.

Impact of Previous and Future Development

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

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.

Go to http://www.nrdc.org/globalWarming/watersustainability/ , click for Kansas – Montana, click on Missouri to view maps with climate change and without climate change to show the anticipated impacts to your county.

Hazard Summary by Jurisdiction

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

Problem Statement

Drought is a hazard that impacts large geographic regions of the country. The sector that is most impacted in Butler County is the farming community. Drought causes damage to crops and can negatively impact the yield of crops depending on the timing of the 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 **0** 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

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

Strength/Magnitude/Extent

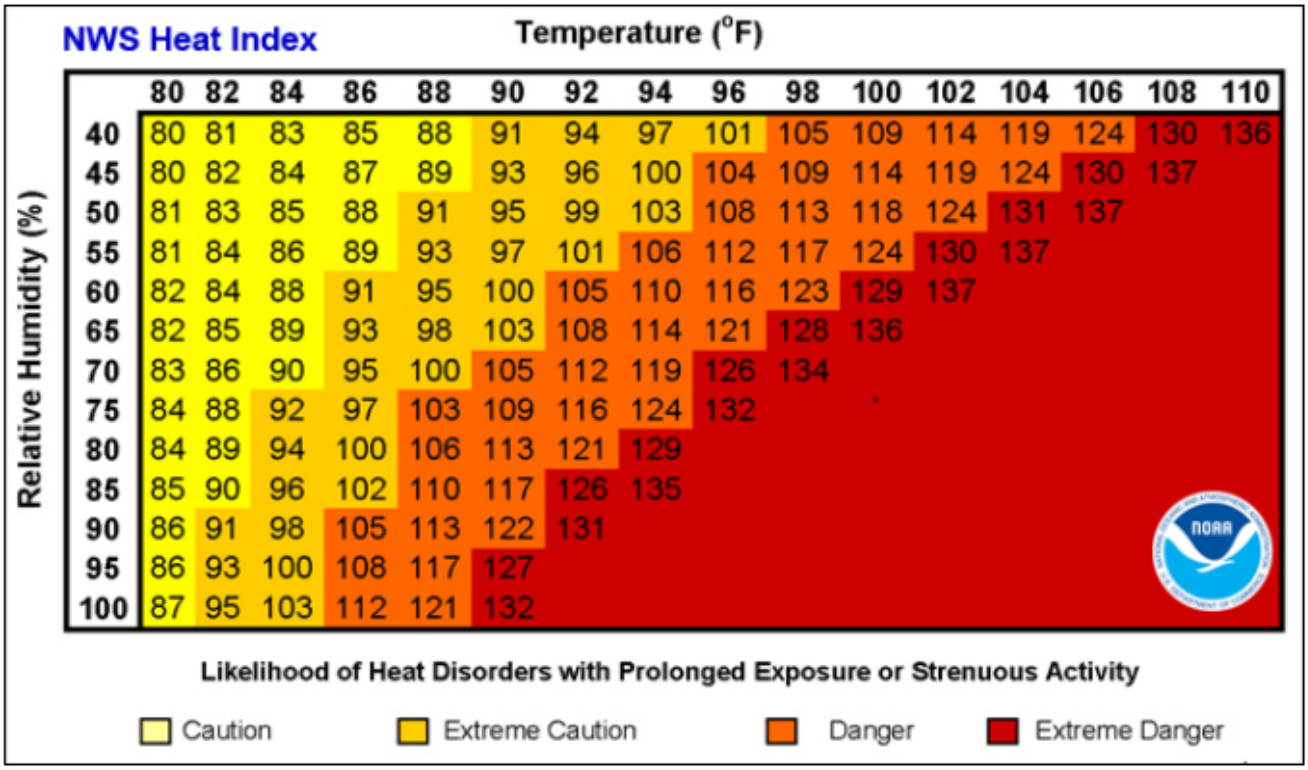
Extreme heat can cause stress to crops and animals. According to USDA Risk Management Agency, losses to insurable crops during the five-year period from 2012-2016 were $13,731,888 and 132,458.82 acres. Extreme heat can also strain electricity delivery and infrastructure overloaded during peak use of air conditioning during extreme heat events. Another type of infrastructure strain occurs on the roadways. When asphalt is exposed to prolonged extreme heat, it can cause buckling of asphalt-paved roads, driveways, and parking lots.

Between 2004 and 2018, an average of 702 heat-related deaths occurred annually in the United States, according to information published by the Centers for Disease Control and Prevention. During the same time-period, there was one death in 2011 and one death in 2016 attributed to extreme heat in Butler County. The National Weather Service stated that among natural hazards, no other natural disaster – not lightening, hurricanes, tornadoes, floods, or earthquakes – causes more deaths.

Those at greatest risk for heat-related illness include infants and children up to five-years-old, people 65-years-old and above, 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.

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.

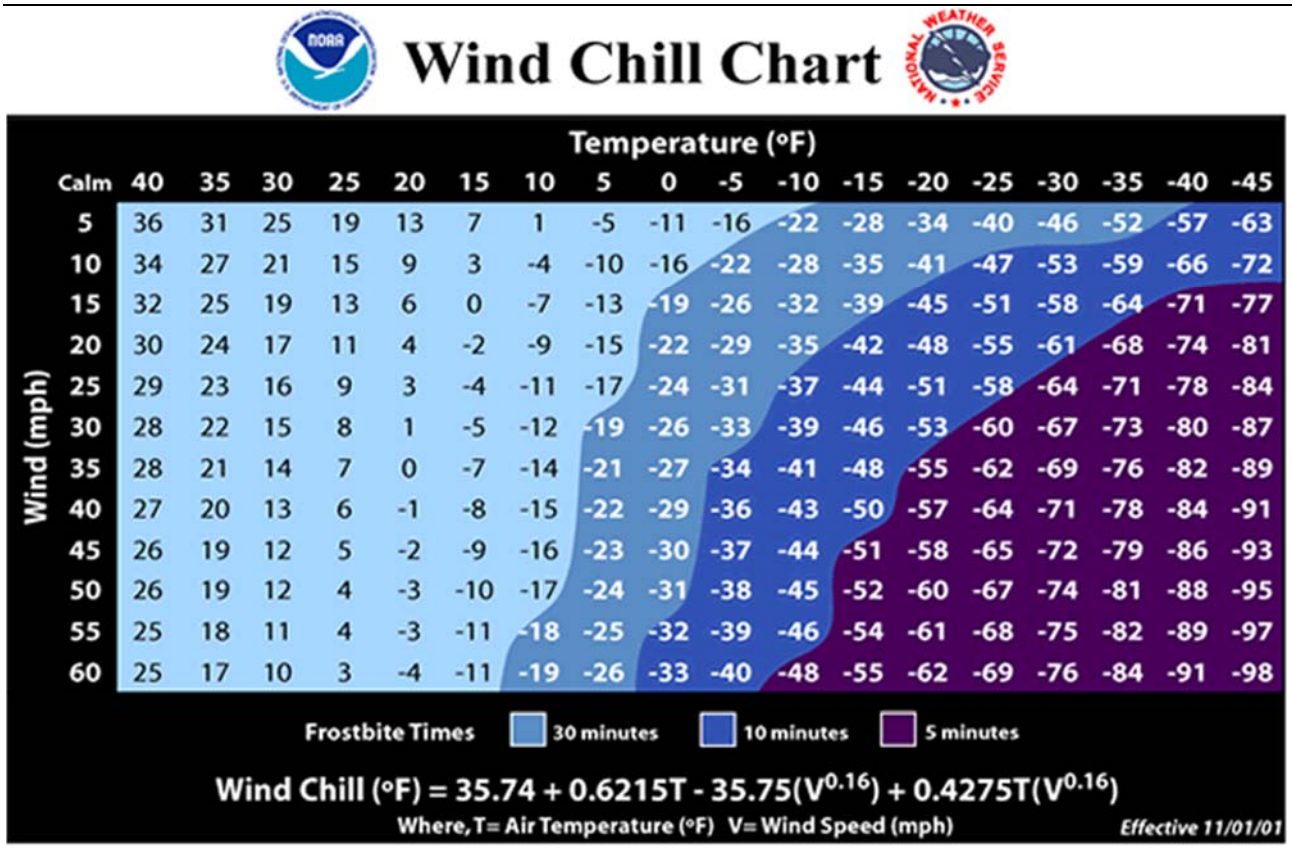
Figure 3.9. Heat Index (HI) Chart



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 3.10. Wind Chill Chart



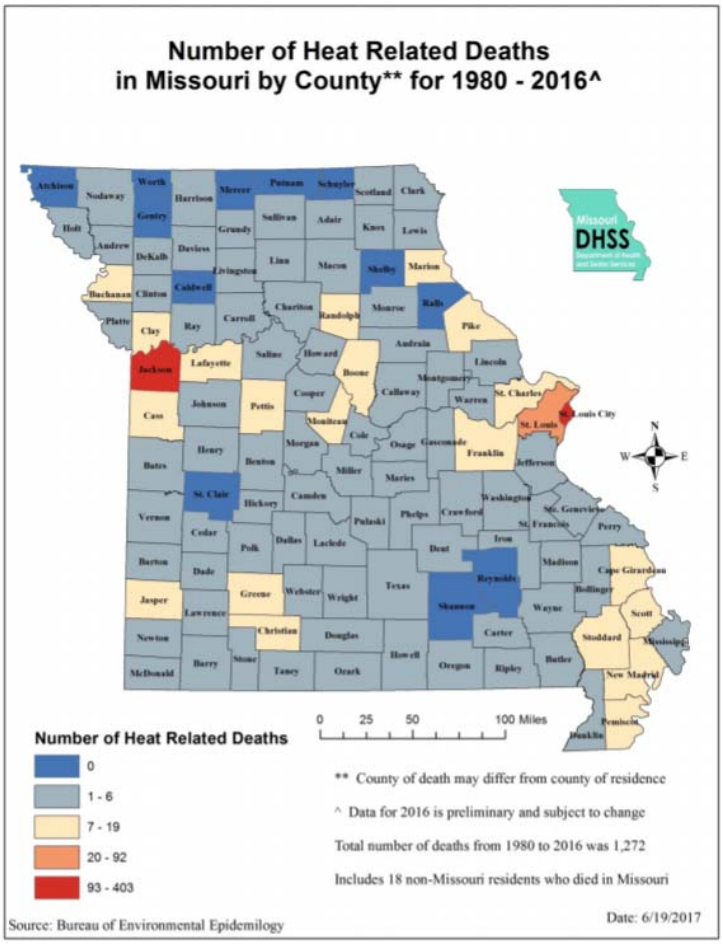
Source: https://www.weather.gov/safety/cold-wind-chill-chart

Previous Occurrences

According to the National Climatic Data Center (NCDC) Storm Events Database, From January 1, 2012 through December 31, 2021, there were 11 reported Excessive Heat Events. These 11 events included more than 50 days of excessive heat. In reviewing the reports provided by the NCDC, there was one fatality in this nearly 10-year timespan: On July 22, 2017, a 23-year-old man became overheated while working outside trimming trees, and died the next day.

The following map **(Figure 3.11.)**, depicts the number of heat-related deaths by county from 2000-2016. Butler County falls within the same colored category as many of its neighbors that have experienced 1-3 deaths during the same time-period.

Figure 3.11. Heat Related Deaths in Missouri 2000 - 2016



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

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 Jan. 1 2012 to Dec. 31, 2021 were $1,352,559.05. 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, 1 death was 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

The probability of future occurrence can be calculated by dividing the number of reported extreme heat events by the number of years. In this case, Butler County experienced 11 heat events over a 10-year period, which equals a slightly greater than 100 percent probability that an extreme heat event will occur in any given year. The average number of events per year is approximately one. Extreme heat events are often under-reported, and this data is based on those events reported by the

NOAA through its NCDC.

Changing Future Conditions Considerations

According to the 2018 Missouri State Hazard Mitigation Plan, under a higher emissions pathway, historically unprecedented warming is projected by the end of the century. Even under a pathway of lower greenhouse gas emissions, average annual temperatures are projected to most likely exceed historical record levels by the middle of the 21st century. For example, in southern Missouri, the annual maximum number of consecutive days with temperatures exceeding 95 degrees F is projected to increase by up to 20 days. Temperature increases will cause future heat waves to be more intense, a concern for this region which already experiences hot and humid conditions. Extreme heat is a concern for urban areas such as St. Louis and Kansas City, where the urban heat island effect raises summer temperatures. If the warming trend conditions, future heat waves are likely to be more intense, and cold wave intensity is projected to decrease.

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 try 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.

Mitigation against the impacts of future temperature increase may include increasing education on heat stress prevention, organizing cooling centers, allocating additional funding to repair and maintain roads damaged by buckling and potholes, and reducing nutrient runoff that contributes to algal blooms. Local governments should also prepare for increased demand on public recreational facilities, utility systems, and healthcare centers. Improving energy efficiency in public buildings will also present an increasingly valuable savings potential.

Vulnerability

Vulnerability Overview

Extreme heat and extreme cold events are common occurrences in Missouri. The method used to determine vulnerability to extreme temperatures across Missouri was statistical analysis of data from several sources: National Centers for Environmental Information (NCEI) storm events data (1996 to December 31, 2016), total population and percentage of population over 65 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, four factors were considered in determining overall vulnerability to extreme temperatures as follows: total population, percentage of population over 65, likelihood of occurrence, and social vulnerability. 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. Once the individual ratings were determined for the above factors, a combined vulnerability rating was computed for extreme heat and extreme cold.

According to the 2018 Missouri State Hazard Mitigation Plan, Butler County had a 2015 population of 25,690 with a total population vulnerability rating of 1 or, “Low.” The percentage of population over the age of 65 was 17.1 percent with a rating of 2, or, “Low-Medium.” Butler County’s Social Vulnerability rating is listed as “Medium,” with a rating of 3.

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

Table 3.27. 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

Potential Losses to Existing Development

Based on 10-years of crop loss data provided by the USDA, Butler County can expect to lose approximately $135,256 in crops due to Extreme Heat on an annual basis. Additionally, in data regarding heat related deaths between 2012 and 2022, one death occurred. This means there is a 10% chance annually that someone will die from a heat-related event.

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.

There has been an increase in the percentage of local residents over the age of 65 between 2010 and 2020. According to the 2020 Census, 19.2 percent of residents are aged 65 and above. This is a more than 2 percent increase from the 2010 census report and a 2.5 percent increase from the 2000 census.

Hazard Summary by Jurisdiction

Those at greatest risk for heat-related illness and deaths include children up to five years of age, people 65 years of age and older, people who are overweight, and people who are ill or on certain medications. To determine jurisdictions within the planning area with populations more vulnerable to extreme heat, demographic data was obtained from the 2010 census on population percentages in each jurisdiction comprised of those under age 5 and over age 65. Data was not available for overweight individuals and those on medications vulnerable to extreme heat. **Table 3.28.** 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 3.28. Butler County Population Under Age 5 and Over Age 65, 2020 Census Data

Jurisdiction	Population Under 5 yrs	Population 65 yrs and over
Butler County	2,570	8,089
City of Poplar Bluff	1,233	3,115

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

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

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

Problem Statement

The risks presented in this section resulting from extreme heat include heat-related illness and death and damage to crops in the county. To address the problem of extreme heat, the MPC have included the following actions:

- Provide heat-related illness educational information to the general public
- Create a database of vulnerable populations in cooperation with home health care agencies.

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 2.4.10.**).

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 make 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.

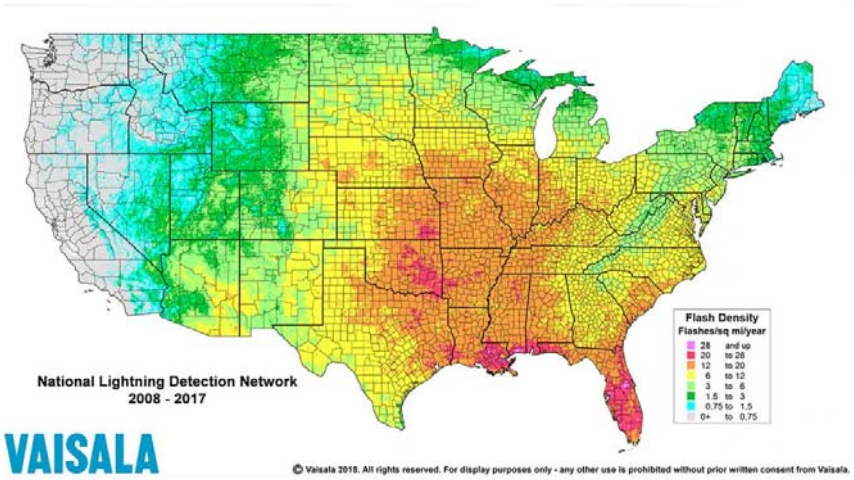
At the time when the updraft can no longer support the hailstone, it will fall to the earth. For example, a ¼" diameter or pea sized hail requires updrafts of 24 miles per hour, while a 2 ¾" diameter or baseball sized hail requires an updraft of 81 miles per hour. According to the NOAA, the largest hailstone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

Geographic Location

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

The map below (**Figure 3.12**) shows lightning frequency in the state. From viewing the map and legend, it can be determined that the average flash density for Butler County is 12 to 20 flashes per square mile per year.

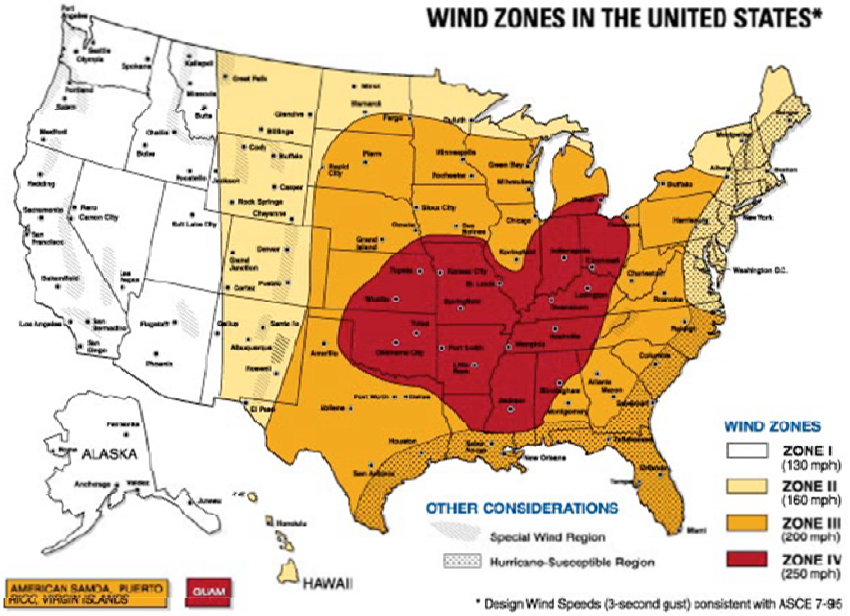
Figure 3.12. Location and Frequency of Lightning in Missouri



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.

The map below (**Figure 3.13.**) shows wind zones in the United States. and indicate graphically the location of the planning area. Butler County is located in what is described as, “Zone IV,” with potential wind speeds up to 250 mph.

Figure 3.13. 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 3.29.** below describes typical damage impacts of the various sizes of hail.

Table 3.29. 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 tables below (**Table 3.30. through Table 3.33.**) summarize past crop damages as indicated by crop insurance claims. The tables illustrate the magnitude of the impact on the planning area's agricultural economy.

Table. 3.30. Crop Insurance Claims Paid in Butler County from Thunderstorms, 01/01/2012 – 12/31/2021

Crop Year	Crop Name	Cause of Loss Description	Insurance Paid
0	0	0	0
Total			

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

Table 3.31. Crop Insurance Claims Paid in Butler County from High Winds, 01/01/2012 – 12/31/2021

Crop Year	Crop Name	Cause of Loss Description	Insurance Paid
2012	Corn	Hot Wind	460
2012	Soybeans	Hot Wind	6,150
2013	Soybeans	Hot Wind	16,085
2014	Rice	Wind/Excess Wind	11,454
2015	Rice	Wind/Excess Wind	6,989
2016	Rice	Wind/Excess Wind	143,975
2017	Rice	Wind/Excess Wind	36,484
2018	Rice	Wind/Excess Wind	48,060
2018	Rice	Hot Wind	34,253
2018	Corn	Wind/Excess Wind	2,476.50
2018	Soybeans	Wind/Excess Wind	1,119
2018	Soybeans	Hot Wind	4,994
2019	Rice	Wind/Excess Wind	129,550
2019	Corn	Wind/Excess Wind	33,913.50
2019	Soybeans	Wind/Excess Wind	2,228
2020	Rice	Wind/Excess Wind	23,007
Total			$501,198

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

Table 3.32. Crop Insurance Claims Paid in Butler County from Lightning, 01/01/2012 – 12/31/2021

Crop Year	Crop Name	Cause of Loss Description	Insurance Paid
0	0	0	0
Total			

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

Table 3.33. Crop Insurance Claims Paid in Butler County from Hail, 01/01/2012 – 12/31/2021

Crop Year	Crop Name	Cause of Loss Description	Insurance Paid
2018	Corn	Hail	13,880.50
2020	Corn	Hail	5,488
2020	Soybeans	Hail	22,037
Total			$41,405.50

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

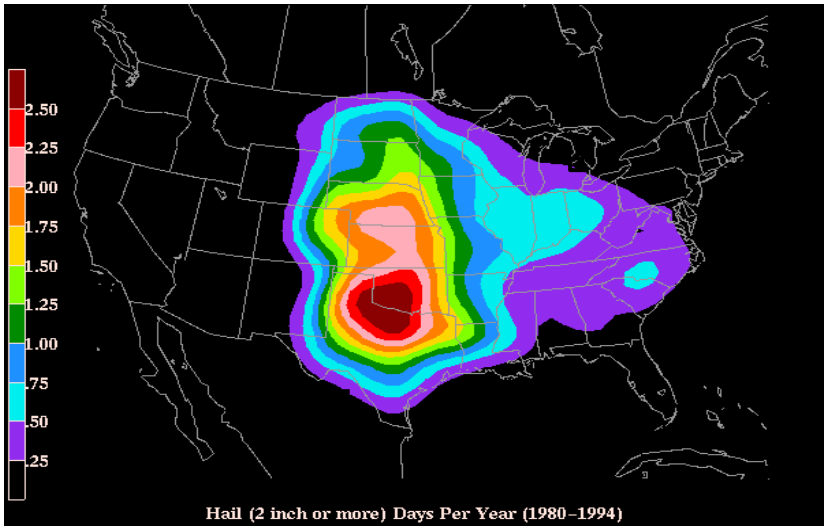
It is important to note limitations to the use of NCEI reported lightning events include the fact that only lightning events that result in fatality, injury and/or property and crop damage are in the NCEI.

Probability of Future Occurrence

The probability of future occurrence can be calculated by dividing the number of reported thunderstorm-related events by the number of years. In this case, Butler County experienced 93 events over a 10-year period, which equals a greater than 100 percent probability this type of event will occur in any given year. The average number of thunderstorm-related events per year is 9.3.

The following map (**Figure 3.14.**) 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. Butler County, according to map data, is located in a zone typically receives two-inch or larger hail half to three-quarters days per year.

Figure 3.14. Annual Hailstorm Probability (2" diameter or larger), U 1980- 1994



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

Changing Future Conditions Considerations

According to the 2018 Missouri State Hazard Mitigation Plan, NASA's Earth Observatory provides an analysis on how climate change could, theoretically, increase potential storm energy by warming the surface and putting more moisture in the air through evaporation. The presence of warm, moist air near the surface is a key ingredient for summer storms that meteorologists have termed "convective available potential energy," or CAPE. With an increase in CAPE, there is greater potential for cumulus clouds to form. The study also counters this theory with the theory that warming in the Arctic could lead to less wind shear in the mid-latitude areas prone to summer storms, making the storms less likely.

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

According to the *2018 Missouri State Hazard Mitigation Plan*, Butler County has a Severe Thunderstorm Combined Vulnerability rating of, "Medium-High," in the category of Social Vulnerability, a rating of, "Medium," in the category of "Percentage of Mobile Homes," a rating of, "Low-Medium," in the category of, "Building Exposure," and a rating of, "Low," in the category of, "Housing Density." The method used to determine vulnerability to severe thunderstorms 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 and mobile home 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, six factors were considered in determining overall vulnerability to lightning as follows: housing density, building exposure, percentage of mobile homes, 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

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

Using data spanning the 10-year period from 2012 through 2021, it can be determined that the potential losses to existing development will be, and have been, minimal when compared to the potential exposure. The reported property loss for all components of the thunderstorm hazard is $1,152,000 compared to the total exposure of approximately $3,682,000. The total annualized crop loss averages $54,260 compared to the total crop exposure of approximately $86,624,000.

Previous and Future Development

With major future development in Butler County expected to be minimal, change is not anticipated regarding exposure and losses associated with thunderstorm events.

Hazard Summary by Jurisdiction

Although thunderstorms/high winds/lightning/hail events are area-wide, there are demographics indicating higher losses in one jurisdiction as compared to another, with the primary factor being population density. According to the 2020 Census, the population density of Butler County is estimated at 62 persons per square mile, while the population density for City of Poplar Bluff is estimated at 1,319.1 persons per square mile. The damages resulting from a thunderstorm have the potential to be greater in the more concentrated towns than in the sparsely-populated unincorporated areas of the county.

Problem Statement

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

3.4.9 Severe Winter Weather

Hazard Profile

Hazard Description

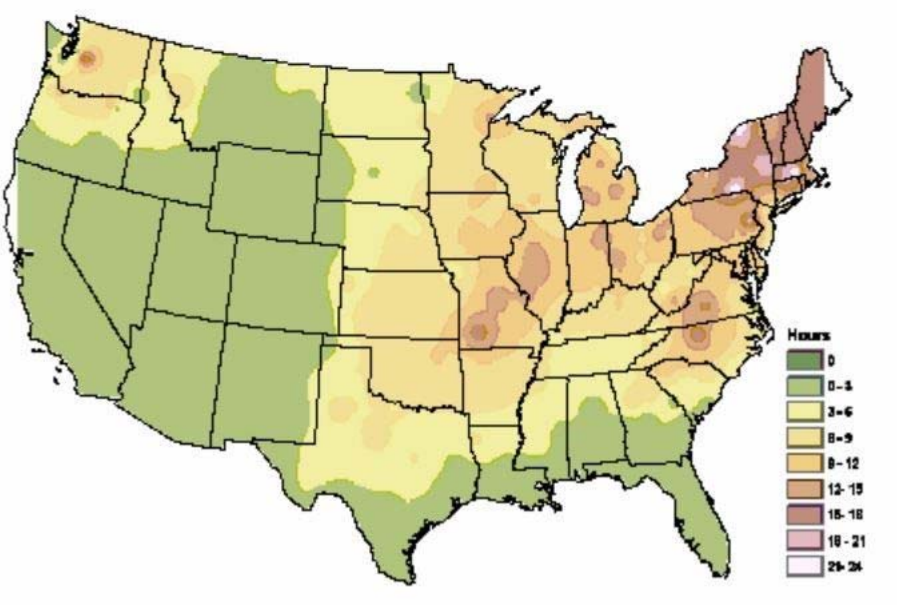
A major winter storm can last for several days and be accompanied by high winds, freezing rain or sleet, heavy snowfall, and cold temperatures. The National Weather Service describes different types of winter storm events as follows.

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

Geographic Location

All jurisdictions in the county are vulnerable to heavy snow, ice, extreme cold temperatures and freezing rain. According to the map below (**Figure 3.15.**) Butler County is on the border of the area that receives 8-9 and 9-12 hours of freezing rain per year.

Figure 3.15. 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 3.34. below provides pervious occurrences and damages as reported by the NCDC Storm Events Database for January 1, 2012 through December 31, 2021. These events are for blizzard, cold/wind chill, extreme cold/wind chill, heavy snow, ice storm, sleet, winter storm, and winter weather.

Table 3.34. NCDC Butler County Winter Weather Events Summary, January 1, 2012 – December 31, 2021

Date	Event Type	Deaths	Injuries	Property Damage	Crop Damage
2/13/2012	Winter Weather	0	0	$0	$0
12/25/2012	Winter Storm	0	0	$0	$0
12/28/2012	Winter Weather	0	0	$0	$0
2/21/2013	Ice Storm	0	0	$100,000	$0
3/21/2013	Winter Weather	0	0	$0	$0
12/5/2013	Winter Storm	0	0	$0	$0
1/6/2014	Cold/Wind Chill	0	0	$0	$0
2/2/2014	Winter Storm	0	0	$0	$0
2/4/2014	Winter Storm	0	0	$0	$0
2/10/2014	Winter Weather	0	0	$0	$0
3/2/2014	Winter Storm	0	0	$0	$0
11/16/2014	Winter Weather	0	0	$0	$0
1/11/2015	Winter Weather	0	0	$0	$0
2/15/2015	Winter Storm	0	0	$0	$0
2/17/2015	Winter Weather	0	0	$0	$0
2/19/2015	Cold/Wind Chill	0	0	$0	$0
2/20/2015	Winter Storm	0	0	$0	$0
2/28/2015	Winter Weather	0	0	$0	$0
3/1/2015	Winter Weather	0	0	$0	$0
3/4/2015	Winter Storm	0	0	$0	$0
1/19/2016	Winter Weather	0	0	$0	$0
1/21/2016	Winter Weather	0	0	$0	$0
2/14/2016	Winter Weather	0	0	$0	$0
1/5/2017	Winter Weather	0	0	$0	$0
1/13/2017	Winter Weather	0	0	$0	$0
1/1/2018	Cold/Wind Chill	0	0	$0	$0
1/12/2018	Winter Weather	0	0	$0	$0
1/16/2018	Cold/Wind Chill	0	0	$0	$0
2/6/2018	Winter Weather	0	0	$0	$0
2/11/2018	Winter Weather	0	0	$0	$0

4/7/2018	Winter Weather	0	0	$0	$0
11/14/2018	Winter Weather	0	0	$0	$0
12/8/2018	Winter Weather	0	0	$0	$0
1/11/2019	Winter Weather	0	0	$0	$0
2/15/2019	Winter Weather	0	0	$0	$0
11/11/2019	Winter Weather	0	0	$0	$0
1/27/2021	Winter Weather	0	0	$0	$0
2/10/2021	Winter Weather	0	0	$0	$0
2/14/2021	Cold/Wind Chill & Winter Storm	0	0	$0	$0
2/16/2021	Cold/Wind Chill	0	0	$0	$0
2/17/2021	Winter Weather	0	0	$0	$0
Total	41 Events	0	0	$100,000	$0

Source: Storm Events Database, date accessed 6/6/2022

The most recent Presidential Disaster Declaration due to winter weather events occurred in 2009 and is identified as Disaster No. 3303. Prior declarations also occurred in 2008 as Disaster No. 1748 and 2007 as Disaster No. 3281.

Winter storms, cold, frost and freeze take a toll on crop production in the planning area. **Table 3.35.** 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 3.35. Crop Insurance Claims Paid in Butler County as a Result of Cold Conditions and Snow January 1, 2012 – December 31, 2021

Crop Year	Crop Name	Cause of Loss Description	Insurance Paid ($)
2012	Rice	Cold Wet Weather	$8,820
2013	Soybeans	Cold Wet Weather	$4,382
2014	Wheat	Cold Winter	$1,165
2014	Wheat	Cold Wet Weather	$368
2014	Wheat	Cold Wet Weather	$8,950
2014	Wheat	Cold Wet Weather	$21,086
2014	Rice	Cold Wet Weather	$26,574
2014	Rice	Cold Wet Weather	$15,279
2014	Rice	Cold Wet Weather	$251,411
2014	Corn	Cold Wet Weather	$22,375
2015	Rice	Cold Wet Weather	$63,184
2015	Corn	Cold Wet Weather	$128,835
2016	Rice	Cold Wet Weather	$5,865
2016	Rice	Cold Wet Weather	$9,462
2016	Corn	Cold Wet Weather	$522

2016	Corn	Cold Wet Weather	$1,052
2016	Soybeans	Cold Wet Weather	$3,127
2018	Rice	Cold Wet Weather	$16,852
2018	Corn	Cold Wet Weather	$50,371
2018	Soybeans	Cold Wet Weather	$3,824
2019	Corn	Cold Winter	$9,708
2020	Rice	Cold Wet Weather	$90,851
2020	Corn	Cold Wet Weather	$16,915
2020	Soybeans	Cold Wet Weather	$7,245
2021	Wheat	Cold Wet Weather	$932
2021	Rice	Cold Wet Weather	$152,725
2021	Corn	Cold Wet Weather	$8,706

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

Probability of Future Occurrence

The probably of future occurrence, based on 41 events occurring during the 10-year period from Jan. 1, 2012 – Dec. 31, 2021, is approximately 4.1 cold weather events per year ranging from extreme cold temperatures to snow and ice. This is a greater than 100 percent chance of severe winter weather each year.

Changing Future Conditions Considerations

According to the 2018 Missouri State Hazard Mitigation Plan, 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

According to the *2018 Missouri State Hazard Mitigation Plan*, Butler County has a Severe Winter Weather Combined Vulnerability rating of, “Medium-High,” in the category of Social Vulnerability, a rating of, “Medium,” in the category of “Total Building Exposure,” and a rating of, “Low,” in the category of, “Housing Density.” 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.

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

In reviewing loss data provided by the NCDC between the January 1, 2012 and December 31, 2021, there were 41 events and a total of $100,000 in property damage. Therefor, the projected annual loss amount totals $10,000 with many future property loss incidents occurring as a result of utility failure or loss of power.

Previous and Future Development

Future development and growth is anticipated in and around the City of Poplar Bluff, including the unincorporated areas surrounding Poplar Bluff. This anticipated growth could potentially increase the vulnerability to Severe Winter Weather and may also increase the demand on utilities and exposure to infrastructure networks.

Hazard Summary by Jurisdiction

All jurisdictions within Butler County are equally vulnerable to winter weather events. However, the cities of Fisk, Neelyville, Poplar Bluff, and Qulin have populations that are higher risk from some of the damages resulting from winter weather. There are nursing homes and senior housing complexes

in Poplar Bluff that house a large number of senior citizens who are more vulnerable to the effects of winter weather. There is also a senior housing complex located in the City of Qulin. The residents of these facilities are more prone to health concerns that results from extreme cold temperatures, are typically less mobile, which could lead to falls on icy surfaces. Finally, the facilities would be crippled and much-needed medical equipment would not work in the event of a power outage caused by winter weather.

Problem Statement

Winter weather comes with myriad impacts ranging from health concerns due to extreme cold temperatures to residents falling or experiencing motor vehicle accidents and power outages, all due to ice accumulation on streets, sidewalks, and power lines. The mitigation planning committee was concerned about the availability of emergency power generators at critical facilities and has proposed an action plan to continue to seek funding for critical facilities currently without generators. These facilities include water and wastewater treatment plants, nursing homes, schools, and fire stations.

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

Tornadoes can occur anywhere in Butler County and impact all jurisdictions in the county.

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 3.36.)** 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 3.36. Enhanced F Scale for Tornado Damage

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

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

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

Table 3.37. Enhanced Fujita Scale with Potential Damage

Enhanced Fujita Scale			
Scale	Wind Speed (mph)	Relative Frequency	Potential Damage
EF0	65-85	53.5%	Light. Peels surface off some roofs; some damage to gutters 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

Table (**Table 3.37.)** includes NCEI reported tornado events and damages since 2007 in the planning area. It is necessary to go back as far as possible because of the random and intermittent nature of tornado events. There are limitations to the use of 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.

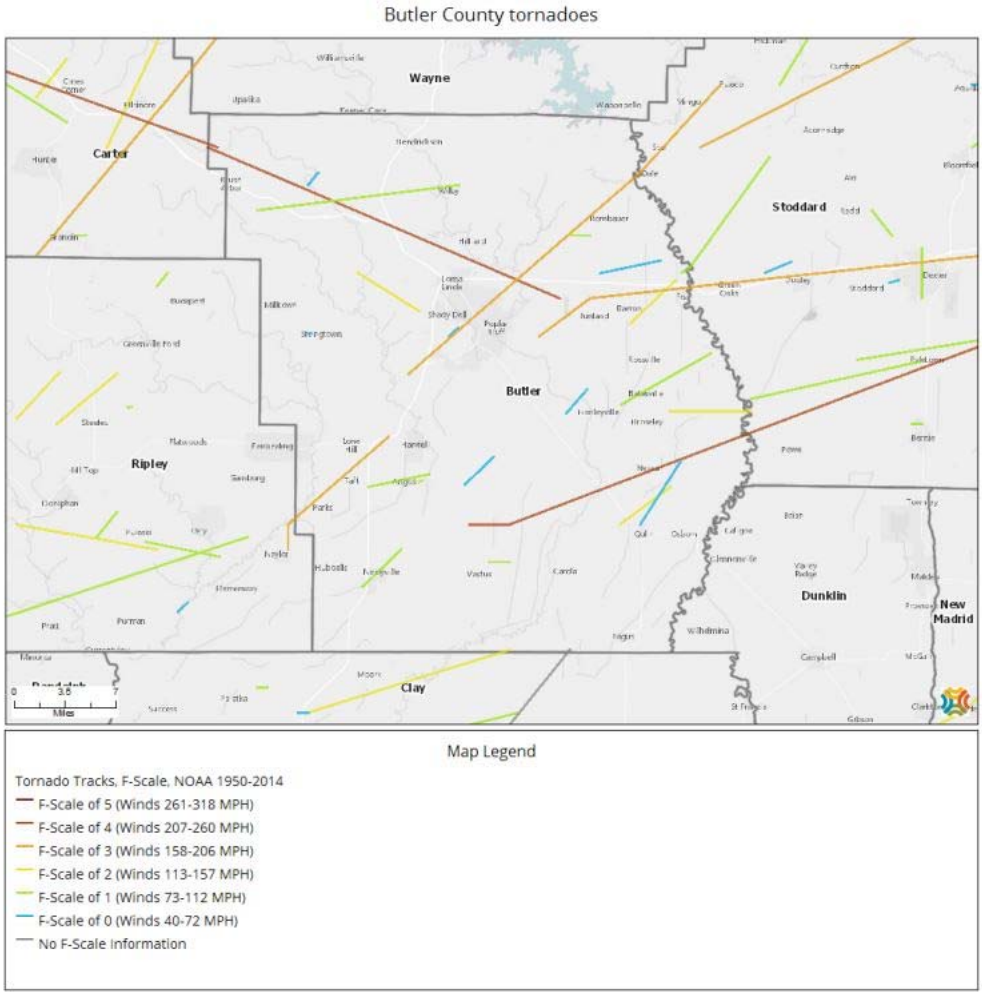
Table 3.37. Recorded Tornadoes in Butler County, Jan. 1, 2007 – Dec. 31, 2021

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	1.543M	0.00K
HARVIELL	BUTLER CO.	MO	02/05/2008	20:03	CST-6	Tornado	EF1	0	0	100.00K	0.00K
FISK	BUTLER CO.	MO	02/05/2008	20:18	CST-6	Tornado	EF2	0	0	150.00K	0.00K
HENDRICKSON	BUTLER CO.	MO	05/01/2010	21:00	CST-6	Tornado	EF0	0	0	1.00K	0.00K
STRINGTOWN	BUTLER CO.	MO	12/31/2010	14:25	CST-6	Tornado	EF2	0	0	250.00K	0.00K
NEELYVILLE	BUTLER CO.	MO	04/23/2011	23:02	CST-6	Tornado	EF1	0	0	175.00K	0.00K
HARVIELL	BUTLER CO.	MO	04/27/2011	14:15	CST-6	Tornado	EF0	0	0	0.00K	0.00K
POPLAR BLUFF	BUTLER CO.	MO	05/25/2011	16:14	CST-6	Tornado	EF0	0	0	0.00K	0.00K
FISK	BUTLER CO.	MO	09/01/2012	15:32	CST-6	Tornado	EF0	0	0	0.00K	0.00K
QULIN	BUTLER CO.	MO	09/01/2012	15:43	CST-6	Tornado	EF0	0	0	0.00K	0.00K
JUNLAND	BUTLER CO.	MO	01/29/2013	20:45	CST-6	Tornado	EF2	0	0	60.00K	0.00K
POPLAR BLUFF	BUTLER CO.	MO	04/10/2013	19:58	CST-6	Tornado	EF0	0	0	20.00K	0.00K
HARVIELL	BUTLER CO.	MO	10/31/2013	17:30	CST-6	Tornado	EF1	0	0	80.00K	0.00K
BROSELEY	BUTLER CO.	MO	10/31/2013	17:48	CST-6	Tornado	EF1	0	0	100.00K	0.00K
STRINGTOWN	BUTLER CO.	MO	04/03/2014	18:56	CST-6	Tornado	EF0	0	0	17.00K	0.00K
FISK	BUTLER CO.	MO	04/03/2014	20:00	CST-6	Tornado	EF1	0	0	2.00K	0.00K
HENDRICKSON	BUTLER CO.	MO	03/09/2017	18:32	CST-6	Tornado	EF1	0	0	25.00K	0.00K
BROSELEY	BUTLER CO.	MO	03/09/2017	19:14	CST-6	Tornado	EF1	0	0	500.00K	0.00K
STRINGTOWN	BUTLER CO.	MO	05/27/2017	19:18	CST-6	Tornado	EF0	0	0	40.00K	0.00K
QULIN	BUTLER CO.	MO	05/16/2018	18:00	CST-6	Tornado	EF0	0	0	3.00K	0.00K
STRINGTOWN	BUTLER CO.	MO	03/12/2020	16:20	CST-6	Tornado	EF0	0	0	5.00K	0.00K
QULIN	BUTLER CO.	MO	08/08/2021	18:14	CST-6	Tornado	EF0	0	0	15.00K	0.00K
Totals:								0	0	1.543M	0.00K

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

The map below (**Figure 3.15.)** shows historic tornado paths in the planning area.

Figure 3.15. Butler County Map of Historic Tornado Events



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

According to data from the USDA Risk Management Agency, no insurance payments were paid in Butler County for crop damages as a result of tornadoes between 2007 and 2021.

Probability of Future Occurrence

There is a 100 percent chance that a tornado will occur in Butler County each year based on 15-years of statistical data identifying 21 tornado events during that time period.

Changing Future Conditions Considerations

According to the 2018 Missouri State Hazard Mitigation Plan, scientists do not know how the frequency and severity of tornadoes will change. Research published in 2015 suggests that changes in heat and moisture content in the atmosphere, brought on by a warming world, could be playing a role in making tornado outbreaks more common and severe in the U.S. The research concluded that the number of days with large outbreaks have been increasing since the 1950s and that densely concentrated tornado outbreaks are on the rise. It is notable that the research shows that the area of tornado activity is not expanding, but rather the areas already subject to tornado activity are seeing the more densely packed tornadoes. Because Missouri experiences on average around 39.6

tornadoes a year, such research is closely followed by meteorologists in the state.

Vulnerability

Vulnerability Overview

Butler County is located in the area known as, “Tornado Alley.” The map below (**Figure 3.16.**) illustrates areas where dangerous tornadoes historically have occurred.

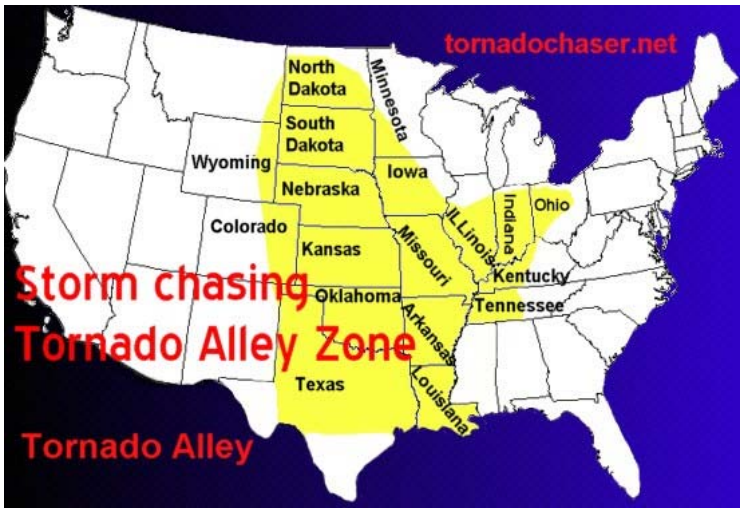
According to the 2018 Missouri State Hazard Mitigation Plan, Butler County has a vulnerability rating of, “Low-Medium,” in the category of Total Building Exposure; “Low,” in Population Density; “Medium-High,” in Social Vulnerability; and, “Medium,” in Percent Mobile Homes.

The method used to determine vulnerability to tornadoes across Missouri was statistical analysis of data from several sources: HAZUS building exposure value data, population density and mobile home data from the U.S. Census (2015 ACS), 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, and storm events data (1950 to December 31, 2016) from the National Centers for Environmental Information (NCEI). It is important to realize that one limitation to the NCEI data is that many tornadoes that might have occurred in uninhabited areas, as well as some in inhabited areas, may not have been reported. The incompleteness of the data suggests that it is not appropriate for use in parametric modeling. In addition, NOAA data cannot show a realistic frequency distribution of different Fujita scale tornado events, except for recent years. Thus a parametric model based on a combination of many physical aspects of the tornado to predict future expected losses was not used. The statistical model used for this analysis was probabilistic based purely on tornado frequency and historic losses. It is based on past experience and forecasts the expected results for the immediate or extended future. From the statistical data collected, six factors were considered in determining overall vulnerability to tornadoes as follows: building exposure, population density, social vulnerability, percentage of mobile homes, likelihood of occurrence, and 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.

Figure 3.16. Tornado Alley in the U.S.



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

Potential Losses to Existing Development

In reviewing NCDC-provided tornado data spanning January 1, 2007 through December 31, 2021, there were 21 tornadoes resulting in property dagames of $100,000. This averages nearly $5,000 in property damage per event with a probability of more than one event per year. It can be assumed this trend will continue with a tornado occurring somewhere in the county every year with an average property damage value of $5,000.

Previous and Future Development

Future development, increase in population, and overall growth will lead to an increase in vulnerability, particularly around and in the City of Poplar Bluff, which is expected to see the most development moving forward.

Hazard Summary by Jurisdiction

As can be seen when discussing other potential hazards, higher population concentration has the potential to result in greater risk and loss to individual jurisdictions. The cities of Fisk, Neelyville, Poplar Bluff, and Qulin, have a higher concentration of people and housing than the rural areas in Butler County, therefore, the risk for damages, injuries, and deaths is higher. Poplar Bluff R-1 School District and Three Rivers College have completed construction of tornado safe rooms on their campuses. Twin Rivers has a desire to build a safe room on its high school campus located in the unincorporated community of Broseley. These safe rooms have reduced the risk to death and injury for those who seek shelter during a tornado.

Problem Statement

Tornadoes are destructive and can impact any area of the county with very short notice. Tornadoes can cause injury, loss of life, damage to property and to crops. One of the priorities set forth my the mitigation planning committee was to seek out possible funding to map the coverage area of the county's tornado sirens and upgrade those sirens and coverage areas as funds are available.

3.4.11 Wildfire

Hazard Profile

Hazard Description

Due to the rural nature of Butler County, urban and structural fires are not discussed within this plan. The greater and more prevalent hazard in Butler County is wildfires.

The fire incident types for wildfires include: 1) natural vegetation fire, 2) outside rubbish fire, 3) special outside fire, and 4) cultivated vegetation, crop fire.

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

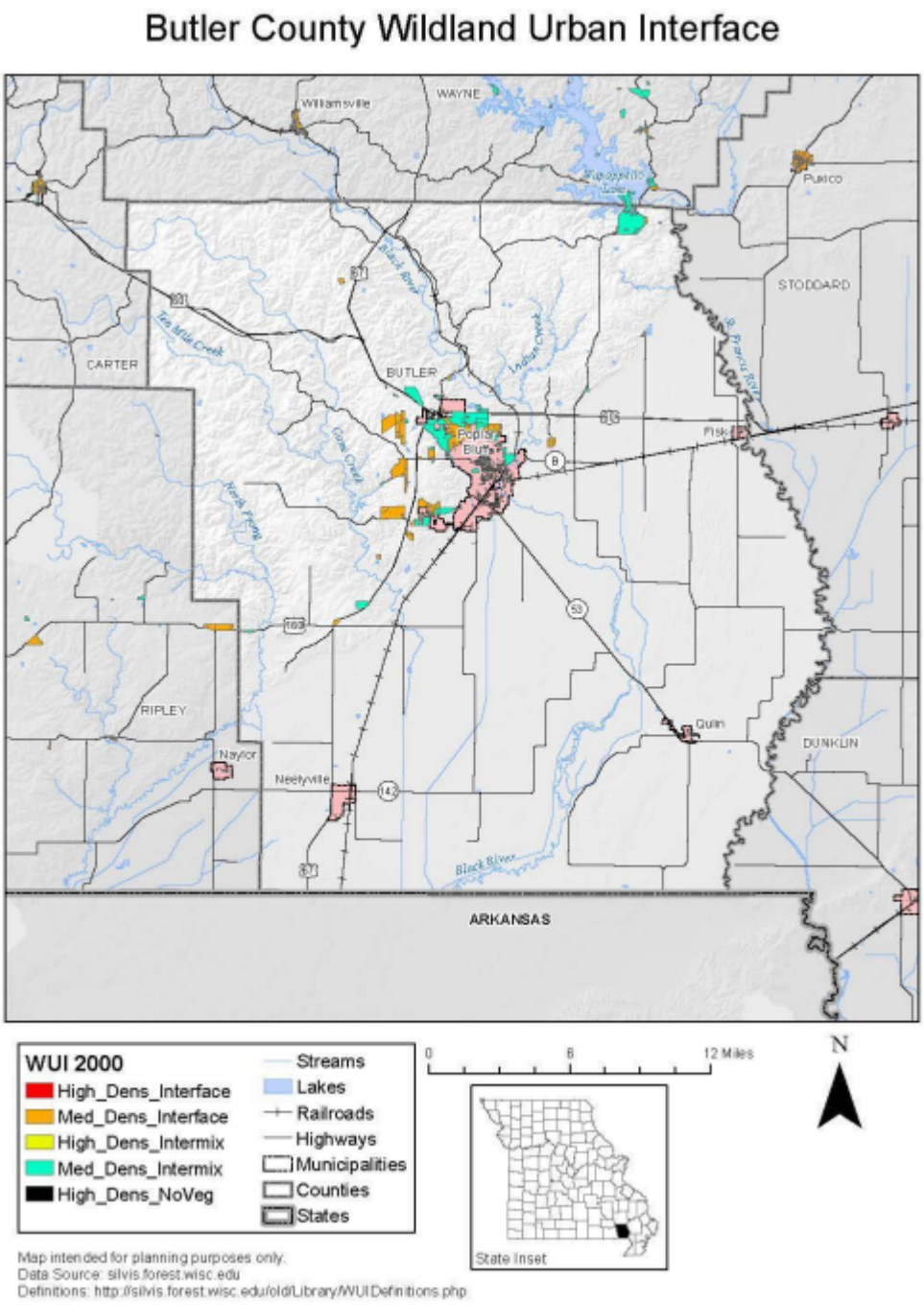
Most of Missouri fires occur during the spring season between February and May. The length and severity of wildland fires depend largely on weather conditions. Spring in Missouri is usually characterized by low humidity and high winds. These conditions result in higher fire danger. In addition, due to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

Geographic Location

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

According to **Figure 3.17**. below, the City of Poplar Bluff is most at-risk due to WUI.

Figure 3.17 Wildland Urban Interface Map, Butler County, Missouri



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.

Previous Occurrences

According to the Missouri Department of Conservation Wildfire Data Search, there have been 409 wildfires in Butler County in the 5-year period from June 11, 2017 through June 10, 2022. On average, each event burned less than four acres of land. However, there are exceptions to this rule and occasionally, many acres were lost at a time. No deaths or injuries were reported due to these fires.

According to local school districts, fire departments, public water district officials, and county emergency management staff, there have been no wildfires resulting in damages to any school district facilities within the county. There also have not been any fires resulting in damages to the public water supply districts.

Probability of Future Occurrence

To calculate the probability of the future occurrence of wildfires, divide the reported number of wildfires (409) by the number of years (5) which equals an estimated 81.8 wildfires per year in the planning area. This means Butler County can expect to see nearly 82 wildfires in any given year.

Changing Future Conditions Considerations

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 0. Higher temperatures will also reduce the number of 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.

Vulnerability

Vulnerability Overview

A large portion of Butler County is covered by areas of the Mark Twain National Forest, which is

where many of the wildland fires in the county occur. As presented in data above, it is certain that a wildland fire will occur, with a historical average of 82 per year. However, most of these fires are small, with the average fire burning approximately four acres. In further reviewing the data relating to reported wildfires, it can be seen that many of the fires are less than an acre with only a limited number of fires annually burning more than four.

According to the *2018 Missouri State Hazard Mitigation Plan*, Butler County saw 1,158 wildfires between 2004 and 2016, which averages 89 wildfires per year. The total number of acres burned during that period was 4,151.09, an average of 319 acres per year.

Additionally, the State HMP states the following vulnerability data for Butler County: Total No. of Structures at Risk is 8,280; Total Value of Structures at Risk is $1,958,767,835; and a Total Population of 16,047. Included in the Total Number of Structures at Risk: Agriculture; Commercial, Education; Government; Industrial; and Residential.

The method used to determine vulnerability to wildfires fires across Missouri was a GIS comparative analysis of wildland urban interface and intermix (WUI) areas against building exposure data to determine the types, numbers, and estimated values of buildings at risk to wildfire. This GIS-based analysis utilized data from several sources: the Missouri Spatial Data Inventory Service (MSDIS), HAZUS building exposure value data, and wildland urban interface and intermix area data from the University of Wisconsin-Madison SILVIS Lab. To calculate estimated values of buildings at risk, buildings values available in the HAZUS census block data were used to determine an average value for each property type. This average value per property type was then applied to the number of structures in the WUI areas, by type, to calculate an overall estimated value of buildings at risk by type. In addition to counts and values of structures at risk, an estimated population impacted for each county was calculated based on the number of residential properties in the WUI areas multiplied by the average household size

Potential Losses to Existing Development

Although dollar values are not assigned to prior losses, it can be determined that over the five years of data collected from the MDC, there have been damages to seven residences and eleven outbuildings. It is also reported that four residences and twelve outbuildings have been destroyed. When adding the two categories together, there have been eleven residences impacted by wildland fires and twenty-three outbuildings. When reviewing this historical data, it can be predicted that there will be an average of two residences destroyed or damaged each year and three outbuildings either damaged or destroyed each year by wildland fires.

Impact of Previous and Future Development

Future development is not expected to increase the potential impact of wildland fires in Butler County.

Hazard Summary by Jurisdiction

Wildfires predominantly occur in the Mark Twain National Forest, which covers a large portion of Butler County. The City of Poplar Bluff is identified as a Wildland/Urban Interface, which makes it at greater risk for loss due to wildfire activity. The cities of Neelyville, Qulin, and Fisk are at a lower risk due limited population and structures.

Problem Statement

Due to the rural nature of Butler County and the large portion of the county covered by Mark Twain National Forest, wildfires are inevitable. The greatest risk to property damages occur in the Wildland

and Urban Interface areas where residential areas intersect with the wildland areas. Based on historical data, residences and outbuildings have been damaged and destroyed by wildland fires.

In reviewing the risk of wildland fires and the historical data related to wildland fires, the mitigation planning committee felt that two goals could be incorporated into the plan to help reduce the impacts of wildfires:

- Seek funding and develop a fire safety awareness program addressing all types of fires. Included in this project would also be the purchase and installation of smoke detectors.
- Continue coordination of burn bans with cooperation from the county commissioners, county emergency management director, local fire departments, and National Forest Service, and the Missouri Department of Conservation.

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 Butler County's existing hazard mitigation plan approved by FEMA in August 2017. Therefore, the goals from the *2017 Butler 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 risk assessment 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. The MPC also reviewed the goals from current surrounding county plans.

As sated above, the MPC reviewed the goals from the prior plan update following the discussion of risk during the risk assessment planning meeting. After a breakout discussion, which included a review of state plan goals, the MPC determined to leave the goals unamended. The same four goals identified within the 2017 plan update were carried forward to this 2022 plan update. The four goals are as follows:

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

4.2 Identification and Analysis of Mitigation Actions

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

During the second MPC meeting, the results of the risk assessment update were provided to the MPC members for review and the key issues were identified for specific hazards. Changes in risk since adoption of the previously approved plan were discussed. 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. Clarification of the difference between mitigation actions and response actions was discussed.

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 as applicable.

The focus of Meeting #3 was update of the mitigation strategy. For a comprehensive range of mitigation actions to consider[7(a)], the MPC reviewed the following information during Meeting #3:

- A list of actions proposed in the previous mitigation plan, the current State Plan, and approved plans in surrounding counties,
- Key issues from the risk assessments, including the problem statements concluding each hazard profile and vulnerability analysis,
- State priorities established for 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 Meeting #3, individual jurisdictions, including school 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.

Each participating jurisdiction considered mitigation actions intended to reduce risk to existing buildings and infrastructure, as well as, limit risk to future development/redevelopment. The participating jurisdictions also identified mitigation actions addressing the following mitigation categories: prevention, structure and infrastructure projects, natural systems protection, emergency services, and education and outreach.

The MPC reviewed the actions from the previously approved plan to determine progress made since the plan had been adopted. Prior to Meeting #3, the list of actions for each jurisdiction was emailed 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, there were five completed actions, forty continuing actions (either ongoing or modified), and seven deleted actions.

Table 4.1provides a summary of the action statuses for each prior and currently participating jurisdiction. The Neelyville R-IV School District did not participate within the 2018 Butler County Hazard Mitigation Plan; consequently, neither completed, continuing, or deleted actions—specific to the district—are included in the below table.

Table 4.1. Action Status Summary

Jurisdiction	Completed Actions	Continuing Actions (ongoing or modify)	Deleted Actions
Butler County	3	23	6
City of Poplar Bluff	1	7	0
City of Qulin	0	4	1
Neelyville R-IV School District	N/A	N/A	N/A
Poplar Bluff R-I School District	0	6	0
Three Rivers College	1	4	0
Twin Rivers R-X School District	0	6	0

Table 4.2 provides a summary of the completed and deleted actions from the previous plan. The Neelyville R-IV School District did not participate within the *2018 Butler County Hazard Mitigation Plan*; consequently, neither deleted, nor completed action—specific to the district—are included in the below table.

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

Completed Actions	Completion Details (date, amount, funding source)
Butler County	
Outdoor warning siren mapping	Mapping completed funded by Butler County EMA Budget
Make hazard mitigation plan publicly available	Plan was made available, 2018 at no cost
EMA text alerts for inclement weather	Text alert system established funded by Butler County EMA Budget
City of Poplar Bluff	
Participate in flood buyout programs to relocate residents from flood prone areas	The city purchased and acquired numerous residential properties previously damaged by floodwaters.
City of Qulin	No previously-identified actions were determined to have been "completed" during the city's mitigation action assessment.
Poplar Bluff R-I School District	No previously-identified actions were determined to have been "completed" during the district's mitigation action assessment.
Twin Rivers R-X School District	No previously-identified actions were determined to have been "completed" during the district's mitigation action assessment.
Three Rivers College	
Construct a tornado safe room	The college has constructed two tornado safe rooms including one within the newly-constructed Libla Family Sports Complex.
Deleted Actions	**Reason for Deletion**
Butler County	
CFM training	No financial resources to fund action.
Tornado safe room	No financial resources to fund action.
Flood crossing dangers	Action too vague to implement.
Retention pond construction	No financial resources to fund action.
Gather inundation data for levee failure	No specialized staff with technical knowledge needed to conduct effort.
Equip school buses with 2-way radios	No legal authority to implement.
City of Poplar Bluff	No previously-identified mitigation actions were deleted during the city's mitigation action assessment.
City of Qulin	
Participate in flood buyout programs to relocate residents from flood prone areas	The city does not engage in these types of programs.
Poplar Bluff R-I School District	No previously-identified mitigation actions were deleted during the district's mitigation action assessment.
Twin Rivers R-X School District	No previously-identified mitigation actions were deleted during the district's mitigation action assessment.
Three Rivers College	No previously-identified non-completed mitigation actions were deleted during the college's mitigation action assessment.

Source: *2018 Butler County Hazard Mitigation Plan*; 2022 Mitigation Action Status Worksheets

All incomplete mitigation actions identified within the *2018 Butler County Hazard Mitigation Plan* (with the exception of the completed and deleted actions) have been carried forward to the current plan update. Jurisdictional members of the MPC determined the deletion of twelve prior mitigation actions necessary—five due to completion and the others due to either irrelevance, financial infeasibility, or a lack of local capacity. Both deleted and completed actions are listed above within Table 4.2. In many cases the previously identified mitigation actions were no longer

relevant to the particular jurisdiction. Implementation barriers for nearly all participating jurisdictions consisted primarily of lack of resources (both financial and human). Specifically, the lack of funding with which to compensate a facilitator for the plan maintenance process continues to be the prevailing reason why mitigation actions rarely come to fruition.

The goals and actions of this updated plan were developed through review by and discussions held among the members of the mitigation planning committee (MPC). MPC members were encouraged to view proposed actions within the broad priorities of hazard mitigation and weigh the cost of each project relative to future cost savings. All actions were found to be cost effective, environmentally sound, and technically feasible.

Certain operating principles can improve fiscal and operational efficiency, help maintain focus on the overall goal of community improvement and well-being, and help ensure implementation of the actions. The MPC committed to implementing each mitigation action according to the following principals:

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

4.3 Implementation of Mitigation Actions

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

Jurisdictional MPC members were encouraged to meet with others in their community to finalize the actions to be submitted for the updated mitigation strategy. Throughout the MPC consideration and discussion, emphasis was placed on the importance of a benefit-cost analysis in determining future implementation feasibility. (The *Disaster Mitigation Act* requires benefit-cost review as the primary method by which mitigation projects should be prioritized.) The benefit/cost review at the planning stage primarily consisted of a qualitative analysis and was not the detailed process required grant funding application.

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*. 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 prioritization process methodology did not change from that used in the prior plan update process. Actions were prioritized independently for participating jurisdiction.

FEMA's STAPLEE methodology was used to assess the costs and benefits, overall feasibility of mitigation actions, and other issues impacting project[7(a)]. 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? (5-10 points)
Will the implanted action result in a reduction of disaster damage? (5-10 points)

The final scores are listed below in the analysis of each action. The worksheets are attached to this plan as Appendix E. 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)	

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

Completed by
(Name, Title, Phone Number) _____

Each participating jurisdiction identified mitigation actions addressing those hazards with the highest probability of occurrence in their community/service area and dollar value of historic damage. Additional mitigation actions were developed specific to each jurisdiction and based on the community's/service area's risk and vulnerabilities. Jurisdictional MPC members were encouraged to meet with others in their community to identify the actions to be submitted for the updated mitigation strategy.

Throughout the planning process, emphasis was placed upon the importance of a benefit-cost analysis in determining project priority. The *Disaster Mitigation Act* requires benefit-cost review as the primary method by which mitigation projects should be prioritized. The MPC decided to pursue implementation according to when and where damage occurs, available funding, political will, jurisdictional priority, and priorities identified in the Missouri State Hazard Mitigation Plan. The benefit/cost review at the planning stage consisted primarily of a qualitative analysis.

For each action, the plan sets forth a narrative describing the benefit(s) that could be realized from action implementation as well as the responsible parties and planning mechanism to be used during implementation. The cost was estimated as closely as possible with further refinement to be supplied as project development occurs.

The table below (Table 4.3) lists the mitigation actions identified via the current planning process. The worksheets that follow are action specific, arranged by jurisdiction, and provide a succinct, yet comprehensive, description of each action.

Each jurisdiction participating in the plan update process, hazards identified with the highest probability of occurrence and historic damages. At least one strategy was developed to mitigate future damages resulting from that hazard. Furthermore, each jurisdiction participating within the National Flood Insurance Program (NFIP) identified at least one action related to its continuing participation within the program. An Action Worksheet was then completed for each jurisdiction-specific mitigation action. Table 4.3 below summarizes the mitigation actions identified during the plan update process. The completed mitigation action worksheets follow the summary table and are grouped by the plan goal primarily addressed by the actions.

Table 4.3. Mitigation Action Matrix

#	Action	Jurisdiction	Priority	Goals Addressed (see page v)	Hazards Addressed	Address Current Development	Address Future Development	Continued Compliance with NFIP
	Prevention Public Education							
1.1	Provide heat illness education to the public	Butler County	High (34)	#1	Extreme Heat			
1.2	Provide earthquake education & increase awareness	Butler County	High (34)	#1	Earthquake			
1.2	Provide earthquake education & increase awareness	Poplar Bluff R-I School District	High (31)	#1	Earthquake			
1.2	Provide earthquake education & increase awareness	Twin Rivers R-X School District	High (31)	#1	Earthquake			
1.2	Provide earthquake education & increase awareness	Three Rivers College	High (32)	#1	Earthquake			
1.3	Implement earthquake drills	Neelyville R-IV School District	High (35)	#1	Earthquake			
1.4	Implement tornado drills	Butler County	High (32)	#1	Tornado			
1.4	Implement tornado drills	Neelyville R-IV School District	High (35)	#1	Tornado			
1.5	Increase tornado awareness & provide education	Poplar Bluff R-I School District	High (31)	#1	Tornado			

#	Action	Jurisdiction	Priority	Goals Addressed (see page v)	Hazards Addressed	Address Current Development	Address Future Development	Continued Compliance with NFIP
1.5	Increase tornado awareness & provide education	Twin Rivers R-X School District	High (30)	#1	Tornado			
1.5	Increase tornado awareness & provide education	Three Rivers College	High (32)	#1	Tornado			
1.6	Smoke detector installation education	Butler County	High (33)	#1	Wildfire			
3.1	Provide fire safety education to the public	City of Poplar Bluff	Low (24)	#1	Wildfire			
3.2	Implement fire drills	Poplar Bluff R-I School District	High (34)	#1	All Hazards			
3.2	Implement fire drills	Twin Rivers R-X School District	High (35)	#1	All Hazards			
3.2	Implement fire drills	Three Rivers College	High (35)	#1	All Hazards			
3.3	Map sinkholes	Butler County	High (36)	#3	Sinkholes		X	
2.1	Establish alternate transportation routes	Butler County	High (34)	#1	Flood			
2.1	Establish alternate transportation routes for school buses	Poplar Bluff R-I School District	Medium (28)	#1	Flood			

#	Action	Jurisdiction	Priority	Goals Addressed (see page v)	Hazards Addressed	Address Current Development	Address Future Development	Continued Compliance with NFIP
2.1	Establish alternate transportation routes for school buses	Twin Rivers R-X School District	High (30)	#1	Flood			
	Structure and Infrastructure Projects							
2.2	Prioritize work on low water crossings vulnerable to floods	Butler County	High (40)	#3	Flood	X		
2.3	Explore/install lightning protection	Butler County	High (39)	#3	Thunderstorm	X		
3.4	Repair levees along the Black River	Butler County	High (41)	#3	Flood	X	X	
3.5	Clean debris out of the Black River	Butler County	High (37)	#3	Flood	X		
3.6	Ditch clean-out & construction	Butler County	High (38)	#3	Flood	X	X	
3.6	Ditch clean-out & construction	City of Poplar Bluff	Medium (29)	#3	Flood	X	X	
3.6	Clean out drainage ditches	City of Qulin	High (30)	#3	Flood	X	X	
2.4	Trim trees near overhead power lines	City of Poplar Bluff	Medium (25)	#1	Thunderstorm & Sever Winter Weather	X		
2.5	Seek funding for water/sewer improvements	Butler County	High (31)	#1	Drought	X	X	
2.5	Improve city water supply & treatment infrastructure	City of Qulin	Low (24)	#1	Drought	X	X	
2.5	Upgrade water treatment system	City of Poplar Bluff	Low (24)	#1	Flood	X	X	

#	Action	Jurisdiction	Priority	Goals Addressed (see page v)	Hazards Addressed	Address Current Development	Address Future Development	Continued Compliance with NFIP
2.6	Ensure back-up wells are installed	Butler County	High (34)	#1	Drought			
1.7	Construct a tornado safe room	Poplar Bluff R-I School District	Medium (25)	#1	Tornado			
1.7	Construct a tornado safe room	Twin Rivers R-X School District	High (30)	#1	Tornado			
3.7	Purchase properties & relocate residents	Butler County	High (38)	#3	Flood	X	X	
3.7	Purchase properties & relocate residents	City of Poplar Bluff	High (30)	#3	Flood	X	X	
	Natural Systems Protection							
3.8	Adopt/enforce floodplain management requirements, including regulating new construction in Special Flood Hazard Areas	Butler County	High (37)	#4	Flood		X	X
3.8	Adopt/enforce floodplain management requirements, including regulating new construction in Special Flood Hazard Areas	City of Poplar Bluff	High (32)	#4	Flood		X	X
3.8	Adopt/enforce floodplain management requirements, including regulating new construction in Special Flood Hazard Areas	City of Qulin	High (35)	#4	Flood		X	X
4.1	Explore CRS institution	Butler County	High (32)	#4	Flood	X	X	X
	Emergency Services							
2.7	Provide education to VFD, EMA, Health Dept., EMS, law enforcement, & weather spotters	Butler County	High (40)	#2	All			

#	Action	Jurisdiction	Priority	Goals Addressed (see page v)	Hazards Addressed	Address Current Development	Address Future Development	Continued Compliance with NFIP
2.8	Seek funding for generators	Butler County	High (33)	#2	All			
	Education and Outreach							
4.2	Integrate mitigation actions into other planning documents/mechanisms	Butler County	Medium (27)	#3	All	X	X	
4.2	Integrate mitigation actions into other planning documents/mechanisms	City of Qulin	Medium (26)	#3	All	X	X	
4.2	Integrate mitigation actions into other planning documents/mechanisms	City of Poplar Bluff	Medium (26)	#3	All	X	X	
4.2	Integrate mitigation actions into other planning documents/mechanisms	Neelyville R-IV School District	Medium (27)	#3	All	X	X	
4.2	Integrate mitigation actions into other planning documents/mechanisms	Poplar Bluff R-I School District	High (30)	All	All			
4.2	Integrate mitigation actions into other planning documents/mechanisms	Twin Rivers R-X School District	Medium (28)	All	All			
4.2	Integrate mitigation actions into other planning documents/mechanisms	Three Rivers College	Medium (27)	All	All			
1.8	Construct a vulnerable populations database	Butler County	High (32)	#1	All			
4.3	Maintain StormReady certification	Butler County	High (32)	All	Thunderstorm	X		

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

Action 1.1 Extreme Heat Education

Action Worksheet	
Name of Jurisdiction:	Butler County
Risk / Vulnerability	
Problem being Mitigated:	Death and injury due to heat-induced illness
Hazard(s) Addressed:	Extreme Heat
Action or Project	
Action/Project Number:	1.1
Name of Action or Project:	Extreme Heat Education
Action or Project Description:	Provide educational resources to residents on avoiding heat related illnesses and/or death.
Applicable Goal Statement:	Improve the protection of human life, health, and safety from adverse effects of disaster.
Estimated Cost:	$1,000
Benefits:	Reduction in illness, death, and loss wages due to heat exposure.
Plan for Implementation	
Responsible Organization/Department:	County Health Department
Action/Project Priority:	High (34)
Timeline for Completion:	1-3 years
Potential Fund Sources:	Local funds
Local Planning Mechanisms to be Used in Implementation, if any:	Nutrition Center Seminars, Radio Advertisements, Newspaper Advertisement, and Social Media Campaigns
Progress Report	
Action Status	Continuing, In Progress
Report of Progress	The county conducts seasonal education using social and traditional media.
Completed by:	Robbie Meyers, Emergency Management Director

Action 1.2 Earthquake Education

Action Worksheet	
Name of Jurisdiction:	Butler County
Risk / Vulnerability	
Problem being Mitigated:	Death, injury, and property damage due to earthquake
Hazard(s) Addressed:	Earthquake
Action or Project	
Action/Project Number:	1.2
Name of Action or Project:	Earthquake Education
Action or Project Description:	Provide educational resources to residents on avoiding earthquake-related injury/death and mitigating property damage due to earthquake.
Applicable Goal Statement:	Improve the protection of human life, health, and safety from adverse effects of disaster.
Estimated Cost:	$1,000
Benefits:	Reduction in illness, death, and property damages due to earthquake.
Plan for Implementation	
Responsible Organization/Department:	Butler County EMA
Action/Project Priority:	High (34)
Timeline for Completion:	1-3 years
Potential Fund Sources:	Local funds
Local Planning Mechanisms to be Used in Implementation, if any:	Nutrition Center Seminars, Radio Advertisements, Newspaper Advertisement, and Social Media Campaigns
Progress Report	
Action Status	Continuing, In Progress
Report of Progress	The county is continuously focused upon this action and includes it within all media and events, including exercises.
Completed by:	Robbie Meyers, Butler County Emergency Management Director

Action 1.2 Earthquake Education

Action Worksheet	
Name of Jurisdiction:	Poplar Bluff R-I School District
Risk / Vulnerability	
Problem being Mitigated:	Death, injury, and property damage due to earthquake
Hazard(s) Addressed:	Earthquake
Action or Project	
Action/Project Number:	1.2
Name of Action or Project:	Earthquake Education
Action or Project Description:	Provide educational resources to district residents on avoiding earthquake-related injury/death and mitigating property damage due to earthquake.
Applicable Goal Statement:	Improve the protection of human life, health, and safety from adverse effects of disaster.
Estimated Cost:	$1,000
Benefits:	Reduction in illness, death, and property damages due to earthquake.
Plan for Implementation	
Responsible Organization/Department:	Poplar Bluff R-I School District Administration
Action/Project Priority:	High (31)
Timeline for Completion:	1-3 years
Potential Fund Sources:	District General Operating Budget
Local Planning Mechanisms to be Used in Implementation, if any:	Board meetings & social media campaigns
Progress Report	
Action Status	Continue, In Progress
Report of Progress	The district participates in state and national drills to increase preparedness on an ongoing basis.
Completed by:	Scott Dill, Superintendent

Action 1.2 Earthquake Education

Action Worksheet	
Name of Jurisdiction:	Twin Rivers R-X School District
Risk / Vulnerability	
Problem being Mitigated:	Death, injury, and property damage due to earthquake
Hazard(s) Addressed:	Earthquake
Action or Project	
Action/Project Number:	1.2
Name of Action or Project:	Earthquake Education
Action or Project Description:	Provide educational resources to district residents on avoiding earthquake-related injury/death and mitigating property damage due to earthquake.
Applicable Goal Statement:	Improve the protection of human life, health, and safety from adverse effects of disaster.
Estimated Cost:	$1,000
Benefits:	Reduction in illness, death, and property damages due to earthquake.
Plan for Implementation	
Responsible Organization/Department:	Twin Rivers R-X School District Administration
Action/Project Priority:	High (31)
Timeline for Completion:	1-3 years
Potential Fund Sources:	District General Operating Budget
Local Planning Mechanisms to be Used in Implementation, if any:	Board meetings & social media campaigns
Progress Report	
Action Status	Continue, In Progress
Report of Progress	Recent small quakes have raised awareness. No formal plan written, just more drill practice and information shared.
Completed by:	Seth McBroom, Principal, Qulin Middle School

Action 1.2 Earthquake Education

Action Worksheet	
Name of Jurisdiction:	Three Rivers College
Risk / Vulnerability	
Problem being Mitigated:	Death, injury, and property damage due to earthquake
Hazard(s) Addressed:	Earthquake
Action or Project	
Action/Project Number:	1.2
Name of Action or Project:	Earthquake Education
Action or Project Description:	Provide educational resources to district residents on avoiding earthquake-related injury/death and mitigating property damage due to earthquake.
Applicable Goal Statement:	Improve the protection of human life, health, and safety from adverse effects of disaster.
Estimated Cost:	$1,000
Benefits:	Reduction in illness, death, and property damages due to earthquake.
Plan for Implementation	
Responsible Organization/Department:	Three Rivers College Administration
Action/Project Priority:	High (32)
Timeline for Completion:	1-3 years
Potential Fund Sources:	College General Operating Budget
Local Planning Mechanisms to be Used in Implementation, if any:	Board meetings & social media campaigns
Progress Report	
Action Status	Continue, In Progress
Report of Progress	The educational awareness never ceases as the district has a change in students from semester to semester. The district participates in the Great American Shake Out and provides information throughout the year concerning awareness and steps to take during an actual event.
Completed by:	Chuck Stratton, Director of Special Projects/Public Safety

Action 1.3 Earthquake Safety Drills

Action Worksheet	
Name of Jurisdiction:	Neelyville R-IV School District
Risk / Vulnerability	
Problem being Mitigated:	Death/injury due to building damage/collapse resulting from earthquake
Hazard(s) Addressed:	Earthquake
Action or Project	
Action/Project Number:	1.3
Name of Action or Project:	Earthquake Drills
Action or Project Description:	Conduct earthquake drills within both school campuses.
Applicable Goal Statement:	Improve the protection of human life, health, and safety from adverse effects of disaster.
Estimated Cost:	$0
Benefits:	Reduction in injury/death among students and district staff due to earthquake.
Plan for Implementation	
Responsible Organization/Department:	Neelyville R-IV School District Administration
Action/Project Priority:	High (35)
Timeline for Completion:	Ongoing
Potential Fund Sources:	N/A
Local Planning Mechanisms to be Used in Implementation, if any:	District Emergency Operations Plan
Progress Report	
Action Status	New – Jurisdiction did not participate in prior planning effort
Report of Progress	N/A
Completed by:	Heather Black, Superintendent

Action 1.4 Tornado Safety Drills

Action Worksheet	
Name of Jurisdiction:	Butler County
Risk / Vulnerability	
Problem being Mitigated:	Injury or death due to flying debris resulting from high wind events.
Hazard(s) Addressed:	Tornado
Action or Project	
Action/Project Number:	1.4
Name of Action or Project:	Tornado Safety Drills
Action or Project Description:	Regularly practice tornado safety drills within county-owned facilities.
Applicable Goal Statement:	Improve the protection of human life, health, and safety from adverse effects of disasters.
Estimated Cost:	N/A
Benefits:	Reduction in injuries/deaths due to tornadoes.
Plan for Implementation	
Responsible Organization/Department:	Butler County Emergency Management Agency
Action/Project Priority:	High (32)
Timeline for Completion:	Ongoing
Potential Fund Sources:	N/A
Local Planning Mechanisms to be Used in Implementation, if any:	Butler County Emergency Response Operations Plan
Progress Report	
Action Status	Continuing, In Progress
Report of Progress	The county is increasing partners in conducting drills.
Completed by:	Robbie Meyers, Emergency Management Director

Action 1.4 Tornado Safety Drills

Action Worksheet	
Name of Jurisdiction:	Neelyville R-IV School District
Risk / Vulnerability	
Problem being Mitigated:	Injury or death due to flying debris resulting from high wind events.
Hazard(s) Addressed:	Tornado
Action or Project	
Action/Project Number:	1.4
Name of Action or Project:	Tornado Safety Drills
Action or Project Description:	Regularly practice tornado safety drills upon both school campuses.
Applicable Goal Statement:	Improve the protection of human life, health, and safety from adverse effects of disasters.
Estimated Cost:	N/A
Benefits:	Reduction in injuries and deaths due to tornadoes.
Plan for Implementation	
Responsible Organization/Department:	Neelyville R-IV School District Superintendent
Action/Project Priority:	High (35)
Timeline for Completion:	Ongoing
Potential Fund Sources:	N/A
Local Planning Mechanisms to be Used in Implementation, if any:	Neelyville R-IV Schools Emergency Operations Plan
Progress Report	
Action Status	New – Jurisdiction did not participate in prior planning effort
Report of Progress	N/A
Completed by:	Heather Black, Superintendent

Action 1.5 Tornado Awareness/Education

Action Worksheet	
Name of Jurisdiction:	Poplar Bluff R-I School District
Risk / Vulnerability	
Problem being Mitigated:	Injury or death due to tornado.
Hazard(s) Addressed:	Tornado
Action or Project	
Action/Project Number:	1.5
Name of Action or Project:	Tornado Awareness/Education
Action or Project Description:	Provide education to increase tornado awareness and encourage preparedness measures.
Applicable Goal Statement:	Improve the protection of human life, health, and safety from adverse effects of disasters.
Estimated Cost:	$1,000
Benefits:	Reduction in injuries/deaths due to tornadoes.
Plan for Implementation	
Responsible Organization/Department:	Poplar Bluff R-I School District Superintendent
Action/Project Priority:	High (31)
Timeline for Completion:	Ongoing
Potential Fund Sources:	N/A
Local Planning Mechanisms to be Used in Implementation, if any:	Poplar Bluff R-I Schools Emergency Operations Plan
Progress Report	
Action Status	Continue, In Progress
Report of Progress	The district participates in state and national drills to increase preparedness on an ongoing basis.
Completed by:	Scott Dill, Superintendent

Action 1.5 Tornado Awareness/Education

Action Worksheet	
Name of Jurisdiction:	Twin Rivers R-X School District
Risk / Vulnerability	
Problem being Mitigated:	Injury or death due to tornado.
Hazard(s) Addressed:	Tornado
Action or Project	
Action/Project Number:	1.5
Name of Action or Project:	Tornado Awareness/Education
Action or Project Description:	Provide education to increase tornado awareness and encourage preparedness measures.
Applicable Goal Statement:	Improve the protection of human life, health, and safety from adverse effects of disasters.
Estimated Cost:	$1,000
Benefits:	Reduction in injuries/deaths due to tornadoes.
Plan for Implementation	
Responsible Organization/Department:	Twin Rivers R-X School District Superintendent
Action/Project Priority:	High (30)
Timeline for Completion:	Ongoing
Potential Fund Sources:	N/A
Local Planning Mechanisms to be Used in Implementation, if any:	Twin Rivers R-X Schools Emergency Operations Plan
Progress Report	
Action Status	Continuing, In Progress
Report of Progress	Drill work. Met with EMS Director for guidance on safest areas in each building.
Completed by:	Seth McBroom, Principal, Qulin Middle School

Action 1.5 Tornado Awareness/Education

Action Worksheet	
Name of Jurisdiction:	Three Rivers College
Risk / Vulnerability	
Problem being Mitigated:	Injury or death due to tornado.
Hazard(s) Addressed:	Tornado
Action or Project	
Action/Project Number:	1.5
Name of Action or Project:	Tornado Awareness/Education
Action or Project Description:	Provide education to increase tornado awareness and encourage preparedness measures.
Applicable Goal Statement:	Improve the protection of human life, health, and safety from adverse effects of disasters.
Estimated Cost:	$1,000
Benefits:	Reduction in injuries/deaths due to tornadoes.
Plan for Implementation	
Responsible Organization/Department:	Three Rivers College Administration
Action/Project Priority:	High (32)
Timeline for Completion:	Ongoing
Potential Fund Sources:	N/A
Local Planning Mechanisms to be Used in Implementation, if any:	Three Rivers College Emergency Operations Plan
Progress Report	
Action Status	Continue, Not Started
Report of Progress	The educational awareness never ceases as the college has a change in students from semester to semester. While the message stays basically the same, the audience doesn't. The district provides direction for response to weather warnings monthly during its mass alert texting.
Completed by:	Chuck Stratton, Director of Special Projects/Public Safety

Action 1.6 Smoke Detector Installation Education

Action Worksheet	
Name of Jurisdiction:	Butler County
Risk / Vulnerability	
Problem being Mitigated:	Injury or death due fire.
Hazard(s) Addressed:	Wildfire
Action or Project	
Action/Project Number:	1.6
Name of Action or Project:	Smoke Detector Installation Education
Action or Project Description:	Provide education regarding the importance and method of installation smoke detectors.
Applicable Goal Statement:	Improve the protection of human life, health, and safety from adverse effects of disasters.
Estimated Cost:	$1,000
Benefits:	Reduction in injuries/deaths due to fire.
Plan for Implementation	
Responsible Organization/Department:	Butler County Emergency Management Agency & Butler County Fire Department
Action/Project Priority:	High (33)
Timeline for Completion:	Ongoing
Potential Fund Sources:	N/A
Local Planning Mechanisms to be Used in Implementation, if any:	County Emergency Management Agency Operating Budget
Progress Report	
Action Status	Continuing, In Progress
Report of Progress	The county EMA will continue working with the Butler County Fire Department to promote fire safety.
Completed by:	Robbie Meyers, Emergency Management Director

Action 1.7 Tornado Saferoom

Action Worksheet	
Name of Jurisdiction:	Poplar Bluff R-I School District
Risk / Vulnerability	
Problem being Mitigated:	Lack of shelter during high wind events.
Hazard(s) Addressed:	Tornado
Action or Project	
Action/Project Number:	1.7
Name of Action or Project:	Tornado Saferoom
Action or Project Description:	Build a tornado safe room upon the district campus.
Applicable Goal Statement:	Improve the protection of human life, health, and safety from adverse effects of disasters.
Estimated Cost:	$2,500,000
Benefits:	Prevention of injuries and deaths due to high winds resulting from tornados.
Plan for Implementation	
Responsible Organization/Department:	District Administration
Action/Project Priority:	High (25)
Timeline for Completion:	5 years
Potential Fund Sources:	School district capital improvement funds & HMGP funding
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process
Progress Report	
Action Status	Continue, Not Started
Report of Progress	The district has not been awarded grants to proceed with construction.
Completed by:	Scott Dill, Superintendent

Action 1.7 Tornado Saferoom

Action Worksheet	
Name of Jurisdiction:	Twin Rivers R-X School District
Risk / Vulnerability	
Problem being Mitigated:	Lack of shelter during high wind events.
Hazard(s) Addressed:	Tornado
Action or Project	
Action/Project Number:	1.7
Name of Action or Project:	Tornado Saferoom
Action or Project Description:	Build a tornado safe room upon the district campus.
Applicable Goal Statement:	Improve the protection of human life, health, and safety from adverse effects of disasters.
Estimated Cost:	$2,000,000
Benefits:	Prevention of injuries and deaths due to high winds resulting from tornados.
Plan for Implementation	
Responsible Organization/Department:	District Administration
Action/Project Priority:	High (30)
Timeline for Completion:	5 years
Potential Fund Sources:	School district capital improvement funds & HMGP funding
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process
Progress Report	
Action Status	New
Report of Progress	N/A
Completed by:	Seth McBroom, Principal, Qulin Middle School

Action 1.8 Vulnerable Populations Database

Action Worksheet	
Name of Jurisdiction:	Butler County
Risk / Vulnerability	
Problem being Mitigated:	Public awareness
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	1.8
Name of Action or Project:	Vulnerable Populations Database
Action or Project Description:	Create a database of vulnerable populations within the jurisdiction and establish plans for response to each type of applicable natural hazard.
Applicable Goal Statement:	Improve the protection of human life, health, and safety from adverse effects of disasters.
Estimated Cost:	$70,000
Benefits:	Reduction in injuries/deaths of vulnerable populations due to natural hazards.
Plan for Implementation	
Responsible Organization/Department:	Butler County Health Department (database) Butler County Emergency Management Agency (response plan)
Action/Project Priority:	High (32)
Timeline for Completion:	3-5 years
Potential Funding Sources:	Butler County Health Department and Butler County Emergency Management Agency Annual Operating Budgets
Local Planning Mechanisms to be Used in Implementation, if any:	County Health Department and Emergency Management Agency Operating Budgets
Progress Report	
Action Status	Continuing, In Progress
Report of Progress	The county EMA partners with the county health department to maintain list.
Completed by:	Robbie Meyers, Emergency Management Director

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

Action 2.1 Establish Alternate Transportation Routes

Action Worksheet	
Name of Jurisdiction:	Butler County
Risk / Vulnerability	
Problem being Mitigated:	Blocked transportation routes following a natural hazard event.
Hazard(s) Addressed:	Dam Failure, Earthquake, Flood, Severe Winter Weather, Thunderstorm, Tornado, & Wildfire
Action or Project	
Action/Project Number:	2.1
Name of Action or Project:	Establish Alternate Transportation Routes
Action or Project Description:	Predetermine alternate transportation routes considering bridge failure and/or impassable roadways due to flood and/or debris resulting from a natural hazard event.
Applicable Goal Statement:	Implement mitigation actions that improve the continuity of government and essential services from the adverse effects of disasters.
Estimated Cost:	$0
Benefits:	Safe and dependable transport of emergency medical and response services in the event of the natural disaster.
Plan for Implementation	
Responsible Organization/Department:	Butler County Highway Department
Action/Project Priority:	High (34)
Timeline for Completion:	1 year
Potential Fund Sources:	N/A
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process and County Commission Inter-Departmental Meetings
Progress Report	
Action Status	Continuing, In Progress
Report of Progress	The county is working with local, state, and federal partners to maintain appropriate alternate routes.
Completed by:	Robbie Meyers, Butler County Emergency Management Director

Action 2.1 Establish Alternate Transportation Routes

Action Worksheet	
Name of Jurisdiction:	Poplar Bluff R-I School District
Risk / Vulnerability	
Problem being Mitigated:	Blocked transportation routes following a natural hazard event.
Hazard(s) Addressed:	Dam Failure, Earthquake, Flood, Severe Winter Weather, Thunderstorm, Tornado, & Wildfire
Action or Project	
Action/Project Number:	2.1
Name of Action or Project:	Establish Alternate Transportation Routes
Action or Project Description:	Predetermine alternate transportation routes considering bridge failure and/or impassable roadways due to flood and/or debris resulting from a natural hazard event.
Applicable Goal Statement:	Implement mitigation actions that improve the continuity of government and essential services from the adverse effects of disasters.
Estimated Cost:	$0
Benefits:	Safety and complete transport of students to and from school and continued operation of classroom instruction.
Plan for Implementation	
Responsible Organization/Department:	Poplar Bluff R-I School District Transportation Department
Action/Project Priority:	Medium (28)
Timeline for Completion:	1 year
Potential Fund Sources:	N/A
Local Planning Mechanisms to be Used in Implementation, if any:	District Administration Annual Planning
Progress Report	
Action Status	Continuing, In Progress
Report of Progress	The district continues to enhance its transportation preparedness and is currently updating all routes and integrating routing software.
Completed by:	Scott Dill, Superintendent

Action 2.1 Establish Alternate Transportation Routes

Action Worksheet	
Name of Jurisdiction:	Twin Rivers R-X School District
Risk / Vulnerability	
Problem being Mitigated:	Blocked transportation routes following a natural hazard event.
Hazard(s) Addressed:	Dam Failure, Earthquake, Flood, Severe Winter Weather, Thunderstorm, Tornado, & Wildfire
Action or Project	
Action/Project Number:	2.1
Name of Action or Project:	Establish Alternate Transportation Routes
Action or Project Description:	Predetermine alternate transportation routes considering bridge failure and/or impassable roadways due to flood and/or debris resulting from a natural hazard event.
Applicable Goal Statement:	Implement mitigation actions that improve the continuity of government and essential services from the adverse effects of disasters.
Estimated Cost:	$0
Benefits:	Safety and complete transport of students to and from school and continued operation of classroom instruction.
Plan for Implementation	
Responsible Organization/Department:	Twin Rivers R-X School District Transportation Department
Action/Project Priority:	Medium (30)
Timeline for Completion:	1 year
Potential Fund Sources:	N/A
Local Planning Mechanisms to be Used in Implementation, if any:	District Administration Annual Planning
Progress Report	
Action Status	Continue, Not Started
Report of Progress	Has been discussed, but no progress completed.
Completed by:	Seth McBroom, Principal, Qulin Middle School

Action 2.2 Low Water Crossing Work Prioritization

Action Worksheet	
Name of Jurisdiction:	Butler County
Risk / Vulnerability	
Problem being Mitigated:	Transportation disruptions, injury, and loss of life
Hazard(s) Addressed:	Flood
Action or Project	
Action/Project Number:	2.2
Name of Action or Project:	Low Water Crossing Work Prioritization
Action or Project Description:	Identify low water crossings that pose the greatest risk to travelers during flood events and prioritize crossings for repair/replacement when planning improvements to the county's transportation infrastructure.
Applicable Goal Statement:	Implement mitigation actions that improve the protection of public and private property from the adverse effects of disasters.
Estimated Cost:	N/A
Benefits:	Prevention of injury, loss of life, and transportation disruptions due to flooded low water crossings.
Plan for Implementation	
Responsible Organization/Department:	County Road & Bridge Department
Action/Project Priority:	High (40)
Timeline for Completion:	Ongoing
Potential Fund Sources:	County funds & BRO funding (MODOT)
Local Planning Mechanisms to be Used in Implementation, if any:	County Annual Budget Process
Progress Report	
Action Status	Continue, In Progress
Report of Progress	The county will continue to prioritize safety regarding low water crossing issues.
Completed by:	Robbie Meyers, Butler County Emergency Management Director

Action 2.3 Explore/Install Lightning Protection

Action Worksheet	
Name of Jurisdiction:	Butler County
Risk / Vulnerability	
Problem being Mitigated:	Incapacitation of critical facilities and communication infrastructure
Hazard(s) Addressed:	Thunderstorm
Action or Project	
Action/Project Number:	2.3
Name of Action or Project:	Explore/Install Lightning Protection
Action or Project Description:	Install needed lightning protection at critical facilities and upon essential communication equipment.
Applicable Goal Statement:	Implement mitigation actions that improve the protection of public and private property from the adverse effects of disaster.
Estimated Cost:	$150,000
Benefits:	Continuity of essential public services and communication infrastructure during and following thunderstorm events.
Plan for Implementation	
Responsible Organization/Department:	County Commission
Action/Project Priority:	High (39)
Timeline for Completion:	3-5 years
Potential Fund Sources:	Local Funds, USDA Rural Development Community Facility Grants
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process
Progress Report	
Action Status	Continue, In Progress
Report of Progress	The county continues review of its critical facilities and communication equipment on lightning protection
Completed by:	Robbie Meyers, Butler County Emergency Management Director

Action 2.4 Tree Trimming

Action Worksheet	
Name of Jurisdiction:	City of Poplar Bluff
Risk / Vulnerability	
Problem being Mitigated:	Incapacitation of critical facilities and communication infrastructure
Hazard(s) Addressed:	Thunderstorm & Severe Winter Weather
Action or Project	
Action/Project Number:	2.4
Name of Action or Project:	Tree Trimming
Action or Project Description:	Trim trees, limbs, and brush over and around overhead electric utility lines.
Applicable Goal Statement:	Implement mitigation actions that improve the protection of public and private property from the adverse effects of disaster.
Estimated Cost:	$50,000
Benefits:	Continuity of electric service to critical facilities, communications infrastructure, residences, and commercial enterprises during/following severe winter weather, thunderstorm and other high wind events.
Plan for Implementation	
Responsible Organization/Department:	Poplar Bluff Street Department
Action/Project Priority:	High (25)
Timeline for Completion:	3-5 years
Potential Fund Sources:	Street Department Annual Budget
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process
Progress Report	
Action Status	Continue, In Progress
Report of Progress	
Completed by:	Matt Winters, City Manager

Action 2.5 Seek Funding for Water Improvements

Action Worksheet	
Name of Jurisdiction:	Butler County
Risk / Vulnerability	
Problem being Mitigated:	Inadequate water supply during drought conditions
Hazard(s) Addressed:	Drought
Action or Project	
Action/Project Number:	2.5
Name of Action or Project:	Seek Funding for Water Improvements
Action or Project Description:	Seek funding to increase the availability of potable water during drought conditions.
Applicable Goal Statement:	Improve the protection of human life, health, and safety from adverse effects of disasters.
Estimated Cost:	N/A
Benefits:	Improve public water supply
Plan for Implementation	
Responsible Organization/Department:	Butler County Commission
Action/Project Priority:	High (31)
Timeline for Completion:	5-10 years
Potential Fund Sources:	N/A
Local Planning Mechanisms to be Used in Implementation, if any:	Technical assistance provided via membership within the Ozark Foothills Regional Planning Commission
Progress Report	
Action Status	Continue, In Progress
Report of Progress	The county works with the water and sewer districts on funding opportunities to improve.
Completed by:	Robbie Meyers, Butler County Emergency Management Director

Action 2.5 Upgrade Water Systems

Action Worksheet	
Name of Jurisdiction:	City of Poplar Bluff
Risk / Vulnerability	
Problem being Mitigated:	Inadequate water supply during drought conditions
Hazard(s) Addressed:	Drought
Action or Project	
Action/Project Number:	2.5
Name of Action or Project:	Upgrade water systems
Action or Project Description:	Seek funding to increase the availability of potable water during drought conditions.
Applicable Goal Statement:	Improve the protection of human life, health, and safety from adverse effects of disasters.
Estimated Cost:	$3,500,000
Benefits:	Improve public water supply
Plan for Implementation	
Responsible Organization/Department:	City Council
Action/Project Priority:	Low (24)
Timeline for Completion:	5-10 years
Potential Fund Sources:	USDA Loan/Grant Funds & Community Development Block Grants
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process Technical Assistance Provided via Membership within the Ozark Foothills Regional Planning Commission
Progress Report	
Action Status	Continue, In Progress
Report of Progress	The city continues to make improvements and routine maintenance to its water supply treatment. The city is still seeking funding for an emergency backup water well
Completed by:	Matt Winters, City Planner

Action 2.5 Upgrade Water Systems

Action Worksheet	
Name of Jurisdiction:	City of Qulin
Risk / Vulnerability	
Problem being Mitigated:	Inadequate water supply during drought conditions
Hazard(s) Addressed:	Drought
Action or Project	
Action/Project Number:	2.5
Name of Action or Project:	Upgrade water systems
Action or Project Description:	Seek funding to increase the availability of potable water during drought conditions.
Applicable Goal Statement:	Improve the protection of human life, health, and safety from adverse effects of disasters.
Estimated Cost:	$1,800,000
Benefits:	Improve public water supply
Plan for Implementation	
Responsible Organization/Department:	Board of Aldermen
Action/Project Priority:	Low (24)
Timeline for Completion:	5-10 years
Potential Fund Sources:	USDA Loan/Grant Funds & Community Development Block Grants
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process Technical Assistance Provided via Membership within the Ozark Foothills Regional Planning Commission
Progress Report	
Action Status	Continue, Not Started
Report of Progress	The city is currently upgrading back-up equipment.
Completed by:	Carlee Decker, City Clerk

Action 2.6 Back-Up Water Wells

Action Worksheet	
Name of Jurisdiction:	Butler County
Risk / Vulnerability	
Problem being Mitigated:	Inadequate potable water supply during drought conditions
Hazard(s) Addressed:	Drought
Action or Project	
Action/Project Number:	2.6
Name of Action or Project:	Back-Up Water Wells
Action or Project Description:	Seek funding to increase the availability of potable water during drought conditions.
Applicable Goal Statement:	Improve the protection of human life, health, and safety from adverse effects of disasters.
Estimated Cost:	$2,000,000
Benefits:	Sustain life during drought events
Plan for Implementation	
Responsible Organization/Department:	Public Water Supply Districts in Butler County
Action/Project Priority:	High (34)
Timeline for Completion:	5-10 years
Potential Fund Sources:	USDA Loan/Grant Funds & Community Development Block Grants
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process Technical Assistance Provided via Membership within the Ozark Foothills Regional Planning Commission
Progress Report	
Action Status	Continue, In Progress
Report of Progress	The county works with public water supply districts for funding of back-up wells.
Completed by:	Robbie Meyers, Butler County Emergency Management Director

Action 2.7 Emergency Officials Education/Training

Action Worksheet	
Name of Jurisdiction:	Butler County
Risk / Vulnerability	
Problem being Mitigated:	Lack of education/training among emergency responders.
Hazard(s) Addressed:	All Hazards
Action or Project	
Action/Project Number:	2.7
Name of Action or Project:	Emergency Officials Education/Training
Action or Project Description:	Provide education and training to volunteer fire fighters, emergency medical providers, law enforcement, health department personnel, and weather spotters as needed.
Applicable Goal Statement:	Improve the protection of human life, health, and safety from adverse effects of disasters.
Estimated Cost:	$10,000
Benefits:	Improve response to disasters to minimize incidence of injury and loss of life.
Plan for Implementation	
Responsible Organization/Department:	Emergency Management Director
Action/Project Priority:	High (40)
Timeline for Completion:	5-10 years
Potential Fund Sources:	Annual Budget
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process EMD Reports Provided during County Commission Meetings
Progress Report	
Action Status	Continue, In Progress
Report of Progress	The county is adding more earthquake preparedness for volunteers and facilitating in-person and virtual training for volunteers via the National Weather Service.
Completed by:	Robbie Meyers, Butler County Emergency Management Director

Action 2.8 Generator Funding

Action Worksheet	
Name of Jurisdiction:	Butler County
Risk / Vulnerability	
Problem being Mitigated:	Loss of Power
Hazard(s) Addressed:	All hazards resulting in power loss
Action or Project	
Action/Project Number:	2.8
Name of Action or Project:	Generator Funding
Action or Project Description:	Seek funding for generator acquisition and installation within all county government and critical facilities.
Applicable Goal Statement:	Implement mitigation actions that improve the continuity of government and essential services from the adverse effects of disasters.
Estimated Cost:	$400,000
Benefits:	Continuity of emergency response and regular governmental services following a disaster event.
Plan for Implementation	
Responsible Organization/Department:	Emergency Management Director
Action/Project Priority:	High (33)
Timeline for Completion:	5-10 years
Potential Fund Sources:	USDA Loan/Grant Funds & Community Development Block Grants
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process Technical Assistance Provided via Membership within the Ozark Foothills Regional Planning Commission
Progress Report	
Action Status	Continue, In Progress
Report of Progress	The county will continue seeking funds for generators.
Completed by:	Robbie Meyers, Butler County Emergency Management Director

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

Action 3.1 Fire Safety Education

Action Worksheet	
Name of Jurisdiction:	City of Poplar Bluff
Risk / Vulnerability	
Problem being Mitigated:	Property damage due to wild/outdoor fires
Hazard(s) Addressed:	Wildfire
Action or Project	
Action/Project Number:	3.1
Name of Action or Project:	Fire Safety Education
Action or Project Description:	Provide education to the public regarding the prevention of wildfires.
Applicable Goal Statement:	Implement mitigation actions that improve the protection of public and private property from the adverse effects of disasters.
Estimated Cost:	N/A
Benefits:	Reduction in the number of acres and structures burned by wildfires or other outdoor fires.
Plan for Implementation	
Responsible Organization/Department:	Poplar Bluff Fire Department (PBFD)
Action/Project Priority:	Medium (24)
Timeline for Completion:	Ongoing
Potential Fund Sources:	PBFD Annual Budget
Local Planning Mechanisms to be Used in Implementation, if any:	N/A
Progress Report	
Action Status	Continue, In Progress
Report of Progress	The Poplar Bluff Fire Department provides educational programs to schools and the public on a regular basis.
Completed by:	Matt Winters, City Planner

Action 3.2 Fire Safety Drills

Action Worksheet	
Name of Jurisdiction:	Poplar Bluff R-I School District
Risk / Vulnerability	
Problem being Mitigated:	Injury and loss of life due to fire
Hazard(s) Addressed:	All hazards resulting in fire
Action or Project	
Action/Project Number:	3.2
Name of Action or Project:	Fire Safety Drills
Action or Project Description:	Implement fire drills within all district facilities on a regular basis.
Applicable Goal Statement:	Improve the protection of human life, health, and safety from adverse effects of disasters.
Estimated Cost:	N/A
Benefits:	Reduction in the number of injuries/deaths resulting from fires.
Plan for Implementation	
Responsible Organization/Department:	District Administration
Action/Project Priority:	High (34)
Timeline for Completion:	Ongoing
Potential Fund Sources:	District's General Operating Budget
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process
Progress Report	
Action Status	Continue, In Progress
Report of Progress	The district participates in state and national drills to increase preparedness on an ongoing basis.
Completed by:	Scott Dill, Superintendent

Action 3.2 Fire Safety Drills

Action Worksheet	
Name of Jurisdiction:	Twin Rivers R-X School District
Risk / Vulnerability	
Problem being Mitigated:	Injury and loss of life due to fire
Hazard(s) Addressed:	All hazards resulting in fire
Action or Project	
Action/Project Number:	3.2
Name of Action or Project:	Fire Safety Drills
Action or Project Description:	Implement fire drills within all district facilities on a regular basis.
Applicable Goal Statement:	Improve the protection of human life, health, and safety from adverse effects of disasters.
Estimated Cost:	N/A
Benefits:	Reduction in the number of injuries/deaths resulting from fires.
Plan for Implementation	
Responsible Organization/Department:	District Administration
Action/Project Priority:	High (35)
Timeline for Completion:	Ongoing
Potential Fund Sources:	District's General Operating Budget
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process
Progress Report	
Action Status	Continue, In Progress
Report of Progress	Guest speakers and continued drills to ensure safety.
Completed by:	Seth McBroom, Principal, Qulin Elementary School

Action 3.2 Fire Safety Drills

Action Worksheet	
Name of Jurisdiction:	Three Rivers College
Risk / Vulnerability	
Problem being Mitigated:	Injury and loss of life due to fire
Hazard(s) Addressed:	All hazards resulting in fire
Action or Project	
Action/Project Number:	3.2
Name of Action or Project:	Fire Safety Drills
Action or Project Description:	Implement fire drills within all college facilities on a regular basis.
Applicable Goal Statement:	Improve the protection of human life, health, and safety from adverse effects of disasters.
Estimated Cost:	N/A
Benefits:	Reduction in the number of injuries/deaths resulting from fires.
Plan for Implementation	
Responsible Organization/Department:	College Administration
Action/Project Priority:	High (35)
Timeline for Completion:	Ongoing
Potential Fund Sources:	College's General Operating Budget
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process
Progress Report	
Action Status	Continue, In Progress
Report of Progress	The educational awareness never ceases as the district has a change in students from semester to semester. The college provides training and awareness through drills, local fire department participation, and demonstrations by its fire training department including the use of its digital fire extinguisher prop.
Completed by:	Chuck Stratton, Director of Special Projects and Public Safety

Action 3.3 Mapping of Sinkholes

Action Worksheet	
Name of Jurisdiction:	Butler County
Risk / Vulnerability	
Problem being Mitigated:	Property damage due to ground disturbance resulting from karst topography
Hazard(s) Addressed:	Sinkholes
Action or Project	
Action/Project Number:	3.3
Name of Action or Project:	Mapping of Sinkholes
Action or Project Description:	Create a county wide map of active and potential sinkholes.
Applicable Goal Statement:	Implement mitigation actions that improve the protection of public and private property from the adverse effects of disasters.
Estimated Cost:	$8,000
Benefits:	Prevention of future property damage due to sinkholes
Plan for Implementation	
Responsible Organization/Department:	County Commission
Action/Project Priority:	High (36)
Timeline for Completion:	Ongoing
Potential Fund Sources:	Local funds
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process
Progress Report	
Action Status	Continue, In Progress
Report of Progress	The county will seek funding to maintain, map, and implement mitigation actions on sinkholes.
Completed by:	Robbie Meyers, Butler County Emergency Management Director

Action 3.4 Levee Repair

Action Worksheet	
Name of Jurisdiction:	Butler County
Risk / Vulnerability	
Problem being Mitigated:	Agricultural assets damage due to flooding
Hazard(s) Addressed:	Riverine Floods
Action or Project	
Action/Project Number:	3.4
Name of Action or Project:	Levee Repair
Action or Project Description:	Repair levees along the Black River in partnership with county drainage districts
Applicable Goal Statement:	Implement mitigation actions that improve the protection of public and private property from the adverse effects of disasters.
Estimated Cost:	$4,000,000
Benefits:	Reduce/Eliminate damage to and seasonal suspension of use of agricultural land due to riverine flooding.
Plan for Implementation	
Responsible Organization/Department:	Butler County Commission
Action/Project Priority:	High (41)
Timeline for Completion:	5 years
Potential Fund Sources:	CDBG Funding, USDA Grant Programs
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process Technical Assistance Provision via Membership within the Ozark Foothills Regional Planning Commission
Progress Report	
Action Status	Continue, In Progress
Report of Progress	The county will work with levee districts and seek federal and state funding.
Completed by:	Robbie Meyers, Butler County Emergency Management Director

Action 3.5 Stream Debris Removal

Action Worksheet	
Name of Jurisdiction:	Butler County
Risk / Vulnerability	
Problem being Mitigated:	Residential structural/contents damage due to flooding
Hazard(s) Addressed:	Flash and Riverine Floods
Action or Project	
Action/Project Number:	3.5
Name of Action or Project:	Resident Relocation
Action or Project Description:	Remove natural and manmade debris deposits from the Black River in the southeastern portion of the county to improve stream flow and prevent water back-ups during high rain events.
Applicable Goal Statement:	Implement mitigation actions that improve the protection of public and private property from the adverse effects of disasters.
Estimated Cost:	$2,5000,000
Benefits:	Reduce/Eliminate damage to and seasonal suspension of use of agricultural land due to riverine flooding.
Plan for Implementation	
Responsible Organization/Department:	Butler County Commission
Action/Project Priority:	High (37)
Timeline for Completion:	5 years
Potential Fund Sources:	HMGP Grant Funding, CDBG Funding, USDA Funding
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process Attendance at meetings of drainage district throughout county. Technical Assistance Provision via Membership within the Ozark Foothills Regional Planning Commission
Progress Report	
Action Status	Continue, In Progress
Report of Progress	The county is continuing planning and enhancing partnerships for funding and actions related to debris removal
Completed by:	Robbie Meyers, Butler County Emergency Management Director

Action 3.6 Ditch Cleanout & Construction

Action Worksheet	
Name of Jurisdiction:	Butler County
Risk / Vulnerability	
Problem being Mitigated:	Property damage—including agricultural assets—and transportation hindrances due to flooding.
Hazard(s) Addressed:	Flash and Riverine Floods
Action or Project	
Action/Project Number:	3.6
Name of Action or Project:	Resident Relocation
Action or Project Description:	Clean out ditches and construct new ditches or drainage systems as needed.
Applicable Goal Statement:	Implement mitigation actions that improve the protection of public and private property from the adverse effects of disasters.
Estimated Cost:	$2,5000,000
Benefits:	Reduce/Eliminate damage to property, temporary suspension of agricultural production, and continued operation of transportation routes.
Plan for Implementation	
Responsible Organization/Department:	Butler County Commission & County Drainage Districts
Action/Project Priority:	High (38)
Timeline for Completion:	5 years
Potential Fund Sources:	CDBG Funding, USDA Funding, & Local Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process Attendance at meetings of drainage districts throughout county. Technical Assistance Provision via Membership within the Ozark Foothills Regional Planning Commission
Progress Report	
Action Status	Continue, In Progress
Report of Progress	The county is working with state and federal partners to further this project.
Completed by:	Robbie Meyers, Butler County Emergency Management Director

Action 3.6 Ditch Cleanout & Construction

Action Worksheet	
Name of Jurisdiction:	City of Poplar Bluff
Risk / Vulnerability	
Problem being Mitigated:	Property damage and transportation hindrances due to flooding.
Hazard(s) Addressed:	Flash and Riverine Floods
Action or Project	
Action/Project Number:	3.6
Name of Action or Project:	Ditch Cleanout & Construction
Action or Project Description:	Clean out ditches and construct new ditches or drainage systems as needed.
Applicable Goal Statement:	Implement mitigation actions that improve the protection of public and private property from the adverse effects of disasters.
Estimated Cost:	$2,0000,000
Benefits:	Reduce/Eliminate damage to property—both personal and real—and enable the regular functioning of transportation infrastructure during high rain events.
Plan for Implementation	
Responsible Organization/Department:	Poplar Bluff City Council
Action/Project Priority:	Medium (29)
Timeline for Completion:	3-5 years
Potential Fund Sources:	CDBG funding, USDA funding, & Local funds
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process Technical Assistance Provision via Membership within the Ozark Foothills Regional Planning Commission
Progress Report	
Action Status	Continue, In Progress
Report of Progress	The city street department routinely cleans out ditches throughout city limits to allow for unobstructed flow of stormwater
Completed by:	Matt Winters, City Manager

Action 3.6 Ditch Cleanout

Action Worksheet	
Name of Jurisdiction:	City of Qulin
Risk / Vulnerability	
Problem being Mitigated:	Property damage and transportation hindrances due to flooding.
Hazard(s) Addressed:	Flash and Riverine Floods
Action or Project	
Action/Project Number:	3.6
Name of Action or Project:	Ditch Cleanout & Construction
Action or Project Description:	Remove natural and manmade debris deposits from the Black River in the southeastern portion of the county to improve stream flow and prevent water back-ups during high rain events.
Applicable Goal Statement:	Implement mitigation actions that improve the protection of public and private property from the adverse effects of disasters.
Estimated Cost:	$20,000
Benefits:	Protection of roadways, surrounding property, and preventive measure for damages.
Plan for Implementation	
Responsible Organization/Department:	Qulin City Council
Action/Project Priority:	High (30))
Timeline for Completion:	1-5 years
Potential Fund Sources:	HMGP Grant Funding, CDBG Funding, USDA Funding
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process Attendance at meetings of drainage district throughout county. Technical Assistance Provision via Membership within the Ozark Foothills Regional Planning Commission
Progress Report	
Action Status	Continue, In Progress
Report of Progress	This is an ever season project for the city.
Completed by:	Carlee Decker, City Clerk

Action 3.7 Resident Relocation

Action Worksheet	
Name of Jurisdiction:	Butler County
Risk / Vulnerability	
Problem being Mitigated:	Residential structural/contents damage due to flooding
Hazard(s) Addressed:	Flash and Riverine Floods
Action or Project	
Action/Project Number:	3.7
Name of Action or Project:	Resident Relocation
Action or Project Description:	Participate in flood buyout programs to relocate residents from flood prone areas
Applicable Goal Statement:	Implement mitigation actions that improve the protection of public and private property from the adverse effects of disasters.
Estimated Cost:	$1,800,000
Benefits:	Eliminate damage to structures and personal property, as well as avoid displacement of residents due to flash and riverine flooding.
Plan for Implementation	
Responsible Organization/Department:	Butler County Commission
Action/Project Priority:	High (38)
Timeline for Completion:	5 years
Potential Fund Sources:	HMGP Grant Funding & CDBG Funding
Local Planning Mechanisms to be Used in Implementation, if any:	Annual Budget Process Technical Assistance Provision via Membership within the Ozark Foothills Regional Planning Commission
Progress Report	
Action Status	Continue, Not Started
Report of Progress	The county will work with agencies and residents in flood buyout programs when funding is available.
Completed by:	Robbie Meyers, Butler County Emergency Management Director

Action 3.8 Floodplain Management

Action Worksheet	
Name of Jurisdiction:	Butler County
Risk / Vulnerability	
Problem being Mitigated:	Construction/development in areas prone to flooding.
Hazard(s) Addressed:	Flood
Action or Project	
Action/Project Number:	3.8
Name of Action or Project:	Floodplain Management
Action or Project Description:	Enforce floodplain management requirements, including regulating new construction in Special Flood Hazard Areas.
Applicable Goal Statement:	Implement mitigation actions that improve the protection of public and private property from the adverse effects of disasters.
Estimate Cost:	N/A
Benefits:	Elimination of property damage due to flooding for all new construction.
Plan for Implementation	
Responsible Organization/Department:	Floodplain Administrator & County Commission
Action/Project Priority:	High (39)
Timeline for Completion:	Ongoing
Potential Fund Sources:	N/A
Local Planning Mechanisms to be Used in Implementation, if any:	County Commission Meeting Departmental Reports
Progress Report	
Action Status	Continue, In Progress
Report of Progress	The county engages in an ongoing process of enforcement thereby promoting the mandate of the NFIP.
Completed by:	Robbie Meyers, Butler County Emergency Management Director

Action 3.8 Floodplain Management

Action Worksheet	
Name of Jurisdiction:	City of Poplar Bluff
Risk / Vulnerability	
Problem being Mitigated:	Construction/development in areas prone to flooding.
Hazard(s) Addressed:	Flood
Action or Project	
Action/Project Number:	3.8
Name of Action or Project:	Floodplain Management
Action or Project Description:	Enforce floodplain management requirements, including regulating new construction in Special Flood Hazard Areas.
Applicable Goal Statement:	Implement mitigation actions that improve the protection of public and private property from the adverse effects of disasters.
Estimated Cost:	N/A
Benefits:	Elimination of property damage due to flooding for all new construction.
Plan for Implementation	
Responsible Organization/Department:	Board of Aldermen
Action/Project Priority:	High (32)
Timeline for Completion:	Ongoing
Potential Fund Sources:	N/A
Local Planning Mechanisms to be Used in Implementation, if any:	City Council Meetings and Departmental Reports
Progress Report	
Action Status	Continue, In Progress
Report of Progress	The City of Poplar Bluff continues to enforce floodplain ordinances
Completed by:	Matt Winters, City Planner

Action 3.8 Floodplain Management

Action Worksheet	
Name of Jurisdiction:	City of Qulin
Risk / Vulnerability	
Problem being Mitigated:	Construction/development in areas prone to flooding.
Hazard(s) Addressed:	Flood
Action or Project	
Action/Project Number:	3.8
Name of Action or Project:	Floodplain Management
Action or Project Description:	Enforce floodplain management requirements, including regulating new construction in Special Flood Hazard Areas.
Applicable Goal Statement:	Implement mitigation actions that improve the protection of public and private property from the adverse effects of disasters.
Estimated Cost:	N/A
Benefits:	Elimination of property damage due to flooding for all new construction.
Plan for Implementation	
Responsible Organization/Department:	City Council
Action/Project Priority:	High (35)
Timeline for Completion:	Ongoing
Potential Fund Sources:	N/A
Local Planning Mechanisms to be Used in Implementation, if any:	Departmental Reports provided during City Council Meetings
Progress Report	
Action Status	Continue, In Progress
Report of Progress	The city's floodplain requirements were enforced from 2017-2022.
Completed by:	Carlee Decker, City Clerk

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

Action 4.1 Community Rating System

Action Worksheet	
Name of Jurisdiction:	Butler County
Risk / Vulnerability	
Problem being Mitigated:	Public Awareness
Hazard(s) Addressed:	Flood
Action or Project	
Action/Project Number:	4.1
Name of Action or Project:	Community Rating System
Action or Project Description:	Explore CRS county wide. Receive a community rating.
Applicable Goal Statement:	Implement mitigation actions that improve the protection of community tranquility from the adverse effects of disasters.
Estimated Cost:	$2,500
Benefits:	Reduced flood insurance premiums and mitigation of property damages due to flood.
Plan for Implementation	
Responsible Organization/Department:	Floodplain Administrator County Commission
Action/Project Priority:	High (32)
Timeline for Completion:	1-3 years
Potential Fund Sources:	Local Funds
Local Planning Mechanisms to be Used in Implementation, if any:	County Commission Meetings and Technical Assistance Provided via Membership with the Ozark Foothills Regional Planning Commission
Progress Report	
Action Status	New
Report of Progress	N/A
Completed by:	Vince Lampe, Presiding Commissioner

Action 4.2 Plan Integration

Action Worksheet	
Name of Jurisdiction:	Butler County
Risk / Vulnerability	
Problem being Mitigated:	Consistency in planning for public safety and resource protection
Hazard(s) Addressed:	All
Action or Project	
Action/Project Number:	4.2
Name of Action or Project:	Plan Integration
Action or Project Description:	Integrate updated mitigation actions into other community/regional plans, such as comprehensive plans to streamline planning initiatives and promote efficient use of limited resources.
Applicable Goal Statement:	Implement mitigation actions that improve the protection of community tranquility from the adverse effects of disasters.
Estimated Cost:	n/a
Benefits:	Efficient use of limited resources and project implementation.
Plan for Implementation	
Responsible Organization/Department:	County Commission
Action/Project Priority:	Medium, (27)
Timeline for Completion:	Ongoing
Potential Fund Sources:	n/a
Local Planning Mechanisms to be Used in Implementation, if any:	Meetings of the County Commission Technical Assistance Provided via Membership within the Ozark Foothills Regional Planning Commission (RPC)
Progress Report	
Action Status	Continue, In-Progress
Report of Progress	The county continues to work with partners to integrate plans.
Completed by:	Robbie Meyers, Butler County Emergency Management Director

Action 4.2 Plan Integration

Action Worksheet	
Name of Jurisdiction:	City of Poplar Bluff
Risk / Vulnerability	
Problem being Mitigated:	Consistency in planning for public safety and resource protection
Hazard(s) Addressed:	All
Action or Project	
Action/Project Number:	4.2
Name of Action or Project:	Plan Integration
Action or Project Description:	Integrate updated mitigation actions into other community/regional plans, such as the comprehensive plans to streamline planning initiatives and promote efficient use of limited resources.
Applicable Goal Statement:	Implement mitigation actions that improve the protection of community tranquility from the adverse effects of disasters.
Estimated Cost:	n/a
Benefits:	Efficient use of limited resources and project implementation.
Plan for Implementation	
Responsible Organization/Department:	City Planner
Action/Project Priority:	Medium (26)
Timeline for Completion:	Ongoing
Potential Fund Sources:	n/a
Local Planning Mechanisms to be Used in Implementation, if any:	City Council Meetings Technical Assistance Provided via Membership within the Ozark Foothills Regional Planning Commission (RPC)
Progress Report	
Action Status	Continue
Report of Progress	The city's identified mitigation actions were considered during development of the regional economic development strategy dated 2018.
Completed by:	Matt Winters, City Manager

Action 4.2 Plan Integration

Action Worksheet	
Name of Jurisdiction:	City of Qulin
Risk / Vulnerability	
Problem being Mitigated:	Consistency in planning for public safety and resource protection
Hazard(s) Addressed:	All
Action or Project	
Action/Project Number:	4.2
Name of Action or Project:	Plan Integration
Action or Project Description:	Integrate updated mitigation actions into other community/regional plans, such as the comprehensive plans to streamline planning initiatives and promote efficient use of limited resources.
Applicable Goal Statement:	Implement mitigation actions that improve the protection of community tranquility from the adverse effects of disasters.
Estimated Cost:	n/a
Benefits:	Efficient use of limited resources and project implementation.
Plan for Implementation	
Responsible Organization/Department:	City Council
Action/Project Priority:	Medium (26)
Timeline for Completion:	Ongoing
Potential Fund Sources:	n/a
Local Planning Mechanisms to be Used in Implementation, if any:	City Council Meetings Technical Assistance Provided via Membership within the Ozark Foothills Regional Planning Commission (RPC)
Progress Report	
Action Status	Continue, In Progress
Report of Progress	Mitigation actions were considered during development of the regional economic development strategy during 2018
Completed by:	Carlee Decker, City Clerk

Action 4.2 Plan Integration

Action Worksheet	
Name of Jurisdiction:	Neelyville R-IV School District
Risk / Vulnerability	
Problem being Mitigated:	Consistency in planning for public safety and resource protection
Hazard(s) Addressed:	All
Action or Project	
Action/Project Number:	
Name of Action or Project:	Plan Integration
Action or Project Description:	Integrate updated mitigation actions into other community/regional plans, such as the comprehensive plans to streamline planning initiatives and promote efficient use of limited resources.
Applicable Goal Statement:	Implement mitigation actions that improve the protection of community tranquility from the adverse effects of disasters.
Estimated Cost:	n/a
Benefits:	Efficient use of limited resources and project implementation.
Plan for Implementation	
Responsible Organization/Department:	District Board of Directors & District Administration
Action/Project Priority:	Medium, 27
Timeline for Completion:	Ongoing
Potential Fund Sources:	n/a
Local Planning Mechanisms to be Used in Implementation, if any:	School board meetings and district plan update initiatives
Progress Report	
Action Status	Continue, In-Progress
Report of Progress	Mitigation actions are considered within all appropriate planning initiatives.
Completed by:	Heather Black, Superintendent

Action 4.2 Plan Integration

Action Worksheet	
Name of Jurisdiction:	Poplar Bluff R-I School District
Risk / Vulnerability	
Problem being Mitigated:	Consistency in planning for public safety and resource protection
Hazard(s) Addressed:	All
Action or Project	
Action/Project Number:	4.2
Name of Action or Project:	Plan Integration
Action or Project Description:	Integrate updated mitigation actions into other community/regional plans, such as the comprehensive plans to streamline planning initiatives and promote efficient use of limited resources.
Applicable Goal Statement:	Implement mitigation actions that improve the protection of community tranquility from the adverse effects of disasters.
Estimated Cost:	n/a
Benefits:	Efficient use of limited resources and project implementation.
Plan for Implementation	
Responsible Organization/Department:	District Board of Directors & District Administration
Action/Project Priority:	High (30)
Timeline for Completion:	Ongoing
Potential Fund Sources:	n/a
Local Planning Mechanisms to be Used in Implementation, if any:	School Board Meetings and District Plan Update Initiatives
Progress Report	
Action Status	Continue, In Progress
Report of Progress	The district will continue.
Completed by:	Scott Dill, Superintendent

Action 4.2 Plan Integration

Action Worksheet	
Name of Jurisdiction:	Twin Rivers R-X School District
Risk / Vulnerability	
Problem being Mitigated:	Consistency in planning for public safety and resource protection
Hazard(s) Addressed:	All
Action or Project	
Action/Project Number:	4.2
Name of Action or Project:	Plan Integration
Action or Project Description:	Integrate updated mitigation actions into other community/regional plans, such as the comprehensive plans to streamline planning initiatives and promote efficient use of limited resources.
Applicable Goal Statement:	Implement mitigation actions that improve the protection of community tranquility from the adverse effects of disasters.
Estimated Cost:	n/a
Benefits:	Efficient use of limited resources and project implementation.
Plan for Implementation	
Responsible Organization/Department:	District Board of Directors & District Administration
Action/Project Priority:	Medium (28)
Timeline for Completion:	Ongoing
Potential Fund Sources:	n/a
Local Planning Mechanisms to be Used in Implementation, if any:	School board meetings and district plan update initiatives
Progress Report	
Action Status	Continue, In Progress
Report of Progress	Mitigation actions are considered within all appropriate planning initiatives.
Completed by:	Seth McBroom, Principal, Qulin Middle School

Action 4.2 Plan Integration

Action Worksheet	
Name of Jurisdiction:	Three Rivers College
Risk / Vulnerability	
Problem being Mitigated:	Consistency in planning for public safety and resource protection
Hazard(s) Addressed:	All
Action or Project	
Action/Project Number:	
Name of Action or Project:	Plan Integration
Action or Project Description:	Integrate updated mitigation actions into other community/regional plans, such as the comprehensive plans to streamline planning initiatives and promote efficient use of limited resources.
Applicable Goal Statement:	Implement mitigation actions that improve the protection of community tranquility from the adverse effects of disasters.
Estimated Cost:	n/a
Benefits:	Efficient use of limited resources and project implementation.
Plan for Implementation	
Responsible Organization/Department:	College Board of Directors & College Administration
Action/Project Priority:	Medium (27)
Timeline for Completion:	Ongoing
Potential Fund Sources:	n/a
Local Planning Mechanisms to be Used in Implementation, if any:	Board of Directors meetings and college plan update initiatives
Progress Report	
Action Status	Continue, In-Progress
Report of Progress	Plan integration is part of the college's Emergency Procedures Plan (EPP) which is evaluated and updated annually. A complete rewrite of the college's EPP is in progress currently.
Completed by:	Chuck Stratton, Director of Special Projects/Public Safety

Action 4.3 StormReady Certification Maintenance

Action Worksheet	
Name of Jurisdiction:	Butler County
Risk / Vulnerability	
Problem being Mitigated:	Need for emergency preparedness
Hazard(s) Addressed:	Severe Thunderstorm, Tornado, and Severe Winter Weather
Action or Project	
Action/Project Number:	4.3
Name of Action or Project:	StormReady Certification Maintenance
Action or Project Description:	Take actions to maintain the county's StormReady certification.
Applicable Goal Statement:	Implement mitigation actions that improve the protection of community tranquility from the adverse effects of disasters.
Estimated Cost:	$0
Benefits:	Reduced flood insurance premiums and mitigation of property damages due to flood.
Plan for Implementation	
Responsible Organization/Department:	County Emergency Management Agency
Action/Project Priority:	High (32)
Timeline for Completion:	Ongoing
Potential Fund Sources:	N/A
Local Planning Mechanisms to be Used in Implementation, if any:	Emergency Management Agency Annual Budget Process
Progress Report	
Action Status	Continue, In Progress
Report of Progress	The county is working with the National Weather Service to be re-certified as StormReady.
Completed by:	Robbie Meyers, Butler County Emergency Management Agency

5 PLAN MAINTENANCE PROCESS

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

5.1 Monitoring, Evaluating, and Updating the Plan

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

5.1.1 Responsibility for Plan Maintenance

Where possible, plan participants, including all three participating school 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 Butler 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:

- Capital improvement plans of participating jurisdictions;
- Ordinances of participating jurisdictions;
- Ripley County Emergency Operations Plan;
- Annual budgets;
- Other community plans that incorporate the county, such as its Regional Transportation Plan and the Comprehensive Economic Development Strategy;
- School District 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) is an advisory body and can only make recommendations to county, city, town, or district elected officials. Its primary duty is to see the plan successfully carried out and to report to the community governing boards and the public on the status of plan implementation and mitigation opportunities. Other duties include reviewing and promoting mitigation proposals, hearing stakeholder concerns about hazard mitigation, passing concerns on to appropriate entities, and posting relevant information in areas accessible to the public.

5.1.2 Plan Maintenance Schedule

The MPC (or other designated responsible entity) agrees to meet annually and after a state or federally declared hazard event as appropriate to monitor progress and update the mitigation strategy. The Butler 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(s).

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 (or other designated responsible entity) during the annual[10(b)] meeting should review changes in vulnerability identified as follows:

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

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

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

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

- Each proposed action in the plan identified an individual, office, or agency responsible for action implementation. This entity will track and report on an annual basis to the

jurisdictional MPC (or designated responsible entity) member on action status. The entity will provide input on whether the action as implemented meets the defined objectives and is likely to be successful in reducing risk.

- If the action does not meet identified objectives, the jurisdictional MPC (or designated responsible entity) member will determine necessary remedial action, making any required modifications to the plan.

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

5.2 Incorporation into Existing Planning Mechanisms

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

Where possible, plan participants, including school and special districts, will use existing plans and/or programs to implement hazard mitigation actions. Those existing plans and programs were described in Section 2 of this plan. Based on the capability assessments of the participating jurisdictions, communities in Butler 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:

- Capital improvement plans of participating jurisdictions;
- Ordinances of participating jurisdictions;
- Butler County Emergency Operations Plan;
- Annual budgets;
- Other community plans that incorporate the county, such as its Regional Transportation Plan and the Comprehensive Economic Development Strategy;
- School District 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 Butler County Emergency Management Director will provide the updated Mitigation Strategy with current status of each mitigation action to the County Commission, as well as all Mayors, City Clerks, and School District Superintendent. 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	Integration Process for Previous Plan	Integration Process for Current Plan
Butler County	Comprehensive Economic Development Strategy (CEDS)	County representative(s) attended CEDS planning meetings and recommended goals and strategies related to hazard mitigation for inclusion within the regional planning document as appropriate.	County representative(s) will attend all CEDS planning meetings and identify mitigation actions for inclusion within the regional planning document as appropriate.
City of Poplar Bluff	Comprehensive Economic Development Strategy (CEDS)	City representative(s) attended CEDS planning meetings and recommended goals and strategies related to hazard mitigation for inclusion within the regional planning document as appropriate.	City representative(s) will at tend all CEDS planning meetings and identify mitigation actions for inclusion within the regional planning document as appropriate.
City of Qulin	Comprehensive Economic Development Strategy (CEDS)	City representative(s) attended CEDS planning meetings and recommended goals and strategies related to hazard mitigation for inclusion within the regional planning document as appropriate.	City representative(s) will attend all CEDS planning meetings and identify mitigation actions fo r inclusion within the regional planning document as appropriate.
Poplar Bluff R-1 School District	Annual Budget Process	Implemented annual planning and budget process meetings and recommended goals and strategies related to hazard mitigation for inclusion within the annual budget of expenditures as applicable.	School district administrators will execute goals and strategies identified within this hazard mitigation plan via its annual budget process.
Twin Rivers R-X School District	Annual Budget Process	Implemented annual planning and budget process meetings and recommended goals and strategies related to hazard mitigation for inclusion within the annual budget of expenditures as applicable.	School district administrators will execute goals and strategies identified within this hazard mitigation plan via its annual budget process.

Neelyville R-IV School District	Annual Budget Process	Not Applicable – Did not participate in previous hazard mitigation planning process.	School district administrators will execute goals and strategies identified within this hazard mitigation plan via its annual budget 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 a regional 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.

Butler County Hazard Mitigation Plan, 2022

Appendix C – Planning Meeting Documentation

1. Initial Coordination Meeting
2. Project Kick-Off Meeting
3. Risk Assessment Meeting
4. Mitigation Strategy Meeting

2022 Butler County Hazard Mitigation Plan Update Meeting Report

Date: April 28, 2021 **Place:** Ozark Foothills Regional Planning Commission **Time:** 1 p.m.

Persons Attending: See Attached Attendance Roster

Subject Discussed: The purpose of this meeting was to provide an overview of the forthcoming hazard mitigation plan. The update process/purpose/requirements were explained to the attendees. The participating jurisdictions designated a representative to the Mitigation Planning Committee, future meeting location was selected, public input solicitation was discussed, additional MPC members and stakeholders were identified, community survey material discussed.

Action Taken: Those in attendance agreed to move forward with publishing a public survey as soon as possible to give the public as much time as they need to complete the form. The goal was to encourage participation.

Unresolved Problems: None

Future Meeting Schedule: The next meeting will occur on June 7, 2021.

2022 Butler County Hazard Mitigation Plan Update Meeting Report

Date: June 7, 2021 **Place:** Poplar Bluff R-1 School District **Time:** 1 p.m.

Persons Attending: See Attached Attendance Roster

Subject Discussed: The purpose of this meeting was to review and identify hazards in the planning area. Discussion was held regarding the county's previous disaster declarations, data collection questionnaires were distributed, public feedback methodologies and other data sources were identified.

Action Taken: Members of the MPC will complete data questionnaires and return at next meeting.

Unresolved Problems: None

Future Meeting Schedule: The next meeting will occur on July 20, 2021.

2022 Butler County Hazard Mitigation Plan Update Meeting Report

Date: July 20, 2021 **Place:** Greater Poplar Bluff Area Chamber of Commerce **Time:** 1 p.m.

Persons Attending: See Attached Attendance Roster

Subject Discussed: Butler County's HMP goals were reviewed and 2022 goals were established. Jurisdictional capabilities were determined, completed Risk Assessment reviewed and refined.

Action Taken: MPC members turned in Data Questionnaires to the mitigation planner.

Unresolved Problems: None

Future Meeting Schedule: None. The next meeting will occur once the HMP 2022 update is closer to completion to review the document prior to submission to SEMA.

2022 Butler County Hazard Mitigation Plan Update Meeting Report

Date: June 15, 2022 **Place:** Ozark Foothills Regional Planning Commission **Time:** 1 p.m.

Persons Attending: See Attached Attendance Roster

Subject Discussed: The MPC reviewed the finalized Risk Assessment, which included updates regarding an earthquake occurring in November 2021. 2017's county plan actions were reviewed. Updated goals established using STAPLEE, plan for maintenance of plan established. The committee wants to maintain the plan using the same process as noted in the prior plan.

Action Taken: None. Once the document is finalized, the participating jurisdictions will approve the plan as part of the HMP update process.

Unresolved Problems: None

Future Meeting Schedule: None.

BUTLER COUNTY

2022 HAZARD MITIGATION PLAN UPDATE

KICK-OFF MEETING

APRIL 28, 2021

NAME	ORGANIZATION	PREFERRED CONTACT INFO
Scott Dill	PB-RI	
Bob FREDWELL	BCFD	
Ralph Stucker	PBFD	
Emily Goodwin	BCHD	
Robbie Myers	Butler Co EMA	
Steve Hatcher	PBC	
James Sisk	City of PB - conference call	
Chelsea Cordia	OFRPC	chelsea@ofrpc.org
Helen Parish	Neelyville R-IV	dparish2 neelyville.k12.mo.us
Seth McBroom	Twin Rivers	smcbroom@tr10.us
JUSTIN PARKS	CITY OF QULIN	573-778-6299 qulinmayor@gmail.com
Chuck Stratton	THRU RIVERS	cstratton@trcc.edu

BUTLER COUNTY

2022 HAZARD MITIGATION PLAN UPDATE

MEETING #1

JUNE 7, 2021

NAME	ORGANIZATION	PREFERRED CONTACT INFO
Debra Parish	Neelyville R-IV	dparish@neelyville.k12.mo.us
Kori Cowen	Butler Co. Health Dept.	cowen.kori@lpha.mo.gov
[illegible]	PB-RI	
Steve Hatton	PB Chamber	Shatton@pbchamber.org
Chuck Stratton	3 Rivers College	cstratton@trcc.edu
Ralph Stucker	PBFD	rstucker@pbfire.org
Bob FREDWELL	BCFD	bfredwell@imsinternet.net
Robbie Myers	Butler Co EMA	bcema@tcmax.net
Carlee Decker	City of Qulin	qulinclerk@qulin.net
Crystal Jones	OFRPC	crystal@ofrpc.org
James Sisk	City of PB - conference call	
Seth McBroom	Twin Rivers	smcbroom@tr10.us

BUTLER COUNTY

2022 HAZARD MITIGATION PLAN UPDATE

MEETING #2

JULY 20, 2021

NAME	ORGANIZATION	PREFERRED CONTACT INFO
Crystal Jones	OFRPC	573-785-6402
Steve Hamilton	PB Chamber	573-429-8361
Bobbie Myers	Butler Co EMA	573-872-7585
Chuck Stratton	Three Rivers	573-776-5335
Emily Goodin	BCHD	573-785-8478
Debra Parish	Neelyville R-IV	573-989-3813
Bob Fredwell	Butler Co. Fire	573-785-6049
Ralph Stuter	City of Poplar Bluff / Poplar Bluff Fire Dept	573 686-8692
Scott S	PBS-RI	417-217-5030
James Sisk	City of Poplar Bluff	573-429-2191
Seth Mc Broom	Twin Rivers	(573) 714-5152
Justin Parks	City of Qulin	qulinmayor@gmail.com

BUTLER COUNTY

2022 HAZARD MITIGATION PLAN UPDATE

MEETING #3

JUNE 15, 2022

NAME	ORGANIZATION	PREFERRED CONTACT INFO
Debra Parish	Neelyville R-IV	None
Heather Black	Neelyville R-IV	hblack@neelyville.k12.mo.us
Seth McBroom	Twin Rivers R-X	smcbroom@tr10.us
JUSTIN PARKS	CITY OF QULIN	qulinmayor@gmail.com
Robbie Myers	Butler Co EMA	bcema@tcmax.net
Emily Gordin	Butler Co Health Dept	emily.gordin@lpha.mo.gov
Scott Dill	PB-RT	scottdill@pb.k12.mo.us
Matt Winters	City of Poplar Bluff	mwinters@pbcity.org
Chuck Stratton	Three Rivers	cstratton@trcc.edu

Butler County Hazard Mitigation Plan, 2022

Appendix D – Public Participation Documentation

Butler County Hazard Mitigation Plan Community Feedback Survey

ATTENTION BUTLER COUNTY RESIDENTS AND BUSINESSES!!!

The federal government requires all counties, cities and school districts to have hazard mitigation plans approved by FEMA to be eligible for Hazard Mitigation & Flood Mitigation Assistance Grants. Butler County's current plan expires February 21, 2023. A committee has been formed to update the plan. The committee's goal is to lessen the damages caused by natural hazards occurring in Butler County.

Public input is an IMPORTANT part of the planning process. We want to hear YOUR opinion regarding the likelihood each natural hazard will occur in your community, the impact you believe it will have, and the types of actions you think will help prevent damages in Butler County.

YOUR OPINIONS are important to the planning process and will be included. Please take 3 minutes to answer this short five-question survey. Thank you!

take 3 minutes to answer this short five-question survey. Thank you!

1. Please select where you live (permanently or seasonally) in Butler County from the list below. If you work in Butler County and live elsewhere, please select where you work.

2. There are four school districts with all or some of their district located in Butler County. In which Butler County school district do you live (permanently or seasonally)? If you work, but do not live in Butler County, please indicate the school district in which your work site is located.

3. Please tell us your opinion of the liklihood each of the below hazards will occur where you live in the next year.

	Unlikely	Occasional	Likely	Highly Likely
Dam Failure	◯	◯	◯	◯
Drought	◯	◯	◯	◯

	Unlikely	Occasional	Likely	Highly Likely
Dam Failure	○	○	○	○
Drought	○	○	○	○
Earthquake	○	○	○	○
Extreme Heat	○	○	○	○
Wildfire	○	○	○	○
Flooding	○	○	○	○
Sinkholes	○	○	○	○
Tornado	○	○	○	○
Winter Weather/Snow/Ice/Extreme Cold	○	○	○	○
Levee Failure	○	○	○	○
Thunderstorm/Lightning/High Wind/Hail	○	○	○	○

4. Please tell us your opinion of the potential magnitude of each hazard's impact on your community.

	Negligible	Limited	Critical	Catastrophic

Impact on your community.

	Negligible	Limited	Critical	Catastrophic
Dam Failure	◯	◯	◯	◯
Drought	◯	◯	◯	◯
Earthquake	◯	◯	◯	◯
Extreme Heat	◯	◯	◯	◯
Fires	◯	◯	◯	◯
Flooding	◯	◯	◯	◯
Sinkholes	◯	◯	◯	◯
Tornado	◯	◯	◯	◯
Winter Weather/Snow/Ice/Extreme Cold	◯	◯	◯	◯
Levee Failure	◯	◯	◯	◯
Thunderstorm/Lightning/High Winds/Hail	◯	◯	◯	◯

5. From the list below, please choose which projects you feel would help lessen future damages from these hazards in your community

5. From the list below, please choose which projects you feel would help lessen future damages from these hazards in your community.

- [ ] Purchasing & Demolishing Flood-Prone Properties
- [ ] Elevating Flood-Prone Stuctures
- [ ] Dry Proofing Historical Stuctures
- [ ] Implementing Localized Flood Reduction Efforts (i.e. stormwater management or minor flood control projects)
- [ ] Adding a Community Tornado Safe Room to an Existing Building
- [ ] Retrofitting Existing Buildings & Facilities to Withstand High Winds
- [ ] Building a New Tornado Safe Room
- [ ] Retrofitting Electrical Lines and Power Stations to Withstand High Winds and Ice
- [ ] Stabilizing Banks to Prevent Soil Erosion
- [ ] Taking Actions to Lessen the Chance of Wildfires
- [ ] Other (please specify)

- [ ] Building a New Tornado Safe Room
- [ ] Retrofitting Electrical Lines and Power Stations to Withstand High Winds and Ice
- [ ] Stabilizing Banks to Prevent Soil Erosion
- [ ] Taking Actions to Lessen the Chance of Wildfires
- [ ] Other (please specify)

6. Please tell us about any other issues you feel the Butler County Hazard Mitigation Planning Committee should consider when updating the county's current hazard mitigation plan.

Done

Butler County Hazard Mitigation Plan, 2022

Appendix E – STAPLEE Worksheets

STAPLEE Worksheet		
Name of Jurisdiction:	Butler County	
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:	Adopt and or Enforce Floodplain Ordinances	
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	3
T: Is it **Technically** feasible and potentially successful?	3
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	3
P: Is it **Politically** acceptable?	3
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	3
E: Will the project have either a neutral or positive impact on the natural **Environment**?	3
Will historic structures be saved or protected?	3
Could it be implemented quickly?	3
STAPLEE SCORE	27

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.	10
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	10
	MITIGATION EFFECTIVENESS SCORE	20
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	47

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

STAPLEE Worksheet	
Name of Jurisdiction:	Butler County
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:	Education of Extreme Heat
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	3
T: Is it **Technically** feasible and potentially successful?	2
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	3
P: Is it **Politically** acceptable?	3
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	1
E: Will the project have either a neutral or positive impact on the natural **Environment**?	1
Will historic structures be saved or protected?	0
Could it be implemented quickly?	3
STAPLEE SCORE	19

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.	10
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
MITIGATION EFFECTIVENESS SCORE		15
TOTAL SCORE (STAPLEE + Mitigation Effectiveness)		34

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

STAPLEE Worksheet	
Name of Jurisdiction:	Butler County
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:	Earthquake Awareness
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	3
T: Is it **Technically** feasible and potentially successful?	2
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	3
P: Is it **Politically** acceptable?	3
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	1
E: Will the project have either a neutral or positive impact on the natural **Environment**?	1
Will historic structures be saved or protected?	0
Could it be implemented quickly?	3
STAPLEE SCORE	19

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.	10
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
	MITIGATION EFFECTIVENESS SCORE	15
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	34

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

STAPLEE Worksheet	
Name of Jurisdiction:	Butler County
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:	Tornado Safety Drills
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	3
T: Is it **Technically** feasible and potentially successful?	2
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	3
P: Is it **Politically** acceptable?	3
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	0
E: Will the project have either a neutral or positive impact on the natural **Environment**?	0
Will historic structures be saved or protected?	0
Could it be implemented quickly?	3
STAPLEE SCORE	17

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.	10
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
	MITIGATION EFFECTIVENESS SCORE	15
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	32

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

STAPLEE Worksheet	
Name of Jurisdiction:	Butler County
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:	Fire Education & Alarms
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	3
T: Is it **Technically** feasible and potentially successful?	2
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	3
P: Is it **Politically** acceptable?	3
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	1
E: Will the project have either a neutral or positive impact on the natural **Environment**?	0
Will historic structures be saved or protected?	0
Could it be implemented quickly?	3
STAPLEE SCORE	18

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.	10
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
MITIGATION EFFECTIVENESS SCORE		15
TOTAL SCORE (STAPLEE + Mitigation Effectiveness)		33

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

STAPLEE Worksheet	
Name of Jurisdiction:	Butler County
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:	Hazard Trainings for Emerg Personnel
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	3
T: Is it **Technically** feasible and potentially successful?	3
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	3
P: Is it **Politically** acceptable?	3
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	2
E: Will the project have either a neutral or positive impact on the natural **Environment**?	1
Will historic structures be saved or protected?	2
Could it be implemented quickly?	2
STAPLEE SCORE	22

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.	10
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	8
	MITIGATION EFFECTIVENESS SCORE	18
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	40

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

STAPLEE Worksheet		
Name of Jurisdiction:	Butler County	
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:	Ditch Cleanout & Construction	
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		3
T: Is it **Technically** feasible and potentially successful?		3
A: Does the jurisdiction have the **Administrative** capacity to execute this action?		3
P: Is it **Politically** acceptable?		3
L: Is there **Legal** authority to implement?		3
E: Is it **Economically** beneficial?		2
E: Will the project have either a neutral or positive impact on the natural **Environment**?		2
Will historic structures be saved or protected?		2
Could it be implemented quickly?		1
	STAPLEE SCORE	22
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.	7
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	9
	MITIGATION EFFECTIVENESS SCORE	16
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	38

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

STAPLEE Worksheet	
Name of Jurisdiction:	Butler County
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:	Reinforce Low Water Crossings
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	3
T: Is it **Technically** feasible and potentially successful?	3
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	3
P: Is it **Politically** acceptable?	3
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	3
E: Will the project have either a neutral or positive impact on the natural **Environment**?	3
Will historic structures be saved or protected?	2
Could it be implemented quickly?	1
STAPLEE SCORE	24

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.	8
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	8
	MITIGATION EFFECTIVENESS SCORE	16
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	40

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

STAPLEE Worksheet		
Name of Jurisdiction:	Butler County	
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:	Relocation of Structures from Floodways	
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	3
T: Is it **Technically** feasible and potentially successful?	3
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	3
P: Is it **Politically** acceptable?	3
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	3
E: Will the project have either a neutral or positive impact on the natural **Environment**?	3
Will historic structures be saved or protected?	0
Could it be implemented quickly?	1
STAPLEE SCORE	22

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.	6
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	10
	MITIGATION EFFECTIVENESS SCORE	16
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	38

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

STAPLEE Worksheet	
Name of Jurisdiction:	Butler County
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:	Establish Alternate Transportation
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	3
T: Is it **Technically** feasible and potentially successful?	3
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	3
P: Is it **Politically** acceptable?	3
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	3
E: Will the project have either a neutral or positive impact on the natural **Environment**?	1
Will historic structures be saved or protected?	0
Could it be implemented quickly?	2
STAPLEE SCORE	21

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.	8
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
	MITIGATION EFFECTIVENESS SCORE	13
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	34

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

STAPLEE Worksheet	
Name of Jurisdiction:	Butler County
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:	Promote use and purchase of generators
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	3
T: Is it **Technically** feasible and potentially successful?	2
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	3
P: Is it **Politically** acceptable?	3
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	2
E: Will the project have either a neutral or positive impact on the natural **Environment**?	1
Will historic structures be saved or protected?	2
Could it be implemented quickly?	1
STAPLEE SCORE	20

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.	8
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
MITIGATION EFFECTIVENESS SCORE		13
TOTAL SCORE (STAPLEE + Mitigation Effectiveness)		33

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

STAPLEE Worksheet	
Name of Jurisdiction:	Butler County
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:	Upgrade Water Systems
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	3
T: Is it **Technically** feasible and potentially successful?	3
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	3
P: Is it **Politically** acceptable?	3
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	2
E: Will the project have either a neutral or positive impact on the natural **Environment**?	2
Will historic structures be saved or protected?	1
Could it be implemented quickly?	1
STAPLEE SCORE	21

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.	5
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
	MITIGATION EFFECTIVENESS SCORE	10
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	31

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

STAPLEE Worksheet	
Name of Jurisdiction:	Butler County
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:	Database of Vulnerable People
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	3
T: Is it **Technically** feasible and potentially successful?	3
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	3
P: Is it **Politically** acceptable?	3
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	1
E: Will the project have either a neutral or positive impact on the natural **Environment**?	0
Will historic structures be saved or protected?	0
Could it be implemented quickly?	3
STAPLEE SCORE	19

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.	8
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
	MITIGATION EFFECTIVENESS SCORE	13
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	32

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

STAPLEE Worksheet	
Name of Jurisdiction:	Butler County
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:	Lightning Protection
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	3
T: Is it **Technically** feasible and potentially successful?	2
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	3
P: Is it **Politically** acceptable?	3
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	3
E: Will the project have either a neutral or positive impact on the natural **Environment**?	2
Will historic structures be saved or protected?	2
Could it be implemented quickly?	2
STAPLEE SCORE	23

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.	7
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	9
MITIGATION EFFECTIVENESS SCORE		16
TOTAL SCORE (STAPLEE + Mitigation Effectiveness)		39

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

STAPLEE Worksheet	
Name of Jurisdiction:	Butler County
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:	Mapping of Sinkholes
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	3
T: Is it **Technically** feasible and potentially successful?	3
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	3
P: Is it **Politically** acceptable?	3
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	2
E: Will the project have either a neutral or positive impact on the natural **Environment**?	1
Will historic structures be saved or protected?	2
Could it be implemented quickly?	1
STAPLEE SCORE	21

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.	8
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	7
	MITIGATION EFFECTIVENESS SCORE	15
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	36

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

STAPLEE Worksheet	
Name of Jurisdiction:	Butler County
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:	Levee Repairs
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	3
T: Is it **Technically** feasible and potentially successful?	3
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	3
P: Is it **Politically** acceptable?	3
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	3
E: Will the project have either a neutral or positive impact on the natural **Environment**?	1
Will historic structures be saved or protected?	2
Could it be implemented quickly?	0
STAPLEE SCORE	21

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.	10
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	10
	MITIGATION EFFECTIVENESS SCORE	20
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	41

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

STAPLEE Worksheet	
Name of Jurisdiction:	Butler County
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:	Black River Cleanout
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	3
T: Is it **Technically** feasible and potentially successful?	2
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	3
P: Is it **Politically** acceptable?	3
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	2
E: Will the project have either a neutral or positive impact on the natural **Environment**?	2
Will historic structures be saved or protected?	2
Could it be implemented quickly?	1
STAPLEE SCORE	21

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.	7
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	9
	MITIGATION EFFECTIVENESS SCORE	16
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	37

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

STAPLEE Worksheet	
Name of Jurisdiction:	Butler County
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:	Backup Wells
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	3
T: Is it **Technically** feasible and potentially successful?	3
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	3
P: Is it **Politically** acceptable?	3
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	2
E: Will the project have either a neutral or positive impact on the natural **Environment**?	1
Will historic structures be saved or protected?	0
Could it be implemented quickly?	2
STAPLEE SCORE	20

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.	9
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
	MITIGATION EFFECTIVENESS SCORE	14
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	34

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

STAPLEE Worksheet	
Name of Jurisdiction:	Butler County
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:	National Flood Insurance Program
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	3
T: Is it **Technically** feasible and potentially successful?	3
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	3
P: Is it **Politically** acceptable?	3
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	2
E: Will the project have either a neutral or positive impact on the natural **Environment**?	1
Will historic structures be saved or protected?	1
Could it be implemented quickly?	3
STAPLEE SCORE	22

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.	5
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
	MITIGATION EFFECTIVENESS SCORE	10
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	32

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

STAPLEE Worksheet	
Name of Jurisdiction:	Butler County
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:	Planning
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	3
T: Is it **Technically** feasible and potentially successful?	3
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	3
P: Is it **Politically** acceptable?	3
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	1
E: Will the project have either a neutral or positive impact on the natural **Environment**?	0
Will historic structures be saved or protected?	0
Could it be implemented quickly?	1
STAPLEE SCORE	17

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.	5
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
	MITIGATION EFFECTIVENESS SCORE	10
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	27

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

STAPLEE Worksheet	
Name of Jurisdiction:	Butler County
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:	Storm Ready
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	3
T: Is it **Technically** feasible and potentially successful?	3
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	3
P: Is it **Politically** acceptable?	3
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	2
E: Will the project have either a neutral or positive impact on the natural **Environment**?	1
Will historic structures be saved or protected?	1
Could it be implemented quickly?	3
STAPLEE SCORE	22

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.	5
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
	MITIGATION EFFECTIVENESS SCORE	10
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	32

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

P.B., 24 – 25

STAPLEE Worksheet	
Name of Jurisdiction:	CITY OF POPLAR BLUFF
Action or Project	
Action/Project Number:	2.4
Name of Action or Project:	Trim trees near overhead power lines.
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	2
T: Is it **Technically** feasible and potentially successful?	3
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	1
P: Is it **Politically** acceptable?	2
L: Is there **Legal** authority to implement?	2
E: Is it **Economically** beneficial?	1
E: Will the project have either a neutral or positive impact on the natural **Environment**?	1
Will historic structures be saved or protected?	1
Could it be implemented quickly?	1
STAPLEE SCORE	14

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.	5
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	6
	MITIGATION EFFECTIVENESS SCORE	11
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	25

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

P.B., 25 = 24

STAPLEE Worksheet	
Name of Jurisdiction:	CITY OF POPLAR BLUFF
Action or Project	
Action/Project Number:	2.5
Name of Action or Project:	Upgrade water treatment system.
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	3
T: Is it **Technically** feasible and potentially successful?	1
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	1
P: Is it **Politically** acceptable?	2
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	2
E: Will the project have either a neutral or positive impact on the natural **Environment**?	1
Will historic structures be saved or protected?	0
Could it be implemented quickly?	0
STAPLEE SCORE	13

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.	6
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
	MITIGATION EFFECTIVENESS SCORE	11
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	24

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

P.B., 3.1 = 24

STAPLEE Worksheet	
Name of Jurisdiction:	CITY OF POPLAR BLUFF
Action or Project	
Action/Project Number:	3.1
Name of Action or Project:	Provide fire safety education to the public.
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	2
T: Is it **Technically** feasible and potentially successful?	1
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	1
P: Is it **Politically** acceptable?	3
L: Is there **Legal** authority to implement?	2
E: Is it **Economically** beneficial?	1
E: Will the project have either a neutral or positive impact on the natural **Environment**?	3
Will historic structures be saved or protected?	0
Could it be implemented quickly?	0
STAPLEE SCORE	13

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.	6
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
MITIGATION EFFECTIVENESS SCORE		11
TOTAL SCORE (STAPLEE + Mitigation Effectiveness)		24

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

P.B., 3.6 = 29

STAPLEE Worksheet	
Name of Jurisdiction:	CITY OF POPLAR BLUFF
Action or Project	
Action/Project Number:	3.6
Name of Action or Project:	Ditch Clean-out & Construction
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	3
T: Is it **Technically** feasible and potentially successful?	3
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	2
P: Is it **Politically** acceptable?	3
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	1
E: Will the project have either a neutral or positive impact on the natural **Environment**?	1
Will historic structures be saved or protected?	0
Could it be implemented quickly?	1
STAPLEE SCORE	17

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.	5
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	7
	MITIGATION EFFECTIVENESS SCORE	12
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	29

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

P.B., 3.7 = 30

STAPLEE Worksheet	
Name of Jurisdiction:	CITY OF POPLAR BLUFF
Action or Project	
Action/Project Number:	3.7
Name of Action or Project:	Purchase properties & relocate residents
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	2
T: Is it **Technically** feasible and potentially successful?	2
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	2
P: Is it **Politically** acceptable?	2
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	2
E: Will the project have either a neutral or positive impact on the natural **Environment**?	2
Will historic structures be saved or protected?	0
Could it be implemented quickly?	0
STAPLEE SCORE	15

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.	6
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	9
	MITIGATION EFFECTIVENESS SCORE	15
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	30

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

P.B., 3.8 = 32

STAPLEE Worksheet	
Name of Jurisdiction:	CITY OF POPLAR BLUFF
Action or Project	
Action/Project Number:	3.8
Name of Action or Project:	Enforce floodplain management requirements, including regulating new construction in SFHA's.
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	1
T: Is it **Technically** feasible and potentially successful?	2
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	3
P: Is it **Politically** acceptable?	3
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	1
E: Will the project have either a neutral or positive impact on the natural **Environment**?	3
Will historic structures be saved or protected?	0
Could it be implemented quickly?	2
STAPLEE SCORE	18

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.	5
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	9
	MITIGATION EFFECTIVENESS SCORE	14
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	32

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

P.B., 4.2 = 26

STAPLEE Worksheet	
Name of Jurisdiction:	CITY OF POPLAR BLUFF
Action or Project	
Action/Project Number:	4.2
Name of Action or Project:	Integrate mitigation actions into other planning documents/mechanisms
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	2
T: Is it **Technically** feasible and potentially successful?	1
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	3
P: Is it **Politically** acceptable?	3
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	0
E: Will the project have either a neutral or positive impact on the natural **Environment**?	3
Will historic structures be saved or protected?	0
Could it be implemented quickly?	1
STAPLEE SCORE	16

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.	5
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
	MITIGATION EFFECTIVENESS SCORE	10
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	26

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

Qulin, 2.5 = 24

STAPLEE Worksheet	
Name of Jurisdiction:	CITY OF QULIN
Action or Project	
Action/Project Number:	2.5
Name of Action or Project:	Improve city water supply & treatment infrastructure
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	2
T: Is it **Technically** feasible and potentially successful?	1
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	1
P: Is it **Politically** acceptable?	3
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	2
E: Will the project have either a neutral or positive impact on the natural **Environment?**	1
Will historic structures be saved or protected?	0
Could it be implemented quickly?	0
STAPLEE SCORE	13

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.	6
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
	MITIGATION EFFECTIVENESS SCORE	11
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	24

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

3.6 Qulin –30

STAPLEE Worksheet	
Name of Jurisdiction:	CITY OF QULIN
Action or Project	
Action/Project Number:	3.6
Name of Action or Project:	Clean out drainage ditches.
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	3
T: Is it **Technically** feasible and potentially successful?	2
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	3
P: Is it **Politically** acceptable?	2
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	2
E: Will the project have either a neutral or positive impact on the natural **Environment**?	1
Will historic structures be saved or protected?	0
Could it be implemented quickly?	1
STAPLEE SCORE	17

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.	5
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	8
	MITIGATION EFFECTIVENESS SCORE	13
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	30

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

Qulin 3.8 = 35

STAPLEE Worksheet	
Name of Jurisdiction:	CITY OF QULIN
Action or Project	
Action/Project Number:	3.8
Name of Action or Project:	Adopt/Enforce floodplain ordinances & regulate construction in SFHAs.
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	1
T: Is it **Technically** feasible and potentially successful?	3
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	3
P: Is it **Politically** acceptable?	2
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	3
E: Will the project have either a neutral or positive impact on the natural **Environment**?	2
Will historic structures be saved or protected?	0
Could it be implemented quickly?	3
STAPLEE SCORE	20

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.	5
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	10
	MITIGATION EFFECTIVENESS SCORE	15
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	35

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

PR 1.2 = 31
Quin 4.2 = 26

STAPLEE Worksheet	
Name of Jurisdiction:	CITY OF QULIN
Action or Project	
Action/Project Number:	4.2
Name of Action or Project:	Integrate mitigation actions into other plans.
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	3
T: Is it **Technically** feasible and potentially successful?	1
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	3
P: Is it **Politically** acceptable?	3
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	0
E: Will the project have either a neutral or positive impact on the natural **Environment**?	3
Will historic structures be saved or protected?	0
Could it be implemented quickly?	0
STAPLEE SCORE	16

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.	5
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
	MITIGATION EFFECTIVENESS SCORE	10
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	26

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

P.B. 1,2 = 31
R-I

STAPLEE Worksheet	
Name of Jurisdiction:	POPLAR BLUFF R-I SCHOOL DISTRICT
Action or Project	
Action/Project Number:	1.2
Name of Action or Project:	Provide earthquake awareness/education.
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	3
T: Is it **Technically** feasible and potentially successful?	2
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	3
P: Is it **Politically** acceptable?	3
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	1
E: Will the project have either a neutral or positive impact on the natural **Environment**?	3
Will historic structures be saved or protected?	0
Could it be implemented quickly?	1
STAPLEE SCORE	17

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.	8
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	6
	MITIGATION EFFECTIVENESS SCORE	14
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	31

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

P.B R-I 1.5 = 31

STAPLEE Worksheet		
Name of Jurisdiction:	POPLAR BLUFF R-I SCHOOL DISTRICT	
Action or Project		
Action/Project Number:	1.5	
Name of Action or Project:	Increase tornado awareness & provide education	
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	3
T: Is it **Technically** feasible and potentially successful?	1
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	3
P: Is it **Politically** acceptable?	3
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	1
E: Will the project have either a neutral or positive impact on the natural **Environment**?	3
Will historic structures be saved or protected?	0
Could it be implemented quickly?	1
STAPLEE SCORE	18

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.	8
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
	MITIGATION EFFECTIVENESS SCORE	13
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	31

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

P.B.R-I 1.7 = 25

STAPLEE Worksheet	
Name of Jurisdiction:	POPLAR BLUFF R-I SCHOOL DISTRICT
Action or Project	
Action/Project Number:	1.7
Name of Action or Project:	Construct a tornado safe room.
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	2
T: Is it **Technically** feasible and potentially successful?	1
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	2
P: Is it **Politically** acceptable?	2
L: Is there **Legal** authority to implement?	2
E: Is it **Economically** beneficial?	1
E: Will the project have either a neutral or positive impact on the natural **Environment**?	1
Will historic structures be saved or protected?	0
Could it be implemented quickly?	0
STAPLEE SCORE	11

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.	9
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
	MITIGATION EFFECTIVENESS SCORE	14
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	25

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

P.B. R-I 2.1 = 28

STAPLEE Worksheet	
Name of Jurisdiction:	POPLAR BLUFF R-I SCHOOL DISTRICT
Action or Project	
Action/Project Number:	2.1
Name of Action or Project:	Establish alternate transportation routes.
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	2
T: Is it **Technically** feasible and potentially successful?	2
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	3
P: Is it **Politically** acceptable?	3
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	0
E: Will the project have either a neutral or positive impact on the natural **Environment**?	3
Will historic structures be saved or protected?	0
Could it be implemented quickly?	1
STAPLEE SCORE	17

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.	6
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
	MITIGATION EFFECTIVENESS SCORE	11
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	28

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

P.B.R-I 3.2 = 34

STAPLEE Worksheet	
Name of Jurisdiction:	POPLAR BLUFF R-I SCHOOL DISTRICT
Action or Project	
Action/Project Number:	3.2
Name of Action or Project:	Improvement fire drills.
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	3
T: Is it **Technically** feasible and potentially successful?	3
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	3
P: Is it **Politically** acceptable?	3
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	0
E: Will the project have either a neutral or positive impact on the natural **Environment**?	3
Will historic structures be saved or protected?	0
Could it be implemented quickly?	3
STAPLEE SCORE	21

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.	8
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
	MITIGATION EFFECTIVENESS SCORE	13
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	34

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

P.B.R-I 4.2 = 30

STAPLEE Worksheet	
Name of Jurisdiction:	POPLAR BLUFF R-I SCHOOL DISTRICT
Action or Project	
Action/Project Number:	4.2
Name of Action or Project:	Integrate mitigation actions into plans.
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	3
T: Is it **Technically** feasible and potentially successful?	3
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	3
P: Is it **Politically** acceptable?	3
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	1
E: Will the project have either a neutral or positive impact on the natural **Environment**?	2
Will historic structures be saved or protected?	0
Could it be implemented quickly?	2
STAPLEE SCORE	20

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.	5
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
	MITIGATION EFFECTIVENESS SCORE	10
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	30

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

Neelyville R-IV, 1.3 = 35

STAPLEE Worksheet	
Name of Jurisdiction:	NEELYVILLE R-IV SCHOOL DISTRICT
Action or Project	
Action/Project Number:	1.3
Name of Action or Project:	Implement earthquake drills.
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	3
T: Is it **Technically** feasible and potentially successful?	3
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	3
P: Is it **Politically** acceptable?	3
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	1
E: Will the project have either a neutral or positive impact on the natural **Environment**?	3
Will historic structures be saved or protected?	0
Could it be implemented quickly?	3
STAPLEE SCORE	22

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.	8
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
	MITIGATION EFFECTIVENESS SCORE	13
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	35

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

Neelyville R-IV, 1.4 = 35

STAPLEE Worksheet	
Name of Jurisdiction:	NEELYVILLE R-IV SCHOOL DISTRICT
Action or Project	
Action/Project Number:	1.4
Name of Action or Project:	Implement tornado drills.
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	3
T: Is it **Technically** feasible and potentially successful?	3
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	3
P: Is it **Politically** acceptable?	3
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	1
E: Will the project have either a neutral or positive impact on the natural **Environment**?	3
Will historic structures be saved or protected?	0
Could it be implemented quickly?	3
STAPLEE SCORE	22

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.	8
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
	MITIGATION EFFECTIVENESS SCORE	13
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	35

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

Neelyville R-III, 4.2 = 29

STAPLEE Worksheet	
Name of Jurisdiction:	NEELYVILLE R-IV SCHOOL DISTRICT
Action or Project	
Action/Project Number:	4.2
Name of Action or Project:	Integrate mitigation actions into other plans
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	3
T: Is it **Technically** feasible and potentially successful?	3
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	3
P: Is it **Politically** acceptable?	2
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	0
E: Will the project have either a neutral or positive impact on the natural **Environment**?	3
Will historic structures be saved or protected?	0
Could it be implemented quickly?	0
STAPLEE SCORE	17

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.	5
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
	MITIGATION EFFECTIVENESS SCORE	10
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	27

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

T.R. R-X 1.2 = 31

STAPLEE Worksheet	
Name of Jurisdiction:	TWIN RIVERS R-X SCHOOL DISTRICT
Action or Project	
Action/Project Number:	1.2
Name of Action or Project:	Provide earthquake awareness & education
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	3
T: Is it **Technically** feasible and potentially successful?	2
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	3
P: Is it **Politically** acceptable?	3
L: Is there **Legal** authority to implement?	2
E: Is it **Economically** beneficial?	0
E: Will the project have either a neutral or positive impact on the natural **Environment**?	3
Will historic structures be saved or protected?	0
Could it be implemented quickly?	2
STAPLEE SCORE	18

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.	7
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	6
	MITIGATION EFFECTIVENESS SCORE	13
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	31

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

T.R.R-X, 1.5 = 30

STAPLEE Worksheet	
Name of Jurisdiction:	TWIN RIVERS R-X SCHOOL DISTRICT
Action or Project	
Action/Project Number:	1.5
Name of Action or Project:	Increase tornado awareness & provide education
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	3
T: Is it **Technically** feasible and potentially successful?	2
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	2
P: Is it **Politically** acceptable?	3
L: Is there **Legal** authority to implement?	2
E: Is it **Economically** beneficial?	0
E: Will the project have either a neutral or positive impact on the natural **Environment**?	3
Will historic structures be saved or protected?	0
Could it be implemented quickly?	2
STAPLEE SCORE	17

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.	8
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
	MITIGATION EFFECTIVENESS SCORE	13
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	30

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

T.R.R-X, 1.7 = 30

STAPLEE Worksheet

Name of Jurisdiction:	TWIN RIVERS R-X SCHOOL DISTRICT
Action or Project	
Action/Project Number:	1.7
Name of Action or Project:	Construct a tornado saferoom
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	3
T: Is it **Technically** feasible and potentially successful?	2
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	1
P: Is it **Politically** acceptable?	3
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	2
E: Will the project have either a neutral or positive impact on the natural **Environment**?	2
Will historic structures be saved or protected?	0
Could it be implemented quickly?	0
STAPLEE SCORE	16

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.	9
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
	MITIGATION EFFECTIVENESS SCORE	14
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	30

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

T.R. R-X, 2.1 = 30

STAPLEE Worksheet	
Name of Jurisdiction:	TWIN RIVERS R-X SCHOOL DISTRICT
Action or Project	
Action/Project Number:	2.1
Name of Action or Project:	Establish alternate transportation routes for school buses.
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	2
T: Is it **Technically** feasible and potentially successful?	2
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	3
P: Is it **Politically** acceptable?	3
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	1
E: Will the project have either a neutral or positive impact on the natural **Environment**?	2
Will historic structures be saved or protected?	0
Could it be implemented quickly?	3
STAPLEE SCORE	19

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.	6
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
	MITIGATION EFFECTIVENESS SCORE	11
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	30

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

T.R. R-X, 32-35

STAPLEE Worksheet	
Name of Jurisdiction:	TWIN RIVERS R-X SCHOOL DISTRICT
Action or Project	
Action/Project Number:	3.2
Name of Action or Project:	Implement fire drills
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	3
T: Is it **Technically** feasible and potentially successful?	3
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	3
P: Is it **Politically** acceptable?	3
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	0
E: Will the project have either a neutral or positive impact on the natural **Environment**?	3
Will historic structures be saved or protected?	0
Could it be implemented quickly?	3
STAPLEE SCORE	21

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.	9
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
	MITIGATION EFFECTIVENESS SCORE	14
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	35

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

T.R R+, 4.2 = 28

STAPLEE Worksheet	
Name of Jurisdiction:	TWIN RIVERS R-X SCHOOL DISTRICT
Action or Project	
Action/Project Number:	4.2
Name of Action or Project:	Integrate mitigation actions into other plans.
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	2
T: Is it **Technically** feasible and potentially successful?	2
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	3
P: Is it **Politically** acceptable?	3
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	1
E: Will the project have either a neutral or positive impact on the natural **Environment**?	3
Will historic structures be saved or protected?	0
Could it be implemented quickly?	1
STAPLEE SCORE	18

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.	5
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
	MITIGATION EFFECTIVENESS SCORE	10
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	28

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

TRC, 1.2 = 32

STAPLEE Worksheet	
Name of Jurisdiction:	THREE RIVERS COLLEGE
Action or Project	
Action/Project Number:	1.2
Name of Action or Project:	Provide earthquake education & awareness.
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	3
T: Is it **Technically** feasible and potentially successful?	2
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	3
P: Is it **Politically** acceptable?	3
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	1
E: Will the project have either a neutral or positive impact on the natural **Environment**?	3
Will historic structures be saved or protected?	0
Could it be implemented quickly?	2
STAPLEE SCORE	20

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.	7
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
	MITIGATION EFFECTIVENESS SCORE	12
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	32

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

TRC 1.5, = 32

STAPLEE Worksheet	
Name of Jurisdiction:	THREE RIVERS COLLEGE
Action or Project	
Action/Project Number:	1.5
Name of Action or Project:	Increase tornado awareness & provide education
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	3
T: Is it **Technically** feasible and potentially successful?	2
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	3
P: Is it **Politically** acceptable?	3
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	1
E: Will the project have either a neutral or positive impact on the natural **Environment**?	3
Will historic structures be saved or protected?	0
Could it be implemented quickly?	2
STAPLEE SCORE	20

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.	7
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
MITIGATION EFFECTIVENESS SCORE		12
TOTAL SCORE (STAPLEE + Mitigation Effectiveness)		32

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

TRC 1.7 = 28

STAPLEE Worksheet	
Name of Jurisdiction:	THREE RIVERS COLLEGE
Action or Project	
Action/Project Number:	1.7
Name of Action or Project:	Construct a tornado safe room
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	3
T: Is it **Technically** feasible and potentially successful?	1
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	2
P: Is it **Politically** acceptable?	3
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	1
E: Will the project have either a neutral or positive impact on the natural **Environment**?	3
Will historic structures be saved or protected?	0
Could it be implemented quickly?	0
STAPLEE SCORE	16

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.	7
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
	MITIGATION EFFECTIVENESS SCORE	12
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	28

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

TRC, 3.2, = 35

STAPLEE Worksheet	
Name of Jurisdiction:	THREE RIVERS COLLEGE
Action or Project	
Action/Project Number:	3.2
Name of Action or Project:	implement fire drills
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	3
T: Is it **Technically** feasible and potentially successful?	3
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	3
P: Is it **Politically** acceptable?	3
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	1
E: Will the project have either a neutral or positive impact on the natural **Environment**?	3
Will historic structures be saved or protected?	0
Could it be implemented quickly?	3
STAPLEE SCORE	22

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.	8
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
	MITIGATION EFFECTIVENESS SCORE	13
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	35

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

TRC 4.2 = 27

STAPLEE Worksheet	
Name of Jurisdiction:	THREE RIVERS COLLEGE
Action or Project	
Action/Project Number:	4.2
Name of Action or Project:	Integrate mitigation actions into other plans
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	3
T: Is it **Technically** feasible and potentially successful?	1
A: Does the jurisdiction have the **Administrative** capacity to execute this action?	3
P: Is it **Politically** acceptable?	3
L: Is there **Legal** authority to implement?	3
E: Is it **Economically** beneficial?	0
E: Will the project have either a neutral or positive impact on the natural **Environment**?	3
Will historic structures be saved or protected?	0
Could it be implemented quickly?	1
STAPLEE SCORE	17

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.	5
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	5
	MITIGATION EFFECTIVENESS SCORE	10
	TOTAL SCORE (STAPLEE + Mitigation Effectiveness)	27

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

Butler County Hazard Mitigation Plan, 2022

Appendix F – Adoption Resolutions

BUTLER COUNTY, MISSOURI

RESOLUTION NO. 01 09 23

A RESOLUTION OF THE COUNTY OF BUTLER IN MISSOURI ADOPTING THE *2023 BUTLER COUNTY HAZARD MITIGATION PLAN.*

WHEREAS the County of Butler recognizes the threat that natural hazards pose to people and property within the County of Butler; and,

WHEREAS the County of Butler has participated in the preparation of a multi-jurisdictional local hazard mitigation plan, hereby known as the *2023 Butler County Hazard Mitigation Plan*, hereafter referred to as the *Plan*, in accordance with the *Disaster Mitigation Act of 2000*; and,

WHEREAS the *Plan* identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the County of Butler from the impacts of future hazards and disasters; and,

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

WHEREAS adoption by the County of Butler demonstrates their commitment to hazard mitigation and achieving the goals outlined in the *Plan*.

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

The County of Butler adopts the final FEMA-approved *Plan*.

ADOPTED by a vote of 2 in favor and _____against, and _____abstaining, this 9 day of January,2023.

By (Sig): [signature]
Print name: Vic Lamps

ATTEST:
By (Sig.): [signature]
Print name: Donna Hillis

COURT OF BUTLER COUNTY, MO.
GEN. W.O. BUTLER

CITY OF QULIN, MISSOURI

RESOLUTION NO. __

A RESOLUTION OF THE CITY OF QULIN IN MISSOURI ADOPTING THE *2023 BUTLER COUNTY HAZARD MITIGATION PLAN.*

WHEREAS the City of Qulin recognizes the threat that natural hazards pose to people and property within the City of Qulin; and,

WHEREAS the City of Qulin has participated in the preparation of a multi-jurisdictional local hazard mitigation plan, hereby known as the *2023 Butler County Hazard Mitigation Plan*, hereafter referred to as the *Plan*, in accordance with the *Disaster Mitigation Act of 2000*; and,

WHEREAS the *Plan* identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the City of Qulin from the impacts of future hazards and disasters; and,

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

WHEREAS adoption by the City of Qulin demonstrates their commitment to hazard mitigation and achieving the goals outlined in the *Plan*.

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

The City of Qulin adopts the final FEMA-approved *Plan*.

ADOPTED by a vote of 3 in favor and 0 against, and 0 abstaining, this 10 day of JAN, 2023.

By (Sig): _____
Print name: JUSTIN PARKS

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

POPLAR BLUFF R-I SCHOOL DISTRICT RESOLUTION NO. __

A RESOLUTION OF THE POPLAR BLUFF R-I SCHOOL DISTRICT IN MISSOURI ADOPTING THE *2023 BUTLER COUNTY HAZARD MITIGATION PLAN.*

WHEREAS the Poplar Bluff R-I School District recognizes the threat that natural hazards pose to people and property within the Poplar Bluff R-I School District's service area; and,

WHEREAS the Poplar Bluff R-I School District has participated in the preparation of a multi-jurisdictional local hazard mitigation plan, hereby known as the *2023 Butler County Hazard Mitigation Plan*, hereafter referred to as the *Plan*, in accordance with the *Disaster Mitigation Act of 2000*; and,

WHEREAS the *Plan* identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the Poplar Bluff R-I School District's service area from the impacts of future hazards and disasters; and,

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

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

NOW THEREFORE, BE IT RESOLVED BY THE POPLAR BLUFF R-I SCHOOL DISTRICT, in the State of Missouri, THAT:

The Poplar Bluff R-I School District adopts the final FEMA-approved *Plan*.

ADOPTED by a vote of all in favor and zero against, zero abstaining, this 19th day of January, 2023.

By (Sig): _____
Print name: John Scott, Board President

ATTEST:
By (Sig.): _____
Print name: Carla Thompson, Executive Board Secretary

TWIN RIVERS R-X SCHOOL DISTRICT RESOLUTION NO. __

A RESOLUTION OF THE TWIN RIVERS R-X SCHOOL DISTRICT IN MISSOURI ADOPTING THE *2023 BUTLER COUNTY HAZARD MITIGATION PLAN.*

WHEREAS the Twin Rivers R-X School District recognizes the threat that natural hazards pose to people and property within the Twin Rivers R-X School District's service area; and,

WHEREAS the Twin Rivers R-X School District has participated in the preparation of a multi-jurisdictional local hazard mitigation plan, hereby known as the *2023 Butler County Hazard Mitigation Plan*, hereafter referred to as the *Plan*, in accordance with the *Disaster Mitigation Act of 2000*; and,

WHEREAS the *Plan* identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the Twin Rivers R-X School District's service area from the impacts of future hazards and disasters; and,

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

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

NOW THEREFORE, BE IT RESOLVED BY THE TWIN RIVERS R-X SCHOOL DISTRICT, in the State of Missouri, THAT:

The Twin Rivers R-X School District adopts the final FEMA-approved *Plan*.

ADOPTED by a vote of 6 in favor and Ø against, and Ø abstaining, this 17th day of January,2023.

By (Sig): Robert W. Brown Supt.
Print name: Robert W. Brown

ATTEST: Stephanie Acup
By (Sig.): Stephanie Acup
Print name: Stephanie Acup