CONTRIBUTORS

Lewis County Hazard Mitigation Planning Committee

Jurisdictional Representatives

Name		Title	Department	Jurisdiction/Agency/Organizatio
John	French	Superintendent		Lewis County C-3 School District
Jesse	Uhlmeyer	Superintendent		Canton R-V School District
Wayne	Murphy	Presiding Commissioner	Commission	Lewis County
Travis	Fleer	Southern District Commissioner	Commission	Lewis County
Deann	Whiston	Northern District Commissioner	Commission	Lewis County
Wendy	Lewis	City Clerk		City of La Belle
John	Roach	City Administrator		City of La Grange
Vancell	Scifres	Mayor		City of Monticello
Mary	Fretwell	City Administrator		City of Canton
Jarrod	Phillips	Mayor		City of Canton
Cheryl	Thrower	City Clerk		City of Ewing
Shirley	Hetzler	City Clerk		City of Lewistown

Stakeholder Representatives

Name		Title	Department	Agency/Organization
Ralph	Martin	Director	Economic Development	Lewis County I.D.A.
Travis	Mathes	Member Services Manager	Member Services	Lewis County R.E.C.

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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. Lewis County and participating jurisdictions and school/special districts developed this multi-jurisdictional local hazard mitigation plan update to reduce future losses from hazard events to the County and its communities and school/special districts. The plan is an update of a plan that was approved on October 25, 2018. 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 County Multi-Hazard Mitigation Plan is a multi-jurisdictional plan that covers the following jurisdictions that participated in the planning process:

- Unincorporated Lewis County
- Canton
- La Grange
- La Belle
- Lewistown
- Ewing
- Monticello
- Lewis County C-3 School District
- Canton R-V School District

Lewis County and the entities listed above developed a Multi-Jurisdictional Hazard Mitigation Plan that was approved by FEMA on October 25, 2018 (hereafter referred to as the *2018 Lewis County 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 Lewis County and participating jurisdictions. The MPC updated the risk assessment that identified and profiled hazards that pose a risk to Lewis County and analyzed jurisdictional vulnerability to these hazards. The MPC also examined the capabilities in place to mitigate the hazard damages, with emphasis on changes that have occurred since the previously approved plan was adopted. The MPC determined that the planning area is vulnerable to several hazards that are identified, profiled, and analyzed in this plan. Riverine and flash flooding, winter storms, severe thunderstorms/hail/lightning/high winds, and tornadoes are among the hazards that historically have had a significant impact.

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

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

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	Hazards Addressed	Address Current Development	Address Future Development	Continued Compliance with NFIP
	Prevention Public Education							
Lewis County 2023.1	Obtain Sufficient Generators for Shelters	Lewis County	High	1	All Hazards	✓		
Lewis County 2023.2	Transportation Infrastructure	Lewis County	High	1	All Hazards	✓		
Lewis County 2023.3	NFIP Participation	Lewis County	High	3	Flooding			✓
Lewis County 2023.4	Install/Upgrade Warning Sirens	Lewis County	Medium	3	All Hazards	✓		
Lewis County 2023.5	Safe Rooms and Storm Shelters	Lewis County	High	3	Tornado, Severe Storms	✓		
Lewis County 2023.6	Response to Pandemic	Lewis County	Medium	2	Pandemic	✓	✓	
Canton 2023.1	NFIP Participation	Canton	High	3	Flooding			✓
Canton 2023.2	Safe Rooms and Strom Shelters	Canton	High	3	Tornado, Severe Storms	✓		
Canton 2023.3	Raising the North Levee	Canton	High	3	Flooding	✓	✓	
Canton 2023.4	Replace Flood Gates of North Levee	Canton	High	3	Flooding	✓	✓	
Canton 2023.5	Anchoring fuel tanks and other storage tanks	Canton	Low	3	All Hazards	✓		
Canton 2023.6	Transportation Infrastructure	Canton	High	1	All Hazards	✓		
Canton 2023.7	Install/Upgrade Warning Signs	Canton	Medium	3	All Hazards	✓		
Canton 2023.8	Generators for Shelters/City Facilities	Canton	High	1	All Hazards	✓		
Ewing 2023.1	Generators for Shelters	Ewing	High	1	All Hazards	✓		
Ewing 2023.2	Install/Upgrade Warning Sirens	Ewing	Medium	3	All Hazards	✓		
Ewing 2023.3	Transportation Infrastructure	Ewing	High	1	All Hazards	✓		

#	Action	Jurisdiction	Priority	Goals Addressed	Hazards Addressed	Address Current Development	Address Future Development	Continued Compliance with NFIP
Ewing 2023.4	Safe Rooms and Storm Shelters	Ewing	High	3	Tornado, Severe Storm	✓		
Ewing 2023.5	Pursue NFIP Participation	Ewing	High	3	Flooding			✓
Labelle 2023.1	Safe Rooms and Storm Shelters	LaBelle	High	3	Tornado, Severe Storms	✓		
LaBelle 2023.2	Install/Upgrade Warning Signs	LaBelle	Medium	3	All Hazards	✓		
LaBelle 2023.3	Transportation Infrastructure	LaBelle	High	1	All Hazards	✓		
LaBelle 2023.4	Generators for Shelters	LaBelle	High	1	All Hazards	✓		
LaBelle 2023.5	Pursue NFIP Participation	LaBelle	High	3	Flooding			✓
LaGrange 2023.1	NFIP Participation	LaGrange	High	3	Flooding			✓
LaGrange 2023.2	Generators for Shelters	LaGrange	High	1	All Hazards	✓		
LaGrange 2023.3	Safe Rooms and Storm Shelters	LaGrange	High	3	Tornado, Severe Storm	✓		
LaGrange 2023.4	Install/Upgrade Warning Sirens	LaGrange	Medium	3	All Hazards	✓		
LaGrange 2023.5	Transportation Infrastructure	LaGrange	High	1	All Hazards	✓		
LaGrange 2023.6	Anchoring Fuel Tank and other Storage Tanks	LaGrange	Low	3	All Hazards	✓		
Lewistown 2023.1	Safe Rooms and Storm Shelters	Lewistown	High	3	Tornado and Severe Storm	✓		
Lewistown 2023.2	Installation/Upgrade Warning Sirens	Lewistown	Medium	3	All Hazards	✓		
Lewistown 2023.3	Transportation Infrastructure	Lewistown	High	1	All Hazards	✓		
Lewistown 2023.4	Generators for Shelters	Lewistown	High	1	All Hazards	✓		
Lewistown 2023.5	Pursue NFIP Participation	Lewistown	High	3	Flooding			✓
Monticello 2023.1	Safe Rooms and Storm Shelters	Monticello	High	3	Tornado and Severe Storm	✓		
Monticello 2023.2	Install/Upgrade Warning Sirens	Monticello	Medium	3	All Hazards	✓		
Monticello 2023.3	Transportation Infrastructure	Monticello	High	1	All Hazards	✓		
Monticello 2023.4	Generators for Shelters	Monticello	High	1	All Hazards	✓		

#	Action	Jurisdiction	Priority	Goals Addressed	Hazards Addressed	Address Current Development	Address Future Development	Continued Compliance with NFIP
Monticello 2023.5	Pursue NFIP Participation	Monticello	High	3	Flooding			✓
CRV 2023.1	Safe Rooms	Canton R-V	High	3	Tornado, Severe Storms, Earthquake	✓		
CRV 2023.2	Upgrade Intercom System	Canton R-V	Medium	3	Tornado, Severe Storms, Earthquake	✓		
CRV 2023.3	Generators	Canton R-V	Medium	1	All Hazards	✓		
LC1 2023.1	Safe Rooms	Lewis County C-1	High	3	Tornado, Severe Storms, Earthquake	✓		
LC1 2023.2	Upgrade Intercom System	Lewis County C-1	Medium	3	Tornado, Severe Storms, Earthquake	✓		
LC1 2023.3	Generators	Lewis County C-1	Medium	1	All Hazards	✓		
	Structure and Infrastructure Projects							
Lewis County 2023.1	Obtain Sufficient Generators for Shelters	Lewis County	High	1	All Hazards	✓		
Lewis County 2023.2	Transportation Infrastructure	Lewis County	High	1	All Hazards	✓		
Lewis County 2023.3	NFIP Participation	Lewis County	High	3	Flooding			✓
Lewis County 2023.4	Install/Upgrade Warning Sirens	Lewis County	Medium	3	All Hazards	✓		
Lewis County 2023.5	Safe Rooms and Storm Shelters	Lewis County	High	3	Tornado, Severe Storms	✓		
Canton 2023.1	NFIP Participation	Canton	High	3	Flooding			✓
Canton 2023.2	Safe Rooms and Strom Shelters	Canton	High	3	Tornado, Severe Storms	✓		
Canton 2023.3	Raising the North Levee	Canton	High	3	Flooding	✓	✓	
Canton 2023.4	Replace Flood Gates of North Levee	Canton	High	3	Flooding	✓	✓	
Canton 2023.5	Anchoring fuel tanks and other storage tanks	Canton	Low	3	All Hazards	✓		

#	Action	Jurisdiction	Priority	Goals Addressed	Hazards Addressed	Address Current Development	Address Future Development	Continued Compliance with NFIP
Canton 2023.6	Transportation Infrastructure	Canton	High	1	All Hazards	✓		
Canton 2023.7	Install/Upgrade Warning Signs	Canton	Medium	3	All Hazards	✓		
Canton 2023.8	Generators for Shelters/City Facilities	Canton	High	1	All Hazards	✓		
Ewing 2023.1	Generators for Shelters	Ewing	High	1	All Hazards	✓		
Ewing 2023.2	Install/Upgrade Warning Sirens	Ewing	Medium	3	All Hazards	✓		
Ewing 2023.3	Transportation Infrastructure	Ewing	High	1	All Hazards	✓		
Ewing 2023.4	Safe Rooms and Storm Shelters	Ewing	High	3	Tornado, Severe Storm	✓		
Ewing 2023.5	Pursue NFIP Participation	Ewing	High	3	Flooding			✓
Labelle 2023.1	Safe Rooms and Storm Shelters	LaBelle	High	3	Tornado, Severe Storms	✓		
LaBelle 2023.2	Install/Upgrade Warning Signs	LaBelle	Medium	3	All Hazards	✓		
LaBelle 2023.3	Transportation Infrastructure	LaBelle	High	1	All Hazards	✓		
LaBelle 2023.4	Generators for Shelters	LaBelle	High	1	All Hazards	✓		
LaBelle 2023.5	Pursue NFIP Participation	LaBelle	High	3	Flooding			✓
LaGrange 2023.1	NFIP Participation	LaGrange	High	3	Flooding			✓
LaGrange 2023.2	Generators for Shelters	LaGrange	High	1	All Hazards	✓		
LaGrange 2023.3	Safe Rooms and Storm Shelters	LaGrange	High	3	Tornado, Severe Storm	✓		
LaGrange 2023.4	Install/Upgrade Warning Sirens	LaGrange	Medium	3	All Hazards	✓		
LaGrange 2023.5	Transportation Infrastructure	LaGrange	High	1	All Hazards	✓		
LaGrange 2023.6	Anchoring Fuel Tank and other Storage Tanks	LaGrange	Low	3	All Hazards	✓		
Lewistown 2023.1	Safe Rooms and Storm Shelters	Lewistown	High	3	Tornado and Severe Storm	✓		
Lewistown 2023.2	Installation/Upgrade Warning Sirens	Lewistown	Medium	3	All Hazards	✓		
Lewistown 2023.3	Transportation Infrastructure	Lewistown	High	1	All Hazards	✓		

#	Action	Jurisdiction	Priority	Goals Addressed	Hazards Addressed	Address Current Development	Address Future Development	Continued Compliance with NFIP
Lewistown 2023.4	Generators for Shelters	Lewistown	High	1	All Hazards	✓		
Lewistown 2023.5	Pursue NFIP Participation	Lewistown	High	3	Flooding			✓
Monticello 2023.1	Safe Rooms and Storm Shelters	Monticello	High	3	Tornado and Severe Storm	✓		
Monticello 2023.2	Install/Upgrade Warning Sirens	Monticello	Medium	3	All Hazards	✓		
Monticello 2023.3	Transportation Infrastructure	Monticello	High	1	All Hazards	✓		
Monticello 2023.4	Generators for Shelters	Monticello	High	1	All Hazards	✓		
Monticello 2023.5	Pursue NFIP Participation	Monticello	High	3	Flooding			✓
CRV 2023.1	Safe Rooms	Canton R-V	High	3	Tornado, Severe Storms, Earthquake	✓		
CRV 2023.2	Upgrade Intercom System	Canton R-V	Medium	3	Tornado, Severe Storms, Earthquake	✓		
CRV 2023.3	Generators	Canton R-V	Medium	1	All Hazards	✓		
LC1 2023.1	Safe Rooms	Lewis County C-1	High	3	Tornado, Severe Storms, Earthquake	✓		
LC1 2023.2	Upgrade Intercom System	Lewis County C-1	Medium	3	Tornado, Severe Storms, Earthquake	✓		
LC1 2023.3	Generators	Lewis County C-1	Medium	1	All Hazards	✓		
	Natural Systems Protection							
Lewis County 2023.3	NFIP Participation	Lewis County	High	3	Flooding			✓
Canton 2023.1	NFIP Participation	Canton	High	3	Flooding			✓
Ewing 2023.5	Pursue NFIP Participation	Ewing	High	3	Flooding			✓
LaGrange 2023.1	NFIP Participation	LaGrange	High	3	Flooding			✓
LaBelle 2023.5	Pursue NFIP Participation	LaBelle	High	3	Flooding			✓
Lewistown 2023.5	Pursue NFIP Participation	Lewistown	High	3	Flooding			✓

#	Action	Jurisdiction	Priority	Goals Addressed	Hazards Addressed	Address Current Development	Address Future Development	Continued Compliance with NFIP
Monticello 2023.5	Pursue NFIP Participation	Monticello	High	3	Flooding			✓
	Emergency Services							
Lewis County 2023.1	Obtain Sufficient Generators for Shelters	Lewis County	High	1	All Hazards	✓		
Lewis County 2023.3	NFIP Participation	Lewis County	High	3	Flooding			✓
Lewis County 2023.4	Install/Upgrade Warning Sirens	Lewis County	Medium	3	All Hazards	✓		
Lewis County 2023.5	Safe Rooms and Storm Shelters	Lewis County	High	3	Tornado, Severe Storms	✓		
Canton 2023.1	NFIP Participation	Canton	High	3	Flooding			✓
Canton 2023.2	Safe Rooms and Strom Shelters	Canton	High	3	Tornado, Severe Storms	✓		
Canton 2023.3	Raising the North Levee	Canton	High	3	Flooding	✓	✓	
Canton 2023.4	Replace Flood Gates of North Levee	Canton	High	3	Flooding	✓	✓	
Canton 2023.7	Install/Upgrade Warning Signs	Canton	Medium	3	All Hazards	✓		
Canton 2023.8	Generators for Shelters/City Facilities	Canton	High	1	All Hazards	✓		
Ewing 2023.1	Generators for Shelters	Ewing	High	1	All Hazards	✓		
Ewing 2023.2	Install/Upgrade Warning Sirens	Ewing	Medium	3	All Hazards	✓		
Ewing 2023.4	Safe Rooms and Storm Shelters	Ewing	High	3	Tornado, Severe Storm	✓		
Ewing 2023.5	Pursue NFIP Participation	Ewing	High	3	Flooding			✓
Labelle 2023.1	Safe Rooms and Storm Shelters	LaBelle	High	3	Tornado, Severe Storms	✓		
LaBelle 2023.2	Install/Upgrade Warning Signs	LaBelle	Medium	3	All Hazards	✓		
LaBelle 2023.4	Generators for Shelters	LaBelle	High	1	All Hazards	✓		
LaBelle 2023.5	Pursue NFIP Participation	LaBelle	High	3	Flooding			✓
LaGrange 2023.1	NFIP Participation	LaGrange	High	3	Flooding			✓

#	Action	Jurisdiction	Priority	Goals Addressed	Hazards Addressed	Address Current Development	Address Future Development	Continued Compliance with NFIP
LaGrange 2023.2	Generators for Shelters	LaGrange	High	1	All Hazards	✓		
LaGrange 2023.3	Safe Rooms and Storm Shelters	LaGrange	High	3	Tornado, Severe Storm	✓		
LaGrange 2023.4	Install/Upgrade Warning Sirens	LaGrange	Medium	3	All Hazards	✓		
Lewistown 2023.1	Safe Rooms and Storm Shelters	Lewistown	High	3	Tornado and Severe Storm	✓		
Lewistown 2023.2	Installation/Upgrade Warning Sirens	Lewistown	Medium	3	All Hazards	✓		
Lewistown 2023.4	Generators for Shelters	Lewistown	High	1	All Hazards	✓		
Lewistown 2023.5	Pursue NFIP Participation	Lewistown	High	3	Flooding			✓
Monticello 2023.1	Safe Rooms and Storm Shelters	Monticello	High	3	Tornado and Severe Storm	✓		
Monticello 2023.2	Install/Upgrade Warning Sirens	Monticello	Medium	3	All Hazards	✓		
Monticello 2023.4	Generators for Shelters	Monticello	High	1	All Hazards	✓		
Monticello 2023.5	Pursue NFIP Participation	Monticello	High	3	Flooding			✓
CRV 2023.1	Safe Rooms	Canton R-V	High	3	Tornado, Severe Storms, Earthquake	✓		
CRV 2023.2	Upgrade Intercom System	Canton R-V	Medium	3	Tornado, Severe Storms, Earthquake	✓		
CRV 2023.3	Generators	Canton R-V	Medium	1	All Hazards	✓		
LC1 2023.1	Safe Rooms	Lewis County C-1	High	3	Tornado, Severe Storms, Earthquake	✓		
LC1 2023.2	Upgrade Intercom System	Lewis County C-1	Medium	3	Tornado, Severe Storms, Earthquake	✓		
LC1 2023.3	Generators	Lewis County C-1	Medium	1	All Hazards	✓		
	Education and Outreach							
Lewis County 2023.3	NFIP Participation	Lewis County	High	3	Flooding			✓
Ewing 2023.5	Pursue NFIP Participation	Ewing	High	3	Flooding			✓

#	Action	Jurisdiction	Priority	Goals Addressed	Hazards Addressed	Address Current Development	Address Future Development	Continued Compliance with NFIP
Canton 2023.1	NFIP Participation	Canton	High	3	Flooding			✓
LaGrange 2023.1	NFIP Participation	LaGrange	High	3	Flooding			✓
LaBelle 2023.5	Pursue NFIP Participation	LaBelle	High	3	Flooding			✓
Monticello 2023.5	Pursue NFIP Participation	Monticello	High	3	Flooding			✓
CRV 2023.2	Upgrade Intercom System	Canton R-V	Medium	3	Tornado, Severe Storms, Earthquake	✓		
LC1 2023.2	Upgrade Intercom System	Lewis County C-1	Medium	3	Tornado, Severe Storms, Earthquake	✓		

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

- The participating jurisdictions adopted the plan as a Prerequisite for mitigation grant eligibility.
- Robert T. Stafford Disaster Relief and Emergency Act (Public Law 93-288) as amended by the Disaster Mitigation Act of 2000 (Public Law 106-390) and the implementing regulations set forth by the Interim Final Rule published in the *Federal Register* on February 26, 2002, (44 CFR §201.6) and finalized on October 31, 2007.
- FEMA's Local Mitigatin Planning Handbook, March 2013 and FEMA's Local Mitigation Plan Review Guide, October 1, 2011.

1.2 BACKGROUND AND SCOPE

This plan is a 5-year update of a plan that was approved on October 25, 2018. The plan and update was prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 to result in the eligibility for the Federal Emergency Management Agency (FEMA) Hazard Mitigation Assistance Grant programs.

- Following is a list of participants in both the previous plan as well as the current update; County of Lewis, Canton, LaGrange, LaBelle, Lewistown, Ewing, Monticello, Lewis County C-1 and Canton R-V School Districts.

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

1.3 PLAN ORGANIZATION

Set forth the outline of the plan. If there are changes in the format from the previously approved plan, explain what they are and why the changes were made.

- 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

Insert table **(Table 1.1)** showing each chapter and summarizing 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	Noted new GIS capabilities for participating jurisdictions.
Chapter 3 - Risk Assessment	Combined extreme heat and extreme cold into one hazard: extreme temperatures.
Chapter 4 - Mitigation Strategy	The mitigation category of each action was added to the action worksheets.
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.

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

- Assist in establishing a Mitigation Planning Committee (MPC) as defined by the Disaster

Mitigation Act (DMA),

- Ensure the updated plan meets the DMA requirements as established by federal regulations and follows the most current planning guidance of the Federal Emergency Management Agency (FEMA),
- Facilitate the entire plan development process,
- Identify the data that MPC participants could provide and conduct the research and documentation necessary to augment that data,
- Assist in soliciting public input,
- Produce the draft and final plan update in a FEMA-approvable document and coordinate the Missouri State Emergency Management Agency (SEMA) and (FEMA) plan reviews.

Table 1.2. Jurisdictional Representatives of Lewis County Mitigation Planning Committee

Name		Title	Department	Jurisdiction/Agency/Organizatio
John	French	Superintendent		Lewis County C-3 School District
Jesse	Uhlmeyer	Superintendent		Canton R-V School District
Wayne	Murphy	Presiding Commissioner	Commission	Lewis County
Travis	Fleer	Southern District Commissioner	Commission	Lewis County
Deann	Whiston	Northern District Commissioner	Commission	Lewis County
Wendy	Lewis	City Clerk		City of La Belle
John	Roach	City Administrator		City of La Grange
Vancell	Scifres	Mayor		City of Monticello
Mary	Fretwell	City Administrator		City of Canton
Jarrod	Phillips	Mayor		City of Canton
Cheryl	Thrower	City Clerk		City of Ewing
Shirley	Hetzler	City Clerk		City of Lewistown

Table 1.3 demonstrates each member's expertise in the six mitigation categories (Prevention, Property Protection, Structural Flood Control Projects, Natural Resource Protection, Public Information, and Emergency Services).

Table 1.3. MPC Capability with Six Mitigation Categories

Community Department/Office	Preventive Measures	Structure and Infrastructure Projects		Natural Resource Protection	Public Information	Emergency Services
		Property Protection	Structural Flood Control Projects			
County Commission	✓	✓	✓	✓	✓	✓
City Clerk					✓	
School Administrator	✓	✓				
City Administrator	✓	✓	✓	✓	✓	✓

1.4.1 Multi-Jurisdictional Participation

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

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

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

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

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

The importance of active public participation in such an endeavor is obvious but can be difficult to obtain reality. No where's difficulty is more apparent than in small rural communities like those in Northeast Missouri. The jurisdictions listed in Table 1.4 participated in all elements of the planning process.

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

Local government jurisdictions, school districts and special districts are required to participate in the planning process and formally adopt the plan. The County of Lewis, Canton, LaGrange, LaBelle, Lewistown, Ewing, Monticello, Lewis County C-3 School District, and Canton R-V School District participated in the plan update by meeting minimal requirements as described in the next paragraph. Each participating jurisdiction has formally adopted the mitigation plan.

Minimum participation requirements included:

- Designation of a representative to serve on the MPC
- Provision of sufficient information to support plan development by completion and return of Data Collection Questionnaires and validating/correcting critical facility inventories.
- When applicable provide progress reports on mitigation actions from previously approved plan and identify additional mitigation actions plan.
- Eliminate from further consideration those actions from the previously approved plan that were not implemented because they were impractical, inappropriate, not cost-effective, or

were otherwise not feasible.

- Review and comment on plan drafts
- Formally adopt the mitigation plan prior to submittal to SEMA and FEMA for final approval.

Table 1.4. Jurisdictional Participation in Planning Process

Jurisdiction	Planning Meeting	Data Collection Questionnaire Response	Update/Develop Mitigation Actions
Lewis County	✓	✓	✓
City of Canton	✓	✓	✓
City of LaGrange	✓	✓	✓
City of LaBelle	✓	✓	✓
City of Lewistown	✓	✓	✓
City of Ewing	✓	✓	✓
City of Monticello	✓	✓	✓
Lewis County C-3 School Dist.	✓	✓	✓
Canton R-V School District	✓	✓	✓

1.4.2 The Planning Steps

- Cite the sources for the plan update framework and development process using FEMA's *Local Mitigation Planning Handbook (March 2013), Local Mitigation Plan Review Guide (October 1, 2011),* and *Integrating Hazard Mitigation Into Local Planning: Case Studies and Tools for Community Officials (March 1, 2013).* Note, the planning "How To" guides developed prior to 2012 are no longer current.
- Describe how development of the plan followed the 10-step planning process adapted from FEMA's Community Rating System (CRS) and Flood Mitigation Assistance programs. Explain that the 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, under the Community Rating System. Insert the following table showing 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)

Include narrative in the plan similar to that outlined below. It should include information about what happened at the MPC level during the ten steps and the nine tasks outlined above.

Step 1: Organize the Planning Team
(Handbook Tasks 1, 2, and 4)

Table 1.6. Schedule of MPC Meetings

Meeting	Topic	Date
Informational Meeting	Communicated directly with Lewis County Commission and local jurisdictions to discuss the planning process and importance of participation	June - July 2022
Planning Participation	Every local jurisdiction was contacted by email and phone calls to discuss the planning process and importance of participation	July - October 2022
Planning Meeting	Purpose, process, planning area, building the team and stakeholders, participation requirements, public outreach, data collection questionnaires, discussion of hazards, risk assessment, determine/update goals and actions, review of the draft plan, discussion of plan update process, plan maintenance, discussion of adoption resolutions	November - April 2022

In June 2022, NEMO RPC staff met with the Lewis County Commissioners to begin the planning process. From July through October planning meetings were held for the Lewis County Plan Update. Local jurisdictions were notified by e-mail and letter of the planning meeting and they were scheduled with each jurisdiction. The agenda for the individual planning meetings is included in Appendix B as well as the minutes for the planning meetings.

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 Planning Meeting agenda is included in Appendix B which includes discussion, minutes, participation sheet and copies of the handouts. As stated in the minutes, the participants felt a survey tool would not be effective and chose to solicit public involvement at the local level as they would be key contacts for obtaining public comment. Public notice was also posted on the NEMO RPC website, and a notice was posted at the Lewis County Courthouse.

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

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

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

The Lewis County stakeholders were invited to attend the Planning Meeting, review the updated plan, and provide their input. Stakeholders invited to participate include police departments, fire departments, economic developer, water districts, and Missouri Department of Transportation. Neighboring communities were informed of the Lewis County plan update and were invited to attend or offer input to the plan as necessary. No comments were received from the stakeholders during the planning process.

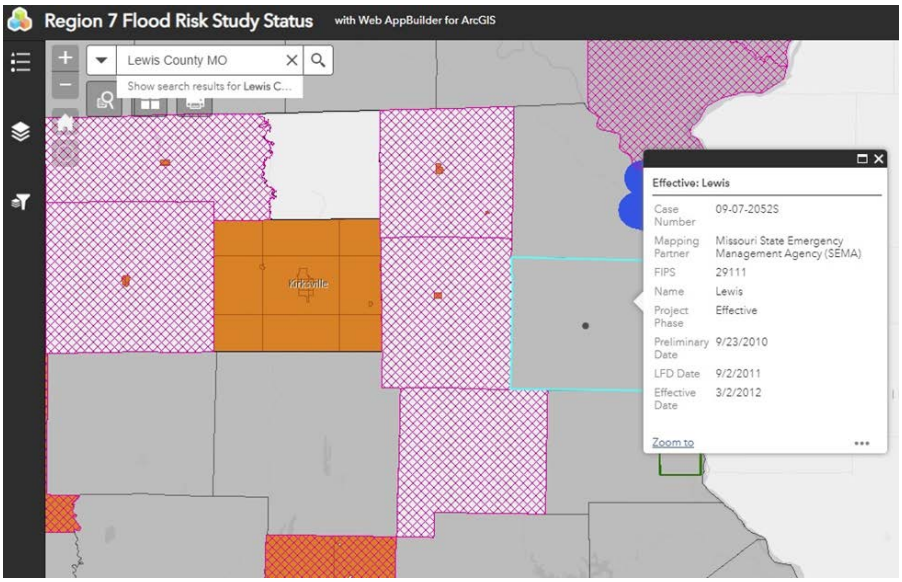
Coordination with FEMA Risk MAP Project

- Lewis County participates in NFIP, as does the Cities of Canton and LaGrange

- Risk MAP provides high quality flood maps and information to better assess the risk of flooding and improve flood mitigation planning. Each Risk MAP flood risk project is tailored to the needs of each community and may involve different products and services.
- There are many different flood risk projects underway in communities across the country, though none seem to be currently active in Lewis County.

Figure 1.1. RiskMAP Study Status Map

Figure 1.2.



Integration of Other Data, Reports, Studies, and Plans

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

Examples of information that was incorporated into the plan include:

- FEMA FIRM maps
- DNR dam inspection reports
- SEMA's Arc GIS helped with mapping for hazards
- 2018 State Hazard Mitigation Plan- building counts and content exposure
- American Factfinder and 2019 American Community survey, demography.

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

Participating jurisdictions was asked to review the following and provide comment on them:

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

The information obtained from the jurisdictions can be reviewed in Section 4 of this document. Data Collection Questionnaires were disseminated to jurisdictions in attendance. Participants were requested to review and complete the questionnaires.

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

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

All loss estimates could not be provided due to lack of information provided by participating Jurisdictions. Value of building in the community was obtained and is provided in the plan.

Step 6: Set Goals
(Handbook Task 6)

The MPC reviewed the goals from the previously approved plan at the Lewis County Multi-Jurisdictional Plan Update Planning Meeting updated and accepted the following goals:

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

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

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

The above goals are also referenced in Chapter 4.

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

Participating jurisdictions were asked to review the mitigation strategy from the previously approved plan and note changes and update strategies to their individual jurisdictions. Committee members were requested to address progress (or lack thereof) on previously

identified actions in the previously approved plan. MPC members were encouraged to continue forward only those actions that substantively address long-term mitigation solutions to the risk identified in the risk assessment.

There were minimal changes to any of the risk assessment in the plan. The MPC used the STAPLEE method to analyze and prioritize proposed actions. Members were provided a copy of the FEMA publication Mitigation Ideas – A Resource for Reducing Risk to Natural Hazard at the Planning meeting.

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)

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

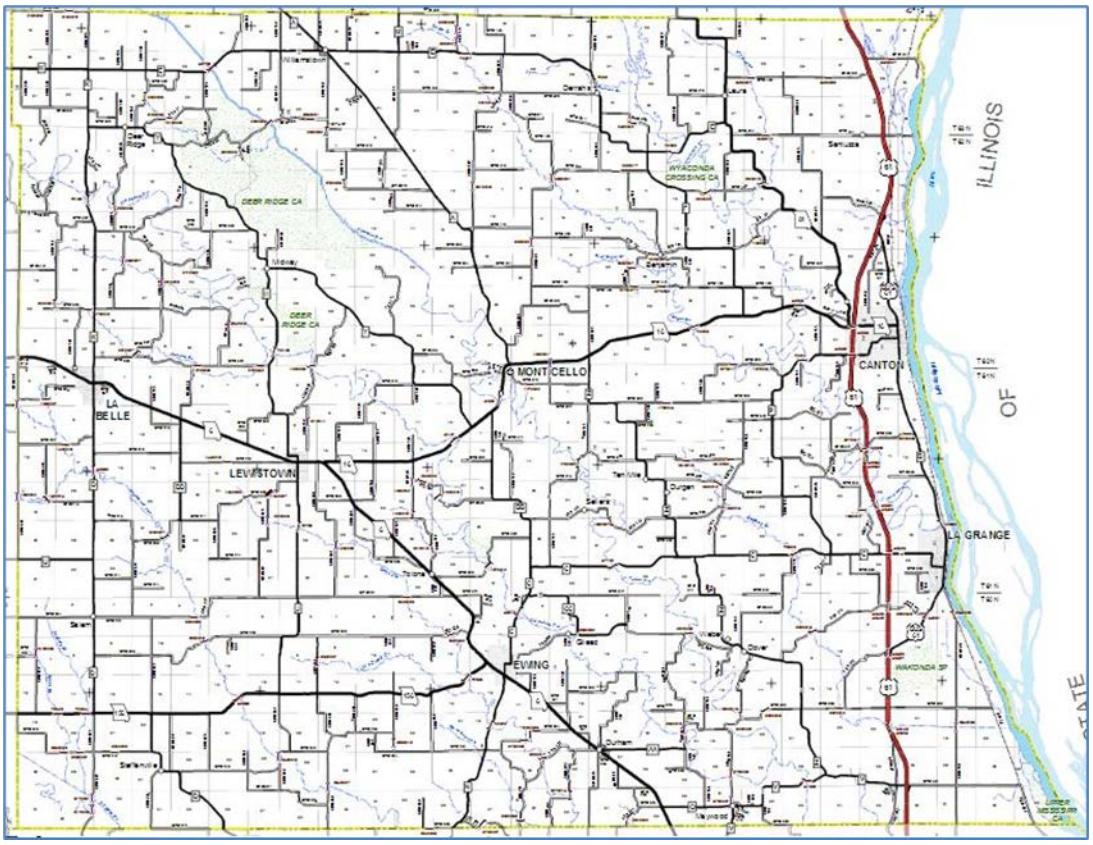
Step 10: Implement, Evaluate, and Revise the Plan
(Handbook Tasks 7 & 9)

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

2 PLANNING AREA PROFILE AND CAPABILITIES

2.1 LEWIS COUNTY PLANNING AREA PROFILE

Figure 2.1. Lewis County



2.1.1 Geography, Geology and Topography

Lewis county has a total area of 511 square miles, of which 505 square miles is land and 5.8 square miles is water. The County includes several major physiographic regions. Along the eastern border of the Missouri River lie Alluvial floodplains, adjacent to which are heavily timbered, strongly sloping hills. The rest of the county is dissected from northwest to southeast by several streams and their accompanying floodplains which, like the Missouri River Floodplain, are surrounded by strongly sloping forested hills. Between those you find broad ridges with gently sloping prairie. Elevations range from 470 feet above flood plain along the Missouri River to 670 feet in the west central part of the County.

There are differences in risk and vulnerability associated with these different areas -Examples of hazards that vary with physiographic region include dam failure, flash flood, grass or wildland fire, levee failure, river flood, flash flood, and sinkholes/land subsidence. These differences will be discussed in greater detail in the vulnerability sections of each hazard in the risk assessment (Section 3).

2.1.2 Climate

The consistent pattern of climate in Lewis County is one of cold winters and long, hot summers. Heavy rains occur mainly in the spring and early summer when moist air from the Gulf of Mexico interacts with drier continental air. The amount of annual rainfall is normally adequate for corn, soybeans, and all the grain crops commonly grown in the county.

Winters: In winter, the average temperature is 28 degrees, and the average daily minimum temperature is 19. The lowest temperature on record is -20, which occurred on February 9th, 1979. The average snowfall is about 27 inches. The greatest snow depth of any one was 20 inches. On average, 24 days of the year have at least 1 inch of snow on the ground, but this number fluctuates wildly from year to year. The sun shines about 50% of the time possible.

Summers: In summer, the average temperature is 74 degrees, and the average daily maximum temperature is 86 degrees. The highest recorded temperature is 111 degrees, which occurred on July 14, 1954. The average relative humidity in midafternoon is about 60 percent. It is higher at night, and the average at dawn is about 85 percent. The sun shines 65 percent of the time possible.

Precipitation: The total annual precipitation is 35.57 inches. Of this, nearly 24 inches (65%) usually falls between April and September and the growing season of most crops falls within this period. In 2 years out of 10, rainfall is less than 18 inches. The heaviest 1-day rainfall event was 5.38 inches that fell on August 5, 1970.

Wind: The prevailing wind is from the south. Average wind speed is highest (12 mph) in spring.

Thunderstorms and Tornadoes: Thunderstorms occur on about 45 days each year. Tornadoes and severe thunderstorms occur occasionally but are local in extent and of short duration, causing varying amounts of damage in small areas. Hailstorms occur in scattered small areas at times during the warmer part of the year.

2.1.3 Population/Demographics

Table 2.1 provides the populations for each city, village, and the unincorporated county for 2000, 2010, and latest population estimates or American Community Survey with the number and percentage change. The unincorporated area population can be estimated by subtracting the populations of the incorporated areas from the overall county population.

Table 2.1. Lewis County Population 2000-2010 by Jurisdiction

Jurisdiction	Total Population 2010	Total Population 2020	2010-2020 # Change	2010-2020 % Change
Lewis County	10,211	10,032	-179	-1.75%
Canton	2377	2,774	397	16.7%
Ewing	456	406	-50	-10.96%
La Belle	660	631	31	4.69%
La Grange	931	892	-39	-4.18%
Lewistown	546	522	-24	-4.39%
Monticello	98	104	6	6.12%

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

According to 2020 Census data 5.6% of the County's population was under the age of 5 (563). This percentage aligns closely with the Nation at 5.7% and the State at 5.8%. Lewis County has a population of 1,932 (19.2%) residents who are over the age of 65. At the National level 16.9% of residents are 65 and over, while 17.6% of Missourians are over the age of 65. The median age of residents in the County is 40.9 with the highest percentage of residents falling between the ages of 45-54. The median age of residents of the US is 38.1 with 38.7 being the median age of residents in the State. There are 4,544 total housing units in the County. The average household size is 2.0 compared to that of the Nation at 2.52 and the State at 2.66. Racial makeup of the County is predominately white (93%) with 1.1% of the population being of Hispanic descent.

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

According to the SoVI Score for Lewis County, they have a medium social vulnerability to environmental hazards.

Figure 2.2 Social Vulnerability to Environmental Hazards

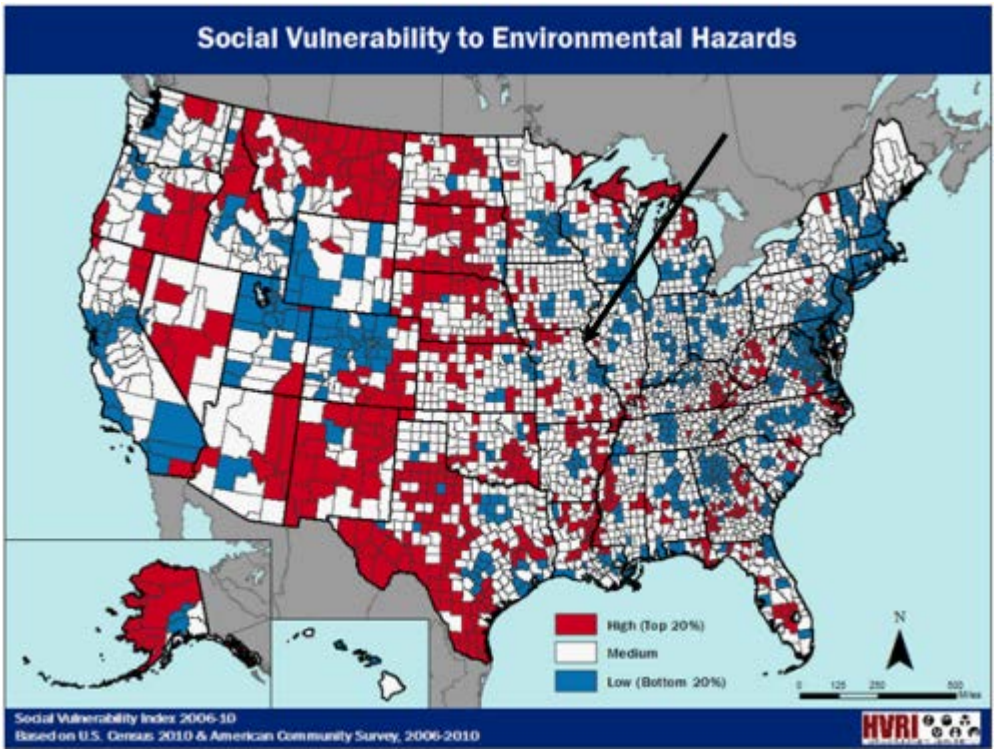


Table 2.2. Unemployment, Poverty, Education, and Language Percentage Demographics, Lewis County, Missouri

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
Lewis County	4,486	6.9%	9.1%	29.6%	8.3%	1.5%
Canton	1,273	12.5%	11.3%	26.0%	8.1%	2.8%
Ewing	152	3.9%	3.0%	25.2%	5.4%	0%
LaBelle	256	6.25%	25.4%	34.7%	9.0%	0%
LaGrange	430	2%	8.7%	36.0%	5.7%	0%
Lewistown	320	9.3%	15.5%	40.4%	11.4%	0%
Monticello	108	.9%	0%	43.2%	5.7%	1%
Nation	168,246,346	6.3%	13.2%	80.4%	31.7%	21.7%
Missouri	3,108,366	4.6%	13.5%	82.0%	29.08%	6%

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

2.1.4 History

Lewis County

The first settlers in Lewis County were the Native Americans and their ancestors. At the time of European exploration, the Fox and Sac Tribes favored the area as a hunting ground. The French claimed the areas in 1712 and then ceded it to Spain in 1762, who gave it back in 1801 to the French, who then sold it to the United States in 1802 as part of the Louisiana Purchase.

Originally the US Government signed treaties with the Sac, and Fox Tribes designating a wide area-including what would one day become Lewis County – as “Indian Territory”. However, by 1840 the Tribes had been removed to reservations and the area was opened to settlement.

The first permanent European settlement in the County was established in 1819, as settlers from Kentucky and Virginia built along the Missouri river near present day LaGrange. As more settlers arrived and began to move away from the river and toward the interior of the County, farming became the economic base; corn, winter wheat, and livestock were the predominate sources of income for settlers in the region.

As the local economy grew and stabilized, churches and schools were built, and a county government was formed. The county was named in honor of Captain Meriwether Lewis (of the Corps of Discovery Expedition). Established in 1833, it included not only what is now Lewis County, but also Clark, Knox, and Scotland Counties, an area with a population of roughly 600. The present boundaries (Fig 2.1) were established in 1845. In 1859 the population of the County was a little over six thousand people, but by 1900 it had risen to more than sixteen thousand. The population had declined to just over eleven thousand in 1940 and has hovered around the ten thousand mark for the last three decades.

Canton: The city of Canton predates the surrounding Lewis County by three years, having been founded in 1830, but the town was not officially incorporated until 1851.

Originally Canton struggled to grow in the shadow of Tully - founded in 1834 on the banks of the Mississippi river just a mile to the north – which had a slightly better area for steamboats to anchor. Tully slowed Canton's growth for the first two decades of its existence until it was destroyed by a devastating flood in 1851. Canton, close to the river but on higher ground, survived the flood relatively intact and subsequently experienced rapid growth - by 1860 it had a population of over 2,000 people.

In an era where railroads were still few and river traffic was the primary method of transporting large amounts of cargo long distances, Canton became a major trading and shipping point for towns and counties on the northeast Missouri interior. A stage line ran from Canton as far west as Kirksville, some eighty miles distant, prior to the Civil War when strategic river port town became a hotly contested prize between US and Confederate forces. Federal troops occupied Canton in July 1861 to quell recent unrest and quash recruiting by Confederate forces and pro-confederate guerrillas.

Another key event in Canton's history came about in 1853 with the founding of "Christian University", now known as Culver-Stockton College. Though shut down for a short interval during the Civil War, the college reopened in 1865 and has been a foundation of the community since many of its buildings are listed on the National Register of Historic Places.

Canton continued its role as gateway to northeast Missouri, with several industries catering to those needs. Pork processing had begun in the 1840s, with thousands of hogs being slaughtered by the

late 1870s. Iron plows, wagons, a patented hand corn planter, and buttons—using mussel shells from the nearby river—were some of the diverse items manufactured in Canton in the 19th century.

The fledgling rail service that existed in antebellum times was disrupted during the Civil War but was restored in 1871 with the arrival of the St. Louis, Keokuk & Northwestern Railroad.

While the Mississippi river has been the lifeblood of the town (and the County), it has also been Canton's nemesis throughout the years. Major flooding has occurred many times, some of the more notable - in addition to the 1851 flood - were in 1929, 1973, 1993 and 2008. The 1929 flood was caused by a levee break. Within an hour of the break two square miles of the town and surrounding countryside were underwater, including more than 200 homes and the Canton school building but no lives were lost.

Tornadoes have also been unkind to Canton. Several smaller ones have touched down in or very near the town in its history, with most doing little damage. However, a large tornado struck Canton on May 10, 2003, damaging an estimated 100 structures, 40 of them severely, but leaving only four persons injured.

Ewing: A post office called Ewing had been in operation since 1894.The community has the name of William Ewing, a pioneer citizen.

La Belle: The first permanent settlement at La Belle (French for “The Beautiful”) was made in 1857. The city was incorporated in 1872, although it had been a village and stagecoach stop much earlier.

La Grange: La Grange was founded in 1830. In 1858 the Southern Baptists opened the LaGrange Male and Female Seminary. It later became LaGrange College, with a two-year junior college program. In 1928 it moved to Hannibal as Hannibal–LaGrange College (now Hannibal-La Grange University).
Lewistown: The community of Lewiston, named for Lewis County, was platted in 1871 when the railroad was extended to that point. The name was changed to Lewistown in 1897.

Monticello: Monticello, meaning "Little Mountain” was established in 1833, located in a commanding position on the east bluffs of the North Fabius river.

2.1.5 Occupations

Table 2.3. Occupation Statistics, Lewis 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
Lewis County	23.3%	22.6%	18.6%	13.0%	22.5%
Canton	26.4%	35.4%	16.2%	5.5%	16.5%
Ewing	20.0%	20.0%	22.3%	6.9%	30.8%
LaBelle	15.1%	18.3%	23.8%	11.9%	31.0%
LaGrange	11.0%	30.8%	25.4%	10.0%	22.9%
Lewistown	18.5%	17.4%	20.1%	4.6%	39.4%
Monticello	9.1%	11.4%	45.5%	9.1%	25.0%

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

2.1.6 Agriculture

Lewis County's Census of Agriculture was last updated in 2017. According to this data, Lewis County has a total of 636 farms with a total acreage of 213,678. The average farm size is 336 acres which is higher than the state average of 285. The top crops for Lewis County are soybeans with 60,577 acres planted and corn is second with 54,480 acres planted.

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

Table 2.4. FEMA HMA Grants in County from 1993-2022

Disaster Declaration	Project Type	Sub-Grantee	Date Approved	Project Total
DR-0995-0027-R	Acquisition of Private Real Property	LaGrange	4/21/1994	$82,432
DR-1708-0005-R	Acquisition of Private Real Property	LaGrange	7/25/2014	$386,822
DR-0995-0023-R	Acquisition of Private Real Property	Canton	5/6/1994	$71,471
Total				**$540,725**

Source: Federal Emergency Management Agency, 2022

2.1.8 FEMA Public Assistance (PA) Grants in Planning Area

Table 2.5. FEMA PA Grants in County from 1993-2022

Disaster Declaration	Project Type	Project Size	Applicant	Project Total
1403	Severe Ice Storm	Small	Lewis County	$20,826.45
1412	Severe Storm	Small	Lewis County	$125,215.30
1463	Severe Storm	Small/Large	Lewis County	$321,468.10
1773	Severe Storm	Small/Large	Lewis County	$1,443,344.00
1809	Severe Storm	Small	Lewis County	$112,880.60
1847	Severe Storm	Small	Lewis County	$140,806.90
1934	Severe Storm	Small/Large	Lewis County	$152,185.30
1961	Severe Storm	Small	Lewis County	$81,349.67
4130	Severe Storm	Small	Lewis County	$85,847.00
4200	Severe Storm	Small	Lewis County	$111,717.10
4238	Severe Storm	Small	Lewis County	$1,207,090.00
4551	Severe Storm	Large / Small	Lewis County	$877,785.20
4490	Biological	Small	Lewis County	$24,197.91
Total				**$4,704,713.53**

Source: Federal Emergency Management Agency, 2022

2.2 JURISDICTIONAL PROFILES AND MITIGATION CAPABILITIES

2.2.1 Unincorporated Lewis County

The jurisdiction of Lewis County includes all unincorporated areas within the County boundaries. It is a class 3 county (meaning it has an assessed valuation of less than six-hundred million dollars) governed by a County Commission consisting of 3 elected officials; a Presiding, Northern, and Southern Commissioner. They preside over the activities and operations of the County assessor, Circuit clerk, Collector, Coroner, County Clerk, Public Administrator, Prosecuting Attorney, Recorder of Deeds, Road and Bridge Department, Sheriff, Surveyor, Treasurer, and Emergency Management.

Mitigation Initiatives/Capabilities

The county has relatively meager revenue, resulting in lean budgets and limited staff capabilities. The unpopularity of government regulation with the local populace also has resulted in a dearth of zoning regulation in the county. There is no planning or zoning apart from NFIP mandated flood plain regulations. The Emergency Management Director (EMD) presides over a small group of emergency management volunteers, and acts as Chair for its sister group, the Local Emergency Preparedness Commission. The EMD is responsible for disaster prevention, developing and maintaining disaster plans and programs, response and recovery after a disaster, and all other aspects of the County's Emergency Management Program. The EMD also bears the brunt of responsibility for flood plain management.

Table 2.6. Unincorporated Lewis County Mitigation Capabilities

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

Floodplain Ordinance	YES
Subdivision Ordinance	NO
Tree Trimming Ordinance	NO
Nuisance Ordinance	NO
Stormwater Ordinance	NO
Drainage Ordinance	NO
Site Plan Review Requirements	NO
Historic Preservation Ordinance	NO
Landscape Ordinance	NO
Seismic Construction Ordinance	NO
Program	
Zoning/Land Use Restrictions	NO
Codes Building Site/Design	NO
Hazard Awareness Program	NO
National Flood Insurance Program (NFIP)	YES
NFIP Community Rating System (CRS) program	YES
National Weather Service (NWS) Storm Ready	NO
Firewise Community Certification	NO
Building Code Effectiveness Grading (BCEGs)	NO
ISO Fire Rating	9
Capabilities	Status Including Date of Document or Policy
Economic Development Program	YES
Land Use Program	NO
Public Education/Awareness	NO
Property Acquisition	NO
Planning/Zoning Boards	NO
Stream Maintenance Program	NO
Tree Trimming Program	NO
Engineering Studies for Streams (Local/County/Regional)	YES
Mutual Aid Agreements	YES
Studies/Reports/Maps	
Hazard Analysis/Risk Assessment (Local)	YES
Hazard Analysis/Risk Assessment (County)	YES
Flood Insurance Maps	YES
FEMA Flood Insurance Study (Detailed)	YES
Evacuation Route Map	NO
Critical Facilities Inventory	YES
Vulnerable Population Inventory	NO
Land Use Map	NO
Staff/Department	
Building Code Official	NO
Building Inspector	NO
Mapping Specialist (GIS)	NO
Engineer	NO
Development Planner	NO
Public Works Official	NO
Emergency Management Director	NO
NFIP Floodplain Administrator	YES
Emergency Response Team	NO
Hazardous Materials Expert	NO
Local Emergency Planning Committee	NO
County Emergency Management Commission	NO
Sanitation Department	NO

Transportation Department	YES
Economic Development Department	NO
Housing Department	NO
Historic Preservation	NO
Non-Governmental Organizations (NGOs)	
American Red Cross	NO
Salvation Army	NO
Veterans Groups	NO
Local Environmental Organization	NO
Homeowner Associations	NO
Neighborhood Associations	NO
Chamber of Commerce	NO
Community Organizations (Lions, Kiwanis, etc.	NO
Capabilities	Status Including Date of Document or Policy
Local Funding Availability	
Apply for Community Development Block	YES
Fund projects through Capital	YES
Authority to levy taxes for a specific purpose	NO
Fees for water, sewer, gas, or electric services	NO
Impact fees for new development	NO
Ability to incur debt through general obligation bonds	NO
Ability to incur debt through special tax bonds	NO
Ability to incur debt through private activities	NO
Withhold spending in hazard prone areas	NO

Source: Data Collection Questionnaire 2022

2.2.2 Incorporated Cities

Table 2.7. Canton Mitigation Capabilities

Capability	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	NO
Builder's Plan	NO
Capital Improvement Plan	YES
Local Emergency Plan	YES
County Emergency Plan	NO
Local Recovery Plan	NO
County Recovery Plan	NO
Local Mitigation Plan	NO
County Mitigation Plan	YES
Local Mitigation Plan (PDM)	NO
County Mitigation Plan (PDM)	NO
Economic Development Plan	NO
Transportation Plan	NO
Land-use Plan	NO
Flood Mitigation Assistance (FMA) Plan	NO
Watershed Plan	NO
Firewise or other fire mitigation plan	NO
School Mitigation Plan	NO
Critical Facilities Plan (Mitigation/Response/Recovery)	NO
Policies/Ordinance	
Zoning Ordinance	YES
Building Code	YES
Floodplain Ordinance	YES
Subdivision Ordinance	NO
Tree Trimming Ordinance	YES
Nuisance Ordinance	YES
Storm Water Ordinance	NO
Drainage Ordinance	NO
Seismic Construction Ordinance	NO
Capability	
Site Plan Review Requirements	YES
Historic Preservation Ordinance	YES
Landscape Ordinance	NO
Iowa Wetlands and Riparian Areas Conservation Plan	NO
Debris Management Plan	NO
Program	
Zoning/Land Use Restrictions	YES
Codes Building Site/Design	NO
National Flood Insurance Program (NFIP) Participant	YES
NFIP Community Rating System (CRS) Participating Community	YES
Hazard Awareness Program	YES
National Weather Service (NWS) Storm Ready	NO
Building Code Effectiveness Grading (BCEGs)	NO
ISO Fire Rating	NA
Economic Development Program	YES
Land Use Program	NO
Public Education/Awareness	NO
Property Acquisition	NO
Planning/Zoning Boards	NO
Stream Maintenance Program	NO
Tree Trimming Program	YES

Capability	Status Including Date of Document or Policy
Engineering Studies for Streams (Local/County/Regional)	YES
Mutual Aid Agreements	YES
Studies/Reports/Maps	
Hazard Analysis/Risk Assessment (Local)	YES
Hazard Analysis/Risk Assessment (County)	YES
Flood Insurance Maps	YES
FEMA Flood Insurance Study (Detailed)	YES
Evacuation Route Map	NO
Critical Facilities Inventory	YES
Vulnerable Population Inventory	NO
Land Use Map	NO
Staff/Department	
Building Code Official	YES
Building Inspector	YES
Mapping Specialist (GIS)	NO
Engineer	NO
Development Planner	NO
Public Works Official	YES
Emergency Management Coordinator	YES
NFIP Floodplain Administrator	YES
Emergency Response Team	NO
Hazardous Materials Expert	NO
Local Emergency Planning Committee	NO
County Emergency Management Commission	NO
Sanitation Department	NO
Transportation Department	NO
Economic Development Department	NO
Housing Department	NO
Historic Preservation	YES
Non-Governmental Organizations (NGOs)	
American Red Cross	YES
Salvation Army	NO
Veterans Groups	YES
Environmental Organization	NO
Homeowner Associations	NO
Neighborhood Associations	NO
Chamber of Commerce	YES
Community Organizations (Lions, Kiwanis, etc.	YES
Local Funding Availability	
Ability to apply for Community Development Block Grants	YES
Ability to fund projects through Capital Improvements funding	YES
Authority to levy taxes for a specific purpose	YES
Fees for water, sewer, gas, or electric services	YES
Impact fees for new development	NO
Ability to incur debt through general obligation bonds	YES
Ability to incur debt through special tax bonds	YES
Ability to incur debt through private activities	NO
Ability to withhold spending in hazard prone areas	NO

Source: Data Collection Questionnaire, 2022

Table 2.8. City of Ewing Capabilities

Capability	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	NO
Builder's Plan	NO
Capital Improvement Plan	NO
Local Emergency Plan	YES
County Emergency Plan	NO
Local Recovery Plan	NO
County Recovery Plan	NO
Local Mitigation Plan	NO
County Mitigation Plan	YES
Local Mitigation Plan (PDM)	NO
County Mitigation Plan (PDM)	NO
Economic Development Plan	NO
Transportation Plan	NO
Land-use Plan	NO
Flood Mitigation Assistance (FMA) Plan	NO
Watershed Plan	NO
Firewise or other fire mitigation plan	NO
School Mitigation Plan	NO
Critical Facilities Plan (Mitigation/Response/Recovery)	NO
Policies/Ordinance	
Zoning Ordinance	NO
Building Code	NO
Floodplain Ordinance	NO
Subdivision Ordinance	NO
Tree Trimming Ordinance	NO
Nuisance Ordinance	YES
Storm Water Ordinance	NO
Drainage Ordinance	NO
Seismic Construction Ordinance	NO
Capability	
Site Plan Review Requirements	NO
Historic Preservation Ordinance	NO
Landscape Ordinance	NO
Iowa Wetlands and Riparian Areas Conservation Plan	NO
Debris Management Plan	NO
Program	
Zoning/Land Use Restrictions	NO
Codes Building Site/Design	NO
National Flood Insurance Program (NFIP) Participant	NO
NFIP Community Rating System (CRS) Participating Community	NO
Hazard Awareness Program	NO
National Weather Service (NWS) Storm Ready	NO
Building Code Effectiveness Grading (BCEGs)	NO
ISO Fire Rating	5
Economic Development Program	NO
Land Use Program	NO
Public Education/Awareness	NO
Property Acquisition	NO
Planning/Zoning Boards	NO
Stream Maintenance Program	NO
Tree Trimming Program	NO
Engineering Studies for Streams (Local/County/Regional)	NO
Mutual Aid Agreements	YES

Capability	Status Including Date of Document or Policy
Studies/Reports/Maps	
Hazard Analysis/Risk Assessment (Local)	NO
Hazard Analysis/Risk Assessment (County)	NO
Flood Insurance Maps	NO
FEMA Flood Insurance Study (Detailed)	NO
Evacuation Route Map	NO
Critical Facilities Inventory	NO
Vulnerable Population Inventory	NO
Land Use Map	NO
Staff/Department	
Building Code Official	NO
Building Inspector	NO
Mapping Specialist (GIS)	NO
Engineer	NO
Development Planner	NO
Public Works Official	YES
Emergency Management Coordinator	YES
NFIP Floodplain Administrator	NO
Emergency Response Team	YES
Hazardous Materials Expert	NO
Local Emergency Planning Committee	NO
County Emergency Management Commission	YES
Sanitation Department	YES
Transportation Department	NO
Economic Development Department	NO
Housing Department	NO
Historic Preservation	NO
Non-Governmental Organizations (NGOs)	
American Red Cross	NO
Salvation Army	NO
Veterans Groups	NO
Environmental Organization	NO
Homeowner Associations	NO
Neighborhood Associations	NO
Chamber of Commerce	NO
Community Organizations (Lions, Kiwanis, etc.	NO
Local Funding Availability	
Ability to apply for Community Development Block Grants	YES
Ability to fund projects through Capital Improvements funding	YES
Authority to levy taxes for a specific purpose	NO
Fees for water, sewer, gas, or electric services	YES
Impact fees for new development	NO
Ability to incur debt through general obligation bonds	YES
Ability to incur debt through special tax bonds	YES
Ability to incur debt through private activities	NO
Ability to withhold spending in hazard prone areas	NO

Source: Data Collection Questionnaire, 2022

Table 2.9. City of LaBelle Capabilities

Capability	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	NO
Builder's Plan	NO
Capital Improvement Plan	NO
Local Emergency Plan	NO
County Emergency Plan	NO
Local Recovery Plan	NO
County Recovery Plan	NO
Local Mitigation Plan	NO
County Mitigation Plan	YES
Local Mitigation Plan (PDM)	NO
County Mitigation Plan (PDM)	NO
Economic Development Plan	NO
Transportation Plan	NO
Land-use Plan	NO
Flood Mitigation Assistance (FMA) Plan	NO
Watershed Plan	NO
Firewise or other fire mitigation plan	NO
School Mitigation Plan	NO
Critical Facilities Plan (Mitigation/Response/Recovery)	NO
Policies/Ordinance	
Zoning Ordinance	NO
Building Code	NO
Floodplain Ordinance	NO
Subdivision Ordinance	NO
Tree Trimming Ordinance	NO
Nuisance Ordinance	YES
Storm Water Ordinance	NO
Drainage Ordinance	NO
Seismic Construction Ordinance	NO
Capability	
Site Plan Review Requirements	NO
Historic Preservation Ordinance	NO
Landscape Ordinance	NO
Iowa Wetlands and Riparian Areas Conservation Plan	NO
Debris Management Plan	NO
Program	
Zoning/Land Use Restrictions	NO
Codes Building Site/Design	NO
National Flood Insurance Program (NFIP) Participant	NO
NFIP Community Rating System (CRS) Participating Community	NO
Hazard Awareness Program	NO
National Weather Service (NWS) Storm Ready	NO
Building Code Effectiveness Grading (BCEGs)	NO
ISO Fire Rating	NA
Economic Development Program	NO
Land Use Program	NO
Public Education/Awareness	NO
Property Acquisition	NO
Planning/Zoning Boards	NO
Stream Maintenance Program	NO
Tree Trimming Program	NO
Engineering Studies for Streams (Local/County/Regional)	NO
Mutual Aid Agreements	YES

Capability	Status Including Date of Document or Policy
Studies/Reports/Maps	
Hazard Analysis/Risk Assessment (Local)	NO
Hazard Analysis/Risk Assessment (County)	NO
Flood Insurance Maps	NO
FEMA Flood Insurance Study (Detailed)	NO
Evacuation Route Map	NO
Critical Facilities Inventory	NO
Vulnerable Population Inventory	NO
Land Use Map	NO
Staff/Department	
Building Code Official	NO
Building Inspector	YES
Mapping Specialist (GIS)	NO
Engineer	NO
Development Planner	NO
Public Works Official	NO
Emergency Management Coordinator	NO
NFIP Floodplain Administrator	NO
Emergency Response Team	NO
Hazardous Materials Expert	NO
Local Emergency Planning Committee	NO
County Emergency Management Commission	NO
Sanitation Department	NO
Transportation Department	NO
Economic Development Department	NO
Housing Department	NO
Historic Preservation	NO
Non-Governmental Organizations (NGOs)	
American Red Cross	NO
Salvation Army	NO
Veterans Groups	NO
Environmental Organization	NO
Homeowner Associations	NO
Neighborhood Associations	NO
Chamber of Commerce	NO
Community Organizations (Lions, Kiwanis, etc.	NO
Local Funding Availability	
Ability to apply for Community Development Block Grants	YES
Ability to fund projects through Capital Improvements funding	YES
Authority to levy taxes for a specific purpose	YES
Fees for water, sewer, gas, or electric services	YES
Impact fees for new development	NO
Ability to incur debt through general obligation bonds	NO
Ability to incur debt through special tax bonds	NO
Ability to incur debt through private activities	NO
Ability to withhold spending in hazard prone areas	NO

Source: Data Collection Questionnaire, 2022

Table 2.10. City of LaGrange Capabilities

Capability	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	NO
Builder's Plan	NO
Capital Improvement Plan	NO
Local Emergency Plan	NO
County Emergency Plan	NO
Local Recovery Plan	NO
County Recovery Plan	NO
Local Mitigation Plan	NO
County Mitigation Plan	YES
Local Mitigation Plan (PDM)	NO
County Mitigation Plan (PDM)	NO
Economic Development Plan	NO
Transportation Plan	NO
Land-use Plan	NO
Flood Mitigation Assistance (FMA) Plan	NO
Watershed Plan	NO
Firewise or other fire mitigation plan	NO
School Mitigation Plan	NO
Critical Facilities Plan (Mitigation/Response/Recovery)	NO
Policies/Ordinance	
Zoning Ordinance	NO
Building Code	NO
Floodplain Ordinance	YES
Subdivision Ordinance	NO
Tree Trimming Ordinance	NO
Nuisance Ordinance	YES
Storm Water Ordinance	NO
Drainage Ordinance	NO
Seismic Construction Ordinance	NO
Capability	
Site Plan Review Requirements	NO
Historic Preservation Ordinance	NO
Landscape Ordinance	NO
Iowa Wetlands and Riparian Areas Conservation Plan	NO
Debris Management Plan	NO
Program	
Zoning/Land Use Restrictions	NO
Codes Building Site/Design	NO
National Flood Insurance Program (NFIP) Participant	YES
NFIP Community Rating System (CRS) Participating Community	YES
Hazard Awareness Program	NO
National Weather Service (NWS) Storm Ready	NO
Building Code Effectiveness Grading (BCEGs)	NO
ISO Fire Rating	NO
Economic Development Program	NO
Land Use Program	NO
Public Education/Awareness	NO
Property Acquisition	NO
Planning/Zoning Boards	NO
Stream Maintenance Program	NO
Tree Trimming Program	NO
Engineering Studies for Streams (Local/County/Regional)	NO
Mutual Aid Agreements	YES

Capability	Status Including Date of Document or Policy
Studies/Reports/Maps	
Hazard Analysis/Risk Assessment (Local)	NO
Hazard Analysis/Risk Assessment (County)	NO
Flood Insurance Maps	YES
FEMA Flood Insurance Study (Detailed)	NO
Evacuation Route Map	NO
Critical Facilities Inventory	NO
Vulnerable Population Inventory	NO
Land Use Map	NO
Staff/Department	
Building Code Official	NO
Building Inspector	YES
Mapping Specialist (GIS)	NO
Engineer	NO
Development Planner	NO
Public Works Official	NO
Emergency Management Coordinator	YES
NFIP Floodplain Administrator	NO
Emergency Response Team	NO
Hazardous Materials Expert	NO
Local Emergency Planning Committee	NO
County Emergency Management Commission	NO
Sanitation Department	NO
Transportation Department	NO
Economic Development Department	NO
Housing Department	NO
Historic Preservation	YES
Non-Governmental Organizations (NGOs)	
American Red Cross	YES
Salvation Army	NO
Veterans Groups	YES
Environmental Organization	NO
Homeowner Associations	NO
Neighborhood Associations	NO
Chamber of Commerce	NO
Community Organizations (Lions, Kiwanis, etc.	YES
Local Funding Availability	
Ability to apply for Community Development Block Grants	YES
Ability to fund projects through Capital Improvements funding	YES
Authority to levy taxes for a specific purpose	YES
Fees for water, sewer, gas, or electric services	YES
Impact fees for new development	NO
Ability to incur debt through general obligation bonds	YES
Ability to incur debt through special tax bonds	YES
Ability to incur debt through private activities	NO
Ability to withhold spending in hazard prone areas	YES

Source: Data Collection Questionnaire, 2022

Table 2.11. City of Lewistown Capabilities

Capability	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	NO
Builder's Plan	NO
Capital Improvement Plan	NO
Local Emergency Plan	YES
County Emergency Plan	NO
Local Recovery Plan	NO
County Recovery Plan	NO
Local Mitigation Plan	NO
County Mitigation Plan	YES
Local Mitigation Plan (PDM)	NO
County Mitigation Plan (PDM)	NO
Economic Development Plan	NO
Transportation Plan	NO
Land-use Plan	NO
Flood Mitigation Assistance (FMA) Plan	NO
Watershed Plan	NO
Firewise or other fire mitigation plan	NO
School Mitigation Plan	NO
Critical Facilities Plan (Mitigation/Response/Recovery)	NO
Policies/Ordinance	
Zoning Ordinance	NO
Building Code	NO
Floodplain Ordinance	NO
Subdivision Ordinance	NO
Tree Trimming Ordinance	NO
Nuisance Ordinance	YES
Storm Water Ordinance	NO
Drainage Ordinance	NO
Seismic Construction Ordinance	NO
Capability	
Site Plan Review Requirements	NO
Historic Preservation Ordinance	NO
Landscape Ordinance	NO
Iowa Wetlands and Riparian Areas Conservation Plan	NO
Debris Management Plan	NO
Program	
Zoning/Land Use Restrictions	NO
Codes Building Site/Design	NO
National Flood Insurance Program (NFIP) Participant	NO
NFIP Community Rating System (CRS) Participating Community	NO
Hazard Awareness Program	NO
National Weather Service (NWS) Storm Ready	NO
Building Code Effectiveness Grading (BCEGs)	NO
ISO Fire Rating	NO
Economic Development Program	NO
Land Use Program	NO
Public Education/Awareness	NO
Property Acquisition	NO
Planning/Zoning Boards	NO
Stream Maintenance Program	NO
Tree Trimming Program	NO
Engineering Studies for Streams (Local/County/Regional)	NO
Mutual Aid Agreements	YES

Capability	Status Including Date of Document or Policy
Studies/Reports/Maps	
Hazard Analysis/Risk Assessment (Local)	NO
Hazard Analysis/Risk Assessment (County)	NO
Flood Insurance Maps	NO
FEMA Flood Insurance Study (Detailed)	NO
Evacuation Route Map	NO
Critical Facilities Inventory	NO
Vulnerable Population Inventory	NO
Land Use Map	NO
Staff/Department	
Building Code Official	NO
Building Inspector	NO
Mapping Specialist (GIS)	NO
Engineer	NO
Development Planner	NO
Public Works Official	YES
Emergency Management Coordinator	NO
NFIP Floodplain Administrator	NO
Emergency Response Team	NO
Hazardous Materials Expert	NO
Local Emergency Planning Committee	NO
County Emergency Management Commission	NO
Sanitation Department	NO
Transportation Department	NO
Economic Development Department	NO
Housing Department	NO
Historic Preservation	NO
Non-Governmental Organizations (NGOs)	
American Red Cross	NO
Salvation Army	NO
Veterans Groups	YES
Environmental Organization	NO
Homeowner Associations	NO
Neighborhood Associations	NO
Chamber of Commerce	NO
Community Organizations (Lions, Kiwanis, etc.	YES
Local Funding Availability	
Ability to apply for Community Development Block Grants	YES
Ability to fund projects through Capital Improvements funding	YES
Authority to levy taxes for a specific purpose	YES
Fees for water, sewer, gas, or electric services	YES
Impact fees for new development	NO
Ability to incur debt through general obligation bonds	YES
Ability to incur debt through special tax bonds	YES
Ability to incur debt through private activities	NO
Ability to withhold spending in hazard prone areas	NO

Source: Data Collection Questionnaire, 2022

Table 2.12. Village of Monticello Capabilities

Capability	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	NO
Builder's Plan	NO
Capital Improvement Plan	NO
Local Emergency Plan	NO
County Emergency Plan	YES
Local Recovery Plan	NO
County Recovery Plan	NO
Local Mitigation Plan	NO
County Mitigation Plan	YES
Local Mitigation Plan (PDM)	NO
County Mitigation Plan (PDM)	NO
Economic Development Plan	NO
Transportation Plan	NO
Land-use Plan	NO
Flood Mitigation Assistance (FMA) Plan	NO
Watershed Plan	NO
Firewise or other fire mitigation plan	NO
School Mitigation Plan	NO
Critical Facilities Plan (Mitigation/Response/Recovery)	NO
Policies/Ordinance	
Zoning Ordinance	NO
Building Code	NO
Floodplain Ordinance	NO
Subdivision Ordinance	NO
Tree Trimming Ordinance	NO
Nuisance Ordinance	YES
Storm Water Ordinance	NO
Drainage Ordinance	NO
Seismic Construction Ordinance	NO
Capability	
Site Plan Review Requirements	NO
Historic Preservation Ordinance	NO
Landscape Ordinance	NO
Iowa Wetlands and Riparian Areas Conservation Plan	NO
Debris Management Plan	NO
Program	
Zoning/Land Use Restrictions	NO
Codes Building Site/Design	NO
National Flood Insurance Program (NFIP) Participant	NO
NFIP Community Rating System (CRS) Participating Community	NO
Hazard Awareness Program	NO
National Weather Service (NWS) Storm Ready	NO
Building Code Effectiveness Grading (BCEGs)	NO
ISO Fire Rating	8
Economic Development Program	NO
Land Use Program	NO
Public Education/Awareness	NO
Property Acquisition	NO
Planning/Zoning Boards	NO
Stream Maintenance Program	NO
Tree Trimming Program	NO
Engineering Studies for Streams (Local/County/Regional)	NO
Mutual Aid Agreements	YES

Capability	Status Including Date of Document or Policy
Studies/Reports/Maps	
Hazard Analysis/Risk Assessment (Local)	NO
Hazard Analysis/Risk Assessment (County)	NO
Flood Insurance Maps	NO
FEMA Flood Insurance Study (Detailed)	NO
Evacuation Route Map	NO
Critical Facilities Inventory	NO
Vulnerable Population Inventory	NO
Land Use Map	NO
Staff/Department	
Building Code Official	NO
Building Inspector	NO
Mapping Specialist (GIS)	NO
Engineer	NO
Development Planner	NO
Public Works Official	NO
Emergency Management Coordinator	NO
NFIP Floodplain Administrator	NO
Emergency Response Team	NO
Hazardous Materials Expert	NO
Local Emergency Planning Committee	YES
County Emergency Management Commission	NO
Sanitation Department	NO
Transportation Department	NO
Economic Development Department	NO
Housing Department	NO
Historic Preservation	NO
Non-Governmental Organizations (NGOs)	
American Red Cross	YES
Salvation Army	NO
Veterans Groups	NO
Environmental Organization	NO
Homeowner Associations	NO
Neighborhood Associations	NO
Chamber of Commerce	NO
Community Organizations (Lions, Kiwanis, etc.	YES
Local Funding Availability	
Ability to apply for Community Development Block Grants	YES
Ability to fund projects through Capital Improvements funding	YES
Authority to levy taxes for a specific purpose	YES
Fees for water, sewer, gas, or electric services	YES
Impact fees for new development	NO
Ability to incur debt through general obligation bonds	YES
Ability to incur debt through special tax bonds	YES
Ability to incur debt through private activities	NO
Ability to withhold spending in hazard prone areas	NO

Source: Data Questionnaire Date: 2022

2.2.3 Summary of Jurisdictional Capabilities

Table 2.13. Mitigation Capabilities Summary Table

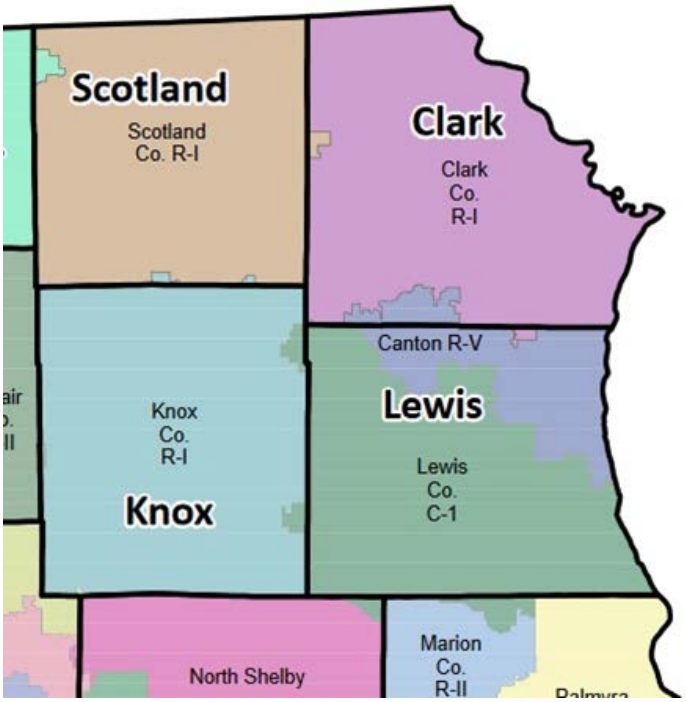
CAPABILITIES	Lewis County	Canton	Ewing	LaBelle	LaGrange	Lewistown	Monticello
Planning Capabilities							
Comprehensive Plan	No	No	No	No	No	No	No
Builder's Plan	No	No	No	No	No	No	No
Capital Improvement Plan	No	Yes	No	No	No	No	No
Local Emergency Plan	No	Yes	No	No	No	No	No
County Emergency Plan	Yes	No	Yes	No	No	Yes	Yes
Local Recovery Plan	No	No	No	No	No	No	No
County Recovery Plan	No	No	No	No	No	No	No
Local Mitigation Plan	No	No	No	No	No	No	No
County Mitigation Plan	Yes	Yes	Yes	Yes	Yes	Yes	Yes
Local Mitigation Plan (PDM)	No	No	No	No	No	No	No
County Mitigation Plan (PDM)	No	No	No	No	No	No	No
Debris Management Plan	No	No	No	No	No	No	No
Economic Development Plan	No	No	No	No	No	No	No
Transportation Plan	No	No	No	No	No	No	No
Land-use Plan	No	No	No	No	No	No	No
Flood Mitigation Assistance (FMA) Plan	No	No	No	No	No	No	No
Watershed Plan	No	No	No	No	No	No	No
Firewise or other fire mitigation plan	No	No	No	No	No	No	No
School Mitigation Plan	No	No	No	No	No	No	No
Critical Facilities Plan (Mitigation/Response/Recovery)	No	No	No	No	No	No	No
Policies/Ordinance							
Zoning Ordinance	No	Yes	No	No	No	No	No
Building Code	No	Yes	No	No	No	No	No
Floodplain Ordinance	Yes	Yes	No	No	Yes	No	No
Subdivision Ordinance	No	No	No	No	No	No	No
Tree Trimming Ordinance	No	Yes	No	No	No	No	No
Nuisance Ordinance	No	Yes	Yes	Yes	No	Yes	No
Storm Water Ordinance	No	No	No	No	No	No	No
Drainage Ordinance	No	No	No	No	No	No	No
Site Plan Review Requirements	No	Yes	No	No	No	No	No
Historic Preservation Ordinance	No	Yes	No	No	No	No	No
Landscape Ordinance	No	No	No	No	No	No	No
Seismic Construction Ordinance	No	No	No	No	No	No	No
Program							
Zoning/Land Use Restrictions	No	Yes	No	No	No	No	No
Codes Building Site/Design	No	No	No	No	No	No	No
National Flood Insurance Program (NFIP) Participant	Yes	Yes	No	No	Yes	No	No
NFIP Community Rating System (CRS) Participating Community	Yes	No	No	No	No	No	No
Hazard Awareness Program	No	Yes	No	No	No	No	No
National Weather Service (NWS) Storm Ready	No	No	No	No	No	No	No
Building Code Effectiveness Grading (BCEGs)	No	No	No	No	No	No	No
ISO Fire Rating	No	Yes/ 5	Yes/5	No	No	No	Yes/8

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

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

Source: Data Collection Questionnaire, 2022

2.2.4 Public School District Profiles and Mitigation Capabilities



Lewis County is serviced by two public school districts: Canton R-V located in the City of Canton and Lewis County C-1, located in the City of Ewing. A very tiny portion of Lewis County is part of Clark County R-1, but no Clark County R-1 infrastructure is in Lewis County.

There are some limitations to the district data for Lewis County C-1, as the enrollment data is for the entire school district and not just the portion located in Lewis County.

Table 2.14. Lewis County School District's Buildings and Enrollment Data, 2022

District Name	Building Name	Building Enrolment
Canton R-V	Canton Elementary	278
Canton R-V	Canton High	223
Lewis County C-1	Highland Elementary	519
Lewis County C-1	Highland Jr.-Sr. High	399

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

Table 2.15. Summary of Mitigation Capabilities- Canton R-V and Lewis County C-1 School Districts

Capability	Canton R-V	Lewis County C-1
Planning Elements		
Master Plan/ Date	Yes (12/12/2022)	Yes (2022)
Capital Improvement Plan/Date	Yes	Yes
School Emergency Plan / Date	Yes	Yes
Weapons Policy/Date	Yes	Yes
Personnel Resources		
Full-Time Building Official (Principal)	Yes	Yes
Emergency Manager	Yes	Yes
Grant Writer	Yes	Yes

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

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.

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

This chapter is divided into four main parts:

- **Section 3.1 Hazard Identification** identifies the hazards that threaten the planning area and provides a factual basis for elimination of hazards from further consideration;
- **Section 3.2 Assets at Risk** provides the planning area's total exposure to natural hazards, considering critical facilities and other community assets at risk;
- **Section 3.3 Land Use and Development** discusses development that has occurred since the last plan update and any increased or decreased risk that resulted. This section also discusses areas of planned future development and any implications on risk/vulnerability;
- **Section 3.4 Hazard Profiles and Vulnerability Analysis** provides more detailed information about the hazards impacting the planning area. For each hazard, there are three sections: 1) Hazard Profile provides a general description and discusses the threat to the planning area, the geographic location at risk, potential Strength/Magnitude/Extent, previous occurrences of hazard events, probability of future occurrence, risk summary by jurisdiction, impact of future development on the risk; 2) Vulnerability Assessment further defines and quantifies populations, buildings, critical facilities, and other community/school or special district assets at risk to natural hazards; and 3) Problem Statement briefly summarizes the problem and develops possible solutions.

3.1 Hazard Identification

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.

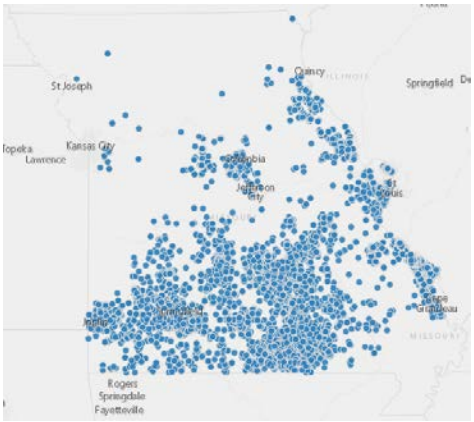
Natural hazards can be complex, occurring with a wide range of intensities. Some events are instantaneous and offer no window of warning, such as earthquakes. Some offer a short warning in which to alert the public to take actions, such as tornadoes or severe thunderstorms. Others occur less frequently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

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

3.1.1 Review of Existing Mitigation Plans

The MPC previously developed a multi-jurisdiction Hazard Mitigation Plan dated 2018 and Lewis County, Canton, Ewing, LaBelle, LaGrange, Lewistown, Monticello, Canton R-V School District, Lewis County C-1 School District participated in the multi-jurisdictional county-wide plan. The 2018 Hazard Mitigation Plan was consulted in development of the risk assessment and information included and updated where appropriate.

Landslides and Land Subsidence/Sinkholes, according to the USGS website, are not likely to occur in Lewis County due to the type of soil and substructure in Northern Missouri. A map composed with data from MoDNR (below) highlights the point.



Sinkholes in Missouri 2018, https://data-msdis.opendata.arcgis.com/datasets/mo-2018-sinkholes/explore?location=38.500734%2C-89.264371%2C6.90

The MPC decided to include only natural hazards and public health risks. The human-caused and technological hazards were eliminated from further analysis due to these hazards are not necessary for plans to meet the requirements of the Disaster Mitigation Act of 2000.

3.1.2 Review Disaster Declaration History

Declarations may be granted when the severity and magnitude of an event surpasses the ability of the local government to respond and recover. Disaster assistance is supplemental and sequential. When the local government's capacity has been surpassed, a state disaster declaration may be issued, allowing for the provision of state assistance. If the disaster is so severe that both the local and state governments' capacities are exceeded; a federal emergency or disaster declaration may be issued allowing for the provision of federal assistance.

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

Table 3.1 Provides the FEMA Disaster Declarations that included Lewis County, Missouri from 1965 to present.

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

Disaster Number	Description	Declaration Date Incident Period	Individual Assistance (IA) Public Assistance (PA)
198	Floods	6/14/1965	NA
372	Heavy Rains, Tornadoes, Flooding	4/19/1973	IA,PA
407	Severe Storms, Flooding	11/1/1973	IA,PA
779	Severe Storms, Flooding	10/14/1986	PA
995	Severe Storms, Flooding	7/9/1993	IA,PA
1054	Severe Storm, Tornadoes, Hail, Flooding	6/2/1995	IA
1412	Severe Storm, Tornadoes & Flooding	5/6/2002	PA
1403	Severe Winter Ice Storm	2/6/2002	IA,PA
1463	Severe Storm, Tornadoes & Flooding	5/6/2003	IA,PA
3232	Hurricane	9/10/2005	NA
3281	Severe Winter Storm	12/12/2007	PA
1773	Severe Storms & Flooding	6/25/2008	IA,PA
1809	Severe Storms, Flooding & Tornado	11/13/2008	IA,PA
1847	Severe Storms, Flooding & Tornado	6/19/2009	PA
3303	Severe Winter Storm	1/30/2009	NA
1934	Severe Storms, Flooding & Tornado	8/17/2010	PA
3325	Flooding	6/30/2011	NA
3317	Severe Winter Storm	2/3/2011	NA

1961	Severe Winter Storm & Snowstorm	3/23/2011	PA
4130	Severe Storms, Straight-Line Winds, Tornado & Flooding	7/18/2013	PA
4200	Severe Storms, Straight-Line Winds, Tornado & Flooding	10/31/2014	PA
4238	Severe Storms, Straight-Line Winds, Tornado & Flooding	8/7/2015	PA
3374	Severe Storms, Straight-Line Winds, Tornado & Flooding	1/2/2016	NA
4451	Severe Storms, Tornadoes & Flooding	7/9/2019	IA,PA
3482	COVID	3/13/2020	NA
4490	COVID-19 Pandemic	3/26/2020	NA

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 (2010, 2013, and 2018)
- Previously approved planning area Hazard Mitigation Plan (2018)
- Federal Emergency Management Agency (FEMA)
- Missouri Department of Natural Resources
- National Drought Mitigation Center Drought Reporter
- US Department of Agriculture's (USDA) Risk Management Agency Crop Insurance Statistics
- National Agricultural Statistics Service (Agriculture production/losses)
- Data Collection Questionnaires completed by each jurisdiction
- State of Missouri GIS data
- Environmental Protection Agency
- Flood Insurance Administration
- Hazards US (Hazus)
- Missouri Department of Transportation
- Missouri Division of Fire Marshal Safety
- Missouri Public Service Commission
- National Fire Incident Reporting System (NFIRS)
- National Oceanic and Atmospheric Administration's (NOAA) National Centers for Environmental Information (NCEI);
- County and local Comprehensive Plans to the extent available
- County Emergency Management
- County Flood Insurance Rate Map, FEMA
- Flood Insurance Study, FEMA
- SILVIS Lab, Department of Forest Ecology and Management, University of Wisconsin
- U.S. Army Corps of Engineers
- U.S. Department of Transportation
- United States Geological Survey (USGS)
- Various articles and publications available on the internet (you should state that you will give citations to the sources in the body of the plan)

Note that the only centralized source of data for many of the weather-related hazards is the National Oceanic and Atmospheric Administration's (NOAA) National Centers for Environmental Information (NCEI). Although it is usually the best and most current source, there are limitations to the data which should be noted. The NCEI documents the occurrence of storms and other significant weather phenomena having sufficient intensity to cause loss of life, injuries, significant property damage, and/or disruption to commerce. In addition, it is a partial record of other significant meteorological events, such as record maximum or minimum temperatures or precipitation that occurs in connection with another event. Some information appearing in the NCEI may be provided by or gathered from sources outside the National Weather Service (NWS), such as the media, law enforcement and/or other government agencies, private companies, individuals, etc. An effort is made to use the best available information but because of time and resource constraints, information from these sources may be unverified by the NWS. Those using information from NCEI should be cautious as the NWS does not guarantee the accuracy or validity of the information.

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

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

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

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

3.1.4 Hazards Identified

The jurisdictions in Lewis County differ in their susceptibilities to certain hazards. The hazards identified were based on the input from the planning team members, available historical data and the hazard modeling results described with the hazard mitigation plans. The jurisdictions and hazards chosen that significantly impact the planning area is listed in alphabetical order in Table 3.2. The chart includes an "x" to indicate the jurisdiction is impacted by the hazard and a "-"indicates the hazard is not applicable to that jurisdiction.

Table 3.2. Hazards Identified for Each Jurisdiction

Jurisdiction	Dam Failure	Drought	Earthquake	Extreme Temperatures	Fire / Wildfire	Flooding (River and Flash)	Levee Failure	Severe Winter Weather	Thunderstorm/Lightning/Hail/ High Wind	Tornado
Lewis County	X	X	X	X	X	X	X	X	X	X
City of Canton	-	X	X	X	-	X	X	X	X	X
City of Ewing	X	X	X	X	-	-	-	X	X	X
City of La Belle	-	X	X	X	-	-	-	X	X	X
City of La Grange	-	X	X	X	-	X	X	X	X	X
City of Lewistown	-	X	X	X	-	-	-	X	X	X
City of Monticello	-	X	X	X	-	-	-	X	X	X
Lewis County C-1 School	-	X	X	X	-	-	-	X	X	X
Canton School District	-	X	X	X	-	X	X	X	X	X

3.1.5 Multi-Jurisdictional Risk Assessment

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

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

3.2 Assets at Risk

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

3.2.1 Total Exposure of Population and Structures

Unincorporated County and Incorporated Cities

In the following three tables, population data is based on 2010 Census Bureau data. Building counts and building exposure values are based on parcel data 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 **Table 3.3**. Land values have been purposely excluded from consideration because land remains following disasters, and subsequent market devaluations are frequently short term and difficult to quantify. Another reason for excluding land values is that state and federal disaster assistance programs generally do not address loss of land (other than crop insurance). It should be noted that the total valuation of buildings is based on county assessors' data which may not be current. In addition, government-owned properties are usually taxed differently or not at all, and so may not be an accurate representation of true value. Note that public school district assets and special districts assets are included in the total exposure tables assets by community and county.

Table 3.3 shows the total population, building count, estimated value of buildings, estimated value of contents and estimated total exposure to parcels for the unincorporated county and each incorporated city. For multi-county communities, the population and building data may include data on assets located outside the planning area. **Table 3.4** that follows provides the building value exposures for the county and each city in the planning area broken down by usage type. Finally, **Table 3.5** provides the building count total for the county and each city in the planning area broken out by building usage types (residential, commercial, industrial, and agricultural).

Table 3.3. Maximum Population and Building Exposure by Jurisdiction

Jurisdiction	2021 Annual Population Estimate	Building Count	Building Exposure ($)	Contents Exposure ($)	Total Exposure ($)
Canton	2,774	2,114	$164,013	$96,296	$260,309
Ewing	406	542	$35,708	$20,111	$55,819
La Belle	664	407	$27,902	$16,381	$44,283
La Grange	825	867	$58,680	$34,105	$92,785
Lewistown	521	332	$23,745	$14,262	$38,007
Monticello	104	200	$8,986	$5,016	$14,002
Lewis County	10,032	16,102	$309,091	$155,601	$464,692
Totals	**10,032**	**20,564**	**$628,153**	**$341,772**	**$969,896**

Source: U.S. Bureau of the Census, Annual population estimates/ 5-Year American Community Survey 2021; 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
Canton	$122,245	$22,144	$7,489	$89	$152,967
Ewing	$30,986	$4,212	$0	$105	$35,303
La Belle	$23,460	$3,645	$535	$59	$27,699
La Grange	$51,643	$3,807	$2,782	$144	$58,376
Lewistown	$19,550	$3,321	$642	$29	$23,542
Monticello	$7,156	$1,134	$0	$135	$8,425
Unincorporated Lewis Co.	$268,173	$13,203	$5,135	$19,409	$305,920
Totals	**$523,213**	**$51,466**	**$16,583**	**$19,970**	**$612,232**

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
Canton	1,657	273	70	56	2,056
Ewing	420	52	0	66	538
La Belle	318	45	5	37	405
La Grange	700	47	26	91	864
Lewistown	265	41	6	18	330
Monticello	97	14	0	85	196
Unincorporated Lewis Co.	3,635	163	48	12,240	16,086
Totals	**7,092**	**635**	**155**	**12,593**	**20,475**

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

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	Total Exposure ($)
Lewis County C-1 School	918	2	$44,901,605
Canton School District	501	2	$86,862,950

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

3.2.2 Critical and Essential Facilities and Infrastructure

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

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

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

- NEMO RPC critical facility inventory

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
Lewis County	X		X	X				X	X		X			X				X						
Canton				X			X	X	X					X	X	X		X				X	X	
Ewing				X			X	X	X					X								X	X	
La Belle				X			X	X	X					X	X							X	X	
La Grange				X			X	X	X					X		X	X	X					X	
Lewistown				X			X	X	X					X	X								X	
Monticello				X				X	X					X									X	
Totals																								

Source: Data Collection Questionnaires, NEMO RPC Inventory List.

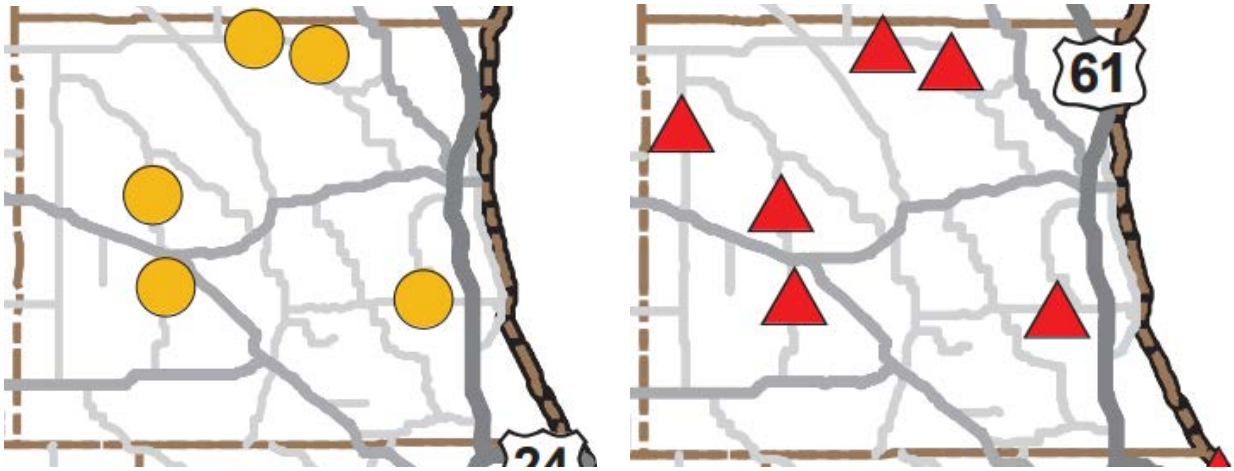
Bridges: The term “scour critical” refers to one of the database elements in the National Bridge Inventory. This element is quantified using a “scour index”, which is a number indicating the vulnerability of a bridge to scour during a flood. Bridges with a scour index between 1 and 3 are considered “scour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

Figure 3.1. Lewis County Bridges

Missouri								
County	Bridge Counts				Bridge Area (Square Meters)			
	All	Good	Fair	Poor	All	Good	Fair	Poor
Lewis (111)	169	48	107	14	40,911	17,519	20,268	3,124

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

Figure 3.2. Lewis County Structurally Deficient Bridges



Weight Restricted Bridges Poor Condition Bridges

3.2.3 Other Assets

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

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

Table 3.8. Threatened and Endangered Species in Lewis County

Common Name	Scientific Name	Status
Gray Bat	Myotis Grisescens	Endangered
Indiana Bat	Myotis Sodalis	Endangered
Northern Long-eared Bat	Myotis Septentrionalis	Threatened
Pallid Sturgeon	Scaphirhynchus albus	Endangered
Higgins Eye (pearlymussel)	Lampsilis higginsii	Endangered
Sheepnose Mussel	Plethobasus cyphyus	Endangered
Spectaclecase (Mussel)	Cumberlandia monodonta	Endangered
Eastern Prairie Fringed Orchid	Platanthera leucophaea	Endangered

Source: U.S. Fish and Wildlife Service, http://www.fws.gov/midwest/Endangered/lists/missouri-cty.html; see also https://ecos.fws.gov/ipac/ and select 'Get Started" > Step '1 Find Location', choose select by state or county and enter the county name, selecting the appropriate community > follow remaining on-screen instructions.

Natural Resources: Lewis County has six conservation and recreational areas. The Missouri Department of Conservation (MDC) provides a database of lands the MDC owns, leases, or manages for public use. Use **Table 3.9** to provide the names and locations of parks and conservation areas in the planning area.

Table 3.9. Parks in Lewis County

Park / Conservation Area	Address	City
Wakonda State Park	32836 State Park Road	La Grange
Martin Park	Hwy 136 and MO-81	Canton
Central Park	S 5th St	Canton
Ewing Community Park	205 E Main St	Ewing
Monticello Park	Benton St	Monticello
Johnson Park	5th & Main St	La Belle

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

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

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

Property	Address	City	Date Listed
First Presbyterian Church	401 Jefferson	La Grange	8/28/2012
Williams Gray House	407 Washington	La Grange	6/3/1999
Dr J.A. Hay House	406 W Monroe	La Grange	6/3/1999
Henderson Hall	College Hill	Canton	10/2/1978
Joseph Hipkins House	500 S 3rd St	La Grange	5/8/2008
Lewis County Courthouse	100 E Lafayette St	Monticello	1/12/2005
Lincoln School	MO B	Canton	2/10/1983
Lock & Dam No 20 Historic District	North of Henderson St	Canton	3/10/2004
John McKoon House	500 W Monroe	La Grange	6/3/1999

Quincy, Missouri & Pacific Railroad Station	Off MO 16	Lewistown	5/7/1979
Freda Rhoda House	200 S Second St	La Grange	6/3/1999
A.C. Waltman House	302 Lewis St	La Grange	6/3/1999

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 the major non-government employers in the planning area (**Table 3.11**).

Table 3.11. Major Non-Government Employers in Lewis County

Employer Name	Main Locations	Product or Service	Employees
Ayerco	Canton	Truck Stops	49
Mark Twain Casino	Lagrange	Casino	250
Charles Industries	Canton	Manufacturing	100

Source: Data Collection Questionnaires; MoDED

Agriculture The table below shows agriculture-related jobs in the Lewis County economy. **(Table 3.12)**

Table 3.12. Agriculture-Related Jobs in Lewis County

Item		Lewis
Hired farm labor	farms	141
	workers	355
	$1,000 payroll	3,578
Farms with-		
1 worker	farms	78
	workers	78
2 workers	farms	35
	workers	70
3 or 4 workers	farms	21
	workers	77
5 to 9 workers	farms	5
	workers	(D)
10 workers or more	farms	2
	workers	(D)
Workers by days worked:		
150 days or more	farms	61
	workers	144
Farms with-		
1 worker	farms	34
	workers	34
2 workers	farms	16
	workers	32
3 or 4 workers	farms	6
	workers	(D)
5 to 9 workers	farms	4
	workers	26
10 workers or more	farms	1
	workers	(D)
Less than 150 days	farms	106
	workers	211
Farms with-		
1 worker	farms	66
	workers	66
2 workers	farms	31
	workers	62
3 or 4 workers	farms	6
	workers	21
5 to 9 workers	farms	1
	workers	(D)
10 workers or more	farms	2
	workers	(D)
Reported only workers working 150 days or more	farms	35
	workers	62
	$1,000 payroll	964
Reported only workers working less than 150 days	farms	80
	workers	113
	$1,000 payroll	263
Reported both - workers working 150 days or more and workers working less than 150 days	farms	26
	150 days or more, workers	82
	less than 150 days, workers	98
	$1,000 payroll	2,351
Total migrant workers	farms	-
	workers	-
Migrant farm labor on farms with hired labor	farms	-
	workers	-
Migrant farm labor on farms reporting only contract labor	farms	-
	workers	-
Unpaid workers	farms	276
	workers	673

SOURCE:
HTTPS://WWW.NASS.USDA.GOV/PUBLICATIONS/AGCENSUS/2017/FULL_REPORT/VOLUME_1,_CHAPTER_2_COUNTY_LEVEL/MISSOURI/ST29_2_0007_0007.PDF

3.3 Land Use and Development

3.3.1 Development Since Previous Plan Update

Population data can sometimes be used to determine the potential for future development. An increase in population will spur a need for additional housing and attract commercial development. As indicated by the information in **Table 3.13** Lewis County has experienced a slight decrease in population.

Table 3.13. County Population Growth, 2010-2020

Jurisdiction	Total Population 2010	Total Population 2020	2010-2020 # Change	2010-2020 % Change
Lewis County	10,211	10,032	-179	-1.75%
Canton	2377	2,774	397	16.7%
Ewing	456	406	-50	-10.96%
La Belle	660	631	31	4.69%
La Grange	931	892	-39	-4.18%
Lewistown	546	522	-24	-4.39%
Monticello	98	104	6	6.12%

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

Population growth or decline is generally accompanied by increases or decreases in the number of housing units. The cities of Canton, La Belle, La Grange & Lewistown all showed an increase in housing with Ewing, & Monticello reflecting a decline. Overall, there has been an increase in housing in Lewis County of 1.17% as shown in **Table 3.13.**

Table 3.14. Change in Housing Units, 2010-2020

Jurisdiction	Housing Units 2010	Housing Units 2020	2010-2020 # Change	2000-2020 % Change
Lewis County	4,584	4,544	-40	0.8%
Canton	954	978	28	2.93%
Ewing	252	194	-58	-23.01%
La Belle	214	336	122	57%
La Grange	194	318	124	63.99%
Lewistown	214	264	50	23.36%
Monticello	192	65	-127	-66.14%

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

3.3.2 Future Land Use and Development

School District's Future Development

Both School districts have completed renovations and but are not anticipating any future development. Canton R-V plans some building additions on the current campus.

Special District's Future Development

There were no Special districts indicating future development.

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.

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

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 Lewis 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.

- **Vulnerability Overview:**
  The plan must provide an overall summary of each jurisdiction's vulnerability to the identified hazards. The overall summary of vulnerability identifies structures, systems, populations or other community assets as defined by the community that are susceptible to damage and loss for hazard events.

- **Potential Losses to Existing Development:**
  (Including types and numbers, of buildings, critical facilities, etc.) For each participating jurisdiction, the plan must describe the potential impacts of the hazard. Impact means the consequences of effect of the hazard on the jurisdiction and its assets. Assets are determined by the community and include, for example, people, structures, facilities, systems, capabilities, and/or activities that have value to the community. For example, impacts could be described by referencing historical disaster impacts and/or an estimate of potential future losses.

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

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

Problem Statements

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

3.4.1 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 3.4.3 and Section 3.4.2 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.

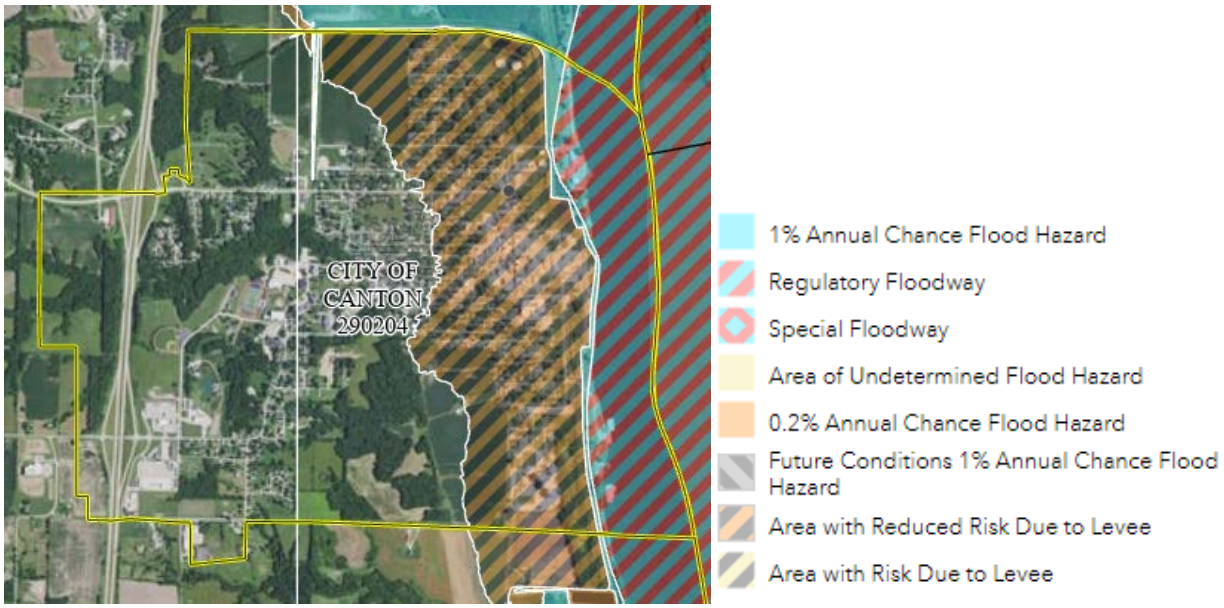
In certain areas, aging storm sewer systems are not designed to carry the capacity currently needed to handle the increased storm runoff. Typically, the result is water backing into basements, which damages mechanical systems and can create serious public health and safety concerns. This combined with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

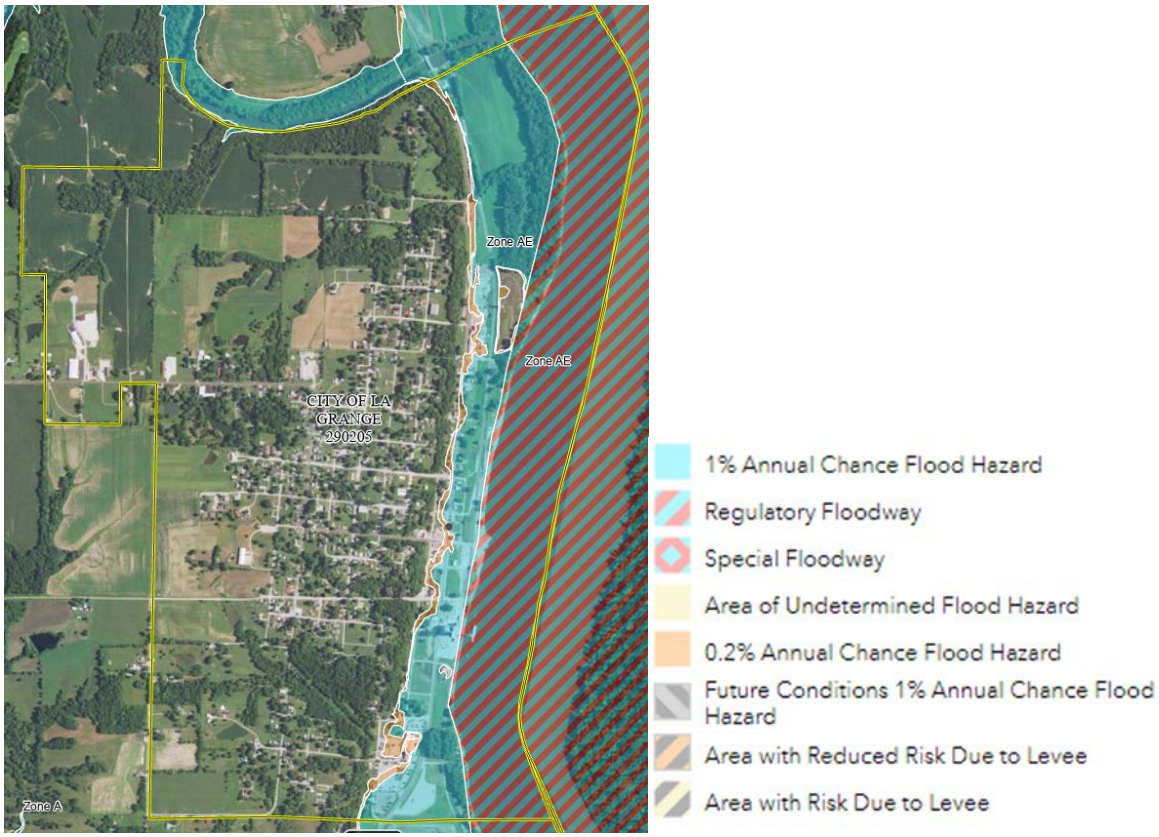
Geographic Location

Riverine flooding is most likely to occur in Special Flood Hazard Areas (SFHA's). Flood Plain maps of the 3 communities with SFHA's within their jurisdiction you will find below. LaBelle, Lewistown, and Ewing do not have SFHA's within their jurisdictions. Tables **3.15** and **3.16** shows Lewis County's flood history using a 20-year time frame for previous events.

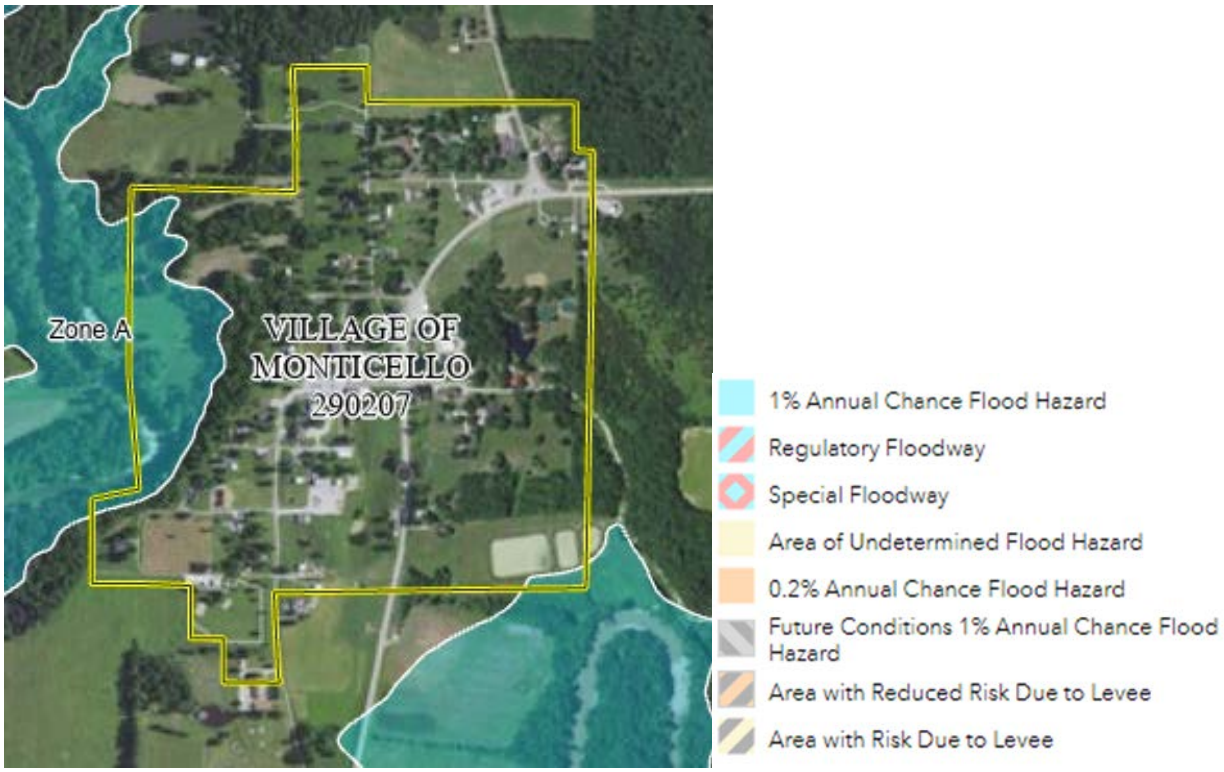
City of Canton Flood Hazard Map



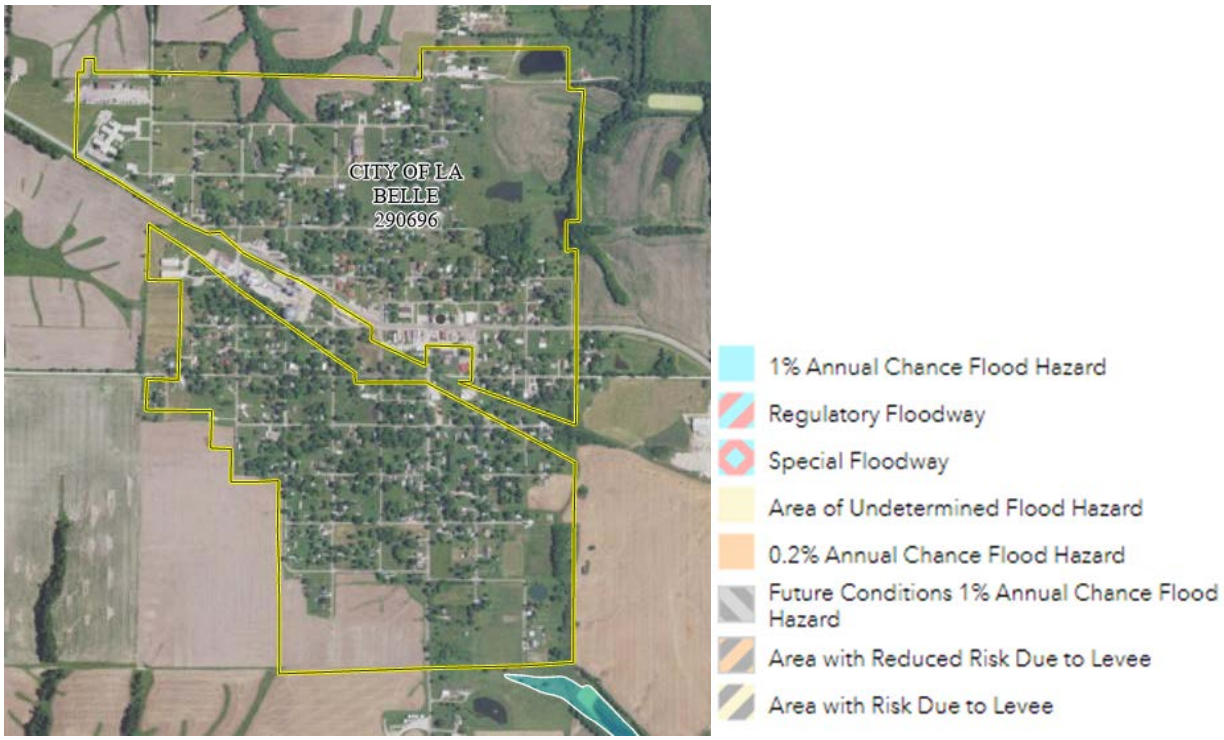
LaGrange Flood Hazard Map



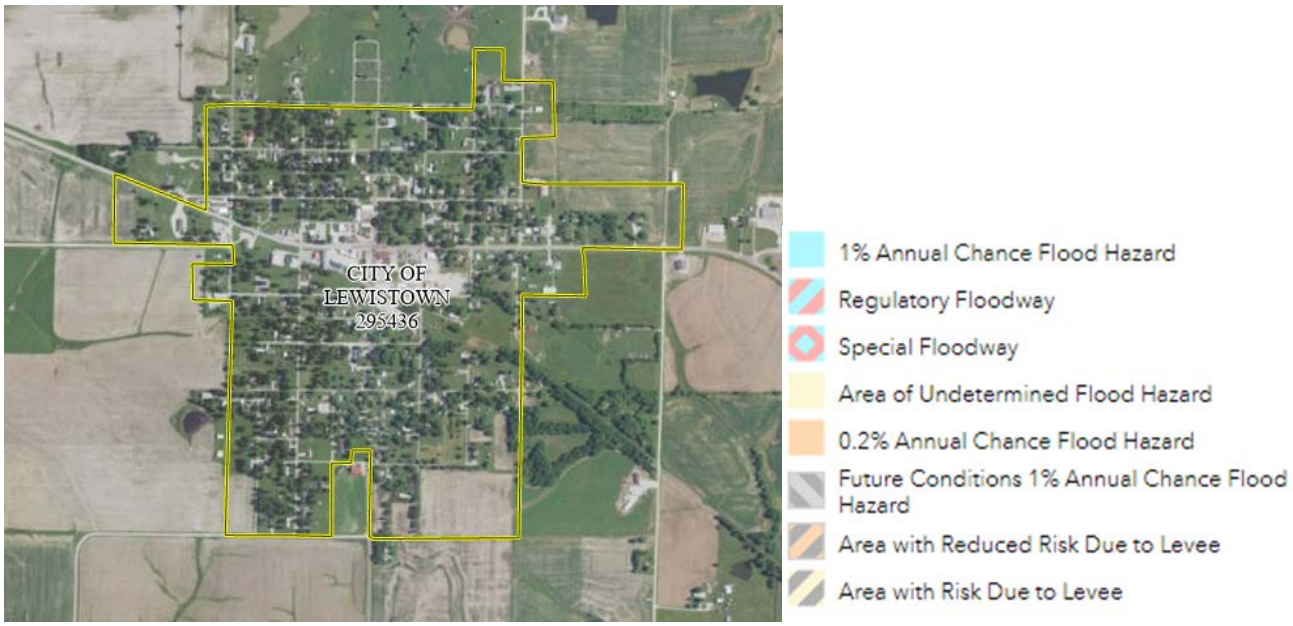
Monticello Flood Hazard Map



LaBelle Flood Hazard Map



Lewistown Flood Hazard Map



Ewing Flood Hazard Map

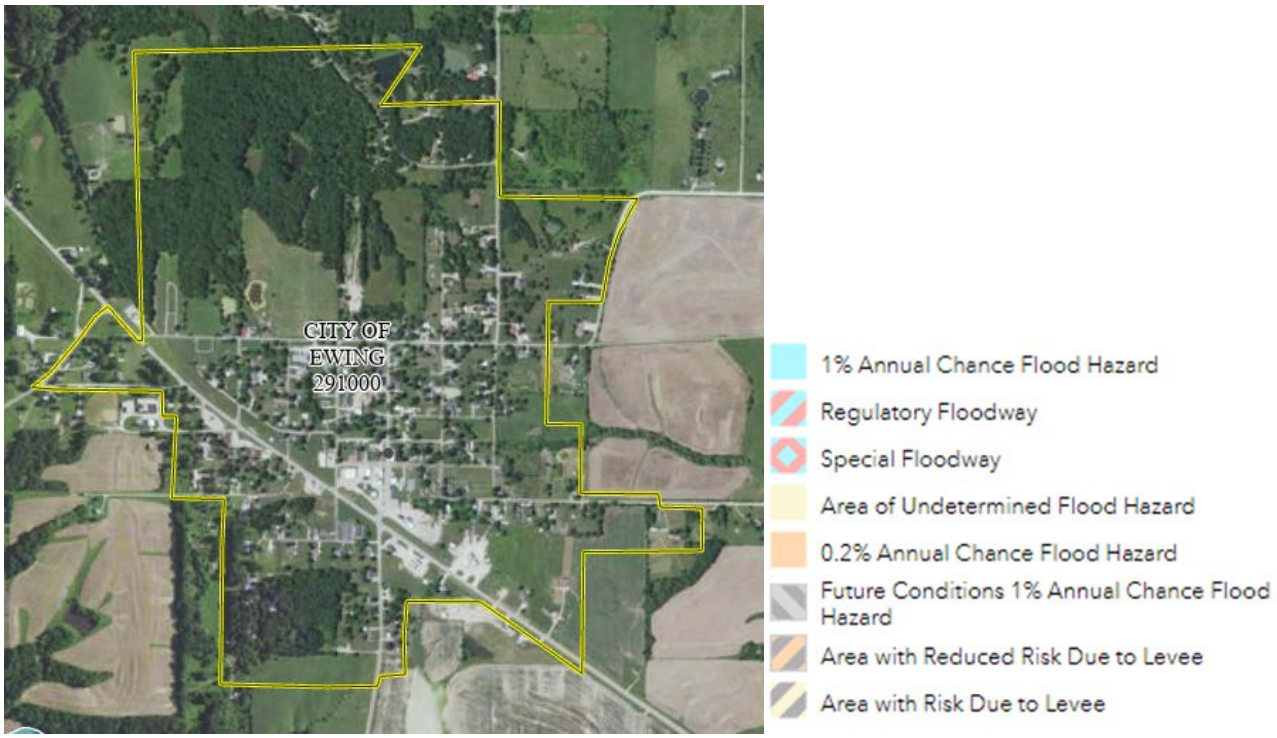


Table 3.15. Lewis County NCEI Flood Events by Location, 2002-2022

Location	# of Events
Unincorporated County	9
-Unincorporated County (unspecified)- 4 flood events	
-Unincorporated County (Fenway)- 3 flood events	
-Unincorporated County (Derrahs)- 1 flood events	
-Unincorporated County (Maywood)- 1 flood events	
Canton	1
Monticello	3

Source: National Centers for Environmental Information, 01/15/2023

Flash flooding occurs in SFHAs and those locations in the planned 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.

Table 3.16 shows the number of flash flood events by location recorded by NCEI for the 20-year period.

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

Location	# of Events
Unincorporated County	18
-Unincorporated County (unspecified)- 4 flash flood events	
-Unincorporated County (Deer Ridge)- 7 flash flood events	
-Unincorporated County (Benjamin)- 1 flash flood events	
-Unincorporated County (Steffenville)- 1 flash flood events	
-Unincorporated County (Fenway)- 5 flash flood events	
Ewing	1
La Grange	2
La Belle	2

Source: National Centers for Environmental Information, 01/15/2023

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.

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

Table 3.17 provides details on NFIP participation for the communities in the planning area. **Table 3.18** provides details with the number of policies in force, amount of insurance in force, number of closed losses, and total payments for each jurisdiction, where applicable

Table 3.17. NFIP Participation in Lewis County

Community ID #	Community Name	NFIP Participant (Y/N/Sanctioned)	Current Effective Map Date	Regular-Emergency Program Entry Date
2908448	Lewis County	Y	01/16/15	09/01/89
2902048	Canton	Y	01/16/15	02/01/77
290205	La Grange	Y	03/02/12	07/13/76

Source: NFIP Community Status Book, 01/15/23; 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

Lewis County, Canton, and LaGrange a floodplain administrator regulates the continued compliance with the National Flood Insurance Program. Although the Village of Monticello is mapped, they are not participating in the National Flood Insurance Program. Monticello has not participated for several reasons including lack of staffing, local buy-in, and all 1% flood risk areas are in areas where there will never be development.

Lewis County and the jurisdictional floodplain administrators will continue to draft ordinances to enact regarding substantial damage and substantial improvement provisions following a flood event.

Table 3.18. NFIP Policy and Claim Statistics as of Date

Community Name	Policies in Force	Insurance in Force	Closed Losses	Total Payments
Lewis County	13	2,560,600	11	190,824.44
Canton	105	26,847,000	26	316,881.16
La Grange	19	2,560,600	67	1,347,366.65

Source: NFIP Community Status Book, 1/15/23; BureauNet, http://bsa.nfipstat.fema.gov/reports/reports.html; *Closed Losses are those flood insurance claims that resulted in payment.

Repetitive Loss/Severe Repetitive Loss Properties

Repetitive Loss Properties are those properties with at least two flood insurance payments of $1,000 or more in a 10-year period. According to the Flood Insurance Administration, jurisdictions included in the planning area have a combined total of 11 repetitive loss properties.

Table 3.19. Lewis County Repetitive Loss Properties

# of Properties	# of Losses	Total paid	Average Payment
11	35	$ 627,813.24	$ 17,937.52

Source: Flood Insurance Administration as of 2/10/2023

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.

Previous Occurrences

Disaster Number	Description	Declaration Date Incident Period	Individual Assistance (IA) Public Assistance (PA)
198	Floods	6/14/1965	NA
372	Heavy Rains, Tornadoes, Flooding	4/19/1973	IA,PA
407	Severe Storms, Flooding	11/1/1973	IA,PA
779	Severe Storms, Flooding	10/14/1986	PA
995	Severe Storms, Flooding	7/9/1993	IA,PA
1054	Severe Storm, Tornadoes, Hail, Flooding	6/2/1995	IA
1412	Severe Storm, Tornadoes & Flooding	5/6/2002	PA
1773	Severe Storms & Flooding	6/25/2008	IA,PA
1809	Severe Storms, Flooding & Tornado	11/13/2008	IA,PA
1847	Severe Storms, Flooding & Tornado	6/19/2009	PA
1934	Severe Storms, Flooding & Tornado	8/17/2010	PA
3325	Flooding	6/30/2011	NA
1934	Severe Storms, Flooding & Tornado	8/17/2010	PA
3325	Flooding	6/30/2011	NA
4130	Severe Storms, Straight-Line Winds, Tornado & Flooding	7/18/2013	PA
4200	Severe Storms, Straight-Line Winds, Tornado & Flooding	10/31/2014	PA
4238	Severe Storms, Straight-Line Winds, Tornado & Flooding	8/7/2015	PA
3374	Severe Storms, Straight-Line Winds, Tornado & Flooding	1/2/2016	NA
4451	Severe Storms, Tornadoes & Flooding	7/9/2019	IA,PA

Table 3.20. NCEI Lewis County Flash Flood Events Summary, 2003 to 2023

Year	# of Events	# of Deaths	# of Injuries	Property Damages	Crop Damages
2003	1	0	0	0	0
2004	1	0	0	0	0
2008	3	0	0	16.0k	0
2009	3	0	0	0	0
2010	1	0	0	0	0
2011	2	0	0	0	0
2013	1	0	0	0	0
2014	2	0	0	0	0
2015	4	1	0	0	0
2019	3	0	0	0	0

Source: NCEI, data accessed 2003-2023

Table 3.21. NCEI Lewis County Riverine Flood Events Summary, 2003 to 2023

Year	# of Events	# of Deaths	# of Injuries	Property Damages	Crop Damages
2007	1	0	0	0	0
2008	2	0	0	940.0K	8.9M
2010	2	1	0	0	0
2013	4	0	0	11.0K	75.0K

Source: NCEI, 2003-2023

On August 8th, 2007 Heavy rain upstream caused minor flooding on the Mississippi River from Northeast Missouri to just north of S. Louis. The river ranged from about 1 to 3 feet over flood stage with some areas still in flood when the month ended. Heavy rain upstream caused minor flooding on the Mississippi River. At Canton, the river peaked about 1.5 feet over flood stage.

On June 4th, 2008, The Mississippi River at Canton, MO crested at 27.73 feet on 6/18. This is the second highest crest ever recorded. A major sandbagging effort by the residents, the Missouri National Guard, and volunteers saved much of the town from flooding. Levee breaks upstream on the Illinois side also helped lower the crest, as initially, a record crest was expected. Further south, the town of LaGrange was not as lucky. At least 30 homes and 12 business were flooded. Damage to public infrastructure was estimated at $940,000. Agricultural damage was estimated at $8.9 million.

On July 8th, 2008, The Mississippi River crested at Canton, MO on July 1 at 20.95 ft. The river went below flood stage on July 8.

On June 14th, 2010, moderate flooding affected areas along the Mississippi River from mid-June through the end of the month. There was little damage other than some roads near the river being closed and some low-land farm fields flooded.

On April 18th 2013, Heavy rain pushed the North and Middle Fabius Rivers to major flood levels. Damage was limited to some closed roads and flooded farmland. The North Fabius River rose to major flood levels in Lewis County. The river crested on April 20th. Damage was limited to some closed roads and flooded farmland.

Probability of Future Occurrence

With the history of flooding in the planning area, it is likely that flooding of various levels will occur. The probability of a flash flood event occurring in the planning area in any given year is 50%. Although flood events occur in the planning area there is only a 20% probability in any given year.

Changing Future Conditions Considerations

According to the National Climate Assessment, extreme rainfall events and flooding have increased during the last century, and these trends are expected to continue. If these trends continue Canton, LaGrange, and Monticello could see larger impacts since located in specific flood hazard areas. This could also put jurisdictions that are not in specific flood hazard areas more at risk to flash flooding and the possibility of near SPHA's getting closer to jurisdictions.

Vulnerability

Vulnerability Overview

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

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

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

Potential Losses to Existing Development

The HAZUS-MH analysis provides the number of buildings impacted, estimates of building repair costs, and the associated loss of building contents and business inventory. Income loss data accounts for losses such as business interruption and rental income losses as well as the resources associated with damage repaid and job and housing losses. The displaced population is based on the inundation area.

Structural Damage	Contents Damage	Inventory Loss	Total Direct Loss	Total income Loss	Total Direct and income Loss	Calc Loss Ratio	Bldgs Risk	# substantially damaged
4,055,000	6,384,000	273,000	10,712,000	8,172,000	18,884,000	0.96%	15	1

Total of Displaced People	People with shelter needs
426	121

Impact of Previous and Future Development

Due to the prevalence of flooding, historically, development in Lewis County is highly regulated. Future development should not impact or be impacted by flash and riverine flooding, as such

development will be located out of the flood plain, protected by levees, elevated, or otherwise flood proofed in some way to mitigate potential flooding impacts.

EMAP Consequence Analysis

For communities with emergency management programs seeking EMAP accreditation, complete Table 3.22 to summarize the detrimental impacts from flooding.

Table 3.22. EMAP Impact Analysis: Flooding

Subject	Detrimental Impacts
Public	Localized impact expected to be severe for incident areas and moderate to light for other adversely affected areas.
Responders	Localized impact expected to limit damage to personnel in the flood areas at the time of the incident.
Continuity of Operations	Damage to facilities/personnel in the area of the incident may require temporary relocation of some operations. Localized disruption of roads, facilities, and/or utilities caused by incident may postpone delivery of some services.
Property, Facilities, and Infrastructure	Localized impact to facilities and infrastructure in the area of the incident. Some severe damage possible.
Environment	Localized impact expected to be severe for incident areas and moderate to light for other areas affected by the flood or HazMat spills.
Economic Condition of Jurisdiction	Local economy and finances adversely affected, possibly for an extended period of time.
Public Confidence in the Jurisdiction's Governance	Ability to respond and recover may be questioned and challenged if planning, response, and recovery not timely and effective.

Hazard Summary by Jurisdiction

Flood risk is high in the eastern side of Lewis County (where the Mississippi river and its adjacent floodplain are located) and highest in those communities that lie along that area. Canton is protected by a levee which has held through recent historical floods, while La Grange has no such protection and has seen a portion of its downtown area swallowed by Mississippi floodwaters in 1993 and 2001, and 2008. Monticello has some slight flash flood risk, and flash flood is a risk at various points in the county, generally located in low lying areas near bridge crossings.

Problem Statement

Lewis County's location along the Mississippi river carries with it a risk of massive flooding, however, this is a risk that's been recognized and dealt with for many decades, and the most recent incidents of disastrous flooding in Missouri in 1993 and 1995 simply drove home the need for robust planning, mitigation, and response capabilities in Lewis County. While it is still possible that an unfortunate series of events could conspire to create flooding issues in Lewis County, the truth is that the County and the river side communities in it have spent decades and millions of local, State, and Federal dollars constructing the elaborate flood control structures along the Mississippi to protect lives and property. The Lock and Dam and levee systems have kept residents safe and will likely continue to do so for the foreseeable future. Tight regulation and oversight on development will ensure that growth in the industrial, commercial, and housing sectors doesn't increase vulnerability to flood impacts.

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

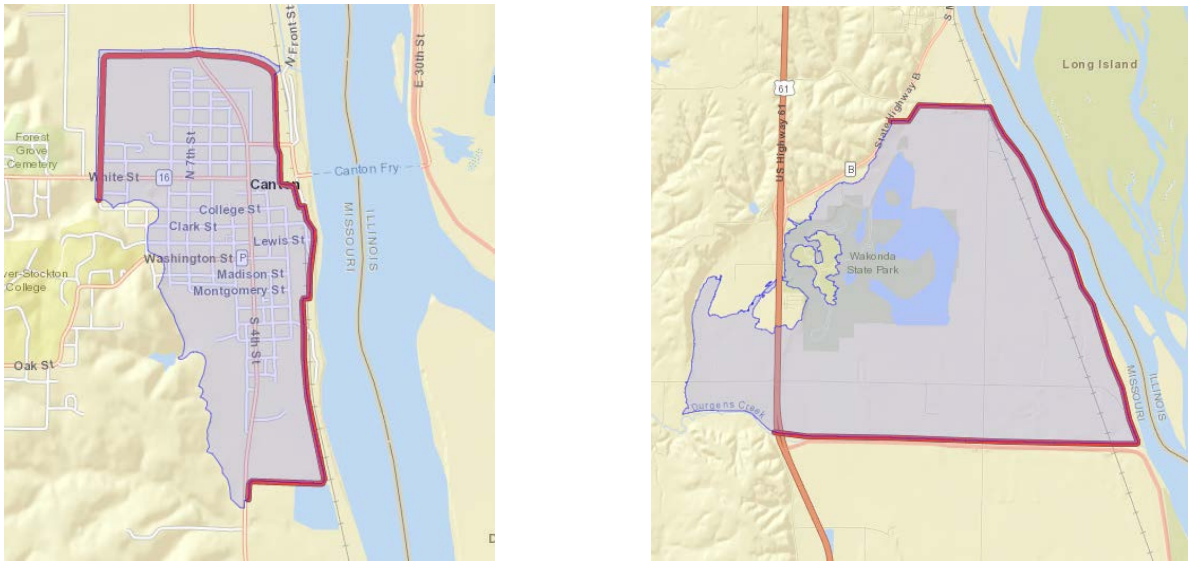
Missouri is a state with many levees. Currently, there is no single comprehensive inventory of levee systems in the state. Levees have been constructed across the state by public entities and private entities with varying levels of protection, inspection oversight, and maintenance. The lack of a comprehensive 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.

For purposes of the levee failure profile and risk assessment, those levees indicated on the Preliminary DFIRM as providing protection from at least the 1-percent annual chance flood will be discussed and further analyzed. It is noted that increased discharges are being taken into account in revision of the flood maps as part of the RiskMap efforts. This may result in changes to the flood protection level that existing levees are certified as providing.

Figure 3.3. County Levees Shown on DFIRM as Providing Protection from the 1-Percent Annual Chance Flood



Source: National Levee Database, 1/15/2023

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

A great historical flood in Lewis County in 1929 was caused by a levee break. Within an hour of the break two square miles of the town of Canton and surrounding countryside were underwater, including more than 200 homes and the Canton school building were lost, but miraculously there were no recorded casualties. Periodic flooding of the downtown Canton area happened again after World War II, but was largely ended by construction of a bigger and stronger levee in the 1960s. Due to the new levee the Mississippi Flood of 1973, the Great Flood of 1993 and the June 2008 Midwest floods left Canton with far less damage than previous events and spared the town from the fates of other river towns. Downstream, the City of La Grange lacks the protection of any levee system and for that reason has experienced more frequent flooding, seeing a portion of its downtown area swallowed by floodwater in 1993 and 2001, and 2008.

Probability of Future Occurrence

The lack of a centralized database for Missouri levees and no records of previous levee failure events in Lewis County render it impossible to accurately calculate probability. The probability of levee failure increases with the severity of the flooding that typically causes levee failure and any decrease in inspection and maintenance.

Changing Future Conditions Considerations

The impact of changing future conditions on levee failure will most likely be related to changes in precipitation and flood likelihood. Climate change projections suggest that precipitation may increase and occur in more extreme events, which may increase risk of flooding, putting stress on levees and increasing likelihood of levee failure.

Vulnerability

Vulnerability Overview

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

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

Both Routine and Periodic Inspections result in a rating for operation and maintenance. Each levee segment receives an overall segment inspection rating of Acceptable, Minimally Acceptable, or Unacceptable. **Figure 3.4** below defines the three ratings.

Figure 3.4. 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.

There are no levees in the planning area rated as unacceptable.

Potential Losses to Existing Development

Losses to significantly built-up areas seem to be limited to the downtown area of Canton, on the city's east side directly adjacent to the river.

Impact of Previous and Future Development

Development is strictly regulated due to the decades-long history of flooding along the Mississippi river.

EMAP Consequence Analysis

For communities with emergency management programs seeking EMAP accreditation, complete Table 3.23 to summarize the detrimental impacts from levee failure.

Table 3.23. EMAP Impact Analysis: Levee Failure

Subject	Detrimental Impacts
Public	Localized impact expected to be severe for inundation area and moderate to light for other adversely affected areas.
Responders	Localized impact expected to limit damage to personnel in the inundation area at the time of the incident.
Continuity of Operations	Damage to facilities/personnel in the area of the incident may require temporary relocation of some operations. Localized disruption of roads and/or utilities may postpone delivery of some services.
Property, Facilities, and Infrastructure	Localized impact to facilities and infrastructure in the inundation area of the incident. Some severe damage possible.
Environment	Localized impact expected to be severe for inundation area and moderate to light for other adversely affected areas.
Economic Condition of Jurisdiction	Local economy and finances adversely affected, possibly for an extended period of time, depending on damage and length of investigation.
Public Confidence in the Jurisdiction's Governance	Localized impact expected to adversely affect confidence in local, state, and federal government, regardless of the levee owner.

Hazard Summary by Jurisdiction

The only community protected by a levee in Lewis County is the City of Canton, which has remained relatively unscathed since the initial construction of the current levee system in the 1960s.

Problem Statement

Currently the levee systems in place in Lewis County seem to be functioning properly and have protected their assigned areas in the face of even severe flooding, evidenced in the differences between the flooding history of the City of Canton, which has a levee, and its downstream neighbor LaGrange which does not. LaGrange will continue to experience flood issues until it, too, is protected by a levee structure similar to the one surrounding the City of Canton. In the absence of a levee structure, the systematic relocation of homes and businesses out of the floodplain area immediately adjacent to the river is the only way to mitigate future damages.

3.4.3 Dam Failure

Hazard Profile

Hazard Description

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

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

Data on Dams in Lewis County has been drawn from two sources; a listing maintained by the Missouri Department of Natural Resources (MoDNR) and the Army Corps of Engineers' National Inventory of Dams (NID). Each has its own system of classifying dams. Neither the MDNR nor the NID hazard potential classification references the condition of the dam

Table 3.24. MoDNR Dam Hazard Classification Definitions

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

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

Table 3.25. NID Dam Hazard Classification Definitions

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

Source: National Inventory of Dams

Geographic Location

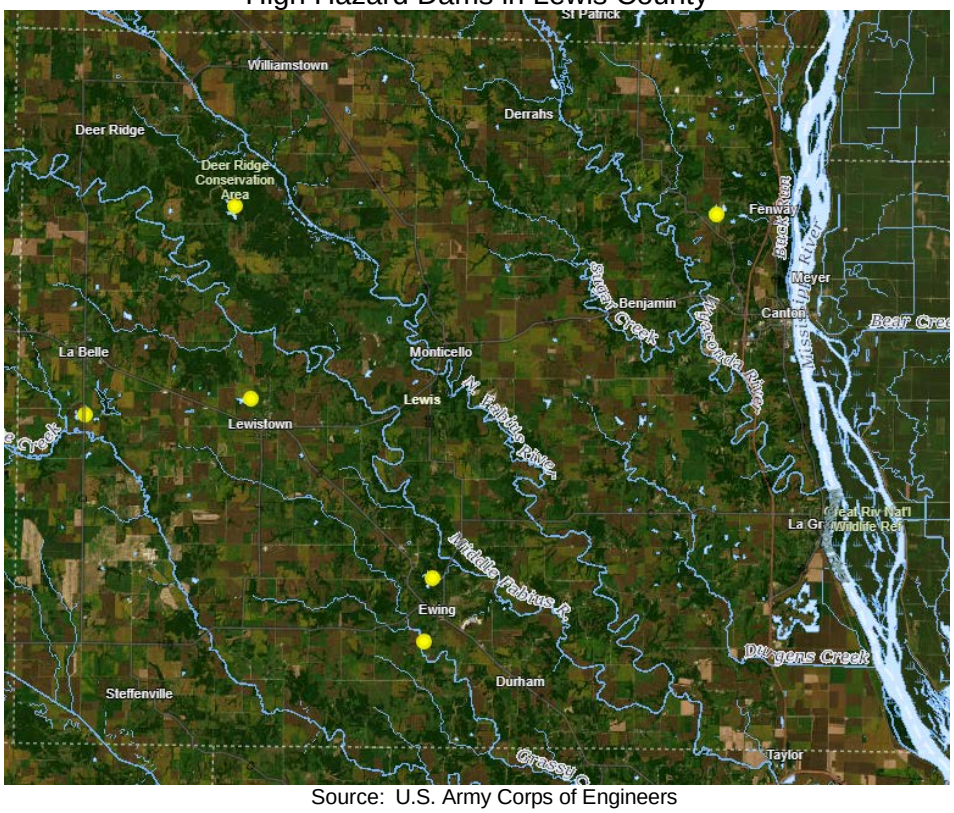
Dams Located Within the Planning Area

Table 3.26. High Hazard Dams in the Lewis 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
Ewing Lake Dam	Yes	39	881	5/12/2015	TR-MIDDLE FABIUS RIVER	Taylor	16	Private
City of Lewistown Dam	No	25	468	NA	TR-MIDDLE FABIUS RIVER	Taylor	20	City of Lewistown
Deer Ridge Community Lake Dam	Yes	38	608	7/13/2016	TR-NORTH FABIUS RIVER	MONTICELLO	8	Mo Dept. of Conservation
LaBelle Old City Lake Dam	Yes	35	339	5/31/2011	TR TROUBLESOME CREEK	STEFFENVILLE	11	City of LaBelle
Buck-Doe Run Watershed Structure #27a	Not Required	27	144	NA	ARTESIAN BRANCH	Canton	3	BUCK DOE RUN WSD SUBDST
Klocke Lake Dam	Not Required	18	67	NA	TR-GRASSY CREEK	Hannibal	25	RICHARD KLOCKE

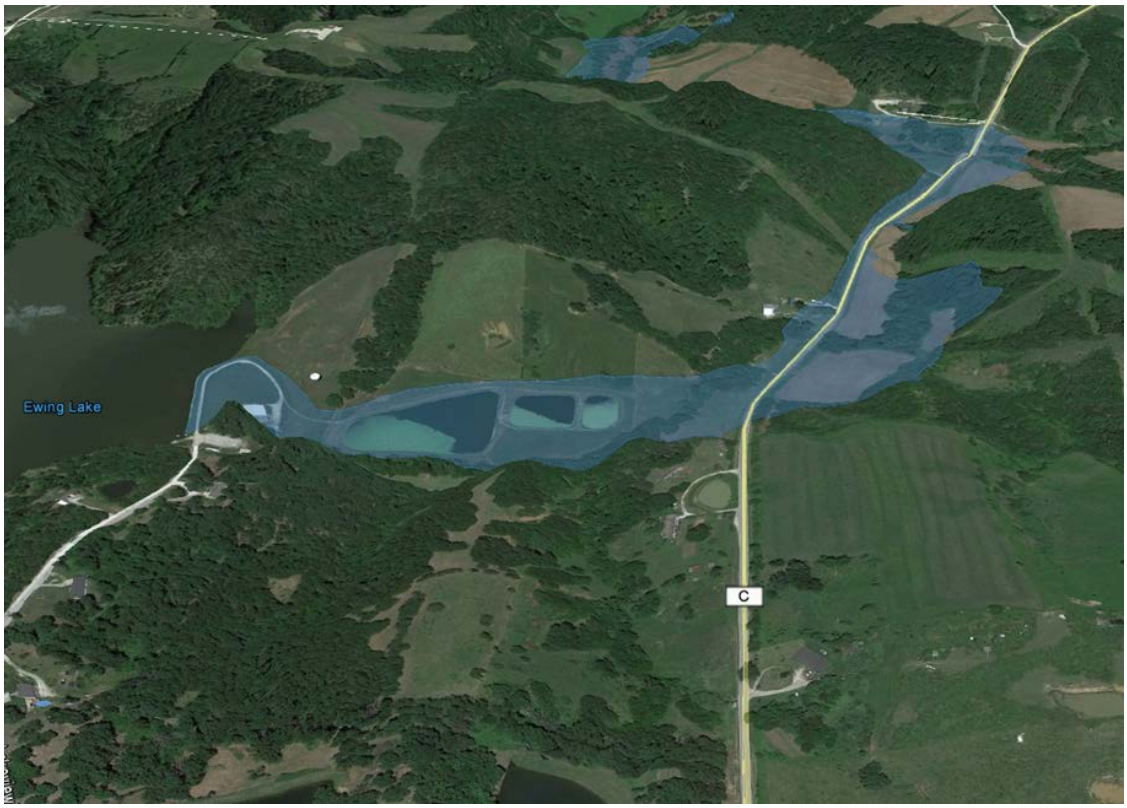
Sources: Missouri Department of Natural Resources, https://dnr.mo.gov/geology/wrc/dam-safety/damsinmissouri.htm and National Inventory of Dams, http://nid.usace.army.mil/cm_apex/f?p=838:12. Contact the MoDNR Dam and Reservoir Safety Program at 800-361-4827 to request the inundation maps for your county to show geographic locations at risk, extent of failure and to perform GIS analysis of those assets at risk to dam failure.

Figure 3.5. High Hazard Dam Locations in Lewis County and Areas Impacted in the Event of Breach.



Source: U.S. Army Corps of Engineers

Ewing Lake Dam Inundation Area



Deer Ridge Community Lake Dam Inundation Area

La Belle Old City Lake Dam Inundation Area

Buck-Doe Run Watershed Structure #27a Inundation Area

City of Lewistown Dam Inundation Area

Klocke Lake Dam Inundation Area

Upstream Dams Outside the Planning Area

Upstream dams that could affect Lewis County are related to flood control on the Mississippi River. Failure on the part of Lock and Dam infrastructure upstream or a decision by the Army Corps to release increased amounts of water into the Mississippi River from flood control reservoirs could create issues along the river which forms the eastern border of Lewis County.

Figure 3.6. Upstream Dams Outside Lewis County

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

Strength/Magnitude/Extent

None of the high hazard dams in Lewis County appear to have inundation areas that threaten any populated area or any infrastructure, with the exception of a portion of Hwy C which could be inundated by water from the Ewing City Lake Dam in the event of a catastrophic failure at that location. However, catastrophic failure of any high hazard dams has the potential to result in greater destruction due to the potential speed of onset and greater depth, extent, and velocity of flooding. For this reason, dam failures could flood areas outside of mapped flood hazards.

Previous Occurrences

According to Stanford University's National Performance of Dams Program, there were 82 dam incidents in Missouri from 1975 to 2013. Of these 82 incidents, 17 percent were failures. According to that same database, none of these incidents involved any high hazard dams in Lewis County.

Probability of Future Occurrence

As there are no records of dam failure in Lewis County on which to calculate probability a probability calculation is not possible.

Changing Future Conditions Considerations

According to the National Climate Assessment, extreme rainfall events and flooding have increased during the last century. These trends are expected to continue and have an effect on current infrastructure.

Source: National Climate Assessment; https://nca2014.globalchange.gov/

Vulnerability

Vulnerability Overview

None of the high hazard dams in Lewis County appear to have inundation areas that threaten any populated area or any infrastructure, with the exception of a portion of Hwy C which could be inundated by water from the Ewing City Lake Dam in the event of a catastrophic failure at that location. However, catastrophic failure of any high hazard dams has the potential to result in greater destruction due to the potential speed of onset and greater depth, extent, and velocity of flooding. For this reason, dam failures could flood areas outside of mapped flood hazards.

Potential Losses to Existing Development:

There does not appear to be development at risk to dam failure, with respect to the high hazard dams in the MoDNR and US Army Corps records. Lock and Dam No. 20 could fail and cause flooding along the Mississippi river to the south, in Canton and Lagrange – Riverine flood risk is analyzed in the flooding section of this document.

Impact of Previous and Future Development

Future development in the county should have little impact on the number of damages caused by a dam failure in the planning area, as the hazard zones are well known and development in those areas should be limited, prohibiting occupancies such as residential, commercial, or industrial structures.

EMAP Consequence Analysis

For communities with emergency management programs seeking EMAP accreditation, complete Table 3.27 to summarize the detrimental impacts from dam failure.

Table 3.27. EMAP Impact Analysis: Dam Failure

Subject	Detrimental Impacts
Public	Localized impact expected to be severe for inundation area and moderate to light for other adversely affected areas.
Responders	Localized impact expected to limit damage to personnel in the inundation area at the time of the incident.
Continuity of Operations	Damage to facilities/personnel in the area of the incident may require temporary relocation of some operations. Localized disruption of roads and/or utilities may postpone delivery of some services. Regulatory waivers may be needed locally. Fulfillment of some contracts may be difficult. Impact may reduce deliveries.
Property, Facilities, and Infrastructure	Localized impact to facilities and infrastructure in the inundation area of the incident. Some severe damage possible.
Environment	Localized impact expected to be severe for inundation area and moderate to light for other adversely affected areas.
Economic Condition of Jurisdiction	Local economy and finances adversely affected, possibly for an extended period of time, depending on damage and length of investigation.
Public Confidence in the Jurisdiction's Governance	Localized impact expected to primarily adversely affect dam owner and local entities.

Hazard Summary by Jurisdiction

Even in areas where there are high hazard dams, there is very little threat that an inundation would present a threat to human life. The only area with any mentionable risk is Hwy C near Ewing, which could be inundated by waters from the Old City Lake in the event of a catastrophic failure of that structure.

Problem Statement

While there are a small number of high hazard dams in Lewis County, there does not appear to be any development at risk to dam failure, as these dams are located in unpopulated rural areas and there appear to be no structures or infrastructure of any kind within the areas that may become inundated in the event of a dam breach. Lock and Dam No. 20 on the Mississippi River north of Canton could fail and cause flooding along the river to the south, in Canton and La Grange. Riverine flood risk is analyzed in the flooding section of this document.

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.

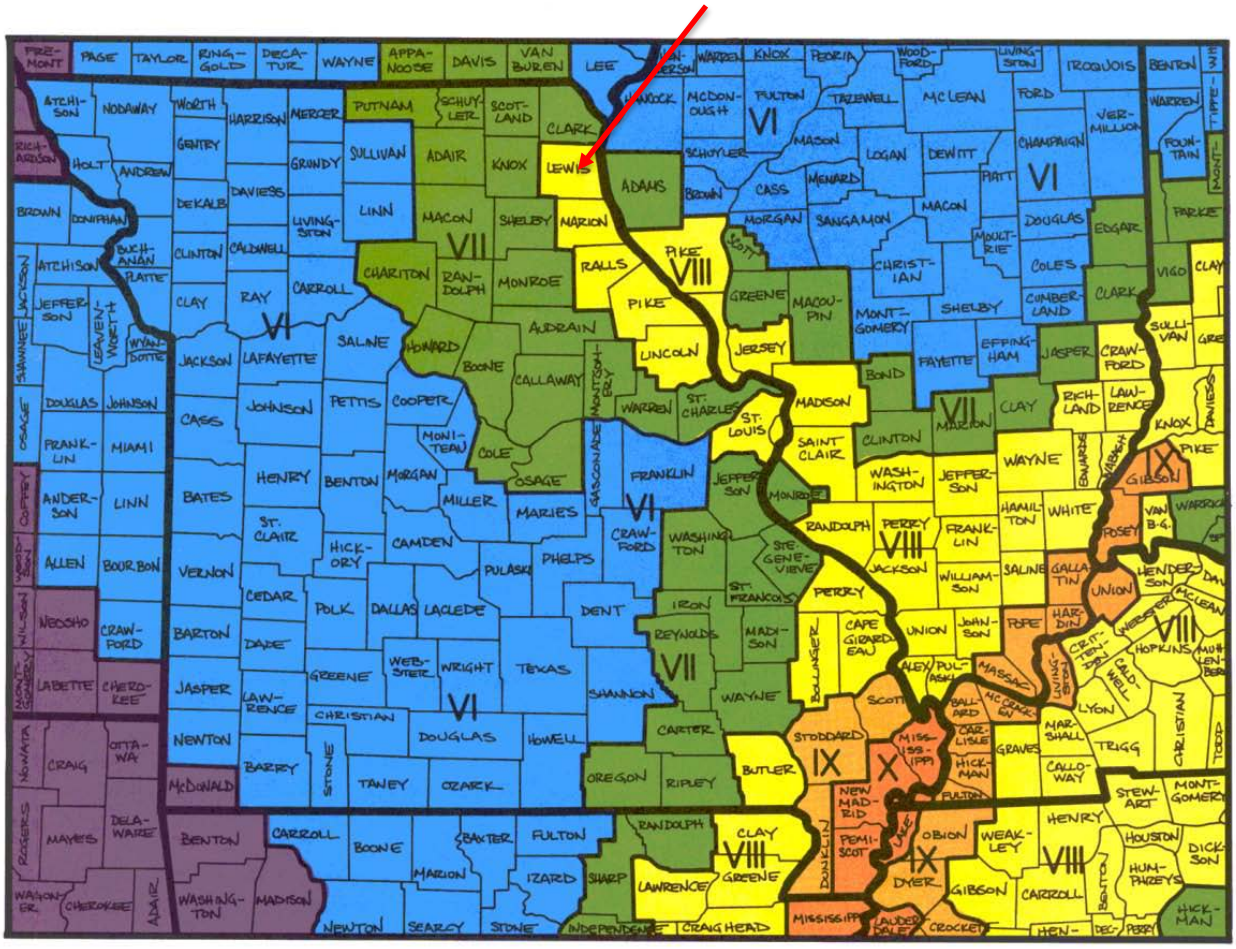
Missouri holds the record for the most devastating earthquake in the history of post- settlement North America. The New Madrid 1811-1812 earthquake series included five earthquakes of magnitude 8.0 (Modified Mercalli Intensity Scale) or higher occurring in the period December 16, 1811 through February 7, 1812. These earthquakes affected an estimated 600,000 square kilometers. Movement was felt as far away as Quebec, and damage was reported Charleston, South Carolina, and Washington D.C.

Geographic Location

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

The following SEMA map (**Figure 3.7**) shows the highest projected Modified Mercalli intensities by county from a potential magnitude 7.6 earthquake whose epicenter could be anywhere along the length of the New Madrid Seismic Zone. The secondary maps in **Figure 3.7** on page 3.98 show the same regional intensities for 6.7 and 8.6 earthquake, respectively. Insert arrows or outline the planning area or use narrative to describe what the following maps illustrate about the planning area.

Figure 3.7. Impact Zones for Earthquake Along the New Madrid Fault

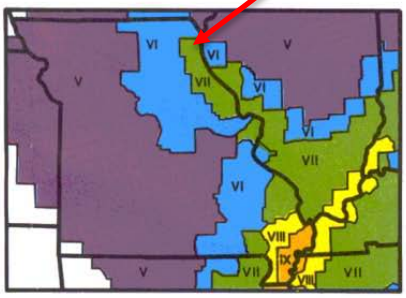


This map shows the highest projected Modified Mercalli intensities by county from a potential magnitude – 7.6 earthquake whose epicenter could be anywhere along the length of the New Madrid seismic zone.

6.7

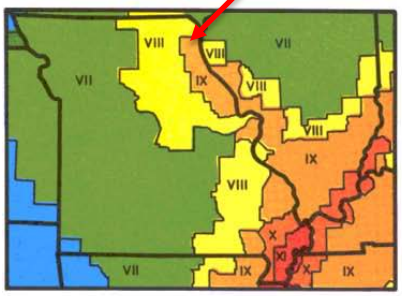
7.6

8.6



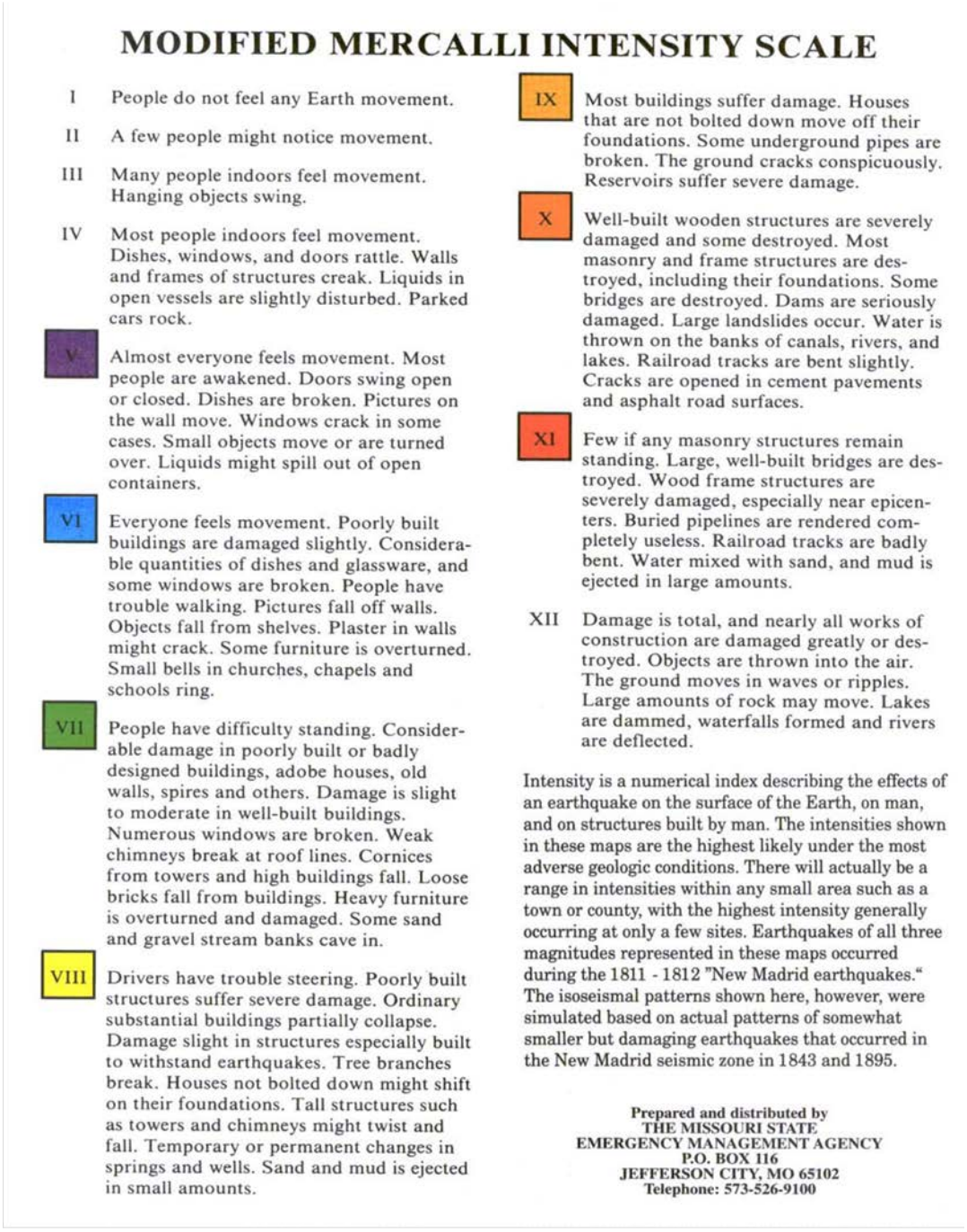
This map shows the highest projected Modified Mercalli intensities by county from a potential magnitude – 6.7 earthquake whose epicenter could be anywhere along the length of the New Madrid seismic zone.

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 3.8. Projected Earthquake Intensities



MODIFIED MERCALLI INTENSITY SCALE

I People do not feel any Earth movement.

II A few people might notice movement.

III Many people indoors feel movement. Hanging objects swing.

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

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

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

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

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

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

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

XI Few if any masonry structures remain standing. Large, well-built bridges are destroyed. Wood frame structures are severely damaged, especially near epicenters. Buried pipelines are rendered completely useless. Railroad tracks are badly bent. Water mixed with sand, and mud is ejected in large amounts.

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

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

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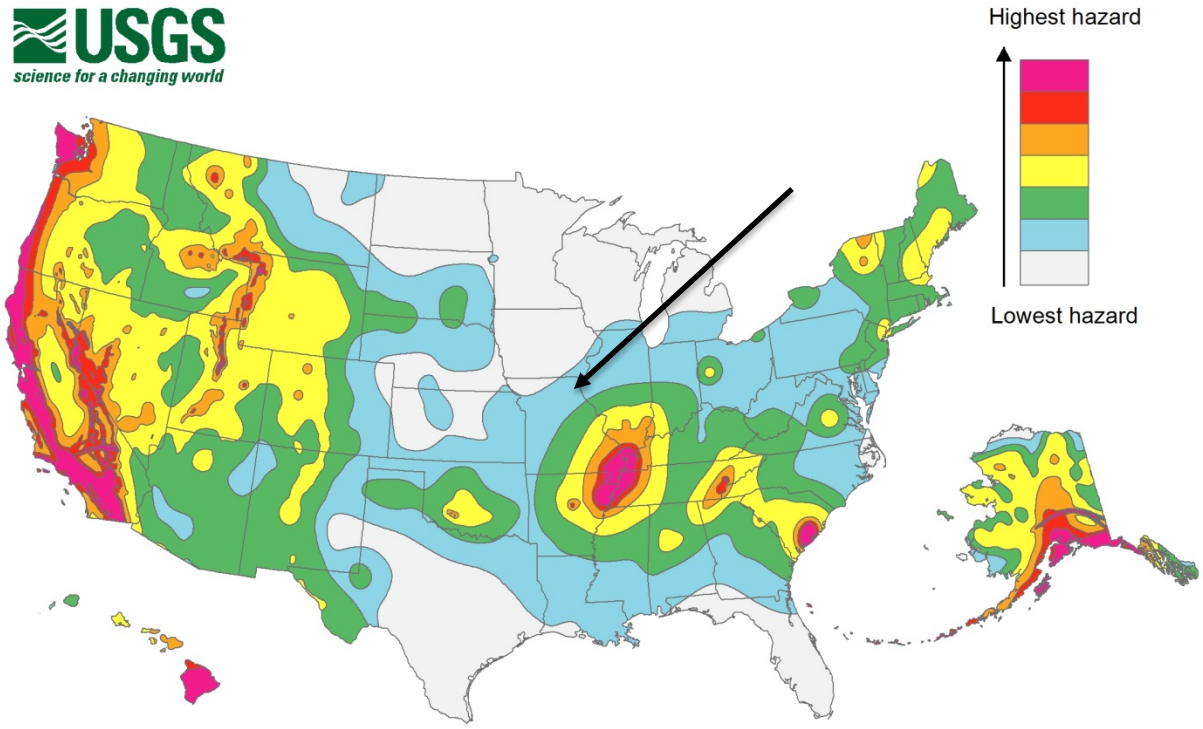
THE MISSOURI STATE
EMERGENCY MANAGEMENT AGENCY
P.O. BOX 116
JEFFERSON CITY, MO 65102
Telephone: 573-526-9100

Figure 3.9 illustrates seismicity in the United States. The Arrow indicates that the Lewis County Planning Area is in a relatively low hazard area.

Figure 3.9. 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

There have been 0 earthquakes recorded in Lewis County since 1931.

Probability of Future Occurrence

Risk Level:	Total Number of Earthquakes in Lewis County since 1931	Probability of A 5.0 Earthquake within next 50 years
Very Low	0	0.23%

Changing Future Conditions Considerations

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

According to the National Climate Assessment, earthquakes have increased during the last century, and these trends are expected to continue, as depicted below.

Vulnerability

Vulnerability Overview

According to the data obtained from the 2018 Missouri State Plan, Lewis County was rated as very low risk on the Earthquake Risk Rating.

The State of Earthquake Coverage Report states that the average premium for earthquake coverage in Lewis County was $55 in 2014.

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. Data is included for the planning area from State Plan Tables 3.60, 3.61, 3.62, 3.63 and Figures 3.91, 3.92, 3.93, and 3.94.

Table 3.60. HAZUS-MH Earthquake Loss Estimation: Annualized Loss Scenario

County	Total Losses, in $ Thousands	Loss Per Capita, in $ Thousands	Loss Ratio, in $ per Million
Lewis	$15	$0.0015	$15

Table 3.61. Hazus Earthquake Loss Estimation 2% Probability of Exceedance in 50 Years Scenario Results – Summary of Overall Impacts in Missouri

Type of Impact	Summary of Modeled Impacts
Total Buildings Damaged	Slight: 372,790 Moderate: 223,225 Extensive: 88,883 Complete: 47,549
Building and Income Related Losses	$51.4 billion
Total Economic Losses (includes building, income and lifeline losses)	$63.4 billion
Casualties (based on 2 a.m. time of occurrence)	Without requiring hospitalization: 15,454 Requiring hospitalization: 3,855 Life threatening: 512 Fatalities: 999
Casualties (based on 2 p.m. time of occurrence)	Without requiring hospitalization: 21,732 Requiring hospitalization: 5,727 Life threatening: 833 Fatalities: 1,606
Casualties (based on 5 p.m. time of occurrence)	Without requiring hospitalization: 15,480 Requiring hospitalization: 4,020 Life threatening: 574 Fatalities: 1,090
Damage to Schools	339 with at least moderate damage*
Damage to Medical Facilities	159 with at least moderate damage*
Damage to Fire Stations	194 with at least moderate damage*
Damage to Transportation Systems	819 highway bridges, at least moderate damage* 464 highway bridges, complete damage* 4 railroad bridges, moderate damage 12 airport facilities, moderate damage
Households without Power/Water Service (based on 2,375,611 households)	Power loss, Day 1: 364,335 Water loss, Day 1: 753,546 Water loss, Day 3: 730,857 Water loss, Day 7: 687,407 Water loss, Day 30: 549,352 Water loss, Day 90: 254,958
Displaced Households	48,730
Shelter Requirements	32,237 people out of 5,988,927 total population
Debris Generation	16.2 million tons

Table 3.62. Hazus Earthquake Loss Estimation 2% Probability of Exceedance in 50 Years Scenario Results – Summary of by Occupancy Class (Millions of Dollars)

Category	Area	Single Family	Other Residential	Commercial	Industrial	Others	Total
Income Losses	Wage	$0.00	$137.35	$1,494.55	$82.36	$119.30	$1,833.52
	Capital-Related	$0.00	$58.59	$1,217.03	$50.99	$30.64	$1,357.23
	Rental	$610.67	$425.50	$666.99	$30.81	$55.85	$1,789.81
	Relocation	$2,089.36	$380.76	$1,107.27	$147.23	$460.23	$4,184.85
	Subtotal	**$2,700.03**	**$1,002.20**	**$4,485.84**	**$311.39**	**$666.02**	**$9,165.41**
Capital Stock Losses	Structural	$3,581.98	$879.63	$2,018.83	$573.42	$605.33	$7,659.20
	Non-Structural	$12,295.72	$3,928.15	$5,230.69	$1,737.85	$1,559.66	$24,752.07
	Content	$3,915.69	$1,007.10	$2,641.24	$1,170.28	$799.40	$9,533.72
	Inventory	$0.00	$0.00	$72.52	$199.57	$15.57	$287.66
	Subtotal	**$19,793.39**	**$5,814.88**	**$9,963.28**	**$3,681.12**	**$2,979.96**	**$42,232.65**
	Total	**$22,493.42**	**$6,817.08**	**$14,449.12**	**$3,992.51**	**$3,645.98**	**$51,398.06**

Table 3.63. HAZUS-MH Earthquake Loss Estimation 2% Probability of Exceedance in 50 Years Scenario Direct Economic Losses Results Summary by County (All values in thousands)

County	Cost Structural Damage	Cost Non-Structural Damage	Cost Contents Damage	Inventory Loss	Loss Ratio %	Relocation Loss	Capital Related Loss	Wages Losses	Rental Income Loss	Total Loss
Lewis	$1,750	$3,777	$1,131	$40	0.56	$1,026	$261	$313	$421	$8,719

Figure 3.91. HAZUS-MH Earthquake Loss Estimation: Annualized Loss Scenario—Direct Economic Losses to Buildings

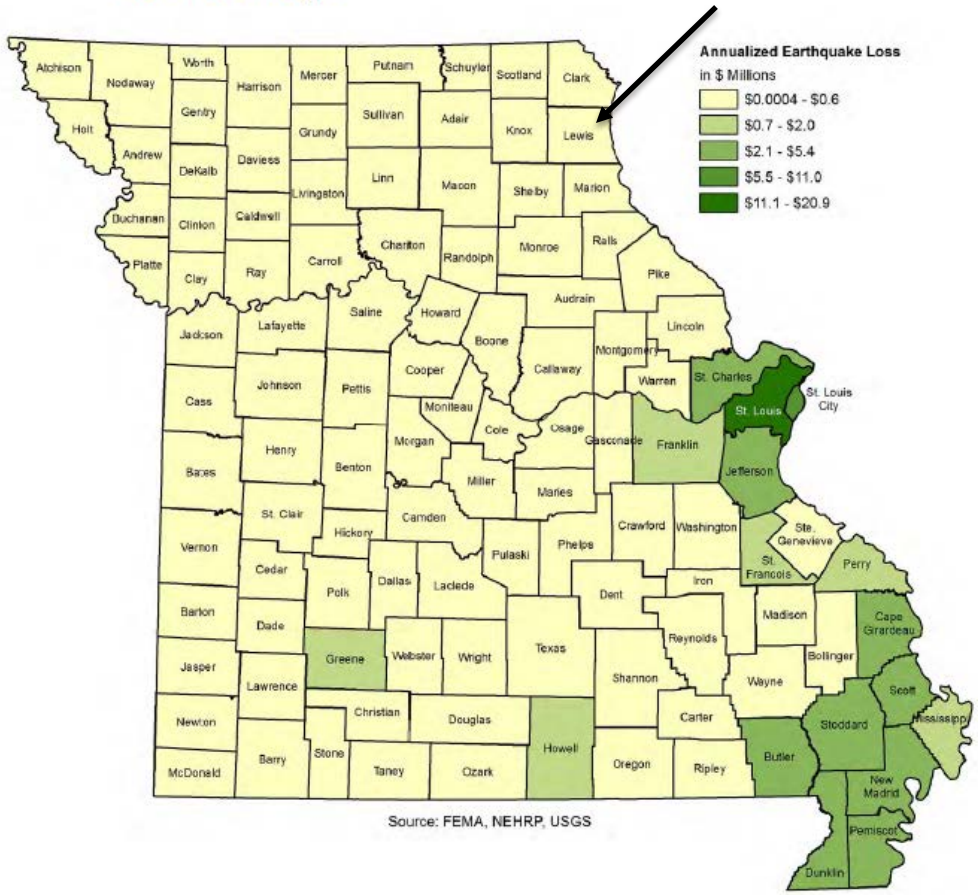


Figure 3.92. HAZUS- MH Earthquake 2% Probability of Exceedance in 50 Years —Ground Shaking and Liquefaction Potential

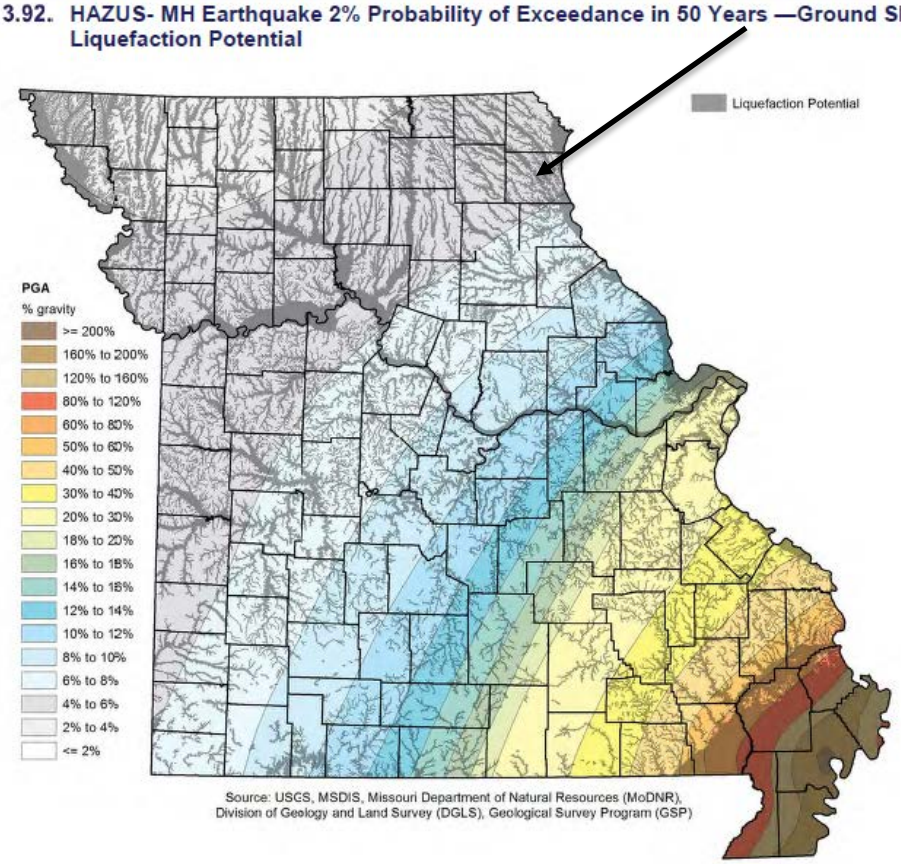


Figure 3.93. HAZUS-MH Earthquake Loss Estimation with a 2% Probability of Exceedance in 50 Years Scenario—Total Building Loss

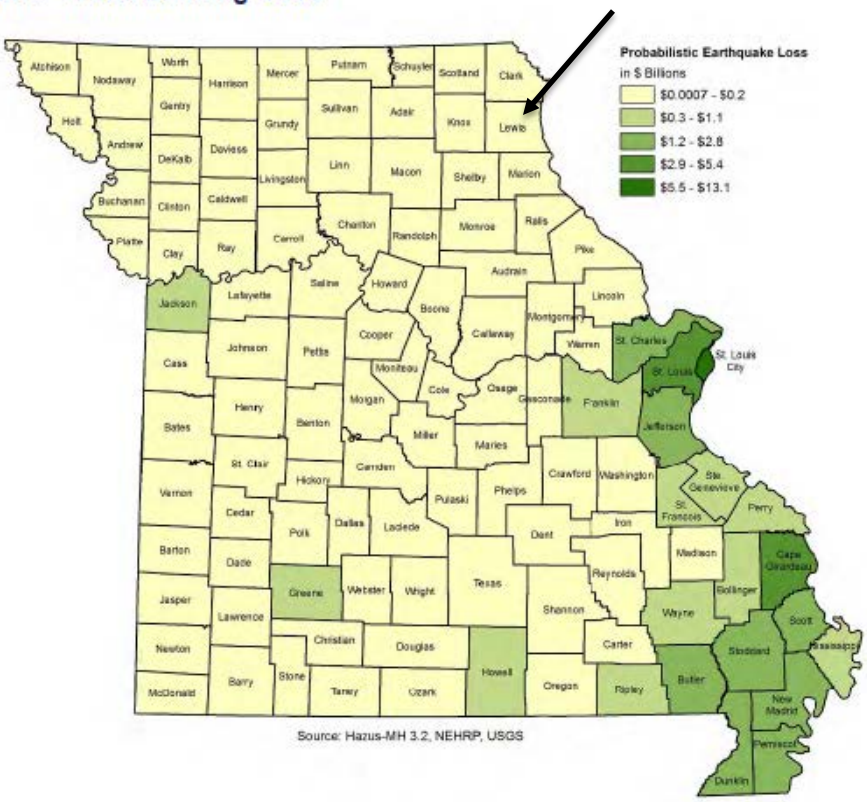
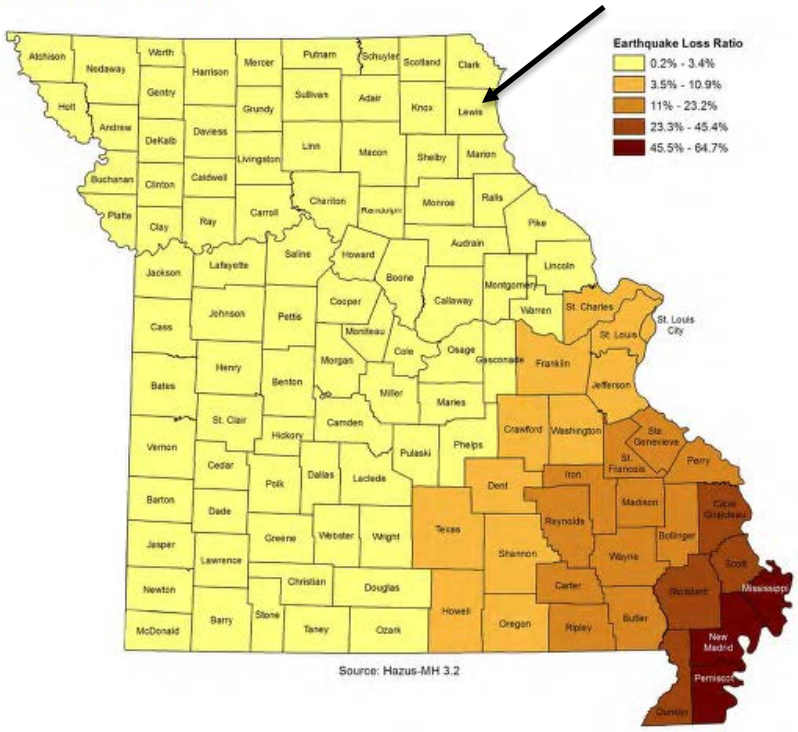


Figure 3.94. HAZUS-MH Earthquake Loss Estimation with a 2% Probability of Exceedance in 50 Years Scenario—Loss Ratio



Impact of Previous and Future Development

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

EMAP Consequence Analysis

Table 3.28. EMAP Impact Analysis: Earthquakes

Subject	Detrimental Impacts
Public	Adverse impact expected to be severe for unprotected personnel and moderate to light for protected personnel.
Responders	Adverse impact expected to be severe for unprotected personnel and moderate to light for protected personnel.
Continuity of Operations	Damage to facilities/personnel in the area of the incident may require relocation of operations and lines of succession execution. Disruption of lines of communication and destruction of facilities may extensively postpone delivery of services.
Property, Facilities, and Infrastructure	Damage to facilities and infrastructure in the area of the incident may be extensive for facilities, people, infrastructure, and HazMat.
Environment	May cause extensive damage, creating denial or delays in the use of some areas. Remediation needed.
Economic Condition of Jurisdiction	Local economy and finances adversely affected, possibly for an extended period of time.

Public Confidence in the Jurisdiction's Governance	Ability to respond and recover may be questioned and challenged if planning, response, and recovery not timely and effective.

Hazard Summary by Jurisdiction

The earthquake intensity is not likely to vary greatly throughout the planning area and all jurisdictions within the planning area will be the same throughout. However, La Grange could see a greater amount of structural damage due to having a higher percentage (29%) of residences built prior to 1939 than other jurisdictions in the planning area. In Monticello, 26.7% of the residences were built prior to 1939 and could see higher damage than the City of Ewing since only 13.4% of the residences built prior to 1939, which puts them at a lower risk.

Problem Statement

The risk of direct impact to Lewis County is low (less than 25%) but the severity of impacts by such an event if it does occur will range from moderate to severe. In addition, a seismic event of lesser magnitude may not inflict much direct damage on Lewis County but the county's proximity to affected areas will likely see great demand for mutual-aid via emergency response assets and sheltering resources.

3.4.5 Drought

Hazard Profile

Hazard Description

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

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

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

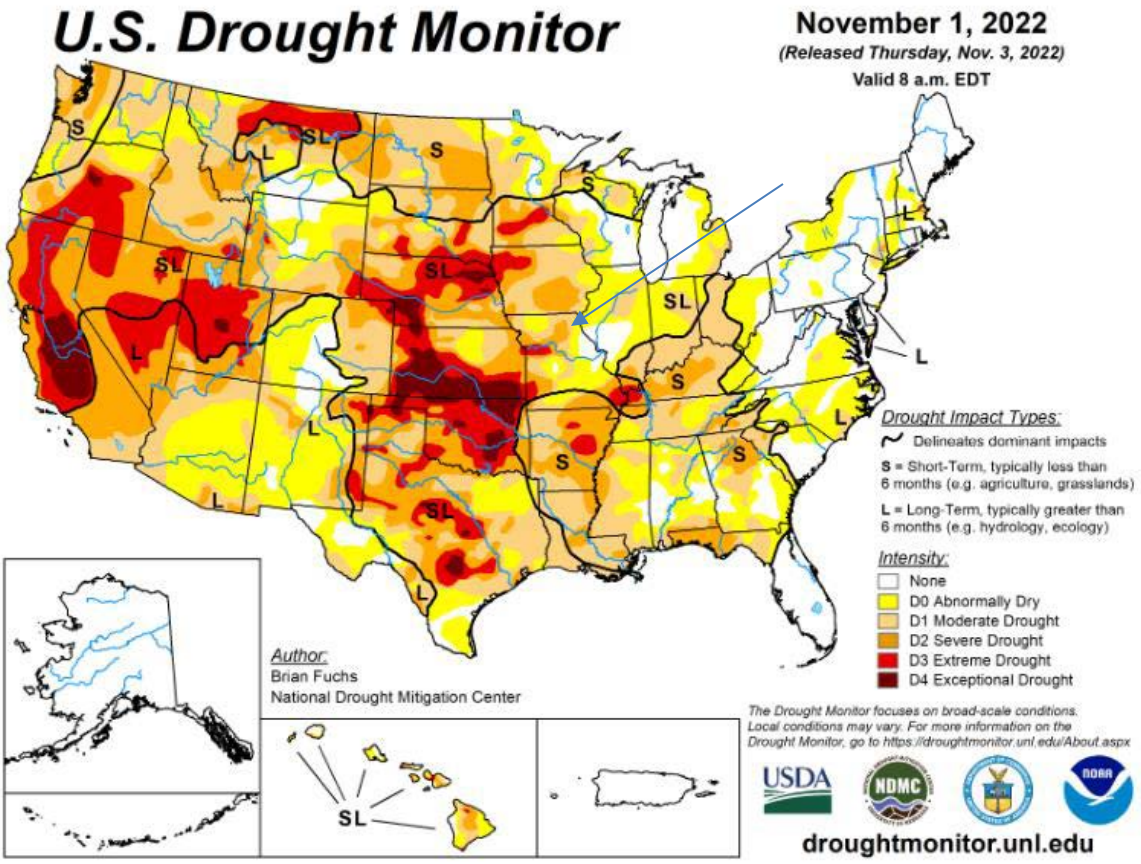
- Agricultural drought focus is on soil moisture deficiencies, differences between actual and potential evaporation, reduced ground water or reservoir levels, etc. Plant demand for water depends on prevailing weather conditions, biological characteristics of the specific plant, its stage of growth, and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

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

Geographic Location

Because of the broad scope of drought, all of Lewis County is susceptible to this hazard. Agricultural land is extremely vulnerable to drought impacts, and according to US Census data 78% of Lewis County total land area is classified as farmland, making the impact of drought one that is acutely felt by County residents.

Figure 3.10. 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 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.

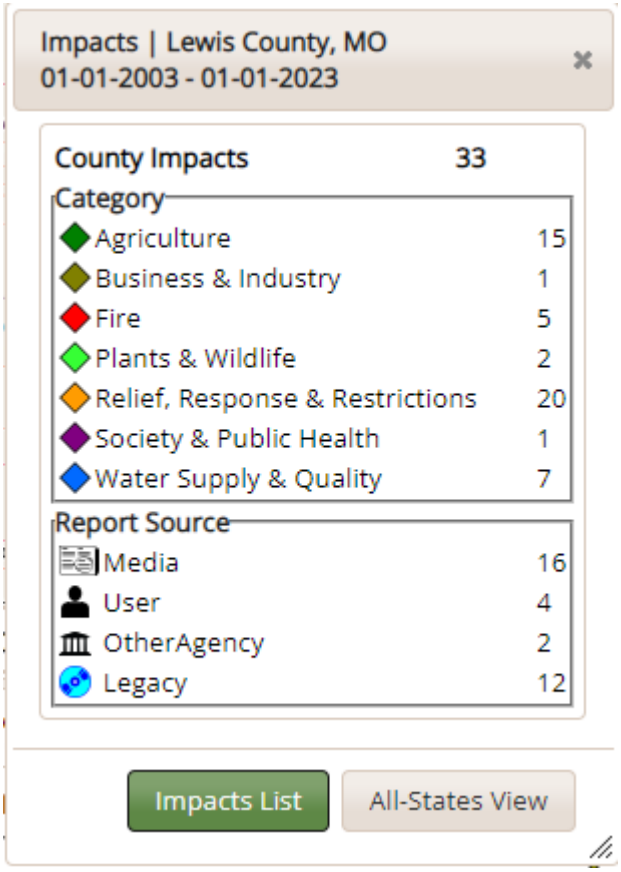
Previous Occurrences

Drought occurs periodically in Missouri with the most severe and costly in historical times occurring in 2018. Other major droughts, usually characterized by deficient rainfall combined with unusually high summer temperatures were in 2013 and 2005. Although droughts are not the spectacular weather events that floods, blizzards or tornadoes can be, historically they produce more economic damage to the State than all other weather events combined.

According to the National Center for Environmental Information, during the 20-year period from 2003 to 2023, Lewis County had 33 reported drought impacts. The following are the categories:

- Agriculture
- Business and Industry
- Fire
- Plants & Wildlife
- Relief, Response, & Restrictions
- Society and Public Health
- Water Supply & Quality

Figure 3.11. NCEI Drought Impacts



Probability of Future Occurrence

Over a 20-year period Lewis County experienced six drought events, indicating a 30% annual average percentage probability of drought occurring in the planning area. This is considered a “low moderate” probability.

Changing Future Conditions Considerations

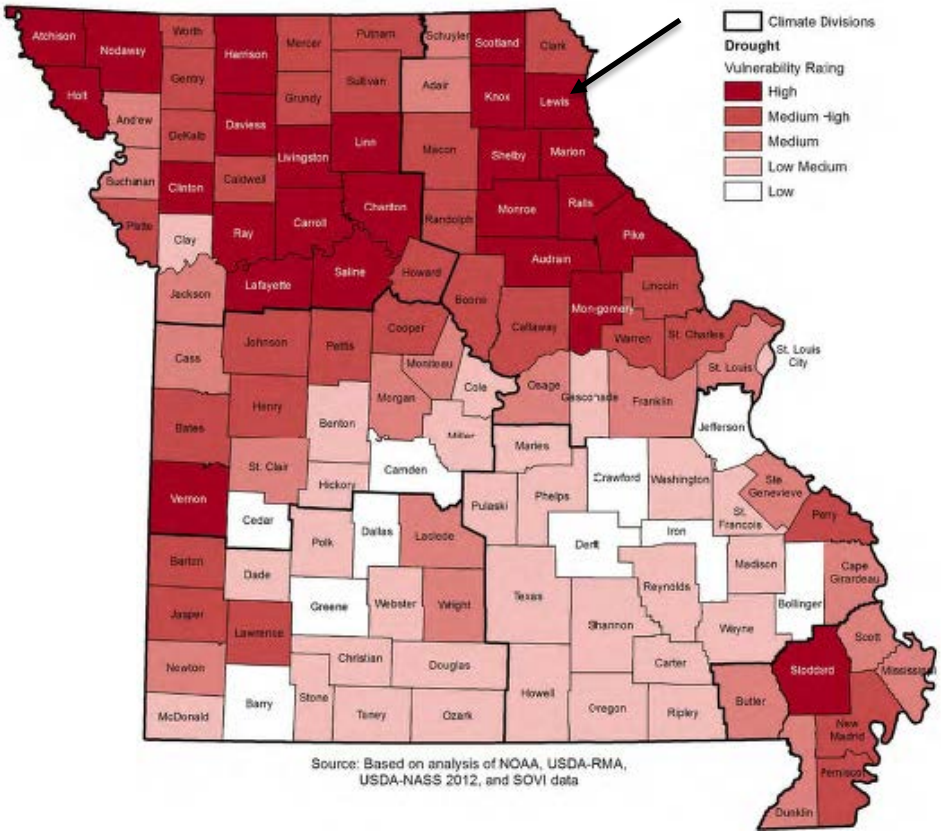
The 2018 State Plan, states that severe drought, a natural part of Missouri’s climate, is a risk to this agriculture dependent state. Future increases in evaporation rates due to higher temperatures may increase the intensity of naturally occurring droughts. The number of heavy rainfall events is predicted to increase, yet researchers currently expect little change in total rainfall amounts, indicating the periods between heavy rainfalls will be marked by an increasing number of dry days. Higher temperatures and increased evapotranspiration increase the likelihood of a drought. This could lead to agricultural drought and suppressed crop yields.

Vulnerability

Vulnerability Overview

According to the analysis from the 2018 State Plan, Lewis County is a High Vulnerability County for droughts.

Figure 3.12. Missouri Drought Vulnerability by County



Source: Missouri State Hazard Mitigation Plan, 2018, Arrow Indicates Lewis County

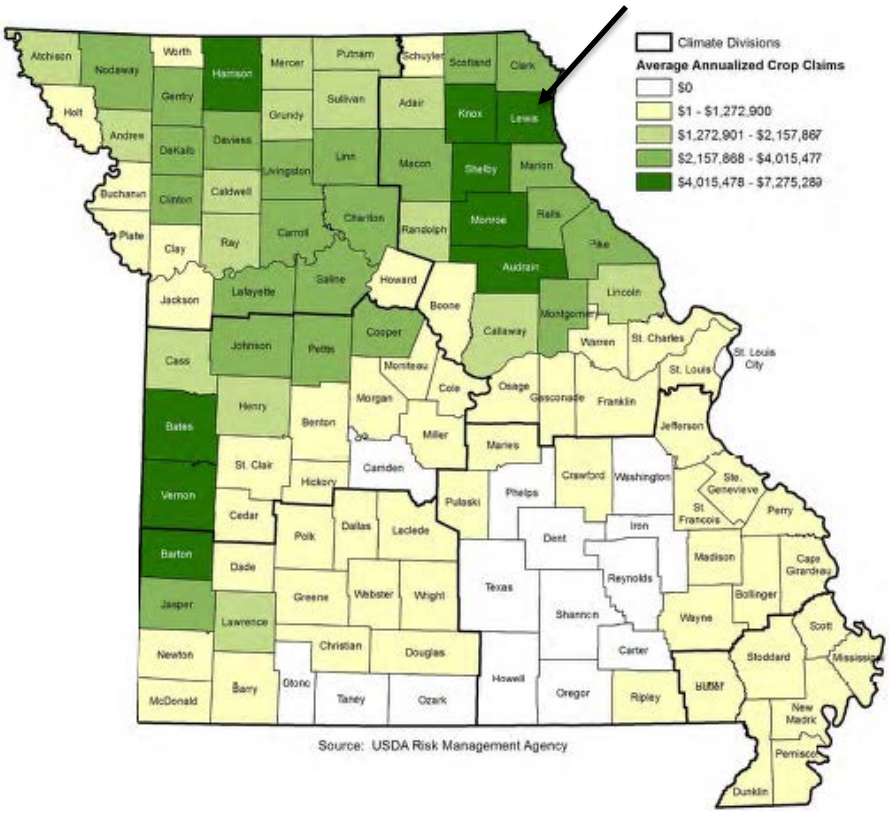
Potential Losses to Existing Development

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

Impact of Previous and Future Development

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

Figure 3.13. Annualized Drought Crop Insurance Claims Paid 2007-2016



Source: Missouri State Hazard Mitigation Plan, 2018, Arrow Indicates Lewis County

Changing Future Conditions Considerations

A new analysis, performed for the Natural Resources Defense Council, examined the effects of climate change on water supply and demand in the contiguous United States. The study found that more than 1,100 counties will face higher risks of water shortages by mid-century as a result of climate change. Two of the principal reasons for the projected water constraints are shifts in precipitation and potential evapotranspiration (PET). Climate models project decreases in precipitation in many regions of the U.S., including areas that may currently be described as experiencing water shortages of some degree. **Figure 3.14** ranks Lewis County as moderate on the Water Supply Sustainability Index.

Figure 3.14. Climate Change Impacts on Water Supply in Missouri

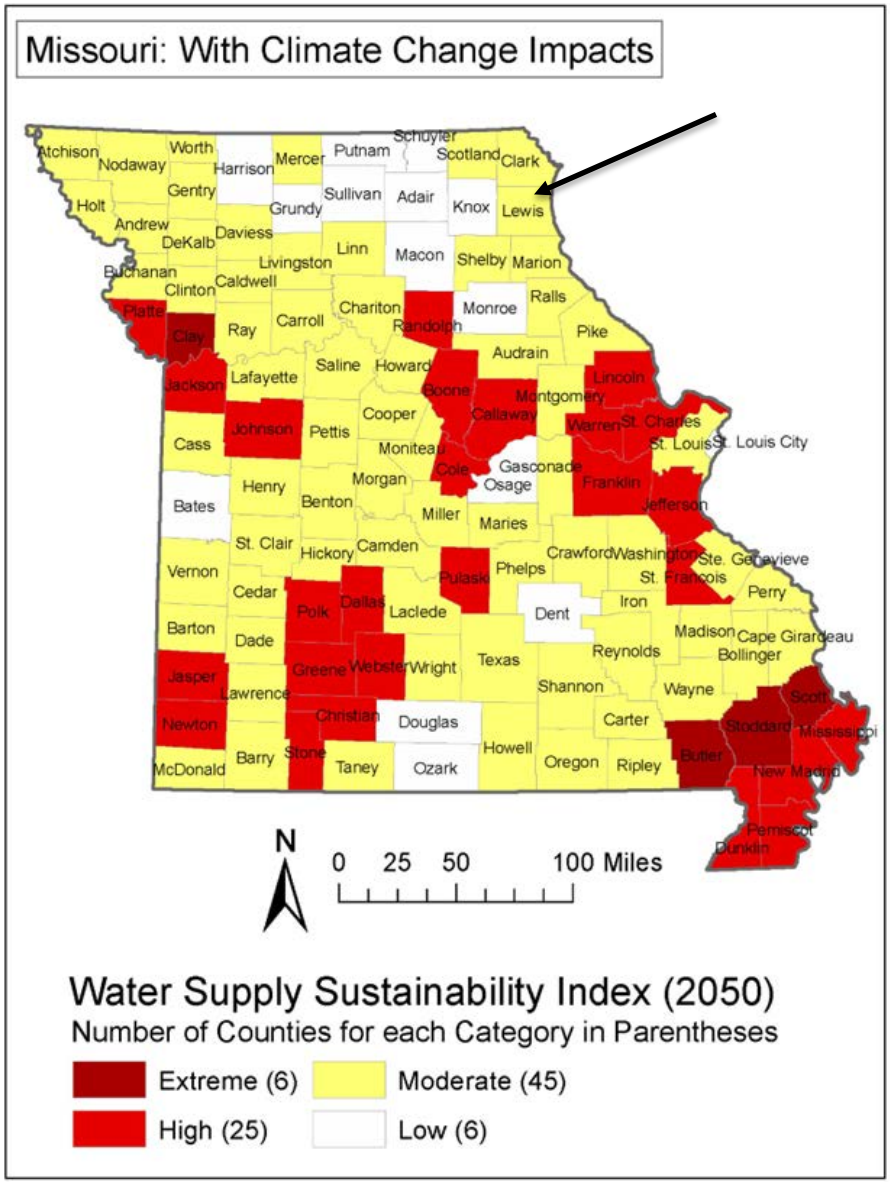


Table 3.29. EMAP Impact Analysis: Drought

Subject	Detrimental Impacts
Public	Most damage expected to be agricultural in nature. However, water supply disruptions may adversely affect people.
Responders	Nature of hazard expected to minimize any serious damage to properly equipped and trained personnel.
Continuity of Operations	Unlikely to necessitate execution of the Continuity of Operations Plan. Nature of hazard expected to minimize serious damage to services, except for moderate impact on water utilities.
Property, Facilities, and Infrastructure	Nature of hazard expected to minimize any serious damage to facilities.
Environment	May cause disruptions in wildlife habitat, increasing interface with people, and reducing numbers of animals.
Economic Condition of Jurisdiction	Local economy and finances dependent on abundant water supply adversely affected for duration of drought.
Public Confidence in the Jurisdiction's Governance	Ability to respond and recover may be questioned and challenged if planning, response, and recovery not timely and effective.

Hazard Summary by Jurisdiction

There is no variance by jurisdiction to this threat. Drought conditions would be the same in small communities as those experienced in rural areas, but the magnitude would be different with only lawns and local gardens impacted. In addition, building foundations could be weakened due to shrinking and expanding soils.

Problem Statement

Lewis County does not have severe drought vulnerability. Surface and groundwater resources are abundant and typically supply enough water only for domestic needs and irrigation even during drought conditions.

3.4.6 Extreme Temperatures

Hazard Profile

Hazard Description

Extreme temperature events, both hot and cold, can impact human health and mortality, natural ecosystems, agriculture and other economic sectors. According to information provided by FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks. Ambient air temperature is one component of heat conditions, with relative humidity being the other. The relationship of these factors creates what is known as the apparent temperature. The Heat Index chart shown in **Figure 3.15** uses both of these factors to produce a guide for the apparent temperature or relative intensity of heat conditions.

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

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

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

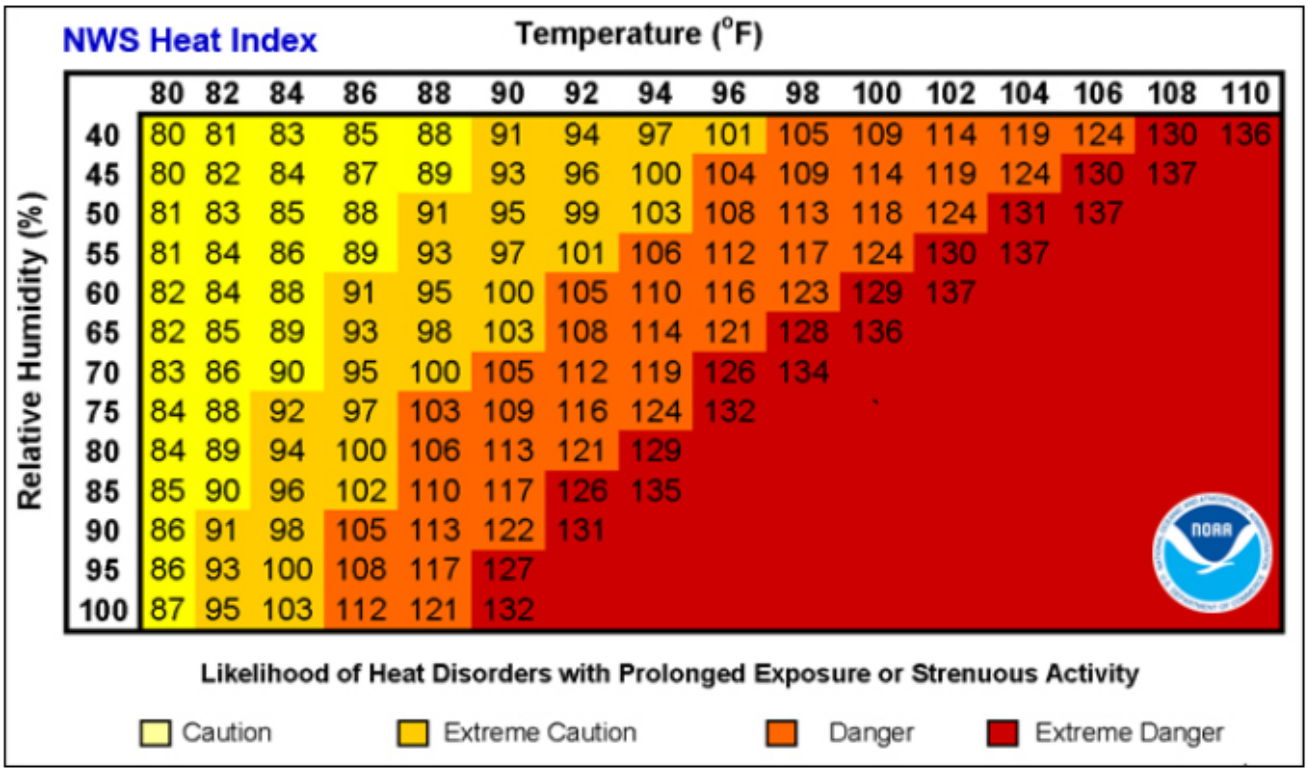
Geographic Location

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

Strength/Magnitude/Extent

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

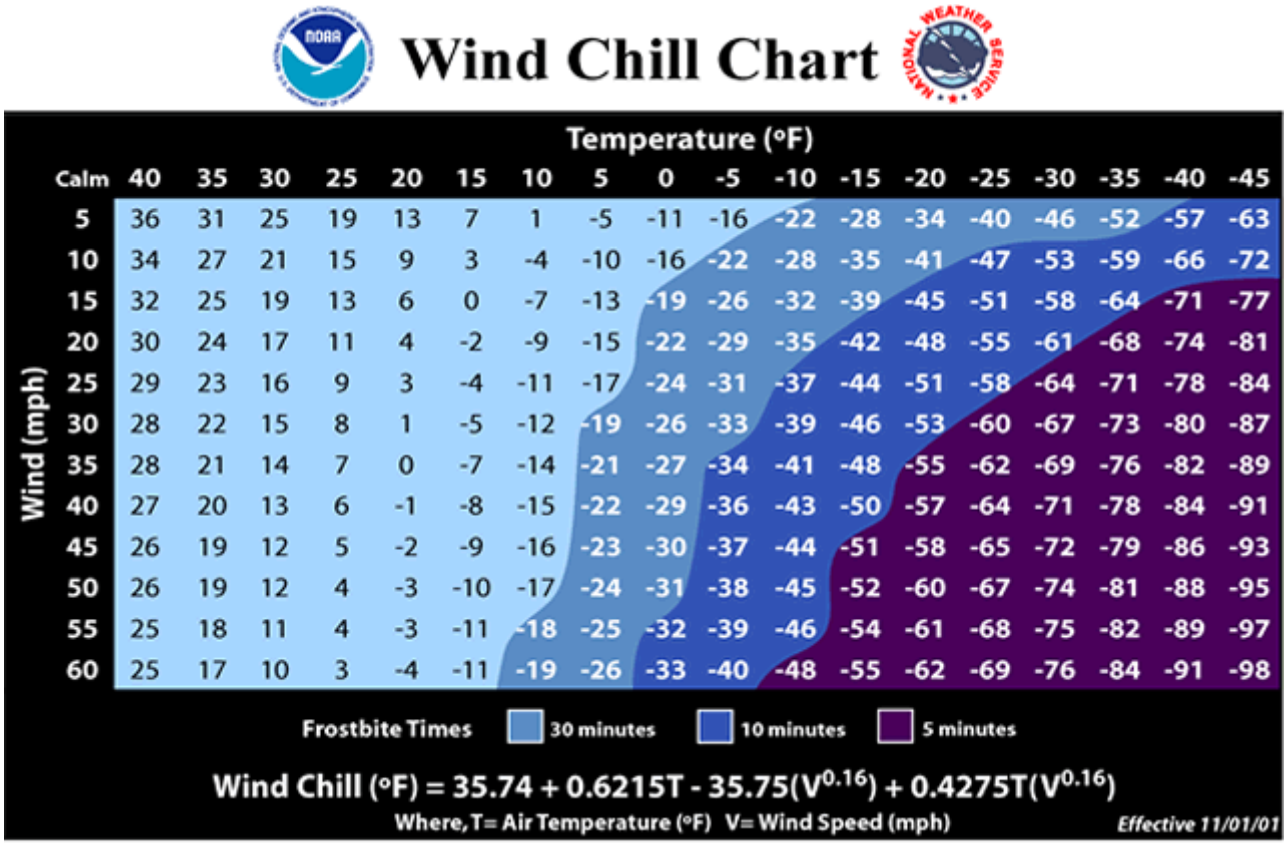
Figure 3.15. Heat Index (HI) Chart



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 3.16. Wind Chill Chart

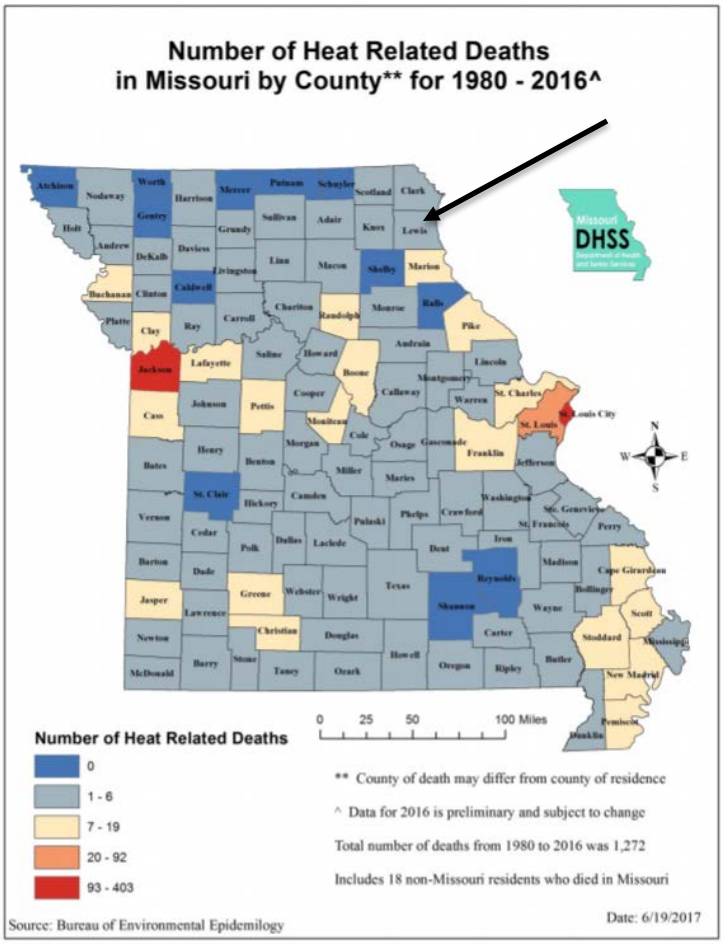


Source: https://www.weather.gov/safety/cold-wind-chill-chart

Previous Occurrences

The recorded events in the National Centers for Environmental Information (NCEI) database state there have been 20 recorded events of excessive heat in the 20-year period of 2003-2023. There were 0 deaths or injuries associated with these events. The NCEI database shows 0 recorded events of extreme cold/wind chill. **Figure 3.17** illustrates 1-6 heat related deaths in Lewis County between the time of 1980-2016, no supporting documentation could be found to elaborate on any incident.

Figure 3.17. 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 2013 to 2022 were $1,620,401. Extreme heat can also strain electricity delivery infrastructure overloaded during peak use of air conditioning during extreme heat events. Another type of infrastructure damage from extreme heat is road damage. When asphalt is exposed to prolonged extreme heat, it can cause buckling of asphalt-paved roads, driveways, and parking lots.

From 1988-2011, there were 3,496 fatalities in the U.S. attributed to summer heat. This translates to an annual national average of 146 deaths. During the same period, 0 deaths were recorded in the planning area, according to NCEI data. The National Weather Service stated that among natural hazards, no other natural disaster—not lightning, hurricanes, tornadoes, floods, or earthquakes—causes more deaths.

Probability of Future Occurrence

NOAA information dating back to 2002 indicates 9 years with extreme heat events (2007, 2009, 2010, 2011, 2012, 2014, 2015, 2016). Based on this historical data, the calculated probability of an extreme heat event in any given year is 40%.

Changing Future Conditions Considerations

According to the 2018 Missouri State Plan, average annual temperatures are projected to most likely exceed historical record levels by the middle of the 21st century. The impacts of extreme heat events are experienced most acutely by the elderly and other vulnerable populations. High temperatures are exacerbated in urban environments, a phenomenon known as the urban heat island effect, which in turn tend to have higher concentrations of vulnerable populations. Higher demand for electricity when people attempt 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.

According to the National Climate Assessment, extreme temperature events have increased during the last century, and these trends are expected to continue, as depicted below.

Vulnerability

Vulnerability Overview

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

Table 3.30 lists typical symptoms and health impacts due to exposure to extreme heat.

Table 3.30. 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

Extreme heat can impact agriculture in a significant way, especially as extreme heat events often coincide with drought (see drought section).

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.

EMAP Consequence Analysis

For communities with emergency management programs seeking EMAP accreditation, complete Table 3.31 to summarize the detrimental impacts from extreme temperatures.

Table 3.31. EMAP Impact Analysis: Extreme Temperatures

Subject	Detrimental Impacts
Public	Localized impact expected to be severe for incident areas and moderate to light for other adversely affected areas.
Responders	Localized impact expected to limit damage to personnel in the areas at the time of the incident.
Continuity of Operations	Unlikely to necessitate execution of the Continuity of Operations Plan. Extent of agricultural damage depends on duration. Water supplies and electricity may be disrupted.
Property, Facilities, and Infrastructure	Nature of hazard expected to minimize any serious damage to facilities. Asphalt parking lots and roads are routinely damaged during periods of extreme heat as the hot asphalt becomes less rigid and can be displaced by heavy equipment or automobiles.
Environment	Potential for crop damage; May cause disruptions in wildlife habitat, increase interface with people, and reduce numbers of animals.
Economic Condition of Jurisdiction	Local economy and finances dependent on stable electricity and water supply adversely affected for duration of heat wave.
Public Confidence in the Jurisdiction's Governance	Ability to respond and recover may be questioned and challenged if planning, response, and recovery not timely and effective.

Hazard Summary by Jurisdiction

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

summarizes vulnerable populations in the participating jurisdictions. Note that school and special districts are not included in the table because students and those working for the special districts are not customarily in these age groups.

Table 3.32. Lewis County Population Under Age 5 and Over Age 65, 2021 Census Data

Jurisdiction	Population Under 5 yrs	Population 65 yrs and over
Lewis County	563	1,932
Canton	94	463
Ewing	40	67
La Belle	37	135
La Grange	6	227
Lewistown	30	90
Monticello	18	16

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

All schools in Lewis County have air conditioning which does not put school age children at risk during extreme temperatures. Due to this, the schools do not have a policy in affect to close if there are extreme temperatures.

Problem Statement

All areas of Lewis County are at equal risk to the hazards of extreme heat –however, those with larger numbers of children and elderly among the population may be more vulnerable. The City of Canton, being the most populous community, is the most vulnerable according to these criteria.

3.4.7 Severe Thunderstorms Including High Winds, Hail, and Lightning

Hazard Profile

Hazard Description

Thunderstorms

A thunderstorm is defined as a storm that contains lightning and thunder which is caused by unstable atmospheric conditions. When cold upper air sinks and warm moist air rises, storm clouds or 'thunderheads' develop resulting in thunderstorms. This can occur singularly, as well as in clusters or lines. The National Weather Service defines a thunderstorm as "severe" if it includes hail that is one inch or more, or wind gusts that are at 58 miles per hour or higher. At any given moment across the world, there are about 1,800 thunderstorms occurring. Severe thunderstorms most often occur in Missouri in the spring and summer, during the afternoon and evenings, but can occur at any time. Other hazards associated with thunderstorms are heavy rains resulting in flooding (discussed separately in **Section 3.4.1**) and tornadoes (discussed separately in **Section 3.4.9**).

High Winds

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

Lightning

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

Hail

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

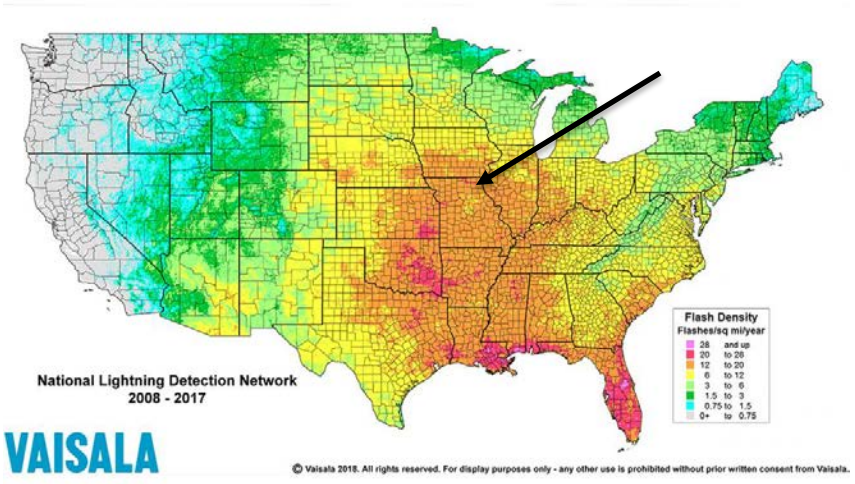
At the time when the updraft can no longer support the hailstone, it will fall down to the earth. For example, a ¼" diameter or pea sized hail requires updrafts of 24 miles per hour, while a 2 ¾" diameter or baseball sized hail requires an updraft of 81 miles per hour. According to the NOAA, the largest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

Geographic Location

All of Lewis County is susceptible to thunderstorms/high winds/hail and lighting events. Although these events occur similarly throughout the planning area, they are more frequently reported in more urbanized areas. In addition, damages are more likely to occur in more densely developed urban areas.

Figure 3.18 shows lightning frequency in the nation. The arrow indicates the Lewis County Planning area.

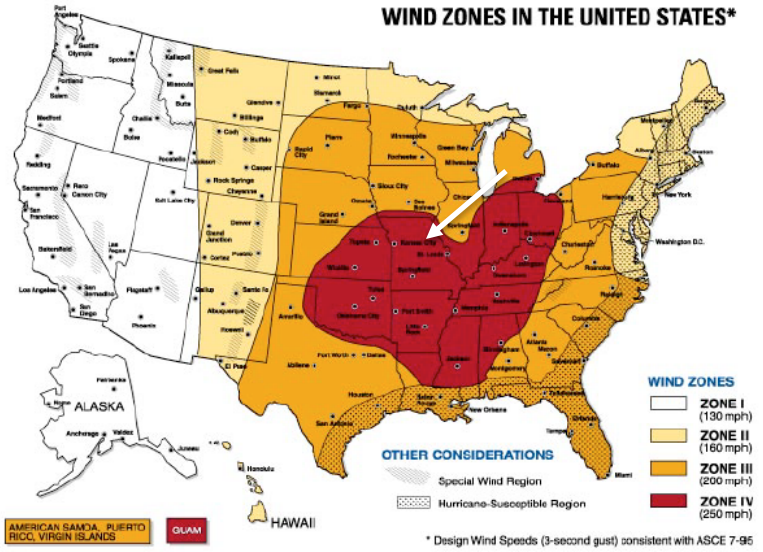
Figure 3.18. Location and Frequency of Lightning in Missouri



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

Figure 3.19 shows wind zones in the United State. The arrow indicates Lewis County.

Figure 3.19. Wind Zones in the United States



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

Strength/Magnitude/Extent

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

Table 3.33. Tornado and Storm Research Organization Hailstorm Intensity Scale

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

Source: Tornado and Storm Research Organization (TORRO), Department of Geography, Oxford Brookes University
Notes: In addition to hail diameter, factors including number and density of hailstones, hail fall speed and surface wind speeds affect severity. http://www.torro.org.uk/site/hscale.php

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

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

Previous Occurrences

Table 3.34. Reported Events and Damages Lewis County from Thunderstorms 2013-2023

Wind Magnitude	Number of Events	Property Damage	Crop Damages
35 kts	1	0	0
52 kts	1	0	0
56 kts	12	7.00K	0
61 kts	4	15.00K	0

August 18, 2022 - A cold front moved southeast through the region with storms developing along and ahead of the boundary. Some of the storms became severe with isolated reports of large hail and damaging winds over portions of northeast Missouri as well as west central Illinois. Thunderstorm winds caused moderate damage to a farm outbuilding.

August 20, 2021 - Thunderstorm winds blew down several large trees as well as a couple of power poles around the town of Canton.

July 9, 2021 - On the evening of July 9th, intense thunderstorms developed rapidly along a warm front draped from northwest to southeast across the area. There were two rounds of thunderstorms, the first being discrete, rotating storms called supercells. These supercell thunderstorms dropped large hail across portions of western Illinois (Mt. Sterling area) and also across the western St. Louis metro area. Hail in excess of 2 inches was noted in both of these supercells. Over time, the storms congealed into a large complex of thunderstorms known as a mesoscale convective complex (MCC). This line of storms contained damaging, sometimes destructive winds as they quickly pushed southeast across east-central Missouri into southwest Illinois. The worst damage was noted from Rensselaer, MO southward to Perry, MO, where straight-line winds of 90 mph were found. This same line of storms also affected the St. Louis metro area, bringing widespread 60-70 mph winds across the metro causing many large tree limbs to fall and many to be without power. Thunderstorm winds blew down numerous tree limbs around town in the city of Ewing.

Table 3.35. Reported Events and Damages in Lewis County from High Winds 2013-2023

No Data Available for High Wind Incidents

Table 3.36. Reported Events and Damages in Lewis County from Hail 2013-2023. Events Summarized by Size

Hail Size (inches)	Number of Events	Property Damages	Crop Damages
.88	2	0	0
1.00	16	0	0
1.25	1	0	0
1.50	2	0	0
1.75	9	0	0

Table 3.37. Reported Events and Damages in Lewis County from Lightning 2013-2023

No Data or Incidents Reported. 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.

Table 3.38. Crop Insurance Claims Paid in Lewis County from High Winds, 2013-2022

Crop Year	Crop Name	Cause of Loss Description	Insurance Paid
2013	Corn	Wind/Excess Wind	$4,684
2014	Corn	Wind/Excess Wind	$109,218
2016	Corn	Wind/Excess Wind	$49,032
2021	Corn	Wind/Excess Wind	$4,483
2022	Soybeans	Wind/Excess Wind	$6,807
2022	Soybeans	Hot Wind	$62,595
Total			**$236,819**

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

Table 3.39. Crop Insurance Claims Paid in Lewis County from Hail, 2013-2022.

Crop Year	Crop Name	Cause of Loss Description	Insurance Paid
2018	Soybeans	Hail	$1,372
2021	Corn	Hail	$12,525
Total			**$13,897**

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

Probability of Future Occurrence

Thunderstorms

Thunderstorm wind events 50 knots and greater have a probability of occurring 1.7 times per year in any given year. These rates are expected to continue in the future.

High Winds

The probability of high winds is low but could not be calculated since there had not been an event in the planning area over the last 10 years.

Lightning

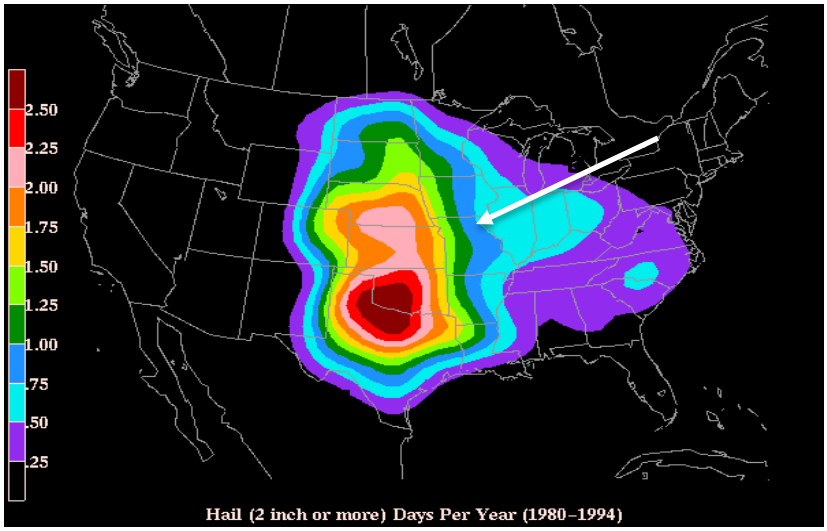
The probability of lightning events is low but could not be calculated since there had not been an event in the planning area over the last 10 years.

Hail

Based on the date, there have been 28 events in a 10-year period producing an average of 1.00 hail in Lewis County planning area. Based on this history there is a probability of 2.8 events per year in the planning area.

Figure 3.20 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. Lewis County is located in the region to receive between .75 and 1 hailstorms annually.

Figure 3.20. 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 Plan, predicted increases in temperature could help create atmospheric conditions that are fertile breeding grounds for severe thunderstorms and tornadoes in Missouri. Possible impacts include an increased risk to life and property in both the public and private sectors. Public utilities and manufactured housing developments will be especially prone to damages. Jurisdictions already affected should be prepared for more of these events and should thus prioritize mitigation actions such as construction of safe rooms for vulnerable populations, retrofitting and/or hardening existing structures, improving warning systems and public education, and reinforcing utilities and additional critical infrastructure.

Vulnerability

Vulnerability Overview

Severe thunderstorm losses are usually attributed to the associated hazards of hail, downburst winds, lightning and heavy rains. Losses due to hail and high wind are typically insured losses that are localized and do not result in presidential disaster declarations. However, in some cases, impacts are severe and widespread and assistance outside state capabilities is necessary. Hail

and wind also can have devastating impacts on crops. Severe thunderstorms/heavy rains that lead to flooding are discussed in the flooding hazard profile. Hailstorms cause damage to property, crops, and the environment, and can injure and even kill livestock. In the United States, hail causes more than $1 billion in damage to property and crops each year. Even relatively small hail can shred plants to ribbons in a matter of minutes. Vehicles, roofs of buildings and homes, and landscaping are also commonly damaged by hail. Hail has been known to cause injury to humans, occasionally fatal injury.

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

Most lightning damages occur to electronic equipment located inside buildings. But structural damage can also occur when a lightning strike causes a building fire. In addition, lightning strikes can cause damages to crops, if fields or forested lands are set on fire. Communications equipment and warning transmitters and receivers can also be knocked out by lightning strikes. http://www.vaisala.com/en/products/thunderstormandlightningdetectionsystems/Pages/NLDN.aspx and http://www.lightningsafety.noaa.gov/

Potential Losses to Existing Development

Over the last 10 years Lewis County has 46 thunderstorm events that caused a reported $22,000 in damages, an average annual loss of approximately $2,200 dollars.

Previous and Future Development

There is no significant development anticipated which would result in an increase in population or increased exposure to damage.

EMAP Consequence Analysis

For communities with emergency management programs seeking EMAP accreditation, complete Table 3.39 to summarize the detrimental impacts from severe thunderstorms.

Table 3.40. EMAP Impact Analysis: Severe Thunderstorms

Subject	Detrimental Impacts
Public	Localized impact expected to be severe for incident areas and moderate to light for other adversely affected areas.
Responders	Localized impact expected to limit damage to personnel in the areas at the time of the incident.
Continuity of Operations	Damage to facilities/personnel in the area of the incident may require temporary relocation of some operations. Localized disruption of roads, facilities, and/or utilities caused by incident may postpone delivery of some services.
Property, Facilities, and Infrastructure	Localized impact to facilities and infrastructure in the area of the incident. Some severe damage possible.
Environment	Localized impact expected to be severe for incident areas and moderate to light for other areas affected by the storm or HazMat spills.

Subject	Detrimental Impacts
Economic Condition of Jurisdiction	Losses to private structures covered, for the most part, by private insurance.
Public Confidence in the Jurisdiction's Governance	Ability to respond and recover may be questioned and challenged if planning, response, and recovery not timely and effective.

Hazard Summary by Jurisdiction

Thunderstorm /high winds/lightning/hail events are area-wide; NCEI data did not seem to indicate that any particular community had significantly higher vulnerability than any other, beyond larger communities having more structures that could be damaged.

Lewis County C-1 School district has one high school campus and one elementary school campus, both located in Lewistown. Canton R-V has one main building, as well as a daycare, bus garage, Vo-Ag building and a Greenhouse located in Canton.

Problem Statement

The county is vulnerable to the high winds, lighting, and hail associated with thunderstorms – particularly winds and hail, which can cause extensive damage to agricultural assets, particularly crops.

3.4.8 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.

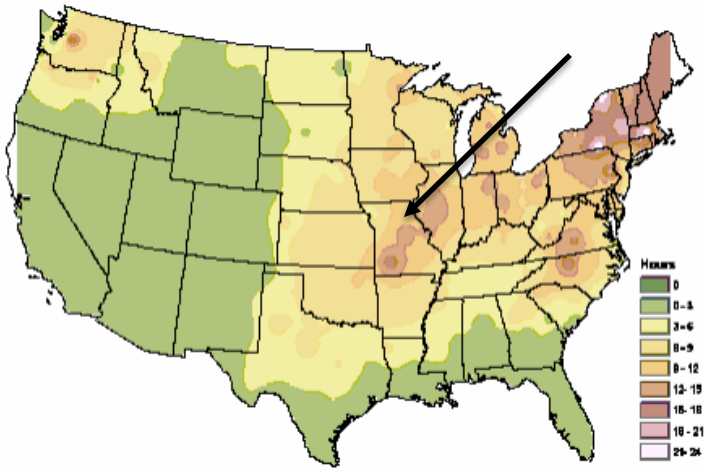
- **Blizzard**—Winds of 35 miles per hour or more with snow and blowing snow reducing visibility to less than ¼ mile for at least three hours.
- **Blowing Snow**—Wind-driven snow that reduces visibility. Blowing snow may be falling snow and/or snow on the ground picked up by the wind.
- **Snow Squalls**—Brief, 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

The entire Lewis County planning area is vulnerable to heavy snow, extreme temperatures and freezing rain. The snow season normally extends from late November through mid-March, but significant snows have fallen as early as November 24th to as late as April 4th.

Figure 3.21 shows the average number of hours per year with freezing rain. Lewis County receives approximately 9-12 hours of freezing rain per year.

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



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

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 3.41 includes NCEI reported events and damages for the past 10 years.

Table 3.41. NCEI Lewis County Winter Weather Events Summary, 2013-2022

Type of Event	Inclusive Dates	Magnitude	# of Injuries	Property Damages	Crop Damages
Winter Storm	2/21/2013		0	0	0
Winter Storm	12/21/2013		0	0	0
Winter Storm	2/4/2014		0	0	0
Winter Storm	1/1/21		0	0	0
Winter Storm	12/22/22		0	0	0
Heavy Snow	2/25/2013		0	0	0
Heavy Snow	3/24/2013		0	0	0
Heavy Snow	4/1/2018		0	0	0
Heavy Snow	1/11/2019		0	0	0
Heavy Snow	2/1/22		0	0	0
Heavy Snow	2/17/2022		0	0	0
Blizzard	11/25/2018		0	0	0

Source: NCEI, data accessed 1/15/2023

11/25/2018 - A strong area of low pressure tracked east across Kansas, Missouri, and central Illinois on November 25th, bringing heavy snowfall and gusty winds to the region. This caused blizzard conditions across portions of central and northeast Missouri, as well as west central Illinois, with less than a quarter of a mile visibility at times during the afternoon and evening. Strong northwest winds between 25 and 35 mph with gusts near 50 mph at times were reported during the storm. The heaviest snowfall reports were over portions of northeast Missouri and west central Illinois. Before the precipitation changed over to snow, there were a few strong to severe storms, but no reports of severe

weather were received. Up to 8 inches of snow fell across Lewis County with winds gusting up to 50 mph at times. This caused reduced visibilities of less than a quarter of a mile at times and hazardous driving conditions.

2/4/2014 - An early February winter storm dropped from 6 to 13 inches of snow across Central and Northeast Missouri. Travel was very difficult and most schools in rural areas were closed the rest of the week.

Table 3.42 showing 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 3.42. Crop Insurance Claims Paid in Lewis County as a Result of Cold Conditions and Snow 2013-2022

Crop Year	Crop Name	Cause of Loss Description	Insurance Paid ($)
2013	Soybeans	Cold Wet Weather	$4,430
2013	Corn	Cold Wet Weather	$4,136
2013	Wheat	Cold Wet Weather	$44,575
2014	Soybeans	Cold Wet Weather	$9,957
2014	Wheat	Cold Wet Weather / Cold Winter	$394,568
2015	Wheat	Cold Winter	$8,243
2015	Corn	Cold Wet Weather	$103,317
2016	Corn	Cold Wet Weather	$6,010
2016	Soybeans	Cold Wet Weather	$3,903
2017	Corn	Cold Wet Weather	$3,258
2018	Wheat	Cold Wet Weather / Cold Winter	$9,243
2018	Corn	Cold Wet Weather	$37,359
2019	Wheat	Cold Wet Weather	$7,076
2019	Corn	Cold Wet Weather	$4,256
2020	Corn	Cold Wet Weather	$100,304
2020	Soybeans	Cold Wet Weather	$45,758
2021	Corn	Cold Wet Weather	$59,728
2021	Soybeans	Cold Wet Weather	$95,824
Total			**$941,945**

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

Probability of Future Occurrence

According to NCEI, during the 10-year period from 2013-2023 the planning area experienced 12 winter storm events. This means there is a probability of 1.2 events any given year in the Lewis County planning area.

Changing Future Conditions Considerations

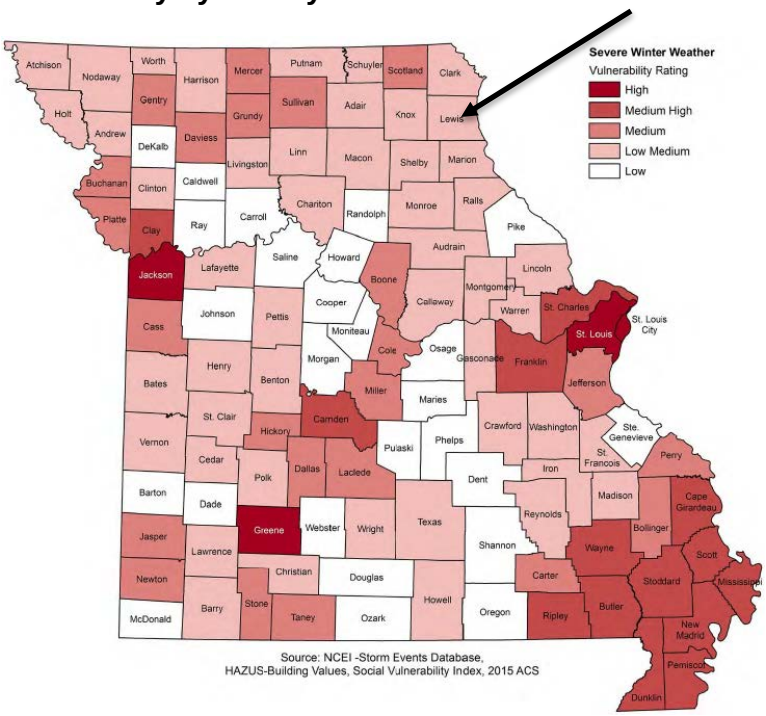
According to the 2018 Missouri State Plan, a shorter overall winter season and fewer days of extreme cold may have both positive and negative indirect impacts. Warmer winter temperatures may result in changing distributions of native plant and animal species and/or an increase in pests and non-native species. Warmer winter temperatures will result in a reduction of lake ice cover. Reduced lake ice cover impacts aquatic ecosystems by raising water temperatures. Water temperature is linked to dissolved oxygen levels and many other environmental parameters that affect fish, plant, and other animal populations. A lack of ice cover also leaves lakes exposed to wind and evaporation during a time of year when they are normally protected. As both temperature and precipitation increase during

the winter months, freezing rain will be more likely. Additional wintertime precipitation in any form will contribute to saturation and increase the risk and/or severity of spring flooding. A greater proportion of wintertime precipitation may fall as rain rather than snow.

Vulnerability

Vulnerability Overview

Figure 3.22. Severe Winter Weather Vulnerability by County



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

NCEI reflects no property damage in the past 10 years. Under-reporting and other data limitations may have caused this, but the fact remains that most damages associate with severe winter weather involve automobile accidents and injuries incurred as people try to travel through the winter environment or compensate for the low temperatures, rather than directly being a result of the winter

weather. Potential losses in Lewis County due to severe winter weather are on the low side, comparative to the damages that may accompany hazard events like tornados and hail storms.

Previous and Future Development

No development resulting in a significant increase in population (and therefore increased exposure to damage) is expected.

EMAP Consequence Analysis

For communities with emergency management programs seeking EMAP accreditation, complete Table 3.43 to summarize the detrimental impacts from severe winter weather.

Table 3.43. EMAP Impact Analysis: Severe Winter Weather

Subject	Detrimental Impacts
Public	Localized impact expected to be severe for affected areas and moderate to light for other less affected areas.
Responders	Adverse impact expected to be severe for unprotected personnel and moderate to light for trained, equipped, and protected personnel.
Continuity of Operations	Unlikely to necessitate execution of the Continuity of Operations Plan. Localized disruption of roads and/or utilities caused by incident may postpone delivery of some services.
Property, Facilities, and Infrastructure	Localized impact to facilities and infrastructure in the areas of the incident. Power lines and roads most adversely affected.
Environment	Environmental damage to trees, bushes, etc.
Economic Condition of Jurisdiction	Local economy and finances may be adversely affected, depending on damage.
Public Confidence in the Jurisdiction's Governance	Ability to respond and recover may be questioned and challenged if planning, response, and recovery not timely and effective.

Hazard Summary by Jurisdiction

Severe Winter Weather tends to affect all jurisdictions equally.

Problem Statement

Lewis County does have some vulnerability to severe winter weather, particularly in regards to transportation concerns. Excessive snowfall can overwhelm road crews, hamper emergency response, and bring commerce to a temporary halt.

3.4.9 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 in the entire planning area and no area is immune from tornado damage.

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 3.44**) 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 3.44. 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 3.45**. 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 3.45. Enhanced Fujita Scale with Potential Damage

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

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

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

Previous Occurrences

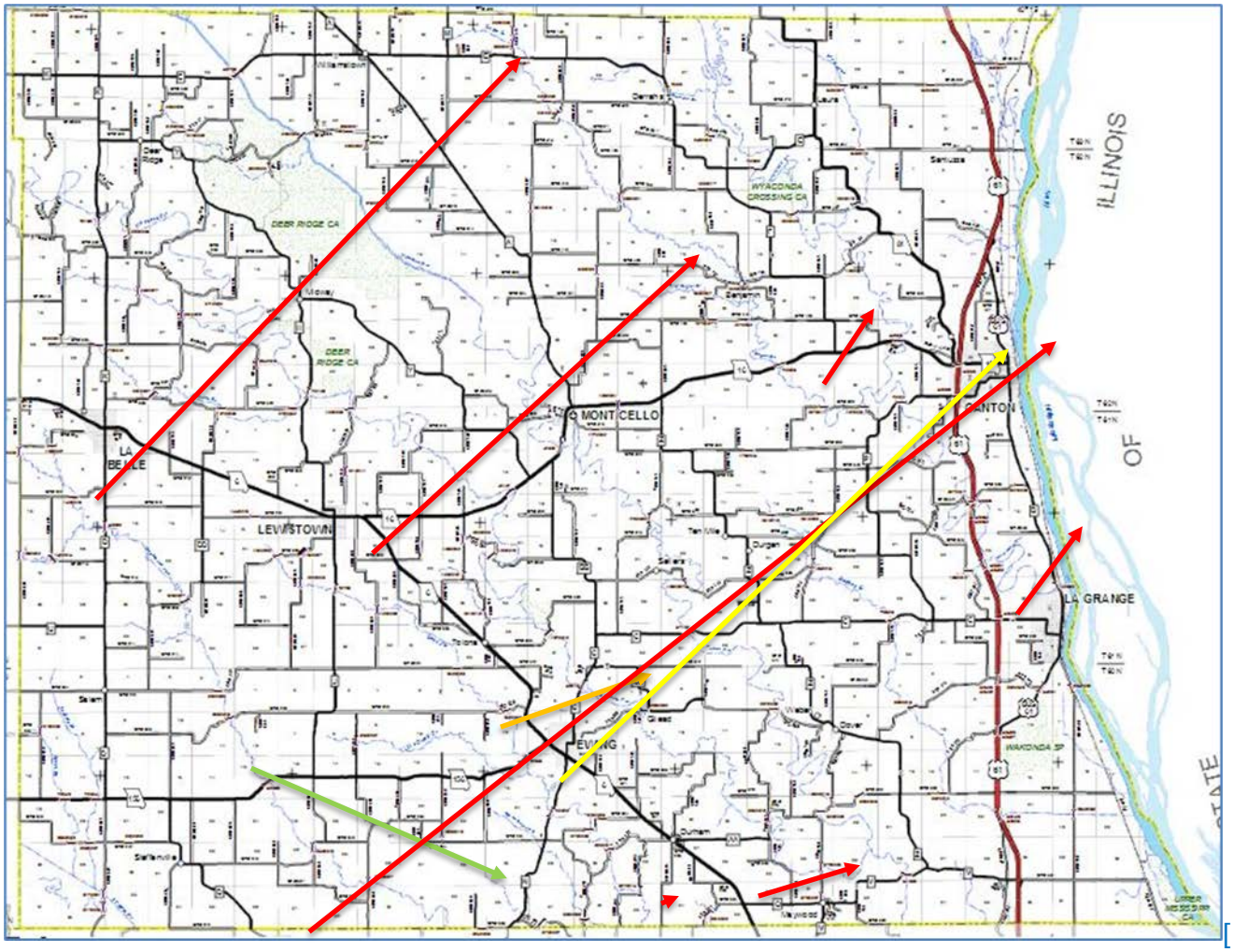
There are limitations to the use of NCEI tornado data that must be noted. For example, one tornado may contain multiple segments as it moves geographically. A tornado that crosses a county line or state line is considered a separate segment for the purposes of reporting to the NCEI. Also, a tornado that lifts off the ground for less than 5 minutes or 2.5 miles is considered a separate segment. If the tornado lifts off the ground for greater than 5 minutes or 2.5 miles, it is considered a separate tornado. Tornadoes reported in Storm Data and the Storm Events Database are in segments.

Table 3.46. Recorded Tornadoes in Lewis County, 1993 – Present

Date	Beginning Location	Ending Location	Length (miles)	Width (yards)	F/EF Rating	Death	Injury	Property Damage	Crop Damages
4/30/1997	Ewing	N of Canton	15	100	F1	0	1	200K	0
4/30/1997	W of LaGrange	N of LaGrange	1	50	F0	0	0	20K	0
6/14/1998	E of Lewistown	NE of Monticello	9.5	75	F1	0	0	0	0
4/8/1999	S of LaBelle	N of Monticello	16	150	F2	0	2	2.1M	0
6/4/1999	W of Canton	WNW of Canton	.5	50	F0	0	0	0	0
5/10/2003	SE of Steffenville	NE of Canton	20	200	F2	0	6	5M	0
5/10/2003	NE of Steffenville	S of Ewing	4	50	F0	0	0	0	0
8/8/2007	S of Durham	S of Durham	.1	10	EF0	0	0	0	0
5/30/2008	NW of Ewing	NE of Ewing	3.35	70	EF1	0	0	10K	0
4/27/2016	WNW of Maywood	NNE of Maywood	2.01	150	EF1	0	0	0	0
Total			**71.46**	**905**		**0**	**9**	**7.33M**	**0**

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

Figure 3.23. Lewis County Map of Historic Tornado Events



Source: NCEI Maps

During the time period from 2013 to 2022 the USDA Risk Management Agency shows there have been zero payments made for Tornado damage in Lewis County.

Probability of Future Occurrence

Over the course of the last 30 years there have been 10 tornado events in Lewis County. Those numbers would suggest there is 33% chance that any given year there could be a tornado in the Lewis County Planning Area.

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

Lewis County is located in a region of the U.S. with high frequency of dangerous and destructive tornadoes referred to as "Tornado Alley". The high frequency has been determined by looking at the total number of tornadoes in the 17 states included in tornado alley. **Figure 3.24** illustrates the areas where dangerous tornadoes historically have occurred.

Figure 3.24. Tornado Alley in the U.S.

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

Potential Losses to Existing Development

In Lewis County, the NCEI estimated damages from 1993-2023 is $7,330,000 with the annualized property damage at $244,333 per year.

Previous and Future Development

There is no significant development anticipated which would result in an increase in population or increased exposure to damage.

EMAP Consequence Analysis

For communities with emergency management programs seeking EMAP accreditation, complete Table 3.47 to summarize the detrimental impacts from tornadoes.

Table 3.47. EMAP Impact Analysis: Tornadoes

Subject	Detrimental Impacts
Public	Localized impact expected to be severe for incident areas and moderate to light for other adversely affected areas.
Responders	Localized impact expected to limit damage to personnel in the areas at the time of the incident.

Subject	Detrimental Impacts
Continuity of Operations	Damage to facilities/personnel in the area of the incident may require temporary relocation of some operations. Localized disruption of roads, facilities, and/or utilities caused by incident may postpone delivery of some services.
Property, Facilities, and Infrastructure	Localized impact to facilities and infrastructure in the area of the incident. Some severe damage possible.
Environment	Localized impact expected to be severe for incident areas and moderate to light for other areas affected by the storm or HazMat spills.
Economic Condition of Jurisdiction	Local economy and finances adversely affected, possibly for an extended period of time.
Public Confidence in the Jurisdiction's Governance	Ability to respond and recover may be questioned and challenged if planning, response, and recovery not timely and effective.

Hazard Summary by Jurisdiction

A tornado event could occur anywhere in the planning area, but some jurisdictions could suffer heavier damages because of the age, type, and density of the housing. The greater the population, the greater the structure density and the greater the risk of damage.

Problem Statement

Tornadoes are common hazards in Lewis County and all of Missouri, and all geographic areas within the County are equally prone to experiencing such an event. Vulnerability to such an event tends to depend on the infrastructure present in the area where the event occurs, cropland and built-up areas each represent a significant economic vulnerability to Tornadoes, but human life is more important and that risk runs parallel to the population density of the affected areas.

3.4.10 Wildfire

Hazard Profile

Hazard Description

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

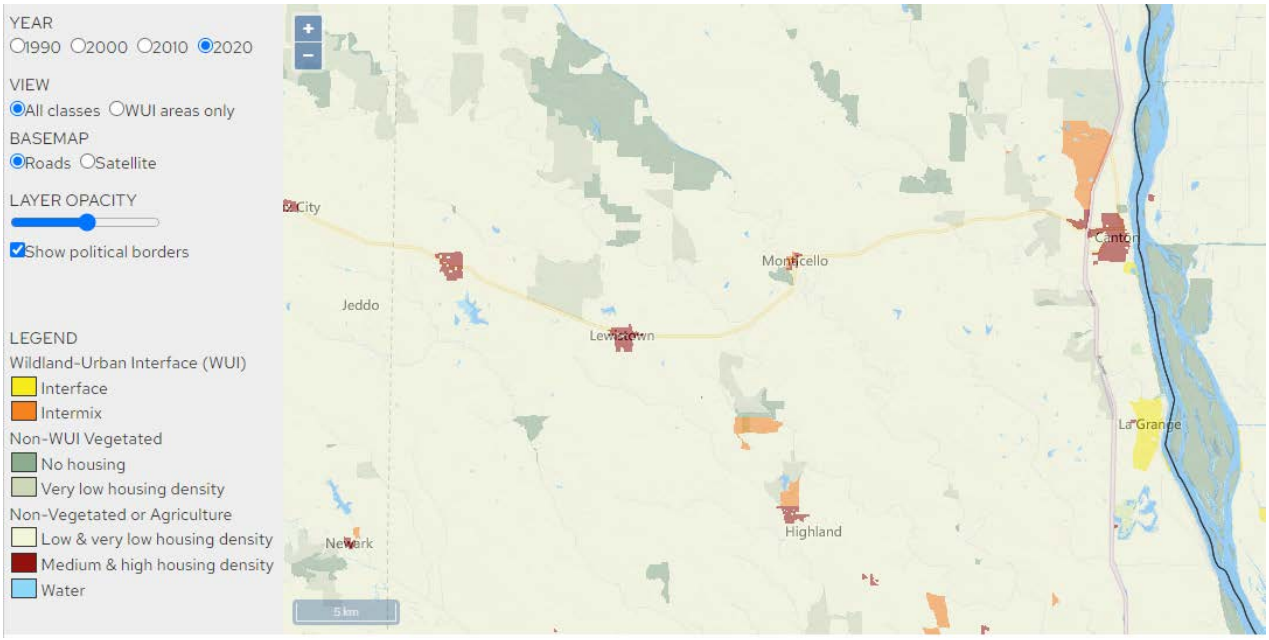
The Forestry Division of the Missouri Department of Conservation (MDC) is responsible for protecting privately owned and state-owned forests and grasslands from wildfires. To accomplish this task, eight forestry regions have been established in Missouri for fire suppression. The Forestry Division works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

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

Geographic Location

Wildland-Urban Interface refers to the zone of transition between unoccupied land and human development and needs to be defined in the plan. Within the WUI, there are two specific areas identified: 1) Interface and 2) Intermix. The interface areas are those areas that abut wildland vegetation and the Intermix areas are those areas that intermingle with wildland areas.

Figure 3.25. Wildland-Urban Interface for Lewis County



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.

At this time, no information is available on the severity of damages from the planning area on wildfires.

Previous Occurrences

According to information obtained from the Missouri Division of Fire Safety (MDFS) Website as well as the Missouri Department of Conversation Wildfire Data Search, there were 125 reported wildland or grass fires in Lewis County from 2013 to 2023. In total, these 159 fires burned 1,898 acres and no injuries were reported.

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

Probability of Future Occurrence

When analyzing the wildland fires, there has been an average of 15.8 fires burning 189.8 acres per year. However, it was reported these fires did not result in major damages.

Changing Future Conditions Considerations

According to the 2018 State Plan, higher temperatures and changes in rainfall are unlikely to substantially reduce forest cover in Missouri, although the composition of trees in the forests may change. More droughts would reduce forest productivity and changing future conditions are also likely to increase the damage from insects and diseases. But longer growing seasons and increased carbon dioxide concentrations could more than offset the losses from those factors. Forests cover about one-third of the state, dominated by oak and hickory trees. As the climate changes, the abundance of pines in Missouri's forests is likely to increase, while the population of hickory trees is likely to decrease.

Additionally, stated in the 2018 State Plan, 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

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

As outlined in the Missouri 2018 State Plan, Lewis County was given a low vulnerability rating being based on housing, density, likelihood, building exposure, annualized property loss ratio, and death/injury factor. The data for wildfires are insufficient due to only 57% of fire departments in Missouri reporting to the National Fire Incident Reporting System. The majority of the fire departments in the planning area are comprised of volunteers and are limited on the time spent to report information.

Potential Losses to Existing Development

The potential loss to existing development due to wildfire is difficult to determine due to lack of sufficient historical data. An average number of fires per year have been determined; however, there are no losses reported associated with the data. Information on historical losses was sought after through various sources including the Missouri Division of Fire Safety and The Missouri Department of Conservation.

Impact of Previous and Future Development

Future development in the Wildland-Urban Interface would increase hazard vulnerability.

EMAP Consequence Analysis

Table 3.48. EMAP Impact Analysis: Wildfire

Subject	Detrimental Impacts
Public	Localized impact expected to be severe for incident areas and moderate to light for other adversely affected areas.
Responders	Localized impact expected to limit damage to personnel in the incident areas at the time of the incident.
Continuity of Operations	Damage to facilities/personnel in the area of the incident may require temporary relocation of some operations. Localized disruption of roads and/or utilities caused by incident may postpone delivery of some services.
Property, Facilities, and Infrastructure	Localized impact to facilities and infrastructure in the area of the incident. Some severe damage possible.
Environment	Localized impact expected to be severe for incident areas and moderate to light for other areas affected by smoke or HazMat remediation.
Economic Condition of Jurisdiction	Local economy and finances may be adversely affected, depending on damage and length of investigations.
Public Confidence in the Jurisdiction's Governance	Ability to respond and recover may be questioned and challenged if planning, response, and recovery not timely and effective.

Hazard Summary by Jurisdiction

A small area near the City of Canton is the only designated wildland-urban interface area in the County. This area has an increased risk compared to the County overall.

Problem Statement

Lewis County does experience Wildland fire events on a regular basis, but the acreage destroyed in these events is relatively small, though a disproportionate number of structures seem to have been affected. The risk of more seriously damaging events is fairly low, though it is higher in the designated Wildland-urban interface near Canton.

3.4.11 Pandemic

Hazard Profile

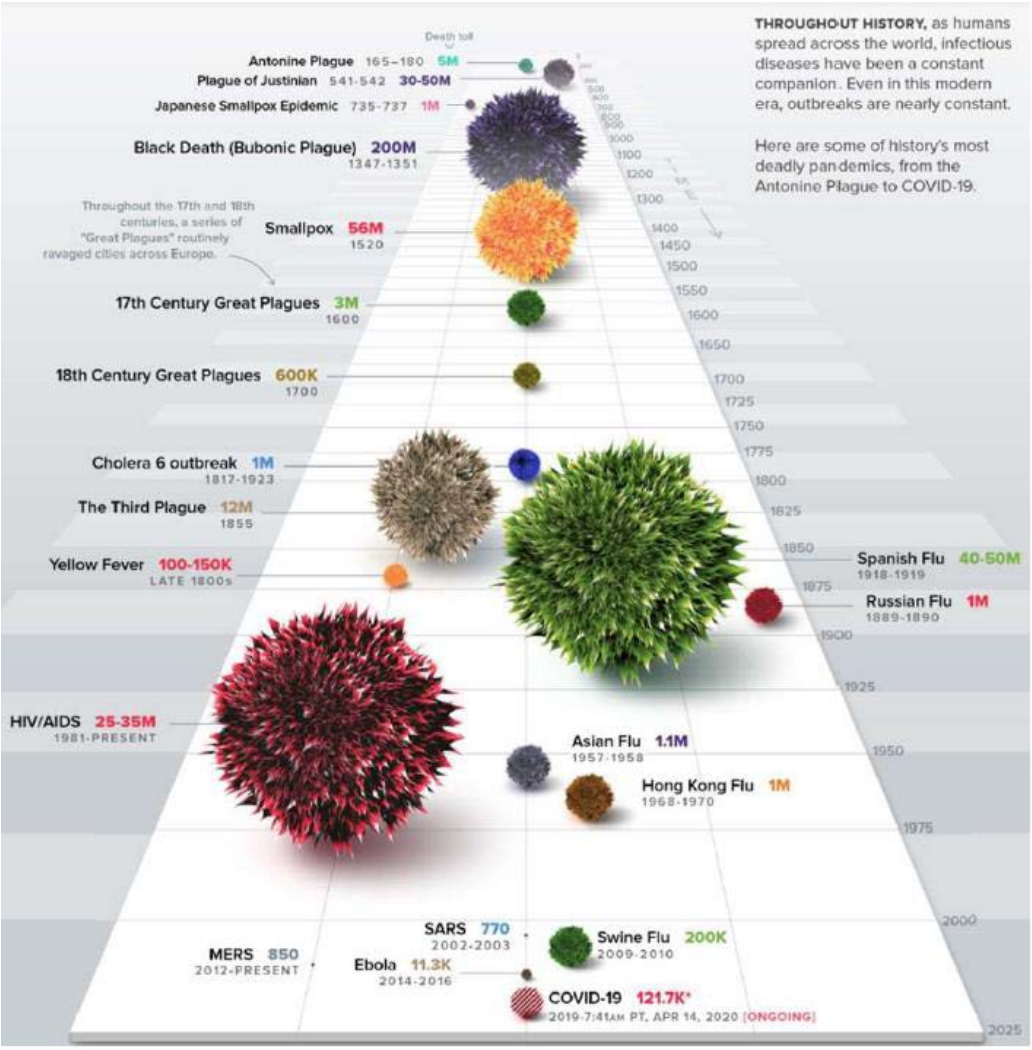
Hazard Description
According to the Center for Disease Control, a pandemic is a global outbreak of disease. Pandemics happen when a new virus emerges to infect people and can spread between people sustainably. Because there is little to no pre-existing immunity against the new virus, it spreads worldwide.

Geographic Location
All of Lewis County are susceptible to a pandemic outbreak due to its main characteristic of being on a global level.

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

Previous Occurrences
The planning area, in addition to others across the globe, is currently in the midst of a pandemic. The virus that causes COVID-19 is infecting people and spreading easily from person-to-person. On March 11, 2020, the COVID-19 outbreak was characterized as a pandemic by the World Health Organization. According to the Center for Disease Control, this is the first pandemic known to be caused by a new coronavirus. In the past century, there have been four pandemics caused by the emergence of new influenza viruses. As a result, most research and guidance around pandemics is specific to influenza, but the same premises can be applied to the current COVID-19 pandemic. Pandemics of respiratory disease follow a certain progression outlined in a “Pandemic Intervals Framework.” Pandemics begin with an investigation phase, followed by recognition, initiation, and acceleration phases. The peak of illnesses occurs at the end of the acceleration phase, which is followed by a deceleration phase, during which there is a decrease in illnesses. Different countries can be in different phases of the pandemic at any point in time and different parts of the same country can also be in different phases of a pandemic.
As humans have spread across the world, so have infectious diseases. Even in this modern era, outbreaks are nearly constant, though not every outbreak reaches pandemic level. Figure 3.26 below outlines the history of pandemics dating back to 165.

Figure 3.26. History of Pandemics



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

Probability of Future Occurrence

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

Changing Future Conditions Considerations

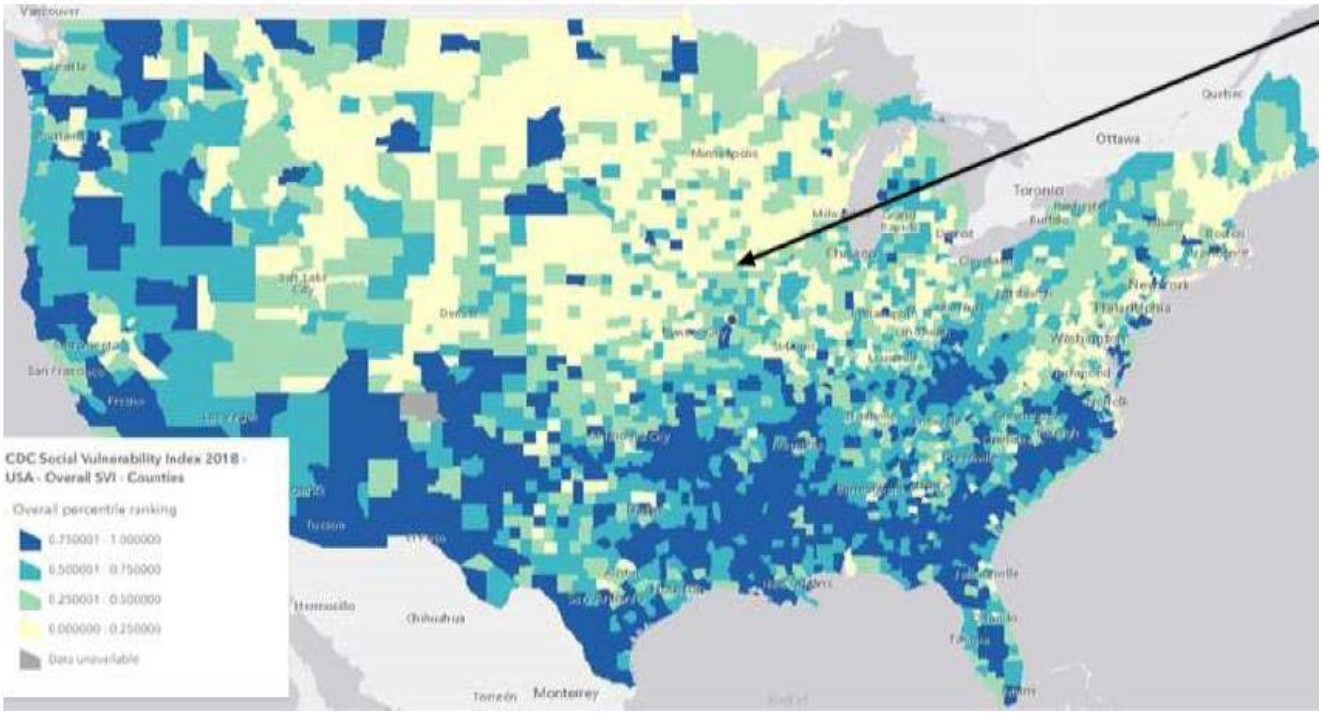
Climate change and weather patterns are widely thought to have direct impacts on the probability and severity of future pandemic outbreaks. Habitat loss due to climate is bringing animals that can transmit disease in contact with humans more often. Floods can enhance the spread of infectious agents like insects, bacteria, and viruses. Increasing temperatures and humidity affect the development, survival and spread of not only pathogens, but also their hosts (often animals).

Vulnerability

Vulnerability Overview

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

Figure 3.27. Social Vulnerability Rating in the United States



Source: https://livingatlas.arcgis.com/policy/browse/?loc=94.542,39.439,5&col=88f17b4580e846609f92c9f75a9d9eee,2c8fdc6267e4439e968837020e7618f3,48638a1be455429287d6756985013910,02a82293e2dd475391cb3699b5e82d61,d89c527f2e6b4d658db0948ea9d49cd9,48a70b524601428ba297e3106b751401,be559110b5c34591b1a767fbb807bcbf,e0427fbc472f4a45b7d94d182a5e9591,142e65436bed4063973380feae6ed248&viz=2c8fdc6267e4439e96883702 0e7618f3&hs=1 *Arrow indicates Lewis County

Potential Losses to Existing Development

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

Impact of Previous and Future Development

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

Hazard Summary by Jurisdiction

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

Problem Statement

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

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 Lewis County's existing hazard mitigation plan approved by FEMA on October 25th, 2018. Therefore, the goals from the [year of prior approval] County A Hazard Mitigation Plan were reviewed to see if they were still valid, feasible, practical, and applicable to the defined hazard impacts. The MPC conducted a discussion session during their second meeting to review and update the plan goals. To ensure that the goals developed for this update were comprehensive and supported State goals, the 2018 State Hazard Mitigation Plan goals were reviewed. The MPC also reviewed the goals from current surrounding county plans.

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

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

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

It was determined the broadly stated goals were still valid for the 2023 update.

4.2 Identification and Analysis of Mitigation Actions

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

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

The MPC included problem statements in the plan update at the end of each hazard profile. The problem statements summarize the risk to the planning area presented by each hazard and include possible methods to reduce that risk. Use of the problem statements allowed the MPC to recognize new and innovative strategies for mitigate risks in the planning area.

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

- A list of actions proposed in the previous mitigation plan, the current State Plan, and approved plans in surrounding counties,
- Key issues from the risk assessments, including the problem statements concluding each hazard profile and vulnerability analysis,
- State priorities established for HMA grants, and
- Public input during meetings, responses to data collection questionnaires, and other efforts to involve the public in the plan development process.

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

The MPC reviewed the actions from the previously approved plan for progress made since the plan had been adopted. The previous plan had action items listed however they were not jurisdiction specific. Due to the action items not being jurisdiction specific all items were deleted, and action items were developed to be specific to each jurisdiction. Based on the status updates, there were 3 completed actions, 32 continuing actions (either ongoing or modified), and 26 deleted actions.

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

Table 4.1. Action Status Summary

Jurisdiction	Completed Actions	Continuing Actions (ongoing or modify)	Deleted Actions
Lewis County	1	4	7
Canton	0	7	3
Ewing	0	3	3
LaBelle	0	3	3
LaGrange	0	4	3
Lewistown	0	3	3
Monticello	0	3	1
Canton R-V	1	3	1
Lewis County C-1	1	2	2

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

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

Completed Actions	Completion Details (date, amount, funding source)
Lewis County	
Develop a detailed County-wide inventory of emergency shelters and safe rooms.	Completed in 2019 by NEMO RPC. Funded through a CDBG mitigation grant.
Canton R-V	
Participate in the "Great American Shake Up" Earthquake drill	Earthquake drills completed each year.
Lewis County C-1	
Participate in the "Great American Shake Up" Earthquake drill	Earthquake drills completed each year.
Deleted Actions	**Reason for Deletion**
Lewis County	
Form a committee to study the current state of public notification systems in the county and determine how best to improve them.	Deemed not needed with new notification systems through cellular phones.
Provide opportunities for training so local businesses are equipped to develop their own emergency plans.	No demand from local businesses
Participate in the "Great American Shake Up" Earthquake drill	Action was conducted and determined to be an everyday item
Coordinate and conduct a standalone event to educate the public about emergency preparedness and early warning systems.	Lack of public support and engagement.
Invite SEMA mitigation specialists to present information to city councils, county commission, schools, and the Northeast Missouri Regional Planning Commission meetings.	Lack of demand from city councils and county entities.
Design and implement joint training (or drills) between agencies, public & private entities (including	Action was deemed to be an everyday item.

schools/businesses). Publicize county or citywide drills	
Form committee to assess storm water management plans and facilitate development of such plans where there is a need	Action was deemed to be and everyday item.
Canton	
Form a committee on public notification systems. This Committee will analyze different types of systems and funding sources, the reach and effectiveness of current warning systems, and target demographics in order to develop a strategy to leverage local funding, grant opportunities, and technology to provide early warning to as many people as possible	Action deemed to be an everyday item.
Participate in the "Great American Shake Up" Earthquake drill	Action deemed to be an everyday item.
Invite SEMA mitigation specialists to present information to city councils, county commission, schools, and the Northeast Missouri Regional Planning Commission meetings.	Lack of demand from city council
Ewing	
Form a committee on public notification systems. This Committee will analyze different types of systems and funding sources, the reach and effectiveness of current warning systems, and target demographics in order to develop a strategy to leverage local funding, grant opportunities, and technology to provide early warning to as many people as possible	Action deemed to be an everyday item.
Participate in the "Great American Shake Up" Earthquake drill	Action deemed to be an everyday item
Invite SEMA mitigation specialists to present information.	Lack of demand from city council
LaBelle	
Form a committee on public notification systems. This Committee will analyze different types of systems and funding sources, the reach and effectiveness of current warning systems, and target demographics in order to develop a strategy to leverage local funding, grant opportunities, and technology to provide early warning to as many people as possible	Action deemed to be an everyday item.
Participate in the "Great American Shake Up" Earthquake drill	Action deemed to be an everyday item.
Invite SEMA mitigation specialists to present information to city councils, county commission, schools, and the Northeast Missouri Regional Planning Commission meetings.	Lack of demand from city council
LaGrange	
Form a committee on public notification systems. This Committee will analyze different types of systems and funding sources, the reach and effectiveness of current warning systems, and target demographics in order to develop a strategy to leverage local funding, grant opportunities, and technology to provide early warning to as many people as possible	Action deemed to be an everyday item.
Participate in the "Great American Shake Up" Earthquake drill	Action deemed to be an everyday item.
Invite SEMA mitigation specialists to present information to city councils, county commission, schools, and the Northeast Missouri Regional Planning Commission meetings.	Lack of demand from city council
Lewistown	
Form a committee on public notification systems. This Committee will analyze different types of systems and funding sources, the reach and effectiveness of current warning systems, and target demographics in order to develop a strategy to leverage local funding, grant opportunities, and technology to provide early warning to as many people as possible	Action deemed to be an everyday item.

Participate in the “Great American Shake Up” Earthquake drill	Action deemed to be an everyday item.
Invite SEMA mitigation specialists to present information to city councils, county commission, schools, and the Northeast Missouri Regional Planning Commission meetings.	Lack of demand from city council
Monticello	
Form a committee on public notification systems. This Committee will analyze different types of systems and funding sources, the reach and effectiveness of current warning systems, and target demographics in order to develop a strategy to leverage local funding, grant opportunities, and technology to provide early warning to as many people as possible	Action deemed to be an everyday item.
Canton R-V	
Implement the Red Cross “pillowcase program”	Action deemed to be an everyday event.
Lewis County C-1	
Coordinate and conduct a standalone event to educate the public about emergency preparedness and early warning systems.	Action deemed to be an everyday event.
Implement the Red Cross “pillowcase program”	Action deemed to be an everyday event.

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

4.3 Implementation of Mitigation Actions

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

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

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

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

ACTION WORKSHEET

Action Worksheet	
Name of Jurisdiction:	Lewis County
Risk / Vulnerability	
Hazard(s) Addressed:	All Hazards
Problem being Mitigated:	Lack of access to power, especially by vulnerable individuals (such as those that depend on powered medical equipment or drugs that must be refrigerated) in the event of a prolonged power outage.
Action or Project	
Applicable Goal Statement:	Goal 1: Public Awareness- Using a variety of communications avenues to increase the citizens' awareness of and promote education about the natural hazards that they may face. Their vulnerability to these hazards, and how to lessen the effect of future natural hazards.
Action/Project Number:	Lewis County 2023.1
Name of Action or Project:	Obtain Sufficient Generators for Shelters
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Research ways to purchase sufficient back-up generators
Estimated Cost:	$50,000-$75,000
Benefits:	Lives protected from hazards such as extreme heat and cold
Plan for Implementation	
Responsible Organization/Department:	Lewis County EMD
Supporting Organization/Department:	Lewis County Commission
Action/Project Priority:	High
Timeline for Completion:	2026
Potential Fund Sources:	N/A
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, County EOP
Progress Report	
Action Status:	Continuing
Report of Progress:	Continuing to support the pursuit to purchase generators

Action Worksheet	
Name of Jurisdiction:	Lewis County
Risk / Vulnerability	
Hazard(s) Addressed:	All Hazards – Primarily Flooding
Problem being Mitigated:	Flash flooding, dangerous curves, or slopes where hazards can be exacerbated by ice storms or precipitation.
Action or Project	
Applicable Goal Statement:	Goal 1: Public Awareness- Using a variety of communications avenues to increase the citizens' awareness of and promote education about the natural hazards that they may face. Their vulnerability to these hazards, and how to lessen the effect of future natural hazards.
Action/Project Number:	Lewis County 2023.2
Name of Action or Project:	Replace existing bridges, replace low water crossings with bridges, and raise flood prone roads.
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Structure grants proposals for road/bridge upgrades so that hazard mitigation concerns are also met, and address mitigation needs in transportation planning.
Estimated Cost:	$2,000,000
Benefits:	Bridges will be safe, low water crossings will be accessible, and roads that typically flood will no longer flood.
Plan for Implementation	
Responsible Organization/Department:	Lewis County Road and Bridge
Supporting Organization/Department:	Lewis County Commission
Action/Project Priority:	High
Timeline for Completion:	2028
Potential Fund Sources:	N/A
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, NEMO RPC TAC Needs List
Progress Report	
Action Status:	Continuing
Report of Progress:	Continuing to support the pursuit of funding for road and bridge improvements

Action Worksheet	
Name of Jurisdiction:	Lewis County
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding
Problem being Mitigated:	Flood
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	Lewis County 2023.3
Name of Action or Project:	NFIP Participation
Mitigation Category:	Natural Systems Protection, Structure and Infrastructure Projects, Emergency Services, Education and Outreach
Action or Project Description:	1.Adoption of NFIP minimum floodplain management criteria via local regulation. 2.Adoption of the latest effective Flood Insurance Map (Firm), if applicable. 3.Implementation and enforcement of local floodplain management regulations to regulate and permit development in SFHA's. 4.Appointment of a designee or agency to implement the addressed commitments and requirements of the NFIP. 5.Floodplain administrator will continue to implement the substantial improvement / substantial damage provisions of their floodplain management regulations after an event.
Estimated Cost:	NA
Benefits:	Protection of life and reduction of damages due to accessibility to citizens in times of need
Plan for Implementation	
Responsible Organization/Department:	County Commission/EMD
Action/Project Priority:	High
Timeline for Completion:	Every year
Potential Fund Sources:	County Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Floodplain Ordinance
Progress Report	
Action Status:	Continuing
Report of Progress:	Continuing NFIP Participation

Action Worksheet	
Name of Jurisdiction:	Lewis County
Risk / Vulnerability	
Hazard(s) Addressed:	Tornadoes, Severe Thunderstorms
Problem being Mitigated:	Early Warning Sirens
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	Lewis County 2023.4
Name of Action or Project:	Install/Upgrade Warning Sirens
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Installation or upgrade of warning sirens in areas of the County needing a siren or one upgraded.
Estimated Cost:	$100,000
Benefits:	Mitigation actions will limit the future harm to structures and lives in the County.
Plan for Implementation	
Responsible Organization/Department:	County EMD/County Commission
Action/Project Priority:	Medium Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds / Local Funds
Local Planning Mechanisms to be Used in Implementation, if any:	NA
Progress Report	
Action Status:	NEW
Report of Progress:	NEW Project

Action Worksheet	
Name of Jurisdiction:	Lewis County
Risk / Vulnerability	
Hazard(s) Addressed:	Tornado, Severe Thunderstorms
Problem being Mitigated:	Lack of shelter for residents.
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	Lewis County 2023.5
Name of Action or Project:	Safe Rooms and Storm Shelters
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Build safe rooms and establish local ordinances requiring community storm shelters within sizable mobile home parks and subdivisions.
Estimated Cost:	$2,000,000
Benefits:	The project protects citizens from harm due to tornados or severe thunderstorms.
Plan for Implementation	
Responsible Organization/Department:	County Commission / EMD
Action/Project Priority:	High Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds
Local Planning Mechanisms to be Used in Implementation, if any:	NA
Progress Report	
Action Status:	NEW
Report of Progress:	NEW Project

Action Worksheet	
Name of Jurisdiction:	Lewis County
Risk / Vulnerability	
Hazard(s) Addressed:	Pandemic
Problem being Mitigated:	Protecting lives from pandemic outbreaks.
Action or Project	
Applicable Goal Statement:	Goal 2: Strengthen communication and coordination between local governments, emergency personnel, public agencies, and citizens to mitigate the effect of future natural hazards
Action/Project Number:	Lewis County 2023.6
Name of Action or Project:	Response to Pandemic
Mitigation Category:	Emergency Services, Prevention, Public Education
Action or Project Description:	Project will provide necessary resources for the response to pandemic outbreaks.
Estimated Cost:	$500,000
Benefits:	The project protects citizens from harm due to pandemic outbreaks.
Plan for Implementation	
Responsible Organization/Department:	County Commission / EMD
Action/Project Priority:	Medium Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds
Local Planning Mechanisms to be Used in Implementation, if any:	NA
Progress Report	
Action Status:	NEW
Report of Progress:	NEW Project

Action Worksheet	
Name of Jurisdiction:	City of Canton
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding
Problem being Mitigated:	Continue to participate in the NFIP
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	Canton 2023.1
Name of Action or Project:	NFIP Participation
Mitigation Category:	Natural Systems Protection, Structure and Infrastructure Projects, Emergency Services, Education and Outreach
Action or Project Description:	1.Adoption of NFIP minimum floodplain management criteria via local regulation. 2.Adoption of the latest effective Flood Insurance Map (Firm), if applicable. 3.Implementation and enforcement of local floodplain management regulations to regulate and permit development in SFHA's. 4.Appointment of a designee or agency to implement the addressed commitments and requirements of the NFIP. 5.Floodplain administrator will continue to implement the substantial improvement / substantial damage provisions of their floodplain management regulations after an event.
Estimated Cost:	NA
Benefits:	Protection of life and reduction of damages due to accessibility to citizens in times of need.
Plan for Implementation	
Responsible Organization/Department:	City Council / EMD
Action/Project Priority:	High Priority
Timeline for Completion:	1 Year
Potential Fund Sources:	City Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Floodplain Ordinance
Progress Report	
Action Status:	Continuing
Report of Progress:	Continuing NFIP Participation

Action Worksheet	
Name of Jurisdiction:	City of Canton
Risk / Vulnerability	
Hazard(s) Addressed:	Tornado, Severe Thunderstorms
Problem being Mitigated:	Lack of shelter for residents.
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	Canton 2023.2
Name of Action or Project:	Safe Rooms and Storm Shelters
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Build safe rooms and establish local ordinances requiring community storm shelters within sizable mobile home parks and subdivisions.
Estimated Cost:	$2,000,000
Benefits:	The project protects citizens from harm due to tornados or severe thunderstorms.
Plan for Implementation	
Responsible Organization/Department:	City Council / EMD
Action/Project Priority:	High Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan
Progress Report	
Action Status:	Continuing
Report of Progress:	Continue to seek funding for safe/shelter room improvement/construction.

Action Worksheet	
Name of Jurisdiction:	City of Canton
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding
Problem being Mitigated:	Flooding
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	Canton 2023.3
Name of Action or Project:	Raising the North Levee
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Raising of the Canton north levee to build more resiliency to the possibilities of flooding.
Estimated Cost:	$2,000,000
Benefits:	The project protects citizens from harm due to flooding.
Plan for Implementation	
Responsible Organization/Department:	Floodplain Administrator / City Council
Action/Project Priority:	High Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds, FEMA BRIC
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan
Progress Report	
Action Status:	Continuing
Report of Progress:	Continue to seek funding for the raising of the north levee.

Action Worksheet	
Name of Jurisdiction:	City of Canton
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding
Problem being Mitigated:	Flooding
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	Canton 2023.4
Name of Action or Project:	Replace Flood Gates of North Levee
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Installation of more resilient flood gates on the North Levee
Estimated Cost:	$2,000,000
Benefits:	The project protects citizens from harm due to flooding.
Plan for Implementation	
Responsible Organization/Department:	Floodplain Administrator / City Council
Action/Project Priority:	High Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds, FEMA BRIC
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan
Progress Report	
Action Status:	Continuing
Report of Progress:	Continue to seek funding for flood gates for the north levee.

Action Worksheet	
Name of Jurisdiction:	City of Canton
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding
Problem being Mitigated:	Flotation of Fuel Tanks
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	Canton 2023.5
Name of Action or Project:	Anchoring fuel tanks and other storage tanks to prevent flotation.
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	City will enforce ordinances to make sure all tanks are secured to the ground
Estimated Cost:	$0
Benefits:	Reducing possible damages caused by tanks floating due to high floods.
Plan for Implementation	
Responsible Organization/Department:	Flood Plain Administrator
Action/Project Priority:	Low
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Internal
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Flood Plain Regulation, City Ordinances
Progress Report	
Action Status:	Continuing
Report of Progress:	Continue to enforce ordinances to secure tanks to the ground.

Action Worksheet	
Name of Jurisdiction:	City of Canton
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding, Severe Thunderstorms
Problem being Mitigated:	Transportation Infrastructure Closure
Action or Project	
Applicable Goal Statement:	Goal 1: Public Awareness- Using a variety of communications avenues to increase the citizens' awareness of and promote education about the natural hazards that they may face. Their vulnerability to these hazards, and how to lessen the effect of future natural hazards.
Action/Project Number:	Canton 2023.6
Name of Action or Project:	Transportation Infrastructure
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Structure grants proposals for road/bridge upgrades so that hazard mitigation concerns are also met.
Estimated Cost:	$2,000,000
Benefits:	Bridges will be safe, low water crossings will be accessible, and roads that typically flood will no longer flood.
Plan for Implementation	
Responsible Organization/Department:	City Council / City Manager
Action/Project Priority:	High Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds, CDBG, MoDot, USDA
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan
Progress Report	
Action Status:	Continuing
Report of Progress:	Continue to seek funding for transportation infrastructure projects.

Action Worksheet	
Name of Jurisdiction:	City of Canton
Risk / Vulnerability	
Hazard(s) Addressed:	Tornadoes, Severe Thunderstorms
Problem being Mitigated:	Early Warning Sirens
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	Canton 2023.7
Name of Action or Project:	Install/Upgrade Warning Sirens
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Installation or upgrade of warning sirens in the city.
Estimated Cost:	$100,000
Benefits:	Mitigation actions will limit the future harm to structures and lives in the city.
Plan for Implementation	
Responsible Organization/Department:	City Manager
Action/Project Priority:	Medium Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds / Local Funds
Local Planning Mechanisms to be Used in Implementation, if any:	NA
Progress Report	
Action Status:	NEW
Report of Progress:	NEW Project

Action Worksheet	
Name of Jurisdiction:	City of Canton
Risk / Vulnerability	
Hazard(s) Addressed:	All Hazards
Problem being Mitigated:	Lack of access to power, especially by vulnerable individuals (such as those that depend on powered medical equipment or drugs that must be refrigerated) in the event of a prolonged power outage.
Action or Project	
Applicable Goal Statement:	Goal 1: Public Awareness- Using a variety of communications avenues to increase the citizens' awareness of and promote education about the natural hazards that they may face. Their vulnerability to these hazards, and how to lessen the effect of future natural hazards.
Action/Project Number:	Canton 2023.8
Name of Action or Project:	Obtain Sufficient Generators for Shelters / City Facilities
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Research ways to purchase sufficient back-up generators
Estimated Cost:	$350,000
Benefits:	Lives protected from hazards such as extreme heat and cold and prevention of loss of community services
Plan for Implementation	
Responsible Organization/Department:	City Manager
Action/Project Priority:	High
Timeline for Completion:	2028
Potential Fund Sources:	Hazard Mitigation Funds, Local Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, County EOP
Progress Report	
Action Status:	New
Report of Progress:	New

Action Worksheet	
Name of Jurisdiction:	City of Ewing
Risk / Vulnerability	
Hazard(s) Addressed:	All Hazards
Problem being Mitigated:	Lack of access to power, especially by vulnerable individuals (such as those that depend on powered medical equipment or drugs that must be refrigerated) in the event of a prolonged power outage.
Action or Project	
Applicable Goal Statement:	Goal 1: Public Awareness- Using a variety of communications avenues to increase the citizens' awareness of and promote education about the natural hazards that they may face. Their vulnerability to these hazards, and how to lessen the effect of future natural hazards.
Action/Project Number:	Ewing 2023.1
Name of Action or Project:	Obtain Sufficient Generators for Shelters
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Research ways to purchase sufficient back-up generators
Estimated Cost:	$100,000-$150,000
Benefits:	Lives protected from hazards such as extreme heat and cold
Plan for Implementation	
Responsible Organization/Department:	City Clerk
Supporting Organization/Department:	City Council
Action/Project Priority:	High
Timeline for Completion:	2028
Potential Fund Sources:	N/A
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan
Progress Report	
Action Status:	New
Report of Progress:	New

Action Worksheet	
Name of Jurisdiction:	City of Ewing
Risk / Vulnerability	
Hazard(s) Addressed:	Tornadoes, Severe Storms
Problem being Mitigated:	Early Warning Sirens
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	Ewing 2023.2
Name of Action or Project:	Install/Upgrade Warning Sirens
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Installation or upgrade of warning sirens in City.
Estimated Cost:	$100,000
Benefits:	Mitigation actions will limit the future harm to structures and lives in the City.
Plan for Implementation	
Responsible Organization/Department:	City Clerk / City Council
Action/Project Priority:	Medium Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds / Local Funds
Local Planning Mechanisms to be Used in Implementation, if any:	NA
Progress Report	
Action Status:	Continuing
Report of Progress:	Continue to pursue funding for upgraded siren systems

Action Worksheet	
Name of Jurisdiction:	City of Ewing
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding, Severe Thunderstorms
Problem being Mitigated:	Transportation Infrastructure Closure
Action or Project	
Applicable Goal Statement:	Goal 1: Public Awareness- Using a variety of communications avenues to increase the citizens' awareness of and promote education about the natural hazards that they may face. Their vulnerability to these hazards, and how to lessen the effect of future natural hazards.
Action/Project Number:	Ewing 2023.3
Name of Action or Project:	Transportation Infrastructure
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Structure grants proposals for road/bridge upgrades so that hazard mitigation concerns are also met.
Estimated Cost:	$2,000,000
Benefits:	Bridges will be safe, low water crossings will be accessible, and roads that typically flood will no longer flood.
Plan for Implementation	
Responsible Organization/Department:	City Clerk / City Council
Action/Project Priority:	High Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds, CDBG, MoDot, USDA
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan
Progress Report	
Action Status:	Continuing
Report of Progress:	Continue to seek funding for transportation infrastructure projects.

Action Worksheet	
Name of Jurisdiction:	City of Ewing
Risk / Vulnerability	
Hazard(s) Addressed:	Tornado, Severe Thunderstorms
Problem being Mitigated:	Lack of shelter for residents.
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	Ewing 2023.4
Name of Action or Project:	Safe Rooms and Storm Shelters
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Build safe rooms and establish local ordinances requiring community storm shelters within sizable mobile home parks and subdivisions.
Estimated Cost:	$2,000,000
Benefits:	The project protects citizens from harm due to tornados or severe thunderstorms.
Plan for Implementation	
Responsible Organization/Department:	City Council / City Clerk
Action/Project Priority:	High Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan
Progress Report	
Action Status:	Continuing
Report of Progress:	Continue to seek funding for safe/shelter room improvement/construction.

Action Worksheet	
Name of Jurisdiction:	City of Ewing
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding
Problem being Mitigated:	Flooding
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	Ewing 2023.5
Name of Action or Project:	Pursue NFIP Participation
Mitigation Category:	Natural Systems Protection, Structure and Infrastructure Projects, Emergency Services, Education and Outreach
Action or Project Description:	Pursue participation and good standing with the National Flood Insurance Program
Estimated Cost:	NA
Benefits:	Protection of life and reduction of damages due to accessibility to citizens in times of need
Plan for Implementation	
Responsible Organization/Department:	City Clerk / City Council
Action/Project Priority:	High
Timeline for Completion:	2025
Potential Fund Sources:	Local Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Floodplain Ordinance
Progress Report	
Action Status:	New
Report of Progress:	New

Action Worksheet	
Name of Jurisdiction:	City of LaBelle
Risk / Vulnerability	
Hazard(s) Addressed:	Tornado, Severe Thunderstorms
Problem being Mitigated:	Lack of shelter for residents.
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	LaBelle 2023.1
Name of Action or Project:	Safe Rooms and Storm Shelters
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Build safe rooms and establish local ordinances requiring community storm shelters within sizable mobile home parks and subdivisions.
Estimated Cost:	$2,000,000
Benefits:	The project protects citizens from harm due to tornados or severe thunderstorms.
Plan for Implementation	
Responsible Organization/Department:	City Council / City Clerk
Action/Project Priority:	High Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan
Progress Report	
Action Status:	Continuing
Report of Progress:	Continue to seek funding for safe/shelter room improvement/construction.

Action Worksheet	
Name of Jurisdiction:	City of LaBelle
Risk / Vulnerability	
Hazard(s) Addressed:	Tornadoes, Severe Thunderstroms
Problem being Mitigated:	Early Warning Sirens
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	LaBelle 2023.2
Name of Action or Project:	Install/Upgrade Warning Sirens
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Installation or upgrade of warning sirens in City.
Estimated Cost:	$100,000
Benefits:	Mitigation actions will limit the future harm to structures and lives in the City.
Plan for Implementation	
Responsible Organization/Department:	City Clerk / City Council
Action/Project Priority:	Medium Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds / Local Funds
Local Planning Mechanisms to be Used in Implementation, if any:	NA
Progress Report	
Action Status:	Continuing
Report of Progress:	Continue to pursue funding for upgraded siren systems

Action Worksheet	
Name of Jurisdiction:	City of LaBelle
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding, Severe Thunderstorms
Problem being Mitigated:	Transportation Infrastructure Closure
Action or Project	
Applicable Goal Statement:	Goal 1: Public Awareness- Using a variety of communications avenues to increase the citizens' awareness of and promote education about the natural hazards that they may face. Their vulnerability to these hazards, and how to lessen the effect of future natural hazards.
Action/Project Number:	LaBelle 2023.3
Name of Action or Project:	Transportation Infrastructure
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Structure grants proposals for road/bridge upgrades so that hazard mitigation concerns are also met.
Estimated Cost:	$2,000,000
Benefits:	Bridges will be safe, low water crossings will be accessible, and roads that typically flood will no longer flood.
Plan for Implementation	
Responsible Organization/Department:	City Clerk / City Council
Action/Project Priority:	High Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds, CDBG, MoDot, USDA
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan
Progress Report	
Action Status:	Continuing
Report of Progress:	Continue to seek funding for transportation infrastructure projects.

Action Worksheet	
Name of Jurisdiction:	City of LaBelle
Risk / Vulnerability	
Hazard(s) Addressed:	All Hazards
Problem being Mitigated:	Lack of access to power, especially by vulnerable individuals (such as those that depend on powered medical equipment or drugs that must be refrigerated) in the event of a prolonged power outage.
Action or Project	
Applicable Goal Statement:	Goal 1: Public Awareness- Using a variety of communications avenues to increase the citizens' awareness of and promote education about the natural hazards that they may face. Their vulnerability to these hazards, and how to lessen the effect of future natural hazards.
Action/Project Number:	LaBelle 2023.4
Name of Action or Project:	Obtain Sufficient Generators for Shelters
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Research ways to purchase sufficient back-up generators
Estimated Cost:	$100,000-$150,000
Benefits:	Lives protected from hazards such as extreme heat and cold
Plan for Implementation	
Responsible Organization/Department:	City Clerk
Supporting Organization/Department:	City Council
Action/Project Priority:	High
Timeline for Completion:	2028
Potential Fund Sources:	Hazard Mitigation Grants
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan
Progress Report	
Action Status:	New
Report of Progress:	New

Action Worksheet	
Name of Jurisdiction:	City of LaBelle
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding
Problem being Mitigated:	Flooding
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	LaBelle 2023.5
Name of Action or Project:	Pursue NFIP Participation
Mitigation Category:	Natural Systems Protection, Structure and Infrastructure Projects, Emergency Services, Education and Outreach
Action or Project Description:	Pursue participation and good standing with the National Flood Insurance Program
Estimated Cost:	NA
Benefits:	Protection of life and reduction of damages due to accessibility to citizens in times of need
Plan for Implementation	
Responsible Organization/Department:	City Clerk / City Council
Action/Project Priority:	High
Timeline for Completion:	2025
Potential Fund Sources:	Local Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Floodplain Ordinance
Progress Report	
Action Status:	New
Report of Progress:	New

Action Worksheet	
Name of Jurisdiction:	City of LaGrange
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding
Problem being Mitigated:	Continue to participate in the NFIP
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	LaGrange 2023.1
Name of Action or Project:	NFIP Participation
Mitigation Category:	Natural Systems Protection, Structure and Infrastructure Projects, Emergency Services, Education and Outreach
Action or Project Description:	1.Adoption of NFIP minimum floodplain management criteria via local regulation. 2.Adoption of the latest effective Flood Insurance Map (Firm), if applicable. 3.Implementation and enforcement of local floodplain management regulations to regulate and permit development in SFHA's. 4.Appointment of a designee or agency to implement the addressed commitments and requirements of the NFIP. 5.Floodplain administrator will continue to implement the substantial improvement / substantial damage provisions of their floodplain management regulations after an event.
Estimated Cost:	NA
Benefits:	Protection of life and reduction of damages due to accessibility to citizens in times of need.
Plan for Implementation	
Responsible Organization/Department:	City Council / EMD
Action/Project Priority:	High Priority
Timeline for Completion:	1 Year
Potential Fund Sources:	City Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Floodplain Ordinance
Progress Report	
Action Status:	Continuing
Report of Progress:	Continuing NFIP Participation

Action Worksheet	
Name of Jurisdiction:	City of LaGrange
Risk / Vulnerability	
Hazard(s) Addressed:	All Hazards
Problem being Mitigated:	Lack of access to power, especially by vulnerable individuals (such as those that depend on powered medical equipment or drugs that must be refrigerated) in the event of a prolonged power outage.
Action or Project	
Applicable Goal Statement:	Goal 1: Public Awareness- Using a variety of communications avenues to increase the citizens' awareness of and promote education about the natural hazards that they may face. Their vulnerability to these hazards, and how to lessen the effect of future natural hazards.
Action/Project Number:	LaGrange 2023.2
Name of Action or Project:	Obtain Sufficient Generators for Shelters
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Research ways to purchase sufficient back-up generators
Estimated Cost:	$100,000-$150,000
Benefits:	Lives protected from hazards such as extreme heat and cold
Plan for Implementation	
Responsible Organization/Department:	City Administrator
Supporting Organization/Department:	City Council
Action/Project Priority:	High
Timeline for Completion:	2028
Potential Fund Sources:	Hazard Mitigation Grants
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan
Progress Report	
Action Status:	New
Report of Progress:	New

Action Worksheet	
Name of Jurisdiction:	City of LaGrange
Risk / Vulnerability	
Hazard(s) Addressed:	Tornado, Severe Thunderstorms
Problem being Mitigated:	Lack of shelter for residents.
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	LaGrange 2023.3
Name of Action or Project:	Safe Rooms and Storm Shelters
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Build safe rooms and establish local ordinances requiring community storm shelters within sizable mobile home parks and subdivisions.
Estimated Cost:	$2,000,000
Benefits:	The project protects citizens from harm due to tornados or severe thunderstorms.
Plan for Implementation	
Responsible Organization/Department:	City Council / City Administrator
Action/Project Priority:	High Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan
Progress Report	
Action Status:	Continuing
Report of Progress:	Continue to seek funding for safe/shelter room improvement/construction.

Action Worksheet	
Name of Jurisdiction:	City of LaGrange
Risk / Vulnerability	
Hazard(s) Addressed:	Tornadoes, Severe Thunderstorms
Problem being Mitigated:	Early Warning Sirens
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	LaGrange 2023.4
Name of Action or Project:	Install/Upgrade Warning Sirens
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Installation or upgrade of warning sirens in City.
Estimated Cost:	$100,000
Benefits:	Mitigation actions will limit the future harm to structures and lives in the City.
Plan for Implementation	
Responsible Organization/Department:	City Administrator
Action/Project Priority:	Medium Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds / Local Funds
Local Planning Mechanisms to be Used in Implementation, if any:	NA
Progress Report	
Action Status:	Continuing
Report of Progress:	Continue to pursue funding for upgraded siren systems

Action Worksheet	
Name of Jurisdiction:	City of LaGrange
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding, Severe Thunderstorms
Problem being Mitigated:	Transportation Infrastructure Closure
Action or Project	
Applicable Goal Statement:	Goal 1: Public Awareness- Using a variety of communications avenues to increase the citizens' awareness of and promote education about the natural hazards that they may face. Their vulnerability to these hazards, and how to lessen the effect of future natural hazards.
Action/Project Number:	LaGrange 2023.5
Name of Action or Project:	Transportation Infrastructure
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Structure grants proposals for road/bridge upgrades so that hazard mitigation concerns are also met.
Estimated Cost:	$2,000,000
Benefits:	Bridges will be safe, low water crossings will be accessible, and roads that typically flood will no longer flood.
Plan for Implementation	
Responsible Organization/Department:	City Administrator
Action/Project Priority:	High Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds, CDBG, MoDot, USDA
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan
Progress Report	
Action Status:	Continuing
Report of Progress:	Continue to seek funding for transportation infrastructure projects.

Action Worksheet	
Name of Jurisdiction:	City of LaGrange
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding
Problem being Mitigated:	Floatation of fuel tanks.
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	LaGrange 2023.6
Name of Action or Project:	Anchoring fuel tanks and other storage tanks to prevent flotation.
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	City will enforce ordinances to make sure all tanks are secured to the ground
Estimated Cost:	$0
Benefits:	Reducing possible damages caused by tanks floating due to high floods.
Plan for Implementation	
Responsible Organization/Department:	City Administrator
Action/Project Priority:	Low
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Internal
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan, Flood Plain Regulation, City Ordinances
Progress Report	
Action Status:	Continuing
Report of Progress:	Continue to enforce ordinances to secure tanks to the ground.

Action Worksheet	
Name of Jurisdiction:	City of Lewistown
Risk / Vulnerability	
Hazard(s) Addressed:	Tornado, Severe Thunderstorms
Problem being Mitigated:	Lack of shelter for residents.
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	Lewistown 2023.1
Name of Action or Project:	Safe Rooms and Storm Shelters
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Build safe rooms and establish local ordinances requiring community storm shelters within sizable mobile home parks and subdivisions.
Estimated Cost:	$2,000,000
Benefits:	The project protects citizens from harm due to tornados or severe thunderstorms.
Plan for Implementation	
Responsible Organization/Department:	City Council / City Clerk
Action/Project Priority:	High Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan
Progress Report	
Action Status:	Continuing
Report of Progress:	Continue to seek funding for safe/shelter room improvement/construction.

Action Worksheet	
Name of Jurisdiction:	City of Lewistown
Risk / Vulnerability	
Hazard(s) Addressed:	Tornadoes, Severe Thunderstorms
Problem being Mitigated:	Early Warning Sirens
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	Lewistown 2023.2
Name of Action or Project:	Install/Upgrade Warning Sirens
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Installation or upgrade of warning sirens in City.
Estimated Cost:	$100,000
Benefits:	Mitigation actions will limit the future harm to structures and lives in the City.
Plan for Implementation	
Responsible Organization/Department:	City Clerk / City Council
Action/Project Priority:	Medium Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds / Local Funds
Local Planning Mechanisms to be Used in Implementation, if any:	NA
Progress Report	
Action Status:	Continuing
Report of Progress:	Continue to pursue funding for upgraded siren systems

Action Worksheet	
Name of Jurisdiction:	City of Lewistown
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding, Severe Storms
Problem being Mitigated:	Transportation Infrastructure Closure
Action or Project	
Applicable Goal Statement:	Goal 1: Public Awareness- Using a variety of communications avenues to increase the citizens' awareness of and promote education about the natural hazards that they may face. Their vulnerability to these hazards, and how to lessen the effect of future natural hazards.
Action/Project Number:	Lewistown 2023.3
Name of Action or Project:	Transportation Infrastructure
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Structure grants proposals for road/bridge upgrades so that hazard mitigation concerns are also met.
Estimated Cost:	$2,000,000
Benefits:	Bridges will be safe, low water crossings will be accessible, and roads that typically flood will no longer flood.
Plan for Implementation	
Responsible Organization/Department:	City Clerk / City Council
Action/Project Priority:	High Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds, CDBG, MoDot, USDA
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan
Progress Report	
Action Status:	Continuing
Report of Progress:	Continue to seek funding for transportation infrastructure projects.

Action Worksheet	
Name of Jurisdiction:	City of Lewistown
Risk / Vulnerability	
Hazard(s) Addressed:	All Hazards
Problem being Mitigated:	Lack of access to power, especially by vulnerable individuals (such as those that depend on powered medical equipment or drugs that must be refrigerated) in the event of a prolonged power outage.
Action or Project	
Applicable Goal Statement:	Goal 1: Public Awareness- Using a variety of communications avenues to increase the citizens' awareness of and promote education about the natural hazards that they may face. Their vulnerability to these hazards, and how to lessen the effect of future natural hazards.
Action/Project Number:	Lewistown 2023.4
Name of Action or Project:	Obtain Sufficient Generators for Shelters
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Research ways to purchase sufficient back-up generators
Estimated Cost:	$100,000-$150,000
Benefits:	Lives protected from hazards such as extreme heat and cold
Plan for Implementation	
Responsible Organization/Department:	City Clerk
Supporting Organization/Department:	City Council
Action/Project Priority:	High
Timeline for Completion:	2028
Potential Fund Sources:	Hazard Mitigation Grants
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan
Progress Report	
Action Status:	New
Report of Progress:	New

Action Worksheet	
Name of Jurisdiction:	City of Lewistown
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding
Problem being Mitigated:	Flooding
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	Lewistown 2023.5
Name of Action or Project:	Pursue NFIP Participation
Mitigation Category:	Natural Systems Protection, Structure and Infrastructure Projects, Emergency Services, Education and Outreach
Action or Project Description:	Pursue participation and good standing with the National Flood Insurance Program
Estimated Cost:	NA
Benefits:	Protection of life and reduction of damages due to accessibility to citizens in times of need
Plan for Implementation	
Responsible Organization/Department:	City Clerk / City Council
Action/Project Priority:	High
Timeline for Completion:	2025
Potential Fund Sources:	Local Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Floodplain Ordinance
Progress Report	
Action Status:	New
Report of Progress:	New

Action Worksheet	
Name of Jurisdiction:	Village of Monticello
Risk / Vulnerability	
Hazard(s) Addressed:	Tornado, Severe Thunderstorms
Problem being Mitigated:	Lack of shelter for residents.
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	Monticello 2023.1
Name of Action or Project:	Safe Rooms and Storm Shelters
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Build safe rooms and establish local ordinances requiring community storm shelters within sizable mobile home parks and subdivisions.
Estimated Cost:	$2,000,000
Benefits:	The project protects citizens from harm due to tornados or severe thunderstorms.
Plan for Implementation	
Responsible Organization/Department:	City Council / City Clerk
Action/Project Priority:	High Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan
Progress Report	
Action Status:	Continuing
Report of Progress:	Continue to seek funding for safe/shelter room improvement/construction.

Action Worksheet	
Name of Jurisdiction:	Village of Monticello
Risk / Vulnerability	
Hazard(s) Addressed:	Tornadoes, Severe Thunderstorms
Problem being Mitigated:	Early Warning Sirens
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	Monticello 2023.2
Name of Action or Project:	Install/Upgrade Warning Sirens
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Installation or upgrade of warning sirens in City.
Estimated Cost:	$100,000
Benefits:	Mitigation actions will limit the future harm to structures and lives in the City.
Plan for Implementation	
Responsible Organization/Department:	City Clerk / City Council
Action/Project Priority:	Medium Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds / Local Funds
Local Planning Mechanisms to be Used in Implementation, if any:	NA
Progress Report	
Action Status:	Continuing
Report of Progress:	Continue to pursue funding for upgraded siren systems

Action Worksheet	
Name of Jurisdiction:	Village of Monticello
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding, Severe Thunderstorms
Problem being Mitigated:	Transportation infrastructure closure
Action or Project	
Applicable Goal Statement:	Goal 1: Public Awareness- Using a variety of communications avenues to increase the citizens' awareness of and promote education about the natural hazards that they may face. Their vulnerability to these hazards, and how to lessen the effect of future natural hazards.
Action/Project Number:	Monticello 2023.3
Name of Action or Project:	Transportation Infrastructure
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Structure grants proposals for road/bridge upgrades so that hazard mitigation concerns are also met.
Estimated Cost:	$2,000,000
Benefits:	Bridges will be safe, low water crossings will be accessible, and roads that typically flood will no longer flood.
Plan for Implementation	
Responsible Organization/Department:	City Clerk / City Council
Action/Project Priority:	High Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds, CDBG, MoDot, USDA
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan
Progress Report	
Action Status:	Continuing
Report of Progress:	Continue to seek funding for transportation infrastructure projects.

Action Worksheet	
Name of Jurisdiction:	Village of Monticello
Risk / Vulnerability	
Hazard(s) Addressed:	All Hazards
Problem being Mitigated:	Lack of access to power, especially by vulnerable individuals (such as those that depend on powered medical equipment or drugs that must be refrigerated) in the event of a prolonged power outage.
Action or Project	
Applicable Goal Statement:	Goal 1: Public Awareness- Using a variety of communications avenues to increase the citizens' awareness of and promote education about the natural hazards that they may face. Their vulnerability to these hazards, and how to lessen the effect of future natural hazards.
Action/Project Number:	Monticello 2023.4
Name of Action or Project:	Obtain Sufficient Generators for Shelters
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Research ways to purchase sufficient back-up generators
Estimated Cost:	$100,000-$150,000
Benefits:	Lives protected from hazards such as extreme heat and cold
Plan for Implementation	
Responsible Organization/Department:	City Clerk
Supporting Organization/Department:	City Council
Action/Project Priority:	High
Timeline for Completion:	2028
Potential Fund Sources:	Hazard Mitigation Grants
Local Planning Mechanisms to be Used in Implementation, if any:	Hazard Mitigation Plan
Progress Report	
Action Status:	New
Report of Progress:	New

Action Worksheet	
Name of Jurisdiction:	Village of Monticello
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding
Problem being Mitigated:	Flooding
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	Monticello 2023.5
Name of Action or Project:	Pursue NFIP Participation
Mitigation Category:	Natural Systems Protection, Structure and Infrastructure Projects, Emergency Services, Education and Outreach
Action or Project Description:	Pursue participation and good standing with the National Flood Insurance Program
Estimated Cost:	NA
Benefits:	Protection of life and reduction of damages due to accessibility to citizens in times of need
Plan for Implementation	
Responsible Organization/Department:	City Clerk / City Council
Action/Project Priority:	High
Timeline for Completion:	2025
Potential Fund Sources:	Local Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Floodplain Ordinance
Progress Report	
Action Status:	New
Report of Progress:	New

Action Worksheet	
Name of Jurisdiction:	Canton R-V
Risk / Vulnerability	
Hazard(s) Addressed:	Tornado, Severe Thunderstorms, Earthquake
Problem being Mitigated:	Lack of shelter for students and employees of the district.
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	CRV 2023.1
Name of Action or Project:	Safe Rooms
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Build safe rooms
Estimated Cost:	$1,000,000
Benefits:	Protect human lives.
Plan for Implementation	
Responsible Organization/Department:	Canton R-V Superintendent
Action/Project Priority:	High Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds
Local Planning Mechanisms to be Used in Implementation, if any:	NA
Progress Report	
Action Status:	Continuing
Report of Progress:	Continue to look to obtain funding for additional safe rooms

Action Worksheet	
Name of Jurisdiction:	Canton R-V
Risk / Vulnerability	
Hazard(s) Addressed:	Tornado, Severe Thunderstorms, Earthquake
Problem being Mitigated:	Lack of intercom system throughout entire school.
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	CRV 2023.2
Name of Action or Project:	Intercom System
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services, Outreach
Action or Project Description:	Upgrade intercom system.
Estimated Cost:	$150,000
Benefits:	Protect human lives.
Plan for Implementation	
Responsible Organization/Department:	Canton R-V Superintendent
Action/Project Priority:	Medium Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds
Local Planning Mechanisms to be Used in Implementation, if any:	NA
Progress Report	
Action Status:	NEW
Report of Progress:	NEW Project

Action Worksheet	
Name of Jurisdiction:	Canton R-V
Risk / Vulnerability	
Hazard(s) Addressed:	All Hazards
Problem being Mitigated:	Lack of access to power, especially by vulnerable individuals (such as those that depend on powered medical equipment or drugs that must be refrigerated) in the event of a prolonged power outage.
Action or Project	
Applicable Goal Statement:	Goal 1: Public Awareness- Using a variety of communications avenues to increase the citizens' awareness of and promote education about the natural hazards that they may face. Their vulnerability to these hazards, and how to lessen the effect of future natural hazards.
Action/Project Number:	CRV 2023.3
Name of Action or Project:	Generators
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services, Outreach
Action or Project Description:	Purchase additional generators
Estimated Cost:	$150,000
Benefits:	Lives protected from hazards such as extreme heat and cold
Plan for Implementation	
Responsible Organization/Department:	Canton R-V Superintendent
Action/Project Priority:	Medium Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds
Local Planning Mechanisms to be Used in Implementation, if any:	NA
Progress Report	
Action Status:	Continuing
Report of Progress:	Continue to seek funding for additional generators

Action Worksheet	
Name of Jurisdiction:	Lewis County C-1
Risk / Vulnerability	
Hazard(s) Addressed:	Tornado, Severe Thunderstorms, Earthquake
Problem being Mitigated:	Lack of shelter for students and employees of the district.
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	LC1 2023.1
Name of Action or Project:	Safe Rooms
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services
Action or Project Description:	Build safe rooms
Estimated Cost:	$1,000,000
Benefits:	Protect human lives.
Plan for Implementation	
Responsible Organization/Department:	Lewis County C-1 Superintendent
Action/Project Priority:	High Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds
Local Planning Mechanisms to be Used in Implementation, if any:	NA
Progress Report	
Action Status:	Continuing
Report of Progress:	Continue to look to obtain funding for additional safe rooms

Action Worksheet	
Name of Jurisdiction:	Lewis County C-1
Risk / Vulnerability	
Hazard(s) Addressed:	Tornado, Severe Thunderstorms, Earthquake
Problem being Mitigated:	Lack of intercom system throughout entire school.
Action or Project	
Applicable Goal Statement:	Goal 3: Investigate, implement, maintain, and enforce mitigation policies and programs that limit the impact of natural hazards: on the loss of life; on new and existing properties.
Action/Project Number:	LC1 2023.2
Name of Action or Project:	Intercom System
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services, Outreach
Action or Project Description:	Upgrade intercom system.
Estimated Cost:	$150,000
Benefits:	Protect human lives.
Plan for Implementation	
Responsible Organization/Department:	Lewis County C-1 Superintendent
Action/Project Priority:	Medium Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds
Local Planning Mechanisms to be Used in Implementation, if any:	NA
Progress Report	
Action Status:	NEW
Report of Progress:	NEW Project

Action Worksheet	
Name of Jurisdiction:	Lewis County C-1
Risk / Vulnerability	
Hazard(s) Addressed:	All Hazards
Problem being Mitigated:	Lack of access to power, especially by vulnerable individuals (such as those that depend on powered medical equipment or drugs that must be refrigerated) in the event of a prolonged power outage.
Action or Project	
Applicable Goal Statement:	Goal 1: Public Awareness- Using a variety of communications avenues to increase the citizens' awareness of and promote education about the natural hazards that they may face. Their vulnerability to these hazards, and how to lessen the effect of future natural hazards.
Action/Project Number:	LC1 2023.3
Name of Action or Project:	Generators
Mitigation Category:	Prevention, Structure and Infrastructure Projects, Emergency Services, Outreach
Action or Project Description:	Purchase additional generators
Estimated Cost:	$150,000
Benefits:	Lives protected from hazards such as extreme heat and cold
Plan for Implementation	
Responsible Organization/Department:	Lewis County C-1 Superintendent
Action/Project Priority:	Medium Priority
Timeline for Completion:	1-5 Year
Potential Fund Sources:	Hazard Mitigation Grant Funds
Local Planning Mechanisms to be Used in Implementation, if any:	NA
Progress Report	
Action Status:	Continuing
Report of Progress:	Continue to seek funding for additional generators

Table 4.3. Mitigation Action Matrix

#	Action	Jurisdiction	Priority	Goals Addressed	Hazards Addressed	Address Current Development	Address Future Development	Continued Compliance with NFIP
	Prevention Public Education							
Lewis County 2023.1	Obtain Sufficient Generators for Shelters	Lewis County	High	1	All Hazards	✓		
Lewis County 2023.2	Transportation Infrastructure	Lewis County	High	1	Flooding and Severe Storm	✓		
Lewis County 2023.3	NFIP Participation	Lewis County	High	3	Flooding			✓
Lewis County 2023.4	Install/Upgrade Warning Sirens	Lewis County	Medium	3	Tornado, Severe Storm	✓		
Lewis County 2023.5	Safe Rooms and Storm Shelters	Lewis County	High	3	Tornado, Severe Storms	✓		
Lewis County 2023.6	Response to Pandemic	Lewis County	Medium	2	Pandemic	✓	✓	
Canton 2023.1	NFIP Participation	Canton	High	3	Flooding			✓
Canton 2023.2	Safe Rooms and Strom Shelters	Canton	High	3	Tornado, Severe Storms	✓		
Canton 2023.3	Raising the North Levee	Canton	High	3	Flooding	✓	✓	
Canton 2023.4	Replace Flood Gates of North Levee	Canton	High	3	Flooding	✓	✓	
Canton 2023.5	Anchoring fuel tanks and other storage tanks	Canton	Low	3	Flooding	✓		
Canton 2023.6	Transportation Infrastructure	Canton	High	1	Flooding and Severe Storm	✓		
Canton 2023.7	Install/Upgrade Warning Signs	Canton	Medium	3	Tornado, Severe Storm	✓		
Canton 2023.8	Generators for Shelters/City Facilities	Canton	High	1	All Hazards	✓		
Ewing 2023.1	Generators for Shelters	Ewing	High	1	All Hazards	✓		
Ewing 2023.2	Install/Upgrade Warning Sirens	Ewing	Medium	3	Tornado, Severe Storm	✓		
Ewing 2023.3	Transportation Infrastructure	Ewing	High	1	Flooding and Severe Storm	✓		

#	Action	Jurisdiction	Priority	Goals Addressed	Hazards Addressed	Address Current Development	Address Future Development	Continued Compliance with NFIP
Ewing 2023.4	Safe Rooms and Storm Shelters	Ewing	High	3	Tornado, Severe Storm	✓		
Ewing 2023.5	Pursue NFIP Participation	Ewing	High	3	Flooding			✓
Labelle 2023.1	Safe Rooms and Storm Shelters	LaBelle	High	3	Tornado, Severe Storms	✓		
LaBelle 2023.2	Install/Upgrade Warning Signs	LaBelle	Medium	3	Tornado, Severe Storm	✓		
LaBelle 2023.3	Transportation Infrastructure	LaBelle	High	1	Flooding and Severe Storm	✓		
LaBelle 2023.4	Generators for Shelters	LaBelle	High	1	All Hazards	✓		
LaBelle 2023.5	Pursue NFIP Participation	LaBelle	High	3	Flooding			✓
LaGrange 2023.1	NFIP Participation	LaGrange	High	3	Flooding			✓
LaGrange 2023.2	Generators for Shelters	LaGrange	High	1	All Hazards	✓		
LaGrange 2023.3	Safe Rooms and Storm Shelters	LaGrange	High	3	Tornado, Severe Storm	✓		
LaGrange 2023.4	Install/Upgrade Warning Sirens	LaGrange	Medium	3	Tornado, Severe Storm	✓		
LaGrange 2023.5	Transportation Infrastructure	LaGrange	High	1	Flooding and Severe Storm	✓		
LaGrange 2023.6	Anchoring Fuel Tank and other Storage Tanks	LaGrange	Low	3	Flooding	✓		
Lewistown 2023.1	Safe Rooms and Storm Shelters	Lewistown	High	3	Tornado and Severe Storm	✓		
Lewistown 2023.2	Installation/Upgrade Warning Sirens	Lewistown	Medium	3	Tornado, Severe Storm	✓		
Lewistown 2023.3	Transportation Infrastructure	Lewistown	High	1	Flooding and Severe Storm	✓		
Lewistown 2023.4	Generators for Shelters	Lewistown	High	1	All Hazards	✓		
Lewistown 2023.5	Pursue NFIP Participation	Lewistown	High	3	Flooding			✓
Monticello 2023.1	Safe Rooms and Storm Shelters	Monticello	High	3	Tornado and Severe Storm	✓		
Monticello 2023.2	Install/Upgrade Warning Sirens	Monticello	Medium	3	Tornado, Severe Storm	✓		
Monticello 2023.3	Transportation Infrastructure	Monticello	High	1	Flooding and Severe Storm	✓		
Monticello 2023.4	Generators for Shelters	Monticello	High	1	All Hazards	✓		

#	Action	Jurisdiction	Priority	Goals Addressed	Hazards Addressed	Address Current Development	Address Future Development	Continued Compliance with NFIP
Monticello 2023.5	Pursue NFIP Participation	Monticello	High	3	Flooding			✓
CRV 2023.1	Safe Rooms	Canton R-V	High	3	Tornado, Severe Storms, Earthquake	✓		
CRV 2023.2	Upgrade Intercom System	Canton R-V	Medium	3	Tornado, Severe Storms, Earthquake	✓		
CRV 2023.3	Generators	Canton R-V	Medium	1	All Hazards	✓		
LC1 2023.1	Safe Rooms	Lewis County C-1	High	3	Tornado, Severe Storms, Earthquake	✓		
LC1 2023.2	Upgrade Intercom System	Lewis County C-1	Medium	3	Tornado, Severe Storms, Earthquake	✓		
LC1 2023.3	Generators	Lewis County C-1	Medium	1	All Hazards	✓		
	Structure and Infrastructure Projects							
Lewis County 2023.1	Obtain Sufficient Generators for Shelters	Lewis County	High	1	All Hazards	✓		
Lewis County 2023.2	Transportation Infrastructure	Lewis County	High	1	Flooding and Severe Storm	✓		
Lewis County 2023.3	NFIP Participation	Lewis County	High	3	Flooding			✓
Lewis County 2023.4	Install/Upgrade Warning Sirens	Lewis County	Medium	3	Tornado and Severe Storm	✓		
Lewis County 2023.5	Safe Rooms and Storm Shelters	Lewis County	High	3	Tornado, Severe Storms	✓		
Canton 2023.1	NFIP Participation	Canton	High	3	Flooding			✓
Canton 2023.2	Safe Rooms and Strom Shelters	Canton	High	3	Tornado, Severe Storms	✓		
Canton 2023.3	Raising the North Levee	Canton	High	3	Flooding	✓	✓	
Canton 2023.4	Replace Flood Gates of North Levee	Canton	High	3	Flooding	✓	✓	
Canton 2023.5	Anchoring fuel tanks and other storage tanks	Canton	Low	3	Flooding	✓		

#	Action	Jurisdiction	Priority	Goals Addressed	Hazards Addressed	Address Current Development	Address Future Development	Continued Compliance with NFIP
Canton 2023.6	Transportation Infrastructure	Canton	High	1	Flooding and Severe Storm	✓		
Canton 2023.7	Install/Upgrade Warning Signs	Canton	Medium	3	Tornado and Severe Storm	✓		
Canton 2023.8	Generators for Shelters/City Facilities	Canton	High	1	All Hazards	✓		
Ewing 2023.1	Generators for Shelters	Ewing	High	1	All Hazards	✓		
Ewing 2023.2	Install/Upgrade Warning Sirens	Ewing	Medium	3	Tornado and Severe Storm	✓		
Ewing 2023.3	Transportation Infrastructure	Ewing	High	1	Flooding and Severe Storm	✓		
Ewing 2023.4	Safe Rooms and Storm Shelters	Ewing	High	3	Tornado, Severe Storm	✓		
Ewing 2023.5	Pursue NFIP Participation	Ewing	High	3	Flooding			✓
Labelle 2023.1	Safe Rooms and Storm Shelters	LaBelle	High	3	Tornado, Severe Storms	✓		
LaBelle 2023.2	Install/Upgrade Warning Signs	LaBelle	Medium	3	Tornado and Severe Storm	✓		
LaBelle 2023.3	Transportation Infrastructure	LaBelle	High	1	Flooding and Severe Storm	✓		
LaBelle 2023.4	Generators for Shelters	LaBelle	High	1	All Hazards	✓		
LaBelle 2023.5	Pursue NFIP Participation	LaBelle	High	3	Flooding			✓
LaGrange 2023.1	NFIP Participation	LaGrange	High	3	Flooding			✓
LaGrange 2023.2	Generators for Shelters	LaGrange	High	1	All Hazards	✓		
LaGrange 2023.3	Safe Rooms and Storm Shelters	LaGrange	High	3	Tornado, Severe Storm	✓		
LaGrange 2023.4	Install/Upgrade Warning Sirens	LaGrange	Medium	3	Tornado and Severe Storm	✓		
LaGrange 2023.5	Transportation Infrastructure	LaGrange	High	1	Flooding and Severe Storm	✓		
LaGrange 2023.6	Anchoring Fuel Tank and other Storage Tanks	LaGrange	Low	3	Flooding	✓		
Lewistown 2023.1	Safe Rooms and Storm Shelters	Lewistown	High	3	Tornado and Severe Storm	✓		
Lewistown 2023.2	Installation/Upgrade Warning Sirens	Lewistown	Medium	3	Tornado and Severe Storm	✓		
Lewistown 2023.3	Transportation Infrastructure	Lewistown	High	1	Flooding and Severe Storm	✓		

#	Action	Jurisdiction	Priority	Goals Addressed	Hazards Addressed	Address Current Development	Address Future Development	Continued Compliance with NFIP
Lewistown 2023.4	Generators for Shelters	Lewistown	High	1	All Hazards	✓		
Lewistown 2023.5	Pursue NFIP Participation	Lewistown	High	3	Flooding			✓
Monticello 2023.1	Safe Rooms and Storm Shelters	Monticello	High	3	Tornado and Severe Storm	✓		
Monticello 2023.2	Install/Upgrade Warning Sirens	Monticello	Medium	3	Tornado and Severe Storm	✓		
Monticello 2023.3	Transportation Infrastructure	Monticello	High	1	Flooding and Severe Storm	✓		
Monticello 2023.4	Generators for Shelters	Monticello	High	1	All Hazards	✓		
Monticello 2023.5	Pursue NFIP Participation	Monticello	High	3	Flooding			✓
CRV 2023.1	Safe Rooms	Canton R-V	High	3	Tornado, Severe Storms, Earthquake	✓		
CRV 2023.2	Upgrade Intercom System	Canton R-V	Medium	3	Tornado, Severe Storms, Earthquake	✓		
CRV 2023.3	Generators	Canton R-V	Medium	1	All Hazards	✓		
LC1 2023.1	Safe Rooms	Lewis County C-1	High	3	Tornado, Severe Storms, Earthquake	✓		
LC1 2023.2	Upgrade Intercom System	Lewis County C-1	Medium	3	Tornado, Severe Storms, Earthquake	✓		
LC1 2023.3	Generators	Lewis County C-1	Medium	1	All Hazards	✓		
	Natural Systems Protection							
Lewis County 2023.3	NFIP Participation	Lewis County	High	3	Flooding			✓
Canton 2023.1	NFIP Participation	Canton	High	3	Flooding			✓
Ewing 2023.5	Pursue NFIP Participation	Ewing	High	3	Flooding			✓
LaGrange 2023.1	NFIP Participation	LaGrange	High	3	Flooding			✓
LaBelle 2023.5	Pursue NFIP Participation	LaBelle	High	3	Flooding			✓
Lewistown 2023.5	Pursue NFIP Participation	Lewistown	High	3	Flooding			✓

#	Action	Jurisdiction	Priority	Goals Addressed	Hazards Addressed	Address Current Development	Address Future Development	Continued Compliance with NFIP
Monticello 2023.5	Pursue NFIP Participation	Monticello	High	3	Flooding			✓
	Emergency Services							
Lewis County 2023.1	Obtain Sufficient Generators for Shelters	Lewis County	High	1	All Hazards	✓		
Lewis County 2023.3	NFIP Participation	Lewis County	High	3	Flooding			✓
Lewis County 2023.4	Install/Upgrade Warning Sirens	Lewis County	Medium	3	Tornado and Severe Storm	✓		
Lewis County 2023.5	Safe Rooms and Storm Shelters	Lewis County	High	3	Tornado, Severe Storms	✓		
Canton 2023.1	NFIP Participation	Canton	High	3	Flooding			✓
Canton 2023.2	Safe Rooms and Strom Shelters	Canton	High	3	Tornado, Severe Storms	✓		
Canton 2023.3	Raising the North Levee	Canton	High	3	Flooding	✓	✓	
Canton 2023.4	Replace Flood Gates of North Levee	Canton	High	3	Flooding	✓	✓	
Canton 2023.7	Install/Upgrade Warning Signs	Canton	Medium	3	Tornado and Severe Storm	✓		
Canton 2023.8	Generators for Shelters/City Facilities	Canton	High	1	All Hazards	✓		
Ewing 2023.1	Generators for Shelters	Ewing	High	1	All Hazards	✓		
Ewing 2023.2	Install/Upgrade Warning Sirens	Ewing	Medium	3	Tornado and Severe Storm	✓		
Ewing 2023.4	Safe Rooms and Storm Shelters	Ewing	High	3	Tornado, Severe Storm	✓		
Ewing 2023.5	Pursue NFIP Participation	Ewing	High	3	Flooding			✓
Labelle 2023.1	Safe Rooms and Storm Shelters	LaBelle	High	3	Tornado, Severe Storms	✓		
LaBelle 2023.2	Install/Upgrade Warning Signs	LaBelle	Medium	3	Tornado and Severe Storm	✓		
LaBelle 2023.4	Generators for Shelters	LaBelle	High	1	All Hazards	✓		
LaBelle 2023.5	Pursue NFIP Participation	LaBelle	High	3	Flooding			✓
LaGrange 2023.1	NFIP Participation	LaGrange	High	3	Flooding			✓

#	Action	Jurisdiction	Priority	Goals Addressed	Hazards Addressed	Address Current Development	Address Future Development	Continued Compliance with NFIP
LaGrange 2023.2	Generators for Shelters	LaGrange	High	1	All Hazards	✓		
LaGrange 2023.3	Safe Rooms and Storm Shelters	LaGrange	High	3	Tornado, Severe Storm	✓		
LaGrange 2023.4	Install/Upgrade Warning Sirens	LaGrange	Medium	3	Tornado and Severe Storm	✓		
Lewistown 2023.1	Safe Rooms and Storm Shelters	Lewistown	High	3	Tornado and Severe Storm	✓		
Lewistown 2023.2	Installation/Upgrade Warning Sirens	Lewistown	Medium	3	Tornado and Severe Storm	✓		
Lewistown 2023.4	Generators for Shelters	Lewistown	High	1	All Hazards	✓		
Lewistown 2023.5	Pursue NFIP Participation	Lewistown	High	3	Flooding			✓
Monticello 2023.1	Safe Rooms and Storm Shelters	Monticello	High	3	Tornado and Severe Storm	✓		
Monticello 2023.2	Install/Upgrade Warning Sirens	Monticello	Medium	3	All Hazards	✓		
Monticello 2023.4	Generators for Shelters	Monticello	High	1	All Hazards	✓		
Monticello 2023.5	Pursue NFIP Participation	Monticello	High	3	Flooding			✓
CRV 2023.1	Safe Rooms	Canton R-V	High	3	Tornado, Severe Storms, Earthquake	✓		
CRV 2023.2	Upgrade Intercom System	Canton R-V	Medium	3	Tornado, Severe Storms, Earthquake	✓		
CRV 2023.3	Generators	Canton R-V	Medium	1	All Hazards	✓		
LC1 2023.1	Safe Rooms	Lewis County C-1	High	3	Tornado, Severe Storms, Earthquake	✓		
LC1 2023.2	Upgrade Intercom System	Lewis County C-1	Medium	3	Tornado, Severe Storms, Earthquake	✓		
LC1 2023.3	Generators	Lewis County C-1	Medium	1	All Hazards	✓		
	Education and Outreach							
Lewis County 2023.3	NFIP Participation	Lewis County	High	3	Flooding			✓
Ewing 2023.5	Pursue NFIP Participation	Ewing	High	3	Flooding			✓

#	Action	Jurisdiction	Priority	Goals Addressed	Hazards Addressed	Address Current Development	Address Future Development	Continued Compliance with NFIP
Canton 2023.1	NFIP Participation	Canton	High	3	Flooding			✓
LaGrange 2023.1	NFIP Participation	LaGrange	High	3	Flooding			✓
LaBelle 2023.5	Pursue NFIP Participation	LaBelle	High	3	Flooding			✓
Monticello 2023.5	Pursue NFIP Participation	Monticello	High	3	Flooding			✓
CRV 2023.2	Upgrade Intercom System	Canton R-V	Medium	3	Tornado, Severe Storms, Earthquake	✓		
LC1 2023.2	Upgrade Intercom System	Lewis County C-1	Medium	3	Tornado, Severe Storms, Earthquake	✓		

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

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

5.1.2 Plan Maintenance Schedule

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

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

5.1.3 Plan Maintenance Process

Progress on the proposed actions can be monitored by evaluating changes in vulnerabilities identified in the plan. The MPC (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[10(b)] 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 Board of (Supervisors or Commissioner) and the governing boards of the other participating jurisdictions.

5.2 Incorporation into Existing Planning Mechanisms

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

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

Where possible, plan participants, including school and special districts, will use existing plans and/or programs to implement hazard mitigation actions. Those existing plans and programs were described in Section 2 of this plan. Based on the capability assessments of the participating jurisdictions, communities in Lewis County will continue to plan and implement programs to reduce losses to life and property from hazards. This plan builds upon the momentum developed through previous and related planning efforts and mitigation programs and recommends implementing actions, where possible, through the following plans:

- General or master plans of participating jurisdictions.
- Ordinances of participating jurisdictions;
- County "A" Emergency Operations Plan;
- Capital improvement plans and budgets;
- Other community plans within the County, such as water conservation plans, storm water management plans, and parks and recreation plans;
- School and Special District Plans and budgets; and
- Other plans and policies outlined in the capability assessment sections for each jurisdiction in Chapter 2 of this plan.

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

Additionally, after the annual review of the Hazard Mitigation Plan, the Lewis County Emergency Management Director will provide the updated Mitigation Strategy with current status of each mitigation action to the County (Boards of Supervisors or Commissions) as well as all Mayors, City Clerks, and School District Superintendents. 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
Unincorporated Lewis County	Road and Bridge Dept. Project list County Emergency Operations Plan	County Commissioners attended all planning meetings and identified actions relating to transportation infrastructure.	Commissioners attended all planning meetings. Identified new actions relating to transportation infrastructure.
City of Canton	Local Budget	The previous plan was not integrated into previous budgets due to the items not applicable to being added in previous plans.	The Hazard Mitigation Plan will be integrated into future budgets by consulting the plan during the planning process.
City of Ewing	Local Budget	The previous plan was not integrated into previous budgets due to the items not applicable to being added in previous plans.	The Hazard Mitigation Plan will be integrated into future budgets by consulting the plan during the planning process.
City of LaBelle	Local Budget	The previous plan was not integrated into previous budgets due to the items not applicable to being added in previous plans.	The Hazard Mitigation Plan will be integrated into future budgets by consulting the plan during the planning process.
City of LaGrange	Local Budget	The previous plan was not integrated into previous budgets due to the items not applicable to being added in previous plans.	The Hazard Mitigation Plan will be integrated into future budgets by consulting the plan during the planning process.
City of Lewistown	Local Budget	The previous plan was not integrated into previous budgets due to the items not applicable to being added in previous plans.	The Hazard Mitigation Plan will be integrated into future budgets by consulting the plan during the planning process.
Village of Monticello	Local Budget	The previous plan was not integrated into previous budgets due to the items not applicable to being added in previous plans.	The Hazard Mitigation Plan will be integrated into future budgets by consulting the plan during the planning process.
Canton R-V School District	Master Plan	The previous plan was not integrated into previous budgets due to the items not applicable to being added in previous plans.	The Hazard Mitigation Plan will be integrated into future budgets by consulting the plan during the planning process.
Lewis County C-1 School District	Master Plan	The previous plan was not integrated into previous budgets due to the items not applicable to being added in	The Hazard Mitigation Plan will be integrated into future budgets by consulting the plan during the planning

		previous plans.	process.

5.3 Continued Public Involvement

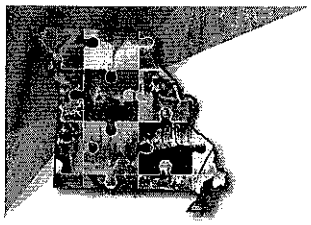
44 CFR Requirement §201.6(c)(4)(iii): [The plan maintenance process shall include a] discussion on how the community will continue public participation in the plan maintenance process.

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

APPENDIX A
REFERENCES

- Missouri State Hazard Mitigation Plan (2013 and 2018)
- Federal Emergency Management Agency, https://www.fema.gov/data-visualization-summary-disaster-declarations-and-grants
- State Emergency Management Agency (SEMA)- http://sema.dps.mo.gov/programs/mitigation_management.php
- Department of Elementary and Secondary Education (DESE)- http://mcds.dese.mo.gov/quickfacts/Pages/District-and-School-Information.aspx
- Data Collection Questionnaires completed by each jurisdiction
- Previously approved planning area Hazard Mitigation Plan 2018
- Transportation for America- http://t4america.org/maps-tools/bridges/
- U.S. Department of Transportation- http://www.fhwa.dot.gov/bridge/nbi/no10/county.cfm
- U.S. Fish and Wildlife Service- , http://www.fws.gov/midwest/Endangered/lists/missouri-cty.html
- Missouri Department of Conservation- https://nature.mdc.mo.gov/discover-nature/places
- Missouri Department of Natural Resources- http://dnr.mo.gov/shpo/mnrlist.htm
- Missouri Economic Research and Information Center- https://www.missourieconomy.org/employers/default.aspx
- USDA Ag Census- https://www.agcensus.usda.gov/Publications/2012/Full_Report/Volume_1,_Chapter_2_County_Level/Missouri/st29_2_007_007.pdf
- Missouri Economic Research Brief- https://www.missourieconomy.org/pdfs/missouri_farms_and_agribusiness.pdf

Appendix B



SEMA Mitigation Management

LOCAL MITIGATION PLAN FORMAT GUIDANCE
KICKOFF MEETING INVITATION FOR JURISDICTIONS

Subject: Lewis County Multi-Jurisdictional Hazard Mitigation Plan Update

On behalf of Lewis County, you are invited to the conference call planning meeting to update the Lewis County Multi-Jurisdictional Hazard Mitigation Plan.

Lewis County Multi-Jurisdictional Hazard Mitigation Plan Update
Kickoff Meeting
November 7, 2022
Meeting Time: 10:00 AM
Call-in Number: (844)844-0414
Access Code: 511868

Lewis County is beginning the process to update the Lewis County Multi-Jurisdictional Hazard Mitigation Plan to better protect the people and property of Lewis County from the effects of natural hazard events. The existing plan was approved by FEMA in October 2018. The plan update will be prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 (Public Law 106-390) and the implementing regulations. These regulations establish the requirements that hazard mitigation plans must meet, in order for Lewis County and the participating jurisdictions, to be eligible for certain federal disaster assistance and hazard mitigation funding under the Robert T. Stafford Disaster Relief and Emergency Act (Public Law 93-288). Because Lewis County is subject to many kinds of hazards, access to these federal programs is vital.

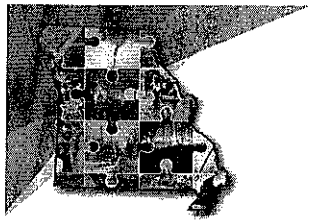
What is a Hazard Mitigation Plan?
A hazard mitigation plan is the result of a planning process which identifies policies and actions that can be implemented over the long term to reduce the risk and future losses resulting from hazard events. The Lewis County Multi-Jurisdictional Hazard Mitigation Plan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

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

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

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

What can I expect by participating in the planning committee?
The planning committee will be provided with information on what activities are required to be performed to be included in the plan. Required activities include the following:



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

- **Required Activities include:** Participating jurisdictions will be required to complete as much of the data questionnaire as possible and return, complete critical/essential facilities and non-government employer form. Review planning meeting PowerPoint including federal planning requirements. Review project timeline.
- **Risk Assessment Meeting.** Review and provide comments on the risk assessment.
- **Mitigation Strategy Meeting.** Updating of existing mitigation actions and identification and development of new mitigation strategies based upon the risk assessment.

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

- **Lewis County Multi-Jurisdictional Hazard Mitigation Plan, October 2018**
  https://nemorpc.org/wp-content/uploads/2023/01/Lewis-County-HMP-2018.pdf

- **The requirements and procedures for state, tribal and local mitigation plans as presented in the Code of Federal Regulations (CFR) at Title 44, Chapter 1, Part 201**
  https://www.fema.gov/hazard-mitigation-planning-laws-regulations-policies

- **Frequently Asked Questions regarding hazard mitigation planning**
  https://www.fema.gov/hazard-mitigation-planning-frequently-asked-questions

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

Thank you,

Derek Weber
Executive Director
Northeast Missouri Regional Planning Commission

Lewis County
Multi-Jurisdictional Hazard Mitigation Plan Update
Conference Call Planning Meeting
November 7, 2022
10:00 A.M.

Agenda

Welcome/Introductions — Derek Weber, Executive Director
Northeast Missouri RPC

Hazard Mitigation Planning Purpose/Grant Programs

Data Collection Questionnaires

Participation Requirements/Status

Discussion of Hazards

Update Mitigation Goals

Discuss Mitigation Action Updates

Next Steps/Timeline

Questions?

To	**Lewis County Hazard Mitigation Planning Committee**
From	**Derek Weber, Executive Director** **Northeast Missouri Regional Planning Commission**
Tel / E-mail	**(660)465-7281 Ext. 1 / derekweber@nemorpc.org**
Date	**November 11th, 2020**
Subject	**Minutes from Lewis County Hazard Mitigation Planning Conference Call held on November 7th 2022 at 10:00 AM**

This document is a record of attendance and a summary of the issues discussed during the above meeting. The presentation began with an introduction on the purpose of hazard mitigation planning, grant programs linked to an approved plan, and the benefits of a multi-jurisdictional approach. The hazard mitigation planning process was reviewed to include requirements for participation and public involvement and the use of data collection questionnaires. The planning committee participated in a discussion of the hazards that have the potential to impact Lewis County, including preliminary research on each hazard. The sources for compiling a GIS layer of critical facilities were also discussed and additional sources identified by planning committee members were noted. The meeting concluded with a discussion of the next steps in the planning process. The meeting was held via conference call beginning at 10:00 AM.

Attendees

Name		Title	Department	Jurisdiction/Agency/Organizatio
John	French	Superintendent		Lewis County C-3 School District
Jesse	Uhlmeyer	Superintendent		Canton R-V School District
Wayne	Murphy	Presiding Commissioner	Commission	Lewis County
Travis	Fleer	Southern District Commissioner	Commission	Lewis County
Deann	Whiston	Northern District Commissioner	Commission	Lewis County
Wendy	Lewis	City Clerk		City of La Belle
John	Roach	City Administrator		City of La Grange
Vancell	Scifres	Mayor		City of Monticello
Mary	Fretwell	City Administrator		City of Canton
Jarrod	Phillips	Mayor		City of Canton
Cheryl	Thrower	City Clerk		City of Ewing
Shirley	Hetzler	City Clerk		City of Lewistown

Introductions

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

Hazard Mitigation Planning Purpose

Derek Weber, Executive Director with NEMO RPC presented information on the purpose of Hazard Mitigation Planning and the Disaster Mitigation Act of 2000. The attendees were reminded this is an update of the Lewis County Hazard Mitigation Plan, previously approved in October 2018. The current plan expires in October 2023.

Grant Programs Linked to Approved Plan

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

Participation Requirements

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

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

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

Data Collection Questionnaires

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

Discussion/Prioritization of Hazards

Initial research information was presented on the hazards being considered for inclusion in the hazard mitigation plan. The attendees agreed to continue with all the previous natural hazards covered in the previous plan and add Pandemic Hazard.

Update Mitigation Goals

Following the discussion of risk assessment, Derek Weber facilitated a discussion of the mitigation goals. Common categories of mitigation goals were presented as well as the 2018 State Hazard Mitigation Plan goals.

This planning effort is an update to an existing hazard mitigation plan. As a result, the goals from the previous hazard mitigation plan were reviewed. The updated goals are as follows:

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

Mitigation Actions Updates

The planning committee members informed them they would be contacted to review past mitigation actions and how they wanted to proceed with new mitigation actions. Jurisdictions were informed they were required to have at least one mitigation action.

For each Continuing and New action to be included in the plan, the responsible jurisdiction must complete the STAPLEE Worksheet and record the results on either the spreadsheet OR action plan worksheet. The STAPLEE worksheet provides a framework to determine the general effectiveness in accomplishing the goals of life safety and/or reduction or prevention of damage from a hazard event. This method analyzes the Social, Technical, Administrative, Political, Legal, Economic and Environmental aspects of a project and is commonly used by public administration officials and planners for making planning decisions.

Next Steps

The meeting concluded with a discussion of the remaining steps to complete the planning process. Participants were informed they would be contacted for completion of mitigation action items. Resolutions will need to be adopted by each jurisdiction and a sample will be emailed.

Multi-Jurisdictional Hazard Mitigation Plan

Data Collection Questionnaire

For Local Governments

County: Lewis County

Jurisdiction: Unincorporated Lewis County

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

Prepared by: Wayne Murphy Jr.

Phone: 573-767-5205

Email: lewis@sos.mo.gob

Date:11/7/22

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

Name: Derek Weber

Address: 121 S. Cecil St. Memphis MO 63555

Email: derekweber@nemorpc.org

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

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

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

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

Element	Yes, No, N/A	Comments and/or Weblink
Policies/Ordinance		
Zoning Ordinance	No	
Building Code	Version: No	
Floodplain Ordinance	Date: Yes 10-31-11	
Subdivision Ordinance	No	
Tree Trimming Ordinance	No	
Nuisance Ordinance	No	
Stormwater Ordinance	No	
Drainage Ordinance	No	
Site Plan Review Requirements	No	
Historic Preservation Ordinance	No	
Landscape Ordinance	No	
Program		
Zoning/Land Use Restrictions	No	
Codes Building Site/Design	No	
Hazard Awareness Program	No	
National Flood Insurance Program (NFIP)	Yes	
NFIP Community Rating System (CRS) program	?	If so, what is your current level rating?
National Weather Service (NWS) Storm Ready Certification	No	
Firewise Community Certification	No	
Building Code Effectiveness Grading (BCEGs)	No	
ISO Fire Rating	Rating: 9	
Economic Development Program	Yes	
Land Use Program	No	
Public Education/Awareness	No	
Property Acquisition	No	
Planning/Zoning Boards	No	
Stream Maintenance Program	No	
Tree Trimming Program	No	
Engineering Studies for Streams (Local/County/Regional)	No	

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

Element	Yes, No, N/A	Comments and/or Weblink
Local Environmental Organization	No	
Homeowner Associations	No	
Neighborhood Associations	No	
Chamber of Commerce	No	
Community Organizations (Lions, Kiwanis, etc.	No	

Financial Resources	Is your jurisdiction able to? Yes or No
Apply for Community Development Block Grants	Yes
Fund projects thru Capital Improvements funding	Yes
Authority to levy taxes for specific purposes	No
Fees for water, sewer, gas, or electric services	No
Impact fees for new development	No
Incur debt through general obligation bonds	No
Incur debt through special tax bonds	No
Incur debt through private activities	No
Withhold spending in hazard prone areas	No

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

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

Additional Questions

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

   Commission

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

   None

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

   None

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

   None

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

   0

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

   0

6. Does your community utilize any other warning systems such as Cable Override, Reverse 911, etc? If so, please describe.

   No

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

   None

   Please provide address locations:

VULNERABILITY ASSESSMENT

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

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

Critical Facilities and Infrastructure

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

Essential Facilities	**High Potential Loss Facilities**	**Transportation and Lifeline**
Hospitals and other medical facilities	Power plants	Highways, bridges, and tunnels
Police stations	Dams/levees	Railroads and facilities
Fire station	Military installations	Bus facilities
Emergency Operations Centers	Hazardous material sites	Airports
	Schools	Water treatment facilities
	Shelters	Natural gas facilities and pipelines
	Day care centers	Oil facilities and pipelines
	Nursing homes	Communications facilities
	Main government buildings	

Economic Assets

Economic assets at risk may include major employers or primary economic sectors, such as agriculture, whose losses or inoperability would have severe impacts on the community and its ability to recover from disaster.

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

Ursa - Canton

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

None

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

None

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

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

Wayne Murphy Jr
Dee Whigton
Travis Fleer

Yes

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

Asset Inventory

Please list critical facilities and other community assets, the square feet, values, and occupancy/capacity. If not applicable, enter "N/A"). In the last column, use the codes from the previous page to indicate hazards to which the asset is vulnerable. Add as many rows as needed. If this information is available in GIS format, please provide.

Critical Facilities

Name of Asset	Address	Area (sq.ft.)	Replacement Value (Insured) ($)	Contents Value ($)	Occupancy/ Capacity (#)	Natural Hazards
Essential Facilities such as hospitals and other medical facilities, police and fire stations, Emergency Operations Centers						
NA						

Name of Asset	Address	Area (sq.ft.)	Replacement Value (Insured) ($)	Contents Value ($)	Occupancy/ Capacity (#)	Natural Hazards
High Potential Loss Facilities such as power plants, dams/levees, military installations, hazardous materials sites, shelters, day care centers, nursing homes, main government buildings (Do not include schools—they will be reported by the school districts)						
Transportation and Lifelines such as highways, bridges, and tunnels; railroads and facilities, bus facilities, airports, water treatment facilities, natural gas facilities and pipelines, oil facilities, oil facilities and pipelines, communications facilities						

***If replacement cost data is not available, use the best available data (assessed valuation or other method for estimating cost) and explain any data deficiencies.**

Economic Assets (Major Employers, etc)

Asset	Address	Product/ Service	Value (if known)	Number of Employees	Hazards

HISTORIC HAZARD EVENTS

Please fill out the sheet on the next page for each significant hazard event that affected **Your Jurisdiction. Make as many copies as necessary to record all events** and complete with as much detail as possible. This includes all events associated with the hazards listed below that have caused previous damage in your jurisdiction. It is especially important to capture events that either were not included in the previous Hazard Mitigation Plan or occurred since the plan was completed. Attach supporting documentation, photocopies of newspaper articles, or other original sources.

Jurisdiction	Lewis County
Type of event	Flood
Nature and magnitude of event	Washed out Bridge
Location	Co RD 356
Date of event	July 2015
Injuries	NO
Deaths	NO
Property damage	NO
Infrastructure damage	Yes
Crop damage	NO
Business/economic impacts	NO
Road/school/other closures	Yes
Other damage	NO
Insured losses	NO
Federal/state disaster relief funding	Yes
Source of information	Community
Comments	

ASSESSMENT OF PREVIOUSLY PROPOSED ACTIONS

Jurisdiction: Unincorporated Lewis County

The contractor/plan development facilitator has provided a list of actions proposed in the previously approved plan for each jurisdiction. Use the worksheet below to evaluate whether each action is still current, feasible, desirable, and/or creates benefit that outweighs the cost.

The worksheet should include information on the status of the action and progress made in implementation, if any. This includes:

- For **completed actions** provide a description of the implementation process. This may be a success story you would like to publicize in your community.
- Some of the actions might have been **ongoing** in nature, such public information and education programs. When this is the case, indicate what activity has occurred during the previous five years, and indicate if this program is still viable enough that it should be carried on into the future.
- If **no progress** has been made in the implementation of a given action, discuss why. Note that implementation is not a requirement. However, if no progress has been made, perhaps this is an action that would be appropriate to delete in the updated plan.

During review of the previously approved actions, consider whether any new actions should be proposed. Perhaps damages from a recent hazard event have indicated the need for new approaches to protect property and life. Review the problem statements from the updated plan for ideas. Also review the FEMA publication *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards (January 2013).*

#	Action	Status			Description of Implementation Activities or Reasons for Lack of Progress	Keep – ✓ Delete – X Modify – M
		Complete	Ongoing	No Progress		
Lew 1	Develop a detailed county-wide inventory of emergency shelters and safe rooms	X			Completed by NEMO RPC in 2019.	X
Lew 1A	Acquire a generator through a grant for a Shelter site			X		✓
Lew 3	Form a committee to study the current state of public notification systems in the county and determine how best to improve them			X	No Action taken	X

#	Action	Status			Description of Implementation Activities or Reasons for Lack of Progress	Keep – ✓ Delete – X Modify – M
		Complete	Ongoing	No Progress		
Lew 5	Structure grants proposals for road/bridge upgrades so that hazard mitigation concerns are also met, and address mitigation needs in transportation planning via the local Transportation Advisory Committee and their needs assessments, which form the basis of MoDot's 5 year plans.		X		Grants have been obtained for Bridges and will continue to look to obtain additional funding.	**M**
Lew 7	Provide opportunities for training so local businesses are equipped to develop their own emergency plans.			X		X
Lew 8	Participate in the "Great American Shake Up" Earthquake drill			X		X
Lew 9	Coordinate and conduct a standalone event to educate the public about emergency preparedness and early warning systems.			X		X
Lew 10	Invite SEMA mitigation specialists to present information to city councils, county commission, schools, and the Northeast Missouri Regional Planning Commission meetings.			X		X
Lew 11	Design and implement joint training (or drills) between agencies, public & private entities (including schools/businesses). Publicize county or citywide drills			X		X
Lew 12	Form committee to assess storm water management plans and facilitate development of such plans where there is a need			X		X
Lew NFIP	NFIP Participation	X	X			✓

Multi-Jurisdictional Hazard Mitigation Plan

Data Collection Questionnaire

For Local Governments

County: Lewis County

Jurisdiction: City of Canton

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

Prepared by: Mary Fretwell

Phone: 573-767-5205

Email:

Date:11/12/22

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

Name: Derek Weber

Address: 121 S. Cecil St. Memphis MO 63555

Email: derekweber@nemorpc.org

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

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

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

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

Element	Yes, No, N/A	Comments
Policies/Ordinance		
Zoning Ordinance	Yes	
Building Code	Version: No	
Floodplain Ordinance	Date: Yes	
Subdivision Ordinance	No	
Tree Trimming Ordinance	Yes?	
Nuisance Ordinance	Yes	
Storm Water Ordinance	No	
Drainage Ordinance	No	
Site Plan Review Requirements	Yes?	
Historic Preservation Ordinance	Yes	
Landscape Ordinance	No	
Program		
Zoning/Land Use Restrictions	Yes	
Codes Building Site/Design	No	
Hazard Awareness Program	No	
National Flood Insurance Program	Yes	
Community Rating System (CRS) program under the National Flood Insurance Program (NFIP)?	If so, what is your current level rating? N/A	
National Weather Service (NWS) Storm Ready Certification	No	
Firewise Community Certification	No	
Building Code Effectiveness Grading (BCEGs)	No	
ISO Fire Rating	Rating: 05/5X Yes	
Economic Development Program	No	
Land Use Program	No	
Public Education/Awareness	No	
Property Acquisition	No	
Planning/Zoning Boards	Yes	
Stream Maintenance Program	No	
Tree Trimming Program	Yes	
Engineering Studies for Streams (Local/County/Regional)		
Mutual Aid Agreements	Yes yes	
Studies/Reports/Maps		
Hazard Analysis/Risk Assessment (City)	No	
Hazard Analysis/Risk Assessment (County)	No	
Evacuation Route Map	No	
Critical Facilities Inventory	No	need development
Vulnerable Population Inventory	No	
Land Use Map	No	

Element Staff/Department	Yes, No, N/A	Comments Full Time or Part Time?
Building Code Official	YES	
Building Inspector	YES	
Mapping Specialist (GIS)	NO	
Engineer	NO	
Development Planner	NO	
Public Works Official	YES	
Emergency Management Coordinator	YES	
NFIP Floodplain Administrator	YES	
Bomb and/or Arson Squad	NO	
Emergency Response Team	NO	
Hazardous Materials Expert	NO	
Local Emergency Planning Committee	NO	
County Emergency Management Commission	NO	
Sanitation Department	NO	
Transportation Department	NO	
Economic Development Department	NO	
Housing Department	NO	
Historic Preservation	YES	Volunteers
Non-Governmental Organizations (NGOs)	Is there a local chapter? Yes or No	
American Red Cross	NO	
Salvation Army	NO	
Veterans Groups	YES	
Local Environmental Organization	NO	
Homeowner Associations	NO	
Neighborhood Associations	NO	
Chamber of Commerce	?	
Community Organizations (Lions, Kiwanis, etc.	Yes	
Financial Resources	Is your jurisdiction able to? Yes or No	
Apply for Community Development Block Grants	Yes	
Fund projects thru Capital Improvements funding	Yes	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	Yes	
Impact fees for new development		
Incur debt through general obligation bonds	Yes	
Incur debt through special tax bonds	Yes	
Incur debt through private activities	NO	
Withhold spending in hazard prone areas	No	

Additional Questions

1. How is your government structure organized? (Commission, Mayor/City Council, how many members)
   Mayor/council 6 council members
2. List any past or ongoing public education or information programs, such as for responsible water use, fire safety, household preparedness, or environmental education.

3. List any other past or ongoing projects or programs designed to reduce disaster losses, these may include projects to protect critical facilities. Be sure to include pending or approved projects submitted for FEMA mitigation grants. Levee upgrade - 18 inch height increase - new floodgate
   Increased stormwater pump maintenance spending

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

5. How many outdoor warning sirens are in your community? 5.
   How are they activated (indicate responsible department/personnel)? 911 - w/ local backups
6. Does your community utilize any other warning systems such as Cable Override, Reverse 911, etc? If so, please describe. Code Red program to notify residents / businesses

---

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

   Please provide address locations:

8. List residential, commercial and industrial development in your jurisdiction since last plan update. Date of last plan:
   US Wellness Meats
   Add'l bins at Ucrsa Farmers Coop
9. Describe development trends and expected growth areas. Is any new development expected to occur in the 100-year floodplain? Is any new development expected to occur in any other known hazard areas? If possible, please provide a map indicating potential/planned growth areas.

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

11. Please list major employers in your jurisdiction with an estimated number of employees.
    Canton R-V School 72
    Culver-Stockton College 198
    Charles Industries 100

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

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

We ~~have~~ require permits for floodplain development with stipulations to ~~insure~~ ensure proper design, damage resistant construction, HVAC systems designed to minimize flood water from infiltrating systems, and H_2O supply + sewage systems designed to prevent contamination during a flood event.

VULNERABILITY ASSESSMENT

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

Riverine Flooding (Major & Flash)-**RF**	Severe Winter Weather (incl. snow, ice, severe cold)-**SWW**	Hazardous Materials Release (fixed facility, accidents)-**HM**
Dam Failure-**DF**	Droughts-**D**	Mass Transportation Accident-**MTA**
Levee Failure-**LF**	Extreme Temperatures-**ET**	Nuclear Power Plants (emergencies & accidents)-**NPP**
Earthquake-**EQ**	Fires (structural, urban, and wild)-**F**	Public Health Emergencies/Environmental Issues-**PH**
Land Subsidence / Sinkholes-**LSS**	Attack (nuclear, conventional, chemical, and biological)-**A**	Special Events-**SE**
Severe Thunderstorm (incl. winds, hail, lightning)-**ST**	Civil Disorder-**CD**	Terrorism-**TX**
Tornadoes-**T**	Cyber Disruption-**CyD**	Utilities (interruptions & system failures)-**U**

Critical Facilities and Infrastructure

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

Essential Facilities	**High Potential Loss Facilities**	**Transportation and Lifeline**
Hospitals and other medical facilities	Power plants	Highways, bridges, and tunnels
Police stations	Dams/levees	Railroads and facilities
Fire station	Military installations	Bus facilities
Emergency Operations Centers	Hazardous material sites	Airports
	Schools	Water treatment facilities
	Shelters	Natural gas facilities and pipelines
	Day care centers	Oil facilities and pipelines
	Nursing homes	Communications facilities
	Main government buildings	

Economic Assets

Economic assets at risk may include major employers or primary economic sectors, such as agriculture, whose losses or inoperability would have severe impacts on the community and its ability to recover from disaster.

Asset Inventory

Please list critical facilities and other community assets, the square feet, values, and occupancy/capacity. If not applicable, enter "N/A"). In the last column, use the codes from the previous page to indicate hazards to which the asset is vulnerable. Add as many rows as needed. If this information is available in GIS format, please provide.

Critical Facilities

Name of Asset	Address	Square Feet	*Replacement Value (Insured)	Contents Value	Occupancy/ Capacity #	Hazards
Essential Facilities such as hospitals and other medical facilities, police and fire stations, Emergency Operations Centers						
~~City Hall~~ / Police Dept.						
Canton Fire Dept						
Canton Med. Clinic -						
- Hannibal Clinic						
- Quincy Med Group						
~~Canton Level~~						
~~Canton RV Daycare~~						
~~Happytime Preschool~~						
~~CSC~~						
~~Canton RV School~~						
Lift Stations - N/ middle/ [illegible]						
~~Business of Hwy 61~~						

Name of Asset	Address	Square Feet	*Replacement Value (Insured)	Contents Value	Occupancy/ Capacity #	Hazards
High Potential Loss Facilities such as power plants, dams/levees, military installations, hazardous materials sites, shelters, day care centers, nursing homes, main government buildings (Do not include schools—they will be reported by the school districts)						
Canton Levee						
Happytime Preschool						
Canton City Hall						
Lift Stations						
Transportation and Lifelines such as highways, bridges, and tunnels; railroads and facilities, bus facilities, airports, water treatment facilities, natural gas facilities and pipelines, oil facilities, oil facilities and pipelines, communications facilities						
Hwy 61 - Bus. 61						
Water Plant						
WW Lagoon						
Century Link Hub Building	behind Mexican restaurant					
Rogers Oil barge Facility & tanks						

***If replacement cost data is not available, use the best available data (assessed valuation or other method for estimating cost) and explain any data deficiencies.**

Economic Assets (Major Employers, etc)

Asset	Address	Product/ Service	Value (if known)	Number of Employees	Hazards
Ursa Farmers Coop					
Charles Industries					
Ayers Oil					
Culver Stockton					
Canton RV School					

ASSESSMENT OF PREVIOUSLY PROPOSED ACTIONS

Jurisdiction: City of Canton

The contractor/plan development facilitator has provided a list of actions proposed in the previously approved plan for each jurisdiction. Use the worksheet below to evaluate whether each action is still current, feasible, desirable, and/or creates benefit that outweighs the cost.

The worksheet should include information on the status of the action and progress made in implementation, if any. This includes:

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#	Action	Status			Description of Implementation Activities or Reasons for Lack of Progress	Keep – ✓ Delete – X Modify – M
		Complete	Ongoing	No Progress		
Can 2	Develop a community shelter plan, Incorporate shelter improvements or safe room construction into capital improvement plans		X			M

#	Action	Status			Description of Implementation Activities or Reasons for Lack of Progress	Keep – ✓ Delete – X Modify – M
		Complete	Ongoing	No Progress		
Can 3	Form a committee on public notification systems. This Committee will analyze different types of systems and funding sources, the reach and effectiveness of current warning systems, and target demographics in order to develop a strategy to leverage local funding, grant opportunities, and technology to provide early warning to as many people as possible			X		**X**
Can 4	Raise the North Levee		X			✓
Can 4a	Replace the Flood Gate at North Levee		X			✓
Can 4b	Installation of Flood Walls		X			✓
Can 5	Structure grant proposals for road/bridge upgrades so that hazard mitigation concerns are also met			X		**M**
Can 8	Participate in the "Great American Shake Up" Earthquake Drill			X		X
Can 10	Invite SEMA mitigation specialists to present information to city councils, county commission, schools, and the Northeast Missouri Regional Planning Commission meetings.			X		X
Can 11	Anchoring fuel tanks and other storage tanks to prevent flotation			X		✓
Can NFIP	NFIP Participation	X	X			✓

Multi-Jurisdictional Hazard Mitigation Plan

Data Collection Questionnaire

For Local Governments

County: Lewis County

Jurisdiction: City of Ewing

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

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

Name: Derek Weber

Address: 121 S. Cecil St. Memphis MO 63555

Email: derekweber@nemorpc.org

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

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

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

Element	Yes, No, N/A	Comments
Planning Capabilities		
Comprehensive Plan	Date: No	
Builder's Plan	Date: No	
Capital Improvement Plan	Date: No	
City Emergency Operations Plan	Date: No	
County Emergency Operations Plan	Date: 2014 Yes	
Local Recovery Plan	Date: No	
County Recovery Plan	Date: No	
City Mitigation Plan	Date: No	
County Mitigation Plan	Date: 2014 Yes	
Debris Management Plan	Date: No	
Economic Development Plan	Date: No	
Transportation Plan	Date: No	
Land-use Plan	Date: No	
Flood Mitigation Assistance (FMA) Plan	Date: No	
Watershed Plan	Date: No	
Firewise or other fire mitigation plan	Date: No	
Critical Facilities Plan (Mitigation/Response/Recovery)	Date: No	

Element	Yes, No, N/A	Comments
Policies/Ordinance		
Zoning Ordinance	No	
Building Code	Version: No	
Floodplain Ordinance	Date: No	
Subdivision Ordinance	No	
Tree Trimming Ordinance	No	
Nuisance Ordinance	2004 Yes	
Storm Water Ordinance	No	
Drainage Ordinance	No	
Site Plan Review Requirements	No	
Historic Preservation Ordinance	No	
Landscape Ordinance	No	
Program		
Zoning/Land Use Restrictions	No	
Codes Building Site/Design	No	
Hazard Awareness Program	No	
National Flood Insurance Program	No	
Community Rating System (CRS) program under the National Flood Insurance Program (NFIP)?	If so, what is your current level rating?	
National Weather Service (NWS) Storm Ready Certification	No	
Firewise Community Certification	No	
Building Code Effectiveness Grading (BCEGs)	No	
ISO Fire Rating	Rating: 5	
Economic Development Program	No	
Land Use Program	No	
Public Education/Awareness	No	
Property Acquisition	No	
Planning/Zoning Boards	No	
Stream Maintenance Program	No	
Tree Trimming Program	No	
Engineering Studies for Streams (Local/County/Regional)	,	
Mutual Aid Agreements	R4-FD YES	
Studies/Reports/Maps		
Hazard Analysis/Risk Assessment (City)	No	
Hazard Analysis/Risk Assessment (County)	No	
Evacuation Route Map	No	
Critical Facilities Inventory	No	
Vulnerable Population Inventory	No	
Land Use Map	No	

Staff/Department		Full Time or Part Time?

Element	Yes, No, N/A	Comments
Building Code Official	NO	
Building Inspector	NO	
Mapping Specialist (GIS)	NO	
Engineer	NO	
Development Planner	NO	
Public Works Official	YES	
Emergency Management Coordinator	Yes	
NFIP Floodplain Administrator	NO	
Bomb and/or Arson Squad	NO	
Emergency Response Team	YES	
Hazardous Materials Expert	NO	
Local Emergency Planning Committee	NO	
County Emergency Management Commission	YES	
Sanitation Department	YES	
Transportation Department	NO	
Economic Development Department	NO	
Housing Department	NO	
Historic Preservation	NO	
Non-Governmental Organizations (NGOs)	Is there a local chapter? Yes or (No)	
American Red Cross	NO	
Salvation Army	NO	
Veterans Groups	NO	
Local Environmental Organization	NO	
Homeowner Associations	NO	
Neighborhood Associations	NO	
Chamber of Commerce	NO	
Community Organizations (Lions, Kiwanis, etc.	NO	
Financial Resources	Is your jurisdiction able to? Yes or No	
Apply for Community Development Block Grants	YES	
Fund projects thru Capital Improvements funding	YES	
Authority to levy taxes for specific purposes	YES	
Fees for water, sewer, gas, or electric services	Sewer YES	
Impact fees for new development	NO	
Incur debt through general obligation bonds	YES	
Incur debt through special tax bonds	NO	
Incur debt through private activities	NO	
Withhold spending in hazard prone areas	NO	

Additional Questions

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

   Mayor/City Council - 1 Mayor 4 Council Members

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

   Responsible Sewer Use

3. List any other past or ongoing projects or programs designed to reduce disaster losses, these may include projects to protect critical facilities. Be sure to include pending or approved projects submitted for FEMA mitigation grants. Don't Know

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

   Tornado Shelter for Senior Housing

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

   None

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

   N/A

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

7. Does your community have designated public tornado shelters/saferooms? If so, are they constructed in accordance with FEMA standards? NO

   Please provide address locations:

   N/A

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

   None

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

   N/A

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

    Sewer upgrade mandated by DNR - We chose Land Application on land the City bought.

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

    Heartland Resources, Inc. - 5 Farmers Co-Op - 5
    United State Bank, Branch - 6 Post Office - 5
    Johnnies Service - 7 Dollar General 5

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

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

N/A

Asset Inventory

Please list critical facilities and other community assets, the square feet, values, and occupancy/capacity. If not applicable, enter "N/A"). In the last column, use the codes from the previous page to indicate hazards to which the asset is vulnerable. Add as many rows as needed. If this information is available in GIS format, please provide.

Critical Facilities

Name of Asset	Address	Square Feet	*Replacement Value (Insured)	Contents Value	Occupancy/ Capacity #	Hazards
Essential Facilities such as hospitals and other medical facilities, police and fire stations, Emergency Operations Centers						
EWING SEWER SYSTEM	LAKEVIEW DR.					LF, PH, U
R4 Fire Protection-Ewing	101 NORTH MAIN ST.					
FARMERS CO-OP	115 S. GILEAD ST. / 204-206-208 EAST HWY 6					HM
LEWIS CO WATER DEPT	107 S. GILEAD / Water Tower					U, T

Name of Asset	Address	Square Feet	*Replacement Value (Insured)	Contents Value	Occupancy/ Capacity #	Hazards
High Potential Loss Facilities such as power plants, dams/levees, military installations, hazardous materials sites, shelters, day care centers, nursing homes, main government buildings (Do not include schools—they will be reported by the school districts)						
EWING SENIOR HOUSING	101 WEST BRYAN ST.				32 units	
Transportation and Lifelines such as highways, bridges, and tunnels; railroads and facilities, bus facilities, airports, water treatment facilities, natural gas facilities and pipelines, oil facilities, oil facilities and pipelines, communications facilities						
MO STATE HWY #6						
MO STATE HWY #156						

***If replacement cost data is not available, use the best available data (assessed valuation or other method for estimating cost) and explain any data deficiencies.**

ASSESSMENT OF PREVIOUSLY PROPOSED ACTIONS

Jurisdiction: City of Ewing

The contractor/plan development facilitator has provided a list of actions proposed in the previously approved plan for each jurisdiction. Use the worksheet below to evaluate whether each action is still current, feasible, desirable, and/or creates benefit that outweighs the cost.

The worksheet should include information on the status of the action and progress made in implementation, if any. This includes:

- For **completed actions** provide a description of the implementation process. This may be a success story you would like to publicize in your community.
- Some of the actions might have been **ongoing** in nature, such public information and education programs. When this is the case, indicate what activity has occurred during the previous five years, and indicate if this program is still viable enough that it should be carried on into the future.
- If **no progress** has been made in the implementation of a given action, discuss why. Note that implementation is not a requirement. However, if no progress has been made, perhaps this is an action that would be appropriate to delete in the updated plan.

During review of the previously approved actions, consider whether any new actions should be proposed. Perhaps damages from a recent hazard event have indicated the need for new approaches to protect property and life. Review the problem statements from the updated plan for ideas. Also review the FEMA publication *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards (January 2013).*

#	Action	Status			Description of Implementation Activities or Reasons for Lack of Progress	Keep – ✓ Delete – X Modify – M
		Complete	Ongoing	No Progress		
Ewn 2	Develop a community shelter plan, Incorporate shelter improvements or safe room construction into capital improvement plans		X			M

#	Action	Status			Description of Implementation Activities or Reasons for Lack of Progress	Keep – ✓ Delete – X Modify – M
		Complete	Ongoing	No Progress		
Ewn 3	Form a committee on public notification systems. This Committee will analyze different types of systems and funding sources, the reach and effectiveness of current warning systems, and target demographics to develop a strategy to leverage local funding, grant opportunities, and technology to provide early warning to as many people as possible			X		**X**
Ewn 3A	Install warning sirens with automated units that have battery back-up		X			**M**
Ewn 5	Structure grants proposals for road/bridge upgrades so that hazard mitigation concerns are also met.		X			**M**
Ewn 8	Participate in the "Great American Shake Up" Earthquake Drill			X		X
Ewn 10	Invite SEMA mitigation specialists to present information to city councils, county commission, schools, and the Northeast Missouri Regional Planning Commission meetings.			X		X

Multi-Jurisdictional Hazard Mitigation Plan

Data Collection Questionnaire

For Local Governments

County: Lewis County

Jurisdiction: City of LaBelle

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

Prepared by: Wendy Lewis, Clerk

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

Name: Derek Weber

Address: 121 S. Cecil St. Memphis MO 63555

Email: derekweber@nemorpc.org

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

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

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

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

Element	Yes, No, N/A	Comments and/or Weblink
Policies/Ordinance		
Zoning Ordinance	NO	
Building Code	NO	
Floodplain Ordinance	NO	
Subdivision Ordinance	NO	
Tree Trimming Ordinance	NO	
Nuisance Ordinance	YES	
Stormwater Ordinance	NO	
Drainage Ordinance	NO	
Site Plan Review Requirements	NO	
Historic Preservation Ordinance	NO	
Landscape Ordinance	NO	
Program		
Zoning/Land Use Restrictions	NO	
Codes Building Site/Design	NO	
Hazard Awareness Program	NO	
National Flood Insurance Program (NFIP)	NO	
NFIP Community Rating System (CRS) program	NO	
National Weather Service (NWS) Storm Ready Certification	NO	
Firewise Community Certification	NO	
Building Code Effectiveness Grading (BCEGs)	NO	
ISO Fire Rating	Rating:	
Economic Development Program	NO	
Land Use Program	NO	
Public Education/Awareness	NO	
Property Acquisition	NO	
Planning/Zoning Boards	NO	
Stream Maintenance Program	NO	
Tree Trimming Program	NO	
Engineering Studies for Streams (Local/County/Regional)	NO	

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

Element	Yes, No, N/A	Comments and/or Weblink
Local Environmental Organization	NO	
Homeowner Associations	NO	
Neighborhood Associations	NO	
Chamber of Commerce	NO	
Community Organizations (Lions, Kiwanis, etc.	NO	

Financial Resources	Is your jurisdiction able to? Yes or No
Apply for Community Development Block Grants	YES
Fund projects thru Capital Improvements funding	YES
Authority to levy taxes for specific purposes	YES
Fees for water, sewer, gas, or electric services	YES
Impact fees for new development	NO
Incur debt through general obligation bonds	NO
Incur debt through special tax bonds	NO
Incur debt through private activities	NO
Withhold spending in hazard prone areas	YES

Additional Questions

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

   Mayor/ Council

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

   None

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

   None

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

   None

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

   1

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

   Fire Dept.

6. Does your community utilize any other warning systems such as Cable Override, Reverse 911, etc? If so, please describe.

   NA

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

   Local Churches: Christian Church, Mt. Olive Church Not FEMA standard

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

   New Coffee Shop Constructed

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

   None

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

    None

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

    Labelle Manor Nursing Home
    Caseys
    Lumley Locker

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

    Amy Turpin, Wendy Lewis. Amy was not re-elected.

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

    NA

ASSESSMENT OF PREVIOUSLY PROPOSED ACTIONS

Jurisdiction: City of LaBelle

The contractor/plan development facilitator has provided a list of actions proposed in the previously approved plan for each jurisdiction. Use the worksheet below to evaluate whether each action is still current, feasible, desirable, and/or creates benefit that outweighs the cost.

The worksheet should include information on the status of the action and progress made in implementation, if any. This includes:

- For **completed actions** provide a description of the implementation process. This may be a success story you would like to publicize in your community.
- Some of the actions might have been **ongoing** in nature, such public information and education programs. When this is the case, indicate what activity has occurred during the previous five years, and indicate if this program is still viable enough that it should be carried on into the future.
- If **no progress** has been made in the implementation of a given action, discuss why. Note that implementation is not a requirement. However, if no progress has been made, perhaps this is an action that would be appropriate to delete in the updated plan.

During review of the previously approved actions, consider whether any new actions should be proposed. Perhaps damages from a recent hazard event have indicated the need for new approaches to protect property and life. Review the problem statements from the updated plan for ideas. Also review the FEMA publication *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards (January 2013).*

#	Action	Status			Description of Implementation Activities or Reasons for Lack of Progress	Keep – ✓ Delete – X Modify – M
		Complete	Ongoing	No Progress		
LAB 2	Develop a community shelter plan, Incorporate shelter improvements or safe room construction into capital improvement plans		X			**M**

#	Action	Status			Description of Implementation Activities or Reasons for Lack of Progress	Keep – ✓ Delete – X Modify – M
		Complete	Ongoing	No Progress		
LAB 3	Form a committee on public notification systems. This Committee will analyze different types of systems and funding sources, the reach and effectiveness of current warning systems, and target demographics to develop a strategy to leverage local funding, grant opportunities, and technology to provide early warning to as many people as possible			X		**X**
LAB 3A	Install warning sirens with automated units that have battery back-up		X			**M**
LAB 5	Structure grants proposals for road/bridge upgrades so that hazard mitigation concerns are also met.		X			**M**
LAB 8	Participate in the "Great American Shake Up" Earthquake Drill			X		X
LAB 10	Invite SEMA mitigation specialists to present information to city councils, county commission, schools, and the Northeast Missouri Regional Planning Commission meetings.			X		X

Multi-Jurisdictional Hazard Mitigation Plan

Data Collection Questionnaire

For Local Governments

County: Lewis County

Jurisdiction: City of LaGrange

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

Prepared by: John Roach, Administrator

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

Name: Derek Weber

Address: 121 S. Cecil St. Memphis MO 63555

Email: derekweber@nemorpc.org

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

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

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

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

Element	Yes, No, N/A	Comments and/or Weblink
Policies/Ordinance		
Zoning Ordinance	NO	
Building Code	NO	
Floodplain Ordinance	NO	
Subdivision Ordinance	NO	
Tree Trimming Ordinance	NO	
Nuisance Ordinance	YES	
Stormwater Ordinance	NO	
Drainage Ordinance	NO	
Site Plan Review Requirements	NO	
Historic Preservation Ordinance	NO	
Landscape Ordinance	NO	
Program		
Zoning/Land Use Restrictions	NO	
Codes Building Site/Design	NO	
Hazard Awareness Program	NO	
National Flood Insurance Program (NFIP)	NO	
NFIP Community Rating System (CRS) program	NO	
National Weather Service (NWS) Storm Ready Certification	NO	
Firewise Community Certification	NO	
Building Code Effectiveness Grading (BCEGs)	NO	
ISO Fire Rating	Rating: 6	
Economic Development Program	NO	
Land Use Program	NO	
Public Education/Awareness	NO	
Property Acquisition	NO	
Planning/Zoning Boards	NO	
Stream Maintenance Program	NO	
Tree Trimming Program	NO	
Engineering Studies for Streams (Local/County/Regional)	NO	

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

Element	Yes, No, N/A	Comments and/or Weblink
Local Environmental Organization	NO	
Homeowner Associations	NO	
Neighborhood Associations	NO	
Chamber of Commerce	NO	
Community Organizations (Lions, Kiwanis, etc.	YES	

Financial Resources	Is your jurisdiction able to? Yes or No
Apply for Community Development Block Grants	YES
Fund projects thru Capital Improvements funding	YES
Authority to levy taxes for specific purposes	NO
Fees for water, sewer, gas, or electric services	YES
Impact fees for new development	NO
Incur debt through general obligation bonds	NO
Incur debt through special tax bonds	NO
Incur debt through private activities	NO
Withhold spending in hazard prone areas	NO

Additional Questions

1. How is your government structure organized? (Commission, Mayor/City Council, how many members)
   Mayor and 6 Council members

2. List any past or ongoing public education or information programs, such as for responsible water use, fire safety, household preparedness, or environmental education.
   None

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

4. Describe any hazard-related concerns or issues regarding the vulnerability of special needs populations, such as the elderly, disabled, low-income, or migrant farm workers.
   None

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

   How are they activated (indicate responsible department/personnel)? *911 or Fire station*

6. Does your community utilize any other warning systems such as Cable Override, Reverse 911, etc? If so, please describe. *Reverse 911*

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

   Please provide address locations:
   None

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

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

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

11. Please list major employers in your jurisdiction with an estimated number of employees.
    Terrible's Mark Twain Casino
    NEMO Manufacturing

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

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

Asset Inventory

Please list critical facilities and other community assets, the square feet, values, and occupancy/capacity. If not applicable, enter "N/A"). In the last column, use the codes from the previous page to indicate hazards to which the asset is vulnerable. Add as many rows as needed. If this information is available in GIS format, please provide.

Critical Facilities

Name of Asset	Address	Square Feet	*Replacement Value (Insured)	Contents Value	Occupancy/ Capacity #	Hazards
Essential Facilities such as hospitals and other medical facilities, police and fire stations, Emergency Operations Centers						
La Grange Police Dept.	200 Washington St	1500				EQ – ST – T – F- SWW
La Grange Fire Dept.	702 Route C	6000				EQ – ST – T – F- SWW

Name of Asset	Address	Square Feet	*Replacement Value (Insured)	Contents Value	Occupancy/ Capacity #	Hazards
High Potential Loss Facilities such as power plants, dams/levees, military installations, hazardous materials sites, shelters, day care centers, nursing homes, main government buildings (Do not include schools—they will be reported by the school districts)						
Daycare	506 W. Wyaconda					EQ – ST – T – F- SWW
Transportation and Lifelines such as highways, bridges, and tunnels; railroads and facilities, bus facilities, airports, water treatment facilities, natural gas facilities and pipelines, oil facilities, oil facilities and pipelines, communications facilities						
Water treatment plant						EQ -ST –T- F-SWW - TX
Sewer Treatment plant						EQ -ST -T -F- SWW - U
BNSF Railroad line						EQ – SWW -MTA
State Highway 61						EQ – SWW - MTA

***If replacement cost data is not available, use the best available data (assessed valuation or other method for estimating cost) and explain any data deficiencies.**

Economic Assets (Major Employers, etc)

Asset	Address	Product/ Service	Value (if known)	Number of Employees	Hazards
Terrible's Mark Twain Casino	104 E. Pierce	Revenue			EQ – ST – T - TX

ASSESSMENT OF PREVIOUSLY PROPOSED ACTIONS

Jurisdiction: City of LaGrange

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#	Action	Status			Description of Implementation Activities or Reasons for Lack of Progress	Keep – ✓ Delete – X Modify – M
		Complete	Ongoing	No Progress		
LAG 2	Develop a community shelter plan, Incorporate shelter improvements or safe room construction into capital improvement plans		X			M

#	Action	Status			Description of Implementation Activities or Reasons for Lack of Progress	Keep – ✓ Delete – X Modify – M
		Complete	Ongoing	No Progress		
LAG 3	Form a committee on public notification systems. This Committee will analyze different types of systems and funding sources, the reach and effectiveness of current warning systems, and target demographics to develop a strategy to leverage local funding, grant opportunities, and technology to provide early warning to as many people as possible			X		**X**
LAG 5	Structure grants proposals for road/bridge upgrades so that hazard mitigation concerns are also met.		X			**M**
LAG 8	Participate in the "Great American Shake Up" Earthquake Drill			X		X
LAG 10	Invite SEMA mitigation specialists to present information to city councils, county commission, schools, and the Northeast Missouri Regional Planning Commission meetings.			X		X
LAG 11	Anchoring fuel tanks and other storage tanks to prevent flotation		X			✓
LAG NFIP	NFIP Participation	X	X			✓

Multi-Jurisdictional Hazard Mitigation Plan

Data Collection Questionnaire

For Local Governments

County: Lewis County

Jurisdiction: City of Lewistown

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Address: 121 S. Cecil St. Memphis MO 63555

Email: derekweber@nemorpc.org

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

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

Element	Yes, No, N/A	Comments
Policies/Ordinance		
Zoning Ordinance	NO	
Building Code	Version: NO	
Floodplain Ordinance	Date: NO	
Subdivision Ordinance	NO	
Tree Trimming Ordinance	NO	
Nuisance Ordinance	Yes	
Storm Water Ordinance	NO	
Drainage Ordinance	NO	
Site Plan Review Requirements	NO	
Historic Preservation Ordinance	NO	
Landscape Ordinance	NO	
Program		
Zoning/Land Use Restrictions	NO	
Codes Building Site/Design	NO	
Hazard Awareness Program	NO	
National Flood Insurance Program	NO	
Community Rating System (CRS) program under the National Flood Insurance Program (NFIP)?	If so, what is your current level rating? N/K	
National Weather Service (NWS) Storm Ready Certification	NO	
Firewise Community Certification	NO	
Building Code Effectiveness Grading (BCEGs)	NO	
ISO Fire Rating	Rating: 6	
Economic Development Program	NO	
Land Use Program	NO	
Public Education/Awareness	NO	
Property Acquisition	NO	
Planning/Zoning Boards	NO	
Stream Maintenance Program	NO	
Tree Trimming Program	NO	
Engineering Studies for Streams (Local/County/Regional)	NO	
Mutual Aid Agreements	N/A	
Studies/Reports/Maps		
Hazard Analysis/Risk Assessment (City)	NO	
Hazard Analysis/Risk Assessment (County)	NO	
Evacuation Route Map	NO	
Critical Facilities Inventory	NO	
Vulnerable Population Inventory	NO	
Land Use Map	NO	

Element	Yes, No, N/A	Comments
Staff/Department		Full Time or Part Time?
Building Code Official	N/A	
Building Inspector	Yes	Part
Mapping Specialist (GIS)	N/A	
Engineer	N/A	
Development Planner	N/A	
Public Works Official	Yes	Full
Emergency Management Coordinator	N/A	
NFIP Floodplain Administrator	N/A	
Bomb and/or Arson Squad	N/A	
Emergency Response Team	N/A	
Hazardous Materials Expert	N/A	
Local Emergency Planning Committee	N/A	
County Emergency Management Commission	N/A	
Sanitation Department	Yes	Full - Contract
Transportation Department	N/A	
Economic Development Department	N/A	
Housing Department	N/A	
Historic Preservation	N/A	
Non-Governmental Organizations (NGOs)	Is there a local chapter? Yes or No	
American Red Cross	NO	
Salvation Army	NO	
Veterans Groups	American Legion	
Local Environmental Organization	NO	
Homeowner Associations	NO	
Neighborhood Associations	NO	
Chamber of Commerce	NO	
Community Organizations (Lions, Kiwanis, etc.	Vikings	
Financial Resources	Is your jurisdiction able to? Yes or No	
Apply for Community Development Block Grants	Yes	
Fund projects thru Capital Improvements funding	Yes	
Authority to levy taxes for specific purposes	Yes	
Fees for water, sewer, gas, or electric services	Yes	
Impact fees for new development	Yes	
Incur debt through general obligation bonds	Yes	
Incur debt through special tax bonds	Yes	
Incur debt through private activities	Yes	
Withhold spending in hazard prone areas	NO	

Additional Questions

1. How is your government structure organized? (Commission, Mayor/City Council, how many members)
   Mayor/ City Council Mayor & 4 Council members
2. List any past or ongoing public education or information programs, such as for responsible water use, fire safety, household preparedness, or environmental education.
   none
3. List any other past or ongoing projects or programs designed to reduce disaster losses, these may include projects to protect critical facilities. Be sure to include pending or approved projects submitted for FEMA mitigation grants.
   none
4. Describe any hazard-related concerns or issues regarding the vulnerability of special needs populations, such as the elderly, disabled, low-income, or migrant farm workers. NONE
5. How many outdoor warning sirens are in your community? 1
   How are they activated (indicate responsible department/personnel)? Fire Dept & 911
6. Does your community utilize any other warning systems such as Cable Override, Reverse 911, etc? If so, please describe. no
7. Does your community have designated public tornado shelters/saferooms? If so, are they constructed in accordance with FEMA standards? Yes & Yes
   Please provide address locations: 101 N OAK, Lewistown
8. List residential, commercial and industrial development in your jurisdiction since last plan update.
   new - Business -
9. Describe development trends and expected growth areas. Is any new development expected to occur in the 100-year floodplain? Is any new development expected to occur in any other known hazard areas? If possible, please provide a map indicating potential/planned growth areas.
   none
10. Are any new facilities or infrastructure planned for construction during the next five years? If so, please provide facility name and purpose along with proposed locations, if known.
    none
11. Please list major employers in your jurisdiction with an estimated number of employees.
    United State Bank - 25
    St General - 10
    Country Corner Grocery - 12
    County market Conv. Store - 12

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

none

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

none

VULNERABILITY ASSESSMENT

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

Riverine Flooding (Major & Flash)-**RF**
Dam Failure-**DF**
Levee Failure-**LF**
Earthquake-**EQ**
Land Subsidence / Sinkholes-**LSS**
Severe Thunderstorm (incl. winds, hail, lightning)-**ST**
Tornadoes-**T**
Severe Winter Weather (incl. snow, ice, severe cold)-**SWW**
Droughts-**D**
Extreme Temperatures-**ET**
Fires (structural, urban, and wild)-**F**
Attack (nuclear, conventional, chemical, and biological)-**A**
Civil Disorder-**CD**
Cyber Disruption-**CyD**
Hazardous Materials Release (fixed facility, accidents)-**HM**
Mass Transportation Accident-**MTA**
Nuclear Power Plants (emergencies & accidents)-**NPP**
Public Health Emergencies/Environmental Issues-**PH**
Special Events-**SE**
Terrorism-**TX**
Utilities (interruptions & system failures)-**U**

Critical Facilities and Infrastructure

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

Essential Facilities	**High Potential Loss Facilities**	**Transportation and Lifeline**
Hospitals and other medical facilities	Power plants	Highways, bridges, and tunnels
Police stations	Dams/levees	Railroads and facilities
Fire station	Military installations	Bus facilities
Emergency Operations Centers	Hazardous material sites	Airports
	Schools	Water treatment facilities
	Shelters	Natural gas facilities and pipelines
	Day care centers	Oil facilities and pipelines
	Nursing homes	Communications facilities
	Main government buildings	

Economic Assets

Economic assets at risk may include major employers or primary economic sectors, such as agriculture, whose losses or inoperability would have severe impacts on the community and its ability to recover from disaster.

Asset Inventory

Please list critical facilities and other community assets, the square feet, values, and occupancy/capacity. If not applicable, enter "N/A"). In the last column, use the codes from the previous page to indicate hazards to which the asset is vulnerable. Add as many rows as needed. If this information is available in GIS format, please provide.

Critical Facilities

Name of Asset	Address	Square Feet	*Replacement Value (Insured)	Contents Value	Occupancy/ Capacity #	Hazards
Essential Facilities such as hospitals and other medical facilities, police and fire stations, Emergency Operations Centers						
Fire Station		N/K	N/K	N/K		EQ, ST, F, Snow,
Quincy Med Grp		N/K	N/K	N/K		PH

Name of Asset	Address	Square Feet	*Replacement Value (Insured)	Contents Value	Occupancy/ Capacity #	Hazards
High Potential Loss Facilities such as power plants, dams/levees, military installations, hazardous materials sites, shelters, day care centers, nursing homes, main government buildings (Do not include schools—they will be reported by the school districts)						
Country Aire - Nursing Home		u/k	u/k	u/k	u/k	EQ, ST, Snow, F, L
Transportation and Lifelines such as highways, bridges, and tunnels; railroads and facilities, bus facilities, airports, water treatment facilities, natural gas facilities and pipelines, oil facilities, oil facilities and pipelines, communications facilities						
Sewer Lagoon	u/k	u/k	u/k	u/k	—	DF, LF

***If replacement cost data is not available, use the best available data (assessed valuation or other method for estimating cost) and explain any data deficiencies.**

Economic Assets (Major Employers, etc)

Asset	Address	Product/ Service	Value (if known)	Number of Employees	Hazards
Heetco					HM
County Market Conv. Store		u/k	u/k	u/k	HM

ASSESSMENT OF PREVIOUSLY PROPOSED ACTIONS

Jurisdiction: City of Lewistown

The contractor/plan development facilitator has provided a list of actions proposed in the previously approved plan for each jurisdiction. Use the worksheet below to evaluate whether each action is still current, feasible, desirable, and/or creates benefit that outweighs the cost.

The worksheet should include information on the status of the action and progress made in implementation, if any. This includes:

- For **completed actions** provide a description of the implementation process. This may be a success story you would like to publicize in your community.
- Some of the actions might have been **ongoing** in nature, such public information and education programs. When this is the case, indicate what activity has occurred during the previous five years, and indicate if this program is still viable enough that it should be carried on into the future.
- If **no progress** has been made in the implementation of a given action, discuss why. Note that implementation is not a requirement. However, if no progress has been made, perhaps this is an action that would be appropriate to delete in the updated plan.

During review of the previously approved actions, consider whether any new actions should be proposed. Perhaps damages from a recent hazard event have indicated the need for new approaches to protect property and life. Review the problem statements from the updated plan for ideas. Also review the FEMA publication *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards (January 2013).*

#	Action	Status			Description of Implementation Activities or Reasons for Lack of Progress	Keep – ✓ Delete – X Modify – M
		Complete	Ongoing	No Progress		
LST 2	Develop a community shelter plan, Incorporate shelter improvements or safe room construction into capital improvement plans		X			M

#	Action	Status			Description of Implementation Activities or Reasons for Lack of Progress	Keep – ✓ Delete – X Modify – M
		Complete	Ongoing	No Progress		
LST 3	Form a committee on public notification systems. This Committee will analyze different types of systems and funding sources, the reach and effectiveness of current warning systems, and target demographics to develop a strategy to leverage local funding, grant opportunities, and technology to provide early warning to as many people as possible			X		**X**
LST 3A	Install warning sirens with automated units that have battery back-up		X			**M**
LST 5	Structure grants proposals for road/bridge upgrades so that hazard mitigation concerns are also met.		X			**M**
LST 8	Participate in the "Great American Shake Up" Earthquake Drill			X		X
LST 10	Invite SEMA mitigation specialists to present information to city councils, county commission, schools, and the Northeast Missouri Regional Planning Commission meetings.			X		X

Multi-Jurisdictional Hazard Mitigation Plan

Data Collection Questionnaire

For Local Governments

County: Lewis County

Jurisdiction: Village of Monticello

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

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

Name: Derek Weber

Address: 121 S. Cecil St. Memphis MO 63555

Email: derekweber@nemorpc.org

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

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

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

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

Element	Yes, No, N/A	Comments and/or Weblink
Policies/Ordinance		
Zoning Ordinance	NO	
Building Code	NO	
Floodplain Ordinance	NO	
Subdivision Ordinance	NO	
Tree Trimming Ordinance	NO	
Nuisance Ordinance	YES	
Stormwater Ordinance	NO	
Drainage Ordinance	NO	
Site Plan Review Requirements	NO	
Historic Preservation Ordinance	NO	
Landscape Ordinance	NO	
Program		
Zoning/Land Use Restrictions	NO	
Codes Building Site/Design	NO	
Hazard Awareness Program	NO	
National Flood Insurance Program (NFIP)	NO	
NFIP Community Rating System (CRS) program	NO	
National Weather Service (NWS) Storm Ready Certification	NO	
Firewise Community Certification	NO	
Building Code Effectiveness Grading (BCEGs)	NO	
ISO Fire Rating	Rating: 8	
Economic Development Program	NO	
Land Use Program	NO	
Public Education/Awareness	NO	
Property Acquisition	NO	
Planning/Zoning Boards	NO	
Stream Maintenance Program	NO	
Tree Trimming Program	NO	
Engineering Studies for Streams (Local/County/Regional)	NO	

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

Element	Yes, No, N/A	Comments and/or Weblink
Local Environmental Organization	NO	
Homeowner Associations	NO	
Neighborhood Associations	NO	
Chamber of Commerce	NO	
Community Organizations (Lions, Kiwanis, etc.	YES	

Financial Resources	Is your jurisdiction able to? Yes or No
Apply for Community Development Block Grants	YES
Fund projects thru Capital Improvements funding	YES
Authority to levy taxes for specific purposes	NO
Fees for water, sewer, gas, or electric services	YES
Impact fees for new development	NO
Incur debt through general obligation bonds	YES
Incur debt through special tax bonds	YES
Incur debt through private activities	NO
Withhold spending in hazard prone areas	NO

Additional Questions

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

   Mayor/ Council

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

   None

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

   None

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

   None

5. How many outdoor warning sirens are in your community? None

6. Does your community utilize any other warning systems such as Cable Override, Reverse 911, etc? If so, please describe.

   NA

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

   None

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

   None

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

None

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

None

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

Lewis County Courthouse
Lewis County Health Department
Bank of Monticello

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

Vancell Scifers

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

NA

ASSESSMENT OF PREVIOUSLY PROPOSED ACTIONS

Jurisdiction: Village of Monticello

The contractor/plan development facilitator has provided a list of actions proposed in the previously approved plan for each jurisdiction. Use the worksheet below to evaluate whether each action is still current, feasible, desirable, and/or creates benefit that outweighs the cost.

The worksheet should include information on the status of the action and progress made in implementation, if any. This includes:

- For **completed actions** provide a description of the implementation process. This may be a success story you would like to publicize in your community.
- Some of the actions might have been **ongoing** in nature, such public information and education programs. When this is the case, indicate what activity has occurred during the previous five years, and indicate if this program is still viable enough that it should be carried on into the future.
- If **no progress** has been made in the implementation of a given action, discuss why. Note that implementation is not a requirement. However, if no progress has been made, perhaps this is an action that would be appropriate to delete in the updated plan.

During review of the previously approved actions, consider whether any new actions should be proposed. Perhaps damages from a recent hazard event have indicated the need for new approaches to protect property and life. Review the problem statements from the updated plan for ideas. Also review the FEMA publication *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards (January 2013).*

#	Action	Status			Description of Implementation Activities or Reasons for Lack of Progress	Keep – ✓ Delete – X Modify – M
		Complete	Ongoing	No Progress		
MNT 2	Develop a community shelter plan, Incorporate shelter improvements or safe room construction into capital improvement plans		X			**M**

#	Action	Status			Description of Implementation Activities or Reasons for Lack of Progress	Keep – ✓ Delete – X Modify – M
		Complete	Ongoing	No Progress		
MNT 3	Form a committee on public notification systems. This Committee will analyze different types of systems and funding sources, the reach and effectiveness of current warning systems, and target demographics to develop a strategy to leverage local funding, grant opportunities, and technology to provide early warning to as many people as possible			X		**X**
MNT 3A	Install warning sirens with automated units that have battery back-up		X			**M**
MNT 5	Structure grants proposals for road/bridge upgrades so that hazard mitigation concerns are also met.		X			**M**

Multi-Jurisdictional Hazard Mitigation Plan

Data Collection Questionnaire

For School Districts and Educational Institutions

County: Lewis

School District /
Educational Institution Name: Canton R-V School District

Return by:

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

Prepared by: Mr. Jesse Uhlmeyer

Phone: (573)288-5216

Email: juhlmeyer@canton.k12.mo.us

Date: 10/21/2022

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

Name: _____

Address: _____

Email: _____

Fax: _____

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

The purpose of this section is to collect information to document existing capabilities as well as determine existing plans, studies, reports, and technical information that may need to be incorporated in the mitigation plan.

Please indicate which of the following your school district / institution has in place. For elements that do not pertain to you, please indicate with "N/A". If applicable, please provide a completion date for the element. If your school district / institution has any of the **underlined and bolded** elements, please provide a copy of the document to the contact indicated on the front of this questionnaire and indicate method in the comments column (i.e. available on the web, will email or mail).

Planning Elements	Yes/No	Date of Latest Version	Comments
Master Plan	Yes	12/12/2022	
Capital Improvement Plan	Yes	4/1/2022	
School Emergency Plan Shelter in place protocols Evacuation protocols	Yes	7/11/2022	
Weapons Policy	Yes	7/11/2022	

Administrative/Technical

Identify the technical and personnel resources responsible for activities related to hazard mitigation/loss prevention within your school district / institution.

Personnel Resources	Yes/No	Department/Position	Comments
Full-time building official (i.e. Principal)	Yes	High School / Elementary Principals	
Emergency Manager	Yes	Central Office / Superintendent	
Grant Writer	Yes	Central Office / Superintendent	
Public Information Officer	Yes	Central Office / Superintendent	

Financial Resources

Identify whether your school district /institution has access to or is eligible to use the following financial resources for hazard mitigation.

Financial Resources	Accessible/Eligible to Use (Y/N)	Comments
Capital improvements project funding	Yes	
Local funds	Yes	
General obligation bonds	Yes	
Special tax bonds	No	
Private activities/donations	Yes	
State and federal funds	Yes	

Additional Capabilities Questions

1. Are your buildings equipped with a public address (PA) system or other emergency alert system? Please describe.
   Our buildings are equipped with building-wide and district-wide PA systems that is antiquated.

2. Does your school buildings' have NOAA Weather Radios?
   Weather radios are located in each building office.

3. List any past or ongoing projects or programs designed to reduce disaster losses, these may include projects to protect facilities or provide education regarding hazards that could occur.
   A portion of the Early Learning Center that will be built beginning in November of 2023 will be designed and designated as a storm shelter for the occupancy of the ELC building. The main campus does not have storm shelters or safe rooms for the occupancy.

4. List any other past or ongoing projects or programs designed to reduce disaster losses, these may include projects to protect critical facilities.
   None at this time.

5. Do any of your buildings have designated tornado shelters or "saferooms"? If so, are they constructed in accordance with FEMA standards?
   The Early Learning Center shelter that will be constructed will not meet all of the FEMA standards.

6. Did your school district / institution make any additions to buildings or construction new buildings since the last plan update (2010)? Please list the buildings and the improvement.
   No. Additions are planned for the 2024-2025 school year.

7. Does your school district / institution plan to remodel or construct any buildings in the next 5 years? If so, please list the building or proposed building and planned improvements. Are any planned construction activities in known hazard areas?
   The Early Learning Center project will be located on the current campus.

8. What percentage is your projected enrollment expected to increase or decrease in the next five years?
   Projected enrollment number look to remain unchanged over the next 5 years.

9. Do you have your own campus police? Please explain your police department or who you rely on for security needs.

   We contract with the Lewis County Sheriff's Office to provide a School Resource Officer.

VULNERABILITY ASSESSMENT

Asset Inventory

The purpose of this worksheet is to assist in the assessment of the vulnerable populations and facilities owned by your school district / institution. Use the table below to compile a detailed inventory of specific assets at risk. In the natural hazard column of the asset inventory table, indicate (by assigned abbreviation) which of the following hazards the asset is vulnerable to:

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

Please list buildings owned by your school district / institution including the square feet, values, and occupancy/capacity. If not applicable or not available, enter "N/A". Add as many rows as needed. **If you have this data in GIS formats, or other formats, please provide in lieu of this.**

Name of Asset	Address	Area (sq.ft.)	Replacement Value (Insured) ($)	Contents Value ($)	Occupancy/ Capacity (#)	Natural Hazards
Main Campus	200 South 4th Street	105217	$18,021,000	$3,403,000	N/A	RF/LF/ST/T
Daycare	307 Madison Street	3496	$602,813	$114,714	N/A	RF/LF/ST/T
VoAg Building	200 South Washington Street	3565	$614,785	$116,978	N/A	RF/LF/ST/T
Greenhouse	200 South 4th Street	960	$78,900	$33,075	N/A	RF/LF/ST/T
Bus Garage	Lewis Street	3600	$197,136	$118,126	N/A	RF/LF/ST/T

Multi-Jurisdictional Hazard Mitigation Plan

Data Collection Questionnaire

For School Districts and Educational Institutions

County: Lewis County

School District /
Educational Institution Name: Lewis County C-1 School District

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

Prepared by: John French, Superintendent

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

The purpose of this section is to collect information to document existing capabilities as well as determine existing plans, studies, reports, and technical information that may need to be incorporated in the mitigation plan.

Please indicate which of the following your school district / institution has in place. For elements that do not pertain to you, please indicate with "N/A". If applicable, please provide a completion date for the element. If your school district / institution has any of the **underlined and bolded** elements, please provide a copy of the document to the contact indicated on the front of this questionnaire and indicate method in the comments column (i.e. available on the web, will email or mail).

Planning Elements	Yes/No	Date of Latest Version	Comments
Master Plan	Yes	2006 - written / Annually Updated & training provided	
Capital Improvement Plan	Yes	2016	
School Emergency Plan Shelter in place protocols Evacuation protocols	Yes	2022	
Weapons Policy	Yes	2021	

Administrative/Technical

Identify the technical and personnel resources responsible for activities related to hazard mitigation/loss prevention within your school district / institution.

Personnel Resources	Yes/No	Department/Position	Comments
Full-time building official (i.e. Principal)	Yes	2 per building	
Emergency Manager	Yes	Administrators	
Grant Writer	Yes	Curriculum Director	
Public Information Officer	Yes	Generally Superintendent	

Financial Resources

Identify whether your school district /institution has access to or is eligible to use the following financial resources for hazard mitigation.

Financial Resources	Accessible/Eligible to Use (Y/N)	Comments
Capital improvements project funding	Yes	
Local funds	Yes	
General obligation bonds	No	
Special tax bonds	No	
Private activities/donations	Possibly	
State and federal funds	Yes	

Additional Capabilities Questions

1. Are your buildings equipped with a public address system or other emergency alert system? Please describe. Yes - we have intercom systems in both buildings, as well as a bell/alarm system on top of a fire alarm system. The elementary building also has an alarm system for building security.
2. Does your school buildings' have NOAA Weather Radios?

   Yes

3. List any past or ongoing projects or programs designed to reduce disaster losses, these may include projects to protect facilities or provide education regarding hazards that could occur.

   Security camera upgrades, facility upgrades, Annual training (such as intruder training provided by STRATEGOS), School Resource Officer, Bus Crisis Training, Emergency & Evacuation dri

4. List any other past or ongoing projects or programs designed to reduce disaster losses, these may include projects to protect critical facilities.

   School Resource Officer & partnership with the Lewis County Sheriffs' Office. Have applied for a FEMA shelter for each campus, but no luck in getting this.

5. Do any of your buildings have designated tornado shelters or "saferooms"? If so, are they constructed in accordance with FEMA standards?

   No, we use interior rooms & hallways.

6. Did your school district / institution make any additions to buildings or construction new buildings since the last plan update (2010)? Please list the buildings and the improvement.

   Yes - additions @ the highschool to include the science wing & administration office

7. Does your school district / institution plan to remodel or construct any buildings in the next 5 years? If so, please list the building or proposed building and planned improvements. Are any planned construction activities in known hazard areas?

   Depending on funding & whether a FEMA shelter would be approved, we would be looking to build them. We are also in need of additional gymnasiums in the district.

8. What percentage is your projected enrollment expected to increase or decrease in the next five years?

   Decreasing over the last few years — about 30 per year since 2014-2015.

9. Do you have your own campus police? Please explain your police department or who you rely on for security needs.

   We have a School Resource Officer, which is a partnership between the school district & the Sheriff's office (each cover ½ of his salary). Lewis County Sheriff's Department

VULNERABILITY ASSESSMENT

Asset Inventory

The purpose of this worksheet is to assist in the assessment of the vulnerable populations and facilities owned by your school district / institution. Use the table below to compile a detailed inventory of specific assets at risk. In the hazard specific column of the asset inventory table, indicate (by assigned abbreviation) which of the following hazards the asset is vulnerable to:

Riverine Flooding (Major & Flash)-**RF**

Dam Failure-**DF**
Levee Failure-**LF**
Earthquake-**EQ**
Land Subsidence / Sinkholes-**LSS**
Severe Thunderstorm (incl. winds, hail, lightning)-**ST**
Tornadoes-**T**

Severe Winter Weather (incl. snow, ice, severe cold)-**SWW**
Droughts-**D**
Extreme Temperatures-**ET**
Fires (structural, urban, and wild)-**F**
Attack (nuclear, conventional, chemical, and biological)-**A**
Civil Disorder-**CD**
Cyber Disruption-**CyD**

Hazardous Materials Release (fixed facility, accidents)-**HM**
Mass Transportation Accident-**MTA**
Nuclear Power Plants (emergencies & accidents)-**NPP**
Public Health Emergencies/Environmental Issues-**PH**
Special Events-**SE**
Terrorism-**TX**
Utilities (interruptions & system failures)-**U**

Please list buildings owned by your school district / institution including the square feet, values, and occupancy/capacity. If not applicable or not available, enter "N/A". Add as many rows as needed. **If you have this data in GIS formats, or other formats, please provide in lieu of this.**

Name of Asset	Address	Square Feet	Replacement Value (Insured)	Contents Value	Occupancy/ Capacity #	Hazards
HIGHLAND HIGH SCHOOL	21504 State Hwy 16, Lewistown, MO 63452				500	EQ, LSS, ST, T, SWW, F, A, CyD, HM, MTA, PH, SE, TX, U
HIGHLAND ELEMENTARY SCHOOL	25189 Heritage Ave., Lewistown, MO 63452				500	"

Appendix C

Lewis County, Missouri RESOLUTION NO. 05222023

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

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

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

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

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

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

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

LEWIS COUNTY HEREBY adopts the **LEWIS COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN.**

ADOPTED by LEWIS COUNTY COMMISSION, this 22 day of May, 2023.

Wayne Murphy Jr, Presiding Commissioner

Deanne Whiston, Northern District Commissioner

Travis Fleer, Southern District Commissioner

LEWIS COUNTY COMMISSION MISSOURI SEAL

ATTEST:

Shannon Sapp, County Clerk

City of Canton, Missouri RESOLUTION NO. 2023-1

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

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

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

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

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

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

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

CITY OF CANTON HEREBY adopts the **LEWIS COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN.**

ADOPTED by City of Canton City Council, this 15 day of May, 2023

Jarrod Phillips, Mayor

Christina Deangmany, City Clerk

City of Ewing, Missouri RESOLUTION NO. _____

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

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

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

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

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

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

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

THE CITY OF EWING HEREBY adopts the **LEWIS COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN.**

Date: June 5, 2023

Certifying Official:

By: Dean Wagy

Print Name & Title: Dean Wagy Mayor

ATTEST:

By: Cheryl M. Thrower

Print Name & Title: CHERYL M. THROWER

City of Lewistown, Missouri RESOLUTION NO. __

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

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

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

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

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

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

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

THE CITY OF LEWISTOWN HEREBY adopts the **LEWIS COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN.**

Date: 6/6/2023

Certifying Official:

By: _____

Print Name & Title: Steve McKenzie Mayor

ATTEST:

By: Lori Washburn

Print Name & Title: Lori Washburn, Treasurer

RESOLUTION OF THE BOARD OF ALDERMEN
OF
THE CITY OF LABELLE, MISSOURI

A RESOLUTION OF THE **CITY OF LA BELLE**, MISSOURI ADOPTING THE **LEWIS COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN** AND THE EFFORT TO BECOME A DISASTER RESISTANCE COMMUNITY.

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

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

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

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

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

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

CITY OF LA BELLE HEREBY adopts the **LEWIS COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN.**

ADOPTED by City of La Belle City Council, this 8th day of May, 2023

Mayor Zachy Sharpe

Attest City Clerk Wendy Lewis

City of La Grange, Missouri

A RESOLUTION OF THE **CITY OF LA GRANGE,** MISSOURI ADOPTING THE **LEWIS COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN (2023-2028 Plan)** AND THE EFFORT TO BECOME A DISASTER RESISTANCE COMMUNITY.

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

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

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

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

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

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

CITY OF LA GRANGE HEREBY adopts the **LEWIS COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN (2023-2028 Plan).**

ADOPTED by City of La Grange City Council, this 12 day of June, 2023.

Robert Corbin, Mayor

Kim Schneider, City Clerk

Village of Monticello, Missouri RESOLUTION NO. _____

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

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

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

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

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

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

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

THE VILLAGE OF MONTICELLO HEREBY adopts the **LEWIS COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN.**

Date: June 6, 2023

Certifying Official:

By (Sig): Vancell Scifres Mayor

Print name: Vancell Scifres

ATTEST:
By (Sig.): Cindy Grgurich, City Clerk

Print name: Cindy GRGURICH

LEWIS COUNTY C-1 SCHOOL DISTRICT, Missouri RESOLUTION NO. _

A RESOLUTION OF THE **LEWIS COUNTY C-1 SCHOOL DISTRICT,** MISSOURI ADOPTING THE **LEWIS COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN** AND THE EFFORT TO BECOME A DISASTER RESISTANCE COMMUNITY.

WHEREAS the **LEWIS COUNTY C-1 SCHOOL DISTRICT** recognizes the threat that natural hazards pose to people and property within the **CANTON R-V SCHOOL DISTRICT**; and

WHEREAS the **LEWIS COUNTY C-1 SCHOOL DISTRICT** has participated in the preparation of a multi-jurisdictional local hazard mitigation plan, hereby known as the **LEWIS COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN**, hereafter referred to as the *Plan*, in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS the ***LEWIS COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN*** identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the **LEWIS COUNTY C-1 SCHOOL DISTRICT** from the impacts of future hazards and disasters; and

WHEREAS **LEWIS COUNTY C-1 SCHOOL DISTRICT** recognizes that land use policies have a major impact on whether people and property are exposed to natural hazards, the **LEWIS COUNTY C-1 SCHOOL DISTRICT** will endeavor to integrate the *Plan* into the comprehensive planning process; and

WHEREAS adoption by **LEWIS COUNTY C-1 SCHOOL DISTRICT** demonstrates their commitment to hazard mitigation and achieving the goals outlined in the *Plan*.

NOW THEREFORE, BE IT RESOLVED BY THE SCHOOL BOARD OF LEWIS COUNTY C-1 SCHOOL DISTRICT, in the State of Missouri, THAT: In accordance with LEWIS COUNTY C-1 SCHOOL DISTRICT School Board Policy, HEREBY adopts the **LEWIS COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN.**

ADOPTED by a vote of 6 in favor and 0 against and 0 abstaining, this 10th day of May, 2023.

Robert P Miller

, Board President

ATTEST:

Tracy Zimmerman

,Board Secretary

CANTON R-V SCHOOL DISTRICT, Missouri RESOLUTION NO. FY23-02

A RESOLUTION OF THE **CANTON R-V SCHOOL DISTRICT**, MISSOURI ADOPTING THE **LEWIS COUNTY MULTI-JURISDICTIONAL HAZARD MITIGATION PLAN** AND THE EFFORT TO BECOME A DISASTER RESISTANCE COMMUNITY.

WHEREAS the **CANTON R-V SCHOOL DISTRICT** recognizes the threat that natural hazards pose to people and property within the **CANTON R-V SCHOOL DISTRICT**; and

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

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

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

WHEREAS adoption by **CANTON R-V SCHOOL DISTRICT** demonstrates their commitment to hazard mitigation and achieving the goals outlined in the *Plan*.

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

ADOPTED by a vote of 4 in favor and 0 against and 0 abstaining, this 12 day of June, 2023.

Michelle L Z

, Board President

ATTEST:

Terry R Spurgeon

,Board Secretary