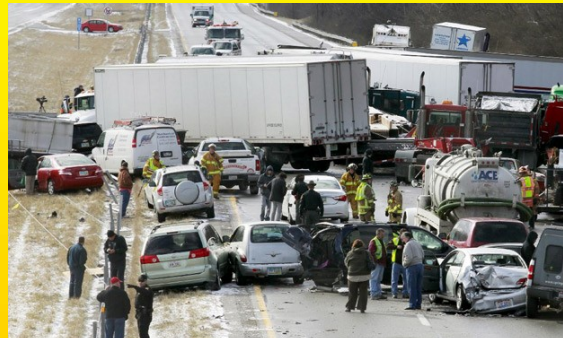


LEWIS COUNTY MISSOURI



HAZARD MITIGATION PLAN 2018-2023

CONTRIBUTORS

Lewis County Hazard Mitigation Planning Committee

Cheryl Thrower	City Clerk	City Gov.	City of Ewing
Vancell Scifres	Mayor	Village Gov.	Village of Monticello
Harry Scifres	Asst. Chief	Fire Department	Western Lewis Co. Fire
Henry Gunsauls	Fire Chief	Fire Service	City of La Grange
Wayne Murphy Jr.	Commissioner	County Commission	Lewis County
John French	Superintendent	Administration	Lewis County C-1 Schools
Amy Turpin	Mayor	City Gov.	City of LaBelle
Wendy Lewis	City Clerk	City Gov.	City of LaBelle
Roy Lewis	Alderman	City Gov.	City of LaBelle
Ottie Lewis	City Collector	City Gov.	City of Labelle
Steve McKenzie	Mayor	City Gov.	City of Lewistown
Cynthia Kell	Public Works Director	City Gov.	City of Canton
David Keith	Director	Emergency Management	Lewis County
Gretchen Keith	Asst. Director	Emergency Management	Lewis County
Travis Fleer	Commissioner	County Commission	Lewis County
Thomas Dolan	Citizen	NA	City of Ewing
Trish Smith	CERT member	Emergency Management	City of LaBelle
Robbie Walker	Captain	Fire Department	City of LaBelle
Jerry McKenzie	Asst. Chief	Fire Department	Western Lewis Co. Fire
Clair Murphy	Citizen	NA	Lewis County
Jesse Uhlmeier	Superintendent	Administration	Canton R-V Schools

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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 the participating jurisdictions and school/special districts within its boundaries developed this multi-jurisdictional local hazard mitigation plan update to reduce future losses from hazards. The plan is the five year update of an existing plan. 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 Lewis County Multi-Hazard Mitigation Plan is a multi-jurisdictional plan that covers the following jurisdictions that participated in the planning process:

Lewis County			
Canton	Ewing	La Belle	La Grange
Lewistown	Monticello		
Canton R-V (Canton)	Lewis County C-1 (Ewing)		

Lewis County and the entities listed above developed an update to the Multi-Jurisdictional Hazard Mitigation Plan that was approved by FEMA on [date]. This current planning effort serves to update that previously approved plan.

The plan update process followed a methodology prescribed by FEMA, which began with the formation of a Mitigation Planning Committee (MPC) comprised of representatives from Lewis County and participating jurisdictions. The MPC analyzed an updated 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:

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

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

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

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

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

Goal 6: Secure resources for investment in hazard mitigation

Goal 7: Take steps to mitigate damages due to flooding.

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

This plan has been reviewed by and adopted with resolutions or other documentation of adoption by all participating jurisdictions and schools/special districts. The documentation of each adoption is included in Appendix D, and a model resolution is included on the following page.

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

Lewis County
Canton
*Lewistown**

Ewing
Monticello

La Belle

La Grange

Canton R-V (Canton)

Lewis County C-1 (Ewing)

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

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1.1 PURPOSE

Hazard mitigation is “any action 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 and the participating jurisdictions and school districts developed this multi-jurisdictional local hazard mitigation plan update to reduce future losses from hazard events.

Entities within Lewis County that do not adopt the plan will not be eligible for Hazard Mitigation funding.

This plan was created in compliance with 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. (Hereafter, these requirements and regulations will be referred to collectively as the Disaster Mitigation Act or DMA). The regulations established the requirements for local hazard mitigation plans are in the Robert T. Stafford Disaster Relief and Emergency Act (Public Law 93-288).

1.2 BACKGROUND AND SCOPE

This document is the 5-year update of a plan that was approved on March 19, 2012. 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 following local governments and school districts participated in both the original plan as well as the plan update, which allows them to adopt the plan and secure eligibility for Hazard Mitigation Grant Funding they could not otherwise obtain*.

- Lewis County
- City of Canton
- City of LaGrange
- Canton R-V
- City of Ewing
- City of Lewistown
- Lewis County C-1
- City of LaBelle
- Village of Monticello

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

* 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. (Hereafter, these requirements and regulations will be referred to collectively as the Disaster Mitigation Act or DMA). The regulations established the requirements for local hazard mitigation plans are in the Robert T. Stafford Disaster Relief and Emergency Act (Public Law 93-288).

1.3 PLAN ORGANIZATION

This latest (2018) update document involved review, evaluation, and amendment of the existing Plan. It addresses the same natural hazards that were addressed in the original Plan, with man-made/technological hazards not addressed except in the context of cascading damages. Following is a breakdown of the organization of the 2018 Lewis County Hazard Mitigation Plan Update.

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

Table 1.1. Changes Made in Plan Update

Plan Section	Changes
Chapter 1: Introduction and Planning Process	Updated information on the current/new planning process, participants, etc.
Chapter 2: Planning Area Profile and Capabilities	Updated information on community resources, staffing, and census demographics relating to population, housing, income, and commercial and industrial activity
Chapter 3: Risk Assessment	New hazards were added to the risk assessment: <ul style="list-style-type: none">▪ Attack: Nuclear/ Conventional/Chemical/ Biological▪ Civil Disorder▪ Hazardous Materials release; Fixed Facility / Transportation incidents▪ Mass Transportation Accident▪ Public Health Emergencies/ Environmental Issues▪ Special Events▪ Terrorism▪ Utility disruption/failure▪ Electromagnetic Pulse (EMP)
Chapter 4: Mitigation Strategy	The old plan was analyzed; actions completed or thought not to be applicable were removed. New actions were added to the plan.
Chapter 5: Plan Implementation and Maintenance	This section contains more detail than the previous plan, on specific individuals and their responsibilities in regards to implementing actions and ensuring the plan maintenance process is followed.

1.4 PLANNING PROCESS

Lewis County, Missouri contracted with the North Central Missouri Regional Planning Commission (NEMO RPC) to facilitate the update of the multi-jurisdictional, local hazard mitigation plan. (Due to staffing issues, NEMO RPC contracted with its sister agency the Green Hills RPC for assistance in this planning effort). In fulfillment of this role, NEMO RPC

- Assisted in establishing a Mitigation Planning Committee (MPC) as defined by the Disaster Mitigation Act (DMA),
- Ensured the updated plan met the DMA requirements as established by federal regulations and followed the most current planning guidance of the Federal Emergency Management Agency (FEMA),
- Facilitated the entire plan development process, Identified the data that MPC participants could provide and conducted the research and documentation necessary to augment that data,
- Assisted in soliciting public input,
- Produced the draft and final plan update in a FEMA-approvable document, and coordinated the Missouri State Emergency Management Agency (SEMA) and (FEMA) plan reviews.

Table 1.2. Lewis County Hazard Mitigation Planning Committee

Name	Title	Department	Jurisdiction/Org.
Cheryl Thrower	City Clerk	City Gov.	City of Ewing
Vancell Scifres	Mayor	Village Gov.	Village of Monticello
Harry Scifres	Asst. Chief	Fire Department	Western Lewis Co. Fire
Henry Gunsauls	Fire Chief	Fire Service	City of La Grange
Wayne Murphy Jr.	Commissioner	County Commission	Lewis County
John French	Superintendent	Administration	Lewis County C-1 Schools
Amy Turpin	Mayor	City Gov.	City of LaBelle
Wendy Lewis	City Clerk	City Gov.	City of LaBelle
Roy Lewis	Alderman	City Gov.	City of LaBelle
Ottie Lewis	City Collector	City Gov.	City of Labelle
Steve McKenzie	Mayor	City Gov.	City of Lewistown
Cynthia Kell	Public Works Director	City Gov.	City of Canton
David Keith	Director	Emergency Management	Lewis County
Gretchen Keith	Asst. Director	Emergency Management	Lewis County
Travis Fleer	Commissioner	County Commission	Lewis County
Thomas Dolan	Citizen	NA	City of Ewing
Trish Smith	CERT member	Emergency Management	City of LaBelle
Robbie Walker	Captain	Fire Department	City of LaBelle
Jerry McKenzie	Asst. Chief	Fire Department	Western Lewis Co. Fire
Clair Murphy	Citizen	NA	Lewis County
Jesse Uhlmeier	Superintendent	Administration	Canton R-V Schools

1.4.1 Multi-Jurisdictional Participation

Incorporated communities, public schools and special districts, and various other stakeholders in mitigation planning were invited to participate in the plan update via direct solicitation and participation from the public was solicited via social media (the Planning Committee Facebook page- documentation in Appendix B). Each jurisdiction participated in the planning process by furnishing completed survey questionnaires, providing progress reports on actions in the previously approved plan, reviewing and giving input on the plan update, and attending the planning meetings (or, alternately, communicating via email and phone).

Participants formally adopted the plan prior to submission to SEMA/FEMA.

The table below (**Table 1.3**) shows the representation of each participating jurisdiction at the planning meetings, the provision of responses to the Data Collection Questionnaire, and the update/development of mitigation actions. Sign-in sheets and other documentation are located in appendix B.

Table 1.3. Jurisdictional Participation in Planning Process

Jurisdiction	Kick-off Meeting	Meeting #1	Meeting #2	Data Collection Questionnaire Response	Update/Develop Mitigation Actions	Phone/Email
Lewis County	✓	✓	✓	✓	✓	✓
City of Canton	✓	✓	X	✓	✓	✓
City of Ewing	✓	X	X	X	✓	✓
City of LaBelle	✓	✓	✓	✓	✓	✓
City of LaGrange	✓	X	✓	✓	✓	✓
City of Lewistown	✓	✓	X	✓	✓	✓
Village of Monticello	✓	✓	X	✓	✓	✓
Canton R-V	X	X	X	✓	✓	✓
Lewis County C-1	✓	✓	X	✓	✓	✓

Canton R-V did not attend the planning meetings, and was solicited individually for participation by staffers from the North Missouri Regional Planning Commission, in order to attain data and eventual plan adoption.

1.4.2 The Planning Steps

- The plan update framework and development process was accomplished 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)*.
- Development of the plan followed the 10-step planning process adapted from FEMA's Community Rating System (CRS) and Flood Mitigation Assistance programs, which allows the plan to meet funding eligibility requirements of the Hazard Mitigation Grant Program, Pre-Disaster Mitigation Program, Community Rating System, and Flood Mitigation

Assistance Program.

The CRS process aligns with the Nine Task Process outlined in the 2013 *Local Mitigation Planning Handbook*.

Table 1.4. County Mitigation Plan Update Process

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

Table 1.5. Schedule of MPC Meetings

Meeting	Topic	Date/Location
Kick-off Meeting	<p>Selected representatives were contacted and invited to the meeting. An FAQ about Hazard mitigation, the County's previously adopted plan, and the update process was provided and discussed.</p> <p>A committee contact list was created and survey questionnaires were distributed. A date for Planning Meeting #1 was set.</p>	<p>Jan 16, 2018 5:30 PM</p> <p>Lewis Co. Courthouse</p>
Planning Meeting #1	<p>Committee members were invited, and urged to bring department heads and other interested parties. There was a quick overview of the FAQ for those who might not have been present at the previous meeting and a reminder of participation requirements.</p> <p>The mitigation goals of the previous plan were discussed and retained. There were not changes to the goals.</p> <p>There was an overview of hazards and risk analysis, a discussion of hazards in the old plan and new hazards in the update, and open discussion on specific vulnerabilities and local concerns.</p> <p>The previous plan's actions were discussed and an update was provided on each action.</p> <p>Discussions were held on old actions and proposed new actions for inclusion in the plan.</p> <p>The time and place for meeting #2 was set.</p>	<p>Feb 12, 2018 5:30 PM</p> <p>Lewis Co. Courthouse</p>

Planning Meeting #2	<p>Committee members were invited, and again urged to bring department heads and other individuals.</p> <p>The public was solicited with advertisements on local public “swap shop” Facebook pages</p> <p>There was a review of Hazard Mitigation FAQ, the planning process, and what had occurred over the course of the previous meetings.</p> <p>The bulk of the meeting was an open discussion of the proposed actions for the plan update, followed by a scoring period where meeting participants used the STAPLEE forms to score individual actions for prioritization in the plan framework.</p> <p>There was a short discussion of the plan maintenance process and the resolution of adoption.</p> <p>Copies of the sample resolution were provided to all jurisdictional representatives.</p>	<p>March 6, 2018 5:30 PM</p> <p>LaBelle, MO Fire Station</p>
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Copies of agendas, hand-out materials, and minutes for all meetings are found in Exhibit B.

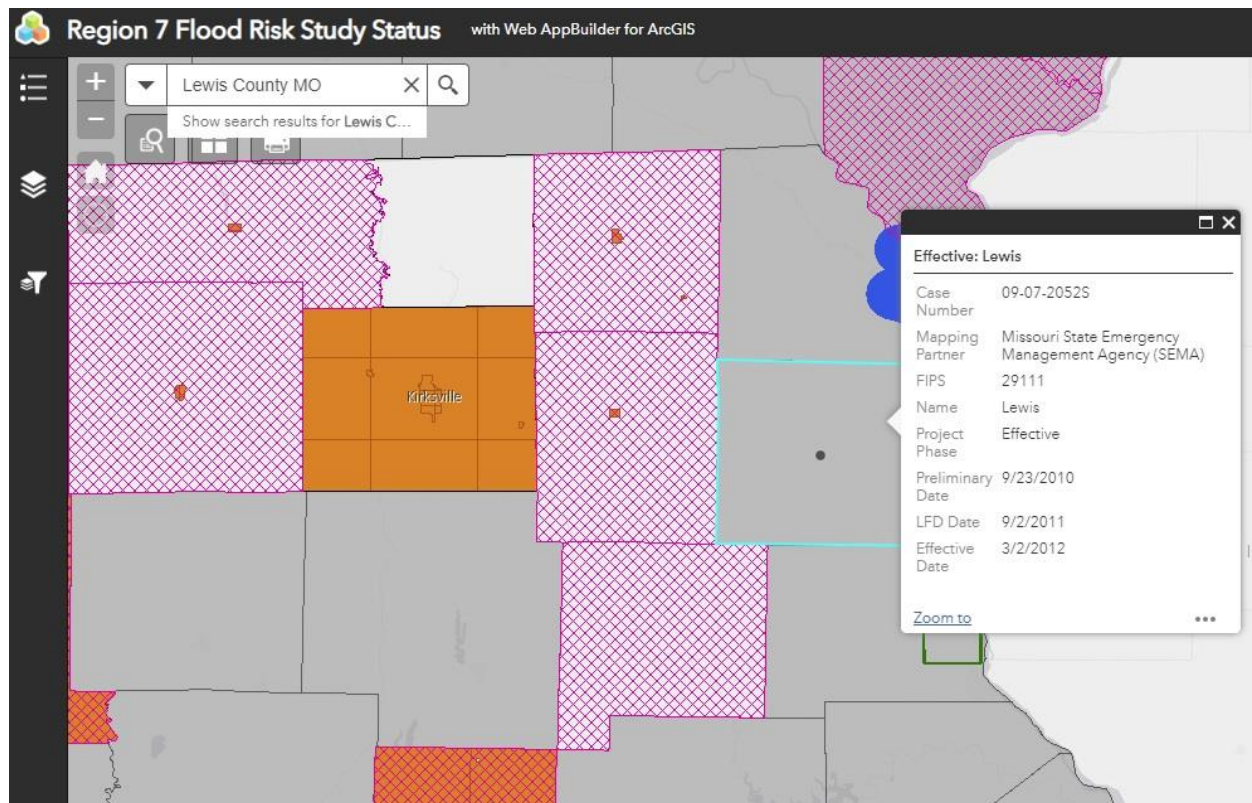
Coordination with FEMA Risk MAP Project

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. Map of RiskMAP projects



Integration of Other Data, Reports, Studies, and Plans

During the 1st planning meeting in January of 2018 the MPC identified and profiled the hazards in the County. This was accomplished by reviewing:

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

This information is available in the Risk Assessment Chapter (4) of this document.

Assets for each jurisdiction were identified using census data, the state GIS structure coverage, HAZUS, and the Data Collection Questionnaires distributed to participating jurisdictions.

Losses were estimated using projected damages and existing asset data.

Jurisdictions provided information on their regulatory, personnel, fiscal, and technical capabilities, and existing mitigation initiatives which can be found in Chapter 2 of this document.

Vulnerability estimates were taken from the Current State Plan, as the best and most recent data available.

Goals

The MPC reviewed goals from the previously approved plan, and decided they should remain unchanged. Those goals were:

- | | |
|--------|---|
| Goal 1 | Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities. |
| Goal 2 | Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy. |
| Goal 3 | Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities. |
| Goal 4 | Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation. |
| Goal 5 | Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefit of special interests. |
| Goal 6 | Secure resources for investment in hazard mitigation |
| Goal 7 | Take steps to mitigate damages due to flooding. |

Reviewing Possible Mitigation Actions and Activities

The HMPC met for the second time in February 2018, in order to review the mitigation strategy from the previously approved plan and discuss changes and updates. Committee members discussed progress (or lack of it) on various actions in the previously approved plans in their jurisdictions. HMPC members were encouraged to continue moving forward only those actions that substantively addressed long-term risks identified in the risk assessment.

There were virtually no changes to any of the risks assessed in the plan, though additional hazards were added. The current plan addresses man-made and technological hazards as well as the natural hazards addressed in previous years. These new hazards are:

- Attack: Nuclear/ Conventional/Chemical/ Biological
- Civil Disorder
- Hazardous Materials release; Fixed Facility / Transportation incidents
- Mass Transportation Accident
- Public Health Emergencies/ Environmental Issues
- Special Events
- Terrorism
- Utility disruption/failure
- Electromagnetic Pulse (EMP)

Once again, the HMPC used a modified STAPLEE method to analyze and prioritize proposed actions.

Drafting the Action Plan

After reviewing past and proposed mitigation activities and prioritizing them with the STAPLEE process, a draft action plan was composed and work on the plan began to reach a point where a draft was ready for submission to SEMA/FEMA.

Adoption of the Plan

Adoption resolution examples were given to the jurisdictional representatives with instructions to return to their respective governing bodies and conduct the adoption by whatever means their community utilizes for such activities.

Implementing, Evaluating, and Revising the Plan

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

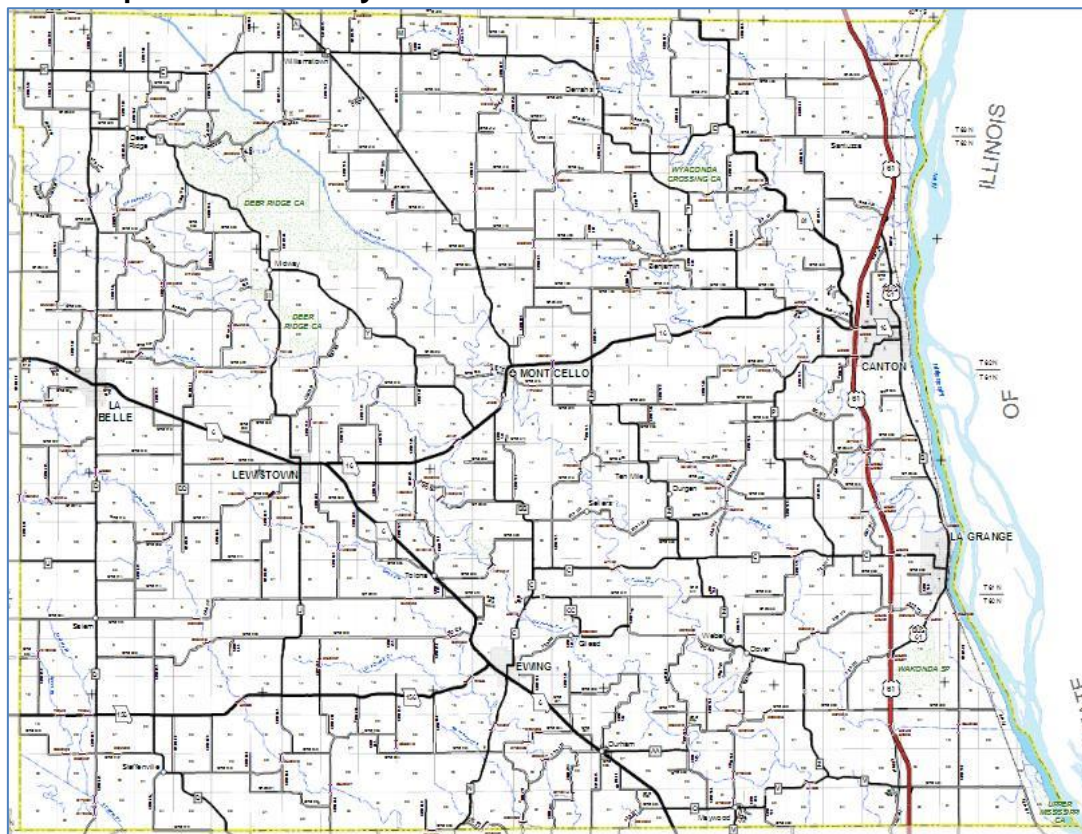
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2. Lewis County Planning Area Profile

Figure 2.1.

Map of Lewis County



2.1.2 Geography, Geology and Topography

Lewis county has a total area of 511 square miles (1,320 km²), of which 505 square miles (1,310 km²) is land and 5.8 square miles (15 km²) (1.1%) is water. The County includes several major physiographic regions: along the County's 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 which are found broad ridges with gently sloping prairie. Elevations range from 470 ft 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).

2.1.3 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 of 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 at 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.

2.1.4 Population/Demographics

Table 2.1. Lewis County Population 2000-2010 by Community

Jurisdiction	2000 Population	2010 Population	2000-2010 # Change	2000-2010 % Change
Missouri	5,595,210	5,988,927	+ 393,717	+ 7.04
Lewis County	10,211	10,494	+ 283	+ 2.7
Canton	2,377	2,562	+ 185	+ 6.6
Ewing	456	477	+ 21	- 4.6
La Belle	660	623	- 37	+ 5.6
La Grange	931	984	- 53	- 5.7
Lewistown	534	611	- 77	- 14.4
Monticello	98	109	+ 11	+ 11.2

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

Population breakdown by age

Jurisdiction	Total Population	Population Under 5 yrs	Percent of population under 5	Population 65 yrs and over	Percent of Population 65 Yrs and older
Missouri	5,988,927	-	6.2	-	14.0
Lewis County	10,494	343	3.3	800	3.3
Canton	2,562	75	2.9	195	7.6
Ewing	477	16	3.4	59	12.3
La Belle	623	25	4.0	63	10.1
La Grange	984	34	3.5	73	3.5
Lewistown	611	7	1.1	49	8.0
Monticello	109	5	4.6	14	12.8

There are 3,846 households in Lewis County, with an average household size of 2.45 persons compared to the State and US average household sizes of 2.48 and 2.64, respectively.

The vulnerability analyses in the next chapter of this plan will include Social Vulnerability Index (SoVI ®) information from the Hazards and Vulnerability Research Institute at the University of South Carolina; the index was designed to evaluate and rank a community's ability to respond to, cope with, recover from, and adapt to disasters. It synthesizes 30 socioeconomic variables which research literature suggests contribute to reduction in a community's ability to prepare for, respond to, and recover from hazards. SoVI ® data sources include primarily those from the United States Census Bureau.

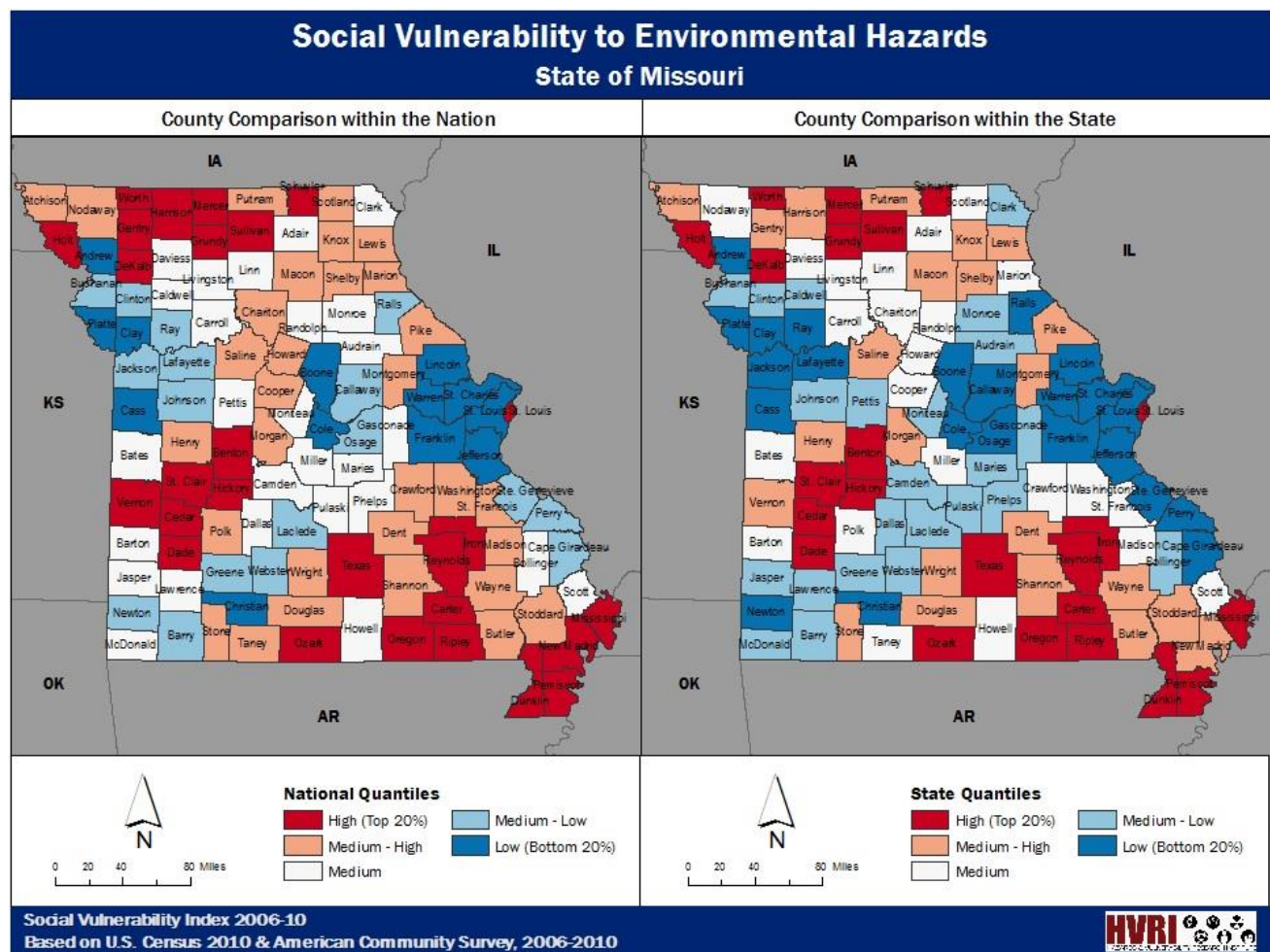


Table 2.2. Unemployment, Poverty, Education, and Language Percentage Demographics, Lewis County, Missouri

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 (spoken language other than English)
Lewis County	4,918	3.6	6.6	46.7	48.1	3.8
Canton	1,136	2.3	10.4	43.6	39.1	1.3
Ewing	130	1.9	3.8	59.2	57.7	1.2
La Belle	252	2.1	13.3	53	67.8	1.2
La Grange	481	6.3	15.7	78.7	9.4	0.7
Lewistown	259	1.9	1.5	59.9	50	0.0
Monticello	88	3.8	0.0	45.5	40	0.0

Source: U.S. Census, 2011 American Community Survey, 5-year Estimates, www.towncharts.com

2.1.5 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 and many of it's 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 aforementioned 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 stage coach 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.

2.1.6 Occupations

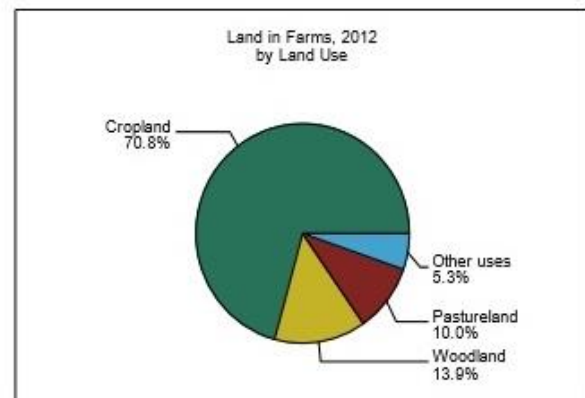
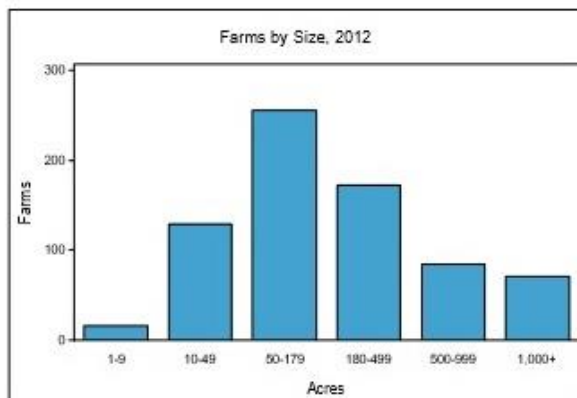
Table 2.3. Occupation Statistics, Lewis County, Missouri

Place	Civilian Employed Population 16 years and over		Service Occupations	Sales and Office Occupations	Natural Resources, Construction, and Maintenance Occupations	Production, Transportation, and Material Moving Occupations
Lewis County	4,918	23.3%	22.6%	18.6%	13.0%	22.5%
Canton	1,136	26.4%	35.4%	16.2%	5.5%	16.5%
Ewing	130	20.0%	20.03%	22.3	6.9%	30.8%
La Belle	252	15.1%	18.3%	23.8%	11.9%	31.0%
La Grange	481	11.0%	30.8%	25.4%	10.0%	22.9%
Lewistown	259	18.5%	17.4%	20.1%	4.6%	39.4%
Monticello	88	9.1%	11.4%	45.5%	9.1%	25.0%

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

2.1.7 Agriculture

	2012	2007	% change
Number of Farms	729	750	- 3
Land in Farms	284,283 acres	261,299 acres	+ 9
Average Size of Farm	390 acres	348 acres	+ 12
Market Value of Products Sold	\$81,224,000	\$73,037,000	+ 11
Crop Sales \$51,946,000 (64 percent)			
Livestock Sales \$29,278,000 (36 percent)			
Average Per Farm	\$111,418	\$97,383	+ 14
Government Payments	\$4,159,000	\$3,529,000	+ 18
Average Per Farm Receiving Payments	\$8,029	\$6,487	+ 24



Ranked items among the 114 state counties and 3,079 U.S. counties, 2012

Item	Quantity	State Rank	Universe ¹	U.S. Rank	Universe ¹
MARKET VALUE OF AGRICULTURAL PRODUCTS SOLD (\$1,000)					
Total value of agricultural products sold	81,224	43	114	1,355	3,077
Value of crops including nursery and greenhouse	51,946	29	114	1,137	3,072
Value of livestock, poultry, and their products	29,278	53	114	1,315	3,076
VALUE OF SALES BY COMMODITY GROUP (\$1,000)					
Grains, oilseeds, dry beans, and dry peas	(D)	25	114	827	2,926
Tobacco	-	-	12	-	436
Cotton and cottonseed	-	-	7	-	635
Vegetables, melons, potatoes, and sweet potatoes	111	53	109	1,807	2,802
Fruits, tree nuts, and berries	(D)	(D)	107	(D)	2,724
Nursery, greenhouse, floriculture, and sod	(D)	102	107	(D)	2,678
Cut Christmas trees and short rotation woody crops	-	-	55	-	1,530
Other crops and hay	(D)	(D)	113	(D)	3,049
Poultry and eggs	11	97	113	2,331	3,013
Cattle and calves	(D)	(D)	114	(D)	3,056
Milk from cows	(D)	(D)	96	(D)	2,038
Hogs and pigs	(D)	(D)	109	(D)	2,827
Sheep, goats, wool, mohair, and milk	720	3	110	231	2,988
Horses, ponies, mules, burros, and donkeys	222	36	114	1,154	3,011
Aquaculture	(D)	32	46	(D)	1,366
Other animals and other animal products	7	83	114	2,372	2,924
TOP CROP ITEMS (acres)					
Soybeans for beans	80,426	26	111	364	2,162
Corn for grain	73,249	9	108	436	2,638
Forage-land used for all hay and haylage, grass silage, and greenchop	14,641	93	114	1,275	3,057
Wheat for grain, all	4,939	40	108	986	2,537
Winter wheat for grain	4,939	40	108	909	2,480
TOP LIVESTOCK INVENTORY ITEMS (number)					
Cattle and calves	24,677	64	114	1,146	3,063
Hogs and pigs	(D)	(D)	108	(D)	2,889
Goats, all	2,290	5	113	175	2,996
Layers	867	86	113	1,983	3,040
Horses and ponies	709	73	114	1,648	3,072

Other County Highlights, 2012

Economic Characteristics	Quantity	Operator Characteristics	Quantity
Farms by value of sales:		Principal operators by primary occupation:	
Less than \$1,000	200	Farming	323
\$1,000 to \$2,499	41	Other	406
\$2,500 to \$4,999	56		
\$5,000 to \$9,999	55	Principal operators by sex:	
\$10,000 to \$19,999	59	Male	655
\$20,000 to \$24,999	16	Female	74
\$25,000 to \$39,999	48		
\$40,000 to \$49,999	32	Average age of principal operator (years)	58.9
\$50,000 to \$99,999	81		
\$100,000 to \$249,999	71	All operators by race ² :	
\$250,000 to \$499,999	37	American Indian or Alaska Native	2
\$500,000 or more	33	Asian	-
Total farm production expenses (\$1,000)	84,595	Black or African American	2
Average per farm (\$)	116,042	Native Hawaiian or Other Pacific Islander	-
		White	1,033
Net cash farm income of operation (\$1,000)	19,542	More than one race	7
Average per farm (\$)	26,806	All operators of Spanish, Hispanic, or Latino Origin ²	2

See "Census of Agriculture, Volume 1, Geographic Area Series" for complete footnotes, explanations, definitions, and methodology.

- Represents zero. (D) Withheld to avoid disclosing data for individual operations.

¹ Universe is number of counties in state or U.S. with item. ² Data were collected for a maximum of three operators per farm.

2.1.8 FEMA Hazard Mitigation Assistance Grants in Planning Area

Table 2.4. FEMA HMA Grants in County from 1993-2015

Project Type	Sub applicant	Award Date	Project Total
200.1: Acquisition of Private Real Property (Structures and Land) - Riverine	Canton City	1993-07-09	\$ 71,471
200.1: Acquisition of Private Real Property (Structures and Land) - Riverine	La Grange	1993-07-09	\$ 82,432
200.1: Acquisition of Private Real Property (Structures and Land) - Riverine	La Grange	2007-06-11	\$ 386,822
Total			\$ 540,725

Source: Missouri State Emergency Management Agency, <https://www.fema.gov/openfema-dataset-hazard-mitigation-grants-v1>

2.2 Jurisdictional Profiles and Mitigation Capabilities

This section will include individual profiles for each participating jurisdiction. It will also include a discussion of previous mitigation initiatives in the planning area. There will be a summary table indicating specific capabilities of each jurisdiction that relate to their ability to implement mitigation opportunities. The unincorporated county is profiled first, followed by the incorporated communities, the special districts, and the public school districts.

2.2.1 Unincorporated 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 2.5. **Unincorporated Lewis County Mitigation Capabilities**

Capabilities	Status
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
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	Amended 10-31-11
Subdivision Ordinance	No
Tree Trimming Ordinance	No
Nuisance Ordinance	No
Storm Water Ordinance	No
Drainage Ordinance	No
Site Plan Review Requirements	No
Historic Preservation Ordinance	No
Landscape Ordinance	No
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 - Nondelegated	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	9

Capabilities	Status
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
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	Yes
Economic Development Department	No
Housing Department	No
Planning Consultant	No
Regional Planning Agencies	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
Capabilities	Status
Authority to levy taxes for a specific purpose	No
Fees for water, sewer, gas, or electric services	No
Impact fees for new development	No
Ability to incur debt through general obligation bonds	No
Ability to incur debt through special tax bonds	No
Ability to incur debt through private activities	No
Ability to withhold spending in hazard prone areas	No

Source: Data Collection Questionnaire, 2018

2.2.2 Incorporated Communities

Canton

Capabilities	Status
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
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
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 Participant	Yes
Hazard Awareness Program	Yes
National Weather Service (NWS) Storm Ready	No
Building Code Effectiveness Grading (BCEGs)	No
ISO Fire Rating	NA

Capabilities	Status
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	

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 Director	Yes
NFIP Floodplain Administrator	Yes
Bomb and/or Arson Squad	No
Emergency Response Team	No
Hazardous Materials Expert	No
Local Emergency Planning Committee	No
County Emergency Management Commission	No
Sanitation Department	No
Transportation Department	No
Economic Development Department	No
Housing Department	No
Planning Consultant	No
Regional Planning Agencies	No
Historic Preservation	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
Financial Resources	
Ability to apply for Community Development Block Grants	Yes
Ability to fund projects through Capital Improvements funding	Yes
Authority to levy taxes for a specific purpose	Yes
Fees for water, sewer, gas, or electric services	Yes
Impact fees for new development	No
Ability to incur debt through general obligation bonds	Yes
Ability to incur debt through special tax bonds	Yes
Ability to incur debt through private activities	No
Ability to withhold spending in hazard prone areas	No

Source: Data Collection Questionnaire, 2018

City of Ewing

Capabilities	Status
Planning Capabilities	
Comprehensive Plan	No
Builder's Plan	No
Capital Improvement Plan	No
Local Emergency Plan	No
County Emergency Plan	Yes: 2014
Local Recovery Plan	No
County Recovery Plan	No
Local Mitigation Plan	No
County Mitigation Plan	Yes: 2014
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: 2014
Storm Water Ordinance	No
Drainage Ordinance	No
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 - Nondelegated	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

Capabilities	Status
Economic Development Program	No
Land Use Program	No
Public Education/Awareness	No
Property Acquisition	No
Planning/Zoning Boards	No
Stream Maintenance Program	No
Tree Trimming Program	No
Engineering Studies for Streams (Local/County/Regional)	No
Mutual Aid Agreements	Yes

Studies/Reports/Maps	
Hazard Analysis/Risk Assessment (Local)	No
Hazard Analysis/Risk Assessment (County)	No
Flood Insurance Maps	No
FEMA Flood Insurance Study (Detailed)	No
Evacuation Route Map	No
Critical Facilities Inventory	No
Vulnerable Population Inventory	No
Land Use Map	No
Staff/Department	
Building Code Official	No
Building Inspector	No
Mapping Specialist (GIS)	No
Engineer	No
Development Planner	No
Public Works Official	Yes/PT
Emergency Management Director	Yes/ PT
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
Planning Consultant	No
Regional Planning Agencies	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	
Ability to fund projects through Capital Improvements funding	
Capabilities	Status
Authority to levy taxes for a specific purpose	Yes
Fees for water, sewer, gas, or electric services	Yes/ Sewer
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, 2018

City of La Belle

Capabilities	Status
Planning Capabilities	
Comprehensive Plan	No
Builder's Plan	No
Capital Improvement Plan	No
Local Emergency Plan	No
County Emergency Plan	No
Local Recovery Plan	No
County Recovery Plan	No
Local Mitigation Plan	No
County Mitigation Plan	Yes
Economic Development Plan	No
Transportation Plan	No
Land-use Plan	No
Flood Mitigation Assistance (FMA) Plan	No
Watershed Plan	No
Firewise or other fire mitigation plan	No
School Mitigation Plan	No
Critical Facilities Plan (Mitigation/Response/Recovery)	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
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 Participant	No
Hazard Awareness Program	No
National Weather Service (NWS) Storm Ready	No
Building Code Effectiveness Grading (BCEGs)	No
ISO Fire Rating	No

Capabilities	Status
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	Yes

Studies/Reports/Maps	
Hazard Analysis/Risk Assessment (Local)	No
Hazard Analysis/Risk Assessment (County)	No
Flood Insurance Maps	No
FEMA Flood Insurance Study (Detailed)	No
Evacuation Route Map	No
Critical Facilities Inventory	No
Vulnerable Population Inventory	No
Land Use Map	No
Staff/Department	
Building Code Official	No
Building Inspector	Yes
Mapping Specialist (GIS)	No
Engineer	No
Development Planner	No
Public Works Official	No
Emergency Management Director	No
NFIP Floodplain Administrator	Yes
Bomb and/or Arson Squad	No
Emergency Response Team	No
Hazardous Materials Expert	No
Local Emergency Planning Committee	No
County Emergency Management Commission	No
Sanitation Department	No
Transportation Department	No
Economic Development Department	No
Housing Department	No
Planning Consultant	No
Regional Planning Agencies	No
Historic Preservation	No
Non-Governmental Organizations (NGOs)	
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
Financial Resources	
Ability to apply for Community Development Block Grants	Yes
Ability to fund projects through Capital Improvements funding	Yes
Authority to levy taxes for a specific purpose	Yes
Fees for water, sewer, gas, or electric services	Yes
Impact fees for new development	No
Ability to incur debt through general obligation bonds	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, 2018

Capabilities	Status
Planning Capabilities	
Comprehensive Plan	No
Builder's Plan	No
Capital Improvement Plan	No
Local Emergency Plan	No
County Emergency Plan	No
Local Recovery Plan	No
County Recovery Plan	No
Local Mitigation Plan	No
County Mitigation Plan	Yes
Economic Development Plan	No
Transportation Plan	No
Land-use Plan	No
Flood Mitigation Assistance (FMA) Plan	No
Watershed Plan	No
Firewise or other fire mitigation plan	No
School Mitigation Plan	No
Critical Facilities Plan (Mitigation/Response/Recovery)	No
Policies/Ordinance	
Zoning Ordinance	No
Building Code	No
Floodplain Ordinance	Yes
Subdivision Ordinance	No
Tree Trimming Ordinance	No
Nuisance Ordinance	No
Storm Water Ordinance	No
Drainage Ordinance	No
Site Plan Review Requirements	No
Historic Preservation Ordinance	No
Landscape Ordinance	No
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 Participant	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
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 Director	Yes
NFIP Floodplain Administrator	No
Bomb and/or Arson Squad	No
Emergency Response Team	No
Hazardous Materials Expert	No
Local Emergency Planning Committee	No
County Emergency Management Commission	No
Sanitation Department	No
Transportation Department	No
Economic Development Department	No
Housing Department	No
Planning Consultant	No
Regional Planning Agencies	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
Financial Resources	
Ability to apply for Community Development Block Grants	Yes
Ability to fund projects through Capital Improvements funding	Yes
Authority to levy taxes for a specific purpose	Yes
Fees for water, sewer, gas, or electric services	Yes
Impact fees for new development	No
Ability to incur debt through general obligation bonds	Yes
Ability to incur debt through special tax bonds	Yes
Ability to incur debt through private activities	No
Ability to withhold spending in hazard prone areas	Yes

Source: Data Collection Questionnaire, 2018

City of Lewistown

Capabilities	Status
--------------	--------

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
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
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	
Codes Building Site/Design	
National Flood Insurance Program (NFIP) Participant	
NFIP Community Rating System Participant	
Hazard Awareness Program	
National Weather Service (NWS) Storm Ready	
Building Code Effectiveness Grading (BCEGs)	
ISO Fire Rating	
Capabilities	Status
Economic Development Program	No
Land Use Program	No
Public Education/Awareness	No
Property Acquisition	No
Planning/Zoning Boards	No
Stream Maintenance Program	No
Tree Trimming Program	No
Engineering Studies for Streams (Local/County/Regional)	No
Mutual Aid Agreements	No
Studies/Reports/Maps	
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 Director	No
NFIP Floodplain Administrator	No
Bomb and/or Arson Squad	No
Emergency Response Team	No
Hazardous Materials Expert	No
Local Emergency Planning Committee	No
County Emergency Management Commission	No
Sanitation Department	No
Transportation Department	No
Economic Development Department	No
Housing Department	No
Planning Consultant	No
Regional Planning Agencies	No
Historic Preservation	No
Non-Governmental Organizations (NGOs)	
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	Yes
Ability to incur debt through general obligation bonds	Yes
Ability to incur debt through special tax bonds	Yes
Ability to incur debt through private activities	Yes
Ability to withhold spending in hazard prone areas	No

Source: Data Collection Questionnaire, 2018

Village of Monticello

Capabilities	Status
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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
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
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 Participant	No
Hazard Awareness Program	No
National Weather Service (NWS) Storm Ready	No
Building Code Effectiveness Grading (BCEGs)	No
ISO Fire Rating	8

Capabilities	Status
Economic Development Program	No
Land Use Program	No
Public Education/Awareness	No
Property Acquisition	No
Planning/Zoning Boards	No
Stream Maintenance Program	No
Tree Trimming Program	No
Engineering Studies for Streams (Local/County/Regional)	No
Mutual Aid Agreements	Yes
Studies/Reports/Maps	
Hazard Analysis/Risk Assessment (Local)	No

Hazard Analysis/Risk Assessment (County)	No
Flood Insurance Maps	No
FEMA Flood Insurance Study (Detailed)	No
Evacuation Route Map	No
Critical Facilities Inventory	No
Vulnerable Population Inventory	No
Land Use Map	No
Staff/Department	
Building Code Official	No
Building Inspector	No
Mapping Specialist (GIS)	No
Engineer	No
Development Planner	No
Public Works Official	No
Emergency Management Director	No
NFIP Floodplain Administrator	No
Bomb and/or Arson Squad	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
Planning Consultant	No
Regional Planning Agencies	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	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, 2018

Table 2.6. Incorporated Community Mitigation Capabilities Summary Table

CAPABILITIES	Lewis County	City of Canton	City of Ewing	City of La Belle	City of La Grange	City of Lewistown	Village of 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
Fire wise 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
Wetlands and Riparian Areas Conservation Plan	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

CAPABILITIES	Lewis County	City of Canton	City of Ewing	City of La Belle	City of La Grange	City of Lewistown	Village of Monticello
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
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
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	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
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
Bomb and/or Arson Squad	No	No	No	No	No	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
Planning Consultant	No	No	No	No	No	No	No
Regional Planning Agencies	No	No	No	No	No	No	No
Historic Preservation	No	Yes	No	No	No	No	No

CAPABILITIES	Lewis County	City of Canton	City of Ewing	City of La Belle	City of La Grange	City of Lewistown	Village of Monticello
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
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/ Sewer	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 Questionnaires

2.2.3 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 located 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.

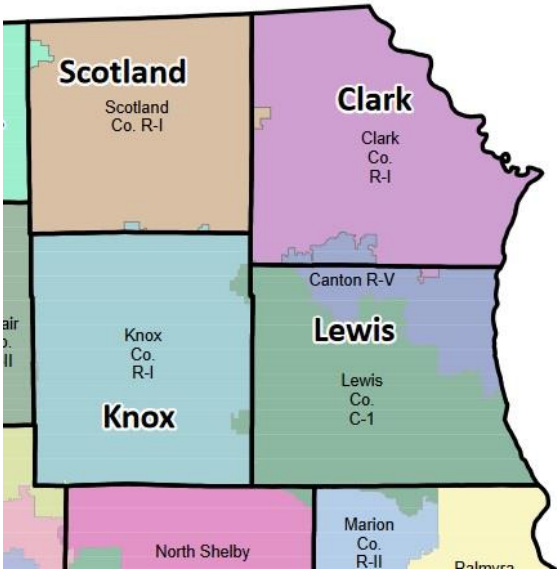


Table 2.7. School District A Buildings and Enrollment Data (2018)

District Name	Building Name	Building Enrolment
Canton R-V	Canton Elementary	318
Canton R-V	Canton High School	209
Lewis County C-1	Highland Elementary	497
Lewis County C-1	Highland Jr-Sr high	445

<http://mcids.dese.mo.gov/quickfacts/Pages/District-and-School-Information.aspx>

Table 2.8. Summary of Mitigation Capabilities-School District A, B, and C

Capability	Lewis County C-1 (Lewistown)	Canton R-V (Canton)
Planning Elements		
Master Plan/ Date	Yes / 2008 with annual updates	Yes / 2012
Capital Improvement Plan/Date	Yes / 2016	No
School Emergency Plan / Date	Yes / 2017	Yes
Weapons Policy/Date	Yes / 2000	Yes
Personnel Resources		
Full-Time Building Official (Principal)	Yes	Yes
Emergency Manager	Yes	Yes
Grant Writer	Yes	No
Public Information Officer	Yes	Yes
Financial Resources		
Capital Improvements Project Funding	Yes	Yes
Local Funds	Yes	Yes
General Obligation Bonds	No	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/ Safe room	No	No
Campus Police	No, but there is a School Resource Officer (Lewis County Sheriff's Dept.)	No

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Risk Assessment

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 jurisdictions in the planning area to better understand their potential risk to the identified hazards. This assessment will provide a framework for developing and prioritizing mitigation actions to reduce risk from future hazard events.

Census data of building permit activity in Lewis County indicates that there has been relatively little development in the 5 years since the previous Hazard Mitigation Plan was adopted.

3.1	New Constr uction (Permi ts) 2011- 2015	2011		2012		2013		2014		2015		5 Year Total	
		Units	Cost	Unit	Cost	Units	Cost	Units	Cost	Units	Cost	Units	Cost
	Single Family	5	529,000	2	250,000	3	430,000	3	442,000	2	250,000	15	1,901,000
	Two Family	0	-	0	-	0	-	4	175,000	0	-	4	175,000
	Three and Four Family	0	-	0	-	0	-	0	-	0	-	0	
	Five or more family	0	-	0	-	0	-	0	-	0	-		
	Total	5	529,000	2	250,000	3	430,000	7	617,000	2	250,000	19	2,076,000

Source: US Census

This chapter is divided into four main parts:

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

Section 3.1 Hazard Identification

Across the United States, natural, manmade, and other disasters have led to increasing numbers of deaths, injuries, property damages, and disruptions of business and government services. This can take an immense toll on people, businesses and government, especially in these challenging economic times. The time, money and effort to respond to and recover from disasters divert public resources and attention from other important programs. Lewis County has been a part of 11 disaster declaration from 1993 to 2017.

People and property are at risk from a variety of hazards that have the potential for causing widespread loss of life and damage to property, infrastructure, and the environment, and Lewis County recognizes both the potential consequences of these disaster events and the need to reduce their impacts through proper planning and preventive measures. The great majority of disasters in Missouri are weather related; the state is subject not only to extremes of weather but of abrupt weather. The state's geographic location makes it subject to multiple air streams which often clash and produce extreme weather phenomena, the most spectacular of which is of course the dreaded Tornado - however, the more common and damaging results of these patterns include floods, droughts, and severe winter weather.



In Missouri, local plans customarily include only natural hazards, as only natural hazards are required by federal regulations to be included. The MPC determined it would restrict its risk assessment to the required hazards.

3.1.1 Review of Existing Mitigation Plans

For the Lewis County Mitigation Plan Update, the hazards discussed in the original plan were reviewed to determine if changes were warranted. The planning committee determined that conditions in the planning area remained largely unchanged and therefore all of the hazards addressed in the previous plan should be addressed in the update. Those hazards are:

- Thunderstorm: High Winds/ Hail/ Lightning/ Tornado
- Flood: Riverine/Flash Flooding
- Levee Failure
- Severe Winter Weather: Extreme Cold/ Ice Storm/ Heavy Snowfall
- Drought
- Heat wave
- Earthquake
- Dam Failure
- Fire

While previous Hazard Mitigation Plans addressed only “natural” hazards, the planning committee decided to upgrade the County plan to include man made and technological hazards in its analysis. The new hazards included in the plan update are:

- Attack: Nuclear/ Conventional/Chemical/ Biological
- Civil Disorder
- Hazardous Materials release; Fixed Facility / Transportation incidents
- Mass Transportation Accident
- Public Health Emergencies/ Environmental Issues
- Special Events
- Terrorism
- Utility disruption/failure
- Electromagnetic Pulse (EMP)

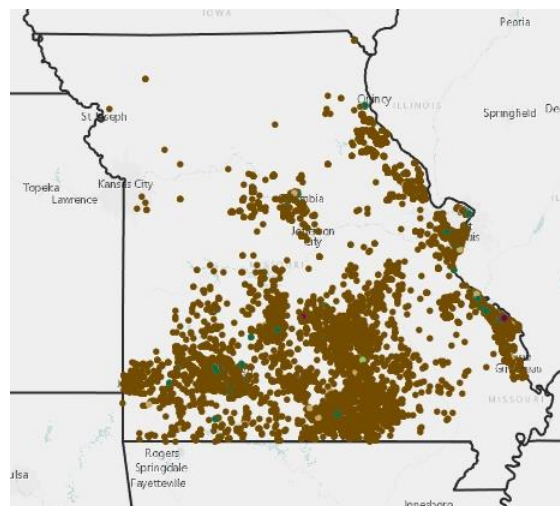
Hazards Excluded and Why

Landslides and land subsidence/sinkholes, according to the USGS website, are not likely to occur in County due to the type of soil and substructure in Northern Missouri. A map composed with data from Mo DNR (right) highlights this point.

Coastal storms - hurricanes or tsunamis were excluded, for obvious reasons.

Geothermal activity is not present in or near the county, and was therefore excluded.

Nuclear facilities were not considered, as the closest nuclear facilities were in excess of 50 miles, which per the 2013 update of the State Hazard Mitigation Plan is the radius of potential contamination hazard for water and soil in the event of a catastrophic incident.



3.1.2 Lewis County Disaster Declaration History

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

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

Table 3.1. FEMA Disaster Declarations that included Lewis County, Missouri; 1990-2015

Disaster Number	Description	Incident Period	Individual Assistance (IA) Public Assistance (PA)
995	Flooding, Severe Storm	June to October, 1993	Both
1054	Severe Storms, Tornadoes, Hail, Flooding	May to June, 1995	Both
1403	Ice Storm	January to February, 2002	Both
1463	Severe Storms, Tornadoes, Flooding	May, 2003	Both
1773	Severe Storms and Flooding	June to August, 2008	Both
1809	Severe Storms, Flooding and Tornadoes	September, 2008	Both
1847	Severe Storms, Tornadoes, Flooding	May, 2009	Both
1934	Severe Storms, Tornadoes and Flooding	June to July, 2010	Both
4130	Severe Weather, Flooding, and Tornadoes	May to June, 2013	Both
4200	Severe Weather, Flooding, and Tornadoes	September, 2014	Both
4238	Flash Flooding and Severe Storms	August, 2015	Both

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

3.1.3 Research Additional Sources

The following additional data sources were used to analyze the impacts of hazards in the planning area:

- Current Missouri State Hazard Mitigation Plan
- Previously approved planning area Hazard Mitigation Plan (date)
- Federal Emergency Management Agency (FEMA)
- Missouri Department of Natural Resources (MDNR)
- National Drought Mitigation Center Drought Reporter
- US Department of Agriculture's (USDA) Risk Management Agency Crop Insurance Statistics
- National Agricultural Statistics Service (Agriculture production/losses)
- Data Collection Questionnaires completed by each jurisdiction
- State of Missouri GIS data
- Environmental Protection Agency
- Flood Insurance Administration
- Hazards US (HAZUS)
- Missouri Department of Transportation
- Missouri Division of Fire Marshal Safety
- Missouri Public Service Commission
- National Fire Incident Reporting System (NFIRS)
- National Oceanic and Atmospheric Administration's (NOAA) National Center for Environmental Information (NCEI)
- Lewis 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)

The only centralized source of data for many of the weather-related hazards is the National Oceanic and Atmospheric Administration's (NOAA) National Center for Environmental Information (NCEI), formerly known as the National Climatic Data Center. Although it is usually the best and most current source, there are limitations to the data; 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.

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 2017, as entered by the NWS. Due to changes in the data collection and processing procedures over time, there are unique periods of record available depending on the event type.

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

Below is a listing of all the hazards that significantly impact the planning area and were chosen for further analysis. Not all hazards impact every jurisdiction. An “x” indicates 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

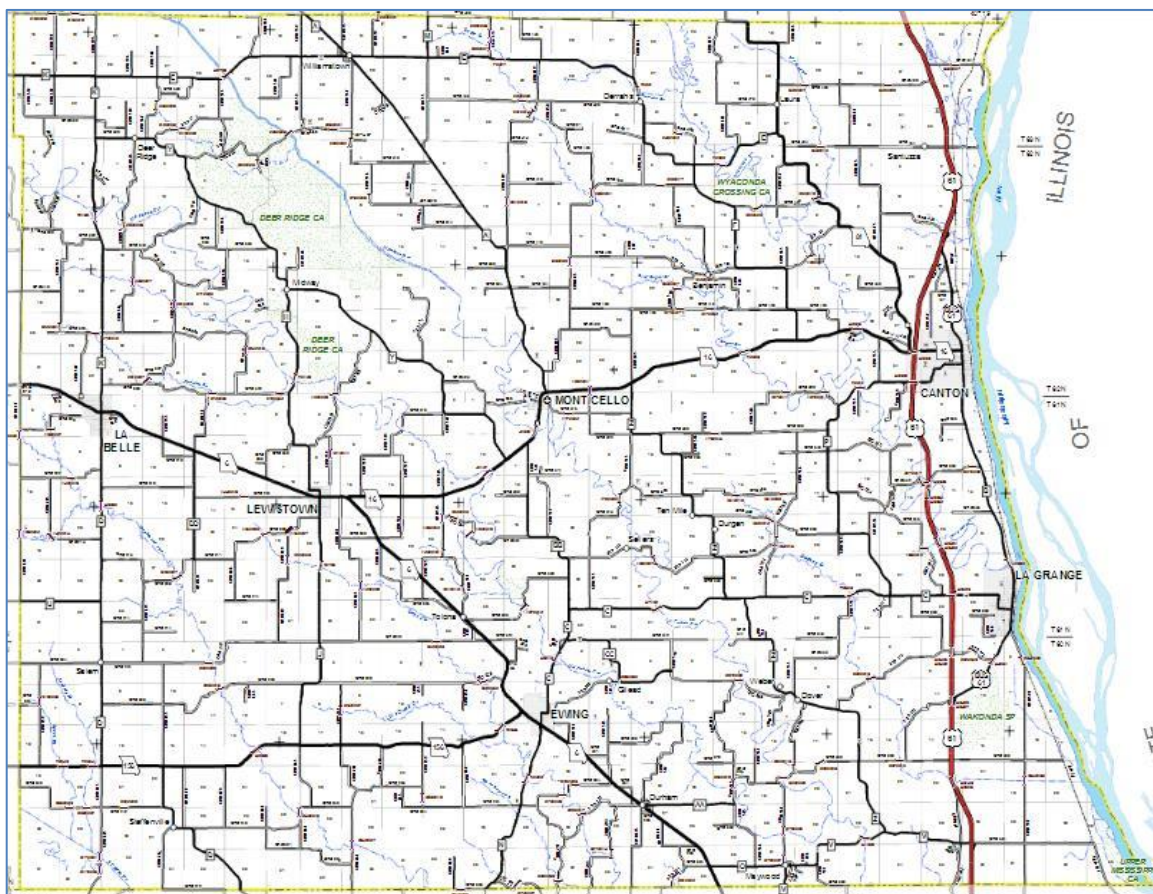
Jurisdiction	Dam Failure	Drought	Earthquake	Extreme Heat	Fires (Wildland)	Flooding (River and Flash)	Levee Failure	Severe Winter Weather	Thunderstorm/Lightning/Hail/High Wind	Tornado
Lewis County	x	x	x	x	x	x	x	x	x	x
Canton	-	x	x	x	-	x	x	x	x	x
Ewing	x	x	x	x	-	-	-	x	x	x
La Belle		x	x	x	-	-	-	x	x	x
La Grange		x	x	x	-	x	x	x	x	x
Lewistown		x	x	x	-	-	-	x	x	x
Monticello		x	x	x	-	-	-	x	x	x
Canton R-V (Canton)		x	x	x	-	x	x	x	x	x
Lewis County C-1 (Ewing)		x	x	x	-	-		x	x	x
Cedar Falls School (Canton)		x	x	x	-	-		x	x	x
Culver Stockton College (Canton)		x	x	x	-	-		x	x	x

- **Structure Fires** were excluded as they are considered a well mitigated hazard, with a complex infrastructure already in place to handle both routine and extraordinary incidents.
- **Sinkholes** were excluded as the current DNR map indicates no significant risk of this hazard in Lewis County.

3.1.5 Multi-Jurisdictional Risk Assessment

The Lewis County Hazard Mitigation Plan is a multi-jurisdictional plan update.

Lewis county has a total area of 511 square miles (1,320 km²), of which 505 square miles (1,310 km²) is land and 5.8 square miles (15 km²) (1.1%) is water. The County includes several major physiographic regions: along the County's 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 which are found broad ridges with gently sloping prairie. Elevations range from 470 ft 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.

3.2 Assets at Risk

This section assesses the planning area population, structures, critical facilities and infrastructure, and other important assets that may be at risk to hazards. There has been no significant change in the planning area since the last 5 year update.

3.2.1 Total Exposure of Population and Structures

Unincorporated Lewis County and Incorporated Communities

Tables 3.3 and 3.4 shows the total population and building counts, based on census data and a state wide GIS database built in 2012 recording structures by type.

Table 3.3. Maximum Population and Building Counts by Jurisdiction-

Jurisdiction	2010 Population	Building Count (all buildings)
Lewis County	10,494	26,560
Canton	2,562	3,104
Ewing	477	868
La Belle	623	756
La Grange	984	1,743
Lewistown	611	639
Monticello	109	254

Sources: Population, 2010 U.S. Census; Building Count s – MSDIS structures database

Table 3.4. Building Counts by Usage Type

Jurisdiction	Agricultural	Banking and Finance	Building General	Commercial and Retail	Education	Emergency Response	Energy	Government and Military	Health and Medical	Industry	Information/communication	Mail and Shipping	Attractions and Landmarks	Transportation Facilities	Water Supply and Treatment
Lewis County	12603	5	13078	462	51	6	16	6	7	139	6	3	129	27	23
Canton	66	0	2633	249	40	0	0	1	0	70	0	1	26	0	18
Ewing	72	0	740	52	0	1	0	0	0	0	0	0	0	0	2
La Belle	40	2	664	36	0	1		1	2	5	1	0	2	0	0
La Grange	101	1	1566	40	0	2	0	1	0	26	0	0	5	1	0
Lewistown	20	1	570	33	0	1	3	1	0	3	0	0	7	0	0
Monticello	85	1	151	12	1	1	0	1	0	0	0	1	0	1	0

Sources: MSDIS statewide structures database 2014

School Districts and Special Districts

Even though schools and special districts' total assets are included in the tables above, additional discussion is required, based on the data that is available from the districts' completion of the Data Collection Questionnaire and district maintained websites. Information on the participating public school districts is provided in **Table 3.6** below.

Table 3.5. Population and Building Exposure by Jurisdiction-Public School Districts

Public School District	Enrolment	Building Count	Total Exposure (Assessed Valuation)
Canton R-V (Canton)	527	2	\$44,620,801
Lewis County C-1 (Ewing)	942	2	\$85,029,510

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

3.2.2 Critical and Essential Facilities and Infrastructure

This section will include information from the Data Collection Questionnaire and other sources concerning the vulnerability of participating jurisdictions' critical, 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:

- List other sources used to assemble critical facility inventory
- Chemical Facilities (Tier II Facilities) information (if included in the list of hazards identified by the participants) can be obtained by contacting the county LEPC. The LEPC will then request information (name, address, purpose for asking, etc.) and then provide the information. In order to find out who the LEPC contact is for your planning areas, see <http://sema.dps.mo.gov/docs/programs/executive/MERC/LEPC-addresses.pdf>.
- HAZUS contains an inventory of critical facilities that can be exported for each jurisdiction.
- The Homeland Security Infrastructure Protection Program (HSIPP) is another source. But access may be restricted.

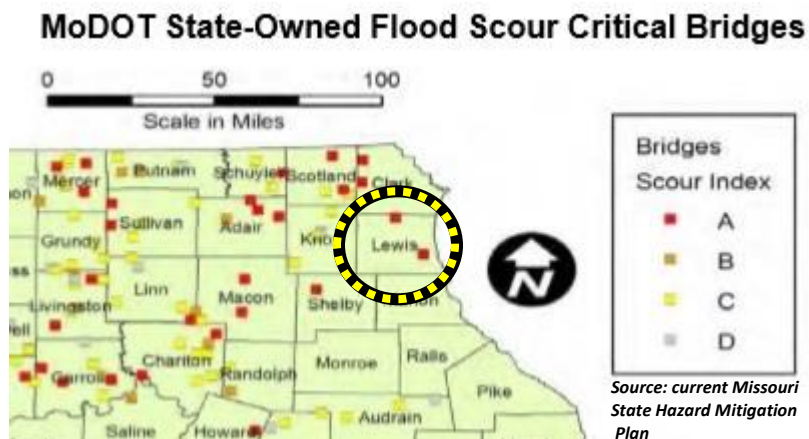
Table 3.6. Inventory of Critical/Essential Facilities and Infrastructure by Jurisdiction

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
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	
La Belle				x				x	x					x								x	
La Grange				x				x	x					x		x	x	x					
Lewistown				x			x	x	x					x	x								
Monticello								x	x					x								x	
Williamstown								x	x														

Source: Data Collection Questionnaires; HAZUS, etc.

Lewis County Bridges

Figure 3.1. Lewis County Scour Critical Bridges

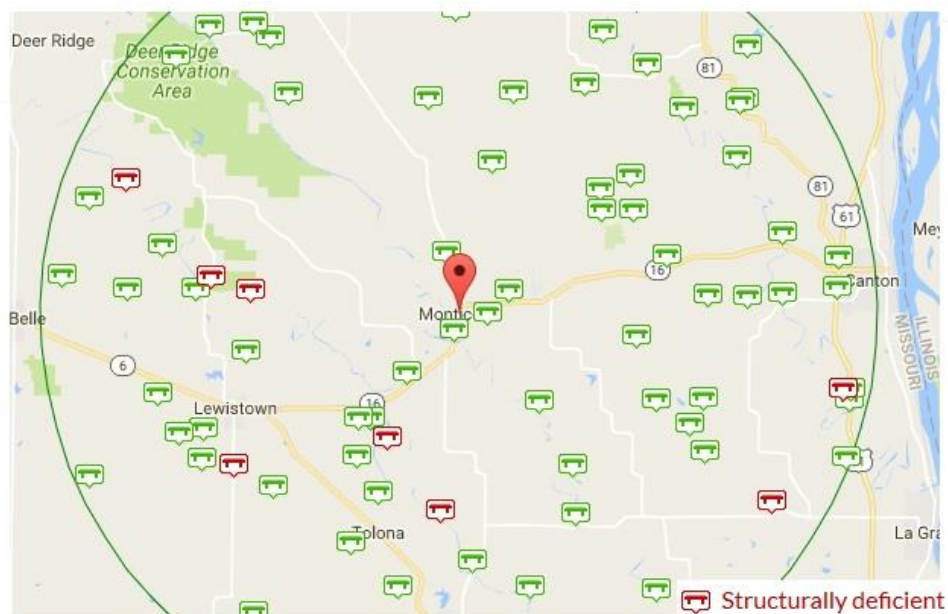


Bridge Scour is the removal of sediment such as sand and rocks from around bridge abutments or piers, caused by swiftly moving water and can scoop out scour holes compromising the integrity of the bridge. The Missouri Department of Transportation uses a classification system of A-D to indicate the potential for scour. Those bridges in the A Class are “scour critical”- those that are most vulnerable to scour - and those in the D Class are those that are least vulnerable to scour.

Figure 3.2. Structurally Deficient Bridges *Source: <http://www.fhwa.dot.gov/bridge/nbi/no10/county.cfm>*

Total Count	Structurally Deficient	Functionally Obsolete	Totally deficient
164	19	18	37

Note: Map (right) Shows bridges within 10 miles of county center. It is assumed the other 10 structurally deficient bridges listed by the Federal Highway Administration are located outside this area. In addition the map does not display functionally obsolete or totally deficient bridges, only those classified as “structurally deficient”.



Source: <http://t4america.org/maps-tools/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 3.7. Threatened and Endangered Species in Lewis County

Common Name	Scientific Name	Status
Least Tern	<i>Sterna Antillarum</i>	Federally Ranked Endangered
Piping Plover	<i>Caradrius melodus</i>	Federally Ranked Threatened
Rufa Red Knot	<i>Calidris Canutus Rufa</i>	Federally Ranked Threatened
Indiana Bat	<i>Myotis Sodalis</i>	Federally Ranked Endangered
Northern Long-Eared Bat	<i>Myotis Septendtrionalis</i>	Federally Ranked Threatened
Pallis Sturgeon	<i>Scaphirhynchus Albus</i>	Federally Ranked Endangered
Bald Eagle	<i>Haliaeetus Leucocephalus</i>	State Ranked Vulnerable
Black Sandshell	<i>Ligumia Recta</i>	State Ranked Imperiled
Brassy Minnow	<i>Hybognathus Haninsoni</i>	Sate Ranked Vulnerable
Cerulean Warbler	<i>Setophaga Cerulea</i>	State Ranked Vulnerable
Eastern Foxsnake	<i>Pantherophis Vulpinus</i>	State Ranked Critically Imperiled
Ebonysell	<i>Susconaia Ebena</i>	State Ranked Critically Imperiled
Evening Primrose	<i>Oenothera Clelandil</i>	State Ranked Imperiled
Franklin's Ground Squirrel	<i>Poliocitellus Franklinii</i>	State Ranked Imperiled
Grove Sandwort	<i>Moehringia Lateriflora</i>	State Ranked Imperiled
Hickorynut	<i>Obovaria Olivaria</i>	State Ranked Vulnerable
Lake Bank Sedge	<i>Carex Lacustris</i>	State Ranked Imperiled
Long-Tailed Weasel	<i>Mustela Frenata</i>	State Ranked Vulnerable
Mississippi Silvery Minnow	<i>Hybognathus nuchalis</i>	State Ranked Vulnerable
Quaking Aspen	<i>Populus Tremuloides</i>	State Ranked Imperiled
Regal Fritillary	<i>Speyeria Idalia</i>	State Ranked Vulnerable
River Darter	<i>Percina Shumardi</i>	State Ranked Vulnerable
Rock Pocketbook	<i>Arcidens Confragosus</i>	State Ranked Vulnerable
Rose Turtlehead	<i>Chelone Obliqua</i>	State Ranked Imperiled
Sand Grasshopper	<i>Psinidia Fenestralis</i>	State Ranked Imperiled
Schweintz's Flatsedge	<i>Cyperus Schweintzii</i>	State Ranked Vulnerable
Sheepnose	<i>Plethobasus Cyphus</i>	State Ranked Imperiled
Spinulose Shiled Fern	<i>Dryopteris Carthusiana</i>	State Ranked Imperiled
Wartyback	<i>Quadrula Nodulata</i>	State Ranked Vulnerable
Western Sand Darter	<i>Ammocrypta Clara</i>	State Ranked Imperiled

Source: U.S. Fish and Wildlife Service, Missouri Department of Conservation

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

Table 3.8. State parks, Conservation and Wildlife Areas in Lewis County

Area Name	Location	Description
Wakonda State Park	Just south of LaGrange, Mo on Hwy 61	The park consists of 1,053.87 acres featuring six lakes and a rare sand prairie. There are boat ramps, hiking and biking trails, a 20,000 square foot swimming beach, picnic areas, and campsites featuring sewer/electric/water amenities.
Wyconda Crossing Conservation Area	5.75 miles west/northwest of Canton, Mo	148 acres of forested area landlocked by private owners, accessible from the Wyaconda river only. No designated trails. Primitive camping only, no amenities.
Canton Ferry Access	Canton, Mo	Mississippi River Access featuring a boat ramp and courtesy dock.
Deer Ridge Conservation Area	5 miles north and 2 miles west of Lewistown, Mo	7,000 acres total: 5,000 of forest, a 48 acre lake with boat ramp and dock, 33 fishless ponds, three permanent streams, 19 miles of multi-use trails, shooting range, 4 designated camping areas with restrooms and 4 primitive camping areas with no amenities, and 1 horse campground.
Labelle Lake Conservation Area	2 miles south and 1 mile east of Labelle, Mo	334 acres total, predominately grassland with a 112 acre lake with dock, boat ramp and 2 restrooms. No camping amenities.
Sunnyside School Access	South 2 miles, west 1.5 miles from Canton, Mo	120 acre area, 30 acres forested, allowing access to the Wyaconda River via boat ramp. No designated trails. Primitive camping only, no amenities.
Talona Access	3.4 miles north, 1 mile west of Ewing, Mo	176 acre area, approximately 94 acres forested. Access to the Middle Fabius River via boat ramp. No designated trails. Primitive Camping only, no amenities.
Fenway Landing Access	4.5 miles north, 1 mile east of Canton, Mo	US Army Corps of Engineers- Picnic area and boat ramp access to the Mississippi River.
Upper Mississippi Conservation Area	From the Melvin Price Lock and Dam at Alton, Illinois, to LaGrange, Missouri.	14,912 mostly forested acres in 87 scattered tracts adjacent to the Mississippi River, and some river islands. No designated trails. Two boat ramps, one restroom area, and 91 waterfowl, hunting blinds.

<http://mdc4.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 lists properties in Lewis County that are on the National Register of Historic Places

Table 3.9. Lewis County Properties on the National Register of Historic Places

Property	Address	City	Date Listed
First Presbyterian Church	401 Jefferson	LaGrange, Mo	08/28/12
William Gray House	407 Washington	LaGrange, Mo	06/03/99
Dr. J.A. Hay House	406 W Monroe St.	LaGrange, Mo	06/03/99
Henderson Hall	College Hill	Canton, Mo	10/02/78
Joseph Hipkins House	500 S. 3 rd St.	LaGrange, Mo	05/08/05
Lewis County Courthouse	100 E. Lafayette St.	Monticello, Mo	05/08/08
Lincoln School	Mo. Hwy B	Canton, Mo	02/10/83
Lock and Dam No. 20 Historical District	0.5 mi. N of Henderson St.	Canton, Mo	03/10/04
John McKoon House	500 W. Monroe St.	LaGrange, Mo	06/03/99
Quincy, Missouri, and Pacific RR Station	Off Mo 6	Lewistown, Mo	05/07/79
Fred Rhoda House	200 S 2 nd St.	LaGrange, Mo	06/03/99
A.C. Waltman House	302 Lewis St.	LaGrange, Mo	06/03/99

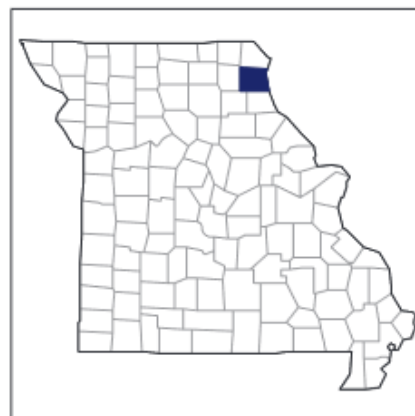
Source: Missouri Department of Natural Resources – Missouri National Register Listings by County
<http://dnr.mo.gov/shpo/mnrlist.htm>

Agriculture Agriculture plays an important role in the Lewis County economy, both in terms of production and in terms of the river providing a transport hub for ag producers in the region. The following pages reflect information from the most recent Census of Agriculture.

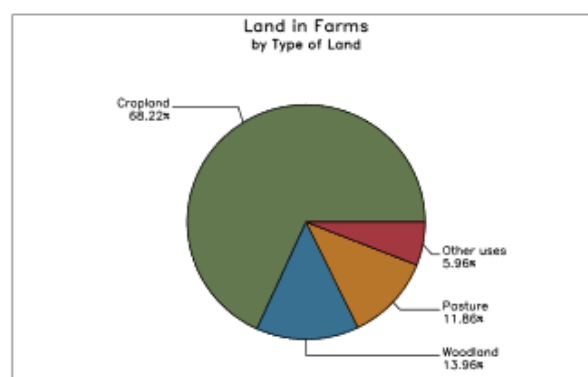
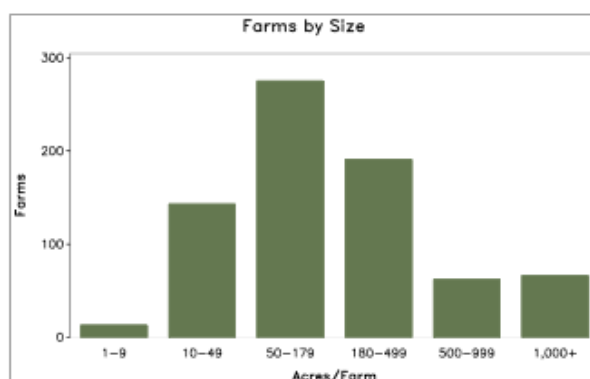
2007 CENSUS OF AGRICULTURE

County Profile

Lewis County Missouri



	2007	2002	% change
Number of Farms	750	838	- 11
Land in Farms	261,299 acres	284,450 acres	- 8
Average Size of Farm	348 acres	339 acres	+ 3
Market Value of Products Sold	\$73,037,000	\$49,146,000	+ 49
Crop Sales \$44,189,000 (61 percent)			
Livestock Sales \$28,849,000 (39 percent)			
Average Per Farm	\$97,383	\$58,647	+ 66
Government Payments	\$3,529,000	\$3,950,000	- 11
Average Per Farm Receiving Payments	\$6,487	\$7,854	- 17



2007 CENSUS OF AGRICULTURE

County Profile

Lewis County – Missouri

Ranked items among the 114 state counties and 3,079 U.S. counties, 2007

Item	Quantity	State Rank	Universe ¹	U.S. Rank	Universe ¹
MARKET VALUE OF AGRICULTURAL PRODUCTS SOLD (\$1,000)					
Total value of agricultural products sold	73,037	41	114	1,201	3,076
Value of crops including nursery and greenhouse	44,189	25	114	942	3,072
Value of livestock, poultry, and their products	28,849	49	114	1,220	3,069
VALUE OF SALES BY COMMODITY GROUP (\$1,000)					
Grains, oilseeds, dry beans, and dry peas	(D)	22	114	652	2,933
Tobacco	-	-	11	-	437
Cotton and cottonseed	-	-	8	-	626
Vegetables, melons, potatoes, and sweet potatoes	139	48	109	1,673	2,796
Fruits, tree nuts, and berries	(D)	(D)	97	(D)	2,859
Nursery, greenhouse, floriculture, and sod	4	108	109	2,636	2,703
Cut Christmas trees and short rotation woody crops	-	-	63	-	1,710
Other crops and hay	(D)	(D)	114	(D)	3,054
Poultry and eggs	13	104	113	2,352	3,020
Cattle and calves	11,212	68	114	1,096	3,054
Milk and other dairy products from cows	(D)	3	106	(D)	2,493
Hogs and pigs	(D)	(D)	112	(D)	2,922
Sheep, goats, and their products	460	1	112	267	2,998
Horses, ponies, mules, burros, and donkeys	162	45	113	1,287	3,024
Aquaculture	-	-	45	-	1,498
Other animals and other animal products	2	101	110	2,449	2,875
TOP CROP ITEMS (acres)					
Corn for grain	59,773	14	107	527	2,834
Soybeans for beans	58,923	37	104	448	2,039
Forage - land used for all hay and haylage, grass silage, and greenchop	16,088	94	114	1,251	3,050
Wheat for grain, all	8,678	37	108	764	2,481
Corn for silage	1,696	6	97	729	2,263
TOP LIVESTOCK INVENTORY ITEMS (number)					
Cattle and calves	23,180	78	114	1,280	3,080
Hogs and pigs	8,558	51	111	733	2,958
Goats, all	2,113	6	113	261	3,023
Horses and ponies	794	79	114	1,696	3,056
Layers	613	96	113	2,015	3,024

Other County Highlights

Economic Characteristics	Quantity	Operator Characteristics	Quantity
Farms by value of sales:		Principal operators by primary occupation:	
Less than \$1,000	277	Farming	308
\$1,000 to \$2,499	38	Other	442
\$2,500 to \$4,999	35	Principal operators by sex:	
\$5,000 to \$9,999	68	Male	672
\$10,000 to \$19,999	56	Female	78
\$20,000 to \$24,999	25	Average age of principal operator (years)	
\$25,000 to \$39,999	56		58.2
\$40,000 to \$49,999	14	All operators by race²:	
\$50,000 to \$99,999	49	American Indian or Alaska Native	4
\$100,000 to \$249,999	73	Asian	-
\$250,000 to \$499,999	33	Black or African American	1
\$500,000 or more	28	Native Hawaiian or Other Pacific Islander	-
Total farm production expenses (\$1,000)	50,952	White	1,044
Average per farm (\$)	67,936	More than one race	13
Net cash farm income of operation (\$1,000)	28,719	All operators of Spanish, Hispanic, or Latino Origin²	
Average per farm (\$)	38,292		13

See "Census of Agriculture, Volume 1, Geographic Area Series" for complete footnotes, explanations, definitions, and methodology.

(D) Cannot be disclosed. (Z) Less than half of the unit shown.

¹ Universe is number of counties in state or U.S. with item. ² Data were collected for a maximum of three operators per farm.

3.3 Land Use and Development

3.3.1 Development since Previous Plan Update

The table below shows county growth, as reflected in US Census data.

Table 3.10. County Population Growth, 2000-2010

Jurisdiction	2000 Population	2010 Population	2000-2010 # Change	2000-2010 % Change
Lewis County	10,211	10,494	+ 283	+ 2.7
Canton	2,377	2,562	+ 185	+ 6.6
Ewing	456	477	+ 21	- 4.6
La Belle	660	623	- 37	+ 5.6
La Grange	931	984	- 53	- 5.7
Lewistown	534	611	- 77	- 14.4
Monticello	98	109	+ 11	+ 11.2

Source: U.S. Bureau of the Census, Decennial Census; 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. **Table 3.14** provides the change in numbers of housing units in the planning area from 2000 to 2010.

Table 3.11. Change in Housing Units, 2000-2010

Jurisdiction	Housing Units 2000	Housing Units 2010	2000-2010 # Change	2000-2010 % change
Lewis County	4,602	4,535	-67	- 1.5
Canton	1,005	1,006	+1	+ 0.09
Ewing	223	214	-9	- 4.2
La Belle	324	377	+53	+ 14.0
La Grange	523	445	-78	- 17.5
Lewistown	309	271	-38	- 14.0
Monticello	52	60	+8	+ 13.3

Source: U.S. Bureau of the Census, Decennial Census; Population Statistics are for entire incorporated areas as reported by the U.S. Census Bureau

3.3.2 Future Land Use and Development

Lewis County is a small county, with business and industry centered on agricultural production and river shipping. There has been little change on any significant scale in the County in the last five years, and future growth, land use, and development are projected to change very little, and the county's risks will, correspondingly, remain unchanged.

3.4 Hazard Profiles, Vulnerability, and Problem Statements

Each hazard will be analyzed individually in a hazard profile. The profile will consist of a general hazard description, location, severity/magnitude/extent, previous events, future probability, a discussion of risk variations between jurisdictions, and how anticipated development could impact risk. At the end of each hazard profile will be a vulnerability assessment, followed by a summary problem statement.

Hazard Profiles

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

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

Geographic Location: This section describes the geographic location of the hazard in the planning area. When possible, maps have been used to indicate the specific locations of the planning area that are vulnerable to specific hazards. For some hazards, the entire planning area is at risk.

Severity/Magnitude/Extent: This includes information about the severity, magnitude, and extent of a hazard. For some hazards, this is accomplished with description of a value on an established scientific scale or measurement system, such as an EF2 tornado on the Enhanced Fujita Scale. Severity, magnitude, and extent can also include the speed of onset and the duration of hazard events. Describing the severity/magnitude/extent of a hazard is not the same as describing its potential impacts on a community. Severity/magnitude/extent defines the characteristics of the hazard regardless of the people and property it affects.

Previous Occurrences: This section includes available information on historic incidents and their impacts. Historic event records form a solid basis for probability calculations.

Probability of Future Occurrence: The frequency of recorded past events is used to estimate the likelihood of future occurrences. Probability was determined by dividing the number of recorded events by the number of years and multiplying by 100. This gives the percent chance of the event happening in any given year. For events occurring more than once annually, the probability will be reported 100% in any given year, with a statement of the average number of events annually.

The discussion on the probability of future occurrence also considers changing future conditions, such as the effects of long-term changes in weather patterns and climate on the identified hazards.

Vulnerability Assessments

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

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

The vulnerability assessments in the 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.

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

Vulnerability Overview

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

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

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, possible ways to resolve those problems, and challenges that may make mitigation efforts difficult. Jurisdiction-specific information will be presented in those cases where the risk varies across the planning area.

3.4.2 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 Dam Inventory (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 3.12. MDNR Dam Hazard Classification Definitions

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

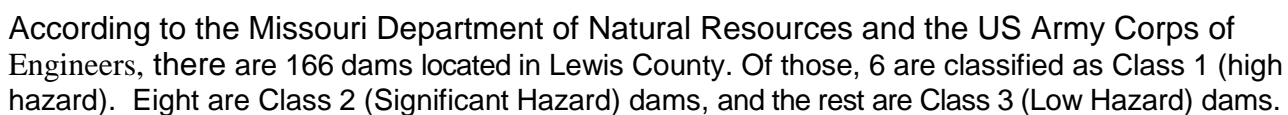
Source: Missouri Department of Natural Resources, http://dnr.mo.gov/env/wrc/docs/rules_reg_94.pdf

Table 3.13. NID Dam Hazard Classification Definitions

Hazard Class	Definition
Low	Failure or mis-operation results in no probable loss of human life and low economic and/ or environmental losses (primarily limited to owner's property)
Significant	Failure or mis-operation results in no probable loss of human life but can cause economic loss.
High	Failure or mis-operation will probably cause loss of human life

Source: National Inventory of Dams

Dams in Planning Area



There is one dam operated by the United States Army Corps of Engineers (USACE): Built in 1935, Lock and Dam No. 20 is located on the Upper Mississippi River, about one mile upstream from Canton, Missouri.

It includes a 2,369 feet (722 m) long dam and a lock chamber that is 110 feet wide by 600 feet long. There is also an incomplete auxiliary lock.

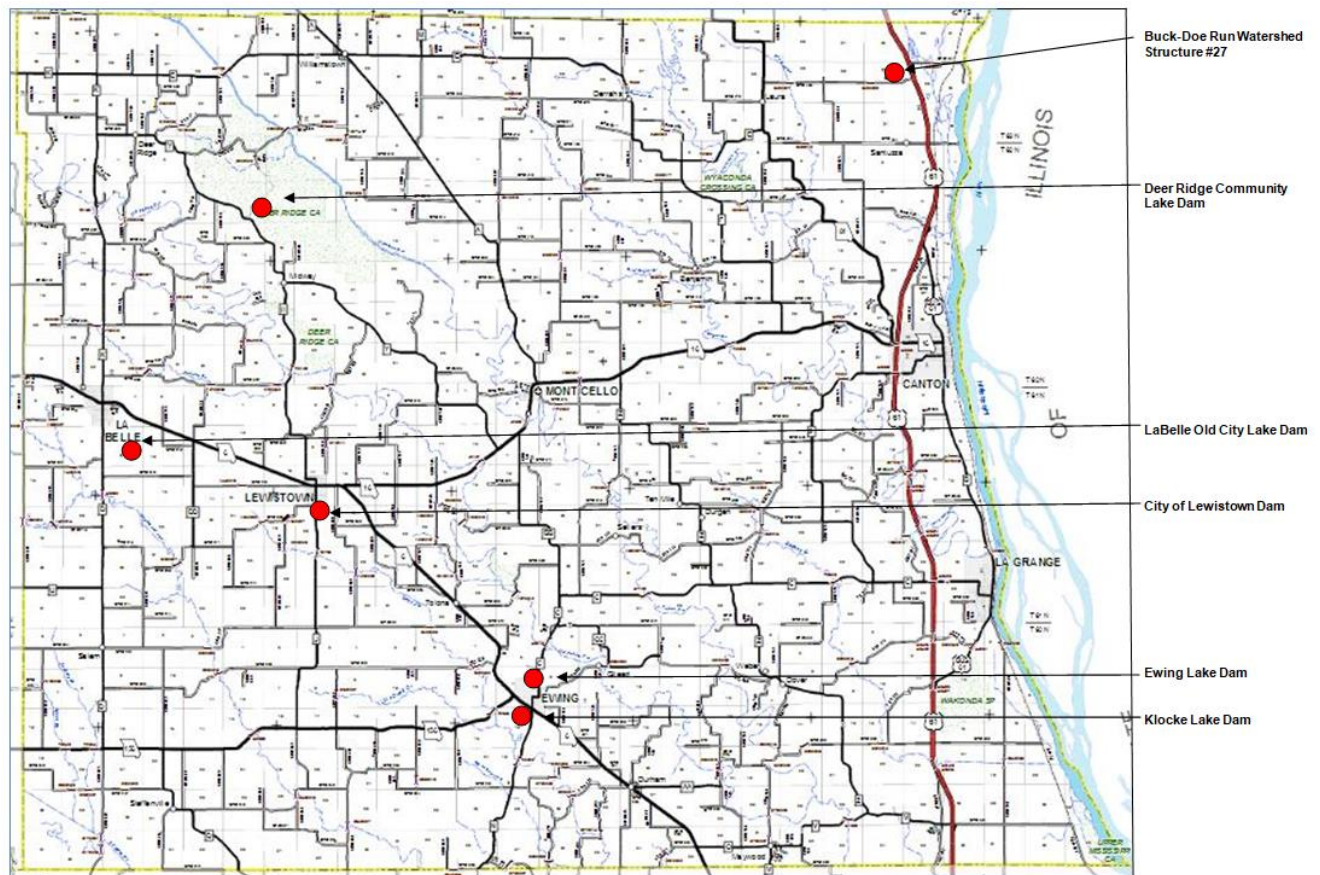


Table 3.14. High or Significant Hazard Dams in the Lewis County Planning Area

Dam Name	Hazard Rating	Dam Height (Ft)	River	Nearest Down stream City	Dist. to Nearest City (Miles)
EWING LAKE DAM	High	39	TR-MIDDLE FABIVS RIVER	TAYLOR	16
CITY OF LEWISTOWN DAM	High	25	TR-MIDDLE FABIVS RIVER	TAYLOR	20
DEER RIDGE COMMUNITY LAKE DAM	High	38	TR-NORTH FABIVS RIVER	MONTICELLO	8
LA BELLE OLD CITY LAKE DAM	High	35	TR TROUBLESOME CREEK	STEFFENVILLE	11
BUCK-DOE RUN WATERSHED STRUCTURE #27A	High	27	ARTESIAN BRANCH	CANTON	3
KLOCKE LAKE DAM	High	18	TR-GRASSY CREEK	HANNIBAL	25
MISSISSIPPI RIVER DAM 20	Significant	37	MISSISSIPPI RIVER	CANTON	1
BUCK-DOE RUN WTRSHD #6 DAM	Significant	46	ARTESIAN BRANCH	CANTON	X
DURGENS CREEK WATERSHED DAM 5	Significant	25	TR-DURGENS CREEK	HANNIBAL	X
BUCK & DOE RUN WATERSHED DAM 39	Significant	35	TR-BUCK RUN CR	CANTON	X
BUCK & DOE RUN SITE #3	Significant	36	DOE RUN	CANTON	X
BUCK,DOE RUN #4 DAM	Significant	48	TR-BUCK RUN	CANTON	X
BUCK & DOE RUN WTRSHD SITE #5 DAM	Significant	20	TR-MISSISSIPPI RIVER	CANTON	X
BUCK & DOE RUN WATERSHED DAM 37	Significant	34	TR-BUCK RUN CR	CANTON	x

Sources: Missouri Department of Natural Resources, <http://dnr.mo.gov/env/wrc/dam-safety/statemap.htm> and National Inventory of Dams, http://nid.usace.army.mil/cm_apex/f?p=838:12 DNR Dam and Reservoir Safety Program inundation maps showing geographic locations at risk, extent of failure and assets at risk.

Figure 3.3. High Hazard Dam Locations in Lewis County



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

Ewing City Lake Dam: Inundation area shown in blue



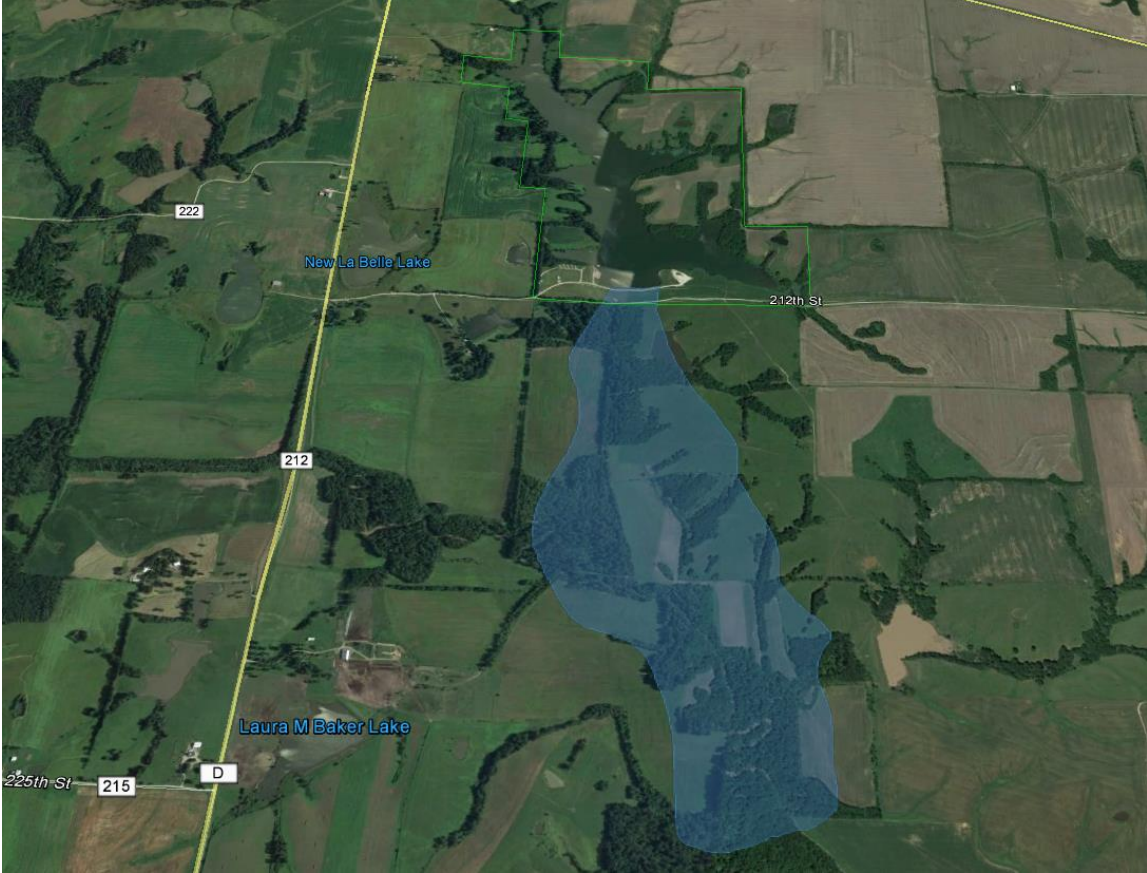
City of Lewiston Lake Dam: Inundation area shown in blue



Deer Ridge Community Lake Dam: Inundation area shown in blue



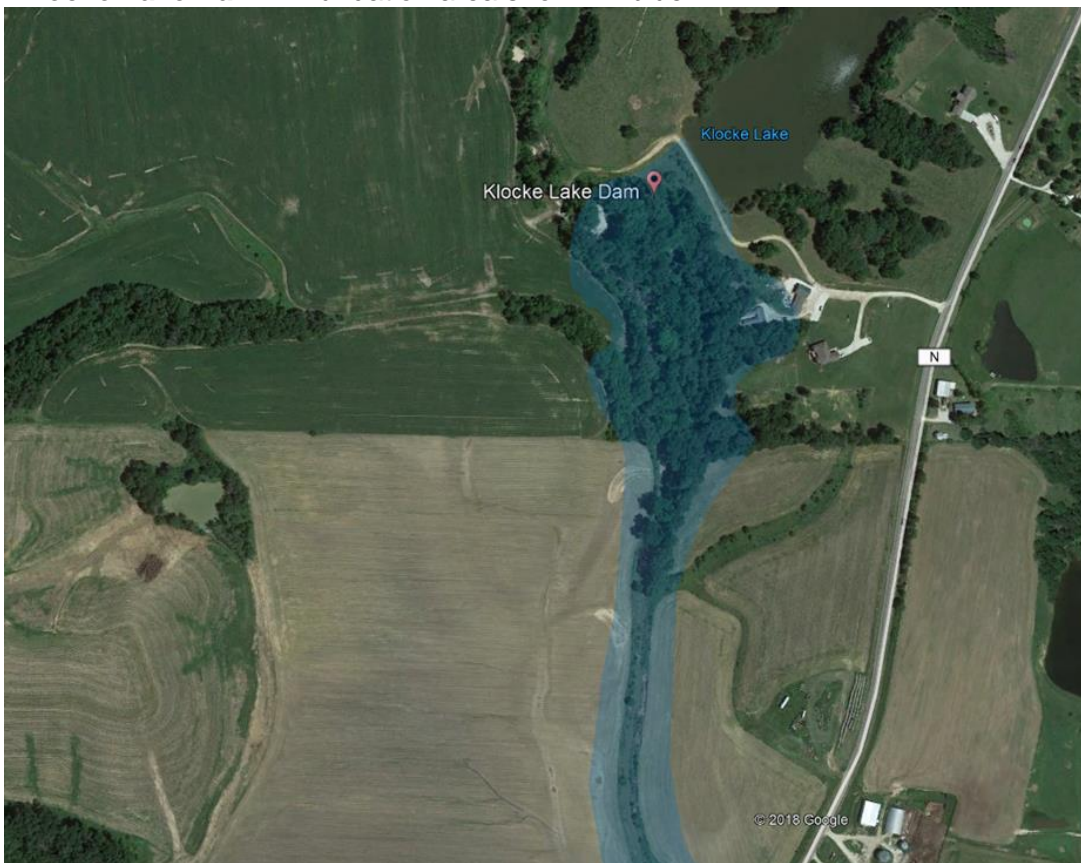
La Belle Old City Lake Dam: Inundation area shown in blue



Buck Doe Run Watershed Structure #27A. : Inundation area shown in blue



Klocke Lake Dam : Inundation area shown in blue



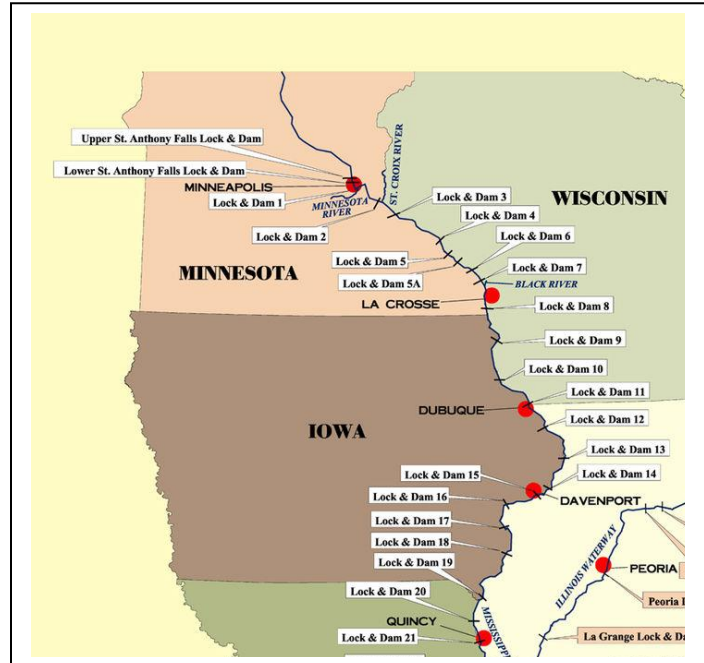
Upstream Dams Outside the Planning Area

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. This will be discussed in further detail in the flooding section of this risk assessment.

Severity/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, such a calculation is not possible.

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 the amount 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.

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.

3.4.3 Drought

Hazard Profile

Hazard Description

Include general information about drought. For example, 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.

Data sources: <http://www.drought.unl.edu/> <http://droughtreporter.unl.edu/>

Geographic Location

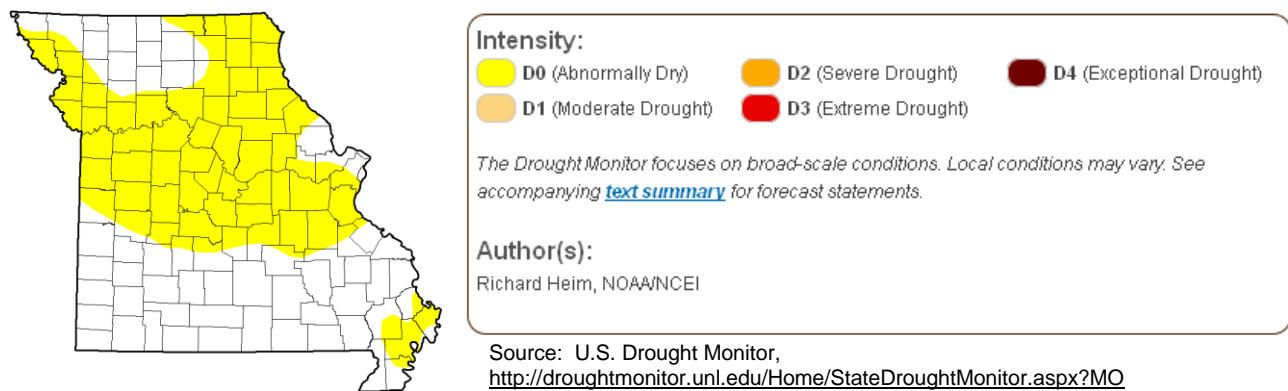
Because of the broad scope of drought, all of Lewis County is susceptible to this hazard. Agricultural land is extremely vulnerable to drought impacts, and according to US Census data 78% of Lewis County total land area is classified as farmland, making the impact of drought one that is acutely felt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

Severity/Magnitude/Extent

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. In Lewis County and Northern Missouri in general, drought has an especially significant effect on drinking water supplies. Ground water is scarce and unreliable in Northern Missouri and most water systems in the region obtain water from surface sources. During prolonged periods of drought, reservoirs may become depleted and stream levels may drop so low that water can't be pumped from them – they may even go completely dry. The impacts of this can be severe.

Figure 3.4. U.S. Drought Monitor Map of Missouri, November 2015



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

Six drought events were reported to NCEI between 1990 and 2017. April 2000 was the driest on record in the state of Missouri, according to the Midwestern Climate Center. April's dry weather represented a continuation of long-term drought dating back to July 1999, as rainfall deficits in most locations exceeded 10 inches and the U.S. Drought Monitor showed most of Missouri in a severe drought. According to the Missouri State Climatologist, 1999-2000 was the 5th driest July-through-April period on record. The areas hardest hit by the long-term drought were along Missouri's northern border, where rainfall deficits had reached 15 to 20 inches. In 2012 Missouri saw the worst drought in 25 years. Dry conditions, which started in the spring, intensified during the month of July and continued expanded across the state. There were yearly rainfall deficits of 10 to 15 inches. Below normal precipitation continued through July. The drought continued to intensify through August and Missouri saw yearly rainfall deficits in the 10 to 15 inch range. The remnants of Hurricane Isaac brought some much needed relief to drought conditions across the area on the 1st of September, which eased the drought conditions somewhat, but drought remained through September and on into October.

Probability of Future Occurrence

Over a 25 year period Lewis County experienced six drought events, indicating a 24% annual average percentage probability of drought occurring in the planning area. This is considered a "low moderate" probability.

Although drought is not predictable, long-range outlooks and predicted impacts of climate change could indicate an increased chance of drought.

Vulnerability

Lewis County has less drought vulnerability than many Missouri Counties, due to its plentiful surface and ground water supplies.

Past losses in Lewis County, 2011 - 2017

Total Crop Loss to Drought, in dollars	Acres Affected
\$ 58,605,300	263,426

Potential Losses to Existing Development

Determining the direct and indirect costs associated with drought is difficult because of the broad impacts of drought and the difficulty of establishing when droughts begin and end.

Impact of Previous and Future Development

For the most part there is no development in the County that will affect or be affected by the impacts of drought, which predominately affects agricultural infrastructure.

Impact of Climate Change

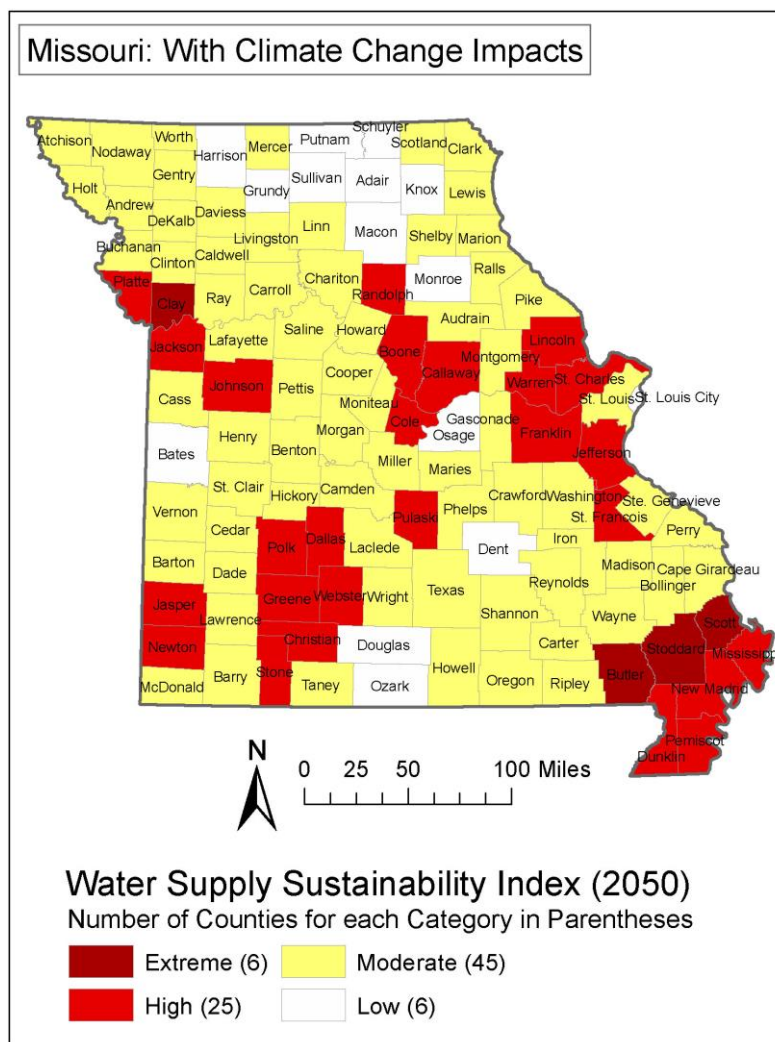
A new analysis, performed for the Natural Resources Defense Council, examined the effects of climate change on water supply and demand in the contiguous United States. The study found that more than 1,100 counties will face higher risks of water shortages by mid-century as a result of climate change.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

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.



3.4.4 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

The history of the New Madrid fault line and its potential for another major earthquake is well known and much studied, and analysis indicates that Lewis County is located in such a way that it would be heavily impacted by a major seismic event on the New Madrid, reaching an 8 on the Modified Mercalli Intensity Scale in the event of a 7.6 magnitude earthquake.

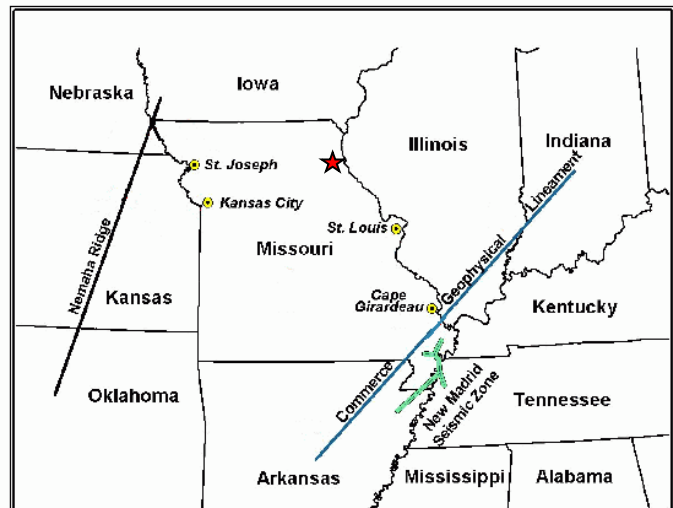
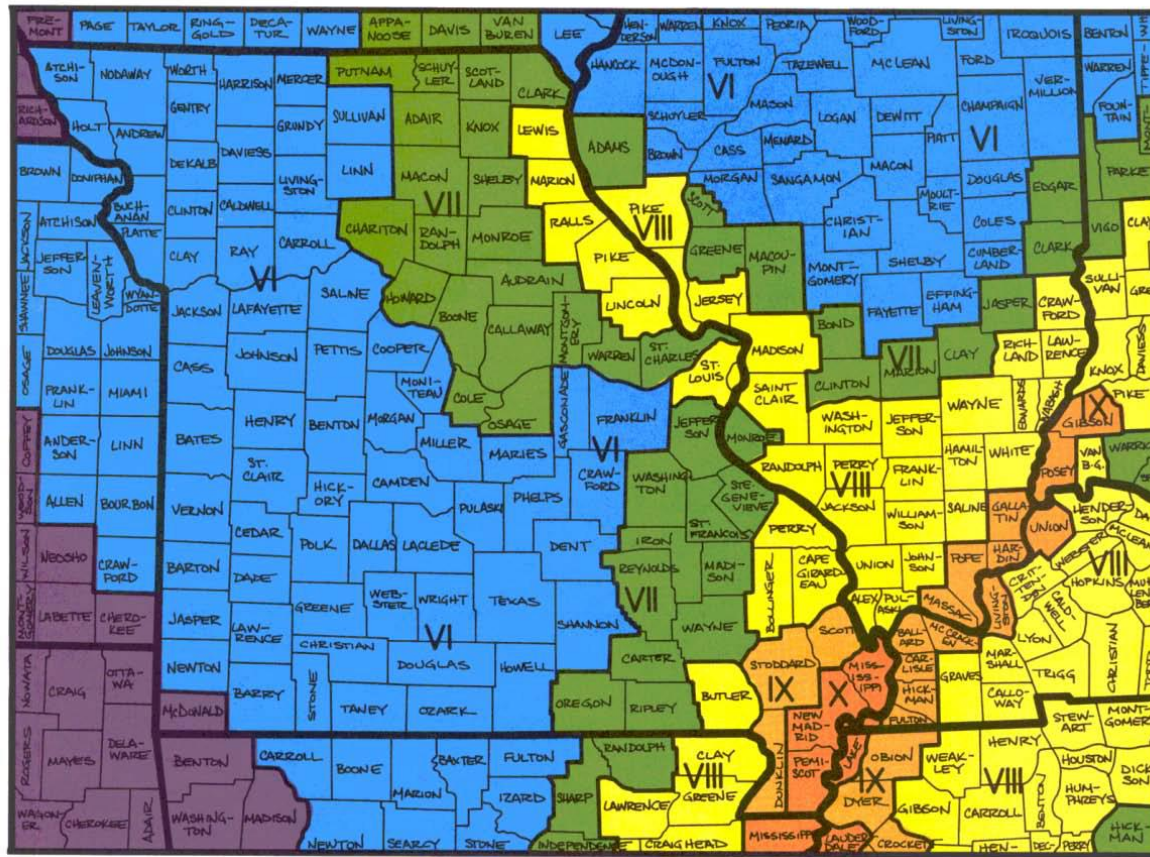
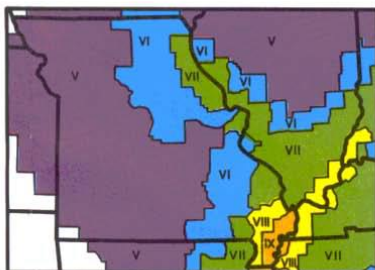


Figure 3.5. Impact Zones for Earthquake Along the New Madrid Fault

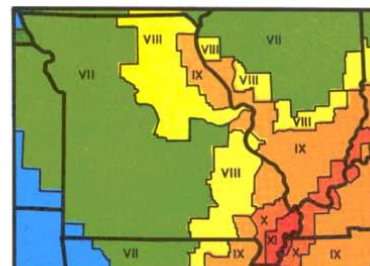


This map shows the highest projected Modified Mercalli intensities by county from a potential magnitude - 7.6 earthquake whose epicenter could be anywhere along the length of the New Madrid seismic zone.



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

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



Source:

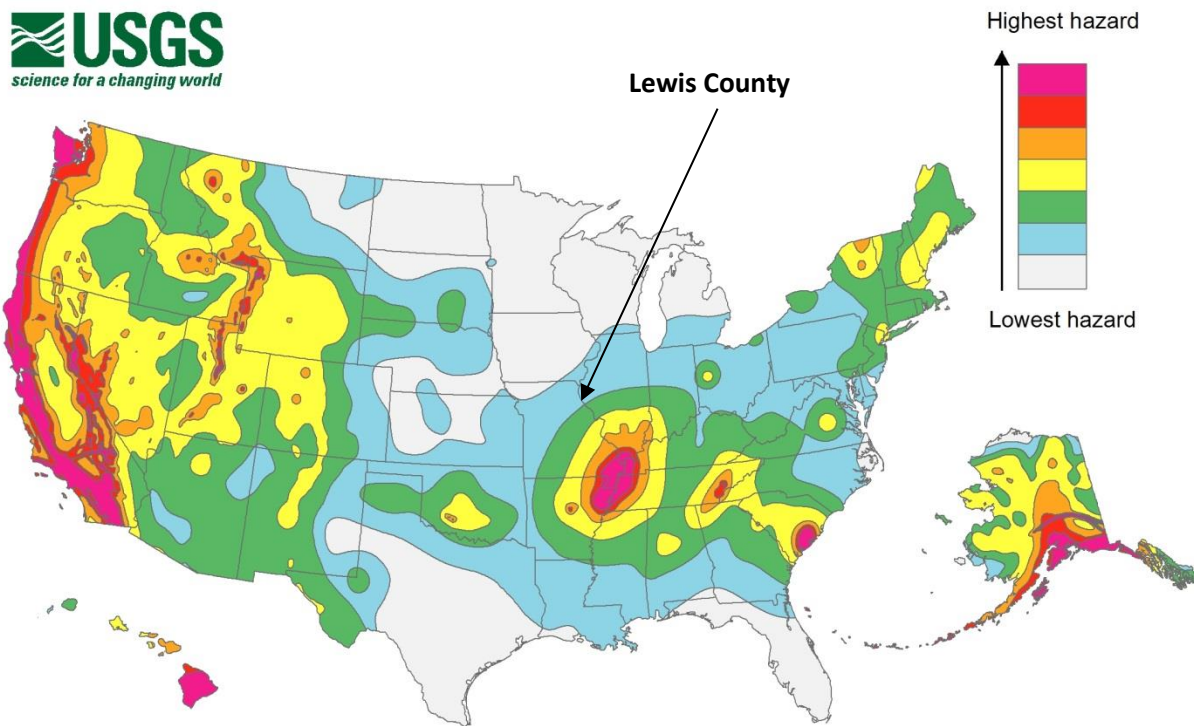
http://sema.dps.mo.gov/docs/programs/Planning,%20Disaster%20&%20Recovery/State%20of%20Missouri%20Hazard%20Analysis/2012-State-Hazard-Analysis/Annex_F_Earthquakes.pdf

PROJECTED EARTHQUAKE INTENSITIES

MODIFIED MERCALLI INTENSITY SCALE

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

Figure 3.6. United States Seismic Hazard Map



Source: United States Geological Survey at http://earthquake.usgs.gov/hazards/products/conterminous/2017/HazardMap2017_lg.jpg

Severity/Magnitude/Extent

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

<http://www.homefacts.com/earthquakes/Missouri/Lewis-County.html>

Probability of Future Occurrence

There is an estimated .23% chance of a major earthquake within the next 50 years.

<http://www.homefacts.com/earthquakes/Missouri/Lewis-County.html>

Hazard Summary by Jurisdiction

Since the earthquake intensity is not likely to vary greatly throughout Lewis County, the risk will be the same throughout. However, damages could differ if there are structural variations in the built environment. For example, older structures and those structures which are not in prime condition are likely to experience higher damages.

Vulnerability

Vulnerability Overview

The State Hazard Mitigation Plan quantifies the population and building exposed to potential hazards by county, providing a numeric breakdown for Lewis County derived from inventory data associated with FEMA's loss estimation software HAZUS-MH MR4.

Building Loss Total (\$)	Loss Ratio	Income Loss Total (\$)	Total Loss (\$)	Loss Ratio Rank (of 115 Total)
4,055,000	0.96%	8,172,000	10,712,000	0.96

Potential Losses to Existing Development

HAZUS building inventory counts are based on the 2000 census data adjusted to 2006 numbers using the Dun & Bradstreet Business Population Report. Inventory values reflect 2006 valuations, based on RSMeans (a supplier of construction cost information) replacement costs. Population counts are 2008 estimates from the U.S. Census Bureau.

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.

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.

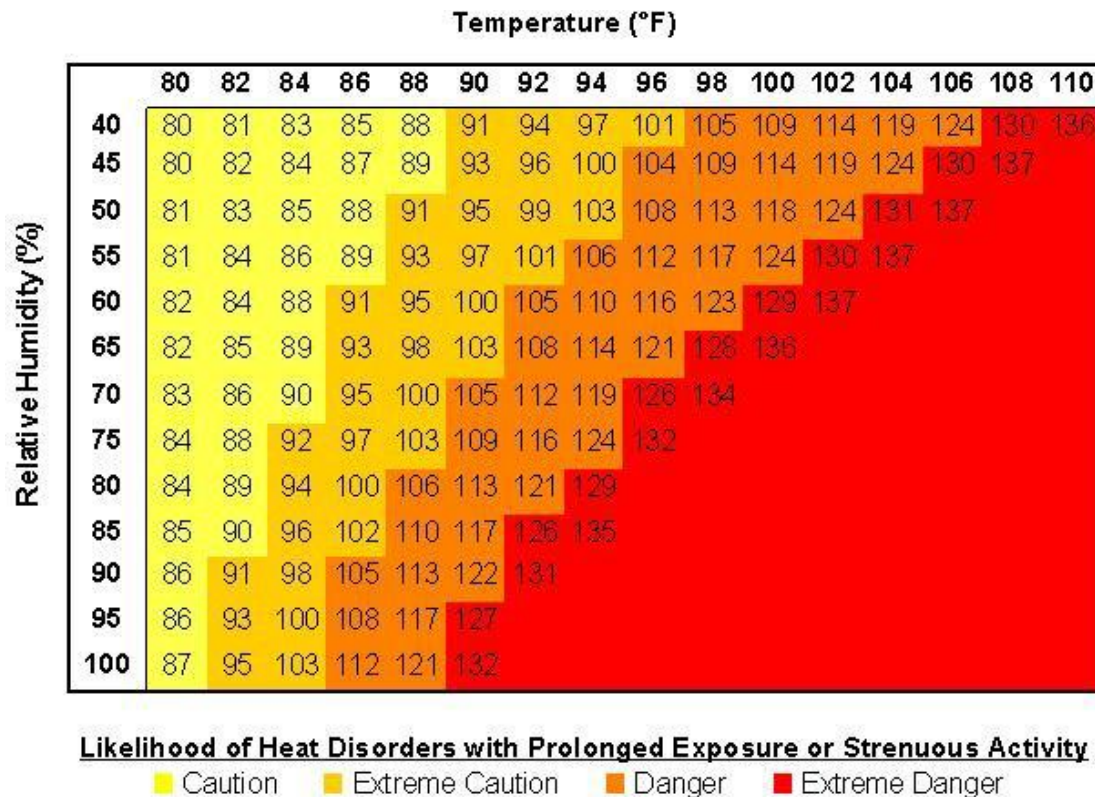
3.4.5 Extreme Heat

Hazard Profile

Hazard Description

Extreme temperature events, both hot and cold, can impact human health and mortality, natural ecosystems, agriculture and other economic sectors. The remainder of this section profiles extreme heat. Extreme cold events are profiled in combination with Winter Storms under “Severe Winter Weather”. 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 3.7** uses both of these factors to produce a guide for the apparent temperature or relative intensity of heat conditions.

Figure 3.7. Heat Index (HI) Chart



Source: National Weather Service (NWS)

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

Geographic Location

Heat is an area-wide hazard event, and that the risk of extreme heat does not vary across the planning area.

Severity/Magnitude/Extent

Extreme heat can cause stress to crops and animals and strain electricity delivery infrastructure overloaded during peak use of air conditioning. 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. The National Weather Service stated that among natural hazards, no other natural disaster—not lightning, hurricanes, tornadoes, floods, or earthquakes—causes more deaths.

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

Table 3.15. Typical Health Impacts of Extreme Heat

Heat Index (HI)	Disorder
80-90° F (HI)	Fatigue possible with prolonged exposure and/or physical activity
90-105° F (HI)	Sunstroke, heat cramps, and heat exhaustion possible with prolonged exposure and/or physical activity
105-130° F (HI)	Heatstroke/sunstroke highly likely with continued exposure

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

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

Previous Occurrences

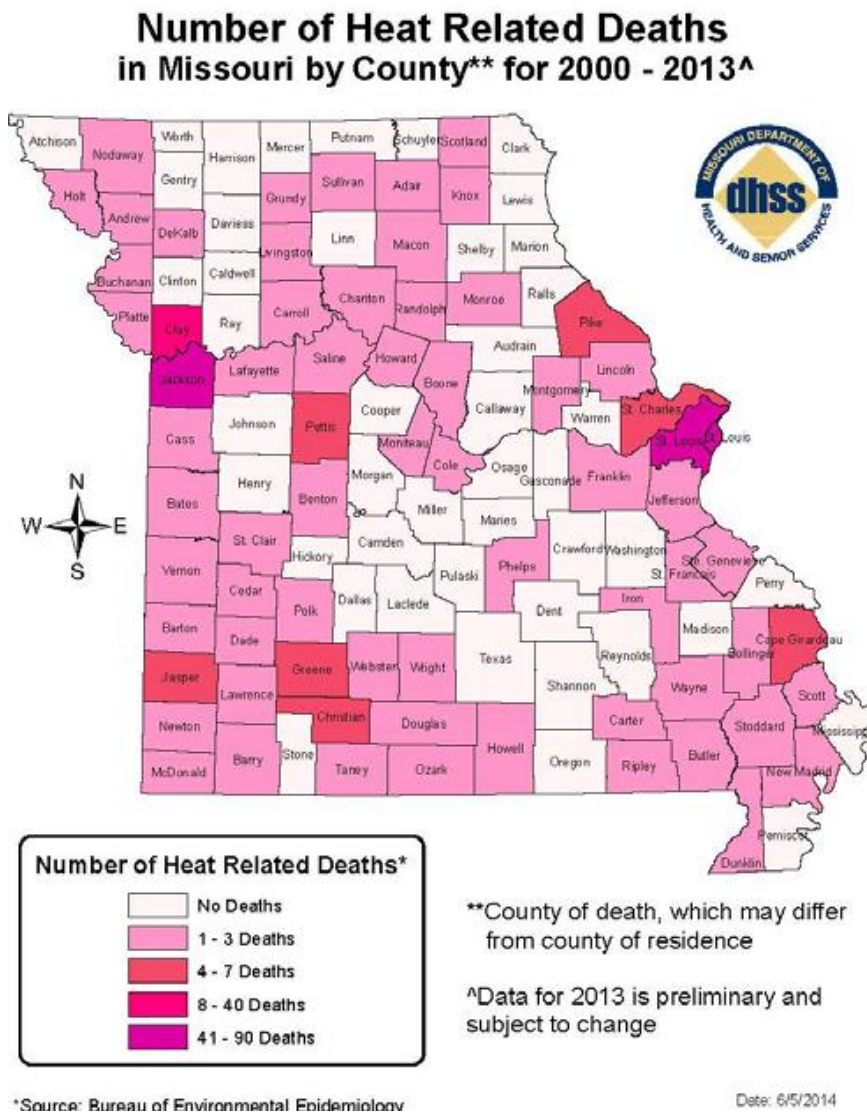
NCEI's storm event database contains record of 33 event reported between 990 and 2013.

In 2007 an upper level ridge of high pressure, persisted across the area from August 6th through August 17th. The combination of heat and humidity, produced heat index readings in the 105 to 115 degree range.

In 2013 an unusually strong upper level ridge of high pressure, dominated the central United States with very hot and dry conditions, from July 18th through 25th 2012. High temperatures in the 100 to 110 degree range, combined with humidity, produced afternoon and early evening heat indices in the 100 to 110 degree range. Overnight low temperatures were in the 70s to lower 80s.

No deaths or illnesses in Lewis County were reported to NCEI for either of these events. This is corroborated by a map from the Bureau of Environmental Epidemiology showing deaths by Missouri County between 2000 and 2013 (The most recent sample period that's been mapped).

Figure 3.8. Heat Related Deaths in Missouri 2000 - 2013



Probability of Future Occurrence

Based on the number of recorded past events the future probability of extreme heat events in Lewis County is 100%

Vulnerability

All Missouri communities are vulnerable to the impacts of extreme heat, but those with a higher percentage of elderly may be more at risk due to the heightened vulnerability of that segment of the population; elderly individuals often live alone and have other complicating medical conditions – additionally, they may lack air conditioning or refuse to incur higher utility expenses by using it. Lewis County is one of those communities with higher risk to the effects of extreme heat events, as 16.3% of the total population is over 65 years of age, according to the US Census.

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, and increases the strain on electricity infrastructure, as more electricity is needed to accommodate the growing population. While there is some population growth in Lewis County the elderly population is growing, as modern medicine continues to extend the average life span.

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 3.16. County Population Under Age 5 and Over Age 65, 2010 Census Data

Jurisdiction	Population Under 5 yrs	Population 65 yrs and over
Lewis County	343	800
Canton	75	195
Ewing	16	59
La Belle	25	63
La Grange	34	73
Lewistown	7	49
Monticello	5	14
Williamstown	10	21

Source: U.S. Census Bureau,

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.

3.4.6 Wildfire

Hazard Profile

Hazard Description

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

Most wildfires occur during the spring season between February and May. The length and severity of both structural and wildland fires depend largely on weather conditions. Spring 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 to burn their garden spots, brush piles, and other areas in the spring. The second most critical period of the year is fall. Depending on the weather conditions, a sizeable number of fires may occur between mid-October and late November.

Geographic Location

The risk of wildfires is higher in communities with more wildland–urban interface (WUI) areas. The WUI refers to the zone of transition between unoccupied land and human development - 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. The map (below) indicates that the risk in Lewis County is low, with only a small area near Canton designated as an area of wildland-urban interface

U.S. Forest Service - Wildland Urban Interface

This map service, derived from U.S. Forest Service (USFS) data, represents U.S. wildland-urban interface (WUI) areas in high severity forested types in 2000.



Esri, HERE, DeLorme, USGS, NGA, EPA, USDA, NPS | United States Department of Agriculture (USDA), Forest Health Technology Enterprise Team (FHTET)

Severity/Magnitude/Extent

Wildland fires 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. They are typically a result of human activity rather than lightning or some other natural event, and 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, the extensive stands of evergreens found in the western US that fuel the large fire storms seen on television news stories do not exist in Lewis County. 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 to 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. Source: <http://www.firewisemissouri.org/wildfire-in-missouri.html>

Previous Occurrences

The State Hazard Mitigation plan utilizes data from the Missouri Department of Conservation to analyze past wildfire events. In a four year period, Lewis County experienced 50 wildfires that destroyed over fifteen hundred acres, an average of more than 10 fires per year and an average loss of 6 acres per event.

Wildfires 2004-2008	Average annual # of Wildfires	Likelihood Rating 1-5	Acres Burned	Average Annual Acres burned	Total Buildings Damaged
50	10	1	311	62	400

Probability of Future Occurrence

With an average of ten wildfire events annually, the statistical likelihood of future wildfire events in any given year is 100%.

Vulnerability

While Lewis County’s copious pasture, crop, and woodland is vulnerable to wildfire – the risk to human lives and property is more limited to an area near Canton (as depicted by the map on the previous page).

Potential Losses to Existing Development

There is an average of 10 wildfires per year in Lewis County, with an average of 6 acres burned per fire. The cost of that is dependent on whether the area was pasture or cropland, but there is some potential for agricultural loss. Losses to buildings seem oddly disproportionate, with 400 buildings being recorded as having incurred damage in wildfires.

Impact of Previous and Future Development

Development in Lewis County is gradual and tends to be on very modest scale. Vulnerability to wildfire will remain relatively unchanged.

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.

3.4.7 Flooding (Flash and River)

Profile

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. 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. Dam and levee failures, themselves usually the result of excessive or rapid rainfall or snowmelt, are also considered 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 a 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 Lewis County.

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

Geographic Location

Riverine flooding is most likely to occur in Special Flood Hazard Areas (SFHAs). Flood Plain maps and other products are available for Lewis County (See following pages).

City of Canton Flood Hazard Map



Map Legend

National Flood Hazard Layer - Flood Hazard Zones, FEMA June 2015

- Floodway
- 1% Annual Chance (100 Year) Flood Zone
- 0.2% Annual Chance (500 Year) Flood Zone
- Area with Reduced Risk Due to Levee
- Future Conditions 1% Annual Chance
- Area of Undetermined Hazard
- Water

Community Commons, 11/17/2016

LaGrange Flood Hazard Map



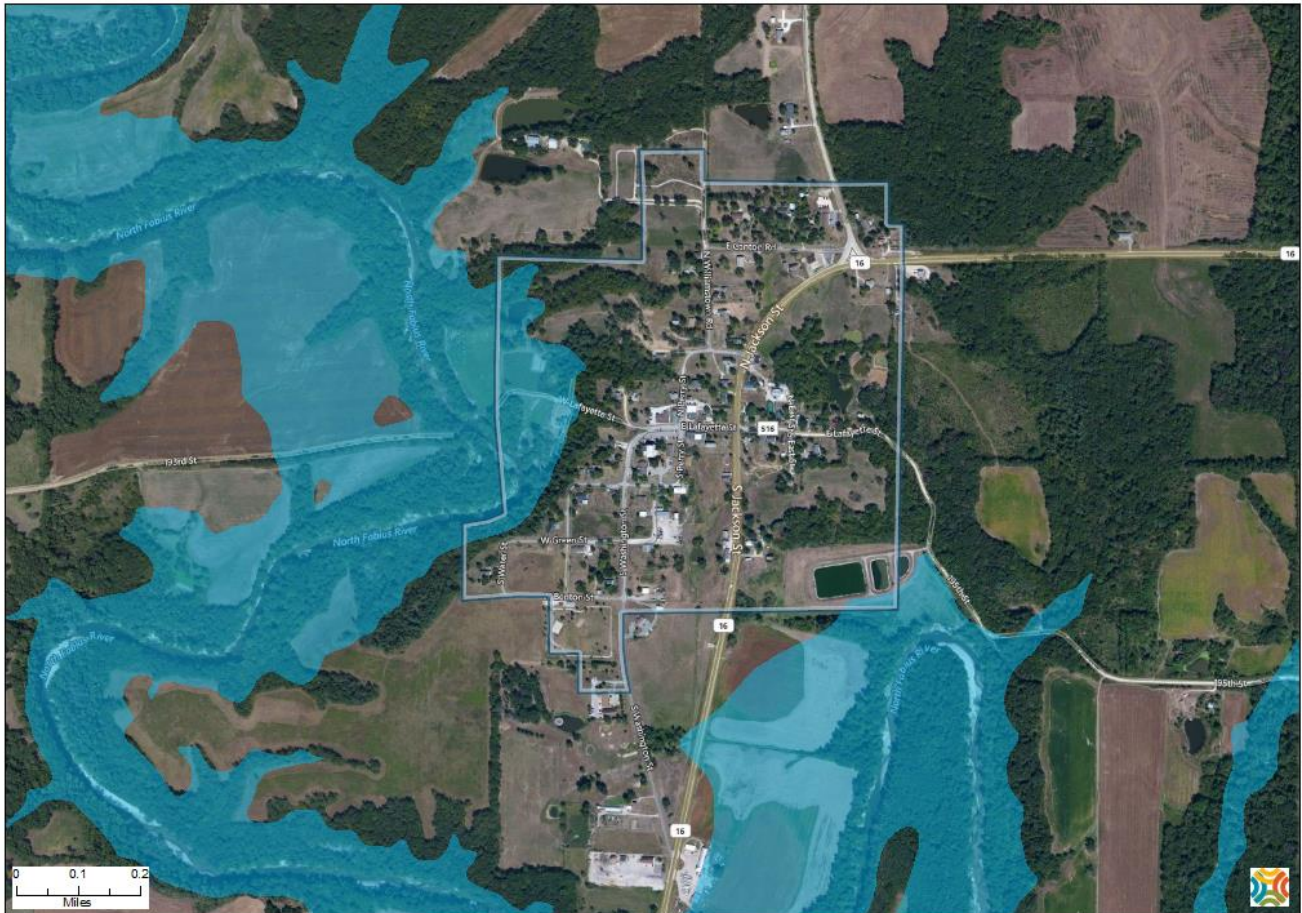
Map Legend

National Flood Hazard Layer - Flood Hazard Zones, FEMA June 2015

- Floodway
- 1% Annual Chance (100 Year) Flood Zone
- 0.2% Annual Chance (500 Year) Flood Zone
- Area with Reduced Risk Due to Levee
- Future Conditions 1% Annual Chance
- Area of Undetermined Hazard
- Water

Community Commons, 11/17/2016

Monticello Flood Hazard Map



Map Legend

National Flood Hazard Layer - Flood Hazard Zones, FEMA June 2015

- Floodway
- 1% Annual Chance (100 Year) Flood Zone
- 0.2% Annual Chance (500 Year) Flood Zone
- Area with Reduced Risk Due to Levee
- Future Conditions 1% Annual Chance
- Area of Undetermined Hazard
- Water

Community Commons, 11/17/2016

Table 3.17. Lewis County NCEI Flood Events by Location, 1995-2017

Location	Date	Deaths	Injuries	Property Damage	Crop Damage
LEWIS (ZONE)	05/01/1996	0	0	0.00K	0.00K
LEWIS (ZONE)	04/14/2001	0	0	0.00K	0.00K
LEWIS (ZONE)	05/01/2001	0	0	0.00K	0.00K
LEWIS (ZONE)	05/14/2001	0	0	0.00K	0.00K
LEWIS (ZONE)	04/28/2002	0	0	0.00K	0.00K
LEWIS (ZONE)	05/01/2002	0	0	0.00K	0.00K
LEWIS (ZONE)	05/07/2002	0	0	0.00K	0.00K
LEWIS (ZONE)	05/11/2002	0	0	0.00K	0.00K
CANTON	08/25/2007	0	0	0.00K	0.00K
FENWAY	06/04/2008	0	0	940.00K	8.900M
FENWAY	07/08/2008	0	0	0.00K	0.00K
MONTICELLO	05/15/2010	1	0	0.00K	0.00K
DERRAHS	06/14/2010	0	0	0.00K	0.00K
MONTICELL	04/18/2013	0	0	2.00K	30.00K
FENWAY	04/18/2013	0	0	5.00K	20.00K
MONTICELLO	04/18/2013	0	0	2.00K	20.00K
MAYWOOD	05/25/2013	0	0	2.00K	5.00K
Totals:		1	0	951.00K	8.975M

Source: National Center for Environmental Information

Flash flooding occurs in SFHAs and those locations in the planning area that are low-lying. They also occur in areas without adequate drainage to carry away the amount of water that falls during intense rainfall events.

Table 3.18. Lewis County NCEI Flash Flood Events by Location, 1995-2017

Location	Date	Deaths	Injuries	Property Damage	Crop Damage
COUNTYWIDE	10/05/1998	0	0	0.00K	0.00K
COUNTYWIDE	05/13/2001	0	0	0.00K	0.00K
EAST PORTION	08/02/2001	0	0	0.00K	0.00K
COUNTYWIDE	05/06/2002	0	0	0.00K	0.00K
COUNTYWIDE	05/12/2002	0	0	0.00K	0.00K
COUNTYWIDE	07/08/2003	0	0	0.00K	0.00K
COUNTYWIDE	08/27/2004	0	0	0.00K	0.00K
DEER RIDGE	06/03/2008	0	0	16.00K	0.00K
DEER RIDGE	06/25/2008	0	0	0.00K	0.00K
EWING	07/21/2008	0	0	0.00K	0.00K
FENWAY	04/30/2009	0	0	0.00K	0.00K
DEER RIDGE	05/15/2009	0	0	0.00K	0.00K
BENJAMIN	08/17/2009	0	0	0.00K	0.00K
FENWAY	09/18/2010	0	0	0.00K	0.00K
DEER RIDG	06/02/2011	0	0	0.00K	0.00K
LA GRANGE	06/26/2011	0	0	0.00K	0.00K
STEFFENVILLE	04/18/2013	0	0	0.00K	0.00K
DEER RIDGE	07/25/2014	0	0	0.00K	0.00K
FENWAY	09/10/2014	0	0	0.00K	0.00K
LA BELLE	06/20/2015	0	0	0.00K	0.00K
DEER RIDGE	06/25/2015	0	0	0.00K	0.00K
FENWAY	06/26/2015	0	0	0.00K	0.00K
LA GRANGE	07/11/2015	1	0	0.00K	0.00K
Totals:		1	0	16.00K	0.00K

Source: National Center for Environmental Information

Severity/Magnitude/Extent

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

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

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

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

National Flood Insurance Program (NFIP) Participation

Table 3.19. NFIP Participation in Lewis County

Community ID #	Community Name	NFIP Participant (Y/N)	Current Effective Map Date	Regular-Emergency Program Entry Date
290844B	Lewis County	Y	01/16/15	09/01/89
290204B	Canton	Y	01/16/15	02/01/77
-	Ewing	-	-	-
-	La Belle	-	-	-
290205#	La Grange	Y	03/02/12	07/13/76
-	Lewistown	-	-	-
-	Monticello	-	-	-
-	Williamstown	-	-	-

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

Monticello was sanctioned on 12/27/1975. Sanction actions will be reviewed in annual meetings. Lewis County, Canton and Lagrange participate with NFIP by having floodplain ordinances and a designated flood plain manager

Table 3.20. NFIP Policy and Claim Statistics as of 09/30/2017

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
LaGrange	19	2,560,600	67	1,347,366.65

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

Repetitive Loss/Severe Repetitive Loss Properties

Repetitive Loss Properties are those properties with at least two flood insurance payments of \$5,000 or more in a 10-year period. According to the Flood Insurance Administration, jurisdictions included in Lewis County have a combined total of 11 repetitive loss properties. 10 of these properties are residential and one is listed as other-non residential.

Table 3.21. Lewis County Severe Repetitive Loss Properties

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

Source: Missouri State Hazard Mitigation Plan current update

Severe Repetitive Loss (SRL): A SRL property is defined 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

Lewis County has been part of nine disaster declarations involving flooding in the last 20 years.

Disaster Number	Description	Incident Period	Individual Assistance (IA) Public Assistance (PA)
1054	Severe Storms, Tornadoes, Hail, Flooding	May to June, 1995	Both
1463	Severe Storms, Tornadoes, Flooding	May, 2003	Both
1773	Severe Storms and Flooding	June to August, 2008	Both
1809	Severe Storms, Flooding and Tornadoes	September, 2008	Both
1847	Severe Storms, Tornadoes, Flooding	May, 2009	Both
1934	Severe Storms, Tornadoes and Flooding	June to July, 2010	Both
4130	Severe Weather, Flooding, and Tornadoes	May to June, 2013	Both
4200	Severe Weather, Flooding, and Tornadoes	September, 2014	Both
4238	Flash Flooding and Severe Storms	August, 2015	Both

Table 3.22. NCEI Lewis County Flash and Riverine Flood Events Summary, 1995 to 2017

Flood Type	# of Events	# of Deaths	# of Injuries	Property Damages	Crop Damages
Riverine	17	1	0	951.00K	8.975M
Flash	23	1	0	16.00K	0.00K

Source: NCEI, data accessed December 2016

Probability of Future Occurrence

Using the historical frequency of flood events to determine the probability of future events, the probability of Lewis County experiencing at least one riverine flooding event in a 12 month period is 85%. The probability for flash flood events is 100%

Vulnerability

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.

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 in order 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.

3.4.8 Levee Failure

Hazard Profile

Hazard Description

Following is sample language. 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://content.asce.org/ASCELeveeGuide.html>). 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.

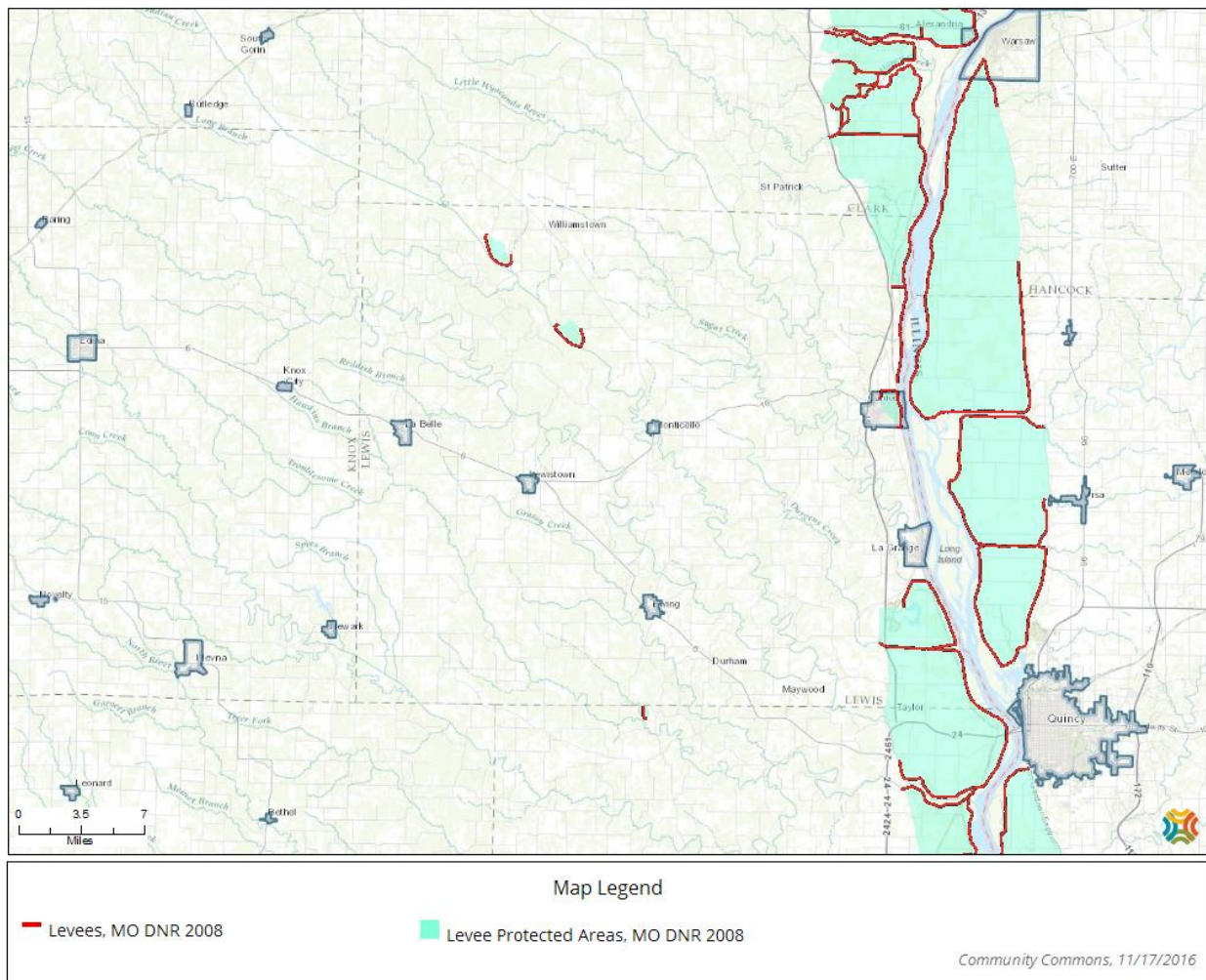
There are two concurrent nation-wide levee inventory development efforts, one led by the United State Army Corps of Engineers (USACE) and one led by Federal Emergency Management Agency (FEMA). The National Levee Database (NLD), developed by USACE, captures all USACE related levee projects, regardless 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.

It is likely that there are 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. 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.

Lewis County Levees

Levees in Lewis County Missouri



Lewis County Levee DFIRM Accreditation Status

Primary Community	Levee Owner	USACE Levee Safety Program (Y/N)	Levee Status? (PAL/deaccredited/NA)
Canton		Y	Undetermined

Severity/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, but 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.

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 3.10 below defines the three ratings.

Figure 3.9. 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.

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.

Vulnerability

Due to the lack of suitable data repositories, it is not possible to conduct a comprehensive analysis to determine vulnerability to Levee Failure in Lewis County.

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 do to the decades-long history of flooding along the Mississippi river.

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.

3.4.9 Thunderstorm/High Winds/Lightning/Hail

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 and tornadoes, which are discussed separately in this plan.

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 1/4" diameter or pea sized hail requires updrafts of 24 miles per hour, while a 2 3/4" 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.

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

Average Flash Density
#/sq km/yr

- 14+
- 10 to 14
- 8 to 10
- 6 to 8
- 5 to 6
- 4 to 5
- 3 to 4
- 2 to 3
- 1 to 2
- 5 to 1
- 1 to .5
- 0+ to .1

Terrain Map of
Mogollon Rim Region
Southwest USA.

Cloud-To-Ground
Stroke Density Over
Mogollon Rim Region

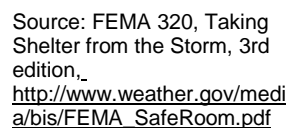
Over 20 years
of lightning detection.

1980-2007
1980-1999
1999-2007

Lewis County

VAISALA

Figure 3.11. Wind Zones in the United States



Severity/Magnitude/Extent

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

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

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

Based on information provided by the Tornado and Storm Research Organization (TORRO), **Table 3.23** below describes typical damage impacts of the various sizes of hail.

Table 3.23. 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/hyscale.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 tables below (**Tables 3.28 through Table 3.31**) summarize past crop damages as indicated by crop insurance claims. The tables illustrate the magnitude of the impact on the planning area's agricultural economy. Agriculture dominates the economy in the planning area.

Table 3.24. Crop Insurance Claims Paid in Lewis County from Thunderstorms, 2011-2017

Acres Affected	
149,753	\$ 21,345,387.00

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

Table 3.25. Crop Insurance Claims Paid in Lewis County from high Winds, 2011-2017

Acres Affected	Insurance Paid
307.82	\$ 113,902.00

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

Table 3.26. Crop Insurance Claims Paid in Lewis County from Lightning, 2011-2017

Acres Affected	Insurance Paid
NO	DATA

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

Table 3.27. Crop Insurance Claims Paid in Lewis County from Hail, 2011-2017

Acres Affected	Insurance Paid
128.9	\$ 15,044.00

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

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

Hazard	Occurrences 1990-2015	Recorded Injuries	Recorded deaths	Recorded damages (Property & Crop)	Hazard Rating	
					Probability of Occurrence Low / Moderate/ High	Potential Severity Low/Moderate/High
Thunderstorm *	82	5	0	85 K	328%: High	Moderate
Lightning	3	3	0	0		
Hail	74	2	0	85 K		
High Winds	5	0	0	0		

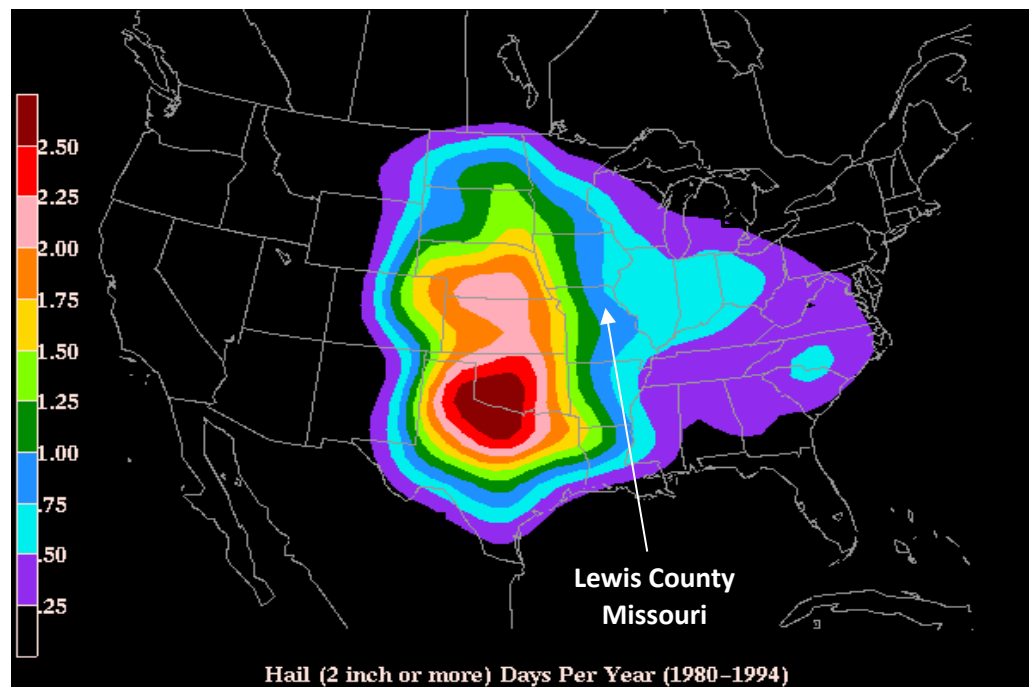
Data Limitations: Only lightning events that result in fatality, injury and/or property and crop damage are recorded by NDCD.

Probability of Future Occurrence

A total of eighty-two Thunderstorm events over 25 years indicate that more than an average of three events will occur annually. There is a 100% probability of a hail event in any given year, a 20% chance of wind events, and 12% chance of lighting events.

Figure 3.13 is based on hailstorm data from 1980-1994 and shows the probability of hailstorm occurrence (2" diameter or larger) based on number of days per year. Lewis County is shown on the map.

Figure 3.12. Annual Hailstorm Probability (2" diameter or larger), 1980- 1994



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

Vulnerability

Vulnerability Overview

Severe Thunderstorms are a common occurrence in Missouri. Since wind, hail, and lightning are all contributing elements of severe thunderstorms in Missouri, the planning team focused on damaging winds in excess of 67 miles per hour (58 knots), hail in excess of 0.75 inches or larger and damaging lightning strikes to analyze vulnerability, risk, and estimated losses to this hazard across the State of Missouri.

The method used to determine vulnerability to severe thunderstorms was statistical analysis of data from several sources: National Center for Environmental Information (NCEI) storm events data (1993 to July 2009), Crop Insurance Claims data from USDA's Risk Management Agency (2004-2008), U.S. Census Data (2000), USDA's Census of Agriculture (2007), and the calculated Social Vulnerability Index for Missouri Counties from the Hazards and Vulnerability Research Institute in the Department of Geography at the University of South Carolina. The table on the next page provides the housing density, building exposure, crop exposure, and social vulnerability data. These are the common data elements for the analysis of wind and hail.

Housing Unites/ Sqmi	Total Building Exposure	Crop Exposure (Census of Agriculture)	Social Vulnerability Index (1 to 5)
9.1	\$ 531,257,000	\$ 44,189,000	3

Potential Losses to Existing Development

Over the last 20 years Lewis County has 82 thunderstorm events that caused a reported \$85,000 in damages, an average annual loss of approximately \$4000 dollars.

Previous and Future Development

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

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 Mo. 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.

3.4.10 Tornado

HazardProfile

Hazard Description

The NWS defines a tornado as “a violently rotating column of air extending from a thunderstorm to the ground.” It is usually spawned by a thunderstorm and produced when cool air overrides a layer of warm air, forcing the warm air to rise rapidly. Often, vortices remain suspended in the atmosphere as funnel clouds. When the lower tip of a vortex touches the ground, it becomes a tornado. High winds not associated with tornadoes are profiled separately in this document .

Essentially, tornadoes are a vortex storm with two components of winds. The first is the rotational winds that can measure up to 500 miles per hour, and the second is an uplifting current of great strength. The dynamic strength of both these currents can cause vacuums that can overpressure structures from the inside.

Although tornadoes have been documented in all 50 states, most of them occur in the central United States due to its unique geography and presence of the jet stream. The jet stream is a high-velocity stream of air that separates the cold air of the north from the warm air of the south. During the winter, the jet stream flows west to east from Texas to the Carolina coast. As the sun moves north, so does the jet stream, which at summer solstice flows from Canada across Lake Superior to Maine. During its move northward in the spring and its recession south during the fall, the jet stream crosses Missouri, causing the large thunderstorms that breed tornadoes.

A typical tornado can be described as a funnel-shaped cloud in contact with the earth’s surface that is “anchored” to a cloud, usually a cumulonimbus. This contact on average lasts 30 minutes and covers an average distance of 15 miles. The width of the tornado (and its path of destruction) is usually about 300 yards. However, tornadoes can stay on the ground for upward of 300 miles and can be up to a mile wide. The National Weather Service, in reviewing tornadoes occurring in Missouri between 1950 and 1996, calculated the mean path length at 2.27 miles and the mean path area at 0.14 square mile.

The average forward speed of a tornado is 30 miles per hour but may vary from nearly stationary to 70 miles per hour. The average tornado moves from southwest to northeast, but tornadoes have been known to move in any direction. Tornadoes are most likely to occur in the afternoon and evening, but have been known to occur at all hours of the day and night.

Geographic Location

Tornadoes can occur anywhere in the planning area.

Severity/Magnitude/Extent

Tornadoes are the most violent of all atmospheric storms and are capable of tremendous destruction. Wind speeds can exceed 250 miles per hour and damage paths can be more than one mile wide and 50 miles long. Tornadoes have been known to lift and move objects weighing more than 300 tons a distance of 30 feet, toss homes more than 300 feet from their foundations, and siphon millions of tons of water from water bodies. Tornadoes also can generate a tremendous amount of flying debris or “missiles,” which often become airborne shrapnel that causes additional damage. If wind speeds are high enough, missiles can be thrown at a building with enough force to penetrate windows, roofs, and

walls. However, the less spectacular damage is much more common.

Tornado magnitude is classified according to the EF- Scale (or the Enhance Fujita Scale, based on the original Fujita Scale developed by Dr. Theodore Fujita, a renowned severe storm researcher). The EF-Scale (see **Table 3.28**) 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 3.28. 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 3.29**. The damage descriptions are summaries. For the actual EF scale it is necessary to look up the damage indicator (type of structure damaged) and refer to the degrees of damage associated with that indicator. Information on the Enhanced Fujita Scale's damage indicators and degrees of damage is located online at www.spc.noaa.gov/efscale/ef-scale.html.

Enhanced Fujita Scale with Potential Damage

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

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

Enhanced weather forecasting has provided the ability to predict severe weather likely to produce

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

Previous Occurrences

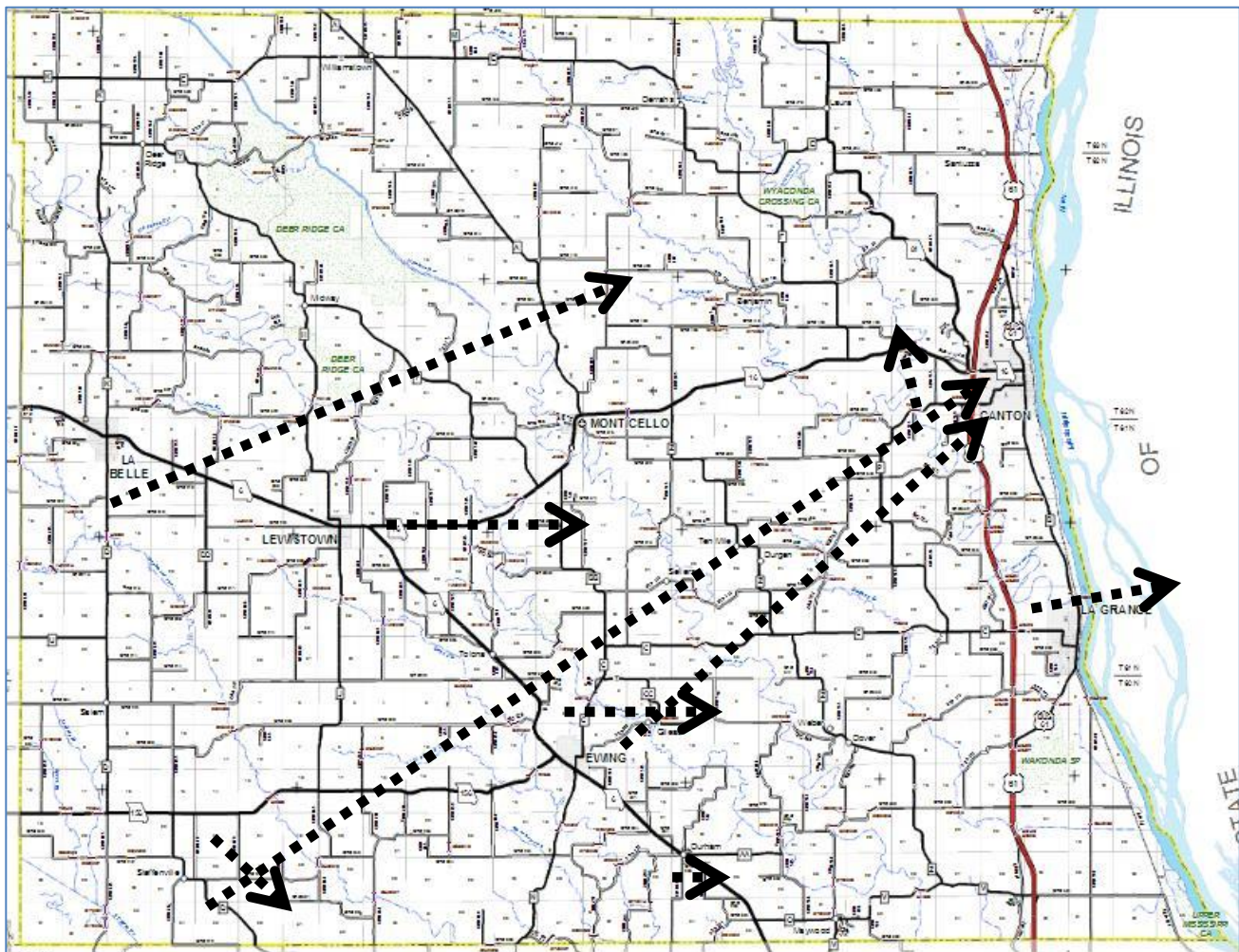
The table below shows 9 tornado events in a twenty-year period. There are limitations to keep in mind when reviewing the NCEI data on previous tornado events; For example, one tornado may contain multiple segments as it moves geographically. A tornado that crosses a county line or state line is considered 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 3.30. Recorded Tornadoes in Lewis County, 1995-2017

Date	Beginning Location	Ending Location	Length (miles)	Width (yards)	F/EF Rating	Death	Injury	Property Damage	Crop Damages
04/30/1997	Ewing	Canton	15	100	F1	0	1	200 K	0
04/30/1997	1 Mile W of La Grange	Illinois	1	50	F0	0	0	20 K	0
06/14/1998	1 Mile E of Lewiston	5 Miles NE of Monticello	9.5	75	F1	0	0	0	0
04/08/1999	1 Mile S of LaBelle	8 Miles N of Monticello	16	150	F2	0	2	2.1 M	0
06/04/1999	4 Miles W of Canton	4 Miles W/NW of Canton	.5	50	F0	0	0	0	0
05/10/2003	4 Miles SE of Steffenville	1 Miles NE of Canton	20	200	F2	0	6	5 M	0
05/10/2003	3 Miles NE of Steffenville	3 Miles SE of Steffenville	4	50	F0	0	0	0	0
08/08/2007	1 Mile S of Durham	1 Miles S of Durham	0.1	10	F0	0	0	0	0
05/30/2008	2 Miles NW of Ewing	3 Miles NE of Ewing	3.35	70	F1	0	0	10 K	0
TOTALS						0	9	7.3 M	0

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

Figure 3.13. Lewis County Map of Historic Tornado Events



Probability of Future Occurrence

Lewis County has experienced nine tornado events in the last 20 years, which indicates a 45% chance such an event will occur in any given year.

Vulnerability

Vulnerability Overview

Lewis County, and all of Missouri, is located firmly within a region of the U.S. with high frequency of dangerous and destructive tornadoes referred to as “Tornado Alley”. See map (Figure 3.15) next page.

Figure 3.14. Tornado Alley in the U.S.



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

In the Current Missouri State Hazard Mitigation Plan update, the State looked at four factors to determine tornado vulnerability. This vulnerability analysis measured the likelihood of future tornado impacts, average annual property loss ratio (total building exposure value divided by average annualized historic losses), population change (percent change), and housing change (percent change). Scales were created to rank these factors: likelihood (1-3), loss ratio with exposure (1-3), population change (1-3), and housing change (1-3). The factor scores were added up for each county for the purposes of ranking the counties by total vulnerability.

Factors Considered Moderate (1) High (2) Very High (3)	Factors Considered Moderate (1) High (2) Very High (3)	Factors Considered Moderate (1) High (2) Very High (3)	Factors Considered Moderate (1) High (2) Very High (3)
Likelihood of Occurrence (# of events/ yrs. of data)	Likelihood of Occurrence (# of events/ yrs. of data)	Likelihood of Occurrence (# of events/ yrs. of data)	Likelihood of Occurrence (# of events/ yrs. of data)
6-24 25-49 50-68	6-24 25-49 50-68	6-24 25-49 50-68	6-24 25-49 50-68
Loss Ratio % 0-.113 0.114-.226 0.227-0.340	Loss Ratio % 0-.113 0.114-.226 0.227-0.340	Loss Ratio % 0-.113 0.114-.226 0.227-0.340	Loss Ratio % 0-.113 0.114-.226 0.227-0.340

Lewis County is rated as having a moderate vulnerability according to this scoring system.

County	# of Tornadoes	Likelihood of Occurrence	Probability Rating	Total Exposure (\$)	Annualized Historic Loss	Loss Ratio	Loss Ratio Rating	Population Growth % Change	Pop. Change Rating	Housing % Change	Housing Ratio Rating	Total Vulnerability
Lewis	12	20.48%	1	531,257,000	80,214	0.015%	1	18.2%	2	3.39%	1	Moderate

Potential Losses to Existing Development

Bearing in mind the rural population density in Lewis County and a historical record involving predominately weaker tornadoes, the potential for losses to existing development in Lewis County does exist but is far greater in communities (where building density is higher) than in the unincorporated areas of the County, especially in the context of critical facilities like schools. A tornado event could

occur anywhere in the planning area, but some jurisdictions would suffer heavier damages because of the high concentration of structures. These areas are also where critical facilities like school campuses are located.

Previous and Future Development

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

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.

3.4.11 Winter Weather/Snow/Ice/Severe Cold

Hazard Description

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

- **Blizzard**—Winds of 35 miles per hour or more with snow and blowing snow reducing visibility to less than $\frac{1}{4}$ mile for at least three hours.
- **Blowing Snow**—Wind-driven snow that reduces visibility. Blowing snow may be falling snow and/or snow on the ground picked up by the wind.
- **Snow Squalls**—Brief, intense snow showers accompanied by strong, gusty winds. Accumulation may be significant.
- **Snow Showers**—Snow falling at varying intensities for brief periods of time. Some accumulation is possible.
- **Freezing Rain**—Measurable rain that falls onto a surface with a temperature below freezing. This causes it to freeze to surfaces, such as trees, cars, and roads, forming a coating or glaze of ice. Most freezing-rain events are short lived and occur near sunrise between the months of December and March.
- **Sleet**—Rain drops that freeze into ice pellets before reaching the ground. Sleet usually bounces when hitting a surface and does not stick to objects.

Geographic Location

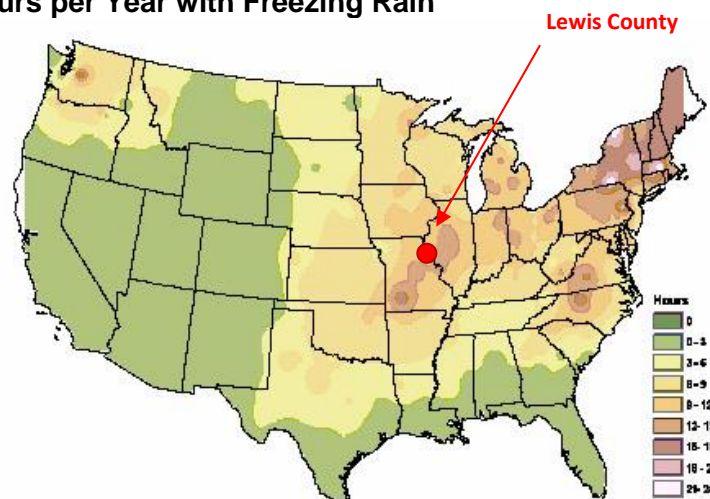
The entire county is vulnerable to heavy snow, ice, extreme cold temperatures and freezing rain.

Figure 3.12 Shows the zone in which Lewis county is located, and how many hours of freezing rain is indicated annually.

Source: American Meteorological Society.
“Freezing Rain Events in the United States.”

<http://ams.confex.com/ams/pdfpapers/71872.pdf>

Figure 3.15. NWS Statewide Average Number of Hours per Year with Freezing Rain



Severity/Magnitude/Extent

Severe winter storms include extreme cold, heavy snowfall, ice, and strong winds which can push the wind chill well below zero degrees in the planning area. Heavy snow can bring a community to a standstill by inhibiting transportation (in whiteout conditions), weighing down utility lines, and by causing structural collapse in buildings not designed to withstand the weight of the snow.

Repair and snow removal costs can be significant. Ice buildup can collapse utility lines and communication towers, as well as make transportation difficult and hazardous. Ice can also become a problem on roadways if the air temperature is high enough that precipitation falls as freezing rain rather than snow.

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

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

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

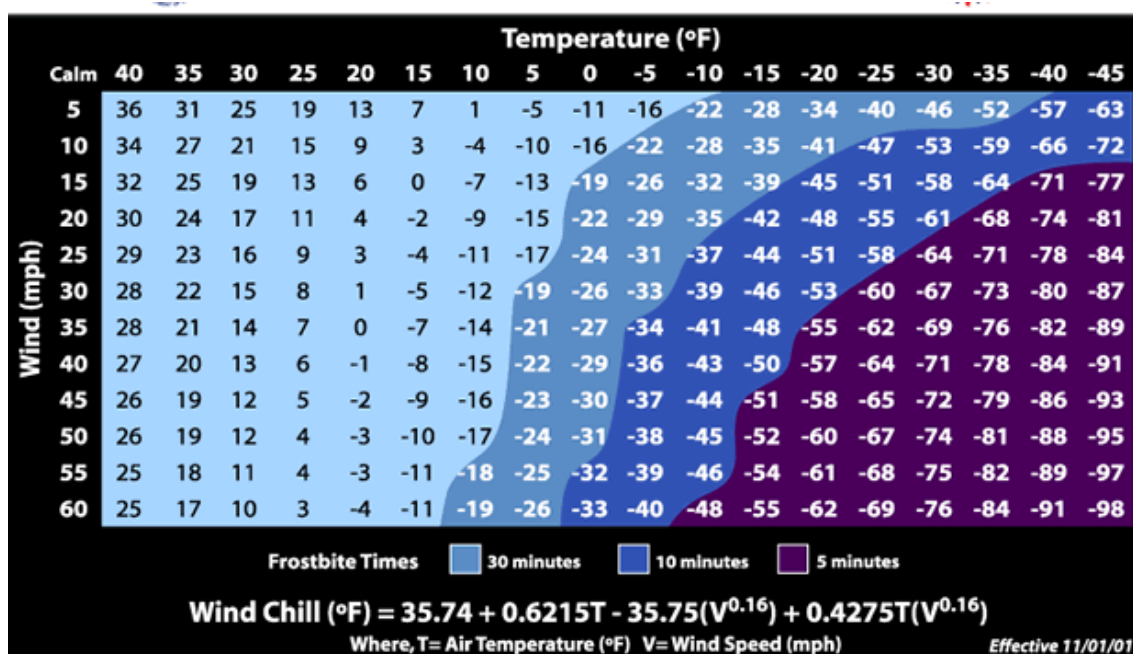
Buildings with overhanging tree limbs are more vulnerable to damage during winter storms when limbs fall. Businesses experience loss of income as a result of closure during power outages. In general heavy winter storms increase wear and tear on roadways though the cost of such damages is difficult to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

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

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

Wind can greatly amplify the impact of cold ambient air temperatures. Provided by the National Weather Service, **Figure 3.17** below shows the relationship of wind speed to apparent temperature and typical time periods for the onset of frostbite.

Figure 3.16. Wind Chill Chart



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

Winter storms, cold, frost and freeze take a toll on crop production in the planning area. Table 3.18 shows the USDA's Risk Management Agency payments for insured crop losses in Lewis County as a result of winter weather for the past 5 years.

Table 3.31. Crop Insurance Claims in Lewis County as a result of Cold Conditions and Snow 2004-2017

Acres Affected	Monetary Loss
5,139	\$ 693,639

Source: USDA Risk Management Agency

Previous Occurrences

Table 3.32. NCEI Lewis County Winter Weather Events Summary, 1966 – 2017 (40 total)

Type of Event	Number of Events	Magnitude	# of deaths	# of Injuries	Damages (Property and Crops)
Blizzard	1	-	0	0	None recorded
Cold/Wind Chill	3	-	0	0	None recorded
Extreme Cold/ Wind Chill	1	-	0	0	None recorded
Heavy Snow	1	-	0	0	None recorded
Ice Storm	6	-	0	0	None recorded
Sleet	0	-	-	-	None recorded
Winter Storm	26	-	0	0	None recorded
Winter Weather	3	-	0	0	None recorded
TOTALS	41				

Source: NCEI, data accessed [insert date]

Blizzard

In late December of 2011 the first true blizzard in many years hit from Central to Northeast Missouri. Up to 20 inches of snow fell along with winds gusting over 40 mph. For many counties it was a record snowfall event. The National Guard was called out to help clear County roads and assist with emergency transportation. The region was brought to a standstill for several days. A Federal disaster declaration was obtained for many counties in order to assist with the cost of snow removal.

Cold/ Wind Chill

In January of 2014 a winter storm that brought heavy snow to much of the area followed that up with the coldest temperatures in 20 years, with Canton registering a temperature of -13. Other parts of the region saw temperatures as low as -33.

Extreme Cold/ Wind Chill

On December 16th of 2000, a blast of Arctic air forced temperatures into the single digits with wind chill values down to 30 below zero. The wind chill remained from 20 below to 40 below zero through noon on the following day

Ice Storm

In December of 2007 a major ice storm hit parts of central, northeast, and east central Missouri. Up to a half inch of ice accumulated along with up to one inch of sleet. Trees and power lines were down throughout the area. Many businesses had to close due to loss of electricity. Schools across the area were closed for several days.

Winter Storm

Five winter storms have struck Lewis County since 2010, ranging in snowfall from 3 to 20 inches, and often involving mixed precipitation (sleet and snow) which created dangerous road conditions and made transportation difficult. In 2011, snow and freezing rain prompted a disaster declaration and the National Guard was deployed to assist with emergency transportation.

Winter Weather

Winter weather is a designation indicating less extreme winter events than those classified as a "Winter Storm"- milder temperatures, less precipitation.

On December 1 of 2007, a light coating of ice formed on roads in northeast Missouri and West Central Illinois the result of light freezing rain. Numerous auto accidents were reported across the region. Five days later the region experienced snowfall from two to four inches in depth. In January of 2010 snow fall of 3 to 5 inches fell, driven by winds gusting from 20 to 30 mph which caused some drifting.

Probability of Future Occurrence

Forty one winter weather events affected Lewis County between 1995 and 2015. This indicates a 100% possibility of winter events occurring in any given year.

Vulnerability

In the current State Hazard Mitigation Plan, seven factors were considered in determining the overall severe winter storm vulnerability; housing density, likelihood of occurrence, building exposure, crop exposure, average annual property loss ratio, average annual crop insurance claims, and social vulnerability. To complete the analysis using these factors, a rating value of 1-5 was assigned to the data with 1 being the lowest, and five the highest.

Housing Unites per Sqr. Mi	Total \$ Building Exposure	\$ Crop Exposure (2007)	Social Vulnerability Index (1-5)	Total Incidents	Total \$ Property Losses	Total \$ insurance Paid
9.1	\$531,257,000	\$44,189,000	5	27	\$2,400,000	\$178,459

Potential Losses to Existing Development

NCEI reflects no property damage in the past 20 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.

Future Development

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

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.

3.4.12 CBRNE Attack (Chemical, Biological, Radiological, Nuclear or high yield Explosive)

Hazard Description

Of all the possible disasters and hazards that can be imagined, a strategic CBRNE (Chemical, Biological, Radiological, Nuclear or high yield Explosive) attack could have the most devastating and far-reaching consequences. The use of these weapons against the United States is unlikely; however, as long as such weapons exist, there is always a chance that they could be used. The potential for traditional war related attacks, using conventional weapons, is a scenario that is more likely to occur, based on currently available information.

Although the threat of all-out nuclear war has been significantly reduced with the dissolution of the former Soviet Union, several scenarios still exist that might subject a jurisdiction to widespread radioactive contamination or high-levels of radiation exposure. While the threat of nuclear attack has diminished over the past several years, concerns over the use of chemical and biological warfare agents have increased. Recent events, such as the September 11, 2001, terrorist attacks on the World Trade Center buildings in New York City and the Pentagon in Washington DC, along with the anthrax-related attacks in 2001, have increased both the public and the policy maker's awareness of the vulnerability of the United States to future attacks involving CBRNE. Attacks against the United States as a whole, and against individual states or local entities, can be categorized as originating from either domestic or international sources. However, because the impacts on life and property would largely be the same regardless of the source of such an attack, similar preparedness, response, and recovery activities apply.

CBRNE weapons have often been used to terrorize an unprotected population, instead of actual use as weapons of war. However, the potential damage that can occur in the event of such an attack is extensive, particularly to human health. A single nuclear weapon detonation could cause widespread destruction, and all aforementioned types of attacks could cause extensive casualties. It could affect the entire population in the vicinity of the impacted area, and some areas would experience direct weapons effects: blast, heat, and initial nuclear radiation. Other areas would experience indirect weapons effects, primarily radioactive fallout. As long as world leaders maintain rational thinking, the probability of an attack by a nation-state remains low, but does not rule out attack by a terrorist group. Secondary effects of these attacks, which could strain the country and state, include lack of adequate shelter, food, water, health and medical facilities and personnel, and mortuary services; disruption of communication systems; power outages and other critical infrastructures.

The population is vulnerable to two separate categories of effects associated with these types of attacks: direct and indirect.

Direct Effects

These are effects directly associated with detonation or use of the weapon.

Conventional Weapons : Direct effects of conventional weapons generally are related to injuries inflicted by penetration of ammunition rounds or shrapnel from exploding ordnance (mortars, etc.). Injuries from shock waves/blast overpressure near the targets may also occur, along with damage caused by fires produced from incendiary warheads, grenades, and other munitions. In addition, some injuries may occur as a result of flying or falling debris where the weapons are used. Heavy artillery use can also damage roadways and buildings and disrupt utility services for lengthy periods of time.

Chemical and Biological Weapons : Direct effects of chemical weapons involve initial spread of agents and fragmentation of the weapons. Chemical agents are toxins used to produce neurological and pulmonary injuries or death. Biological agents are infectious microbes used to produce illness or death. They can be dispersed as aerosols or airborne particles directly onto a population, producing an immediate effect (a few seconds to a few minutes for chemical agents) or a delayed effect (several hours to several days for biological agents). Severity of injuries depends on the type and amount of the agent used and duration of exposure. Because some biological agents take time to grow and cause disease, an attack using this type of agent may go unnoticed for several days.

Nuclear Weapons: Direct effects include intense heat, blast energy, and high-intensity nuclear radiation. These effects generally will be limited to the immediate area of the detonation (up to 22 miles), depending on weapon size, altitude of burst, and atmospheric conditions.

Agroterrorism: The direct effect of agroterrorism is the intentional introduction of a contagious animal disease or fast spreading plant disease that affects livestock and food crops and disrupts the food supply chain. Agroterrorism could cause disease in livestock, crops, and in some cases (anthrax, or monkey pox, for example), humans. Diseases that can be transmitted to humans from animals are called zoonotic. It would not only require the agriculture industry to destroy livestock and food crops, but also affect the consumer confidence in the food supply resulting in tremendous economic damage for, potentially, an extended period. The food supply could be severely affected not only for the immediate area and the United States, but the world market, since the United States exports huge quantities of food to other nations. Recently, the federal government recognized the vulnerability of the agricultural/food supply presidential decision directives and encouraged complementary state and local actions.

Radiological Weapon : Direct effects of a radiological weapon are the same as a conventional high explosive, but with the added danger posed by exposure to radiological materials. A radiological dispersion device (RDD) or “dirty bomb” will contaminate an area by spreading radiological dust and debris over a large area.

Explosive Weapon (large amount of high explosive) : The direct results of an explosive weapon are immense destruction caused by the blast and could result in multiple fatalities. Instances of these effects include Oklahoma City, Kobhar Towers, the marine barracks in Lebanon, and the African Embassy bombings.

Indirect Effects

These are effects not directly associated with the detonation and use of the weapon.

Conventional Weapons : Unexploded ordinance throughout a battle zone or explosion hazards to those in the area can persist after warfare has ended. Many conventional munitions also contain toxic compounds that can leach into surrounding soils and groundwater if left in place.

Chemical and Biological Weapons—Indirect effects are generally limited to downwind areas. They can be geographically widespread and vary in intensity—depending on weapon size, type of chemical or biological agent, and wind patterns. The spread of these agents can contaminate food and water supplies, destroy livestock, and ravage crops.

Nuclear Weapon : When a nuclear weapon detonates, intense heat, blast, and overpressure will cause severe injuries and fatalities in the surrounding area and radiation poisoning at more distant locations. A detonation near or on the ground draws up large quantities of earth and debris into a mushroom cloud. This material becomes radioactive, and the particles can be carried by wind hundreds of miles before they drop back to earth as “fallout.” In an attack, many areas of the United States would probably escape fallout altogether or experience non life-threatening levels of radiation. However, because weather that determines where fallout will land is so unpredictable, no locality in the United States is free from risk of receiving deadly radiation levels after a strategic attack. Less than lethal exposures will result in longer-term effects on health and contamination of food, water, and food production.

Agroterrorism : Agroterrorism’s indirect effects are loss of breeding stock to replenish herds and flocks, loss of seed crops, and possibly loss of land use for a long period of time depending on the disease involved. Agroterrorism has a high probability of creating an economic disaster for states highly vested in food production, and potentially the nation.

Radiological Weapon : The indirect effect of an RDD is inability to use the contaminated area for a short to long period of time, depending on the identity of the radioactive material. Because radioactive material from an RDD can penetrate wood, asphalt, concrete, and masonry (and radioactive dust and particles can enter the smallest crevices), decontamination will be extremely difficult or impossible.

Explosive Weapon (large amount of high explosive) : The indirect effect of an explosive weapon is the fear, terror, and lasting psychological damage to survivors and other individuals. The information in Table 3.3.12b is from the Impact Analysis of Potential for Detrimental Impacts of Hazards done for the Emergency Management Accreditation Program.

Geographic Location

Given the nature of the hazard, this type of event could occur in any location.

Previous Occurrences

In 2007 a graduate student threatened the University of Missouri-Rolla with the claim of a bomb and anthrax. This threat shut down the university for several hours and canceled classes for the day. While it ultimately proved to be false threats from a disgruntled student, police encountered him holding a bag, claiming it was a bomb and armed with a knife. After decontaminating the student and clearing the dorms it was determined that no evidence of anthrax existed.

In 2012, a robot was used to inspect and eliminate an IED at Lone Pine Trailer Park in Pettis County near Sedalia. County Sheriff were serving routine arrest warrants when they spotted a handgun in a nearby parked car. While retrieving the weapon the sheriff spotted the IED and immediately cleared the area. The state police bomb squad handled the elimination of the IED.

The following is a listing of incidents that occurred in Missouri between 2004 and 2012:

	2004	2005	2006	2007	2010	2011	2012
Bombings	20	11	28	13	24	46	32
Attempted Bombings	6	0	0	2	-	-	-
Incendiary Bombings	3	2	4	1	46	317	391
Total Injured	1	0	3	0	23	46	106
Total Killed	2	0	0	0	16	15	49
Total Incidents of Thefts of Explosives	2	4	2	5	1	3	-

Source: United States Bomb Data Center; <http://www.atf.gov/explosives/groups/usbdcc/> & ATF's BATS database.

Measure of Probability and Severity

The use of these weapons against the United States is unlikely; therefore *the probability is rates as "low"*. Because of the potential devastation and significant secondary effects caused by this type of attack, *the potential severity is rated "high"*

Vulnerability

The entire county is equally exposed to this risk, but those areas with greater population density have a greater vulnerability.

Potential Losses to Existing Development

Depending on the exact nature of the threat, losses could range from sever to catastrophic, impacting not only lives and property but damaging the environment of a large area for an extremely long period of time.

Impact of Future Development

Given the limited nature of development in Lewis County, it's difficult to quantify the impacts of hazards on future infrastructure.

Hazard Summary by Jurisdiction

Due to the fact that such attacks generally target heavily populated areas, the County does not have the level of risk that nearby parts of the KC metropolitan area have – however, it could be assumed that the more populated the area, the greater it's risk of such a hazard. The City of Canton, being the largest community and something of an economic center point would therefore possess the highest risk and most vulnerability to such a hazard.

Problem Statement

Given the nature of this type of event and the huge range of variables involved and a potential for massive impacts, it's difficult to predict or plan for.

3.4.13 Civil Disorder

Hazard Description

Civil disorder is a term that generally refers to groups of people purposely choosing not to observe a law, regulation, or rule, usually in order to bring attention to their cause, concern, or agenda. In Missouri, state statutes define civil disorder as “any public disturbance involving acts of violence by assemblages of three or more persons, which cause an immediate danger of or results in damage or injury to the property or person of any other individual.”

Civil disorder can take the form of small gatherings or large groups blocking or impeding access to a building or disrupting normal activities by generating noise and intimidating people. They can range from a peaceful sit-in to a full-scale riot in which a mob burns or otherwise destroys property and terrorizes individuals. Even in its more passive forms, a group that blocks roadways, sidewalks, or buildings interferes with public order. In the 1990s, abortion clinics, for example, were targets for these disruptive-type activities.

Throughout this country’s history, incidents that disrupted the public peace have figured prominently. The constitutional guarantees allow for ample expression of protest and dissent, and in many cases collide with the preamble’s requirement of the government “to ensure domestic tranquility. The balance between an individual’s and group’s legitimate expression of dissent and the right of the populace to live in domestic tranquility requires the diligent efforts of everyone to avoid such confrontations in the future. In the United States, a crowd itself is constitutionally protected under “the right of the people to peacefully assemble.” However, assemblies that are not peaceable are not protected, and this is generally the dividing line between crowds and mobs. The laws that deal with disruptive conduct are generally grouped into offenses that disturb the public peace. They range from misdemeanors, such as blocking sidewalks or challenging another to fight, to felonies, such as looting and rioting.

Missouri law makes “promoting civil disorder in the first degree” a class C felony, according to Section 574.070 of the Revised Missouri Statutes. As stated in one provision of the law, “Whoever teaches or demonstrates to any other person the use, application, or construction of any firearm, explosive, or incendiary device capable of causing injury or death to any person, knowing or intending that such firearm, explosive or incendiary device be used in furtherance of a civil disorder, is guilty of promoting civil disorder in the first degree.”

Types of Crowds: A crowd may be defined as a casual, temporary collection of people without a strong, cohesive relationship. Crowds can be classified into four general categories:

- **Casual Crowd**—A casual crowd is merely a group of people who happen to be in the same place at the same time. Examples of this type include shoppers and sightseers. The likelihood of violent conduct nearly nonexistent.
- **Cohesive Crowd**—A cohesive crowd consists of members who are involved in some type of unified behavior. Members of this group are involved in some type of common activity, such as worshiping, dancing, or watching a sporting event. Although they may have intense internal discipline (e.g., rooting for a team), they require substantial provocation to arouse to action.

-
- **Expressive Crowd**—An expressive crowd is one held together by a common commitment or purpose. Although they may not be formally organized, they are assembled as an expression of common sentiment or frustration. Members wish to be seen as a formidable influence. One of the best examples of this type is a group assembled to protest something.
 - **Aggressive Crowd**—An aggressive crowd is made up of individuals who have assembled for a specific purpose. This crowd often has leaders who attempt to arouse the members or motivate them to action. Members are noisy and threatening and will taunt authorities. They tend to be impulsive and highly emotional and require only minimal stimulation to arouse them to violence. Examples of this type of crowd include demonstrations and strikes.

Types of Mobs: A mob can be defined as a large disorderly crowd or throng. Mobs can be emotional, loud, tumultuous, violent, and lawless. Like crowds, mobs have different levels of commitment and can be classified into four categories:

- **Aggressive Mob**—An aggressive mob is one that attacks, riots, and terrorizes. The object of violence may be a person, property, or both. An aggressive mob is distinguished from an aggressive crowd only by lawless activity. Examples of aggressive mobs are the inmate mobs in prisons and jails, mobs that act out their frustrations after political defeat, or violent mobs at political protests or rallies.
- **Escape Mob**—An escape mob is attempting to flee from something such as a fire, bomb, flood, or other catastrophe. Members of escape mobs have lost their capacity to reason and are generally impossible to control. They are characterized by unreasonable terror.
- **Acquisitive Mob**—An acquisitive mob is one motivated by a desire to acquire something. Riots caused by other factors often turn into looting sprees. This mob exploits a lack of control by authorities in safeguarding property. Examples of acquisitive mobs would include the looting in South Central Los Angeles in 1992, or food riots in other countries.
- **Expressive Mob**—An expressive mob is one that expresses fervor or revelry following some sporting event, religious activity, or celebration. Members experience a release of pent up emotions in highly charged situations. Examples of this type of mob include the June 1994 riots in Canada following the Stanley Cup professional hockey championship, European soccer riots, and those occurring after other sporting events in many countries, including the United States.

Although members of mobs have differing levels of commitment, as a group they are far more committed than members of a crowd. As such, a “mob mentality” sets in, which creates a cohesiveness and sense of purpose that is lacking in crowds. Thus, any strategy that causes individual members to contemplate their personal actions will tend to be more effective than treating an entire mob as a single entity.

Geographic Location

The entire county, due to its low population density, has a very low risk to this hazard – however, recent events such as the Bundy Ranch Standoff, the Occupation of the Federal Wildlife Refuge Building in Burns Oregon, and Native American protests against the Dakota Access Oil Pipeline demonstrate that civil disorder CAN occur in remote rural locations.

Past Events

Unfortunately Missouri has not avoided a nationwide trend of consistent riotous behavior or disruptive civil disorder, as other states have witnessed in the past several decades.

On **August 9, 2014**, in Ferguson, Missouri the fatal shooting of a black suspect by a white police officer sparked protests and riots. As the case was ongoing, police established curfews and deployed riot squads to maintain order.

On August 10 some people began looting businesses, vandalizing vehicles, and confronting police officers who sought to block off access to several areas of the city. At least 12 businesses were looted or vandalized and a QuikTrip convenience store and gas station was set on fire, leading to over 30 arrests. The people arrested face charges of assault, burglary, and theft. Police used a variety of equipment, including riot gear and helicopters, to disperse the crowd by 2:00 a.m. Two police officers suffered minor injuries during the events

On August 11, police fired tear gas to disperse a crowd at the burnt shell of the QuikTrip convenience store, set on fire by looters the night before. According to reports, gunshots were fired in Ferguson and five people were arrested. Some protesters threw rocks at police officers. The police responded by firing tear gas and bean bag rounds at protesters.



Ferguson Police respond to civil unrest, August 17, 2014

On August 12, at a protest in Clayton some protestors threw bottles at officers, prompting the use of tear gas to disperse the crowd. The following day, a SWAT team of around 70 officers arrived at a protest demanding that protesters disperse. That night, police used smoke bombs, flash grenades, rubber bullets, and tear gas to disperse the crowd.

As night fell on August 13, some protesters threw projectiles at police including Molotov cocktails, and police launched tear gas and smoke bombs.

On Friday night, protests continued near the QuikTrip until police arrived at around 11:00 p.m. At around 1:30 a.m. Saturday morning, rioters broke into and looted the Ferguson Market & Liquor store as well as other nearby businesses; after the initial break-in, a group of protesters and observers gathered near the storefronts of the looted businesses in an attempt to prevent further looting.

On August 18, after violent clashes during the imposed curfew, Governor Nixon issued an Executive Order calling in the National Guard to "help restore peace and order and to protect the citizens of Ferguson. Nixon also announced that there would be no curfew on the night of August 18. That night, after several hundred protesters, some of whom were seen throwing bottles, charged toward a

wall of police 60 wide and five deep, members of the crowd pushed them back including clergymen and community leaders locking arms, averting a more serious confrontation. Seventy-eight individuals were arrested.

On the evening of September 28, a large crowd protested. Bottles and rocks were thrown at officers. Support from other police forces was requested. Eight protesters were arrested on failure to disperse and resisting arrest charges.

On October 2, 2014 St. Louis County Police and Missouri State Highway Patrol arrested more than a dozen people, who were charged with offenses that included failure to comply with police, noise ordinance violations and resisting arrest.

On October 13, protesters attempted to cross police lines to meet with officers at the Ferguson Police Department. Dozens of protesters, estimated to be over 50, were arrested.

On November 21, two alleged members of the New Black Panther Party were arrested for buying explosives they planned to detonate during protests. Those suspects were also indicted for purchasing two pistols under false pretenses.

On November 24, the grand jury decided not to indict the police officer who had fatally shot the black suspect in Ferguson. Following the announcement there were peaceful protests as well as rioting. A dozen buildings were burned down; there was gunfire, looting, vandalism, and destruction of two St. Louis County Police patrol cars, as well as burning of various non-police cars. Police in Ferguson deployed tear gas and ordered protesters in the street to disperse. There were 61 people arrested in Ferguson on charges including burglary and trespassing. In the hours following the grand jury decision, over 25 buildings and businesses were set on fire in the towns of Ferguson and Dellwood; many more were looted. In one case, firefighters evacuated the scene of a fire due to gunshots being heard, and for the same reason could not respond to other fires.

2015

In the early morning hours of March 12 two police officers were shot outside the Ferguson police station. An "intense manhunt" was launched for the person or persons responsible for the shooting.

On March 14 twenty year-old black male Jeffrey L. Williams was arrested in connection with the shooting.

On April 29 looting resumed in Ferguson in the wake of black suspect being killed by Police in Baltimore, Maryland. Two people were shot in the neck and a third was shot in the leg, with all three victims being in stable condition. Six people were arrested, one for shooting one of the victims and five for looting a Mobil gas station. Four police cars were damaged after rocks were thrown at them. Several items were also set on fire.

On the night of August 9, the anniversary of the Police Shooting in Ferguson, two groups of suspected looters began firing at each other during a demonstration. Four plain-clothed officers in an unmarked sports utility vehicle responded to the scene. There, they shot a man who allegedly opened fire on them with a stolen 9mm SIG Sauer handgun. The suspect, identified as Tyrone Harris Jr., was hospitalized in "critical and unstable" condition. Three hours after the shooting, two teenagers were wounded in an apparent drive-by shooting as they were walking near a memorial

dedicated to Brown. A journalist was also attacked and robbed in a parking lot, while three police officers were injured by protesters. Following the violence, officials placed St. Louis County under a state of emergency on August 10, which was lifted three days later. Protests continued that day and into the night, with one such event shutting down Interstate 70. More than 100 protesters were arrested during the demonstrations. Early in the morning of August 11, more than 20 additional protesters were arrested. Ferguson continues to be the site of unrest.

The most notable incident in Missouri previous to Ferguson was the full scale riot that broke out at the Men's State Penitentiary in Jefferson City at about 6:00 p.m. on September 22, 1954 after an inmate released several prisoners. At 7:00 p.m., all available state highway patrolmen were directed to report to the penitentiary as quickly as possible to quell the riot. Several buildings and vehicles were burning at that time, and some 500 inmates were loose, hurling bricks, yelling, and attempting to escape. Both chapels were ablaze, as well as several prison shops and factories.

When the riot was over, 2,000 police officers and National Guardsmen were on duty at the prison, 3 inmates had been killed and 21 wounded by gunfire. One other prisoner was murdered by stabbing and beating, and eight others were injured in fighting with each other. Five buildings were completely destroyed, and two others partially destroyed, resulting in more than \$10 million in losses to state property.

Probability and Severity

Given the urban nature of large scale Civil Disturbances historically and the predominately rural nature of Lewis County, *the probability of such events is rated as low.*

Should Lewis County experience future incidents of disruptive civil disorder or rioting, *the severity of a given event could range from low to high*, depending on many factors. A spirited demonstration that gets out of hand may result in several arrests, minor damage to property (police vehicles with broken windows, etc.), some injuries, and manpower/overtime costs for police, fire, and other response services. To a greater extent, the threat of urban or intercity riots has the potential for millions of dollars in property damage, possible loss of life, and serious injuries, and extensive arrests. Sustaining police at the scene for extended periods, and possibly mobilizing state highway patrol and National Guard units, can add to the extensive manpower costs.

Impact of the Hazard

When rioting does break out, it generally proves extremely difficult for first-responder law enforcement authorities to quell the mob promptly. The rules of constitutional law set stringent limits on how police officers can behave toward the people they try to arrest. Restraint also plays a crucial part in avoiding any action that "fans the flames." Initial police presence is often undermined because forces may be staffed below the peak loads needed to bring things back under control. As a result, the riot may continue until enough state police or National Guard units arrive to bolster the arrest process and subsequently restore order. In many cases, damage to life and property may already be extensive.

The table below is an Impact Analysis of Potential for Detrimental Impacts of Hazards done for the Emergency Management Accreditation Program.

EMAP Impact Analysis: Civil Disorder

Subject	Detrimental Impacts
Health and Safety of Persons in the Area at Time of Incident	Localized impact expected to be severe for unprotected personnel and moderate to light for protected personnel.
Health and Safety of Personnel Responding to the Incident	Localized 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 temporary relocation of operations.
Property, Facilities, and Infrastructure	Localized impact to facilities and infrastructure in the area of the incident. Some severe damage possible.
Delivery of Services	Localized disruption of lines of communication and destruction of facilities may postpone delivery of some services.
The Environment	May cause extensive damage in isolated cases and some denial or delays in the use of some areas. Remediation needed.
Economic and Financial Condition	Local economy and finances adversely affected, possibly for an extended period of time, depending on damage.
Regulatory and Contractual Obligations	Regulatory waivers may be needed. Fulfillment of some contracts may be difficult. Impact may reduce deliveries.
Reputation of or Confidence in the Entity	Ability to respond and recover may be questioned and challenged if planning, response, and recovery not timely and effective.

Vulnerability

Potential Losses to Existing Development

Dependent on the size and nature of the civil disturbance, any structures in the area are at risk to damage and casualties may be a possibility.

Impact of Future Development

Due to the limited nature of development in Lewis County, it's difficult to quantify possible future assets which may be affected by this hazard.

Hazard Summary by Jurisdiction

Urban communities are at a much higher risk to this hazard than those in less populated rural areas. The larger the community, the larger the vulnerability as there are more people and property that may be harmed.

Problem Statement

In the wake of numerous urban riots in the late 1960s and beyond, a unique approach in law enforcement began to emerge as a viable means to reduce the risk of such future riots. Known as “community policing,” its philosophy rests on the belief that reducing and controlling serious crime requires the police to pay renewed attention to all problems that allow serious crime to occur. In its comprehensive report following the devastating 1967 Detroit riot for example, the Kerner Commission noted that police “cannot, and should not, resist becoming involved in community service matters.”

The benefits to law enforcement and public order, the commission says, include the following:

- Because of their “front-line position” police will be better able to identify problems in their community that may lead to disorder.
- They will be better able to handle incidents requiring police intervention.
- Willing performance of such work can gain police the respect and support of the community.
- Development of non-adversary contacts can provide the police with a vital source of information and intelligence concerning the communities they serve.

While this mindset may have been revolutionary in urban areas, it has been the more or less customary way of conducting police business in small rural communities. In addition, the culture of rural Missouri is not particularly conducive towards civil unrest – however, as we have seen with incidents involving grazing rights in Nevada and Pipeline easements in North Dakota, isolated rural areas are not exempt from the possibility of civil unrest and the actors involved may not necessarily be locals.

3.4.14 Cyber Disruption

Hazard Description

Cyber disruption is best described as an interruption or disruption of the normal operations, use and/or function of a cybernetic system. Disruptions can typically fall into two very general categories; un-intentional disruption and intentional disruption.

Un-intentional disruptions are the more common type of disruption as they usually occur when a portion of the system fails. This can look like a typo or mistake in the code used to design the system or a physical failure of hardware or network. Disruption can also be a cascading effect of a failure of other systems supporting the network, i.e. power.

Intentional disruption is typically a directed 'attack' on a cybernetic system to achieve an intended goal, which is usually malicious in intent. These types of disruptions are the most worrisome to governments as they pose the potential to cause irreparable harm to the function and capability of critical systems or supporting systems that are used in daily operations. The FBI defines this intentional disruption as a threat: "a cyber-threat is any circumstance or event with the potential to adversely impact operations (including mission, functions, image, or reputation), agency assets, or individuals through an information system via unauthorized access, destruction, disclosure, modification of information, and/or denial of service."

Past Events

Even though it's an emerging hazard, it has not gone unnoticed. Recognizing the national reliance on cyberspace and the interdependent nature of the Nation's current cyber infrastructure, President Obama commissioned the Cyberspace Policy Review. This report was released on May 29, 2009 and builds on the Comprehensive National Cyber Security Initiative (CNCI). In 2010, the Department of Homeland Security (DHS) issued the Interim Version in September 2010 of the NCIRP. In November 2011, DHS Secretary Janet Napolitano signed the DHS Blueprint for Cyber Future.

As cyber disruption it is still a very new hazard, the reporting and tracking of disruptive events is difficult. In most cases, it is not required to report an event, and when it is reported most of the information is protected due to the sensitive nature of the systems that were disrupted. However, there currently exist a number of complex databases that track historical cyber disruptions. Each system makes use of its own definitions and tracking methods. As of the release of this plan one database lists that 392,223 cyber-attacks have occurred since November 2010, which was when they started tracking such events. There have been some notable disruption events that did attain national attention:

- A recent famous cyber event was during the 2012 election when 255,238 requests for absentee ballots in Miami-Dade Florida were discovered to be the first officially documented time that an election was attempted to be altered by cyber-attacks.
- In early January of 2013, a series of US bank websites were taken down by denial of service attacks, including Capital One, 5th3rd, and PNC banks
- In May of 2011, Lockheed Martin was attacked but it was detected and as a result 100,000 accounts were locked as a precaution.

Over all, it is apparent that cyber disruption attacks vary in sources, type, and target. As such it can be difficult to protect and plan for.

Probability and Severity

The probability of a cyber-disruption is high. Every second of every day, there will always exist a possibility for both intentional and un-intentional disruptions. To date, historical events within Missouri have tended to be un-intentional. The number of targets for intentional cyber-attacks would seem at this time to be limited to a couple power plants and government databases. Though there are targets, Missouri is not aware of a current threat against any of the critical facilities or databases. Moving forward, awareness of the growing threat from both domestic and international cyber-attacks does impress the need to develop robust defense and counter attack systems to protect against the increasing likelihood of an attack.

The projected severity of a Cyber Disruption ranges from low to high depending upon the system disrupted and the intention of the attacker. Some systems have redundant capabilities or are not critical to daily operations. As such the severity of a disruption to that system is low. However, there are other systems that are integral to operations, contain sensitive information, or provide access/control to critical systems. A disruption to those systems would have a severe impact on the state.

It is difficult to quantify an exact probability or severity of a disruption due to the limited information available and the many unknown factors. The intent of an intentional disruptor could range from something as minor as leaving a message to a major issue with sensitive data collection or control of a critical facility. The probability of an error or failure is also hard to quantify as most systems are properly update, replaced, and maintained as needed. Usually it is an extenuating circumstance that drives a failure, which cannot be measured.

Impact of the Hazard

Though a Cyber Disruption can have limited impacts within a system's own operations, it also can have extended cascading affects throughout multiple systems. The system that is disrupted and the source of the disruption are major factors in the impact. If it is an intentional disruption and the system is critical then the impact has the potential to quite devastating. Some examples of cyber disruption impacts include:

- Failure of a medical research database: Localized impact with typically limited impacts that can be recovered due to database backups.
- Government intranet failure due to hardware: Though very disrupting, this event usually doesn't have long term impacts.
- Breach of sensitive database for the justice offices: The information could be altered, added to, or publicly shared causing wide-spread long-term impacts.
- Utility services remotely accessed and controlled: The attacker could drastically impact not only the government, critical facilities, and public services but also the public itself.

Vulnerability

While many people from small communities may feel that “cyber attack” is really just a concern for huge financial institutions, corporations, and government installations, this is not the case. In August of 2011, the “hacktivist” collective known as Anonymous breached 70 law enforcement computer systems, defacing websites and exposing sensitive information, such as email, tips on suspected crimes and profiles of gang members. This didn’t occur at federal, state or large metropolitan law enforcement departments –the attackers targeted small, mostly rural police and sheriff offices. Cyber-attacks can happen in any state or locality.

Small jurisdictions tend not to have IT staff at all, let alone security specialists to oversee data protection on a round-the-clock basis. In 2011, a National Association of State Chief Information Officers (NASCIO) survey found that half of states responding spent less than 3 percent of their IT budget on security. When it seems to be such a low priority at the State Level, where there IS a budget for such things, one can extrapolate what cyber security must look like in sparsely populated rural communities.

Nonetheless, those same small-town agencies are increasingly running critical services on computers that can be easily shut down by hackers, cybercriminals or just a disgruntled employee.

Likewise, while small businesses have not historically been the target of cybercrime, 2015 saw a drastic change, according to Toni Allen, UK head of client propositions at the British Standards Institute (BSI); “The latest Government Security Breaches Survey found that nearly three-quarters (74%) of small organizations reported a security breach in the last year; an increase on the 2013 and 2014 survey.” This sharp rise indicates that small businesses are specifically targeted by digital attackers, most likely because of their typically lax or even nonexistent cyber security.

Potential Losses to Existing Development

At best cyber-attacks are disruptive, and can inhibit the normal function of systems for days or longer. At worst, they can result in the corruption or complete loss of data on a massive scale.

Impact of Future Development

Commercial and industrial development in Lewis County is relatively minimal, making it difficult to project any significant change in terms of vulnerability.

Hazard Summary by Jurisdiction

Communities that have government infrastructure or commercial concerns are more vulnerable to cyber-attack and more likely to be targets. Schools also can be targets.

Problem Statement

Cyber Disruption is an emerging hazard that has gained an increasing notoriety as the vulnerability to disruption grows parallel with the dependence on cybernetic system even in small rural communities.

3.4.16 Hazardous Materials Release (Fixed Facility/Transpiration Incidents, Clandestine Labs)

Hazard Description

A hazardous material is any substance or material in a quantity or form that may pose a reasonable risk to health, the environment, or property. The category hazardous material includes incidents involving substances such as toxic chemicals, fuels, nuclear wastes and/or products, and other radiological and biological or chemical agents. For the purposes of this analysis, only accidental or incidental releases of hazardous materials from two different kinds of incidents are addressed: fixed facility incidents and transportation-related accidents. In consideration of recent worldwide and national events, incidents involving terrorism or national attacks, which involve hazardous materials of any type, are addressed in other sections of this plan.

Generally, with a fixed facility, the hazards are pre-identified, and the facility is required by law to prepare a risk management plan and provide a copy to the local emergency planning committee (LEPC) and local fire departments. Missouri Tier II forms must also be filed with the Missouri Emergency Response Commission (MERC) at the State Emergency Management Agency (SEMA.) For specific site plans, each county LEPC is required by law to maintain a copy of these plans.

The exact location of a hazardous materials accident is not possible to predict. The close proximity of railroads, highways, airports, waterways, pipelines, and industrial facilities to populated areas, schools, and businesses could put a large number of individuals in danger at any time. In addition, essential service facilities, such as police and fire stations, hospitals, nursing homes, and schools near major transportation routes in the State are also at risk from potential hazardous materials transportation incidents.

Federal Highway Administration statistics indicate that 1 of 10 motor vehicles is engaged in the transport of hazardous materials of some type. The U.S. Army Corps of Engineers also indicates that over 9,000 tons of petroleum products and over 200,000 tons of chemicals and related products are shipped annually by river barge via the Missouri River between Omaha and Kansas City. Previous estimates have indicated that, nationwide, over four billion tons of hazardous materials are shipped each year by various transportation modes. Approximately 20 flights each day out of Lambert Airport in St. Louis carry nuclear medicines, and Tri-State Motor Transit Company of Joplin has approximately 25 shipments of high explosives each week.

Commercial carriers traverse the continental United States. Even arterial highways in Missouri are maintained to provide more favorable traveling conditions than in other central states. Also, the locations of nuclear facilities in relation to mines and fuel processing plants result in shipments of radioactive products and wastes across Missouri.

Missouri is at the crossroads for rail and truck transport of nuclear waste to the Yucca Mountain, Nevada, test site. Truck shipments alone will affect 25 different states, 266 counties, and two Indian reservations. This will be a potentially large waste shipping campaign from as many as 19 nuclear reactors through other corridor states to Nevada.

The railroad systems in Missouri transport voluminous types and amounts of hazardous materials on their 6,351 miles of rails that traverse the State. Though individual cars may be placarded to reveal contents such as hazardous materials, only estimates can be obtained concerning volumes of such materials, because only the interstate traffic is counted or measured. Interstate shipments are accounted for where they originate and terminate.

Increased use and transport of materials across the country has created serious problems for

emergency services personnel. Many factors can increase the magnitude of an otherwise simple transportation accident into an incident of potential hazard to high numbers of people. Following are potential factors to be considered:

- Over 14,000 different chemicals are estimated as being shipped by the various transportation modes. Some types of highly toxic chemicals do not require placarding if shipped in quantities of less than 1,000 pounds, even though lesser quantities could devastate a small town.
- Only a few emergency response organizations in the larger cities and counties near the more metropolitan areas have had training for handling peacetime radiological problems. With recent federal grants and programs in place to provide funding for training, exercises, and equipment for state Homeland Security Response Teams and local responders, the general capabilities of hazardous materials response personnel and teams statewide is expected to improve

Railroads throughout Missouri may carry radioactive material shipments; the switching yards at St. Louis and Kansas City process more of these transcontinental trains than any other yards in the country.

During any radiological emergency, regardless of the cause, local officials and emergency responders will likely require state or federal support in the detection, monitoring, and analysis of radiological data for decision-making.

Geographic Location

Due to the ubiquitous presence of HAZMAT transport vehicles on both rail and highways throughout the country, it can easily be said that the areas most prone to HAZMAT incidents are those with the highest volume of traffic. Various fixed facility (predominately ag related) are also areas of risk.

Past Events

The Environmental Protection Agency (EPA) maintains a National Priority List (NPL) which serves primarily informational purposes, identifying for the States and the public those known releases or threatened releases of hazardous substances, pollutants, or contaminants throughout the United States and its territories. The NPL is intended primarily to guide the EPA in determining which sites warrant further investigation. Inclusion of a site on the NPL does not in itself reflect a judgment of the activities of its owner or operator, it does not require those persons to undertake any action, nor does it assign liability to any person. The NPL serves primarily informational purposes, identifying for the States and the public those sites or other releases that appear to warrant remedial actions.

In Missouri, there are currently 31 active NPL sites, none of which are located in Lewis County.

The Missouri Department of Natural Resources' role in emergency response is to minimize damages in a hazardous substance emergency, with the highest priority being the protection of people and then the environment. The department's mandate to address environmental emergencies includes "any chemical, petroleum, or other material spilled on to the land, water, or atmosphere" that might impact the public health/safety and/or the environment. The Missouri "Spill Bill"* (Section 260.500 to 260.550 RSMo) requires the department to maintain a 24-hour EER Hotline, and provides the authority to initiate a cleanup or provide cleanup oversight for chemical releases.

Under the Missouri Spill Bill (260.500 – 260.550 RSMo) responsible parties/spillers are required to report releases of hazardous substances to the department's 24-Hour Environmental Emergency Response (EER) Hotline 573-634-2436 or to the National Response Center 800-424-8802. EER Duty Officers maintaining the EER Hotline provide technical assistance regarding the chemical and necessary cleanup actions, work with the responsible party/spiller to ensure that proper cleanup is completed and impact to the public health and environment is minimized, conduct notifications to various agencies, and determine if an on-site response is needed by EER staff. EER Duty Officers complete an EER Incident Report into the Missouri Environmental Emergency Response Tracking System (MEERTS) on each incident reported on the 24-Hour Environmental Emergency Response Hotline or via fax from the National Response Center. Once the EER Incident Report is finalized, it is made available.

During the period from 2011-2017, there were 67 Hazmat incidents in Lewis County. Forty-three of them involved meth labs, the rest involved vehicular accidents and operator errors at facilities or by applicators in the field.

The Missouri Highway Patrol's Division of Drug and Crime Control serves as the collection and entry point for statewide methamphetamine laboratory seizures. The department's involvement in the methamphetamine laboratory crisis in Missouri began in 1997. Law enforcement agencies were being inundated with large quantities of hazardous waste, chemicals and debris associated with the production of methamphetamine. At the direction of the governor, the Missouri Methamphetamine Enforcement and Environmental Protection Task Force was formed to address this and other issues related to the burgeoning problem. Numerous local, state and federal agencies and organizations banded together and, under the direction of the Meth/Special Projects Unit, created the Clandestine Drug Lab Collection Station (CDLCS) Program. Local fire service and law enforcement agencies operate collection stations throughout the State with technical and financial assistance provided by the department.

The Meth/Special Projects Unit provides a variety of supplies, personal protective equipment and air monitoring equipment to law enforcement at no cost. Examples of packaging/cleanup supplies available include 5-gallon chemical overpack buckets, hazardous materials labels, eye wash bottles, safety goggles, safety glasses, absorbent material, pH paper, hand sanitizer, etc. Personal protective equipment includes chemical protective coveralls, boot covers, nitrile gloves, air-purifying respirators, cartridges, self-contained breathing apparatus and air cylinders. Drager pumps and tubes along with organic vapor meters and multi-gas meters have been provided to collection station operators, drug task forces and law enforcement agencies throughout the State. Inquiries concerning supplies and equipment procurement may be made by e-mail or by calling 573-526-3349. Information about the Meth/Special Projects Unit can be found at <http://www.dnr.mo.gov/env/esp/meth-special-projects.htm>

Probability and Severity

Hazardous Materials Fixed-Facility Accident

The probability of occurrence is rated as moderate. With the new regulations from EPA and the Occupational Health and Safety Administration, along with more stringent state laws and employee awareness training, this rating may be lowered to low or raised to high based on past performance. This rating means the probability of occurrence is possible during the expected lifetime of the facility.

The severity of consequences is rated as moderate but may be either low or high depending on the type and amount of chemical released. This means the chemical is expected to move into the surrounding environment at a concentration sufficient to cause serious injuries and/or death, unless prompt and effective corrective actions are taken. Injuries and/or death would be expected only for personnel exposed over an extended period or when individual personal health conditions create complications.

Hazardous Materials Transportation Accident

The probability of occurrence is rated as high because of the large volume of hazardous materials being hauled over the highways and railways in Missouri. This rating means that the probability of occurrence is considered sufficiently high as to assume that an event will occur at least once within any mode of transportation (including water, pipeline, and air) during a three-year HSEES reporting period.

The severity of the consequences is rated as moderate, but may be either low or high depending on the location of the accident and the time of day. This rating means injuries and/or death are expected only for exposed personnel over extended periods of time or when individual personal health conditions create complications.

Vulnerability

Vulnerability is high due to the amount of roadway in the county, the ubiquitous nature of HAZMAT products being transported, and agricultural use of HAZMAT products in Agricultural pursuits. The majority of HAZMAT fixed facilities in the County are ag-related. The areas most prone to HAZMAT incidents are those with the highest volume of traffic, particularly US 63 which runs from Louisiana to Wisconsin.

Potential Losses to Existing Development

HAZMAT events don't necessarily present a great threat of direct loss to existing development – they do constitute temporary health hazards and have the potential to close off areas to public use and through traffic for considerable periods of time. The effects of this range from minor inconvenience to a major issue if such an event were to cause a shutdown of US 63.

Impact of Future Development

Commercial and industrial development in Lewis County is relatively minimal, making it difficult to project any significant change in terms of vulnerability.

Hazard Summary by Jurisdiction

The areas most prone to HAZMAT incidents are those with the highest volume of traffic, particularly US 63— therefore, of Lewis County's communities, Canton has the highest risk.

Problem Statement

Lewis County, like the entire State of Missouri is susceptible to this type of hazard, depending on a number of factors such as the type of chemical, amount released/spilled, method of release, location of release, time of day, and weather conditions.

This hazard could have a significant impact on the public health, the environment, private property, and the economy. The impact of this type of disaster will likely be localized to the immediate area surrounding the incident. The initial concern will be for people, then the environment. If contamination occurs, the spiller is responsible for the cleanup actions and will work closely with the Missouri Department of Natural Resources, EPA, and the local jurisdiction to ensure that cleanup is done safely and in accordance with federal and state laws.

Local government (county or municipal) is more often directly impacted by hazardous materials incidents than state or federal government. Local responders are generally the first on scene for any incident. Therefore, they have the responsibility for treating any injured victims and transporting them to a hospital for more complete medical care. Also, local first responders have the initial responsibility for controlling exposure of emergency workers and the public to any radioactive materials and to contain the spread of radioactive contamination as much as possible. While cleanup of any actual spill of radioactive materials rests with the shipper (in most cases), local responders may be required to provide site control for several hours until the responsible parties arrive on the scene.

Any disaster or emergency incident, such as an earthquake or a flood, could result in additional concerns when it involves hazardous materials. For example, during the floods of 1993, a large propane tank farm in St. Louis was threatened by rising floodwaters, forcing evacuations of nearby residents in several areas. Another hazardous materials incident related to the 1993 floods involved an on-going ammonia release from the La Roche Industries, Inc., facility near Crystal City, Missouri, caused by power failure and failure of the cooling system on a large ammonia tank, which ultimately resulted in off-gassing of ammonia through the tank's pressure relief check valves. The ammonia cloud over the plant led to a declaration of restricted air space in the plant vicinity for several days. In addition, thousands of chemical containers ranging from household products and 55-gallon drums to 10,000-gallon fuel storage tanks were displaced statewide as a result of the flood damage. A federal disaster declaration was issued, the Federal Response Plan (FRP) was implemented, and Emergency Support Function #10—Hazardous Materials Annex was activated to support the statewide response to hazardous materials incidents like these and others that resulted from the flooding.

Each emergency event will need to be evaluated on an incident-specific basis, and top priority must be given to the protection of the public, then the environment, and property. Tier II Forms are filed and maintained by the Missouri Emergency Response Commission at SEMA. Site specific plans are on file with each county's local emergency planning commission. Transportation and evacuation routes are addressed in the Lewis County Emergency Operations Plan.

3.4.17 Mass Transportation Incident

Hazard Description

For the purpose of this plan, mass transportation is defined as the means, or system, that transfers large groups of individuals from one place to another. This profile addresses only transportation accidents involving people, not materials. Thus, mass transportation accidents include public airlines, railroad passenger cars, metro rail travel, tour buses, city bus lines, school buses, riverboat casinos, and other means of public transportation. Commercial motor vehicles are defined as trucks having six or more tires on the power unit, buses or school buses having occupant capacities of 16 or more, and vehicles displaying hazardous materials placards.

Missouri serves as a transportation crossroad for the United States. Missouri, being centrally located in the nation, is a natural hub for many major airlines (approximately 10 airports in the State carry passengers) and other types of tourist and business travel. Many cross-country travelers use Missouri terminals to connect with transport changes. The state's airways, railways, and highways are used as nonstop thoroughfares as well.

Normally, the largest numbers of people are transported during the morning and evening rush hours. Amtrak, the State's major passenger rail carrier, uses tracks that cross the entire state from east to west. Although Amtrak has experienced a decline in passengers during this decade, it continues to carry a large number of passengers daily. The peak periods are related to holidays or special events.

Tour bus travel in the State is on the increase. With Branson continuing to expand, more bus traffic in the State can be expected.

Geographic Location

The localities most prone to Mass transportation incidents are those traffic ways with high volumes of traffic – in Lewis County this is US 63 in particular. In addition, the BNSF Railroad runs parallel to the Mississippi river in Lewis County, passing through the Communities of Canton and LaGrange. Barge traffic presents its own issues.

Past Events

Commercial Vehicles

Commercial motor vehicles have been involved in a significant number of Missouri traffic accidents. Statistics from the Missouri State Highway Patrol Statistical Analysis Center show that in 2011, 9.2 percent of all traffic accidents involved a commercial motor vehicle, compared to 8 percent in 2007. Of fatal traffic accidents, 15.2 percent involved a commercial motor vehicle, decreasing from 16 percent in 2007. A total of 120 persons were killed and 3,479 were injured in commercial motor vehicle-related accidents in 2011. In 2007, 168 persons were killed and 5,284 injured in commercial motor vehicle related accidents. In 2011, accidents involving buses and school buses resulted in four fatalities, compared to six fatalities in 2007.

Railroads

On May 14, 1997, about 9:00 p.m., a Missouri and Northern Arkansas Railroad (M&NA) train, the Cotter North local, was traveling northbound in non-signaled territory when it entered a siding track and collided with an unattended and unoccupied Branson Scenic Railway (BSR) excursion train. The collision occurred in downtown Branson, Missouri, on the M&NA Aurora Subdivision at milepost (MP) 447.3. When the collision occurred, the lead locomotive unit of the striking train derailed and caught fire. Also, both locomotive units of the parked train derailed. Both train crewmembers of the M&NA train sustained minor injuries. The costs associated with the accident were \$410,625. Though this incident didn't affect Lewis County it did demonstrate the kind of event that could happen anywhere in the State, even Lewis County.

Probability and Severity

Based on the latest available information, *the probability and severity of a mass transportation accident are both rated as moderate.*

Vulnerability

Potential Losses to Existing Development

Mass traffic incidents typically don't involve too much damage to development, so much as injuries, deaths, and disruption of services associated with the normal flow of traffic on a major traffic way.

Impact of Future Development

Commercial and industrial development in Lewis County is relatively minimal, making it difficult to project any significant change in terms of vulnerability.

Hazard Summary by Jurisdiction

The areas most prone to traffic incidents are those with roads having the highest volume of traffic, in Lewis County this is US 63 in particular – due to this and the presence of the Railroad and the Mississippi river, the communities of Canton and LaGrange have the greatest risk of experiencing mass transportation incidents.

Problem Statement

A mass transportation accident, which could include those involving buses, could burden a local jurisdiction's available medical services. To minimize this problem, mutual aid agreements with adjoining jurisdictions should be developed between ambulance services and the hospitals. This type of hazard could involve hazardous materials or a fire, which would compound the impacts of the incident. Severe weather could also hamper response efforts.

3.4.18 Public Health Emergency/ Environmental Issues

Hazard Description

Public health emergencies can take many forms—disease epidemics, large-scale incidents of food or water contamination, or extended periods without adequate water and sewer services. There can also be harmful exposure to chemical, radiological, or biological agents, and large-scale infestations of disease-carrying insects or rodents. The first part of this section focuses on emerging public health concerns and potential pandemics, while the second part addresses natural and human-caused air and water pollution.

Public health emergencies can occur as primary events by themselves, or they may be secondary to another disaster or emergency, such as tornado, flood, or hazardous material incident. The common characteristic of most public health emergencies is that they adversely impact, or have the potential to adversely impact, a large number of people. Public health emergencies can be worldwide or localized in scope and magnitude. Deadly outbreaks can kill or sicken thousands of people across the county or around the globe, as in the case of the Spanish Flu epidemic of 1918–1919.

Whether natural or manmade, health officials say the threat of a dangerous new strain of influenza virus in pandemic proportions is a very real possibility in the years ahead. Unlike most illnesses, the flu is especially dangerous because it is spread through the air. A classic definition of influenza is a respiratory infection with fever. Each year, flu infects humans and spreads around the globe. There are three types of influenza virus: Types A, B, and C. Type A is the most common, most severe, and the primary cause of flu epidemics. Type B cases occur sporadically and sometimes as regional or widespread epidemics. Type C cases are quite rare and hence sporadic, but localized outbreaks have occurred. Seasonal influenza usually is treatable, and the mortality rate remains low. Each year, scientists estimate which particular strain of flu is likely to spread, and they create a vaccine to combat it. A flu pandemic occurs when the virus suddenly changes or mutates and undergoes an “antigenic shift,” permitting it to attach to a person’s respiratory system and leave the body’s immune system defenseless against the invader.

Environmental concerns addressed in this profile focus on air and water pollution, because contamination of those media can have widespread impacts on public health and devastating consequences. Particular issues of primary concern associated with sources of air and water pollution change over time depending on recent industrial activity, economic development, enforcement of environmental regulations, new scientific information on adverse health effects of particular contaminants or concentrations, and other factors.

Geographic Area

Geography can affect the development and spread of environmental issues, especially as it pertains to contamination of the air, soil, or water. Public health emergencies seem to revolve more around population density and patterns of movement than geography per se, and it can be said that more densely populated areas are at a higher risk of experiencing an epidemic if a disease vector is present within them.

Past Events

Influenza Pandemics

Since the early 1900s, three lethal pandemics have swept the globe, although none have compared to the infamous Spanish Flu event of 1918–1919, which killed more than 20 million people. Its primary victims were mostly young, healthy adults. The 1957 Asian Flu pandemic killed about 70,000 people in the United States, mostly the elderly and chronically ill. The 1968 Hong Kong Flu pandemic killed 34,000 Americans. In addition to those three pandemics, several “pandemic scares” have occurred; the Swine Flu of 1976, Russian Flu of 1977, and Avian Flu of 1997 are notable flu scares that occurred in the twentieth century.

Avian Flu (H5N1)

The Avian flu (H5N1) is a Type A influenza virus that occurs mainly in birds and is highly contagious among birds. The Avian Flu virus was especially virulent, and made an unusual jump from chickens to humans. At least 18 people were infected, and six died in the outbreak. Since 2003, a growing number of human H5N1 cases have been reported in Asia, Europe, and Africa. More than half of the people infected with the H5N1 virus have died. Most of these cases are all believed to have been caused by exposure to infected poultry. There has been no sustained human-to-human transmission of the disease, but the concern is that H5N1 will evolve into a virus capable of human-to-human transmission. Scientists are concerned that as H5N1 continues to evolve, it could make humans more susceptible to infection. Since humans have little or no immune protection against H5N1, such a change could spark an influenza pandemic with potentially high rates of illness and death. For treatment (and prevention) of human infection with avian influenza A viruses, the Center for Disease Control and World Health Organization currently recommend oseltamivir or zanamivir, two of four prescription antiviral medications currently licensed for use in the United States.. Researchers are working to produce alternative treatments. Thailand has begun a phase 1 clinical trial to test an H5N1 avian, or bird, influenza vaccine in a needle-free, nasal spray form. This trial is a result of international collaboration with health agencies around the world, including the U.S. Department of Health and Human Services’ Biomedical Advanced Research and Development Authority (BARDA). The study and data analysis is expected to be complete by May 2013.

Smallpox

Smallpox is a contagious, sometimes fatal, infectious disease. There is no specific treatment for smallpox disease, and the only prevention is vaccination. Smallpox is caused by the variola virus that emerged in human populations thousands of years ago. It is generally spread by face-to-face contact or by direct contact with infected bodily fluids or contaminated objects (such as bedding or clothing). A person with smallpox is sometimes contagious with onset of fever, but the person becomes most contagious with the onset of rash. The rash typically develops into sores that spread over all parts of the body. The infected person remains contagious until the last smallpox scab is gone. Smallpox outbreaks have occurred periodically for thousands of years, but the disease is now largely eradicated after a worldwide vaccination program was implemented. After the disease was eliminated, routine vaccination among the general public was stopped. The last case of smallpox in the United States was in 1949.

It should be noted that after recent terrorist events in the United States, there is heightened concern that the variola virus might be used as an agent of bioterrorism. For this reason, the U.S. government is taking precautions for dealing with a smallpox outbreak

St. Louis Encephalitis

In the United States, the leading type of epidemic flaviviral encephalitis is St. Louis encephalitis (SLE), which is transmitted by mosquitoes that become infected by feeding on birds infected with the virus. SLE is the most common mosquito-transmitted pathogen in the United States. There is no evidence to suggest that the virus can be spread from person to person.

Between 1964 and 2010, there were 4,693 confirmed cases of SLE in the United States. Seventy-seven of these cases were in Missouri. According to the Center for Disease Control, there was one case of SLE in Missouri in 2010. It should be noted, however, that less than 1 percent of SLE infections are clinically apparent, so the vast majority of infections remain undiagnosed. Illnesses range from mild headaches and fever to convulsions, coma, and paralysis. The last major outbreak of SLE occurred in the Midwest from 1974 to 1977, when over 2,500 cases were reported in 35 states. The most recent outbreak of St. Louis encephalitis was in 2001 in Monroe and West Monroe, Louisiana, with 63 reported cases. The disease is generally milder in children than in adults, with the elderly at highest risk for severe illness and death. Approximately 3 to 30 percent of cases are fatal; no vaccine against SLE exists.

Meningitis

Meningitis is an infection of fluid that surrounds a person's spinal cord and brain. High fever, headache, and stiff neck are common symptoms of meningitis, which can develop between several hours to one to two days after exposure. Meningitis can be caused by either a viral or bacterial infection; however, a correct diagnosis is critically important, because treatments for the two varieties differ. Meningitis is transmitted through direct contact with respiratory secretions from an infected carrier. Primary risk groups include infants and young children, household contact with patients, and refugees. The disease is of most concern in Africa, where 213,658 cases were reported during 1996–1997, with 21,830 deaths. In the United States, periodic outbreaks continue to occur, particularly among adolescents and young adults. About 2,600 people in the United States get the disease each year. According to the Missouri Department of Health and Senior Services, there were 23 cases in Missouri in 2010. Generally, 10 to 14 percent of cases are fatal, and 11 to 19 percent of those who recover suffer from permanent hearing loss, mental retardation, loss of limbs, or other serious effects. Two vaccines are available in the United States.

Lyme Disease

Lyme disease was named after the town of Lyme, Connecticut, where an unusually large frequency of arthritis-like symptoms was observed in children in 1977. It was later found that the problem was caused by bacteria transmitted to humans by infected deer ticks, causing an average of more than 16,000 reported infections in the United States each year (however, the disease is greatly under reported). Lyme disease bacteria are not transmitted from person to person. Following a tick bite, 80 percent of patients develop a red “bulls-eye” rash accompanied by tiredness, fever, headache, stiff neck, muscle aches, and joint pain. If untreated, some patients may develop arthritis, neurological abnormalities, and cardiac problems, weeks to months later. Lyme disease is rarely fatal. During early stages of the disease, oral antibiotic treatment is generally effective, while intravenous treatment may be required in more severe cases.

In the United States, Lyme disease is mostly found in the northeastern, mid-Atlantic, and upper north central regions, and in several counties in northwestern California but has been reported in every state. In 2005, 23,305 cases of Lyme disease were reported to the Centers for Disease Control and Prevention. According to the DHSS, in 2010, Missouri showed a decreasing trend for the occurrence of Lyme disease with five cases, the lowest since 2009 when 10 cases were reported. There have been no reported cases of Lyme disease that originated in Missouri.

West Nile Virus

West Nile virus is a flavivirus spread by infected mosquitoes and is commonly found in Africa, West Asia, and the Middle East. It was first documented in the United States in 1999. Although it is not known where the U.S. virus originated, it most closely resembles strains found in the Middle East. It is closely related to St. Louis encephalitis and can infect humans, birds, mosquitoes, horses, and other mammals.

Most people who become infected with West Nile virus will have either no symptoms or only mild effects. However, on rare occasions, the infection can result in severe and sometimes fatal illness. There is no evidence to suggest that the virus can be spread from person to person.

An abundance of dead birds in an area may indicate that West Nile virus is circulating between the birds and mosquitoes in that area. Although birds are particularly susceptible to the virus, most infected birds survive. The continued expansion of West Nile virus in the United States indicates that it is permanently established in the Western Hemisphere. As of December 11, 2012, 48 states have reported West Nile virus infections in people, birds, or mosquitoes. A total of 5,387 cases of West Nile virus disease in people, including 243 deaths, have been reported to CDC. The 5,387 cases reported thus far in 2012 is the highest number of West Nile virus disease cases reported to CDC through the second week in December since 2003. Eighty percent of the cases have been reported from 13 states (Texas, California, Louisiana, Illinois, Mississippi, South Dakota, Michigan, Oklahoma, Nebraska, Colorado, Arizona, Ohio, and New York) and a third of all cases have been reported from Texas.

Severe Acute Respiratory Syndrome (SARS)

SARS is a respiratory illness that has recently been reported in Asia, North America, and Europe. Although the cause of SARS is currently unknown, scientists have detected in SARS patients a previously unrecognized coronavirus that appears to be a likely source of the illness. In general, humans infected with SARS exhibit fevers greater than 100.4°F, headaches, an overall feeling of discomfort, and body aches. Some people also experience mild respiratory symptoms. After two to seven days, SARS patients may develop a dry cough and have trouble breathing.

The primary way that SARS appears to spread is by close person-to-person contact; particularly by an infected person coughing or sneezing contaminated droplets onto another person, with a transfer of those droplets to the victim's eyes, nose, or mouth. The global outbreak of 2003 was contained. There were no confirmed cases in Missouri.

H1N1 Influenza (Pandemic Influenza)

The H1N1 virus, also known as the swine flu, is a respiratory disease of pigs caused by type A influenza viruses that regularly cause outbreaks of influenza in pigs. This virus is a unique grouping

of influenza virus genes never previously seen in either animals or people. The virus genes are a combination of genes most closely related to North American swine-lineage H1N1 and Eurasian lineage swine-origin H1N1 influenza viruses. Due to this combination, initial reports referred to the virus as a swine origin influenza virus. However, investigations of initial human cases did not identify exposures to pigs and quickly it became apparent that this new virus was circulating among humans and not among U.S. pig herds.

The new flu virus spread quickly across the United States and the world in the spring of 2009. The first U.S. case of H1N1 was diagnosed on April 15, 2009. By April 21, the Centers for Disease Control and Prevention (CDC) was working to develop a vaccine for this new virus. The U.S. government declared H1N1 a public health emergency on April 26. By June, 18,000 cases of H1N1 had been reported in the U.S. Additionally, 74 countries were affected by the pandemic. H1N1 vaccine supply was limited in the beginning. People at the highest risk of complications got the vaccine first. By November 2009, 48 states had reported cases of H1N1, mostly in young people. That same month, over 61 million vaccine doses were ready. Reports of flu activity began to decline in parts of the country, which gave the medical community a chance to vaccinate more people. 80 million people were vaccinated against H1N1, which minimized the impact of the illness. The CDC estimates that 43 million to 89 million people had H1N1 between April 2009 and April 2010. They estimate between 8,870 and 18,300 H1N1 related deaths. On August 10, 2010 the World Health Organization (WHO) declared an end to the global H1N1 flu pandemic.

According to the September 1, 2009 H1N1 Virus Briefing document produced by the Missouri Department of Health and Senior Services, the H1N1 virus, also known as swine flu, first emerged in Mexico in March 2009 and caused illness in people worldwide. As of August 23, 2009, the World Health Organization reported over 209,438 laboratory-confirmed cases of H1N1 with 2,185 deaths. Missouri saw its first H1N1 case in April 2009. Since then, the State reported hundreds of confirmed cases and eleven deaths. In Missouri, as well as worldwide, the illness associated with this new virus continued to be similar to the seasonal flu. Most people who have become ill have recovered without requiring medical treatment. However, the virus has been shown to be particularly aggressive in some segments of the population not usually affected by the regular flu. These groups include pregnant women, schoolage children, and those with underlying chronic health conditions, such as obesity or asthma.

The H1N1 flu outbreak was serious. In late March and early April 2009, cases of human H1N1 infection were first reported in Southern California and near San Antonio, Texas. For comparison, only 12 human cases of swine flu were detected in the U.S. from December 2005 to February 2009, with no deaths occurring. The last swine flu outbreak in the U.S. was in 1976. On Friday, April 24, 2009 the State health department issued a Health Advisory to Missouri's medical community and to public health departments. The Health Advisory asked hospital intensive care units to collect influenza specimens from patients with flu-like illness, confirmed influenza, bacterial pneumonia, or lower respiratory illness with fever. The department also asked the existing network of key health care providers to collect specimens from outpatients suffering from those symptoms.

The World Health Organization declared this outbreak a worldwide influenza pandemic. The declaration was based on the spread of the virus throughout the world, not on the severity of the illness. The Missouri Department of Health and Senior Services prepared for such a pandemic with its Missouri Pandemic Influenza Response plan. Additional activities included enhanced surveillance for the H1N1 virus by requiring immediate, detailed reporting of all diagnosed or suspected cases;

conducting more frequent analysis of surveillance data; and activating additional surveillance providers. The State Public Health Laboratory in Jefferson City is a state-of-the-art facility that handles many kinds of infectious agents.

Environmental Issues

Although Missouri has never had an environmental disaster of large proportions, there are many instances where hazardous substances can impact the environment with considerable consequences to either air or water. Floods often temporarily interrupt community water supplies, creating the need for emergency potable water for thousands of people. In July 1993, for example, St. Joseph's municipal water plant was forced to shut down for an extended period when contaminated floodwater threatened to enter the system. Floodwaters also disrupt wastewater treatment facilities, resulting in the discharge of raw or improperly treated sewage. Periodically, water pollutants cause fish kills in Missouri streams, and excessive air pollutants associated with smog in large metropolitan areas create public health problems.

In 1983, the town of Times Beach, located in St. Louis County, was evacuated due to dioxin contamination. Dioxin is chemical compound found to cause severe health effects when high levels of exposure occur. In the 1920s and 30s, the town was a summer resort but had since become a lowmiddle class town. Due to the dust problem from unpaved roads, a local waste hauler was hired to spray waste oil in and around the town on the dirt roads. The waste hauler had also been hired by a local company to dispose of toxic waste. The toxic waste came from a facility in western Missouri that had once produced Agent Orange during the Vietnam War. The hauler was unaware of the dioxin content and mixed it with the oil being sprayed. A problem first arose when 62 horses died after the mixture was sprayed in a stable to mitigate dust. On December 5, 1982, the Meramec River flooded causing an evacuation due to more than 95% of the town being under ten feet of water. On December 23, 1982 the EPA announced that dangerous levels of dioxin were found in the soil around Times Beach. By 1985, the Times Beach was evacuated. It was later found that the waste contained 2,000 times the amount of dioxin content of Agent Orange. It was the largest civilian exposure to dioxin in the county's history.

Air Pollution Staff in the State of Missouri Air Quality Monitoring section operates approximately 140 instruments at 40 locations around the State as part of a network to monitor air pollutants known to affect people's health. In addition, staff conducts special air quality studies. Because of high amounts of ozone, carbon dioxide, nitrogen compounds, and other vehicular pollutants in the St. Louis metropolitan area, vehicles registered in the counties of St. Louis, St. Charles, and Jefferson, as well as St. Louis City, are required to have their exhaust systems routinely checked to determine whether emissions standards are being achieved. In addition, all service stations around St. Louis are now required to have new gas nozzles that recapture gasoline vapors, thus preventing them from being released to the atmosphere. These vapors (unburned hydrocarbons) chemically react with nitrogen oxides when exposed to the sunlight and form ozone, which is the basis for smog.

Water Pollution

The Missouri Department of Natural Resources also maintains the State's water quality management plan and has developed individual plans for each drainage basin in Missouri.

According to the 2012 Water Quality Report, state concerns include the following:

- Channelization has caused aquatic habitat degradation in 32 percent of Missouri's streams and contributes to flooding, high water velocities, and streambank erosion as they try to recreate their natural sinuosity.
- Eutrophication of large, recreationally important reservoirs continues to be a concern.
- Abandoned lead-zinc mines and their tailings continue to impact waters decades after mining has ceased. Missouri's Superfund Program is addressing some of these concerns.
- Additional ground water protection measures are needed.
- There are 427 Class I confined animal feeding operations in Missouri.
- The data on fish that have been collected and the data on invertebrates that are still being collected indicate that many of these communities throughout the State are suffering from degraded quality of aquatic habitat.

In addition to State water pollution management, the Environmental Protection Agency (EPA) maintains the National Pollutant Discharge Elimination System (NPDES). Authorized by the Clean Water Act, the NPDES permit program controls water pollution by regulating point sources that discharge pollutants into waters of the United States. Point sources are discrete conveyances such as pipes or man-made ditches. Individual homes that are connected to a municipal system, use a septic system, or do not have a surface discharge do not need an NPDES permit; however, industrial, municipal, and other facilities must obtain permits if their discharges go directly to surface waters. In most cases, the NPDES permit program is administered by authorized states. Since its introduction in 1972, the NPDES permit program is responsible for significant improvements to our Nation's water quality.

Probability and Severity

Probability: High Severity: In 2012 there was concern among health officials that there was a high probability of a dangerous new strain of the influenza virus sometime in the future. In fact, they believed that worldwide influenza outbreak on the scale and severity of the Spanish Flu was not farfetched. Catastrophic consequences were predicted. A much larger percentage of the world's population is clustered in cities, making them ideal breeding grounds for epidemics. Additionally, the explosive growth in air travel means the virus could literally be spread around the globe within hours. Under such conditions, there may be very little warning time. Most experts believe we will have just one to six months between the time that a dangerous new influenza strain is identified and the time that outbreaks begin to occur in the United States. Outbreaks are expected to occur simultaneously throughout much of the nation, preventing shifts in human and material resources that normally occur with other natural disasters. These and many other aspects make influenza pandemic unlike any other public health emergency or community disaster.

Vulnerability

Potential Losses to Existing Development

Environmental and public health emergencies generally have more of a direct impact on human health and morbidity than hard assets and infrastructure, but both can also have impacts on the local economy and some types of commercial and industrial development, especially residential realty and business concerns that rely on natural resources for their income stream, like agriculture and tourism.

Impact of Future Development

Commercial and industrial development in Lewis County is relatively minimal, making it difficult to project any significant change in terms of vulnerability.

Hazard Summary by Jurisdiction

While no particular community really has a greater risk to this hazard, schools tend to experience higher rates of infectious disease transmission than the general population, akin to that of nursing homes, prisons, and other institutional settings.

Problem Statement

For planning purposes, it is reasonable to assume a rapid movement of a pandemic flu virus from major metropolitan areas to rural areas of the State, especially those rural areas in close proximity to metropolitan areas, like Lewis County. The effect of a pandemic on individual communities would likely be relatively prolonged—weeks to months. The impact of the next pandemic could have a devastating effect on the health and well-being of Missouri citizens and the American public. For such an outbreak in the future, the Centers for Disease Control and Prevention estimate that in the United States alone:

- Up to 200 million persons will be infected
- Between 40 and 100 million persons will become clinically ill
- Between 18 and 45 million persons will require outpatient care
- Between 300,000 and 800,000 persons will be hospitalized
- Between 88,000 and 300,000 people will die nationwide
- Effective preventive and therapeutic measures, including vaccines and antiviral agents, likely will be in short supply, as well as some antibiotics to treat secondary infections
- Economic losses from the next pandemic may range from \$500 to \$675 billion, depending on the attack rate (Reuters)

Preparing for, responding to and recovering from pandemic influenza will require a strategy with many similarities to other disease outbreaks, be they naturally occurring or resulting from terrorist actions. The time-honored public health activities to lessen the impact on morbidity and mortality such as education, vaccination, prophylaxis, isolation/quarantine and the closure of public facilities are common to all, despite the particular disease of concern. In addition, clear, concise communication with the public, within the Missouri Department of Health and Senior Services (DHSS), and with other agencies remains a critical component, as does the ability of the involved agencies to achieve collaboration and coordination. By its very nature, an influenza pandemic, once

started, will not be stopped until it has run its course. This course can be shortened and weakened by many things, with vaccination being the gold standard for protecting the population. Pandemic plans describe strategies of preparedness, response and recovery to attempt to decrease illnesses and deaths during the pandemic period to manageable levels (i.e., that do not overwhelm the critical infrastructures of the State), and to promote community resiliency and rapid recovery.

DHSS has emergency pandemic flu response plans in place, internally, and as part of the State response through the Missouri State Emergency Operations Plan (SEOP) that have been tried, tested and exercised for all aspects of response and recovery, including those mentioned above relating to disease surveillance, investigation and control. Where necessary, details or public information templates unique to pandemic influenza have been added into plans. The current pandemic plan gives background information related to pandemic influenza, outlines the DHSS concept of operations for response, lists primary and support functional areas and provides technical support annexes outlining the available resources (i.e., “tools”) available to temper the pandemic and promote community resiliency and recovery. Components of other all-hazard plans incorporated through partnership with the State Emergency Management Agency and other local, state, and federal agencies are expected to be utilized in accordance with need.

A broad, diverse and geographically dispersed group of agencies and organizations, representing the length, breadth and interests of the State collaborated with the DHSS in working to prepare for pandemic influenza. With committees organized under the umbrella of the Missouri Homeland Security Advisory Council, over four hundred representatives from hospitals, livestock corporations, local public health agencies (LPHAs), other state agencies, funeral homes, laboratories, financial institutions, fire departments, local and state governments, school boards, utility companies, universities, nursing homes and coroner’s offices, among others, engaged with DHSS providing input and expertise to produce the Missouri Pandemic Influenza Response Plan.

DHSS has primary responsibility to safeguard the health of the people of the State and all its subdivisions and will respond in the event of pandemic influenza to attempt to limit the impact on public health by reducing morbidity and mortality. These actions may also limit the impact on the social and economic infrastructure of the State. DHSS will serve to support the LPHAs in this effort, and lead the State-level response of a coordinated multitude of federal, state and private organizations and agencies. DHSS reserves the flexibility to modify the plan during the pandemic in response to the actual behavior of the disease and the effectiveness of the ongoing response. Lessons learned from previous waves will be incorporated going forward and modifications in planning may be made across all sectors to meet the key goals in public health and critical infrastructure support. Such changes will be rapidly and effectively communicated from DHSS to all partnered agencies and organizations per the communications plan to ensure best practices are consistently implemented statewide.

Local emergency management officials should identify pollution hazard areas so that in case of a natural disaster, recovery steps will not be delayed. Pollution of public drinking water, for example, can cause severe problems with reentry and recovery. If alternate sources of safe drinking water can be identified, or relocation of water intakes can eliminate polluted drinking water, then recovery can be quicker, and local resources can be used to address other problems.

With the increases in motor vehicle registrations throughout the State, the levels of nitrocarbon emissions will naturally rise. Combinations of smog and carbon monoxide levels will also increase. In sufficient quantities, these pollutants can have deleterious effects on the health of thousands of Missourians.

3.4.19 Special Events

Hazard Description

Significant special events may include any type of event where large groups of people are gathered together, regardless of the cause or purpose of the event, where expanded security and other resources are required above and beyond the resources typically available to local and/or state government. In such instances, event sponsors, in conjunction with local and state authorities, are responsible for coordinating the event and requesting Federal assistance, if necessary.

Special events may be motivated by political, economic or social causes or large holiday events such as an annual Fair, where large numbers of people crowd onto a small area.

The perception of inherent dangers and threats facing this country and Missouri has changed significantly since the terrorist attacks of September 11, 2001. In keeping with the framework of the National Response Plan, Emergency Operations Plans should consider special events as described herein. Past events in Missouri, though none have affected Lewis County specifically, offer lessons about some of the potential impacts on security and medical resources that a special event could have.

Anytime a large number of people are congregated in one area, an incident resulting from just about any of the hazards could have devastating impacts. For example, consider the impact a sudden, severe hailstorm could have on the population visiting the Fair. A hailstorm such as this struck the north St. Louis County area in April 2001, causing thousands of dollars of damage to residences and vehicles. This storm produced baseball-size (and larger) hailstones, which killed many pets and nearly all the waterfowl residing at local park ponds. An incident such as this could have devastating impacts if it were to suddenly strike a fairgrounds and find hundreds of people in attendance and without shelter.

The potential impact a terrorist attack incident could impose at such an event is exponentially greater. Medical services would likely be overwhelmed with the number of injuries.

Geographic Area

Special events generally occur in populated communities, so any community that hosts sporting events, music concerts, fairs or festivals has some vulnerability to this hazard.

Past Events

Pope John Paul II visited St. Louis, Missouri, on January 26 and 27, 1999. This pastoral visit included 30 hours of speeches, parades, prayer services, and a papal mass for about 104,000 people at the St. Louis America's Center, which filled every available seat in the center, including the Edward Jones Dome and adjoining convention exhibit hall. This mass is billed as the largest U.S. indoors gathering ever and was designated a National Special Security Event. This two-day series of events also included a welcome address by President Bill Clinton and ceremonial farewell meeting with Vice-President Al Gore and was attended by many state officials, including Missouri Governor Mel Carnahan.

Event activities were spread throughout the St. Louis metropolitan area, from the Lambert–St. Louis International Airport to the downtown area and the grounds of the Gateway Arch on the Mississippi

Riverfront. This was undoubtedly the largest single special event to occur in Missouri in recent years, with security concerns reaching to national and international levels. Close coordination between local, state, and Federal law enforcement agencies is required to provide adequate security measures for events like this. The potential for hazards from mass transportation accidents was also elevated for this event, as one quote said, "Seemingly every school bus in the region was enlisted to transport people from suburban pickup points down into St. Louis America's Center for the papal mass." Fortunately, this event was conducted without any major incidents.

The Hyatt Regency Hotel at Union Station in St. Louis hosted the World Congress meeting of the World Agricultural Forum May 18 to 20, 2003. The forum brought together agriculture industry leaders and world leaders to discuss the future of global agriculture. Mindful of Seattle's experience with violent protestors who disrupted the World Trade Organization (WTO) meeting there in December 1999, St. Louis police were braced for any possible problems that could arise from hundreds or even thousands of protestors descending on St. Louis for this event. Four Seattle police officers were invited to St. Louis to talk about what happened at the 1999 WTO event (50,000 demonstrators overwhelmed 400 Seattle officers and protestors smashed windows and vandalized cars as police fought back with rubber bullets and tear gas). Washington, DC, police were also invited to St. Louis to share their experiences with riots during protests of major global conferences in their city. Although St. Louis police were not anticipating the same level or intensity of violence as in Seattle, they did have intelligence reports that some visitors would be in St. Louis who were involved in the Seattle protests and other demonstrations.

Another conference, called Biodevastation 7, was scheduled immediately prior to the World Agricultural Forum (May 16 to 18, 2003) in St. Louis, which involved a gathering of opponents to genetic engineering. An organizer with the group had indicated that 200 to 800 people were expected to attend the Biodevastation 7 conference and that there would be 200 to 2,000 protestors at the World Agricultural Forum. During this time period, in nearby Creve Coeur, Missouri, extra police were also on hand at the Monsanto property for the annual Creve Coeur Days. Monsanto, an agriculture industry leader, is a host of the annual celebration, which includes carnival rides and game booths on its property. Creve Coeur police coordinated a plan with St. Louis police to gather information about possible protests at this event. A local international security consulting firm was in charge of security for the World Agricultural Forum conference. They worked with St. Louis police and other law enforcement agencies to prepare for possible protests at the event. Close coordination between these agencies helped to ensure that St. Louis was prepared to provide adequate security for the event and the international visitors to the city. Other than a couple of minor incidents between police and activists in the days leading up to the conference, no incidents were reported. A protest outside the conference on May 18 drew only a few hundred demonstrators, all peaceful, and only a handful of demonstrators were present during the event's two days.

In 2015 the Kansas City Royals won the World Series. On November 3rd the Royals returned to the City for a 2.3 mile-long parade that wound through the downtown area, which began at noon and continued until 2 pm, though the celebration would go on much longer. Large portions of downtown Kansas City were completely shut down and people were shuttled in from points outside the location of the celebration. The smooth, untroubled nature of such a large (estimates ranged to 800,000 in attendance) and fairly impromptu event in Kansas City garnered media attention, especially juxtaposed with the sporadic civil unrest and ongoing racial tensions making national news across the state in St. Louis.

Probability and Severity

Due to the annual nature of the county fair, the *probability is rated as high* that the county could be host to a special event that will require significant security and other emergency planning considerations. The overall *probability that a disastrous incident from any cause would occur in conjunction with a designated special event or special security event is considered moderate*.

The severity of incidents occurring in conjunction with designated special events could range from low to high, depending on many factors. The severity of these incidents will be a function of the

number of people attending these events and the type and severity of the specific hazards that affect the events. Considerations of severity could range from a hoax bomb scare or terrorist threat where no one is physically injured and without any property damage to a full-scale disaster affecting a large number of people gathered at one time with mass injuries and property damage by natural, accidental, terrorist, or criminal causes.

Vulnerability

Potential Losses to Existing Development

With special events, the potential damages to existing development will be the same as those outlined in the individual hazards in this plan – the concern is that there is a concentration of people who may be located in harm's way – for instance, a Tornado striking a community represents a certain potential loss in hard assets and human casualties. A Tornado striking a community during a major festival when there is a significant temporary increase in human population and that population is largely located outside would have the same potential for loss of hard assets but a greatly increased threat to human life safety.

Impact of Future Development

Commercial and industrial development in Lewis County is relatively minimal, making it difficult to project any significant change in terms of vulnerability.

Hazard Summary by Jurisdiction

Vulnerability to this hazard is similar for any community where special events may occur.

Problem Statement

As with the measure of probability and severity, the potential impact of hazards occurring in association with any special event must be evaluated as a function of the specific hazard that could cause the impact on a large number of people attending any event. Refer to the impact of the hazard discussions in other hazard profiles for more hazard-specific impact considerations. Regardless of the purpose or cause, special events will place a large number of people in one area at one time. Anytime people are crowded together in one place, an incident resulting from just about any of the hazards could have compounded and devastating impacts.

In such instances, event sponsors, in conjunction with local and state authorities, are responsible for coordinating the event and requesting assistance at the Federal level, if necessary. Local and state authorities are responsible for coordinating requirements from the organization sponsoring an event

and determining resource shortfalls and submitting resource requests, through the existing structures and mechanisms, to the national level for consideration. Event sponsors are responsible for developing concepts for conducting the event, identifying resource requirements necessary to support the event, and submitting resource requests to local and state governments for consideration.

3.4.20 Terrorism

Hazard Description

Terrorism, as defined by the Federal Bureau of Investigation (FBI) is, “the unlawful use of force or violence against persons or property to intimidate or coerce a government, the civilian population, or any segment thereof, in furtherance of political or social objectives.” 50 The effects of terrorism can vary significantly, including loss of life, injuries to people and properties, and disruptions in services (e.g., water supplies, public transportation, and communications).

According to the FBI, there are two primary types of terrorism: Domestic and international.

- *Domestic* Terrorism involves groups or individuals whose terrorist activities are directed at elements of US local, state or federal government or populations without foreign direction.
- *International* Terrorism involves terrorist activity committed by nations, groups or individuals who are foreign-based and/or directed by countries or groups outside the United States or whose activities transcend national boundaries.

Domestic Terrorism

According to the FBI, domestic terrorist groups are those with actual or potential terrorist intent represent interests that span the full spectrum of political and economic viewpoints, as well as social issues and concerns :

- **White Supremacists or Right-Wing Terrorists**—Right-wing terrorist groups often adhere to the principles of racial supremacy and embrace antigovernment, antiregulatory beliefs. Generally, extremist right-wing groups engage in activities that are protected by constitutional guarantees of free speech and assembly. Examples of this type of group include Aryan Nations, the Order, and Posse Comitatus. Missouri has seen some activity from these groups in the past few years. According to the Southern Poverty Law Center, Missouri has two extremist groups operating within its borders. Although a state statute against paramilitary training exists, one of these groups is also known to have such a facility in Missouri. In addition, several special gatherings of extremist groups have taken place within the State in recent years.
- **Black Separatists**—United States-based black separatist groups follow radical variants of Islam and in some cases express solidarity with al-Qa’ida and other international terrorist groups.
- **Animal Rights and Environmental Terrorists**—Operating under the umbrella of the Animal Liberation Front and Earth Liberation Front, these terrorists use a variety of tactics against their targets, including arson, sabotage/vandalism, theft of research animals, and the occasional use of explosive devices.
- **Anarchists**—The potential for violence by anarchists and other emerging revolutionary groups, such as the Anarchist Black Cross Federation (ABCF), will continue to be an issue for law enforcement. The stated goals of the ABCF are “the abolishment of prisons, the system of laws, and the capitalist state.” The ABCF believes in armed resistance to achieve a stateless and classless society. The ABCF has continued to organize, recruit, and train anarchists in the use of firearms.

- Anti-abortion Extremists—The FBI has investigated anti-abortion groups with potential violent anti-abortion extremists views and are linked to terrorism ideologies or groups that pose a current threat.

International Terrorism

The United States continues to face an ongoing challenge from international terrorism. In general terms, the international terrorist threat can be divided into three categories: loosely affiliated extremists operating under the radical jihad movement, formal terrorist organizations, and state sponsors of terrorism. Each of these categories, which represent threats to U.S. citizens and interests both abroad and at home, are described below:

- Loosely Affiliated Extremists — These are motivated by political or religious beliefs, and pose the most urgent threat to the United States.
- Formal Terrorist Organizations — These organizations are typically autonomous and have their own infrastructures, personnel, financial arrangements, and training facilities.
- State Sponsors of Terrorism — This category includes countries known to sponsor terrorism and to view it as a tool of foreign policy. Currently, the U.S. Department of state recognizes four countries in this category: Iran, Sudan, Syria, and Cuba.
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Foreign Terrorist Organizations (FTOs) are foreign organizations that are designated by the Secretary of State in accordance with Section 219 of the Immigration and Nationality Act, as amended by the Antiterrorism and Effective Death Penalty Act of 1996. A list is compiled every two years.

Foreign Terrorist Organizations, per the Bureau of Counterterrorism, US Dept. of State	
Date Designated	Name
10/8/1997	Abu Nidal Organization (ANO)
10/8/1997	Abu Sayyaf Group (ASG)
10/8/1997	Aum Shinrikyo (AUM)
10/8/1997	Basque Fatherland and Liberty (ETA)
10/8/1997	Gama'a al-Islamiyya (Islamic Group) (IG)
10/8/1997	HAMAS
10/8/1997	Harakat ul-Mujahidin (HUM)
10/8/1997	Hizballah
10/8/1997	Kahane Chai (Kach)
10/8/1997	Kurdistan Workers Party (PKK) (Kongra-Gel)
10/8/1997	Liberation Tigers of Tamil Eelam (LTTE)
10/8/1997	National Liberation Army (ELN)
10/8/1997	Palestine Liberation Front (PLF)
10/8/1997	Palestinian Islamic Jihad (PIJ)
10/8/1997	Popular Front for the Liberation of Palestine (PFLF)

10/8/1997	PFLP-General Command (PFLP-GC)
10/8/1997	Revolutionary Armed Forces of Colombia (FARC)
10/8/1997	Revolutionary People's Liberation Party/Front (DHKP/C)
10/8/1997	Shining Path (SL)
10/8/1999	al-Qa'ida (AQ)
9/25/2000	Islamic Movement of Uzbekistan (IMU)
5/16/2001	Real Irish Republican Army (RIRA)
12/26/2001	Jaish-e-Mohammed (JEM)
12/26/2001	Lashkar-e Tayyiba (LeT)
3/27/2002	Al-Aqsa Martyrs Brigade (AAMB)
3/27/2002	Asbat al-Ansar (AAA)
3/27/2002	al-Qaida in the Islamic Maghreb (AQIM)
8/9/2002	Communist Party of the Philippines/New People's Army (CPP/NPA)
10/23/2002	Jemaah Islamiya (JI)
1/30/2003	Lashkar i Jhangvi (LJ)
3/22/2004	Ansar al-Islam (AAI)
7/13/2004	Continuity Irish Republican Army (CIRA)
12/17/2004	Islamic State of Iraq and the Levant (formerly al-Qa'ida in Iraq)
6/17/2005	Islamic Jihad Union (IJU)
3/5/2008	Harakat ul-Jihad-i-Islami/Bangladesh (HUJI-B)
3/18/2008	al-Shabaab
5/18/2009	Revolutionary Struggle (RS)
7/2/2009	Kata'ib Hizballah (KH)
1/19/2010	al-Qa'ida in the Arabian Peninsula (AQAP)
8/6/2010	Harakat ul-Jihad-i-Islami (HUJI)
9/1/2010	Tehrik-e Taliban Pakistan (TTP)
11/4/2010	Jundallah
5/23/2011	Army of Islam (AOI)
9/19/2011	Indian Mujahedeen (IM)
3/13/2012	Jemaah Anshorut Tauhid (JAT)
5/30/2012	Abdallah Azzam Brigades (AAB)
9/19/2012	Haqqani Network (HQN)
3/22/2013	Ansar al-Dine (AAD)
11/14/2013	Boko Haram
11/14/2013	Ansaru
12/19/2013	al-Mulathamun Battalion
1/13/2014	Ansar al-Shari'a in Benghazi
1/13/2014	Ansar al-Shari'a in Darnah
1/13/2014	Ansar al-Shari'a in Tunisia
4/10/2014	ISIL Sinai Province (formally Ansar Bayt al-Maqdis)

5/15/2014	al-Nusrah Front
8/20/2014	Mujahidin Shura Council in the Environs of Jerusalem (MSC)
9/30/2015	Jaysh Rijal al-Tariq al Naqshabandi (JRTN)
1/14/2016	ISIL-Khorasan (ISIL-K)
5/20/2016	Islamic State of Iraq and the Levant's Branch in Libya (ISIL-Libya)
7/2/2009	Kata'ib Hizballah (KH)
1/19/2010	al-Qa'ida in the Arabian Peninsula (AQAP)
8/6/2010	Harakat ul-Jihad-i-Islami (HUJI)
9/1/2010	Tehrik-e Taliban Pakistan (TTP)
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5/20/2016	Islamic State of Iraq and the Levant's Branch in Libya (ISIL-Libya)

Delisted Organizations		
Date Removed	Name	Date Originally Listed
10/8/1999	Democratic Front for the Liberation of Palestine - Hawatmeh Faction	10/8/1997
10/8/1999	Khmer Rouge	10/8/1997
10/8/1999	Manuel Rodriguez Patriotic Front Dissidents	10/8/1997
10/8/2001	Japanese Red Army	10/8/1997

10/8/2001	Tupac Amaru Revolution Movement	10/8/1997
5/18/2009	Revolutionary Nuclei	10/8/1997
10/15/2010	Armed Islamic Group (GIA)	10/8/1997
9/28/2012	Mujahedin-e Khalq Organization (MEK)	10/8/1997
5/28/2013	Moroccan Islamic Combatant Group (GICM)	10/11/2005
7/15/2014	United Self Defense Forces of Colombia	9/10/2001
9/3/2015	Revolutionary Organization 17 November (17N)	10/8/1997
12/9/2015	Libyan Islamic Fighting Group (LIFG)	12/17/2004

Terrorism can take place in various forms, depending on the technological means available to the terrorist group, the nature of the issue motivating the attack, and the points of weakness of their target. Potential terrorist actions include the following:

- **Bombings**—Bombings have long been used in terrorist attacks and probably represent the most “traditional” form of terrorism. These types of incidents range from small-scale letter bombs to large-scale attacks on specific buildings. Other bomb-related incidents frequently involve “suicide bombers,” who believe that by using themselves as the delivery and detonation method of a bomb attack they demonstrate their dedication to an ideology.
- **Airline Attacks**—In the past, terrorist acts involving aircrafts were generally limited to hijackings and bombings. However, the attacks on the World Trade Center buildings in New York City and the pentagon in 2001 brought a new avenue to light—the use of commercial aircrafts to attack infrastructure targets. Foreign surface-to-air missile attacks also present a threat to U.S. aircrafts.
- **Weapons of Mass Destruction (WMD) Attacks**—WMD attacks usually involve nuclear weapons or biological or chemical agents. Chemical and biological agents are infectious microbes or toxins used to produce illness or death. They can be dispersed as aerosols or airborne particles directly onto a population, producing an immediate effect (a few seconds to a few minutes) or a delayed effect (several hours to several days). Severity of injuries depends on the type and amount of the agent used and duration of exposure. Because some biological agents take time to grow and cause disease, an attack using this type of agent may go unnoticed for several days. Though less likely, a nuclear event has the potential to cause immense damage to infrastructure and cause large numbers of casualties. Even a small event such as an Improvised Nuclear Device (IND) explosion has the ability to destroy cities and cause the immediate and delayed death of 100,000 people.
- **Infrastructure Attacks**—These types of attacks can impact various potential targets, including water distribution systems and treatment plants, utility companies and services, emergency services, gas and oil production facilities, telecommunications centers, transportation

terminals, media facilities, government buildings, and religious institutions. The goal is to disrupt or remove critical services to the populace that is dependent upon them. Though the loss of life usually is limited, infrastructure attacks can have a wider direct effect on the populace.

- **Cyberterrorism**—Cyberterrorism pertains to attacks on computer-based systems that are designed to spread disinformation and propaganda, deny service to legitimate computer users, spread electronic viruses to corrupt vital data, or cause critical infrastructure outages. Political conflicts that have led to attacks on cyber systems include clashes between India and Pakistan, Israel and the Palestinians, the North Atlantic Treaty Organization, and Serbia.
- **Agroterrorism**—Agroterrorism involves intentional contamination of commercial produce or meat supplies. Because the United States supplies approximately 16 percent of the world's meat, 40 percent of its soybeans, and 41 percent of its corn, a deadly fungus or bacteria could be devastating. Of the 222 possible bioterrorism attacks that have occurred worldwide in the twentieth century, only 17 of these targeted commercial livestock or plants, according to the Institute for National Strategic Studies.
- **Arson**—Intentional fires have caused extensive damage during terrorist-related incidents in the past. These types of incidents may also be associated with bombings and usually target specific structures, such as churches. Although deliberately set fires have been reported at 15 churches in Missouri, none have been determined to be hate crime-related or terrorist-related incidents.
- **Kidnappings/Assassinations**—Kidnappings and assassinations may also be terrorist-related incidents, but because these events generally involve few individuals, their effect on emergency management operations may be minimal in terms of response.

After the attacks on September 11, 2001, parts of 22 domestic agencies were consolidated into one department, the U.S. Department of Homeland Security (DHS), to protect the nation against future terrorist threats. Roles of those agencies include analyzing threats and intelligence, guarding national borders and airports, protecting critical infrastructure, and coordinating response efforts for future emergencies. Many feel the creation of DHS is the most significant transformation of the U.S. government in the last 50 years.

The FBI is the lead federal agency for investigating terrorism. The FBI is authorized to open an investigation whenever, "facts or circumstances reasonably indicate that two or more persons are engaged in an enterprise for the purpose of furthering political or social goals wholly or in part through activities that involve force or violence and a violation of the criminal laws of the United States."

In any given year, the FBI engages in approximately 24 full-scale domestic terrorism investigations. The FBI maintains a state-of-the-art computer database known as the Terrorist Information System, which contains information on known or suspected terrorist groups and individuals. The system contains information on over 200,000 individuals and over 3,000 organizations.

An essential weapon in the battle against terrorists is the Joint Terrorism Task Force (JTTF). A national JTTF, located at FBI Headquarters, includes representatives from the U.S. Department of Defense, U.S. Department of Energy, FEMA, Central Intelligence Agency, Customs Service, Secret Service, and the Immigration and Naturalization Service. Additionally, there are 66 local JTTFs where representatives from federal agencies, state and local law enforcement personnel, and first responders work together to track down terrorists and prevent acts of terrorism in the United States.

There are two JTTFs in Missouri, one in Kansas City and one in St. Louis.

After terrorist-related events, communities may receive assistance from state and federal agencies operating within the existing Integrated Emergency Management System. FEMA is the lead federal agency for supporting state and local response to the consequences of terrorist attacks.

Past Events

The following section highlights noteworthy terrorist-related threats and actual attacks that have occurred in the United States since 1970.

In 1972, members of a U.S. fascist group called Order of the Rising Sun were found in possession of 30 to 40 kilograms of typhoid bacteria cultures, which they planned to use to contaminate water supplies in Chicago, St. Louis, and other large Midwestern cities.

In 1984, two members of an Oregon cult headed by Bhagwan Shree Rajneesh cultivated Salmonella bacteria and used it to contaminate restaurant salad bars in an attempt to affect the outcome of a local election. Although approximately 751 people became ill and 45 were hospitalized, there were no fatalities.

In February 1993, an improvised bomb exploded in a rental van parked on the second level of the World Trade Center's parking basement. The bomb contained approximately 1,200 to 1,500 pounds of a homemade fertilizer-based explosive, urea nitrate. The blast produced a crater 150 feet in diameter and five floors deep. Although the motive for the attack was never confirmed, it is believed that the suspect who masterminded the bombing was either backed by a loose network of militant Muslims or directed by Iraq. The incident, which killed 6 people and injured more than 1,000, was the most significant international terrorist act that had ever been committed on U.S. soil at that time.

In April 1995, a massive bomb exploded inside a rental truck parked near the Murrah Federal Building in Oklahoma City, destroying half the nine-story building and killing 168 people. The incident was traced to Timothy McVeigh, who was convicted of the bombing.

and executed by lethal injection in June 2001. He was the first federal prisoner to be executed in 38 years. McVeigh was a survivalist who believed individual rights (e.g., gun control) were being deprived by government agencies. Consequently, he was convinced he acted to defend the Constitution and saw himself as a crusader and hero. This was the worst terrorist event, either domestic or international in origin that had ever occurred in the United States at that time.

In March 1995, four members of the Minnesota Patriots Council, a right-wing militia organization advocating the violent overthrow of the U.S. government, were convicted of conspiracy charges under the Biological Weapons Anti-Terrorism Act of 1989 for planning to use ricin, a lethal biological toxin. The four men allegedly conspired to assassinate federal agents who served papers on one of them for tax violations.

In May 1995, a member of the neo-Nazi organization Aryan Nations was arrested in Ohio on charges of mail fraud. He allegedly misrepresented himself when ordering three vials of freeze-dried Yersinia Pestis, the bacteria that causes bubonic plague, from a Maryland biological laboratory.

In October 1995, the Amtrak Sunset Limited passenger train derailed near Hyder, Arizona. It was determined that the train track had been sabotaged, causing the train to derail and topple 30 feet from a bridge. A letter signed by the Sons of Gestapo was left at the scene. One person was killed

and 83 others were injured in this incident.

In November 1995, members of the Tri-States Militia (a group composed of militia from at least 30 states) were arrested after being linked to five would-be terrorists whose bomb plots were thwarted by federal and state law enforcement agencies. The plots involved blowing up the Southern Poverty Law Center, offices of the Anti-Defamation League, federal buildings, abortion clinics, and gay community locations.

In July 1996, a pipe bomb exploded in Atlanta's Centennial Olympic Park as the city was hosting the summer Olympic Games. One person was killed and dozens were wounded

On September 11, 2001 there were a series of coordinated terrorist suicide attacks by Islamic extremists upon the United States of America. Nineteen terrorists (see link) affiliated with al-Qaeda hijacked four commercial passenger jet airliners. Each team of hijackers included a trained pilot.



Sept. 11, 2001 saw the deadliest terrorist attack on American soil in US History

The hijackers intentionally crashed two of the airliners (United Airlines Flight 175 and American Airlines Flight 11) into the World Trade Center in New York City, - one plane into each tower (1 WTC and 2 WTC), resulting in the collapse of both buildings soon afterward and extensive damage to nearby buildings. The hijackers crashed a third airliner (American Airlines Flight 77) into the Pentagon in Arlington County, Virginia, near Washington, D.C. Passengers and members of the flight crew on the fourth aircraft (United Airlines Flight 93) attempted to retake control of their plane from the hijackers; that plane crashed into a field near the town of Shanksville in rural Somerset County, Pennsylvania. In addition to the 19 hijackers, 2,974 people died as an immediate result of the attacks, and the death of at least one person from lung disease was ruled by a medical examiner to be a result of exposure to WTC dust. Another 24 people are missing and presumed dead. The victims were predominantly civilians. The New York City Fire Department lost 341 New York City Fire Department firefighters and 2 paramedics, while 23 New York Police Department, 37 Port Authority Police Department officers, and 8 private ambulance personnel were killed. There were 125 victims in the Pentagon. The dead included 8 children. The youngest victim was a 2 year-old child on Flight 175, the oldest an 82 year-old passenger on Flight 11. According to the Associated Press, the city identified over 1,600 bodies but was unable to identify the rest (about 1,100 people).

They report that the city has "about 10,000 unidentified bone and tissue fragments that cannot be matched to the list of the dead." Bone fragments were still being found in 2006 as workers prepared the damaged Deutsche Bank Building for demolition. The attacks created widespread confusion across the United States. All international civilian air traffic was banned from landing on US soil for three days; aircraft already in flight were either turned back or redirected to airports in

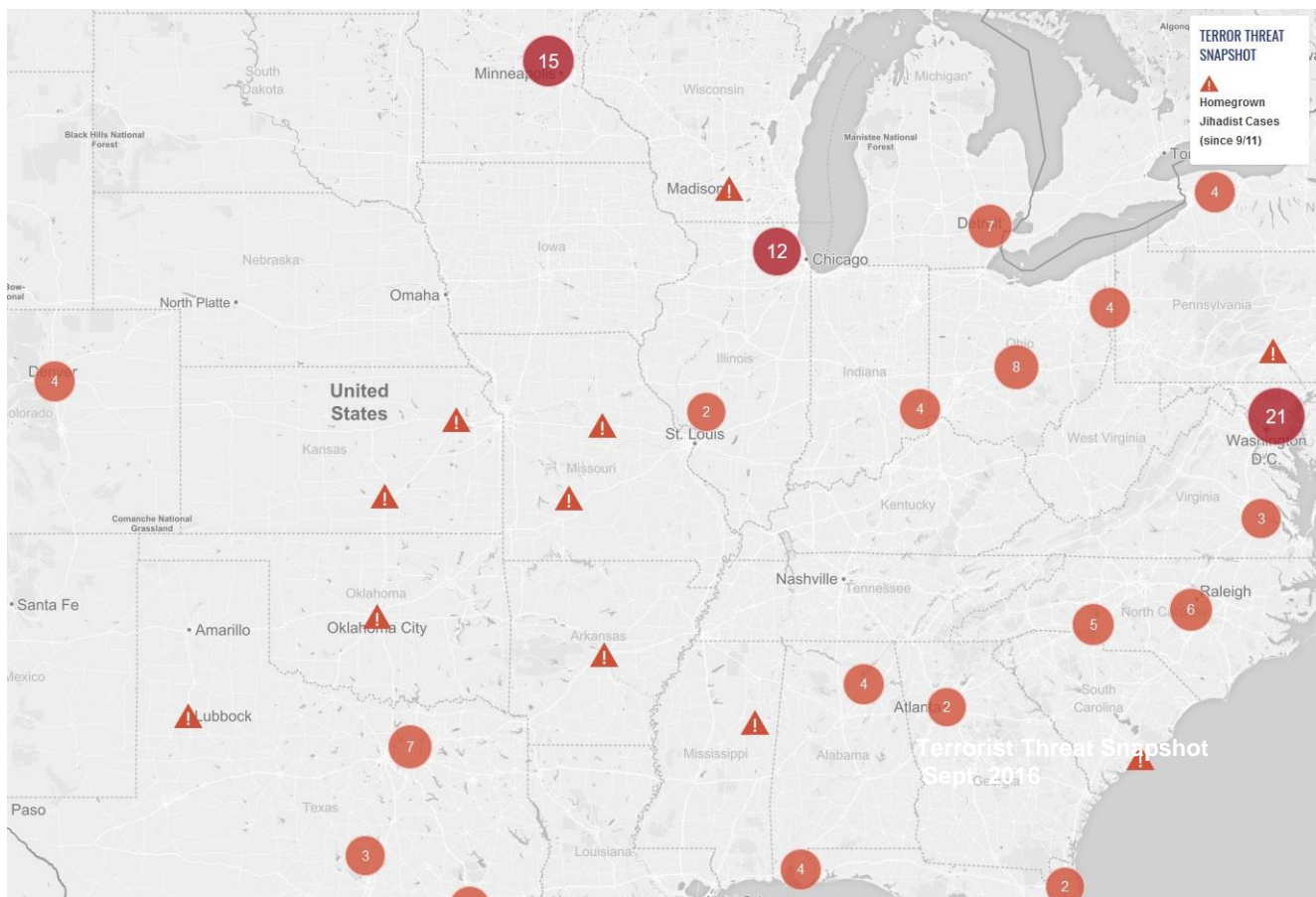
Canada or Mexico. Unconfirmed and often contradictory reports were aired and published throughout the day. One of the most prevalent of these reported that a car bomb had been detonated at the U.S. State Department's headquarters.

Between early October and early December 2001, five people died from anthrax infection, and at least 13 others contracted the disease in Washington, DC; New York City; Trenton, New Jersey; and Boca Raton, Florida. Anthrax spores were found in a number of government buildings and postal facilities in these and other areas. Most of the confirmed anthrax cases were tied to contaminated letters mailed to media personalities and U.S. senators. Thousands of people were potentially exposed to the spores and took preventive antibiotics. Numerous mail facilities and government buildings were shut down for investigation and decontamination. In the wake of these incidents, federal, state, and local emergency response agencies across the United States responded to thousands of calls to investigate suspicious packages, unknown powders, and other suspected exposures. Almost all of the incidents turned out to involve no actual biohazard. Nevertheless, emergency responders typically treated each call as a potentially serious health and safety risk. During this tense time, in Missouri, the Department of Health and Senior Services (DHSS) issued numerous health alert advisories to local officials and the public, providing guidance on how to handle anthrax or suspicious letters and packages during a time of extremely heightened tensions. DHSS also instituted a surveillance system, contacting health providers to obtain public health information twice weekly, while also working to improve the public health infrastructure, information sharing, health communication networks, and hospital surge capabilities.

On October 2nd, 2002, a month long sniper spree terrorized the entire Washington DC area as a sniper duo gunned down 10 people at random. It ended when the law enforcement team lead by the Montgomery County SWAT, supported by the FBI and the State Police, arrested the shooters at a truck stop while sleeping in their modified vehicle. The car had been altered by the snipers to accommodate the ability to get into the truck and shoot through a hole without having to leave the vehicle. Their targets were random and varied in age and gender. They struck in both Maryland and Virginia.

Probability and Severity

While a terrorist attack is possible in Missouri; *the probability of such an attack is moderate*, taking into account that the nation has been on a high or elevated threat level since 2001. The Terror Threat Snapshot for September of 2016 WASHINGTON, D.C. – The Homeland Security Committee releases a monthly terrorist threat “snapshot” assessing the growing threat America, the West, and the world face from ISIS and other Islamist terrorists.



Their website contains a constantly updated map showing the site of terrorist related incidents, arrests and investigations as well as the latest “snapshot” report.

In January of 2018 some key points of the assessment were

- A spike in homegrown Islamist incidents with four arrests in the United States for providing material support to ISIS. Two of those arrested also offered to commit attacks on behalf of the organization. These arrests bring the total number of homegrown jihadist cases in the U.S. since 2013 to 150.
- December 12, 2017: Akayed Ullah, 27, a Bangladeshi immigrant living in Brooklyn, attempted to carry out the first suicide bombing in the U.S. Inspired by ISIS, Ullah built a low-tech explosive device that he detonated on the subway, wounding four, including himself.
- December 20, 2017: A 29-year-old German citizen was arrested by German officials for planning an attack in Karlsruhe. The man has connections to ISIS and planned to ram a vehicle into crowds.
- ISIS recruiter Abdullah Ibrahim al-Faisal was sanctioned by the U.S. Department of the Treasury for actions that directly contributed to attacks on innocent people around the world. Widely regarded as a key facilitator of people and material support, the designation by Treasury will greatly diminish his capabilities. Faisal is currently facing extradition proceedings in Jamaica.

Should Missouri experience a terrorist attack, *the severity of such an attack could range from high to low depending on the attack*. For instance, if a building was destroyed and no casualties occurred,

as long as it was not a critical facility, the severity of the attack would be low. However, if a terrorist group decided to contaminate a large urban area's water supply with a poisonous chemical, the severity of the attack could be very high due to the number of people directly affected by the attack, as well as damage to that community's sense of well-being. An attack of this nature could potentially result in mass hysteria and instability concerning the government's ability to protect its citizens.

Vulnerability

Due to the nature of terrorist acts, risk is generally predicated on population density. Attackers typically want to get as much "bang for their buck" as they can in terms of casualties. However, the psychological impact of an attack carried out in the rural heartland of America, shattering the complacency of "it can't happen here" thinking could be an attractive motivation. The risk of an attack may be lower in Lewis County than it is in nearby Kansas City, where shopping malls and sports complexes offer convenient target-rich environments, but by no means can it be discounted. The entirety of the County is equally vulnerable, but given the nature of terrorist attacks, more densely populated areas are at greater risk of attacks designed to harm people, while the entire county is vulnerable to agro terrorism that could be designed to harm the nation's food supply.

Potential Losses to Existing Development

Potential loss is dependent on the method of attack. This may range from conventional weapons, improvised explosives and weapons of mass destruction of various size, scope, and type (CBRN), sabotage of existing HAZMAT facilities or transportation to cause explosions or the release of toxic materials, or even cyber-attack. These potential effects of these hazards are outlined in the various sections of this plan.

Impact of Future Development

Hazard Summary by Jurisdiction

As greater population density translates to greater vulnerability, the risk to the communities of Lewis County can be rated (in relation to each other) by their population:

Jurisdiction	Population
Canton	2,562
Ewing	477
La Belle	623
La Grange	984
Lewistown	611
Monticello	109

Problem Statement

The threat of terrorism in the United States remains a concern. Although several different extremist groups have been identified in Missouri, there have been no indications of any specific recent terrorist activities in the state. The potential does remain, however, for new extremist and/or terrorist groups to move into the State at any time. As such vigilance on behalf of the state is important, as new threats evolve more quickly that defenses can be developed against them.

An open society such as ours remains a potential target for terrorists. Large cities with a variety of news media outlets represent more likely locations for terrorist acts, due to the general desire of

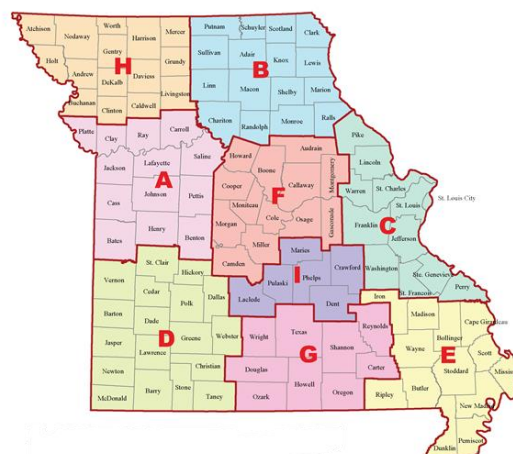
terrorists to want their acts to reverberate in the news media and reach the largest audience possible. Since Missouri does not have a large share of the media markets compared to some states, it is not as likely a target for terrorist activity as those other states. However, the Oklahoma City bombing debunked the idea that rural America is completely safe from terrorists.

Terrorist acts could potentially undermine the confidence that people have in their own security and in their government's ability to protect them from harm. For example, instructions to make bombs are readily accessible to potential terrorists (including via the Internet), and the materials for their construction are readily available. Because bombs can be made so easily, the threat of a bomb should not be taken lightly. The threat of a bomb can disrupt a community almost as effectively as an actual bomb, while creating far fewer risks for the persons making the threat. Therefore, no matter how large or small the incident, a terrorist act can potentially have a major impact on a community.

To improve and assist in the homeland security efforts, Former Governor Blunt signed an executive order formalizing the merger of homeland security responsibilities into the Department of Public Safety. To assist in addressing the rising terror threats, Current Missouri Governor Jay Nixon named Jerry Lee to be director of the Department of Public Safety on Oct 18, 2011. Mr. Lee chairs a 17-member council made up of directors from other state departments and agencies. These include the State Emergency Management Agency, Department of Health and Senior Services, Department of Transportation, Department of Agriculture, Department of Natural Resources, Department of Economic Development, Missouri State Highway Patrol, Missouri State Water Patrol, Missouri National Guard, Missouri State Fire Marshall, Missouri State Public Service Commission, chief information officer of the State, and three members appointed by the governor. This council ensures that proper homeland security plans are in place at local and state levels while also examining how homeland security grant funds can best be coordinated and expedited.

Local communities are focused and engage in Missouri's Homeland Security Program through the establishment of regional advisory groups, called Regional Homeland Security Oversight Committees (RHSOCs). RHSOCs fall under the governance structure of the Homeland Security Advisory Council. Missouri's program is focused on establishing a common sense, logical governance structure and process to facilitate homeland security related decisions consistently across the State.

The SEMA Emergency Response Regions Map (right) displays the 9 Response Regions for Missouri. Lewis County resides within Region H. Region H encompasses a variety of specialized response teams with enhanced capabilities for response to terrorist attacks, including incidents involving nuclear or radiological materials and biological and chemical agents.



3.4.21 Utility Failure

Hazard Description

Utility interruptions and failures may involve electrical power, natural gas, public water, and communications systems. All of these systems or combinations of these utility systems exist virtually throughout the County. Many utilities are localized and serve only one community, while other utilities serve a regional area. Utilities are often dispersed over a wide area, and many have facilities located throughout their service area. For example, many electric companies have multiple generating facilities, which can redistribute power via transmission lines as they are connected to load stations. Therefore, power can be redistributed, if needed, so that power is lost to as limited an area as possible. Many water companies have some type of back-up systems such as water impoundments, other deep wells, or hook-up arrangements with other water companies. Similar switching and rerouting capabilities may exist with communications and natural gas utilities. Utility systems exist everywhere and are subject to damage from digging, fire, traffic accidents, geomagnetic storms, and severe weather, including flooding and other day-to-day events. Many utilities use emergency batteries or generators to provide back-up power for high priority equipment.

Utility outages and interruptions can be very localized or region wide. Their greatest impact is generally on the very young or elderly, who can be expected to have greater health risks associated with resultant loss of heating/cooling systems and with the loss of medical equipment that requires a power source. Loss of communications can also adversely affect the provision of emergency services, making it difficult to contact the services for emergency assistance. In addition, utility outages can cause significant problems within the financial community, should there be a long-term loss of their data communications.

Geographic Location

As utilities exist everywhere and vast, complex, inter-dependent systems span the nation, the risk of Utility Failure is universal.

Past Events

Because utilities exist everywhere, damage to utilities may occur frequently. This may be due to a backhoe cutting a buried line, an accident involving a motor vehicle, a flood, geomagnetic storms, or other severe weather. Many of these interruptions or failures go unreported to the Public Service Commission (PSC), and no definitive reporting system exists. Therefore, limited statistical information is available.

During the flood of 1993, telecommunications companies proved their adaptability by using cellular service to replace wire line service in areas where service could not be restored in a timely manner. One local exchange company (LEC) used a trailer with cellular pay phones where the land lines were interrupted. Another company temporarily replaced analog subscriber carrier service with site-based cellular service. Short-haul portable microwave was also used to replace copper lines lost during the flood.

On January 30, 2002, a severe ice storm struck portions of western and northern Missouri, leaving devastation and darkened homes and businesses. Many news articles referred to this ice storm as the worst in Missouri's history. During the ice storm, ice accumulated on any object that was at or

below freezing, and the weight of the ice broke utility poles, conductors, tree limbs, and other objects

that could not withstand the weight of the ice. Ice accumulations over an inch were reported in many areas. Many tree branches could not withstand the added weight of the ice and fell to the ground, striking whatever was in their path. Cars, homes, streets, properties, and electric power facilities were recipients of the falling trees and limbs. When the ice began to melt, the falling ice caused additional outages. Some electric customers experienced outages more than once during that period, as power was restored but interrupted again by falling limbs.

At the peak of outages, over 400,000 customers were without power. Within three days, most of these customers were returned to service, but many customers in more heavily damaged areas were without power for over a week. Utilities affected by the ice storm quickly mobilized all of their available crews and sought outside assistance. Work crews from 16 different states came to western Missouri in an effort to rapidly restore power to as many customers as possible.

In January 2009, a Canadian cold front with a lot of Gulf moisture pushed through Missouri bringing snow, sleet and freezing rain. Over two and one-half inches of ice covered most of the southeast portion of the state. Heavy ice accumulations caused over 3,800 AmerenUE transmission and distribution poles to break. Similar breakages were experienced by municipal and electric cooperative systems and transmission operators Entergy and Southwestern Power Administration, which deliver power to some municipalities in southeastern Missouri. Because of the extent of damage, some people were without power for up to three weeks.

In January 2011 the Missouri Department of Transportation (MODOT) conducted snow-clearing from approximately 1,200 miles of roads in 16 counties that requested help after experiencing record amounts of snow in last week's blizzard in counties that received record amounts of snow. Lewis was one of sixteen counties that had record snow, and one of 44 that requested assistance from the state.

Probability and Severity

Because utilities exist throughout the State and are vulnerable to interruptions or failures, *there is a high probability that this hazard may occur at any time or any place* throughout Lewis County and the State. In many cases, these are small isolated events, well within the capabilities of the local utility to address. Therefore, *the degree of severity of these day-to-day events may be considered low*. Due to long-range planning, regulation, and diligence of the utility operators, major interruptions resulting in a high degree of severity are few and far between.

Vulnerability

Potential Losses to Existing Development

Losses due to this hazard are rarely of the permanent variety such as the damages caused by tornadoes or similar hazards. The losses are disruption to service, damage to sensitive electronic equipment, computer data servers, and the like. On the commercial side, there can be loss of commodities if refrigeration is lost for an extended period of time.

Impact of Future Development

Commercial and industrial development in Lewis County is relatively minimal, making it difficult to project any significant change in terms of vulnerability.

Hazard Summary by Jurisdiction

The County and all its communities are equally vulnerable to the effects of this hazard.

Problem Statement

Utility companies are generally well prepared to deal with day-to-day outages. The earthquake threat to statewide and multi-state utilities is the greatest concern to the integrity and operability of Missouri's utilities. Severe weather causes more frequent local, and occasionally widespread, utility outages. Manmade incidents, accidental or intentional, could significantly impact utility service. Geomagnetic storms could disrupt communications and affect utility services. (For more information on such hazards, see the next section in Electromagnetic Pulse).

Planning, regulation, mitigation, and mutual aid are all just a few tools available to reduce, speed recovery from, and prevent utility interruptions and failures.

3.4.22 Electromagnetic Pulse (EMP)

Hazard Description

An electromagnetic pulse (EMP), also sometimes called a transient electromagnetic disturbance, is a short burst of electromagnetic energy. Such a pulse's origination may be a natural occurrence or man-made and can occur as a radiated, electric or magnetic field or a conducted electric current, depending on the source.

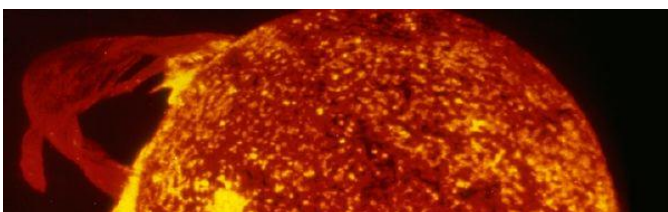
EMP interference is generally disruptive or damaging to electronic equipment and at higher energy levels a powerful EMP event such as a lightning strike can damage physical objects such as buildings and aircraft structures. Minor EMP events will cause low levels of electrical noise or interference which can affect the operation of susceptible devices, and at a high voltage level an EMP can induce a spark, for example from an electrostatic discharge when fuelling a vehicle. Such sparks have been known to cause fuel-air explosions and precautions must be taken to prevent them. A large and energetic EMP (such as that associated with lightning) can induce high currents and damage or disrupt electrical equipment.

The damaging effects of EMP have also led to the introduction of EMP weapons, from tactical missiles with a small radius of effect to nuclear bombs tailored for maximum EMP effect over a wide area. Different types of EMP can arise from both natural and man-made sources.

Different types of EMP event include:

- Lightning electromagnetic pulse (LEMP): The discharge is typically an initial huge current flow, at least mega-amps, followed by a train of pulses of decreasing energy.
- Electrostatic discharge (ESD): as a result of two charged objects coming into close proximity or even contact.
- Meteoric EMP. The discharge of electromagnetic energy resulting from either the impact of a meteoroid with a spacecraft or the explosive breakup of a meteoroid passing through the Earth's atmosphere.
- Coronal Mass Ejection (CME). A massive burst of gas and magnetic field arising from the solar corona and being released into the solar wind sometimes referred to as a Solar EMP.
- Nuclear electromagnetic pulse (NEMP), as a result of a nuclear explosion. A variant of this is the high altitude nuclear EMP (HEMP), which produces a pulse of a much larger amplitude and different characteristics due to particle interactions with the Earth's atmosphere and subsequently the Earth's magnetic fields driving an oscillation in electric current after the original pulse from the particle and ray interactions on the atmosphere.

Of these, one is both the most likely to occur and the most likely to have severe, widespread impacts: The CME.



The primary risk of a CME is the potential for the long-term loss of electric power and the cascading affects that it would have on other critical infrastructure sectors; however, other low-frequency, high-impact events are also capable of causing long-term power outages on a regional or national scale.

An extensive study by John Kapperman and William Radasky of the National Oceanic and Aeronautical Administration examined the resiliency of the U.S. electric grid, based on a study that went back to 2008. The study concluded large-scale blackouts caused by a major EMP event (such as a large CME)

would affect more than 130 million people in the U.S. “for years.” Such an event either would damage or destroy some 300 large extra-high-voltage transformers, resulting in a “prolonged recovery period with long-term shortages of electric power to the affected areas.”

Dr. Vincent Peter Pry, a member of the congressional EMP Commission and executive director of the Task Force on National and Homeland Security, stated that a major event “could blackout the national electric grid for months or years and collapse all the other critical infrastructures -- communications, transportation, banking and finance, food and water -- necessary to sustain modern society and the lives of 310 million Americans”. He also went so far as to warn of “existential threats that could kill 9 of 10 Americans through starvation, disease, and societal collapse.”

EMP threatens all critical infrastructure sectors - those sectors that rely heavily on communications technology, information technology, the electric grid, or that use a SCADA system are particularly vulnerable but the complex interconnectivity among critical infrastructure sectors carries a serious potential for cascading failures, complicating not only the impact of the event but the recovery from it.

The Strategic National Risk Assessment identifies space weather as a hazard that poses significant risk to the security of the Nation, and the 2015 draft document “National Space Weather Strategy” indicates that reducing the Nation’s vulnerability to space weather (the variations in the space environment between the sun and Earth that can affect infrastructure systems and technologies in space and on Earth) is a national priority. At this time DHS has not issued a National Planning Scenario for an EMP, but two of the stated goals in the draft Space Weather Strategy is to develop comprehensive guidance to support existing response and recovery constructs to manage space weather events and to improve mitigation efforts to focus on long-term vulnerability reduction and enhancing resilience to disasters. This includes a power outage response and recovery plan.

Geographic Location

Because of the ubiquitous nature of electrical power and electronic devices in our modern world and the vital nature of all the functions that are dependent on power, the risks of this hazard are equal across the nation, though more populous areas may experience greater negative social impacts on a more rapid timeline.

Past Events

The Solar Storm of 1859—known as the Carrington Event—was a powerful geomagnetic solar storm during which a solar coronal mass ejection hit Earth's magnetosphere and induced one of the largest geomagnetic storms on record, September 1–2, 1859. Worldwide reports on the effects of the geomagnetic storm of 1859 were compiled and published by American mathematician Elias Loomis, which support the observations of Carrington and Stewart. Aurorae were seen around the world, those in the northern hemisphere as far south as the Caribbean; those over the Rocky Mountains in the U.S. were so bright that their glow awoke gold miners, who began preparing breakfast because they thought it was morning. People in the northeastern United States could read a newspaper by the aurora's light. The aurora was visible as far from the poles as Sub-Saharan Africa (Senegal, Mauritania, perhaps Monrovia, Liberia), Monterrey and Tampico in Mexico, Queensland, Cuba, Hawaii, and even at lower latitudes very close to the equator, such as in Colombia. Telegraph systems all over Europe and North America failed, in some cases giving telegraph operators electric shocks. Telegraph pylons threw sparks. Some telegraph operators could continue to send and receive messages despite having disconnected their power supplies.

In June 2013, a joint venture from researchers at Lloyd's of London and Atmospheric and Environmental Research (AER) in the United States used data from the Carrington Event to estimate the current cost of a similar event to the U.S. alone at \$0.6–2.6 trillion.

Since 1859, the earth has not suffered the effects of a CME of that size, though less powerful events are not rare. Some of the more recent ones are listed below. This data was obtained from <http://www.solarstorms.org/SRefStorms.html>

January 25, 1938 The Fatima Storm - The Great Aurora was seen over the whole of Europe and as far south as Southern Australia, Sicily, Portugal and across the Atlantic to Bermuda and Southern California. All transatlantic radio communication was interrupted. The pulse was responsible for delaying express trains on the Manchester to Sheffield line after electrical disturbance hit the signaling apparatus. Short wave radio sets were interfered with and the teletype system at the local office of the Western Union was started up by the phenomenon.

March 25, 1940 The Easter Sunday Storm - On Easter Sunday calls by millions of people were halted between 10:00 AM and 4:00 PM creating pandemonium at nearly all Western Union offices. A telephone cable between Fargo North Dakota and Winnipeg was found with its wires fused together, presumably from the voltage surges. Consolidated Edison of New York also reported 1,500 volt dips in three electrical generators in New York City located in Brooklyn and the Bronx. In Bangor Maine, lightning arresters were burned out as well. The New York Times noted that United Press reported earth currents at 400 Volts in Boston, 450 in Milwaukee, and more than 750 Volts near St. Louis. All tolled, the Associated Press's entire investment of 185,000 miles of leased wires were put out of service. Practically every long-distance telegraph or telephone office in the country was doing repair work in what was considered one of the worst such events in history. AT&T land lines had been badly disrupted by 600 volt surges on wires designed for 48 volts. In the Atlantic Cable between Scotland and Newfoundland, voltages up to 2,600 volts were recorded during the storm. Coast Guard radio stations were blocked,

although compasses were not affected. Excessive voltage in the Boston and Kene telegraph lines 'blew fuses'. In several instances fuses were 'blown' and vacuum tubes ran the risk of damage due to these influences

February 11, 1958 - Radio blackout cuts US off from the rest of the world. Aurora visible in Los Angeles, Tulsa, Boston, Seattle, Canada and Newfoundland. Voltages in electrical telegraph circuits exceeded 320 volts in Newfoundland. Intense red glow gave way to curtains and shimmering draperies. [New York Times, February 11, 1958, p. 62]. Although not seen over New York, it was so intense over Europe that people wondered about fires and warfare.

March 13, 1989 - The Quebec Blackout Storm - Astronomers were busily tracking "Active Region 5395" on the Sun when suddenly it disgorged a massive cloud of superheated gas on March 10, 1989. Three days later, and seemingly unrelated to the solar paroxysm, people around the world saw a spectacular Northern Lights display. Most newspapers that reported this event considered the spectacular aurora to be the most newsworthy aspect of the storm. Seen as far south as Florida and Cuba, the vast majority of people in the Northern Hemisphere had never seen such a spectacle in recent memory.

At 2:45 AM on March 13, electrical ground currents created by the magnetic storm found their way into the power grid of the Hydro-Quebec Power Authority. Giant capacitors tried to regulate these currents but failed within a few seconds as automatic protective systems took them off-line one by one. Suddenly, the entire 9,500 megawatt output from Hydro-Quebec's La Grande Hydroelectric Complex found itself without proper regulation. Power swings tripped the supply lines from the 2000 megawatt Churchill Falls generation complex, and 18 seconds later, the entire Quebec power grid collapsed. Six million people were affected as they woke to find no electricity to see them through a cold Quebec wintry night. People were trapped in darkened office buildings and elevators, stumbling around to find their way out. Traffic lights stopped working, Engineers from the major North American power companies were worried too. Some would later conclude that this could easily have been a \$6 billion catastrophe affecting most US East Coast cities. All that prevented the cascade from affecting the United States were a few dozen capacitors on the Allegheny Network. [Newspaper Archive]

October 29, 2003 - The Halloween Storm - This Halloween Storm spawned auroras that were seen over most of North America. Extensive satellite problems were reported, including the loss of the \$450 million Midori-2 research satellite. Highly publicized in the news media. A huge solar storm has impacted the Earth, just over 19 hours after leaving the sun. This is one of the fastest solar storm in historic times, only beaten by the perfect solar storm in 1859 which spent an estimated 17 hours in transit. A few days later on November 4, 2003 one of the most powerful x-ray flares ever detected, swamped the sensors of dozens of satellites, causing satellite operations anomalies....but no aurora. Originally classified as an X28 flare, it was upgrade to X34 a month later. In all of its fury, it never became a white light flare such as the one observed by Carrington in 1859. Astronauts hid deep within the body of the International Space Station, but still reported radiation effects and ocular 'shooting stars'.

Probability and Severity

It is difficult to calculate the probability of Occurrence for an event such as a CME. Space is large and the earth is a small moving target, and the sun's coronal mass ejections are random, both in size and trajectory. The earth has not been hit by a CME comparable to the Carrington Event for 157 years – however in 2013 such an event narrowly (in cosmic terms) missed the earth, passing through the earth's orbital path a mere week after the earth had passed through on in its circuitous route. The general consensus among astrophysicists and government planners is that major EMP events are a low frequency, high consequence threat; therefore the probability of an EMP is rated as “low” and the severity as “high”.

Vulnerability

Potential Losses to Existing Development

Losses due to this hazard are rarely of the permanent variety such as the damages caused by tornadoes or similar hazards. The losses are disruption to service, damage to sensitive electronic equipment, computer data servers, and the like.

Impact of Future Development

Commercial and industrial development in Lewis County is relatively minimal, making it difficult to project any significant change in terms of vulnerability.

Hazard Summary by Jurisdiction

The County and all its communities are equally vulnerable to the effects of this hazard

Problem Statement

The National Defense Authorization Act for fiscal year 2006 reestablished the EMP Commission to continue its efforts “to monitor, investigate, and make recommendations, and report to Congress on the evolving threat to the United States from electromagnetic pulse attack resulting from the detonation of a nuclear weapon or weapons at high altitude.” Those findings can be encapsulated with a sentence from the overview: *“unprecedented cascading failures of our major infrastructures could result. In that event, a regional or national recovery would be long and difficult and would seriously degrade the safety and overall viability of our Nation.”*

Moreover, the Congressional Commission on the Strategic Posture of the United States independently re-examined the EMP threat, and concurred with the assessment and recommendations of the EMP Commission. So, too, did the National Academy of Sciences, the DOE–NERC report, and the FERC interagency report. In all, five commissions and major independent U.S. government studies have independently concurred with the EMP Commission's threat assessment and recommendations.

Not one official commission or U.S. government study dissents from this consensus.

And yet still, the Government Accountability Office released a report in April of 2016 detailing the political apathy and bureaucratic dysfunction obstructing EMP mitigation, stating that even though divisions within Homeland Security have been given specific tasks, these tasks have not been completed. There had been no identification of the electrical infrastructure that most need protecting, nor had the agencies coordinated strategies to address risks associated with EMPs, including research and development of equipment designed to mitigate damage.

As of the 2016 writing of this document the United States Government still has not addressed vulnerability to EMP in beyond the theoretical planning stage, and comprehensive guidance has not been provided to state and local authorities on planning or mitigation for EMP events of any scale. Additionally, congress has not yet passed any of the dozens of comprehensive legislation addressing the mitigation of EMP vulnerabilities that have come before them.

Until such time as guidance is available, there is little that County and City governments can do to mitigate a major EMP event. Continuity of government and the preservation of vital public services have to be the top priorities. It is the recommendation of this plan that the County and municipalities be aware of the threat and monitor the development of Federal guidance in order to incorporate that guidance into their emergency operations planning as it becomes available.

4 MITIGATION STRATEGY

4	MITIGATION STRATEGY	4.1
4.1	<i>Goals.....</i>	4.1
4.2	<i>Identification and Analysis of Mitigation Actions.....</i>	4.2
4.3	<i>Implementation of Mitigation Actions</i>	4.5

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.

- **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

This planning effort is an update Lewis County's existing hazard mitigation plan. Therefore, the goals from the previously approved 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. The MPC also reviewed the goals from other county plans.

The previous plan goals were found to remain valid and sufficient for the County's planning effort.

- | | |
|--------|---|
| Goal 1 | Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities. |
| Goal 2 | Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy. |
| Goal 3 | Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities. |
| Goal 4 | Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation. |
| Goal 5 | Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefit of special interests. |
| Goal 6 | Secure resources for investment in hazard mitigation |
| Goal 7 | Take steps to mitigate damages due to flooding. |

4.2 Identification and Analysis of Mitigation Actions

The planning committees discussed the difference between mitigation actions and response actions, and the need for plan actions to adhere to the SMART principal: The Goals should be

- **Specific**
- **Measurable**
- **Achievable**
- **Relevant**
- **Time Bound**

During the second MPC meeting, the results of the risk assessment update were provided to the MPC members for review and the key issues were identified for specific hazards. Changes in risk since adoption of the previously approved plan were discussed. The second meeting concluded with the distribution of a list of possible mitigation actions to prompt discussions within and among the jurisdictions. The list included possible new mitigation actions, as well as actions from the previously approved plan. Actions from the previous plan included completed actions, on-going actions, and actions upon which progress had not been made. The MPC discussed SEMA's identified funding priorities and the types of mitigation actions generally recognized by FEMA.

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

The focus of the first post kick-off meeting was a review of the previous plan's mitigation strategy. The MPC reviewed the following information during that 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 Hazard Mitigation Assistance grants, and
- Public input during meetings, responses to Data Collection Questionnaires, and other efforts to involve the public in the plan development process.

The MPC reviewed the actions and each jurisdiction was instructed to provide information regarding the "Action Status" with one of the following status choices:

- 1. Completed, with a description of the progress.
- 2. Not Started/Continue in Plan Update, with a discussion of the reasons for lack of progress.
- 3. Successfully completed/ongoing
- 4. Deleted, with a discussion of the reasons for deletion.

18 actions were discarded and 20 were found to have functioned as planned.

Table 4.1 on the next page provides a summary of status for each action.

Table 4.1. Past Plan Actions From 2012 Lewis County Plan - Status Summary

Action #	Description	Jurisdiction adopting	Status	Discussion
1.1.1	Education program on emergency	All	3	Functioned as planned
1.2.1	Encourage cities to obtain early warning systems and improved communications systems	LaBelle, Monticello, Ewing	4	Discarded due to vague language
1.2.2	Promote use of weather radios by local residents and schools to ensure advanced warning about threatening weather	Canton Lewistown	4	Discarded due to vague language
1.2.3	Partner with local radio stations to ensure that appropriate warning is provided to county residents of impending disasters.	All	3	Functioned as planned
1.3.1	Implement tree trimming programs, dead tree removal programs.	All	3	Functioned as planned
1.3.2	Examine potential road and bridge upgrades that would reduce danger to residents during occurrences of natural disasters	All	3	Functioned as planned
2.1.1	Encourage a self-inspection program at critical facilities to assure that the building infrastructure is earthquake, flood, and tornado resistant	All	4	Discarded due to vague language
2.1.2	Encourage businesses to develop emergency plans	All	4	Discarded due to vague language
2.2.1	Educate residents about the dangers of floodplain development and the benefits of the National Flood Insurance Program.	Lewis County Canton LaGrange		Discarded due to vague language
2.3.1	Encourage minimum standards for building codes in all cities.	All	4	Discarded due to vague language
2.3.2	Encourage local governments to develop and implement regulations for securing of hazardous materials tanks and mobile homes to reduce hazards during flooding and high winds.	All	4	Discarded due to vague language
3.1.1.	Distribute SEMA brochures at public facilities and events.	All	3	Functioned as planned
3.1.2	Regular press releases from county and city EMD offices concerning hazards, where they strike, frequency and preparation.	Lewis County	3	Functioned as planned
3.2.1	Encourage local residents to purchase weather radios through press releases and brochures	All	4	Discarded due to vague language
3.2.2	Ask SEMA mitigation specialists to present information to city councils, county commission, schools, and the Northeast Missouri Regional Planning Commission meetings.	Lewis County	3	Functioned as planned
3.3.1	Cities/county should continually re-evaluate hazard mitigation plan and merge with other community planning	All	3	Functioned as planned
3.3.2	Press releases by cities/county regarding adopted mitigation measures to keep public abreast of changes and/or new regulations.	All	3	Functioned as planned
3.4.1	Encourage county health department and local American Red Cross chapter to use publicity campaigns that make residents aware of proper measures to take during times of threatening conditions.	Lewis County	4	Discarded due to vague language
3.4.2	Publicize county or citywide drills.	All	3	Functioned as planned
4.1.1	Encourage joint meetings of different organizations/agencies for mitigation planning.	All	4	Functioned as planned
4.1.2	Joint training (or drills) between agencies, public & private entities (including schools/businesses).	All	3	Functioned as planned
4.1.3	Pool different agency resources to achieve widespread mitigation planning results.	All	3	Functioned as planned
4.2.1	Encourage meetings between EMD, city/county, and SEMA to familiarize officials with mitigation planning, implementation, and Discarded due to vague language budgeting.	All	4	Discarded due to vague language
5.1.1	Encourage communities to budget for	Ewing, LaBelle, and	4	Discarded due to vague

	enhanced warning systems.	Monticello.		language
5.1.2	Encourage communities to develop storm water management plans.	All	4	Discarded due to vague language
5.1.3	Coordinate and integrate hazard mitigation activities, where appropriate, with emergency operations plans and procedures.	Lewis County	3	Functioned as planned
5.1.4	Encourage cities to require stormwater management plans for all new development—both residential and commercial properties.	All	4	Discarded due to vague language
5.2.1	Encourage local government to purchase properties in the floodplain as funds become available and convert that land into public space/recreation area.	Canton, LaGrange	4	Discarded due to vague language
5.2.2	Encourage communities to discuss zoning repetitive loss properties in the floodplain as open space.	Canotn, LaGrange	4	Discarded due to vague language
6.1.1	Work with SEMA Region I coordinator to learn about new mitigation funding opportunities.	All	3	Functioned as planned
6.1.2	Structure grant proposals for road/bridge upgrades so that hazard mitigation concerns are also met.	Lewis County	3	Functioned as planned
6.1.3	Work with state/local/federal agencies to include mitigation in all economic and community development projects.	All	3	Functioned as planned
6.1.4	Encourage local governments and schools to budget for mitigation projects.	All	4	Discarded due to vague language
6.2.1	Encourage jurisdictions to implement cost-share programs with property owners for mitigation projects that benefit the community as a whole.	All	4	Discarded due to vague language
6.2.2	Implement public awareness program about the benefits of hazard mitigation projects, both public and private.	All	3	Functioned as planned
6.3.1	Prioritize mitigation projects, based on cost-effectiveness, and sites facing the greatest threat to life, health and property.	All	3	Functioned as planned
7.1.1	Jurisdictions will continue to require permits for new building in the floodplain and also to comply with all federal laws.	Lewis County, Canton	3	Functioned as planned
7.1.2	<u>New maps are coming out in 2011 and with new maps</u> there will be ordinances adopted to reflect the new mapping standards. Will continue to participate in mapping meetings. Will seek CFM certification for floodplain managers Will request LOMR and LOMA if necessary Will acquire RLP and SRLP with funding assistance. Will continue to monitor open space to ensure compliance with buyout requirements. Continue to have a working relationship with SEMA regarding floodplain management	Lewis County, Canton	3	Functioned as planned

4.3 Implementation of Current Plan Mitigation Actions

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 Missouri State Hazard Mitigation Plan. The benefit/cost review at the planning stage primarily consisted of a qualitative analysis, and was not the detailed process required grant funding application. For each action, the plan sets forth a narrative describing the types of benefits that could be realized from action implementation. The cost was estimated as closely as possible, with further refinement to be supplied as project development occurs.

The plan must indicate if the prioritization process and/or methodology have changed since the previous plan's adoption. If the process has changed, describe how it changed and why it changed. If the prioritization process and methodology have not changed, state this here in the plan with a description. Sample text if FEMA's suggested STAPLEE methodology is used follows: FEMA's STAPLEE methodology was used to assess the costs and benefits, overall feasibility of mitigation actions, and other issues impacting project. During the prioritization process, the MPC used worksheets to assign scores. The worksheets posed questions based on the STAPLEE elements as well as the potential mitigation effectiveness of each action. Scores were based on the responses to the questions as follows:

Definitely yes = 3 points

Maybe yes = 2 points

Probably no = 1

Definitely no = 0

The following questions were asked for each proposed action.

S: Is the action socially acceptable?

T: Is the action technically feasible and potentially successful?

A: Does the jurisdiction have the administrative capability to successfully implement this action?

P: Is the action politically acceptable?

L: Does the jurisdiction have the legal authority to implement the action?

E: Is the action economically beneficial?

E: Will the project have an environmental impact that is either beneficial or neutral? (score "3" if positive and "2" if neutral)

Will the implemented action result in lives saved?

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

The worksheets are attached to this plan as Appendix B with the minutes for meeting 2. 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.

Lewis County Hazard Mitigation Plan Actions

Lewis County Actions

Action No:	LEW-1
Description	Develop a detailed county-wide inventory of emergency shelters and safe rooms
Jurisdictions Selecting the Action:	County
Responsible Agency/ Party:	Lewis County Emergency Management Director
Partner Agencies	Red Cross
Mechanism of Implementation	Designation of a Shelter Coordinator (Emergency Management)
Problem(s) to be Mitigated:	Lack of readily available, organized and useful information on available shelters and safe rooms; With this inventory, 911 dispatch (directly to callers or through emergency responders on scene) could advise individuals displaced by disaster of the closest available shelter. In addition, emergency management and incident commanders will have access to information detailing the locations, assets, and limitations of shelters as they relate to the needs imposed by a given situation. The safe room data could enable responders to more quickly locate potential survivors in the wake of a catastrophic event. The coordinator will facilitate updates and further discussion on shelters and safe rooms at the quarterly plan maintenance meetings.
Process	<ul style="list-style-type: none"> • Appoint a shelter coordinator • Work with representatives from each community to develop a list of shelters and safe rooms: This list will contain, for example : <ul style="list-style-type: none"> ▪ Shelter/ Safe room location ▪ Contact Info ▪ Facility info including capacity and amenities (Showers, kitchen, segregated spaces, stored supplies) ▪ Whether the site has a generator or the capacity to interface with a portable generator
Applicable Goal(s)	Goal 1: Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Hazards Addressed:	All hazards
Estimated Cost:	\$0
Potential Funding Sources	NA
Cost/Benefit Discussion:	Being a matter that could be adequately handled by volunteers, there is great benefit at no cost
Prioritization Discussion:	As such an inventory does not yet exist, this project was seen as having a high priority
Priority	High
Timeline for Implementation/Completion:	2019
Status of Action:	Pending
Report of Progress:	Emergency Management will assess the progress of this project at the 2020 annual HMP committee meeting.

Action No:	LEW-1a
Description	Acquire a generator through a grant for a Shelter site
Jurisdictions Selecting the Action:	County
Responsible Agency/ Party:	Lewis County Emergency Management Director
Partner Agencies	FEMA/SEMA, CDBG
Mechanism of Implementation	Grant
Problem(s) to be 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.
Process	Identify a suitable shelter site that needs a generator (via the information compiled in Action LEW-1). Apply for grant. Obtain generator.
Applicable Goal(s)	Goal 1: Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Hazards Addressed:	All hazards
Estimated Cost:	\$20,000 - \$50,000
Potential Funding Sources	Grant funding
Cost/Benefit Discussion:	Grant funding rather than in-house expenditures makes this action attractive.
Prioritization Discussion:	As such an inventory does not yet exist, this project was seen as having a high priority
Priority	High
Timeline for Implementation/Completion:	2020
Status of Action:	Pending
Report of Progress:	Emergency Management will assess the progress of this project at the 2021 HMP committee meeting.

Action No:	LEW-3
Description	Form a committee to study the current state of public notification systems in the county and determine how best to improve them
Jurisdictions Selecting the Action:	Lewis County
Responsible Agency/ Party:	County Emergency Management Director
Partners	Municipal Contacts
Mechanism of Implementation	Emergency Management sub-committee
Problem(s) to be Mitigated:	Lack of effective early warning systems
Process	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
Applicable Goal(s)	5: Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefit of special interests.
Hazards Addressed:	All hazards
Estimated Cost:	0\$
Potential Funding Sources	NA
Cost/Benefit Discussion:	No cost, significant benefit for planning purposes.
Prioritization Discussion:	The compilation of this information was given a high priority.
Priority	High
Timeline for Implementation/Completion:	2019
Status of Action:	Pending
Report of Progress:	Action status will be analyzed in Lewis County Emergency

	Management's 2020 annual report.
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Action No:	LEW-5
Description	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.
Jurisdictions Selecting the Action:	Lewis County
Responsible Agency/ Party:	County Commission
Partners	Lewis County Road and Bridge Dept., MoDOT, NEMO RPC, Missouri's Community Development Block Grant Program.
Mechanism of Implementation	Participation in the regional Transportation Advisory Committee (TAC) , coordinated with MoDOT by the North East Missouri Regional Planning Commission.
Problem(s) to be Mitigated:	Flash flooding, dangerous curves or slopes where hazards can be exacerbated by ice storms or precipitation.
Process	Through participation in the regional Transportation Advisory Committee (TAC) (coordinated with MoDOT by the North East Missouri Regional Planning Commission) the County Commission will work with its Road and Bridge department to be aware of all transportation issues and consider the mitigation of hazards in their planning solutions. This information will be used for grant applications for county assets and, for state roadways, submitted to the regional TAC, where they will be ranked with regional projects, and the results of that ranking process result in the formulation of the STIP (Statewide Transportation Improvement Program) - a 5 year schedule of transportation projects undertaken by MoDOT. The commission will also represent any jurisdictions within Lewis County on the TAC board.
Applicable Goal(s)	Goal 2: Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy Goal 6: Secure resources for investment in hazard mitigation
Hazards Addressed:	All, primarily flooding
Estimated Cost:	\$0
Potential Funding Sources	CDBG, MoDOT
Cost/Benefit Discussion:	At no real capital outlay and the potential for important transportation projects to be funded and completed, this action was very attractive
Prioritization Discussion:	This action received a low priority, mainly due to its ease of implementation removing any sense of urgency. However, it was scheduled fairly early in the 5 year plan.
Priority	Low
Timeline for Implementation/Completion:	2020
Status of Action:	Pending
Report of Progress:	The Commission's annual report will include a statement on the progress of Transportation Planning efforts which the HMP committee will review in 2021.

Action No:	LEW-7
Description	Provide opportunities for training so local businesses are equipped to develop their own emergency plans.
Jurisdictions Selecting the Action:	Lewis County
Responsible Agency/ Party:	Lewis County Emergency Management Director
Partners	SEMA/FEMA
Mechanism of Implementation	Publicly offered, free training
Problem(s) to be Mitigated:	Lack of emergency planning (mitigation and response) in private business.
Process	Emergency Management will coordinate free SEMA/FEMA training on emergency planning for small businesses, and advertise those opportunities to their target demographic.
Applicable Goal(s)	Goal 1: Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Hazards Addressed:	All
Estimated Cost:	\$0
Potential Funding Sources	NA
Cost/Benefit Discussion:	For little cost, small business owners and managers could be trained to create and implement emergency plans for their facilities.
Prioritization Discussion:	The committee felt this was a good project due to its low cost and potential benefits.
Priority	Moderate
Timeline for Implementation/Completion:	2020
Status of Action:	Pending
Report of Progress:	Lewis County Emergency Management will assess this action at the annual HMP meeting in 2021.

Action No:	LEW-8
Description	Participate in the "Great American Shake Up" Earthquake drill
Jurisdictions Selecting the Action:	Lewis County
Responsible Agency/ Party:	Lewis County Emergency Management Director
Partners	SEMA/FEMA
Mechanism of Implementation	Implementation of a scheduled earthquake drill
Problem(s) to be Mitigated:	Lack of training on what to do in the event of an earthquake
Process	Implementation of an earthquake drill to take place per the Great American Shake Out : https://www.shakeout.org/centralus/missouri/
Applicable Goal(s)	Goal 3: Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.
Hazards Addressed:	Earthquake
Estimated Cost:	\$0
Potential Funding Sources	NA
Cost/Benefit Discussion:	There was no cost, with some benefit in preparedness.
Prioritization Discussion:	This project was not considered a pressing priority.
Priority	Low
Timeline for Implementation/Completion:	2020
Status of Action:	Pending
Report of Progress:	Lewis County Emergency Management will assess this action at the annual HMP meeting in 2021

Action No:	LEW-9
Description	Coordinate and conduct a standalone event to educate the public about emergency preparedness and early warning systems.
Jurisdictions Selecting the Action:	Lewis County
Responsible Agency/ Party:	Lewis County Emergency Management Director
Partners	Canton R-V, Lewis County C-1
Mechanism of Implementation	Public events held in local school facilities, which are already a familiar venue for citizens of the county due to local school sports and other events that take place there.
Problem(s) to be Mitigated:	Lack of education on emergency preparedness and personal weather awareness
Process	This event will be organized and coordinated by Lewis County Emergency Management and the School Districts. Emergency management will arrange for guest speaker(s) –meteorologist(s), storm chaser(s) , Red Cross disaster experts, etc.-, and provide information on weather radios (and ideally very inexpensive models for sale and/or to give away) . These events will be held at school facilities, and feature high school student volunteers who can help less tech-savvy attendees who need assistance downloading and installing warning apps on their smart phones.
Applicable Goal(s)	Goal 3: Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.
Hazards Addressed:	Earthquake
Estimated Cost:	\$0
Potential Funding Sources	NA
Cost/Benefit Discussion:	There was no cost, with some benefit in preparedness.
Prioritization Discussion:	This project was not considered a pressing priority.
Priority	Low
Timeline for Implementation/Completion:	2021
Status of Action:	Pending
Report of Progress:	Lewis County Emergency Management will assess this action at the annual HMP meeting in 2022
Action No:	LEW-10
Description	Invite SEMA mitigation specialists to present information to city councils, county commission, schools, and the Northeast Missouri Regional Planning Commission meetings.
Jurisdictions Selecting the Action:	Lewis County
Responsible Agency/ Party:	Lewis County Emergency Management Director
Partners	SEMA
Mechanism of Implementation	Public meetings held at the courthouse
Problem(s) to be Mitigated:	Lack of education on emergency preparedness and personal weather awareness
Process	SEMA will be invited to present informational programs to the public in public meetings at the County Courthouse.
Applicable Goal(s)	Goal 3: Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.
Hazards Addressed:	All
Estimated Cost:	\$0
Potential Funding Sources	NA
Cost/Benefit Discussion:	There was no cost, with some benefit in preparedness.
Prioritization Discussion:	This project was not considered a pressing priority.
Priority	Low
Timeline for Implementation/Completion:	2022
Status of Action:	Pending
Report of Progress:	Lewis County Emergency Management will assess this action at the annual HMP meeting in 2023

Action No:	LEW-11
Description	Design and implement joint training (or drills) between agencies, public & private entities (including schools/businesses). Publicize county or citywide drills
Jurisdictions Selecting the Action:	Lewis County
Responsible Agency/ Party:	Lewis County Emergency Management Director
Partners	SEMA, City of Canton, City of Ewing, City of LaGrange, City of LaBelle, City of Lewistown, Village of Monticello, Canton R-V School District, Lewis County C-1 School District.
Mechanism of Implementation	Lewis County Emergency Management meetings
Problem(s) to be Mitigated:	A need for development of inter-agency communication and coordination
Process	Emergency Management will coordinate the design and implementation of exercises which involve a wide array of participants – schools, private business, and government offices as well as response agencies.
Applicable Goal(s)	Goal 4: Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.
Hazards Addressed:	All
Estimated Cost:	\$0
Potential Funding Sources	NA
Cost/Benefit Discussion:	There was no cost, with some benefit in preparedness.
Prioritization Discussion:	This project was not considered a pressing priority.
Priority	Low
Timeline for Implementation/Completion:	2022
Status of Action:	Pending
Report of Progress:	Lewis County Emergency Management will assess this action at the annual HMP meeting in 2023

Action No:	LEW-12
Description	Form committee to assess storm water management plans and facilitate development of such plans where there is a need
Jurisdictions Selecting the Action:	Lewis County
Responsible Agency/ Party:	Lewis County Commission
Partners	Lewis County Road and Bridge, MoDOT
Mechanism of Implementation	Lewis County Commission meetings, Road and Bridge Department Reports, TAC committee involvement
Problem(s) to be Mitigated:	Flash flooding
Process	The County commission will coordinate with the Road and Bridge department head and local MoDot planners to determine where in the county storm water drainage issues create flash flood hazards.
Applicable Goal(s)	Goal 1: Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities. Goal 2: Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy. Goal 7: Take steps to mitigate damages due to flooding.
Hazards Addressed:	All
Estimated Cost:	\$0
Potential Funding Sources	NA
Cost/Benefit Discussion:	There was no cost, with some benefit in preparedness.
Prioritization Discussion:	This project was not considered a pressing priority.
Priority	Low
Timeline for Implementation/Completion:	2023
Status of Action:	Pending
Report of Progress:	Lewis County Emergency Management will assess this action at the annual HMP meeting in 2024

Action No:	LEW-NFIP
Description	NFIP Participation
Jurisdictions Selecting the Action:	Lewis County
Responsible Agency/ Party:	Floodplain Administrator
Partners	Unknown
Mechanism of Implementation	Floodplain Ordinance
Problem(s) to be Mitigated:	Flood
Process	Continue adoption and enforcement of floodplain management requirements, including regulating new construction in Special Flood Hazard Areas (SFHAs).
Applicable Goal(s)	Goal 1: Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities. Goal 2: Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy. Goal 7: Take steps to mitigate damages due to flooding.
Hazards Addressed:	Flooding
Estimated Cost:	\$0
Potential Funding Sources	NA
Priority	High
Timeline for Implementation/Completion:	Continuing
Status of Action:	Continuing

City of Canton Actions

Action No:	CAN-2
Description	Develop a community shelter plan, Incorporate shelter improvements or safe room construction into capital improvement plans
Jurisdictions Selecting the Action:	City of Canton
Responsible Agency/ Party:	Canton Emergency Management Director
Partners	Red Cross, Local Churches, Lewis County Emergency Management
Mechanism of Implementation	Designation of a Coordinator (Most likely Emergency Management) who will develop an inventory of spaces available for use as emergency shelters and safe rooms, and develop a simple set of standard operating guidelines and procedures for activating and operating those shelters and safe rooms. The local community shelter coordinator will use the shelter plan to determine which shelter spaces can be improved by acquiring a backup generator or by the completion of electrical work to make a site able to seamlessly interface with a portable generator, or renovations and additions such as restrooms or showers stalls. These improvements can be addressed by seeking grant funding or, in the case of available budget funds; they can be included in existing capital improvement plans.
Problem(s) to be Mitigated:	Lack of pre-disaster organization of emergency sheltering options; With this action each jurisdiction will have multiple alternate shelters available and there will be an established protocol to put them into service. Providing this information to the County Shelter Coordinator (See action LEW-1) will also make it easier for responders from other jurisdictions to locate potential survivors in the wake of a catastrophic event. The community shelter coordinator will provide updates and participate in further discussion on shelters and safe rooms at the quarterly plan maintenance meetings.

Process	<ul style="list-style-type: none"> • Appoint a shelter coordinator • Work with representatives from Community groups such as local churches and schools to designate spaces suitable for emergency sheltering and work out standard operating procedures. • Work with the County Shelter Coordinator to create and maintain the County-Wide shelter inventory. The inventory of shelters will contain, at a minimum, the following info: <ul style="list-style-type: none"> ▪ Shelter location ▪ Contact Info ▪ Facility info including capacity and amenities (Showers, Kitchen, Segregated spaces, stored supplies) <p><i>Note: Every designated shelter space need not be perfectly suited for sheltering at the onset – Sheltering plans can include actions such as pursuing funding (through fund-raising or seeking grants) to improve existing shelter areas that are less than ideal- funds and assistance may be sought for such items as electrical work to make a site able to seamlessly interface with a portable generator, obtaining an on-site generator, undertaking renovations and additions such as restrooms or showers stalls, and other actions which may be identified and incorporated into both the shelter plan and the Hazard Mitigation Plan</i></p>
Applicable Goal(s)	Goal 1: Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Hazards Addressed:	All hazards
Estimated Cost:	\$0
Potential Funding Sources	NA
Cost/Benefit Discussion:	Being a matter that could be adequately handled by volunteers or made part of an employee's existing duties, there is great benefit at no cost
Prioritization Discussion:	As there is no shelter inventory or any shelter plans in Lewis County at the present time, this project was seen as having a high priority
Priority	High
Timeline for Implementation/Completion:	2019
Status of Action:	Pending
Report of Progress:	Emergency Management will assess the progress of this project in 2020

Action No:	CAN-3
Description	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
Jurisdictions Selecting the Action:	City of Canton
Responsible Agency/ Party:	Canton Emergency Management Director
Partners	Lewis County Emergency Management
Mechanism of Implementation	Lewis County Emergency Management sub-committee
Problem(s) to be Mitigated:	Lack of information and organized planning on warning systems
Process	The City will supply a representative to the committee, which 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
Applicable Goal(s)	5: Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefit of special interests.
Hazards Addressed:	All hazards
Estimated Cost:	0\$
Potential Funding Sources	NA
Cost/Benefit Discussion:	No cost, all benefit
Prioritization Discussion:	This was considered to have a high priority due to the usefulness of

	the information and the ease of implementation
Priority	High
Timeline for Implementation/Completion:	2019
Status of Action:	Pending
Report of Progress:	Action status will be analyzed in Lewis County Emergency Management's 2020 annual report.

Action No:	CAN-4
Description	Raise the north levee
Jurisdictions Selecting the Action:	City of Canton
Responsible Agency/ Party:	Floodplain Administrator
Partners	Lewis County Emergency Management, FEMA/SEMA
Mechanism of Implementation	Grant program administration
Problem(s) to be Mitigated:	Flooding
Process	Coordination between SEMA/FEMA and the US Army Corps for flood plain analysis, cost/benefit analysis to work towards project scoping and preliminary engineering to obtain an accurate project description and cost estimate, then obtain funding for the project.
Applicable Goal(s)	Goal 2. Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy. Goal 7. Take steps to reduce damages due to flooding.
Hazards Addressed:	Flooding
Estimated Cost:	Unknown
Potential Funding Sources	Internal, grants
Cost/Benefit Discussion:	Cost may make this mitigation action unobtainable.
Prioritization Discussion:	Flood mitigation is seen as a high priority subject for the City of Canton.
Priority	High
Timeline for Implementation/Completion:	2022
Status of Action:	Pending
Report of Progress:	Report by Canton floodplain administrator at the 5 year update kick-off.

Action No:	CAN-4a
Description	Replace the flood gate at the North Levee
Jurisdictions Selecting the Action:	City of Canton
Responsible Agency/ Party:	Canton Floodplain Administrator
Partners	Lewis County Emergency Management, FEMA/SEMA
Mechanism of Implementation	Grant program administration
Problem(s) to be Mitigated:	Flooding
Process	Coordination between SEMA/FEMA and the US Army Corps for flood plain analysis, cost/benefit analysis to work towards project scoping and preliminary engineering to obtain an accurate project description and cost estimate, then obtain funding for the project.
Applicable Goal(s)	Goal 2. Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy. Goal 7. Take steps to reduce damages due to flooding.
Hazards Addressed:	Flooding
Estimated Cost:	Unknown
Potential Funding Sources	Internal, grants
Cost/Benefit Discussion:	Cost may make this mitigation action unobtainable.
Prioritization Discussion:	Flood mitigation is seen as a high priority subject for the City of Canton.
Priority	High
Timeline for Implementation/Completion:	2022
Status of Action:	Pending
Report of Progress:	Report by Canton floodplain administrator at the 5 year update kick-off.

Action No:	CAN-5
Description	Structure grants proposals for road/bridge upgrades so that hazard mitigation concerns are also met.
Jurisdictions Selecting the Action:	City of Canton
Responsible Agency/ Party:	City Manager
Partners	NEMO RPC, Missouri's Community Development Block Grant Program.
Mechanism of Implementation	Grant project applications
Problem(s) to be Mitigated:	Hazards which can be mitigated by transportation, infrastructure, or public facility improvement projects.
Process	Through planning activities, the City will become aware of issues and hazards that require mitigation. Where such mitigation is amenable to grant-fundable projects, the City will work with NEMO RPC to apply for grant funds from agencies such as Missouri CDBG, USDA Rural Development, and MoDNR.
Applicable Goal(s)	Goal 2: Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy Goal 6: Secure resources for investment in hazard mitigation
Hazards Addressed:	All
Estimated Cost:	\$0
Potential Funding Sources	CDBG, MoDOT, DNR, USDA
Cost/Benefit Discussion:	At no real capital outlay and the potential for important transportation projects to be funded and completed, this action was very attractive
Prioritization Discussion:	This action received a low priority, mainly due to its ease of implementation removing any sense of urgency. However, it was scheduled fairly early in the 5 year plan.
Priority	Low
Timeline for Implementation/Completion:	2019
Status of Action:	Pending
Report of Progress:	The City's annual report in 2020 will include a statement on the progress of grant funding applications.

Action No:	CAN-8
Description	Participate in the "Great American Shake Up" Earthquake drill
Jurisdictions Selecting the Action:	City of Canton
Responsible Agency/ Party:	City Manager
Partners	SEMA/FEMA, Lewis County Emergency Management
Mechanism of Implementation	Implementation of a scheduled earthquake drill
Problem(s) to be Mitigated:	Lack of training on what to do in the event of an earthquake
Process	Implementation of an earthquake drill to take place per the Great American Shake Out : https://www.shakeout.org/centralus/missouri/
Applicable Goal(s)	Goal 3: Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.
Hazards Addressed:	Earthquake
Estimated Cost:	\$0
Potential Funding Sources	NA
Cost/Benefit Discussion:	There was no cost, with some benefit in preparedness.
Prioritization Discussion:	This project was not considered a pressing priority.
Priority	Low
Timeline for Implementation/Completion:	2020
Status of Action:	Pending
Report of Progress:	Lewis County Emergency Management will assess this action at the annual HMP meeting in 2021

Action No:	CAN-10
Description	Invite SEMA mitigation specialists to present information to city councils, county commission, schools, and the Northeast Missouri Regional Planning Commission meetings.
Jurisdictions Selecting the Action:	City of Canton
Responsible Agency/ Party:	City Manager/Emergency Management Director
Partners	SEMA
Mechanism of Implementation	Public meetings held City Hall
Problem(s) to be Mitigated:	Lack of education on emergency preparedness and personal weather awareness
Process	SEMA will be invited to present informational programs to the public in public meetings at the City Hall.
Applicable Goal(s)	Goal 3: Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.
Hazards Addressed:	All
Estimated Cost:	\$0
Potential Funding Sources	NA
Cost/Benefit Discussion:	There was no cost, with some benefit in preparedness.
Prioritization Discussion:	This project was not considered a pressing priority.
Priority	Low
Timeline for Implementation/Completion:	2021
Status of Action:	Pending
Report of Progress:	Lewis County Emergency Management will assess this action at the annual HMP meeting in 2022

Action No:	CAN-11
Description	Anchoring fuel tanks and other storage tanks to prevent flotation
Jurisdictions Selecting the Action:	City of Canton
Responsible Agency/ Party:	Flood Plain Administrator
Partners	NEMO RPC, Missouri's Community Development Block Grant Program, FEMA/SEMA, Lewis County Emergency Management
Mechanism of Implementation	Flood Plain Regulation, City Ordinances
Problem(s) to be Mitigated:	Flooding
Process	The City of Canton will investigate similar ordinances and their application both to small residential tanks and large industrial tanks then draft their own ordinance and subsequently implement it per their existing method of doing so.
Applicable Goal(s)	Goal 2. Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy. Goal 7. Take steps to reduce damages due to flooding.
Hazards Addressed:	All
Estimated Cost:	Unknown
Potential Funding Sources	Grant, internal
Cost/Benefit Discussion:	There is no cost to the City
Prioritization Discussion:	
Priority	Low
Timeline for Implementation/Completion:	2019
Status of Action:	Pending
Report of Progress:	The City's annual report in 2020 will include a statement on the progress of the implementation of a new ordinance and with the compliance of tank owners within the city.

Action No:	CAN-NFIP
Description	NFIP Participation
Jurisdictions Selecting the Action:	City of Canton
Responsible Agency/ Party:	Floodplain Administrator
Partners	Unknown
Mechanism of Implementation	Floodplain Ordinance
Problem(s) to be Mitigated:	Flood
Process	Continue adoption and enforcement of floodplain management requirements, including regulating new construction in Special Flood Hazard Areas (SFHAs).
Applicable Goal(s)	Goal 1: Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities. Goal 2: Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy. Goal 7: Take steps to mitigate damages due to flooding.
Hazards Addressed:	Flooding
Estimated Cost:	\$0
Potential Funding Sources	NA
Priority	High
Timeline for Implementation/Completion:	Continuing
Status of Action:	Continuing

City of Ewing Actions

Action No:	EWN-2
Description	Develop a community shelter plan, incorporate shelter improvements or safe room construction into capital improvement plans
Jurisdictions Selecting the Action:	City of Ewing
Responsible Agency/ Party:	Emergency Management Director
Partners	Red Cross, Local Churches, Lewis County Emergency Management
Mechanism of Implementation	Designation of a Coordinator (Most likely Emergency Management) who will develop an inventory of spaces available for use as emergency shelters and safe rooms, and develop a simple set of standard operating guidelines and procedures for activating and operating those shelters and safe rooms. The local community shelter coordinator will use the shelter plan to determine which shelter spaces can be improved by acquiring a backup generator or by the completion of electrical work to make a site able to seamlessly interface with a portable generator, or renovations and additions such as restrooms or showers stalls. These improvements can be addressed by seeking grant funding or, in the case of available budget funds; they can be included in existing capital improvement plans.
Problem(s) to be Mitigated:	Lack of pre-disaster organization of emergency sheltering options; With this action each jurisdiction will have multiple alternate shelters available and there will be an established protocol to put them into service. Providing this information to the County Shelter Coordinator (See action LEW-1) will also make it easier for responders from other jurisdictions to locate potential survivors in the wake of a catastrophic event. The community shelter coordinator will provide updates and participate in further discussion on shelters and safe rooms at the quarterly plan maintenance meetings.

Process	<ul style="list-style-type: none"> • Appoint a shelter coordinator • Work with representatives from Community groups such as local churches and schools to designate spaces suitable for emergency sheltering and work out standard operating procedures. • Work with the County Shelter Coordinator to create and maintain the County-Wide shelter inventory. The inventory of shelters will contain, at a minimum, the following info: <ul style="list-style-type: none"> ▪ Shelter location ▪ Contact Info ▪ Facility info including capacity and amenities (Showers, Kitchen, Segregated spaces, stored supplies) <p><i>Note: Every designated shelter space need not be perfectly suited for sheltering at the onset – Sheltering plans can include actions such as pursuing funding (through fund-raising or seeking grants) to improve existing shelter areas that are less than ideal- funds and assistance may be sought for such items as electrical work to make a site able to seamlessly interface with a portable generator, obtaining an on-site generator, undertaking renovations and additions such as restrooms or showers stalls, and other actions which may be identified and incorporated into both the shelter plan and the Hazard Mitigation Plan</i></p>
Applicable Goal(s)	Goal 1: Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Hazards Addressed:	All hazards
Estimated Cost:	\$0
Potential Funding Sources	NA
Cost/Benefit Discussion:	Being a matter that could be adequately handled by volunteers or made part of an employee's existing duties, there is great benefit at no cost
Prioritization Discussion:	As there is no shelter inventory or any shelter plans in Lewis County at the present time, this project was seen as having a high priority
Priority	High
Timeline for Implementation/Completion:	2020
Status of Action:	Pending
Report of Progress:	Emergency Management will assess the progress of this project in 2020

Action No:	EWN-3
Description	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
Jurisdictions Selecting the Action:	City of Ewing
Responsible Agency/ Party:	Emergency Management Director
Partners	Lewis County Emergency Management
Mechanism of Implementation	Appoint a City representative to the County level Committee
Problem(s) to be Mitigated:	Lack of effective early warning systems
Process	The City will supply a representative to the committee, which 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
Applicable Goal(s)	5: Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefit of special interests.
Hazards Addressed:	All hazards
Estimated Cost:	0\$
Potential Funding Sources	NA
Cost/Benefit Discussion:	No cost, all benefit
Prioritization Discussion:	This was considered to have a high priority due to the usefulness of the information and the ease of implementation

Priority	High
Timeline for Implementation/Completion:	2019
Status of Action:	Pending
Report of Progress:	Action status will be analyzed in Lewis County Emergency Management's 2020 annual report.

Action No:	EWN-3a
Description	Install warning sirens with automated units that have battery back-up
Jurisdictions Selecting the Action:	City of Ewing
Responsible Agency/ Party:	City Emergency Management Director
Partner Agencies	FEMA/SEMA, CDBG, USDA
Mechanism of Implementation	Grant
Problem(s) to be Mitigated:	Lack of warning of severe weather
Process	Get a bid for sirens. Apply for Grant. Obtain Grant. Obtain Sirens.
Applicable Goal(s)	Goal 1: Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Hazards Addressed:	Tornado
Estimated Cost:	\$20,000 - \$50,000
Potential Funding Sources	Grant funding
Cost/Benefit Discussion:	Grant funding rather than in-house expenditures makes this action attractive.
Prioritization Discussion:	As tornadoes cause a lot of public anxiety, warning systems are considered very important
Priority	High
Timeline for Implementation/Completion:	2020
Status of Action:	Pending
Report of Progress:	Ewing's Emergency Management Director will assess the progress of this project at the 2021 HMP committee meeting.

Action No:	EWN-5
Description	Structure grants proposals for road/bridge upgrades so that hazard mitigation concerns are also met.
Jurisdictions Selecting the Action:	City of Ewing
Responsible Agency/ Party:	City Clerk
Partners	NEMO RPC, Missouri's Community Development Block Grant Program.
Mechanism of Implementation	Grant project applications
Problem(s) to be Mitigated:	Hazards which can be mitigation by transportation, infrastructure, or public facility improvement projects.
Process	Through planning activities, the City will become aware of issues and hazards that require mitigation. Where such mitigation is amenable to grant-fundable projects, the City will work with NEMO RPC to apply for grant funds from agencies such as Missouri CDBG, USDA Rural Development, and MoDNR.
Applicable Goal(s)	Goal 2: Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy Goal 6: Secure resources for investment in hazard mitigation
Hazards Addressed:	All
Estimated Cost:	\$0
Potential Funding Sources	CDBG, MoDOT, DNR, USDA
Cost/Benefit Discussion:	At no real capital outlay and the potential for important transportation projects to be funded and completed, this action was very attractive
Prioritization Discussion:	This action received a low priority, mainly due to its ease of implementation removing any sense of urgency. However, it was scheduled fairly early in the 5 year plan.

Priority	Low
Timeline for Implementation/Completion:	2020
Status of Action:	Pending
Report of Progress:	The City's annual report will include a statement on the progress of grant funding applications in 2021.

Action No:	EWN-8
Description	Participate in the "Great American Shake Up" Earthquake drill
Jurisdictions Selecting the Action:	City of Ewing
Responsible Agency/ Party:	City Clerk
Partners	SEMA/FEMA, Lewis Co. Emergency Management
Mechanism of Implementation	Implementation of a scheduled earthquake drill
Problem(s) to be Mitigated:	Lack of training on what to do in the event of an earthquake
Process	Implementation of an earthquake drill to take place per the Great American Shake Out : https://www.shakeout.org/centralus/missouri/
Applicable Goal(s)	Goal 3: Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.
Hazards Addressed:	Earthquake
Estimated Cost:	\$0
Potential Funding Sources	NA
Cost/Benefit Discussion:	There was no cost, with some benefit in preparedness.
Prioritization Discussion:	This project was not considered a pressing priority.
Priority	Low
Timeline for Implementation/Completion:	2020
Status of Action:	Pending
Report of Progress:	Lewis County Emergency Management will assess this action at the annual HMP meeting in 2021

Action No:	EWN-10
Description	Invite SEMA mitigation specialists to present information.
Jurisdictions Selecting the Action:	City of Ewing
Responsible Agency/ Party:	City Clerk/Emergency Management Director
Partners	SEMA
Mechanism of Implementation	Public meetings held City Hall or Fire Station
Problem(s) to be Mitigated:	Lack of education on emergency preparedness and personal weather awareness
Process	SEMA will be invited to present informational programs to the public in public meetings at the City Hall.
Applicable Goal(s)	Goal 3: Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.
Hazards Addressed:	All
Estimated Cost:	\$0
Potential Funding Sources	NA
Cost/Benefit Discussion:	There was no cost, with some benefit in preparedness.
Prioritization Discussion:	This project was not considered a pressing priority.
Priority	Low
Timeline for Implementation/Completion:	2020
Status of Action:	Pending
Report of Progress:	Lewis County Emergency Management will assess this action at the annual HMP meeting

City of LaBelle Actions

Action No:	LAB-2
Description	Develop a community shelter plan, Incorporate shelter improvements or safe room construction into capital improvement plans
Jurisdictions Selecting the Action:	City of LaBelle
Responsible Agency/ Party:	City Council
Partners	Red Cross, Local Churches, Lewis County Emergency Management
Mechanism of Implementation	Designation of a Coordinator (Most likely Emergency Management) who will develop an inventory of spaces available for use as emergency shelters and safe rooms, and develop a simple set of standard operating guidelines and procedures for activating and operating those shelters and safe rooms. The local community shelter coordinator will use the shelter plan to determine which shelter spaces can be improved by acquiring a backup generator or by the completion of electrical work to make a site able to seamlessly interface with a portable generator, or renovations and additions such as restrooms or showers stalls. These improvements can be addressed by seeking grant funding or, in the case of available budget funds; they can be included in existing capital improvement plans.
Problem(s) to be Mitigated:	Lack of pre-disaster organization of emergency sheltering options; With this action each jurisdiction will have multiple alternate shelters available and there will be an established protocol to put them into service. Providing this information to the County Shelter Coordinator (See action LEW-1) will also make it easier for responders from other jurisdictions to locate potential survivors in the wake of a catastrophic event. The community shelter coordinator will provide updates and participate in further discussion on shelters and safe rooms at the quarterly plan maintenance meetings.
Process	<ul style="list-style-type: none"> • Appoint a shelter coordinator • Work with representatives from Community groups such as local churches and schools to designate spaces suitable for emergency sheltering and work out standard operating procedures. • Work with the County Shelter Coordinator to create and maintain the County-Wide shelter inventory. The inventory of shelters will contain, at a minimum, the following info: <ul style="list-style-type: none"> ▪ Shelter location ▪ Contact Info ▪ Facility info including capacity and amenities (Showers, Kitchen, Segregated spaces, stored supplies) <p><i>Note: Every designated shelter space need not be perfectly suited for sheltering at the onset – Sheltering plans can include actions such as pursuing funding (through fund-raising or seeking grants) to improve existing shelter areas that are less than ideal- funds and assistance may be sought for such items as electrical work to make a site able to seamlessly interface with a portable generator, obtaining an on-site generator, undertaking renovations and additions such as restrooms or showers stalls, and other actions which may be identified and incorporated into both the shelter plan and the Hazard Mitigation Plan</i></p>
Applicable Goal(s)	Goal 1: Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Hazards Addressed:	All hazards
Estimated Cost:	\$0
Potential Funding Sources	NA
Cost/Benefit Discussion:	Being a matter that could be adequately handled by volunteers or made part of an employee's existing duties, there is great benefit at no cost
Prioritization Discussion:	As there is no shelter inventory or any shelter plans in Lewis County at the present time, this project was seen as having a high priority
Priority	High
Timeline for Implementation/Completion:	2017-2018
Status of Action:	Pending

Report of Progress:	Emergency Management will assess the progress of this project in 2020
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Action No:	LAB-3
Description	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
Jurisdictions Selecting the Action:	City of LaBelle
Responsible Agency/ Party:	City Council
Partners	Lewis County Emergency Management
Mechanism of Implementation	Appoint a City representative to the County level Committee
Problem(s) to be Mitigated:	Lack of effective early warning systems
Process	The City will supply a representative to the committee, which 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
Applicable Goal(s)	5: Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefit of special interests.
Hazards Addressed:	All hazards
Estimated Cost:	0\$
Potential Funding Sources	NA
Cost/Benefit Discussion:	No cost, all benefit
Prioritization Discussion:	This was given a high rating due to ease of implementation and the usefulness of the information
Priority	High
Timeline for Implementation/Completion:	2019
Status of Action:	Pending
Report of Progress:	Action status will be analyzed in Lewis County Emergency Management's 2020 annual report.

Action No:	LAB-3a
Description	Install warning sirens with automated units that have battery back-up
Jurisdictions Selecting the Action:	City of LaBelle
Responsible Agency/ Party:	City Emergency Management Director
Partner Agencies	FEMA/SEMA, CDBG, USDA
Mechanism of Implementation	Grant
Problem(s) to be Mitigated:	Lack of warning of severe weather
Process	Get a bid for sirens. Apply for Grant. Obtain Grant. Obtain Sirens.
Applicable Goal(s)	Goal 1: Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Hazards Addressed:	Tornado
Estimated Cost:	\$20,000 - \$50,000
Potential Funding Sources	Grant funding
Cost/Benefit Discussion:	Grant funding rather than in-house expenditures makes this action attractive.
Prioritization Discussion:	As tornadoes cause a lot of public anxiety, warning systems are considered very important
Priority	High
Timeline for Implementation/Completion:	2020
Status of Action:	Pending
Report of Progress:	LaBelle's Emergency Management Director will assess the progress of this project at the 2021 HMP committee meeting.

Action No:	LAB-5
Description	Structure grants proposals for road/bridge upgrades so that hazard mitigation concerns are also met.
Jurisdictions Selecting the Action:	City of Labelle
Responsible Agency/ Party:	City Clerk
Partners	NEMO RPC, Missouri's Community Development Block Grant Program.
Mechanism of Implementation	Grant project applications
Problem(s) to be Mitigated:	Hazards which can be mitigation by transportation, infrastructure, or public facility improvement projects.
Process	Through planning activities, the City will become aware of issues and hazards that require mitigation. Where such mitigation is amenable to grant-fundable projects, the City will work with NEMO RPC to apply for grant funds from agencies such as Missouri CDBG, USDA Rural Development, and MoDNR.
Applicable Goal(s)	Goal 2: Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy Goal 6: Secure resources for investment in hazard mitigation
Hazards Addressed:	All
Estimated Cost:	\$0
Potential Funding Sources	CDBG, MoDOT, DNR, USDA
Cost/Benefit Discussion:	At no real capital outlay and the potential for important transportation projects to be funded and completed, this action was very attractive
Prioritization Discussion:	This action received a low priority, mainly due to its ease of implementation removing any sense of urgency. However, it was scheduled fairly early in the 5 year plan.
Priority	Low
Timeline for Implementation/Completion:	2019
Status of Action:	Pending
Report of Progress:	The City's annual report will include a statement on the progress of grant funding applications.

Action No:	LAB-8
Description	Participate in the "Great American Shake Up" Earthquake drill
Jurisdictions Selecting the Action:	City of Labelle
Responsible Agency/ Party:	City Clerk
Partners	SEMA/FEMA, Lewis County Emergency Management
Mechanism of Implementation	Implementation of a scheduled earthquake drill
Problem(s) to be Mitigated:	Lack of training on what to do in the event of an earthquake
Process	Implementation of an earthquake drill to take place per the Great American Shake Out : https://www.shakeout.org/centralus/missouri/
Applicable Goal(s)	Goal 3: Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.
Hazards Addressed:	Earthquake
Estimated Cost:	\$0
Potential Funding Sources	NA
Cost/Benefit Discussion:	There was no cost, with some benefit in preparedness.
Prioritization Discussion:	This project was not considered a pressing priority.
Priority	Low
Timeline for Implementation/Completion:	2020
Status of Action:	Pending
Report of Progress:	Lewis County Emergency Management will assess this action at the

	annual HMP meeting
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Action No:	LAB-10
Description	Invite SEMA mitigation specialists to present information to city councils, county commission, schools, and the Northeast Missouri Regional Planning Commission meetings.
Jurisdictions Selecting the Action:	City of LaBelle
Responsible Agency/ Party:	City Clerk
Partners	SEMA
Mechanism of Implementation	Public meetings held City Hall or Fire Station
Problem(s) to be Mitigated:	Lack of education on emergency preparedness and personal weather awareness
Process	SEMA will be invited to present informational programs to the public in public meetings at the City Hall.
Applicable Goal(s)	Goal 3: Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.
Hazards Addressed:	All
Estimated Cost:	\$0
Potential Funding Sources	NA
Cost/Benefit Discussion:	There was no cost, with some benefit in preparedness.
Prioritization Discussion:	This project was not considered a pressing priority.
Priority	Low
Timeline for Implementation/Completion:	2020
Status of Action:	Pending
Report of Progress:	Lewis County Emergency Management will assess this action at the annual HMP meeting

City of LaGrange Actions

Action No:	LAG-2
Description	Develop a community shelter plan, Incorporate shelter improvements or safe room construction into capital improvement plans
Jurisdictions Selecting the Action:	City of LaGrange
Responsible Agency/ Party:	City Clerk
Partners	Red Cross, Local Churches, Lewis County Emergency Management
Mechanism of Implementation	Designation of a Coordinator (Most likely Emergency Management) who will develop an inventory of spaces available for use as emergency shelters and safe rooms, and develop a simple set of standard operating guidelines and procedures for activating and operating those shelters and safe rooms. The local community shelter coordinator will use the shelter plan to determine which shelter spaces can be improved by acquiring a backup generator or by the completion of electrical work to make a site able to seamlessly interface with a portable generator, or renovations and additions such as restrooms or showers stalls. These improvements can be addressed by seeking grant funding or, in the case of available budget funds; they can be included in existing capital improvement plans.
Problem(s) to be Mitigated:	Lack of pre-disaster organization of emergency sheltering options; With this action each jurisdiction will have multiple alternate shelters available and there will be an established protocol to put them into service. Providing this information to the County Shelter Coordinator (See action LEW-1) will also make it easier for responders from other jurisdictions to locate potential survivors in the wake of a catastrophic event. The community shelter coordinator will provide updates and

	participate in further discussion on shelters and safe rooms at the quarterly plan maintenance meetings.
Process	<ul style="list-style-type: none"> • Appoint a shelter coordinator • Work with representatives from Community groups such as local churches and schools to designate spaces suitable for emergency sheltering and work out standard operating procedures. • Work with the County Shelter Coordinator to create and maintain the County-Wide shelter inventory. The inventory of shelters will contain, at a minimum, the following info: <ul style="list-style-type: none"> ▪ Shelter location ▪ Contact Info ▪ Facility info including capacity and amenities (Showers, Kitchen, Segregated spaces, stored supplies) <p><i>Note: Every designated shelter space need not be perfectly suited for sheltering at the onset – Sheltering plans can include actions such as pursuing funding (through fund-raising or seeking grants) to improve existing shelter areas that are less than ideal- funds and assistance may be sought for such items as electrical work to make a site able to seamlessly interface with a portable generator, obtaining an on-site generator, undertaking renovations and additions such as restrooms or showers stalls, and other actions which may be identified and incorporated into both the shelter plan and the Hazard Mitigation Plan</i></p>
Applicable Goal(s)	Goal 1: Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Hazards Addressed:	All hazards
Estimated Cost:	\$0
Potential Funding Sources	NA
Cost/Benefit Discussion:	Being a matter that could be adequately handled by volunteers or made part of an employee's existing duties, there is great benefit at no cost
Prioritization Discussion:	As there is no shelter inventory or any shelter plans in Lewis County at the present time, this project was seen as having a high priority
Priority	High
Timeline for Implementation/Completion:	2017-2018
Status of Action:	Pending
Report of Progress:	Emergency Management will assess the progress of this project in 2020

Action No:	LAG-3
Description	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
Jurisdictions Selecting the Action:	City of LaGrange
Responsible Agency/ Party:	City Council
Partners	Lewis County Emergency Management
Mechanism of Implementation	Appoint a City representative to the County level Committee
Problem(s) to be Mitigated:	Lack of effective early warning systems
Process	The City will supply a representative to the committee, which 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
Applicable Goal(s)	5: Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefit of special interests.
Hazards Addressed:	All hazards
Estimated Cost:	0\$
Potential Funding Sources	NA
Cost/Benefit Discussion:	No cost, all benefit

Prioritization Discussion:	This was given a high rating due to ease of implementation and the usefulness of the information
Priority	High
Timeline for Implementation/Completion:	2019
Status of Action:	Pending
Report of Progress:	Action status will be analyzed in Lewis County Emergency Management's 2020 annual report.

Action No:	LAG-5
Description	Structure grants proposals for road/bridge upgrades so that hazard mitigation concerns are also met.
Jurisdictions Selecting the Action:	City of LaGrange
Responsible Agency/ Party:	City Clerk
Partners	NEMO RPC, Missouri's Community Development Block Grant Program.
Mechanism of Implementation	Grant project applications
Problem(s) to be Mitigated:	Hazards which can be mitigation by transportation, infrastructure, or public facility improvement projects.
Process	Through planning activities, the City will become aware of issues and hazards that require mitigation. Where such mitigation is amenable to grant-fundable projects, the City will work with NEMO RPC to apply for grant funds from agencies such as Missouri CDBG, USDA Rural Development, and MoDNR.
Applicable Goal(s)	Goal 2: Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy Goal 6: Secure resources for investment in hazard mitigation
Hazards Addressed:	All
Estimated Cost:	\$0
Potential Funding Sources	CDBG, MoDOT, DNR, USDA
Cost/Benefit Discussion:	At no real capital outlay and the potential for important transportation projects to be funded and completed, this action was very attractive
Prioritization Discussion:	This action received a low priority, mainly due to its ease of implementation removing any sense of urgency. However, it was scheduled fairly early in the 5 year plan.
Priority	Low
Timeline for Implementation/Completion:	2019
Status of Action:	Pending
Report of Progress:	The City's annual report will include a statement on the progress of grant funding applications.

Action No:	LAG-8
Description	Participate in the "Great American Shake Up" Earthquake drill
Jurisdictions Selecting the Action:	City of LaGrange
Responsible Agency/ Party:	City Clerk
Partners	SEMA/FEMA, Lewis County Emergency Management
Mechanism of Implementation	Implementation of a scheduled earthquake drill
Problem(s) to be Mitigated:	Lack of training on what to do in the event of an earthquake
Process	Implementation of an earthquake drill to take place per the Great American Shake Out : https://www.shakeout.org/centralus/missouri/
Applicable Goal(s)	Goal 3: Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.
Hazards Addressed:	Earthquake
Estimated Cost:	\$0
Potential Funding Sources	NA
Cost/Benefit Discussion:	There was no cost, with some benefit in preparedness.
Prioritization Discussion:	This project was not considered a pressing priority.

Priority	Low
Timeline for Implementation/Completion:	2020
Status of Action:	Pending
Report of Progress:	Lewis County Emergency Management will assess this action at the annual HMP meeting

Action No:	LAG-10
Description	Invite SEMA mitigation specialists to present information to city councils, county commission, schools, and the Northeast Missouri Regional Planning Commission meetings.
Jurisdictions Selecting the Action:	City of LaGrange
Responsible Agency/ Party:	City Clerk
Partners	SEMA
Mechanism of Implementation	Public meetings held City Hall or Fire Station
Problem(s) to be Mitigated:	Lack of education on emergency preparedness and personal weather awareness
Process	SEMA will be invited to present informational programs to the public in public meetings at the City Hall.
Applicable Goal(s)	Goal 3: Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.
Hazards Addressed:	All
Estimated Cost:	\$0
Potential Funding Sources	NA
Cost/Benefit Discussion:	There was no cost, with some benefit in preparedness.
Prioritization Discussion:	This project was not considered a pressing priority.
Priority	Low
Timeline for Implementation/Completion:	2020
Status of Action:	Pending
Report of Progress:	Lewis County Emergency Management will assess this action at the annual HMP meeting

Action No:	LAG-11
Description	Anchoring fuel tanks and other storage tanks to prevent flotation
Jurisdictions Selecting the Action:	City of La Grange
Responsible Agency/ Party:	Flood Plain Administrator
Partners	NEMO RPC, Missouri's Community Development Block Grant Program, FEMA/SEMA, Lewis County Emergency Management
Mechanism of Implementation	Flood Plain Regulation, City Ordinances
Problem(s) to be Mitigated:	Flooding
Process	The City of La Grange will investigate similar ordinances and their application both to small residential tanks and large industrial tanks then draft their own ordinance and subsequently implement it per their existing method of doing so.
Applicable Goal(s)	Goal 2. Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy. Goal 7. Take steps to reduce damages due to flooding.
Hazards Addressed:	All
Estimated Cost:	Unknown
Potential Funding Sources	Grant, internal
Cost/Benefit Discussion:	There is no cost to the City
Prioritization Discussion:	
Priority	Low
Timeline for Implementation/Completion:	2019
Status of Action:	Pending
Report of Progress:	The City's annual report in 2020 will include a statement on the

	progress of the implementation of a new ordinance and with the compliance of tank owners within the city.
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Action No:	CAN-NFIP
Description	NFIP Participation
Jurisdictions Selecting the Action:	City of Canton
Responsible Agency/ Party:	Floodplain Administrator
Partners	Unknown
Mechanism of Implementation	Floodplain Ordinance
Problem(s) to be Mitigated:	Flood
Process	Continue adoption and enforcement of floodplain management requirements, including regulating new construction in Special Flood Hazard Areas (SFHAs).
Applicable Goal(s)	Goal 1: Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities. Goal 2: Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy. Goal 7: Take steps to mitigate damages due to flooding.
Hazards Addressed:	Flooding
Estimated Cost:	\$0
Potential Funding Sources	NA
Priority	High
Timeline for Implementation/Completion:	Continuing
Status of Action:	Continuing

City of Lewistown Actions

Action No:	LST-2
Description	Develop a community shelter plan, Incorporate shelter improvements or safe room construction into capital improvement plans
Jurisdictions Selecting the Action:	City of Lewistown
Responsible Agency/ Party:	City Clerk
Partners	Red Cross, Local Churches, Lewis County Emergency Management
Mechanism of Implementation	Designation of a Coordinator (Most likely Emergency Management) who will develop an inventory of spaces available for use as emergency shelters and safe rooms, and develop a simple set of standard operating guidelines and procedures for activating and operating those shelters and safe rooms. The local community shelter coordinator will use the shelter plan to determine which shelter spaces can be improved by acquiring a backup generator or by the completion of electrical work to make a site able to seamlessly interface with a portable generator, or renovations and additions such as restrooms or showers stalls. These improvements can be addressed by seeking grant funding or, in the case of available budget funds; they can be included in existing capital improvement plans.
Problem(s) to be Mitigated:	Lack of pre-disaster organization of emergency sheltering options; With this action each jurisdiction will have multiple alternate shelters available and there will be an established protocol to put them into service. Providing this information to the County Shelter Coordinator (See action LEW-1) will also make it easier for responders from other jurisdictions to locate potential survivors in the wake of a catastrophic event. The community shelter coordinator will provide updates and participate in further discussion on shelters and safe rooms at the quarterly plan maintenance meetings.

Process	<ul style="list-style-type: none"> • Appoint a shelter coordinator • Work with representatives from Community groups such as local churches and schools to designate spaces suitable for emergency sheltering and work out standard operating procedures. • Work with the County Shelter Coordinator to create and maintain the County-Wide shelter inventory. The inventory of shelters will contain, at a minimum, the following info: <ul style="list-style-type: none"> ▪ Shelter location ▪ Contact Info ▪ Facility info including capacity and amenities (Showers, Kitchen, Segregated spaces, stored supplies) <p><i>Note: Every designated shelter space need not be perfectly suited for sheltering at the onset – Sheltering plans can include actions such as pursuing funding (through fund-raising or seeking grants) to improve existing shelter areas that are less than ideal- funds and assistance may be sought for such items as electrical work to make a site able to seamlessly interface with a portable generator, obtaining an on-site generator, undertaking renovations and additions such as restrooms or showers stalls, and other actions which may be identified and incorporated into both the shelter plan and the Hazard Mitigation Plan</i></p>
Applicable Goal(s)	Goal 1: Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Hazards Addressed:	All hazards
Estimated Cost:	\$0
Potential Funding Sources	NA
Cost/Benefit Discussion:	Being a matter that could be adequately handled by volunteers or made part of an employee's existing duties, there is great benefit at no cost
Prioritization Discussion:	As there is no shelter inventory or any shelter plans in Lewis County at the present time, this project was seen as having a high priority
Priority	High
Timeline for Implementation/Completion:	2017-2018
Status of Action:	Pending
Report of Progress:	Emergency Management will assess the progress of this project in 2020

Action No:	LST-3
Description	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
Jurisdictions Selecting the Action:	City of Lewistown
Responsible Agency/ Party:	City Council
Partners	Lewis County Emergency Management
Mechanism of Implementation	Appoint a City representative to the County level Committee
Problem(s) to be Mitigated:	Lack of effective early warning systems
Process	The City will supply a representative to the committee, which 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
Applicable Goal(s)	5: Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefit of special interests.
Hazards Addressed:	All hazards
Estimated Cost:	0\$
Potential Funding Sources	NA
Cost/Benefit Discussion:	No cost, all benefit
Prioritization Discussion:	This was given a high rating due to ease of implementation and the usefulness of the information

Priority	High
Timeline for Implementation/Completion:	2019
Status of Action:	Pending
Report of Progress:	Action status will be analyzed in Lewis County Emergency Management's 2020 annual report.

Action No:	LST-3a
Description	Install warning sirens with automated units that have battery back-up
Jurisdictions Selecting the Action:	City of Lewiston
Responsible Agency/ Party:	City Emergency Management Director
Partner Agencies	FEMA/SEMA, CDBG, USDA
Mechanism of Implementation	Grant
Problem(s) to be Mitigated:	Lack of warning of severe weather
Process	Get a bid for sirens. Apply for Grant. Obtain Grant. Obtain Sirens.
Applicable Goal(s)	Goal 1: Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Hazards Addressed:	Tornado
Estimated Cost:	\$20,000 - \$50,000
Potential Funding Sources	Grant funding
Cost/Benefit Discussion:	Grant funding rather than in-house expenditures makes this action attractive.
Prioritization Discussion:	As tornadoes cause a lot of public anxiety, warning systems are considered very important
Priority	High
Timeline for Implementation/Completion:	2020
Status of Action:	Pending
Report of Progress:	Lewiston's Emergency Management Director will assess the progress of this project at the 2021 HMP committee meeting.

Action No:	LST-5
Description	Structure grants proposals for road/bridge upgrades so that hazard mitigation concerns are also met.
Jurisdictions Selecting the Action:	City of Lewistown
Responsible Agency/ Party:	City Clerk
Partners	NEMO RPC, Missouri's Community Development Block Grant Program.
Mechanism of Implementation	Grant project applications
Problem(s) to be Mitigated:	Hazards which can be mitigation by transportation, infrastructure, or public facility improvement projects.
Process	Through planning activities, the City will become aware of issues and hazards that require mitigation. Where such mitigation is amenable to grant-fundable projects, the City will work with NEMO RPC to apply for grant funds from agencies such as Missouri CDBG, USDA Rural Development, and MoDNR.
Applicable Goal(s)	Goal 2: Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy Goal 6: Secure resources for investment in hazard mitigation
Hazards Addressed:	All
Estimated Cost:	\$0
Potential Funding Sources	CDBG, MoDOT, DNR, USDA
Cost/Benefit Discussion:	At no real capital outlay and the potential for important transportation projects to be funded and completed, this action was very attractive
Prioritization Discussion:	This action received a low priority, mainly due to its ease of implementation removing any sense of urgency. However, it was scheduled fairly early in the 5 year plan.

Priority	Low
Timeline for Implementation/Completion:	2019
Status of Action:	Pending
Report of Progress:	The City's annual report will include a statement on the progress of grant funding applications in 2020

Action No:	LST-8
Description	Participate in the "Great American Shake Up" Earthquake drill
Jurisdictions Selecting the Action:	City of Lewistown
Responsible Agency/ Party:	City Clerk
Partners	SEMA/FEMA, Lewis County Emergency Management
Mechanism of Implementation	Implementation of a scheduled earthquake drill
Problem(s) to be Mitigated:	Lack of training on what to do in the event of an earthquake
Process	Implementation of an earthquake drill to take place per the Great American Shake Out : https://www.shakeout.org/centralus/missouri/
Applicable Goal(s)	Goal 3: Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.
Hazards Addressed:	Earthquake
Estimated Cost:	\$0
Potential Funding Sources	NA
Cost/Benefit Discussion:	There was no cost, with some benefit in preparedness.
Prioritization Discussion:	This project was not considered a pressing priority.
Priority	Low
Timeline for Implementation/Completion:	2020
Status of Action:	Pending
Report of Progress:	Lewis County Emergency Management will assess this action at the annual HMP meeting in 2021

Action No:	LST-10
Description	Invite SEMA mitigation specialists to present information to city councils, county commission, schools, and the Northeast Missouri Regional Planning Commission meetings.
Jurisdictions Selecting the Action:	City of Lewistown
Responsible Agency/ Party:	City Clerk
Partners	SEMA
Mechanism of Implementation	Public meetings held City Hall or Fire Station
Problem(s) to be Mitigated:	Lack of education on emergency preparedness and personal weather awareness
Process	SEMA will be invited to present informational programs to the public in public meetings at the City Hall.
Applicable Goal(s)	Goal 3: Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.
Hazards Addressed:	All
Estimated Cost:	\$0
Potential Funding Sources	NA
Cost/Benefit Discussion:	There was no cost, with some benefit in preparedness.
Prioritization Discussion:	This project was not considered a pressing priority.
Priority	Low
Timeline for Implementation/Completion:	2020
Status of Action:	Pending
Report of Progress:	Lewis County Emergency Management will assess this action at the annual HMP meeting

Village of Monticello Actions

Action No:	MNT-2
Description	Develop a community shelter plan, Incorporate shelter improvements or safe room construction into capital improvement plans
Jurisdictions Selecting the Action:	Village of Monticello
Responsible Agency/ Party:	Mayor and Council
Partners	Red Cross, Local Churches, Lewis County Emergency Management
Mechanism of Implementation	<p>Designation of a Municipal/ School district Shelter Coordinator who will develop an inventory of spaces available for use as emergency shelters and safe rooms, and develop a simple set of standard operating guidelines and procedures for activating and operating those shelters and safe rooms. While schools are some of the most likely sites for an emergency shelter in time of disaster, there is no established, well organized plan for how such operations would be conducted, especially if school were in session and the school wished to continue its normal academic operation while simultaneously operating as a shelter.</p> <p>The local community shelter coordinator will use the shelter plan to determine which shelter spaces can be improved by acquiring a backup generator or by the completion of electrical work to make a site able to seamlessly interface with a portable generator, or renovations and additions such as restrooms or showers stalls. These improvements can be addressed by seeking grant funding or, in the case of available budget funds; they can be included in existing capital improvement plans.</p>
Problem(s) to be Mitigated:	Lack of pre-disaster organization of emergency sheltering options; With this action each jurisdiction will have multiple alternate shelters available and there will be an established protocol to put them into service. Providing this information to the County Shelter Coordinator will also make it easier for responders from other jurisdictions to locate potential survivors in the wake of a catastrophic event. The community shelter coordinator will provide updates and participate in further discussion on shelters and safe rooms at the quarterly plan maintenance meetings.
Process	<ul style="list-style-type: none"> • Appoint a shelter coordinator for the City and school • Work with representatives from Community groups such as local churches and schools to designate spaces suitable for emergency sheltering and work out standard operating procedures. • Work with the County Shelter Coordinator to create and maintain the County-Wide shelter inventory. The inventory of shelters will contain, at a minimum, the following info: <ul style="list-style-type: none"> ▪ Shelter location ▪ Contact Info ▪ Facility info including capacity and amenities (Showers, Kitchen, Segregated spaces, stored supplies) <p><i>Note: Every designated shelter space need not be perfectly suited for sheltering at the onset – Sheltering plans can include actions such as pursuing funding (through fund-raising or seeking grants) to improve existing shelter areas that are less than ideal- funds and assistance may be sought for such items as electrical work to make a site able to seamlessly interface with a portable generator, obtaining an on-site generator, undertaking renovations and additions such as restrooms or showers stalls, and other actions which may be identified and incorporated into both the shelter plan and the Hazard Mitigation Plan</i></p>
Applicable Goal(s)	Goal 1: Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Hazards Addressed:	All hazards
Estimated Cost:	\$0
Potential Funding Sources	NA
Cost/Benefit Discussion:	Being a matter that could be adequately handled by volunteers or made part of an employee's existing duties, there is great benefit at no cost
Prioritization Discussion:	As there is no shelter inventory or any shelter plans in Lewis County at the present time, this project was seen as having a high priority

Priority	High
Timeline for Implementation/Completion:	2017-2018
Status of Action:	Pending
Report of Progress:	Emergency Management will assess the progress of this project in July of 2017 and again at the first LEPC/EM meeting scheduled in 2018.

Action No:	MNT-3
Description	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
Jurisdictions Selecting the Action:	Village of Monticello
Responsible Agency/ Party:	Mayor and Council
Partners	Lewis County Emergency Management
Mechanism of Implementation	Appoint a City representative to the County level Committee
Problem(s) to be Mitigated:	Lack of effective early warning systems
Process	The Village will supply a representative to the committee, which 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
Applicable Goal(s)	5: Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefit of special interests.
Hazards Addressed:	All hazards
Estimated Cost:	0\$
Potential Funding Sources	NA
Cost/Benefit Discussion:	No cost, all benefit
Prioritization Discussion:	This was given a high rating due to ease of implementation and the usefulness of the information
Priority	High
Timeline for Implementation/Completion:	2019
Status of Action:	Pending
Report of Progress:	Action status will be analyzed in Lewis County Emergency Management's 2020 annual report.

Action No:	MNT-3a
Description	Install warning sirens with automated units that have battery back-up
Jurisdictions Selecting the Action:	Village of Monticello
Responsible Agency/ Party:	Mayor
Partner Agencies	FEMA/SEMA, CDBG, USDA
Mechanism of Implementation	Grant
Problem(s) to be Mitigated:	Lack of warning of severe weather
Process	Get a bid for sirens. Apply for Grant. Obtain Grant. Obtain Sirens.
Applicable Goal(s)	Goal 1: Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Hazards Addressed:	Tornado
Estimated Cost:	\$20,000 - \$50,000
Potential Funding Sources	Grant funding
Cost/Benefit Discussion:	Grant funding rather than in-house expenditures makes this action attractive.
Prioritization Discussion:	As tornadoes cause a lot of public anxiety, warning systems are considered very important
Priority	High
Timeline for Implementation/Completion:	2020

Status of Action:	Pending
Report of Progress:	Monticello's mayor will assess the progress of this project at the 2021 HMP committee meeting.

Action No:	MNT-5
Description	Structure grants proposals for road/bridge upgrades so that hazard mitigation concerns are also met.
Jurisdictions Selecting the Action:	Village of Monticello
Responsible Agency/ Party:	Mayor and Council
Partners	NEMO RPC, Missouri's Community Development Block Grant Program.
Mechanism of Implementation	Grant project applications
Problem(s) to be Mitigated:	Hazards which can be mitigation by transportation, infrastructure, or public facility improvement projects.
Process	Through planning activities, the City will become aware of issues and hazards that require mitigation. Where such mitigation is amenable to grant-fundable projects, the City will work with NEMO RPC to apply for grant funds from agencies such as Missouri CDBG, USDA Rural Development, and MoDNR.
Applicable Goal(s)	Goal 2: Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy Goal 6: Secure resources for investment in hazard mitigation
Hazards Addressed:	All
Estimated Cost:	\$0
Potential Funding Sources	CDBG, MoDOT, DNR, USDA
Cost/Benefit Discussion:	At no real capital outlay and the potential for important transportation projects to be funded and completed, this action was very attractive
Prioritization Discussion:	This action received a low priority, mainly due to its ease of implementation removing any sense of urgency. However, it was scheduled fairly early in the 5 year plan.
Priority	Low
Timeline for Implementation/Completion:	2019
Status of Action:	Pending
Report of Progress:	The Village's annual report will include a statement on any grant funding applications.

Canton R-V School District Actions

Action No:	CRV-2
Description	Develop a community shelter plan - Incorporate shelter improvements or safe room construction into capital improvement plans
Jurisdictions Selecting the Action:	Canton R-V School District
Responsible Agency/ Party:	Superintendent
Partners	Red Cross, Local Churches, Lewis County Emergency Management
Mechanism of Implementation	<p>While schools are some of the most likely sites for an emergency shelter in time of disaster, there is no established, well organized plan for how such operations would be conducted, especially if school were in session and the school wished to continue its normal academic operation while simultaneously operating as a shelter.</p> <p>The local community shelter coordinator will use the shelter plan to determine which shelter spaces can be improved by acquiring a backup generator or by the completion of electrical work to make a site able to seamlessly interface with a portable generator, or renovations and additions such as restrooms or showers stalls. These improvements can be addressed by seeking grant funding or, in the case of available budget funds; they can be included in existing capital improvement plans.</p>
Problem(s) to be Mitigated:	<p>Lack of pre-disaster organization of emergency sheltering options; With this action each jurisdiction will have multiple alternate shelters available and there will be an established protocol to put them into service. Providing this information to the County Shelter Coordinator will also make it easier for responders from other jurisdictions to locate potential survivors in the wake of a catastrophic event. The community shelter coordinator will provide updates and participate in further discussion on shelters and safe rooms at the quarterly plan maintenance meetings.</p>
Process	<ul style="list-style-type: none"> • Appoint a shelter coordinator • Work with representatives from Community groups such as local churches and schools to designate spaces suitable for emergency sheltering and work out standard operating procedures. • Work with the County Shelter Coordinator to create and maintain the County-Wide shelter inventory. The inventory of shelters will contain, at a minimum, the following info: <ul style="list-style-type: none"> ▪ Shelter location ▪ Contact Info ▪ Facility info including capacity and amenities (Showers, Kitchen, Segregated spaces, stored supplies) <p><i>Note: Every designated shelter space need not be perfectly suited for sheltering at the onset – Sheltering plans can include actions such as pursuing funding (through fund-raising or seeking grants) to improve existing shelter areas that are less than ideal- funds and assistance may be sought for such items as electrical work to make a site able to seamlessly interface with a portable generator, obtaining an on-site generator, undertaking renovations and additions such as restrooms or showers stalls, and other actions which may be identified and incorporated into both the shelter plan and the Hazard Mitigation Plan</i></p>
Applicable Goal(s)	Goal 1: Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Hazards Addressed:	All hazards
Estimated Cost:	\$0
Potential Funding Sources	NA
Cost/Benefit Discussion:	Being a matter that could be adequately handled by volunteers or made part of an employee's existing duties, there is great benefit at no cost
Prioritization Discussion:	As there is no shelter inventory or any shelter plans in Lewis County at the present time, this project was seen as having a high priority

Priority	High
Timeline for Implementation/Completion:	2018-2019
Status of Action:	Pending
Report of Progress:	Emergency Management will assess the progress of this project in July of 2019 and again at the first LEPC/EM meeting scheduled in 2020.

Action No:	CRV-8
Description	Participate in the "Great American Shake Up" Earthquake drill
Jurisdictions Selecting the Action:	Canton R-V School District
Responsible Agency/ Party:	Superintendent
Partners	SEMA/FEMA, Lewis County Emergency Management
Mechanism of Implementation	Implementation of a scheduled earthquake drill
Problem(s) to be Mitigated:	Lack of training on what to do in the event of an earthquake
Process	Implementation of an earthquake drill to take place per the Great American Shake Out : https://www.shakeout.org/centralus/missouri/
Applicable Goal(s)	Goal 3: Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.
Hazards Addressed:	Earthquake
Estimated Cost:	\$0
Potential Funding Sources	NA
Cost/Benefit Discussion:	There was no cost, with some benefit in preparedness.
Prioritization Discussion:	This project was not considered a pressing priority.
Priority	Low
Timeline for Implementation/Completion:	2020
Status of Action:	Pending
Report of Progress:	Lewis County Emergency Management will assess this action at the annual HMP meeting in 2021
Action No:	CRV-9
Description	Coordinate and conduct a standalone event to educate the public about emergency preparedness and early warning systems.
Jurisdictions Selecting the Action:	Canton R-V School District
Responsible Agency/ Party:	Superintendent
Partners	Lewis County Emergency Management
Mechanism of Implementation	Public events held in local school facilities, which are already a familiar venue for citizens of the county due to local school sports and other events that take place there.
Problem(s) to be Mitigated:	Lack of education on emergency preparedness and personal weather awareness
Process	This event will be organized and coordinated by Lewis County Emergency Management and the School Districts. Emergency management will arrange for guest speaker(s) –meteorologist(s), storm chaser(s) , Red Cross disaster experts, etc.-, and provide information on weather radios (and ideally very inexpensive models for sale and/or to give away) . These events will be held at school facilities, and feature high school student volunteers who can help less tech-savvy attendees who need assistance downloading and installing warning apps on their smart phones.
Applicable Goal(s)	Goal 3: Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.
Hazards Addressed:	Earthquake
Estimated Cost:	\$0
Potential Funding Sources	NA
Cost/Benefit Discussion:	There was no cost, with some benefit in preparedness.
Prioritization Discussion:	This project was not considered a pressing priority.
Priority	Low
Timeline for Implementation/Completion:	2020

Status of Action:	Pending
Report of Progress:	Lewis County Emergency Management will assess this action at the annual HMP meeting in 2021

Action No:	CRV-10
Description	Implement the Red Cross "pillowcase program"
Jurisdictions Selecting the Action:	Canton R-V School District
Responsible Agency/ Party:	Superintendent
Partners	Lewis County Emergency Management, Red Cross
Mechanism of Implementation	Schedule of Red Cross Presentation during the school year
Problem(s) to be Mitigated:	Lack of early childhood education on emergency preparedness
Process	The Pillowcase Project, sponsored by Disney, is an hour long preparedness education program for children in grades 3 – 5, which teaches students about personal and family preparedness, local hazards, and basic coping skills. Red Cross volunteers lead students through a "learn, practice, share" framework to engage them in disaster preparedness. Upon completion, students receive a sturdy pillowcase in which to build their personal emergency supplies kit.
Applicable Goal(s)	Goal 3: Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.
Hazards Addressed:	All hazards
Estimated Cost:	0\$
Potential Funding Sources	NA
Cost/Benefit Discussion:	Zero cost, significant benefit
Prioritization Discussion:	This was given a high priority because it's unknown how long the program might be available.
Priority	High
Timeline for Implementation/Completion:	2020
Status of Action:	Pending
Report of Progress:	Action status will be analyzed in Lewis County Emergency Management's 2021 annual report.

Action No:	CRV-11
Description	Acquire a generator
Jurisdictions Selecting the Action:	Canton RV Schools
Responsible Agency/ Party:	Superintendent
Partner Agencies	FEMA/SEMA, CDBG
Mechanism of Implementation	Grant
Problem(s) to be Mitigated:	Prolonged power outage
Process	Identify a suitable site for a generator to be placed in order to continue to power critical systems the school and allow it to maintain operations (as long as there is fuel available) when the electrical grid is inoperable.
Applicable Goal(s)	Goal 1: Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Hazards Addressed:	Any which may produce power outages – thunderstorm, tornado, ice storm, etc.
Estimated Cost:	\$20,000 - \$50,000
Potential Funding Sources	Grant funding
Cost/Benefit Discussion:	Grant funding rather than in-house expenditures makes this action attractive.
Prioritization Discussion:	This was seen as a way to improve resiliency and make the school more effective as an emergency shelter site if that would ever be required.
Priority	High

Timeline for Implementation/Completion:	2020
Status of Action:	Pending
Report of Progress:	The Canton RV superintendent will assess the progress of this project at the 2021 HMP committee meeting.

Lewis County C-1 School District Actions

Action No:	LCS-2
Description	Develop a community shelter plan - Incorporate shelter improvements or safe room construction into capital improvement plans
Jurisdictions Selecting the Action:	County, Canton, Ewing, La belle, La Grange, town, Monticello, Canton R-V, County C-1
Responsible Agency/ Party:	City Council, school superintendent, or appointed representative
Partners	Red Cross, Local Churches, Lewis County Emergency Management
Mechanism of Implementation	Designation of a Municipal/ School district Shelter Coordinator who will develop an inventory of spaces available for use as emergency shelters and safe rooms, and develop a simple set of standard operating guidelines and procedures for activating and operating those shelters and safe rooms. While schools are some of the most likely sites for an emergency shelter in time of disaster, there is no established, well organized plan for how such operations would be conducted, especially if school were in session and the school wished to continue its normal academic operation while simultaneously operating as a shelter. The local community shelter coordinator will use the shelter plan to determine which shelter spaces can be improved by acquiring a backup generator or by the completion of electrical work to make a site able to seamlessly interface with a portable generator, or renovations and additions such as restrooms or showers stalls. These improvements can be addressed by seeking grant funding or, in the case of available budget funds; they can be included in existing capital improvement plans.
Problem(s) to be Mitigated:	Lack of pre-disaster organization of emergency sheltering options; With this action each jurisdiction will have multiple alternate shelters available and there will be an established protocol to put them into service. Providing this information to the County Shelter Coordinator will also make it easier for responders from other jurisdictions to locate potential survivors in the wake of a catastrophic event. The community shelter coordinator will provide updates and participate in further discussion on shelters and safe rooms at the quarterly plan maintenance meetings.
Process	<ul style="list-style-type: none"> • Appoint a shelter coordinator for the City and school • Work with representatives from Community groups such as local churches and schools to designate spaces suitable for emergency sheltering and work out standard operating procedures. • Work with the County Shelter Coordinator to create and maintain the County-Wide shelter inventory. The inventory of shelters will contain, at a minimum, the following info: <ul style="list-style-type: none"> ▪ Shelter location ▪ Contact Info ▪ Facility info including capacity and amenities (Showers, Kitchen, Segregated spaces, stored supplies) <p><i>Note: Every designated shelter space need not be perfectly suited for sheltering at the onset – Sheltering plans can include actions such as pursuing funding (through fund-raising or seeking grants) to improve existing shelter areas that are less than ideal- funds and assistance may be sought for such items as electrical work to make a site able to seamlessly interface with a portable generator, obtaining an on-site generator, undertaking renovations and additions such as restrooms or showers stalls, and other actions which may be identified and incorporated into both the shelter plan and the Hazard Mitigation Plan</i></p>
Applicable Goal(s)	Goal 1: Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Hazards Addressed:	All hazards
Estimated Cost:	\$0
Potential Funding Sources	NA
Cost/Benefit Discussion:	Being a matter that could be adequately handled by volunteers or made part of

	an employee's existing duties, there is great benefit at no cost
Prioritization Discussion:	As there is no shelter inventory or any shelter plans in Lewis County at the present time, this project was seen as having a high priority
Priority	High
Timeline for Implementation/Completion:	2019
Status of Action:	Pending
Report of Progress:	Emergency Management will assess the progress of this project in July of 2017 and again at the first LEPC/EM meeting scheduled in 2020.

Action No:	LCS-8
Description	Participate in the "Great American Shake Up" Earthquake drill
Jurisdictions Selecting the Action:	Lewis County C-1 School District
Responsible Agency/ Party:	Superintendent
Partners	SEMA/FEMA, Lewis County Emergency Management
Mechanism of Implementation	Implementation of a scheduled earthquake drill
Problem(s) to be Mitigated:	Lack of training on what to do in the event of an earthquake
Process	Implementation of an earthquake drill to take place per the Great American Shake Out : https://www.shakeout.org/centralus/missouri/
Applicable Goal(s)	Goal 3: Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.
Hazards Addressed:	Earthquake
Estimated Cost:	\$0
Potential Funding Sources	NA
Cost/Benefit Discussion:	There was no cost, with some benefit in preparedness.
Prioritization Discussion:	This project was not considered a pressing priority.
Priority	Low
Timeline for Implementation/Completion:	2020
Status of Action:	Pending
Report of Progress:	Lewis County Emergency Management will assess this action at the annual HMP meeting in 2021

Action No:	LCS-9
Description	Coordinate and conduct a standalone event to educate the public about emergency preparedness and early warning systems.
Jurisdictions Selecting the Action:	Lewis County C-1 School District
Responsible Agency/ Party:	Superintendent
Partners	Lewis County Emergency Management
Mechanism of Implementation	Public events held in local school facilities, which are already a familiar venue for citizens of the county due to local school sports and other events that take place there.
Problem(s) to be Mitigated:	Lack of education on emergency preparedness and personal weather awareness
Process	This event will be organized and coordinated by Lewis County Emergency Management and the School Districts. Emergency management will arrange for guest speaker(s) –meteorologist(s), storm chaser(s) , Red Cross disaster experts, etc.-, and provide information on weather radios (and ideally very inexpensive models for sale and/or to give away) . These events will be held at school facilities, and feature high school student volunteers who can help less tech-savvy attendees who need assistance downloading and installing warning apps on their smart phones.
Applicable Goal(s)	Goal 3: Promote education, outreach, research and development

	programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.
Hazards Addressed:	Earthquake
Estimated Cost:	\$0
Potential Funding Sources	NA
Cost/Benefit Discussion:	There was no cost, with some benefit in preparedness.
Prioritization Discussion:	This project was not considered a pressing priority.
Priority	Low
Timeline for Implementation/Completion:	2020
Status of Action:	Pending
Report of Progress:	Lewis County Emergency Management will assess this action at the annual HMP meeting in 2021

Action No:	LCS-10
Description	Implement the Red Cross "pillowcase program"
Jurisdictions Selecting the Action:	Lewis County C-1 School District
Responsible Agency/ Party:	Superintendent
Partners	Lewis County Emergency Management, Red Cross
Mechanism of Implementation	Schedule of Red Cross Presentation during the school year
Problem(s) to be Mitigated:	Lack of early childhood education on emergency preparedness
Process	The Pillowcase Project, sponsored by Disney, is an hour long preparedness education program for children in grades 3 – 5, which teaches students about personal and family preparedness, local hazards, and basic coping skills. Red Cross volunteers lead students through a "learn, practice, share" framework to engage them in disaster preparedness. Upon completion, students receive a sturdy pillowcase in which to build their personal emergency supplies kit.
Applicable Goal(s)	Goal 3: Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.
Hazards Addressed:	All hazards
Estimated Cost:	0\$
Potential Funding Sources	NA
Cost/Benefit Discussion:	Zero cost, significant benefit
Prioritization Discussion:	This was given a high priority because it's unknown how long the program might be available.
Priority	High
Timeline for Implementation/Completion:	2020
Status of Action:	Pending
Report of Progress:	Action status will be analyzed in Lewis County Emergency

	Management's 2021 annual report.
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Action No:	LCS-11
Description	Acquire a generator
Jurisdictions Selecting the Action:	Lewis County C-1 Schools
Responsible Agency/ Party:	Superintendent
Partner Agencies	FEMA/SEMA, CDBG
Mechanism of Implementation	Grant
Problem(s) to be Mitigated:	Prolonged power outage
Process	Identify a suitable site for a generator to be placed in order to continue to power critical systems the school and allow it to maintain operations (as long as there is fuel available) when the electrical grid is inoperable.
Applicable Goal(s)	Goal 1: Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.
Hazards Addressed:	Any which may produce power outages – thunderstorm, tornado, ice storm, etc.
Estimated Cost:	\$20,000 - \$50,000
Potential Funding Sources	Grant funding
Cost/Benefit Discussion:	Grant funding rather than in-house expenditures makes this action attractive.
Prioritization Discussion:	This was seen as a way to improve resiliency and make the school more effective as an emergency shelter site if that would ever be required.
Priority	High
Timeline for Implementation/Completion:	2020
Status of Action:	Pending
Report of Progress:	The Lewis County C-1 Superintendent will assess the progress of this project at the 2021 HMP committee meeting.

5 PLAN MAINTENANCE PROCESS

5 PLAN MAINTENANCE PROCESS	5.1
<i>5.1 Monitoring, Evaluating, and Updating the Plan.....</i>	<i>5.1</i>
5.1.1 Responsibility for Plan Maintenance	5.1
5.1.2 Plan Maintenance Schedule	5.2
5.1.3 Plan Maintenance Process.....	5.2
5.2 Incorporation into Existing Planning Mechanisms	5.3
5.3 Continued Public Involvement	5.4

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

5.1.1 Responsibility for Plan Maintenance

The MPC, as listed in the executive summary of this document, will be a standing committee with oversight by Lewis County Emergency Management. Maintenance involves the participating jurisdictions, including school and special districts:

- Meeting annually, and after a disaster event, to monitor and evaluate the implementation of the plan;
- Acting as a forum for hazard mitigation issues;
- Disseminating hazard mitigation ideas and activities to all participants;
- Pursuing the implementation of high priority, low- or no-cost recommended actions;
- Maintaining vigilant monitoring of multi-objective, cost-share, and other funding opportunities to help the community implement the plan’s recommended actions for which no current funding exists;
- Monitoring and assist in implementation and update of this plan;
- Keeping the concept of mitigation in the forefront of community decision making by identifying plan recommendations when other community goals, plans, and activities overlap, influence, or directly affect increased community vulnerability to disasters;
- Reporting on plan progress and recommended changes to the County Board of Supervisors and governing bodies of participating jurisdictions; and
- Informing and soliciting input from the public.

The 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 will 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 to the meeting.

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

5.1.3 Plan Maintenance Process

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

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

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

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

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

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

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

5.2 Incorporation into Existing Planning Mechanisms

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;
- Emergency Operations Plan (s)
- 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 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 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 Commission 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.

None of the participating jurisdictions were able to provide information on how the mitigation plan was incorporated into other planning mechanisms over the last five years.

Table 1.1 below lists the planning mechanisms by jurisdiction into which the Hazard Mitigation Plan will be integrated.

Table 1.1. Planning Mechanisms Identified for Integration of Hazard Mitigation Plan

Jurisdiction	Planning Mechanisms
Lewis County	Emergency Operations Plan Floodplain Ordinances
City of Canton	Capital Improvement Plan Local Emergency Plan Building Code Flood Plain Ordinances Other Ordinances
City of Ewing	Emergency Operations Plan, Ordinances
City of LaBelle	Emergency Operations Plan, Ordinances
City of La Grange	Emergency Operations Plan, Ordinances
City of Lewistown	Emergency Operations Plan, Ordinances
Village of Monticello	Emergency Operations Plan, Ordinances

5.3 Continued Public Involvement

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

APPENDIX A

Data Collection Questionnaires

- ✓ Lewis County
- ✓ Canton
- ✓ Ewing
- ✓ La Belle
- ✓ La Grange
- ✓ Lewistown
- ✓ Monticello
- ✓ Canton R-V (Canton)
- ✓ Lewis County C-1 (Ewing)

LEWIS COUNTY MISSOURI
Multi-Jurisdictional Hazard Mitigation Plan

**Data Collection Questionnaire
For Local Governments**

Jurisdiction: Lewis Co.

Return to: Green Hills Regional Planning Commission

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: 217-242-9945
Email: lewis@sos.mo.gov
Date: 1-17-18

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

Matt Walker, Hazard Mitigation Planner
Green Hills Regional Planning Commission
1104 Main St. Trenton, MO 64683
(mdw@ghrpc.org) (660) 359-5636 x 22

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		
<u>Comprehensive Plan</u>	Date: <i>No</i>	
Builder's Plan	Date: <i>No</i>	
Capital Improvement Plan	Date: <i>No</i>	
City Emergency Operations Plan	Date: <i>NA</i>	
County Emergency Operations Plan	Date: <i>Yes</i>	
Local Recovery Plan	Date: <i>No</i>	
County Recovery Plan	Date: <i>No</i>	
City Mitigation Plan	Date: <i>NA</i>	
County Mitigation Plan	Date: <i>Yes</i>	
Debris Management Plan	Date: <i>No</i>	
<u>Economic Development Plan</u>	Date: <i>No</i>	
Transportation Plan	Date: <i>No</i>	
Land-use Plan	Date: <i>No</i>	
Flood Mitigation Assistance (FMA) Plan	Date: <i>?</i>	
<u>Watershed Plan</u>	Date: <i>No</i>	
Firewise or other fire mitigation plan	Date: <i>No</i>	
Critical Facilities Plan (Mitigation/Response/Recovery)	Date: <i>No</i>	

Element	Yes, No, N/A	Comments
Policies/Ordinance		
Zoning Ordinance	No	
Building Code	Version: No	
Floodplain Ordinance	Date: Amended 10-31-11	
Subdivision Ordinance	No	
Tree Trimming Ordinance	No	
Nuisance Ordinance	No	
Storm Water Ordinance	No	
Drainage Ordinance	No	
Site Plan Review Requirements	No	
Historic Preservation Ordinance	No	
Landscape Ordinance	No	
Program		
Zoning/Land Use Restrictions	No	
Codes Building Site/Design	No	
Hazard Awareness Program	No	
National Flood Insurance Program	Yes	
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: 9	
Economic Development Program	No Yes	
Land Use Program	No	
Public Education/Awareness	No	
Property Acquisition	No	
Planning/Zoning Boards	No	
Stream Maintenance Program	No	
Tree Trimming Program	No	
<u>Engineering Studies for Streams (Local/County/Regional)</u>	No	
Mutual Aid Agreements	Yes	
Studies/Reports/Maps		
<u>Hazard Analysis/Risk Assessment (City)</u>	NA	
<u>Hazard Analysis/Risk Assessment (County)</u>	?	
Evacuation Route Map	NA	
<u>Critical Facilities Inventory</u>	NA	
<u>Vulnerable Population Inventory</u>	NA	
<u>Land Use Map</u>	NA	

Element	Yes, No, N/A	Comments
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	
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	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	
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	
Builder's Plan	
Capital Improvement Plan	
Local Recovery Plan	
County Recovery Plan	
Debris Management Plan	
Economic Development Plan	
Transportation Plan	
Land-use Plan	
Watershed Plan	
Firewise or other Fire Mitigation Plan such as Community Wildfire Protection Plan	

Additional Questions

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

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

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

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:

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

URSA - Canton MO

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

NONE

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

NO

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

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

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

VULNERABILITY ASSESSMENT

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

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

High Potential Loss Facilities

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

Transportation and Lifeline

Highways, bridges, and tunnels
Railroads and facilities
Bus facilities
Airports
Water treatment facilities
Natural gas facilities and pipelines
Oil facilities and pipelines
Communications facilities

Economic Assets

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

Asset Inventory

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

Critical Facilities

[illegible]

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)						
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	<i>Lewis Co.</i>
Type of event	<i>Flood</i>
Nature and magnitude of event	<i>Bridge washed out</i>
Location	<i>CO, Rd 356</i>
Date of event	<i>July 2015</i>
Injuries	<i>No</i>
Deaths	<i>No</i>
Property damage	<i>No</i>
Infrastructure damage	<i>Yes</i>
Crop damage	<i>No</i>
Business/economic impacts	<i>No</i>
Road/school/other closures	<i>Yes</i>
Other damage	<i>No</i>
Insured losses	<i>No</i>
Federal/state disaster relief funding	<i>Yes</i>
Opinion on likelihood of occurring again	<i>Likely</i>
Source of information	<i>Comm.</i>
Comments	

Jurisdiction	
Type of event	
Nature and magnitude of event	
Location	
Date of event	
Injuries	
Deaths	
Property damage	
Infrastructure damage	
Crop damage	
Business/economic impacts	
Road/school/other closures	
Other damage	
Insured losses	
Federal/state disaster relief funding	
Opinion on likelihood of occurring again	
Source of information	
Comments	

ASSESSMENT OF PREVIOUSLY PROPOSED ACTIONS

Jurisdiction: _____

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 progress made in the implementation of the action, if any. 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 # from previously approved plan	
Description of action	
Person or agency responsible for implementation	
Progress made on implementation since previous plan adoption	
If action is ongoing in nature, describe activities accomplished since previous plan adoption	
Reasons for progress or lack of progress	
Delete, modify, or carry the proposed action forward unchanged	

Jurisdiction: _____

Action # from previously approved plan	
Description of action	
Person or agency responsible for implementation	
Progress made on implementation since previous plan adoption	
If action is ongoing in nature, describe activities accomplished since previous plan adoption	
Reasons for progress or lack of progress	
Delete, modify, or carry the proposed action forward unchanged	

Action # from previously approved plan	
Description of action	
Person or agency responsible for implementation	
Progress made on implementation since previous plan adoption	
If action is ongoing in nature, describe activities accomplished since previous plan adoption	
Reasons for progress or lack of progress	
Delete, modify, or carry the proposed action forward unchanged	

Jurisdiction: _____

Action # from previously approved plan	
Description of action	
Person or agency responsible for implementation	
<i>Designate into which of the following four categories the previously proposed action should be placed, including discussion of that designation.</i>	
Completed since previous plan adoption, and description of progress	
Not Started/Continue in Plan Update, and discussion of reasons for lack of implementation	
In Progress/Continue in Plan Update, with a description of the progress made to date	
Deleted from the update, with a discussion of the reasons for deletion	

Feb. 11/12

LEWIS COUNTY MISSOURI
Multi-Jurisdictional Hazard Mitigation Plan

**Data Collection Questionnaire
For Local Governments**

Jurisdiction: Canton

Return to: Green Hills Regional Planning Commission

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

Prepared by: _____
Phone: _____
Email: _____
Date: _____

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

Matt Walker, Hazard Mitigation Planner
Green Hills Regional Planning Commission
1104 Main St. Trenton, MO 64683
(mdw@ghrpc.org) (660) 359-5636 x 22

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: 0	
County Recovery Plan	Date:	
City Mitigation Plan	Date:	
County Mitigation Plan	Date:	
Debris Management Plan	Date:	
Economic Development Plan	Date:	
Transportation Plan	Date:	
Land-use Plan	Date:	
Flood Mitigation Assistance (FMA) Plan	Date:	
Watershed Plan	Date:	
Firewise or other fire mitigation plan	Date:	
Critical Facilities Plan (Mitigation/Response/Recovery)	Date:	

Element	Yes, No, N/A	Comments
Policies/Ordinance		
Zoning Ordinance	yes	
Building Code	Version: yes	
Floodplain Ordinance	Date: yes	
Subdivision Ordinance	no	
Tree Trimming Ordinance	yes?	
Nuisance Ordinance	yes	
Storm Water Ordinance		
Drainage Ordinance		
Site Plan Review Requirements	yes?	
Historic Preservation Ordinance	yes	
Landscape Ordinance		
Program		
Zoning/Land Use Restrictions	yes	
Codes Building Site/Design		
Hazard Awareness Program		
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		
Firewise Community Certification		
Building Code Effectiveness Grading (BCEGs)		
ISO Fire Rating	Rating: 05/5K yes	
Economic Development Program		
Land Use Program		
Public Education/Awareness		
Property Acquisition		
Planning/Zoning Boards	yes	
Stream Maintenance Program		
Tree Trimming Program	yes	
<u>Engineering Studies for Streams (Local/County/Regional)</u>		
Mutual Aid Agreements	yes yes	
Studies/Reports/Maps		
<u>Hazard Analysis/Risk Assessment (City)</u>		
<u>Hazard Analysis/Risk Assessment (County)</u>		
Evacuation Route Map	N/A	
<u>Critical Facilities Inventory</u>		need development
<u>Vulnerable Population Inventory</u>		
<u>Land Use Map</u>		

Element	Yes, No, N/A	Comments
Staff/Department		Full Time or Part Time?
Building Code Official	yes	
Building Inspector	yes	
Mapping Specialist (GIS)		
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		
Hazardous Materials Expert	no	
Local Emergency Planning Committee		
County Emergency Management Commission		
Sanitation Department	no	
Transportation Department		
Economic Development Department		
Housing Department		
Historic Preservation	yes	Volunteer
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		
Homeowner Associations	no	
Neighborhood Associations		
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		
Withhold spending in hazard prone areas		

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

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

Additional Questions

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

Mayor/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.

*Will upgrade - 18 inch height increase - new floodgate
~~will~~ 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 Ursa Farmers Corp*

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 ~~assure~~ ensure proper design, damage resistant construction, HVAC systems designed to minimize flood water from infiltrating systems, and H₂O 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
<u>Essential Facilities</u> such as hospitals and other medical facilities, police and fire stations, Emergency Operations Centers						
City Hall / Police Dept.						
County Fire Dept.						
County Med. Clinic						
- Hemlock Clinic						
- Quincy Med Group						
County Jail						
County RV Depot						
Hopkinton High School						
ESC						
County RV School						
Lib. Systems - W. Middle / Girls						
Business of Hwy 67						

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						
Highway 101 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						
Highway 101 - Bus Lot						
Water Plant -						
Water Lagoon						
Central City Hall Building	behind Mexican Restaurant					
Ayers - Oil Storage 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
Wisa Farmers Coop					
Charles Industries					
Myers Oil					
Clear Station					
Centon RV School					

HISTORIC HAZARD EVENTS

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

Jurisdiction	
Type of event	
Nature and magnitude of event	
Location	
Date of event	
Injuries	
Deaths	
Property damage	
Infrastructure damage	
Crop damage	
Business/economic impacts	
Road/school/other closures	
Other damage	
Insured losses	
Federal/state disaster relief funding	
Opinion on likelihood of occurring again	
Source of information	
Comments	

Flood 1993
Flood 2008
Fire 2003
Fire 2013

Jurisdiction	
Type of event	
Nature and magnitude of event	
Location	
Date of event	
Injuries	
Deaths	
Property damage	
Infrastructure damage	
Crop damage	
Business/economic impacts	
Road/school/other closures	
Other damage	
Insured losses	
Federal/state disaster relief funding	
Opinion on likelihood of occurring again	
Source of information	
Comments	

ASSESSMENT OF PREVIOUSLY PROPOSED ACTIONS

Jurisdiction: _____

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 progress made in the implementation of the action, if any. 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 # from previously approved plan	
Description of action	
Person or agency responsible for implementation	
Progress made on implementation since previous plan adoption	
If action is ongoing in nature, describe activities accomplished since previous plan adoption	
Reasons for progress or lack of progress	
Delete, modify, or carry the proposed action forward unchanged	

Did we have raising the North levee & replacing the North flood gate?

Jurisdiction: _____

Action # from previously approved plan	
Description of action	
Person or agency responsible for implementation	
Progress made on implementation since previous plan adoption	
If action is ongoing in nature, describe activities accomplished since previous plan adoption	
Reasons for progress or lack of progress	
Delete, modify, or carry the proposed action forward unchanged	

Action # from previously approved plan	
Description of action	
Person or agency responsible for implementation	
Progress made on implementation since previous plan adoption	
If action is ongoing in nature, describe activities accomplished since previous plan adoption	
Reasons for progress or lack of progress	
Delete, modify, or carry the proposed action forward unchanged	

Jurisdiction: _____

Action # from previously approved plan	
Description of action	
Person or agency responsible for implementation	
Designate into which of the following four categories the previously proposed action should be placed, including discussion of that designation.	
Completed since previous plan adoption, and description of progress	
Not Started/Continue in Plan Update, and discussion of reasons for lack of implementation	
In Progress/Continue in Plan Update, with a description of the progress made to date	
Deleted from the update, with a discussion of the reasons for deletion	

LEWIS COUNTY MISSOURI

Multi-Jurisdictional Hazard Mitigation Plan

Data Collection Questionnaire For Local Governments

Jurisdiction: City of Ewing, MO 63440

Return to: Green Hills Regional Planning Commission

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: Cheryl Thrower, City Clerk
Phone: 573 494-3497
Email: ewingcity@marktwain.net
Date: 10/15/2018

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

Matt Walker, Hazard Mitigation Planner
Green Hills Regional Planning Commission
1104 Main St. Trenton, MO 64683
(mdw@ghrpc.org) (660) 359-5636 x 22

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		
<u>Comprehensive Plan</u>	Date:	
Builder's Plan	Date:	
Capital Improvement Plan	Date:	
City Emergency Operations Plan	Date:	
County Emergency Operations Plan	Date: 2014 Yes	
Local Recovery Plan	Date:	
County Recovery Plan	Date:	
City Mitigation Plan	Date:	
County Mitigation Plan	Date: 2014 Yes	
Debris Management Plan	Date:	
<u>Economic Development Plan</u>	Date:	
Transportation Plan	Date:	
Land-use Plan	Date:	
Flood Mitigation Assistance (FMA) Plan	Date:	
<u>Watershed Plan</u>	Date:	
Firewise or other fire mitigation plan	Date:	
Critical Facilities Plan (Mitigation/Response/Recovery)	Date:	

Element	Yes, No, N/A	Comments
Policies/Ordinance		
Zoning Ordinance		
Building Code	Version:	
Floodplain Ordinance	Date:	
Subdivision Ordinance		
Tree Trimming Ordinance		
Nuisance Ordinance	2004 Yes	
Storm Water Ordinance		
Drainage Ordinance		
Site Plan Review Requirements		
Historic Preservation Ordinance		
Landscape Ordinance		
Program		
Zoning/Land Use Restrictions		
Codes Building Site/Design		
Hazard Awareness Program		
National Flood Insurance Program		
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		
Firewise Community Certification		
Building Code Effectiveness Grading (BCEGs)		
ISO Fire Rating	Rating: 5	
Economic Development Program		
Land Use Program		
Public Education/Awareness		
Property Acquisition		
Planning/Zoning Boards		
Stream Maintenance Program		
Tree Trimming Program		
<u>Engineering Studies for Streams (Local/County/Regional)</u>		
Mutual Aid Agreements	R4-FD YES	
Studies/Reports/Maps		
<u>Hazard Analysis/Risk Assessment (City)</u>		
<u>Hazard Analysis/Risk Assessment (County)</u>		
Evacuation Route Map		
<u>Critical Facilities Inventory</u>		
<u>Vulnerable Population Inventory</u>		
<u>Land Use Map</u>		
Staff/Department	Full Time or Part Time?	

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

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.

[illegible]

LEWIS COUNTY MISSOURI**Multi-Jurisdictional Hazard Mitigation Plan****Data Collection Questionnaire
For Local Governments**Jurisdiction: City of LaBelle

Return to: Green Hills Regional Planning Commission

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
Phone: (660) 213-3830
Email: lab@marktwain.net
Date: 9-14-18

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

Matt Walker, Hazard Mitigation Planner
Green Hills Regional Planning Commission
1104 Main St. Trenton, MO 64683
(mdw@ghrpc.org) (660) 359-5636 x 22

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: _____	
Builder's Plan	Date: _____	
Capital Improvement Plan	Date: _____	
City Emergency Operations Plan	Date: _____	
County Emergency Operations Plan	Date: _____	
Local Recovery Plan	Date: _____	
County Recovery Plan	Date: _____	
City Mitigation Plan	Date: _____	
County Mitigation Plan	Date: _____	
Debris Management Plan	Date: _____	
Economic Development Plan	Date: _____	
Transportation Plan	Date: _____	
Land-use Plan	Date: _____	
Flood Mitigation Assistance (FMA) Plan	Date: _____	
Watershed Plan	Date: _____	
Firewise or other fire mitigation plan	Date: _____	
Critical Facilities Plan (Mitigation/Response/Recovery)	Date: _____	
Policies/Ordinance		

Element	Yes, No, N/A	Comments
Zoning Ordinance		
Building Code	Version:	
Floodplain Ordinance	Date:	
Subdivision Ordinance	NA	
Tree Trimming Ordinance		
Nuisance Ordinance	Yes	
Storm Water Ordinance		
Drainage Ordinance		
Site Plan Review Requirements		
Historic Preservation Ordinance		
Landscape Ordinance		
Program		
Zoning/Land Use Restrictions		
Codes Building Site/Design	NA	
Hazard Awareness Program		
National Flood Insurance Program		
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	NA	
Firewise Community Certification		
Building Code Effectiveness Grading (BCEGs)		
ISO Fire Rating	Rating:	
Economic Development Program		
Land Use Program		
Public Education/Awareness	NA	
Property Acquisition		
Planning/Zoning Boards		
Stream Maintenance Program		
Tree Trimming Program		
Engineering Studies for Streams (Local/County/Regional)		
Mutual Aid Agreements	NA	
Studies/Reports/Maps		
Hazard Analysis/Risk Assessment (City)		
Hazard Analysis/Risk Assessment (County)	NA	
Evacuation Route Map		
Critical Facilities Inventory		
Vulnerable Population Inventory		
Land Use Map		

Staff/Department		Full Time or Part Time?
Building Code Official		
Building Inspector	Yes	Full

Element	Yes, No, N/A	Comments
Mapping Specialist (GIS)		
Engineer		
Development Planner		
Public Works Official		
Emergency Management Coordinator	yes	Mayor
NFIP Floodplain Administrator		
Bomb and/or Arson Squad		
Emergency Response Team		
Hazardous Materials Expert		
Local Emergency Planning Committee		
County Emergency Management Commission		
Sanitation Department		
Transportation Department		
Economic Development Department		
Housing Department		
Historic Preservation		
Non-Governmental Organizations (NGOs)	Is there a local chapter? Yes or No	
American Red Cross		
Salvation Army		
Veterans Groups		
Local Environmental Organization		
Homeowner Associations		
Neighborhood Associations		
Chamber of Commerce		
Community Organizations (Lions, Kiwanis, etc.)		
Financial Resources	Is your jurisdiction able to? Yes or No	
Apply for Community Development Block Grants	yes	
Fund projects thru Capital Improvements funding	yes	
Authority to levy taxes for specific purposes	yes	
Fees for water, sewer, gas, or electric services	yes	
Impact fees for new development	No	
Incur debt through general obligation bonds	?	
Incur debt through special tax bonds	?	
Incur debt through private activities	?	
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	NONE
Builder's Plan	
Capital Improvement Plan	
Local Recovery Plan	
County Recovery Plan	
Debris Management Plan	
Economic Development Plan	
Transportation Plan	
Land-use Plan	
Watershed Plan	
Firewise or other Fire Mitigation Plan such as Community Wildfire Protection Plan	

Additional Questions

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

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

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

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

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

Please provide address locations:

Local Churches
Christian Church Mt. Olive Church
400 Lincoln 412 main
LaBelle LaBelle Mo

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

1 new residential home built

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.

Unknown

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

Caseys 10

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

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

VULNERABILITY ASSESSMENT

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

[illegible]

HISTORIC HAZARD EVENTS

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

Jurisdiction	
Type of event	
Nature and magnitude of event	
Location	
Date of event	
Injuries	
Deaths	
Property damage	
Infrastructure damage	
Crop damage	
Business/economic impacts	
Road/school/other closures	
Other damage	
Insured losses	
Federal/state disaster relief funding	
Opinion on likelihood of occurring again	
Source of information	
Comments	

Jurisdiction	
Type of event	
Nature and magnitude of event	
Location	
Date of event	
Injuries	
Deaths	
Property damage	
Infrastructure damage	
Crop damage	
Business/economic impacts	N/A
Road/school/other closures	
Other damage	
Insured losses	
Federal/state disaster relief funding	
Opinion on likelihood of occurring again	
Source of information	
Comments	

LEWIS COUNTY MISSOURI
Multi-Jurisdictional Hazard Mitigation Plan

Data Collection Questionnaire
For Local Governments

Jurisdiction: City of La Grange

Return to: Green Hills Regional Planning Commission

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Prepared by: Henry Gunsauls
Phone: 660-341-5624
Email: yankfin@yahoo.com
Date: 2/13/18

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

Matt Walker, Hazard Mitigation Planner
Green Hills Regional Planning Commission
1104 Main St. Trenton, MO 64683
(mdw@ghrpc.org) (660) 359-5636 x 22

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		
<u>Comprehensive Plan</u>	Date:	
Builder's Plan	Date:	
Capital Improvement Plan	Date:	
City Emergency Operations Plan	Date:	
County Emergency Operations Plan	Date: N/A	
Local Recovery Plan	Date:	
County Recovery Plan	Date: N/A	
City Mitigation Plan	Date:	
County Mitigation Plan	Date: N/A	
Debris Management Plan	Date:	
<u>Economic Development Plan</u>	Date:	
Transportation Plan	Date: N/A	
Land-use Plan	Date:	
Flood Mitigation Assistance (FMA) Plan	Date:	
<u>Watershed Plan</u>	Date:	
Firewise or other fire mitigation plan	Date: N/A	
Critical Facilities Plan (Mitigation/Response/Recovery)	Date:	

Element	Yes, No, N/A	Comments
Policies/Ordinance		
Zoning Ordinance		
Building Code	Version:	
Floodplain Ordinance	Date:	
Subdivision Ordinance	N/A	
Tree Trimming Ordinance		
Nuisance Ordinance		
Storm Water Ordinance		
Drainage Ordinance		
Site Plan Review Requirements		
Historic Preservation Ordinance		
Landscape Ordinance		
Program		
Zoning/Land Use Restrictions		
Codes Building Site/Design		
Hazard Awareness Program	N/A	
National Flood Insurance Program		
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		
Firewise Community Certification	No	
Building Code Effectiveness Grading (BCEGs)	No	
ISO Fire Rating	Rating: 6	
Economic Development Program		
Land Use Program		
Public Education/Awareness	No	
Property Acquisition		
Planning/Zoning Boards		
Stream Maintenance Program	No	
Tree Trimming Program		
<u>Engineering Studies for Streams (Local/County/Regional)</u>		
Mutual Aid Agreements	Yes	
Studies/Reports/Maps		
<u>Hazard Analysis/Risk Assessment (City)</u>		
<u>Hazard Analysis/Risk Assessment (County)</u>	N/A	
Evacuation Route Map	No	
<u>Critical Facilities Inventory</u>		
<u>Vulnerable Population Inventory</u>		
<u>Land Use Map</u>		

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

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

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

Additional Questions

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

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

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

High Potential Loss Facilities

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

Transportation and Lifeline

Highways, bridges, and tunnels
Railroads and facilities
Bus facilities
Airports
Water treatment facilities
Natural gas facilities and pipelines
Oil facilities and pipelines
Communications facilities

Economic Assets

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

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.

[illegible]

Name of Asset	Address	Square Feet	*Replacement Value (Insured)	Contents Value	Occupancy/ Capacity #	Hazards
<u>High Potential Loss Facilities</u> such as power plants, dams/levees, military installations, hazardous materials sites, shelters, day care centers, nursing homes, main government buildings (Do not include schools—they will be reported by the school districts)						
Daycare	506 W. Wyaconda					EQ – ST – T – F- SWWW
<u>Transportation and Lifelines</u> 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-SWWW - TX
Sewer Treatment plant						EQ -ST -T -F- SWWW - U
BNSF Railroad line						EQ – SWWW -MTA
State Highway 61						EQ – SWWW - 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

HISTORIC HAZARD EVENTS

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

Jurisdiction	
Type of event	
Nature and magnitude of event	
Location	
Date of event	
Injuries	
Deaths	
Property damage	
Infrastructure damage	
Crop damage	
Business/economic impacts	
Road/school/other closures	
Other damage	
Insured losses	
Federal/state disaster relief funding	
Opinion on likelihood of occurring again	
Source of information	
Comments	

Jurisdiction	
Type of event	
Nature and magnitude of event	
Location	
Date of event	
Injuries	
Deaths	
Property damage	
Infrastructure damage	
Crop damage	
Business/economic impacts	
Road/school/other closures	
Other damage	
Insured losses	
Federal/state disaster relief funding	
Opinion on likelihood of occurring again	
Source of information	
Comments	

ASSESSMENT OF PREVIOUSLY PROPOSED ACTIONS

Jurisdiction: _____

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 progress made in the implementation of the action, if any. 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 # from previously approved plan	
Description of action	
Person or agency responsible for implementation	
Progress made on implementation since previous plan adoption	
If action is ongoing in nature, describe activities accomplished since previous plan adoption	
Reasons for progress or lack of progress	
Delete, modify, or carry the proposed action forward unchanged	

Jurisdiction: _____

Action # from previously approved plan	
Description of action	
Person or agency responsible for implementation	
Progress made on implementation since previous plan adoption	
If action is ongoing in nature, describe activities accomplished since previous plan adoption	
Reasons for progress or lack of progress	
Delete, modify, or carry the proposed action forward unchanged	

Action # from previously approved plan	
Description of action	
Person or agency responsible for implementation	
Progress made on implementation since previous plan adoption	
If action is ongoing in nature, describe activities accomplished since previous plan adoption	
Reasons for progress or lack of progress	
Delete, modify, or carry the proposed action forward unchanged	

Jurisdiction: _____

Action # from previously approved plan	
Description of action	
Person or agency responsible for implementation	
<i>Designate into which of the following four categories the previously proposed action should be placed, including discussion of that designation.</i>	
Completed since previous plan adoption, and description of progress	
Not Started/Continue in Plan Update, and discussion of reasons for lack of implementation	
In Progress/Continue in Plan Update, with a description of the progress made to date	
Deleted from the update, with a discussion of the reasons for deletion	

LEWIS COUNTY MISSOURI
Multi-Jurisdictional Hazard Mitigation Plan

**Data Collection Questionnaire
For Local Governments**

Jurisdiction: City of Lewistown

Return to: Green Hills Regional Planning Commission

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

Prepared by: _____
Phone: _____
Email: _____
Date: _____

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

Matt Walker, Hazard Mitigation Planner
Green Hills Regional Planning Commission
1104 Main St. Trenton, MO 64683
(mdw@ghrpc.org) (660) 359-5636 x 22

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

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	

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	work through each situation as they happen
Builder's Plan	no need (not zoned)
Capital Improvement Plan	sewer project
Local Recovery Plan	no action needed
County Recovery Plan	—
Debris Management Plan	have a designated area
Economic Development Plan	new business - annexed
Transportation Plan	not needed -
Land-use Plan	address it when brought before board
Watershed Plan	no action needed
Firewise or other Fire Mitigation Plan such as Community Wildfire Protection Plan	fire dept Responsibility

Additional Questions

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

Mayor / City Council Mayor & 4 Council member

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

A 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	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

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

High Potential Loss Facilities

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

Transportation and Lifeline

Highways, bridges, and tunnels
Railroads and facilities
Bus facilities
Airports
Water treatment facilities
Natural gas facilities and pipelines
Oil facilities and pipelines
Communications facilities

Economic Assets

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

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.

[illegible]

Economic Assets (Major Employers, etc)

Asset	Address	Product/ Service	Value (if known)	Number of Employees	Hazards
Heetco					7M
Country Market Gen. Store		u/k	u/k	u/k	4M

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	City of Hewistown
Type of event	Propane Leak
Nature and magnitude of event	Town evacuated
Location	Heeter - Propane plant
Date of event	Feb 2007
Injuries	none
Deaths	none
Property damage	
Infrastructure damage	
Crop damage	no
Business/economic impacts	Business closed
Road/school/other closures	
Other damage	
Insured losses	
Federal/state disaster relief funding	NO
Opinion on likelihood of occurring again	
Source of information	
Comments	

Jurisdiction	Lagoon
Type of event	Torrential Rain
Nature and magnitude of event	Caused damage to levee
Location	Lagoon
Date of event	2006
Injuries	no
Deaths	NO
Property damage	yes
Infrastructure damage	none
Crop damage	no
Business/economic impacts	no
Road/school/other closures	NO
Other damage	
Insured losses	
Federal/state disaster relief funding	yes
Opinion on likelihood of occurring again	
Source of information	
Comments	

ASSESSMENT OF PREVIOUSLY PROPOSED ACTIONS

Jurisdiction: _____

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 progress made in the implementation of the action, if any. 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 # from previously approved plan	
Description of action	Repaired & improved the damaged area
Person or agency responsible for implementation	Contractor for the City
Progress made on implementation since previous plan adoption	none was needed
If action is ongoing in nature, describe activities accomplished since previous plan adoption	Complete
Reasons for progress or lack of progress	Completed
Delete, modify, or carry the proposed action forward unchanged	

Jurisdiction: _____

Action # from previously approved plan	
Description of action	
Person or agency responsible for implementation	
Progress made on implementation since previous plan adoption	
If action is ongoing in nature, describe activities accomplished since previous plan adoption	
Reasons for progress or lack of progress	
Delete, modify, or carry the proposed action forward unchanged	

Action # from previously approved plan	
Description of action	
Person or agency responsible for implementation	
Progress made on implementation since previous plan adoption	
If action is ongoing in nature, describe activities accomplished since previous plan adoption	
Reasons for progress or lack of progress	
Delete, modify, or carry the proposed action forward unchanged	

Jurisdiction: _____

Action # from previously approved plan	
Description of action	
Person or agency responsible for implementation	
<i>Designate into which of the following four categories the previously proposed action should be placed, including discussion of that designation.</i>	
Completed since previous plan adoption, and description of progress	
Not Started/Continue in Plan Update, and discussion of reasons for lack of implementation	
In Progress/Continue in Plan Update, with a description of the progress made to date	
Deleted from the update, with a discussion of the reasons for deletion	

LEWIS COUNTY MISSOURI
Multi-Jurisdictional Hazard Mitigation Plan

**Data Collection Questionnaire
For Local Governments**

Jurisdiction: Monticello

Return to: Green Hills Regional Planning Commission

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: Vance H Scifres
Phone: 660-341-1956
Email: scifres@centurytel.net
Date: 1-18-18

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

Matt Walker, Hazard Mitigation Planner
Green Hills Regional Planning Commission
1104 Main St. Trenton, MO 64683
(mdw@ghrpc.org) (660) 359-5636 x 22

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: N/A	
Builder's Plan	Date: N/A	
Capital Improvement Plan	Date: N/A	
City Emergency Operations Plan	Date: N/A	
County Emergency Operations Plan	Date:	LCEP C
Local Recovery Plan	Date: N/A	
County Recovery Plan	Date: N/A	
City Mitigation Plan	Date:	
County Mitigation Plan	Date:	
Debris Management Plan	Date: N/A	
Economic Development Plan	Date:	
Transportation Plan	Date: N/A	
Land-use Plan	Date: N/A	
Flood Mitigation Assistance (FMA) Plan	Date: N/A	
Watershed Plan	Date:	
Firewise or other fire mitigation plan	Date: N/A	
Critical Facilities Plan (Mitigation/Response/Recovery)	Date: N/A	

	Yes, No, N/A	Comments
Zoning Ordinance	N/A	
Building Code	Version:	
Floodplain Ordinance	Date:	
Subdivision Ordinance		
Tree Trimming Ordinance		
Nuisance Ordinance		
Storm Water Ordinance		
Drainage Ordinance		
Site Plan Review Requirements		
Historic Preservation Ordinance		
Landscape Ordinance	N/A	
Zoning/Land Use Restrictions	N/A	
Codes Building Site/Design	N/A	
Hazard Awareness Program	N/A	
National Flood Insurance Program	N/A	
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	N/A	
Firewise Community Certification	N/A	
Building Code Effectiveness Grading (BCEGs)	N/A	
ISO Fire Rating	Rating: 8	
Economic Development Program	N/A	
Land Use Program	N/A	
Public Education/Awareness	N/A	
Property Acquisition	N/A	
Planning/Zoning Boards	N/A	
Stream Maintenance Program	N/A	
Tree Trimming Program	N/A	
Engineering Studies for Streams (Local/County/Regional)	N/A	
Mutual Aid Agreements	N/A	
Hazard Analysis/Risk Assessment (City)	N/A	
Hazard Analysis/Risk Assessment (County)	N/A	
Evacuation Route Map	N/A	
Critical Facilities Inventory	N/A	
Vulnerable Population Inventory	N/A	
Land Use Map	N/A	

	Yes No N/A	Comments Full Time or Part Time?
Building Code Official	N/A	
Building Inspector	N/A	
Mapping Specialist (GIS)	N/A	
Engineer	N/A	
Development Planner	N/A	
Public Works Official	yes	Part Time
Emergency Management Coordinator	yes	PART TIME
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	yes	Part Time
County Emergency Management Commission	N/A	
Sanitation Department	N/A	
Transportation Department	N/A	
Economic Development Department	N/A	
Housing Department	N/A	
Historic Preservation	N/A	
Do you have 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.)	yes	MASONS
Is your jurisdiction able to?		
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	

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.

Comprehensive Plan	
Builder's Plan	
Capital Improvement Plan	
Local Recovery Plan	
County Recovery Plan	
Debris Management Plan	
Economic Development Plan	
Transportation Plan	
Land-use Plan	
Watershed Plan	
Firewise or other Fire Mitigation Plan such as Community Wildfire Protection Plan	

Additional Questions

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

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

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

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

Please provide address locations:

8. List residential, commercial and industrial development in your jurisdiction since last plan update. *NONE*
9. Describe development trends and expected growth areas. Is any new development expected to occur in the 100-year floodplain? Is any new development expected to occur in any other known hazard areas? If possible, please provide a map indicating potential/planned growth areas. *NONE*

10. Are any new facilities or infrastructure planned for construction during the next five years? If so, please provide facility name and purpose along with proposed locations, if known. *NO*

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

*Lewis County Courthouse - 28
Lewis County Health Dept - Family Services - 12
BANK of Monticello 12
FSA 8*

- 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.**

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)						
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

the long-term federal recovery programs of major disaster declarations. Determinations for declaration type are based on scale and type of damages and institutions or industrial sectors affected.

Table 3.1. FEMA Disaster Declarations that Included Lewis County, Missouri; 1990-2015

Disaster Number	Description	Incident Period	Individual Assistance (IA) Public Assistance (PA)
995	Flooding, Severe Storm	June to October, 1993	Both
1054	Severe Storms, Tornadoes, Hail, Flooding	May to June, 1995	Both
1403	Ice Storm	January to February, 2002	Both
1463	Severe Storms, Tornadoes, Flooding	May, 2003	Both
1773	Severe Storms and Flooding	June to August, 2008	Both
1809	Severe Storms, Flooding and Tornadoes	September, 2008	Both
1847	Severe Storms, Tornadoes, Flooding	May, 2009	Both
1934	Severe Storms, Tornadoes and Flooding	June to July, 2010	Both
4130	Severe Weather, Flooding, and Tornadoes	May to June, 2013	Both
4200	Severe Weather, Flooding, and Tornadoes	September, 2014	Both
4238	Flash Flooding and Severe Storms	August, 2015	Both

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

3.8.3 Research Additional Sources

The following additional data sources were used to analyze the impacts of hazards in the planning area:

- Missouri Hazard Mitigation Plans (2010 and 2013)
- Previously approved planning area Hazard Mitigation Plan (date)
- Federal Emergency Management Agency (FEMA)
- Missouri Department of Natural Resources (MDNR)
- National Drought Mitigation Center Drought Reporter
- US Department of Agriculture's (USDA) Risk Management Agency Crop Insurance Statistics
- National Agricultural Statistics Service (Agriculture production/losses)
- Data Collection Questionnaires completed by each jurisdiction
- State of Missouri GIS data
- Environmental Protection Agency
- Flood Insurance Administration
- Hazards US (HAZUS)
- Missouri Department of Transportation
- Missouri Division of Fire Marshal Safety
- Missouri Public Service Commission
- National Fire Incident Reporting System (NFIRS)
- National Oceanic and Atmospheric Administration's (NOAA) National Climatic Data Center (NCDC);
- Lewis County and local Comprehensive Plans to the extent available
- County Emergency Management

3.8.4 Hazards Identified

Below is a listing of all the hazards that significantly impact the planning area and were chosen for further analysis. Not all hazards impact every jurisdiction. An "x" indicates 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 Heat	Fires (Wildland)	Flooding (River and Flash)	Levee Failure	Severe Winter Weather	Thunderstorm, Lightning	High Wind	Tornado
Lewis County	x	x	x	x	x	x	x	x	x	x	x
Canton	-	x	x	x	-	x	x	x	x	x	x
Ewing	x	x	x	x	-	-	-	x	x	x	x
La Belle		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	x	x
Williamstown		x	x	x	-	-	-	x	x	x	x
Canton R-V (Canton)		x	x	x	-	x	x	x	x	x	x
Lewis County C-1 (Ewing)		x	x	x	-	-	-	x	x	x	x
Cedar Falls School (Canton)		x	x	x	-	-	-	x	x	x	x
Culver Stockton College (Canton)		x	x	x	-	-	-	x	x	x	x

- **Structure Fires** were excluded as they are considered a well mitigated hazard, with a complex infrastructure already in place to handle both routine and extraordinary incidents.
- **Sinkholes** were excluded as the current DNR map indicates no significant risk of this hazard in Lewis County.

ASSESSMENT OF PREVIOUSLY PROPOSED ACTIONS

Jurisdiction: Monterello MO

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 progress made in the implementation of the action, if any. 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 # from previously approved plan	
Description of action	
Person or agency responsible for implementation	
Progress made on implementation since previous plan adoption	
If action is ongoing in nature, describe activities accomplished since previous plan adoption	
Reasons for progress or lack of progress	
Delete, modify, or carry the proposed action forward unchanged	

LEWIS COUNTY MISSOURI
Multi-Jurisdictional Hazard Mitigation Plan

Data Collection Questionnaire
For School Districts and Educational Institutions

County: Lewis

School District / Educational Institution Name: Lewis County C-1

Return by: John French

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
Phone: 573-209-3217
Email: JFrench@lewis.k12.mo.us
Date: 2-13-18

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

Matt Walker, Hazard Mitigation Planner
Green Hills Regional Planning Commission
1104 Main St. Trenton, MO 64683
(mdw@ghrpc.org) (660) 359-5636 x 22

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	
<u>School Emergency Plan</u>			
Shelter in place protocols	Yes	2017	
Evacuation protocols			
Weapons Policy	Yes	20	

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 drill
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 Sheriff's 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 1/2 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.

Asset Name of	Address	Square Feet	Replacement Value (Insured)	Contents Value	Occupancy/Capacity #	Hazards
HIGHLAND HIGH SCHOOL	21504 State Hwy 60, Lewisburg, MO 64501				500	EQ, LSS, ST, T, SWW, F, A, CyD, HM, MTA, PH, SE, TX, U
HIGHLAND ELEMENTARY SCHOOL	25189 Heritage Ave, Lewisburg, MO 64502				500	"

Multi-jurisdictional Mitigation Plan HISTORIC HAZARD EVENTS

Please fill out one sheet for each significant hazard event that affected **your school district / institution** with as much detail as possible. This includes all hazard events listed on the Vulnerability Assessment page that have caused previous damage. Attach supporting documentation, photocopies of newspaper articles, or other original sources.

Type of event	Bus Accident
Nature and magnitude of event	Bus flipped, students injured, No deaths
Location	Roude C
Date of event	4-1-14
Injuries	Yes
Deaths	No
Property damage	Yes - Bus was totaled
Infrastructure damage	No
Crop damage	No
Business/economic impacts	Enrollment decreases could be related, but not provable
Road/school/other closures	Road was closed while cleanup & emergency crews handled the situation
Other damage	N/A
Insured losses	Yes
Federal/state disaster relief funding	No
Opinion on likelihood of occurring again	Hopefully not; However, the accident would not have occurred if there were any kind of shoulders on the roadway (There still are none)
Source of information	Witnesses
Comments	

Multi-jurisdictional Mitigation Plan HISTORIC HAZARD EVENTS

Please fill out one sheet for each significant hazard event that affected **your school district /institution** with as much detail as possible. This includes all hazard events listed on the Vulnerability Assessment page that have caused previous damage. Attach supporting documentation, photocopies of newspaper articles, or other original sources.

Type of event	
Nature and magnitude of event	
Location	
Date of event	
Injuries	
Deaths	
Property damage	
Infrastructure damage	
Crop damage	
Business/economic impacts	
Road/school/other closures	
Other damage	
Insured losses	
Federal/state disaster relief funding	
Opinion on likelihood of occurring again	
Source of information	
Comments	

DRESS CODE

Students should dress appropriately for school. Appearance is important. Keep in mind the following rules.

- Shorts and skirts should not be too short. They should be at least finger tip length when your hand is held down by your side. If they are shorter than the longest fingertip, it will be considered too short.
 - Chains on clothing are not allowed.
 - Clothing with writing, drawings or emblems that are derogatory, or refer to liquor, tobacco or controlled substances, or are designed to represent a hidden meaning is not allowed.
 - Students must wear shoes, boots, or sandals. No bedroom or house slippers are allowed.
 - Shorts, jeans or sweatpants may not have letters, words, or symbols across the behind. No pajama bottoms or boxer shorts.
 - Hats, bandannas, or sunglasses may not be worn *in the building*.
 - Muscle shirts, crop tops, halter tops, fish net tops, backless clothing, spaghetti strap tops, low-cut tops which display cleavage, tops with large armholes, or bare midriff tops are not allowed. Two-piece garments must overlap sufficiently so that during normal movement & sitting, the midriff and/or lower back is not exposed. The torso of students shall be clothed, excessively torn clothing will not be allowed.
 - Dress code rules apply in all classes, including P.E. during the school day, at all school functions (except *Prom*) and on field trips.
- The first offense students will be required to change clothes or wear a t-shirt over the offending garment. On the 2nd offense, students will serve a *Saturday detention*. Any subsequent offense will result in SAAC time.
- Highland High School maintains a "no tolerance" policy regarding gang-related attire. Because it is impossible to anticipate all dress or grooming situations that might be considered improper for school wear, the school administration will have the exclusive right and authority to correct any questionable or improper dress deemed detrimental to students or the school program or disruptive to the educational process.
- If you have any doubt that an outfit is appropriate for school, don't wear it!
- Additional requirements regarding P.E. dress code are listed under Physical Education section of this handbook.

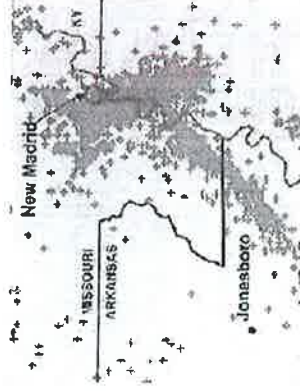
EMERGENCY PROCEDURES

- The purpose of this evacuation plan is to move all students to a position of maximum safety in minimum time. Remember that teachers are to stay with their group at all times and account for all of their students.
- In leaving the building do so as quickly as possible without running. Students should exit in either single file or in columns of twos. All unnecessary talk and commotion should be eliminated.
- After leaving the building take your students at least fifty (50) yards from the building and do not return them to the building until the all clear has sounded. Never should anyone re-enter the building until the all clear sounds.
- Remember - every time the fire alarm sounds it must be considered an actual fire and the emergency plan implemented.
- Fire evacuation plan will be put into effect by the sounding of one continuous ring of the school bell.
- Make sure before leaving the building that all the lights are turned off.
- All of the emergency exit routes are posted in each of the rooms in the building.

Earthquakes in Missouri

The highest earthquake risk in the United States outside the West Coast is in the New Madrid Seismic Zone, centered in southeast Missouri's Bootheel. Damaging earthquakes are not as frequent as in California, but when they do occur, the destruction here can cover an area more than 20 times greater than a similar event there due to the nature of geologic materials in the region. A major earthquake could mean catastrophic damage in the St. Louis and southeast regions of the state, and significant damage throughout Missouri.

The New Madrid Seismic Zone and surrounding area in the central U.S. averages more than 200 earthquakes per year. Most can't be felt, but a few can cause measurable damage.



Experts say there's a 25 to 40 percent chance for a major earthquake in a 50 year period. The result could be major damage from St. Louis to Memphis. The last major earthquake in the New Madrid Seismic Zone was centered in southeast Missouri, near the town of Charleston, in 1895.

The Great New Madrid Earthquakes of 1811-12 were the largest in U.S. history east of the Rocky Mountains. The massive quakes destroyed homes, created lakes and briefly reversed the flow of the Mississippi River. Shaking was felt as far away as the east coast.

Prepared in accordance with Missouri Revised Statutes, Chapter 160, Section 160.433



Missouri State Emergency Management Agency
PO Box 118, Jefferson City, Missouri 65102
Phone: 573-526-9100 Fax: 573-534-7968
E-mail: missouri@jema.dps.mo.gov

discipline action slip will be sent back to the teacher explaining what action was issued or is to be issued.

STUDENT WITHDRAWAL FROM SCHOOL

Students who withdraw from school should get a withdrawal form from the guidance office and take it to each of their teachers for the teacher's signature. The teachers should fill in the grade as of the date leaving. The teachers should list books or other obligations due. The counselor and librarian must also indicate that everything is in order by signing the form. The student returns the form to the office and is given a copy to take to the new school. Teachers will be notified when to drop this student from their roll.

NEWS RELEASE

We strongly urge teachers to help keep our public informed of the workings of the school. This can be done through news articles concerning your teaching area.

SUPPLIES

Supplies will be kept in the office for your convenience. You may check out what supplies you need through the secretary.

CLUBS AND FIELD TRIPS

The activity clubs are encouraged to schedule field trips during the month of September through April and that no trips be scheduled for the month of May for grades 7 - 12. Activity club meetings will be held two times a semester during school hours. Field trips may be taken during summer months with Board approval. All meetings and trips should be cleared through the office.

EMERGENCY PROCEDURES

- The purpose of this evacuation plan is to move all students to a position of maximum safety in minimum time.
- Remember that teachers are to stay with their group at all times and account for all of their students.
- In leaving the building, do so as quickly as possible without running. Students should exit in either single file or in columns of twos. All unnecessary talk and commotion should be eliminated.
- After leaving the building, take your students at least fifty (50) yards from the building and do not return them to the building until the all clear has sounded. Never should anyone re-enter the building until the all clear sounds.
- Make sure before leaving the building that all the lights are turned off.
- All of the emergency exit routes are posted in each of the rooms in the building.

Please evacuate the building using the following emergency assignments:

OPERATION OF FIRE EXTINGUISHERS AT HIGHLAND

1. Hold Upright 2. Pull ring attached to chain 3. Point hose at fire and squeeze handle
THESE FIRE EXTINGUISHERS ARE NOT FOR ELECTRICAL FIRES.

Fire evacuation plan- will be put into effect by the sounding of one continuous ring of the school bell.

Remember - every time the fire alarm sounds it must be considered an actual fire and the emergency plan implemented.

BAND ROOM E03	Exit directly through the double doors east of the band room
ART ROOMS E05A & E05B	Go into the hall and exit through the north doorway
WEIGHT ROOM WR01	Go into the hall and exit through the north doorway
GYM-LOCKER ROOMS & ATHLETIC OFFICES	Exit through the outside doors in the boys and girls locker rooms
IF GYM IS OCCUPIED: SOUTH STANDS NORTH STANDS GYM BALCONY	Games, movies, assembly, etc Exit through the southeast and southwest door from the gym - leave the building via the south doors Exit through the outside doors in the boys and girls locker rooms Leave the gym via the northeast and northwest doors-then exit the building through the north doors
COMMONS AREA	Leave through the front door
OFFICE & TEACHERS WORK AREA	Go up the hall and exit through the front door
S02 & S04	Go up the hall and exit through the front door
BUSINESS ROOM - N02	Go up the hall, through the Commons and exit through the front doors
STUDENT RESTROOMS	Exit through the main rear doors
VENDING AREA	Exit through the main rear doors
KITCHEN	Use outside door in rear of kitchen
MEDIA CENTER & S15	Exit through the east outside door of Media Center
W01,W02,S17A,S06,S08	Exit through west outside door of Media Center
N17B, N15B, N15A, N06,N13	Exit through the outside double doors in the N17B area
N08,W03,W04,W05,W07,N17A	Exit through the outside double doors north of W07
N09B,N09A,N11,N04,N07,N03	Exit through the outside the north door in room N09B.
Chemistry Lab	Exit through the north door in classroom.
Science Rooms	Exit through the west doors to central office exit.

Fire
Emergency
Exits

TORNADO PROCEDURES

1. Signal is a series of short rings of the class bells.
2. Keep quiet, keep calm, and keep classes together.
3. Leave materials, file quickly to designated protection areas.
4. Sit on the floor with hands or book over your head.
5. Listen and follow directions completely.
6. Teachers prop open all classroom doors and north and east outside doors.

Designated Protection Area Assignments

N17B	South classroom wall
N17A	East Science Office Wall
N15B	South Wall of N17B (Chemistry room)
N15A, N09A	South classroom wall
N09B	West wall of N05
N07	West wall of N07 (Foods room)
N05	East classroom wall
N11, N13	Hall outside N02 (Computer room)
N04,N06,N08	Hall outside N02
S04,S06,S08	Hall outside the Media Center
Media Center	South hall outside the Media Center
S15	South Hall outside S15
N02 (Computer)	South wall of classroom
S02 (Computer)	South wall of Business Office
W01	Hall outside the Media Center
W03,W05,W07	Hall on the east side of the room
W04	North and east classroom walls
W02	South and east classroom walls
COMMONS	Hall outside N02 & S02 (Computer rooms)
GYM	Boys and Girls PE Locker Rooms
E05A,E05B,E03	Hall outside of classroom
VO AG BUILDING	Weight lifting room WR01
KITCHEN	East wall of N05
E01 NEAR MUSIC ROOM	Hall outside of Music Room
SCIENCE ROOMS	Hall outside of classroom

Tornado Procedures



LEWIS COUNTY SHERIFF'S OFFICE

David T. Parrish, Sheriff

107 S. Washington, Monticello, Missouri 63457

Phone: (573) 767-5287 Fax: (573) 767-5412

RECEIVED MAR 07 2012

Memorandum

March 6, 2012

TO: E-911, Ewing R-4 Fire Protection District, Western Lewis County Fire Protection District, Lewis County C-1 District, Principal Malone, Principal Fink, Canton Police Department, LaGrange Police Department, Missouri State Highway Patrol

FR: David Parrish, Sheriff

RE: Lewis County C-1 School District Emergency Response

Several years ago several entities met to formulate a general response plan in the event there was ever a major incident at one of the Lewis County C-1 Schools. I have reviewed the plan and made a few minor changes. Since there have been several changes in personnel I wanted to send it out to the new faces. I would ask you each to review it with your own personnel as a reminder.

If you think of additions or changes that need to be made please feel free to let me know. Also, this information should not be disseminated to the general public.

Thank you for your time and concern.

LEWIS COUNTY SHERIFF'S OFFICE

David T. Parrish, Sheriff

Emergency Response Plan

Lewis County C-1 School District

1. Purpose:

The purpose of this plan is to establish general guidelines for a law enforcement, ambulance service, and a fire and rescue response to either Highland High School and/or Highland Elementary School in the event of an intruder, dangerous person, or shooter going onto campus. This plan will familiarize all concerned parties with their respective roles in the event of such an incident. All disciplines will follow their own protocols and procedures as specified by office personnel.

II. Responsibilities:

1. Law Enforcement

Law enforcements primary role will be to stop the threat posed at the school. This includes responding to an active shooter, a person with a firearm, a hostage situation, a dangerous person on campus, etc. The safety of the students and faculty will be of the utmost importance and the safe removal of each affected person is primary. Secondary considerations include crime scene integrity, witness information, evacuation, secondary threats, parents, etc.

2. E-911:

The role of E-911 is to effectively communicate all emergency calls to law enforcement and emergency medical services.

3. Ambulance:

Ambulance personnel will provide medical care to those in need.

4. Fire & Rescue:

The role of fire and rescue is to assist with medical care and to safely remove students from the building.

5. School Personnel:

The role of school personnel is the protection and safety of the students and faculty. School personnel will be responsible for the safe removal and return of the students to parents/legal guardians.

III. School Response/Protocol

1. In the event there is an intruder or dangerous person in the building students and teachers will be advised by intercom "there is an intruder in the building." Once this alarm is given students and teachers will be locked inside classrooms. (Consideration – Staff have been directed not to open the door for anyone except law enforcement) Once the situation is deemed safe the doors will be unlocked by law enforcement personnel or school officials.
2. A staff person will remain on the line with E-911 until law enforcement arrives.
3. Once both schools and the surrounding area are deemed safe students will be transferred to another building as circumstances dictate. Students will then be transported as arranged by school officials to a reunion site.

IV. Communication:

1. Law enforcement will communicate by use of Sheriff's Net and then transfer to law enforcement mutual aid. When communicating with fire departments and/or ambulance mutual aid will be used as well.
2. E-911 shall notify law enforcement of the event by advising there is a **10-100 at stop 422 or 423**. Radio traffic should be kept to an absolute minimum. Use of cell phones is recommended to reduce radio traffic as well.
3. E-911 shall notify the LCSO, MSHP, LaGrange Police Department, and Canton Police Department for assistance.
4. Notification should also be made to necessary ambulance and/or fire. Law enforcement will communicate by use of Sheriff's Net and then transfer to the MTAC channel for communication on scene when communicating with fire departments and/or ambulance mutual aid will be used as well.

V. Staging:

1. Law enforcement will respond to the building in need and stop the threat. As more officers arrive at the scene, and once it is determined there are enough officers at one location, secondary response should be made to the other school to determine it is safe.

2. An incident command center will be established at the First Baptist Church Parking Lot. Fire, ambulance, and law enforcement will be at this location. Media members should be directed to the church as well.

VI. Traffic Control:

1. When necessary, and especially when responding to a report of an active shooter, traffic flow on HWY 6 should be stopped. Westbound traffic should be stopped at 250th Street east of the First Baptist Church. Law enforcement personnel will be responsible for determining this need. Law Enforcement personnel and fire personnel should determine what personnel can effectively stop traffic in a safe manner. It may be necessary for fire personnel to stop traffic until more law enforcement personnel arrive.
2. It should be noted that parents will begin arriving very quickly. Parents cannot be allowed to enter any dangerous area to come to the schools until deemed safe by law enforcement. The school will remove students from one school to the other and then bus them to a reunion site.

VII. Special Tactics/Considerations:

1. The LCSO can directly access HHS's security camera system from the Sheriff's Office. Members of the Sheriff's Office will be able to monitor the camera system and may be able to communicate with first responders.
2. Master Keys: The LCSO has master keys to HHS and HES.
3. It is imperative that a line of communication be developed with the affected school administration. The person who makes the emergency call should remain on the line.
4. This document should only be used to enhance the general understanding for all parties involved. It is non-specific for a reason. Each discipline should follow their own protocols as it pertains to their own specific roles.

*Reunion Site
Elem. - Assembly of God
H.S. - Queen of Peace*

Ewing, Missouri: This Brilliant Company

This small team of data scientists has written an algorithm that is turning the \$200 billion car insurance industry upside down

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SEARCH



February 13, 2018

News

31 hurt in Lewis County school bus crash



(H-W Photo/Sleve Bohnstedt)

Posted: Apr. 1, 2014 10:02 pm Updated: Apr. 15, 2014 10:14 pm

By DAVID ADAM
Herald-Whig Staff Writer

EWING, Mo. — Brenda Mallett joined her 10-year-old son, Drew, at Blessing Hospital in Quincy, Ill., early Tuesday night, a few hours after the school bus he was riding in crashed.

Drew, a fourth-grader at Highland Elementary School in Ewing, was one of 30 students taken to hospitals with injuries after an eastbound Lewis County C-1 School District bus left Route C, overturned and landed on its roof in a ditch along the road.

Mallett said her son suffered a strained neck and a bruise on the back of his head, as well as a scrape on his shoulder that likely happened when he climbed out of a broken window once the bus came to a stop. He was given a computerized tomography scan and later received a clean bill of health from doctors before going home with his parents.

Afterward, Drew told his mother, "At least I have my health."

"That's pretty good for a 10-year-old," Mallett said with a laugh.

Blessing Hospital officials reported 27 students on Bus 18 were admitted. One was transferred to St. Louis Children's Hospital.

One was admitted to the Blessing Hospital Intensive Care Unit and was reported in good condition Wednesday morning. Four others were admitted to the pediatric medical/surgical floor at Blessing Hospital and were reported in good condition Wednesday morning. The rest were treated and released.

Three other students were taken to Hannibal Regional Hospital.





All students were from either Highland Elementary School or Highland High School.

John W. Logan, 62, the driver of the bus, was taken by a private car to Blessing Hospital. He was treated and released.

Lewis County C-1 Superintendent Jacqueline Ebeling went to Blessing Hospital to act as a liaison between students, parents and hospital staff. Ben Buening, assistant principal at Highland High School, was the liaison at Hannibal Regional Hospital.

Neither Ebeling nor Jackie Kennedy, director of transportation for the district, spoke with reporters Tuesday night.

A fax from the Lewis County C-1 School District Wednesday morning contained a 114-word statement that offered information about how many students received medical assistance. It also said the district is not able to comment on the conditions of the students.

"The thoughts and prayers of the community and the school district are with those families and the families of all involved in this accident," the release read.

The Missouri State Highway Patrol completed its investigation Tuesday night. Trooper A.J. Fish reported that the 2007 International school bus traveled off the right side of the road, overcorrected, traveled off the left side of the road, overturned, struck a ditch and came to rest on its top.

Mallett said she was at work when she heard about the crash from her sister.

"She didn't know any details, but I knew (Drew) was on the bus," she said.

She called her son's school to find out more information, only to find out that staff members hadn't heard what happened. Mallett then called her husband, Doug, who had finished work in Keokuk, Iowa, and was on his way to their home in LaGrange.

Doug Mallett headed to the crash site but was redirected to a staging area at Bliven Performance and Auto Repair, about a mile east, to find his son. Students who were not immediately taken by ambulance or helicopter from the crash scene were taken there.

Tim Bliven, who also has children who attend Highland Elementary, took off with another worker to help at the site of the crash. He asked Todd Bowen, a friend who was at the garage having work done on his vehicle, to stay at the business.

Brenda Mallett said her son told her that he "closed his eyes" when the bus started down the embankment on Route C. When the bus stopped, Drew lay on his back. He then climbed out the window.

"One of his friends, his head got cut pretty good, and they got out of the bus and sat on the hillside," Brenda Mallett said. "His friend's little sister was on the bus, and Drew made sure she was OK, too."

Mallett said she had heard one student suffered a broken leg, "but other than that, most of it was just bumps and bruises, as far as I know."

A pastor who provided care and counseling at Blessing Hospital said the passengers on the bus, and another bus that was following it, are dealing with stress and trauma.

"A lot of kids are afraid to get back on the bus. A lot of parents are concerned their kids will have nightmares," said the pastor, who requested that his name not be used.

"There was another school bus right behind the one that crashed. Some of the kids from that second bus were helping take care of kids in the affected bus — and those kids who got there right after the accident are dealing with trauma, too."

Law enforcement reports indicate that the first call for assistance was received by the Marion County 911 Center about 3:30 p.m. Ambulances from Lewis and Clark counties responded. Three Air Evac helicopters also responded to the scene.

Brad Billings, president and CEO of Blessing Health System, said the hospital staff trains for mass-casualty events. The hospital was in "Code Yellow," which means multiple injuries were en route, with all personnel required to be on standby.

"We hope that they don't happen, but when they do, we're prepared for it," Billings said. "We had adequate time, in terms of first being informed that this accident had occurred, to get our teams assembled."

Billings said additional staff was placed on alert, but as the numbers of patients grew, staff were called in to treat patients.

"(Blessing was) pretty organized as far as getting people medical attention," Mallett said. "I've never been there for something like that, but I was very impressed."

Brenda Mallett said she was going to "play it by ear" as to whether Drew would attend school Wednesday.

"I'm guessing he'll be stiff and stuff," she said late Tuesday night. "He's lying down and resting now; he's pretty sore."

Word of the crash circulated quickly in the county. School buses are equipped with radios, and a report of the crash was heard by students as they were riding home on other buses. Text messages were sent by students hearing the initial radio traffic.

An American Red Cross volunteer said she first heard about the crash from children whose friends or family members had alerted them through social media.

Herald-Whig Staff Writers Doug Wilson, Matt Hopf and Steve Elghinger contributed to this report.

— dadam@whig.com/221-3376

BY THE NUMBERS

According to the Missouri Highway Patrol:

- 2 students were taken by Air Evac to Blessing Hospital
 - 1 student was taken by Survival Flight to Blessing Hospital
 - 14 students and driver John W. Logan were taken by private automobile to Blessing Hospital
 - 1 student was taken by Lewis County Ambulance to Blessing Hospital
 - 3 students were taken by Clark County Ambulance to Blessing Hospital
 - 3 students were taken by private automobile to Hannibal Regional Hospital
 - 4 students were taken to Blessing Hospital, but report did not list how
- (The Lewis County C-1 School District reported 30 students were on the bus. The MHP report only listed 26.)
Read the report at whig.me/0402bus.

Herald-Whig Staff Writers Doug Wilson, Matt Hopf and Steve Elghinger contributed to this report.

LEWIS COUNTY MISSOURI

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: Jesse Uhlmeyer, Superintendent
Phone: 573-288-5216 Ext. 103
Email: juhlmeyer@canton.k12.mo.us
Date: July 20, 2018

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

Matt Walker, Hazard Mitigation Planner
Green Hills Regional Planning Commission
1104 Main St. Trenton, MO 64683
(mdw@ghrpc.org) (660) 359-5636 x 22

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	August 2012	
Capital Improvement Plan	No		
<u>School Emergency Plan</u> Shelter in place protocols Evacuation protocols	Yes		
Weapons Policy	Yes		

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	Superintendent	
Emergency Manager	Yes	Superintendent	
Grant Writer	No		
Public Information Officer	Yes	Superintendent	

Financial Resources

Identify whether your school district /institution has access to or is eligible to use the following financial resources for hazard mitigation.

Financial Resources	Accessible/Eligible to Use (Y/N)	Comments
Capital improvements project funding	Yes	
Local funds	Yes	
General obligation bonds	No	
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 system or other emergency alert system? Please describe. **Yes. The district is equipped with an intercom system.**
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. **No**
4. List any other past or ongoing projects or programs designed to reduce disaster losses, these may include projects to protect critical facilities. **No**
5. Do any of your buildings have designated tornado shelters or "saferooms"? If so, are they constructed in accordance with FEMA standards? **The district has a tornado plan, but no specially designed saferooms or shelters.**
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**
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 school district is not planning to construct any new buildings in the next five years. Improvements to the building's boiler system, water distribution, roof and masonry are currently being considered.**
8. What percentage is your projected enrollment expected to increase or decrease in the next five years? **Enrollment is expected to increase annually by 2% beginning with the 2019-20 school year.**
9. Do you have your own campus police? Please explain your police department or who you rely on for security needs. **The district relies on the City of Canton Police Department, the Lewis County Sheriff's Department, and the Missouri State Highway Patrol.**

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	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

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.**

Asset Name of	Address	Square Feet	Replacement Value (Insured)	Contents Value	Occupancy # / Capacity	Hazards
Main Building	200 S. 4 th St., Canton, MO 63435	103,725	15,367,084	2,482,991	33 per 500sq feet	DF,LF,EQ,LSS,ST,T,SWW,D,ET, F,A,CD,CYD,HM,PH,SE,TX,U
Daycare Building	Madison St., Canton, MO 63435	3,496	510,026	7,184	230	DF,LF,EQ,LSS,ST,T,SWW,D,ET, F,A,CD,CYD,HM,PH,SE,TX,U
Bus Garage	Lewis St. Canton, MO 63435	3,3600	152,526	35,215	237	DF,LF,EQ,LSS,ST,T,SWW,D,ET, F,A,CD,HM,PH,SE,TX,U
Vo-Ag Building	2 nd & Washington St. Canton, MO 63435	3,565	521,350	84,523	235	DF,LF,EQ,LSS,ST,T,SWW,D,ET, F,A,CD,CYD,HM,PH,SE,TX,U
Greenhouse	2 nd & Washington St. Canton, MO 63435	960	65,269	79,943	63	DF,LF,EQ,LSS,ST,T,SWW,D,ET, F,A,CD,HM,PH,SE,TX,U

Multi-jurisdictional Mitigation Plan

HISTORIC HAZARD EVENTS

Please fill out one sheet for each significant hazard event that affected **your school district / institution** with as much detail as possible. This includes all hazard events listed on the Vulnerability Assessment page that have caused previous damage. Attach supporting documentation, photocopies of newspaper articles, or other original sources.

Type of event	
Nature and magnitude of event	
Location	
Date of event	
Injuries	
Deaths	
Property damage	
Infrastructure damage	
Crop damage	
Business/economic impacts	
Road/school/other closures	
Other damage	
Insured losses	
Federal/state disaster relief funding	
Opinion on likelihood of occurring again	
Source of information	
Comments	

Multi-jurisdictional Mitigation Plan

HISTORIC HAZARD EVENTS

Please fill out one sheet for each significant hazard event that affected **your school district /institution** with as much detail as possible. This includes all hazard events listed on the Vulnerability Assessment page that have caused previous damage. Attach supporting documentation, photocopies of newspaper articles, or other original sources.

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Road/school/other closures	
Other damage	
Insured losses	
Federal/state disaster relief funding	
Opinion on likelihood of occurring again	
Source of information	
Comments	

APPENDIX B

Public Participation Documentation

01/16/2018 Kick Off Meeting

02/13/2018 Meeting 1

03/06/2018 Meeting 2

AGENDA

- I Introductions**

- II An overview of Hazard Mitigation funding programs and the development of Hazard Mitigation planning and the RPC's role in the state-wide process of developing county-level plans.**

- III Overview of the FAQ**

- IV Overview of the purpose and use of survey questionnaires, distribution of forms to participating jurisdictions to complete and return via mail, email, or fax per the contact information provided on the forms.**

- V Set the date of the next meeting**

- VI Meeting adjourned.**

Lewis County Hazard Mitigation Plan Update 2018 FAQ

What is Hazard Mitigation?

Hazard Mitigation is “any action taken to reduce or eliminate the long-term risks to human life and property from Natural Hazards.” A good example is this: Rebuilding a bridge destroyed by flooding to its original design **IS NOT** mitigation, it’s merely replacement. Rebuilding the bridge with structural modifications that make it more resistant to flood damage in the future **IS** Hazard Mitigation.

What is a Hazard Mitigation Plan?

A Hazard Mitigation Plan is a document created by a committee made up of stakeholders in the community (In this case, Lewis County). During the planning process, this committee looks at information about the potential impacts of natural disasters and develops long-term strategies for protecting people and property in future hazard events, by developing feasible and cost effective mitigation projects.

Doesn't Lewis County Already Have a Hazard Mitigation Plan?

Lewis County does currently have a Hazard Mitigation Plan in effect – however, FEMA requires that to remain current Hazard Mitigation Plans must be updated on a five year schedule.

Why do we need a Hazard Mitigation Plan?

State, Tribal, and Local governments are required to develop a Hazard Mitigation Plan as a condition of receiving certain types of non-emergency disaster assistance (most specifically the Hazard Mitigation Grant Program).

How is Hazard Mitigation Planning Done?

In a broad sense, it’s very much like land use or emergency response planning. A planning committee is created, information is compiled and analyzed, risks and assets are identified, and a plan is formulated to address those risks to the best of the communities’ economic and administrative ability. This plan is then adopted by participating jurisdictions (including school districts and educational institutions).

For more detailed information on Hazard Mitigation Planning, you may visit the Missouri State Emergency Management Agency’s webpage on Hazard Mitigation: http://sema.dps.mo.gov/programs/mitigation_management.php. Information on Lewis County’s planning efforts will be provided on the **Lewis County Mo Hazard Mitigation Planning Committee Facebook page**

<https://www.facebook.com/Lewis-County-Missouri-Hazard-Mitigation-Planning-Committee-1615006578534670/> and meeting reminders and other notifications will be provided to committee members via textcaster.

Who's on the Hazard Mitigation Committee?

At a minimum, the committee must be composed of one representative from each of the participating jurisdictions that wishes to adopt and be covered under the finished plan. Ideally, the committee is also populated with people from all the various sectors of the community, from public safety professionals to ordinary citizens. In addition, it’s best if the communities seek input from neighboring communities outside their own jurisdictions. FEMA has drastically increased its focus on public participation over the years, and any jurisdiction that hasn’t met the minimum level of required participation will be ineligible to adopt the plan, and will therefore be ineligible for certain types of funding.

When will the Hazard Mitigation Committee Meet?

There will be a series of three meetings, besides this initial kick-off meeting.

Kick-Off	THIS MEETING	Committee core group meeting, overview of Hazard mitigation planning, hand out materials and “homework”. Sign up for text caster, brief discussion of the face book page.
Meeting 1	TBA	A short repeat of the overview aimed at attendees who did not attend the kick off will be followed by a brief review of the old plan and discussion about updated demographic and hazard information.
Meeting 2	TBA	New Plan Development – what elements of the old plan should remain, which should be altered, what should be added. What new mitigation has been proposed for the new plan
Meeting 3	TBA	Overview of the rough draft of the completed plan, review of the maintenance and update process, discussion of resolutions of adoption.
Draft Sub	TBA	1 st (and hopefully only) Draft submission

Participation in the planning process is vital for each jurisdiction. Any questions or concerns about the plan should be directed to:

Derek Webber, Director derekwebber@nemorpc.org (660) 465-7281 x 1
Northeast Missouri Regional Planning Commission
121 S. Cecil St. Memphis, Missouri 63555

Matt Walker, Hazard Mitigation Planner mdw@ghrpc.org (660) 359-5636 x 22
Green Hills Regional Planning Commission
1104 Main St. Trenton, MO 64683

Kick – Off Meeting Minutes

The Kick off Meeting for the Lewis County Hazard Mitigation Update planning committee was held, as scheduled, on February 16, 2016 from 5:30 PM – 7:30 PM at the Lewis County Courthouse.

Fourteen people were in attendance to represent a variety of jurisdictions (see sign in sheet, attached)

- Round table introductions were made.
- Matt Walker of Green Hills RPC gave the committee a short history of Hazard Mitigation funding programs and the development of Hazard Mitigation planning and the RPC's role in the state-wide process of developing county-level plans.
- Matt Walker provided a hand out on the Emergency Management Cycle and discussed the role of Hazard Mitigation within that cycle (see attached).
- Matt Walker provided an FAQ handout and led a discussion about what Hazard Mitigation is, described what a Hazard Mitigation Plan is, that the County has one currently which is due for its 5 year update, why the County needs to have a current plan, and how the planning process works. The FAQ handout contained many links to further educational resources relating to Hazard Mitigation and contact information for the RPC staff that will be leading the planning effort as well as a link to the Facebook page set up to provide a public forum for the planning committee. The importance of jurisdictional participation and public outreach was repeatedly stressed.
- The group was provided with data collection questionnaires as "homework", which jurisdictional representatives need to complete and return via mail, email, or fax per the contact information provided on the forms. This information will be utilized in the planning process.
- The date, time and location for the 1st official Hazard Mitigation Planning meeting was set for Feb 12, 2018, at 5:00 PM in the Conference Room of the Church of the Nazarene in Kingston, MO. All attendees were urged to spread the word and attempt to bring as many stake holders with them as they could manage.
- Meeting adjourned.

Name	Title	Jurisdiction represented (if any)	Mileage to and from meeting	Hourly pay rate
Marty Walla	HM Planner	GHRPC	234	\$10
Cheryl Thompson	City Clerk - Hamilton			
Derek Weber	NEMO RPC	NEMO RPC		
Vanessa S. P. S.	Mayor - Hamilton	Hamilton		
WILLIE BRUNSON	Mayor - Hamilton	Hamilton		
Wendy Gonsouls	Frederick LaSalle	LaSalle		
Wayne Pharesky IV	Mayor - Hamilton	Lewis Co.		
John F. Friel	Superintendent	Lewis County Schools		
Amey Dupin	Mayor - Hamilton	LaBelle		
John Dupin	City Clerk	LaBelle		
Bob Dupin	Alderman	LaBelle		
John Dupin	City Clerk	LaBelle		
John Dupin	Mayor	Lewis County		
Emily DeAl	County Director	County		

Lewis County Hazard Mitigation Plan Update

TEXTCASTER SIGN-UP

Name	Email	Mobile Phone Number	Mobile Service Provider
Carly Bell	Carly@Public Works @ centralkent.net	(601) 998-1878	Sprint
John French	JFrench@Lewis.k12.ms.us	(573) 231-2714	US Cellular
Mike Booker	mlbringer@carver.edu	(573) 872-0572	US Cellular
Mary Gwatsch	ygwatsch@yahoo.com	(660) 341-5624	ATT
Ann Turpin	atp@turpin@spoil.com atp@turpin@spoil.com	(660) 316-0177	US Cellular
Steve McBrack	Mayor - (Lewis County) Lewis Lewis	(217) 819-2520	T-Mobile
Wayne Mapp	lewis@scs.ms.gov	(247) 242-9945	US Cellular
Chancell Seftos	seftos@centralkent.net	(660) 341-1956	US Cellular
		() -	
		() -	

AGENDA

- I Introductions
- II Quick overview of the FAQ (aimed at those not present at the kick-off meeting.
– reminder of participation requirements. RESTATE THE IMPORTANCE OF TURNING IN THE COMPLETE QUESTIONNAIRES
- III Discussion of Mitigation Goals in the past plan – discussion of changes, additions, subtractions.
- IV Overview of Hazards, per updated Risk Analysis: open discussion
Hazards in the old Plan
New Hazards considered
- V Discussion of specific Vulnerabilities in Lewis County, per updated statistics -open discussion
- VI Discussion of the previous plans actions (See 11 x 17 plan action overview handout)
- VII Overview of the kind of actions appropriate for inclusion in the plan update
- VIII Proposals for Plan Actions, open discussion
- IX Set the time and place for Meeting #2 (End of February).

Lewis County Hazard Mitigation Plan Update 2018 FAQ

What is Hazard Mitigation?

Hazard Mitigation is “any action taken to reduce or eliminate the long-term risks to human life and property from Natural Hazards.” A good example is this: Rebuilding a bridge destroyed by flooding to its original design **IS NOT** mitigation, it’s merely replacement. Rebuilding the bridge with structural modifications that make it more resistant to flood damage in the future **IS** Hazard Mitigation.

What is a Hazard Mitigation Plan?

A Hazard Mitigation Plan is a document created by a committee made up of stakeholders in the community (In this case, Lewis County). During the planning process, this committee looks at information about the potential impacts of natural disasters and develops long-term strategies for protecting people and property in future hazard events, by developing feasible and cost effective mitigation projects.

Doesn't Lewis County Already Have a Hazard Mitigation Plan?

Lewis County does currently have a Hazard Mitigation Plan in effect – however, FEMA requires that to remain current Hazard Mitigation Plans must be updated on a five year schedule.

Why do we need a Hazard Mitigation Plan?

State, Tribal, and Local governments are required to develop a Hazard Mitigation Plan as a condition of receiving certain types of non-emergency disaster assistance (most specifically the Hazard Mitigation Grant Program).

How is Hazard Mitigation Planning Done?

In a broad sense, it’s very much like land use or emergency response planning. A planning committee is created, information is compiled and analyzed, risks and assets are identified, and a plan is formulated to address those risks to the best of the communities’ economic and administrative ability. This plan is then adopted by participating jurisdictions (including school districts and educational institutions).

For more detailed information on Hazard Mitigation Planning, you may visit the Missouri State Emergency Management Agency’s webpage on Hazard Mitigation: http://sema.dps.mo.gov/programs/mitigation_management.php. Information on Lewis County’s planning efforts will be provided on the **Lewis County Mo Hazard Mitigation Planning Committee Facebook** page

<https://www.facebook.com/Lewis-County-Missouri-Hazard-Mitigation-Planning-Committee-1615006578534670/> and meeting reminders and other notifications will be provided to committee members via textcaster.

Who's on the Hazard Mitigation Committee?

At a minimum, the committee must be composed of one representative from each of the participating jurisdictions that wishes to adopt and be covered under the finished plan. Ideally, the committee is also populated with people from all the various sectors of the community, from public safety professionals to ordinary citizens. In addition, it’s best if the communities seek input from neighboring communities outside their own jurisdictions. FEMA has drastically increased its focus on public participation over the years, and any jurisdiction that hasn’t met the minimum level of required participation will be ineligible to adopt the plan, and will therefore be ineligible for certain types of funding.

When will the Hazard Mitigation Committee Meet?

There will be a series of three meetings, besides this initial kick-off meeting.

Kick-Off	THIS MEETING	Committee core group meeting, overview of Hazard mitigation planning, hand out materials and “homework”. Sign up for text caster, brief discussion of the face book page.
Meeting 1	TBA	A short repeat of the overview aimed at attendees who did not attend the kick off will be followed by a brief review of the old plan and discussion about updated demographic and hazard information.
Meeting 2	TBA	New Plan Development – what elements of the old plan should remain, which should be altered, what should be added. What new mitigation has been proposed for the new plan
Meeting 3	TBA	Overview of the rough draft of the completed plan, review of the maintenance and update process, discussion of resolutions of adoption.
Draft Sub	TBA	1 st (and hopefully only) Draft submission

Participation in the planning process is vital for each jurisdiction. Any questions or concerns about the plan should be directed to:

Derek Webber, Director derekweber@nemorpc.org (660) 465-7281 x 1
Northeast Missouri Regional Planning Commission
121 S. Cecil St. Memphis, Missouri 63555

Matt Walker, Hazard Mitigation Planner mdw@ghrpc.org (660) 359-5636 x 22
Green Hills Regional Planning Commission
1104 Main St. Trenton, MO 64683

Mitigation Goals (2011 Plan)

The Lewis County Hazard Mitigation Planning Committee reviewed the goals, objectives, and actions from the previously approved 2005 Plan. Listed below are the goals, objectives, and actions from the 2011 Plan Update.

Goal #	Description	Type of Strategy	Priority Rank	Estimated Target Date	Method of Evaluation
1	Reduce risks and vulnerabilities of people in hazard-prone areas through current technology, better planning and hazard mitigation activities.	Outreach, Property Protection	High	2016	Participation statistics from Implemented programs
2	Reduce the potential impact of natural disasters on new and existing properties and infrastructure and the local economy.	Property Protection	High	2016	Participation statistics from NFIP. Adoption of ordinances by cities
3	Promote education, outreach, research and development programs to improve the knowledge and awareness among the citizens and industry about hazards they may face, their vulnerability to identified hazards, and hazard mitigation alternatives that can reduce their vulnerabilities.	Outreach	Medium	2015	Participation statistics from Implemented programs
4	Strengthen communication and coordinate participation between public agencies, citizens, non-profit organizations, business, and industry to create a widespread interest in mitigation.	Emergency Services	Medium	2016 Yearly/ongoing	Increased participation in Emergency planning and NIMS
5	Establish priorities for reducing risks to the people and their property with emphasis on long-term and maximum benefits to the public rather than short-term benefit of special interests.	Planning	Medium	2015	Increased mitigation spending. Development of emergency plans
6	Secure resources for investment in hazard mitigation	Budgetary Planning	Medium	2016	Increased number of projects that encourage mitigation
7	Take steps to mitigate damages due to flooding.	Property Protection	High	Ongoing	Participation statistics from the NFIP and fewer flooding damages.

FEMA Disaster Declarations that included Lewis County, Missouri; 1990-2015

Disaster Number	Description	Incident Period	Individual Assistance (IA) Public Assistance (PA)
995	Flooding, Severe Storm	June to	Both
1054	Severe Storms, Tornadoes,	May to June,	Both
1403	Ice Storm	January to	Both
1463	Severe Storms, Tornadoes,	May, 2003	Both
1773	Severe Storms and Flooding	June to	Both
1809	Severe Storms, Flooding and	September,	Both
1847	Severe Storms, Tornadoes,	May, 2009	Both
1934	Severe Storms, Tornadoes	June to July,	Both
4130	Severe Weather, Flooding,	May to June,	Both
4200	Severe Weather, Flooding,	September,	Both
4238	Flash Flooding and Severe	August,	Both

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

Lewis County Hazards Identified by Jurisdiction

Jurisdiction	Dam Failure	Drought	Earthquake	Extreme Heat	Wild land Fires	Flooding	Levee Failure	Severe Winter Weather	Thunderstorm/Lightning/Hail	/High Wind	Tornado	CBRNE Attack	Civil Disorder	Cyber Disruption	Hazardous Materials Release	Mass Transportation Incident	Public Health/Environmental	Emergency	Special Events	Terrorism	Utility Failure
Lewis County	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
Canton		x	x			x	x	x	x		x	x	x	x	x	x	x		x	x	x
Ewing		x	x	x				x	x		x	x	x	x	x	x	x		x	x	x
La Belle		x	x	x				x	x		x	x	x	x	x	x	x		x	x	x
La Grange		x	x	x		x		x	x		x	x	x	x	x	x	x		x	x	x
Lewistown		x	x	x				x	x		x	x	x	x	x	x	x		x	x	x
Monticello		x	x	x				x	x		x	x	x	x	x	x	x		x	x	x
Canton R-V School District (Canton)		x	x	x		x		x	x		x	x	x	x	x	x	x		x	x	x
Lewis County C-1 School District (Ewing)		x	x					x	x		x	x	x	x	x	x	x		x	x	x

- **Structure Fires were excluded** as they are considered a well mitigated hazard, with a complex infrastructure already in place to handle both routine and extraordinary incidents.
- **Sinkholes were excluded** as the current DNR map indicates no significant risk of this hazard in Lewis County.

Hazard	25 Yr Record Occurrences 1990-2015	Recorded Injuries	Recorded deaths	Recorded damages (Property & Crop)	Hazard Rating	
					Probability of Occurrence Low / Moderate / High	Potential Severity Low / Moderate / High
Dam Failure	0	0	0	0	Low	Moderate
Drought *	6	0	0	0	24%: Low Moderate	High
Earthquake	0	0	0	0	Low	High
Extreme Heat *	33	0	0	0	132%: High	Moderate
Heat	18	0	0	0		
Excessive Heat	15	0	0	0		
Wildland Fire	7	0	0	78.2 acres burned	28%: Moderate	Low
Flooding *	40	0	1	9.942 M	160%: High	High
Riverine	17	0	1	9.926 M		
Flash	23	0	1	16 K		
Levee Failure	0	0	0	0	Low	High
Severe Winter Weather *	41	0	0	0	164%: High	Low
Blizzard	1	0	0	0		
Cold/Wind-chill	3	0	0	0		
Extreme Cold/ Wind-chill	1	0	0	0		
Frost/Freeze	1	0	0	0		
Ice Storm	6	0	0	0		
Sleet	0	0	0	0		
Winter Storm	26	0	0	0		
Winter Weather	3	0	0	0		
Thunderstorm *	82	5	0	85 K	328%: High	Moderate
Lightning	3	3	0	0		
Hail	74	2	0	85 K		
High Winds	5	0	0	0		
Tornado *	9	0	9	7.330 M	36%: Moderate	High

* Data source: NCDC Storm Event Database








Hazard	25 Yr Record Occurrences 1990-2015	Recorded Injuries	Recorded deaths	Recorded damages (Property & Crop)	Hazard Rating	
					Probability of Occurrence <i>Low // Moderate/ High</i>	Potential Severity <i>Low/Moderate/High</i>
CBRNE Attack	No Data	No Data	No Data	No Data	Unable to quantify Low	High
Civil Disorder	No Data	No Data	No Data	No Data	Unable to quantify Low	Unable to quantify Moderate
Cyber Disruption	No Data	No Data	No Data	No Data	Unable to quantify Low High	Unable to quantify Moderate High
Hazardous Materials Release	No Data	No Data	No Data	No Data	High	High
Mass Transportation Incident	No Data	No Data	No Data	No Data	Low	High
Public Health/ Environmental Emergencies	No Data	No Data	No Data	No Data	Moderate	Moderate
Special Events	No Data	No Data	No Data	No Data	Low	High
Terrorism	No Data	No Data	No Data	No Data	High	High
Utility Failure	No Data	No Data	No Data	No Data	Low	High
Electromagnetic Pulse	No Data	No Data	No Data	No Data	Low	High

City of Canton Flood Hazard Map



Map Legend

National Flood Hazard Layer - Flood Hazard Zones, FEMA June 2015

-  Floodway
-  1% Annual Chance (100 Year) Flood Zone
-  0.2% Annual Chance (500 Year) Flood Zone
-  Area with Reduced Risk Due to Levee
-  Future Conditions 1% Annual Chance
-  Area of Undetermined Hazard
-  Water

Community Commons, 11/17/2016

LaGrange Flood Hazard Map



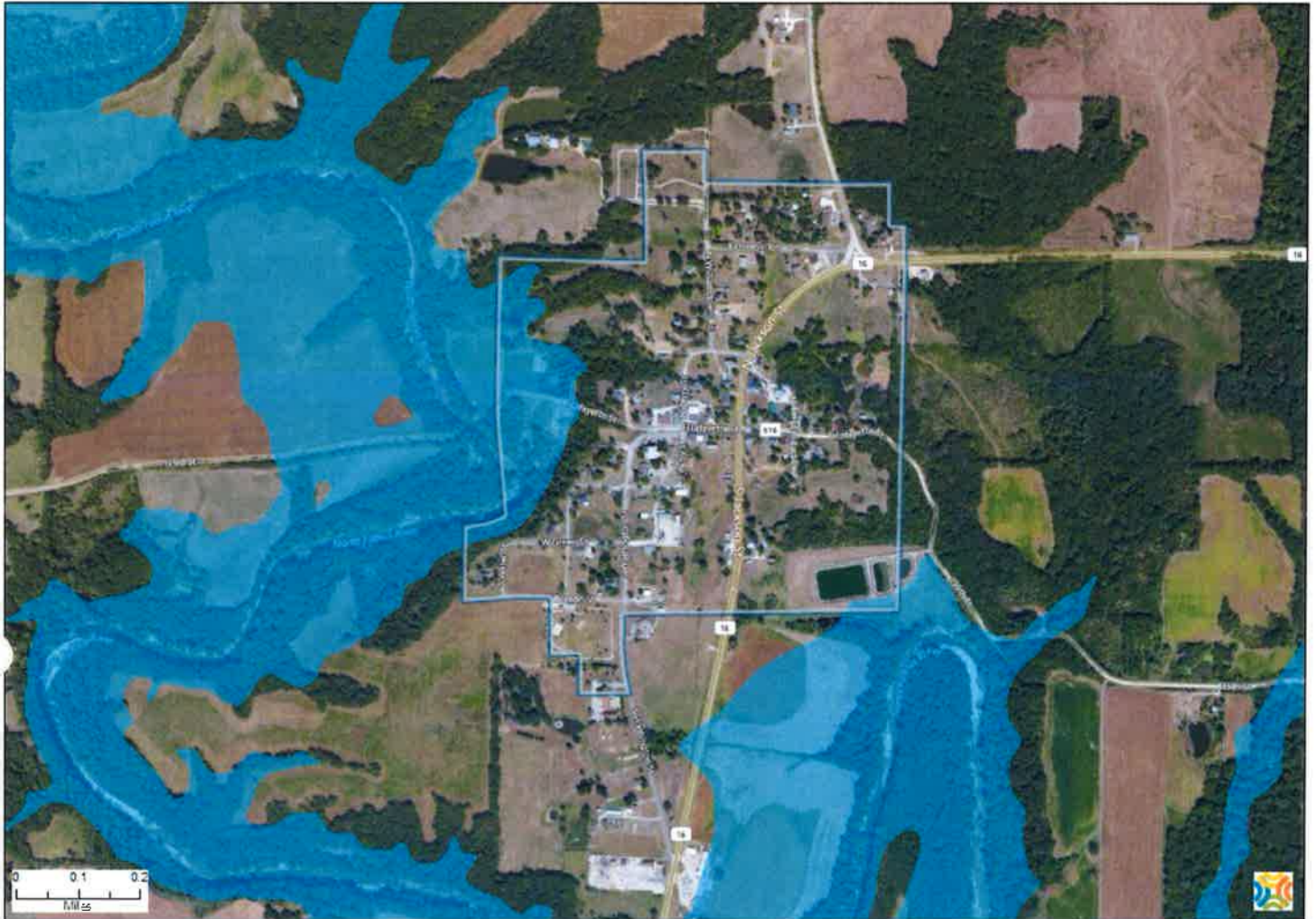
Map Legend

National Flood Hazard Layer - Flood Hazard Zones, FEMA June 2015

- Floodway
- 1% Annual Chance (100 Year) Flood Zone
- 0.2% Annual Chance (500 Year) Flood Zone
- Area with Reduced Risk Due to Levee
- Future Conditions 1% Annual Chance
- Area of Undetermined Hazard
- Water

Community Commons, 11/17/2016

Monticello Flood Hazard Map



Map Legend

National Flood Hazard Layer - Flood Hazard Zones, FEMA June 2015

- Floodway
- 1% Annual Chance (100 Year) Flood Zone
- 0.2% Annual Chance (500 Year) Flood Zone
- Area with Reduced Risk Due to Levee
- Future Conditions 1% Annual Chance
- Area of Undetermined Hazard
- Water

Community Commons, 11/17/2016



Missouri
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Natural Resources

Regulated Dam Report by County



LEWIS

<u>ID Number</u>	<u>Location</u>	<u>Year Complete</u>	<u>Height (ft)</u>	<u>Length (ft)</u>	<u>Drainage Area (acre)</u>	<u>Lake Area (acre)</u>	<u>Hazard Class</u>	<u>Permit Number</u>
BUCK & DOE RUN SITE #3								
MO10188	S21 T63N R06W	1973	36.00	600.00	1,338.00	9.00	3	R-434
BUCK,DOE RUN #4 DAM								
MO10219	S27 T63N R06W	1973	48.00	400.00	110.00	11.00	3	R-347
BUCK-DOE RUN WTRSHD #6 DAM								
MO10207	S15 T62N R06W	1970	46.00	500.00	740.00	9.00	2	R-437
DEER RIDGE COMMUNITY LAKE DAM								
MO10109	S18 T62N R08W	1960	38.00	500.00	608.00	48.00	2	R-291
EWING LAKE DAM								
MO10218	S06 T60N R07W	1967	39.00	595.00	655.00	45.00	2	R-160
LA BELLE OLD CITY LAKE DAM								
MO10372	S16 T61N R09W	1961	35.00	950.00	141.00	17.00	2	R-226

SUMMARY

Regulated Dams: 6	Total:	3,592.00	139.00
Total Dams: 6	Average: 40.33	598.67	23.17



Missouri
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Natural Resources

Missouri Dam Report by County



Regulated
Agriculture Exempt

LEWIS

<u>ID Number</u>	<u>Location</u>	<u>Year Complete</u>	<u>Height (ft)</u>	<u>Length (ft)</u>	<u>Drainage Area (acre)</u>	<u>Lake Area (acre)</u>	<u>Hazard Class</u>	<u>Permit Number</u>
BAKER DAM								
MO10208	S21 T61N R08W	1972	10.00	Unknown	25.00	7.00	3	
BELLEVUE LAKE DAM								
MO12118	S16 T61N R09W	1979	33.00	Unknown	1,318.00	112.00	3	
BOZARTH DAM								
MO50689		1996	28.00	205.00	0.00	2.00		
BUCK & DOE RUN #69 DAM								
MO12347	S04 T62N R06W	1980	25.00	Unknown	73.00	3.00		
BUCK & DOE RUN SITE #3								
MO10188	S21 T63N R06W	1973	36.00	600.00	1,338.00	9.00	3	R-434
BUCK & DOE RUN SITE #62 DAM								
MO12346	S15 T62N R06W	1980	27.00	Unknown	29.00	5.00		
BUCK & DOE RUN WATERSHED DAM 28								
MO50293		1976	25.00	625.00	0.00	9.00		
BUCK & DOE RUN WATERSHED DAM 35								
MO50295		1972	22.00	300.00	0.00	4.00		
BUCK & DOE RUN WATERSHED DAM 37								
MO50296	S22 T63N R06W	1972	32.00	200.00	85.00	1.00	3	
BUCK & DOE RUN WATERSHED DAM 41								
MO50294	S15 T62N R06W	1976	21.00	300.00	204.00	4.00		
BUCK & DOE RUN WATERSHED DAM 47								
MO50297	S02 T62N R06W	1976	27.00	270.00	173.00	2.00		
BUCK & DOE RUN WTRSD SITE #25 DAM								
MO10192	S27 T63N R06W	1972	24.00	Unknown	160.00	6.00	2	
BUCK & DOE RUN WTRSHD SITE #3 DAM								
MO10191	S22 T63N R06W	1970	22.00	Unknown	210.00	5.00	3	
BUCK & DOE RUN WTRSHD SITE #3 DAM								
MO10205	S34 T63N R06W	1972	26.00	Unknown	190.00	4.00	2	



Missouri
Department of
Natural Resources

Missouri Dam Report by County



Regulated
Agriculture Exempt

LEWIS

<u>ID Number</u>	<u>Location</u>	<u>Year Complete</u>	<u>Height (ft)</u>	<u>Length (ft)</u>	<u>Drainage Area (acre)</u>	<u>Lake Area (acre)</u>	<u>Hazard Class</u>	<u>Permit Number</u>
BUCK-DOE RUN WATERSHED STRUCTURE #27B								
MO12081	S09 T62N R06W	1976	28.00	Unknown	95.00	3.00	3	
BUCK-DOE RUN WATERSHED STRUCTURE #42								
MO11335	S22 T62N R06W	1974	26.00	Unknown	300.00	4.00	2	
BUCK-DOE RUN WTRSHD #6 DAM								
MO10207	S15 T62N R06W	1970	46.00	500.00	740.00	9.00	2	R-437
CATFISH LAKE DAM								
MO11509	S28 T63N R08W	1977	19.00	Unknown	600.00	5.00	3	
CITY OF LEWISTOWN DAM								
MO10349	S08 T61N R08W	1965	25.00	Unknown	400.00	35.00	2	
CLARK LAKE DAM								
MO11334	S16 T62N R06W	1975	21.00	Unknown	70.00	9.00	3	
DEER RIDGE COMMUNITY LAKE DAM								
MO10109	S18 T62N R08W	1960	38.00	500.00	608.00	48.00	2	R-291
DIENELL DAM								
MO51111		2002	30.00	348.00	0.00	3.00		
DOSCHER BROS DAM								
MO11493	S28 T60N R08W	1953	25.00	Unknown	23.00	2.00	3	
DURGENS CREEK #125 DAM								
MO12343	S11 T61N R07W	1982	27.00	Unknown	93.00	3.00		
DURGENS CREEK #133 DAM								
MO12344	S05 T60N R06W	1981	30.00	Unknown	41.00	5.00		
DURGENS CREEK WATERSHED #23 DAM								
MO10250	S05 T60N R06W	1971	30.00	Unknown	210.00	6.00	3	
DURGENS CREEK WATERSHED #33 DAM								
MO10196	S32 T61N R06W	1970	30.00	Unknown	160.00	6.00	2	
DURGENS CREEK WATERSHED #34 DAM								
MO10256	S30 T61N R06W	1972	20.00	Unknown	280.00	8.00	3	

Missouri Dam Report by County

LEWIS

<u>ID Number</u>	<u>Location</u>	<u>Year Complete</u>	<u>Height (ft)</u>	<u>Length (ft)</u>	<u>Drainage Area (acre)</u>	<u>Lake Area (acre)</u>	<u>Hazard Class</u>	<u>Permit Number</u>
DURGENS CREEK WATERSHED DAM LT-104								
MO50300	S16 T60N R06W	1981	29.00	445.00	69.00	5.00		
DURGENS CREEK WATERSHED DAM LTS-102								
MO50301	S17 T61N R06W	1980	22.00	540.00	72.00	5.00	3	
DURGENS CREEK WATERSHED DAM LTS-105								
MO50304	S24 T61N R07W	1981	27.00	340.00	73.00	5.00	3	
DURGENS CREEK WATERSHED DAM LTS-120								
MO50302	S34 T61N R06W	1981	30.00	260.00	59.00	5.00	3	
DURGENS CREEK WSHD LAKE DAM 1 B								
MO10115	S18 T61N R06W	1969	24.00	Unknown	640.00	14.00	3	
EVANS DAM								
MO51109		2002	30.00	550.00	0.00	2.00		
EWING LAKE DAM								
MO10218	S06 T60N R07W	1967	39.00	595.00	655.00	45.00	2	R-160
GEISENDORFER LAKE DAM								
MO11142	S35 T62N R08W	1975	23.00	Unknown	70.00	8.00	3	
GRASSY CREEK WATERSHED DAM G-29								
MO50870		1998	24.00	600.00	0.00	5.00		
GRASSY CREEK WATERSHED DAM G-38								
MO50869		1998	25.00	700.00	0.00	7.00		
GRASSY CREEK WATERSHED DAM G-39								
MO50868		1998	27.00	480.00	0.00	4.00		
GRASSY CREEK WATERSHED DAM G-44								
MO50888		1990	26.00	470.00	0.00	4.00		
GRASSY CREEK WATERSHED DAM G-46								
MO50887		1991	25.00	480.00	0.00	5.00		
GRASSY CREEK WATERSHED DAM G-47								
MO51349		2005	26.00	525.00	1.00	10.00		



Missouri
Department of
Natural Resources

Missouri Dam Report by County



Lewis

<u>ID Number</u>	<u>Location</u>	<u>Year Complete</u>	<u>Height (ft)</u>	<u>Length (ft)</u>	<u>Drainage Area (acre)</u>	<u>Lake Area (acre)</u>	<u>Hazard Class</u>	<u>Permit Number</u>
MO50889	GRASSY CREEK WATERSHED DAM G-63	1991	23.00	470.00	1.00	10.00		
MO50884	GRASSY CREEK WATERSHED DAM G-64	1993	33.00	730.00	0.00	5.00		
MO50892	GRASSY CREEK WATERSHED DAM G-65	1990	27.00	409.00	0.00	6.00		
MO50893	GRASSY CREEK WATERSHED DAM G-66	1990	25.00	327.00	0.00	4.00		
MO50880	GRASSY CREEK WATERSHED DAM G-73	1994	27.00	480.00	0.00	5.00		
MO50874	GRASSY CREEK WATERSHED DAM G-74	1996	25.00	460.00	1.00	8.00		
MO50879	GRASSY CREEK WATERSHED DAM G-76	1993	26.00	430.00	0.00	4.00		
MO50873	GRASSY CREEK WATERSHED DAM G-77	1996	24.00	540.00	0.00	4.00		
MO51353	GRASSY CREEK WATERSHED DAM G-79	2005	27.00	395.00	0.00	5.00		
MO50894	GRASSY CREEK WATERSHED DAM G-82	1990	23.00	333.00	0.00	5.00		
MO50896	GRASSY CREEK WATERSHED DAM G-83	1990	22.00	411.00	0.00	5.00		
MO50866	GRASSY CREEK WATERSHED DAM G-84	1999	25.00	590.00	1.00	10.00		
MO50895	GRASSY CREEK WATERSHED DAM G-85	1990	31.00	434.00	0.00	6.00		
MO50883	GRASSY CREEK WATERSHED DAM G-87	1993	27.00	480.00	0.00	4.00		



Missouri Dam Report by County



LEWIS

ID Number	Location	Year Complete	Height (ft)	Length (ft)	Drainage Area (acre)	Lake Area (acre)	Hazard Class	Permit Number
LUTTRELL FARMS DAM								
MO10373	S02 T61N R08W	1956	23.00	Unknown	240.00	16.00	3	
MARKS LAKE DAM								
MO11147	S05 T62N R06W	1968	21.00	Unknown	140.00	7.00	3	
MCCUTCHAN DAM								
MO50690		1996	26.00	300.00	0.00	2.00		
MILLER DAM								
MO51170		2003	27.00	376.00	0.00	2.00		
MISSISSIPPI RIVER LOCK & DAM #20								
MO10303	S25 T62N R06W	1935	37.00	Unknown	0.00	0.00	3	
MURPHY LAKE DAM								
MO10210	S20 T63N R08W	1972	25.00	Unknown	420.00	10.00	3	
NEER DAM								
MO50624		1994	30.00	343.00	0.00	2.00		
ROBERTS DAM								
MO51112		2002	29.00	339.00	0.00	2.00		
SCHMITZ DAM								
MO51110		2002	26.00	244.00	0.00	2.00		
SHARPE LAKE DAM								
MO11502	S12 T60N R09W	1970	19.00	Unknown	50.00	6.00	3	
STICE LAKE DAM								
MO11508	S19 T62N R08W	1958	25.00	Unknown	19.00	2.00	3	
TOO SMALL								
MO11346	S08 T60N R06W	1970	25.00	Unknown	130.00	3.00		
TROUBLESOME CREEK WATERSHED DAM R-27								
MO50312		1988	22.00	450.00	0.00	4.00		
TROUBLESOME CREEK WATERSHED DAM S-27								
MO50955		2000	20.00	485.00	0.00	3.00		

Missouri Dam Report by County

LEWIS

<u>ID Number</u>	<u>Location</u>	<u>Year Complete</u>	<u>Height (ft)</u>	<u>Length (ft)</u>	<u>Drainage Area (acre)</u>	<u>Lake Area (acre)</u>	<u>Hazard Class</u>	<u>Permit Number</u>
TROUBLESOME CREEK WATERSHED DAM S-55								
MO50316		1988	24.00	580.00	1.00	10.00		
TROUBLESOME CREEK WATERSHED DAM S-56								
MO50310		1988	23.00	430.00	0.00	5.00		
TROUBLESOME CREEK WATERSHED DAM S-57								
MO50317		1988	22.00	400.00	0.00	4.00		
TROUBLESOME CREEK WATERSHED DAM S-58								
MO50318		1988	26.00	637.00	0.00	4.00		
TROUBLESOME CREEK WATERSHED DAM S-59								
MO50319		1988	22.00	510.00	0.00	4.00		
TROUBLESOME CREEK WATERSHED DAM S-61								
MO50311		1988	23.00	460.00	0.00	4.00		
TROUBLESOME CREEK WATERSHED DAM S-62								
MO50320		1988	23.00	500.00	0.00	4.00		
TROUBLESOME CREEK WATERSHED DAM S-65								
MO51027		2001	27.00	660.00	1.00	9.00		
TROUBLESOME CREEK WATERSHED DAM S-66								
MO50321		1988	25.00	480.00	0.00	4.00		
TROUBLESOME CREEK WATERSHED DAM S-67								
MO50900		1994	26.00	520.00	0.00	5.00		
TROUBLESOME CREEK WATERSHED DAM S-68								
MO50917		1994	33.00	280.00	0.00	6.00		
TROUBLESOME CREEK WATERSHED DAM S-74								
MO50916		1994	22.00	540.00	0.00	4.00		
TROUBLESOME CREEK WATERSHED DAM S-75								
MO50915		1994	24.00	545.00	0.00	5.00		
TROUBLESOME CREEK WATERSHED DAM S-76								
MO50914		1994	22.00	390.00	0.00	4.00		

Missouri Dam Report by County

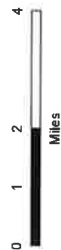
LEWIS

ID Number	Location	Year Complete	Height (ft)	Length (ft)	Drainage Area (acre)	Lake Area (acre)	Hazard Class	Permit Number
UHLMEYER LAKE DAM								
MO12080	S07 T62N R06W	1800	25.00	Unknown	200.00	4.00	3	
WHAN FARMS DAM								
MO51263		2004	28.00	400.00	0.00	6.00		
WILLER LAKE DAM								
MO12078	S33 T62N R06W	1973	22.00	Unknown	110.00	8.00	3	
WILLER LAKE DAM-SEC 20								
MO12077	S20 T63N R06W	1970	17.00	Unknown	90.00	8.00	3	
WILLER LAKE DAM-SEC 32								
MO11331	S32 T63N R06W	1972	17.00	Unknown	400.00	13.00	3	
WURTZBERGER DAM								
MO50623		1994	29.00	383.00	0.00	7.00		
WURTZBURGER LAKE DAM								
MO11510	S28 T63N R08W	1965	20.00	Unknown	50.00	8.00	3	
SUMMARY								
Regulated Dams: 6		Total:				19,938.00	1,151.00	
Total Dams: 157		Average:				126.99	7.33	

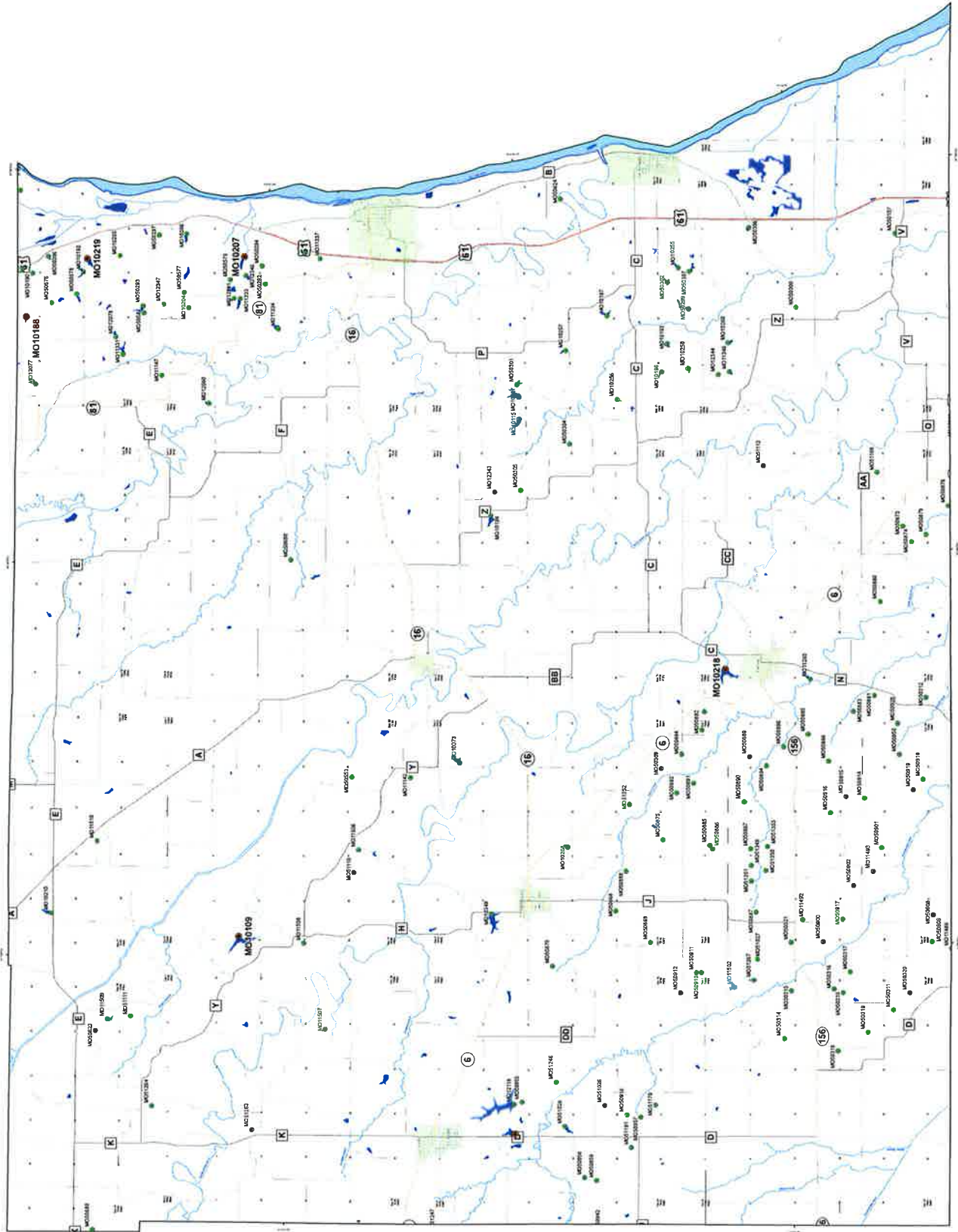
Lewis Co.



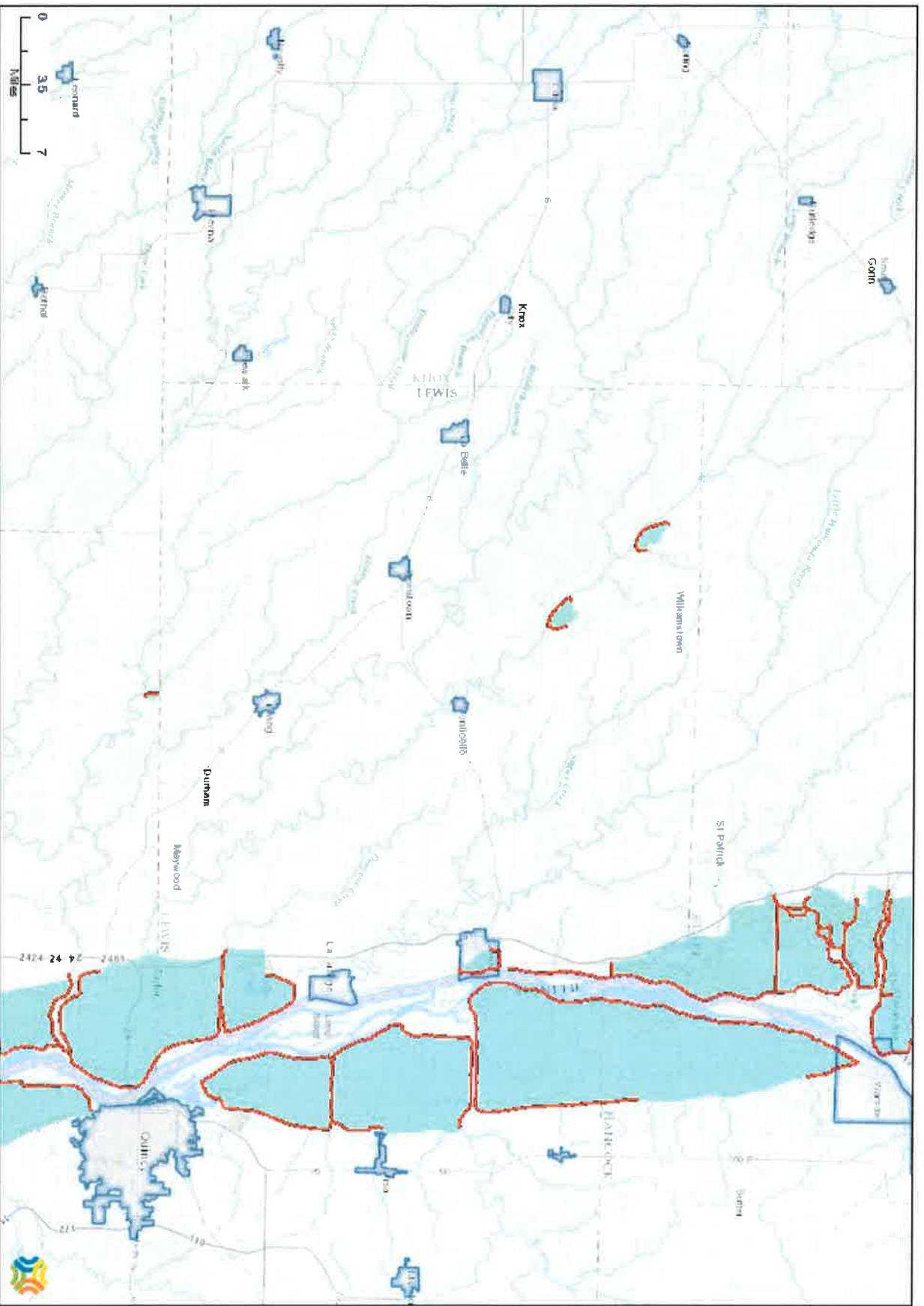
Digital Contour and Cartography by Ken Jones
Water Resources Unit - Salem, MO
March, 2007



Missouri's Wildlife, Wetlands, and Waters are managed by the Missouri Department of Natural Resources. Information on the location of the dam and related features.



Levees in Lewis County Missouri



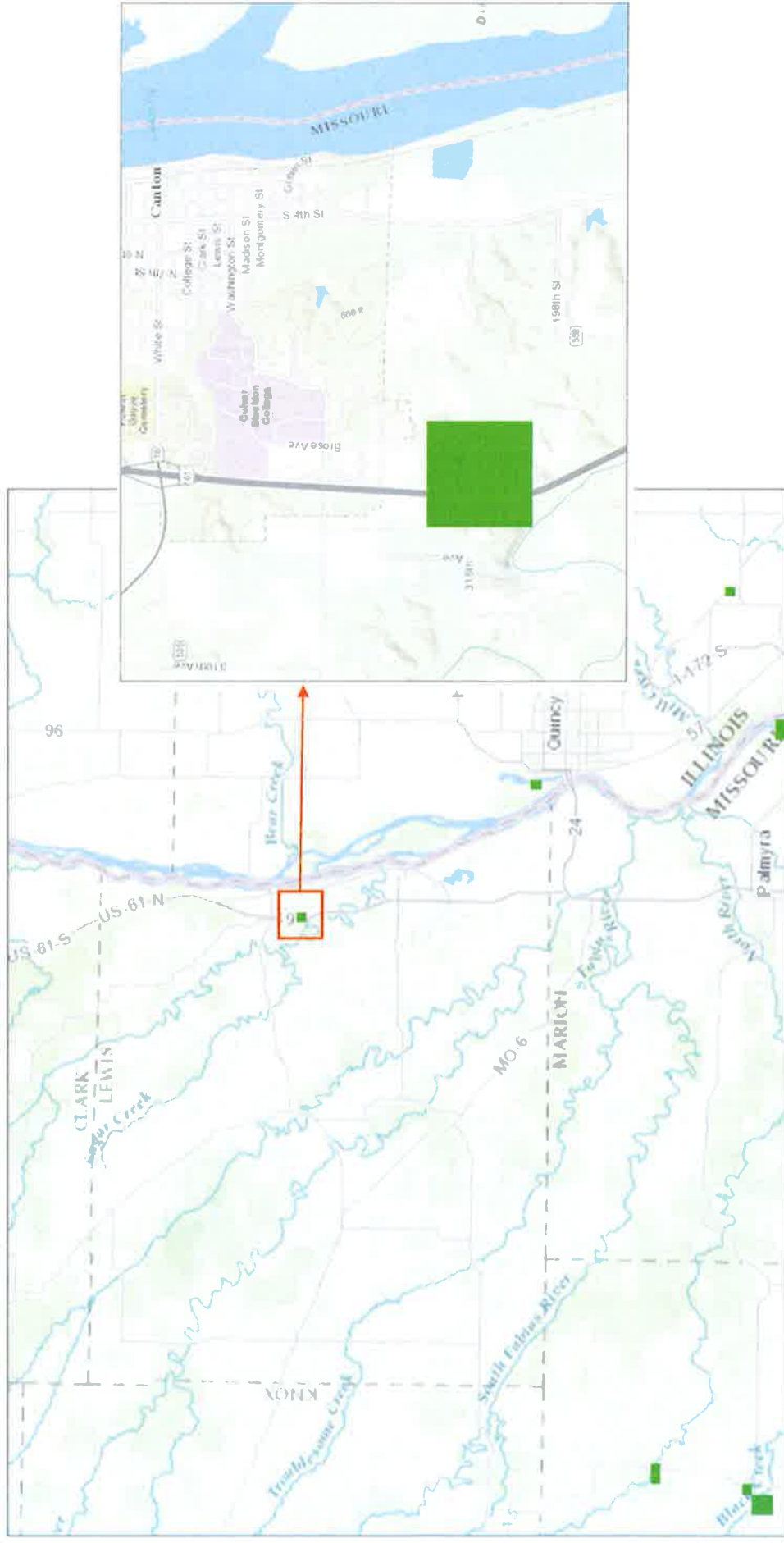
Map Legend

Levees, MO DNR 2008

Levee Protected Areas. MO DNR 2008

U.S. Forest Service - Wildland Urban Interface

This map service, derived from U.S. Forest Service (USFS) data, represents U.S. wildland-urban interface (WUI) areas in high severity forested types in 2000.



Esri, HERE, DeLorme, USGS, NGA, EPA, USDA, NPS | United States Department of Agriculture (USDA), Forest Health Technology Enterprise Team (FHTET)

Action #	Description	Jurisdiction adopting	Status	Note
1.1.1	Education program on emergency	All		
1.2.1	Encourage cities to obtain early warning systems and improved communications systems	LaBelle, Monticello, Ewing		X
1.2.2	Promote use of weather radios by local residents and schools to ensure advanced warning about threatening weather	Canton Lewistown		X
1.2.3	Partner with local radio stations to ensure that appropriate warning is provided to county residents of impending disasters.	All		
1.3.1	Implement tree trimming programs, dead tree removal programs.	All		
1.3.2	Examine potential road and bridge upgrades that would reduce danger to residents during occurrences of natural disasters	All		
2.1.1	Encourage a self-inspection program at critical facilities to assure that the building infrastructure is earthquake, flood, and tornado resistant	All		X
2.1.2	Encourage businesses to develop emergency plans	All		X
2.2.1	Educate residents about the dangers of floodplain development and the benefits of the National Flood Insurance Program.	Lewis County Canton LaGrange		
2.3.1	Encourage minimum standards for building codes in all cities.	All		X
2.3.2	Encourage local governments to develop and implement regulations for securing of hazardous materials tanks and mobile homes to reduce hazards during flooding and high winds.	All		X
3.1.1.	Distribute SEMA brochures at public facilities and events.	All		
3.1.2	Regular press releases from county and city EMD offices concerning hazards, where they strike, frequency and preparation.	Lewis County		
3.2.1	Encourage local residents to purchase weather radios through press releases and brochures	All		X
3.2.2	Ask SEMA mitigation specialists to present information to city councils, county commission, schools, and the Northeast Missouri Regional Planning Commission meetings.	Lewis County		
3.3.1	Cities/county should continually re-evaluate hazard mitigation plan and merge with other community planning	All		
3.3.2	Press releases by cities/county regarding adopted mitigation measures to keep public abreast of changes and/or new regulations.	All		
3.4.1	Encourage county health department and local American Red Cross chapter to use publicity campaigns that make residents aware of proper measures to take during times of threatening conditions.	Lewis County		X
3.4.2	Publicize county or citywide drills.	All		
4.1.1	Encourage joint meetings of different organizations/agencies for mitigation planning.	All		X
4.1.2	Joint training (or drills) between agencies, public & private entities (including schools/businesses).	All		
4.1.3	Pool different agency resources to achieve widespread mitigation planning results.			
4.2.1	Encourage meetings between EMD, city/county, and SEMA to familiarize officials with mitigation planning, implementation, and budgeting.	All		X
5.1.1	Encourage communities to budget for enhanced warning systems.	Ewing, LaBelle, and Monticello.		X
5.1.2	Encourage communities to develop storm water management plans.	All		
5.1.3	Coordinate and integrate hazard mitigation activities, where appropriate, with emergency operations plans and procedures.	Lewis County		
5.1.4	Encourage cities to require stormwater management plans for all new development—both residential and commercial properties.	All		X
5.2.1	Encourage local government to purchase properties in the floodplain as funds become available and convert that land into public space/recreation area.	Canton, LaGrange		X
5.2.2	Encourage communities to discuss zoning repetitive loss properties in the floodplain as open space.	Canton, LaGrange		X
6.1.1	Work with SEMA Region I coordinator to learn about new mitigation funding opportunities.	All		
6.1.2	Structure grant proposals for road/bridge upgrades so that hazard mitigation concerns are also met.	Lewis County		
6.1.3	Work with state/local/federal agencies to include mitigation in all economic and community development projects.	All		
6.1.4	Encourage local governments and schools to budget for mitigation projects.	All		X
6.2.1	Encourage jurisdictions to implement cost-share programs with property owners for mitigation projects that benefit the community as a whole.	All		X
6.2.2	Implement public awareness program about the benefits of hazard mitigation projects, both public and private.	All		
6.3.1	Prioritize mitigation projects, based on cost-effectiveness, and sites facing the greatest threat to life, health and property.	All		
7.1.1	Jurisdictions will continue to require permits for new building in the floodplain and also to comply with all federal laws.	Lewis County, Canton		
7.1.2	<u>New maps are coming out in 2011 and with new maps</u> there will be ordinances adopted to reflect the new mapping standards. Will continue to participate in mapping meetings. Will seek CFM certification for floodplain managers Will request LOMR and LOMA if necessary Will acquire RLP and SRLP with funding assistance. Will continue to monitor open space to ensure compliance with buyout requirements. Continue to have a working relationship with SEMA regarding floodplain management	Lewis County, Canton		X

Name	Title	Jurisdiction represented (if any)	Mileage to and from meeting	Hourly pay rate
Steve McKenzie	Mayor	City of Lewisburg	7	15.00
Jim Sargent	Board member	City of Monticello		
Dave Keith	Emergency manager	Lewis County		12.75
Gretchen Keith	Emergency manager	Lewis County		16.27
Amy Turpin	Mayor	City of LaBelle		
Roy Lewis	Alderman			
Ottie Lewis	Collector			
John French	Superintendent	Lewis County C-1 School District	15 miles	?
Derek Weber	Nemo RPC			
Cindy Kell	City of Canton	City of Canton	15 miles	

Date/Time/Location Feb 13, 2018 / 5:30 PM / Lewis Co. Courthouse

[illegible]

TEXTCASTER SIGN-UP

[illegible]

TEXTCASTER SIGN-UP

[illegible]

AGENDA

- I Introductions
- II Quick overview of the FAQ (aimed at those not present at the kick-off meeting.)
– reminder of participation requirements. RESTATE THE IMPORTANCE OF TURNING IN THE COMPLETE QUESTIONNAIRES
- III Discussion of Mitigation Goals in the past plan – discussion of changes, additions, ~~subtractions.~~ *deletions*
- IV Overview of Hazards, per updated Risk Analysis: open discussion
Hazards in the Old Plan
New Hazards considered
- V Discussion of specific ☒ Vulnerabilities in Lewis County, per updated statistics -open discussion
- VI Discussion of the previous plans actions (See 11 x 17 plan action overview handout)
- VII Overview of the kind of actions appropriate for inclusion in the plan update
- VIII Proposals for Plan Actions, open discussion
- IX Set the time and place for Meeting #2

Emp 7:30 PM

Action #	Description	Jurisdiction adopting	Status	Note
1.1.1	Education program on emergency preparedness	All		
1.2.1	Encourage cities to obtain early warning systems and improved communications systems	LaBelle, Monticello, Ewing, Canton, LaGrange	X	
1.2.2	Promote use of weather radios by local residents and schools to ensure advanced warning about threatening weather	Canton, LaGrange	X	
1.2.3	Partner with local radio stations to ensure that appropriate warning is provided to county residents of impending disasters.	All		
1.3.1	Implement tree trimming programs, dead tree removal programs.	All		
1.3.2	Encourage potential road and bridge upgrades that would reduce danger to residents during occurrences of natural disasters	All		
2.1.1	Encourage a self-inspection program at critical facilities to assure that the building infrastructure is earthquake, flood, and tornado resistant	All		
2.1.2	Encourage businesses to develop emergency plans	All		
2.2.1	Educate residents about the dangers of floodplain development and the benefits of the National Flood Insurance Program.	Lewis County, Canton, LaGrange	X	
2.3.1	Encourage minimum standards for building codes in all cities.	All		
2.3.2	Encourage local governments to develop and implement regulations for securing of hazardous materials tanks and mobile homes to reduce hazards during flooding and high winds.	All	X	
3.1.1	Distribute SEMA brochures at public facilities and events.	All		
3.1.2	Regular press releases from county and city EMD offices concerning hazards, where they strike, frequency and preparation.	Lewis County		
3.2.1	Encourage local residents to purchase weather radios through press releases and brochures	All	X	
3.2.2	Ask SEMA mitigation specialists to present information to city councils, county commission, schools, and the Northeast Missouri Regional Planning Commission meetings.	Lewis County		
3.3.1	Cities/county should continually re-evaluate hazard mitigation plan and merge with other community planning	All		
3.3.2	Press releases by cities/county regarding adopted mitigation measures to keep public abreast of changes and/or new regulations.	All		
3.4.1	Encourage county health department and local American Red Cross chapter to use publicly campaigns that make residents aware of proper measures to take during times of threatening conditions.	Lewis County	X	
3.4.2	Publicize county or citywide drills.	All		
4.1.1	Encourage joint meetings of different organizations/agencies for mitigation planning.	All		
4.1.2	Joint training (or drills) between agencies, public & private entities (including schools/businesses).	All	X	
4.1.3	Pool different agency resources to achieve widespread mitigation planning results.	All		
4.2.1	Encourage meetings between EMD, city/county, and SEMA to familiarize officials with mitigation planning, implementation, and budgeting.	All	X	
5.1.1	Encourage communities to budget for enhanced warning systems.	Ewing, LaBelle, and Monticello.	X	
5.1.2	Encourage communities to develop storm water management plans.	All		
5.1.3	Coordinate and integrate hazard mitigation activities, where appropriate, with emergency operations plans and procedures.	Lewis County		
6.1.1	Encourage cities to require stormwater management plans for all new development—both residential and commercial properties.	All	X	
6.1.2	Encourage local government to purchase properties in the floodplain as funds become available and convert that land into public space/recreation area.	Canton, LaGrange	X	
6.1.3	Encourage communities to discuss zoning repetitive loss properties in the floodplain as open space.	Canton, LaGrange	X	
6.1.4	Work with SEMA Region I coordinator to learn about new mitigation funding opportunities.	All		
6.1.5	Structure grant proposals for road/bridge upgrades so that hazard mitigation concerns are also met.	Lewis County		
6.1.6	Work with state/local/federal agencies to include mitigation in all economic and community development projects.	All		
6.1.7	Encourage local governments and schools to budget for mitigation projects.	All	X	
6.2.1	Encourage jurisdictions to implement cost-share programs with property owners for mitigation projects that benefit the community as a whole.	All	X	
6.2.2	Implement public awareness program about the benefits of hazard mitigation projects, both public and private.	All		
6.3.1	Prioritize mitigation projects, based on cost-effectiveness, and sites facing the greatest threat to life, health and property.	All		
7.1.1	Jurisdictions will continue to require permits for new building in the floodplain and also to comply with all federal laws.	Lewis County, Canton		
7.1.2	New maps are coming out in 2011 and with new maps there will be ordinances adopted to reflect the new mapping standards. Will continue to participate in mapping meetings. Will seek CHM certification for floodplain managers. Will request CHM and FEMA if necessary. Will request RUP and SCLP with funding assistance. Will continue to monitor open space to ensure compliance with buyout requirements. Continue to have a working relationship with SEMA regarding floodplain management.	Lewis County, Canton	X	

FEMA Disaster Declarations that included Lewis County, Missouri; 1990-2015

Disaster Number	Description	Incident Period	Individual Assistance (IA) Public Assistance (PA)	
			Individual Assistance (IA)	Public Assistance (PA)
995	Flooding, Severe Storm	June to	Both	
1054	Severe Storms, Tornadoes,	May to June,	Both	
1403	Ice Storm	January to	Both	
1463	Severe Storms, Tornadoes,	May, 2003	Both	
1773	Severe Storms and Flooding	June to	Both	
1809	Severe Storms, Flooding and	September,	Both	
1847	Severe Storms, Tornadoes,	May, 2009	Both	
1934	Severe Storms, Tornadoes	June to July,	Both	
4130	Severe Weather, Flooding,	May to June,	Both	
4200	Severe Weather, Flooding,	September,	Both	
4238	Flash Flooding and Severe	August,	Both	

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

Lewis County Hazards Identified by Jurisdiction

Jurisdiction	Dam Failure	Drought	Earthquake	Extreme Heat	Wild land Fires	Flooding	Levee Failure	Severe Winter Weather	Thunderstorm/Lightning/Hail	/High Wind	Tornado	CBRNE Attack	Civil Disorder	Cyber Disruption	Hazardous Materials Release	Mass Transportation Incident	Public Health/Environmental	Emergency	Special Events	Terrorism	Utility Failure
Lewis County	x								x		x	x	x	x	x	x	x	x	x	x	x
Canton		x	x	x		x	x	x	x		x	x	x	x	x	x	x	x	x	x	x
Ewing		x	x	x				x	x		x	x	x	x	x	x	x	x	x	x	x
La Belle		x	x	x				x	x		x	x	x	x	x	x	x	x	x	x	x
La Grange		x	x	x		x	x	x	x		x	x	x	x	x	x	x	x	x	x	x
Lewistown		x	x	x				x	x		x	x	x	x	x	x	x	x	x	x	x
Monticello		x	x	x				x	x		x	x	x	x	x	x	x	x	x	x	x
Canton R-V School District		x	x	x		x	x	x	x		x	x	x	x	x	x	x	x	x	x	x
(Canton)																					
Lewis County C-1 School District		x	x	x		x		x	x		x	x	x	x	x	x	x	x	x	x	x
(Ewing)					x	x															

- **Structure Fires were excluded** as they are considered a well mitigated hazard, with a complex infrastructure already in place to handle both routine and extraordinary incidents.
- **Sinkholes were excluded** as the current DNR map indicates no significant risk of this hazard in Lewis County.

Hazard	25 Yr Record Occurrences 1990-2015	Recorded Injuries	Recorded deaths	Recorded damages (Property & Crop)	Hazard Rating	
					Probability of Occurrence Low / Moderate/ High	Potential Severity Low/Moderate/High
Dam Failure	0	0	0	0	Low	Moderate
Drought *	6	0	0	0	24%: Low Moderate	High
Earthquake	0	0	0	0	Low	High
Extreme Heat *	33	0	0	0	132%: High	Moderate
Heat Excessive Heat	18 15	0 0	0 0	0 0		
Wildland Fire	7	0	0	78.2 acres burned	28%: Moderate	Low
Flooding *	40	0	1	9,942 M	160%: High	High
Riverine Flash	17 23	0 0	1 1	9,926 M 16 K		
Levee Failure	0	0	0	0	Low	High
Severe Winter Weather *	41	0	0	0	164%: High	Low
Blizzard	1	0	0	0		
Cold/Wind-chill	3	0	0	0		
Extreme Cold/ Wind-chill	1	0	0	0		
Frost/Freeze	1	0	0	0		
Ice Storm	6	0	0	0		
Sleet	0	0	0	0		
Winter Storm	26	0	0	0		
Winter Weather	3	0	0	0		
Thunderstorm *	82	5	0	85 K	328%: High	Moderate
Lightning	3	3	0	0		
Hail	74	2	0	85 K		
High Winds	5	0	0	0		
Tornado *	9	0	9	7,330 M	36%: Moderate	High

* Data source: NCDC Storm Event Database

Hazard	25 Yr Record Occurrences 1990-2015	Recorded Injuries	Recorded deaths	Recorded damages (Property & Crop)	Hazard Rating	
					Probability of Occurrence Low / Moderate/ High	Potential Severity Low/Moderate/High
CBRNE Attack	No Data	No Data	No Data	No Data	Unable to quantify Low	High
Civil Disorder	No Data	No Data	No Data	No Data	Unable to quantify Low	Unable to quantify Moderate
Cyber Disruption	No Data	No Data	No Data	No Data	Unable to quantify Low	Unable to quantify Moderate
Hazardous Materials Release	No Data	No Data	No Data	No Data	High	High
Mass Transportation Incident	No Data	No Data	No Data	No Data	High	High
Public Health/ Environmental Emergencies	No Data	No Data	No Data	No Data	Low	High
Special Events	No Data	No Data	No Data	No Data	Moderate	Moderate
Terrorism	No Data	No Data	No Data	No Data	Low	High
Utility Failure	No Data	No Data	No Data	No Data	High	High
Electromagnetic Pulse	No Data	No Data	No Data	No Data	Low	High

Lewis County Hazard Mitigation Plan Update 2018 FAQ

What is Hazard Mitigation?

Hazard Mitigation is "any action taken to reduce or eliminate the long-term risks to human life and property from Natural Hazards." A good example is this: Rebuilding a bridge destroyed by flooding to its original design **IS NOT** mitigation, it's merely replacement. Rebuilding the bridge with structural modifications that make it more resistant to flood damage in the future **IS** Hazard Mitigation.

What is a Hazard Mitigation Plan?

A Hazard Mitigation Plan is a document created by a committee made up of stakeholders in the community (In this case, Lewis County). During the planning process, this committee looks at information about the potential impacts of natural disasters and develops long-term strategies for protecting people and property in future hazard events, by developing feasible and cost effective mitigation projects.

Doesn't Lewis County Already Have a Hazard Mitigation Plan?

Lewis County does currently have a Hazard Mitigation Plan in effect – however, FEMA requires that to remain current, Hazard Mitigation Plans must be updated on a five year schedule.

Why do we need a Hazard Mitigation Plan?

State, Tribal, and Local governments are required to develop a Hazard Mitigation Plan as a condition of receiving certain types of non-emergency disaster assistance (most specifically the Hazard Mitigation Grant Program).

How is Hazard Mitigation Planning Done?

In a broad sense, it's very much like land use or emergency response planning. A planning committee is created, information is compiled and analyzed, risks and assets are identified, and a plan is formulated to address those risks to the best of the communities' economic and administrative ability. This plan is then adopted by participating jurisdictions (including school districts and educational institutions).

For more detailed information on Hazard Mitigation Planning, you may visit the Missouri State Emergency Management Agency's webpage on Hazard Mitigation: http://sema.dps.mo.gov/programs/mitigation_management.php. Information on Lewis County's planning efforts will be provided on the **Lewis County Mo Hazard Mitigation Planning Committee Facebook page** and meeting reminders and other notifications will be provided to committee members via email and textcaster.

Who's on the Hazard Mitigation Committee?

At a minimum, the committee must be composed of one representative from each of the participating jurisdictions that wishes to adopt and be covered under the finished plan. Ideally, the committee is also populated with people from all the various sectors of the community, from public safety professionals to ordinary citizens. In addition, it's best if the communities seek input from neighboring communities outside their own jurisdictions. FEMA has drastically increased its focus on public participation over the years, and any jurisdiction that hasn't met the minimum level of required participation will be ineligible to adopt the plan, and will therefore be ineligible for certain types of funding.

When will the Hazard Mitigation Committee Meet?

There will be a series of three meetings, besides this initial kick-off meeting.

Kick-Off	Jan 16, 2018	Committee core group meeting, overview of Hazard mitigation planning, hand out materials and "homework". Sign up for text caster, brief discussion of the face book page.
Meeting 1	THIS MEETING	A short repeat of the overview aimed at attendees who did not attend the kick off will be followed by a brief review of the old plan and discussion about updated demographic and hazard information.
Meeting 2	TBA	New Plan Development – what elements of the old plan should remain, which should be altered, what should be added. What new mitigation has been proposed for the new plan
Meeting 3	TBA	Overview of the rough draft of the completed plan, review of the maintenance and update process, discussion of resolutions of adoption.
Draft Sub	TBA	1 st (and hopefully only) Draft submission

Participation in the planning process is vital for each jurisdiction. Any questions or concerns about the plan should be directed to:

Derek Webber, Director

Northeast Missouri Regional Planning Commission
121 S. Cecil St. Memphis, Missouri 63555

derekweber@nemorpc.org (660) 465-7281 x 1

Matt Walker, Hazard Mitigation Planner

Green Hills Regional Planning Commission
1104 Main St. Trenton, MO 64683

mdw@ghrpc.org (660) 359-5636 x 22

City of Canton Flood Hazard Map



Map Legend

National Flood Hazard Layer - Flood Hazard Zones, FEMA June 2015

- Floodway
- 1% Annual Chance (100 Year) Flood Zone
- 0.2% Annual Chance (500 Year) Flood Zone
- Area with Reduced Risk Due to Levee
- Future Conditions 1% Annual Chance
- Area of Undetermined Hazard
- Water








Community Commons, 11/17/2016

LaGrange Flood Hazard Map



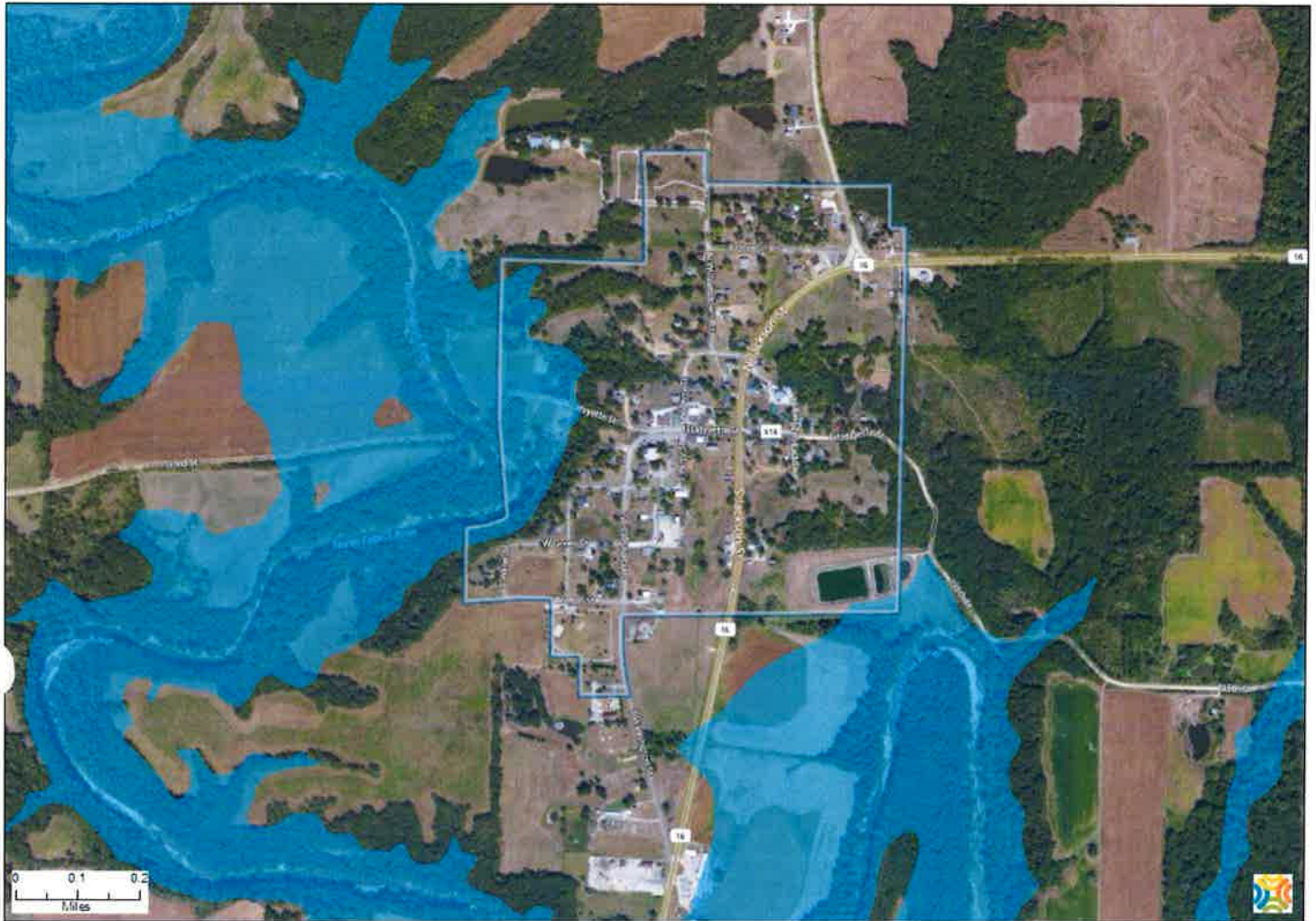
Map Legend

National Flood Hazard Layer - Flood Hazard Zones, FEMA June 2015

-  Floodway
-  1% Annual Chance (100 Year) Flood Zone
-  0.2% Annual Chance (500 Year) Flood Zone
-  Area with Reduced Risk Due to Levee
-  Future Conditions 1% Annual Chance
-  Area of Undetermined Hazard
-  Water








Community Commons, 11/17/2016

Monticello Flood Hazard Map



Map Legend

National Flood Hazard Layer - Flood Hazard Zones, FEMA June 2015

-  Floodway
-  1% Annual Chance (100 Year) Flood Zone
-  0.2% Annual Chance (500 Year) Flood Zone
-  Area with Reduced Risk Due to Levee
-  Future Conditions 1% Annual Chance
-  Area of Undetermined Hazard
-  Water

Community Commons, 11/17/2016

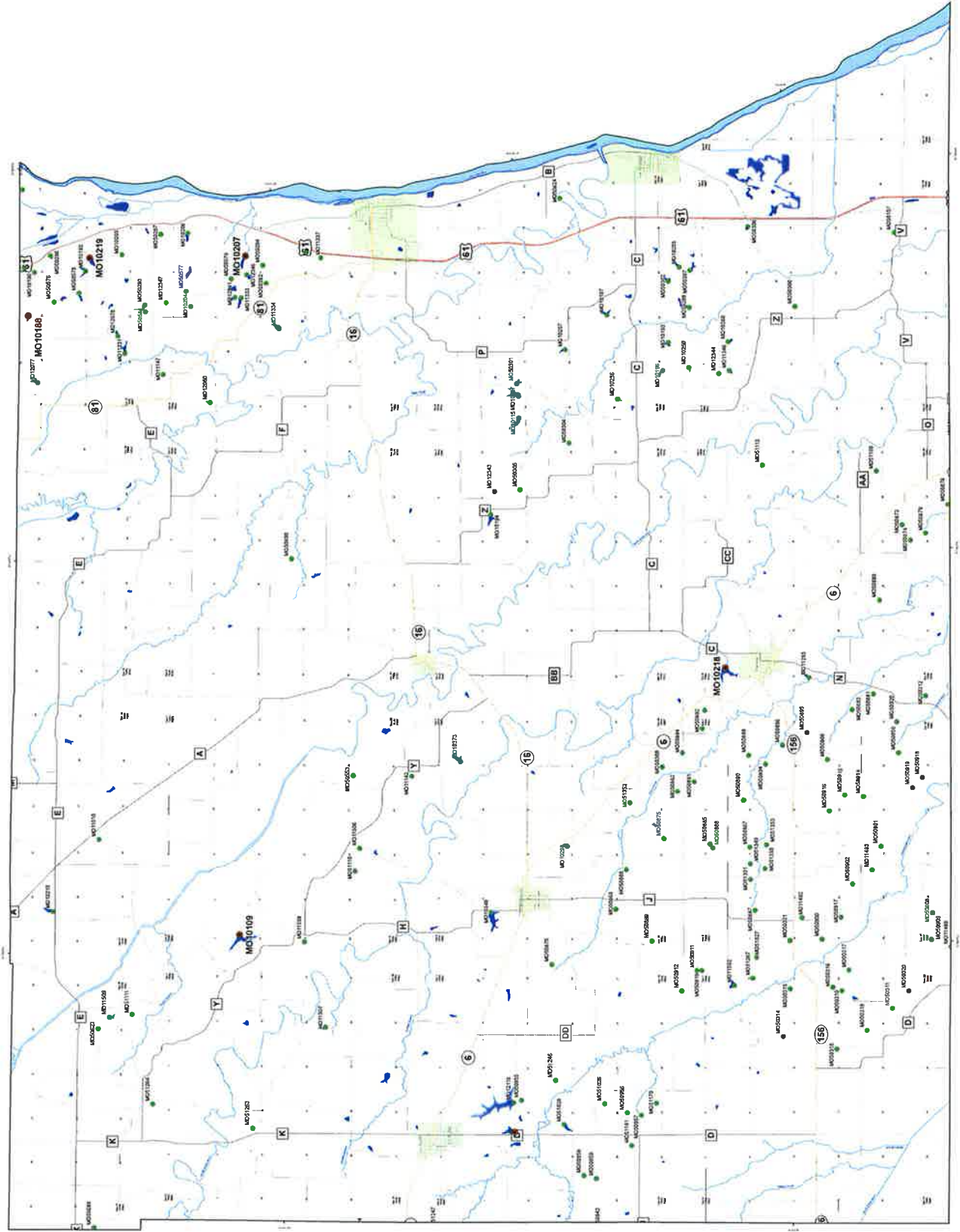
Lewis Co.



Digital Compilation and Cartography by: Keith Jones
 Water Resources Center - SSM, MO
 10/01/2007



Division of Water Resources
 The Missouri Department of Natural Resources
 1000 North Lincoln
 Jefferson, Missouri 64601-1000
 Phone: (618) 251-2000
 Fax: (618) 251-2001
 E-mail: dnr@dnr.mo.gov





Missouri
Department of
Natural Resources

Regulated Dam Report by County



LEWIS

<u>ID Number</u>	<u>Location</u>	<u>Year Complete</u>	<u>Height (ft)</u>	<u>Length (ft)</u>	<u>Drainage Area (acre)</u>	<u>Lake Area (acre)</u>	<u>Hazard Class</u>	<u>Permit Number</u>
BUCK & DOE RUN SITE #3								
MO10188	S21 T63N R06W	1973	36.00	600.00	1,338.00	9.00	3	R-434
BUCK, DOE RUN #4 DAM								
MO10219	S27 T63N R06W	1973	48.00	400.00	110.00	11.00	3	R-347
BUCK-DOE RUN WTRSHD #6 DAM								
MO10207	S15 T62N R06W	1970	46.00	500.00	740.00	9.00	2	R-437
DEER RIDGE COMMUNITY LAKE DAM								
MO10109	S18 T62N R08W	1960	38.00	500.00	608.00	48.00	2	R-291
EWING LAKE DAM								
MO10218	S06 T60N R07W	1967	39.00	595.00	655.00	45.00	2	R-160
LA BELLE OLD CITY LAKE DAM								
MO10372	S16 T61N R09W	1961	35.00	950.00	141.00	17.00	2	R-226

SUMMARY

Regulated Dams: 6

Total Dams: 6

Total:

3,592.00

139.00

Average:

598.67

23.17

Missouri Dam Report by County

LEWIS

ID Number	Location	Year Complete	Height (ft)	Length (ft)	Drainage Area (acre)	Lake Area (acre)	Hazard Class	Permit Number
BAKER DAM								
MO10208	S21 T61N R08W	1972	10.00	Unknown	25.00	7.00	3	
BELLEVUE LAKE DAM								
MO12118	S16 T61N R09W	1979	33.00	Unknown	1,318.00	112.00	3	
BOZARTH DAM								
MO50689		1996	28.00	205.00	0.00	2.00		
BUCK & DOE RUN #69 DAM								
MO12347	S04 T62N R06W	1980	25.00	Unknown	73.00	3.00		
BUCK & DOE RUN SITE #3								
MO10188	S21 T63N R06W	1973	36.00	600.00	1,338.00	9.00	3	R-434
BUCK & DOE RUN SITE #62 DAM								
MO12346	S15 T62N R06W	1980	27.00	Unknown	29.00	5.00		
BUCK & DOE RUN WATERSHED DAM 28								
MO50293		1976	25.00	625.00	0.00	9.00		
BUCK & DOE RUN WATERSHED DAM 35								
MO50295		1972	22.00	300.00	0.00	4.00		
BUCK & DOE RUN WATERSHED DAM 37								
MO50296	S22 T63N R06W	1972	32.00	200.00	85.00	1.00	3	
BUCK & DOE RUN WATERSHED DAM 41								
MO50294	S15 T62N R06W	1976	21.00	300.00	204.00	4.00		
BUCK & DOE RUN WATERSHED DAM 47								
MO50297	S02 T62N R06W	1976	27.00	270.00	173.00	2.00		
BUCK & DOE RUN WTRSD SITE #25 DAM								
MO10192	S27 T63N R06W	1972	24.00	Unknown	160.00	6.00	2	
BUCK & DOE RUN WTRSHD SITE #3 DAM								
MO10191	S22 T63N R06W	1970	22.00	Unknown	210.00	5.00	3	
BUCK & DOE RUN WTRSHD SITE #3 DAM								
MO10205	S34 T63N R06W	1972	26.00	Unknown	190.00	4.00	2	



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Missouri Dam Report by County



Regulated
Agriculture Exempt

LEWIS

ID Number	Location	Year Complete	Height (ft)	Length (ft)	Drainage Area (acre)	Lake Area (acre)	Hazard Class	Permit Number
BUCK-DOE RUN WATERSHED STRUCTURE #27B								
MO12081	S09 T62N R06W	1976	28.00	Unknown	95.00	3.00	3	
BUCK-DOE RUN WATERSHED STRUCTURE #42								
MO11335	S22 T62N R06W	1974	26.00	Unknown	300.00	4.00	2	
BUCK-DOE RUN WTRSHD #6 DAM								
MO10207	S15 T62N R06W	1970	46.00	500.00	740.00	9.00	2	R-437
CATFISH LAKE DAM								
MO11509	S28 T63N R08W	1977	19.00	Unknown	600.00	5.00	3	
CITY OF LEWISTOWN DAM								
MO10349	S08 T61N R08W	1965	25.00	Unknown	400.00	35.00	2	
CLARK LAKE DAM								
MO11334	S16 T62N R06W	1975	21.00	Unknown	70.00	9.00	3	
DEER RIDGE COMMUNITY LAKE DAM								
MO10109	S18 T62N R08W	1960	38.00	500.00	608.00	48.00	2	R-291
DIENELL DAM								
MO51111		2002	30.00	348.00	0.00	3.00		
DOSCHER BROS DAM								
MO11493	S28 T60N R08W	1953	25.00	Unknown	23.00	2.00	3	
DURGENS CREEK #125 DAM								
MO12343	S11 T61N R07W	1982	27.00	Unknown	93.00	3.00		
DURGENS CREEK #133 DAM								
MO12344	S05 T60N R06W	1981	30.00	Unknown	41.00	5.00		
DURGENS CREEK WATERSHED #23 DAM								
MO10250	S05 T60N R06W	1971	30.00	Unknown	210.00	6.00	3	
DURGENS CREEK WATERSHED #33 DAM								
MO10196	S32 T61N R06W	1970	30.00	Unknown	160.00	6.00	2	
DURGENS CREEK WATERSHED #34 DAM								
MO10256	S30 T61N R06W	1972	20.00	Unknown	280.00	8.00	3	



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Regulated
Agriculture Exempt

LEWIS

<u>ID Number</u>	<u>Location</u>	<u>Year Complete</u>	<u>Height (ft)</u>	<u>Length (ft)</u>	<u>Drainage Area (acre)</u>	<u>Lake Area (acre)</u>	<u>Hazard Class</u>	<u>Permit Number</u>
DURGENS CREEK WATERSHED DAM LT-104								
MO50300	S16 T60N R06W	1981	29.00	445.00	69.00	5.00		
DURGENS CREEK WATERSHED DAM LTS-102								
MO50301	S17 T61N R06W	1980	22.00	540.00	72.00	5.00	3	
DURGENS CREEK WATERSHED DAM LTS-105								
MO50304	S24 T61N R07W	1981	27.00	340.00	73.00	5.00	3	
DURGENS CREEK WATERSHED DAM LTS-120								
MO50302	S34 T61N R06W	1981	30.00	260.00	59.00	5.00	3	
DURGENS CREEK WSHD LAKE DAM 1 B								
MO10115	S18 T61N R06W	1969	24.00	Unknown	640.00	14.00	3	
EVANS DAM								
MO51109		2002	30.00	550.00	0.00	2.00		
EWING LAKE DAM								
MO10218	S06 T60N R07W	1967	39.00	595.00	655.00	45.00	2	R-160
GEISENDORFER LAKE DAM								
MO11142	S35 T62N R08W	1975	23.00	Unknown	70.00	8.00	3	
GRASSY CREEK WATERSHED DAM G-29								
MO50870		1998	24.00	600.00	0.00	5.00		
GRASSY CREEK WATERSHED DAM G-38								
MO50869		1998	25.00	700.00	0.00	7.00		
GRASSY CREEK WATERSHED DAM G-39								
MO50868		1998	27.00	480.00	0.00	4.00		
GRASSY CREEK WATERSHED DAM G-44								
MO50888		1990	26.00	470.00	0.00	4.00		
GRASSY CREEK WATERSHED DAM G-46								
MO50887		1991	25.00	480.00	0.00	5.00		
GRASSY CREEK WATERSHED DAM G-47								
MO51349		2005	26.00	525.00	1.00	10.00		

Missouri Dam Report by County

Lewis

<u>ID Number</u>	<u>Location</u>	<u>Year Complete</u>	<u>Height (ft)</u>	<u>Length (ft)</u>	<u>Drainage Area (acre)</u>	<u>Lake Area (acre)</u>	<u>Hazard Class</u>	<u>Permit Number</u>
GRASSY CREEK WATERSHED DAM G- 63 MO50889		1991	23.00	470.00	1.00	10.00		
GRASSY CREEK WATERSHED DAM G- 64 MO50884		1993	33.00	730.00	0.00	5.00		
GRASSY CREEK WATERSHED DAM G- 65 MO50892		1990	27.00	409.00	0.00	6.00		
GRASSY CREEK WATERSHED DAM G- 66 MO50893		1990	25.00	327.00	0.00	4.00		
GRASSY CREEK WATERSHED DAM G- 73 MO50880		1994	27.00	480.00	0.00	5.00		
GRASSY CREEK WATERSHED DAM G- 74 MO50874		1996	25.00	460.00	1.00	8.00		
GRASSY CREEK WATERSHED DAM G- 76 MO50879		1993	26.00	430.00	0.00	4.00		
GRASSY CREEK WATERSHED DAM G- 77 MO50873		1996	24.00	540.00	0.00	4.00		
GRASSY CREEK WATERSHED DAM G- 79 MO51353		2005	27.00	395.00	0.00	5.00		
GRASSY CREEK WATERSHED DAM G- 82 MO50894		1990	23.00	333.00	0.00	5.00		
GRASSY CREEK WATERSHED DAM G- 83 MO50896		1990	22.00	411.00	0.00	5.00		
GRASSY CREEK WATERSHED DAM G- 84 MO50866		1999	25.00	590.00	1.00	10.00		
GRASSY CREEK WATERSHED DAM G- 85 MO50895		1990	31.00	434.00	0.00	6.00		
GRASSY CREEK WATERSHED DAM G- 87 MO50883		1993	27.00	480.00	0.00	4.00		



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Agriculture Exempt

LEWIS

<u>ID Number</u>	<u>Location</u>	<u>Year Complete</u>	<u>Height (ft)</u>	<u>Length (ft)</u>	<u>Drainage Area (acre)</u>	<u>Lake Area (acre)</u>	<u>Hazard Class</u>	<u>Permit Number</u>
LUTTRELL FARMS DAM								
MO10373	S02 T61N R08W	1956	23.00	Unknown	240.00	16.00	3	
MARKS LAKE DAM								
MO11147	S05 T62N R06W	1968	21.00	Unknown	140.00	7.00	3	
MCCUTCHAN DAM								
MO50690		1996	26.00	300.00	0.00	2.00		
MILLER DAM								
MO51170		2003	27.00	376.00	0.00	2.00		
MISSISSIPPI RIVER LOCK & DAM #20								
MO10303	S25 T62N R06W	1935	37.00	Unknown	0.00	0.00	3	
MURPHY LAKE DAM								
MO10210	S20 T63N R08W	1972	25.00	Unknown	420.00	10.00	3	
NEER DAM								
MO50624		1994	30.00	343.00	0.00	2.00		
ROBERTS DAM								
MO51112		2002	29.00	339.00	0.00	2.00		
SCHMITZ DAM								
MO51110		2002	26.00	244.00	0.00	2.00		
SHARPE LAKE DAM								
MO11502	S12 T60N R09W	1970	19.00	Unknown	50.00	6.00	3	
STICE LAKE DAM								
MO11508	S19 T62N R08W	1958	25.00	Unknown	19.00	2.00	3	
TOO SMALL								
MO11346	S08 T60N R06W	1970	25.00	Unknown	130.00	3.00		
TROUBLESOME CREEK WATERSHED DAM R-27								
MO50312		1988	22.00	450.00	0.00	4.00		
TROUBLESOME CREEK WATERSHED DAM S-27								
MO50955		2000	20.00	485.00	0.00	3.00		



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LEWIS

<u>ID Number</u>	<u>Location</u>	<u>Year</u> <u>Complete</u>	<u>Height</u> <u>(ft)</u>	<u>Length</u> <u>(ft)</u>	<u>Drainage</u> <u>Area (acre)</u>	<u>Lake Area</u> <u>(acre)</u>	<u>Hazard</u> <u>Class</u>	<u>Permit</u> <u>Number</u>
TROUBLESOME CREEK WATERSHED DAM S- 55								
MO50316		1988	24.00	580.00	1.00	10.00		
TROUBLESOME CREEK WATERSHED DAM S- 56								
MO50310		1988	23.00	430.00	0.00	5.00		
TROUBLESOME CREEK WATERSHED DAM S- 57								
MO50317		1988	22.00	400.00	0.00	4.00		
TROUBLESOME CREEK WATERSHED DAM S- 58								
MO50318		1988	26.00	637.00	0.00	4.00		
TROUBLESOME CREEK WATERSHED DAM S- 59								
MO50319		1988	22.00	510.00	0.00	4.00		
TROUBLESOME CREEK WATERSHED DAM S- 61								
MO50311		1988	23.00	460.00	0.00	4.00		
TROUBLESOME CREEK WATERSHED DAM S- 62								
MO50320		1988	23.00	500.00	0.00	4.00		
TROUBLESOME CREEK WATERSHED DAM S- 65								
MO51027		2001	27.00	660.00	1.00	9.00		
TROUBLESOME CREEK WATERSHED DAM S- 66								
MO50321		1988	25.00	480.00	0.00	4.00		
TROUBLESOME CREEK WATERSHED DAM S- 67								
MO50900		1994	26.00	520.00	0.00	5.00		
TROUBLESOME CREEK WATERSHED DAM S- 68								
MO50917		1994	33.00	280.00	0.00	6.00		
TROUBLESOME CREEK WATERSHED DAM S- 74								
MO50916		1994	22.00	540.00	0.00	4.00		
TROUBLESOME CREEK WATERSHED DAM S- 75								
MO50915		1994	24.00	545.00	0.00	5.00		
TROUBLESOME CREEK WATERSHED DAM S- 76								
MO50914		1994	22.00	390.00	0.00	4.00		



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Regulated
Agriculture Exempt

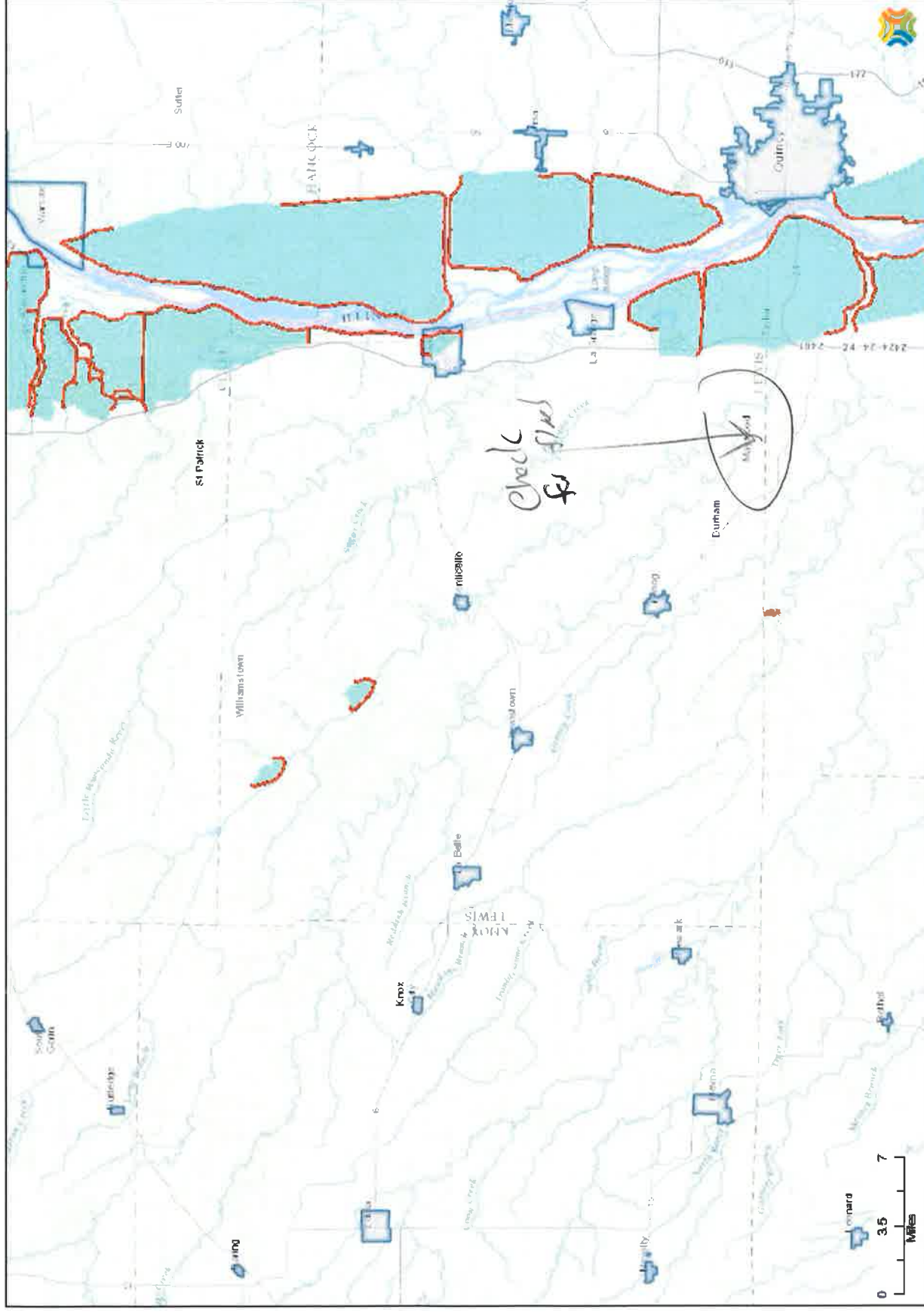
LEWIS

<u>ID Number</u>	<u>Location</u>	<u>Year Complete</u>	<u>Height (ft)</u>	<u>Length (ft)</u>	<u>Drainage Area (acre)</u>	<u>Lake Area (acre)</u>	<u>Hazard Class</u>	<u>Permit Number</u>
UHLMEYER LAKE DAM								
MO12080	S07 T62N R06W	1800	25.00	Unknown	200.00	4.00	3	
WHAN FARMS DAM								
MO51263		2004	28.00	400.00	0.00	6.00		
WILLER LAKE DAM								
MO12078	S33 T62N R06W	1973	22.00	Unknown	110.00	8.00	3	
WILLER LAKE DAM-SEC 20								
MO12077	S20 T63N R06W	1970	17.00	Unknown	90.00	8.00	3	
WILLER LAKE DAM-SEC 32								
MO11331	S32 T63N R06W	1972	17.00	Unknown	400.00	13.00	3	
WURTZBERGER DAM								
MO50623		1994	29.00	383.00	0.00	7.00		
WURTZBURGER LAKE DAM								
MO11510	S28 T63N R08W	1965	20.00	Unknown	50.00	8.00	3	

SUMMARY

Regulated Dams: 6	Total:	19,938.00	1,151.00
Total Dams: 157	Average:	25.99	7.33

Levees in Leas County Missouri



Map Legend

Levees, MO DNR 2008

Levee Protected Areas, MO DNR 2008

U.S. Forest Service - Wildland Urban Interface

This map service, derived from U.S. Forest Service (USFS) data, represents U.S. wildland-urban interface (WUI) areas in high severity forested types in 2000.



Esri, HERE, DeLorme, USGS, NGA, EPA, USDA, NPS | United States Department of Agriculture (USDA), Forest Health Technology Enterprise Team (FHTET)

Name	Title	Jurisdiction represented (if any)	Mileage to and from meeting
<i>Mr. Wake</i>	<i>Owner</i>	<i>CHRPC/MEMURPC</i>	
Derek Weber	planner	NEMO RPC	
Danell Sci'fres	<i>Mayor</i>	<i>LaBelle</i>	
<i>Robert Walker</i>	<i>captain fire dept</i>	<i>LaBelle</i>	
HENRY GUNGENOLS	chief LA GRANGE F.D.	LA GRANGE	
Harry Sci'fres	Chief Western Lewis Co. Fire	La Belle	
Jerry McKeniz	<i>Asst Chief Western Lewis Co. Fire</i>		
Travis FLEER	Lewis Co Suburban Comm	Lewis Co	
Wayne Murphy Jr	Lewis Co. Presiding Comm	Lewis Co	
Chaire Murphy	?	Williamstown	
Tom Dockar	CITIZEN	LaBelle	
Tresh Smith	CERT	LaBelle	
Wendy Lewis	LaBelle City Clerk	LaBelle	
Amy Surpin	Mayor	City of LaBelle	
John French	Super Intendant	Lewis Co. C-1	

AGENDA

- I Introductions
- II Review of the Hazard Mitigation FAQ for those who've not previously attended a meeting
- III Review and discussion of actions from the previous planning meeting
- IV Open discussion regarding plan actions (STAPLEE Analysis). List in packet
 - Jurisdictions selecting actions
 - Partner agencies
 - Mechanism of implementation
 - Time-lines
 - Monitoring progress
- V Discussion of the plan maintenance process
 - Responsibility for plan maintenance
 - The maintenance schedule
 - The maintenance process
 - Incorporating plan maintenance into existing planning mechanisms
 - Continued public involvement
- VI The resolution of adoption (sample in the packet)
 - The necessity of adopting the plan via a resolution of adoption
 - Review of the sample resolution
 - Discussion about editing the resolution
- VII Discussion of the projected first-draft submission to SEMA/FEMA by the end of the month.

Lewis County Hazard Mitigation Plan Update 2018-2022			ion Effectiveness Criteria		TOTAL SCORE
Proposed Mitigation Actions / STAPLEE Analysis		10 points	MITIGATION EFFECTIVENESS SCORE	Priority Level	
Action No.	Description	Will it result in a reduction of disaster damages			
1	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				
2	Coordinate and conduct a standalone event to educate the public about emergency preparedness and early warning systems. This event will include guest speaker(s) – meteorologist(s), storm chaser(s), Red Cross disaster experts, etc., information on weather radios (and ideally very inexpensive models for sale and/or to give away) and feature high school student volunteers who can help attendees who need assistance downloading and installing warning apps on their smart phones.				
3	Develop a detailed county-wide inventory of emergency shelters and safe rooms				
4	Develop Community Shelter Plans and safe room inventories				
5	Develop a Shelter Plan, Incorporate shelter improvement and a proposed storm shelter into existing capital improvement plans				
6	Implement the Red Cross "pillowcase program"				
7	Participate in the "Great American Shake Up" Earthquake drill				
8	Provide opportunities for training to administrators and employees of critical facilities to develop self-inspection processes to assure that the building infrastructure is earthquake, flood, and tornado resistant. Engage local government, utility, and response agency experts to accomplish this and build a rapport between agencies.				
9	Provide opportunities for training so local businesses are equipped to develop their own emergency plans.				
10	Invite SEMA mitigation specialists to present information to city councils, county commission, schools, and the Northeast Missouri Regional Planning Commission meetings.				
11	Design and implement joint training (or drills) between agencies, public & private entities (including schools/businesses). Publicize county or citywide drills				
12	Form committee to assess storm water management plans and facilitate development of such plans where there is a need				
13	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.				

(SCHOOL DISTRICT) ADOPTING THE
18.

that natural hazards pose to

(LOCAL GOVERNING BODY/SCHOOL DISTRICT) the preparation of a multi-
County Hazard Mitigation Plan
the Disaster Mitigation Act of 2000; and

reduce or eliminate long-term risk to people
the impacts of future hazards and disasters;

and use policies have a major impact on whether
(LOCAL GOVERNING BODY/SCHOOL DISTRICT) will endeavor
the process; and

(LOCAL GOVERNING BODY/SCHOOL DISTRICT) demonstrates their commitment to hazard
in the Plan.

ADOPTED BY THE **(LOCAL GOVERNMENT/SCHOOL DISTRICT)**, in the

the State of _____, the **(LOCAL GOVERNING BODY/SCHOOL DISTRICT)** adopts
adopting resolutions,

in favor and _____ against, and _____ abstaining, this _____ day of _____

AD

By _____

Title _____

Signature _____

By _____

name _____

Title _____

Signature _____

By _____

name _____

Title _____

Signature _____

By _____

name _____

Title _____

Signature _____

Lewis County Hazard Mitigation Plan Update 2018-2022 Proposed Mitigation Actions / STAPLEE Analysis		STAPLEE Criteria										Mitigation Effectiveness Criteria			TOTAL SCORE Priority Level 30+ = High 25-29 = Medium -25 = Low
Action No.	Description	Rating 3 to 0 Definitely Yes= 3/ Maybe Yes= 2/ Probably No= 1/ Definitely NO= 0					Rating 3 to 2 Little =2 / Positive = 3		Rating 3 to 0		STAPLEE SCORE	Assign 5 to 10 points		MITGATION EFFECTIVENESS SCORE	
		Is it <u>socially</u> acceptable	Is it <u>technically</u> feasible	Is there <u>admin</u> capacity to execute	Is it <u>politically</u> acceptable	Is there <u>legal</u> authority to Implement?	impact on the <u>economy</u>	impact on the <u>environment</u>	Will historic structures be saved and protected	Could it be implemented quickly		Will it result in lives saved?	Will it result in a reduction of disaster damages		
1	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	3	3	2	3	3	3	2	2	1	22				
2	Coordinate and conduct a standalone event to educate the public about emergency preparedness and early warning systems. This event will include guest speaker(s) – meteorologist(s), storm chaser(s), Red Cross disaster experts, etc.-, information on weather radios (and ideally very inexpensive models for sale and/or to give away) and feature high school student volunteers who can help attendees who need assistance downloading and installing warning apps on their smart phones.	3	3	2	3	3	2	2	2	1	21				
3	Develop a detailed county-wide inventory of emergency shelters and safe rooms	3	3	3	3	3	2	2	1	3	23				
4	Develop Community Shelter Plans and safe room inventories	3	3	3	3	3	2	2	1	3	23				
5	Develop a Shelter Plan, Incorporate shelter improvements and a proposed storm shelter into existing capital improvement plans	3	2	2	3	3	2	2	2	2	20				
6	Implement the Red Cross "pillowcase program"	3	3	3	3	3	2	2	2	3	24				
7	Participate in the "Great American Shake Up" Earthquake drill	3	3	3	3	3	2	2	2	2	23				
8	Provide opportunities for training to administrators and employees of critical facilities to develop self-inspection processes to assure that the building infrastructure is earthquake, flood, and tornado resistant. Engage local government, utility, and response agency experts to accomplish this and build a rapport between agencies.	3	3	1	3	3	2	2	2	2	21				
9	Provide opportunities for training so local businesses are equipped to develop their own emergency plans.	3	3	2	3	2	2	2	1	1	20				
10	Invite SEMA mitigation specialists to present information to city councils, county commission, schools, and the Northeast Missouri Regional Planning Commission meetings.	3	3	3	3	3	2	2	1	1	21				
11	Design and implement joint training (or drills) between agencies, public & private entities (including schools/businesses). Publicize county or citywide drills	3	3	3	3	3	2	2	0	0	19				
12	Form committee to assess storm water management plans and facilitate development of such plans where there is a need	2	2	2	3	2	2	2	0	0	15				
13	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.	2	2	2	2	2	2	2	0	0	14				

Lewis County Hazard Mitigation Plan Update 2018-2022 Proposed Mitigation Actions / STAPLEE Analysis		STAPLEE Criteria										Mitigation Effectiveness Criteria			TOTAL SCORE Priority Level 30+ = High 25-29 = Medium -25 = Low
Action No.	Description	Rating 3 to 0 Definitely Yes= 3/ Maybe Yes= 2/ Probably No= 1/ Definitely NO= 0					Rating 3 to 2 Little =2 / Positive = 3		Rating 3 to 0		STAPLEE SCORE	Assign 5 to 10 points		MITIGATION EFFECTIVENESS SCORE	
		Is it <u>socially</u> acceptable	Is it <u>technically</u> feasible	Is there <u>admin</u> capacity to execute	Is it <u>politically</u> acceptable	Is there <u>legal</u> authority to implement?	impact on the <u>economy</u>	impact on the <u>environment</u>	Will historic structures be saved and protected	Could it be implemented quickly		Will it result in lives saved?	Will it result in a reduction of disaster damages		
1	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	2	3	2	2	2	0	0	1	1	13	8	5	13	26
2	Coordinate and conduct a standalone event to educate the public about emergency preparedness and early warning systems. This event will include guest speaker(s) – meteorologist(s), storm chaser(s), Red Cross disaster experts, etc., information on weather radios (and ideally very inexpensive models for sale and/or to give away) and feature high school student volunteers who can help attendees who need assistance downloading and installing warning apps on their smart phones.	1	3	1	2	0	0	0	0	2	9	7	5	12	21
3	Develop a detailed county-wide inventory of emergency shelters and safe rooms	2	2	2	2	0	0	0	0	2	10	8	5	13	23
4	Develop Community Shelter Plans and safe room inventories	2	2	2	2	0	0	0	0	2	10	8	5	13	23
5	Develop a Shelter Plan, Incorporate shelter improvements and a proposed storm shelter into existing capital improvement plans	2	2	2	1	0	1	1	0	1	10	9	5	14	24
6	Implement the Red Cross "pillowcase program"	2	3	2	2	0	0	0	2	1	11	8	6	14	25
7	Participate in the "Great American Shake Up" Earthquake drill	1	3	2	2	0	0	0	0	2	10	8	6	14	24
8	Provide opportunities for training to administrators and employees of critical facilities to develop self-inspection processes to assure that the building infrastructure is earthquake, flood, and tornado resistant. Engage local government, utility, and response agency experts to accomplish this and build a rapport between agencies.	1	2	1	1	0	0	0	3	1	9	7	7	14	23
9	Provide opportunities for training so local businesses are equipped to develop their own emergency plans.	2	2	2	2	0	1	1	3	2	15	8	8	16	31
10	Invite SEMA mitigation specialists to present information to city councils, county commission, schools, and the Northeast Missouri Regional Planning Commission meetings.	2	2	2	2	0	0	0	2	1	11	8	8	16	27
11	Design and implement joint training (or drills) between agencies, public & private entities (including schools/businesses). Publicize county or citywide drills	1	2	1	2	0	0	0	2	0	8	8	6	14	22
12	Form committee to assess storm water management plans and facilitate development of such plans where there is a need	2	2	1	1	0	0	0	1	0	7	5	6	11	18
13	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.	1	1	1	1	0	0	0	0	1	5	5	6	11	16

Lewis County Hazard Mitigation Plan Update 2018-2022 Proposed Mitigation Actions / STAPLEE Analysis		STAPLEE Criteria										Mitigation Effectiveness Criteria			TOTAL SCORE Priority Level 30+ = High 25-29 = Medium -25 = Low
Action No.	Description	Rating 3 to 0 Definitely Yes= 3/ Maybe Yes= 2/ Probably No= 1/ Definitely NO= 0					Rating 3 to 2 Little =2 / Positive = 3		Rating 3 to 0		STAPLEE SCORE	Assign 5 to 10 points		MITIGATION EFFECTIVENESS SCORE	
		Is it <u>socially</u> acceptable	Is it <u>technically</u> feasible	Is there <u>admin</u> capacity to execute	Is it <u>politically</u> acceptable	Is there <u>legal</u> authority to implement?	impact on the <u>economy</u>	Impact on the <u>environment</u>	Will historic structures be saved and protected	Could it be implemented quickly		Will it result in lives saved?	Will it result in a reduction of disaster damages		
1	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	3	2	1	2	3	3	3	0	0	17	5	5	10	27
2	Coordinate and conduct a standalone event to educate the public about emergency preparedness and early warning systems. This event will include guest speaker(s) – meteorologist(s), storm chaser(s), Red Cross disaster experts, etc.-, information on weather radios (and ideally very inexpensive models for sale and/or to give away) and feature high school student volunteers who can help attendees who need assistance downloading and installing warning apps on their smart phones.	3	2	1	3	3	3	3	0	0	18	10	7	17	35
3	Develop a detailed county-wide inventory of emergency shelters and safe rooms	3	3	2	3	3	3	2	0	0	19	10	5	15	34
4	Develop Community Shelter Plans and safe room inventories	3	3	2	3	3	3	2	0	0	19	10	5	15	34
5	Develop a Shelter Plan, Incorporate shelter improvements and a proposed storm shelter into existing capital improvement plans	2	2	2	3	3	3	1	0	0	16	10	5	15	31
6	Implement the Red Cross "pillowcase program"	3	3	2	3	3	3	1	0	0	18	8	5	13	31
7	Participate in the "Great American Shake Up" Earthquake drill	3	2	1	3	3	3	1	0	0	16	10	5	15	31
8	Provide opportunities for training to administrators and employees of critical facilities to develop self-inspection processes to assure that the building infrastructure is earthquake, flood, and tornado resistant. Engage local government, utility, and response agency experts to accomplish this and build a rapport between agencies.	3	2	1	3	3	3	1	0	0	16	10	5	15	31
9	Provide opportunities for training so local businesses are equipped to develop their own emergency plans.	3	2	1	3	3	2	1	0	0	15	7	5	12	27
10	Invite SEMA mitigation specialists to present information to city councils, county commission, schools, and the Northeast Missouri Regional Planning Commission meetings.	3	2	1	3	3	1	0	0	0	13	7	5	12	25
11	Design and implement joint training (or drills) between agencies, public & private entities (including schools/businesses). Publicize county or citywide drills	3	2	2	2	3	3	0	0	0	15	8	5	13	28
12	Form committee to assess storm water management plans and facilitate development of such plans where there is a need	3	1	1	2	3	0	0	0	0	10	5	5	10	20
13	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.	3	1	1	2	3	2	1	0	0	13	5	5	10	23

Lewis County Hazard Mitigation Plan Update 2018-2022 Proposed Mitigation Actions / STAPLEE Analysis		STAPLEE Criteria										Mitigation Effectiveness Criteria			TOTAL SCORE Priority Level 30+ = High 25-29 = Medium -25 = Low
Action No.	Description	Rating 3 to 0 Definitely Yes= 3/ Maybe Yes= 2/ Probably No= 1/ Definitely NO= 0					Rating 3 to 2 Little =2 / Positive = 3		Rating 3 to 0		STAPLEE SCORE	Assign 5 to 10 points		MITIGATION EFFECTIVENESS SCORE	
		Is it <u>socially</u> acceptable	Is it <u>technically</u> feasible	Is there <u>admin</u> capacity to execute	Is it <u>politically</u> acceptable	Is there <u>legal</u> authority to implement?	impact on the <u>economy</u>	impact on the <u>environment</u>	Will historic structures be saved and protected	Could it be implemented quickly		Will it result in lives saved?	Will it result in a reduction of disaster damages		
1	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	3	2	2	2	1	2	2	0	2	16	8	6	14	30
2	Coordinate and conduct a standalone event to educate the public about emergency preparedness and early warning systems. This event will include guest speaker(s) – meteorologist(s), storm chaser(s), Red Cross disaster experts, etc., information on weather radios (and ideally very inexpensive models for sale and/or to give away) and feature high school student volunteers who can help attendees who need assistance downloading and installing warning apps on their smart phones.	2	2	2	3	1	2	2	0	2	16	7	6	13	29
3	Develop a detailed county-wide inventory of emergency shelters and safe rooms	3	3	2	3	0	2	2	0	3	18	8	5	13	31
4	Develop Community Shelter Plans and safe room inventories	3	3	2	3	0	2	2	0	3	18	7	5	13	31
5	Develop a Shelter Plan, Incorporate shelter improvements and a proposed storm shelter into existing capital improvement plans	3	3	2	3	0	2	2	0	2	17	9	3	12	29
6	Implement the Red Cross "pillowcase program"	3	3	3	3	0	2	2	0	3	19	8	4	14	33
7	Participate in the "Great American Shake Up" Earthquake drill	3	3	2	3	0	2	2	0	2	17	7	5	13	30
8	Provide opportunities for training to administrators and employees of critical facilities to develop self-inspection processes to assure that the building infrastructure is earthquake, flood, and tornado resistant. Engage local government, utility, and response agency experts to accomplish this and build a rapport between agencies.	2	2	1	3	0	2	2	0	2	14	8	4	12	26
9	Provide opportunities for training so local businesses are equipped to develop their own emergency plans.	2	2	2	3	0	2	2	0	2	17	8	7	15	32
10	Invite SEMA mitigation specialists to present information to city councils, county commission, schools, and the Northeast Missouri Regional Planning Commission meetings.	3	3	3	3	0	2	2	0	2	18	8	6	14	32
11	Design and implement joint training (or drills) between agencies, public & private entities (including schools/businesses). Publicize county or citywide drills	3	2	1	3	0	2	2	0	2	15	7	8	15	30
12	Form committee to assess storm water management plans and facilitate development of such plans where there is a need	3	3	2	3	0	2	2	0	2	17	5	7	12	29
13	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.	2	2	3	3	0	3	3	2	0	18	5	6	11	29

Lewis County Hazard Mitigation Plan Update 2018-2022 Proposed Mitigation Actions / STAPLEE Analysis		STAPLEE Criteria										Mitigation Effectiveness Criteria			TOTAL SCORE Priority Level 30+ = High 25-29 = Medium -25 = Low
Action No.	Description	Rating 3 to 0 Definitely Yes= 3/ Maybe Yes= 2/ Probably No= 1/ Definitely NO= 0					Rating 3 to 2 Little =2 / Positive = 3		Rating 3 to 0		STAPLEE SCORE	Assign 5 to 10 points		MITIGATION EFFECTIVENESS SCORE	
		Is it <u>socially</u> acceptable	Is it <u>technically</u> feasible	Is there <u>admin</u> capacity to execute	Is it <u>politically</u> acceptable	Is there <u>legal</u> authority to Implement?	impact on the <u>economy</u>	impact on the <u>environment</u>	Will historic structures be saved and protected	Could it be implemented quickly		Will it result in lives saved?	Will it result in a reduction of disaster damages		
1	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	3	3	2	2	2	2	0	0	1	15	8	5	13	28
2	Coordinate and conduct a standalone event to educate the public about emergency preparedness and early warning systems. This event will include guest speaker(s) – meteorologist(s), storm chaser(s), Red Cross disaster experts, etc., information on weather radios (and ideally very inexpensive models for sale and/or to give away) and feature high school student volunteers who can help attendees who need assistance downloading and installing warning apps on their smart phones.	3	2	2	3	0	0	0	0	2	12	9	5	14	26
3	Develop a detailed county-wide inventory of emergency shelters and safe rooms	3	3	2	3	0	0	0	0	1	12	7	5	12	24
4	Develop Community Shelter Plans and safe room inventories	3	3	2	3	0	0	0	0	1	12	7	5	12	24
5	Develop a Shelter Plan, Incorporate shelter improvements and a proposed storm shelter into existing capital improvement plans	3	3	2	3	1	2	1	0	1	16	5	5	10	26
6	Implement the Red Cross "pillowcase program"	3	3	2	3	0	0	0	0	2	13	8	5	13	26
7	Participate in the "Great American Shake Up" Earthquake drill	3	3	2	3	0	0	0	0	2	13	8	5	13	26
8	Provide opportunities for training to administrators and employees of critical facilities to develop self-inspection processes to assure that the building infrastructure is earthquake, flood, and tornado resistant. Engage local government, utility, and response agency experts to accomplish this and build a rapport between agencies.	2	2	2	2	1	0	0	0	1	12	9	8	17	29
9	Provide opportunities for training so local businesses are equipped to develop their own emergency plans.	2	2	2	2	1	2	0	0	1	12	8	5	13	25
10	Invite SEMA mitigation specialists to present information to city councils, county commission, schools, and the Northeast Missouri Regional Planning Commission meetings.	2	2	2	2	1	2	0	0	1	12	8	5	13	25
11	Design and implement joint training (or drills) between agencies, public & private entities (including schools/businesses). Publicize county or citywide drills	3	3	2	2	1	0	0	0	1	12	8	5	13	25
12	Form committee to assess storm water management plans and facilitate development of such plans where there is a need	3	3	2	2	2	1	0	0	1	14	5	8	13	17
13	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.	3	3	3	3	2	2	1	0	1	18	7	5	12	30

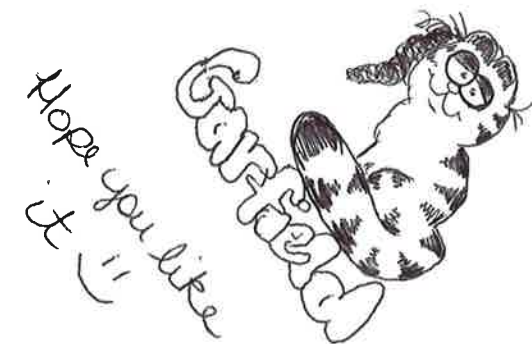
Lewis County Hazard Mitigation Plan Update 2018-2022 Proposed Mitigation Actions / STAPLEE Analysis		STAPLEE Criteria										Mitigation Effectiveness Criteria			TOTAL SCORE Priority Level 30+ = High 25-29 = Medium -25 = Low
Action No.	Description	Rating 3 to 0 Definitely Yes= 3/ Maybe Yes= 2/ Probably No= 1/ Definitely NO= 0					Rating 3 to 2 Little =2 / Positive = 3		Rating 3 to 0		STAPLEE SCORE	Assign 5 to 10 points		MITIGATION EFFECTIVENESS SCORE	
		Is it <u>socially</u> acceptable	Is it <u>technically</u> feasible	Is there <u>admin</u> capacity to execute	Is it <u>politically</u> acceptable	Is there <u>legal</u> authority to Implement?	impact on the <u>economy</u>	impact on the <u>environment</u>	Will historic structures be saved and protected	Could it be implemented quickly		Will it result in lives saved?	Will it result in a reduction of disaster damages		
1	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	3	3	2	2	2	2	2	0	0	16	7	5	12	28
2	Coordinate and conduct a standalone event to educate the public about emergency preparedness and early warning systems. This event will include guest speaker(s) – meteorologist(s), storm chaser(s), Red Cross disaster experts, etc., information on weather radios (and ideally very inexpensive models for sale and/or to give away) and feature high school student volunteers who can help attendees who need assistance downloading and installing warning apps on their smart phones.	3	3	3	2	2	3	1	0	0	17	10	5	15	32
3	Develop a detailed county-wide inventory of emergency shelters and safe rooms	3	3	3	3	2	3	1	0	0	18	8	5	13	31
4	Develop Community Shelter Plans and safe room inventories	3	3	3	3	2	2	1	0	0	17	8	5	13	30
5	Develop a Shelter Plan, Incorporate shelter improvements and a proposed storm shelter into existing capital improvement plans	3	3	2	2	2	2	1	0	0	15	7	5	14	29
6	Implement the Red Cross "pillowcase program"	3	3	2	2	2	2	1	0	0	15	5	5	10	25
7	Participate in the "Great American Shake Up" Earthquake drill	3	3	2	2	2	1	2	0	0	15	7	5	12	27
8	Provide opportunities for training to administrators and employees of critical facilities to develop self-inspection processes to assure that the building infrastructure is earthquake, flood, and tornado resistant. Engage local government, utility, and response agency experts to accomplish this and build a rapport between agencies.	3	3	2	2	2	1	1	0	0	14	7	6	13	27
9	Provide opportunities for training so local businesses are equipped to develop their own emergency plans.	3	3	2	2	2	2	2	0	0	14	8	6	14	30
10	Invite SEMA mitigation specialists to present information to city councils, county commission, schools, and the Northeast Missouri Regional Planning Commission meetings.	3	3	2	2	2	2	1	0	0	15	7	6	13	28
11	Design and implement joint training (or drills) between agencies, public & private entities (including schools/businesses). Publicize county or citywide drills	3	3	3	3	2	2	2	0	0	18	8	6	14	32
12	Form committee to assess storm water management plans and facilitate development of such plans where there is a need	3	2	2	2	2	2	3	0	0	16	6	6	12	28
13	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.	3	2	2	2	2	3	3	0	0	17	6	6	12	29

Lewis County Hazard Mitigation Plan Update 2018-2022 Proposed Mitigation Actions / STAPLEE Analysis		STAPLEE Criteria										Mitigation Effectiveness Criteria			TOTAL SCORE Priority Level
Action No.	Description	Rating 3 to 0 Definitely Yes= 3/ Maybe Yes= 2/ Probably No= 1/ Definitely NO= 0					Rating 3 to 2 Little =2 / Positive = 3		Rating 3 to 0		STAPLEE SCORE	Assign 5 to 10 points		MITIGATION EFFECTIVENESS SCORE	
		Is it <u>socially</u> acceptable	Is it <u>technically</u> feasible	Is there <u>admin</u> capacity to execute	Is it <u>politically</u> acceptable	Is there <u>legal</u> authority to Implement?	impact on the <u>economy</u>	impact on the <u>environment</u>	Will historic structures be saved and protected	Could it be implemented quickly		Will it result in lives saved?	Will it result in a reduction of disaster damages		30+ = High 25-29 = Medium -25 = Low
1	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	3	2	2	1	0	2	2	2	2	16	8	5	13 29	29
2	Coordinate and conduct a standalone event to educate the public about emergency preparedness and early warning systems. This event will include guest speaker(s) – meteorologist(s), storm chaser(s), Red Cross disaster experts, etc., information on weather radios (and ideally very inexpensive models for sale and/or to give away) and feature high school student volunteers who can help attendees who need assistance downloading and installing warning apps on their smart phones.	3	3	2	2	2	2	2	1	1	18	5	5	10 28	28
3	Develop a detailed county-wide inventory of emergency shelters and safe rooms	3	3	3	3	1	3	2	1	3	21	5	10	15 37	37
4	Develop Community Shelter Plans and safe room inventories	3	3	3	3	1	2	2	0	3	20	10	5	15 35	35
5	Develop a Shelter Plan, Incorporate shelter improvements and a proposed storm shelter into existing capital improvement plans <i>School</i>	3	2	2	1	1	2	2	0	0	13	10	8	18	31
6	Implement the Red Cross "pillowcase program" <i>School</i>	3	2	1	1	1	2	2	0	0	12	10	5	15	27
7	Participate in the "Great American Shake Up" Earthquake drill	3	3	3	3	1	2	2	1	3	21	10	5	15 36	36
8	Provide opportunities for training to administrators and employees of critical facilities to develop self-inspection processes to assure that the building infrastructure is earthquake, flood, and tornado resistant. Engage local government, utility, and response agency experts to accomplish this and build a rapport between agencies.	3	3	2	1	2	2	2	0	1	16	10	8	18	34
9	Provide opportunities for training so local businesses are equipped to develop their own emergency plans.	3	3	2	1	1	2	2	0	2	16	10	10	20	36
10	Invite SEMA mitigation specialists to present information to city councils, county commission, schools, and the Northeast Missouri Regional Planning Commission meetings.	3	3	3	3	0	2	2	0	2	18	10	8	18	36
11	Design and implement joint training (or drills) between agencies, public & private entities (including schools/businesses). Publicize county or citywide drills	3	2	1	1	0	2	2	0	1	12	10	10	20	32
12	Form committee to assess storm water management plans and facilitate development of such plans where there is a need	3	1	1	0	1	2	3	0	0	11	5	8	13	24
13	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.	3	1	1	1	2	2	2	0	0	12	6	6	12	24

Lewis County Hazard Mitigation Plan Update 2018-2022 Proposed Mitigation Actions / STAPLEE Analysis		STAPLEE Criteria									Mitigation Effectiveness Criteria			TOTAL SCORE Priority Level 30+ = High 25-29 = Medium -25 = Low	
		Rating 3 to 0 Definitely Yes= 3/ Maybe Yes= 2/ Probably No= 1/ Definitely NO= 0					Rating 3 to 2 Little =2 / Positive = 3		Rating 3 to 0		STAPLEE SCORE	Assign 5 to 10 points			
Action No.	Description	Is it <u>socially</u> acceptable	Is it <u>technically</u> feasible	Is there <u>admin</u> capacity to execute	Is it <u>politically</u> acceptable	Is there <u>legal</u> authority to Implement?	impact on the <u>economy</u>	impact on the <u>environment</u>	Will historic structures be saved and protected	Could it be implemented quickly		Will it result in lives saved?	Will it result in a reduction of disaster damages		
1	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	3	3	2	2	2	3	3							
2	Coordinate and conduct a standalone event to educate the public about emergency preparedness and early warning systems. This invent will include guest speaker(s) – meteorologist(s), storm chaser(s) , Red Cross disaster experts, etc.-, information on weather radios (and ideally very inexpensive models for sale and/or to give away) and feature high school student volunteers who can help attendees who need assistance downloading and installing warning aps on their smart phones.	3	3	2	2	2	3	3							
3	Develop a detailed county-wide inventory of emergency shelters and safe rooms	3	3	3	3	3	3	3							
4	Develop Community Shelter Plans and safe room inventories	3	3	3	3	3	3	3							
5	Develop a Shelter Plan, Incorporate shelter improvements and a proposed storm shelter into existing capital improvement plans	3	3	3	3	3	3	3							
6	Implement the Red Cross "pillowcase program"	3	3	2	2	2	3	3							
7	Participate in the "Great American Shake Up" Earthquake drill	3	3	3	3	3	3	3							
8	Provide opportunities for training to administrators and employees of critical facilities to develop self-inspection processes to assure that the building infrastructure is earthquake, flood, and tornado resistant. Engage local government, utility, and response agency experts to accomplish this and build a rapport between agencies.	3	2	2	2	2	2	3							
9	Provide opportunities for training so local businesses are equipped to develop their own emergency plans.	3	3	2	2	2	2	2							
10	Invite SEMA mitigation specialists to present information to city councils, county commission, schools, and the Northeast Missouri Regional Planning Commission meetings.	3	2	2	2	2	2	2							
11	Design and implement joint training (or drills) between agencies, public & private entities (including schools/businesses). Publicize county or citywide drills	3	3	2	2	2	2	2							
12	Form committee to assess storm water management plans and facilitate development of such plans where there is a need	3	3	3	2	2	2	2							
13	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.	2	2	2	2	2	2	2							

Lewis County Hazard Mitigation Plan Update 2018-2022 Proposed Mitigation Actions / STAPLEE Analysis		STAPLEE Criteria										Mitigation Effectiveness Criteria			TOTAL SCORE
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Action No.	Description	Is it <u>socially</u> acceptable	Is it <u>technically</u> feasible	Is there <u>admin</u> capacity to execute	Is it <u>politically</u> acceptable	Is there <u>legal</u> authority to Implement?	impact on the <u>economy</u>	impact on the <u>environment</u>	Will historic structures be saved and protected	Could it be implemented quickly		Will it result in lives saved?	Will it result in a reduction of disaster damages		
1	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	3	3	2	2	1	2	2	0	2	17	10	5	15	32
2	Coordinate and conduct a standalone event to educate the public about emergency preparedness and early warning systems. This invent will include guest speaker(s) – meteorologist(s), storm chaser(s) , Red Cross disaster experts, etc.-, information on weather radios (and ideally very inexpensive models for sale and/or to give away) and feature high school student volunteers who can help attendees who need assistance downloading and installing warning apps on their smart phones.	3	3	2	2	1	2	2	0	3	18	8	5	13	31
3	Develop a detailed county-wide inventory of emergency shelters and safe rooms	3	3	3	2	1	2	2	0	3					
4	Develop Community Shelter Plans and safe room inventories	3	3	3	3	1	2	2	0	3					
5	Develop a Shelter Plan, Incorporate shelter improvements and a proposed storm shelter into existing capital improvement plans	2	2	2	1	2	2	2	0	2		8	5		
6	Implement the Red Cross "pillowcase program"	3	3	3	2	0	2	2	0	3					
7	Participate in the "Great American Shake Up" Earthquake drill	3	3	2	1	0	2	2	0	3		8	5		
8	Provide opportunities for training to administrators and employees of critical facilities to develop self-inspection processes to assure that the building infrastructure is earthquake, flood, and tornado resistant. Engage local government, utility, and response agency experts to accomplish this and build a rapport between agencies.	3	2	2	0	0									
9	Provide opportunities for training so local businesses are equipped to develop their own emergency plans.	3	3	2	0	0	2	2	0	2		8	5		
10	Invite SEMA mitigation specialists to present information to city councils, county commission, schools, and the Northeast Missouri Regional Planning Commission meetings.	3	2	2	1	0	2	2	0	2					
11	Design and implement joint training (or drills) between agencies, public & private entities (including schools/businesses). Publicize county or citywide drills	3	3	3	0	0	2	2	0	2		8	5		
12	Form committee to assess storm water management plans and facilitate development of such plans where there is a need														
13	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.														

Lewis County Hazard Mitigation Plan Update 2018-2022 Proposed Mitigation Actions / STAPLEE Analysis		STAPLEE Criteria								Mitigation Effectiveness Criteria					TOTAL SCORE	
		Rating 3 to 0 Definitely Yes= 3/ Maybe Yes= 2/ Probably No= 1/ Definitely NO= 0					Rating 3 to 2 Little =2 / Positive = 3		Rating 3 to 0		STAPLEE SCORE	Assign 5 to 10 points		MITIGATION EFFECTIVENESS SCORE		
Action No.	Description	Is it <u>socially</u> acceptable	Is it <u>technically</u> feasible	Is there <u>admin</u> capacity to execute	Is it <u>politically</u> acceptable	Is there <u>legal</u> authority to Implement?	impact on the <u>economy</u>	impact on the <u>environment</u>	Will historic structures be saved and protected	Could it be implemented quickly		Will it result in lives saved?	Will it result in a reduction of disaster damages			Priority Level 30+ = High 25-29 = Medium -25 = Low
1	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	3	3	3	2	3	3									
2	Coordinate and conduct a standalone event to educate the public about emergency preparedness and early warning systems. This invent will include guest speaker(s) – meteorologist(s), storm chaser(s) , Red Cross disaster experts, etc.-, information on weather radios (and ideally very inexpensive models for sale and/or to give away) and feature high school student volunteers who can help attendees who need assistance downloading and installing warning apps on their smart phones.	3	2	2												
3	Develop a detailed county-wide inventory of emergency shelters and safe rooms	3	3	2												
4	Develop Community Shelter Plans and safe room inventories	3	3	2												
5	Develop a Shelter Plan, Incorporate shelter improvements and a proposed storm shelter into existing capital improvement plans	3	2	2												
6	Implement the Red Cross "pillowcase program"	3		2												
7	Participate in the "Great American Shake Up" Earthquake drill	3		2												
8	Provide opportunities for training to administrators and employees of critical facilities to develop self-inspection processes to assure that the building infrastructure is earthquake, flood, and tornado resistant. Engage local government, utility, and response agency experts to accomplish this and build a rapport between agencies.	3		2												
9	Provide opportunities for training so local businesses are equipped to develop their own emergency plans.	3		3												
10	Invite SEMA mitigation specialists to present information to city councils, county commission, schools, and the Northeast Missouri Regional Planning Commission meetings.	3		2												
11	Design and implement joint training (or drills) between agencies, public & private entities (including schools/businesses). Publicize county or citywide drills	3		2												
12	Form committee to assess storm water management plans and facilitate development of such plans where there is a need	3		2												
13	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.	3		2												



APPENDIX C

Signed Resolutions of Adoption

- ✓ Lewis County
- ✓ Canton
- ✓ Ewing
- ✓ La Belle
- ✓ La Grange
- Lewistown
- ✓ Monticello
- ✓ Canton R-V (Canton)
- ✓ Lewis County C-1 (Ewing)

A RESOLUTION OF THE LEWIS COUNTY COMMISSION ADOPTING THE LEWIS COUNTY ALL-HAZARD MITIGATION PLAN (UPDATED 2016)

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

WHEREAS the Lewis County Commission has participated in the preparation of a multi-hazard mitigation plan, hereby known as the *Lewis County All-Hazard Mitigation Plan (Updated 2016)*, 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 Lewis County from the impacts of future hazards and disasters; and

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

WHEREAS adoption by the *Lewis County Commission* demonstrates their commitment to hazard mitigation and achieving the goals outlined in the *Plan*

NOW THEREFORE, BE IT RESOLVED BY THE **LEWIS COUNTY COMMISSION**, in the State of Missouri, that the Lewis County Commission adopts the Plan.

ADOPTED by a vote of 3 in favor and 0 against, and 0 abstaining,

this 6th day of August, 2018

(Sig.): 

Print name: Wayne Murphy, Jr.

ATTEST:

By

(Sig.): 

Print name: Travis Fleer

APPROVED AS TO FORM:

By (Sig.): 

Print name: Chris Flanagan

City of Canton, Missouri RESOLUTION NO. NA

A RESOLUTION OF THE City of Canton, ADOPTING THE LEWIS COUNTY ALL-HAZARD MITIGATION PLAN (UPDATED 2017)

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-hazard mitigation plan, hereby known as the Lewis County All-Hazard Mitigation Plan (Updated 2017), hereafter referred to as the Plan, in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS the Plan identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the City of Canton from the impacts of future hazards and disasters; and WHEREAS the 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 the 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 OF CANTON, in the State of Missouri, THAT:

Section 1. In accordance with local rules for adopting resolutions, the City of Canton adopts the final FEMA-approved plan.

ADOPTED this 17 day of April, 2017.

By :

Print Name & Title:

Tarrod Phillips Mayor

ATTEST:

By:

Print Name & Title:

Christina Seangmany City Clerk

City of Ewing, Missouri RESOLUTION NO. 10-18

A RESOLUTION OF THE City of Ewing, ADOPTING THE LEWIS COUNTY ALL-HAZARD MITIGATION PLAN (UPDATED 2017)

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-hazard mitigation plan, hereby known as the Lewis County All-Hazard Mitigation Plan (Updated 2017), hereafter referred to as the Plan, in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS the Plan identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the City of Ewing from the impacts of future hazards and disasters; and

WHEREAS the 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:

Section 1. In accordance with local rules for adopting resolutions, the City of Ewing adopts the final FEMA-approved plan.

ADOPTED this 9 day of October, 2018.

By: Dean Wagy
Print Name & Title: Dean Wagy Mayor

ATTEST:

By: Cheryl M. Thrower
Print Name & Title: CHERYL M. THROWER

**RESOLUTION OF THE BOARD OF ALDERMEN
OF
THE CITY OF LABELLE, MISSOURI**

**A RESOLUTION OF THE CITY OF LABELLE ADOPTING THE LEWIS
COUNTY HAZARD MITIGATION PLAN UPDATE 2018.**

WHEREAS, the City of LaBelle recognizes the threat that natural hazards pose to people and property within the City of LaBelle; and

WHEREAS, the City of LaBelle has participated in the preparation of a multi-jurisdictional local hazard mitigation plan, hereby known as the Lewis County Hazard Mitigation Plan Update 2018, hereafter referred to as the Plan, in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS the Plan identifies mitigation goals and actions to reduce or eliminate long term risk to people and property in the City of LaBelle from the impacts of future hazards and disasters; and

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

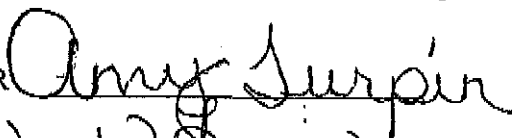
WHEREAS adoption by the City of LaBelle demonstrates their commitment to hazard mitigation and achieving the goals outlined in the Plan.

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

In accordance with NEMORPC, the CITY OF LABELLE adopts the final FEMA-approved Plan.

ADOPTED by a vote of 4 in favor and 0 against, this 16th day of April, 2018.

By Amy Turpin, MAYOR



ATTEST:



City Clerk

City of LaGrange, Missouri RESOLUTION NO. ____

A RESOLUTION OF THE City of LaGrange, ADOPTING THE LEWIS COUNTY ALL-HAZARD MITIGATION PLAN (UPDATED 2017)

WHEREAS the City of LaGrange recognizes the threat that natural hazards pose to people and property within the City of LaGrange; and

WHEREAS the City of LaGrange has participated in the preparation of a multi-hazard mitigation plan, hereby known as the Lewis County All-Hazard Mitigation Plan (Updated 2017), hereafter referred to as the Plan, in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS the Plan identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the City of LaGrange from the impacts of future hazards and disasters; and
WHEREAS the City of LaGrange recognizes that land use policies have a major impact on whether people and property are exposed to natural hazards, the City of LaGrange will endeavor to integrate the Plan into the comprehensive planning process and

WHEREAS adoption by the City of LaGrange demonstrates their commitment to hazard mitigation and achieving the goals outlined in the Plan

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

Section 1. In accordance with local rules for adopting resolutions, the City of LaGrange adopts the final FEMA-approved plan.

ADOPTED this 24 day of April, 2017.

By: Michael Lowe

Print Name & Title: MICHAEL LOWE MAYOR

ATTEST:

By: Kim Schneider

Print Name & Title: Kim Schneider City Clerk

A RESOLUTION OF THE (*City of Monticello*) ADOPTING THE LEWIS COUNTY ALL-
HAZARD MITIGATION PLAN (UPDATED 2016)

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

WHEREAS the *City of Monticello* has participated in the preparation of a multi- hazard mitigation plan, hereby known as the *Lewis County All-Hazard Mitigation Plan (Updated 2016)*, hereafter referred to as "the Plan", in accordance with the Disaster Mitigation Act of 2000; and

WHEREAS the Plan identifies mitigation goals and actions to reduce or eliminate long-term risk to people and property in the *City of Monticello* from the impacts of future hazards and disasters; and

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

WHEREAS adoption by the *City of Monticello* demonstrates their commitment to hazard mitigation and achieving the goals outlined in the *Plan*

NOW THEREFORE, BE IT RESOLVED BY THE *City of Monticello*, in the State of Missouri, that In accordance with *local rule for adopting resolutions* the *City of Monticello* adopts the Plan.

ADOPTED, this 9th day of Oct., 2018

By (Sig): Vancell SciFres Mayor

Print name: VANCELL SciFres

ATTEST:
By (Sig.): Cindy Grgurich, City Clerk

Print name: CINDY GRGURICH

Canton R-V School District, Canton , Missouri

A RESOLUTION OF THE CANTON R-V SCHOOL DISTRICT ADOPTING THE LEWIS COUNTY ALL-HAZARD MITIGATION PLAN

WHEREAS the **Canton R-V School District** recognizes the threat that natural hazards pose to people and property within the (local governing body/school district); and

WHEREAS the **Canton R-V School District** has participated in the preparation of a multi- hazard mitigation plan, hereby known as the Lewis County All-Hazard Mitigation Plan (Updated 2016), 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 **Canton R-V School District** from the impacts of future hazards and disasters; and

WHEREAS the **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 (local governing body) will endeavor to integrate the Plan into the comprehensive planning process and

WHEREAS adoption by the **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 **Canton R-V School District**, in the State of Missouri, that In accordance with **local rule for adopting resolutions** the **local governing body/school district** adopts the Plan.

ADOPTED by a vote of 6 in favor and 0 against, and 0 abstaining,
this 13 day of August, 2018

Board President:
Michelle L. Frazier Date: 8-13-18

Board Secretary:
Larry R. Spurgeon Date: 8-13-18



Lewis County C-1 Schools

PO Box 366, Ewing, MO 63440
Phone: (573) 209-3217 Fax: (573) 209-3318



"Educate to Illuminate"

A RESOLUTION OF THE LEWIS COUNTY C-1 SCHOOL DISTRICT ADOPTING THE LEWIS COUNTY ALL-HAZARD MITIGATION PLAN (EFFECTIVE 2018-2023)

WHEREAS the Lewis County C-1 School District, a Missouri public school district (the "District") recognizes the threat that natural hazards pose to people and property within the District; and

WHEREAS the District has participated in the preparation of a multi-hazard mitigation plan, hereby known as the *Lewis County All-Hazard Mitigation Plan (Effective 2018-2023)*, 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 District from the impacts of future hazards and disasters; and

WHEREAS adoption by the District demonstrates their commitment to hazard mitigation and achieving the goals outlined in the Plan;

NOW THEREFORE, BE IT RESOLVED that the Lewis County C-1 School District adopts the Plan.

ADOPTED by a vote of 6 in favor and 0 against, and 0 abstaining,
this 15th day of Oct, 2018.

By (Sig): Randall Sharpe

Print name: RANDALL SHARPE

ATTEST:
By (Sig.): Patricia A. Ulmeyer

Print name: Patricia A. Ulmeyer