Lincoln County, Missouri

Natural Hazard Mitigation Plan

Draft Report – September 2016

Prepared by:

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CONTRIBUTORS

Lincoln County Hazard Mitigation Planning Committee

Jurisdictional Representatives

Name		Title	Department	Jurisdiction / Agency / Organization
Emma	Epplin-Birdsell	Emergency Management Director	NA	Lincoln County Emergency Management Agency
Mike	Cherry	Fire Chief	NA	Lincoln County Fire Protection District
Genevieve	Weseman	Emergency Planner	NA	Lincoln County Health Department
Terry	Foster	Police Chief	NA	Moscow Mills Police Department
Stan	Rolf	Owner/Operator	NA	Winfield / Pin Oaks Levee District
Kristin	Gentry	Director	Family Support Division	Missouri Department of Social Services
Jim	Harke	Owner / Operator	NA	Cap-au-Gris Levee District
Joe	Edwards	Mechanic	NA	City of Troy
Jodi	Schneider	City Clerk	NA	City of Troy
Mike	Clynch	Mayor	NA	City of Moscow Mills
Tim	Reller	Superintendent	NA	Elsberry R-II School District
William	Barnes	Police Chief	NA	Silex Police Department

Name		Title	Department	Jurisdiction / Agency / Organization
Larry A.	Kirk	Police Chief	NA	Old Monroe Police Department
Jim	Holloway	Lieutenant	NA	Lincoln County Ambulance District
Andy	Binder	Lieutenant, Public Information	NA	Lincoln County Sheriff's Office
Brian	Lourance	Mechanic	Maintenance	City of Troy
Mark	Cross	Mayor	NA	City of Troy
Tonya	Hawkins	Assistant City Clerk	NA	City of Troy

EXECUTIVE SUMMARY

The purpose of natural hazard mitigation is to reduce loss of life and property by lessening the impact of natural disasters. Hazard Mitigation Plan forms the foundation for a community's long-term strategy to reduce disaster losses and break the cycle of disaster damage, reconstruction, and repeated damage. The Boonslick Regional Planning Commission on behalf of Lincoln County and participating jurisdictions developed a Multi-Jurisdictional Hazard Mitigation Plan that was initially approved by the Federal Emergency Management Agency (FEMA) in 2004.

The plan was prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 (DMA 2000). In accordance with DMA 2000 requirements, Lincoln County and participating jurisdictions must update the plan every 5 years. The most recent past multi-Jurisdictional Hazard Mitigation Plan for Lincoln County was updated and approved dated February 8, 2012.

The Lincoln County Hazard Mitigation Plan is a multi-jurisdictional plan that represents several local governments within the county. The participating jurisdictions from the 2011 plan remain the same. The following communities participated in plan development and are represented by the plan through formal adoption:

Lincoln County	Village of Chain of Rocks	City of Elsberry
City of Foley	Village of Fountain N Lakes	City of Hawk Point
City of Moscow Mills	City of Old Monroe	City of Silex
City of Troy	Village of Truxton	Village of Whiteside
City of Winfield	Elsberry R-II School District	Silex R-I School District
Troy R-III School District	Winfield R-IV School District	

In addition to the local governments and school districts, several other entities were contacted to provide support and contribute to the mitigation strategy. These include:

Ameren Electric	Lincoln County PWSD #1	American Red Cross
CenturyLink	Charter Communications	Crider Center
Cuivre River Electric Co-Op	Hawk Point Fire Department	Mercy Medical Center
Foley Drainage District	Northwest Fire Protection District	Sandy Creek Levee District
Montgomery County EMD	Warren County EMD	St. Charles County EMD
Eolia Fire Protection District	Elsberry Fire Protection District	Missouri Department of Transportation
Pike County EMD	Lincoln County Dispatch	Brevator Levee District
U.S. Corps of Engineers		

The planning process followed the methodology prescribed by FEMA, beginning with the formation of a Hazard Mitigation Planning Committee (MPC) comprised of key stakeholders from Lincoln County, participating jurisdictions, state agencies, and other several private non-profit entities.

The MPC updated the risk assessment that identified and profiled hazards that pose a risk to County A 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 – Protect the lives and livelihoods of all citizens

GOAL 2 – Manage growth through sustainable principles and practices

GOAL 3 – Ensure continued operation of government and emergency functions during a disaster

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

44 CFR requirement 201.6(c)(5): The local hazard mitigation plan shall include documentation that the plan has been formally adopted by the governing body of the jurisdiction requesting approval of the plan. For multi-jurisdictional plans, each jurisdiction requesting approval of the plan must document that it has been formally adopted.

This plan has been reviewed by and adopted with resolutions or other documentation of adoption by all participating jurisdictions and schools. The documentation of each adoption is included in Appendix A, 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.

Lincoln County	Chain of Rocks	Fountain N Lakes
Elsberry	Foley	Hawk Point
Moscow Mills	Old Monroe	Silex
Troy	Whiteside	Winfield
Truxton	Elsberry R-II School District	Silex R-I School District
Troy R-III School District	Winfield R-IV School District	

Model Resolution

Resolution #

Adopting the Lincoln County Multi-Jurisdictional Local Hazard Mitigation Plan

Whereas, the (Name of Government/District/Organization seeking FEMA approval of hazard mitigation plan) recognizes the threat that natural hazards pose to people and property within our community; and

Whereas, undertaking hazard mitigation actions will reduce the potential for harm to people and property from future hazard occurrences; and

Whereas, the U.S. Congress passed the Disaster Mitigation Act of 2000 ("Disaster Mitigation Act") emphasizing the need for pre-disaster mitigation of potential hazards;

Whereas, the Disaster Mitigation Act made available hazard mitigation grants to state and local governments; and

Whereas, an adopted Local Hazard Mitigation Plan is required as a condition of future funding for mitigation projects under multiple FEMA pre- and post-disaster mitigation grant programs; and

Whereas, the (Name of Government/District/Organization) fully participated in the hazard mitigation planning process to prepare this Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, the Missouri State Emergency Management Agency and the Federal Emergency Management Agency Region VII officials will review the "Lincoln County Multi-Jurisdictional Local Hazard Mitigation Plan," and approved it as to form and content; and

Whereas, the (Name of Government/District/Organization) desires to comply with the requirements of the Disaster Mitigation Act and to augment its emergency planning efforts by formally adopting the Lincoln County Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption by the governing body for the (Name of Government/District/Organization) demonstrates the jurisdictions' commitment to fulfilling the mitigation goals outlined in this Multi-Jurisdictional Local Hazard Mitigation Plan; and

Whereas, adoption of this legitimizes the plan and authorizes responsible agencies to carry out responsibilities under the plan;

Now, therefore, be it resolved, that the (Name of Government/District/Organization) has adopted the "Lincoln County Multi-Jurisdictional Local Hazard Mitigation Plan" as an official plan.

Date: _____

Certifying Official: _____

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1 INTRODUCTION AND PLANNING PROCESS

1 INTRODUCTION AND PLANNING PROCESS 1

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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." The work done to minimize the impact of natural hazard events to life and property is called Hazard Mitigation. Lincoln County and its participating jurisdictions and school districts developed this multi-jurisdictional local hazard mitigation plan update to reduce future losses from hazard events.

1.2 Background and Scope

This document is the 5-year update of a plan that was approved on February 8, 2012. The plan and the update were prepared pursuant to the requirements of 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). This plan update results in eligibility for the Federal Emergency Management Agency (FEMA) Hazard Mitigation 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.

- **Lincoln County**
- **Village of Chain of Rocks**
- **City of Elsberry**
- **City of Foley**
- **Village of Fountain N Lakes**
- **City of Hawk Point**
- **City of Moscow Mills**
- **City of Old Monroe**
- **City of Silex**

- **City of Troy**
- **Village of Truxton**
- **Village of Whiteside**
- **City of Winfield**
- **Elsberry R-II School District**
- **Silex R-I School District**
- **Troy R-III School District**
- **Winfield R-IV School District**

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

1.3 Plan Organization

The latest update (2016) document involved review, evaluation, and amendment of the existing plan. It addresses the same natural hazards that were addressed in the original plan plus additional hazards as related to Public Health. The select few man-made hazards that were included in the 2011 update are carried forward into this plan, plus Radiation Release was added as a man-made hazard.

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

It should be noted that SEMA directed a new formatting style for the updated plan which required some content to be rewritten and reorganized. However, this resulted in no significant changes to the content of the plan from the 2011 update. The table below illustrates only significant changes made to the content of the plan.

Table 1.1. Changes Made in Plan Update

Section	Summary of Changes Made
1 – Introduction and Planning Process	Reorganized and made more concise
2 – Planning Area Profile and Capabilities	Reorganized and data updated to current
3 – Risk Assessment	Reorganized and all hazard event data was updated and new risk vulnerability analysis was performed using new data. Radiation Release was added as a man-made hazard.
4 – Mitigation Strategy	Reorganized and three new actions were added as Public Health issues to be addressed; 1.3.5 –

Section	Summary of Changes Made
	Identify public health issues and identify ways to promote healthy life style changes, 1.3.6 – Identify causes of disease and promote measures to control spread of disease in case of emergency such as ; reduce vectors, increase awareness of foodborne illness hazards due to spoilage and contamination., 1.7.4 – Identify community health disparities and their effects on post disaster population health, i.e., access to care, messaging, translation services, and mental/behavioral health services.
5 – Plan Implementation and Maintenance	Reorganized and updated

1.4 Planning Process

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

Lincoln County contracted with the Boonslick Regional Planning Commission (BRPC) through SEMA's Scope of Work agreement and participated fully in the preparation of the original 2009 plan and the 2011 update. BRPC's responsibilities under this scope of work include the following;

- Assist in establishing the original Mitigation Planning Committee (MPC) as defined by the Disaster Mitigation Act (DMA), and assist Lincoln County in keeping the committee members current.
- Assess the adherence to the process set forth in the previously approved plan for maintenance, that is, did the MPC meet regularly as specified in the prior plan and explain why or why not the process was followed.
- Ensure the updated plan meets the DMA requirements and follows the most current planning guidance of the Federal Emergency Management Agency, FEMA.
- Facilitate the entire plan development process.
- Identify the data that MPC participants could provide and conduct the research and documentation necessary to augment that data.
- Assist in soliciting public input.
- Produce the draft and final plan update in a FEMA-approved document, and coordinate the reviews of FEMA and the Missouri State Emergency Management Agency (SEMA).

Table 1.2. Jurisdictional Representatives of the Lincoln County MPC

Name		Title	Department	Jurisdiction / Agency / Organization
Emma	Epplin-Birdsell	Emergency Management Director	NA	Lincoln County Emergency Management Agency
Mike	Cherry	Fire Chief	NA	Lincoln County Fire Protection District
Genevieve	Weseman	Emergency Planner	NA	Lincoln County Health Department
Terry	Foster	Police Chief	NA	Moscow Mills Police Department
Stan	Rolf	Owner/Operator	NA	Winfield / Pin Oaks Levee District
Kristin	Gentry	Director	Family Support Division	Missouri Department of Social Services
Jim	Harke	Owner / Operator	NA	Cap-au-Gris Levee District
Joe	Edwards	Mechanic	NA	City of Troy
Jodi	Schneider	City Clerk	NA	City of Troy
Mike	Clynch	Mayor	NA	City of Moscow Mills
Tim	Reller	Superintendent	NA	Elsberry R-II School District
William	Barnes	Police Chief	NA	Silex Police Department
Larry A.	Kirk	Police Chief	NA	Old Monroe Police Department
Jim	Holloway	Lieutenant	NA	Lincoln County Ambulance District
Andy	Binder	Lieutenant, Public Information	NA	Lincoln County Sheriff's Office
Brian	Lourance	Mechanic	Maintenance	City of Troy
Mark	Cross	Mayor	NA	City of Troy
Tonya	Hawkins	Assistant City Clerk	NA	City of Troy

1.4.1 Multi-Jurisdictional Participation

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

The Disaster Mitigation Act requires that each jurisdiction participate in the planning process

and officially adopt the multi-jurisdictional hazard mitigation plan. A Hazard Mitigation Planning Committee (MPC) was created that includes representatives from each participating jurisdiction, departments of the county, school districts and other agencies responsible for making decisions in the plan and agreeing upon the final contents. The Lincoln County Emergency Management Director, along with BRPC, solicited membership in the MPC through updated distribution lists of jurisdictional stakeholders and advertised for additional stakeholders through display ads in local newspapers. In addition, BRPC and the Lincoln County EMD reached out through press releases to local newspapers and radio stations, and posted bulletins at strategic locations. Data Collection Questionnaires were distributed to the participating jurisdictions. A list of all jurisdictions invited to participate is included in Appendix B.

Once formed, the MPC contributed to the planning process by; providing facilities for meetings, attending and participating in meetings, collecting and reporting data and progress of current mitigation actions, determining new mitigation strategies, reviewing drafts, and coordinating and assisting with public involvement and plan adoptions. Jurisdictions are also required to remove from further consideration any mitigation plans that are no longer valid because of impracticality, inappropriateness, not being cost-effective, or otherwise not feasible. Logs of time donated to the MPC were also created.

Minimum participation of each jurisdiction represented requires that the participant provide information to support the plan update through **at least one** of the following methods:

- Appoint a representative to attend the scheduled meetings;
- Alternately schedule meetings with BRPC staff liaison for data collection, risk assessment and mitigation strategies; or
- Communicate with BRPC staff through email concerning data collection, risk assessment and mitigation strategies.
- Formally adopt the mitigation plan.

Table 1.3. Jurisdictional Participation in Planning Process

Jurisdiction	Kick-off Meeting	Meeting #2	Data Collection Questionnaire Response	Update/Develop Mitigation Actions
Lincoln County	**Y**	**Y**	**Y**	**Y**
Village of Chain of Rocks	**N**	**N**	**Y**	**Y**
Village of Fountain N Lakes	**N**	**N**	**N**	**Y**
City of Elsberry	**N**	**N**	**Y**	**Y**
City of Foley	**N**	**N**	**N**	**Y**
City of Hawk Point	**N**	**N**	**Y**	**Y**
City of Moscow Mills	**Y**	**N**	**Y**	**Y**
City of Old Monroe	**Y**	**N**	**Y**	**Y**
City of Silex	**Y**	**N**	**N**	**Y**
City of Troy	**Y**	**Y**	**Y**	**Y**
Village of Whiteside	**N**	**N**	**Y**	**Y**
City of Winfield	**N**	**N**	**Y**	**Y**
Village of Truxton	**N**	**N**	**Y**	**Y**
Elsberry R-II School District	**Y**	**N**	**Y**	**Y**
Silex R-I School District	**N**	**N**	**Y**	**Y**

Troy R-III School District	**N**	**N**	**Y**	**Y**
Winfield R-IV School District	**N**	**N**	**Y**	**Y**

1.4.2 The Planning Steps

The initial scoping process of the planning effort consisted of soliciting local jurisdictions for a representative to attend the initial public meeting. When available, original committee members were invited directly. This effort was conducted in May of 2016 and consisted of detailed email invitations from the Lincoln County EMD explaining the importance of the planning process and jurisdictional participation. Notices were posted at strategic locations, a press release issued, display advertisements placed in local papers, and announcements posted on the BRPC and Lincoln County EMA websites in an attempt to solicit additional members from the public at large.

The kick-off meeting was held on May 18 at the Lincoln County Fire Protection District Training Center in Troy with 16 jurisdiction and stakeholders present. The plan update process was discussed along with the importance of planning participation, the status of action plans was reviewed, and next steps were explained such as email follow-up notices, questionnaire distribution, and contact with the Lincoln County EMD and Boonslick Regional Planning Commission personnel. The MPC further established milestones and meeting dates.

A final meeting was held on September 28, 2016 to review and approve the draft update plan. The MPC and the public were invited to review the plan that was posted to the Lincoln County EMA and BRPC websites weeks before the meeting. Printed copies of the plan were also available for review at the office of the Lincoln County Emergency Management Agency and the offices of the Boonslick Regional Planning Commission. Attendees were invited to participate in person when possible, however, when not possible, they would be kept in the loop via email updates and personal phone calls if necessary. Everyone was encouraged to engage others in the process. Email updates were distributed when necessary to ensure all were informed. The email invitations, public notices, press releases, display ads, web postings, sign-in sheets, minutes, and agenda are included in Appendix B.

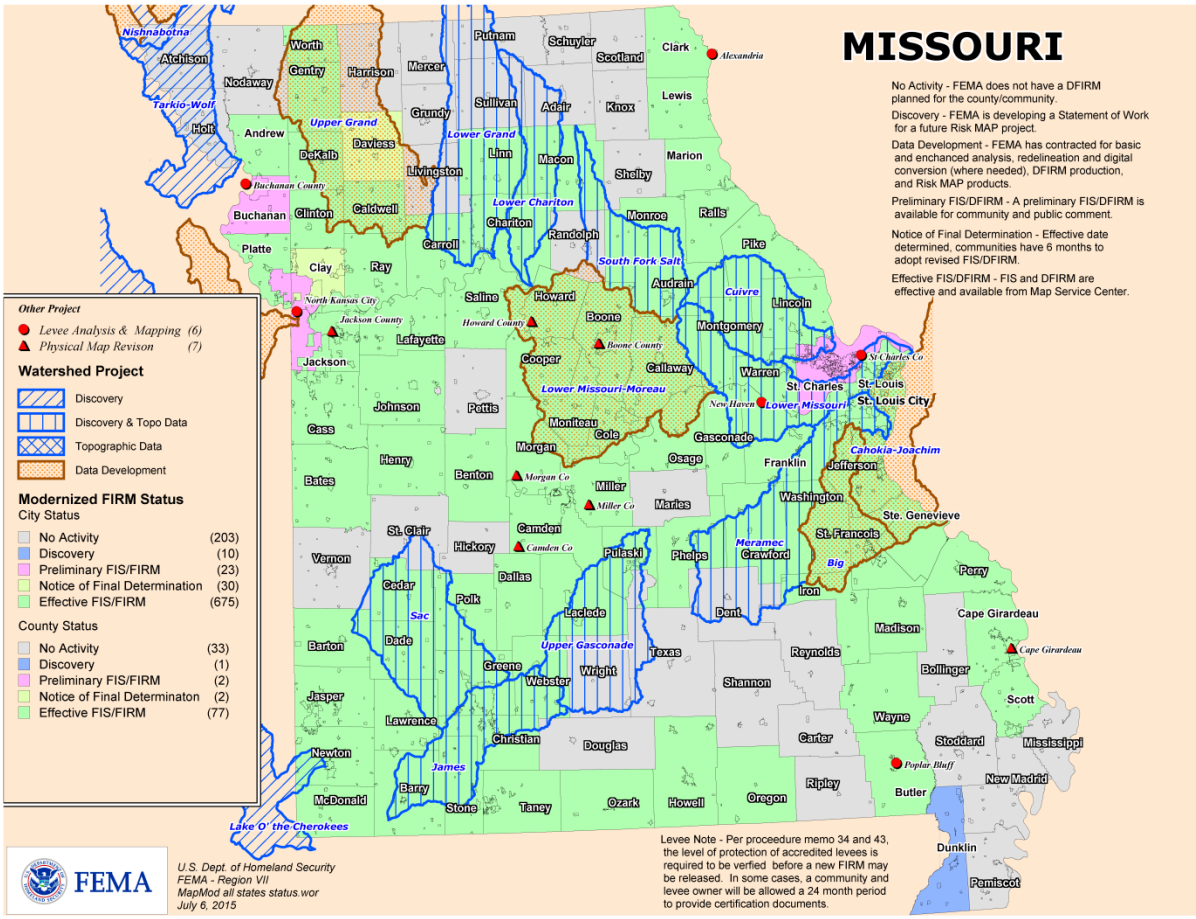
Table 1.4. Schedule of MPC Meetings

Meeting	Topic	Date
Informational Meeting	Planning meetings with the Lincoln County EMD to finalize list of committee members and review the action plan work sheet.	April and May 2016
Planning Meeting 1	Review HMP Background, planning process, schedule, and review/discussion of Goals, Objectives, and Action Plan.	May 18, 2016
Planning Meeting 2	Final review and approval of the updated plan.	September 28, 2016

Coordination with FEMA Risk MAP Project

The following figure shows the status of Risk Mapping activity in Lincoln County. Areas of Lincoln County prone to levee failure and flooding/flash flooding are addressed in Section III.

Figure 1.1. Risk Map Project Map



Integration of Other Data, Reports, Studies, and Plans

Emergency Operations procedures from Lincoln County and other jurisdictions, including dam and levee owners where available, were consulted as necessary.

Assess the Hazards; Identify and Profile Hazards

The Lincoln County Emergency Management Director along with BRPC staff reviewed the natural and man-made disasters included in the 2011 plan and those found in the 2013 Missouri State plan. This exercise was essentially a review of the existing hazards identified and an informal discussion of their status; that is, should be remain in our plan, be eliminated from our plan, and/or should other hazards be added. In addition, BRPC and the Lincoln County EMD reviewed disaster declarations for the county.

The findings were presented to the MPC at the kick-off meeting in May where the committee spent some time discussing the hazards. At the suggestion of the Lincoln County Emergency Management Director (EMD) it was determined to add a reference to evacuation plans due to radiation leakage from the Callaway Nuclear plant in Section III, Hazardous Materials.

Assess the Problem; Identify Assets and Estimate Losses

Web resources, existing reports and plans, Data Collection Questionnaires, and existing geographic information systems (GIS) layers were used to compile information about past hazard events. Hazard profiles from the original plan were reviewed for applicability and revised accordingly. The revised hazard profiles detail the location, previous occurrences, probability of future occurrences, and magnitude/severity of each hazard. In many instances vulnerability estimates were not available for local jurisdictions in which case, they were taken from the 2013 state plan as the best and most recent data available.

The MPC reviewed the goals from the previously approved plan and changes that were made to the 2016 plan were summarized and annotated as to the reason for the change. This activity was conducted at the first meeting where consensus was achieved that they remain valid for the updated plan. The Goals for the 2016 Updated Plan remain the same as those of the 2011 plan.

- GOAL 1: Protect the lives and livelihoods of all citizens
- GOAL 2: Employ sustainable principles and practices to enhance mitigation effectiveness.
- GOAL 3: Ensure continued operation of government and emergency functions during a disaster.

Review Possible Mitigation Actions and Activities

During the kick-off meeting in May, the team reviewed the mitigation strategy from the previously approved plan and proposed the following new actions which were prioritized using a modified STAPLEE (Social, Technical, Administrative, Political, Legal, Economic, Environmental);

- 1.3.5 – Identify public health issues and identify ways to promote healthy life style changes
- 1.3.6 – Identify causes of disease and promote measures to control spread of disease in case of emergency such as ; reduce vectors, increase awareness of foodborne illness hazards due to spoilage and contamination.
- 1.7.4 – Identify community health disparities and their effects on post disaster population health, i.e., access to care, messaging, translation services, and mental/behavioral health services.
- The radiation leak hazard is already addressed by the Lincoln County Emergency Management Agency's EOP which proscribes evacuation procedures and routes.

Draft an Action Plan

Based on information obtained at the kick-off meeting, the revised STAPLEE, and through various forms of communication with jurisdictions, BRPC and the Lincoln County EMD drafted an action plan. This plan was presented to the MPC at a second meeting in September of 2016 wherein their approval was solicited and obtained. Documents and plans reviewed include the Lincoln County Comprehensive Plan (1995), County Emergency Operations Plan (2012), Comprehensive Economic Development Strategy (CEDS, 2014), reports from the National Flood Insurance Program's Community Information System, Missouri State Hazard Mitigation Plan 2013, HAZUS data as well as other data from state and federal agencies. This information

was used to improve the plan's risk assessment and to validate plan's goals, objectives, and mitigation actions. The public was invited to this meeting as well via BRPC and EMA websites and invited to comment before adoption.

Table below shows the list of existing plans, studies, reports, and technical information reviewed and further incorporated into the plan.

Table 1.5. Existing Plans, Studies, and Reports

Existing Plan/ studies/ reports etc.	Does the jurisdiction have this plan technical document? (Yes/No)	Reviewed? (Yes/No)	Method of incorporation into the hazard mitigation plan
Lincoln County Master Plan 2003	Yes	Yes	Land uses, environmental issues.
County Emergency Operations Plan 2009	Yes	Yes	Mitigation measures, Inventory of critical/key/essential facilities
CEDS 2014	Yes	Yes	Provides general demographic, economic, and environmental data
Transportation Plan	Yes	Yes	Existing road networks and transportation incidents
Threat and Hazard Identification and Risk Assessment (THIRA) 2016	Yes	Yes	THIRA mitigation plans were reviewed to assure compatibility
Flood Insurance	Yes	Yes	Information on participating jurisdictions
Disaster Resistant Jobs Plan	Yes	Yes	Information on economic effects of possible disasters in the county

Adopt the Plan

Following approval by the MPC, the draft plan was distributed to the adopting jurisdictions via mail and e-mail. The MPC and the general public were also given one additional opportunity review the plan before adoption. BRPC tracked the adoption process for each jurisdiction and monitored public comment. In order to secure buy-in and officially implement the plan, the governing bodies of each participating jurisdiction adopted the plan. Copies of resolutions of adoption are included in Appendix A.

Implement, Evaluate, and Revise the Plan

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

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2.1 Lincoln County Planning Area Profile

Lincoln County's population in the 2010 census was 52,566. This is a 26% increase in population since the 2000 census population figure of 38,944. During the same decade, Missouri's population increased 7% and the United States population increased by 9%. Lincoln County is one of the 5 fastest growing counties in the state.

Table 2.1. Population Increase Comparison

	2000	2010	Increase	%
Lincoln County	38,944	52,566	13,622	26%
State	5,595,211	5,988,927	393,716	7%
United States	281,421,906	308,745,538	27,323,632	9%

Source: U.S. Bureau of Census

The 2000 census figures show Lincoln County's median home value as $94,900. By the 2010 census, the median home value had climbed to $155,600, or 39%. This compares to Missouri's median home value in 2000 of $86,900, and $137,000 in 2010, for a 37% increase. Similarly, this compares to the median home value of $111,800 for the United States in the 2000 census, $188,400 in the 2010 census, for a 41% increase in median home values nationwide.

Table 2.2. Median Home Value in Lincoln County

	2000	2010	Increase	%
Lincoln County	$ 94,900	$ 155,600	$ 60,700	39%
Missouri	$ 86,900	$ 137,700	$ 50,800	37%
United States	$ 111,800	$ 188,400	$ 76,600	41%

Source: U.S. Bureau of Census

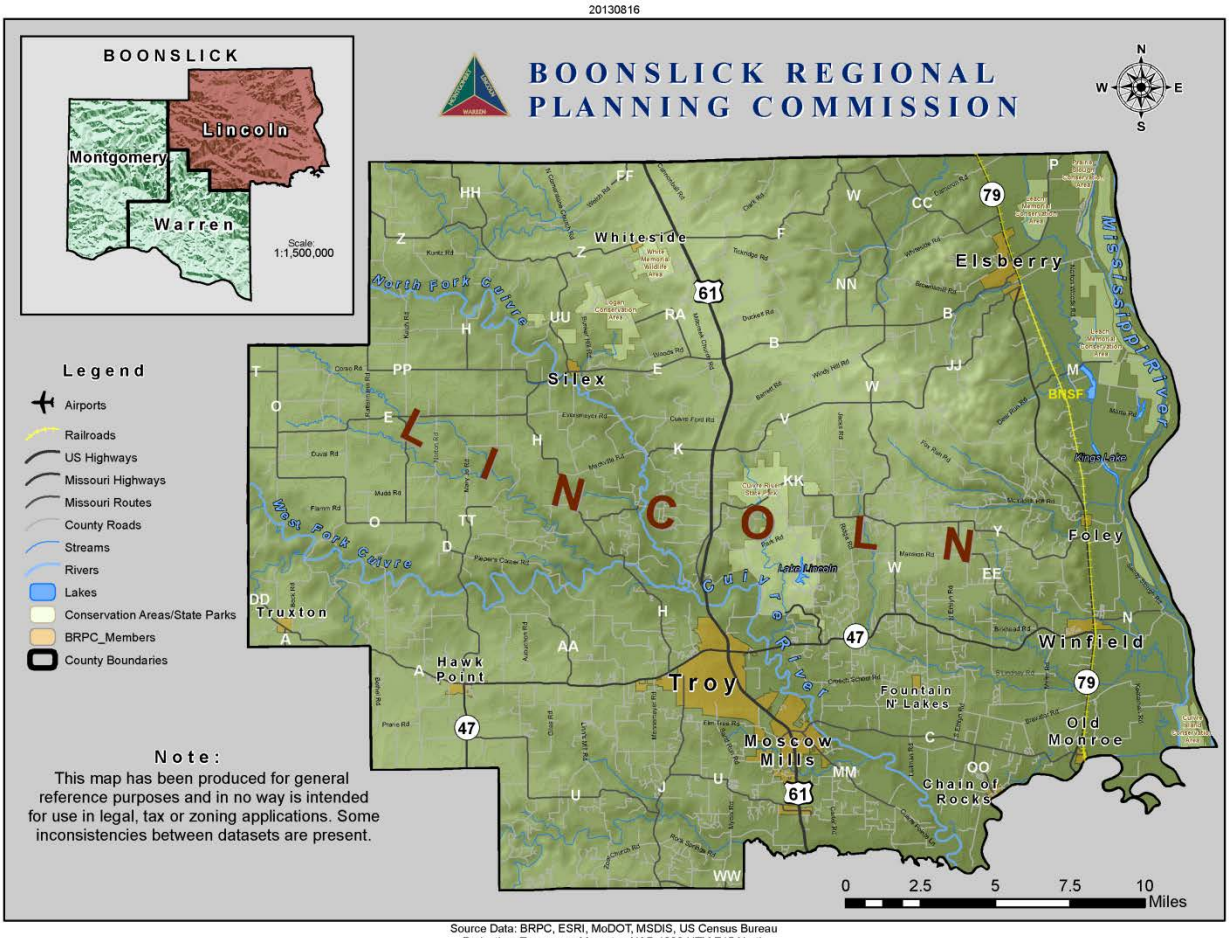
Median household income for Lincoln County compares similarly with state and national figures as well. The 2000 census data puts median household income for Lincoln County at $42,592. The 2010 census data places the county's median household income at $52,897 for a 19% increase since 2000. Missouri's median household income increased by 21% over the same decade; beginning in 2000 at $37,934 and ending in 2010 at $47,764. For the United States, the median household income in 2000 was $41,994, in 2010 it was $53,482; a 21% increase. Lincoln County's median household income is just below the Missouri and U.S. median.

Table 2.3. Median Household Income Comparison

	2000	2010	Increase	%
Lincoln County	$ 42,592	$ 52,897	$ 10,305	19%
Missouri	$ 37,934	$ 47,764	$ 9,830	21%
United States	$ 41,994	$ 53,482	$ 11,488	21%

Source: U.S. Bureau of Census

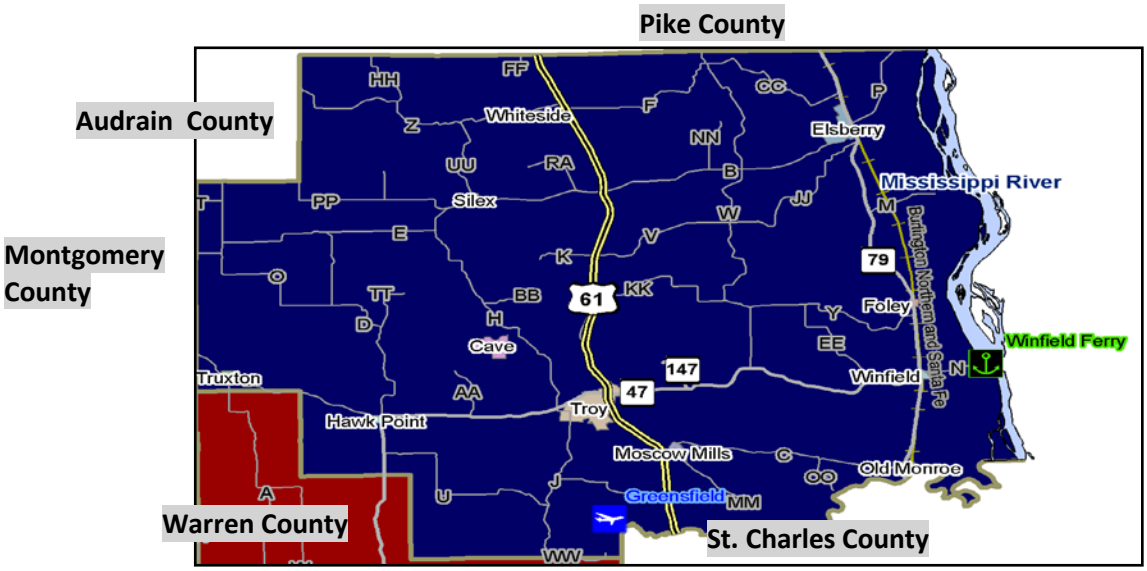
Figure 2.1. Map of Lincoln County, Missouri



2.1.2 **Geography, Geology and Topography**

The southwest border of Lincoln County lies just 5 miles from the St. Louis Metropolitan Planning Organization (MPO) transportation boundary and with 15 miles of St. Louis County proper. The Cuivre River flows across the county from northwest to southeast and the Mississippi River serves as the count's eastern border. Montgomery County lies to the west, Warren County lies to the southwest, and Pike County to the north. St. Charles County is south.

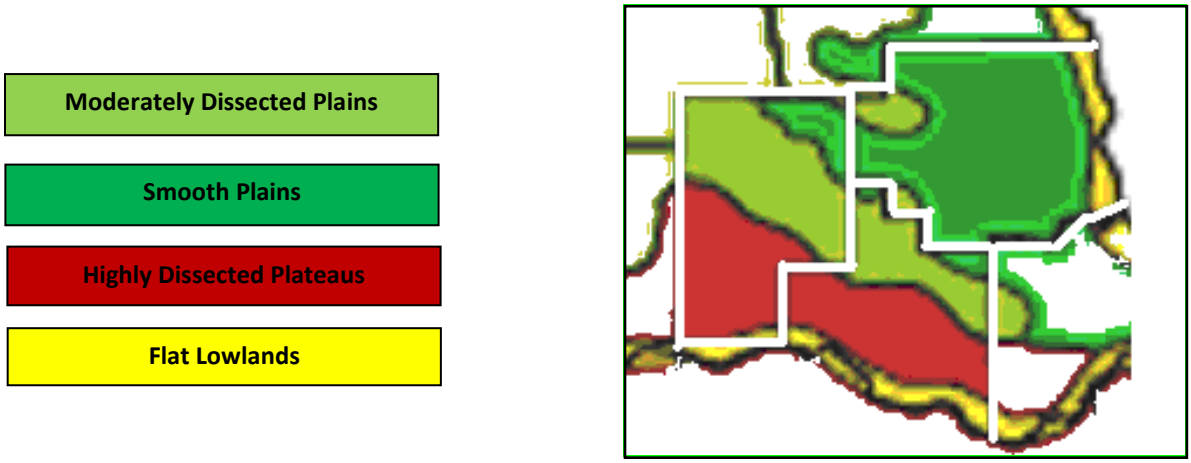
Figure 2.2. Lincoln County Road and Surrounding Counties



Source: Boonslick Regional Planning Commission

Lincoln County encompasses approximately 630 square miles, or 402,000 acres. The land is primarily moderately dissected plains of glacial deposits of clay, silt, sand, and gravel, up to 300 feet think. A large northwest-southeast midsection of these plains is covered in residual cherty limestone (clay and gravel) up to 50 feet thick. The flat lowlands along the Mississippi River are covered loess (silt and clayey silt) up to 100 feet thick with a strip of alluvium soil (silt, sand, and gravel) up to 15 feet thick along the banks of the river. The county is mostly rural with pockets of urban areas in and around the county seat of Troy. The fastest growing areas of the county are adjacent to US61 which bisects the county. Land use is primarily agricultural with some light manufacturing.

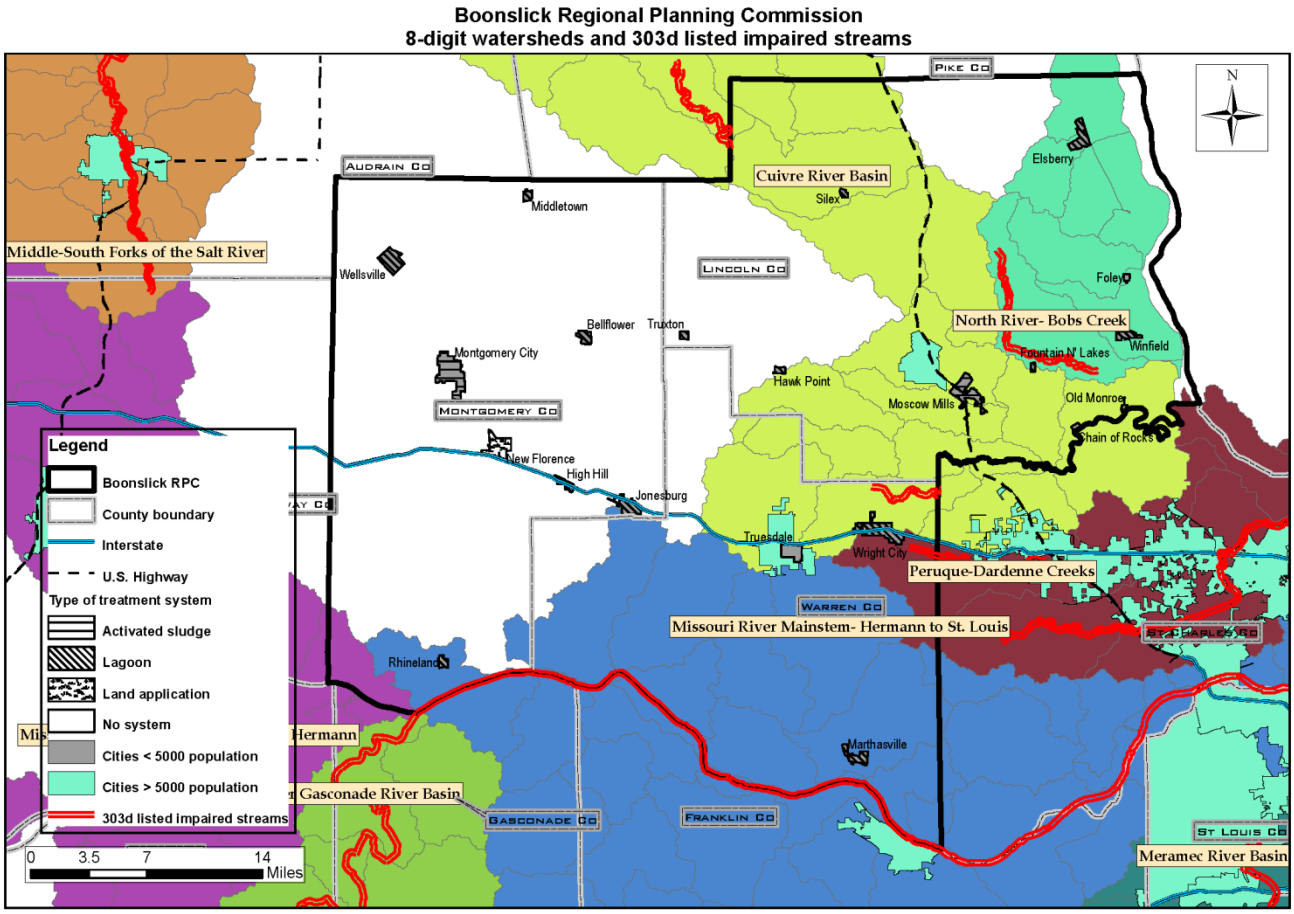
Figure 2.3. Topographic Relief Map of Boonslick Region w/Lincoln County at Top Right



Source: Boonslick Regional Planning Commission

The three main watersheds that cross Lincoln County are the Cuivre River Watershed and the North River / Bob's Creek Watersheds. The map below shows the Lincoln County watersheds and the communities within them.

Figure 2.4. Lincoln County Watersheds



Source: Boonslick Regional Planning Commission

2.1.3 **Climate**

The climate is generally moderate. Temperatures, according to the National Weather Service (NWS) station at Lambert St. Louis Airport, range from an average high of 89 degrees in July to an average low of 21 degrees in January. Rainfall averages 4 inches per month during March through July while the average is 3 inches per month during September through December. January and February average only 2 inches, while snowfall averages 3-5 inches in the winter months. Average wind speeds range from 9 miles per hour in July to 13 miles per hour in March. Winter and spring winds are from the west northwest while summer winds blow primarily from the south.

2.1.4 **Population/Demographics**

Lincoln County's population steadily, but slowly, increased from the turn of the century until 1970. Between 1970 and 2000, the county's population grew at ever-increasing rates as rapid growth in adjacent St. Charles County overflowed into Lincoln County. The population more than doubled between 1970 and 2000 and between 2000 and 2010, the population increased by 26%. Among the state's 114 counties, Lincoln County ranked second in percent of population increase between the 2000 and 2010 censuses.

Today, 49% of the population lives in rural areas of the county; however, only a small percentage of the total population actually lives on a farm. In recent years, many urban dwellers have returned to rural areas due to increases in crime and urban decay. The table below shows the population change of Lincoln County from 2000 to 2010.

Table 2.4. Lincoln County Population 2000 – 2010 by Community

Community	2000 Population	2010 Population	Change	% Change
Lincoln County	52,566	56,566	4,000	7.1%
Chain of Rocks	91	93	2	2.2%
Elsberry	2,047	1,934	(113)	-5.8%
Foley	178	161	(17)	-10.6%
Fountain N Lakes	129	165	36	21.8%
Hawk Point	459	669	210	31.4%
Moscow Mills	1,742	2,509	767	30.6%
Old Monroe	250	265	15	5.7%
Silex	206	187	(19)	-10.2%
Troy	6,737	10,540	3,803	36.1%
Truxton	96	91	(5)	-5.5%
Whiteside	67	75	8	10.7%
Winfield	723	1,404	681	48.5%

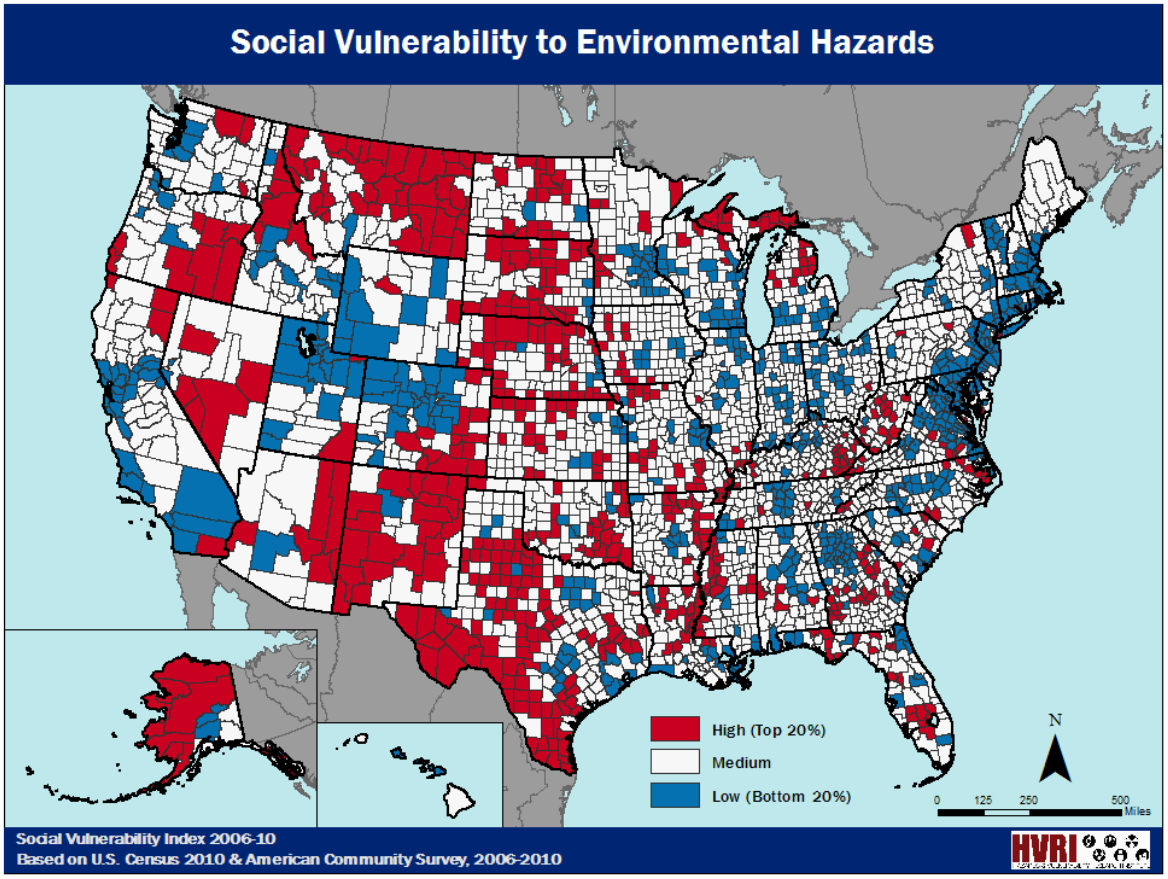
Source: U.S. Bureau of the Census, Decennial Census

According to the 2010-2014 American Community Survey 5-Year Estimates, in Lincoln County, 6.8% of the population is under 5 years of age. This compares to 6.3% for the state and 6.4% for the nation. The same source cites Lincoln County population age 65 or older as 11.6% which compares to 14.6% for Missouri and 13.7% for the nation. Again, using the same source, Lincoln County has an estimated 18,521 households with an average household size of 2.85. That compares to Missouri's estimated 2,361,232 households with an average size of 2.48 and the nation's number of households at 116, 211,092 with an average household size of 2.63.

The University of South Carolina developed an index to evaluate and rank the ability to respond to, cope with, recover from, and adapt to disasters. The index synthesizes 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. The lower the SoVI, the better the county ranks in its resilience to hazard events. The SoVI for the Lincoln County planning area is -2.50877. In comparison to the national average, Lincoln County is at 12.3%.

The map below shows the SoVI for each county within the United States. Lincoln County is colored blue signifying a low SoVI. SoVI is included in the Missouri 2013 Hazard Mitigation Plan.

Figure 2.5. Social Vulnerability to Environmental Hazards



The table below illustrates additional demographic and economic indicators for Lincoln County that comprise the SoVI.

Table 2.5. Lincoln County Labor, Poverty, Education, and Language Percentage Demographics

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)
Lincoln County	26,544	8.0%	11.8%	44.8%	9.8%	2.2%
Chain of Rocks	54	2.1%	11.8%	25.0%	0.0%	0.0%
Elsberry	786	13.7%	13.5%	83.2%	0.0%	0.7%
Foley	56	13.2%	3.8%	0.0%	0.0%	0.0%
Fountain N Lakes	133	14.4%	37.1%	34.2%	0.0%	0.0%
Hawk Point	306	11.3%	19.4%	25.3%	0.0%	0.5%
Moscow Mills	1137	10.5%	21.0%	23.7%	5.5%	1.0%

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)
Old Monroe	121	10.1%	4.7%	36.4%	9.1%	0.0%
Silex	21	7.4%	22.2%	100.0%	0.0%	0.0%
Troy	4,685	4.3%	14.0%	46.4%	6.7%	0.9%
Truxton	26	13.6%	52.6%	100.0%	0.0%	0.0%
Whiteside	34	9.7%	9.5%	40.0%	0.0%	0.0%
Winfield	826	11.9%	14.1%	43.7%	4.2%	1.2%

Source: U.S. Census, 2014 American Community Survey, 5-year Estimates.

2.1.5 **History**

The county's close proximity to the confluence of the Missouri and Mississippi Rivers prompted hunting and foraging incursions into the area early in its history. Prior to the first permanent European settlement, Monroe, during the late 1700s, the area was home and hunting grounds of numerous native Americans. However, the French and Spanish began explorations of what would become Lincoln County as early as the early 1700s. The completion of the Louisiana Purchase in 1803 precipitated an influx of American pioneers from the southeast. Lincoln County was formed from St. Charles County in 1818 and named for Revolutionary War General Benjamin Lincoln of Massachusetts.

2.1.6 **Occupations**

The table below shows the distribution by percentage of major occupational categories for the incorporated cities and Lincoln County as a whole.

Table 2.6. Occupation Statistics Lincoln County

Communities	Management, Business, Science and Arts	Service Occupations	Sales and Office Occupations	Natural Resources, Transportation, Construction, and Maintenance Occupations	Production, Transportation, and Material Moving Occupations
Lincoln County	5,928	3,803	5,981	3,663	3,895
Chain of Rocks	10	10	9	23	-
Elsberry	101	146	154	61	126
Foley	11	8	7	11	7
Fountain N Lakes	18	23	21	12	29
Hawk Point	46	35	63	52	52
Moscow Mills	172	194	200	94	305
Old Monroe	17	16	46	5	15
Silex	5	-	9	-	1

Communities	Management, Business, Science and Arts	Service Occupations	Sales and Office Occupations	Natural Resources, Transportation, Construction, and Maintenance Occupations	Production, Transportation, and Material Moving Occupations
Troy	1,439	591	1,161	549	608
Truxton	2	6	6	4	2
Whiteside	8	4	4	7	5
Winfield	215	114	131	93	129

Source: U.S. Census, 2014 American Community Survey, 5-year Estimates

2.1.7 **Agriculture**

According to the USDA's 2012 Census of Agriculture, there are 1,162 farms in Lincoln County for a total of 281,155 acres. This compares to 99,200 farms in Missouri and 28,300,000 acres. The average size farm in Lincoln County is 242 acres while the state average is larger at 290 acres. The number of farms in Lincoln County in 2012 is down 4.6% from 2007.

The total value of farm products sold in Lincoln County in 2012 is $85,647,000. Crop sales account for 55% of the total sales and livestock account for the remaining 45% of sales. Beef cattle and hogs make up the majority of livestock sales and soybeans, grain corn, and forage crops account for the majority of crop sales. Average sales per Lincoln County farm is $73,707.

Farms in Lincoln County account for 1,042 farm proprietor of jobs (StatsAmerica 2014) plus approximately 119 additional agriculture-related workers (2010-2014 American Community Survey), or 5.1% of the labor force.

2.1.8 **FEMA Hazard Mitigation Assistance Grants in Lincoln County**

Lincoln County has not requested FEMA Hazard Mitigation grant funding; however, a grant application has been submitted and approval is expected in January 2017.

Table 2.7. FEMA HMA Grants in Lincoln County from 1993 - 2016

Project Type	Sub-applicant	Award Date	Project Total
HMGP DR-4238 2016 Flooding and Personal Safety Hazard Mitigation Project	Lincoln County	TBD	$1,500,000
HMGP DR-4250 2016 Tornado Sirens	Lincoln County	TBD	$100,000
Total			$1,600,000

Source: Lincoln County Emergency Management Agency

2.2 Jurisdictional Profiles and Mitigation Capabilities

This section will include individual profiles for each participating jurisdiction. These profiles were created with information provided by the MPC, including the Lincoln County Emergency

Management Agency, participating school districts, and city clerks from each jurisdiction. The table 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, and the public school districts.

2.2.1 **Unincorporated Lincoln County**

Lincoln County is a second-class county and its jurisdiction includes all unincorporated areas within its boundaries. The county is governed by a board of commissioners consisting of a Presiding Commissioner and two associate commissioners; a District 1 Commissioner and a District 2 Commissioner. The county's organizational structure includes the following offices and departments. These county offices work in conjunction with various other non-county-government public safety agencies for the good of Lincoln County residents.

- Assessor
- Auditor
- Board of Commissioners
- Circuit Clerk
- Collector
- Coroner
- County Clerk
- Emergency Management Agency
- Health Department
- Highway Department
- Prosecuting Attorney
- Public Administrator
- Recorder of Deeds
- 911 Dispatch
- Sheriff
- Surveyor
- Treasurer
- Economic Development
- Justice Center

Mitigation Initiatives / Capabilities

The various Lincoln County agencies work together to mitigate public safety issues ranging from the benign to the serious. In addition, when conditions move beyond the mitigation stage these agencies, in conjunction with local Law Enforcement, Fire Protection, Ambulance Districts, and other first responders, are prepared to respond in an immediate and appropriate manner to protect the community from whatever disaster befalls.

The table below summarizes the capabilities of Lincoln County agencies.

Table 2.8. Unincorporated Lincoln County Mitigation Capabilities

Capabilities	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	NA

Capabilities	Status Including Date of Document or Policy
Builder's Plan	NA
Capital Improvement Plan	NA
Local Emergency Plan	NA
County Emergency Plan	Currently updating
Local Recovery Plan	NA
County Recovery Plan	Included in emergency operations plan
Local Mitigation Plan	NA
County Mitigation Plan	09/26/2011
Local Mitigation Plan (PDM)	NA
County Mitigation Plan (PDM)	NA
Economic Development Plan	Comprehensive Economic Development Strategy 2014
Transportation Plan	NA
Land-use Plan	Just floodplain
Flood Mitigation Assistance (FMA)Plan	Na
Watershed Plan	NA
Firewise or other fire mitigation plan	Currently working
School Mitigation Plan	Yes
Critical Facilities Plan (Mitigation / Response / Recovery)	No
Policies/Ordinance	**Status Including Date of Document or Policy**
Zoning Ordinance	No
Building Code	Lincoln County fire, Winfield fire
Floodplain Ordinance	Updated in 2014
Subdivision Ordinance	NA
Tree Trimming Ordinance	Cities and Lincoln County fire
Nuisance Ordinance	NA
Storm Water Ordinance	NA
Drainage Ordinance	NA
Site Plan Review Requirements	NA
Historic Preservation Ordinance	NO ordinance but do promote
Landscape Ordinance	NA
Wetlands and Riparian Areas Conservation Plan	Department of Conservation
Debris Management Plan	Only during disaster
Program	**Status Including Date of Document or Policy**
Zoning/Land Use Restrictions	NA
Codes Building Site/Design	NA
NFIP Participation	Current
NFIP Community Rating System (CRS) Participating Community	In future plans
Hazard Awareness Program	NA
National Weather Service (NWS) StormReady	June 2016
Building Code Effectiveness Grading (BCEGs)	NA
ISO Fire Rating	Varies- 4 to 10
Economic Development Program	Yes
Land Use Program	NA

Capabilities	Status Including Date of Document or Policy
Public Education/Awareness	NA
Property Acquisition	NA
Planning/Zoning Boards	Cities
Stream Maintenance Program	NA
Tree Trimming Program	NA
Engineering Studies for Streams (Local / County / Regional)	Cuivre river and Mississippi river
Mutual Aid Agreements	Countywide
Studies/Reports/Maps	
Hazard Analysis/Risk Assessment (Local)	NA
Hazard Analysis/Risk Assessment (County)	2015
Flood Insurance Maps	2010
FEMA Flood Insurance Study (Detailed)	NA
Evacuation Route Map	NA
Critical Facilities Inventory	Currently working
Vulnerable Population Inventory	US Census, Ambulance & dispatch data
Land Use Map	Just floodplain
Staff/Department	
Building Code Official	NA
Building Inspector	NA
Mapping Specialist (GIS)	Yes
Engineer	Contract
Development Planner	NA
Public Works Official	NA
Emergency Management Director	Yes
NFIP Floodplain Administrator	Yes
Bomb and/or Arson Squad	Contract
Emergency Response Team	CERT
Hazardous Materials Expert	Contract
Local Emergency Planning Committee	Yes
County Emergency Management Commission	Yes
Sanitation Department	Health department, Cities
Transportation Department	Yes
Economic Development Department	Yes
Housing Department	No
Planning Consultant	No
Regional Planning Agencies	Boonslick RPC
Historic Preservation	Yes
Non-Governmental Organizations (NGOs)	**Yes/No**
American Red Cross	Yes
Salvation Army	Yes
Veterans Groups	Yes
Environmental Organization	Yes
Homeowner Associations	Yes

Capabilities	Status Including Date of Document or Policy
Neighborhood Associations	Yes
Chamber of Commerce	Yes
Community Organizations (Lions, Kiwanis, etc.)	Yes
Local Funding Availability	**Yes/No**
Ability to apply for Community Development Block Grants	Yes
Ability to fund projects through Capital Improvements funding	Yes
Capabilities	**Yes/No**
Authority to levy taxes for a specific purpose	Yes
Fees for water, sewer, gas, or electric services	No
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	NA
Ability to withhold spending in hazard prone areas	NA

Source: Data Collection Questionnaire, 2016

2.2.2 Village of Chain of Rocks

The Village of Chain of Rocks is situated on the north side of the Cuivre River, about four miles above Old Monroe. In 1885 there are three general stores, a blacksmith shop and wagon shop, a shoe shop, two doctors, and a telegraph line to Old Monroe. That same year, a 14 foot wide 192 foot long wagon bridge across the Cuivre River to St. Charles County, was constructed by the two counties. Today, the village is a bedroom community consisting of 109 acres.

The Village of Chain of Rocks is governed by a board of four elected members and a chairman. Law Enforcement and ambulance services is provided by the Lincoln County, and fire services is provided by Old Monroe.

Table 2.9. Village of Chain of Rocks Mitigation Capabilities

Capabilities	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	NA
Builder's Plan	NA
Capital Improvement Plan	NA
Local Emergency Plan	NA
County Emergency Plan	NA
Local Recovery Plan	NA
County Recovery Plan	NA
Local Mitigation Plan	NA
County Mitigation Plan	10/13/2011
Local Mitigation Plan (PDM)	NA
County Mitigation Plan (PDM)	NA
Economic Development Plan	NA
Transportation Plan	NA
Land-use Plan	NA

Capabilities	Status Including Date of Document or Policy
Flood Mitigation Assistance (FMA) Plan	NA
Watershed Plan	NA
Firewise or other fire mitigation plan	NA
School Mitigation Plan	NA
Critical Facilities Plan (Mitigation / Response / Recovery)	NA
Policies/Ordinance	**Status Including Date of Document or Policy**
Zoning Ordinance	Yes
Building Code	NA
Floodplain Ordinance	NA
Subdivision Ordinance	NA
Tree Trimming Ordinance	NA
Nuisance Ordinance	NA
Storm Water Ordinance	NA
Drainage Ordinance	NA
Site Plan Review Requirements	NA
Historic Preservation Ordinance	NA
Landscape Ordinance	NA
Wetlands and Riparian Areas Conservation Plan	NA
Debris Management Plan	NA
Program	**Status Including Date of Document or Policy**
Zoning/Land Use Restrictions	NA
Codes Building Site/Design	NA
NFIP Participation	NA
Hazard Awareness Program	NA
National Weather Service (NWS) StormReady	NA
Building Code Effectiveness Grading (BCEGs)	NA
ISO Fire Rating	NA
Economic Development Program	NA
Land Use Program	NA
Public Education/Awareness	NA
Property Acquisition	NA
Planning/Zoning Boards	NA
Stream Maintenance Program	NA
Tree Trimming Program	NA
Engineering Studies for Streams (Local/County/Regional)	NA
Mutual Aid Agreements	NA
Studies/Reports/Maps	**Status Including Date of Document or Policy**
Hazard Analysis/Risk Assessment (Local)	NA
Hazard Analysis/Risk Assessment (County)	NA
Flood Insurance Maps	NA
FEMA Flood Insurance Study (Detailed)	NA
Evacuation Route Map	NA

Capabilities	Status Including Date of Document or Policy
Critical Facilities Inventory	NA
Vulnerable Population Inventory	NA
Land Use Map	NA
Staff/Department	**Yes/No**
Building Code Official	NA
Building Inspector	NA
Mapping Specialist (GIS)	NA
Engineer	NA
Development Planner	NA
Public Works Official	NA
Emergency Management Director	Yes
NFIP Floodplain Administrator	NA
Bomb and/or Arson Squad	NA
Emergency Response Team	NA
Hazardous Materials Expert	NA
Local Emergency Planning Committee	NA
County Emergency Management Commission	Yes
Sanitation Department	NA
Transportation Department	NA
Economic Development Department	NA
Housing Department	NA
Planning Consultant	NA
Regional Planning Agencies	Boonslick RPC
Historic Preservation	NA
Non-Governmental Organizations (NGOs)	**Yes/No**
American Red Cross	NA
Salvation Army	NA
Veterans Groups	NA
Environmental Organization	NA
Homeowner Associations	NA
Neighborhood Associations	NA
Chamber of Commerce	NA
Community Organizations (Lions, Kiwanis, etc.)	NA
Local Funding Availability	**Yes/No**
Ability to apply for Community Development Block Grants	Yes
Ability to fund projects through Capital Improvements funding	NA
Capabilities	**Yes/No**
Authority to levy taxes for a specific purpose	NA
Fees for water, sewer, gas, or electric services	Sewer
Impact fees for new development	NA
Ability to incur debt through general obligation bonds	NA
Ability to incur debt through special tax bonds	NA

Capabilities	Status Including Date of Document or Policy
Ability to incur debt through private activities	NA
Ability to withhold spending in hazard prone areas	NA

Source: Data Collection Questionnaire, 2016

2.2.3 City of Elsberry

Elsberry is on Missouri Highway 79 in Northeastern Lincoln County. On May 5, 1879, what was then the Clarksville & Western Railroad Company reached the farm of Robert T. Elsberry in Lincoln County. With the coming of the railway arose the ambition to found a town which should bear his name. In August of that year, the depot was built, and soon after the town site was plotted. Elsberry is the home of the late Congressman Clarence Cannon, who served in the United States Congress from 1923 until his death in 1964.

Today, the city of Elsberry has a population of just under 2,000 residents and is situated on 1.6 acres, all of it comprised of land. The city is governed by an elected Mayor and three elected aldermen. Elsberry is home to the Elsberry R- III School District and its three attendance centers.

Elsberry is an older community with homes and businesses ranging from new to over 100 years old which can present challenges for the Elsberry Fire Protection District. In addition, flooding can be an issue for Elsberry as much of the city resides in the Mississippi River floodplain. Elsberry has its own fire protection and police department, and is served by the Lincoln County Ambulance District, Base 3, located in town.

The table below summarizes Elsberry's hazard mitigation capabilities.

Table 2.10. City of Elsberry Mitigation Capabilities

Capabilities	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	9-9-1997
Builder's Plan	NA
Capital Improvement Plan	NA
Local Emergency Plan	NA
County Emergency Plan	NA
Local Recovery Plan	NA
County Recovery Plan	NA
Local Mitigation Plan	NA
County Mitigation Plan	10/11/2011
Local Mitigation Plan (PDM)	NA
County Mitigation Plan (PDM)	NA
Economic Development Plan	NA
Transportation Plan	NA
Land-use Plan	NA
Flood Mitigation Assistance (FMA)Plan	NA
Watershed Plan	NA
Firewise or other fire mitigation plan	NA
School Mitigation Plan	NA
Critical Facilities Plan (Mitigation / Response / Recovery)	NA

Capabilities	Status Including Date of Document or Policy
Policies/Ordinance	**Status Including Date of Document or Policy**
Zoning Ordinance	9-9-1997, updated 1-04-2004
Building Code	5-5-2008
Floodplain Ordinance	9-2-1998
Subdivision Ordinance	6-1-2010
Tree Trimming Ordinance	NA
Nuisance Ordinance	6-1-2001
Storm Water Ordinance	4-1-2007
Drainage Ordinance	4-1-2007
Site Plan Review Requirements	11-2-2008
Historic Preservation Ordinance	NA
Landscape Ordinance	NA
Wetlands and Riparian Areas Conservation Plan	NA
Debris Management Plan	NA
Program	**Status Including Date of Document or Policy**
Zoning/Land Use Restrictions	NA
Codes Building Site/Design	NA
NFIP Participation	NA
Hazard Awareness Program	NA
National Weather Service (NWS) StormReady	NA
Building Code Effectiveness Grading (BCEGs)	NA
ISO Fire Rating	NA
Economic Development Program	NA
Land Use Program	NA
Public Education/Awareness	NA
Property Acquisition	NA
Planning/Zoning Boards	NA
Stream Maintenance Program	NA
Tree Trimming Program	NA
Engineering Studies for Streams (Local / County / Regional)	NA
Mutual Aid Agreements	1-5-2015
Studies/Reports/Maps	**Status Including Date of Document or Policy**
Hazard Analysis/Risk Assessment (Local)	NA
Hazard Analysis/Risk Assessment (County)	NA
Flood Insurance Maps	9-29-2010
FEMA Flood Insurance Study (Detailed)	3-30-2009
Evacuation Route Map	No
Critical Facilities Inventory	NA
Vulnerable Population Inventory	NA
Land Use Map	2004
Staff/Department	**Yes/No**
Building Code Official	Yes
Building Inspector	Yes

Capabilities	Status Including Date of Document or Policy
Mapping Specialist (GIS)	No
Engineer	No
Development Planner	No
Public Works Official	Yes
Emergency Management Director	Yes
NFIP Floodplain Administrator	Yes
Bomb and/orArson Squad	No
Emergency Response Team	Yes
Hazardous Materials Expert	No
Local Emergency Planning Committee	Yes
County Emergency Management Commission	Yes
Sanitation Department	No
Transportation Department	No
Economic Development Department	No
Housing Department	No
Planning Consultant	No
Regional Planning Agencies	Boonslick RPC
Historic Preservation	No
Non-Governmental Organizations (NGOs)	**Yes/No**
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.)	Yes
Local Funding Availability	**Yes/No**
Ability to apply for Community Development Block Grants	Yes
Ability to fund projects through Capital Improvements funding	Yes
Capabilities	**Yes/No**
Authority to levy taxes for a specific purpose	Yes
Fees for water, sewer, gas, or electric services	Yes
Impact fees for new development	No
Ability to incur debt through general obligation bonds	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	NA

Source: Data Collection Questionnaire, 2016

2.2.4 **City of Foley**

Foley was incorporated in May of 1890 and today it is a 4th Class City located on Missouri Highway 2.18

79 in east central Lincoln County. The City Government is made up of a five member elected board that includes a Mayor and two aldermen from each of its two wards. Foley operates its own police department while fire service is provided by the Elsberry Fire Protection District and ambulance service is provided by Lincoln County.

The most significant hazard facing Foley is flooding. Structures in Foley are sound but of older construction and present no unusual challenges for fire fighters.

The table below summarizes the hazard mitigation capabilities of Foley.

Table 2.11. City of Foley Mitigation Activities (the questionnaire was not returned)

Capability	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	
Builder's Plan	
Capital Improvement Plan	
Local Emergency Plan	
County Emergency Plan	
Local Recovery Plan	
County Recovery Plan	
Local Mitigation Plan	
County Mitigation Plan	
Local Mitigation Plan (PDM)	
County Mitigation Plan (PDM)	
Economic Development Plan	
Transportation Plan	
Land-use Plan	
Flood Mitigation Assistance (FMA)Plan	
Watershed Plan	
Firewise or other fire mitigation plan	
School Mitigation Plan	
Critical Facilities Plan (Mitigation/Response/Recovery)	
Policies/Ordinance	**Status Including Date of Document or Policy**
Zoning Ordinance	
Building Code	
Floodplain Ordinance	
Subdivision Ordinance	
Tree Trimming Ordinance	
Nuisance Ordinance	
Storm Water Ordinance	
Drainage Ordinance	
Capability	**Status Including Date of Document or Policy**
Site Plan Review Requirements	
Historic Preservation Ordinance	
Landscape Ordinance	
Iowa Wetlands and Riparian Areas Conservation Plan	
Debris Management Plan	
Program	**Status Including Date of Document or Policy**
Zoning/Land Use Restrictions	
Codes Building Site/Design	
NFIP Participation	
Hazard Awareness Program	
National Weather Service (NWS) Storm Ready	
Building Code Effectiveness Grading (BCEGs)	
ISO Fire Rating	
Economic Development Program	
Land Use Program	
Public Education/Awareness	
Property Acquisition	

Capability	Status Including Date of Document or Policy
Planning/Zoning Boards	
Stream Maintenance Program	
Tree Trimming Program	
Engineering Studies for Streams (Local/County/Regional)	
Mutual Aid Agreements	
Studies/Reports/Maps	**Status Including Date of Document or Policy**
Hazard Analysis/ Risk Assessment (Local)	
Hazard Analysis/Risk Assessment (County)	
Flood Insurance Maps	
FEMA Flood Insurance Study (Detailed)	
Evacuation Route Map	
Critical Facilities Inventory	
Vulnerable Population Inventory	
Land Use Map	
Staff/Department	**Status Including Date of Document or Policy**
Building Code Official	
Building Inspector	
Mapping Specialist (GIS)	
Engineer	
Development Planner	
Public Works Official	
Emergency Management Coordinator	
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	
Planning Consultant	
Regional Planning Agencies	
Historic Preservation	
Non-Governmental Organizations (NGOs)	**Status Including Date of Document or Policy**
American Red Cross	
Salvation Army	
Capability	**Status Including Date of Document or Policy**
Veterans Groups	
Environmental Organization	
Homeowner Associations	
Neighborhood Associations	
Chamber of Commerce	
Community Organizations (Lions, Kiwanis, etc.)	
Local Funding Availability	**Status Including Date of Document or Policy**
Ability to apply for Community Development Block Grants	
Ability to fund projects through Capital Improvements funding	
Authority to levy taxes for a specific purpose	
Fees for water, sewer, gas, or electric services	
Impact fees for new development	
Ability to incur debt through general obligation bonds	
Ability to incur debt through special tax bonds	
Ability to incur debt through private activities	
Ability to withhold spending in hazard prone areas	

Source: Data Collection Questionnaire, 2016

2.2.5 **Village of Fountain 'N Lakes**

Fountain 'N Lakes is located in the south eastern portion of Lincoln County, just 6 miles north east of Moscow Mills. The village occupies .14 square miles, all of it land. Structures in the village are sound, of newer construction, and present no unusual challenges for fire fighters. All emergency services for the village are provided by Lincoln County. The village is governed by four trustees and their elected chairperson.

The table below summarizes the hazard mitigation capabilities of the Village of Fountain 'N Lakes.

Table 2.12. Village of Fountain 'N Lakes Mitigation Activities (the questionnaire was not returned)

Capabilities	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	
Builder's Plan	
Capital Improvement Plan	
Local Emergency Plan	
County Emergency Plan	
Local Recovery Plan	
County Recovery Plan	
Local Mitigation Plan	
County Mitigation Plan	
Local Mitigation Plan (PDM)	
County Mitigation Plan (PDM)	
Economic Development Plan	
Transportation Plan	
Land-use Plan	
Flood Mitigation Assistance (FMA) Plan	
Watershed Plan	
Firewise or other fire mitigation plan	
School Mitigation Plan	
Critical Facilities Plan (Mitigation/Response/Recovery)	
Policies/Ordinance	**Status Including Date of Document or Policy**
Zoning Ordinance	
Building Code	
Floodplain Ordinance	
Subdivision Ordinance	
Tree Trimming Ordinance	
Nuisance Ordinance	
Storm Water Ordinance	
Drainage Ordinance	
Site Plan Review Requirements	
Historic Preservation Ordinance	
Landscape Ordinance	
Wetlands and Riparian Areas Conservation Plan	

Capabilities	Status Including Date of Document or Policy
Debris Management Plan	
Program	**Status Including Date of Document or Policy**
Zoning/Land Use Restrictions	
Codes Building Site/Design	
NFIP Participation	
Hazard Awareness Program	
National Weather Service (NWS) Storm Ready	
Building Code Effectiveness Grading (BCEGs)	
ISO Fire Rating	
Economic Development Program	
Land Use Program	
Public Education/Awareness	
Property Acquisition	
Planning/Zoning Boards	
Stream Maintenance Program	
Tree Trimming Program	
Engineering Studies for Streams (Local/County/Regional)	
Mutual Aid Agreements	
Studies/Reports/Maps	**Status Including Date of Document or Policy**
Hazard Analysis/Risk Assessment (Local)	
Hazard Analysis/Risk Assessment (County)	
Flood Insurance Maps	
FEMA Flood Insurance Study (Detailed)	
Evacuation Route Map	
Critical Facilities Inventory	
Vulnerable Population Inventory	
Land Use Map	
Staff/Department	**Yes/No**
Building Code Official	
Building Inspector	
Mapping Specialist (GIS)	
Engineer	
Development Planner	
Public Works Official	
Emergency Management Director	
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	

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

Source: Data Collection Questionnaire, 2016

2.2.6 **City of Hawk Point**

It is said that Hawk Point derived its name from its proximity to where hawks came to roost at a point of woods where timber left off and open, rolling hills began. The community was founded sometime in the first half of the 19th century with the earliest records showing the first Post Office was established on February 20, 1840. It is now classified as a 4th class city with a mayor and 4 elected aldermen serving on the city council. Hawk Point is home to the Hawk Point Elementary School, part of the Troy R-III School District.

The city lies on .37 square miles of land at the intersection of Missouri Highway 47 and county highways A and D. Hawk Point provides its own police and fire departments but relies on the Lincoln County Ambulance district for ambulance service. The structures in town are a mix of old and new and offer no particular difficulty for fire fighters.

The table below summarizes the mitigation capabilities of Hawk Point.

Table 2.13. City of Hawk Point Mitigation Capabilities

Capabilities	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	n/a
Builder's Plan	n/a
Capital Improvement Plan	Wastewater Project: Fall 2016
Local Emergency Plan	Lincoln County Emergency Plan
County Emergency Plan	Lincoln County Emergency Plan
Local Recovery Plan	n/a
County Recovery Plan	n/a
Local Mitigation Plan	n/a
County Mitigation Plan	n/a
Local Mitigation Plan (PDM)	n/a
County Mitigation Plan (PDM)	n/a
Economic Development Plan	n/a
Transportation Plan	n/a
Land-use Plan	n/a
Flood Mitigation Assistance (FMA) Plan	n/a
Watershed Plan	n/a
Firewise or other fire mitigation plan	n/a
School Mitigation Plan	n/a
Critical Facilities Plan (Mitigation/Response/Recovery)	n/a
Policies/Ordinance	**Status Including Date of Document or Policy**
Zoning Ordinance	n/a
Building Code	n/a
Floodplain Ordinance	Chapter 151: Flood Plain Regulations
Subdivision Ordinance	Chapter 153: Subdivision Regulations
Tree Trimming Ordinance	Mentioned in §52.02 (E) & §52.03 (C)
Nuisance Ordinance	Chapter 90: Nuisances
Storm Water Ordinance	Mentioned in §51.05 (A) (B)
Drainage Ordinance	Mentioned in §51.05 (A) (B)
Site Plan Review Requirements	n/a
Historic Preservation Ordinance	n/a
Landscape Ordinance	Mentioned in §152.04 (C1)
Wetlands and Riparian Areas Conservation Plan	n/a
Debris Management Plan	n/a
Program	Status Including Date of Document or Policy
Zoning/Land Use Restrictions	n/a
Codes Building Site/Design	n/a
National Flood Insurance Program (NFIP) Participant – Non-delegated	n/a
NFIP Community Rating System (CRS) Participating Community	n/a
Hazard Awareness Program	n/a

Capabilities	Status Including Date of Document or Policy
National Weather Service (NWS) Storm Ready	n/a
Building Code Effectiveness Grading (BCEGs)	n/a
ISO Fire Rating	n/a
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
Studies/Reports/Maps	Status Including Date of Document or Policy
Hazard Analysis/Risk Assessment (Local)	n/a
Hazard Analysis/Risk Assessment (County)	n/a
Flood Insurance Maps	n/a
FEMA Flood Insurance Study (Detailed)	n/a
Evacuation Route Map	n/a
Critical Facilities Inventory	n/a
Vulnerable Population Inventory	n/a
Land Use Map	n/a
Staff/Department	Yes/No
Building Code Official	n/a
Building Inspector	n/a
Mapping Specialist (GIS)	n/a
Engineer	n/a
Development Planner	n/a
Public Works Official	n/a
Emergency Management Director	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	Yes
Sanitation Department	n/a
Transportation Department	n/a
Economic Development Department	n/a
Housing Department	n/a
Planning Consultant	n/a
Regional Planning Agencies	Boonslick RPC
Historic Preservation	n/a
Non-Governmental Organizations (NGOs)	Yes/No

Capabilities	Status Including Date of Document or Policy
American Red Cross	n/a
Salvation Army	n/a
Veterans Groups	VFW
Environmental Organization	n/a
Homeowner Associations	n/a
Neighborhood Associations	n/a
Chamber of Commerce	n/a
Community Organizations (Lions, Kiwanis, etc.	Lions Club
Local Funding Availability	Yes/No
Ability to apply for Community Development Block Grants	Yes
Ability to fund projects through Capital Improvements funding	Yes
Capabilities	Yes/No
Authority to levy taxes for a specific purpose	Yes
Fees for water, sewer, gas, or electric services	Yes
Impact fees for new development	n/a
Ability to incur debt through general obligation bonds	n/a
Ability to incur debt through special tax bonds	n/a
Ability to incur debt through private activities	n/a
Ability to withhold spending in hazard prone areas	n/a

Source: Data Collection Questionnaire, 2016

2.2.7 **City of Moscow Mills**

Moscow Mills is situated on the western bank of the Cuivre River, four miles southeast of the Lincoln County seat of Troy. Settlers began arriving in Lincoln County in the late 1790s, attracted by Spanish land grants. When hostilities with the Sac and Fox tribes escalated with the beginning of the War of 1812 settlers under the direction of Major Christopher Clark erected a fort around the nearby spring. In 1817, one of the first notable settlers, Shapley Ross, moved his large household from Kentucky to Lincoln County. After acquiring a grist and saw mill on the Cuivre River near Clark's Fort, Shapley Ross began construction of a stone house on the hill overlooking the mill and the river.

In 1821 Ross and two other landowners decided to found a town as a competing point with Monroe, Troy, and Alexandria for the location of the county seat. The town of Moscow was platted just east Clark's Fort and was named Moscow after the capitol of Russia, following a 19th-century fashion of using names of foreign capitals. Although the town lost the competition for the county seat, Moscow continued to grow as a farming community. In the 1830's the Old River Mill was constructed by Henry Martin and continued in operation under various owners until approximately 1945. The location of the mill has been turned into the Mill Site Park.

In 1870, with the prospect of railroad service to Moscow, the proprietors of the town's vacant lots had the town resurveyed. Railroad service to the town continued until the 1970s. The town was renamed in 1878 when it was discovered during the reapplication process for a post office that another Moscow existed in Clay County. Some stories indicated that Mills was added to the name because of the grain mills that were built along the river.

Today, Moscow Mills rests on 3.1 square miles of land at U.S. Highway 61 and county road C. The city is governed by an elected mayor and 4-member board of aldermen. A city clerk handles day-to-day matters with the residents. Moscow Mills is home to the William R. Cappel Elementary school, part of

the Troy R-III School District.

Moscow Mills operates its own police department and relies on Lincoln County for Ambulance service and fire protection. Structures in Moscow Mills range from new to roughly 100 years old. Most are well-maintained and present no adverse issues for fire fighters. The table below summarizes Moscow Mill's hazard mitigation capabilities.

Table 2.14. City of Moscow Mills Mitigation Capabilities

Capabilities	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	Completed 04/03/2003
Builder's Plan	NA
Capital Improvement Plan	NA
Local Emergency Plan	NA
County Emergency Plan	NA
Local Recovery Plan	NA
County Recovery Plan	NA
Local Mitigation Plan	NA
County Mitigation Plan	10/11/2011
Local Mitigation Plan (PDM)	NA
County Mitigation Plan (PDM)	NA
Economic Development Plan	NA
Transportation Plan	NA
Land-use Plan	NA
Flood Mitigation Assistance (FMA)Plan	NA
Watershed Plan	NA
Firewise or other fire mitigation plan	NA
School Mitigation Plan	NA
Critical Facilities Plan (Mitigation/Response/Recovery)	NA
Policies/Ordinance	**Status Including Date of Document or Policy**
Zoning Ordinance	Adopted 10/22/2007
Building Code	Adopted 10/20/2008
Floodplain Ordinance	Adopted 05/08/2006
Subdivision Ordinance	Part of zoning code
Tree Trimming Ordinance	NA
Nuisance Ordinance	Adopted 06/14/1993
Storm Water Ordinance	Adopted 11/20/2006
Drainage Ordinance	Part of Storm Water Ordinance
Site Plan Review Requirements	Part of zoning code
Historic Preservation Ordinance	NA
Landscape Ordinance	Some landscaping mentioned in zoning code
Wetlands and Riparian Areas Conservation Plan	NA
Debris Management Plan	NA
Program	**Status Including Date of Document or Policy**
Zoning/Land Use Restrictions	NA

Capabilities	Status Including Date of Document or Policy
Codes Building Site/Design	NA
NFIP Participation	NA
Hazard Awareness Program	NA
National Weather Service (NWS) Storm Ready	NA
Building Code Effectiveness Grading (BCEGs)	NA
ISO Fire Rating	NA
Economic Development Program	NA
Land Use Program	NA
Public Education/Awareness	NA
Property Acquisition	NA
Planning/Zoning Boards	NA
Stream Maintenance Program	NA
Tree Trimming Program	NA
Engineering Studies for Streams (Local/County/Regional)	NA
Mutual Aid Agreements	NA
Studies/Reports/Maps	**Status Including Date of Document or Policy**
Hazard Analysis/Risk Assessment (Local)	NA
Hazard Analysis/Risk Assessment (County)	NA
Flood Insurance Maps	NA
FEMA Flood Insurance Study (Detailed)	NA
Evacuation Route Map	NA
Critical Facilities Inventory	NA
Vulnerable Population Inventory	NA
Land Use Map	NA
Staff/Department	**Yes/No**
Building Code Official	NA
Building Inspector	NA
Mapping Specialist (GIS)	NA
Engineer	NA
Development Planner	NA
Public Works Official	NA
Emergency Management Director	NA
NFIP Floodplain Administrator	NA
Bomb and/or Arson Squad	NA
Emergency Response Team	NA
Hazardous Materials Expert	NA
Local Emergency Planning Committee	NA
County Emergency Management Commission	Yes
Sanitation Department	NA
Transportation Department	NA
Economic Development Department	NA
Housing Department	NA
Planning Consultant	NA

Capabilities	Status Including Date of Document or Policy
Regional Planning Agencies	Boonslick RPC
Historic Preservation	NA
Non-Governmental Organizations (NGOs)	**Yes/No**
American Red Cross	NA
Salvation Army	NA
Veterans Groups	NA
Environmental Organization	NA
Homeowner Associations	NA
Neighborhood Associations	NA
Chamber of Commerce	NA
Community Organizations (Lions, Kiwanis, etc.)	NA
Local Funding Availability	**Yes/No**
Ability to apply for Community Development Block Grants	Yes
Ability to fund projects through Capital Improvements funding	Yes
Capabilities	**Yes/No**
Authority to levy taxes for a specific purpose	NA
Fees for water, sewer, gas, or electric services	NA
Impact fees for new development	NA
Ability to incur debt through general obligation bonds	NA
Ability to incur debt through special tax bonds	NA
Ability to incur debt through private activities	NA
Ability to withhold spending in hazard prone areas	NA

Source: Data Collection Questionnaire, 2016

2.2.8 City of Old Monroe

The city of Old Monroe was laid out in 1819 at the site of Fort Howard and named for President James Monroe. The Battle of the Sink Hole was fought on May 24, 1815, after the official end of the War of 1812, between Missouri Rangers and Sauk Indians led by Black Hawk. The battle was fought in a low spot near the mouth of the Cuivre River near the current day city of Old Monroe. The city was originally named "Monroe" and it served as the county seat from 1819 until 1823. The name would change to its current form around 1857 when Monroe County and its county seat, Monroe City, were established. The postal office then labeled the older town as Old Monroe. The city has a total area of .26 square miles of which .25 square miles is land and .01 square miles is water.

The city is governed by an elected three person board of aldermen and an elected mayor. Structures in Old Monroe present no unusual difficulty for fire fighters. Old Monroe provides its own Fire Department and Law Enforcement; however, ambulance service is provided by St. Charles County.

The table below shows the mitigation capabilities of the city of Old Monroe.

Table 2.15. City of Old Monroe Mitigation Capabilities

Capabilities	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	Yes, 06/16/2009

Capabilities	Status Including Date of Document or Policy
Builder's Plan	Yes
Capital Improvement Plan	Yes
Local Emergency Plan	Yes
County Emergency Plan	Yes
Local Recovery Plan	NA
County Recovery Plan	Yes
Local Mitigation Plan	Yes
County Mitigation Plan	Yes, 11/29/2011
Local Mitigation Plan (PDM)	NA
County Mitigation Plan (PDM)	NA
Economic Development Plan	NA
Transportation Plan	NA
Land-use Plan	Yes
Flood Mitigation Assistance (FMA)Plan	Yes
Watershed Plan	Yes
Firewise or other fire mitigation plan	Yes
School Mitigation Plan	Yes
Critical Facilities Plan (Mitigation/Response/Recovery)	Yes
Policies/Ordinance	**Status Including Date of Document or Policy**
Zoning Ordinance	Yes
Building Code	Yes
Floodplain Ordinance	Yes
Subdivision Ordinance	NA
Tree Trimming Ordinance	Yes
Nuisance Ordinance	Yes
Storm Water Ordinance	Yes
Drainage Ordinance	NA
Site Plan Review Requirements	NA
Historic Preservation Ordinance	NA
Landscape Ordinance	NA
Wetlands and Riparian Areas Conservation Plan	NA
Debris Management Plan	NA
Program	**Status Including Date of Document or Policy**
Zoning/Land Use Restrictions	Yes
Codes Building Site/Design	NA
NFIP Participation	Yes
Hazard Awareness Program	NA
National Weather Service (NWS) Storm Ready	Yes
Building Code Effectiveness Grading (BCEGs)	NA
ISO Fire Rating	NA
Economic Development Program	Yes
Land Use Program	NA
Public Education/Awareness	NA

Capabilities	Status Including Date of Document or Policy
Property Acquisition	NA
Planning/Zoning Boards	Yes
Stream Maintenance Program	NA
Tree Trimming Program	Yes
Engineering Studies for Streams (Local/County/Regional)	NA
Mutual Aid Agreements	Yes
Studies/Reports/Maps	**Status Including Date of Document or Policy**
Hazard Analysis/Risk Assessment (Local)	NA
Hazard Analysis/Risk Assessment (County)	NA
Flood Insurance Maps	Yes
FEMA Flood Insurance Study (Detailed)	Yes
Evacuation Route Map	NA
Critical Facilities Inventory	NA
Vulnerable Population Inventory	NA
Land Use Map	NA
Staff/Department	**Yes/No**
Building Code Official	No
Building Inspector	No
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	Yes
Sanitation Department	No
Transportation Department	No
Economic Development Department	No
Housing Department	No
Planning Consultant	No
Regional Planning Agencies	Boonslick RPC
Historic Preservation	No
Non-Governmental Organizations (NGOs)	**Yes/No**
American Red Cross	No
Salvation Army	No
Veterans Groups	No
Environmental Organization	No
Homeowner Associations	No
Neighborhood Associations	No

Capabilities	Status Including Date of Document or Policy
Chamber of Commerce	No
Community Organizations (Lions, Kiwanis, etc.)	Yes
Local Funding Availability	**Yes/No**
Ability to apply for Community Development Block Grants	Yes
Ability to fund projects through Capital Improvements funding	Yes
Capabilities	**Yes/No**
Authority to levy taxes for a specific purpose	Yes
Fees for water, sewer, gas, or electric services	Yes
Impact fees for new development	No
Ability to incur debt through general obligation bonds	No
Ability to incur debt through special tax bonds	No
Ability to incur debt through private activities	No
Ability to withhold spending in hazard prone areas	No

Source: Data Collection Questionnaire, 2016

2.2.9 **City of Silex**

Silex occupies .19 square miles of land located on County Road E in central Lincoln County. The city resides within the flood plain of the north fork of the Cuivre River and Mill Creek which make the town prone to flash flooding; so much so, that following the 1996 flood, most of its residents took a buy out and moved into custom-build homes above the flood plain. Silex provides its own police and fire services, but continues to rely on Lincoln County for Ambulance Services. The majority of homes in Silex were constructed within the past 5 years while many of the commercial structures in the flood prone part of town are much older. None of the structures provide a challenge for fire fighters.

The city of Silex is governed by four elected board members and an elected mayor. Silex is home to the Silex R-I School District and its 2 attendance centers.

Table 2.16. City of Silex Mitigation Capabilities (the questionnaire was not returned)

Capabilities	Status Including Date of Document or Policy
Comprehensive Plan	
Builder's Plan	
Capital Improvement Plan	
Local Emergency Plan	
County Emergency Plan	
Local Recovery Plan	
County Recovery Plan	
Local Mitigation Plan	
County Mitigation Plan	
Local Mitigation Plan (PDM)	
County Mitigation Plan (PDM)	
Economic Development Plan	
Transportation Plan	
Land-use Plan	

Capabilities	Status Including Date of Document or Policy
Flood Mitigation Assistance (FMA)Plan	
Watershed Plan	
Firewise or other fire mitigation plan	
School Mitigation Plan	
Critical Facilities Plan (Mitigation/Response/Recovery)	
Policies/Ordinance	**Status Including Date of Document or Policy**
Zoning Ordinance	
Building Code	
Floodplain Ordinance	
Subdivision Ordinance	
Tree Trimming Ordinance	
Nuisance Ordinance	
Storm Water Ordinance	
Drainage Ordinance	
Site Plan Review Requirements	
Historic Preservation Ordinance	
Landscape Ordinance	
Wetlands and Riparian Areas Conservation Plan	
Debris Management Plan	
Program	**Status Including Date of Document or Policy**
Zoning/Land Use Restrictions	
Codes Building Site/Design	
NFIP Participation	
Hazard Awareness Program	
National Weather Service (NWS) Storm Ready	
Building Code Effectiveness Grading (BCEGs)	
ISO Fire Rating	
Economic Development Program	
Land Use Program	
Public Education/Awareness	
Property Acquisition	
Planning/Zoning Boards	
Stream Maintenance Program	
Tree Trimming Program	
Engineering Studies for Streams (Local/County/Regional)	
Mutual Aid Agreements	
Studies/Reports/Maps	**Status Including Date of Document or Policy**
Hazard Analysis/Risk Assessment (Local)	
Hazard Analysis/Risk Assessment (County)	
Flood Insurance Maps	
FEMA Flood Insurance Study (Detailed)	
Evacuation Route Map	
Critical Facilities Inventory	

Capabilities	Status Including Date of Document or Policy
Vulnerable Population Inventory	
Land Use Map	
Staff/Department	**Yes/No**
Building Code Official	
Building Inspector	
Mapping Specialist (GIS)	
Engineer	
Development Planner	
Public Works Official	
Emergency Management Director	
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	
Planning Consultant	
Regional Planning Agencies	
Historic Preservation	
Non-Governmental Organizations (NGOs)	**Yes/No**
American Red Cross	
Salvation Army	
Veterans Groups	
Environmental Organization	
Homeowner Associations	
Neighborhood Associations	
Chamber of Commerce	
Community Organizations (Lions, Kiwanis, etc.)	
Local Funding Availability	**Yes/No**
Ability to apply for Community Development Block Grants	
Ability to fund projects through Capital Improvements funding	
Capabilities	**Yes/No**
Authority to levy taxes for a specific purpose	
Fees for water, sewer, gas, or electric services	
Impact fees for new development	
Ability to incur debt through general obligation bonds	
Ability to incur debt through special tax bonds	
Ability to incur debt through private activities	
Ability to withhold spending in hazard prone areas	

Source: Data Collection Questionnaire, 2016

2.2.10 City of Troy

During the summer of 1799, Major Christopher Clark of Kentucky, discovered a spring in a clearing at what is now Main and Boone streets in Troy. Joseph Cottle and Zadock Woods, both of Vermont, heard about the discovered and by 1801 had arrived at the spring, and with the help of Major Clark, constructed two cabins at the spring. By 1802, they were joined by other families and the beginnings of a village emerged. The residents decided to name the settlement Troy, in part to please a settler, Joseph Robbins, a grocer from Troy, New York. Troy was laid out in 1819 and incorporated as a village in 1825.

Today, Troy is the county seat of Lincoln County and is classified as a 4th class city. It is home to the Troy R-III school district and its 8 Troy attendance centers, plus Mercy Hospital Lincoln, a 70-bed facility now part of the Mercy Health Care System.

Troy is governed by an elected mayor and 6 aldermen, two from each of the city's 3 wards. The city employs a full time clerk to conduct its day to day business. Troy provides its own police department and depends on Lincoln County for ambulance service and fire protection. Structures in Troy range from over one hundred years old to brand new and they offer no adverse challenges for fire fighter and other first responders. The table below shows Troy's mitigation capabilities.

Table 2.17. City of Troy Mitigation Capabilities

Capabilities	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	Latest update: 2012
Builder's Plan	NA
Capital Improvement Plan	NA
Local Emergency Plan	NA
County Emergency Plan	Outdoor Warning Siren Activation, Policy No. 100, approved by the Board of Alderman on April 18, 2016
Local Recovery Plan	NA
County Recovery Plan	NA
Local Mitigation Plan	NA
County Mitigation Plan	10/17/2011
Local Mitigation Plan (PDM)	NA
County Mitigation Plan (PDM)	NA
Economic Development Plan	NA
Transportation Plan	NA
Land-use Plan	NA
Flood Mitigation Assistance (FMA) Plan	NA
Watershed Plan	Pending MS4 Permit Approval
Firewise or other fire mitigation plan	NA
School Mitigation Plan	NA
Critical Facilities Plan (Mitigation/Response/Recovery)	NA
Policies/Ordinance	**Status Including Date of Document or Policy**
Zoning Ordinance	Ord. 503A 7-17-2000
Building Code	Ord. 936 7-21-2003, Ord 1110 12-21-2009 and Adopted 2015

Capabilities	Status Including Date of Document or Policy
	Codes in May 2016
Floodplain Ordinance	Ord. 876 1-16-2001
Subdivision Ordinance	Ord. 549 2-15-1971
Tree Trimming Ordinance	Ord. 1216 8-7-2015
Nuisance Ordinance	Ord. 503A 7-17-2000
Storm Water Ordinance	Ord. 880 5-21-2001
Drainage Ordinance	Ord. 848 8-7-1998
Site Plan Review Requirements	Ord. 503A 7-17-2000; Ord. 977 12-20-2004
Historic Preservation Ordinance	Ord. 1206 1-20-2015
Landscape Ordinance	Ord. 503A 7-17-2000; Ord. 973A 2-22-2005
Wetlands and Riparian Areas Conservation Plan	N/A
Debris Management Plan	Ord. 1079 10-20-2008
Program	Status Including Date of Document or Policy
Zoning/Land Use Restrictions	Planning & Zoning/Building Official
Codes Building Site/Design	NA
National Flood Insurance Program (NFIP) Participant – Non-delegated	September 29, 2010
NFIP Community Rating System (CRS) Participating Community	NA
Hazard Awareness Program	NA
National Weather Service (NWS) Storm Ready	2009
Building Code Effectiveness Grading (BCEGs)	3
ISO Fire Rating	ISO rating 3
Economic Development Program	Troy Convention and Visitors Bureau
Land Use Program	Planning & Zoning/Comprehensive Plan 2012
Public Education/Awareness	NA
Property Acquisition	NA
Planning/Zoning Boards	Yes—monthly meetings
Stream Maintenance Program	NA
Tree Trimming Program	Tree City USA
Engineering Studies for Streams (Local/County/Regional)	NA
Mutual Aid Agreements	MOU-Narcotics 10-20-2014; Lincoln County Countywide
	Mutual Aid 2014 and Addendum 10-24-2014 for reciprocal
	Emergency aid
Studies/Reports/Maps	Status Including Date of Document or Policy
Hazard Analysis/Risk Assessment (Local)	2011
Hazard Analysis/Risk Assessment (County)	2011
Flood Insurance Maps	September 29, 2010
FEMA Flood Insurance Study (Detailed)	September 29, 2010
Evacuation Route Map	NA
Critical Facilities Inventory	NA
Vulnerable Population Inventory	NA
Land Use Map	Planning & Zoning/Comprehensive Plan 2012
Staff/Department	Yes/No

Capabilities	Status Including Date of Document or Policy
Building Code Official	Yes
Building Inspector	Yes
Mapping Specialist (GIS)	Yes
Engineer	No
Development Planner	No
Public Works Official	Yes
Emergency Management Director	No
NFIP Floodplain Administrator	Yes
Bomb and/or Arson Squad	No
Emergency Response Team	Yes
Hazardous Materials Expert	No
Local Emergency Planning Committee	Safety Committee
County Emergency Management Commission	Lincoln County Emergency Management Assn
Sanitation Department	No
Transportation Department	Public Works Dept.
Economic Development Department	Contract through Troy Chamber of Commerce
Housing Department	No
Planning Consultant	No
Regional Planning Agencies	Boonslick RPC
Historic Preservation	Yes
Non-Governmental Organizations (NGOs)	Yes/No
American Red Cross	Yes
Salvation Army	Yes
Veterans Groups	Yes
Environmental Organization	Through Sanitation Hauler- Curbside Recycling
Homeowner Associations	Yes
Neighborhood Associations	Yes
Chamber of Commerce	Yes
Community Organizations (Lions, Kiwanis, etc.	Yes
Local Funding Availability	Yes/No
Ability to apply for Community Development Block Grants	Yes
Ability to fund projects through Capital Improvements funding	Yes
Capabilities	Yes/No
Authority to levy taxes for a specific purpose	Yes
Fees for water, sewer, gas, or electric services	Yes
Impact fees for new development	No
Ability to incur debt through general obligation bonds	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

2.2.11 Village of Truxton

The village of Truxton is located on County Road A in Lincoln County on .25 square miles of land. There are no bodies of water within the village. The village of Truxton is governed by 4 elected trustees and a chairperson. Fire services is provided by Hawk Point and Lincoln County provides law enforcement and ambulance district services to the village.

Table 2.18. Village of Truxton Mitigation Capabilities

Capabilities	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	NA
Builder's Plan	NA
Capital Improvement Plan	NA
Local Emergency Plan	NA
County Emergency Plan	NA
Local Recovery Plan	NA
County Recovery Plan	NA
Local Mitigation Plan	NA
County Mitigation Plan	Yes
Local Mitigation Plan (PDM)	NA
County Mitigation Plan (PDM)	NA
Economic Development Plan	NA
Transportation Plan	NA
Land-use Plan	NA
Flood Mitigation Assistance (FMA)Plan	NA
Watershed Plan	NA
Firewise or other fire mitigation plan	Fire station in town
School Mitigation Plan	NA
Critical Facilities Plan (Mitigation/Response/Recovery)	NA
Policies/Ordinance	**Status Including Date of Document or Policy**
Zoning Ordinance	NA
Building Code	NA
Floodplain Ordinance	NA
Subdivision Ordinance	NA
Tree Trimming Ordinance	NA
Nuisance Ordinance	Some
Storm Water Ordinance	NA
Drainage Ordinance	NA
Site Plan Review Requirements	NA
Historic Preservation Ordinance	NA
Landscape Ordinance	NA
Wetlands and Riparian Areas Conservation Plan	NA
Debris Management Plan	NA
Program	**Status Including Date of Document or Policy**
Zoning/Land Use Restrictions	No

Capabilities	Status Including Date of Document or Policy
Codes Building Site/Design	No
NFIP Participation	No
Hazard Awareness Program	No
National Weather Service (NWS) Storm Ready	No
Building Code Effectiveness Grading (BCEGs)	No
ISO Fire Rating	No
Economic Development Program	No
Land Use Program	No
Public Education/Awareness	No
Property Acquisition	No
Planning/Zoning Boards	No
Stream Maintenance Program	No
Tree Trimming Program	No
Engineering Studies for Streams (Local/County/Regional)	No
Mutual Aid Agreements	No
Studies/Reports/Maps	**Status Including Date of Document or Policy**
Hazard Analysis/Risk Assessment (Local)	No
Hazard Analysis/Risk Assessment (County)	No
Flood Insurance Maps	No
FEMA Flood Insurance Study (Detailed)	No
Evacuation Route Map	No
Critical Facilities Inventory	No
Vulnerable Population Inventory	No
Land Use Map	No
Staff/Department	**Yes/No**
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	No
County Emergency Management Commission	No
Sanitation Department	No
Transportation Department	No
Economic Development Department	No
Housing Department	No
Planning Consultant	No

Capabilities	Status Including Date of Document or Policy
Regional Planning Agencies	Boonslick RPC
Historic Preservation	No
Non-Governmental Organizations (NGOs)	**Yes/No**
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	**Yes/No**
Ability to apply for Community Development Block Grants	Yes
Ability to fund projects through Capital Improvements funding	Yes
Capabilities	**Yes/No**
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	Yes

2.2.12 Village of Whiteside

The Village of Whiteside is named for Isaac Whiteside who settled in the area circa during the early 19th century. The village is located on County Road Z in north west Lincoln County. It encompasses .09 square miles and includes no bodies of water. It is governed by 3 elected trustees and one chairperson. Lincoln County provides ambulance and law enforcement services for the village while the Eolia fire department provides fire protection. No are no significant issues to trouble emergency responders. The table below shows the mitigation capabilities for the Village of Whiteside.

Table 2.19. Village of Whiteside Mitigation Capabilities

Capabilities	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	NA
Builder's Plan	NA
Capital Improvement Plan	NA
Local Emergency Plan	NA
County Emergency Plan	NA
Local Recovery Plan	NA
County Recovery Plan	NA
Local Mitigation Plan	NA
County Mitigation Plan	09/28/2011
Local Mitigation Plan (PDM)	NA
County Mitigation Plan (PDM)	NA
Economic Development Plan	NA
Transportation Plan	NA
Land-use Plan	NA
Flood Mitigation Assistance (FMA)Plan	NA
Watershed Plan	NA
Firewise or other fire mitigation plan	NA
School Mitigation Plan	NA
Critical Facilities Plan (Mitigation/Response/Recovery)	NA
Policies/Ordinance	**Status Including Date of Document or Policy**
Zoning Ordinance	NA
Building Code	NA
Floodplain Ordinance	NA
Subdivision Ordinance	NA
Tree Trimming Ordinance	NA
Nuisance Ordinance	NA
Storm Water Ordinance	NA
Drainage Ordinance	NA
Site Plan Review Requirements	NA
Historic Preservation Ordinance	NA
Landscape Ordinance	NA
Wetlands and Riparian Areas Conservation Plan	NA
Debris Management Plan	NA
Program	**Status Including Date of Document or Policy**
Zoning/Land Use Restrictions	NA
Codes Building Site/Design	NA
NFIP Participation	NA
Hazard Awareness Program	NA
National Weather Service (NWS) Storm Ready	NA
Building Code Effectiveness Grading (BCEGs)	NA

Capabilities	Status Including Date of Document or Policy
ISO Fire Rating	NA
Economic Development Program	NA
Land Use Program	NA
Public Education/Awareness	NA
Property Acquisition	NA
Planning/Zoning Boards	NA
Stream Maintenance Program	NA
Tree Trimming Program	NA
Engineering Studies for Streams (Local/County/Regional)	NA
Mutual Aid Agreements	NA
Studies/Reports/Maps	**Status Including Date of Document or Policy**
Hazard Analysis/Risk Assessment (Local)	NA
Hazard Analysis/Risk Assessment (County)	NA
Flood Insurance Maps	NA
FEMA Flood Insurance Study (Detailed)	NA
Evacuation Route Map	NA
Critical Facilities Inventory	NA
Vulnerable Population Inventory	NA
Land Use Map	NA
Staff/Department	**Yes/No**
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	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	Boonslick RPC
Historic Preservation	No
Non-Governmental Organizations (NGOs)	**Yes/No**
American Red Cross	No
Salvation Army	No

Capabilities	Status Including Date of Document or Policy
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	**Yes/No**
Ability to apply for Community Development Block Grants	Yes
Ability to fund projects through Capital Improvements funding	No
Capabilities	**Yes/No**
Authority to levy taxes for a specific purpose	No
Fees for water, sewer, gas, or electric services	Yes
Impact fees for new development	No
Ability to incur debt through general obligation bonds	No
Ability to incur debt through special tax bonds	No
Ability to incur debt through private activities	No
Ability to withhold spending in hazard prone areas	No

2.2.13 City of Winfield

Winfield was founded in 1879 by David T. Killam who named the town after his father, Winfield. Winfield was later incorporated in 1882. The town is situated on the Mississippi River just north of the Cuivre River. During the late 1800s, the town was quiet prosperous and one could travel to the town by horse and wagon, carriage, river or rail. Today, Missouri Highway 79 runs through the town situated on .64 square miles.

Winfield lies within the flood plain of the Mississippi River and as such frequently floods. In 2008 floodwaters opened a 150-foot breach in a primary levee along the Mississippi River in Winfield. The breach allowed floodwaters to claim dozens of homes and large tracts of farmland and put pressure on a secondary levee. The breach also prompted Lincoln County emergency officials to order the evacuation of residents east of Winfield.

The city of Winfield is governed by a mayor and city council form of government. Winfield is home to the Winfield R- IV School District and its 4 attendance Centers. There are no structures in Winfield that are of particular concern to emergency responders. The table below shows the mitigation capabilities of the City of Winfield.

Table 2.20. City of Winfield Mitigation Capabilities

Capabilities	Status Including Date of Document or Policy
Planning Capabilities	
Comprehensive Plan	IN WORKS
Builder's Plan	NA
Capital Improvement Plan	IN WORKS
Local Emergency Plan	IN WORKS
County Emergency Plan	NA

Capabilities	Status Including Date of Document or Policy
Local Recovery Plan	NA
County Recovery Plan	NA
Local Mitigation Plan	NA
County Mitigation Plan	12-12-2011
Local Mitigation Plan (PDM)	NA
County Mitigation Plan (PDM)	NA
Economic Development Plan	NA
Transportation Plan	NA
Land-use Plan	1997
Flood Mitigation Assistance (FMA) Plan	NA
Watershed Plan	NA
Firewise or other fire mitigation plan	NA
School Mitigation Plan	NA
Critical Facilities Plan (Mitigation/Response/Recovery)	NA
Policies/Ordinance	**Status Including Date of Document or Policy**
Zoning Ordinance	1997
Building Code	1-2015
Floodplain Ordinance	9-2010
Subdivision Ordinance	9-1987
Tree Trimming Ordinance	NA
Nuisance Ordinance	7-2003
Storm Water Ordinance	NA
Drainage Ordinance	NA
Site Plan Review Requirements	1997
Historic Preservation Ordinance	8-2016
Landscape Ordinance	NA
Wetlands and Riparian Areas Conservation Plan	NA
Debris Management Plan	NA
Program	Status Including Date of Document or Policy
Zoning/Land Use Restrictions	1997
Codes Building Site/Design	1-2015
National Flood Insurance Program (NFIP) Participant – Non-delegated	9-2010
NFIP Community Rating System (CRS) Participating Community	9-2010
Hazard Awareness Program	NA
National Weather Service (NWS) Storm Ready	NA
Building Code Effectiveness Grading (BCEGs)	NA
ISO Fire Rating	6
Economic Development Program	NA
Land Use Program	NA
Public Education/Awareness	NA
Property Acquisition	NA
Planning/Zoning Boards	1-2015

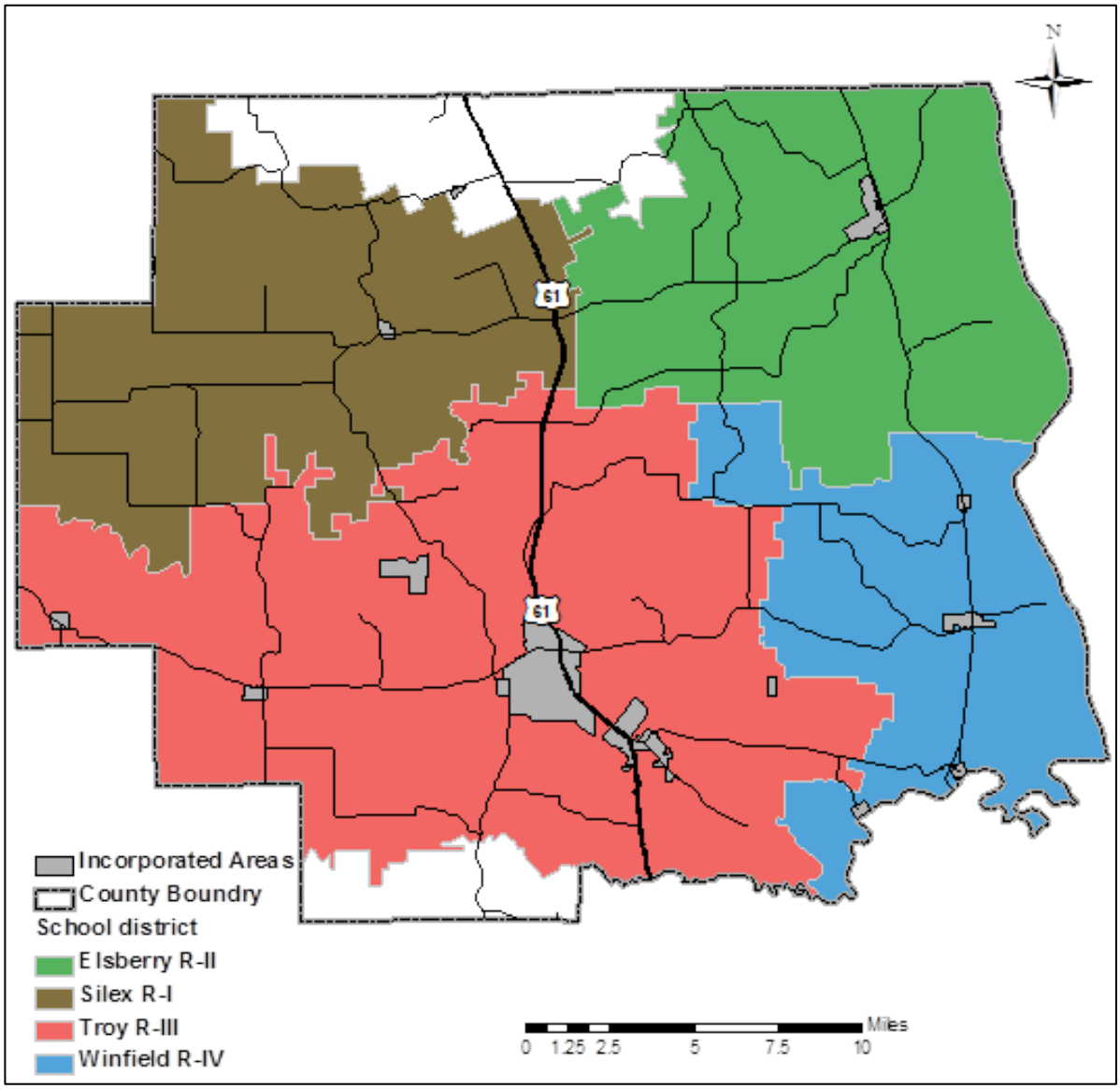
Capabilities	Status Including Date of Document or Policy
Stream Maintenance Program	NA
Tree Trimming Program	NA
Engineering Studies for Streams (Local/County/Regional)	NA
Mutual Aid Agreements	NA
Studies/Reports/Maps	Status Including Date of Document or Policy
Hazard Analysis/Risk Assessment (Local)	NA
Hazard Analysis/Risk Assessment (County)	NA
Flood Insurance Maps	9-2010
FEMA Flood Insurance Study (Detailed)	9-2010
Evacuation Route Map	NA
Critical Facilities Inventory	NA
Vulnerable Population Inventory	NA
Land Use Map	6-2015
Staff/Department	Yes/No
Building Code Official	YES
Building Inspector	YES
Mapping Specialist (GIS)	NA
Engineer	NA
Development Planner	NA
Public Works Official	YES
Emergency Management Director	NA
NFIP Floodplain Administrator	YES
Bomb and/or Arson Squad	NA
Emergency Response Team	NA
Hazardous Materials Expert	NA
Local Emergency Planning Committee	NA
County Emergency Management Commission	NA
Sanitation Department	NA
Transportation Department	NA
Economic Development Department	NA
Housing Department	NA
Planning Consultant	NA
Regional Planning Agencies	Boonslick RPC
Historic Preservation	YES
Non-Governmental Organizations (NGOs)	Yes/No
American Red Cross	No
Salvation Army	No
Veterans Groups	No
Environmental Organization	No
Homeowner Associations	YES
Neighborhood Associations	No
Chamber of Commerce	No
Community Organizations (Lions, Kiwanis, etc.	No

Capabilities	Status Including Date of Document or Policy
Local Funding Availability	Yes/No
Ability to apply for Community Development Block Grants	No
Ability to fund projects through Capital Improvements funding	No
Capabilities	Yes/No
Authority to levy taxes for a specific purpose	No
Fees for water, sewer, gas, or electric services	YES
Impact fees for new development	No
Ability to incur debt through general obligation bonds	No
Ability to incur debt through special tax bonds	No
Ability to incur debt through private activities	No
Ability to withhold spending in hazard prone areas	No

2.2.14 Public School District Profiles and Mitigation Capabilities

There are four school districts located in Winfield R-IV; Elsberry R-II, Silex R-I, Troy R-III, and Winfield R-IV. A small number of Lincoln County students are served by the Warren County R-III School District. The figure below provides the boundaries of the school districts participating in this plan.

Table 2.21. Boundaries of School Districts Serving Lincoln County



Source: Boonslick Regional Planning Commission

The **Elsberry R-II District** operates three campuses in the City of Elsberry with a total of 812 students and 98 certificated staff. The district participates in the Lincoln County Hazard Mitigation Planning effort.

The **Silex R-I District** is located in Silex and it also participates in Hazard Mitigation Planning with the County. The district operates two attendance centers, including a high school and elementary school for a total student population of 370. The district employs 41 certificated staff.

The **Troy R-III** serves the City of Troy plus the Moscow Mills K-5 Elementary school in Moscow Mills and the Hawk Point K-5 elementary school in Hawk Point. The district has a total enrollment of 6,370. The district employs 487 certificated staff. The district participates in the Lincoln County Hazard Mitigation Planning effort.

The **Winfield R-IV** serves the City of Winfield with four attendance centers ranging from Kindergarten through high school. There are 1,532 students and 137 certificated staff. The district participates in the Lincoln County Hazard Mitigation Planning process.

Table 2.22. School District Buildings and Enrollment Data, July 2016

District Name	Building Name(s)	Building Enrolment
Elsberry R-II	Elsberry High	232
	Ida Cannon Middle	252
	Clarence Cannon Elementary	328
Silex R-I	Silex High	204
	Silex Elementary	167
	Wright City West Elementary	504
	Wright City East Elementary	240
	Wright Start Pre-School	62
	Marthasville Elementary	214
Troy R-III	Troy Buchanan High	2,200
	Troy Middle, Middle South	1,381
	Hawk Point Elementary, Boone Elementary, Cappel Elementary, Cuivre Park Elementary, Lincoln Elementary, Main Street Elementary, Claude Brown Elementary	2,789
Winfield R-IV	Winfield High	475
	Winfield Middle	316
	Winfield Elementary / Intermediate	741

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

Table 2.23. Summary of Mitigation Capabilities – School Districts Serving Lincoln County

Capability	Elsberry R-II	Silex R-I	Troy R-III	Winfield R-IV
Planning Elements				
Master Plan	No	Yes	Yes	In the process of updating
Capital Improvement Plan	No	No	Yes	No
School Emergency Plan	Yes, Annually	Yes	Yes	Yes, 2011
Weapons Policy	Yes, Annually	Yes	Yes, 2016	Yes, 2011
Personnel Resources				
Full-Time Building Official (Principal)	Yes	Yes	Yes, 13 Principals	Yes in all buildings
Emergency Manager	Yes	Yes	Yes	Yes
Grant Writer	No	No	No	No
Public Information Officer	No	No	Yes	No
Financial Resources				
Capital Improvements Project Funding	No	Yes	Yes	Yes
Local Funds	Yes	Yes	Yes	Yes
General Obligation Bonds	Yes	Yes	Yes	Yes
Special Tax Bonds	No	No	Yes	No
Private Activities / Donations	No	No	Yes	No
State And Federal Funds/Grants	Yes	Yes	Yes	Yes
Other				
Public Education Programs	Yes	Yes	Yes	Yes
Privately Or Self-Insured?	Private	Private	Private	Private
Fire Evacuation Training	Yes	Yes	Yes	Yes
Tornado Sheltering Exercises	Yes	Yes	Yes	Yes
Public Address / Emergency Alert System	Yes	Yes	Yes, Parent Link	Yes
NOAA Weather Radios	Yes	Yes	Yes	Yes
Lock-Down Security Training	Yes	Yes	Yes	Yes
Mitigation Programs	No	No	Yes	No
Tornado Shelter/ Safe room	No	2 basements	Yes, community safe room currently under construction	No
Campus Police	No	Yes	School resource officers	Yes
Future enrollment growth	Don't anticipate any	Don't anticipate any	Projected growth until 2020: 100 additional each year	Don't anticipate any
Plans for new construction	Not in the near future	Not in the near future	Yes, 2017-2018	Not in the near future

Data Collection Questionnaires, 2016

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3 - RISK ASSESSMENT

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

The risk assessment process identifies and profiles relevant hazards and assesses the exposure of lives, property, and infrastructure to these hazards. The goal of the risk assessment is to estimate the potential loss in the Lincoln County planning area, including loss of life, personal injury, property damage, and economic loss, from a hazard event. The risk assessment process allows Lincoln County and its participating communities and school districts to better understand their potential risk to the identified hazards. The Hazard Mitigation Plan will provide a framework for Lincoln County to develop and prioritize mitigation actions and reduce risk from future hazard events.

The risk assessment for Lincoln County and its jurisdictions followed the methodology described in the FEMA publication 386-2, Understanding Your Risks: Identifying Hazards and Estimating Losses (2002), which includes a four-step process:

1. Identify Hazards
2. Profile hazard Events
3. Inventory Assets
4. Estimate Losses

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 described, there are three sections:

- **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;
- **Vulnerability Assessment** further defines and quantifies populations, buildings, critical facilities, and other community / school or special district assets at risk to natural hazards; and

- **Problem Statement** briefly summarizes the problem and develops possible solutions.

There were no significant changes to Lincoln County that affects planning since the 2011 plan update.

3.1 Hazard Identification

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

For this multi-jurisdictional plan, the risk assessment only addresses each jurisdiction's risks where they deviate from the risks facing the rest of Lincoln County. The area of Lincoln County is 640 square miles and the county is fairly uniform in terms of climate and topography as well as construction characteristics and development trends. Accordingly, overall hazards and vulnerability do not vary greatly across the planning area for most hazards.

Although the multi-hazard risk mitigation for Lincoln County began as a plan that addresses only naturally occurring hazards, over the years the plan has grown to include some man-made and technological hazards as well. For purposes of this plan, man-made hazards are defined as those accidently caused by man, such as chemical spills due to train derailments. Technological hazards are those created by a failure in technology such as a power failure to an entire town or region. It should be noted that this plan does not specifically address intentionally created events such as an active shooter, although the aftermath of such intentional events may be handled in much the same way as if it were caused by a natural or accidental event. Lincoln County is an active participant in the SEMA/FEMA Threat and Hazard Identification and Risk Assessment (THIRA) annual assessment which addressed not only natural, but some man-made and accidental threats.

3.1.1 Review of Existing Mitigation Plans

All the hazards from the 2011 update were reviewed and determined to remain applicable for this plan. The MPC also considered whether any new or additional hazards should be included for this update and a determination was made that there were none to be added.

The following natural hazards are not included in this analysis because they do not threaten Missouri: avalanches, coastal erosion, coastal storms, hurricanes, tsunamis, and volcanoes. While expansive soils, landslides, and rock falls are recognized as hazards in Missouri, they occur infrequently and their impacts are minimal; so they will not be profiled further in this document. Lincoln County has no record of any of the above hazards taking place here.

Prior to MPC review of current and potential hazards, BRPC in conjunction with the Lincoln County Emergency Management Director (EMD) did a preliminary review comparing the hazards from the 2011 plan against the State Hazard Mitigation Plan of 2013. BRPC and the county EMD also considered if new or emergent threats should be added. Further, a review of disaster declarations made since the updated plan was issued showed only two disasters declared, each of them being typical occurrences in Lincoln County. At the request of the county Health Department, three new

actions related to public health were recommended to the MPC to be added. These are included in Section IV. There were no differences or additional recommendations to be made and the MPC was so informed. The MPC was led through an exercise to determine if changes to the hazards should be made and the team decided none were warranted.

3.1.2 Review Disaster Declaration History

One method used by the MPC to prioritize hazards was to examine events that triggered federal and/or state disaster declarations. Federal and/or state declarations may be granted when the severity and magnitude of an event surpasses the ability of the local government to respond and recover. Disaster assistance is supplemental and sequential. When the local government's capacity has been surpassed, a state disaster declaration may be issued, allowing for the provision of state assistance. Should the disaster be 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.

The federal government may issue a disaster declaration through FEMA, the U.S. Department of Agriculture (USDA), and/or the Small Business Administration. 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.

A USDA disaster declaration certifies that the affected county has suffered at least a 30 percent loss in one or more crop or livestock areas and provides affected producers with access to low-interest loans and other programs to help mitigate disaster impacts. In accordance with the Consolidated Farm and Rural Development Act counties neighboring those receiving disaster declarations are named as contiguous disaster counties and are eligible for the same assistance. The table below lists federal disaster declarations received by Lincoln County. Each of the disaster events affected multiple counties so the estimated damages reflect total losses to all counties.

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.

There were five FEMA disaster declarations for Lincoln County since the 2011 updated plan, however, because these disasters are common for Lincoln County, no additional discussion or consideration from the MPC took place regarding FEMA disaster declarations.

Table 3.1. FEMA Declared Disasters for Lincoln County; January 2006 to February 2016

Disaster Number	IA Program Declared	PA Program Declared	Declaration Date	Disaster Type	Title	Total Cost
4250	No	Yes	1/21/2016	DR	SEVERE STORMS, TORNADOES, STRAIGHT-LINE WINDS, AND FLOODING	$200K - $500K (est)
3374	No	Yes	1/2/2016	EM	SEVERE STORMS, TORNADOES, STRAIGHT-LINE WINDS, AND FLOODING	
4238	No	Yes	8/7/2015	DR	SEVERE STORMS, TORNADOES, STRAIGHT-LINE WINDS, AND FLOODING	$4M - $8M(est)
4130	No	Yes	7/18/2013	DR	SEVERE STORMS, STRAIGHT-LINE WINDS, TORNADOES, AND FLOODING	$15,804.16
3317	No	Yes	2/3/2011	EM	SEVERE WINTER STORM	
3303	No	Yes	1/30/2009	EM	SEVERE WINTER STORM	
1809	No	Yes	11/13/2008	DR	SEVERE STORMS, FLOODING, AND A TORNADO	$26,222.38
1773	Yes	Yes	6/25/2008	DR	SEVERE STORMS AND FLOODING	$333,797.25
1749	Yes	Yes	3/19/2008	DR	SEVERE STORMS AND FLOODING	
1736	No	Yes	12/27/2007	DR	SEVERE WINTER STORMS	$79,813.01
3281	No	Yes	12/12/2007	EM	SEVERE WINTER STORMS	
1676	No	Yes	1/15/2007	DR	SEVERE WINTER STORMS AND FLOODING	$36,318.94
1631	Yes	Yes	3/16/2006	DR	SEVERE STORMS, TORNADOES AND FLOODING	

Source: FEMA, https://www.fema.gov/disaster/

3.1.3 Additional Sources

Note that the only centralized source of data for many of the weather-related hazards is the National Oceanic and Atmospheric Administration's (NOAA) National Climatic Data Center (NCDC). Although it is usually the best and most current source, there are limitations to the data which should be noted. The NCDC 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 NCDC 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 and the like. An effort is made to use the best available information but because of time and resource constraints, information from these sources may be unverified by the NWS. Those using information from NCDC should be cautious as the NWS does not guarantee the accuracy or validity of the information.

The NCDC 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 through December 2015, as entered by the NWS. Due to changes in the data collection and processing procedures over time, there are unique periods of record available depending on the event type. The following timelines show the different time spans for each period of unique data collection and processing procedures.

- Tornado: From 1950 through 1954, only tornado events were recorded.
- Tornado, Thunderstorm Wind and Hail: From 1955 through 1992, only tornado, thunderstorm wind and hail events were keyed from the paper publications into digital data. From 1993 to 1995, only tornado, thunderstorm wind and hail events have been extracted from the Unformatted Text Files.

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

The table below lists the Lincoln County Storm Events recorded between January 1, 1990 and December 31, 2015. During this period a total of 378 events occurred, however, only those with deaths, injuries, or damage are included below. This is the most current data available from the National Climatic Data Center. Storm events include weather related events such as excessive heat, heavy rains, floods, Tornados, High Winds, Thunder Storms, Ice Storms, Winter Weather (Snow), and the like. For the 25-year period covered below, only one death and just 14 injuries were reported, all of which were related to excessive heat. Common hazards such as tornadoes and floods accounted for most of the crop and property damage of over $5.6M.

Table 3.2. NCDC Storm Events for Lincoln County; January 1, 1990 – December 31, 2015

Event	Date	Start Location	End Location	Deaths	Injuries	Property Loss	Crop Loss
Hail	4/24/1993	Davis	Davis	0	0	$5,000	$ 0
TS/Wind, Hail	5/10/1993	Troy	Troy	0	0	$5,500	$ 0

Event	Date	Start Location	End Location	Deaths	Injuries	Property Loss	Crop Loss
TS/Wind	11/20/1994	Old Monroe, Winfield	Old Monroe, Winfield	0	0	$1,200	$ 0
TS/Wind	4/10/1995	Troy, Winfield	Troy, Winfield	0	0	$ 1,100	$0
TS/Wind	7/25/1995	Troy	Troy	0	0	$ 200	$500
TS/Wind	5/25/1996	Troy	Troy	0	0	$5,000	$0
Heat	7/18/1998	Lincoln County	Lincoln County	0	1	$0	$0
Tornado	2/11/1999	Whiteside	Whiteside	0	0	$100,000	$0
Heat	8/28/2000	Lincoln County	Lincoln County	0	7	$0	$ 0
Heat	9/1/2000	Lincoln County	Lincoln County	0	3	$0	$0
TS/Wind	8/10/2001	Troy	Troy	0	0	$5,000	$0
Heat	7/26/2002	Lincoln County	Lincoln County	0	1	$0	$0
Heat	8/1/2002	Lincoln County	Lincoln County	0	1	$0	$0
Heat	7/03/2003	Lincoln County	Lincoln County	0	1	$0	$0
Heat	7/20/2005	Lincoln County	Lincoln County	1	0	$0	$0
Tornado	3/13/2006	Olney	Olney	0	0	$2,500,000	$0
TS/Wind	7/17/2007	Foley	Foley	0	0	$5,000	$0
Strong Wind	5/11/2008	Lincoln County	Lincoln County	0	0	$0	$5,000
Flood	6/4/2008	Dameron	Dameron	0	0	$1,600,000	$0
Flash Flood	6/18/2008	Cap Au Gris	Cap Au Gris	0	0	$75,000	$0
Flash Flood	6/19/2008	Apex	Apex	0	0	$500,000	$0
Flash Flood	6/27/2008	Cap Au Gris	Cap Au Gris	0	0	$500,000	$0
TS/Wind	6/10/2009	Winfield	Winfield	0	0	$3,000	$0
Strong Wind	12/9/2009	Lincoln County	Lincoln County	0	0	$1,000	$0
Flood	4/16/2013	Dameron	Dameron	0	0	$50,000	$15,000
Flood	6/1/2013	Dameron	Dameron	0	0	$3,000	$5,000
Flood	12/27/2015	Truxton	Truxton	0	0	$240,000	$0
TOTALS				**1**	**14**	**$5,600,000**	**$25,500**

Source: National Oceanic and Atmospheric Administration's (NOAA) National Climatic Data Center (NCDC)

The Table below lists U.S. Department of Agriculture disaster declarations for Lincoln County (January 1, 2005 – June 15, 2016).

Table 3.3. USDA Declared Disasters in Lincoln County 2005 to 2016

USDA Disaster No.	Start Date	Drought	Flooding	Tornado	Severe Storms	Cold	Heat	High Winds	Wild Fire	Winter Storms	Excessive Moisture
S2106	01/01/2005	X									
S2119	01/01/2005	X									
M1631	3/11/2006			X	X						
M1681	11/30/2006									X	
S2407	01/01/2006	X									
S2483	01/01/2006	X									
M1736	12/06/2007									X	
N873	01/12/2007									X	
S2521	04/03/2007					X				X	
S2532	03/30/2007					X				X	
S3299	7/17/2012	X									
M4116	06/03/2013		X								
S-NA	08/12/2015		X								X

Source: US Department of Agriculture

The following additional sources of data were consulted for information relevant to past impacts and locations of those events in the Lincoln County planning area:

- Missouri Hazard Mitigation Plan (2013)
- Lincoln County Hazard Mitigation Plan (August 2011)
- Federal Emergency Management Agency (FEMA)
- Missouri Emergency Management Agency (SEMA)
- 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)
- State of Missouri GIS data
- Hazards US(HAZUS)
- Missouri Department of Transportation (HAZMAT Spills, MAJOR road closures)
- County and local Comprehensive Plans to the extent available
- Lincoln County Emergency Management
- Lincoln County Flood Insurance Rate Map, FEMA
- U.S. Army Corps of Engineers (USACE)
- U.S. Department of Transportation
- United States Geological Survey (USGS)
- Region C Threat and Hazard Identification and Risk Assessment (THIRA 2016)
- Missouri Department of Transportation (MoDOT)
- Lincoln County Emergency Operation Procedures (2012)
- Lincoln County Local Emergency Planning Committee (LEPC)
- Flood Frequency Analysis, Final Report, February 29, 2016

3.1.4 Hazards Identified

The table below lists in alphabetical order the hazards that significantly impact Lincoln County that were chosen for further analysis. Not all hazards impact every jurisdiction. An “X” in the table column indicates the jurisdiction is impacted by the hazard, and an empty cell indicates the hazard is not applicable to that jurisdiction. Each of the hazards listed have an equal likelihood of occurrence throughout the county and its communities with the exception of Dam Failure, Wild Fires, and Flood/Levee failures which by nature are located in low-lying areas downstream from dams, levees, and rivers.

Table 3.4. Hazards Identified for Each Lincoln County Jurisdiction

	Dam Failure	Drought	Earthquake	Extreme Heat	Floods/Flash Floods	Levee Failure	Hail Storms	Severe Winter Weather	Thunderstorms /High Winds	Tornadoes	Wild Fires	Sink Holes	Hazardous Materials	Terrorism	Transportation Disruption	Utility Disruption/Power Failure
Lincoln County	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X	X
Chain of Rocks	X	X	X	X	X		X	X	X	X			X	X	X	X
Elsberry	X	X	X	X	X	X	X	X	X	X		X	X	X	X	X
Foley	X	X	X	X	X	X	X	X	X	X			X	X	X	X
Fountain ‘N Lakes	X	X	X	X	X		X	X	X	X			X	X	X	X
Hawk Point	X	X	X	X	X		X	X	X	X			X	X	X	X
Moscow Mills	X	X	X	X	X		X	X	X	X			X	X	X	X
Old Monroe	X	X	X	X	X	X	X	X	X	X			X	X	X	X
Silex	X	X	X	X	X	X	X	X	X	X			X	X	X	X
Troy	X	X	X	X	X		X	X	X	X			X	X	X	X
Truxton	X	X	X	X	X		X	X	X	X			X	X	X	X
Whiteside	X	X	X	X	X		X	X	X	X			X	X	X	X
Winfield	X	X	X	X	X	X	X	X	X	X			X	X	X	X
Elsberry R-II	X	X	X	X	X		X	X	X	X		X	X	X	X	X
Silex R-I	X	X	X	X	X		X	X	X	X			X	X	X	X
Troy R-III	X	X	X	X	X		X	X	X	X			X	X	X	X
Winfield R-IV	X	X	X	X	X		X	X	X	X			X	X	X	X

Source: Boonslick Regional Planning Commission

3.1.5 Multi-Jurisdictional Risk Assessment

For this multi-jurisdictional plan, the risk assessment assesses each jurisdiction's risk where they deviate from the risks facing the entire county. Lincoln County is not geographically large at just 630 square miles, and is fairly uniform in terms of climate and topography as well as construction characteristics and development trends. Accordingly, overall hazards and vulnerability do not vary greatly across the planning area.

This is an update to the 2011 plan. Hazards added since the last update will be noted as such. For this update, all hazards were assessed on a county-wide basis except where so noted. Some hazards, like flooding, vary in risk across the planning area. Those variations were discussed by the MPC and included in the profile where appropriate. The hazards that vary across the planning area in terms of risk include dam failure, flash flood, grass or wild fire, levee failure, river flood, and flash flood.

The county is essentially rural with more densely populated areas in and around Troy, Moscow Mills, Elsberry, and Winfield. All four of the aforementioned cities have school attendance centers located within their boundaries. Winfield lies in an alluvial plain and as such is subject to occasional flooding brought on by levee breaches and the high waters of the Mississippi River. Development tends to take root in these cities and along major US and State highways; US 61 and Missouri Highways 79 and 47. Row crops across the county are susceptible to drought, floods, hail, and high winds. Livestock is not as big a concern but ranching is adversely affected by flooding, drought, and extremes of heat and cold. Where appropriate, these differences will be explained in greater detail in the vulnerability sections of each hazard.

Each hazard identified in Section 3.1, Hazard Identification, is profiled individually in this section in alphabetical order for easier reference. The level of information presented in the profiles varies by hazard based on the information available. With each update of this plan, new information will be incorporated to provide for better evaluation and prioritization of the hazards that affect Lincoln County.

The sources used to collect information for these profiles include those mentioned in Section 3.1.3 as well as those cited individually in each hazard section. Detailed profiles for each of the identified hazards include information on the following characteristics of the hazard:

Hazard Description

This section consists of a general description of the hazard and the types of impacts it may have on a community. It also includes a ranking to indicate typical warning times and duration of hazard events.

Historical Statistics

This section describes the geographic extent or location of the hazard in the planning area and includes the information on historic incidents and their impacts based upon the sources described in Section 3.1.4 Hazard Identification and the information provided by the MPC. Where available,

maps are utilized to indicate the areas of the planning area that are vulnerable to the subject hazard.

Probability of Future Occurrence

The frequency of past events is used to gauge the likelihood of future occurrences. Where possible, the probability and severity of occurrence was calculated based on historical data.

Probability was determined by dividing the number of events observed by the number of years and multiplying by 100. This gives the percent chance of the event happening in any given year.

An example would be three droughts occurring over a 30-year period, which suggests a 10 percent chance of a drought occurring in any given year.

Magnitude/Severity

The magnitude of the impact of a hazard event (past and perceived) is related directly to the vulnerability of the people, property, and the environment it affects. This is a function of when the event occurs, the location affected the resilience of the community, and the effectiveness of the emergency response and disaster recovery efforts.

3.2 Assets at Risk

In this section of the plan, the Lincoln County population, structures, critical facilities and infrastructure, and other important assets that may be at risk to hazards are assessed. There were no changes to the planning area since the previously approved plan was adopted.

The base for the vulnerability assessment for this update will include the Missouri State Hazard Mitigation Plan 2013 as well as other jurisdictional specific information provided by communities. The State Plan vulnerability analysis is mostly based on Hazus-MH risk assessment. Hazus is a nationally applicable standardized methodology that contains models for estimating potential losses from earthquakes, floods, and hurricanes. Hazus is used for mitigation recovery as well as preparedness and response. DFIRMs are available for flood risk assessment.

3.2.1 Total Exposure of Population and Structures

Table 3.5 shows the total population and building count by usage type for Lincoln County.

Table 3.6 that follows provides the building value exposures for Lincoln County broken down by usage type.

Table 3.5. Maximum Population and Building Count for Lincoln County

Population (2010)	Residential	Commercial	Industrial	Agricultural	Religion	Government	Education	Total
52,566	20,207	755	285	188	77	54	23	21,589

Source: 2013 Missouri State Hazard Mitigation Plan

Table 3.6. Building Values / Exposure by Usage Type for Lincoln County

Residential	Commercial	Industrial	Agricultural	Religion	Government	Education	Total
3,608,615	313,815	98,208	29,524	50,078	44,201	195,590	4,340,031

Source: 2013 Missouri State Hazard Mitigation Plan

3.2.2 Critical and Essential Facilities and Infrastructure

This section includes 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 life line 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 from information provided by the county Emergency Management Director and County LEPC contact for Tier II Chemical Facilities information.

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

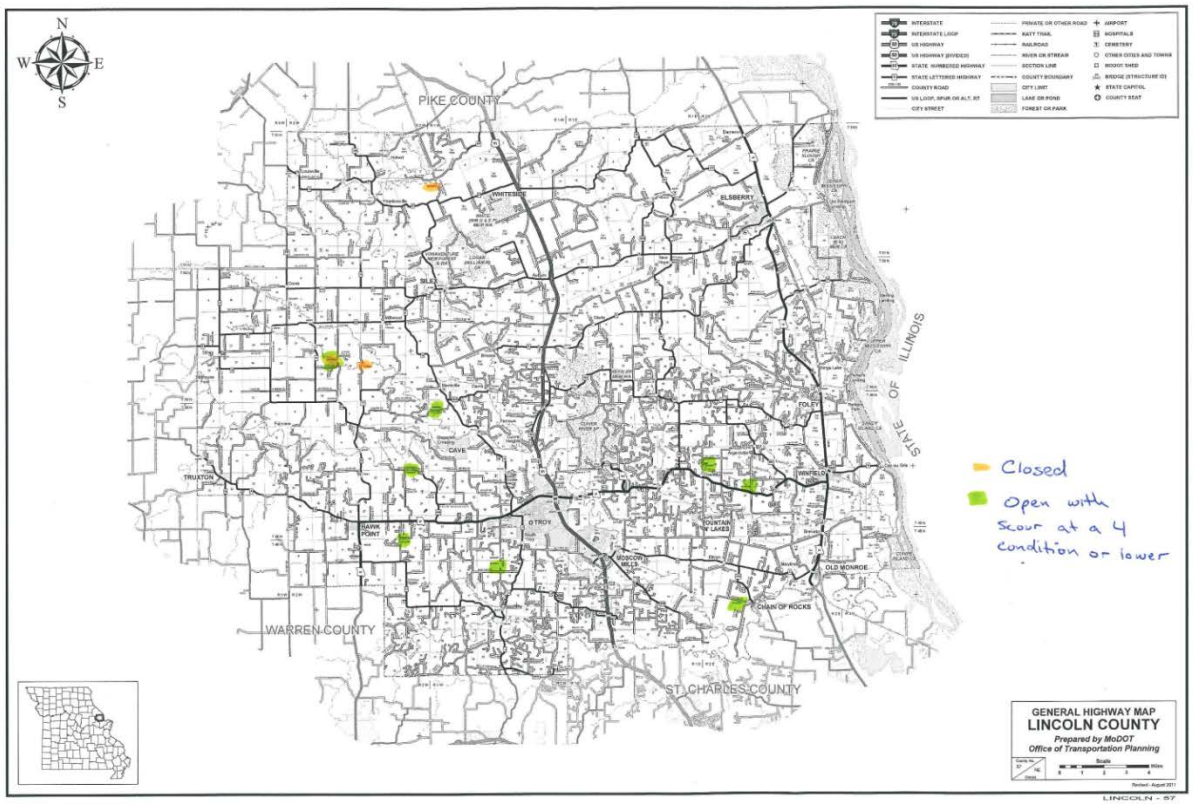
Jurisdiction	Airport Facility	Bus Facility	Childcare Facility	Communications Tower	Electric Power Facility	Emergency Operations	Fire Service	Government	Shelters	Highway Bridge	Hospital/Health Care	Natural Gas Facility	Nursing Homes	Police Station	Potable Water Facility	Rail	Sanitary Pump Stations	School Facilities	Stormwater Pump Stations	Tier II Chemical Facility	Wastewater Facility	Total
Unincorporated Lincoln County	4	0	0	16	8	1	9	7	0	1	0	0	0	1	1	1	3	0	0	4	2	58
Chain of Rocks	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Elsberry	0	0	1	0	0	1	0	1	0	0	0	0	2	1	1	0	0	0	0	31	0	38
Foley	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	2	0	4
Fountain ‘N Lakes	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	1
Hawk Point	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	19	0	21
Moscow Mills	0	0	0	0	0	0	0	1	0	0	0	0	2	1	0	0	2	0	0	24	0	30
Old Monroe	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	1	0	0	5	0	8
Silex	0	0	0	0	0	0	0	1	0	0	0	0	2	1	0	0	1	0	0	18	1	24
Troy	0	1	6	4	0	0	0	2	1	0	1	0	7	1	1	0	2	0	1	137	2	166
Truxton	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	1	0	3
Whiteside	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1
Winfield	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	7	0	8
Elsberry R-II	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	3
Silex R-I	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0	1	0	3
Troy R-III	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	8	0	1	0	10
Winfield R-IV	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	2	0	1	0	4
Totals	4	5	8	20	8	2	9	18	1	1	1	0	13	9	3	1	9	12	1	253	5	383

Source: Lincoln County EM, Data Collection Questionnaires; MoDOT, DNR, DHSS

Scour Critical Bridges

The term “scour critical” refers to a bridge that upon inspection was determined to be unstable due to erosion, or scouring, of its foundation. A bridge with a scour index (or “condition”) between 1 and 3 is considered critical. There are five Scour Critical bridges located in Lincoln County, two of which are closed. The closed bridges, shown in orange of the figure below, are the Coon Creek bridge on the Fred Norton Road and the Little Lead Creek bridge on the Stanek Road. The remaining three are open and under remedial care. Neither are within city limits.

Figure 3.1. Lincoln County Scour Critical Bridges



Source: Missouri Department of Transportation (MoDOT)

3.2.3 Other Assets

Assessing the vulnerability of the planning area to disaster also requires data on the natural, historic, cultural, and economic assets of the area. This information is important for many reasons. These types of resources warrant a greater degree of protection due to their unique and irreplaceable nature and contribution to the overall economy. Knowing about these resources in advance allows for consideration immediately following a hazard event, which is when the potential for damages is higher.

The rules for reconstruction, restoration, rehabilitation, and / or replacement are often different for these types of designated resources. The presence of natural resources can reduce the impacts of future natural hazards, such as wetlands and riparian habitats which help absorb floodwaters. Losses to economic assets like these (e.g., major employers or primary economic sectors) could have severe impacts on a community and its ability to recover from disaster.

Table 3.8. Threatened and Endangered Species in Lincoln County

Common Name	Scientific Name	Status
Decurrent False Aster	Boltonia decurrens	Threatened
Indiana Bat	Myotis sodalist	Endangered
Least Tern	Sterna antillarum	Endangered
Northern Long-eared Bat	Myotis septentrionalis	Threatened
Pallid Sturgeon	Scaphirhynchus albus	Endangered
Piping Plover	Charadrius melodus	Threatened
Rufa Red Knot	Calidris canutus rufa	Threatened
Running Buffalo Clover	Trifolium Stoloniferum	Endangered

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

Natural Resources

The Missouri Department of Conservation (MDC) provides a database of lands it owns, leases, or manages for public use. Those assets are listed in the table below for the Lincoln County planning area. The MDC areas are listed in the first part of the table and the remainder of the table lists state and local assets.

Table 3.9. Parks in Lincoln County

MDC Area Name	Address	City
Crouch (R H) Access	Shafer Road	Troy
Cuivre Island Conservation Area	Dalbow Road	Old Monroe
Kessler Mem Wilderness Area	Route KK	Troy
Leach (B K) Mem Conservation Area	Route M	Elsberry
Logan (William R) Conservation Area	Route RA	Troy
Millsap Bridge Access	Beck Road	Truxton
Prairie Slough Conservation Area	Route P	Elsberry
Sandy Island Conservation Area	Route N	Lock & Dam #25
Vonaventure Mem Forest and Wilderness Area	Route UU	Silex
White (William G and Erma Parke) Mem Wilderness Area	Route Z	Whiteside

Source: Missouri Department of Conservation; http://mdc4.mdc.mo.gov/applications/moatlas/AreaList.aspx?txtUserID=guest&txtAreaNm=s

State / City Park Name	Address	City
Avery Park	805 Cap Au Gris	Troy
Cuivre River State Park	678 State Route 147	Troy
Elsberry City Park	401-499 Griffin Street	Elsberry

State / City Park Name	Address	City
Fairgrounds Park	971 Monroe Street	Troy
Hawk Point Community Park	Maple Street	Hawk Point
Mill Park		Moscow Mills
Old Monroe Community Ball Park	197 East Elm Street	Winfield
Weinand Park	1305 Boone Street	Troy
Woods Fort Park	Main and Boone Streets	Troy

Source: ***http://cityoftroymissouri.com, http://elsberrycity.com, http://moscowmills.com, cityofhawkpoint.jigsy.com***

Historic Resources

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

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

Property	Address	City	Date Listed
Camp Sherwood Forrest Historic District, Cuivre River State Park	678 State Route 147	Troy	3/4/1985
Cuivre River State Park Administrative Area Historic District	678 State Route 147	Troy	3/4/1985
Downton Troy Historic District	Bounded by Annie Avenue, 2nd Street, Marble Street, and Court Street	Troy	10/30/2013
Lock and Dam No. 25 Historic District	10 Sandy Slough Road	Winfield	3/10/2004
Old Rock House	2nd and Mill Streets	Moscow Mills	10/18/1972

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

Economic Resources

The table below shows major non-government employers with 50 or more employees operating within Lincoln County.

Table 3.11. Major Non-Government Employers in Lincoln County

Name	City	Employees
CARING CENTER-LINCOLN COUNTY	TROY	100
COMMUNITY OPPORTUNIES-PEOPLE	TROY	100
GEEDING CONSTRUCTION	TROY	100
HOUGHTON MIFFLIN HARCOURT	TROY	100
KROGER	TROY	100
MC DONALD'S	TROY	100
TROY BUCHANAN SENIOR HIGH SCHL	TROY	100
TROY MIDDLE SCHOOL	TROY	100
TROY NURSING & REHAB	TROY	100
LINCOLN COUNTY SHELTER WRKSHP	TROY	120
CUIVRE RIVER ELECTRIC CO-OP	TROY	126
DADDY RAY'S INC	MOSCOW MILLS	135
LINCOLN COUNTY R II SCHOOL	ELSBERRY	140
WITTE BROTHERS EXCHANGE	TROY	140
WILLIAM R CAPPEL ELEMENTARY	MOSCOW MILLS	60
LINCOLN COUNTY ENVIRONMENTAL	TROY	200
LCMC HOME CARE	TROY	236
LINCOLN COUNTY MEDICAL	TROY	325
WALMART SUPERCENTER	TROY	400
JONES OIL SUPPLY LLC	MOSCOW MILLS	50
QUICK LANE TIRE & AUTO	MOSCOW MILLS	50
MUELLER BROTHERS TIMBER INC	OLD MONROE	50
DENNY'S	TROY	60
BOONE ELEMENTARY SCHOOL	TROY	50
BURGER KING	TROY	50
CANNON REALTY INC	TROY	50
MARQUITZ PONTIAC CAD BCK GM	TROY	50
NORMANDY MACHINE CO	TROY	50
LINCOLN COUNTY BANCORP INC	TROY	60
VICTOR PIPE & STEEL INC	WINFIELD	50
WINFIELD HIGH SCHOOL	WINFIELD	50
MAIN STREET ELEMENTARY SCHOOL	TROY	60
SILEX R1 SCHOOL DISTRICT	SILEX	51
CHAMPION PRECAST INC	TROY	51
SILEX COMMUNITY CARE CTR	SILEX	52
WINFIELD ELEMENTARY SCHOOL	WINFIELD	53
HICKMAN'S IGA	WINFIELD	55
WINFIELD R-4 SCHOOL DISTRICT	WINFIELD	55
TROY CITY HALL	TROY	62

Name	City	Employees
FORREST KEELING NURSERY	ELSBERRY	65
LINCOLN ELEMENTARY	TROY	65
CLAUDE BROWN INTERMEDIATE SCHL	TROY	70
MOST INC	TROY	70
CLARENCE CANNON ELEMENTARY	ELSBERRY	75
BODINE ALUMINUM INC	TROY	750
AGRI-FOODS	HAWK POINT	80
HOUGHTON MIFFLIN HARCOURT	TROY	80
TROY SCHOOL DISTRICT R-3	TROY	85

Source: MERIC; Local Economic Development Commissions

Agriculture

According to the USDA's 2012 Census of Agriculture, there are 1,162 farms in Lincoln County for a total of 281,155 acres. This compares to 99,200 farms in Missouri and 28,300,000 acres. The average size farm in Lincoln County is 242 acres while the state average is larger at 290 acres. The number of farms in Lincoln County in 2012 is up 4.65% from 2007. There is a 16.5% increase in the number of family-run farms since 2007 which accounts for a 10.8% increase in the number of people living on farms. Seventy-nine percent of farms in Lincoln County are family-run.

The total value of farm products sold in Lincoln County in 2012 is $85,647,000. Crop sales account for 56% of the total sales and livestock account for the remaining 44% of sales. Beef cattle and hogs make up the majority of livestock sales and soybeans, grain corn, and forage crops account for the majority of crop sales. Average sales per Lincoln County farm is $73,707.

Farms in Lincoln County account for 1,042 farm proprietor of jobs (StatsAmerica 2014) plus approximately 133 additional agriculture-related workers (2010-2014 American Community Survey), or 6.3% of the labor force.

3.3 Future Land Use and Development

The table below summarizes Lincoln County's population growth between the years of 2000 and 2010.

Table 3.12. Lincoln County Population Growth, 2000 - 2010

Jurisdiction	2000 Population	2010 Population	Change	% Change
Lincoln County	38,994	52,566	13,572	25.8%
Chain of Rocks	91	93	2	2.2%
Elsberry	2,047	1,934	(113)	-5.8%
Foley	178	161	(17)	-10.6%
Fountain N Lakes	129	165	36	21.8%
Hawk Point	459	669	210	31.4%
Moscow Mills	1,742	2,509	767	30.6%

Jurisdiction	2000 Population	2010 Population	Change	% Change
Old Monroe	250	265	15	5.7%
Silex	206	187	(19)	-10.2%
Troy	6,737	10,540	3,803	36.1%
Truxton	96	91	(5)	-5.5%
Whiteside	67	75	8	10.7%
Winfield	723	1,404	681	48.5%

Source: U.S. Bureau of the Census

Population growth or decline is generally accompanied by corresponding increases or decreases in the number of housing units. The table below shows the change in numbers of housing units in the planning area from 2000 to 2010 and illustrates a comparable trend with population.

Table 3.13. Change in Housing Units, 2000 - 2010

Jurisdiction	Housing Units 2010	Housing Units 2000	Change in Housing Units	Percent of Change
Lincoln County Total	21,011	15,511	5,500	26.2%
Chain of Rocks	39	42	(3)	-7.7%
Elsberry	939	889	50	5.3%
Foley	69	74	(5)	-7.2%
Fountain N Lakes	71	59	12	16.9%
Hawk Point	288	208	80	27.8%
Moscow Mills	979	692	287	29.3%
Old Monroe	113	115	(2)	-1.8%
Silex	84	91	(7)	-8.3%
Troy	4,141	2,661	1,480	35.7%
Truxton	41	41	-	0.0%
Whiteside	32	31	1	3.1%
Winfield	568	319	249	43.8%

Source: U.S. Bureau of the Census

All sectors of Lincoln County continue to grow with the county being one of the top five fastest growing counties in the state. Most of the growth is anchored along US 61, Missouri Highway 47, and Missouri Highway 79 in and around Troy, Moscow Mills, and Winfield. Further west in the county, along Missouri Highway 47, the Hawk Point area continues to attract new residents. According to population metrics listed on the State of Missouri's website, the 30-year population forecast for Lincoln County shows a growth of 52,000 residents by 2030; a 134.4% increase from the 2000 census. Also important to note are the county's plans to build a multi-modal transportation hub along the Mississippi River.

School Districts' Future Development

The Troy School District enrollment is currently 6,436 with projected growth to be 100 students per year through 2020. A middle school is planned for the 2017-2018 school year. In addition, the district constructed a safe room with FEMA funds.

The Silex R-I district is building a flash flood resilient track and field complex in a flash flood prone area of old Silex.

The Elsberry and Winfield districts reported no future development activities.

3.4 Hazard Profiles, Vulnerability, and Problem Statements

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

Hazard Profiles

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

Each hazard identified in this section will be profiled individually in alphabetical order for easier reference. The level of information presented in the profiles varies 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 Lincoln County. Detailed profiles for each of the identified hazards include information categorized as follows:

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

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

Severity / Magnitude / Extent: The severity, magnitude, and extent of a hazard event is directly related to the vulnerability of the people, property, and environment it affects. 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. The severity/magnitude/extent of a hazard is not the same as 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: Where available, data related to past occurrences of similar events and their impacts will be presented. Historic event records form a solid basis for probability calculations.

Probability of Future Occurrence: The frequency of 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 percentage of likelihood 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.

Vulnerability Assessments

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

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

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

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

Requirement §201.6(c)(2)(ii):(AsofOctober1,2008) [The risk assessment] must also address National Flood Insurance Program (NFIP) insured structures that have been repetitively damaged in floods.

Following the hazard profile for each hazard will be the vulnerability assessment. The vulnerability assessment further defines and quantifies populations, buildings, critical facilities, and other community assets at risk to damages from natural hazards. The vulnerability assessments will be based on the best available county-level data, which is in the Missouri Hazard Mitigation Plan (2013).The county-level assessments in the State Plan were based on the following sources:

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

The vulnerability assessments in the Lincoln 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.

The Vulnerability Assessment will also address potential losses to existing development, including types and numbers of buildings, and critical facilities; potential losses of future development; and for hazards that vary by jurisdiction, a jurisdictional summary.

Problem Statements

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

3.4.1 Dam Failure

Hazard Profile

Hazard Description

A dam is defined by the National Dam Safety Act as an artificial barrier that impounds or diverts water and (1) is at least six feet high and stores at least 50 acre-feet of water, or (2) is at least 25 feet high and stores at least 15 acre-feet.

Missouri's DNR regulates the design, construction and maintenance of 4,100 non-federal, non-agricultural dams that are at least 35 feet high. Dam owners have primary responsibility for the safe design, operation and maintenance of their dams. They are responsible for providing early warning of problems at the dam, for developing an effective emergency action plan, and for coordinating that plan with local officials. The state has ultimate responsibility for public safety and many states regulate construction, modification, maintenance, and operation of dams. DNR's Dam Safety Division maintains a database of all dams regardless of federal, state, local or private ownership.

The failure of dams or levees can result in injuries, loss of life, and damage to property and the environment. While levees are built solely for flood protection, dams often serve multiple purposes, one of which may be flood control. Severe flooding and other storms can increase the potential that dams and levees will be damaged and fail as a result of the physical force of the flood waters or overtopping.

Dams and levees are usually engineered to withstand a flood with a computed risk of occurrence. If a larger flood occurs, then that structure will likely be overtopped. If during the overtopping, the dam fails or is washed out, the water behind is released as a flash flood. Failed dams can create floods that are catastrophic to life and property, in part because of the tremendous energy of the released water.

Oversight is extremely valuable to the owners as well as those people living downstream of the dam who could be flooded in the event the dam should fail. Dams can fail for many reasons. The most common are:

- Piping: internal erosion caused by embankment leakage, foundation leakage and deterioration of pertinent structures appended to the dam.

- Erosion: inadequate spillway capacity causing overtopping of the dam, flow erosion, and inadequate slope protection.

- Structure Failure: caused by an earthquake, slope instability or faulty construction.

These failure types often are interrelated. For example, erosion, either on the surface or internal, may weaken the dam or lead to structural failure. Additionally, a structural failure may shorten the seepage path and lead to a piping failure.

The tables below illustrate the classifications given to dams by the Missouri Department of Natural Resources and the National Inventory of Dams. Both classification systems are used throughout the United States and Missouri; however, they are not interchangeable.

Table 3.14. MDNR Dam Hazard Classification Definitions

Hazard Class	Definition
Class I	Represents the most severe threat to public safety, life or property
Class II	Represents a moderate threat to public safety, life or property
Class III	Represents the least severe threat to public safety, life or property

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

Table 3.15. NID Dam Hazard Classification Definitions

Hazard Class	Definition
Low Hazard	Dams assigned the low hazard potential classification are those where failure or misuse results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.
Significant Hazard	Dams assigned the significant hazard potential classification are those dams where failure or misuse results in no probable loss of human life but can cause economic loss, environmental damage, disruption of lifeline facilities, or can impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.
High Hazard	Dams assigned the high hazard potential classification are those where failure or misuse will probably cause loss of human life.

Source: National Inventory of Dams

Historical Statistics

The problem of unsafe dams in Missouri was underscored by dam failures at Lawrenceton in 1968, Washington County in 1975, Fredericktown in 1977, and a near failure in Franklin County in 1978.

According to Missouri DNR's Dam Safety Division in Rolla, Lincoln County now has 68 dams. All Lincoln County dams are of earthen construction except for the Winfield Lock and Dam No. 25 on the Mississippi River. The mean dam height in Lincoln County is 28 feet and the mean maximum storage capacity is 182 acre-feet. (An acre-foot is one acre of water that is one foot deep. For example, a 10-acre lake that is 10 feet deep would have a maximum storage capacity of 100 acre-feet.) Many are less than 35 feet high and not regulated by Missouri DNR. Therefore, people living downstream of these smaller unregulated dams are virtually at the mercy of the dam owner's construction and maintenance practices.

Of 68 dams, seven are rated by Missouri DNR as "high" risk. Only nine are regulated by the State. High-hazard dams exhibit one or more characteristics; more than 30 years old; high ratio of maximum storage to dam height; and/or high population density downstream. None of Lincoln County's high risk dams are owned by the United States Army Corps of Engineers (USACE). The Lake Lincoln Dam, a recreational dam six miles from Moscow Mills, is capable of holding the largest body of water; 2,083 acre-feet. Below is a summary table of the county's high-hazard dams.

Table 3.16. High Hazard Dams in the Lincoln County Planning Area

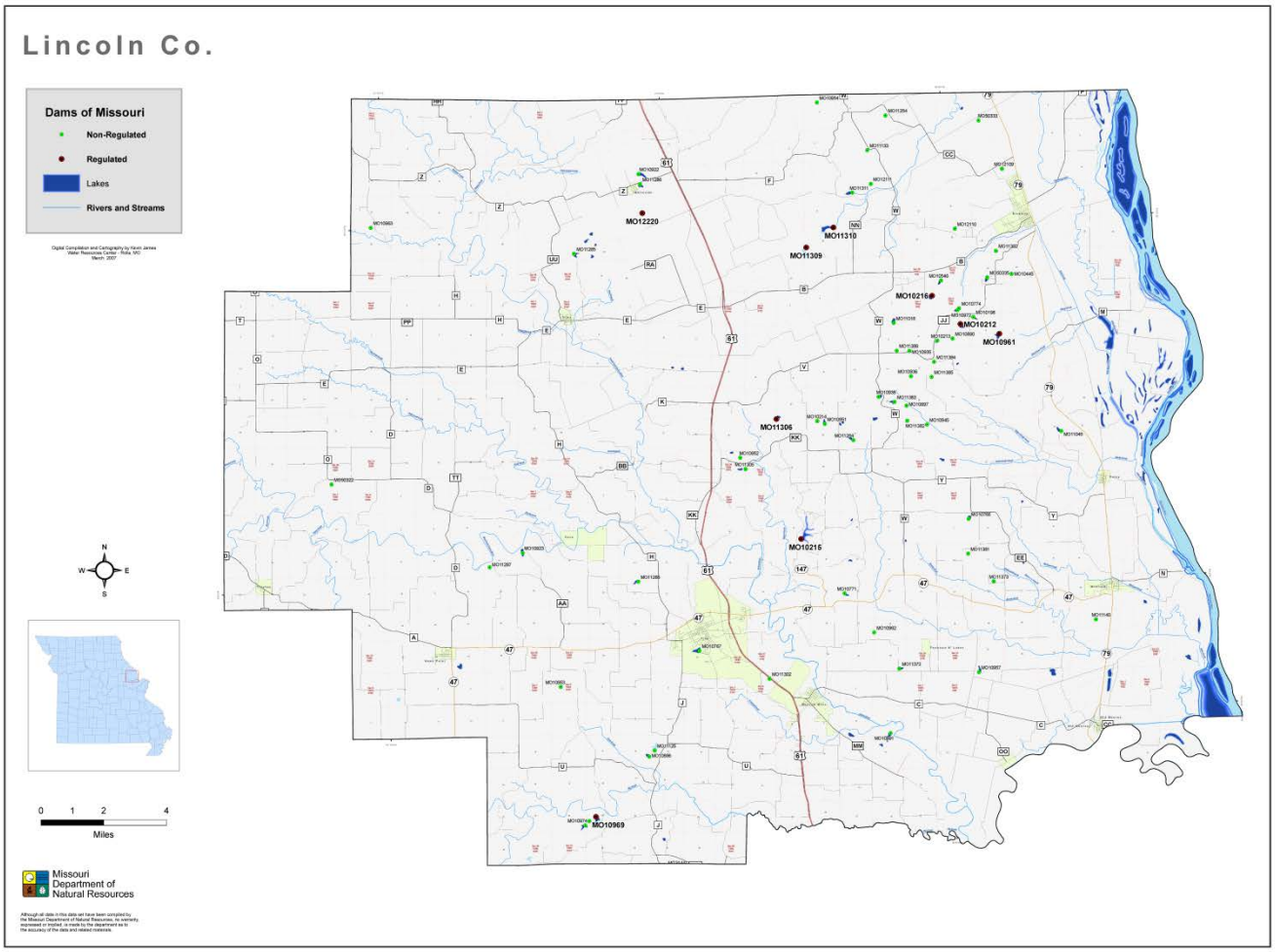
Dam	EAP (Y / N)	Height	Normal Storage (Acre-Ft)	Last Inspection Date	River	Nearest Downstream City	Distance To Nearest City (Miles)	Owner
Lost Creek Dam	N	36	669	NA	Lost Creek	Elsberry	4.1	Private
Gentry Lake Dam	N	31	133	NA	NA	Elsberry	5	Private
Lake Lincoln Dam	N	69	2083	NA	Lincoln Creek	Moscow Mills	6	Private
Lake View Dam	N	28	150	NA	NA	Elsberry	3	Private
Trojan Lake Dam	N	20	255	NA	NA	Troy	1	Private
Westhoff Dam	N	25	40	NA	NA	Winfield	0	Private
White Lake Dam	Y	40	210	NA	NA	Whiteside	0	Private

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

Geographic Location

Dams are distributed throughout Lincoln County. The map immediately below shows all Lincoln County regulated and non-regulated dams.

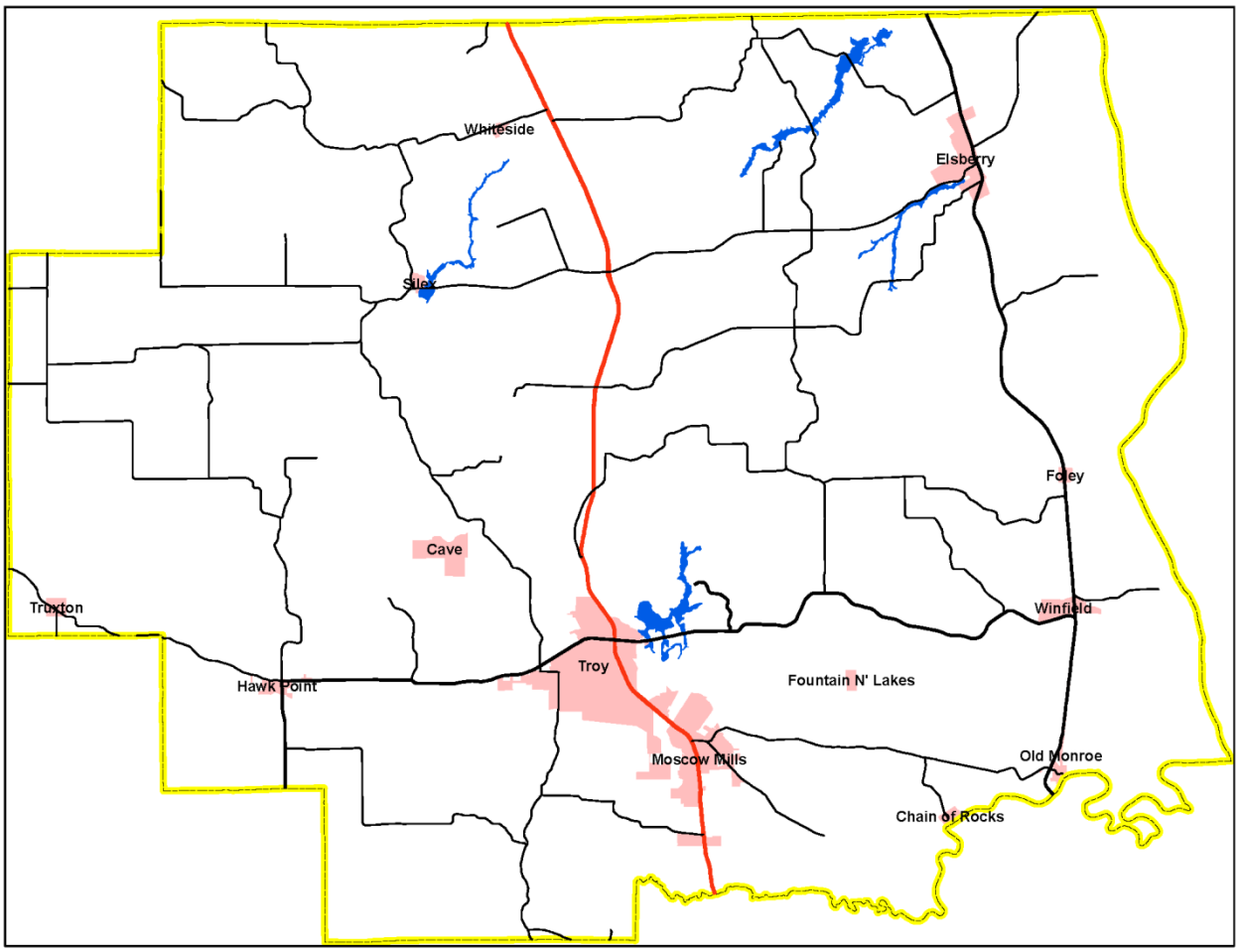
Figure 3.2. Location of Dams in Lincoln County



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

The following map shows possible inundation areas of Lincoln County dams created from shape files provided by the Missouri Department of Natural Resources Division of Dam Safety. DNR continues to work on mapping Lincoln County dams.

Figure 3.3. Lincoln County Dams Inundation Areas



Severity/Magnitude/Extent

A dam failure could create a critical hazard for the City of Elsberry, the Northeast portion of Troy, and the southeast corner of Silex.

It should be noted that the severity/magnitude of dam failure would be similar in some cases to the impacts associated with flood events (see the flood hazard vulnerability analysis and discussion). Based on the hazard class definitions, failure of any of the High Hazard/Class I dams could result in a serious threat of loss of human life, serious damage to residential, industrial or commercial areas, public utilities, public buildings, or major transportation facilities. Catastrophic failure of any high hazard dams has the potential to result in greater destruction due to the potential speed of onset and greater depth, extent, and velocity of flooding. Note that for this reason, dam failures could flood areas outside of mapped flood hazards.

Previous Occurrences

There are no documented prior occurrences of dam failure in Lincoln County.

Probability of Future Occurrence

No failures of a high hazard dam have been reported during the past 20 year period thereby making a calculation of the probability of future occurrence meaningless.

Vulnerability

Vulnerability Overview

While a dam break could flood many rural, unpopulated areas of the county, only three areas are vulnerable to potential loss of property to dam failure; the City of Elsberry, the Northeast portion of Troy, and the southeast corner of Silex. The exposure table below, taken from data in the state's 2013 Hazard Mitigation Plan, shows a worst case scenario wherein all Lincoln County's state-regulated dams failed simultaneously. While this scenario is highly unlikely, it illustrates the total exposure for Lincoln County.

Potential Losses to Existing Development

Table 3.17. Lincoln County Impact / Exposure Estimate

Impact	Exposure
Estimated buildings vulnerable	45
Average exposure value per structure	$108,582
Estimated total potential building exposure	$7,866,637
Estimated total population exposure	241
Estimated building losses	$3,933,318

Sources: 2013 Missouri Hazard Mitigation Plan

Impact of Future Development

Most of Lincoln County's growth surrounds US Highway 61 and Missouri Highways 47 and 79 corridors where little additional potential for loss is likely. The greatest potential for loss remains with the City of Elsberry, the Northeast portion of Troy, and the southeast corner of Silex.

Hazard Summary by Jurisdiction

While a dam break could flood many rural, unpopulated areas of the county, only three areas are vulnerable to potential loss of property to dam failure; the City of Elsberry, the Northeast portion of Troy, and the southeast corner of Silex.

Problem Statement

Areas at risk to inundation due to dam failure in Lincoln County are very limited and for the most part concentrated around the three aforementioned cities which are the only areas with a concentration of structures in the inundation area.

3.4.2 Drought

Hazard Profile

Hazard Description

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

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

- Hydrological drought is associated with the effects of periods of precipitation (including snowfall) shortfalls on surface or subsurface water supply (e.g., stream-flow, 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, stream-flow, 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 groundwater or reservoir levels, etc. Plant demand for water depends on prevailing weather conditions, biological characteristics of the specific plant, its stage of growth, and the physical and biological properties of the soil.

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

Geographic Location

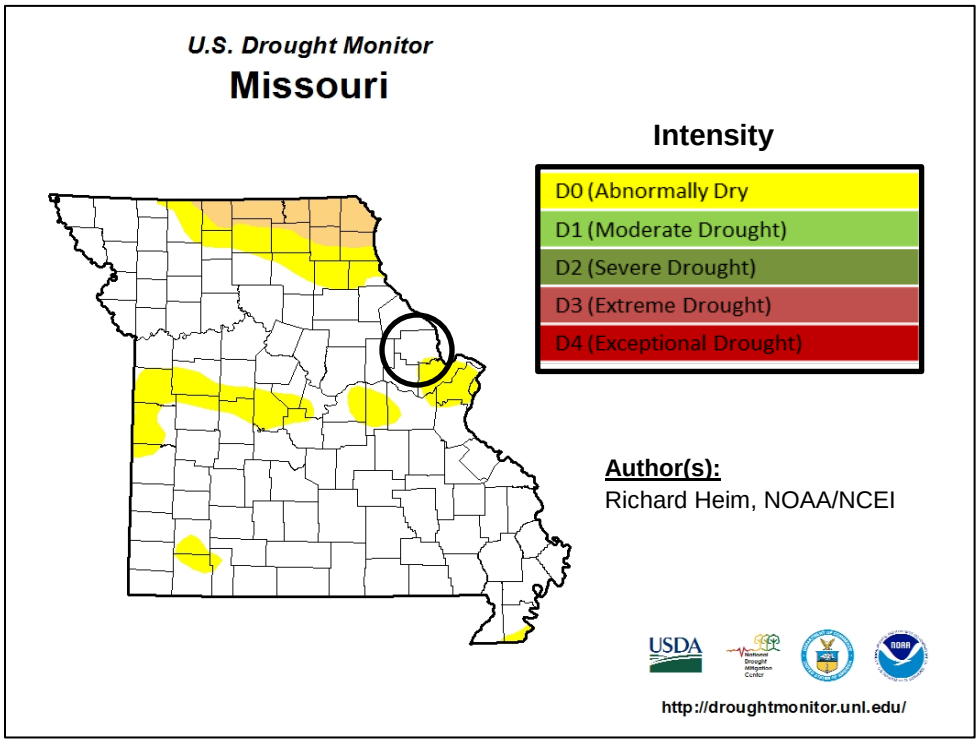
While the entire county is susceptible to drought, the agricultural sector is most at risk. Approximately 70% of the total acreage of Lincoln County is represented by farms. These farms are spread evenly across the county with the highest concentration of highly fertile land being east of MO79 along the Mississippi River's alluvial plain. According to the 2012 Census of Agriculture, the number of acres dedicated to farming has increased in Lincoln County by over 4% since 2007.

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 Lincoln County, drought typically presents a problem for rural water supplies, especially those supplied by small water structures. When good water becomes a scare commodity and people must compete for the available supply, the severity and duration of drought increases dramatically. The figure below uses the Palmer Drought Severity Index (PDSI) to predict drought conditions for the state of Missouri and Lincoln County which is encircled.

Figure 3.4. U.S. Drought Monitor Map of Missouri on July 19, 2016



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

The Palmer Drought Severity 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.

Table 3.19 illustrates potential crop exposure to drought expressed in dollars of damage claimed.

Drought in Lincoln County is primarily a problem of rural water supply, especially those supplied by small ground water systems. When good water becomes a scarce commodity and people must compete for the available supply, the importance of drought severity and duration increases dramatically.

According to the Climate Prediction Center, average annual precipitation for the St. Louis regional area is 39 inches and the state rates Lincoln County for moderate drought susceptibility. Precipitation-related impacts on time scales ranging from a few days to a few months can include effects on wildfire danger, non-irrigated agriculture, topsoil moisture, pasture conditions, and unregulated stream flows. Lack of precipitation over a period of several months or years adversely affects reservoir stores, irrigated agriculture, groundwater levels, and well water depth.

Groundwater resources in the county are adequate to meet domestic and municipal water needs, but due to required well depths, irrigation wells are very expensive. Lincoln County lies in an area of lime stones and sandstones that generally yield 1-15 gallons per minute up to 400 feet deep. Below that depth the water is mineralized.

The DNR’s drought response system has 4 phases. Phase 1 begins when water monitoring analysis indicates anticipated drought consequences. The situation moves to Phase 2 when the PDSI reads -10 to -20. At the same time, stream flow, reservoir levels and groundwater levels are below normal over a period of several months. Phase 3 is based on a PDSI between -2 and -4 and various other factors. Phase 4, or activation of drought emergency procedures, generally begins when the PDSI exceeds -4. The DNR has rated drought susceptibility for the entire state and Lincoln County is at moderate risk of drought.

The table below shows the existing potable water systems in Lincoln County.

Table 3.18. Lincoln County Water Systems

Water System Name	Type	Status	Source Water Type
Autumn Hills MHP	C	A	Ground Water
Bennington Estates	C	A	Ground Water
Brook Hill Subdivision	C	A	Ground Water
Camp Tuckaho	NC	A	Ground Water

Water System Name	Type	Status	Source Water Type
Castles Grocery and Café	NC	A	Ground Water
Crest View Mobile Court	C	A	Ground Water
Cuivre River State Park Camp Derricote	NC	A	Ground Water
Cuivre River State Park, Camp Sherwood	NC	A	Ground Water
Cuivre River State Park, Picnic Shelter	NC	A	Ground Water
El Shaddai Ranch	NC	A	Ground Water
Elsberry Municipal Water	C	A	Ground Water
Elsberry Health Center	C	A	Ground Water
Emerald Green Estates	C	A	Ground Water
Fawn Lakes	C	A	Ground Water
Glen Meadows	C	C	Ground Water
Hawk Point Municipal Water	C	A	Ground Water
Hometown Court	C	A	Ground Water
J.R. Diamonds	NC	A	Ground Water
Lake Forrest Subdivision	C	A	Ground Water
Lakeview Subdivision Water	C	A	Ground Water
Lincoln County PWSD #1	C	A	Ground Water
Lincoln County PWSD #2	NC	A	Ground Water Pump
Lincoln County Hideout	NC	A	Ground Water
Lindemann MHP	C	A	Ground Water
Majestic Lakes	C	A	Ground Water
Moscow Mills Municipal Water	C	A	Ground Water
North Troy Business Park	NTNC	A	Ground Water
Operating Engineers Business School	NC	A	Ground Water
Quail Run MHP	C	A	Ground Water
Rockport Subdivision	C	A	Ground Water

Water System Name	Type	Status	Source Water Type
Silex Municipal Water	C	A	Ground Water
Silex Nursing Home	C	A	Ground Water
Southfield Subdivision	C	A	Ground Water
St. Alphonsus School	NTNC	A	Ground Water
Tara Valley Water Association	C	A	Ground Water
Timber Ridge Estates	C	A	Ground Water
Troy Municipal Water	C	A	Ground Water
Westmier Subdivision	C	A	Ground Water
Winfield Municipal Water	C	A	Ground Water Pump
Cedar Ridge Estates	C	I	Ground Water
Charwood Estates	C	I	Ground Water
Chubby's Restaurant	C	I	Ground Water
Family Child Care Center	NTNC	I	Ground Water
Immaculate Conception School	NTNC	I	Ground Water
Knights of Columbus, Troy	NC	I	Ground Water
Lincoln County Egg Farm	NTNC	I	Ground Water
Lock and Dam No. 25	NTNC	I	Ground Water
Silex Assembly of God	NTNC	I	Ground Water
Skyway Farm	NC	I	Ground Water
Snow Hill Meadows	C	I	Ground Water
Sun Valley Golf Course	NC	I	Ground Water
VFW Post No. 8828	NC	I	Ground Water
Deer Valley Subdivision	C	P	Ground Water

Source: DNR, Drinking Water Watch

Legend

C - Community- Serves at least 15 service connections used by year-round residents or regularly serves 25 year-round residents.

NTNC - Non-Transient / Non-Community- Serves at least the same 25 non-residential individuals during 6 months of the year.

NC - Transient Community - Regularly serves at least 25 non-residential individuals (transient) during 60 or more days per year.

Previous Occurrences

According to the National Drought Mitigation Center's Drought Reporter, there have been five drought impacts to Lincoln County between January 2006 and May 2016. All of these impacts were centered around the drought of 2012 that lasted from July through October. There were five USDA declared drought disasters in Lincoln County; two in 2005, two in 2006 and one in 2012. There was no loss of life.

Probability of Future Occurrence

If the five drought impacts and the five declared disasters listed above are extrapolated over a 20-year span a probability of drought impact would be one impact every 2 years. However, most of the impacts listed by the Drought Reporter could not be quantified. We must go back to 2005, 2006, and 2012 to find declared drought disasters. So, if we use the same 20-year period of performance marked by five declared drought events, we would have a probability of a declared drought every four years, or, a 25% chance each year.

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

Vulnerability

Lincoln County is vulnerable to drought with a 25% likelihood of drought in any given year. As ground water levels continue to deplete, the severity of drought increases. In addition to the effect drought has on agriculture, livestock, residential and industrial use, prolonged drought can also contribute to wildfires.

Past Drought Losses in Lincoln County

The table below shows insurance claims paid for crop losses back to 1998 attributable to drought.

Table 3.19. Crop Exposure Due to Drought Damage; 1998 - 2012

Impact	Exposure
Total Crop Insurance Paid for Drought Damage 1998-2012	$18,973,799
Annualized Crop Insurance Claims for Drought Damage	$ 1,264,920
Crop Exposure (2007 Census of Agriculture)	$39,235,000

Source: 2013 Missouri State Hazard Mitigation Plan

Potential Drought Losses in Lincoln County

Determining the direct and indirect costs associated with drought is difficult because of the broad impacts of drought and the difficulty of determining when droughts begin and end. Using the USDA Risk Management Agency's crop insurance claims paid as a result of drought conditions from 1998 to 2012 produces an annualized crop insurance pay-out of $1,355,271. This figure is the baseline for estimating potential loss due to drought on an annual basis.

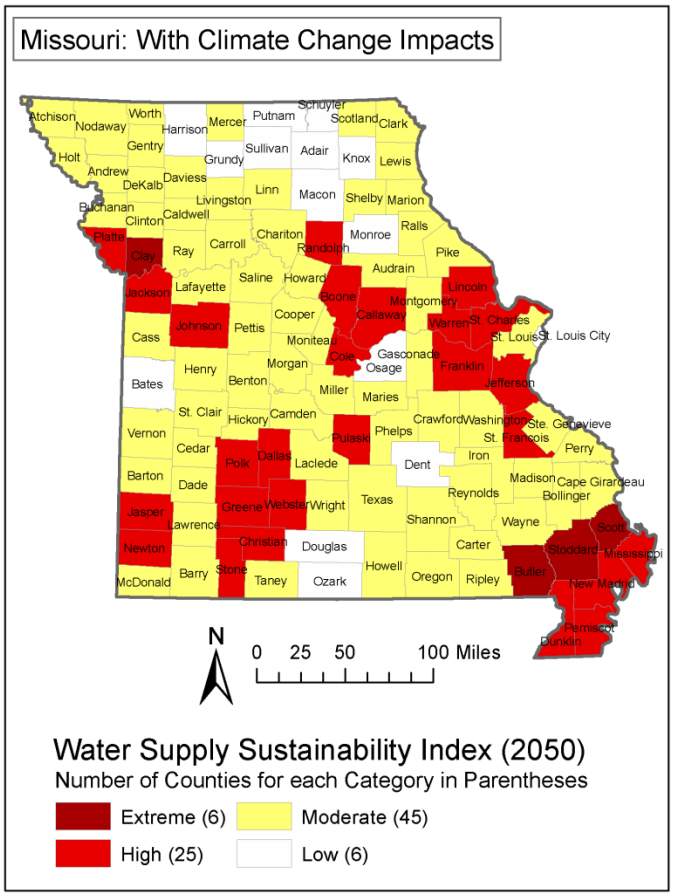
Impact of Future Development

Although Lincoln County experienced a small, 4.5% increase in farm acreage between 2000 and 2010, it is reasonable that over time Lincoln County will see a reduction in agricultural acreage with the land use shifting toward residential and recreational areas as well as some light industrial facilities. This will mitigate crop and livestock impacts but may increase impacts to people and industries. As of this date, this are no known large scale development plans that could impact the water supply.

Impact of Climate Change

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

Figure 3.5. Missouri Water Sustainability Index (2050)



Source: Natural Resources Defense Council

Problem Statement

Lincoln County has severe drought vulnerability which is likely to become worse by mid-century. Surface water sources typically become inadequate during extended drought. Ground water sources are adequate but cannot be depended on to supply water for irrigation and unnecessary activities during times of drought, especially as ground water levels continue to lower.

3.4.3 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.

Geographic Location

While the history of the New Madrid fault line is rich and colorful and its potential for another major earthquake is well known and much studied, the threat lies far enough from Lincoln County that its effects will not be too severe. The same can be said for the Illinois Basin fault. Because the geology across Lincoln County is very similar there is no reason to believe any portion of the county will be more or less susceptible to earthquakes.

Severity/Magnitude/Extent

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

Richter Magnitude Scale

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

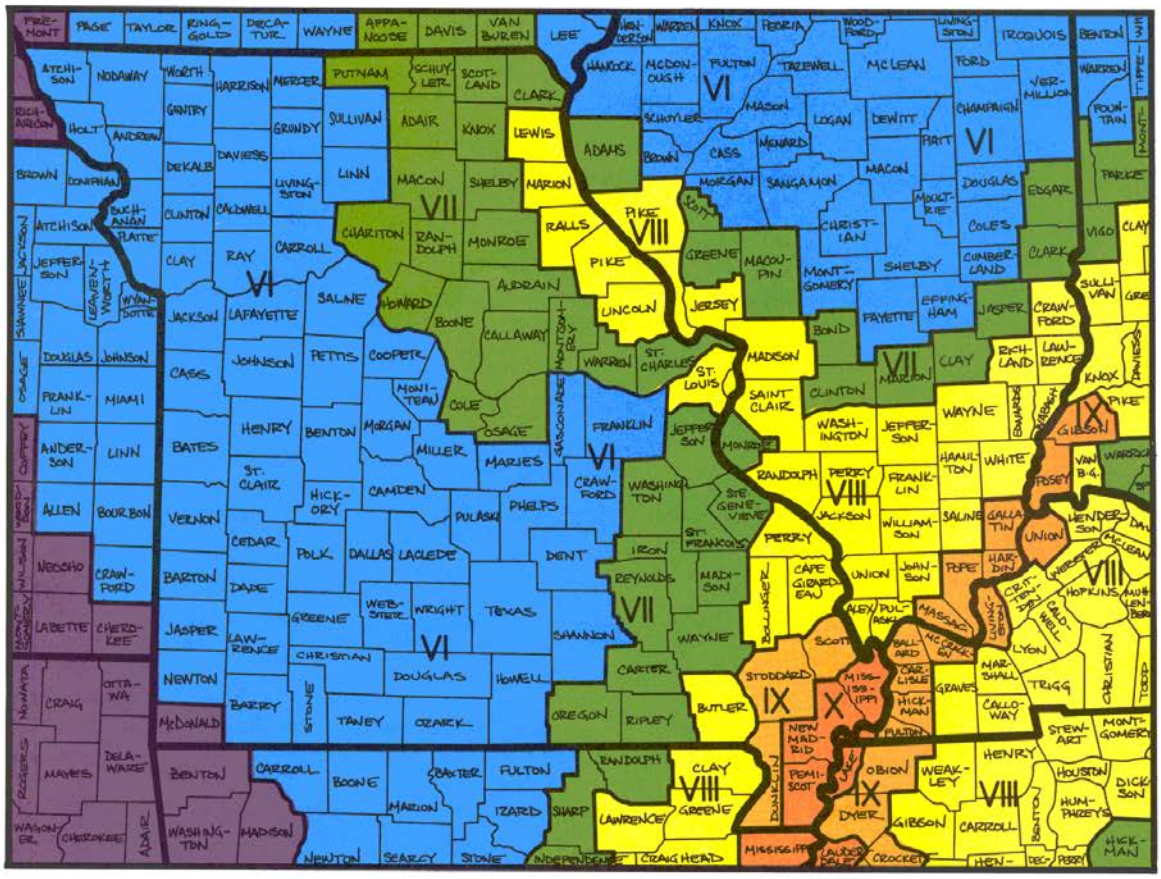
Modified Mercalli Intensity Scale

The intensity of an earthquake is measured by the effect of the earthquake on the earth's surface. The intensity scale is based on the responses to the quake, such as people awakening, movement of furniture, damage to chimneys, etc. The intensity scale currently used in the United States is the Modified Mercalli (MM) Intensity Scale. It was developed in 1931and 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.

The figure below shows the highest projected Modified Mercalli intensities for Missouri by county from a potential magnitude 7.6 earthquake whose epicenter could be anywhere along the length of the New Madrid Seismic Zone. Lincoln County falls into category VII wherein damage is negligible in structures of good design and construction and slight to moderate in well-built ordinary structures. However, considerable damage could be suffered by poorly-built buildings or badly designed structures. Some chimneys may be damaged and people will have difficulty standing.

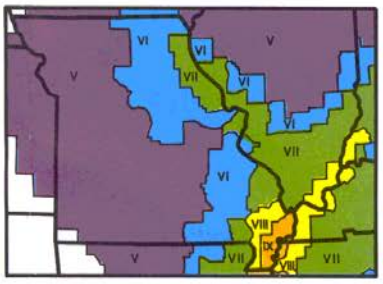
Figure 3.6. Impact Zones for Earthquake Along the New Madrid Fault

PROJECTED EARTHQUAKE INTENSITIES



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

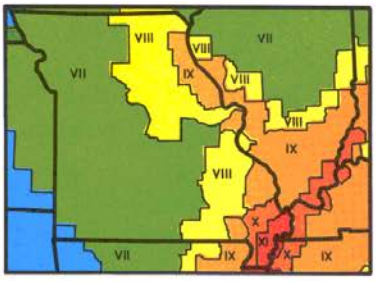
6.7



7.6

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.

8.6



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

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

Figure 3.7. Modified Mercalli Intensity Scale

MODIFIED MERCALLI INTENSITY SCALE

I People do not feel any Earth movement.

II A few people might notice movement.

III Many people indoors feel movement. Hanging objects swing.

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

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

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

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

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

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

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

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

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

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

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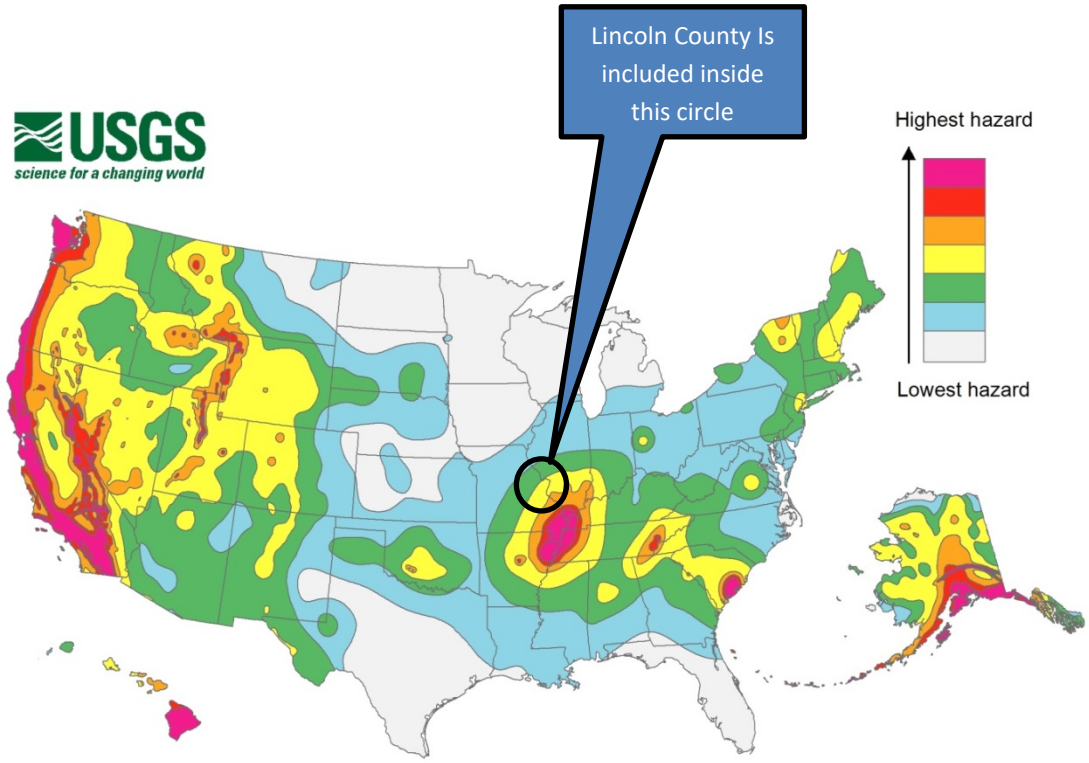
The figure below illustrates seismicity in the United States. The Lincoln County planning area is enclosed in the lower right-hand side of the circle annotated below. As shown by the previous figure, the green area represents category VII on the Modified Mercalli Intensity Scale which encompasses all of Lincoln County.

Figure 3.8. United States Seismic Hazard Map



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

Previous Occurrences

Two earthquake zones -- the New Madrid Seismic Zone and the South Central Illinois Seismic Zone -- could affect Lincoln County because of their close proximity and underlying geological strata. Of these, the New Madrid poses the greatest threat. During the winter of 1811-1812 three earthquakes estimated to have been magnitude 7.5 or greater were centered in the New Madrid fault in southeast Missouri. Thousands of aftershocks continued for years.

Significant earthquakes, each about magnitude 6, occurred in 1843 near Marked Tree, Arkansas, and on October 31, 1895 near Charleston, Missouri. In November 1968 a magnitude 5.5 earthquake centered in southeastern Illinois caused moderate damage to chimneys and walls at Hermann, St. Charles, St. Louis, and Sikeston, Missouri. The felt areas include all or portions of 23 states. Other earthquakes have occurred throughout southeastern parts of Missouri. Smaller, but still destructive, earthquakes are even more likely, according to the Missouri Seismic Safety Commission.

According to Homefacts.com there has been just one earthquake registered within 30 miles of Troy since 1931 when recordkeeping began.

Probability of Future Occurrence

There have been no earthquakes recorded in Lincoln County for 85 years thereby the probability of an earthquake occurring in Lincoln County as zero in any given year. Homefacts.com calculates the probability of a magnitude 5.0 or greater earthquake within the next 50 years at .74%

Impact of Future Development

Future development is not likely to increase the risk of earthquakes but it will contribute to additional exposure in the event of an earthquake.

Vulnerability

Potential Losses to Existing Development

The following earthquake loss data for Lincoln County was taken from the 2013 Missouri State Hazard Mitigation Plan. The first table shows loss for the entire county and the subsequent table reflects the effects of an earthquake that affects just 2% of the county.

Table 3.20. Earthquake Loss Summary for All Areas of Lincoln County Affected

Building Loss	$ 333,000
Income Loss	$ 79,000
Total Economic Loss to Buildings	$ 412,000

Source: 2013 Missouri State Hazard Mitigation Plan

Table 3.21. Earthquake Loss Summary for 2% of Areas of Lincoln County Affected

Structural Damage	$ 44,630
Non-Structural Damage	$ 132,924
Contents Damage and Inventory Loss	$ 45,359
Income Loss	$ 50,319
Total Economic Loss to Buildings	$ 273,227

Source: 2013 Missouri State Hazard Mitigation Plan

3.4.4 Extreme Heat

Hazard Profile

Extreme temperature events, both hot and cold, can impact human health and mortality, natural ecosystems, agriculture and other economic sectors. This section profiles extreme heat. Extreme cold events are profiled later in this section. 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.

In addition, the NWS recently has devised a method to warn of advancing heat waves up to seven days in advance. The new Mean Heat Index is a measure of how hot the temperatures actually feel to a person over the course of a full 24 hours. It differs from the traditional Heat Index in that it is an average of the Heat Index from the hottest and coldest times of each day. Figure below shows the NWS Heat index scale. To find the Heat Index from the table, see the relative humidity along the left side of the table and the air temperature along the top. Where the two intersect is the Heat Index for any given time of day. The Heat Index Chart shown below uses both of these factors to produce a guide for the apparent temperature or relative intensity of heat conditions.

Figure 3.9. Heat Index (HI) Chart

Temperature (°F)

Relative Humidity (%)	80	82	84	86	88	90	92	94	96	98	100	102	104	106	108	110
40	80	81	83	85	88	91	94	97	101	105	109	114	119	124	130	136
45	80	82	84	87	89	93	96	100	104	109	114	119	124	130	137	
50	81	83	85	88	91	95	99	103	108	113	118	124	131	137		
55	81	84	86	89	93	97	101	106	112	117	124	130	137			
60	82	84	88	91	95	100	105	110	116	123	129	137				
65	82	85	89	93	98	103	108	114	121	128	136					
70	83	86	90	95	100	105	112	119	126	134						
75	84	88	92	97	103	109	116	124	132							
80	84	89	94	100	106	113	121	129								
85	85	90	96	102	110	117	126	135								
90	86	91	98	105	113	122	131									
95	86	93	100	108	117	127										
100	87	95	103	112	121	132										

Likelihood of Heat Disorders with Prolonged Exposure or Strenuous Activity

Caution | Extreme Caution | Danger | Extreme Danger

Source: National Weather Service (NWS)

Note: Exposure to direct sun can increase Heat Index values by as much as15°F. The shaded zone above 105°F corresponds to a Heat Index that may cause increasingly severe heat disorders with continued exposure and / or physical activity.

Geographic Location

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

Severity/Magnitude/Extent

Extreme heat can cause stress to crops and animals. In addition, extreme heat can strain electricity delivery infrastructure 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. The table below illustrates how extreme heat can impact a person's health.

Table 3.22. Typical Health Impacts of Extreme Heat

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

Source:NationalWeatherServiceHeatIndexProgram,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

The following table is a summary of extreme heat events listed for Lincoln County and taken from the National Climatic Data Center (NCDC) database for events back to August 5, 2007. Extreme heat

events listed prior to August 2007 were taken from the Lincoln County 2012 HMP. The early data appears to cover the entire St. Louis region, whereas the new data appears to be just for Lincoln County. This is apparent as the new data shows just 1 death and 23 injuries due to heat, whereas the older data records many more fatalities and injuries. Regardless, there were 32 heat events recorded in Lincoln County during the past 22 years resulting in at least 1 death in the county and at least 23 injuries. Limitations are due to how the data is collected and aggregated and are complicated by Lincoln County's inclusion in the St. Louis Metropolitan Statistical Index. State data is included below the chart for a more generalized look at the effects of extreme heat.

Table 3.23. Heat Wave Summary Across Lincoln County (June 1994 – April 2016)

Date	Heat Index	Deaths	Injuries	Property Damage
6/12/1994	100+	4	55	$ -
7/17/1995	120	20	225	$75,000
7/28/1995	NA	0	120	$15,000
8/1/1995	110-120	9	230	$ -
7/18/1998	110	0	1	$ -
7/31/1999	105-115	0	3	$ -
8/28/2000	105-110	0	7	$ -
9/1/2000	105-110	0	3	$ -
7/7/2001	105-110	0	0	$ -
7/17/2001	110-115	0	0	$ -
7/29/2001	110-115	0	0	$ -
8/1/2001	105	0	0	$ -
7/29/2001	105-110	0	4	$ -
8/1/2001	105	0	0	$ -
8/7/2001	102-110	0	0	$ -
8/21/2001	105-110	0	4	$ -
7/8/2002	105-110	0	0	$ -
7/20/2002	105-115	0	0	$ -
7/26/2002	105-115	0	1	$ -
8/1/2002	N/A	0	1	$ -

Date	Heat Index	Deaths	Injuries	Property Damage
7/1/2003	N/A	0	0	$ -
8/15/2003	105	0	0	$ -
8/24/2003	105-110	0	0	$ -
7/20/2005	105-120	1	0	$ -
7/17/2006	105-110	0	0	$ -
7/29/2006	105-110	0	0	$ -
8/1/2006	NA	0	0	$ -
7/1/2011	105	0	0	$ -
7/10/2011	105-110	0	0	$ -
8/6/2011	105-107	0	0	$ -
8/31/2011	105	0	0	$ -
9/1/2011	105	0	0	$ -

Source: National Climatic Data Center

According to the 2013 State HMP, DHSS initiated statewide hyperthermia death surveillance in 1980 in response to a summer heat wave that resulted in the death of 295 individuals. The program defines hyperthermia as physician-diagnosed heat exhaustion, heat stroke, or hot weather/natural environment as a contributing factor in a death. In 2005 and 2006, 25 Missourians died each year from heat-related illnesses. Missouri's heat-related deaths are primarily in the urban, more densely populated areas of St. Louis City, St. Louis County, and Jackson County (Kansas City) (Missouri DHSS, 2013). There was one death in Lincoln County in 2005.

In August 2007, Missouri experienced a heat wave that lasted approximately 21 days and resulted in 34 hyperthermia deaths. The heat wave started August 2 with a heat index of 101 in Cape Girardeau and spread across the State. By August 7, the five cities that DHSS receives daily heat data on from the National Weather Service were experiencing heat indices of 103 or higher. The heat index remained in the upper 90s or higher in at least one of the five areas until August 25.

Public and private emergency response plans were implemented across the State. These responses included opening cooling centers, distributing ice, water, and people checking door-to-door for persons in danger from the heat. Without this quick and intensive response, public health officials believe mortality from the August 2007 heat wave would have been much greater. Fortunately, hot weather during the summer of 2008 was much more sporadic and less prolonged, resulting in 10 deaths statewide.

In 2012, an intense heat wave plagued the Midwest, setting record maximum temperatures in both St. Louis and Columbia in Missouri. The heat wave began at the end of June and extended past the July 4th holiday, occurring during a drought that ranged in severity from moderate to severe. In the St. Louis metropolitan area, 18 heat-related deaths occurred in total (NWS, 2012).

According to the USDA Risk Management Agency, insured crop losses throughout the State of Missouri as a result of excessive heat for the eleven year period of 1998 – 2008 totaled $13,751,457. Excessive heat ranked 6th in the State for insured crop losses. From 2000 to 2010, drought and heat were the source of about 31% of the crop losses in Missouri by indemnity payments (Milhollin, 2012). Also, hot winds in Missouri totaled $885,893 in insured crop losses from the same timeframe.

Probability of Future Occurrence

Regardless of data limitations regarding loss of life, injury, and property loss; the number of heat related events is accurate with 32 events spanning 22 years. Extrapolating this data shows an average of 1.5 heat events per year.

Vulnerability

Potential Losses to Existing Development

As Lincoln County becomes more urban and agricultural related activities diminish the effects of extreme heat reduces for crops and livestock while it increases for personnel.

Impact of Future Development

Population growth can result in increases in the age-groups that are most vulnerable to extreme heat. Population growth also increases the strain on electricity infrastructure and water sources, as more electricity and water are needed to accommodate the growing population.

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

Table 3.24. County Population Under Age 5 and Over Age 65, 2010 Census Data

Jurisdiction	% Under Age 5	Population 5 and Under	% 65 and Older	Population 65 and Older
Lincoln County	6.8%	3,643	11.6%	6,203
Chain of Rocks	9.4%	12	4.7%	6
Elsberry	6.3%	116	19.4%	358

Jurisdiction	% Under Age 5	Population 5 and Under	% 65 and Older	Population 65 and Older
Foley	1.9%	2	9.3%	10
Fountain N Lakes	9.9%	30	9.3%	28
Hawk Point	12.6%	92	8.2%	60
Moscow Mills	12.8%	320	6.4%	160
Old Monroe	5.6%	15	9.7%	26
Silex	1.2%	1	19.0%	16
Troy	9.0%	986	12.3%	1,360
Truxton	2.9%	2	8.8%	6
Winfield	7.1%	122	10.0%	172
Whiteside	0.0%	-	29.3%	22

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

Problem Statement

All areas of Lincoln County are at equal risk to the hazards of extreme heat; however, those areas with larger numbers of elderly among the population may be more vulnerable. Nursing homes are scattered throughout Lincoln County and there are various retirement communities as well with residents over the age of 65.

3.4.5 Flooding

Hazard Profile

Hazard Description

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

Flooding caused by dam failure is discussed in a previous section and will not be addressed here.

A flash flood occurs when water levels rise at an extremely fast rate as a result of intense rain fall over a brief period, sometimes combined with rapid snow melt, 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. Flashflood waters move at very fast speeds and can move boulders, tear out trees, scour channels, destroy buildings, and obliterate bridges. Flash flooding can result in higher loss of life, both human and animal, than slower developing river and stream flooding.

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

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

Geographic Location

Flash flooding can occur in any low lying area of Lincoln County which is adjacent to rivers and creeks during periods of heavy rain when ground is saturated. Many rural roads within the county are dependent upon low water crossings which are not navigable during periods of high water. There are 37 low water crossings in Lincoln County any one of which can be inundated anytime three or more inches of rain falls within a short interval and ground is saturated. During times of flash flooding, these low water crossings can present a risk to life and property if an attempt to cross is made.

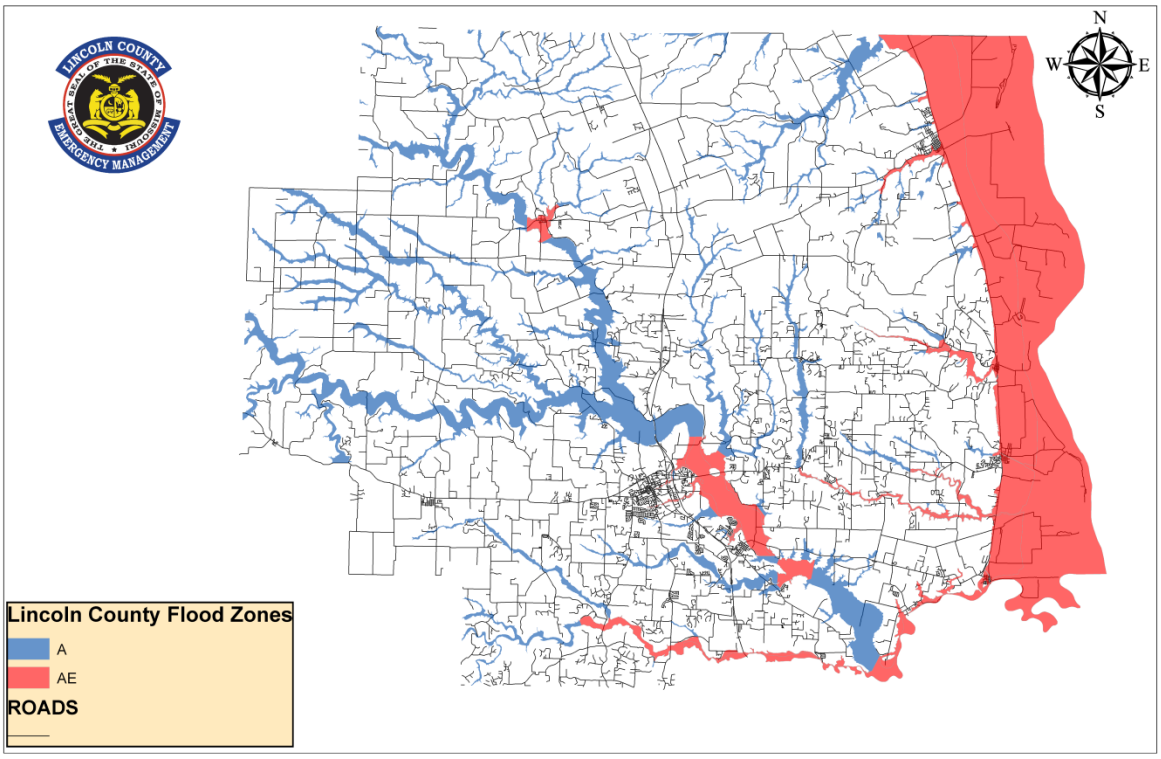
Lincoln County faces two major risk factors for flooding; the Mississippi River and Cuivre River basins. The Mississippi River basin drains the eastern third of the county. The river's floodplain, 3-4 miles wide, runs the length of the county's eastern border. The communities of Elsberry, Foley, Winfield, and Old Monroe line the edge of the floodplain along Missouri Highway 79. The Cuivre River basin drains the rest of the county.

Several individual communities are situated near streams or rivers. The Cuivre River, narrow and flashy, runs south and west of Silex and east of Moscow Mills. Both Chain of Rocks and Old Monroe lie next to the river. Town Branch and Buchanan Creek run through Troy. Bobs Creek and McLean Creek drain into the Mississippi at Winfield. Whiteside lies beside a tributary of Sandy Creek, which also runs west and north around Foley to reach the Mississippi. Lost Creek runs through southern Elsberry while the Old Kings Lake Creek runs north to south through the middle of the Mississippi floodplain.

Secondly, drainage is a major factor due to the predominately clay soils, which cover the rest of the county. With no place to go, the water will find the lowest elevations; often areas 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. Combined with flooding due to overwhelmed storm and sanitary sewers, tremendous flows of water often accompany storm events in these developed areas. Typically, the water backs into basements, damages mechanical systems and can create serious public health and safety concerns.

The figure below illustrates a 100-year flood zone map of Lincoln County. See Appendix D for alphabetized FIRM maps of each participating Lincoln County community.

Figure 3.10. Lincoln County Flood Map



According to NCDC there were 14 flood events in Lincoln County between January 1, 2000 and June 30, 2016. Flood events are typically associated with the Mississippi River. The following table shows these events.

Table 3.25. Lincoln County NCDC Flood Event Locations, January 2000 – June 2016

Date	Type	Location	Deaths	Injury	Property Damage	Crop Damage
6/20/2000	Flood	All Lincoln County	0	0	$ -	$ -
4/16/2001	Flood	All Lincoln County	0	0	$ -	$ -
5/01/2001	Flood	All Lincoln County	0	0	$ -	$ -
4/28/2002	Flood	All Lincoln County	0	0	$ -	$ -
5/1/2002	Flood	All Lincoln County	0	0	$ -	$ -
5/6/2002	Flood	All Lincoln County	0	0	$ -	$ -
8/27/2007	Flood	Winfield	0	0	$ -	$ -
6/4/2008	Flood	Dameron	0	0	$ 1,600,000	$ -
7/16/2008	Flood	Elsberry	0	0	$ -	$ -
6/14/2010	Flood	Dameron	0	0	$ -	$ -
4/16/2013	Flood	Dameron	0	0	$50,000	$15,000
6/1/2013	Flood	Dameron	0	0	$3,000	$ -
12/27/2015	Flood	Truxton	0	0	$240,000	$ -
1/1/2016	Flood	Truxton	0	0	$ -	$ -

Source: National Climatic Data Center

According to NCDC there were 26 flash flood events in Lincoln County between January 1, 1994 and June 30, 2016. The following table shows these events.

Table 3.26. Lincoln County NCDC Flash Flood Event Locations, January 2000 – June 2016

Date	Type	Location	Deaths	Injury	Property Damage	Crop Damage
6/24/2000	Flash Flood	All Lincoln County	0	0	$ -	$ -
5/7/2002	Flash Flood	All Lincoln County	0	0	$ -	$ -
5/12/2002	Flash Flood	All Lincoln County	0	0	$ -	$ -
5/10/2003	Flash Flood	Southern Lincoln County	0	0	$ -	$ -
6/25/2003	Flash Flood	Eastern Lincoln County	0	0	$ -	$ -
7/18/2003	Flash Flood	All Lincoln County	0	0	$ -	$ -
6/18/2008	Flash Flood	Cap Au Gris	0	0	$ 75,000	$ -
6/19/2008	Flash Flood	Apex	0	0	$ 500,000	$ -
6/27/2008	Flash Flood	Cap Au Gris	0	0	$ 500,000	$ -
7/27/2008	Flash Flood	Troy	0	0	$ -	$ -
9/14/2008	Flash Flood	Louisville	0	0	$ -	$ -
6/10/2009	Flash Flood	Old Monroe	0	0	$ -	$ -
10/8/2009	Flash Flood	Elsberry	0	0	$ -	$ -
10/29/2009	Flash Flood	Old Monroe	0	0	$ -	$ -
7/20/2010	Flash Flood	Elsberry	0	0	$ -	$ -
8/12/2010	Flash Flood	Troy	0	0	$ -	$ -
6/26/2011	Flash Flood	Millwood	0	0	$ -	$ -
7/3/2011	Flash Flood	Troy	0	0	$ -	$ -
5/20/2013	Flash Flood	Chain of Rocks	0	0	$ -	$ -
9/2/2014	Flash Flood	Troy	0	0	$ -	$ -
10/2/2014	Flash Flood	Davis	0	0	$ -	$ -
6/18/2015	Flash Flood	Louisville	0	0	$ -	$ -
6/21/2015	Flash Flood	Elsberry	0	0	$ -	$ -

Date	Type	Location	Deaths	Injury	Property Damage	Crop Damage
6/25/2015	Flash Flood	Louisville	0	0	$ -	$ -
12/26/2015	Flash Flood	Elsberry	0	0	$ -	$ -
12/28/2015	Flash Flood	Elsberry	0	0	$ -	$ -

Source: National Climatic Data Center

Severity/Magnitude/Extent

Missouri has a long and active history of flooding over the past century, according to the 2013 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 community's 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; even though Lincoln County has not suffered any deaths during the years 2011-2012.

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

Public health concerns may result from flooding, requiring disease and injury surveillance. Community sanitation to evaluate flood-affected food supplies may also be necessary. Private water and sewage sanitation could be impacted, and vector control (for mosquitoes and other entomology concerns) may be necessary. The Lincoln County Health Department received a grant from SEMA in 2015 for vector control directly related to June 2015 flooding.

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

Lincoln County and seven of its communities participate in the National Flood Insurance Program as shown in the table below. The second table below shows the NFIP Policy and Claim Statistics for Lincoln County and its communities.

Table 3.27. NFIP Participation in Lincoln County

Community ID Number	Community Name	NFIP Participant (Y / N)	Current Effective Map Date	Regular-Emergency Program Entry Date
290750	Village of Chain of Rocks	Y	9/29/2010	8/9/2011
290209	City of Elsberry	Y	9/29/2010	5/2/1977
290210	City of Foley	Y	9/29/2010	3/1/1978
290869	Lincoln County	Y	9/29/2010	3/15/1984
290211	City of Old Monroe	Y	9/29/2010	8/15/1978
290546	City of Moscow Mills	Y	9/29/2010	6/26/2006
290212	Village of Silex	Y	9/29/2010	9/16/1982
290641	City of Troy	Y	9/29/2010	5/5/1981
290213	City of Winfield	Y	9/29/2010	11/17/1982

Source: NFIP Community Status Book, 9/26/2013;http://www.fema.gov/national-flood-insurance-program/national-flood-insurance-program-community-status-book;

Table 3.28. NFIP Policy and Claim Statistics as of May 31, 2016

Community	Policies in Force	Insurance in Force	Closed Losses	Total Payments
Chain of Rocks	1	$ 32,000	2	$ 94,774
Elsberry	20	$ 1,657,000	48	$ 466,253
Foley	29	$ 1,801,300	163	$ 2,415,285
Incorporated County	216	$ 26,441,300	1505	$ 23,526,988
Moscow Mills	10	$ 868,000	NA	NA
Old Monroe	55	$ 6,934,600	99	$ 993,799
Silex	8	$ 388,900	64	$ 1,584,376
Troy	17	$ 3,141,500	8	$ 113,219
Winfield	31	$ 2,740,000	145	$ 3,034,002

Source: NFIP Community Status Book, 5/31/2016; 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 1/1/1978 to 3/31/2016.

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 the planning area have a combined total of 250 repetitive loss properties dating back through 1982.

As of February 29, 2016, all properties have been mitigated, leaving no un-mitigated repetitive loss properties. The table below is a summary of Lincoln County Repetitive Loss Properties. There are 43 Severe Repetitive Loss Properties in the planning area. There are 5 in Foley, 6 in Old Monroe, 1 in Winfield and 1 in Silex. The remaining 30 are in unincorporated portions of the county.

Table 3.29. Lincoln County Repetitive Loss Properties

Jurisdiction	# Properties	Type of Property	# Mitigated	Building Payments	Content Payments	Total Payments	Ave Payments	# Losses
ELSBERRY	1	Residential	2	$31,877.75	$6,503.93	$38,381.68	$19,190.84	2
ELSBERRY	1	Residential	2	$29,021.57	$3,400.00	$32,421.57	$16,210.79	2
ELSBERRY	1	Residential	3	$3,367.29	$423.50	$3,790.79	$1,263.60	3
ELSBERRY	1	Residential	9	$39,990.11	$8,691.52	$48,681.63	$5,409.07	9
ELSBERRY	1	Residential	3	$23,578.14	$12,224.58	$35,802.72	$11,934.24	3
ELSBERRY	1	Residential	5	$63,080.93	$3,674.80	$66,755.73	$13,351.15	5
ELSBERRY	1	Residential	2	$2,884.49	$247.50	$3,131.99	$1,566.00	2
ELSBERRY	1	Residential	2	$14,319.16	$5,545.72	$19,864.88	$9,932.44	2
ELSBERRY	1	Residential	4	$46,996.90	$14,266.07	$61,262.97	$15,315.74	4
ELSBERRY	1	Residential	2	$23,772.21	$8,652.40	$32,424.61	$16,212.31	2
ELSBERRY	1	Residential	7	$36,080.77	$229.00	$36,309.77	$5,187.11	7
ELSBERRY	1	Residential	3	$29,207.65	$0.00	$29,207.65	$9,735.88	3
ELSBERRY	1	Residential	2	$16,477.73	$4,798.75	$21,276.48	$10,638.24	2
ELSBERRY	1	Residential	2	$2,610.38	$1,000.00	$3,610.38	$1,805.19	2
ELSBERRY	1	Residential	3	$60,646.60	$17,126.33	$77,772.93	$25,924.31	3
ELSBERRY	1	Residential	2	$27,375.55	$2,809.84	$30,185.39	$15,092.70	2
FOLEY	1	Residential	2	$20,000.00	$22,286.60	$42,286.60	$21,143.30	2
FOLEY	1	Residential	2	$30,164.89	$5,200.00	$35,364.89	$17,682.45	2
FOLEY	1	Residential	4	$31,946.83	$15,617.98	$47,564.81	$11,891.20	4
FOLEY	1	Residential	2	$14,843.14	$3,714.70	$18,557.84	$9,278.92	2
FOLEY	1	Non-Resid	4	$79,137.50	$7,713.28	$86,850.78	$21,712.70	4
FOLEY	1	Residential	2	$22,110.12	$0.00	$22,110.12	$11,055.06	2
FOLEY	1	Residential	2	$11,809.17	$5,282.70	$17,091.87	$8,545.94	2
FOLEY	1	Residential	4	$112,629.90	$16,626.25	$129,256.15	$32,314.04	4
FOLEY	1	Residential	3	$5,547.88	$1,676.55	$7,224.43	$2,408.14	3
FOLEY	1	Residential	2	$13,260.95	$12,600.00	$25,860.95	$12,930.48	2
FOLEY	1	Non-Resid	2	$16,104.57	$2,100.00	$18,204.57	$9,102.29	2
FOLEY	1	Residential	2	$4,238.88	$0.00	$4,238.88	$2,119.44	2
FOLEY	1	Non-Resid	4	$36,201.33	$26,038.64	$62,239.97	$15,559.99	4
FOLEY	1	Non-Resid	2	$7,787.66	$21,516.00	$29,303.66	$14,651.83	2
FOLEY	1	Residential	6	$47,576.22	$15,890.63	$63,466.85	$10,577.81	6
FOLEY	1	Residential	3	$26,047.06	$615.00	$26,662.06	$8,887.35	3
FOLEY	1	Residential	4	$51,625.40	$0.00	$51,625.40	$12,906.35	4

Jurisdiction	# Properties	Type of Property	# Mitigated	Building Payments	Content Payments	Total Payments	Ave Payments	# Losses
FOLEY	1	Residential	2	$9,921.42	$12,417.32	$22,338.74	$11,169.37	2
FOLEY	1	Residential	4	$26,557.37	$460.00	$27,017.37	$6,754.34	4
FOLEY	1	Residential	4	$17,036.38	$1,447.85	$18,484.23	$4,621.06	4
FOLEY	1	Non-Resid	2	$9,543.69	$7,479.57	$17,023.26	$8,511.63	2
FOLEY	1	Residential	2	$7,734.80	$126.78	$7,861.58	$3,930.79	2
FOLEY	1	Residential	4	$44,589.35	$7,700.87	$52,290.22	$13,072.56	4
FOLEY	1	Residential	2	$39,602.74	$0.00	$39,602.74	$19,801.37	2
FOLEY	1	Residential	2	$6,653.43	$9,800.00	$16,453.43	$8,226.72	2
LINCOLN COUNTY	1	Residential	2	$17,800.74	$0.00	$17,800.74	$8,900.37	2
LINCOLN COUNTY	1	Residential	2	$17,605.90	$4,000.00	$21,605.90	$10,802.95	2
LINCOLN COUNTY	1	Residential	4	$71,644.90	$14,924.30	$86,569.20	$21,642.30	4
LINCOLN COUNTY	1	Residential	3	$22,012.41	$2,200.00	$24,212.41	$8,070.80	3
LINCOLN COUNTY	1	Residential	2	$39,287.24	$25,000.00	$64,287.24	$32,143.62	2
LINCOLN COUNTY	1	Residential	3	$26,595.66	$4,638.60	$31,234.26	$10,411.42	3
LINCOLN COUNTY	1	Residential	2	$66,183.86	$14,800.00	$80,983.86	$40,491.93	2
LINCOLN COUNTY	1	Residential	4	$22,672.45	$9,870.97	$32,543.42	$8,135.86	4
LINCOLN COUNTY	1	Residential	4	$36,394.63	$8,714.70	$45,109.33	$11,277.33	4
LINCOLN COUNTY	1	Residential	4	$70,276.47	$15,540.02	$85,816.49	$21,454.12	4
LINCOLN COUNTY	1	Residential	2	$12,930.35	$2,600.00	$15,530.35	$7,765.18	2
LINCOLN COUNTY	1	Residential	11	$85,401.23	$15,933.48	$101,334.71	$9,212.25	11
LINCOLN COUNTY	1	Residential	8	$46,216.28	$7,935.80	$54,152.08	$6,769.01	8
LINCOLN COUNTY	1	Residential	9	$79,911.22	$17,913.37	$97,824.59	$10,869.40	9
LINCOLN COUNTY	1	Residential	3	$83,066.77	$24,007.08	$107,073.85	$35,691.28	3
LINCOLN COUNTY	1	Residential	3	$25,752.03	$2,500.00	$28,252.03	$9,417.34	3
LINCOLN COUNTY	1	Residential	4	$18,309.30	$9,977.14	$28,286.44	$7,071.61	4
LINCOLN COUNTY	1	Residential	2	$27,711.52	$2,590.00	$30,301.52	$15,150.76	2
LINCOLN COUNTY	1	Residential	11	$46,620.25	$27,582.47	$74,202.72	$6,745.70	11
LINCOLN COUNTY	1	Residential	13	$262,630.76	$57,556.14	$320,186.90	$24,629.76	13
LINCOLN COUNTY	1	Residential	5	$87,015.08	$8,700.00	$95,715.08	$19,143.02	5
LINCOLN COUNTY	1	Residential	3	$25,983.94	$2,200.00	$28,183.94	$9,394.65	3
LINCOLN COUNTY	1	Residential	4	$39,010.06	$12,998.91	$52,008.97	$13,002.24	4
LINCOLN COUNTY	1	Residential	3	$38,860.15	$0.00	$38,860.15	$12,953.38	3
LINCOLN COUNTY	1	Residential	3	$36,276.22	$13,685.09	$49,961.31	$16,653.77	3
LINCOLN COUNTY	1	Residential	2	$23,279.90	$5,000.00	$28,279.90	$14,139.95	2
LINCOLN COUNTY	1	Residential	3	$24,442.45	$1,399.84	$25,842.29	$8,614.10	3
LINCOLN COUNTY	1	Residential	4	$15,143.37	$2,300.00	$17,443.37	$4,360.84	4
LINCOLN COUNTY	1	Residential	2	$13,572.93	$1,254.95	$14,827.88	$7,413.94	2
LINCOLN COUNTY	1	Residential	2	$9,677.77	$1,136.39	$10,814.16	$5,407.08	2
LINCOLN COUNTY	1	Residential	3	$48,695.34	$15,607.29	$64,302.63	$21,434.21	3
LINCOLN COUNTY	1	Residential	27	$154,360.04	$16,713.88	$171,073.92	$6,336.07	27

Jurisdiction	# Properties	Type of Property	# Mitigated	Building Payments	Content Payments	Total Payments	Ave Payments	# Losses
LINCOLN COUNTY	1	Residential	5	$53,834.59	$10,398.34	$64,232.93	$12,846.59	5
LINCOLN COUNTY	1	Residential	5	$53,250.78	$20,045.99	$73,296.77	$14,659.35	5
LINCOLN COUNTY	1	Residential	7	$14,143.65	$10,583.74	$24,727.39	$3,532.48	7
LINCOLN COUNTY	1	Residential	9	$48,871.98	$21,298.79	$70,170.77	$7,796.75	9
LINCOLN COUNTY	1	Residential	2	$6,757.51	$568.92	$7,326.43	$3,663.22	2
LINCOLN COUNTY	1	Residential	2	$5,611.59	$1,878.88	$7,490.47	$3,745.24	2
LINCOLN COUNTY	1	Residential	11	$86,390.45	$28,527.65	$114,918.10	$10,447.10	11
LINCOLN COUNTY	1	Residential	2	$11,532.32	$4,183.87	$15,716.19	$7,858.10	2
LINCOLN COUNTY	1	Residential	2	$17,520.82	$3,900.00	$21,420.82	$10,710.41	2
LINCOLN COUNTY	1	Residential	7	$32,203.62	$8,577.92	$40,781.54	$5,825.93	7
LINCOLN COUNTY	1	Residential	4	$165,507.58	$31,903.26	$197,410.84	$49,352.71	4
LINCOLN COUNTY	1	Residential	2	$1,315.26	$1,372.65	$2,687.91	$1,343.96	2
LINCOLN COUNTY	1	Residential	3	$44,595.79	$7,000.00	$51,595.79	$17,198.60	3
LINCOLN COUNTY	1	Residential	2	$14,781.99	$2,000.00	$16,781.99	$8,391.00	2
LINCOLN COUNTY	1	Residential	5	$42,776.52	$19,777.40	$62,553.92	$12,510.78	5
LINCOLN COUNTY	1	Residential	4	$48,363.62	$8,901.51	$57,265.13	$14,316.28	4
LINCOLN COUNTY	1	Residential	4	$11,005.43	$1,250.95	$12,256.38	$3,064.10	4
LINCOLN COUNTY	1	Residential	2	$14,237.45	$3,370.94	$17,608.39	$8,804.20	2
LINCOLN COUNTY	1	Residential	4	$9,195.31	$2,924.20	$12,119.51	$3,029.88	4
LINCOLN COUNTY	1	Residential	3	$6,282.07	$2,008.00	$8,290.07	$2,763.36	3
LINCOLN COUNTY	1	Residential	4	$37,646.06	$10,729.79	$48,375.85	$12,093.96	4
LINCOLN COUNTY	1	Residential	5	$19,402.66	$1,160.69	$20,563.35	$4,112.67	5
LINCOLN COUNTY	1	Residential	5	$57,356.69	$20,537.35	$77,894.04	$15,578.81	5
LINCOLN COUNTY	1	Residential	4	$116,146.70	$29,332.42	$145,479.12	$36,369.78	4
LINCOLN COUNTY	1	Residential	8	$64,045.58	$14,559.49	$78,605.07	$9,825.63	8
LINCOLN COUNTY	1	Residential	2	$18,525.34	$6,049.00	$24,574.34	$12,287.17	2
LINCOLN COUNTY	1	Residential	2	$25,989.99	$5,448.50	$31,438.49	$15,719.25	2
LINCOLN COUNTY	1	Residential	3	$27,537.62	$4,848.60	$32,386.22	$10,795.41	3
LINCOLN COUNTY	1	Residential	4	$5,023.01	$5,664.44	$10,687.45	$2,671.86	4
LINCOLN COUNTY	1	Residential	2	$7,476.44	$645.50	$8,121.94	$4,060.97	2
LINCOLN COUNTY	1	Residential	3	$11,926.63	$9,252.18	$21,178.81	$7,059.60	3
LINCOLN COUNTY	1	Residential	5	$26,426.17	$10,805.50	$37,231.67	$7,446.33	5
LINCOLN COUNTY	1	Residential	2	$13,514.73	$1,465.00	$14,979.73	$7,489.87	2
LINCOLN COUNTY	1	Non-Resid	2	$10,000.00	$3,176.41	$13,176.41	$6,588.21	2
LINCOLN COUNTY	1	Residential	2	$1,491.09	$3,732.28	$5,223.37	$2,611.69	2
LINCOLN COUNTY	1	Residential	2	$17,202.46	$11,584.55	$28,787.01	$14,393.51	2
LINCOLN COUNTY	1	Residential	2	$10,000.00	$211.70	$10,211.70	$5,105.85	2
LINCOLN COUNTY	1	Residential	2	$6,672.65	$350.00	$7,022.65	$3,511.33	2
LINCOLN COUNTY	1	Residential	2	$9,065.43	$718.00	$9,783.43	$4,891.72	2
LINCOLN COUNTY	1	Residential	2	$9,381.42	$9,611.89	$18,993.31	$9,496.66	2

Jurisdiction	# Properties	Type of Property	# Mitigated	Building Payments	Content Payments	Total Payments	Ave Payments	# Losses
LINCOLN COUNTY	1	Residential	2	$10,090.82	$8,601.21	$18,692.03	$9,346.02	2
LINCOLN COUNTY	1	Non-Resid	2	$22,743.94	$1,656.40	$24,400.34	$12,200.17	2
LINCOLN COUNTY	1	Residential	4	$29,046.53	$11,572.89	$40,619.42	$10,154.86	4
LINCOLN COUNTY	1	Residential	4	$21,898.38	$8,031.46	$29,929.84	$7,482.46	4
LINCOLN COUNTY	1	Residential	3	$44,764.44	$8,600.00	$53,364.44	$17,788.15	3
LINCOLN COUNTY	1	Residential	2	$63,346.53	$13,380.83	$76,727.36	$38,363.68	2
LINCOLN COUNTY	1	Residential	3	$9,720.23	$0.00	$9,720.23	$3,240.08	3
LINCOLN COUNTY	1	Residential	2	$47,908.44	$11,698.51	$59,606.95	$29,803.48	2
LINCOLN COUNTY	1	Residential	2	$3,094.70	$7,129.15	$10,223.85	$5,111.93	2
LINCOLN COUNTY	1	Residential	3	$40,982.05	$11,630.20	$52,612.25	$17,537.42	3
LINCOLN COUNTY	1	Residential	2	$6,541.01	$4,916.75	$11,457.76	$5,728.88	2
LINCOLN COUNTY	1	Residential	2	$48,363.15	$16,600.00	$64,963.15	$32,481.58	2
LINCOLN COUNTY	1	Residential	3	$14,555.00	$4,625.00	$19,180.00	$6,393.33	3
LINCOLN COUNTY	1	Residential	3	$23,692.57	$4,537.55	$28,230.12	$9,410.04	3
LINCOLN COUNTY	1	Residential	3	$32,441.05	$10,000.00	$42,441.05	$14,147.02	3
LINCOLN COUNTY	1	Residential	23	$87,061.90	$515.50	$87,577.40	$3,807.71	23
LINCOLN COUNTY	1	Commercial	2	$40,187.55	$4,355.00	$44,542.55	$22,271.28	2
LINCOLN COUNTY	1	Residential	2	$13,211.32	$5,600.00	$18,811.32	$9,405.66	2
LINCOLN COUNTY	1	Residential	2	$26,815.00	$10,720.00	$37,535.00	$18,767.50	2
LINCOLN COUNTY	1	Residential	5	$35,294.39	$12,376.85	$47,671.24	$9,534.25	5
LINCOLN COUNTY	1	Residential	2	$36,894.13	$11,600.00	$48,494.13	$24,247.07	2
LINCOLN COUNTY	1	Residential	2	$33,248.63	$13,766.20	$47,014.83	$23,507.42	2
LINCOLN COUNTY	1	Commercial	2	$14,787.00	$5,000.00	$19,787.00	$9,893.50	2
LINCOLN COUNTY	1	Residential	2	$21,812.50	$4,000.00	$25,812.50	$12,906.25	2
LINCOLN COUNTY	1	Residential	2	$27,721.45	$15,210.00	$42,931.45	$21,465.73	2
LINCOLN COUNTY	1	Residential	3	$101,926.20	$20,816.16	$122,742.36	$40,914.12	3
LINCOLN COUNTY	1	Residential	3	$36,552.48	$8,750.19	$45,302.67	$15,100.89	3
LINCOLN COUNTY	1	Residential	2	$3,053.81	$1,788.67	$4,842.48	$2,421.24	2
LINCOLN COUNTY	1	Residential	3	$34,654.94	$16,427.43	$51,082.37	$17,027.46	3
LINCOLN COUNTY	1	Residential	2	$10,675.98	$2,439.00	$13,114.98	$6,557.49	2
LINCOLN COUNTY	1	Residential	3	$20,439.93	$9,094.41	$29,534.34	$9,844.78	3
LINCOLN COUNTY	1	Residential	3	$73,521.07	$9,269.85	$82,790.92	$27,596.97	3
LINCOLN COUNTY	1	Residential	3	$24,429.00	$3,982.25	$28,411.25	$9,470.42	3
LINCOLN COUNTY	1	Residential	2	$8,963.35	$0.00	$8,963.35	$4,481.68	2
LINCOLN COUNTY	1	Residential	4	$192,996.28	$60,000.00	$252,996.28	$63,249.07	4
LINCOLN COUNTY	1	Residential	2	$40,455.70	$10,322.87	$50,778.57	$25,389.29	2
LINCOLN COUNTY	1	Residential	2	$58,098.98	$13,400.00	$71,498.98	$35,749.49	2
LINCOLN COUNTY	1	Residential	2	$12,900.14	$8,924.95	$21,825.09	$10,912.55	2
LINCOLN COUNTY	1	Residential	4	$70,768.49	$4,906.31	$75,674.80	$18,918.70	4
LINCOLN COUNTY	1	Residential	4	$39,056.32	$8,900.00	$47,956.32	$11,989.08	4

Jurisdiction	# Properties	Type of Property	# Mitigated	Building Payments	Content Payments	Total Payments	Ave Payments	# Losses
LINCOLN COUNTY	1	Residential	2	$8,812.30	$1,485.00	$10,297.30	$5,148.65	2
LINCOLN COUNTY	1	Residential	2	$14,034.40	$1,000.00	$15,034.40	$7,517.20	2
LINCOLN COUNTY	1	Residential	4	$33,673.67	$10,000.00	$43,673.67	$10,918.42	4
LINCOLN COUNTY	1	Residential	3	$28,111.84	$5,000.00	$33,111.84	$11,037.28	3
LINCOLN COUNTY	1	Residential	2	$19,457.31	$3,505.36	$22,962.67	$11,481.34	2
LINCOLN COUNTY	1	Residential	5	$176,606.21	$20,500.00	$197,106.21	$39,421.24	5
LINCOLN COUNTY	1	Residential	6	$24,326.85	$5,502.10	$29,828.95	$4,971.49	6
LINCOLN COUNTY	1	Residential	5	$52,687.74	$17,472.78	$70,160.52	$14,032.10	5
LINCOLN COUNTY	1	Residential	4	$32,522.30	$11,158.65	$43,680.95	$10,920.24	4
LINCOLN COUNTY	1	Residential	3	$9,211.29	$0.00	$9,211.29	$3,070.43	3
LINCOLN COUNTY	1	Residential	10	$28,336.19	$2,576.82	$30,913.01	$3,091.30	10
LINCOLN COUNTY	1	Residential	5	$13,023.85	$0.00	$13,023.85	$2,604.77	5
LINCOLN COUNTY	1	Residential	30	$269,141.97	$53,974.82	$323,116.79	$10,770.56	30
LINCOLN COUNTY	1	Residential	3	$9,411.85	$5,333.50	$14,745.35	$4,915.12	3
LINCOLN COUNTY	1	Residential	11	$83,515.98	$15,522.19	$99,038.17	$9,003.47	11
LINCOLN COUNTY	1	Residential	2	$41,406.40	$11,810.87	$53,217.27	$26,608.64	2
LINCOLN COUNTY	1	Residential	4	$26,349.37	$4,004.91	$30,354.28	$7,588.57	4
LINCOLN COUNTY	1	Residential	2	$24,218.10	$3,700.00	$27,918.10	$13,959.05	2
LINCOLN COUNTY	1	Residential	2	$9,753.51	$2,466.86	$12,220.37	$6,110.19	2
LINCOLN COUNTY	1	Residential	2	$26,032.01	$2,200.00	$28,232.01	$14,116.01	2
LINCOLN COUNTY	1	Residential	2	$21,452.14	$5,000.00	$26,452.14	$13,226.07	2
LINCOLN COUNTY	1	Residential	8	$79,682.35	$35,476.36	$115,158.71	$14,394.84	8
LINCOLN COUNTY	1	Residential	3	$33,856.71	$14,161.33	$48,018.04	$16,006.01	3
LINCOLN COUNTY	1	Residential	3	$131,323.96	$16,100.00	$147,423.96	$49,141.32	3
LINCOLN COUNTY	1	Residential	2	$30,028.06	$0.00	$30,028.06	$15,014.03	2
LINCOLN COUNTY	1	Residential	3	$36,824.33	$15,188.60	$52,012.93	$17,337.64	3
LINCOLN COUNTY	1	Residential	2	$25,759.34	$0.00	$25,759.34	$12,879.67	2
LINCOLN COUNTY	1	Residential	2	$24,734.82	$2,366.98	$27,101.80	$13,550.90	2
LINCOLN COUNTY	1	Residential	2	$40,906.62	$3,766.71	$44,673.33	$22,336.67	2
LINCOLN COUNTY	1	Commercial	6	$103,071.51	$143,567.21	$246,638.72	$41,106.45	6
LINCOLN COUNTY	1	Residential	3	$115,082.21	$18,166.05	$133,248.26	$44,416.09	3
LINCOLN COUNTY	1	Residential	2	$35,665.62	$0.00	$35,665.62	$17,832.81	2
LINCOLN COUNTY	1	Residential	3	$101,389.03	$25,000.00	$126,389.03	$42,129.68	3
LINCOLN COUNTY	1	Residential	2	$32,597.18	$13,677.11	$46,274.29	$23,137.15	2
LINCOLN COUNTY	1	Residential	2	$25,580.19	$0.00	$25,580.19	$12,790.10	2
LINCOLN COUNTY	1	Residential	2	$28,284.67	$4,698.83	$32,983.50	$16,491.75	2
LINCOLN COUNTY	1	Residential	3	$24,517.32	$7,160.56	$31,677.88	$10,559.29	3
LINCOLN COUNTY	1	Residential	2	$86,646.81	$16,210.71	$102,857.52	$51,428.76	2
LINCOLN COUNTY	1	Residential	2	$0.00	$13,771.34	$13,771.34	$6,885.67	2
LINCOLN COUNTY	1	Residential	2	$29,689.97	$10,000.00	$39,689.97	$19,844.99	2

Jurisdiction	# Properties	Type of Property	# Mitigated	Building Payments	Content Payments	Total Payments	Ave Payments	# Losses
LINCOLN COUNTY	1	Residential	11	$29,616.17	$403.50	$30,019.67	$2,729.06	11
LINCOLN COUNTY	1	Residential	12	$28,650.30	$6,609.98	$35,260.28	$2,938.36	12
LINCOLN COUNTY	1	Residential	4	$13,308.08	$0.00	$13,308.08	$3,327.02	4
LINCOLN COUNTY	1	Residential	4	$11,920.01	$0.00	$11,920.01	$2,980.00	4
LINCOLN COUNTY	1	Non-Resid	2	$0.00	$9,668.86	$9,668.86	$4,834.43	2
LINCOLN COUNTY	1	Residential	3	$61,516.77	$2,237.77	$63,754.54	$21,251.51	3
LINCOLN COUNTY	1	Residential	3	$53,039.95	$0.00	$53,039.95	$17,679.98	3
LINCOLN COUNTY	1	Residential	3	$7,300.08	$0.00	$7,300.08	$2,433.36	3
LINCOLN COUNTY	1	Residential	2	$4,574.21	$0.00	$4,574.21	$2,287.11	2
LINCOLN COUNTY	1	Residential	2	$37,776.31	$0.00	$37,776.31	$18,888.16	2
LINCOLN COUNTY	1	Residential	2	$17,606.35	$0.00	$17,606.35	$8,803.18	2
LINCOLN COUNTY	1	Residential	2	$33,493.41	$10,417.98	$43,911.39	$21,955.70	2
LINCOLN COUNTY	1	Commercial	2	$311,830.30	$0.00	$311,830.30	$155,915.15	2
LINCOLN COUNTY	1	Residential	2	$44,364.01	$0.00	$44,364.01	$22,182.01	2
LINCOLN COUNTY	1	Residential	4	$33,117.83	$1,469.33	$34,587.16	$8,646.79	4
LINCOLN COUNTY	1	Residential	5	$10,059.74	$0.00	$10,059.74	$2,011.95	5
LINCOLN COUNTY	1	Residential	2	$29,132.82	$0.00	$29,132.82	$14,566.41	2
LINCOLN COUNTY	1	Non-Resid	2	$19,174.97	$0.00	$19,174.97	$9,587.49	2
LINCOLN COUNTY	1	Residential	2	$116,600.00	$0.00	$116,600.00	$58,300.00	2
LINCOLN COUNTY	1	Residential	2	$64,457.63	$21,646.58	$86,104.21	$43,052.11	2
LINCOLN COUNTY	1	Non-Resid	2	$55,799.03	$30,000.00	$85,799.03	$42,899.52	2
LINCOLN COUNTY	1	Residential	2	$21,740.46	$8,556.88	$30,297.34	$15,148.67	2
LINCOLN COUNTY	1	Residential	2	$4,746.81	$0.00	$4,746.81	$2,373.41	2
MOSCOW MILLS	1	Residential	5	$26,849.26	$20,061.95	$46,911.21	$9,382.24	5
OLD MONROE	1	Residential	3	$55,799.90	$29,561.59	$85,361.49	$28,453.83	3
OLD MONROE	1	Residential	2	$32,450.23	$0.00	$32,450.23	$16,225.12	2
OLD MONROE	1	Residential	2	$7,764.84	$1,383.75	$9,148.59	$4,574.30	2
OLD MONROE	1	Residential	3	$21,844.00	$9,779.28	$31,623.28	$10,541.09	3
OLD MONROE	1	Non-Resid	2	$0.00	$7,934.04	$7,934.04	$3,967.02	2
OLD MONROE	1	Residential	2	$6,194.62	$3,064.75	$9,259.37	$4,629.69	2
OLD MONROE	1	Residential	3	$4,671.84	$3,918.00	$8,589.84	$2,863.28	3
OLD MONROE	1	Residential	2	$13,854.18	$7,413.81	$21,267.99	$10,634.00	2
OLD MONROE	1	Residential	3	$18,361.08	$0.00	$18,361.08	$6,120.36	3
OLD MONROE	1	Residential	4	$47,855.76	$7,548.99	$55,404.75	$13,851.19	4
OLD MONROE	1	Residential	4	$26,454.18	$6,940.30	$33,394.48	$8,348.62	4
OLD MONROE	1	Residential	3	$28,276.09	$7,836.60	$36,112.69	$12,037.56	3
OLD MONROE	1	Residential	4	$39,618.91	$13,366.32	$52,985.23	$13,246.31	4
OLD MONROE	1	Residential	3	$14,683.09	$4,477.00	$19,160.09	$6,386.70	3
OLD MONROE	1	Residential	5	$153,614.08	$65,296.25	$218,910.33	$43,782.07	5
OLD MONROE	1	Residential	2	$13,949.57	$2,600.00	$16,549.57	$8,274.79	2

Jurisdiction	# Properties	Type of Property	# Mitigated	Building Payments	Content Payments	Total Payments	Ave Payments	# Losses
OLD MONROE	1	Residential	5	$51,588.36	$0.00	$51,588.36	$10,317.67	5
OLD MONROE	1	Residential	2	$15,962.53	$2,417.73	$18,380.26	$9,190.13	2
SILEX	1	Residential	5	$43,571.83	$5,405.50	$48,977.33	$9,795.47	5
SILEX	1	Residential	3	$69,587.65	$9,410.97	$78,998.62	$26,332.87	3
SILEX	1	Commercial	2	$25,282.08	$100.00	$25,382.08	$12,691.04	2
SILEX	1	Non-Resid	2	$75,829.91	$29,772.91	$105,602.82	$52,801.41	2
TROY	1	Residential	2	$6,772.55	$479.50	$7,252.05	$3,626.03	2
TROY	1	Residential	2	$4,574.11	$5,506.00	$10,080.11	$5,040.06	2
TROY	1	Non-Resid	3	$86,275.69	$0.00	$86,275.69	$28,758.56	3
WINFIELD	1	Residential	3	$61,890.08	$4,600.00	$66,490.08	$22,163.36	3
WINFIELD	1	Residential	2	$14,452.62	$0.00	$14,452.62	$7,226.31	2
WINFIELD	1	Residential	2	$7,368.04	$3,248.00	$10,616.04	$5,308.02	2
WINFIELD	1	Residential	3	$5,280.65	$2,716.56	$7,997.21	$2,665.74	3
WINFIELD	1	Residential	2	$9,539.10	$1,100.00	$10,639.10	$5,319.55	2
WINFIELD	1	Residential	6	$79,563.34	$21,552.32	$101,115.66	$16,852.61	6
WINFIELD	1	Residential	2	$44,615.20	$10,000.00	$54,615.20	$27,307.60	2
WINFIELD	1	Non-Resid	2	$21,296.29	$800.00	$22,096.29	$11,048.15	2
WINFIELD	1	Non-Resid	2	$40,550.86	$21,000.00	$61,550.86	$30,775.43	2

Source: Flood Insurance Administration as of February 29, 2016

Previous Occurrences

The largest disaster to impact Lincoln County in recent years was the Great Flood of 1993. Flooding covered the eastern part of the county along its 25-mile border with the Mississippi River. Two major Mississippi River levees were breached by the relentless volume of water. In addition, heavy and frequent rain events along the Cuivre River and the North Fork of the Cuivre River caused flash flooding on the western side of the county.

During the 1994 flood, the Cuivre River also flooded farmland and parts of Old Monroe. East of Troy, where the flood stage is 21 feet, the river crested at 33 feet. At Old Monroe, with flood stage at 24 feet, the crest reached 32.9 feet.

During June 2008 the Mississippi overflowed 90% of the levees in eastern Lincoln County, rushing into Foley and other towns. The Army Corps of Engineers estimated the river would have reached 39.2 feet, which is 13-14 feet above flood stage for many communities in the county. In total, up to 350 homes were flooded and most residents east of highway 79 left their homes. Four homes were destroyed and 161 more homes received major damage. MoDOT closed 37 roads in eastern Missouri and railroad lines, barges, and river locks and dams were shut down.

Within the past 15 years flood events have not resulted in any deaths or injuries within Lincoln County. However, while not included in the table below, flooding was severe during June and December 2015 and resulted in U.S. 61 and MO 79 being closed a total of 12 times due to high water. Some roads and bridges required extensive maintenance as a result of the flooding.

The table below summarizes FEMA Declared Flood Events from the past 20 years.

Table 3.30. Lincoln County FEMA Declared Flood Events Summary,1996 to 2016

Declaration No.	Event	Date Declared
FEMA-1631-DR	Severe Winter Storms and Flooding	March 16, 2006
FEMA-1675-DR	Severe Winter Storms and Flooding	January 14, 2007
FEMA-1749-DR	Severe Storms and Flooding	March 19, 2008
FEMA-1773-DR	Severe Storms and Flooding	June 25, 2008
FEMA-1809-DR	Severe Storms, Tornados, and Flooding	November 13, 2008
FEMA-4130-DR	Severe Storms, Straight Line Winds, Tornadoes and Flooding	July 18, 2013
FEMA-4238-DR	Severe Storms, Straight Line Winds, Tornadoes and Flooding	August 7, 2015
FEMA-4250-DR	Severe Storms, Straight Line Winds, Tornadoes and Flooding	January 21, 2016

Source: NCDC, data accessed June 2, 2016

Probability of Future Occurrence

There were eight declared floods in the 20 years between 1996 and June 2016 making the probability of a declared flood event every 2.5 years, or, a 40% chance each year. NCDC data shows just 3 flash floods for Lincoln County between the years of 1990 and 2015 making the likelihood of a flash flood one in every 3.25 years, or 12% in any given year. It should be noted that NOAA alerts the Lincoln County planning area for flash floods dozens of times per year and each alert brings the possibility of loss of life or property damage depending on the circumstances.

Vulnerability

Vulnerability Overview

HAZUS data from March 2013 estimates there are 17,820 buildings in Lincoln County which have an aggregate total replacement cost of $2,485,000,000 in 2006 dollars. This number includes essential facilities such as a hospital, 23 schools, 15 fire stations, nine police stations, and one emergency operations center. HAZUS estimates a 100-year flood would moderately damage 388 building and destroy 259. It is estimated that two police stations and three fire stations would be unusable for a period of time and that 1,260 displaced people will seek temporary shelter.

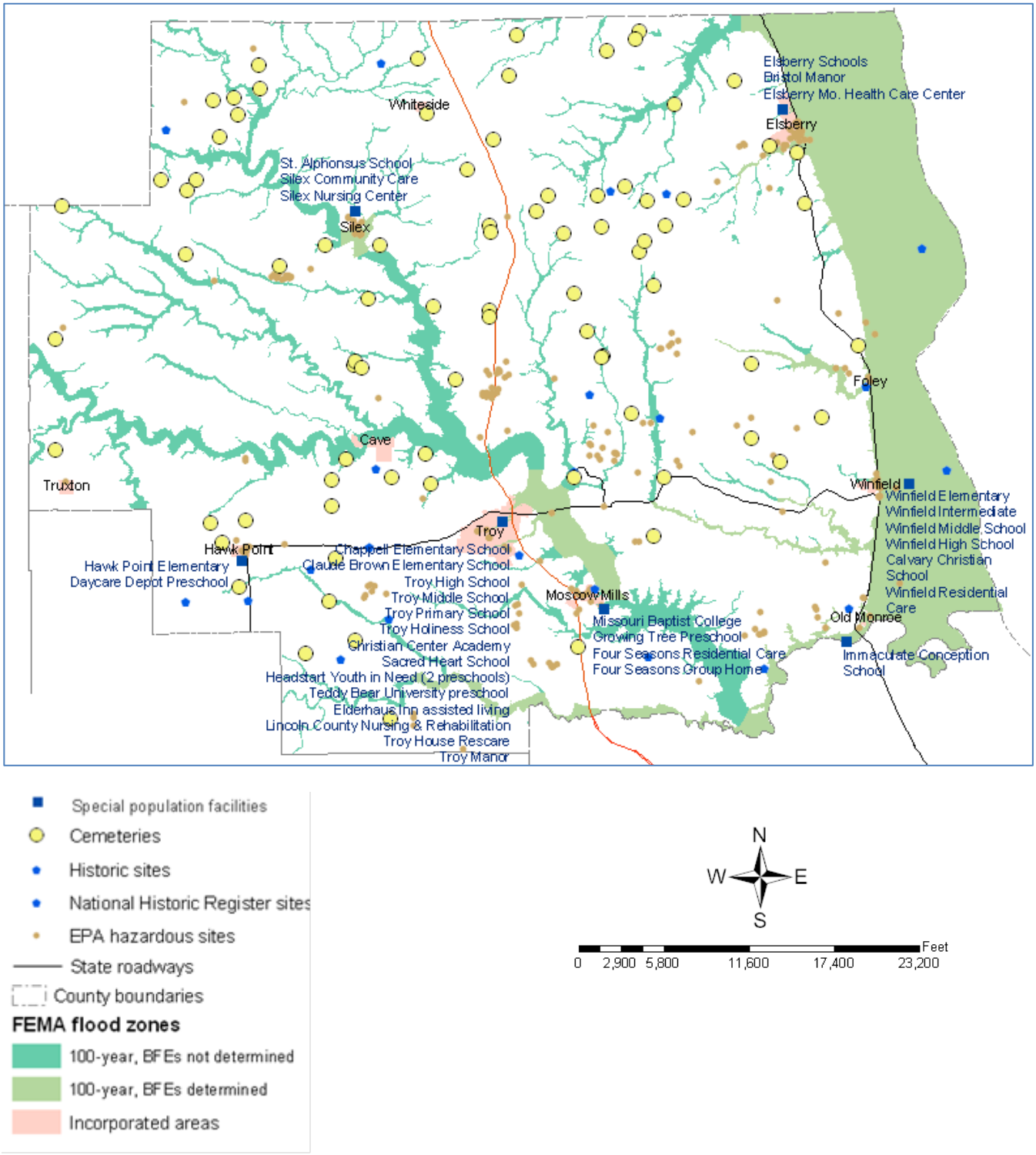
Table 3.31. HAZUS Loss Forecast for 100-Year Flood in Lincoln County

Direct Building Loss	Business Interruption	Total Economic Loss
$ 165,280,000	$ 1,190,000	$ 166,470,000

Source: 2013 Missouri State Hazard Mitigation Plan

The Hazards U.S. Multi-Hazard (HAZUS-MH) was used to generate a one percent annual flood, or 100-year flood, event for major rivers and creeks in the County. The software produces a flood polygon and flood depth grid that represents the 100-year flood. While not as accurate as official flood maps these floodplain boundaries are for use in GIS-based loss estimation. The figure below shows the critical facilities within the county.

Figure 3.11. Critical Facilities in 100-Year Flood Plain



Potential Losses to Existing Development

The Mississippi River Floodplain remains agricultural in nature with family farms sparely distributed within them. However, this real estate is desirable for development with portions of Winfield, Foley,

Old Monroe, and Elsberry resting within the flood plain along Missouri Highway 79 adjacent to the River. In addition, Silex and Moscow Mills are vulnerable to the Cuivre River. The Cuivre's flood plain bumps directly against the city limits of Troy.

Critical facilities within a 100-year flood plain include a hospital, 23 schools, 15 fire stations, nine police stations, and one emergency operations center.

Figure 3.12. Total Exposure to Lincoln County Due to Levee Failure/Flooding

Structure Damage	Contents Damage	Inventory Loss	Total Direct Loss	Total Income Loss	Total Direct and Income Losses
$116,090,040	$103,608,822	$3,386,544	$223,085,406	$1,608,912	$224,694,318

Source: 2013 Missouri State Hazard Mitigation Plan

Impact of Future Development

Development upstream, in the form of additional levees, creates the greatest impact to Mississippi River flooding in Lincoln County due to channeling additional water into waterways. The county regulates development within incorporated areas located in the floodplain of the Mississippi River. Flash floods will continue to impact residents choosing to live in rural communities and areas where low water crossings are required to access their homes. There is anticipated to be little or no increase in run off created by potential development.

Problem Statement

Lincoln County faces two major risk factors for flooding; flooding from the Mississippi River and flash flooding by numerous smaller rivers and creeks, principally, the Cuivre River. According to the federal government's Flood Insurance Rating Maps (FIRM), for Lincoln County 22% of the land lies within the 100-year floodplain. The majority of that 22% lies directly adjacent to Mississippi and Cuivre Rivers. Flooding, particularly flash flooding, in the planning area's rivers and creeks will continue to be an issue due to the geography.

Flow frequency analysis, based on historical annual peak discharges, and the provisional December 2015 peak discharge as measured by the U.S. Geological Survey stream gauges located throughout the State of Missouri, provides additional insight into flood frequency. One gauge was located in Lincoln County, on the Cuivre River at a point near Troy. According to FEMA's Flood Frequency Analysis dated February 29, 2016; data collected indicate a flood of the magnitude of the December 2015 to January 2016 could occur every four years. A flood of this magnitude could result in a water level of 28 feet at the Cuivre River bridge over US 61 at Troy.

3.4.6 Levee Failure

Hazard Profile

Hazard Description

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

Levees can be small agricultural levees that protect farmland from high-frequency flooding. Levees can also be larger, designed to protect people and property in larger urban areas from less frequent flooding events such as the 100-year and 500-year flood levels. For purposes of this discussion, levee failure will refer to both overtopping and breach as defined in FEMA's Publication "So You Live Behind a Levee" (http://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 flood waters exceed the height of a levee and flow over its crown. As the water passes over the top, it may erode the levee, worsening the flooding and potentially causing an opening, or breach, in the levee.
>
> **Breaching: When a Levee Gives Way**
>
> A levee breach occurs when part of a levee gives way, creating an opening through which floodwaters may pass. A breach may occur gradually or suddenly. The most dangerous breaches happen quickly during periods of high water. The resulting torrent can quickly swamp a large area behind the failed levee with little or no warning.

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

Geographic Location

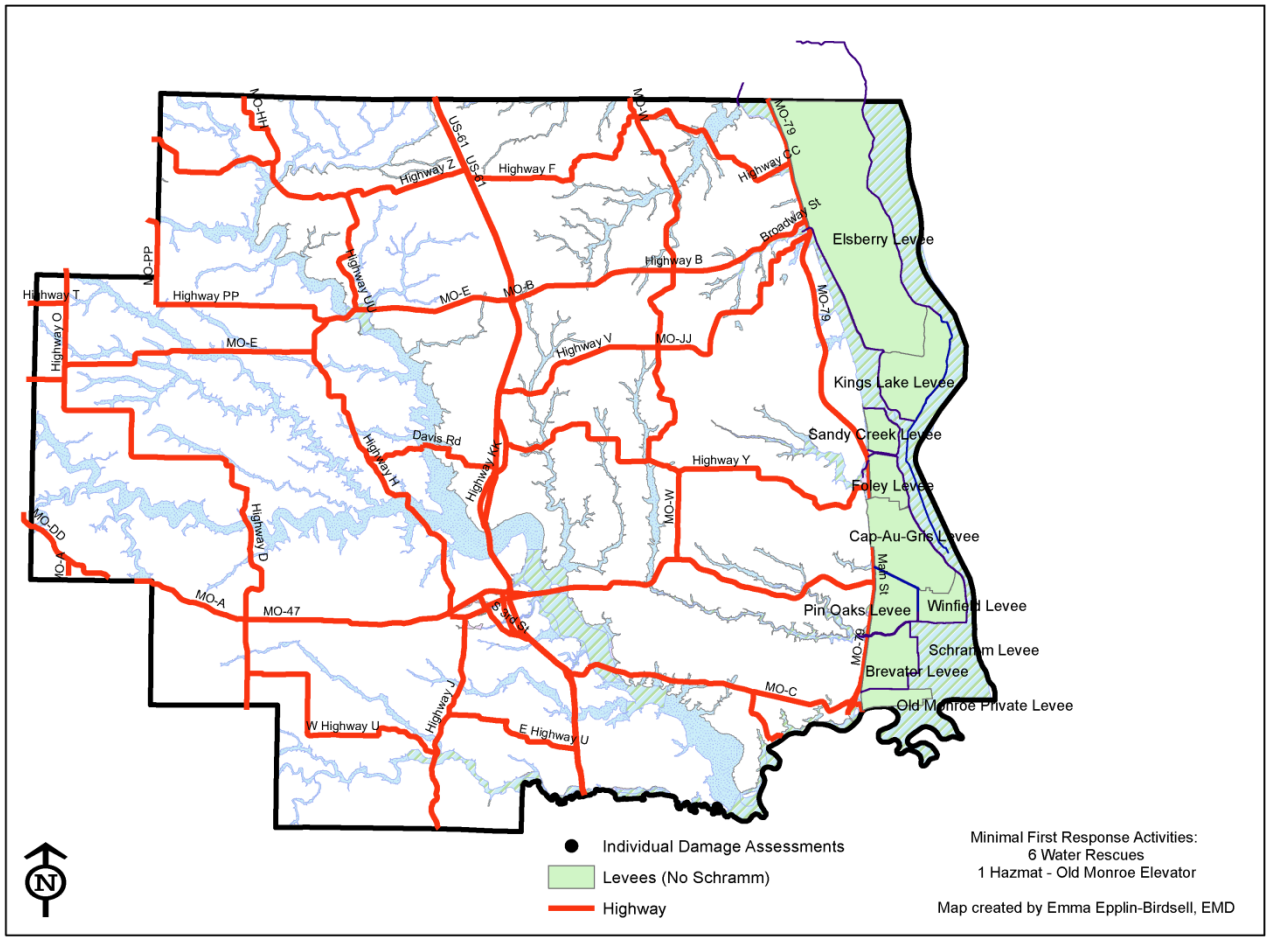
Missouri is a state with many levees. Currently, there is no single comprehensive inventory of levee systems in the state. Levees have been constructed across the state by public entities and private entities with varying levels of protection, inspection oversight, and maintenance. The lack of a comprehensive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

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

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

Lincoln County has 11 drainage and levee districts; the Brevator District, the Winfield District, the Foley District, Sandy Creek District, King's Lake District, Schram Levee, Old Monroe private, Old Monroe Public, Pin Oak District, Cap Au Gris District, and the Elsberry District. Eight of these districts are regulated by the US Army Corps of Engineers, while two are private and one is public.

Figure 3.13. Certified Levees and Missouri River Levees in Lincoln County



Source: Lincoln County Emergency Management Agency, 2015

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.

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. The table below defines the three ratings. The only USACE inspected levee in the planning area is the Tuque Creek levee which was inspected in October of 2012 and found to be minimally acceptable by the Corps.

Table 3.32. 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.

Source: U.S. Corps of Engineers

Previous Occurrences

There were more than 1,000 Federal and non-Federal levee breaches during the Great Flood of 1993. From June to August 1993, rainfall totals surpassed greater than 24 inches of rain fell on northern and central Missouri. These amounts were approximately 200-350 percent greater than normal. The Missouri River crested at 48.87 feet at Kansas City on July 27. This crest moved down the Missouri River setting new records at Boonville, Jefferson City, Hermann, St. Charles, and other locations. The first levee was overtopped on June 7, but levee failures soon became common. Levee failures resulted in large amounts of sediments deposited in some inundated areas, and large quantities of sediments were scoured from other inundated areas. In Lincoln County, the Winfield/Pin Oak levee was breached in June of 2015 and in December, the Brevator and Old Monroe Public levees were breached. In St. Louis, out of 42 Federal levees, 12 of them failed or overtopped and out of 47 non-Federal levees, 39 failed (U. S. Geological Survey).

Towns along the Mississippi River from Illinois to Missouri were building barriers in an attempt to hold back rising floodwaters by mid-June. As many as 27 levees were in jeopardy of overflowing as the river was projected to rise (NCDC)

Heavy rains throughout Iowa and Missouri during June 2008 caused flooding along the Mississippi River drainage system within the USACE, St. Louis District in Missouri and Illinois. Heavy rainfall in April and May saturated the Midwest causing much of the additional heavy rains in June to develop directly into runoff. Rainfall totals over Missouri and Iowa ranged from 8-15 inches during the months of May and June. The saturated soil combined with the heavy rains created near record river levels throughout the northern portion of the St. Louis District.

The Mississippi overflowed 90 percent of the levees in eastern Lincoln County, rushing into Foley, and other towns around the county in June, 2008. The Army Corp of Engineers estimated that the river would have reached 39.2 feet, which is 13 to 14 feet above flood stage for many communities in Lincoln County. The average water level in Lincoln County was 34.3 feet, which is about eight feet above flood stage. On June 6, 2008 floodwaters opened a 150-foot breach in a primary levee along the Mississippi River in Winfield. The breach allowed floodwaters to claim dozens of homes and large tracts of farmland and put pressure on a secondary levee. The breach also prompted Lincoln County emergency officials to order the evacuation of residents east of Winfield.

Probability of Future Occurrence

Three levee failures during the last 26 years produces a probability of occurrence as once every 8.6 years.

Vulnerability

Potential Losses to Existing Development

The Mississippi River Floodplain remains agricultural in nature with family farms sparely distributed within them. The Cities of Elsberry, Foley, Winfield and Old Monroe lie within the Mississippi's Floodplain and are frequently at risk of flooding due to levee failure or overtopping. In a worst case scenario, Old Monroe could completely flood. Critical facilities at risk include Missouri Highway 79 as well as infrastructure associated with the above towns. The table below shows worst case exposure to the county.

Figure 3.14. Total Exposure to Lincoln County Due to Levee Failure/Flooding

Structure Damage	Contents Damage	Inventory Loss	Total Direct Loss	Total Income Loss	Total Direct and Income Losses
$116,090,040	$103,608,822	$3,386,544	$223,085,406	$1,608,912	$224,694,318

Source: 2013 Missouri State Hazard Mitigation Plan

Impact of Future Development

Development upstream, in the form of additional levees, creates the greatest impact to Mississippi River flooding in Lincoln County due to channeling additional water into waterways. The county

regulates development within incorporated areas located in the floodplain of the Mississippi River. Flash floods and levee failures will continue to impact residents choosing to live in rural areas where low water crossings are required to access their homes. There is anticipated to be little or no increase in run off created by potential development; however, that could change within 15 years due to the potential development of a multi-hub transportation center, including a port, along the Mississippi in Lincoln County.

Hazard Summary by Jurisdiction

As stated above, the agricultural areas, along with the cities of eastern Lincoln County depend on levees to hold back flood waters.

Problem Statement

Levee failure poses a signature risk to residents, businesses, and transportation corridors in Lincoln County located along the Mississippi River and its associated levees. While flooding and associated levee failure in Lincoln County will continue, loss of life and property, outside of that of crops, will remain unlikely. Flooding, particularly flash flooding, and levee failure associated with the flooding in the planning area's rivers and creeks will continue to be an issue due the geography.

3.4.7 Sinkholes

Hazard Profile

Hazard Description

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

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

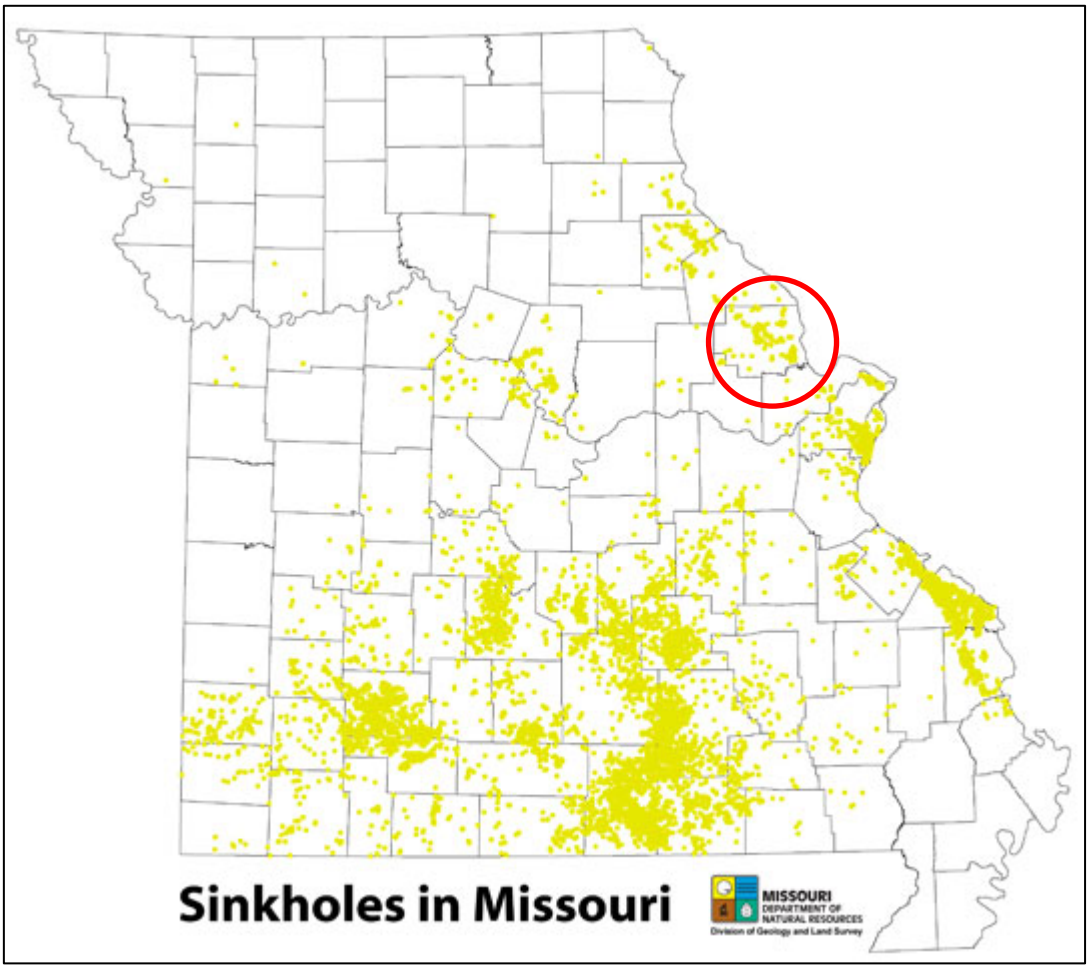
In the case of sinkholes, the rock below the surface is rock that has been dissolving by circulating groundwater. As the rock dissolves, spaces and caverns form, and ultimately the land above the spaces collapse. In Missouri, sinkhole problems are usually a result of surface materials above openings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

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

Geographic Location

The figure below shows sink holes scattered across the county with a higher concentration in the center and northern portions of the county where there is a mix of limestone/shale and dolomite/limestone which contributes to the formation of sink holes. There is no recorded instance of damage caused by sink holes in Lincoln County. Most sink holes are in unincorporated areas.

Figure 3.15. Location of Sink Holes in Lincoln County



Source: Missouri Department of Natural Resources

Severity/Magnitude/Extent

Sinkholes vary in size and location, and these variances will determine the impact of the hazard. A sinkhole could result in the loss of a personal vehicle, a building collapse, or damage to infrastructure such as roads, water, or sewer lines. Groundwater contamination is also possible from a sinkhole. Because of the relationship of sinkholes to groundwater, pollutants captured or dumped in sinkholes could affect a community's groundwater system. Sinkhole collapse could be triggered by large earthquakes. Sinkholes located in floodplains can absorb floodwaters but make detailed flood hazard studies difficult to model.

The 2013 State Plan included only seven documented sinkhole "notable events". The plan stated that sinkholes are common to Missouri and the probability is high that they will occur in the future. To date, Missouri sinkholes have historically not had major impacts on development nor have they caused serious damage. Thus, the severity of future events is likely to be low.

Previous Occurrences

Sink holes occur naturally in Lincoln County and can develop nearly anywhere. There is no record of property damage or personal injuries due to sink holes in the county.

Probability of Future Occurrence

There are no records available in the planning area from which to derive quantifiable probabilities.

Vulnerability

Lincoln County is vulnerable to damage to property and personal injury due to sink holes.

Potential Losses to Existing Development

The location of current sink holes and sink hole prone areas is well known to current property owners and developers who avoid construction in those areas. Potential losses are slight due to the rural locations of the sink holes.

Impact of Future Development

Builders avoid construction in known sink hole areas thereby avoiding potential risk.

Problem Statement

There is potential risk to Lincoln County residents due to sink holes. However, most sink holes are found in uninhabited rural areas and construction in sink hole prone areas is avoided. Therefore, the risk is nearly non-existent.

3.4.8 Thunderstorms/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 floods and flash floods, high winds, hail, and tornadoes. Each of these hazards is discussed separately elsewhere in this section.

High Winds

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

Lightning

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

Hail

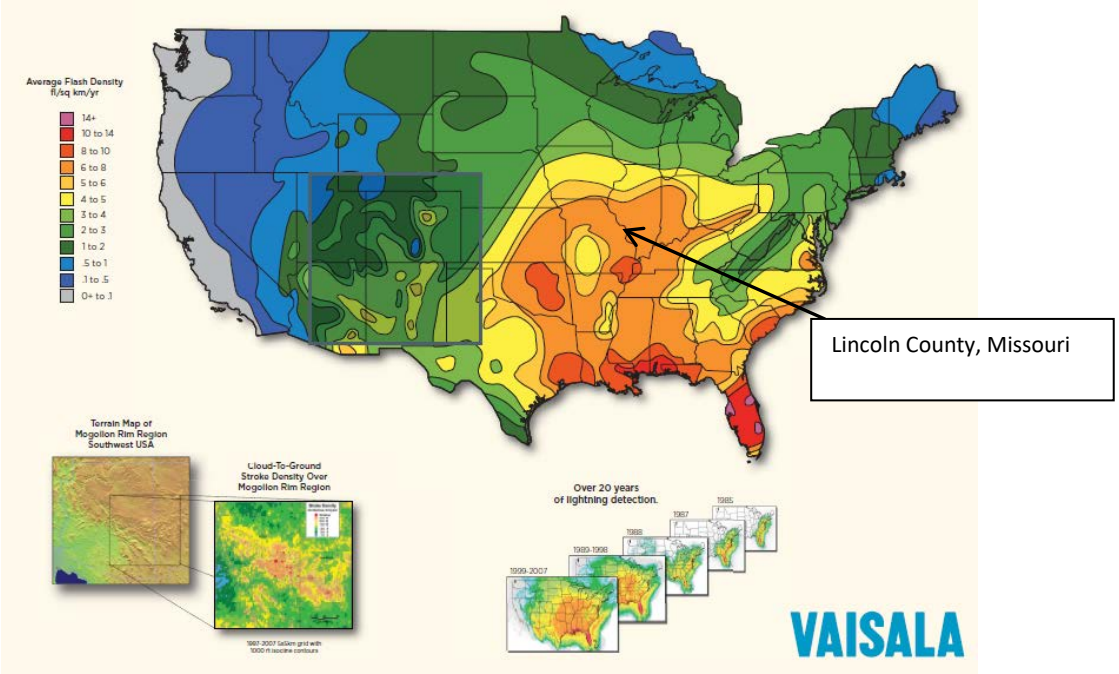
According to the National Oceanic and Atmospheric Administration (NOAA), hail is precipitation that is formed when thunderstorm updrafts carry raindrops upward into extremely cold atmosphere causing them to freeze. The raindrops form into small frozen droplets. They continue to grow as they come into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

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

Geographic Location

Thunderstorms, high winds, hail, and lightning are county-wide hazards and can occur anywhere throughout the state of Missouri. 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 populated urban areas.

Figure 3.16. Location and Frequency of Lightning in the U.S.A.



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

Figure 3.17. Wind Zones in the United States

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

Severity/Magnitude/Extent

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

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

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

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

Table 3.33. Tornado and Storm Research Organization Hail Storm Intensity Scale

Intensity Category	Inches Diameter	Size Description	Typical Damage Impacts
Hard Hail	0.2-0.4	Pea	No damage
Potentially Damaging	0.4-0.6	Mothball	Slight general damage to plants, crops
Significant	0.6-0.8	Marble, grape	Significant damage to fruit, crops, vegetation
Severe	0.8-1.2	Walnut	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
Severe	1.2-1.6	Pigeon's egg	Wide spread glass damage, vehicle bodywork damage
Destructive	1.6-2.0	Golf ball	Whole sale destruction of glass, damage to tiled roofs, significant risk of injuries
Destructive	2.0-2.4	Hen's egg	Bodywork of grounded aircraft dented, brick walls pitted
Destructive	2.4-3.0	Tennis ball	Severe roof damage, risk of serious injuries
Destructive	3.0-3.5	Large orange	Severe damage to aircraft bodywork
Super Hailstorms	3.6-3.9	Grapefruit	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open
Super Hail Storms	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 hail stones, hail fall speed and surface wind speeds affect severity. http://www.torro.org.uk/site/hscale.php

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

The onset of thunderstorms with lightning, high wind, and hail is generally rapid. Duration is less than six hours and warning time is generally six to twelve hours. Nationwide, lightning kills 75 to 100 people each year. Lightning strikes can also start structural and wildland fires, as well as damage electrical systems and equipment. According to the USDA Risk Management Agency, between the years of 2005 and 2016 there were no crop damages paid due to thunderstorms. Damages due to Lightning, High Winds, and Hail are listed in the tables below.

Table 3.34. Crop Insurance Claims Paid in Lincoln County From High Winds, 2005-2015

Crop Year	Crop Name	Cause of Loss Description	Insurance Paid
2005	Corn	Excessive Winds	$768
2006	Corn	Excessive Winds	$768
2009	Corn	Excessive Winds	$13,417
2011	Corn	Excessive Winds	$19,937
Total			$34,890

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

Table 3.35. Crop Insurance Claims Paid in Lincoln County From Lightning, 2005-2015

Crop Year	Crop Name	Cause of Loss Description	Insurance Paid
2008	Soybeans	Other – Lightning	$112
2009	Soybeans, Wheat	Other – Lightning	$17,694
2012	Corn	Other – Lightning	$109,691
2013	Corn, Wheat	Other – Lightning	$13,263
Total			$140,760

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

Table 3.36. Crop Insurance Claims Paid in Lincoln County From Hail, 2005-2015

Crop Year	Crop Name	Cause of Loss Description	Insurance Paid
2006	Wheat	Hail	$1042
2009	Corn, Soybeans	Hail	$15,319
2011	Soybeans	Hail	$7,883
2015	Wheat	Hail	$7,589
Total			$31,833

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

Previous Occurrences

The following figures show reported thunderstorm and hail events from January 2005 through December 2015 along with the magnitude of the event (when available), and any associated deaths, injuries, or damage. There were no reports in the NCDC data for lighting and strong wind events. These events are likely under-reported judging from the lack of data from NCDC.

Table 3.37. Thunderstorm Events, 2005-2015

Date	Event	Magnitude (Kts)	Deaths	Injuries	Property Damage	Crop Damage
6/10/2005	Thunderstorm Wind	52	0	0	$ -	$ -
6/10/2005	Thunderstorm Wind	52	0	0	$ -	$ -
6/13/2005	Thunderstorm Wind	50	0	0	$ -	$ -
6/13/2005	Thunderstorm Wind	50	0	0	$ -	$ -
6/13/2005	Thunderstorm Wind	52	0	0	$ -	$ -
6/13/2005	Thunderstorm Wind	55	0	0	$ -	$ -
9/13/2005	Thunderstorm Wind	55	0	0	$ -	$ -
4/2/2006	Thunderstorm Wind	60	0	0	$ -	$ -
6/10/2006	Thunderstorm Wind	50	0	0	$ -	$ -
7/19/2006	Thunderstorm Wind	55	0	0	$ -	$ -
7/19/2006	Thunderstorm Wind	61	0	0	$ -	$ -
7/21/2006	Thunderstorm Wind	60	0	0	$ -	$ -
7/21/2006	Thunderstorm Wind	60	0	0	$ -	$ -
7/21/2006	Thunderstorm Wind	60	0	0	$ -	$ -
7/21/2006	Thunderstorm Wind	52	0	0	$ -	$ -
7/17/2007	Thunderstorm Wind	60	0	0	$ 5,000	$ -
7/17/2007	Thunderstorm Wind	60	0	0	$ -	$ -
8/12/2007	Thunderstorm Wind	60	0	0	$ -	$ -
10/18/2007	Thunderstorm Wind	56	0	0	$ -	$ -
7/27/2008	Thunderstorm Wind	56	0	0	$ -	$ -
8/5/2008	Thunderstorm Wind	52	0	0	$ -	$ -
8/5/2008	Thunderstorm Wind	56	0	0	$ -	$ -
12/27/2008	Thunderstorm Wind	56	0	0	$ -	$ -
6/10/2009	Thunderstorm Wind	48	0	0	$ 3,000	$ -
6/27/2009	Thunderstorm Wind	70	0	0	$ -	$ -
7/23/2009	Thunderstorm Wind	52	0	0	$ -	$ -
6/19/2010	Thunderstorm Wind	52	0	0	$ -	$ -
8/12/2010	Thunderstorm Wind	52	0	0	$ -	$ -
8/12/2010	Thunderstorm Wind	56	0	0	$ -	$ -
10/26/2010	Thunderstorm Wind	52	0	0	$ -	$ -
5/22/2011	Thunderstorm Wind	52	0	0	$ -	$ -
5/23/2011	Thunderstorm Wind	52	0	0	$ -	$ -
5/25/2011	Thunderstorm Wind	52	0	0	$ -	$ -
5/25/2011	Thunderstorm Wind	52	0	0	$ -	$ -
6/10/2011	Thunderstorm Wind	56	0	0	$ -	$ -
7/3/2011	Thunderstorm Wind	56	0	0	$ -	$ -
10/17/2012	Thunderstorm Wind	53	0	0	$ -	$ -
1/29/2013	Thunderstorm Wind	56	0	0	$ -	$ -

Date	Event	Magnitude (Kts)	Deaths	Injuries	Property Damage	Crop Damage
5/30/2013	Thunderstorm Wind	56	0	0	$ -	$ -
5/31/2013	Thunderstorm Wind	52	0	0	$ -	$ -
5/31/2013	Thunderstorm Wind	52	0	0	$ -	$ -
11/17/2013	Thunderstorm Wind	56	0	0	$ -	$ -
11/17/2013	Thunderstorm Wind	61	0	0	$ -	$ -
4/24/2014	Thunderstorm Wind	56	0	0	$ -	$ -
4/28/2014	Thunderstorm Wind	52	0	0	$ -	$ -
6/21/2014	Thunderstorm Wind	52	0	0	$ -	$ -
7/7/2014	Thunderstorm Wind	56	0	0	$ -	$ -
7/7/2014	Thunderstorm Wind	56	0	0	$ -	$ -
4/9/2015	Thunderstorm Wind	56	0	0	$ -	$ -
TOTAL	**49**		**0**	**0**	**$ 8,000**	**0**

Source: NCDC

Table 3.38. Hail Events, 2005 - 2015

Date	Event	Magnitude (" Diameter)	Deaths	Injuries	Property Damage	Crop Damage
1/12/2005	Hail	1.75	0	0	$ -	$ -
5/11/2005	Hail	1	0	0	$ -	$ -
5/11/2005	Hail	0.77	0	0	$ -	$ -
10/20/2005	Hail	0.88	0	0	$ -	$ -
11/5/2005	Hail	1	0	0	$ -	$ -
11/5/2005	Hail	0.75	0	0	$ -	$ -
1/2/2006	Hail	1	0	0	$ -	$ -
1/2/2006	Hail	1	0	0	$ -	$ -
3/13/2006	Hail	1	0	0	$ -	$ -
3/13/2006	Hail	2	0	0	$ -	$ -
4/7/2006	Hail	0.75	0	0	$ -	$ -
4/30/2006	Hail	1.75	0	0	$ -	$ -
4/30/2006	Hail	0.75	0	0	$ -	$ -
5/24/2006	Hail	0.75	0	0	$ -	$ -
5/24/2006	Hail	0.75	0	0	$ -	$ -
5/24/2006	Hail	1.75	0	0	$ -	$ -
1/7/2008	Hail	0.75	0	0	$ -	$ -
2/4/2008	Hail	0.75	0	0	$ -	$ -
2/4/2008	Hail	0.88	0	0	$ -	$ -
2/4/2008	Hail	0.88	0	0	$ -	$ -
3/27/2008	Hail	0.75	0	0	$ -	$ -
3/27/2008	Hail	0.75	0	0	$ -	$ -

Date	Event	Magnitude (" Diameter)	Deaths	Injuries	Property Damage	Crop Damage
3/27/2008	Hail	0.75	0	0	$ -	$ -
3/27/2008	Hail	0.88	0	0	$ -	$ -
3/27/2008	Hail	0.75	0	0	$ -	$ -
4/22/2008	Hail	0.75	0	0	$ -	$ -
4/22/2008	Hail	0.75	0	0	$ -	$ -
5/13/2008	Hail	0.88	0	0	$ -	$ -
5/13/2008	Hail	0.75	0	0	$ -	$ -
5/30/2008	Hail	0.88	0	0	$ -	$ -
5/31/2008	Hail	1.75	0	0	$ -	$ -
7/29/2008	Hail	0.88	0	0	$ -	$ -
8/5/2008	Hail	0.75	0	0	$ -	$ -
8/5/2008	Hail	0.75	0	0	$ -	$ -
7/23/2009	Hail	1	0	0	$ -	$ -
5/3/2010	Hail	0.88	0	0	$ -	$ -
5/3/2010	Hail	1	0	0	$ -	$ -
5/3/2010	Hail	2	0	0	$ -	$ -
12/31/2010	Hail	1	0	0	$ -	$ -
4/19/2011	Hail	0.75	0	0	$ -	$ -
4/19/2011	Hail	1	0	0	$ -	$ -
4/19/2011	Hail	1.75	0	0	$ -	$ -
5/11/2011	Hail	0.88	0	0	$ -	$ -
5/22/2011	Hail	1.75	0	0	$ -	$ -
5/25/2011	Hail	0.75	0	0	$ -	$ -
5/25/2011	Hail	0.75	0	0	$ -	$ -
6/17/2011	Hail	1	0	0	$ -	$ -
3/15/2012	Hail	0.88	0	0	$ -	$ -
4/13/2012	Hail	0.75	0	0	$ -	$ -
4/28/2012	Hail	1	0	0	$ -	$ -
4/28/2012	Hail	1.75	0	0	$ -	$ -
9/7/2012	Hail	1.75	0	0	$ -	$ -
9/7/2012	Hail	0.88	0	0	$ -	$ -
9/25/2012	Hail	0.88	0	0	$ -	$ -
11/17/2013	Hail	0.88	0	0	$ -	$ -
4/13/2014	Hail	1.75	0	0	$ -	$ -
4/28/2014	Hail	0.75	0	0	$ -	$ -
4/28/2014	Hail	1.75	0	0	$ -	$ -
10/6/2014	Hail	2	0	0	$ -	$ -
4/9/2015	Hail	1.75	0	0	$ -	$ -
6/25/2015	Hail	1.75	0	0	$ -	$ -

Date	Event	Magnitude (" Diameter)	Deaths	Injuries	Property Damage	Crop Damage
6/29/2015	Hail	0.88	0	0	$ -	$ -
TOTAL	**62**		**0**	**0**	**$ -**	**$ -**

Source: NCDC

Probability of Future Occurrence

Each of these four events; Thunderstorm Winds, Hail, Lightning and High Winds are likely to happen anywhere in Lincoln County at nearly any time of the year. Lightning and high wind events appear to be under-reported; however it is uncertain why. The lack of data prevents an accurate trend analysis for lightning and high wind. The probability of severe thunderstorms is 4.9 events per year and for hail, 6.2 events per year.

Vulnerability

Lincoln County's total exposure of buildings and crops due to thunderstorms and high winds is $4.3B and its exposure to crop damage from the same hazards is $39.2M.

Potential Losses to Existing Development

There is significant potential of loss to existing development, particularly crops, which will take damage from events of less severity than is required to cause damage to structures. Figures in previous crop insurance claims paid tables support this statement.

Future Development

Additional development results in the exposure of more households and businesses vulnerable to damages from severe thunderstorms, high winds, lightning, and hail.

Hazard Summary by Jurisdiction

These hazards are area-wide. NCDC data does not indicate any particular community or area to have significantly higher losses as compared to another. The City of Troy is the county seat and the most populous of incorporated areas and would therefore be most at risk.

Problem Statement

The county, like the entire state of Missouri, is vulnerable to high winds, lightning, hail and thunderstorms.

3.4.9 Tornado

Hazard Profile

Hazard Description

The NWS defines a tornado as “a violently rotating column of air extending from a thunderstorm to the ground.” It is usually spawned by a thunderstorm and produced when cool air overrides a layer of warm air, forcing the warm air to rise rapidly. Often, vortices remain suspended in the atmosphere as funnel clouds. When the lower tip of a vortex touches the ground, it becomes a tornado.

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

Tornados can occur anywhere in Lincoln County.

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 Enhanced Fujita Scale, based on the original Fujita Scale developed by Dr. Theodore Fujita, a renown severe storm researcher. The EF-Scale; shown below, attempts to rank tornadoes according to wind speed based on the damage caused. This update to the original EF-Scale was implemented in the U.S. on February1,2007.

Table 3.39. Enhanced Fujita Scale for Tornado Damage

FUJITASCALE			DERIVED EF SCALE		OPERATIONAL EF SCALE	
F Number	Fastest¼-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	Over200

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

The table below is based on information from the NOAA Storm Prediction Center. The table shows the wind speeds for the EF scale and summary descriptions of potential damage. For the actual EF scale it is necessary to look up the damage indicator(type of structure damaged) and refer to the degrees of damage associated with that indicator. Information on the Enhanced Fujita Scale's damage indicators and degrees or damage is 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 EF 0).
EF1	86-110	31.6%	Moderate. Roofs severely stripped; mobile homes over turned 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 stories 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 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 300ft.; 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 10 NCDC reported tornado events and damages for Lincoln County since 2005 are shown in the table below. Prior to that date, only really destructive tornadoes were recorded. There are limitations to the use of NCDC tornado data that must be noted. For example, one tornado may contain multiple segments as it moves geographically. A tornado that crosses a county line or state line is considered a separate segment for the purposes of reporting to the NCDC. Also, a tornado that lifts off the ground for less than five 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 3.40. Recorded Tornadoes in Lincoln County, January 2005 – December 2015

Date	Begin Location	End Location	Length (Miles)	Width (Yards)	E/EF Rating	Deaths	Injuries	Property Damage	Crop Damage
6/13/2005	MOSCOW MILLS	MOSCOW MILLS	0.2	50	F0	0	0	$ -	$ -
3/13/2006	OLNEY	DAMERON	24	300	F3	0	6	$ 2,500,000	$ -
3/13/2006	MILLWOOD	MILLWOOD	0.2	75	F1	0	0	$ -	$ -
10/2/2007	HAWK PT	HAWK PT	0.05	30	EF0	0	0	$ -	$ -
12/27/2008	DAVIS	HINES	1.12	40	EF1	0	0	$ -	$ -
4/23/2010	HAWK PT	HAWK PT	0.21	20	EF0	0	0	$ -	$ -
4/23/2010	SILEX	MILLWOOD	0.11	10	EF0	0	0	$ -	$ -
4/23/2010	SILEX	SILEX	0.14	10	EF0	0	0	$ -	$ -
1/29/2013	CHAIN OF ROCKS	CHAIN OF ROCKS	1.66	30	EF0	0	0	$ -	$ -

6/13/2015	HAWK PT	HAWK PT	1.95	50	EF1	0	0	$ -	$ -
TOTAL	**10**					**0**	**6**	**$ 2,500,000**	**$ -**

Source: National Climatic Data Center, http://www.ncdc.noaa.gov/stormevents/

The next 10 figures show the paths of the above tornados along with details of the events. Each of the 10 figures were taken from the National Climatic Data Center, http://www.ncdc.noaa.gov/stormevents/

Figure 3.18. Details and Path of June 13, 2005 Tornado, Moscow Mills

National Centers for Environmental Information

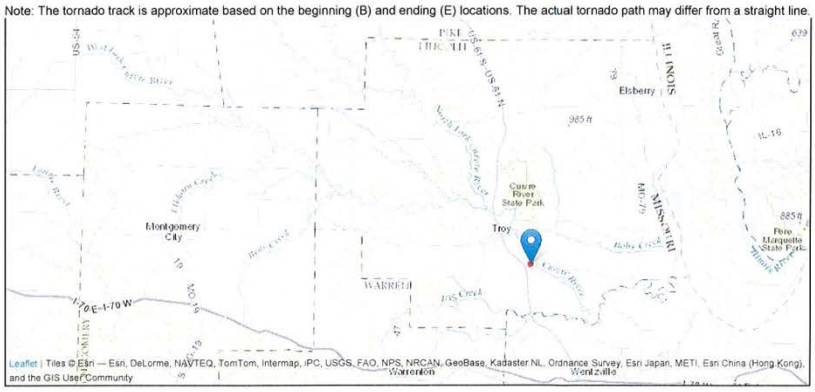
Storm Events Database

Event Details:

Event	**Tornado**
-- Scale	**F0**
-- Length	**.2 Miles**
-- Width	**50 Yards**
State	**MISSOURI**
County/Area	**LINCOLN**
WFO	**LSX**
Report Source	**LAW ENFORCEMENT**
NCEI Data Source	**PDS**
Begin Date	**2005-06-13 16:25:00.0 CST**
Begin Lat/Lon	**38.95/-90.92**
End Date	**2005-06-13 16:25:00.0 CST**
End Location	**MOSCOW MILLS**
End Lat/Lon	**38.95/-90.92**
Deaths Direct/Indirect	**0/0** (fatality details below, when available...)
Injuries Direct/Indirect	**0/0**
Property Damage	
Crop Damage	
Event Narrative	**An off duty Sheriff Deputy reported a small tornado near Meyer Road and Highway C. There was no damage.**

Event Map:

Note: The tornado track is approximate based on the beginning (B) and ending (E) locations. The actual tornado path may differ from a straight line.



All events for this episode:

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	0.00K	0.00K
MOSCOW MILLS	LINCOLN CO.	MO	06/13/2005	16:25	CST	Tornado	F0	0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

National Centers for Environmental Information

Storm Events Database

Event Details:

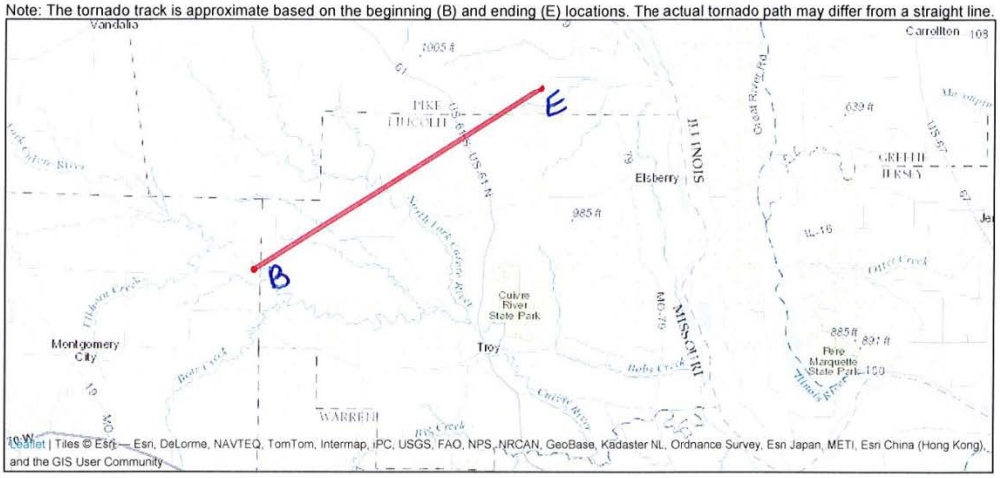
Event	**Tornado**
-- Scale	**F3**
-- Length	**24 Miles**
-- Width	**300 Yards**
State	**MISSOURI**
County/Area	**LINCOLN**
WFO	**LSX**
Report Source	**NWS STORM SURVEY**
NCEI Data Source	**PDS**
Begin Date	**2006-03-13 01:28:00.0 CST**
Begin Location	**2SW OLNEY**
Begin Lat/Lon	**39.07/-91.27**
End Date	**2006-03-13 01:46:00.0 CST**
End Location	**3WNW DAMERON**
End Lat/Lon	**39.25/-90.90**
Deaths Direct/Indirect	**0/0** (fatality details below, when available...)
Injuries Direct/Indirect	**6/0**
Property Damage	**2.5M**
Crop Damage	
Event Narrative	**The tornado that formed in Montgomery County north of Bellflower moved into Lincoln County, strengthened, and caused extensive damage along Highway E on the north side of Olney. A home was completely destroyed as the tornado reached F3 intensity and was about 300 yards wide. The family at home escaped injury as they had taken shelter in the basement. About 1:35 am CST, the tornado destroyed a home and caused damage to a home business along Highway H northwest of Silex. At this point the tornado was a strong F2 and about 200 yards wide. A man in the home that was destroyed suffered a broken leg. At the home business, the home suffered roof damage and had the north side brick wall pulled off of the house. A large machine shed suffered extensive damage and a 50 foot travel trailer and the pickup truck it was attached too were blown onto their sides. The tornado continued northeast and primarily crossed over wildlife and conservation areas south of Whiteside. The tornado crossed US Highway 61 near the intersection with Highway F about 1:40 am CST and caused minor damage at a farm and a couple of homes. An old barn was destroyed, a metal shed was destroyed, a garage had the door buckled and windows blown out. A nearly constant trail of tree damage continued as the tornado approached the Lincoln Pike County line west of Dameron about 1:46 am CST.**

Figure 3.19. Details and Path of March 13, 2006 Tornado, Olney

(2-B)

Event Map:

Note: The tornado track is approximate based on the beginning (B) and ending (E) locations. The actual tornado path may differ from a straight line.



All events for this episode:

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	6	2.700M	0.00K
BELLFLOWER	MONTGOMERY CO.	MO	03/13/2006	01:20	CST	Tornado	F2	0	0	200.00K	0.00K
OLNEY	LINCOLN CO.	MO	03/13/2006	01:28	CST	Tornado	F3	0	6	2.500M	0.00K
ANNADA	PIKE CO.	MO	03/13/2006	01:46	CST	Tornado	F0	0	0	0.00K	0.00K
Totals:								0	6	2.700M	0.00K

Figure 3.20. Details and Path of March 13, 2006 Tornado, Millwood

National Centers for Environmental Information

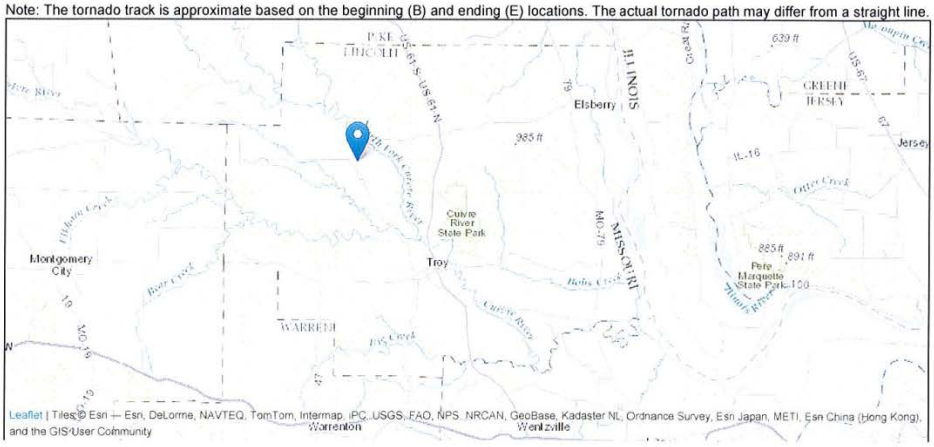
Storm Events Database

Event Details:

Event	**Tornado**
-- Scale	**F1**
-- Length	**.2 Miles**
-- Width	**75 Yards**
State	**MISSOURI**
County/Area	**LINCOLN**
WFO	**LSX**
Report Source	**NWS STORM SURVEY**
NCEI Data Source	**PDS**
Begin Date	**2006-03-13 01:36:00.0 CST**
Begin Location	**1E MILLWOOD**
Begin Lat/Lon	**39.10/-91.08**
End Date	**2006-03-13 01:36:00.0 CST**
End Location	**1E MILLWOOD**
End Lat/Lon	**39.10/-91.08**
Deaths Direct/Indirect	**0/0** (fatality details below, when available...)
Injuries Direct/Indirect	**0/0**
Property Damage	
Crop Damage	
Event Narrative	**A small tornado hit along Highway E about 1 mile east of Millwood. A barn and 2 grain bins were destroyed. Several other buildings had roof damage.**

Event Map:

Note: The tornado track is approximate based on the beginning (B) and ending (E) locations. The actual tornado path may differ from a straight line.



All events for this episode:

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD

Totals:								0	0	0.00K	0.00K
MILLWOOD	LINCOLN CO.	MO	03/13/2006	01:36	CST	Tornado	F1	0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

Figure 3.21. Details and Path of October 2, 2007 Tornado, Hawk Point

National Centers for Environmental Information

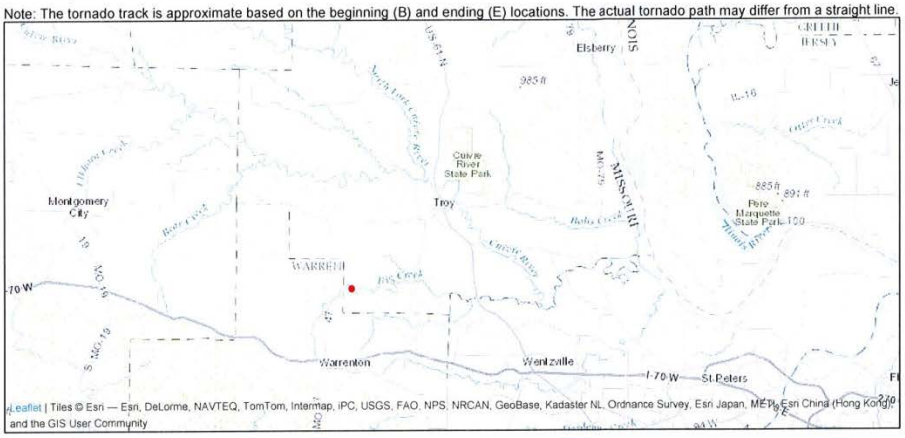
Storm Events Database

Event Details:

Event	**Tornado**
-- Scale	**EF0**
-- Length	**0.05 Miles**
-- Width	**30 Yards**
State	**MISSOURI**
County/Area	**LINCOLN**
WFO	**LSX**
Report Source	**NWS Storm Survey**
NCEI Data Source	**CSV**
Begin Date	**2007-10-02 18:18:00.0 CST-6**
Begin Location	**5SSE HAWK PT**
Begin Lat/Lon	**38.8989/-91.099**
End Date	**2007-10-02 18:19:00.0 CST-6**
End Location	**5SSE HAWK PT**
End Lat/Lon	**38.8991/-91.0986**
Deaths Direct/Indirect	**0/0** (fatality details below, when available...)
Injuries Direct/Indirect	**0/0**
Property Damage	
Crop Damage	**0.00K**
Episode Narrative	**A strong cold front moved through the region, triggering showers and thunderstorms. Several low-topped supercells produced 8 tornadoes and straight line wind damage from central and northeast Missouri to west central Illinois during the evening of October 2nd.**
Event Narrative	**A tornado briefly touched down around 5 miles south southeast of Hawk Point, near Big Creek on North Rock Church Road. It damaged half a dozen trees. The tree tops were sheared off wtih tree limbs up to 2 feet in diameter thrown in different directions.**

Event Map:

Note: The tornado track is approximate based on the beginning (B) and ending (E) locations. The actual tornado path may differ from a straight line.



All events for this episode:

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	2	310.00K	0.00K
WOODLAWN	MONROE CO.	MO	10/02/2007	15:45	CST-6	Tornado	EF2	0	1	60.00K	0.00K
GRANVILLE	MONROE CO.	MO	10/02/2007	15:49	CST-6	Thunderstorm Wind	56 kts. EG	0	0	0.00K	0.00K
NORTH FORK	MONROE CO.	MO	10/02/2007	15:57	CST-6	Thunderstorm Wind	56 kts. EG	0	0	0.00K	0.00K
NORTH FORK	MONROE CO.	MO	10/02/2007	16:00	CST-6	Thunderstorm Wind	70 kts. EG	0	0	50.00K	0.00K
ELY	MARION CO.	MO	10/02/2007	16:14	CST-6	Tornado	EF0	0	0	0.00K	0.00K
WOODLAND	MARION CO.	MO	10/02/2007	16:29	CST-6	Tornado	EF1	0	1	100.00K	0.00K
PALMYRA	MARION CO.	MO	10/02/2007	16:30	CST-6	Tornado	EF0	0	0	50.00K	0.00K
HANNIBAL MUNI ARPT	MARION CO.	MO	10/02/2007	16:35	CST-6	Tornado	EF0	0	0	0.00K	0.00K
BUELL	MONTGOMERY CO.	MO	10/02/2007	17:17	CST-6	Tornado	EF0	0	0	50.00K	0.00K
HAWK PT	LINCOLN CO.	MO	10/02/2007	18:18	CST-6	Tornado	EF0	0	0	0.00K	0.00K
Totals:								0	2	310.00K	0.00K

Figure 3.22. Details and Path of December 27, 2008 Tornado, Davis

National Centers for Environmental Information

Storm Events Database

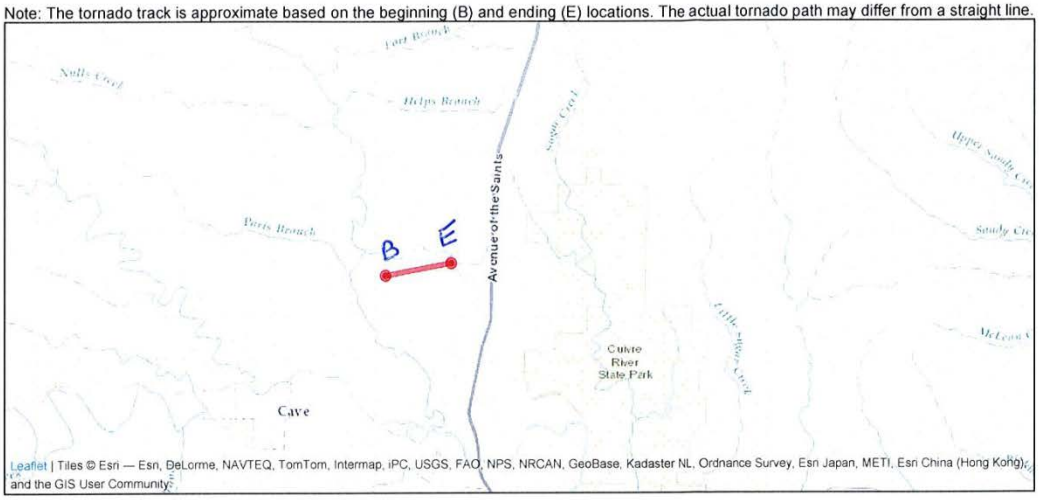
Event Details:

Event	**Tornado**
-- Scale	**EF1**
-- Length	**1.12 Miles**
-- Width	**40 Yards**
State	**MISSOURI**
County/Area	**LINCOLN**
WFO	**LSX**
Report Source	**NWS Storm Survey**
NCEI Data Source	**CSV**
Begin Date	**2008-12-27 11:10:00.0 CST-6**
Begin Location	**1SSE DAVIS**
Begin Lat/Lon	**39.0537/-91.0072**
End Date	**2008-12-27 11:12:00.0 CST-6**
End Location	**1NW HINES**
End Lat/Lon	**39.0566/-90.9866**
Deaths Direct/Indirect	**0/0** (fatality details below, when available...)
Injuries Direct/Indirect	**0/0**
Property Damage	**0.00K**
Crop Damage	**0.00K**
Episode Narrative	**A strong cold front moved through the region...triggering showers and thunderstorms. Some of the thunderstorms became severe with large hail, damaging winds, tornadoes and flash flooding reported.**
Event Narrative	**A tornado touched down 3 miles east of Davis in an open field west of a farmstead and destroyed a 2 story barn. Six by six supports from the barn where driven into the ground near the farm house. The home was about 60 yards to the northeast of the barn and was heavily damaged by the tornado. As the tornado travelled to the east, a couple of new homes sustained minor roof damage on Penrod Road. It continued to the east northeast and damaged three additional machine sheds as well as numerous trees before lifting and dissipating.**

 SB

Event Map:

Note: The tornado track is approximate based on the beginning (B) and ending (E) locations. The actual tornado path may differ from a straight line.



All events for this episode:

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	0.00K	0.00K
SHELBINA	SHELBY CO.	MO	12/27/2008	01:07	CST-6	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
EWING	LEWIS CO.	MO	12/27/2008	09:20	CST-6	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
COLUMBIA	BOONE CO.	MO	12/27/2008	09:26	CST-6	Hail	0.88 in.	0	0	0.00K	0.00K
CANTON	LEWIS CO.	MO	12/27/2008	09:35	CST-6	Thunderstorm Wind	56 kts. EG	0	0	0.00K	0.00K
CENTER	RALLS CO.	MO	12/27/2008	10:03	CST-6	Tornado	EF0	0	0	0.00K	0.00K
RUSH HILL	AUDRAIN CO.	MO	12/27/2008	10:03	CST-6	Tornado	EF1	0	0	0.00K	0.00K
FLINTHILL	RALLS CO.	MO	12/27/2008	10:07	CST-6	Tornado	EF0	0	0	0.00K	0.00K
VANDALIA	AUDRAIN CO.	MO	12/27/2008	10:08	CST-6	Thunderstorm Wind	61 kts. EG	0	0	0.00K	0.00K
BOWLING GREEN	PIKE CO.	MO	12/27/2008	10:37	CST-6	Thunderstorm Wind	61 kts. EG	0	0	0.00K	0.00K
NEW FLORENCE	MONTGOMERY CO.	MO	12/27/2008	10:41	CST-6	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
JONESBURG	MONTGOMERY CO.	MO	12/27/2008	10:58	CST-6	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
DAVIS	LINCOLN CO.	MO	12/27/2008	11:08	CST-6	Thunderstorm Wind	56 kts. EG	0	0	0.00K	0.00K
DAVIS	LINCOLN CO.	MO	12/27/2008	11:10	CST-6	Tornado	EF1	0	0	0.00K	0.00K
CUBA	CRAWFORD CO.	MO	12/27/2008	12:32	CST-6	Thunderstorm Wind	61 kts. EG	0	0	0.00K	0.00K
STEELVILLE	CRAWFORD CO.	MO	12/27/2008	12:32	CST-6	Thunderstorm Wind	50 kts. MG	0	0	0.00K	0.00K
BEAUFORT	FRANKLIN CO.	MO	12/27/2008	12:45	CST-6	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
BOURBON	CRAWFORD CO.	MO	12/27/2008	12:45	CST-6	Thunderstorm Wind	61 kts. EG	0	0	0.00K	0.00K
NEW MELLE	ST. CHARLES CO.	MO	12/27/2008	13:17	CST-6	Flash Flood		0	0	0.00K	0.00K
WASHINGTON MEM ARPT	FRANKLIN CO.	MO	12/27/2008	13:17	CST-6	Flash Flood		0	0	0.00K	0.00K
CHESTERFIELD	ST. LOUIS CO.	MO	12/27/2008	13:40	CST-6	Flash Flood		0	0	0.00K	0.00K
FENTON	ST. LOUIS CO.	MO	12/27/2008	13:50	CST-6	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
HILLSBORO	JEFFERSON CO.	MO	12/27/2008	14:18	CST-6	Flash Flood		0	0	0.00K	0.00K
FARMINGTON	ST. FRANCOIS CO.	MO	12/27/2008	15:07	CST-6	Thunderstorm Wind	56 kts. EG	0	0	0.00K	0.00K
ST LOUIS	ST. LOUIS (C) CO.	MO	12/27/2008	15:07	CST-6	Flash Flood		0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

Figure 3.23. Details and Path of April 23, 2010 Tornado, Hawk Point

National Centers for Environmental Information

Storm Events Database

Event Details:

Event	**Tornado**
-- Scale	**EF0**
-- Length	**0.21 Miles**
-- Width	**20 Yards**
State	**MISSOURI**
County/Area	**LINCOLN**
WFO	**LSX**
Report Source	**Trained Spotter**
NCEI Data Source	**CSV**
Begin Date	**2010-04-23 18:29:00.0 CST-6**
Begin Location	**1W HAWK PT**
Begin Lat/Lon	**38.97/-91.1486**
End Date	**2010-04-23 18:30:00.0 CST-6**
End Location	**1W HAWK PT**
End Lat/Lon	**38.9725/-91.1464**
Deaths Direct/Indirect	**0/0** (fatality details below, when available...)
Injuries Direct/Indirect	**0/0**
Property Damage	**0.00K**
Crop Damage	**0.00K**
Episode Narrative	**Storms formed south of a warm front and moved north, interacting with the frontal boundary. Some of the storms produced brief tornado touch downs, while others produced very heavy rainfall.**
Event Narrative	**A tornado briefly touched down in a field. No damage was reported.**

Event Map:

Note: The tornado track is approximate based on the beginning (B) and ending (E) locations. The actual tornado path may differ from a straight line.

All events for this episode:

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	0.00K	0.00K
PENDLETON	WARREN CO.	MO	04/23/2010	17:40	CST-6	Tornado	EF0	0	0	0.00K	0.00K
NEW TRUXTON	WARREN CO.	MO	04/23/2010	18:11	CST-6	Tornado	EF0	0	0	0.00K	0.00K
HAWK PT	LINCOLN CO.	MO	04/23/2010	18:29	CST-6	Tornado	EF0	0	0	0.00K	0.00K
SILEX	LINCOLN CO.	MO	04/23/2010	18:48	CST-6	Tornado	EF0	0	0	0.00K	0.00K
CALIFORNIA	MONITEAU CO.	MO	04/23/2010	19:10	CST-6	Flash Flood		0	0	0.00K	0.00K
SILEX	LINCOLN CO.	MO	04/23/2010	19:14	CST-6	Tornado	EF0	0	0	0.00K	0.00K
MIDWAY	BOONE CO.	MO	04/23/2010	20:13	CST-6	Flash Flood		0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

Figure 3.24. Details and Path of April 23, 2010 Tornado, Silex/Millwood

National Centers for Environmental Information

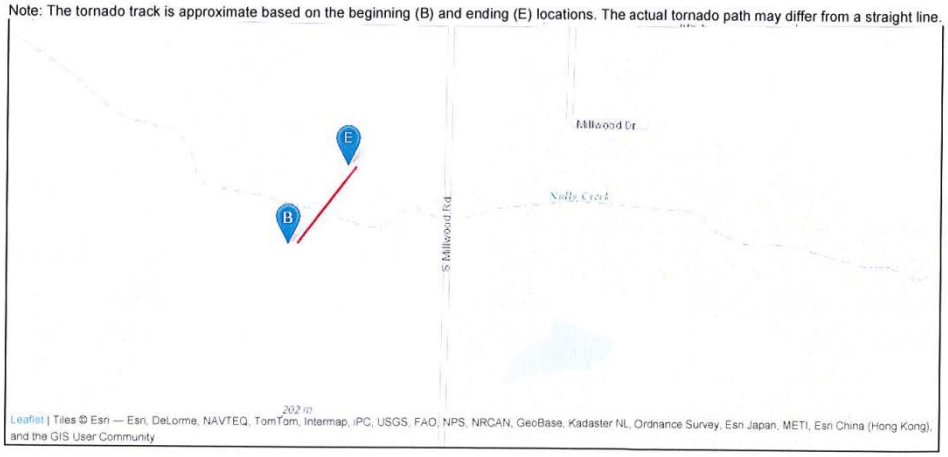
Storm Events Database

Event Details:

Event	**Tornado**
-- Scale	**EF0**
-- Length	**0.11 Miles**
-- Width	**10 Yards**
State	**MISSOURI**
County/Area	**LINCOLN**
WFO	**LSX**
Report Source	**Storm Chaser**
NCEI Data Source	**CSV**
Begin Date	**2010-04-23 18:48:00.0 CST-6**
Begin Location	**3SW SILEX**
Begin Lat/Lon	**39.0993/-91.1096**
End Date	**2010-04-23 18:49:00.0 CST-6**
End Location	**0W MILLWOOD**
End Lat/Lon	**39.1006/-91.1083**
Deaths Direct/Indirect	**0/0** (fatality details below, when available...)
Injuries Direct/Indirect	**0/0**
Property Damage	**0.00K**
Crop Damage	**0.00K**
Episode Narrative	**Storms formed south of a warm front and moved north, interacting with the frontal boundary. Some of the storms produced brief tornado touch downs, while others produced very heavy rainfall.**
Event Narrative	**A tornado briefly touched down in a field. No damage was reported.**

Event Map:

Note: The tornado track is approximate based on the beginning (B) and ending (E) locations. The actual tornado path may differ from a straight line.



All events for this episode:

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	0.00K	0.00K
PENDLETON	WARREN CO.	MO	04/23/2010	17:40	CST-6	Tornado	EF0	0	0	0.00K	0.00K
NEW TRUXTON	WARREN CO.	MO	04/23/2010	18:11	CST-6	Tornado	EF0	0	0	0.00K	0.00K
HAWK PT	LINCOLN CO.	MO	04/23/2010	18:29	CST-6	Tornado	EF0	0	0	0.00K	0.00K
SILEX	LINCOLN CO.	MO	04/23/2010	18:48	CST-6	Tornado	EF0	0	0	0.00K	0.00K
CALIFORNIA	MONITEAU CO.	MO	04/23/2010	19:10	CST-6	Flash Flood		0	0	0.00K	0.00K
SILEX	LINCOLN CO.	MO	04/23/2010	19:14	CST-6	Tornado	EF0	0	0	0.00K	0.00K
MIDWAY	BOONE CO.	MO	04/23/2010	20:13	CST-6	Flash Flood		0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

Figure 3.25. Details and Path of April 23, 2010 Tornado, Silex

National Centers for Environmental Information

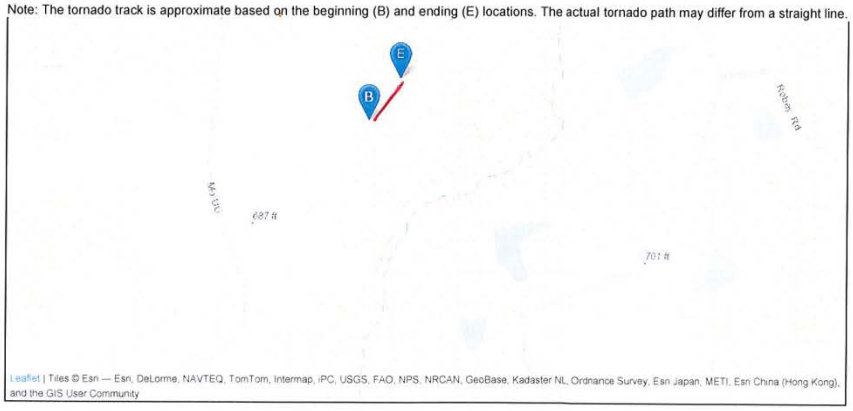
Storm Events Database

Event Details:

Event	**Tornado**
-- Scale	**EF0**
-- Length	**0.14 Miles**
-- Width	**10 Yards**
State	**MISSOURI**
County/Area	**LINCOLN**
WFO	**LSX**
Report Source	**Trained SPOTTER**
NCEI Data Source	**CSV**
Begin Date	**2010 9:14:00.0 CST-6**
Begin Location	**2NNE SILEX**
Begin Lat/Lon	**39.1583/-91.0586**
End Date	**2010-04-23 19:15:00.0 CST-6**
End Location	**2NNE SILEX**
End Lat/Lon	**39.1598/-91.0571**
Deaths Direct/Indirect	**0/0** (fatality details below, when available...)
Injuries Direct/Indirect	**0/0**
Property Damage	**0.00K**
Crop Damage	**0.00K**
Episode Narrative	**Storms formed south of a warm front and moved north, interacting with the frontal boundary. Some of the storms produced brief tornado touch downs, while others produced very heavy rainfall.**
Event Narrative	**A tornado briefly touched down in a field. No damage was reported.**

Event Map:

Note: The tornado track is approximate based on the beginning (B) and ending (E) locations. The actual tornado path may differ from a straight line.



All events for this episode:

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	0.00K	0.00K
PENDLETON	WARREN CO.	MO	04/23/2010	17:40	CST-6	Tornado	EF0	0	0	0.00K	0.00K
NEW TRUXTON	WARREN CO.	MO	04/23/2010	18:11	CST-6	Tornado	EF0	0	0	0.00K	0.00K
HAWK PT	LINCOLN CO.	MO	04/23/2010	18:29	CST-6	Tornado	EF0	0	0	0.00K	0.00K
SILEX	LINCOLN CO.	MO	04/23/2010	18:48	CST-6	Tornado	EF0	0	0	0.00K	0.00K
CALIFORNIA	MONITEAU CO.	MO	04/23/2010	19:10	CST-6	Flash Flood		0	0	0.00K	0.00K
SILEX	LINCOLN CO.	MO	04/23/2010	19:14	CST-6	Tornado	EF0	0	0	0.00K	0.00K
MIDWAY	BOONE CO.	MO	04/23/2010	20:13	CST-6	Flash Flood		0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

Figure 3.26. Details and Path of January 29, 2014 Tornado, Chain of Rocks

National Centers for Environmental Information

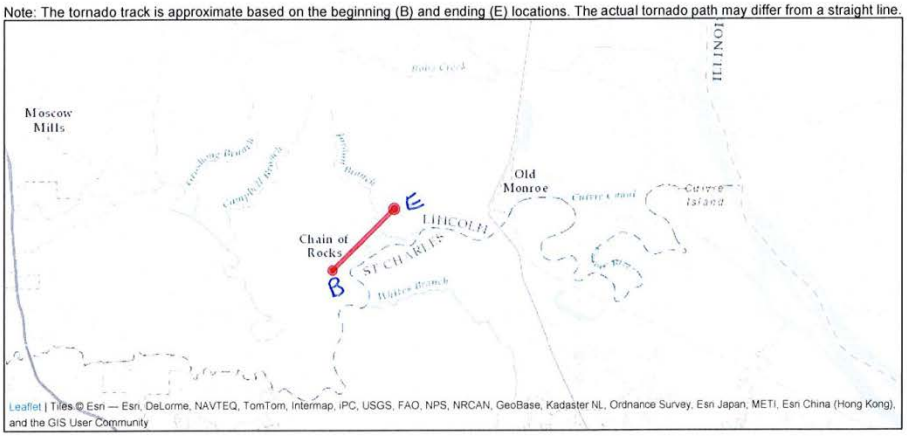
Storm Events Database

Event Details:

Event	Tornado
-- Scale	EF0
-- Length	1.88 Miles
-- Width	30 Yards
State	MISSOURI
County/Area	LINCOLN
WFO	LSX
Report Source	NWS Storm Survey
NCEI Data Source	CSV
Begin Date	2013-01-29 15:36:00.0 CST-6
Begin Location	1SW CHAIN OF ROCKS
Begin Lat/Lon	38.9113/-90.8106
End Date	2013-01-29 15:37:00.0 CST-6
End Location	1NE CHAIN OF ROCKS
End Lat/Lon	38.9282/-90.7987
Deaths Direct/Indirect	0/0 (fatality details below, when available...)
Injuries Direct/Indirect	0/0
Property Damage	
Crop Damage	0.00K
Episode Narrative	A strong cold front moved through the region, triggering showers and thunderstorms. Some of the thunderstorms produced large hail, damaging winds and a couple of tornadoes.
Event Narrative	A tornado touched down along Sycamore Bend Road just southwest of Chain of Rocks. A clear path of tree damage was found south of Sycamore Bend Road, where small branches were snapped from most of the trees within a path that was approximately 20 to 30 yards wide. Some minor roof damage was also noted in this area. The top of one pine tree was snapped off and the tree top was thrown to the northeast. The tornado crossed Sycamore Bend Road and continued northeastward along Jordan Road. A few tree trunks were snapped and several large branches were snapped among the trees along both sides of the road near the Jordan Branch Creek. Minor roof damage was found to several residences along Jordan Road north of the creek. The tornado lifted just south of Highway C.

Event Map:

Note: The tornado track is approximate based on the beginning (B) and ending (E) locations. The actual tornado path may differ from a straight line.



All events for this episode:

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	0.00K	0.00K
ST MARTIN	COLE CO.	MO	01/29/2013	12:45	CST-6	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
HOLTS SUMMIT	CALLAWAY CO.	MO	01/29/2013	13:00	CST-6	Thunderstorm Wind	56 kts. EG	0	0	0.00K	0.00K
WILLIAMSBURG	CALLAWAY CO.	MO	01/29/2013	13:30	CST-6	Thunderstorm Wind	56 kts. EG	0	0	0.00K	0.00K
ARGYLE	OSAGE CO.	MO	01/29/2013	14:20	CST-6	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
BYRON	OSAGE CO.	MO	01/29/2013	14:30	CST-6	Hail	0.88 in.	0	0	0.00K	0.00K
JUDGE	OSAGE CO.	MO	01/29/2013	14:40	CST-6	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
CONCORD HILL	WARREN CO.	MO	01/29/2013	15:14	CST-6	Tornado	EF1	0	0	0.00K	0.00K
FLINT HILL	ST. CHARLES CO.	MO	01/29/2013	15:29	CST-6	Thunderstorm Wind	52 kts. EG	0	0	0.00K	0.00K
CHAIN OF ROCKS	LINCOLN CO.	MO	01/29/2013	15:36	CST-6	Tornado	EF0	0	0	0.00K	0.00K
OLD MONROE	LINCOLN CO.	MO	01/29/2013	15:37	CST-6	Thunderstorm Wind	56 kts. EG	0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

Figure 3.27. Details and Path of June 13, 2015 Tornado, Hawk Point

National Centers for Environmental Information

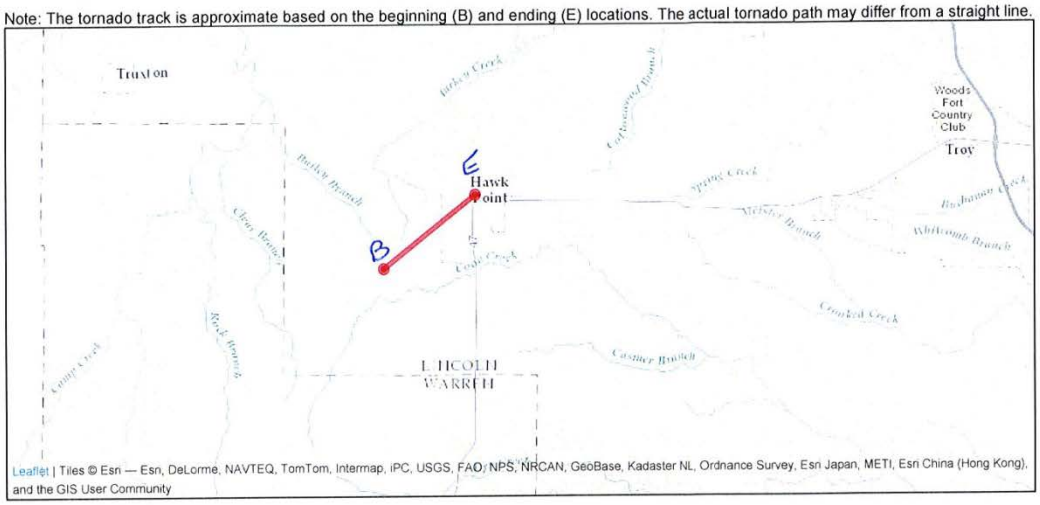
Storm Events Database

Event Details:

Event	**Tornado**
-- Scale	**EF1**
-- Length	**1.95 Miles**
-- Width	**50 Yards**
State	**MISSOURI**
County/Area	**LINCOLN**
WFO	**LSX**
Report Source	**NWS Storm Survey**
NCEI Data Source	**CSV**
Begin Date	**2015-06-13 17:45:00.0 CST-6**
Begin Location	**2WSW HAWK PT**
Begin Lat/Lon	**38.9572/-91.1576**
End Date	**2015-06-13 17:50:00.0 CST-6**
End Location	**0N HAWK PT**
End Lat/Lon	**38.9748/-91.1292**
Deaths Direct/Indirect	**0/0** (fatality details below, when available...)
Injuries Direct/Indirect	**0/0**
Property Damage	**0.00K**
Crop Damage	**0.00K**
Episode Narrative	**As a cold front approached the region, thunderstorms developed ahead of it producing some severe weather.**
Event Narrative	**A weak tornado formed on the leading edge of a line of thunderstorms as it approached the town of Hawk Point in Lincoln County, Missouri. The tornado touched down at a farm home where 3 trees were uprooted or snapped. Minor damage occurred at the home, but an outbuilding was completely destroyed with large debris thrown over 100 yards into an adjacent farm field. The tornado continued on the ground for another almost 2 miles, causing relatively minor damage to homes in the town of Hawk Point. Several large trees were uprooted as well, however the ground was very wet due to previous rains. The tornado severely damaged a business on the north side of town, but the damage was likely exacerbated by implosion of a garage bay door, allowing the roof to be lifted off and one exterior wall to collapse. The tornado lifted shortly thereafter. No injuries or deaths were reported. The tornado was rated EF1 with a max path width of 50 yards. The tornado path length was 1.95 miles.**

Event Map:

Note: The tornado track is approximate based on the beginning (B) and ending (E) locations. The actual tornado path may differ from a straight line.



All events for this episode:

Location	County/Zone	St.	Date	Time	T.Z.	Type	Mag	Dth	Inj	PrD	CrD
Totals:								0	0	0.00K	0.00K
PROVIDENCE	BOONE CO.	MO	06/13/2015	15:55	CST-6	Thunderstorm Wind	56 kts. EG	0	0	0.00K	0.00K
HAWK PT	LINCOLN CO.	MO	06/13/2015	17:45	CST-6	Tornado	EF1	0	0	0.00K	0.00K
Totals:								0	0	0.00K	0.00K

Probability of Future Occurrence

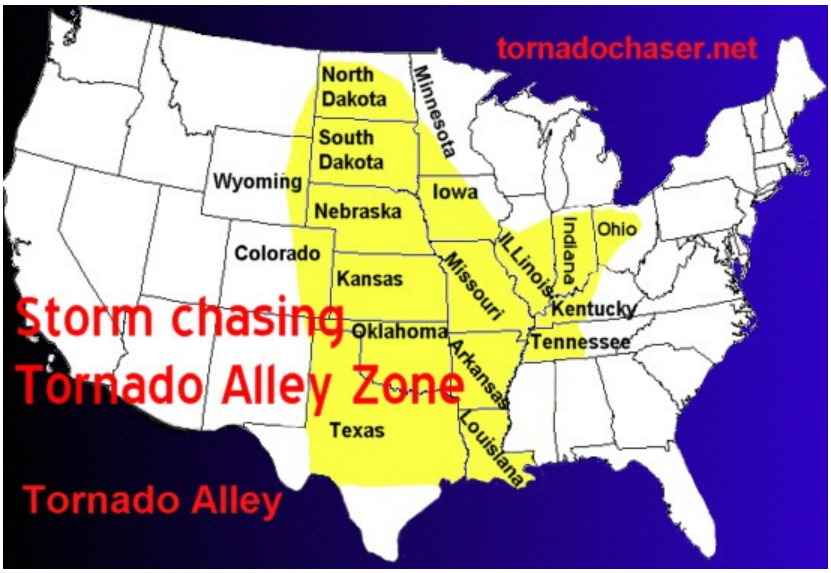
Using the NCDC data of 10 tornadoes between 2005 and 2015, the probability of a tornado striking Lincoln County in any given year is 100%.

Vulnerability

Vulnerability Overview

Lincoln County is located within a region of the U.S. with a high frequency of dangerous and destructive tornadoes referred to as "Tornado Alley". The term first appeared in 1952 as the title of a research project focusing on severe weather in parts of Texas, Oklahoma, Kansas, North and South Dakota, Iowa, Missouri, New Mexico, Colorado, and Minnesota. It is a largely media-driven term.

Figure 3.28. Tornado Alley in the U.S.



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

The state HMP 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 as of 2012 (1-3), population change from 2000 - 2010 (1-3), housing change from 2000-2010 (1-3). The factor scores were added up for each county for the purposes of ranking the counties by total vulnerability. This approach attempts to identify where tornadoes could have the greatest impacts. Devastating tornadoes could still impact counties that ranked lower in this process.

For this reason, the low end of the risk is still considered Moderate and the top end Very High. Counties with a total risk score of eight to nine were considered to be at very high risk. The rating values of all factors were then combined to determine the overall vulnerability rating.

The two-part table below, taken from the 2013 Missouri State Hazard Mitigation Plan, shows Lincoln County's total vulnerability as Very High. Lincoln County is one of the 5 fastest growing counties in the state which partially accounts for its total vulnerability being scored Very High. Note that the number of tornados and the percent likelihood of occurrence differ from either of the previously cited numbers. This is likely due to the range of years the state used for their calculations.

Table 3.41. Vulnerability Calculations from 2013 Missouri HMP

County	# Tornados	Likelihood of Occurrence	Probability Rating	Total Exposure	Annualized Historical Loss	Loss Ratio
Lincoln	16	26.02%	2	$ 4,340,031,000	$ 89,265	0.002%

Loss Ratio Rating	Population Growth % Change	Population Change Rating	Housing % Change	Housing Ratio Change	Total Vulnerability
1	35.0%	3	36.50%	3	Very High

Source: 2013 Missouri State Hazard Mitigation Plan

Potential Losses to Existing Development

Lincoln County has a total exposure of over $4B and an annualized historic loss of $89,265 making the county's vulnerability to loss Very High.

Future Development

Future development is factored into the vulnerability rating above which accounts for a 35.0% population growth and a 36.50% increase in housing. These numbers are likely to be tempered due to a stagnant economy and slow housing market. In addition, three tornado sirens are to be installed during 2017 with the assistance of a FEMA HMA grant.

Hazard Summary by Jurisdiction

A tornado event could occur anywhere in the planning area, but some jurisdictions would suffer heavier damages because of the age of the housing or the high concentration of mobile homes. According to the 2010-2014 ACS Estimates, there are 3,822 mobile homes in the county which account for approximately 18.2% of housing. There are no tornado sirens in unincorporated Lincoln County; however, the chart below lists municipal siren locations.

Table 3.42. Municipal Tornado Sirens in Lincoln County

Municipality	Siren No.	Location
Troy	1	The Legends Subdivision
Troy	2	Water Plant on Boone Street
Troy	3	Behind old City Hall, 200 Main Street
Troy	4	Third and Travis

Municipality	Siren No.	Location
Troy	5	East Cherry Street
Troy	6	MO 47 at Store It and Go Lot (West)
Troy	7	Old Moscow Mills Road and Elm Tree
Troy	8	Crooked Creek on Adelhart (Middle Entrance)
Elsberry	1	Second and Griffin
Elsberry	2	900 Block of Brownsmills Road
Hawk Point	1	121 West Lincoln
Moscow Mills	1	Main Street at Lindenwood
Moscow Mills	2	Tropicana Village Drive
Winfield	1	120 Water Tower Lane
Winfield	2	304 Second Street

Problem Statement

Tornados occur in Lincoln County and they are completely random, striking at will wherever they please. The risk of a tornado is the same in any part of the county but the likelihood of death, injury, and damage is most likely in more developed parts of the county.

3.4.10 Wild Fires

Hazard Profile

Hazard Description

Fire incident types for wild fires include; 1) natural vegetation fire, 2) outside rubbish fire, 3) special outside fire, and 4) cultivated vegetation fire (crop fire).

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

Geographic Location

The risk of wild fires is higher in communities with more wildland–urban interface (WUI) areas. WUI refers to the zone of transition between unoccupied land and human development and needs to be defined in the plan. Within the WUI, there are two specific areas identified: 1) Interface and 2) Intermix. The interface areas are those areas that abut wildland vegetation and the Intermix areas are those areas that intermingle with wildland areas. The following figure shows the Wild Land / Urban interface for Lincoln County. Most of the WUI in Lincoln County is Low Density Intermix and Low Density Interface.

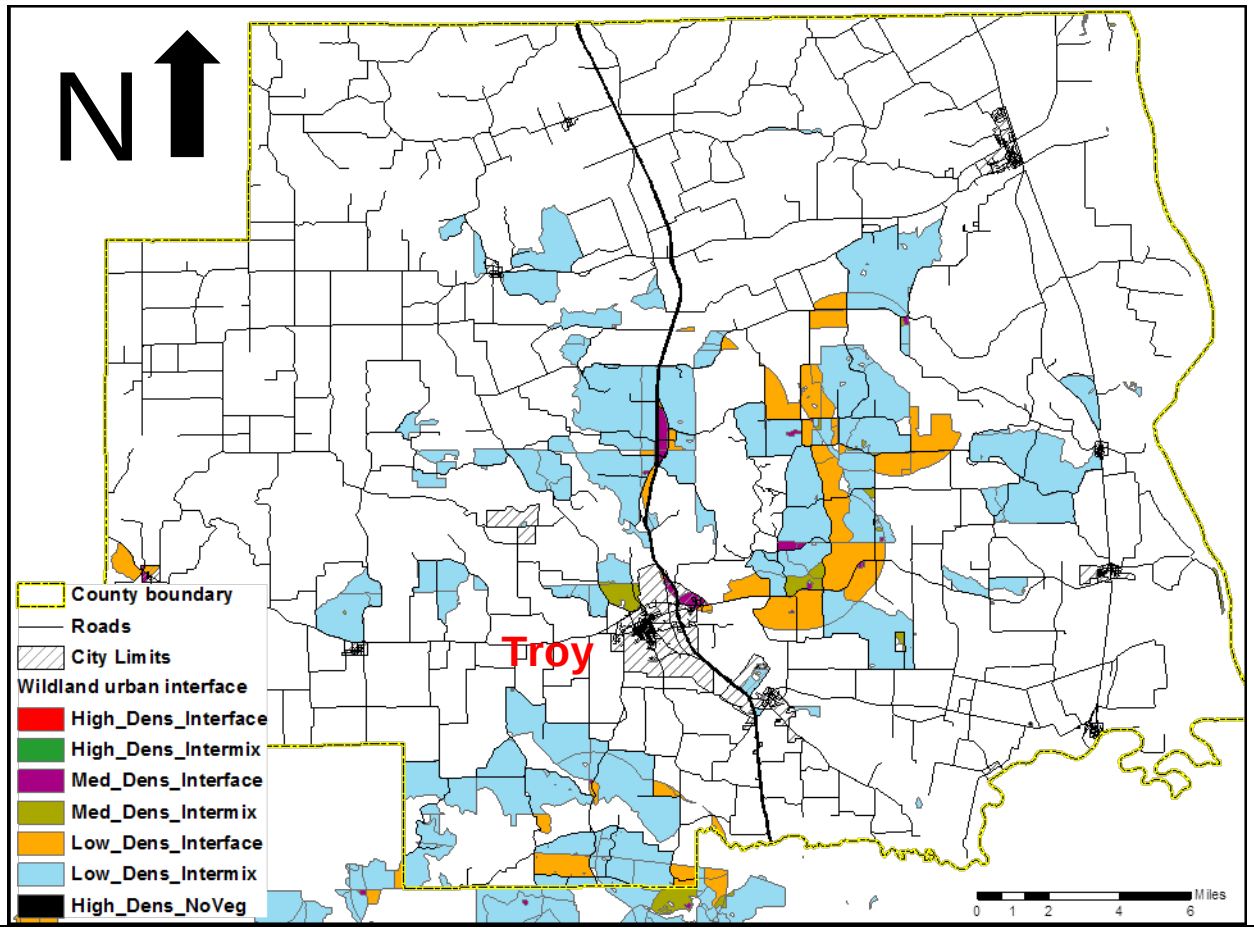


Figure 3.29. Wild Land / Urban Interface of Lincoln County

Source: USDA Forrest Service

Severity/Magnitude/Extent

Wildfires damage the environment, killing some plants and occasionally animals. Firefighters have been injured or killed, and structures can be damaged or destroyed. The loss of plants can heighten the risk of soil erosion and landslides. Although Missouri wildfires are not the size and intensity of those in the Western United States, they could impact recreation and tourism in and near the fires. Wild fires in Missouri have been mostly a result of human activity rather than lightning or some other natural event. Wildfires in Missouri are usually surface fires, burning the dead leaves on the ground or dried grasses. They do sometimes “torch” or “crown” out in certain dense

evergreen stands like eastern red cedar and shortleaf pine. However, Missouri does not have the extensive stands of evergreens found in the western US that fuel the large fire storms seen on television news stories.

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

Previous Occurrences

According to SEMA, wildfires are most common in the southern districts of the state. However, it is possible for wildfires to occur in Lincoln County due to drought, debris burning, and incendiary fires. Debris burning is consistently the number one cause of wildfires. Incendiary fires, willfully set on another person's property, continue to rank second in the number of wildfires each year. Fires caused by natural ignition, like lightning, are rare despite 50 to 70 thunderstorm days per year.

According to the Missouri Department of Conservation website data, during the period of January 1, 2005 through December 31, 2015; 479 wild fires burned 2,600 acres in Lincoln County. Ninety-three residences were threatened, seven residences damaged, and one residence destroyed. During the same period, 26 outbuildings were threatened, nine outbuildings were damaged, and one destroyed. Four commercial buildings were threatened and none destroyed. Almost half the fires were attributed to debris burning, 34% were of unknown origins, 5% each were classified as Miscellaneous and Equipment, 4% were caused by smoking, and the remaining fires were split between arson, children, campfires, and lightning.

There are no records of schools being damaged or threatened by wild fires in Lincoln County.

Probability of Future Occurrence

Lincoln County experienced 479 wildfires over the period of 15 years for an average of 32 wildfires each year. The average acreage burned per fire is 5.4 acres while the number of acres that appears most frequently, the mode, is one acre.

Vulnerability

Vulnerability Overview

Most of Lincoln County is vulnerable to wildfire; however, damage to property has been minor and no human deaths or injuries can be attributed to them.

Potential Losses to Existing Development

There is no reason to believe that significant changes to wildfire vulnerability will take place.

Impact of Future Development

There is significant growth in unincorporated areas of the county increasing the exposure to wildfire damage. However, as stated earlier, the risk is low and does not promise to increase significantly in the near term.

Problem Statement

Lincoln County will continue to experience wildfire events on a regular basis. However, the acreage burned is relatively small, just two buildings have been destroyed, and there has been no loss of life. It is reasonably certain that wildfire will not be a significant contributor to hazards in the county.

3.4.11 Winter Weather / Snow / Ice / Severe Cold

Hazard Profile

Hazard Description

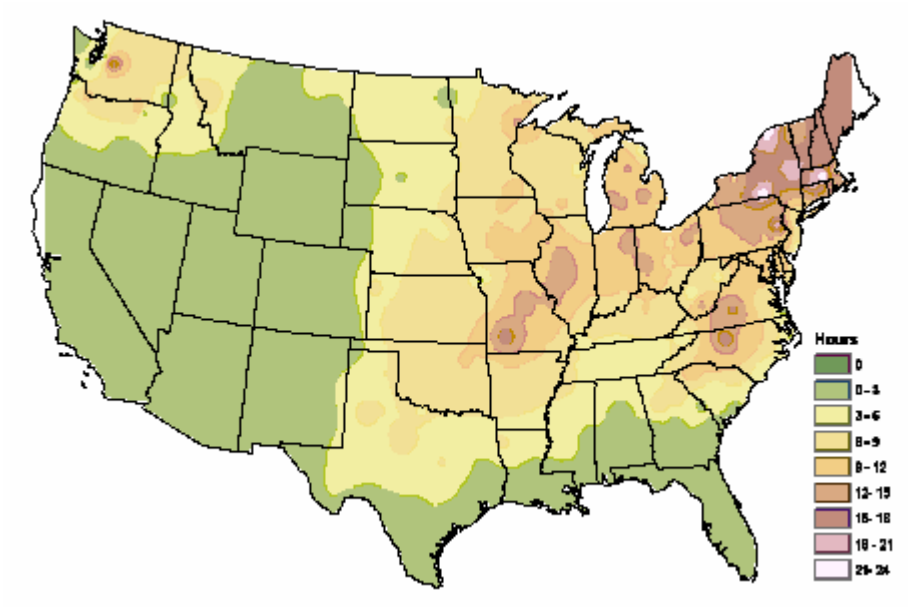
A major winter storm can last for several days and be accompanied by high winds, freezing rain or sleet, heavy snowfall, and cold temperatures. The National Weather Service describes different types of winter storm events as follows.

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

Geographic Location

The entire county is vulnerable to heavy snow, ice, extreme cold temperatures and freezing rain. The figure below shows the average number of hours per year the county receives freezing rain. In the case of Lincoln County the average number of hours per year is 16-18.

Figure 3.30. NWS Statewide Average Number of Hours per Year with Freezing Rain



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

Severity/Magnitude/Extent

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

Extreme cold often accompanies severe winter storms and can lead to hypothermia and frost bite 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**,** the figure below shows the relationship of wind speed to apparent temperature and typical time periods for the onset of frostbite.

Figure 3.31. Wind Chill Chart

Wind (mph)	Temperature (°F)																	
Calm	40	35	30	25	20	15	10	5	0	-5	-10	-15	-20	-25	-30	-35	-40	-45
5	36	31	25	19	13	7	1	-5	-11	-16	-22	-28	-34	-40	-46	-52	-57	-63
10	34	27	21	15	9	3	-4	-10	-16	-22	-28	-35	-41	-47	-53	-59	-66	-72
15	32	25	19	13	6	0	-7	-13	-19	-26	-32	-39	-45	-51	-58	-64	-71	-77
20	30	24	17	11	4	-2	-9	-15	-22	-29	-35	-42	-48	-55	-61	-68	-74	-81
25	29	23	16	9	3	-4	-11	-17	-24	-31	-37	-44	-51	-58	-64	-71	-78	-84
30	28	22	15	8	1	-5	-12	-19	-26	-33	-39	-46	-53	-60	-67	-73	-80	-87
35	28	21	14	7	0	-7	-14	-21	-27	-34	-41	-48	-55	-62	-69	-76	-82	-89
40	27	20	13	6	-1	-8	-15	-22	-29	-36	-43	-50	-57	-64	-71	-78	-84	-91
45	26	19	12	5	-2	-9	-16	-23	-30	-37	-44	-51	-58	-65	-72	-79	-86	-93
50	26	19	12	4	-3	-10	-17	-24	-31	-38	-45	-52	-60	-67	-74	-81	-88	-95
55	25	18	11	4	-3	-11	-18	-25	-32	-39	-46	-54	-61	-68	-75	-82	-89	-97
60	25	17	10	3	-4	-11	-19	-26	-33	-40	-48	-55	-62	-69	-76	-84	-91	-98

Frostbite Times: 30 minutes, 10 minutes, 5 minutes

$$\text{Wind Chill (°F)} = 35.74 + 0.6215T - 35.75(V^{0.16}) + 0.4275T(V^{0.16})$$

Where, T= Air Temperature (°F) V= Wind Speed (mph) *Effective 11/01/01*

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. The table below shows the USDA's Risk Management Agency payments for insured crop losses in Lincoln County as a result of cold conditions and snow for the past 10 years resulting in $408,000 in claims.

Table 3.43. Crop Insurance Claims Paid in Lincoln County as a Result of Cold Conditions and Snow, 2005 - 2015

Crop Year	Crop Name	Cause of Loss Description	Insurance Paid
2005	Wheat	Cold Wet Weather	$88
2005	Corn	Freeze	$139
2005	Corn	Cold Weather	$1,173
2005	Soybeans	Cold Wet Weather	$1,692
2006	Corn	Cold Wet Weather	$816
2006	Soybeans	Cold Wet Weather	$8,929
2007	Wheat	Freeze	$19,694
2007	Corn	Cold Wet Weather	$810
2007	Soybeans	Cold Wet Weather	$1,748
2008	Wheat	Cold Wet Weather	$3,806
2008	Corn	Cold Wet Weather	$900
2009	Wheat	Freeze	$1,128
2009	Wheat	Cold Weather	$9,150

Crop Year	Crop Name	Cause of Loss Description	Insurance Paid
2009	Wheat	Snow	$1,249
2009	Corn	Cold Wet Weather	$14,381
2009	Sorghum	Freeze	$3,880
2009	Soybeans	Cold Weather	$386
2010	Wheat	Cold Weather	$10,937
2010	Wheat	Cold Wet Weather	$52,646
2011	Wheat	Cold Wet Weather	$4,609
2011	Soybeans	Cold Wet Weather	$2,173
2012	Corn	Cold Wet Weather	$12
2012	Corn	Snow	$107,126
2013	Wheat	Cold Wet Weather	$9,825
2013	Wheat	Snow	$9,745
2013	Corn	Cold Wet Weather	$3,645
2013	Corn	Snow	$4,465
2014	Wheat	Freeze	$72,318
2014	Wheat	Cold Weather	$16,528
2014	Wheat	Cold Wet Weather	$35,481
2014	Corn	Cold Wet Weather	$4,935
2014	Soybeans	Cold Wet Weather	$4,431
2015	NA	NA	$0
TOTAL			**$408,845**

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

Previous Occurrences

Since 2006, Lincoln County received four presidential major disaster declarations, and four USDA declarations for this hazard, listed in the table below.

Table 3.44. Disaster Declarations in Lincoln County Involving Winter Storms

Declaration Date	Description	Declaration Type	Disaster Number
January 30, 2009	Severe Winter Storms	Presidential- Major Disaster Declaration	FEMA 3303-DR
March 19, 2008	Severe Winter Storms	Presidential- Major Disaster Declaration	FEMA 1749-DR
December 27, 2007	Severe Winter Storms	Presidential- Major Disaster Declaration	FEMA 1736-DR
December 12, 2007	Severe Winter Storms	Presidential- Major Disaster Declaration	FEMA 3281-DR
January 14, 2007	Severe Winter Storms	Presidential- Major Disaster	FEMA 1676-DR

Declaration Date	Description	Declaration Type	Disaster Number
		Declaration	
December 1, 2007	Winter Storms	USDA	M1676
December 6, 2007	Winter Storms	USDA	N1736
January 12, 2007	Winter Storms	USDA	N873
March 30, 2007	Winter Storms	USDA	S2532

Source: NCDC

The table below shows NCDC reported events and damages for the past 10 years.

Table 3.45. NCDC Lincoln County Winter Weather Events Summary, 2005 - 2016

Date	Event	Magnitude	Deaths	Injuries	Property Damage	Crop Damage
11/30/2006	Winter Storm	NA	0	0	$ -	$ -
12/1/2006	Winter Storm	NA	0	0	$ -	$ -
1/12/2007	Ice Storm	NA	0	0	$ -	$ -
12/6/2007	Winter Weather	NA	0	0	$ -	$ -
12/8/2007	Ice Storm	NA	0	0	$ -	$ -
12/15/2007	Heavy Snow	NA	0	0	$ -	$ -
1/31/2008	Heavy Snow	NA	0	0	$ -	$ -
2/1/2008	Heavy Snow	NA	0	0	$ -	$ -
2/21/2008	Sleet	NA	0	0	$ -	$ -
1/1/2010	Cold/Wind Chill	NA	0	0	$ -	$ -
1/6/2010	Winter Weather	NA	0	0	$ -	$ -
1/19/2011	Heavy Snow	NA	0	0	$ -	$ -
1/31/2011	Winter Storm	NA	0	0	$ -	$ -
2/1/2011	Winter Storm	NA	0	0	$ -	$ -
2/1/2011	Blizzard	NA	0	0	$ -	$ -
2/21/2013	Winter Storm	NA	0	0	$ -	$ -
3/24/2013	Heavy Snow	NA	0	0	$ -	$ -
1/5/2014	Winter Storm	NA	0	0	$ -	$ -
1/5/2014	Winter Storm	NA	0	0	$ -	$ -
1/6/2014	Cold/Wind Chill	NA	0	0	$ -	$ -
2/4/2014	Winter Storm	NA	0	0	$ -	$ -
2/15/2015	Heavy Snow	NA	0	0	$ -	$ -

Source: NCDC, data accessed August 16, 2016

Probability of Future Occurrence

According to NCDC data above, Lincoln County has suffered 22 winter events during the past 10 years. This gives the county a 100% chance of receiving severe winter weather of some type during any given year. The average number of events per year is 2.2

Vulnerability

Vulnerability Overview

Severe Winter Weather including snow, ice, and severe cold has caused more damage for Missourians in recent years with five Presidential Declarations since 2007. The method used by the State of Missouri to determine vulnerability to severe winter weather across Missouri was statistical analysis of data from several sources: National Climatic Data Center (NCDC) storm events data (1993 to December 2012), FEMA's Public Assistance (PA) funds from DR-1672, DR-1736, DR-1748, DR-1822, andDR-1961, Crop Insurance Claims data from USDA's Risk Management Agency (1998-2012), total building exposure from HAZUS-MR4, U.S. Census Data (2000), and the USDA's Census of Agriculture (2007).

The following table provides the housing density, building exposure, crop exposure, total incidents, total property loss, and the total crop insurance paid. These are the common data elements for the analysis of severe winter weather. The total property loss column represents a combination of NCDC and FEMAPA funds. For declared events, the PA damage figures were used in lieu of NCDC data. NCDC damages

Table 3.46. Vulnerability of Lincoln County to Winter Weather

County	Housing Units/sq. mi.	Total Building Exposure	Crop Exposure (2007)	Total Incidents	Total $ Property Loss	Total Crop Insurance Paid
Lincoln	33.5	$4,340,031,000	$39,235,000	44	$3,367,547	$132,678

Source: 2013 Missouri State Hazard Mitigation Plan

Potential Losses to Existing Development

NCDC reflects property damage totaling $3.4M over 10 years. Under-reporting and other data limitations may have caused this figure to be lower than it should, but the fact remains that most damages associated with winter weather involve automobile accidents and injuries incurred as people attempt to travel through the winter environment or compensate for low temperatures, rather than as a direct result of winter weather.

Future Development

Using the same vulnerability figures from the section on Tornados, where future development is factored into the vulnerability rating, a 35.0% population growth and a 36.5% increase in housing

will likely drive increased exposure for the county. These numbers are likely to be tempered due to a stagnant economy and slow housing market.

Problem Statement

Lincoln County has some vulnerability to severe winter weather, particularly in regard to transportation. Excessive snowfall, sleet, freezing rain, and icing conditions can overwhelm road crews, hamper emergency response, and bring commerce to a temporary halt.

3.4.12 Hazardous Materials

Hazard Profile

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. Per the updated 2013 State Hazard Mitigation Plan, the hazardous materials included are substances such as toxic chemicals, fuels, nuclear wastes and /or products, and other radiological and biological or chemical agents. In this section, hazardous materials incidents from fixed facilities and transportation accidents are addressed.

Geographic Location

Three major highways cross the county: US 61 (North-South), Missouri Highway 47 (North/South) and Missouri Highway 79 (North-South along the Missouri River). One active railroad runs North-South paralleling the Mississippi River (Burlington Northern & Santa Fe). There are 253 Tier II facilities in Lincoln County that manufacture, store and use hazardous substances. Six pipelines run through the county. There are a number of fixed facilities in Lincoln County that use or store hazardous substances. The eastern edge of the county, including Missouri Highway 79, are located within flood plains. Flooding in the past has resulted in run-off of agricultural chemicals and petroleum products into the Mississippi River. A Hazardous Materials Flow Study was completed at the end of August, 2016.

In addition, the Callaway Nuclear Plant, operated by Ameren Electric of St. Louis, is located near Fulton, in Callaway County. Emergency Management agencies from the At Risk counties of Callaway, Gasconade, Montgomery, and Osage coordinate their Emergency Operations Plans with those of the Callaway plant. Lincoln County is not included in the planning as it is considered to be outside the anticipated risk zone. However, if unforeseen circumstances require portions of Lincoln County to be evacuated due to a release of radioactive material, Lincoln County is prepared to respond using its planned evacuation scenarios.

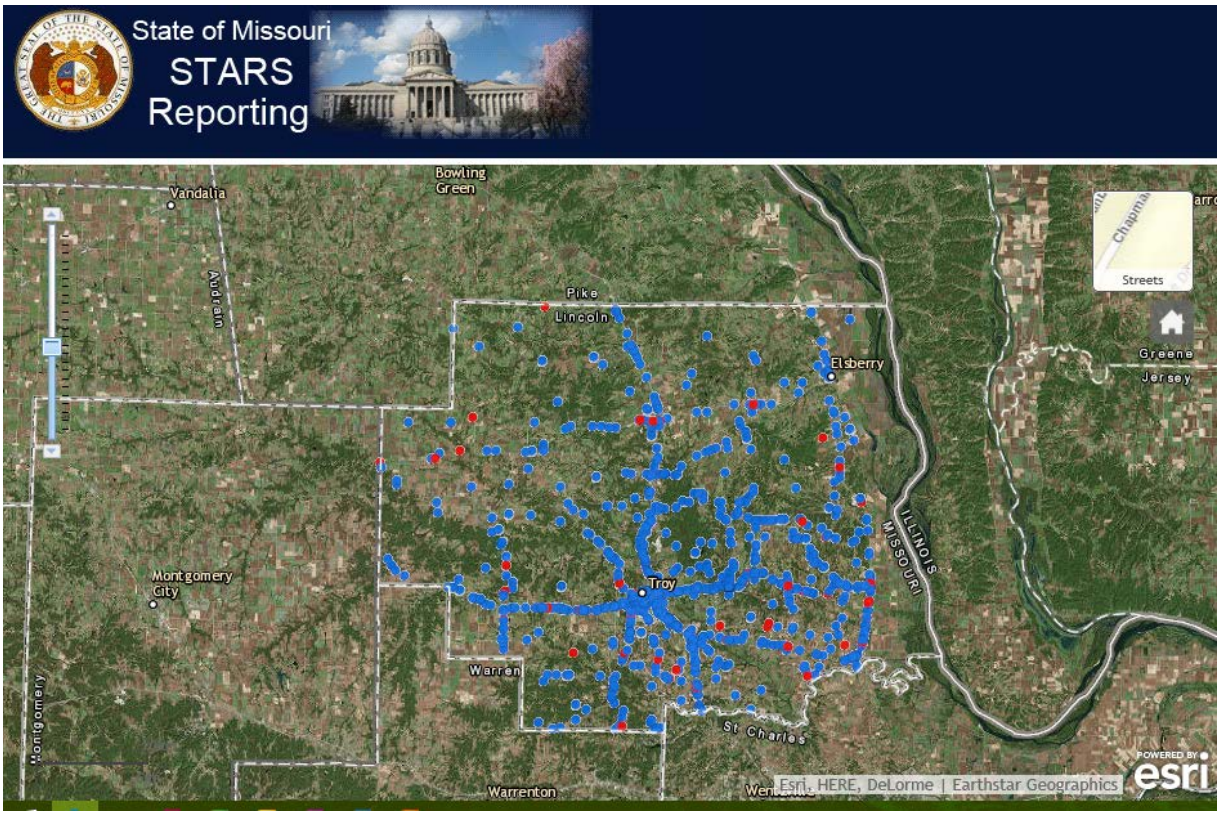
In the event of a serious hazardous materials incident in Lincoln County, most likely it will be a transportation-related accident. Hazardous materials are also transported daily over highways, rail, rivers, and through the skies. A hazardous material incident would mostly likely occur on US 61 or along the Burlington Northern & Santa Fe Railroad. Missouri Highways 47 and 79 could also be the

site of a potential hazardous material incident, but to a lesser extent due to a lighter volume of truck traffic.

Transportation Accidents

According to the Missouri State Highway Patrol crash report, Lincoln County experienced 52 fatal accidents during 2010 through 2015. During the same period there were 1,246 personal injury accidents. Some of these accidents may have contributed to hazardous material spills and road closures consisting of many hours. The figure below is intended to illustrate where the accidents are concentrated. Because of the large number of accidents over 5 years, it is difficult to get an accurate depiction of individual accidents. The blue dots represent personal injury accidents and the red dots signify accidents resulting in deaths.

Figure 3.32. Major Roads Prone to Accidents in Lincoln County



Source: http://www.mshp.dps.mo.gov

Previous Occurrences

The years 2006 through 2009 contained 3,124 accidents in Lincoln County, including fatal, personal injury, and property damage.

Probability of Future Occurrence

Given the already established high accident rate in Lincoln County, the increased volume of traffic, and the deteriorating highway system; the probability of future occurrence is high.

Vulnerability

Vulnerability Overview

The high accident rate in Lincoln County overburdens first responders charged with servicing unincorporated areas of the county and the Cities of Troy, Winfield, and Elsberry through which the high accident prone corridors run. In addition, the possibility of long term road closures due to accidents and hazardous materials spills provide additional stress to local emergency responders. Since 2011, US 61 north and south lanes were closed three times during 2015 due to high water, and MO 79 was closed three times in 2013 and nine times in 2015 due to high water.

Potential Losses to Existing Development

Losses to existing development are primarily due to the cost of jurisdictions responding to accidents within their boundaries.

Future Development

There is an effort underway to reduce the number of grade crossings to a section of US 61 in Lincoln County thereby reducing the potential for traffic accidents. In addition, Lincoln County participates in the Boonslick Region's Transportation Advisory Committee.

Problem Statement

Because Lincoln County is bisected by three major highways, accidents will continue to be an issue, one aggravated by highways designed to carry far fewer vehicles.

3.4.13 Terrorism

Hazard Profile

Hazard Description

Federal Bureau of Investigation (FBI) defines Terrorism as "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." Terrorism causes loss of life, injuries to people and properties, and disruptions in services. According to the State Hazard Mitigation Plan, potential terrorist actions include the following; bombings, airline attacks, weapons of mass destruction (WMD) attacks, Category A agents/infectious release, infrastructure attacks, cyberterrorism, agro-terrorism, arson, kidnappings, and assassinations.

Domestic terrorism is another form of threat which comes from white supremacists, black separatists, animal rights/environmental terrorists, anarchists, antiabortion extremists, and self-

styled militia. According to FBI, international terrorism has been a major challenge for the United States. This threat can be categorized into three: loosely affiliated extremists operating under the radical jihad movement, formal terrorist organizations, and state sponsors of terrorism. The different types of foreign terrorist organizations are listed in the State Hazard Mitigation Plan 2013.

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. Depending on the necessity communities may receive assistance from state and federal agencies operating within the existing Integrated Emergency Management System. FEMA is responsible for supporting state and local response to the consequences of terrorist attacks.

There have been some terrorist groups identified operating in Lincoln County. The county has potential targets for terrorist activities. These may include, but are not limited to:

- Federal, state, county and municipal government facilities and structures.
- HAZMAT Facilities.
- Medical facilities.
- Religious facilities.
- Businesses and manufacturing centers.
- Airports, railroads, highways and navigable rivers.
- Pipelines; power plants; public utilities; landmarks; and large public gatherings.
- Agriculture.

There are twenty eight Homeland Security Response Teams that operate throughout the State of Missouri. Lincoln County is under Region C. There are no terrorism incidents identified within the county.

Probability of Future Occurrence

Lincoln County has received few threats but has not suffered any past incidents of terrorism; therefore, the probability of future occurrence is considered low.

Vulnerability

Vulnerability Overview

Lincoln County may be home to a small number of potential domestic terrorists putting the county at a higher level of risk of domestic terrorism than other counties in Missouri.

Potential Losses to Existing Development

Depending on the type of terrorism employed, potential losses could be assumed to range from low to high. However, Lincoln County lacks the concentration of soft targets that could account for catastrophic losses of life and property.

Future Development

As the county grows it is possible that future development could put Lincoln County at greater risk.

Problem Statement

Although not a prime target for terrorism, Lincoln County (like the entire U.S.) must remain vigilant and prepared respond to an attack by terrorists from within or without.

3.4.14 Disruption of Transportation

Hazard Profile

Hazard Description

Per the State Hazard Mitigation Plan and for the purpose of this study, transportation is defined as the means, or system, that transfers large groups of individuals from one place to another. This hazard addresses only those accidents that involve passenger air or rail travel that results in accident death or injury. Two private transportation companies provide services for residents of Lincoln County; OATS, Incorporated and The LINC. OATS, founded in 1971, is one of the largest providers in the nation. It is a private, not-for profit organization serving 87 of Missouri's 114 counties. The LINC (operated by OATS) provides public transportation for all residents of Lincoln County regardless of age or income. The LINC transports Lincoln County residents to destinations outside Lincoln County for medical appointments.

Geographic Location

Three major highways cross the county; US 61 (North-South), Missouri Highway 47 (North-South), and Missouri Highway 79 (North-South) along the Missouri River. One active railroad also runs North-South (Burlington Northern & Santa Fe). Two hundred fifty-three Tier II facilities in Lincoln County manufacture, store and use hazardous substances. Six pipelines run through the county.

Previous Occurrences

The following table shows the fatality rates by Mode of Travel, 1990–2010 for highway vehicle occupants and transit passengers. There were about 148 fatal accidents in the State involving commercial vehicles.

Table 3.47. Transportation Fatalities by Mode: Select Years 1990-2010

Mode	1990	2000	2009	2010
Air (in aircraft and ground fatalities)				
Large U.S. air carrier	39	92	52	2
Commuter air carrier	6	5	0	0
On-demand air taxi	51	71	17	17
General aviation	770	596	478	450
Highway (in vehicle and non-occupants)[a]	44,599	41,945	33,883	32,885
Pipeline, gas and hazardous liquid	9	38	13	25
Railroad (on train and non-occupants)[b]	729	631	544	601
Transit[c]	235	208	224	215
Waterborne				
Vessel-related, commercial ship	85	53	49	41
Non-vessel related[d], commercial ship	101	69	58	43
Recreational boating	865	701	736	672

[a]Includes fatalities at railroad crossings. [b] Incidents and accidents; includes commuter rail; excludes public highway-rail grade crossings involving motor vehicles. [c] All reportable incident and accident fatalities. [d] For example, a person on board stumbles falls overboard and drowns.

SOURCES: *Air:* National Transportation Safety Board. *Highway:* U.S. Department of Transportation, National Highway Traffic Safety Administration. *Rail:* Highway-rail grade crossings: U.S. Department of Transportation, Federal Railroad Administration. Transit: *Highway-rail grade crossings*: U.S. Department of Transportation, Federal Transit Administration. *Water:* Vessel- and nonvessel-related: U.S. Department of Homeland Security, U.S. Coast Guard. *Recreational boating*: U.S. Department of Homeland Security, U.S. Coast Guard. *Hazardous liquid and gas pipeline*: U.S. Department of Transportation, Pipeline and Hazardous Materials Safety Administration as cited in U.S. Department of Transportation, Research and Innovative Technology Administration, Bureau of Transportation Statistics, National Transportation Statistics, table 2-1, available at http://www.bts.gov/publications/national_transportation_statistics/ as of December 2011.

Source: United States Department of Transportation

Probability of Future Occurrence

The probability of future occurrence is likely; however, the events typically do not more than a few hours.

Vulnerability

Lincoln County is vulnerable to transportation related incidents due to it being bisected by a major commercial transportation routes.

Potential Losses to Existing Development

Potential losses to the existing infrastructure is not likely to be severe.

Future Development

As the area increases in population the exposure to life and property will increase accordingly. A major multi-hub transportation port is being developed along the Mississippi River in Lincoln County. When operational in 10 years or so, the hub will bring increased traffic and additional risks to hazardous material releases.

Problem Statement

A major railroad, a major interstate highway, and a navigable river pass through or along the borders of Lincoln County. In addition, the county lies below the approach path to a major international airport. It is likely that emergency services personnel will continue to be required to respond to transportation related incidents.

3.4.15 Utility Interruptions and Power Failure

Hazard Profile

Hazard Description

This hazard may include electrical power, natural gas, public water supplies, and communications systems. Utility systems exist everywhere and are subject to damage from digging, fire, traffic accidents, and severe weather, including flooding, earthquake, and other day-to-day events.

Geographic Location

This hazard can occur anywhere in Lincoln County.

Previous Occurrences

On January 30, 2002, a severe ice storm struck portions of western and northern Missouri. This hazard was referred as the worst in Missouri's history which left devastated and darkened homes and businesses. Ice accumulations were over an inch and covered all the objects that were at or

below freezing. Further, the weight of the ice broke utility poles, conductors, tree limbs and other objects that could not withstand the weight of the ice. The ice storm of 2005 with 2-6 inches snow caused two deaths.

Utility failures could be localized. These failures impact generally on the very young or elderly, who are more prone to health risks that are associated with resultant loss of heating/cooling systems and with the loss of medical equipment that requires a power source.

The threat of earthquakes has been of greatest concern to the County which obstructs the operability of the existing utilities.

Probability of Future Occurrence

Since utilities exist throughout the County and are vulnerable to interruptions or failures, there is a high probability that this hazard may occur at any time or anyplace throughout the state. The probability of future occurrence is “highly likely”

Vulnerability

Vulnerability Overview

In many respects rural areas of the state such as Lincoln County, are more dependent on electrical power and other utilities than more urbanized areas. Loss of electrical power, along with possible loss of cellular towers, televisions and radios can isolate emergency responders and citizens, especially those who are infirm or injured and require assistance. Loss of power also means people who rely of powered equipment to sustain their lives are in immediate need of power restoration. Healthcare facilities are also vulnerable to the loss of electrical power. The Missouri Statewide Wireless Interoperable Network (MOSWIN) system of radios provides emergency communications during emergencies, including those resulting in loss of electrical power.

Potential Losses to Existing Development

Loss of power and/or utilities can adversely impact any populated area of the county without regard to density of population.

Future Development

Future development will only add to the exposure of the county.

Problem Statement

Lincoln County will continue to be vulnerable to loss of power and/or utilities such as telephone, cellular towers, and home and business healthcare equipment. Utilities continue to harden their infrastructure and businesses and residences should be encouraged to harden their assets as well.

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4 MITIGATION STRATEGY 1
4.1 Goals 1
4.2 Identification and Analysis of Mitigation Actions 2
4.3 Implementation of Mitigation Actions 4

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

This section presents the mitigation strategy updated by the Lincoln County 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 the general goal statements to guide the jurisdictions in lessening disaster impacts as well as specific mitigation actions to directly reduce vulnerability to hazards and losses. The following definitions are taken from FEMA's Local Hazard Mitigation Review Guide (October 1, 2012).

- **Mitigation Goals** are general guidelines that explain what you want to achieve. Goals are long-term policy statements and global visions that support the mitigation strategy. The goals address the risk of hazards identified in the plan.

- **Mitigation Actions** are specific actions, projects, activities, or processes taken to reduce or eliminate long-term risk to people and property from hazards and their impacts. Implementing mitigation actions helps achieve the plan's mission and goals.

4.1 Goals

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

This planning effort is an update to Lincoln County's existing hazard mitigation plan approved by FEMA on February 8, 2012. Therefore, the goals from the previous plan were reviewed to see if they were still valid, feasible, practical, and applicable to the defined hazard impacts. These goals are listed below.

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

Goal 2: Employ sustainable principles and practices to enhance mitigation effectiveness.

Goal 3: Ensure continued operation of government and emergency functions during a disaster.

The MPC conducted a discussion during their kick-off meeting to review and update their plan goals. To ensure that the goals developed for this update were comprehensive and supported state goals, the previously approved plan goals were reviewed. It was determined by the team

that the broadly stated purposes were still valid for the 2016 update. The goals and actions/projects proposed in the 2016 plan also were formed pursuant to these principals stated below.

- To respond to the issues highlighted in the hazard risk and vulnerability sections of this plan.
- To recognize the capabilities, limitations, and resources available to each jurisdiction to implement the polices of this plan.
- To evaluate the broad range of alternative mitigation measures available.
- To adapt polices that most effectively respond to the hazard issues facing each community.
- To implement priority polices according to a 5-year action plan.

4.2 Identification and Analysis of Mitigation Actions

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

During the remainder of the kick-off meeting, the results of the risk assessment conducted by the Lincoln County EMD and Boonslick RPC staff were presented to the MPC for review and the key issues were identified for specific hazards and discussed. The discussion 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. Changes in the risk since the adoption of the previously plan were discussed as well. The MPC discussed SEMA's identified funding priorities and the types of mitigation actions generally accepted by FEMA.

The MPC reviewed the actions from the previously approved plan for progress made since the plan had been adopted, using worksheets included in the appendix. During the meeting, the list of actions was reviewed to determine the Action Status.

All goals and actions from the 2012 plan were carried forward, and new actions were added. Based on the status updates, there were 11 Complete - Sustainment actions, 1 deleted actions, 21 Continuing actions, and 4 actions Not Started. In addition, 3 new actions were added which are included in the Not Started status. Complete – Sustainment actions are those actions that are complete but the team felt they should remain open to ensure continued monitoring.

The first table below lists the status of completed action plans and the second table lists new actions added to the plan update. Continuing Actions are not listed in a table but may be found with the complete set of Action Plan Worksheets. The Action Plan Worksheets are arranged by number.

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

Table 4.1. Action Status Summary

Completed Actions	Completion Details
1.2.6 – NFIP – Monitor development in special flood	County continues to ensure compliance with floodplain regulations and local municipalities continue to do the same.

Completed Actions	Completion Details
hazard areas to ensure compliance with local floodplain management ordinances.	Lack of Planning and Zoning makes it difficult to enact meaningful measures. Planning to upgrade low water crossings to bridges.
1.3.3 – Provide earthquake preparedness and safety literature every year in school districts.	School districts regularly participate in the statewide earthquake drills.
1.5.3 – Identify existing mechanisms to promote NFIP policies and earthquake/seismic insurance and flood insurance.	All county residents can have flood and seismic insurance.
1.6.1 – Encourage tornado safe rooms in new construction.	FEMA grants were used to provide tornado safe rooms in Troy High School, middle school, and the Truxton fire station. Mobile homes are a major concern as people have nowhere to go in the event of severe weather. Will continue to promote FEMA grants and tornado safe rooms. Will continue to encourage COOP templates.
1.7.3 – Provide shelter homes in case of emergency.	There are issues in unincorporated areas. Plan to consider making new mobile home parks build storm shelters for residents.
1.8.2 – Maintain an inventory of vulnerable infrastructure.	County and cities continue to inventory vulnerable structures. A complete inventory will be prioritized and incorporated into the Lincoln County EOP.
1.8.3 – Maintain an inventory of traffic accidents.	High risk areas were identified and presented to local jurisdictions and Regional Transportation Advisory Committee. Some of the presented risk areas were considered for remediation. Due to lack of funds most of the high risk areas will not be addressed. However, some were included in the TAC project list.
2.1.1 – Institute or strengthen regulations to reduce stormwater runoff.	County works with Missouri Extension, Missouri Department of Agriculture, USDA, and local farm bureaus to promote the best agricultural practices.
3.1.3 – Maintain an inventory of levees in the county.	Work with levee districts to support the levee emergency action plans. EMA encourages all levee districts to be involved in the Corps program (2 private, 1 public).
3.2.1 – Identify, review, and implement mechanisms to foster collaboration among jurisdictions, agencies, special districts, and private industry.	County emergency management agency meets regularly with local jurisdictions to promote collaboration. Increase collaboration and community with local businesses and key stakeholders.
3.2.2 – Improve planning, funding, and response coordination.	County works with local jurisdictions and local agencies to identify needs and potential funding sources through grants to improve coordination and communication.

The table below shows the three new actions that were added to address Public Health issues due to pandemics that occur independently, or in the aftermath of other hazards. These were

added at the request of MPC members from Public Health and EMA.

Table 4.2. New Actions Added

New Actions Added	Action Details
1.3.4 – Identify public health issues and identify ways to promote healthy life style changes	Not yet started. Estimated cost is $5,000 per year for labor and supply cost.
1.3.5 – Identify causes of disease and promote measures to control spread of disease in case of emergency such as ; reduce vectors, increase awareness of foodborne illness hazards due to spoilage and contamination.	Not yet started. Estimated cost is $5,000 per year for labor and supply cost.
1.7.4 – Identify community health disparities and their effects on post disaster population health, i.e., access to care, messaging, translation services, and mental/behavioral health services.	Not yet started. Estimated cost is $5,000 per year for labor and supply cost.

4.3 Implementation of Mitigation Actions

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

During review and update of the STAPLEE by the Lincoln County EMD and Boonslick staff, 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.

FEMA's STAPLEE methodology was used to assess the costs and benefits, overall feasibility of mitigation actions, and other issues impacting project. During the prioritization process, the MPC used worksheets to assign scores. The worksheets posed questions based on the STAPLEE

elements as well as the potential mitigation effectiveness of each action. Scores were based on the responses to the questions as follows:

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

The following questions were asked for each proposed action.

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

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

The final STAPLEE score for each action are listed in the Action/Project Priority field on each of the Action Plan Worksheets below. The STAPLEE worksheets are attached to this plan in the appendix. Low priority action items were those that had a total score of between 0 and 24. Moderate priority actions were those scoring between 25 and 29. High priority actions scored 30 or above. A specimen STAPLEE worksheet is shown in Figure 4.1

Figure 4.1. Blank STAPLEE Worksheet

XXXXXX COUNTY
MULTI-JURISDICTIONAL
LOCAL HAZARD MITIGATION PLAN

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

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

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

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

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

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

Figure 4.2. Action Plan Worksheets

Goal 1	Protect the lives and livelihoods of all citizens
Action 1.1.1	Encourage people to equip their homes, schools, businesses and public spaces with NOAA weather radios, included tornado sirens in places of outside congregation
Jurisdiction	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberr ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Winfield R IV School ☑ Troy R III School
Risk/Vulnerability	
Problem being mitigated	Lack of early warning systems
Hazard(s) Addressed	All hazards
Action or Project	
Number	1.1.1
Action or Project Description	Survey residents of unincorporated areas and unserved cities to determine need for early warning system
Applicable Goal Statement	Protect the lives and livelihoods of all citizens
Estimated Cost	Included in cost of Nixle at $9,000 per year. Tornado sirens- 500,000 to 1 million
Benefits	Advance notice will reduce injuries and casualties
Plan for Implementation	
Responsible Organization/ Department	Lincoln County Emergency Management Agency Director, All cities, fire dept, police dept, health dept
Priority	Low
Timeline for Completion	Continuing
Potential Funding Sources	Local funds, Government programs & private funding
Local Planning Mechanisms to be used in Implementation, if any	Lincoln County Emergency Operations Plan
Progress Report	
Action Status	Continuing
Report of Progress	Nixle serves as a county-wide alert system that alerts unincorporated Lincoln County to weather events. Also utilize NOAA weather radios for early alerting of severe weather.

Goal 1	Protect the lives and livelihoods of all citizens
Action 1.2.1	Encourage property owners and occupants in hazard areas to participate in mitigation policy formulation
Jurisdiction	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberr ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Sile ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School
Risk/Vulnerability	
Problem being mitigated	Lack of public input related to floodplain management
Hazard(s) Addressed	Floods and Flash floods
Action or Project	
Number	1.2.1
Action or Project Description	Work with county and city floodplain to identify properties that lie in a hazard area.
Applicable Goal Statement	Protect the lives and livelihoods of all citizens
Estimated Cost	$2,500 for mapping plus tablets
Benefits	Speeds up recovery claims for those affected by flooding.
Plan for Implementation	
Responsible Organization/ Department	Lincoln County Emergency Management Director,County and city flood plain managers
Priority	High
Timeline for Completion	Continuing
Potential Funding Sources	Local funds, Government programs & private funding
Local Planning Mechanisms to be used in Implementation, if any	Lincoln County Emergency Operations Plan, Lincoln County floodplain manager, Emergency Management Agency public outreach, FEMA, SEMA
Progress Report	
Action Status	Continuing
Report of Progress	Lincoln County participates in NFIP. EMD works with floodplain (county & city) and FEMA to identify properties that lie in a hazard area.

Goal 1	Protect the lives and livelihoods of all citizens
Action 1.2.2	Target any remaining repetitive flood loss properties for buyout or relocation
Jurisdiction	☑ Lincoln County ☐ Chain Of Rocks ☐ Fountain N Lakes ☑ Elsberry ☑ Foley ☐ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☐ Whiteside ☑ Winfield ☐ Truxton ☐ Elsberry R-II School ☐ Silex R-I School ☐ Troy R III School ☐ Winfield R IV School
Risk/Vulnerability	
Problem being mitigated	Flood loss of commercial and residential properties
Hazard(s) Addressed	Floods and Flash floods
Action or Project	
Number	1.2.2
Action or Project Description	To work with residents in the floodplain areas estimated 100 homes in county limits
Applicable Goal Statement	Protect the lives and livelihoods of all citizens
Estimated Cost	$1.3 million
Benefits	Reduce injuries, loss of life, and property damage
Plan for Implementation	
Responsible Organization/ Department	Lincoln County Emergency Management Director, Lincoln County Floodplain Manager, Floodplain manager for cities
Priority	High
Timeline for Completion	Continuing
Potential Funding Sources	Local funds, Government programs & private funding
Local Planning Mechanisms to be used in Implementation, if any	Lincoln County Hazard Mitigation Plan
Progress Report	
Action Status	Continuing
Report of Progress	After the 1993 and 2008 floods vast majority of residential structures were brought out by FEMA. The action plan remains continuing in relation to future hazards and properties still lying in the floodplain within the County and cities.

Goal 1	Protect the lives and livelihoods of all citizens
Action 1.2.3	Promote environmentally-sound watershed and storm water practices to decrease flash flooding
Jurisdiction	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School
Risk/Vulnerability	
Problem being mitigated	Community growth alters the watershed
Hazard(s) Addressed	Floods, Levee failure
Action or Project	
Number	1.2.3
Action or Project Description	To develop an environmentally sound watershed plan. To remove low water crossings to bridges.
Applicable Goal Statement	Protect the lives and livelihoods of all citizens
Estimated Cost	Several millions
Benefits	Reduce drownings due to low water crossings and property loss
Plan for Implementation	
Responsible Organization/ Department	Lincoln County Emergency Management Director, Lincoln County Floodplain Manager, Cities, Highway department
Priority	Medium
Timeline for Completion	Continuing
Potential Funding Sources	Local funds, Government programs & private funding
Local Planning Mechanisms to be used in Implementation, if any	Improve low water crossings
Progress Report	
Action Status	Continuing
Report of Progress	City of Troy is updating their sewer plant and storm water management system. City of Winfield has added a storm water management system. Planning to remove low water crossings to bridges which would restrict access to roads with high percentage of water rescues.

Goal 1	Protect the lives and livelihoods of all citizens
Action 1.2.4	Review and revise flood-fighting plans as needed
Jurisdiction	☑ Lincoln County ☐ Chain Of Rocks ☐ Fountain N Lakes ☑ Elsberry ☑ Foley ☐ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☐ Whiteside ☑ Winfield ☐ Truxton ☐ Elsberry R-II School ☐ Silex R-I School ☐ Winfield R IV School ☐ Troy R III School
Risk/Vulnerability	
Problem being mitigated	Lack of levee all district emergency operations plan, one public and two private with no plans
Hazard(s) Addressed	Floods, Levee failure
Action or Project	
Number	1.2.4
Action or Project Description	Develop and implement emergency action plans. No oversight on public or private levees.
Applicable Goal Statement	Protect the lives and livelihoods of all citizens
Estimated Cost	$5,000 labor
Benefits	Reduce loss of life, personal injuries and property damage
Plan for Implementation	
Responsible Organization/ Department	Lincoln County Emergency Management Director, Lincoln County Floodplain Manager, Floodplain manager for cities, Levee districts
Priority	Medium
Timeline for Completion	Continuing
Potential Funding Sources	Local funds, Government programs & private funding
Local Planning Mechanisms to be used in Implementation, if any	Incorporate Levee District Plan into the Lincoln County Emergency Operations Plan, Incorporate flood plans
Progress Report	
Action Status	Continuing
Report of Progress	County is planning to update the emergency plan and Corp levees are repaired as needed. No oversight on public or private levees.

Goal 1	Protect the lives and livelihoods of all citizens
Action 1.2.5	Strengthen floodplain regulations as needed
Jurisdiction	☑ Lincoln County ☑ Chain Of Rocks ☐ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☐ Whiteside ☑ Winfield ☐ Truxton ☐ Elsberry R-II School ☐ Silex R-I School ☐ Troy R III School ☐ Winfield R IV School
Risk/Vulnerability	
Problem being mitigated	Floodplain regulations do not meet local, state, federal regulations
Hazard(s) Addressed	Floods
Action or Project	
Number	1.2.5
Action or Project Description	Review and revise floodplain regulations to meet the state and federal regulation standards and enforce ordinances.
Applicable Goal Statement	Protect the lives and livelihoods of all citizens
Estimated Cost	$5,000 labor
Benefits	Protection of agricultural land, property and cash crops
Plan for Implementation	
Responsible Organization/ Department	Lincoln County Emergency Management Director, Lincoln County Floodplain Manager, Floodplain Manager for cities
Priority	Medium
Timeline for Completion	Continuing
Potential Funding Sources	Local funds, Government programs & private funding
Local Planning Mechanisms to be used in Implementation, if any	Floodplain ordiance,NFIP, FEMA guidelines
Progress Report	
Action Status	Continuing
Report of Progress	County and cities participates in NFIP. County is working on getting the CRS status. Need to enforce ordinances in city and county.

Goal 1	Protect the lives and livelihoods of all citizens
Action 1.2.6	NFIP- Monitor development in special flood hazard areas to ensure compliance with local floodplain management ordinance
Jurisdiction	☑ Lincoln County ☐ Chain Of Rocks ☐ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☐ Whiteside ☑ Winfield ☐ Truxton ☐ Elsberry R-II School ☐ Silex R-I School ☐ Troy R III School ☐ Winfield R IV School
Risk/Vulnerability	
Problem being mitigated	Roads are inundated with water during heavy rains
Hazard(s) Addressed	Floods, Flash floods
Action or Project	
Number	1.2.6
Action or Project Description	Locate and prioritize roads inundated and improve them as necessary. To remove low water crossings to bridges.
Applicable Goal Statement	Protect the lives and livelihoods of all citizens
Estimated Cost	$5,000 labor
Benefits	Reduce loss of life, personal injuries, and property damage
Plan for Implementation	
Responsible Organization/ Department	Lincoln County Emergency Management Director, Lincoln County Floodplain Manager, School District Administrators, Boards of Alderman
Priority	High
Timeline for Completion	Complete
Potential Funding Sources	Local funds, Government programs & private funding
Local Planning Mechanisms to be used in Implementation, if any	Lincoln County Emergency Operations Plan
Progress Report	
Action Status	Complete/Sustainment
Report of Progress	County continues to ensure compliance with floodplain regulations and local municipalities continue to do the same. Lack of Planning & Zoning makes it difficult to enact meaningful measures. Planning to upgrade low water crossings to bridges

Goal 1	Protect the lives and livelihoods of all citizens
Action 1.3.1	Develop hazard area maps and promote use by the public
Jurisdiction	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Winfield R IV School ☑ Troy R III School
Risk/Vulnerability	
Problem being mitigated	The public is not aware of all hazard areas
Hazard(s) Addressed	All hazards
Action or Project	
Number	1.3.1
Action or Project Description	Increase the awareness
Applicable Goal Statement	Protect the lives and livelihoods of all citizens
Estimated Cost	$5,000/year labor
Benefits	Reduce loss of life, personal injuries, and property damage
Plan for Implementation	
Responsible Organization/ Department	Lincoln County Emergency Management Director, Lincoln County & City Floodplain Managers, School District Administrators, Boards of Alderman, Fire and Ambulance Districts, Police, Health department
Priority	Medium
Timeline for Completion	Continuing
Potential Funding Sources	Local funds, Government programs & private funding
Local Planning Mechanisms to be used in Implementation, if any	Warning coverage maps, Hazard mitigation plan, Lincoln County Emergency Operations Plan
Progress Report	
Action Status	Continuing
Report of Progress	County EMA has hazard area maps and continues to distribute information as appropriate. Some Tier II facilities are in floodplain. EMA continues to distribute information.

Goal 1	Protect the lives and livelihoods of all citizens
Action 1.3.2	Identify ways to promote FEMA safety tips and mitigation techniques
Jurisdiction	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Silex ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School
Risk/Vulnerability	
Problem being mitigated	Lack of public awareness of public safety
Hazard(s) Addressed	All hazards
Action or Project	
Number	1.3.2
Action or Project Description	Implement public education program that addressess hazard safety planning.
Applicable Goal Statement	Protect the lives and livelihoods of all citizens
Estimated Cost	$5,000/year for labor
Benefits	Mitigates loss of life, personal injury, and property damage
Plan for Implementation	
Responsible Organization/ Department	Lincoln County Emergency Management Director, Lincoln County & City Floodplain Managers, School District Administrators, Police, Fire and Ambulance Districts, Health Department, Cities
Priority	Low
Timeline for Completion	Continuing
Potential Funding Sources	Local funds, Government programs & private funding
Local Planning Mechanisms to be used in Implementation, if any	Cognizant training plans, Coop Plans
Progress Report	
Action Status	Continuing
Report of Progress	Continue to publicize mitigation and safety techniques using EMA website, Nixle and Facebook. County is looking into flash flood sensors that could be placed upstream in strategic locations to provide advance warning. Coop templates encourage in business, emergency plans in residential.

Goal 1	Protect the lives and livelihoods of all citizens
Action 1.3.3	To provide earthquake preparedness and safety literature every year in the school districts
Jurisdiction	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School
Risk/Vulnerability	
Problem being mitigated	Lack of earthquake preparedness
Hazard(s) Addressed	Earthquakes
Action or Project	
Number	1.3.3
Action or Project Description	Provide earthquake preparedness and safety literature for school districts
Applicable Goal Statement	Protect the lives and livelihoods of all citizens
Estimated Cost	$5,000 labor & material
Benefits	Reduce loss of life, personal injury, and property damage
Plan for Implementation	
Responsible Organization/ Department	Lincoln County Emergency Management Director, School District Administrators, Police, Fire and Ambulance Districts, Cities
Priority	High
Timeline for Completion	Continuing
Potential Funding Sources	Local funds, Government programs & private funding, Homeland Security CERT funding
Local Planning Mechanisms to be used in Implementation, if any	Emergency management training mechanisms, Lincoln County Emergency Operations Plan
Progress Report	
Action Status	Complete/Sustainment
Report of Progress	School districts regularly partcipate in the statewide earthquake drills.

Goal 1	Protect the lives and livelihoods of all citizens
Action 1.3.4	Identify public health issues and identify ways to promote healthy lifestyle changes
Jurisdiction	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School
Risk/Vulnerability	
Problem being mitigated	Pandemics, terrorist activities
Hazard(s) Addressed	Disease
Action or Project	
Number	1.3.5
Action or Project Description	Identify public health issues and identify ways to promote healthy lifestyle changes
Applicable Goal Statement	Protect the lives and livelihoods of all citizens
Estimated Cost	$5,000/year for labor and materials
Benefits	Disease control
Plan for Implementation	
Responsible Organization/ Department	Lincoln County Health Department
Priority	Medium
Timeline for Completion	New
Potential Funding Sources	Local funds, Government programs & private funding
Local Planning Mechanisms to be used in Implementation, if any	Lincoln County Health Department emergency plans
Progress Report	
Action Status	Not Started
Report of Progress	New Action as of this plan update

Goal 1	Protect the lives and livelihoods of all citizens
Action 1.3.5	identify causes of disease and promote measures to control spread of disease in case of emergency such as: reduce vectors, increase awareness of foodborne illness hazards due to spoilage and contamination
Jurisdiction	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School
Risk/Vulnerability	
Problem being mitigated	Pandemics, Terrorist activities
Hazard(s) Addressed	Disease
Action or Project	
Number	1.3.5
Action or Project Description	disease in case of emergency such as: reduce vectors, increase awareness of foodborne illness hazards due to spoilage and contamination
Applicable Goal Statement	Protect the lives and livelihoods of all citizens
Estimated Cost	$5,000/year for labor and materials
Benefits	Disease control
Plan for Implementation	
Responsible Organization/ Department	Lincoln County Health Department
Priority	Medium
Timeline for Completion	New
Potential Funding Sources	Local funds, Government programs & private funding
Local Planning Mechanisms to be used in Implementation, if any	Lincoln County Health Department emergency plans
Progress Report	
Action Status	New
Report of Progress	New Action as of this plan update

Goal 1	Protect the lives and livelihoods of all citizens
Action 1.4.1	Review and upgrade policies to identify and budget additional emergency equipment for health and medical services, mass care agencies, and public information
Jurisdiction	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School
Risk/Vulnerability	
Problem being mitigated	Some emergency equipment is no longer adequate
Hazard(s) Addressed	All hazards
Action or Project	
Number	1.4.1
Action or Project Description	To identify weaknesses and gaps in equipment by doing tabletop exercises and full scale planning exercises
Applicable Goal Statement	Protect the lives and livelihoods of all citizens
Estimated Cost	2-5 million
Benefits	Increases readiness of equipment to respond
Plan for Implementation	
Responsible Organization/ Department	Lincoln County Emergency Management Director, School District Administrators, Cities, Police, Fire and Ambulance Districts, Lincoln County Health Department, Dispatch
Priority	High
Timeline for Completion	Continuing
Potential Funding Sources	Federal Homeland Security funding, Government funds, Assistance to firefighter grants, Local emergency planning committee
Local Planning Mechanisms to be used in Implementation, if any	Lincoln County Emergency Operations Plan, hazard mitigation grant-redundent & backup plans for all first responder agencies & public works.
Progress Report	
Action Status	Continuing
Report of Progress	Need to complete mass care planning ,find ways to provide emergency generators for nursing homes, fuel trailer, and mass transport vehicle

Goal 1	Protect the lives and livelihoods of all citizens
Action 1.5.1	Decrease wildfire risk areas where development is adjacent to forests or grasslands by incorporating buffer zones into subdivision regulations
Jurisdiction	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School
Risk/Vulnerability	
Problem being mitigated	Some areas have the risk of wildfire
Hazard(s) Addressed	Wildfires
Action or Project	
Number	1.5.1
Action or Project Description	Educate public to dangers of wildfire and promote buffer zones between granssland and developments
Applicable Goal Statement	Protect the lives and livelihoods of all citizens
Estimated Cost	$1500/year to maintain the website for fire district
Benefits	Reduces risk of property loss, injuries, and death due to wild fires.
Plan for Implementation	
Responsible Organization/ Department	Lincoln County Planning and Zoning, Fire Chiefs
Priority	Low
Timeline for Completion	Continuing
Potential Funding Sources	Local funds, Government programs & private funding
Local Planning Mechanisms to be used in Implementation, if any	Subdivision regulations, fire regulations
Progress Report	
Action Status	Continuing
Report of Progress	Alerts are made using Nixle. Lincoln County fire protection district exerts some influence over incorporated areas. To properly maintain code to regulate wildland interface.

Goal 1	Protect the lives and livelihoods of all citizens
Action 1.5.2	Promote environmentally-sound, fire-resistant materials for homes
Jurisdiction	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School
Risk/Vulnerability	
Problem being mitigated	Current construction materials prone to catch fires
Hazard(s) Addressed	All hazards
Action or Project	
Number	1.5.2
Action or Project Description	Adopt building codes that adopt fire safety techniques, encourage developers to promote sound safety practices
Applicable Goal Statement	Protect the lives and livelihoods of all citizens
Estimated Cost	$5,000/year for labor and material
Benefits	Increased awarness among city governing bodies
Plan for Implementation	
Responsible Organization/ Department	Lincoln County Emergency Management Director, School District Administrators, Cities, Police, Fire and Ambulance Districts
Priority	Low
Timeline for Completion	5 years
Potential Funding Sources	Local funds, Government programs & private funding
Local Planning Mechanisms to be used in Implementation, if any	Fire regulations
Progress Report	
Action Status	Continuing
Report of Progress	There is no Planning and Zoning currently. Continue to promote through public information and economic development agency & fire districts.

Goal 1	Protect the lives and livelihoods of all citizens
Action 1.5.3	Identify existing mechanisms to promote NFIP policies and earthquake/seismic insurance and flood insurance.
Jurisdiction	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School
Risk/Vulnerability	
Problem being mitigated	Insurance rates are high for people living in floodplain and seismic zones
Hazard(s) Addressed	Earthquake, Floods
Action or Project	
Number	1.5.3
Action or Project Description	Identify properties that lie in floodplain and seismic zones and develop community education program for public lending institutions, real estate agencies and insurance agents
Applicable Goal Statement	Protect the lives and livelihoods of all citizens
Estimated Cost	$5,000 for labor & material
Benefits	Increases public awareness of NFIP insurance & seismic insurance
Plan for Implementation	
Responsible Organization/ Department	Lincoln County Emergency Management Director, Cities, Fire, Planning and Zoning Commision, Building Commission
Priority	Low
Timeline for Completion	Continuing
Potential Funding Sources	Local funds, Government programs & private funding
Local Planning Mechanisms to be used in Implementation, if any	Public awareness events, Nixle
Progress Report	
Action Status	Complete/Sustainment
Report of Progress	All residents can have flood & seismic insurance.

Goal 1	Protect the lives and livelihoods of all citizens
Action 1.5.4	Utilize FEMA information to encourage residential owners to invest in retrofit techniques
Jurisdiction	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School
Risk/Vulnerability	
Problem being mitigated	Residential stuctures are not adequate to sustain natural hazards
Hazard(s) Addressed	All hazards
Action or Project	
Number	1.5.4
Action or Project Description	Identify properties that lie in floodplain and develop community education program for public lending institutions, real estate agencies and insurance agents to generate fund/grant for homeowners to retrofit properties. Promote retrofit in all homes/businesses for all natural hazards
Applicable Goal Statement	Protect the lives and livelihoods of all citizens
Estimated Cost	$5,000/year for labor & materials
Benefits	Increase resiliency of residential structures
Responsible Organization/ Department	County Commissioners, City governments, Economic development
Priority	Low
Timeline for Completion	NA
Potential Funding Sources	Local funds, Government programs & private funding
Local Planning Mechanisms to be used in Implementation, if any	Public awareness events, Nixle
Progress Report	
Action Status	Continuing in cities with planning & zoning
Report of Progress	There is no planning & zoning in the county. Until such time the county incorportaes planning & zoning, this action plan will remain as "no action" status

Goal 1	Protect the lives and livelihoods of all citizens
Action 1.6.1	Encourage tornado safe rooms in new construction.
Jurisdiction	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☐ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School
Risk/Vulnerability	
Problem being mitigated	Many homes do not have a safe place to endure a tornado. Lincoln County has a large percentage of people that live in mobile homes.
Hazard(s) Addressed	Tornadoes and Severe Storms
Action or Project	
Number	1.6.1
Action or Project Description	To promote grants and tornado safe rooms
Applicable Goal Statement	Protect the lives and livelihoods of all citizens
Estimated Cost	1 million
Benefits	Reduce loss of life and personal injuries
Plan for Implementation	
Responsible Organization/ Department	Lincoln County Emergency Management Director, School District Administrators, Cities, Planning and Zoning Commision, Building Commission
Priority	Low
Timeline for Completion	Continuing
Potential Funding Sources	Local funds, Government programs & private funding
Local Planning Mechanisms to be used in Implementation, if any	Public outreach, Coop plans
Progress Report	
Action Status	Complete/Sustainment
Report of Progress	FEMA grants were used to provide tornado safe rooms in Troy High school, middle school and Truxton fire station. Mobile homes are a major concern as people have no where to go in the event of severe weather. Will continue to promote FEMA grants and tornado safe rooms. Will continue to encourage Coop templates.

Goal 1	Protect the lives and livelihoods of all citizens
Action 1.6.2	Encourage up to date commercial/industrial disaster plans that are coordinated with county/city disaster plans
Jurisdiction	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Winfield R IV School ☑ Troy R III School
Risk/Vulnerability	
Problem being mitigated	Many commercial and industrial plants have no disaster plans and business continuity plans.
Hazard(s) Addressed	All hazards
Action or Project	
Number	1.6.2
Action or Project Description	Awareness of disaster plans
Applicable Goal Statement	Protect the lives and livelihoods of all citizens
Estimated Cost	$5,000 for labor & materials
Benefits	Reduces risk of revenue stream loss/tax loss for businesses and loss of income for employees
Plan for Implementation	
Responsible Organization/ Department	Lincoln County Emergency Management Director, School District Administrators, Cities
Priority	Medium
Timeline for Completion	5 years
Potential Funding Sources	Local funds, Government programs & private funding
Local Planning Mechanisms to be used in Implementation, if any	Coop templates, ICS training for large businesses
Progress Report	
Action Status	Continuing
Report of Progress	Working with COAD and faith based initiatives with community outreach and with coop templates. Continue to train private businesses for integration into ICS structure. EMA has all major business plans for a hazardous release.

Goal 1	Protect the lives and livelihoods of all citizens
Action 1.6.3	Encourage operation and infrastructure backup systems for commercial and industrial businesses.
Jurisdiction	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Winfield R IV School ☑ Troy R III School
Risk/Vulnerability	
Problem being mitigated	Many commercial and industrial plants have no disaster plans and business continuity plans.
Hazard(s) Addressed	All hazards
Action or Project	
Number	1.6.3
Action or Project Description	Make businesses aware of the importance of disaster planning and business continuity
Applicable Goal Statement	Protect the lives and livelihoods of all citizens
Estimated Cost	$5,000 fpr labor & materials
Benefits	Reduces risk of revenue stream loss/tax loss for businesses and loss of income for employees
Plan for Implementation	
Responsible Organization/ Department	Lincoln County Emergency Management Director, School District Administrators, Cities
Priority	Medium
Timeline for Completion	5 years
Potential Funding Sources	Local funds, Government programs & private funding
Local Planning Mechanisms to be used in Implementation, if any	Coop templates
Progress Report	
Action Status	Continuing
Report of Progress	Currently encouraging businesses to develop business continuity plans. Churches have safety plans in place. Working with COAD organizations for community outreach with Coop templates.

Goal 1	Protect the lives and livelihoods of all citizens
Action 1.7.1	shelters
Jurisdiction	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School
Risk/Vulnerability	
Problem being mitigated	A significant segment of the county's population has special needs that are not addressed fully
Hazard(s) Addressed	All hazards
Action or Project	
Number	1.7.1
Action or Project Description	To identify special needs population within the county
Applicable Goal Statement	Protect the lives and livelihoods of all citizens
Estimated Cost	$5,000 for labor & materials
Benefits	Reduce loss of life, personal injury and property damage
Plan for Implementation	
Responsible Organization/ Department	Lincoln County EMA, Health department, Red Cross, EMS, Dispatch, DHSS
Priority	Low
Timeline for Completion	3 years
Potential Funding Sources	Local funds, Government programs & private funding
Local Planning Mechanisms to be used in Implementation, if any	Dispatch database, Red Cross database, STARS database
Progress Report	
Action Status	Continuing
Report of Progress	Emergency dispatch maintains a small database of self identified persons. Working on strategies to concentrate on protecting schools, hospitals, and other known facilities housing large number of special needs.

Goal 1	Protect the lives and livelihoods of all citizens
Action 1.7.2	Enhance warning systems and notifications for special populations
Jurisdiction	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☐ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School
Risk/Vulnerability	
Problem being mitigated	There is lack of early warning for exisitng special needs facilities
Hazard(s) Addressed	All hazards
Action or Project	
Number	1.7.2
Action or Project Description	Develop an early warning system for special needs facilities
Applicable Goal Statement	Protect the lives and livelihoods of all citizens
Estimated Cost	Included in cost of NIXLE at $9,000 per year
Benefits	Reduce loss of life and personal injury.
Plan for Implementation	
Responsible Organization/ Department	Lincoln County EMA, Health department, Red Cross, EMS, Dispatch, DHSS
Priority	Medium
Timeline for Completion	Continuing
Potential Funding Sources	Local funds, Government programs & private funding
Local Planning Mechanisms to be used in Implementation, if any	Lincoln County EOP, Nixle for communication
Progress Report	
Action Status	Continuing
Report of Progress	NIXLE serves as a countywide alert system that alerts unincorporated Lincoln County to weather events & emergency hazards.

Goal 1	Protect the lives and livelihoods of all citizens
Action 1.7.3	Provide shelter homes in case of emergency
Jurisdiction	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School
Risk/Vulnerability	
Problem being mitigated	Lack of shelters for special needs population
Hazard(s) Addressed	All hazards
Action or Project	
Number	1.7.3
Action or Project Description	Establish sheltering facilities for special needs population
Applicable Goal Statement	Protect the lives and livelihoods of all citizens
Estimated Cost	$500/year to maintain the shelter inventory
Benefits	Reduces loss of life and personal injury
Plan for Implementation	
Responsible Organization/ Department	Lincoln County EMA, Health department, Red Cross, EMS, Dispatch, DHSS
Priority	Low
Timeline for Completion	Continuing
Potential Funding Sources	Local funds, Government programs & private funding
Local Planning Mechanisms to be used in Implementation, if any	Lincoln County EOP
Progress Report	
Action Status	Complete/Sustainment
Report of Progress	There are issues un unincorporated areas. Plan to consider making new mobile home parks build storm shelters for residents

Goal 1	Protect the lives and livelihoods of all citizens
Action 1.7.4	Identify community health disparities and their effects on post disaster population health i.e. access to care, messaging, translation services, mental/ behavioral health services.
Jurisdiction	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School
Risk/Vulnerability	
Problem being mitigated	Lack of post disaster healthcare
Hazard(s) Addressed	All hazards
Action or Project	
Number	1.7.4
Action or Project Description	Identify community health disparities and their effects on post disaster population health i.e. access to care, messaging, translation services, mental/ behavioral health services.
Applicable Goal Statement	Protect the lives and livelihoods of all citizens
Estimated Cost	$5,000/year for meetings and collateral
Benefits	Post disaster care
Plan for Implementation	
Responsible Organization/ Department	Lincoln County Health Department
Priority	High
Timeline for Completion	New
Potential Funding Sources	Local funds, Government programs & private funding, MRC funding
Local Planning Mechanisms to be used in Implementation, if any	Lincoln County Health Department emergency plans
Progress Report	
Action Status	New
Report of Progress	New Action as of this plan update

Goal 1	Protect the lives and livelihoods of all citizens
Action 1.8.1	Utilize county road right of ways as firebreaks and snow storage
Jurisdiction	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☐ Elsberry R-II School ☐ Silex R-I School ☐ Troy R III School ☐ Winfield R IV School
Risk/Vulnerability	
Problem being mitigated	Reduce distruption to transportation due to hazard events
Hazard(s) Addressed	Heavy snow, wildfires
Action or Project	
Number	1.8.1
Action or Project Description	Evaluate use of highway right of way as fire break and snow containment area
Applicable Goal Statement	Protect the lives and livelihoods of all citizens
Estimated Cost	$5,000 /year for labor & materials
Benefits	Reduces likelihood of transportation disruptions
Plan for Implementation	
Responsible Organization/ Department	County roads and bridges, city roads and bridges
Priority	Low
Timeline for Completion	Continuing
Potential Funding Sources	Local funds, Government programs & private funding
Local Planning Mechanisms to be used in Implementation, if any	County EOP, County roads and bridges plans & procedures
Progress Report	
Action Status	Continuing
Report of Progress	Developed maps for distribution that show emergency ingress and egress routes for most vulnerable areas and prioritizing those of mose importance

Goal 1	Protect the lives and livelihoods of all citizens
Action 1.8.2	Maintain an inventory of vulnerable infrastructure
Jurisdiction	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School
Risk/Vulnerability	
Problem being mitigated	There is low awareness of the number and vulnerability of infrastructure
Hazard(s) Addressed	All hazards
Action or Project	
Number	1.8.2
Action or Project Description	To identify critical infrastructure
Applicable Goal Statement	Protect the lives and livelihoods of all citizens
Estimated Cost	Approximately $30K per year for additional staff to compile and maintain inventory
Benefits	Reduce loss of life, personal injury, property damage, and increases readiness of emergency responders
Plan for Implementation	
Responsible Organization/ Department	Lincoln County EMA, Cities, County highway department, Lincoln County Commission
Priority	Low
Timeline for Completion	Continuing
Potential Funding Sources	Local funds, Government programs & private funding
Local Planning Mechanisms to be used in Implementation, if any	Lincoln County EOP
Progress Report	
Action Status	Complete/Sustainment
Report of Progress	County & Cities continue to inventory vulnerable structures. A complete inventory will be prioritized & incorportated into LC EOP.

Goal 1	Protect the lives and livelihoods of all citizens
Action 1.8.3	Maintain an inventory of traffic incidents
Jurisdiction	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School
Risk/Vulnerability	
Problem being mitigated	High risk of accidents on roadways
Hazard(s) Addressed	Transportation, Utility interruptions and power failures
Action or Project	
Number	1.8.3
Action or Project Description	Identify high risk sections of roadways and determine how to mitigate the risk
Applicable Goal Statement	Protect the lives and livelihoods of all citizens
Estimated Cost	$9,000/year labor & materials
Benefits	Reduce loss of life, property damage, and transportation/utility disruption
Plan for Implementation	
Responsible Organization/ Department	MoDOT, Missouri Highway Patrol, Dispatch
Priority	Medium
Timeline for Completion	3 years
Potential Funding Sources	Local funds, Government programs & private funding, MoDOT funds
Local Planning Mechanisms to be used in Implementation, if any	Trasnportation Advisory Committee (TAC) needs list, Regional Transportation Plan
Progress Report	
Action Status	Complete/Sustainment
Report of Progress	The high risk areas were identified and presented to local jurisdictions and Regional Transportation Advisory Committee. Some of the presented risk areas were considered for remediation. Due to lack of funds most of the high risk areas will not be addressed. However, some were included to the TAC project list.

Goal 2	Manage growth through sustainable principle and practices
Action 2.1.1	Institute or strengthen regulations to reduce stormwater runoff
Jurisdiction	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☐ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☐ Elsberry R-II School ☐ Silex R-I School ☐ Troy R III School ☐ Winfield R IV School
Risk/Vulnerability	
Problem being mitigated	During times of drought, farmers lose valuable cash crops
Hazard(s) Addressed	Drought
Action or Project	
Number	2.1.1
Action or Project Description	Encourage drought resistant programs including programs that provide for storm water retention ponds
Applicable Goal Statement	Manage growth through sustainable principle and practices
Estimated Cost	$5,000 for labor & materials
Benefits	Reduce loss of crops and dependance on ground water
Plan for Implementation	
Responsible Organization/ Department	Lincoln County EMA, University Extension Service, DNR, USDA
Priority	Low
Timeline for Completion	Continuing
Potential Funding Sources	Local funds, Government programs & private funding
Local Planning Mechanisms to be used in Implementation, if any	Mo DNR regulations, City stormwater plans, USDA regulations
Progress Report	
Action Status	Complete/Sustainment
Report of Progress	County works with Missouri Extension, Missouri Department of Agriculture, USDA and local farm bureaus on promoting best agricultural practices

Goal 2	Manage growth through sustainable principle and practices
Action 2.1.2	Encourage best practices for drought-resistant farming and ranching
Jurisdiction	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☐ Elsberry R-II School ☐ Silex R-I School ☐ Troy R III School ☐ Winfield R IV School
Risk/Vulnerability	
Problem being mitigated	During times of drought, farmers lose valuable cash crops
Hazard(s) Addressed	Drought
Action or Project	
Number	2.1.2
Action or Project Description	Encourage drought resistant programs
Applicable Goal Statement	Manage growth through sustainable principle and practices
Estimated Cost	$5,000 for labor & materials
Benefits	Reduce loss of crops and dependance on ground water
Plan for Implementation	
Responsible Organization/ Department	USDA, MO Extension
Priority	Low
Timeline for Completion	Continuing
Potential Funding Sources	Local funds, Government programs & private funding
Local Planning Mechanisms to be used in Implementation, if any	MoDNR regulationns, USDA regulations
Progress Report	
Action Status	Continuing
Report of Progress	County works with Missouri Extension, Missouri Department of Agriculture, USDA and local farm bureaus on promoting best agricultural practices

Goal 2	Manage growth through sustainable principle and practices
Action 2.1.3	Institute a land use plan and reinstate zoning ordinances
Jurisdiction	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☐ Elsberry R-II School ☐ Silex R-I School ☐ Troy R III School ☐ Winfield R IV School
Risk/Vulnerability	
Problem being mitigated	There is no enforcement capability of any land use without planning and zoning
Hazard(s) Addressed	All hazards
Action or Project	
Number	2.1.3
Action or Project Description	Form a citizens committee to investigate a plan to implement planning and zoning
Applicable Goal Statement	Manage growth through sustainable principle and practices
Estimated Cost	$5,000 for labor & materials
Benefits	Reduces loss of life, personal injury and property damage
Plan for Implementation	
Responsible Organization/ Department	County Commissioners, City governments, Lincoln Economic Development, Fire Districts
Priority	Low
Timeline for Completion	NA
Potential Funding Sources	Local funds, Government programs & private funding
Local Planning Mechanisms to be used in Implementation, if any	Planning and zoning ordinance
Progress Report	
Action Status	No action within the county. Continuing in cities with planning & zoning
Report of Progress	There is no planning & zoning in the county. Until such time the county incorportaes planning & zoning, this action plan will remain as "no action" status

Goal 2	Manage growth through sustainable principle and practices
Action 2.2.1	Promote building codes in incorporated areas that currently do not have such regulations
Jurisdiction	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School
Risk/Vulnerability	
Problem being mitigated	Unregulated construction is more likely to sustain damage from hazards listed below
Hazard(s) Addressed	Earthquake, Wildfires, Highwinds and Thunderstorms, Tornadoes, Floods
Action or Project	
Number	2.2.1
Action or Project Description	To encourage adoption of building codes in unincorporated areas through joint communication efforts with local fire departments
Applicable Goal Statement	Manage growth through sustainable principle and practices
Estimated Cost	$7,000/year for labor & materials
Benefits	thunderstorms
Plan for Implementation	
Responsible Organization/ Department	County Commissioners, Fire districts, City governments, Lincoln County economic development
Priority	Low
Timeline for Completion	NA
Potential Funding Sources	Local funds, Government programs & private funding
Local Planning Mechanisms to be used in Implementation, if any	Planning and zoning regulations
Progress Report	
Action Status	No action within the county. Continuing in cities with planning & zoning
Report of Progress	There is no planning & zoning in the county. Until such time the county incorportaes planning & zoning, this action plan will remain as "no action" status

Goal 2	Manage growth through sustainable principle and practices
Action 2.2.2	Implement measures to increase the county's CRS status
Jurisdiction	☑ Lincoln County ☐ Chain Of Rocks ☐ Fountain N Lakes ☑ Elsberry ☑ Foley ☐ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☐ Whiteside ☑ Winfield ☐ Truxton ☐ Elsberry R-II School ☐ Silex R-I School ☐ Troy R III School ☐ Winfield R IV School
Risk/Vulnerability	
Problem being mitigated	Reduce the high cost of property loss due to floods
Hazard(s) Addressed	Floods
Action or Project	
Number	2.2.2
Action or Project Description	Increase City and County CRS scores to qualify for lower flood insurance
Applicable Goal Statement	Manage growth through sustainable principle and practices
Estimated Cost	$10,000/year for labor & materials
Benefits	Up to 45% lower flood insurance rates for residents in designated Special Flood Hazard Areas, up to 10% for non-Special Flood Hazard Areas.
Plan for Implementation	
Responsible Organization/ Department	City and County Floodplain managers, Lincoln County EMA
Priority	Low
Timeline for Completion	3 years
Potential Funding Sources	Local funds, Government programs & private funding
Local Planning Mechanisms to be used in Implementation, if any	Floodplain database, Floodplain procedure guide, Lincoln County EOP
Progress Report	
Action Status	Continuing
Report of Progress	The county plans to pursue CRS status in the next year.

Goal 2	Manage growth through sustainable principle and practices
Action 2.2.3	Encourage open space in new developments
Jurisdiction	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☐ Elsberry R-II School ☐ Silex R-I School ☐ Troy R III School ☐ Winfield R IV School
Risk/Vulnerability	
Problem being mitigated	There is no enforcement capability of any land use without planning and zoning
Hazard(s) Addressed	All hazards
Action or Project	
Number	2.2.3
Action or Project Description	Form a citizens committee to investigate a plan to implement planning and zoning
Applicable Goal Statement	Manage growth through sustainable principle and practices
Estimated Cost	$5,000/year labor and materials
Benefits	Reduces loss of life, personal injury and property damage
Plan for Implementation	
Responsible Organization/ Department	County Commissioners, City governments, Lincoln County economic development, Fire districts
Priority	Low
Timeline for Completion	NA
Potential Funding Sources	Local funds, Government programs & private funding
Local Planning Mechanisms to be used in Implementation, if any	Planning and Zoning regulations
Progress Report	
Action Status	No action within the county. Continuing in cities with planning & zoning
Report of Progress	There is no planning & zoning in the county. Until such time the county incorportaes planning & zoning, this action plan will remain as "no action" status

Goal 2	Manage growth through sustainable principle and practices
Action 2.2.3	Resolve any existing environmental conflicts and take steps to prevent future conflicts.
Jurisdiction	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☐ Elsberry R-II School ☐ Silex R-I School ☐ Troy R III School ☐ Winfield R IV School
Risk/Vulnerability	
Problem being mitigated	There is no enforcement capability of any land use without planning and zoning
Hazard(s) Addressed	All hazards
Action or Project	
Number	2.2.4
Action or Project Description	Form a citizens committee to investigate a plan to implement planning and zoning
Applicable Goal Statement	Manage growth through sustainable principle and practices
Estimated Cost	$5,000/year labor and materials
Benefits	Reduces loss of life, personal injury and property damage
Plan for Implementation	
Responsible Organization/ Department	County Commissioners, City governments, Lincoln County economic development, Fire districts
Priority	Low
Timeline for Completion	NA
Potential Funding Sources	Local funds, Government programs & private funding
Local Planning Mechanisms to be used in Implementation, if any	Planning and Zoning regulations, DNR & Corps Regulations
Progress Report	
Action Status	No action within the county. Continuing in cities with planning & zoning
Report of Progress	There is no planning & zoning in the county. Until such time the county incorportaes planning & zoning, this action plan will remain as "no action" status. Health Department enforces environmental sanitation ordinances even in floodplain.

Goal 3	Ensure continued operation of government and emergency functions in a disaster
Action 3.1.1	Review emergency access routes and evacuation routes and mitigate any problem areas
Jurisdiction	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School
Risk/Vulnerability	
Problem being mitigated	Emergency evacuation routes maybe blocked during emergencies
Hazard(s) Addressed	All hazards
Action or Project	
Number	3.1.1 (Old 3.1.1 is deleted)
Action or Project Description	Identify potentional blockages and work with local authorities
Applicable Goal Statement	Ensure continued operation of government and emergency functions in a disaster
Estimated Cost	$5,000/year for labor & materials
Benefits	Reduce likelihood of transportation disruptions during emergency egress
Plan for Implementation	
Responsible Organization/ Department	LC EMA, Fire Districts, Police departments, LC highway department, City public works department
Priority	Low
Timeline for Completion	Continuing
Potential Funding Sources	Local funds, Government programs & private funding
Local Planning Mechanisms to be used in Implementation, if any	County EOP
Progress Report	
Action Status	Continuing
Report of Progress	Continually review routes, develop and prioritize route maps

Goal 3	Ensure continued operation of government and emergency functions in a disaster
Action 3.1.2	Support periodic inspections of the dams
Jurisdiction	☑ Lincoln County ☐ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☐ Foley ☐ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☐ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☐ Truxton ☐ Elsberry R-II School ☐ Silex R-I School ☐ Troy R III School ☐ Winfield R IV School
Risk/Vulnerability	
Problem being mitigated	Possibility of dam breach
Hazard(s) Addressed	Dam failure
Action or Project	
Number	3.1.2
Action or Project Description	Mitigate possibility pf dam failure and breaching
Applicable Goal Statement	Ensure continued operation of government and emergency functions in a disaster
Estimated Cost	$5,000/year for labor & materials
Benefits	Reduces loss of life, personal injury and property damage
Plan for Implementation	
Responsible Organization/ Department	DNR, Corps regulations
Priority	Low
Timeline for Completion	Continuing
Potential Funding Sources	Local funds, Government programs & private funding
Local Planning Mechanisms to be used in Implementation, if any	Corps regulations, DNR regulations, LC EOP
Progress Report	
Action Status	Continuing
Report of Progress	Encourage dam emergency operations plan from DNR/Corps to EMA. Continue to include dam failure in LC EOP.

Goal 3	Ensure continued operation of government and emergency functions in a disaster
Action 3.1.3	Maintain an inventory of levees in the county
Jurisdiction	☑ Lincoln County ☐ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☐ Hawk Point ☐ Moscow Mills ☑ Old Monroe ☐ Silex ☐ Troy ☐ Whiteside ☑ Winfield ☐ Truxton ☑ Elsberry R-II School ☐ Silex R-I School ☐ Troy R III School ☐ Winfield R IV School
Risk/Vulnerability	
Problem being mitigated	Flooding due to levee failure
Hazard(s) Addressed	Levee failure
Action or Project	
Number	3.1.3
Action or Project Description	Inventory levees in the county
Applicable Goal Statement	Ensure continued operation of government and emergency functions in a disaster
Estimated Cost	$5000/year labor & materials
Benefits	Increases readiness, reduces likelihood of levee failure
Plan for Implementation	
Responsible Organization/ Department	County EMA, Floodplain Manager, Levee Districts
Priority	Medium
Timeline for Completion	Continuing
Potential Funding Sources	Local funds, Government programs & private funding
Local Planning Mechanisms to be used in Implementation, if any	Levee Emergency Action Plans, County EOP
Progress Report	
Action Status	Complete/Sustain
Report of Progress	County emergency management agency and floodplain manager closely work with levee districts to support the levee emergency action plans. EMA encourages all levees to be involved in the Corp program (2 private, 1 public)

Goal 3	Ensure continued operation of government and emergency functions in a disaster
Action 3.2.1	Identify, review, and implement mechanisms to foster collaboration among jurisdictions, agencies, special districts and private industry
Jurisdiction	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School
Risk/Vulnerability	
Problem being mitigated	Ability to respond to disasters is limited to inability to communicate between jurisdictions
Hazard(s) Addressed	All hazards
Action or Project	
Number	3.2.1
Action or Project Description	Determine ways to improve communication between jurisdictions
Applicable Goal Statement	Ensure continued operation of government and emergency functions in a disaster
Estimated Cost	$5000/year labor & materials
Benefits	Increase readiness and effectiveness of emergency reponse
Plan for Implementation	
Responsible Organization/ Department	County EMA,City governments, Schools
Priority	Low
Timeline for Completion	Continuing
Potential Funding Sources	Local funds, Government programs & private funding
Local Planning Mechanisms to be used in Implementation, if any	Community outreach events
Progress Report	
Action Status	Complete/Sustainment
Report of Progress	County emergency management agency meets regularly with local jurisdictions to promote collaboration. Increase collaboration & community with local businesses and key stakeholders

Goal 3	Ensure continued operation of government and emergency functions in a disaster
Action 3.2.2	Improve planning, funding, and response coordination
Jurisdiction	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School
Risk/Vulnerability	
Problem being mitigated	Ability to respond to disasters
Hazard(s) Addressed	All hazards
Action or Project	
Number	3.2.2
Action or Project Description	Determine ways to improve coordination between jurisdictions
Applicable Goal Statement	Ensure continued operation of government and emergency functions in a disaster
Estimated Cost	$5000/year labor & materials
Benefits	Increase readiness and effectiveness of emergency reponse
Plan for Implementation	
Responsible Organization/ Department	County EMA,City governments, Schools
Priority	Low
Timeline for Completion	Continuing
Potential Funding Sources	Local funds, Government programs & private funding
Local Planning Mechanisms to be used in Implementation, if any	Monthly training meetings, monthly stakeholer meetings
Progress Report	
Action Status	Complete/Sustainment
Report of Progress	County works with local jurisdictions and local agencies to identify needs and potential funding sources through grants to improve coordination & communication.

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5 PLAN MAINTENANCE PROCESS

5 PLAN MAINTENANCE PROCESS **1**

5.1 Monitoring, Evaluating, and Updating the Plan *1*

5.1.1 Responsibility for Plan Maintenance 1

5.1.2 Plan Maintenance Schedule 1

5.1.3 Plan Maintenance Process 2

5.2 Incorporation into Existing Planning Mechanisms *3*

5.3 Continued Public Involvement *3*

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

5.1 Monitoring, Evaluating, and Updating the Plan

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

5.1.1 Responsibility for Plan Maintenance

The Lincoln County Hazard Mitigation Planning Committee (MPC) is not a standing committee, and therefore the responsibility for maintenance of the plan actions is delegated to individuals or entities as indicated in Section 4 of this document. These entities are responsible for seeing that the actions placed into the plan are eventually implemented, if possible, and will be tasked with monitoring, evaluating, and maintaining the plan. BRPC coordinates with the County Emergency Management Director and the participating jurisdictions during the plan maintenance process and will coordinate any meetings that may be required.

5.1.2 Plan Maintenance Schedule

The Lincoln County Emergency Management Director will be responsible for initiating the plan reviews and will invite members of the MPC (or other designated responsible entity) to the meeting as necessary.

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.

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

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

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

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

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

5.2 Incorporation into Existing Planning Mechanisms

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

Where possible, plan participants will use existing plans and/or programs to implement hazard mitigation actions. Based on the capability assessments of the participating jurisdictions, communities in Lincoln County will continue to plan and implement programs to reduce loss of life and property from hazards. This plan builds upon the momentum developed through previous related planning efforts and mitigation programs, and recommends implementing actions, where possible, through the following means:

- Lincoln County Master Plan 2003
- Lincoln County Emergency Operations Plan 2009
- Comprehensive Economic Development Strategy 2014
- Regional Transportation Plan 2009
- Threat and Hazard Identification and Risk Assessment (THIRA) 2016
- Disaster Resistant Jobs Plan

The governing bodies of the jurisdictions adopting this plan will encourage all other relevant planning mechanisms under their authority to consult this plan to ensure minimization of risk to natural hazards as well as coordination of activities.

The Lincoln County EMD and the Boonslick Regional Planning Commission will be responsible for integrating the findings and actions of the mitigation plan, as appropriate.

5.3 Continued Public Involvement

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

The hazard mitigation plan update process provides an opportunity to publicize success stories resulting from the plan's implementation and seek additional public comment. Information about the annual reviews will be posted in the local newspaper as well as on the Lincoln County website 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.

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Appendix will be populated with Adoption Resolutions when they are available

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Mark Cunningham

From: Mark Cunningham
Sent: Tuesday, May 03, 2016 9:44 AM
To: 'cblevins@oldmonroefire.com'; 'chief.jeffries@gmail.com'; 'chief@lincolncountyfire.org'; 'chiefhobby@winfieldmo.mo'; 'cityclerk@hawkpointmo.org'; 'cityclerk@moscowmillsmo.com'; 'cityclerkom@centurytel.net'; 'cityhall@foleymissouri.com'; 'cityofsilexmo@gmail.com'; 'cswafford@wffpd.org'; 'dancolbert69@gmail.com'; 'darrellwehde@yahoo.com'; 'david.a.moore2@usace.army.mil'; 'dennis.carver@mercy.net'; 'dovespirit94@aol.com'; 'eddie.trower@chartercom.com'; 'efpd6600@sbcglobal.net'; 'ehenderson@silex.k12.mo.us'; 'EMD@lcmoema.com'; 'eoliafire@windstream.net'; 'Erik.Maninga@MoDOT.mo.gov'; 'fkmarvel@netscape.com'; 'foleychief@copmail.com'; 'gschellert@centurytel.net'; 'hahnrod@centurytel.net'; 'hawkpointmayor@centurytel.net'; 'hppdrb@live.com'; 'jcottle@lcsomo.com'; 'jennifer.harris@lchdmo.org'; 'jfeast@ameren.com'; 'jgarrett@ameren.com'; JoAnn Toerper; 'jodi@cityoftroymissouri.com'; 'jtaylor@troypolice.com'; 'kakouris.clerk@sbcglobal.net'; Krishnapriya Kunapareddy; 'kristin.d.gentry@dss.mo.gov'; 'margie.harrell@lc911dispatch.org'; 'marks@hawkpointfire.org'; 'mayor@moscowmillsmo.com'; 'mayor@winfieldmo.org'; 'mayorvertrees@gmail.com'; 'mcpadella@gmail.com'; 'mcross@cityoftroymissouri.com'; 'Mike Daniels'; 'mmpdchief@centurytel.net'; 'muciduc@hotmail.com'; 'nancybaker@winfield.k12.mo.us'; 'oldmonroepolice@centurylink.net'; 'paul.mueller@dnr.mo.gov'; 'pennym@troy.k12.mo.us'; 'ray@lcad.net'; 'rayoldmanray@aol.com'; 'rob.jungermann@gmail.com'; 'robynloesing@yahoo.com'; 'rolffarms@gmail.com'; 'sfair@fergusoncity.com'; 'silexpolice@gmail.com'; 'Tony.G.Hoffman@CenturyLink.com'; 'treller@elsberry.k12.mo.us'; 'villageoftruxton@gmail.com'; 'wilch.mayor@sbcglobal.net'; 'winfield.publicworks@centurytel.net'; 'winfieldcity@centurytel.net'; 'wpwehde@outlook.com'
Subject: Kick-Off Meeting of the Lincoln County Hazard Mitigation Plan Update Committee
Attachments: HMGP Signed 5-2-16.pdf

Lincoln County Emergency Management/Floodplain Administra
Emma Epplin-Birdsell – Emergency Management Dire
250 W. College Drive, Troy, MO 63
Office - 636.528.6182 x 2
www.lcmoema.

May 2, 2016

RE: Lincoln County Hazard Mitigation Plan Update

Greetings,

The Missouri State Emergency Management Agency has contracted with Boonslick Regional Planning Commission (BRPC) to update the Natural Hazard Mitigation Plan for Lincoln County including all incorporated municipalities and school districts within the county. The purpose of this plan is to reduce or eliminate long term risk to the people and property of the County from the effects of natural hazard events. This approach will ensure that our local governments remain eligible for all disaster recovery assistance possible. BRPC will

1

Mark A. Cunningham, Planner
Boonslick Regional Planning Commission
Region C Homeland Security Oversight Committee (RHSOC)
Hazard Mitigation Planning / Wheels To Work Revolving Loan
111 Steinhagen Road, P.O. Box 429, Warrenton, MO 63383
Phone (636) 456-3473 / Cell (314) 800-6230 Tue / Wed / Thurs: 0800 - 1630
http://www.boonslick.org/

Lincoln County Emergency Management/Floodplain Administration
Emma Epplin-Birdsell – Emergency Management Director
250 W. College Drive, Troy, MO 63379
Office - 636.528.6182 x 2299
www.lcmoema.com

May 2, 2016

RE: Lincoln County Hazard Mitigation Plan Update

Greetings,

The Missouri State Emergency Management Agency has contracted with Boonslick Regional Planning Commission (BRPC) to update the Natural Hazard Mitigation Plan for Lincoln County including all incorporated municipalities and school districts within the county. The purpose of this plan is to reduce or eliminate long term risk to the people and property of the County from the effects of natural hazard events. This approach will ensure that our local governments remain eligible for all disaster recovery assistance possible. BRPC will facilitate the planning process, collect the necessary data, and perform other technical services, including preparing risk assessment and plan documents. However, BRPC will need your help to successfully complete this project.

The hazard mitigation planning process is heavily dependent on the participation of representatives from local government agencies and departments, the public, and other stakeholder groups. A Hazard Mitigation Planning Committee will be formed to support this project and will include representatives from the county, communities, school districts, and other agencies located in, or serving, Lincoln County.

To remain eligible for future hazard mitigation funds all city and county government and school districts MUST participate in the planning process and formally adopt the plan upon its completion. Your organization's participation on the committee is requested due to your ability to contribute needed information, technical knowledge, or other valuable experience to the plan. If you cannot participate, please designate a representative to serve on the committee and attend the kickoff meeting, which will discuss the benefits of developing a hazard mitigation plan, the project schedule and the hazards that affect Lincoln County. The number of meetings and meeting length will be kept to a minimum to respect your time.

Lincoln County Hazard Mitigation Plan Kickoff Meeting – Lunch will be provided
May 18, 2016 – 11am to 1pm
Lincoln County Fire – Training Room
700 East Cherry St., Troy, MO 63379

Please respond with the name and contact information of the person who will attend the kickoff meeting on behalf of your community by contacting Mark Cunningham via telephone (636) 456-3473 or via e-mail at mcunningham@boonslick.org by May 13, 2016.

Sincerely,

Emma Epplin-Birdsell, MPH
Director

BOONSLICK REGIONAL PLANNING COMMISSION

LINCOLN COUNTY
Chain of Rocks
Elsberry
Foley
Fountain N Lakes
Hawk Point
Moscow Mills
Old Monroe
Silex
Troy
Truxton
Whiteside
Winfield

MONTGOMERY COUNTY
Bellflower
High Hill
Jonesburg
McKittrick
Middletown
Montgomery City
New Florence
Rhineland
Wellsville

WARREN COUNTY
Innsbrook
Marthasvillle
Pendleton
Truesdale
Warrenton
Wright City

Established: May 27, 1968

PO Box 429
111 Steinhagen Road
Warrenton, MO 63383-2103
Ph: (636) 456-3473
Fax: (636) 456-2329
www.boonslick.org

For Immediate Release
May 2, 2016
Contact: Ms. Krishnapriya Kunapareddy, Sr. Planner; Boonslick Regional Planning Commission

Lincoln County Hazard Mitigation Update Planning Begins

The Lincoln County Emergency Management Agency, in association with the Boonslick Regional Planning Commission, is beginning the process of updating the County's Natural Hazard Mitigation Plan. The purpose of the plan is to reduce or eliminate long term risk to the people and property of the County from the effects of natural hazard events. This approach will ensure that the County's local governments remain eligible for all possible disaster recovery assistance. The plan covers all incorporated municipalities and school districts within the County.

Boonslick Regional Planning Commission (BRPC) will facilitate the planning process, collect the necessary data, and perform other technical services, including preparing risk assessment and plan documents. The hazard mitigation planning process is heavily dependent on the participation of representatives from local government agencies and departments, the public, and other stakeholder groups.

A Hazard Mitigation Planning Committee kick-off meeting will be held in the Training Room at the Lincoln County Fire – Training Room, 700 East Cherry Street, Troy; from 11am to 1pm on May 18th. Invitations have been sent to representatives from the county, communities, school districts, and other agencies in or that serve Lincoln County. The general public is invited as well.

To remain eligible for future hazard mitigation funds all city and county government and school districts MUST participate in the planning process and formally adopt the plan upon its completion in late 2016.

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BOONSLICK REGIONAL
PLANNING COMMISSION

LINCOLN COUNTY
Chain of Rocks
Elsberry
Foley
Fountain N Lakes
Hawk Point
Moscow Mills
Old Monroe
Silex
Troy
Truxton
Whiteside
Winfield

MONTGOMERY COUNTY
Bellflower
High Hill
Jonesburg
McKittrick
Middletown
Montgomery City
New Florence
Rhineland
Wellsville

WARREN COUNTY
Innsbrook
Marthasvillle
Pendleton
Truesdale
Warrenton
Wright City

Established May 27, 1968

PO Box429
111 Steinhagen
Warrenton, MO 63383
Ph: (636)456-3473
Fax; (636-456-2329
www.boonslick.org

Boonslick Regional Planning Commission

Lincoln County Hazard Mitigation Planning Kick-Off Meeting

Wednesday, May 18, 2016

Notice is hereby given that the Boonslick Regional Planning Commission, in association with the Lincoln County Emergency Management Agency; will conduct a kick-off meeting of the Lincoln County Hazard Mitigation Update Plan in the training room of the Lincoln County Fire House, 700 East Cherry Street, Troy, Missouri 63779 on Wednesday, May 18, 2016. The meeting will commence at 11am and end no later than 1pm.

AGENDA

1. Welcome
2. Introduction to Hazard Mitigation Planning Update Process
3. Background of current Plan
4. Requirements and Expectations for the committee
5. Next Meeting

Posted: Monday, May 02, 2016

Welcome to Boonslick Regional Planning Commission!

Job Fair in Lincoln County a Success!

The Division of Workforce Development and Missouri Job Center/Boonslick Regional Planning Commission, along with the Lincoln County Veterans Commission, organized a job fair which took place in Lincoln County on April 14. The event was a success with seventy-two employers in attendance.

Many individuals expressed how pleased they were with the job fair and gave it very positive reviews. While ninety-one job seekers were in attendance, it is hoped that even more will participate in future events as they become aware of the strong participation by area employers.

The Lincoln County Marine Corps League Detachment 1405 opened the job fair with a ceremony to honor veterans. Those in attendance shared their appreciation for the ceremony. Members of the Missouri Chapter of Glory Riders provided assistance in the parking lot. In addition to job opportunities, veterans were also made aware of other resources available to them.

As is always the case with such an event, many organizations and businesses provided a great deal of help and support. Their assistance in making the job fair available for the residents of the region is greatly appreciated. Please see this list of organizations and businesses to which we would like to say "Thank you!"

Free Pesticide Collection for Missouri Households & Farmers

MISSOURI PESTICIDE COLLECTION EVENT

Saturday, June 4, 2016 • 8:00 a.m. to 1:00 p.m.

Montgomery County Road & Bridge Facility
480 Benton St., Montgomery City, MO 63361

The Missouri Department of Natural Resources worked with the Region I Solid Waste Management District to identify a site to hold a pesticide collection in Montgomery County. The collection is free for Missouri households and farmers. Pesticides from businesses will not be accepted. Check out this flyer for more information.

Lincoln County Hazard Mitigation Planning

The Lincoln County Emergency Management Agency, in association with Boonslick Regional Planning Commission, is beginning the process of updating the county's Natural Hazard Mitigation Plan. The purpose of the plan is to reduce or eliminate long term risk to the people and property of the county from the effects of natural hazard events. This approach will ensure that the county's local governments remain eligible for all possible disaster recovery assistance.

A Hazard Mitigation Planning Committee kick-off meeting will be held at the Lincoln County Fire – Training Room, 700 East Cherry Street, Troy, from 11am to 1pm on May 18th.

All incorporated municipalities and school districts within the county must participate in the planning process and formally adopt the updated plan. The general public is invited as well.

Public Notice

Title VI Program Update

Boonslick Regional Planning Commission is in the process of publishing a Title VI Program and is seeking public comments and suggestions on the proposed standards. The Title VI Program is based on the requirements of Title VI of the Civil Rights Act of 1964, which provides that "no person in the United States shall, on the ground of race, color, or national origin, be excluded from participation in, be denied the benefits of, or be subjected to discrimination under any program of activity receiving Federal financial assistance." A full copy of the document can be reviewed at 111 Steinhagen Drive, Warrenton, MO 63383.

Written comments on the Title VI Program update should be addressed to Boonslick Regional Planning Commission, Attention Chad Eggen, Executive Director, PO Box 429, 111 Steinhagen, Warrenton, MO 63383, or by email to ceggen@boonslick.org must be received by 4:00 p.m. June 3, 2016.

Boonslick Regional Planning Commission will hold a public Hearing on its Title VI Program on June 7, 2016, at 11:00 a.m. in the BRPC Conference Room, 111 Steinhagen Drive, Warrenton, MO 63383.

FS Leasing – Public Sector Financing Presentation

Terry Luetkemeyer, Donna Martin and Peggy Rodgers of First State Community Bank attended the Boonslick Regional Planning Commission general membership meeting Monday, March 28, 2016. They presented information about lease purchase financing.

A tax-exempt lease-purchase agreement is an installment purchase with an option to purchase for a nominal value. Such leases are available for political subdivisions in the State of Missouri, which includes cities, counties and other government entities. Tax exempt financing is typically utilized for equipment; however, it may also be used for implementation of a specific project, to purchase property or to expand existing facilities. Benefits of using a tax-exempt lease include saving capital dollars for projects when leasing is not an option, improvement of cash flow, and spreading the cost of an asset over its useful life.

If you are interested in more information about FS Leasing, you may contact Peggy Rodgers, president of the Warrenton branch at (636) 456-6176 or Brad Schuster, president of the Wright City branch at (636) 745-3337.

The Lincoln County Journal

www.lincolncountyjournal.com TIM SCHMIDT – General Manager
20 Business Park Drive, Troy, MO 63379 (636) 528-9550

PROOF OF PUBLICATION

I certify that the attached advertisement was published in *The Lincoln County Journal*.

Date: May 9, 2016 for a total of 1 insertions.

For: PUBLIC NOTICE: LINCOLN COUNTY EMERGENCY MANAGEMENT AGENCY-UPDATING COUNTY'S NATURAL HAZARD ITIGATION PLAN

Item/Classification: 9130 - Notice

Tim Schmidt, General Manager

SUBSCRIBED AND SWORN BEFORE ME ON THIS

9 DAY OF May, 2016

Kelly M. Albregts
Notary Public

My commission expires Feb. 3, 2017

KELLY M. ALBREGTS
Notary Public - Notary Seal
State of Missouri
Commissioned for Lincoln County
My Commission Expires: February 3, 2017
Commission Number: 13444599

Hazard Mitigation Update Planning

The Lincoln County Emergency Management Agency, in association with Boonslick Regional Planning Commission, is beginning the process of updating the county's Natural Hazard Mitigation Plan. The purpose of the plan is to reduce or eliminate long term risk to the people and property of the county from the effects of natural hazard events. This approach will ensure that the county's local governments remain eligible for all possible disaster recovery assistance.

A Hazard Mitigation Planning Committee kick-off meeting will be held at the Lincoln County Fire - Training Room, 700 East Cherry Street, Troy, from 11am to 1pm on May 18th.

All incorporated municipalities and school districts within the county must participate in the planning process and formally adopt the updated plan. The general public is invited as well.

Publication date: May 10, 2016

Lincoln County Hazard Mitigation Plan **Date: May 18, 2016**

NAME	ORGANIZATION/AGENCY	EMAIL	PHONE	TRAVEL TIME
Emma Eppin-Birdsell	LCEMA	Emd@lcmoema.com	636-528-6182	5 MIN
Mike Cherry	LCFPD	CHIEF@LINCOLNCOUNTYFIRE.ORG	636-528-8567	
Genevieve Wesemen	LCHD	genevieve-wesemen@lchd.mo		
CHAD EGGEN	BOONSLICK RPC	ceggen@boonslick.org		30 MIN 1 way
Jim Hake	Cap-au-Gris Levee	mociduc@hotmail.		
[illegible] Rolf	Winfield Levee L.D.D.	rolffarms@gmail.com		
TERRY Foster	Moscow Mills PD			

Boonslick Regional Planning Commission

Lincoln County Hazard Mitigation Plan **Date: May 18, 2016**

NAME	ORGANIZATION/AGENCY	EMAIL	PHONE	TRAVEL TIME
Kristin Gentry	Family Support Div	Kristin.O.Gentry@dss.mo.gov	636 528-8501	5 min
Mike Clynch	City of Moscow Mills	mayor@moscowmillsmo.com	636-290-0503	10 min
Tim Reller	Elsberry R-II	treller@elsberry.k12.mo.us	573-898-5554	30 min

Boonslick Regional Planning Commission

Lincoln County Hazard Mitigation Plan **Date: May 18, 2016**

NAME	ORGANIZATION/AGENCY	EMAIL	PHONE	TRAVEL TIME
Jodi Schneider	City of Troy	jodi@cityoftroymissouri.com	636-462-7609	5 minutes
Joe Edwards	City of Troy	kcofrq@yahoo.com.	636 262-1814	5 Min
William Barnes	City of Silex	Silexpolice@gmail.com	636 2006201	15 Min
LARRY A KIRK	OLD MONROE	OLD MONROE POLICE @CENTURYLINK.NET	636 661-5112	15 min

Lincoln County Hazard Mitigation Plan **Date: May 18, 2016**

NAME	ORGANIZATION/AGENCY	EMAIL	PHONE	TRAVEL TIME
Jim Holloway	LCAD	jim@lcad.net	636 528-8488	hours & hours
Andy Binder	LCSO	ABinder@lcsomo.com	636-295-4090	

Boonslick Regional Planning Commission

Lincoln County Hazard Mitigation Plan 2017 update

Kickoff Meeting- May 18, 2016

LINCOLN
WARREN
MONTGOMERY

Welcome

Introductions

Background of current plan

Planning process

Review goals/action plans

Next meeting

What is Hazard Mitigation ???

FEMA defines it as **"any action taken to eliminate or reduce the long-term risk to human life and property from natural and technological hazards"**.

Why Develop a Hazard Mitigation Plan?

- Save lives and protect property
- Preserve and protect an areas' environment and economy
- Preserve / maintain essential services and quality of life.
- Provide information to citizens, businesses, and officials.
- Project implementation and funding.

Lincoln County Hazard Mitigation Plan

- Eligibility for grant opportunities from SEMA and FEMA, requires **an approved plan**.
- First adopted in **2004**, updated in **2012**

http://boonslick.org/2011/09/lincoln-county-hazard-mitigation-plan-approved-pending-adoption-status/

This is the **2017 Update**

- Working on the Draft Plan
- Need Multi-Jurisdictional Participation
- Need Public participation
- Plan must be re-approved by SEMA & FEMA
- Plan must be re-adopted by communities

Projects….

Floodplain buyouts, improvements to roads and bridges that were prone to flooding, tornado shelters etc.

Lincoln County FEMA assistance projects

- Low water crossings
- Flood buyouts

Participation and Adoption

Lincoln County
Chain of Rocks
Fountain N Lakes
Elsberry
Foley
Hawk Point
Moscow Mills
Old Monroe
Silex
Troy
Whiteside
Winfield
Truxton

Elsberry R-II
Silex R-I
Troy R-III
Winfield R-IV

Planning Process

Planning Elements
Identification of potential hazards
Goals & action plans
Plan review/comments: July/August (tentative)
Formal adoption

WHO?

Planning Committee/Emergency Management Director/Cities/Schools/ SEMA/FEMA

Missouri HMP:
http://sema.dps.mo.gov/newspubs/publications/

Hazards Identified

- Dam
- Drought
- Earthquake
- Extreme Heat
- Flood/Levee Failure
- Hailstorm
- Severe winter weather
- Thunderstorm and high winds
- Tornado
- Wildfire
- Hazardous materials
- Terrorism
- Transportation
- Utility Interruption & Power failure

Goals/Objectives/Action Plan review (Handout)

[redacted]

Next meeting

Draft Plan Review

Boonslick RPC
111 Steinhagen
Warrenton MO 63383

Lincoln County Hazard Mitigation Plan 2016		
Responsible entities	**Timeline**	**Task**
BRPC/EMD/Commissioners	March /April 2016	Review the action plan worksheet/ Finalize the list of committee members
Meeting 1/ EMD/ Committee members	May 2016	Introduction/ Prioritization of needs
BRPC/EMD/SEMA/other state agencies	May/June 2016	BRPC will work on the draft plan
Meeting 2/ EMD/ Committee members	July 2016	Review the draft plan
BRPC/EMD/Communities and Warren County	August/September 2016	Communities will adopt the resolutions
BRPC/ SEMA/ FEMA	October 2016	Draft plan will be reviewed by SEMA/FEMA
BRPC/EMD/SEMA	November 2016	BRPC will work on edits and changes
BRPC	December 2016	Final plan will be sent to FEMA for approval

Second meeting – August

			2016 STATUS				
Objective	**Task**	**Actions**	**Complete / Delete**	**Complete/ Sustainment**	**Continuing Actions**	**No Action**	**Delete**
Goal 1: Protect the lives and livelihoods of all citizens.							
Objective 1.1: Provide sufficient warning systems.	1.1.1	Encourage people to equip their homes, schools, businesses and public spaces with NOAA weather radios			1.1.1		
Objective 1.2: Decrease the occurrence and impact of flooding.	1.2.1	Encourage property owners and occupants in hazard areas to participate in mitigation policy formulation.			1.2.1		
	1.2.2	Target any remaining repetitive flood loss properties for buyout or			1.2.2		
	1.2.3	Promote environmentally-sound watershed and storm water practices to decrease flash flooding.			1.2.3		
	1.2.4	Review and revise flood-fighting plans as needed.			1.2.4		
	1.2.5	Strengthen floodplain regulations as needed.			1.2.5		
	1.2.6	NFIP- Monitor development in special flood hazard areas to ensure compliance with local flood plain management ordinances. (proposed)		1.2.6			
Objective 1.3: Increase knowledge of safety measures among employers and the general public.	1.3.1	Develop hazard area maps and promote use by the public.			1.3.1		
	1.3.2	Identify ways to promote FEMA safety tips and mitigation techniques.			1.3.2		
	1.3.3	To provide earthquake preparedness and safety literature every year in the school districts.		1.3.3			
Objective 1.4: Increase and maintain appropriate emergency equipment.	1.4.1	Review and upgrade policies to identify and budget additional emergency equipment for health and medical services, mass care agencies, and public information.			1.4.1		
Objective 1.5: Protect residential structures.	1.5.1	Decrease wildfire risk in areas where development is adjacent to forests or grasslands by incorporating buffer zones into subdivision regulations.			1.5.1		
	1.5.2	Promote environmentally-sound, fire-resistant materials for homes.			1.5.2		
	1.5.3	Identify existing mechanisms to promote NFIP policies and earthquake/seismic insurance.		1.5.3			
	1.5.4	Utilize FEMA information to encourage residential owners to invest in retrofit techniques				1.5.4	
Objective 1.6: Protect large employment and commercial facilities.	1.6.1	Encourage tornado safe rooms in new construction. Suggestions include centralized safe rooms in subdivisions and/or safe rooms incorporated into the design of front porch foundations in new homes.		1.6.1			
	1.6.2	Encourage up-to-date commercial/industrial disaster plans that are coordinated with county/city disaster plans.			1.6.2		
	1.6.3	Encourage operation and infrastructure backup systems for commercial and industrial businesses.			1.6.3		
Objective 1.7: Identify populations with special needs or those who may be more vulnerable to the impacts of disasters or hazard events. Proposed in 2012 plan	1.7.1	Maintain inventory of special needs population, equipment & ADA shelters.		1.7.1			
	1.7.2	Enhance warning systems and notifications for special populations.		1.7.2			
	1.7.3	Provide shelter homes in case of emergency		1.7.3			
Objective 1.8 Reduce the disruption to transportation infrastructure from hazard events, by reducing the vulnerability of transportation infrastructure to hazard events. Proposed in 2012 plan	1.8.1	Utilize County road right of ways as firebreaks and snow storage.			1.8.1		
	1.8.2	Maintain inventory of vulnerable infrastructure.		1.8.2			
	1.8.3	Maintain an inventory of traffic incidents.		1.8.3			
Goal 2: Manage growth through sustainable principles and practices							
Objective 2.1: Reduce and prevent degradation of, or conflicts with, natural resources.	2.1.1	Institute or strengthen regulations to reduce stormwater runoff		2.1.1			
	2.1.2	Encourage best practices for drought-resistant farming and ranching		2.1.2			

	2.1.3	Institute a land use plan and reinstate zoning ordinances				2.1.3	
Objective 2.2: Promote sustainable planning, development, and construction practices.	2.2.1	Promote building codes in incorporated areas that currently do not have such regulations.				2.2.1	
	2.2.2	Implement measures to increase the county's CRS status.			2.2.2		
	2.2.3	Encourage open space in new developments				2.2.3	
	2.2.4	Resolve any existing environmental conflicts and take steps to prevent future conflicts.				2.2.4	
Goal 3: Ensure continued operation of government and emergency functions in a disaster							
Objective 3.1: Strengthen critical structures and infrastructures.	3.1.1	Review, prioritize, institute and monitor needed upgrades or retrofits for critical buildings and infrastructures.					3.1.1
	3.1.2	Review emergency access routes and evacuation routes and mitigate any problem areas.			3.1.2		
	3.1.3	Support periodic inspections of the dams			3.1.3		
	3.1.4	Maintain an inventory of levees in the County		3.1.4			
Objective 3.2: Strengthen collaboration among relevant jurisdictions.	3.2.1	Identify, review, and implement mechanisms to foster collaboration among jurisdictions, agencies, special districts and private industry.		3.2.1			
	3.2.2	Improve planning, funding, and response coordination		3.2.2			

Mark Cunningham

From: Mark Cunningham
Sent: Wednesday, May 25, 2016 3:58 PM
To: 'cblevins@oldmonroefire.com'; 'chief.jeffries@gmail.com'; 'chief@lincolncountyfire.org'; 'chiefhobby@winfieldmo.mo'; 'cityclerk@hawkpointmo.org'; 'cityclerk@moscowmillsmo.com'; 'cityclerkom@centurytel.net'; 'cityhall@foleymissouri.com'; 'cityofsilexmo@gmail.com'; 'cswafford@wffpd.org'; 'dancolbert69@gmail.com'; 'darrellwehde@yahoo.com'; 'david.a.moore2@usace.army.mil'; 'dennis.carver@mercy.net'; 'dovespirit94@aol.com'; 'eddie.trower@chartercom.com'; 'efpd6600@sbcglobal.net'; 'ehenderson@silex.k12.mo.us'; 'EMD@lcmoema.com'; 'eoliafire@windstream.net'; 'Erik.Maninga@MoDOT.mo.gov'; 'fkmarvel@netscape.com'; 'foleychief@copmail.com'; 'gschellert@centurytel.net'; 'hahnrod@centurytel.net'; 'hawkpointmayor@centurytel.net'; 'hppdrb@live.com'; 'jcottle@lcsomo.com'; 'jennifer.harris@lchdmo.org'; 'jfeast@ameren.com'; 'jgarrett@ameren.com'; JoAnn Toerper; 'jodi@cityoftroymissouri.com'; 'jtaylor@troypolice.com'; 'kakouris.clerk@sbcglobal.net'; Krishnapriya Kunapareddy; 'kristin.d.gentry@dss.mo.gov'; 'margie.harrell@lc911dispatch.org'; 'marks@hawkpointfire.org'; 'mayor@moscowmillsmo.com'; 'mayor@winfieldmo.org'; 'mayorvertrees@gmail.com'; 'mcpadella@gmail.com'; 'mcross@cityoftroymissouri.com'; 'Mike Daniels'; 'mmpdchief@centurytel.net'; 'muciduc@hotmail.com'; 'nancybaker@winfield.k12.mo.us'; 'oldmonroepolice@centurylink.net'; 'paul.mueller@dnr.mo.gov'; 'pennym@troy.k12.mo.us'; 'ray@lcad.net'; 'rayoldmanray@aol.com'; 'rob.jungermann@gmail.com'; 'robynloesing@yahoo.com'; 'rolffarms@gmail.com'; 'sfair@fergusoncity.com'; 'silexpolice@gmail.com'; 'Tony.G.Hoffman@CenturyLink.com'; 'treller@elsberry.k12.mo.us'; 'villageoftruxton@gmail.com'; 'wilch.mayor@sbcglobal.net'; 'winfield.publicworks@centurytel.net'; 'winfieldcity@centurytel.net'; 'wpwehde@outlook.com'
Subject: Minutes From Lincoln County Hazard Mitigation Planning Kick-Off Meeting
Attachments: LCHMP Kick Off Meeting Minutes May 18 2016.docx; Lincoln County Hazard Mitigation Plan-Kickoff meeting 2016.pptx; Timeline Lincoln County Hazard Mitigation Plan 2016.docx; LCHMP Kick Off Meeting Sign In Sheets.pdf

Team,

Here is the meeting minutes package for the kick-off meeting. Please review the minutes and let me know if you have questions or comments. Thanks,

Mark A. Cunningham, Planner
Boonslick Regional Planning Commission
Region C Homeland Security Oversight Committee (RHSOC)
Hazard Mitigation Planning / Wheels To Work Revolving Loan
111 Steinhagen Road, P.O. Box 429, Warrenton, MO 63383
Phone (636) 456-3473 / Cell (314) 800-6230 Tue / Wed / Thurs: 0800 - 1630
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Mark Cunningham

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Subject: RE: Minutes From Lincoln County Hazard Mitigation Planning Kick-Off Meeting
Attachments: Lincoln Summary of action plans.xlsx

I should have attached this file also...

Mark A. Cunningham, Planner
Boonslick Regional Planning Commission
Region C Homeland Security Oversight Committee (RHSOC)
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Subject: Minutes From Lincoln County Hazard Mitigation Planning Kick-Off Meeting

Team,

Here is the meeting minutes package for the kick-off meeting. Please review the minutes and let me know if you have questions or comments. Thanks,

Mark A. Cunningham, Planner
Boonslick Regional Planning Commission
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Lincoln County Hazard Mitigation Planning Kick-Off Meeting Minutes

May 18, 2016

1. Lincoln County Emergency Management Director, Emma Epplin-Birdsell, called the meeting to order at 10:05 am. There were 17 committee members present, including Ms. Epplin-Birdsell; and Boonslick Regional Planning personnel, Krishnapriya Kunapareddy, Chad Eggen, and Mark Cunningham. A sign-in sheet is part of this meeting package.

2. Emma thanked the group for attending and asked the group to introduce themselves.

3. Emma provided background on the Hazard Mitigation Planning process and explained why it is important for Lincoln County to complete the update. She also mentioned some projects that were accomplished by Lincoln County with mitigation funding provided through FEMA, specifically, Low Water Crossings, Flood Buy-Outs, and a storm shelter for Troy Buchanan High School. Emma then introduced Ms. Krishnapriya Kunapareddy, the project planner for the Boonslick Regional Planning Commission(BRPC).

4. Krishna reviewed the agenda for the meeting and briefed the committee using the PowerPoint presentation which is part of this meeting package.

5. Following the briefing, Krishna directed the committee to review the Action Plan Summary Sheet (Objective/Task/Actions) which is part of this meeting package. Krishna explained that Emma and BRPC did a preliminary assessment of the Action Plan and brought it to the team for their consideration and input. Most of the meeting was spent on this review. All of the tasks and actions on the review were discussed; however, only those prompting further discussion and / or changes are noted in these minutes.

    a. Task 1.1.1 – Continuing actions; NIXLE serves as a county-wide alert system that alerts unincorporated Lincoln County to weather events. Within the City of Troy, it is also used to alert public safety issues such as boil water and Amber Alerts. This task will remain a continuing action to ensure county and city residents continue to be encouraged to use NOAA weather radios for early alerting of severe weather and Amber Alerts.

    b. Task 1.2.1 – Continuing actions; Some Tier II HazMat facilities are located in flood plains. Inside city limits, mitigation policies and regulations are the

responsibility of the respective city. It is believed that the cities are adequately enforcing the regulations. For areas within unincorporated Lincoln County, mitigation policies are enforced by the county. This task will remain as a continuing action to ensure compliance.

c. Task 1.2.2 – Continuing actions; The team discussed this task at some length, especially as it relates to the Silex flash flood buyout that precipitated the relocation of the City of Silex. William Barnes, Police Chief of Silex, stated that FEMA did not provide enough funds to thoroughly complete the task. Therefore, the team decided to add language to the task so it reads, "Target any remaining repetitive flood loss properties for buyout or relocation." "or relocation" was added.

d. Task 1.2.3 – Continuing actions. Troy is updating their sewer plant and storm water management system. Winfield has added a storm water management system.

e. Task 1.2.4 – Continuing actions. EOP is updated as required and levees are repaired as needed.

f. Task 1.2.5 – Continuing actions; Lincoln County is working on getting CRS status.

g. Task 1.2.6 – Complete/Sustainment; the county continues to ensure compliance with flood plain regulations and local municipalities continue to do the same. Lack of Planning and Zoning makes it difficult to enact meaningful measures.

h. Task 1.3.1 – Continuing actions; County EMA has hazard area maps available for public to view but does not actively promote on website and Facebook. Some Tier II facilities are in flood plains. Continue to distribute information.

i. Task 1.3.2 – Continuing action; continue to publicize mitigation and safety techniques using EMA website and Facebook. Lack of Planning and Zoning makes it difficult to enact meaningful measures. County is looking into flash flood

sensors that could be place upstream in strategic locations to provide advance warning.

j. Task 1.3.3 – Complete/Sustainment; schools conduct earthquake drills annually.

k. Task 1.4.1 – Continuing actions; need to complete Mass Care Planning and find way to provide emergency generators for nursing homes.

l. Task 1.5.1 – Continuing action; make new subdivision developers aware of safety concerns. Alerts are made using Nixle and sirens. Lincoln County FPD exerts some influence over incorporated areas.

m. Task 1.5.2 – Continuing action; hampered by lack of Planning and Zoning. Continue to promote through public information and economic development.

n. Task 1.5.3 – Complete/Sustainment; all county residents are able to be NFIP insured.

o. Task 1.5.4. – No Action

p. Task 1.6.1 – Complete/Sustainment; Mobile homes are a major concern as people have nowhere to go in event of severe weather. FEMA grants were used to provide tornado safe rooms in Troy High School, Middle School, and Truxton Fire Station. Will continue to promote FEMA grants and tornado safe rooms. New trailer courts are being required to provide a safe room for residents.

q. Task 1.6.2 – Continuing action; work with coops like faith-based initiatives.

r. Task 1.6.3 – Continuing action; encourage business continuity plans.

s. Task 1.7.1 – Complete/sustainment; Dispatch maintains a small database of self-identified persons. Concentrate on protecting schools, hospitals, and other known facilities housing large number of special needs.

t. Task 1.7.2 - Complete/sustainment; NIXLE serves as a county-wide alert system that alerts unincorporated Lincoln County to weather events.

Lincoln County Hazard Mitigation Planning
Kick-Off Meeting Minutes

May 18, 2016

u. Task 1.7.3 – Complete/Sustainment; large issue in unincorporated areas. People in city can readily find shelter but not so in county. Consider making new mobile home parks build storm shelters for residents.

v. Task 1.8.1 – Continuing action; teams suggests developing maps for distribution that show emergency ingress and egress routes for most vulnerable areas.

w. Task 1.8.2 – Complete/Sustainment

x. Task 1.8.3 – Complete/Sustainment

y. Task 2.1.1 – Complete/Sustainment

z. Task 2.1.2 – Complete/Sustainment; Team agreed to add "ranching" to the action. County EMA refers these issues to USDA.

aa. Task 2.1.3 – No Action

bb. Task 2.2.1 – No Action

cc. Task 2.2.2 – Continuing action; CRS visit later this summer

dd. Task 2.2.3 – No Action

ee. Task 2.2.4 – No Action

ff. Task 3.1.1. – Delete; The committee reviewed the task and agreed that this task Should not have been included in original HMP.

gg. Task 3.1.2. – Continuing action; continually review routes, develop and publicize route maps.

hh. Task 3.1.3 – Continuing action; continue to monitor and inspect damages. Encourage EOPS.

ii. Task 3.1.4 – Complete/Sustain

Lincoln County Hazard Mitigation Planning
Kick-Off Meeting Minutes

May 18, 2016

jj. Task 3.2.1 – Complete/Sustain

kk. Task 3.2.2 – Complete/Sustain

6. Tasks related to Planning and Zoning: The committee discussed that as there is no Planning and Zoning in the County, until such time the county incorporates planning and zoning, the following tasks, Task 1.5.4, Task 2.1.3, Task 2.2.1, Task 2.2.3, Task 2.2.4 will remain as "no action" tasks.

7. Emma suggested that Goal 1 should involve public health with pandemics such as influenza. Krishna and Mark said they will investigate if FEMA will allow that in the HMP.

8. The team was requested to send any new action plans that they feel should be included in the hazard mitigation plan.

9. The meeting was adjourned at 1240.

Mark Cunningham

From: Mark Cunningham
Sent: Wednesday, June 01, 2016 9:48 AM
To: cblevins@oldmonroefire.com; chief.jeffries@gmail.com; chief@lincolncountyfire.org; chiefhobby@winfieldmo.mo; cityclerk@hawkpointmo.org; cityclerk@moscowmillsmo.com; cityclerkom@centurytel.net; cityhall@foleymissouri.com; cityofsilexmo@gmail.com; cswafford@wffpd.org; dancolbert69@gmail.com; darrellwehde@yahoo.com; david.a.moore2@usace.army.mil; dennis.carver@mercy.net; dovespirit94@aol.com; eddie.trower@chartercom.com; efpd6600@sbcglobal.net; ehenderson@silex.k12.mo.us; EMD@lcmoema.com; eoliafire@windstream.net; Erik.Maninga@MoDOT.mo.gov; fkmarvel@netscape.com; foleychief@copmail.com; gschellert@centurytel.net; hahnrod@centurytel.net; hawkpointmayor@centurytel.net; hppdrb@live.com; jcottle@lcsomo.com; jennifer.harris@lchdmo.org; jfeast@ameren.com; jgarrett@ameren.com; JoAnn Toerper; jodi@cityoftroymissouri.com; jtaylor@troypolice.com; kakouris.clerk@sbcglobal.net; Krishnapriya Kunapareddy; kristin.d.gentry@dss.mo.gov; margie.harrell@lc911dispatch.org; marks@hawkpointfire.org; mayor@moscowmillsmo.com; mayor@winfieldmo.org; mayorvertrees@gmail.com; mcpadella@gmail.com; mcross@cityoftroymissouri.com; Mike Daniels; mmpdchief@centurytel.net; muciduc@hotmail.com; nancybaker@winfield.k12.mo.us; oldmonroepolice@centurylink.net; paul.mueller@dnr.mo.gov; pennym@troy.k12.mo.us; ray@lcad.net; rayoldmanray@aol.com; rob.jungermann@gmail.com; robynloesing@yahoo.com; rolffarms@gmail.com; sfair@fergusoncity.com; silexpolice@gmail.com; Tony.G.Hoffman@CenturyLink.com; treller@elsberry.k12.mo.us; villageoftruxton@gmail.com; wilch.mayor@sbcglobal.net; winfield.publicworks@centurytel.net; winfieldcity@centurytel.net; wpwehde@outlook.com
Cc: Krishnapriya Kunapareddy
Subject: Update to LCHMP Committee

LCHMP Committee Members,

At the kick-off meeting it was suggested that Goal 1 should have actions added to involve public health in possible pandemics. Genevieve Weseman of the Lincoln County Health Department and Emma Epplin-Birdsell, the Lincoln County EMD; recommended the following language be added to Goal 1. If there is any objection or input regarding this addition, please let me know. Here are the additional tasks.

1.3.4 Identify public health issues and identify ways to promote healthy life style changes.

1.3.5 Identify causes of disease and promote measures to control spread of disease in case of emergency such as: reduce vectors, increase awareness of foodborne illness hazards due to spoilage and contamination

1.7.4 Identify community health disparities and their effects on post disaster population health i.e. access to care, messaging, translation services, mental/ behavioral health services.

Mark A. Cunningham, Planner
Boonslick Regional Planning Commission
Region C Homeland Security Oversight Committee (RHSOC)
Hazard Mitigation Planning / Wheels To Work Revolving Loan
111 Steinhagen Road, P.O. Box 429, Warrenton, MO 63383
Phone (636) 456-3473 / Cell (314) 800-6230 Tue / Wed / Thurs: 0800 - 1630
http://www.boonslick.org/

1

Mark Cunningham

From: Mark Cunningham
Sent: Thursday, September 08, 2016 8:35 AM
To: 'cblevins@oldmonroefire.com'; 'chief.jeffries@gmail.com'; 'chief@lincolncountyfire.org'; 'chiefhobby@winfieldmo.mo'; 'cityclerk@hawkpointmo.org'; 'cityclerk@moscowmillsmo.com'; 'cityclerkom@centurytel.net'; 'cityhall@foleymissouri.com'; 'cityofsilexmo@gmail.com'; 'cswafford@wffpd.org'; 'dancolbert69@gmail.com'; 'darrellwehde@yahoo.com'; 'david.a.moore2@usace.army.mil'; 'dennis.carver@mercy.net'; 'dovespirit94@aol.com'; 'eddie.trower@chartercom.com'; 'efpd6600@sbcglobal.net'; 'ehenderson@silex.k12.mo.us'; 'EMD@lcmoema.com'; 'eoliafire@windstream.net'; 'Erik.Maninga@MoDOT.mo.gov'; 'fkmarvel@netscape.com'; 'foleychief@copmail.com'; 'gschellert@centurytel.net'; 'hahnrod@centurytel.net'; 'hawkpointmayor@centurytel.net'; 'hppdrb@live.com'; 'jcottle@lcsomo.com'; 'jennifer.harris@lchdmo.org'; 'jfeast@ameren.com'; 'jgarrett@ameren.com'; JoAnn Toerper; 'jodi@cityoftroymissouri.com'; 'jtaylor@troypolice.com'; 'kakouris.clerk@sbcglobal.net'; Krishnapriya Kunapareddy; 'kristin.d.gentry@dss.mo.gov'; 'margie.harrell@lc911dispatch.org'; 'marks@hawkpointfire.org'; 'mayor@moscowmillsmo.com'; 'mayor@winfieldmo.org'; 'mayorvertrees@gmail.com'; 'mcpadella@gmail.com'; 'mcross@cityoftroymissouri.com'; 'Mike Daniels'; 'mmpdchief@centurytel.net'; 'muciduc@hotmail.com'; 'nancybaker@winfield.k12.mo.us'; 'oldmonroepolice@centurylink.net'; 'paul.mueller@dnr.mo.gov'; 'pennym@troy.k12.mo.us'; 'ray@lcad.net'; 'rayoldmanray@aol.com'; 'rob.jungermann@gmail.com'; 'robynloesing@yahoo.com'; 'rolffarms@gmail.com'; 'sfair@fergusoncity.com'; 'silexpolice@gmail.com'; 'Tony.G.Hoffman@CenturyLink.com'; 'treller@elsberry.k12.mo.us'; 'villageoftruxton@gmail.com'; 'wilch.mayor@sbcglobal.net'; 'winfield.publicworks@centurytel.net'; 'winfieldcity@centurytel.net'; 'wpwehde@outlook.com'
Subject: Lincoln County Hazard Mitigation Planning Committee Meeting

Committee Members,

The second meeting of the Lincoln County Hazard Mitigation Planning committee will be held on September 28th in the Training Room of the Lincoln County Fire Protection District Fire House, 700 East Cherry Street, Troy, Missouri 63379. The meeting will begin at 11am and conclude by 1pm. An RSVP is requested.

The purpose of the meeting is for the committee to approve the draft plan for submission to the Missouri State Emergency Management Agency, SEMA. An opportunity to ask questions and comment on the plan will be provided before approval. If the plan is approved at this meeting, no further meetings of the committee will be required. The meeting is open to the public.

The draft plan is posted on the Boonslick Regional Planning Commission's website so that you have an opportunity to review the plan before the meeting. For those unable to connect to the internet, a hard copy will be available for review at the Lincoln County Emergency Management Agency and at the Boonslick Regional Planning Commission's office in Warrenton. Please note that portions of the plan cannot be completed until after this meeting and the adoption resolutions have be passed.

Here is the link to the plan; http://boonslick.org/lincoln-county-hazard-mitigation-plan-documents/

Please review the draft documents and come to the meeting with your questions and comments. You can also email the Director of the Lincoln County Emergency Management Agency, Emma Epplin-Birdsell (EMD@lcmoema.com); Krishna Kunapareddy (krishna@boonslick.org) of the Boonslick Regional Planning Commission; or to me if you have questions.

1

Mark A. Cunningham, Planner
Boonslick Regional Planning Commission
Region C Homeland Security Oversight Committee (RHSOC)
Hazard Mitigation Planning / Wheels To Work Revolving Loan
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BOONSLICK REGIONAL
PLANNING COMMISSION

Lincoln County Hazard Mitigation Plan Documents

LCHMP Cover Page Through Section II

LCHMP Section III – Part 1

LCHMP Section III – Part 2

LCHMP Sections IV and V

LCHMP Appendix A – To be added following adoption resolutions

LCHMP Appendix B – To be added following September 28th meeting

LCHMP Appendix C – STAPLEE Work Sheets

LCHMP Appendix D – FIRM Maps

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BOONSLICK REGIONAL
PLANNING COMMISSION

LINCOLN COUNTY
Chain of Rocks
Elsberry
Foley
Fountain N Lakes
Hawk Point
Moscow Mills
Old Monroe
Silex
Troy
Truxton
Whiteside
Winfield

MONTGOMERY COUNTY
Bellflower
High Hill
Jonesburg
McKittrick
Middletown
Montgomery City
New Florence
Rhineland
Wellsville

WARREN COUNTY
Innsbrook
Marthasvillle
Pendleton
Truesdale
Warrenton
Wright City

Established: May 27, 1968

PO Box 429
111 Steinhagen Road
Warrenton, MO 63383-2103
Ph: (636) 456-3473
Fax: (636) 456-2329
www.boonslick.org

For Immediate Release
September 6, 2016
Contact: Ms. Krishnapriya Kunapareddy, Sr. Planner; Boonslick Regional Planning Commission

Lincoln County Hazard Mitigation Update Planning Nears Completion

The Lincoln County Emergency Management Agency, in association with the Boonslick Regional Planning Commission, is finalizing the process of updating the County's Natural Hazard Mitigation Plan. The purpose of the plan is to reduce or eliminate long term risk to the people and property of the County from the effects of natural hazard events. This approach will ensure that the County's local governments remain eligible for all possible disaster recovery assistance. The plan covers all incorporated municipalities and school districts within the County.

Boonslick Regional Planning Commission (BRPC) has completed the process of data collection and has prepared the risk assessment and plan documents based on information provided by the planning committee.

The Hazard Mitigation Planning Committee will meet to review and approve the plan at 11am on September 28th in the training room of the Lincoln County Fire Protection District Firehouse, 700 East Cherry Street, Troy. The public is invited as well.

To remain eligible for future hazard mitigation funds all city and county government and school districts must participate in the planning process and formally adopt the plan upon its completion in late 2016.

###

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4 acres m/l. 2 bdrm home. Detached garage. Public water. Blacktop frontage. **THORNHILL REAL ESTATE & AUCTION #389B 636-366-4206**

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LOOKING FOR AN INVESTMENT
59.77 acres m/l. 51+ acres tillable, balance in woods. Recently limed. Surveyed. Farmer would continue to lease farm. Montgomery County. **THORNHILL REAL ESTATE & AUCTION 636-366-4206 #361**

305 LOTS & ACREAGE

YOUR BUILDER YOUR PLAN
3.90 +/- acre rural lot in developed subdivision. Beautiful wooded lot. Paved roads, public water, & subdivision amenities. **MEYER & COMPANY 636-462-5555 #18,000 #3001-16005693**

MAYBE THIS ONE'S FOR YOU
25.9 acres m/l. Shed. Property has fencing. Fronts on Hwy W. Public water & sewer available. 1/2 wooded-1/2 pasture. Stocked lake. Trails thru the timbers. **THORNHILL REAL ESTATE #349 636-366-4206**

GATED COMMUNITY
Residential building lot. Wooded lot. Enjoy all the amenities of the community including 220 acre lake for great recreational activities, pool, club house, golfing & tennis courts. **MEYER & COMPANY 636-462-5555 $6,000 #3012-16012086**

ESTABLISHED SUBDIVISION
4.617 +/- acres building lot. Beautiful open cul-de-sac lot with slopes into the woods. Great spot for a walk-out lot. Nice view of the neighbors lake. Easy access to Hwy 61 and Hwy 79. **MEYER & COMPANY 636-462-5555 $32,000 #3023-16022592**

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Fantastic 214 +/- acre. Great combination of crop farm with income and woods for hunting. Perfect place for weekend cabin or permanent home. Borders Cuivre River. Get away to the country with a short drive from St. Louis. **MEYER & CO 636-462-5555 $2,499,000 #3028-16023329**

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Mature trees, roads and underground utilities are in. **$800 down, $132 Month**, No Closing Cost. Call John **314-570-7293**

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125 +/- acres. Private valley with 1 lake and 2 springs fed ponds. 3,000 ft of Big Creek frontage. Fenced & cross fenced. Historic barn, machine shed and split level house. Excellent property for horses, cattle, hunting & fishing. **MEYER & COMPANY $775,000 636-462-5555 #3079-16062713**

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5 acre m/l of hills & woods. Springhaven subdivision. Troy School district. Black top roads. Community water. Family atmosphere. **THORNHILL REAL ESTATE #599 636-366-4206**

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361 HOT OFF THE PRESS

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490 GARAGE SALE & YARD SALES

GARAGE SALES
9/22, 23 & 24
8:30 am - ? for info
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330 & 335 ESSEX CT, TROY

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Hazard Mitigation Update Planning

A Hazard Mitigation Planning Committee meeting will be held at the Lincoln County Fire Protection District Fire House, 700 East Cherry Street, Troy; from 11am to 1pm on September 28th. The purpose of the meeting is to review and approve the draft Hazard Mitigation plan. A copy of the plan is available to view at the Lincoln County Emergency Management Agency and at the Boonslick Regional Planning Commission in Warrenton.

All incorporated municipalities and school districts within the county must participate in the planning process and legally adopt the updated plan. The public is invited as well.

Publication date: September 13 & 20, 2016

REQUEST FOR SEALED BIDS

Separate sealed bids for City of Silex Sewer Treatment System Upgrade will be received by the City Clerk at the office of City Hall, 14 N. First St, Silex, MO 63377 until 2:00pm CT on Tuesday October 18, 2016, and then at said office publicly opened and read aloud.

The Information for Bidders, Form of Bid, Form of Contract, Plans, Specifications, and Forms of Bid Bond, Performance and Payment Bond, and other contract documents may be examined at the engineer's office: Poepping, Stone, Bach & Associates, Inc., 801 Broadway Suite 248, Hannibal, MO 63401, (573) 406-0541.

Copies may be obtained at the office of the Engineer. Bid deposit is $100.00, nonrefundable for hard copies. A pdf copy of the bid documents is available for a nonrefundable charge of $50.00.

The owner reserves the right to waive any informalities or to reject any or all bids.

Each bidder must deposit with his bid security in the amount, form and subject to the conditions provided in the Information for Bidders.

Attention of bidders is particularly called to the requirements as to conditions of employment to be observed and minimum wage rates to be paid under the contract, Section 3-DBE, Segregated Facility, Section 109, and E.O. 11246. MBE and WBE bidders are encouraged to bid.

No bidder may withdraw his bid within 60 days after the actual date of the opening thereof.

City of Silex. EOE.

NOTICE OF PUBLIC HEARING

NOTICE is hereby given that a Public Hearing will be held by the Board of Aldermen of the City of Winfield, Missouri at 6:30 p.m. on 10th day of October, 2016 at the City Hall in Winfield Missouri, concerning the matter of the proposed annexation into the City of Winfield of the following described Real Estate in Lincoln County, Missouri, to wit:

Description of a 97.770 acre tract of land being part of a tract of land conveyed by Deed Book 305 Page 254 of the Lincoln County Records, Situated in U.S. Survey 1816, Township 49 North, Range 2 East of the 5th P.M., Lincoln County, Missouri, and being more particularly described as follows: Commencing at the Southwest corner of Section 23, Township 49 North, Range 2 East, thence South 89 degrees 57'

Lincoln County Emergency Management/Floodplain Administration
250 W. College Drive, Troy, MO 63379
Office - 636.528.6182
www.lcmoema.com

Emma Epplin-Birdsell – Emergency Management Director, Floodplain Administrator
David Harding – Emergency Management Assistant, Floodplain Manager

Boonslick Regional Planning Commission

Lincoln County Hazard Mitigation Planning Second Meeting

Wednesday, September 28, 2016

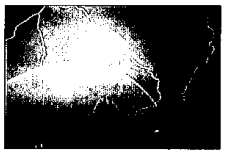
Notice is hereby given that the Boonslick Regional Planning Commission, in association with the Lincoln County Emergency Management Agency, will conduct the second meeting of the Lincoln County Hazard Mitigation Update Planning Committee at the Lincoln County Fire Protection District Fire House, 700 East Cherry Street, Troy, MO on September 28, 2016. The meeting will commence at 11 o'clock in the morning and end no later than 1 o'clock pm.

AGENDA

1. Welcome
2. Question and Answer Session on Draft Plan
3. Approval of Plan
4. Other Topics as Necessary

9/28/2016

Lincoln County Hazard Mitigation Plan 2017 Update



MONTGOMERY LINCOLN WARREN

Review Meeting-
September 28, 2016

Agenda

- Welcome / Introductions
- Plan Background
- Plan Question & Answer Session
- Plan Approval
- Next Steps

1

9/28/2016

Plan Background

- Eligibility for grant opportunities from SEMA/FEMA requires an approved plan
- First adopted in 2004, updated in 2012
- This is the 2017 Update
  - Plan adoption
  - Plan must be re-approved by SEMA & FEMA
  - Plan must be re-adopted by communities

Participation & Adoption

- Lincoln County
- Chain of Rocks
- Elsberry
- Foley
- Fountain N' Lakes
- Hawk Point
- Moscow Mills
- Old Monroe
- Silex
- Troy
- Truxton
- Whiteside
- Winfield
- Elsberry R-II
- Silex R-I
- Troy R-III
- Winfield R-IV

2

9/28/2016

Next Steps

- Meeting Minutes Distributed – September 29
- Plan Updated – September 29
- Re-posted – September 29
- Distributed to jurisdictions – October 4
- Jurisdictions Adopt Plan – October / November
- Adopted Plan Submitted to SEMA / FEMA
- FEMA Approves Plan – Early January
- Annual Plan Review Meeting – Summer 2017

Contacts

Krishna Kunapareddy
Krishna@boonslick.org

Boonslick RPC
111 Steinhagen
Warrenton MO 63383

4

Lincoln County Hazard Mitigation Plan Meeting **Date: September 28, 2016**

NAME	ORGANIZATION/AGENCY	EMAIL	PHONE	TRAVEL TIME
Brian Lourance	City of Troy	city126@centurytel.net	314-565-0138	
MARK CROSS	City of Troy	mcross@cityoftroymissouri.com	636-290-5174	
Tonya Hawkins	City of Troy	tonyah@cityoftroymissouri.com	636-528-4710 ext. 7612	
MIKE CHERRY	LCFPD / EMA	CHIEF@LINCOLNCOUNTYFIRE.ORG	314-565-0139	
Emma Epplin-Birdsall	LC EMA	emd@lcmoema.com	636-528-6182	

Lincoln County Hazard Mitigation Plan Meeting **Date: September 28, 2016**

NAME	ORGANIZATION/AGENCY	EMAIL	PHONE	TRAVEL TIME
Genevieve Weseman	LC Health Dept.	genevieve.weseman@lchdmo.org	(636) 528 6117 ext 408	

Boonslick Regional Planning Commission

Mark Cunningham

To: cblevins@oldmonroefire.com; chief.jeffries@gmail.com; chief@lincolncountyfire.org; cityclerk@hawkpointmo.org; cityclerk@moscowmillsmo.com; cityclerkom@centurytel.net; cityhall@foleymissouri.com; cityofsilexmo@gmail.com; cswafford@wffpd.org; dancolbert69 @gmail.com; darrellwehde@yahoo.com; david.a.moore2@usace.army.mil; dennis.carver@mercy.net; dovespirit94@aol.com; eddie.trower@chartercom.com; efpd6600 @sbcglobal.net; ehenderson@silex.k12.mo.us; EMD@lcmoema.com; eoliafire@windstream.net; Erik.Maninga@MoDOT.mo.gov; fkmarvel@netscape.com; gschellert@centurytel.net; hahnrod@centurytel.net; hawkpointmayor@centurytel.net; hppdrb@live.com; jcottle@lcsomo.com; jennifer.harris@lchdmo.org; jfeast@ameren.com; jgarrett@ameren.com; JoAnn Toerper; jodi@cityoftroymissouri.com; jtaylor@troypolice.com; kakouris.clerk@sbcglobal.net; Krishnapriya Kunapareddy; kristin.d.gentry@dss.mo.gov; margie.harrell@lc911dispatch.org; marks@hawkpointfire.org; mayor@moscowmillsmo.com; mayor@winfieldmo.org; mayorvertrees@gmail.com; mcpadella@gmail.com; mcross@cityoftroymissouri.com; Mike Daniels; mmpdchief@centurytel.net; muciduc@hotmail.com; nancybaker@winfield.k12.mo.us; oldmonroepolice@centurylink.net; pennym@troy.k12.mo.us; ray@lcad.net; rayoldmanray@aol.com; rob.jungermann@gmail.com; robynloesing@yahoo.com; rolffarms@gmail.com; sfair@fergusoncity.com; silexpolice@gmail.com; treller@elsberry.k12.mo.us; villageoftruxton@gmail.com; wilch.mayor@sbcglobal.net; winfieldcity@centurytel.net; wpwehde@outlook.com; tonyah@cityoftroymissouri.com; mcross@cityoftroymissouri.com; city126@centurytel.net

Cc: Krishna Kunapareddy (krishna@boonslick.org)

Subject: Lincoln County Hazard Mitigation Team Meeting 2

Attachments: LCHMP Meeting 2 Minutes September 28 2016.docx; Lincoln County Hazard Mitigation Plan Second Meeting September 2016.pptx; Meeting 2 Sign In Sheets.pdf; City of Elsberry Adoption Resolution Specimen.doc; City of Foley Adoption Resolution Specimen.doc; City of Hawk Point Adoption Resolution Specimen.doc; City of Moscow Mills Adoption Resolution Specimen.doc; City of Old Monroe Adoption Resolution Specimen.doc; City of Silex Adoption Resolution Specimen.doc; City of Troy Adoption Resolution Specimen.docx; City of Winfield Adoption Resolution Specimen.docx; Elsberry RII School District Adoption Resolution Specimen.docx; Lincoln County Adoption Resolution Specimen.doc; Sample Adoption Resolution.doc; Silex RI School District Adoption Resolution Specimen.docx; Troy RIII School District Adoption Resolution Specimen.docx; Village of Chain of Rocks Adoption Resolution Specimen.doc; Village of Fountain N' Lakes Adoption Resolution Specimen.doc; Village of Truxton Adoption Resolution Specimen.doc; Village of Whiteside Adoption Resolution Specimen.doc; Winfield RIV School District Adoption Resolution Specimen.docx

Team,

Thanks for a great Hazard Mitigation Planning meeting on Wednesday. It is good to have your approval of the draft plan.

The draft plan has been updated with the changes discussed at the meeting and is posted at this link; http://boonslick.org/warren-county-hazard-mitigation-plan-draft/. You can also get there from our homepage, Boonslick.org.

This is the draft plan we will be asking our county commission and municipalities to adopt during their October/November meeting cycles. Our hope is for all municipalities and the county to adopt the resolution and email or fax the signed resolutions to us by mid-November. When the resolutions are added to the document it will be sent to SEMA for their review and subsequent approval.

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Please note that the minutes of the meeting are attached, along with the sign-in sheet, PowerPoint Presentation, and (for you city/county clerks) specimen resolution language that can be used by adopting agencies. Feel free to change the format of the resolutions to your own.

We plan to visit each municipality within the next few days to deliver a printed copy of the document along with a DVD. Thanks again for your participation!

Mark A. Cunningham, Planner
Boonslick Regional Planning Commission
Region C Homeland Security Oversight Committee (RHSOC)
Hazard Mitigation Planning / Wheels To Work Revolving Loan
111 Steinhagen Road, P.O. Box 429, Warrenton, MO 63383
Phone (636) 456-3473 / Cell (314) 800-6230 Tue / Wed / Thurs: 0800 - 1630
http://www.boonslick.org/

Lincoln County Hazard Mitigation Planning Meeting 2 Minutes	**May 18, 2016**

1. Lincoln County Emergency Management Director, Emma Epplin-Birdsell, called the meeting to order at 11:07 am. There were 8 committee members present, including Ms. Epplin-Birdsell; and Boonslick Regional Planning personnel, Krishnapriya Kunapareddy and Mark Cunningham. A sign-in sheet is part of this meeting package.

2. Emma thanked the group for attending and asked the group to introduce themselves.

3. Emma reviewed the agenda for the meeting and briefed the committee using the PowerPoint presentation which is part of this meeting package.

4. Emma opened the meeting to discussion of the draft plan and asked if there were any comments, questions, or changes to the plan. There being none, Emma presented her changes which follow:

    a. Page 2.9 – A new grant application was added for tornado sirens at the amount of $100,000.

    b. Page 3.50 – Reference to "The following map…" was deleted in paragraph 6.

    c. Page 3.55 – Communities were added to Table 3.27 NFIP Participation.

    d. Page 3.109 – Tornado sirens were added to the Future Development paragraph.

    e. Page 4.3 – Table 4.1, section 1.6.1, "Co-op" was changed to "COOP".

    f. Section IV – Worksheets 1.2.2, 1.6.2, and 1.8.1 were truncated in the last row. These were expanded to include all missing data.

    g. There being no additional changes or questions, Emma asked for a motion to approve the draft plan as amended. Mayor Cross so moved, Brian Lourance of the City of Troy seconded the motion, and the motion carried by acclamation. There were no Nays.

    h. Emma reviewed the next steps on the process as shown in the presentation, thanked everyone for their assistance, and adjourned the meeting.

Appendix C – STAPLEE WORKSHEETS

Action Title	Encourage people to equip their homes, schools, businesses and public spaces with NOAA weather radios, included tornado sirens in places of outside congregation	
Action ID	1.1.1	
Jurisdictions	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School	
STAPLEE Criteria	**Evaluation Rating**	**Score**
	Definitely YES=3 Maybe YES=2 Probably NO=1 Definitely NO=0	
S: Is it Socially Acceptable?		3
T: IS it Technically feasible and potentially successful?		3
A: Does the jurisdiction have the administrative capacity to execute this action?		3
P: Is it Politically acceptable?		2
L: Is there Legal authority to implement?		3
E: Is it Economically beneficial?		1
E: Will the project have either a neutral (score a 2) or positive (score a 3) impact on the natural environment?		2
Will historic structures be saved or protected?		3
Could it be implemented quickly?		1
STAPLEE Score		**21**
Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
IC: Injuries/Casualties and PD: Property Damage	Two points each	2
LF: Loss of Functionality and EMCC: Emergency Management and Community Costs	Two points each	0
Mitigation Effectivess Score		**2**
Total Score (STAPLEE Score+Mitigation Effectiveness		**23**
Priority Level		
High (30+points)	0	
Medium (25-29 points)	0	
Low (less than 25 points)	23	
Completed by: Boonslick Regional Planning, Lincoln County Emergency Management Agency with concurrence from the HMPC		

Appendix C – STAPLEE WORKSHEETS

Action Title	Encourage property owners and occupants in hazard areas to participate in mitigation policy formulation	
Action ID	1.2.1	
Jurisdictions	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School	
STAPLEE Criteria	**Evaluation Rating**	**Score**
	Definitely YES=3 Maybe YES=2 Probably NO=1 Definitely NO=0	
S: Is it Socially Acceptable?		3
T: IS it Technically feasible and potentially successful?		3
A: Does the jurisdiction have the administrative capacity to execute this action?		3
P: Is it Politically acceptable?		3
L: Is there Legal authority to implement?		3
E: Is it Economically beneficial?		3
E: Will the project have either a neutral (score a 2) or positive (score a 3) impact on the natural environment?		3
Will historic structures be saved or protected?		3
Could it be implemented quickly?		3
STAPLEE Score		**27**
Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
IC: Injuries/Casualties and PD: Property Damage	Two points each	2
LF: Loss of Functionality and EMCC: Emergency Management and Community Costs	Two points each	1
Mitigation Effectivess Score		**3**
Total Score (STAPLEE Score+Mitigation Effectiveness Score)		**30**
Priority Level		
High (30+points)	30	
Medium (25-29 points)	0	
Low (less than 25 points)	0	
Completed by: Boonslick Regional Planning, Lincoln County Emergency Management Agency with concurrence from the HMPC		

Action Title	Target any remaining repetitive flood loss properties for buyout or relocation	
Action ID	1.2.2	
Jurisdictions	☑ Lincoln County ☐ Chain Of Rocks ☐ Fountain N Lakes ☑ Elsberry ☑ Foley ☐ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☐ Whiteside ☑ Winfield ☐ Truxton ☐ Elsberry R-II School ☐ Silex R-I School ☐ Troy R III School ☐ Winfield R IV School	
STAPLEE Criteria	**Evaluation Rating**	**Score**
	Definitely YES=3 Maybe YES=2 Probably NO=1 Definitely NO=0	
S: Is it Socially Acceptable?		3
T: IS it Technically feasible and potentially successful?		3
A: Does the jurisdiction have the administrative capacity to execute this action?		3
P: Is it Politically acceptable?		3
L: Is there Legal authority to implement?		3
E: Is it Economically beneficial?		3
E: Will the project have either a neutral (score a 2) or positive (score a 3) impact on the natural		3
Will historic structures be saved or protected?		2
Could it be implemented quickly?		3
STAPLEE Score		**26**
Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
IC: Injuries/Casualties and PD: Property Damage	Two points each	2
LF: Loss of Functionality and EMCC: Emergency Management and Community Costs	Two points each	2
Mitigation Effectivess Score		**4**
Total Score (STAPLEE Score+Mitigation Effectiveness Score)		**30**
Priority Level		
High (30+points)	30	
Medium (25-29 points)	0	
Low (less than 25 points)	0	
Completed by: Boonslick Regional Planning, Lincoln County Emergency Management Agency with concurrence from the HMPC		

Action Title	Promote environmentally-sound watershed and storm water practices to decrease flash flooding	
Action ID	1.2.3	
Jurisdictions	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School	
STAPLEE Criteria	**Evaluation Rating**	**Score**
	Definitely YES=3 Maybe YES=2 Probably NO=1 Definitely NO=0	
S: Is it Socially Acceptable?		3
T: IS it Technically feasible and potentially successful?		3
A: Does the jurisdiction have the administrative capacity to execute this action?		1
P: Is it Politically acceptable?		2
L: Is there Legal authority to implement?		2
E: Is it Economically beneficial?		3
E: Will the project have either a neutral (score a 2) or positive (score a 3) impact on the natural environment?		3
Will historic structures be saved or protected?		1
Could it be implemented quickly?		0
STAPLEE Score		**18**
Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
IC: Injuries/Casualties and PD: Property Damage	Two points each	4
LF: Loss of Functionality and EMCC: Emergency Management and Community Costs	Two points each	4
Mitigation Effectivess Score		**8**
Total Score (STAPLEE Score+Mitigation Effectiveness Score)		**26**
Priority Level		
High (30+points)	0	
Medium (25-29 points)	26	
Low (less than 25 points)	0	
Completed by: Boonslick Regional Planning, Lincoln County Emergency Management Agency with concurrence from the HMPC		

Action Title	Review and revise flood-fighting plans as needed	
Action ID	1.2.4	
Jurisdictions	☑ Lincoln County ☐ Chain Of Rocks ☐ Fountain N Lakes ☑ Elsberry ☑ Foley ☐ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☐ Whiteside ☑ Winfield ☐ Truxton ☐ Elsberry R-II School ☐ Silex R-I School ☐ Troy R III School ☐ Winfield R IV School	
STAPLEE Criteria	**Evaluation Rating**	**Score**
	Definitely YES=3 Maybe YES=2 Probably NO=1 Definitely NO=0	
S: Is it Socially Acceptable?		3
T: IS it Technically feasible and potentially successful?		3
A: Does the jurisdiction have the administrative capacity to execute this action?		3
P: Is it Politically acceptable?		2
L: Is there Legal authority to		3
E: Is it Economically beneficial?		2
E: Will the project have either a neutral (score a 2) or positive (score a 3) impact on the natural environment?		2
Will historic structures be saved or protected?		2
Could it be implemented quickly?		1
STAPLEE Score		**21**
Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
IC: Injuries/Casualties and PD: Property	Two points each	4
LF: Loss of Functionality and EMCC: Emergency Management and Community Costs	Two points each	4
Mitigation Effectivess Score		**8**
Total Score (STAPLEE Score+Mitigation Effectiveness		**29**
Priority Level		
High (30+points)	0	
Medium (25-29 points)	29	
Low (less than 25 points)	0	
Completed by: Boonslick Regional Planning, Lincoln County Emergency Management Agency with concurrence from the HMPC		

Action Title	Strengthen floodplain regulations as needed	
Action ID	1.2.5	
Jurisdictions	☑ Lincoln County ☑ Chain Of Rocks ☐ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☐ Whiteside ☑ Winfield ☐ Truxton ☐ Elsberry R-II School ☐ Silex R-I School ☐ Troy R III School ☐ Winfield R IV School	
STAPLEE Criteria	**Evaluation Rating**	**Score**
	Definitely YES=3 Maybe YES=2 Probably NO=1 Definitely NO=0	
S: Is it Socially Acceptable?		3
T: IS it Technically feasible and potentially successful?		3
A: Does the jurisdiction have the administrative capacity to execute this action?		2
P: Is it Politically acceptable?		2
L: Is there Legal authority to implement?		3
E: Is it Economically beneficial?		2
E: Will the project have either a neutral (score a 2) or positive (score a 3) impact on the natural environment?		2
Will historic structures be saved or protected?		2
Could it be implemented quickly?		2
STAPLEE Score		**21**
Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
IC: Injuries/Casualties and PD: Property Da	Two points each	2
LF: Loss of Functionality and EMCC: Emergency Management and Community Costs	Two points each	2
Mitigation Effectivess Score		**4**
Total Score (STAPLEE Score+Mitigation Effectiveness Score)		**25**
Priority Level		
High (30+points)	0	
Medium (25-29 points)	25	
Low (less than 25 points)	0	
Completed by: Boonslick Regional Planning, Lincoln County Emergency Management Agency with concurrence from the HMPC		

Action Title	NFIP- Monitor development in special flood hazard areas to ensure compliance with local floodplain management ordinance	
Action ID	1.2.6	
Jurisdictions	☑ Lincoln County ☐ Chain Of Rocks ☐ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☐ Troy ☐ Whiteside ☑ Winfield ☐ Truxton ☐ Elsberry R-II School ☐ Silex R-I School ☐ Troy R III School ☐ Winfield R IV School	
STAPLEE Criteria	**Evaluation Rating**	**Score**
	Definitely YES=3 Maybe YES=2 Probably NO=1 Definitely NO=0	
S: Is it Socially Acceptable?		3
T: IS it Technically feasible and potentially successful?		3
A: Does the jurisdiction have the administrative capacity to execute this action?		3
P: Is it Politically acceptable?		2
L: Is there Legal authority to		2
E: Is it Economically beneficial?		3
E: Will the project have either a neutral (score a 2) or positive (score a 3) impact on the natural environment?		3
Will historic structures be saved or protected?		2
Could it be implemented quickly?		3
STAPLEE Score		**24**
Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
IC: Injuries/Casualties and PD: Property Damage	Two points each	3
LF: Loss of Functionality and EMCC: Emergency Management and Community Costs	Two points each	3
Mitigation Effectivess Score		**6**
Total Score (STAPLEE Score+Mitigation Effectiveness		**30**
Priority Level		
High (30+points)	30	
Medium (25-29 points)	0	
Low (less than 25 points)	0	
Completed by: Boonslick Regional Planning, Lincoln County Emergency Management Agency with concurrence from the HMPC		

Action Title	Develop hazard area maps and promote use by the public	
Action ID	1.3.1	
Jurisdictions	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School	
STAPLEE Criteria	**Evaluation Rating**	**Score**
	Definitely YES=3 Maybe YES=2 Probably NO=1 Definitely NO=0	
S: Is it Socially Acceptable?		3
T: IS it Technically feasible and potentially successful?		3
A: Does the jurisdiction have the administrative capacity to execute this action?		3
P: Is it Politically acceptable?		3
L: Is there Legal authority to implement?		3
E: Is it Economically beneficial?		2
E: Will the project have either a neutral (score a 2) or positive (score a 3) impact on the natural environment?		2
Will historic structures be saved or protected?		1
Could it be implemented quickly?		3
STAPLEE Score		**23**
Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
IC: Injuries/Casualties and PD: Property Da	Two points each	3
LF: Loss of Functionality and EMCC: Emergency Management and Community Costs	Two points each	3
Mitigation Effectivess Score		**6**
Total Score (STAPLEE Score+Mitigation Effectiveness Score)		**29**
	Priority Level	
High (30+points)	0	
Medium (25-29 points)	29	
Low (less than 25 points)	0	
Completed by: Boonslick Regional Planning, Lincoln County Emergency Management Agency with concurrence from the HMPC		

Action Title	Identify ways to promote FEMA safety tips and mitigation techniques
Action ID	1.3.2
Jurisdictions	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School

STAPLEE Criteria	**Evaluation Rating**	**Score**
	Definitely YES=3 Maybe YES=2 Probably NO=1 Definitely NO=0	
S: Is it Socially Acceptable?		3
T: IS it Technically feasible and potentially successful?		3
A: Does the jurisdiction have the administrative capacity to execute this action?		1
P: Is it Politically acceptable?		3
L: Is there Legal authority to implement?		1
E: Is it Economically beneficial?		2
E: Will the project have either a neutral (score a 2) or positive (score a 3) impact on the natural environment?		2
Will historic structures be saved or protected?		1
Could it be implemented quickly?		1
STAPLEE Score		**17**

Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
IC: Injuries/Casualties and PD: Property Damage	Two points each	2
LF: Loss of Functionality and EMCC: Emergency Management and Community Costs	Two points each	2
Mitigation Effectivess Score		**4**
Total Score (STAPLEE Score+Mitigation Effectiveness Score)		**21**

Priority Level	
High (30+points)	0
Medium (25-29 points)	0
Low (less than 25 points)	21

Completed by: Boonslick Regional Planning, Lincoln County Emergency Management Agency with concurrence from the HMPC

Action Title	To provide earthquake preparedness and safety literature every year in the school districts	
Action ID	1.3.3	
Jurisdictions	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School	
STAPLEE Criteria	**Evaluation Rating**	**Score**
	Definitely YES=3 Maybe YES=2 Probably NO=1 Definitely NO=0	
S: Is it Socially Acceptable?		3
T: IS it Technically feasible and potentially successful?		3
A: Does the jurisdiction have the administrative capacity to execute this action?		3
P: Is it Politically acceptable?		3
L: Is there Legal authority to implement?		3
E: Is it Economically beneficial?		3
E: Will the project have either a neutral (score a 2) or positive (score a 3) impact on the natural environment?		2
Will historic structures be saved or protected?		0
Could it be implemented quickly?		3
STAPLEE Score		**23**
Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
IC: Injuries/Casualties and PD: Property Da	Two points each	4
LF: Loss of Functionality and EMCC: Emergency Management and Community Costs	Two points each	4
Mitigation Effectivess Score		**8**
Total Score (STAPLEE Score+Mitigation Effectiveness Score)		**31**
Priority Level		
High (30+points)	31	
Medium (25-29 points)	0	
Low (less than 25 points)	0	
Completed by: Boonslick Regional Planning, Lincoln County Emergency Management Agency with concurrence from the HMPC		

Action Title	Identify public health issues and identify ways to promote healthy life style changes	
Action ID	1.3.5	
Jurisdictions	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☐ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School	
STAPLEE Criteria	**Evaluation Rating**	**Score**
	Definitely YES=3 Maybe YES=2 Probably NO=1 Definitely NO=0	
S: Is it Socially Acceptable?		3
T: IS it Technically feasible and potentially successful?		3
A: Does the jurisdiction have the administrative capacity to execute this action?		3
P: Is it Politically acceptable?		3
L: Is there Legal authority to implement?		2
E: Is it Economically beneficial?		3
E: Will the project have either a neutral (score a 2) or positive (score a 3) impact on the natural environment?		2
Will historic structures be saved or protected?		0
Could it be implemented quickly?		3
STAPLEE Score		**22**
Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
IC: Injuries/Casualties and PD: Property Da	Two points each	2
LF: Loss of Functionality and EMCC: Emergency Management and Community Costs	Two points each	2
Mitigation Effectivess Score		**4**
Total Score (STAPLEE Score+Mitigation Effectiveness Score)		**26**
Priority Level		
High (30+points)	0	
Medium (25-29 points)	26	
Low (less than 25 points)	0	
Completed by: Boonslick Regional Planning, Lincoln County Emergency Management Agency with concurrence from the HMPC		

Action Title	Identify causes of disease and promote measures to control spread of disease in case of emergency such as reduce vectors, increase awareness of foodborne illness hazards due to spoilage and contamination	
Action ID	1.3.6	
Jurisdictions	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School	
STAPLEE Criteria	**Evaluation Rating**	**Score**
	Definitely YES=3 Maybe YES=2 Probably NO=1 Definitely NO=0	
S: Is it Socially Acceptable?		3
T: IS it Technically feasible and potentially successful?		3
A: Does the jurisdiction have the administrative capacity to execute this action?		3
P: Is it Politically acceptable?		3
L: Is there Legal authority to implement?		2
E: Is it Economically beneficial?		3
E: Will the project have either a neutral (score a 2) or positive (score a 3) impact on the natural environment?		2
Will historic structures be saved or protected?		0
Could it be implemented quickly?		3
STAPLEE Score		**22**
Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
IC: Injuries/Casualties and PD: Property Da	Two points each	2
LF: Loss of Functionality and EMCC: Emergency Management and Community Costs	Two points each	2
Mitigation Effectivess Score		**4**
Total Score (STAPLEE Score+Mitigation Effectiveness Score)		**26**
Priority Level		
High (30+points)	0	
Medium (25-29 points)	26	
Low (less than 25 points)	0	
Completed by: Boonslick Regional Planning, Lincoln County Emergency Management Agency with concurrence from the HMPC		

Action Title	Review and upgrade policies to identify and budget additional emergency equipment for health and medical services, mass care agencies, and public information	
Action ID	1.4.1	
Jurisdictions	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School	
STAPLEE Criteria	**Evaluation Rating**	**Score**
	Definitely YES=3 Maybe YES=2 Probably NO=1 Definitely NO=0	
S: Is it Socially Acceptable?		3
T: IS it Technically feasible and potentially successful?		3
A: Does the jurisdiction have the administrative capacity to execute this action?		3
P: Is it Politically acceptable?		3
L: Is there Legal authority to implement?		3
E: Is it Economically beneficial?		2
E: Will the project have either a neutral (score a 2) or positive (score a 3) impact on the natural environment?		2
Will historic structures be saved or protected?		2
Could it be implemented quickly?		2
STAPLEE Score		**23**
Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
IC: Injuries/Casualties and PD: Property Da	Two points each	4
LF: Loss of Functionality and EMCC: Emergency Management and Community Costs	Two points each	4
Mitigation Effectivess Score		**8**
Total Score (STAPLEE Score+Mitigation Effectiveness Score)		**31**
Priority Level		
High (30+points)	31	
Medium (25-29 points)	0	
Low (less than 25 points)	0	
Completed by: Boonslick Regional Planning, Lincoln County Emergency Management Agency with concurrence from the HMPC		

Action Title	Decrease wildlife risk areas where development is adjacent to forests or grasslands by incorporating buffer zones into subdivision regulations	
Action ID	1.5.1	
Jurisdictions	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School	
STAPLEE Criteria	**Evaluation Rating**	**Score**
	Definitely YES=3 Maybe YES=2 Probably NO=1 Definitely NO=0	
S: Is it Socially Acceptable?		3
T: IS it Technically feasible and potentially successful?		3
A: Does the jurisdiction have the administrative capacity to execute this action?		3
P: Is it Politically acceptable?		2
L: Is there Legal authority to implement?		3
E: Is it Economically beneficial?		2
E: Will the project have either a neutral (score a 2) or positive (score a 3) impact on the natural environment?		2
Will historic structures be saved or protected?		0
Could it be implemented quickly?		2
STAPLEE Score		**20**
Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
IC: Injuries/Casualties and PD: Property Da	Two points each	2
LF: Loss of Functionality and EMCC: Emergency Management and Community Costs	Two points each	2
Mitigation Effectivess Score		**4**
Total Score (STAPLEE Score+Mitigation Effectiveness Score)		**24**
Priority Level		
High (30+points)	0	
Medium (25-29 points)	0	
Low (less than 25 points)	24	
Completed by: Boonslick Regional Planning, Lincoln County Emergency Management Agency with concurrence from the HMPC		

Action Title	Promote environmentally-sound, fire-resistant materials for homes	
Action ID	1.5.2	
Jurisdictions	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School	
STAPLEE Criteria	**Evaluation Rating**	**Score**
	Definitely YES=3 Maybe YES=2 Probably NO=1 Definitely NO=0	
S: Is it Socially Acceptable?		3
T: IS it Technically feasible and potentially successful?		2
A: Does the jurisdiction have the administrative capacity to execute this action?		1
P: Is it Politically acceptable?		1
L: Is there Legal authority to implement?		1
E: Is it Economically beneficial?		1
E: Will the project have either a neutral (score a 2) or positive (score a 3) impact on the natural environment?		2
Will historic structures be saved or protected?		1
Could it be implemented quickly?		
STAPLEE Score		**12**
Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
IC: Injuries/Casualties and PD: Property Damage	Two points each	2
LF: Loss of Functionality and EMCC: Emergency Management and Community Costs	Two points each	2
Mitigation Effectivess Score		**4**
Total Score (STAPLEE Score+Mitigation Effectiveness Score)		**16**
Priority Level		
High (30+points)	0	
Medium (25-29 points)	0	
Low (less than 25 points)	16	
Completed by: Boonslick Regional Planning, Lincoln County Emergency Management Agency with concurrence from the HMPC		

Action Title	Identify existing mechanisms to promote NFIP policies, earthquake/seismic insurance and flood insurance.	
Action ID	1.5.3	
Jurisdictions	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School	
STAPLEE Criteria	**Evaluation Rating**	**Score**
	Definitely YES=3 Maybe YES=2 Probably NO=1 Definitely NO=0	
S: Is it Socially Acceptable?		3
T: IS it Technically feasible and potentially successful?		2
A: Does the jurisdiction have the administrative capacity to execute this action?		2
P: Is it Politically acceptable?		2
L: Is there Legal authority to implement?		2
E: Is it Economically beneficial?		2
E: Will the project have either a neutral (score a 2) or positive (score a 3) impact on the natural environment?		2
Will historic structures be saved or protected?		0
Could it be implemented quickly?		1
STAPLEE Score		**16**
Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
IC: Injuries/Casualties and PD: Property Damage	Two points each	2
LF: Loss of Functionality and EMCC: Emergency Management and Community Costs	Two points each	2
Mitigation Effectivess Score		**4**
Total Score (STAPLEE Score+Mitigation Effectiveness Score)		**20**
Priority Level		
High (30+points)	0	
Medium (25-29 points)	0	
Low (less than 25 points)	20	
Completed by: Boonslick Regional Planning, Lincoln County Emergency Management Agency with concurrence from the HMPC		

Action Title	Utilize FEMA information to encourage residential owners to invest in retrofit techniques	
Action ID	1.5.4	
Jurisdictions	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School	
STAPLEE Criteria	**Evaluation Rating**	**Score**
	Definitely YES=3 Maybe YES=2 Probably NO=1 Definitely NO=0	
S: Is it Socially Acceptable?		3
T: IS it Technically feasible and potentially successful?		2
A: Does the jurisdiction have the administrative capacity to execute this action?		1
P: Is it Politically acceptable?		2
L: Is there Legal authority to implement?		1
E: Is it Economically beneficial?		2
E: Will the project have either a neutral (score a 2) or positive (score a 3) impact on the natural environment?		2
Will historic structures be saved or protected?		0
Could it be implemented quickly?		1
STAPLEE Score		**14**
Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
IC: Injuries/Casualties and PD: Property Damage	Two points each	2
LF: Loss of Functionality and EMCC: Emergency Management and Community Costs	Two points each	2
Mitigation Effectivess Score		**4**
Total Score (STAPLEE Score+Mitigation Effectiveness Score)		**18**
Priority Level		
High (30+points)	0	
Medium (25-29 points)	0	
Low (less than 25 points)	18	
Completed by: Boonslick Regional Planning, Lincoln County Emergency Management Agency with concurrence from the HMPC		

Action Title	Encourage tornado safe rooms in new construction.	
Action ID	1.6.1	
Jurisdictions	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☐ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School	
STAPLEE Criteria	**Evaluation Rating**	**Score**
	Definitely YES=3 Maybe YES=2 Probably NO=1 Definitely NO=0	
S: Is it Socially Acceptable?		3
T: IS it Technically feasible and potentially successful?		2
A: Does the jurisdiction have the administrative capacity to execute this action?		1
P: Is it Politically acceptable?		1
L: Is there Legal authority to implement?		2
E: Is it Economically beneficial?		2
E: Will the project have either a neutral (score a 2) or positive (score a 3) impact on the natural environment?		2
Will historic structures be saved or protected?		0
Could it be implemented quickly?		1
STAPLEE Score		**14**
Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
IC: Injuries/Casualties and PD: Property Damage	Two points each	2
LF: Loss of Functionality and EMCC: Emergency Management and Community Costs	Two points each	2
Mitigation Effectivess Score		**4**
Total Score (STAPLEE Score+Mitigation Effectiveness Score)		**18**
Priority Level		
High (30+points)	0	
Medium (25-29 points)	0	
Low (less than 25 points)	18	
Completed by: Boonslick Regional Planning, Lincoln County Emergency Management Agency with concurrence from the HMPC		

Action Title	Encourage up-to-date commercial/industrial disaster plans that are coordinated with county/city disaster plans.	
Action ID	1.6.2	
Jurisdictions	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School	
STAPLEE Criteria	**Evaluation Rating**	**Score**
	Definitely YES=3 Maybe YES=2 Probably NO=1 Definitely NO=0	
S: Is it Socially Acceptable?		3
T: IS it Technically feasible and potentially successful?		2
A: Does the jurisdiction have the administrative capacity to execute this action?		2
P: Is it Politically acceptable?		2
L: Is there Legal authority to implement?		2
E: Is it Economically beneficial?		1
E: Will the project have either a neutral (score a 2) or positive (score a 3) impact on the natural environment?		2
Will historic structures be saved or protected?		0
Could it be implemented quickly?		1
STAPLEE Score		**15**
Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
IC: Injuries/Casualties and PD: Property Damage	Two points each	3
LF: Loss of Functionality and EMCC: Emergency Management and Community Costs	Two points each	3
Mitigation Effectivess Score		**6**
Total Score (STAPLEE Score+Mitigation Effectiveness Score)		**21**
Priority Level		
High (30+points)	0	
Medium (25-29 points)	0	
Low (less than 25 points)	21	
Completed by: Boonslick Regional Planning, Lincoln County Emergency Management Agency with concurrence from the HMPC		

Action Title	Encourage operation and infrastructure backup systems for commercial and industrial businesses.	
Action ID	1.6.3	
Jurisdictions	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School	
STAPLEE Criteria	**Evaluation Rating**	**Score**
	Definitely YES=3 Maybe YES=2 Probably NO=1 Definitely NO=0	
S: Is it Socially Acceptable?		3
T: IS it Technically feasible and potentially successful?		3
A: Does the jurisdiction have the administrative capacity to execute this action?		2
P: Is it Politically acceptable?		2
L: Is there Legal authority to implement?		3
E: Is it Economically beneficial?		2
E: Will the project have either a neutral (score a 2) or positive (score a 3) impact on the natural environment?		2
Will historic structures be saved or protected?		2
Could it be implemented quickly?		2
STAPLEE Score		**21**
Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
IC: Injuries/Casualties and PD: Property Da	Two points each	0
LF: Loss of Functionality and EMCC: Emergency Management and Community Costs	Two points each	4
Mitigation Effectivess Score		**4**
Total Score (STAPLEE Score+Mitigation Effectiveness Score)		**25**
Priority Level		
High (30+points)	0	
Medium (25-29 points)	25	
Low (less than 25 points)	0	
Completed by: Boonslick Regional Planning, Lincoln County Emergency Management Agency with concurrence from the HMPC		

Action Title	Maintain inventory of special needs population, equipment & ADA shelters	
Action ID	1.7.1	
Jurisdictions	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School	
STAPLEE Criteria	**Evaluation Rating**	**Score**
	Definitely YES=3 Maybe YES=2 Probably NO=1 Definitely NO=0	
S: Is it Socially Acceptable?		3
T: IS it Technically feasible and potentially successful?		1
A: Does the jurisdiction have the administrative capacity to execute this action?		2
P: Is it Politically acceptable?		2
L: Is there Legal authority to implement?		2
E: Is it Economically beneficial?		1
E: Will the project have either a neutral (score a 2) or positive (score a 3) impact on the natural environment?		2
Will historic structures be saved or protected?		0
Could it be implemented quickly?		1
STAPLEE Score		**14**
Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
IC: Injuries/Casualties and PD: Property Damage	Two points each	4
LF: Loss of Functionality and EMCC: Emergency Management and Community Costs	Two points each	0
Mitigation Effectivess Score		**4**
Total Score (STAPLEE Score+Mitigation Effectiveness Score)		**18**
Priority Level		
High (30+points)	0	
Medium (25-29 points)	0	
Low (less than 25 points)	18	
Completed by: Boonslick Regional Planning, Lincoln County Emergency Management Agency with concurrence from the HMPC		

Action Title	Enhance warning systems and notifications for special populations	
Action ID	1.7.2	
Jurisdictions	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☐ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School	
STAPLEE Criteria	**Evaluation Rating**	**Score**
	Definitely YES=3 Maybe YES=2 Probably NO=1 Definitely NO=0	
S: Is it Socially Acceptable?		3
T: IS it Technically feasible and potentially successful?		3
A: Does the jurisdiction have the administrative capacity to execute this action?		3
P: Is it Politically acceptable?		3
L: Is there Legal authority to implement?		3
E: Is it Economically beneficial?		3
E: Will the project have either a neutral (score a 2) or positive (score a 3) impact on the natural environment?		2
Will historic structures be saved or protected?		0
Could it be implemented quickly?		2
STAPLEE Score		**22**
Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
IC: Injuries/Casualties and PD: Property Damage	Two points each	4
LF: Loss of Functionality and EMCC: Emergency Management and Community Costs	Two points each	2
Mitigation Effectivess Score		**6**
Total Score (STAPLEE Score+Mitigation Effectiveness Score)		**28**
Priority Level		
High (30+points)	0	
Medium (25-29 points)	28	
Low (less than 25 points)	0	
Completed by: Boonslick Regional Planning, Lincoln County Emergency Management Agency with concurrence from the HMPC		

Action Title	Provide shelter homes in case of emergency	
Action ID	1.7.3	
Jurisdictions	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School	
STAPLEE Criteria	**Evaluation Rating**	**Score**
	Definitely YES=3 Maybe YES=2 Probably NO=1 Definitely NO=0	
S: Is it Socially Acceptable?		3
T: IS it Technically feasible and potentially successful?		2
A: Does the jurisdiction have the administrative capacity to execute this action?		1
P: Is it Politically acceptable?		2
L: Is there Legal authority to implement?		2
E: Is it Economically beneficial?		1
E: Will the project have either a neutral (score a 2) or positive (score a 3) impact on the natural environment?		2
Will historic structures be saved or protected?		0
Could it be implemented quickly?		0
STAPLEE Score		**13**
Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
IC: Injuries/Casualties and PD: Property Damage	Two points each	2
LF: Loss of Functionality and EMCC: Emergency Management and Community Costs	Two points each	2
Mitigation Effectivess Score		**4**
Total Score (STAPLEE Score+Mitigation Effectiveness Score)		**17**
Priority Level		
High (30+points)	0	
Medium (25-29 points)	0	
Low (less than 25 points)	17	
Completed by: Boonslick Regional Planning, Lincoln County Emergency Management Agency with concurrence from the HMPC		

Action Title	Identify community health disparities and their effects on post disaster population health i.e. access to care, messaging, translation services, mental/behavioral health services.	
Action ID	1.7.4	
Jurisdictions	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School	
STAPLEE Criteria	**Evaluation Rating**	**Score**
	Definitely YES=3 Maybe YES=2 Probably NO=1 Definitely NO=0	
S: Is it Socially Acceptable?		3
T: IS it Technically feasible and potentially successful?		3
A: Does the jurisdiction have the administrative capacity to execute this action?		3
P: Is it Politically acceptable?		3
L: Is there Legal authority to implement?		2
E: Is it Economically beneficial?		3
E: Will the project have either a neutral (score a 2) or positive (score a 3) impact on the natural environment?		2
Will historic structures be saved or protected?		0
Could it be implemented quickly?		3
STAPLEE Score		**22**
Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
IC: Injuries/Casualties and PD: Property Da	Two points each	4
LF: Loss of Functionality and EMCC: Emergency Management and Community Costs	Two points each	4
Mitigation Effectivess Score		**8**
Total Score (STAPLEE Score+Mitigation Effectiveness Score)		**30**
Priority Level		
High (30+points)	30	
Medium (25-29 points)	0	
Low (less than 25 points)	0	
Completed by: Boonslick Regional Planning, Lincoln County Emergency Management Agency with concurrence from the HMPC		

Action Title	Utilize county road right of ways as firebreaks and snow storage	
Action ID	1.8.1	
Jurisdictions	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☐ Elsberry R-II School ☐ Silex R-I School ☐ Troy R III School ☐ Winfield R IV School	
STAPLEE Criteria	**Evaluation Rating**	**Score**
	Definitely YES=3 Maybe YES=2 Probably NO=1 Definitely NO=0	
S: Is it Socially Acceptable?		3
T: IS it Technically feasible and potentially successful?		3
A: Does the jurisdiction have the administrative capacity to execute this action?		2
P: Is it Politically acceptable?		2
L: Is there Legal authority to implement?		2
E: Is it Economically beneficial?		1
E: Will the project have either a neutral (score a 2) or positive (score a 3) impact on the natural environment?		2
Will historic structures be saved or protected?		0
Could it be implemented quickly?		2
STAPLEE Score		**17**
Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
IC: Injuries/Casualties and PD: Property Da	Two points each	1
LF: Loss of Functionality and EMCC: Emergency Management and Community Costs	Two points each	3
Mitigation Effectivess Score		**4**
Total Score (STAPLEE Score+Mitigation Effectiveness Score)		**21**
Priority Level		
High (30+points)	0	
Medium (25-29 points)	0	
Low (less than 25 points)	21	
Completed by: Boonslick Regional Planning, Lincoln County Emergency Management Agency with concurrence from the HMPC		

Action Title	Maintain an inventory of vulnerable infrastructure	
Action ID	1.8.2	
Jurisdictions	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School	
STAPLEE Criteria	**Evaluation Rating**	**Score**
	Definitely YES=3 Maybe YES=2 Probably NO=1 Definitely NO=0	
S: Is it Socially Acceptable?		3
T: IS it Technically feasible and potentially successful?		2
A: Does the jurisdiction have the administrative capacity to execute this action?		1
P: Is it Politically acceptable?		2
L: Is there Legal authority to implement?		3
E: Is it Economically beneficial?		1
E: Will the project have either a neutral (score a 2) or positive (score a 3) impact on the natural environment?		2
Will historic structures be saved or protected?		2
Could it be implemented quickly?		2
STAPLEE Score		**18**
Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
IC: Injuries/Casualties and PD: Property Da	Two points each	2
LF: Loss of Functionality and EMCC: Emergency Management and Community Costs	Two points each	3
Mitigation Effectivess Score		**5**
Total Score (STAPLEE Score+Mitigation Effectiveness Score)		**23**
Priority Level		
High (30+points)	0	
Medium (25-29 points)	0	
Low (less than 25 points)	23	
Completed by: Boonslick Regional Planning, Lincoln County Emergency Management Agency with concurrence from the HMPC		

Action Title	Maintain an inventory of traffic incidents	
Action ID	1.8.3	
Jurisdictions	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School	
STAPLEE Criteria	**Evaluation Rating**	**Score**
	Definitely YES=3 Maybe YES=2 Probably NO=1 Definitely NO=0	
S: Is it Socially Acceptable?		3
T: IS it Technically feasible and potentially successful?		2
A: Does the jurisdiction have the administrative capacity to execute this action?		3
P: Is it Politically acceptable?		3
L: Is there Legal authority to implement?		3
E: Is it Economically beneficial?		3
E: Will the project have either a neutral (score a 2) or positive (score a 3) impact on the natural environment?		2
Will historic structures be saved or protected?		0
Could it be implemented quickly?		2
STAPLEE Score		**21**
Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
IC: Injuries/Casualties and PD: Property Damage	Two points each	4
LF: Loss of Functionality and EMCC: Emergency Management and Community Costs	Two points each	0
Mitigation Effectiveness Score		**4**
Total Score (STAPLEE Score+Mitigation Effectiveness Score)		**25**
Priority Level		
High (30+points)	0	
Medium (25-29 points)	25	
Low (less than 25 points)	0	
Completed by: Boonslick Regional Planning, Lincoln County Emergency Management Agency with concurrence from the HMPC		

Action Title	Institute or strengthen regulations to reduce stormwater runoff	
Action ID	2.1.1	
Jurisdictions	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☐ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☐ Elsberry R-II School ☐ Silex R-I School ☐ Troy R III School ☐ Winfield R IV School	
STAPLEE Criteria	**Evaluation Rating**	**Score**
	Definitely YES=3 Maybe YES=2 Probably NO=1 Definitely NO=0	
S: Is it Socially Acceptable?		3
T: IS it Technically feasible and potentially successful?		2
A: Does the jurisdiction have the administrative capacity to execute this action?		1
P: Is it Politically acceptable?		2
L: Is there Legal authority to implement?		2
E: Is it Economically beneficial?		1
E: Will the project have either a neutral (score a 2) or positive (score a 3) impact on the natural environment?		2
Will historic structures be saved or protected?		0
Could it be implemented quickly?		2
STAPLEE Score		**15**
Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
IC: Injuries/Casualties and PD: Property Damage	Two points each	0
LF: Loss of Functionality and EMCC: Emergency Management and Community Costs	Two points each	4
Mitigation Effectivess Score		**4**
Total Score (STAPLEE Score+Mitigation Effectiveness Score)		**19**
Priority Level		
High (30+points)	0	
Medium (25-29 points)	0	
Low (less than 25 points)	19	
Completed by: Boonslick Regional Planning, Lincoln County Emergency Management Agency with concurrence from the HMPC		

Action Title	Encourage best practices for drought-resistant farming and ranching	
Action ID	2.1.2	
Jurisdictions	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☐ Elsberry R-II School ☐ Silex R-I School ☐ Troy R III School ☐ Winfield R IV School	
STAPLEE Criteria	**Evaluation Rating**	**Score**
	Definitely YES=3 Maybe YES=2 Probably NO=1 Definitely NO=0	
S: Is it Socially Acceptable?		3
T: IS it Technically feasible and potentially successful?		2
A: Does the jurisdiction have the administrative capacity to execute this action?		1
P: Is it Politically acceptable?		2
L: Is there Legal authority to implement?		2
E: Is it Economically beneficial?		1
E: Will the project have either a neutral (score a 2) or positive (score a 3) impact on the natural environment?		2
Will historic structures be saved or protected?		0
Could it be implemented quickly?		0
STAPLEE Score		**13**
Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
IC: Injuries/Casualties and PD: Property Damage	Two points each	2
LF: Loss of Functionality and EMCC: Emergency Management and Community Costs	Two points each	2
Mitigation Effectivess Score		**4**
Total Score (STAPLEE Score+Mitigation Effectiveness Score)		**17**
Priority Level		
High (30+points)	0	
Medium (25-29 points)	0	
Low (less than 25 points)	17	
Completed by: Boonslick Regional Planning, Lincoln County Emergency Management Agency with concurrence from the HMPC		

Action Title	Institute a land use plan and reinstate zoning ordinances	
Action ID	2.1.3	
Jurisdictions	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☐ Elsberry R-II School ☐ Silex R-I School ☐ Troy R III School ☐ Winfield R IV School	
STAPLEE Criteria	**Evaluation Rating**	**Score**
	Definitely YES=3 Maybe YES=2 Probably NO=1 Definitely NO=0	
S: Is it Socially Acceptable?		3
T: IS it Technically feasible and potentially successful?		3
A: Does the jurisdiction have the administrative capacity to execute this action?		1
P: Is it Politically acceptable?		2
L: Is there Legal authority to implement?		1
E: Is it Economically beneficial?		2
E: Will the project have either a neutral (score a 2) or positive (score a 3) impact on the natural environment?		3
Will historic structures be saved or protected?		2
Could it be implemented quickly?		2
STAPLEE Score		**19**
Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
IC: Injuries/Casualties and PD: Property Damage	Two points each	2
LF: Loss of Functionality and EMCC: Emergency Management and Community Costs	Two points each	3
Mitigation Effectivess Score		**5**
Total Score (STAPLEE Score+Mitigation Effectiveness Score)		**24**
Priority Level		
High (30+points)	0	
Medium (25-29 points)	0	
Low (less than 25 points)	24	
Completed by: Boonslick Regional Planning, Lincoln County Emergency Management Agency with concurrence from the HMPC		

Action Title	Promote building codes in incorporated areas that currently do not have such regulations	
Action ID	2.2.1	
Jurisdictions	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School	
STAPLEE Criteria	**Evaluation Rating**	**Score**
	Definitely YES=3 Maybe YES=2 Probably NO=1 Definitely NO=0	
S: Is it Socially Acceptable?		3
T: IS it Technically feasible and potentially successful?		3
A: Does the jurisdiction have the administrative capacity to execute this action?		1
P: Is it Politically acceptable?		2
L: Is there Legal authority to implement?		1
E: Is it Economically beneficial?		2
E: Will the project have either a neutral (score a 2) or positive (score a 3) impact on the natural environment?		3
Will historic structures be saved or protected?		0
Could it be implemented quickly?		2
STAPLEE Score		**17**
Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
IC: Injuries/Casualties and PD: Property Damage	Two points each	3
LF: Loss of Functionality and EMCC: Emergency Management and Community Costs	Two points each	3
Mitigation Effectivess Score		**6**
Total Score (STAPLEE Score+Mitigation Effectiveness Score)		**23**
Priority Level		
High (30+points)	0	
Medium (25-29 points)	0	
Low (less than 25 points)	23	
Completed by: Boonslick Regional Planning, Lincoln County Emergency Management Agency with concurrence from the HMPC		

Action Title	Implement measures to increase the county's CRS status	
Action ID	2.2.2	
Jurisdictions	☑ Lincoln County ☐ Chain Of Rocks ☐ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☐ Whiteside ☑ Winfield ☐ Truxton ☐ Elsberry R-II School ☐ Silex R-I School ☐ Troy R III School ☐ Winfield R IV School	
STAPLEE Criteria	**Evaluation Rating**	**Score**
	Definitely YES=3 Maybe YES=2 Probably NO=1 Definitely NO=0	
S: Is it Socially Acceptable?		3
T: IS it Technically feasible and potentially successful?		2
A: Does the jurisdiction have the administrative capacity to execute this action?		2
P: Is it Politically acceptable?		2
L: Is there Legal authority to implement?		2
E: Is it Economically beneficial?		2
E: Will the project have either a neutral (score a 2) or positive (score a 3) impact on the natural environment?		2
Will historic structures be saved or protected?		0
Could it be implemented quickly?		2
STAPLEE Score		**17**
Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
IC: Injuries/Casualties and PD: Property Damage	Two points each	2
LF: Loss of Functionality and EMCC: Emergency Management and Community Costs	Two points each	2
Mitigation Effectivess Score		**4**
Total Score (STAPLEE Score+Mitigation Effectiveness Score)		**21**
Priority Level		
High (30+points)	0	
Medium (25-29 points)	0	
Low (less than 25 points)	21	
Completed by: Boonslick Regional Planning, Lincoln County Emergency Management Agency with concurrence from the HMPC		

Action Title	Encourage open space in new developments	
Action ID	2.2.3	
Jurisdictions	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☐ Elsberry R-II School ☐ Silex R-I School ☐ Troy R III School ☐ Winfield R IV School	
STAPLEE Criteria	**Evaluation Rating**	**Score**
	Definitely YES=3 Maybe YES=2 Probably NO=1 Definitely NO=0	
S: Is it Socially Acceptable?		3
T: IS it Technically feasible and potentially successful?		2
A: Does the jurisdiction have the administrative capacity to execute this action?		1
P: Is it Politically acceptable?		1
L: Is there Legal authority to implement?		1
E: Is it Economically beneficial?		2
E: Will the project have either a neutral (score a 2) or positive (score a 3) impact on the natural environment?		3
Will historic structures be saved or protected?		0
Could it be implemented quickly?		2
STAPLEE Score		**15**
Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
IC: Injuries/Casualties and PD: Property Damage	Two points each	2
LF: Loss of Functionality and EMCC: Emergency Management and Community Costs	Two points each	2
Mitigation Effectivess Score		**4**
Total Score (STAPLEE Score+Mitigation Effectiveness Score)		**19**
Priority Level		
High (30+points)	0	
Medium (25-29 points)	0	
Low (less than 25 points)	19	
Completed by: Boonslick Regional Planning, Lincoln County Emergency Management Agency with concurrence from the HMPC		

Action Title	Resolve any existing environmental conflicts and take steps to prevent future conflicts.	
Action ID	2.2.4	
Jurisdictions	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☐ Elsberry R-II School ☐ Silex R-I School ☐ Troy R III School ☐ Winfield R IV School	
STAPLEE Criteria	**Evaluation Rating**	**Score**
	Definitely YES=3 Maybe YES=2 Probably NO=1 Definitely NO=0	
S: Is it Socially Acceptable?		3
T: IS it Technically feasible and potentially successful?		2
A: Does the jurisdiction have the administrative capacity to execute this action?		1
P: Is it Politically acceptable?		1
L: Is there Legal authority to implement?		1
E: Is it Economically beneficial?		2
E: Will the project have either a neutral (score a 2) or positive (score a 3) impact on the natural environment?		3
Will historic structures be saved or protected?		0
Could it be implemented quickly?		2
STAPLEE Score		**15**
Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
IC: Injuries/Casualties and PD: Property Damage	Two points each	2
LF: Loss of Functionality and EMCC: Emergency Management and Community Costs	Two points each	2
Mitigation Effectivess Score		**4**
Total Score (STAPLEE Score+Mitigation Effectiveness Score)		**19**
Priority Level		
High (30+points)	0	
Medium (25-29 points)	0	
Low (less than 25 points)	19	
Completed by: Boonslick Regional Planning, Lincoln County Emergency Management Agency with concurrence from the HMPC		

Action Title	Review emergency access routes and evacuation routes and mitigate any problem areas	
Action ID	3.1.1 (Old 3.1.1 is deleted)	
Jurisdictions	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School	
STAPLEE Criteria	**Evaluation Rating**	**Score**
	Definitely YES=3 Maybe YES=2 Probably NO=1 Definitely NO=0	
S: Is it Socially Acceptable?		3
T: IS it Technically feasible and potentially successful?		3
A: Does the jurisdiction have the administrative capacity to execute this action?		3
P: Is it Politically acceptable?		2
L: Is there Legal authority to implement?		2
E: Is it Economically beneficial?		2
E: Will the project have either a neutral (score a 2) or positive (score a 3) impact on the natural environment?		2
Will historic structures be saved or protected?		0
Could it be implemented quickly?		2
STAPLEE Score		**19**
Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
IC: Injuries/Casualties and PD: Property Damage	Two points each	2
LF: Loss of Functionality and EMCC: Emergency Management and Community Costs	Two points each	1
Mitigation Effectivess Score		**3**
Total Score (STAPLEE Score+Mitigation Effectiveness Score)		**22**
Priority Level		
High (30+points)	0	
Medium (25-29 points)	0	
Low (less than 25 points)	22	
Completed by: Boonslick Regional Planning, Lincoln County Emergency Management Agency with concurrence from the HMPC		

Action Title	Support periodic inspections of the dams	
Action ID	3.1.2	
Jurisdictions	☐ Lincoln County ☐ Chain Of Rocks ☑ Fountain N Lakes ☐ Elsberry ☐ Foley ☐ Hawk Point ☑ Moscow Mills ☐ Old Monroe ☐ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☐ Truxton ☐ Elsberry R-II School ☐ Silex R-I School ☐ Troy R III School ☐ Winfield R IV School	
STAPLEE Criteria	**Evaluation Rating**	**Score**
	Definitely YES=3 Maybe YES=2 Probably NO=1 Definitely NO=0	
S: Is it Socially Acceptable?		3
T: IS it Technically feasible and potentially successful?		2
A: Does the jurisdiction have the administrative capacity to execute this action?		2
P: Is it Politically acceptable?		2
L: Is there Legal authority to implement?		3
E: Is it Economically beneficial?		2
E: Will the project have either a neutral (score a 2) or positive (score a 3) impact on the natural environment?		2
Will historic structures be saved or protected?		0
Could it be implemented quickly?		2
	STAPLEE Score	**18**
Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
IC: Injuries/Casualties and PD: Property Damage	Two points each	2
LF: Loss of Functionality and EMCC: Emergency Management and Community Costs	Two points each	2
	Mitigation Effectivess Score	**4**
Total Score (STAPLEE Score+Mitigation Effectiveness Score)		**22**
	Priority Level	
High (30+points)	0	
Medium (25-29 points)	0	
Low (less than 25 points)	22	
Completed by: Boonslick Regional Planning, Lincoln County Emergency Management Agency with concurrence from the HMPC		

Action Title	Maintain an inventory of levees in the county	
Action ID	3.1.3	
Jurisdictions	☑ Lincoln County ☐ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☐ Hawk Point ☐ Moscow Mills ☑ Old Monroe ☐ Silex ☐ Troy ☐ Whiteside ☑ Winfield ☐ Truxton ☑ Elsberry R-II School ☐ Silex R-I School ☐ Troy R III School ☐ Winfield R IV School	
STAPLEE Criteria	**Evaluation Rating**	**Score**
	Definitely YES=3 Maybe YES=2 Probably NO=1 Definitely NO=0	
S: Is it Socially Acceptable?		3
T: IS it Technically feasible and potentially successful?		3
A: Does the jurisdiction have the administrative capacity to execute this action?		2
P: Is it Politically acceptable?		3
L: Is there Legal authority to implement?		3
E: Is it Economically beneficial?		2
E: Will the project have either a neutral (score a 2) or positive (score a 3) impact on the natural environment?		2
Will historic structures be saved or protected?		2
Could it be implemented quickly?		2
STAPLEE Score		**22**
Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
IC: Injuries/Casualties and PD: Property Damage	Two points each	3
LF: Loss of Functionality and EMCC: Emergency Management and Community Costs	Two points each	3
Mitigation Effectivess Score		**6**
Total Score (STAPLEE Score+Mitigation Effectiveness Score)		**28**
Priority Level		
High (30+points)	0	
Medium (25-29 points)	28	
Low (less than 25 points)	0	
Completed by: Boonslick Regional Planning, Lincoln County Emergency Management Agency with concurrence from the HMPC		

Action Title	Identify, review, and implement mechanisms to foster collaboration among jurisdictions, agencies, special districts and private industry	
Action ID	3.2.1	
Jurisdictions	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School	
STAPLEE Criteria	**Evaluation Rating**	**Score**
	Definitely YES=3 Maybe YES=2 Probably NO=1 Definitely NO=0	
S: Is it Socially Acceptable?		3
T: IS it Technically feasible and potentially successful?		2
A: Does the jurisdiction have the administrative capacity to execute this action?		2
P: Is it Politically acceptable?		2
L: Is there Legal authority to implement?		3
E: Is it Economically beneficial?		2
E: Will the project have either a neutral (score a 2) or positive (score a 3) impact on the natural environment?		2
Will historic structures be saved or protected?		0
Could it be implemented quickly?		1
STAPLEE Score		**17**
Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
IC: Injuries/Casualties and PD: Property Damage	Two points each	2
LF: Loss of Functionality and EMCC: Emergency Management and Community Costs	Two points each	2
Mitigation Effectivess Score		**4**
Total Score (STAPLEE Score+Mitigation Effectiveness Score)		**21**
Priority Level		
High (30+points)	0	
Medium (25-29 points)	0	
Low (less than 25 points)	21	
Completed by: Boonslick Regional Planning, Lincoln County Emergency Management Agency with concurrence from the HMPC		

Action Title	Improve planning, funding, and response coordination	
Action ID	3.2.2	
Jurisdictions	☑ Lincoln County ☑ Chain Of Rocks ☑ Fountain N Lakes ☑ Elsberry ☑ Foley ☑ Hawk Point ☑ Moscow Mills ☑ Old Monroe ☑ Silex ☑ Troy ☑ Whiteside ☑ Winfield ☑ Truxton ☑ Elsberry R-II School ☑ Silex R-I School ☑ Troy R III School ☑ Winfield R IV School	
STAPLEE Criteria	**Evaluation Rating**	**Score**
	Definitely YES=3 Maybe YES=2 Probably NO=1 Definitely NO=0	
S: Is it Socially Acceptable?		3
T: IS it Technically feasible and potentially successful?		2
A: Does the jurisdiction have the administrative capacity to execute this action?		2
P: Is it Politically acceptable?		2
L: Is there Legal authority to implement?		3
E: Is it Economically beneficial?		2
E: Will the project have either a neutral (score a 2) or positive (score a 3) impact on the natural environment?		2
Will historic structures be saved or protected?		0
Could it be implemented quickly?		2
STAPLEE Score		**18**
Mitigation Effectiveness Criteria	**Evaluation Rating**	**Score**
IC: Injuries/Casualties and PD: Property Da	Two points each	2
LF: Loss of Functionality and EMCC: Emergency Management and Community Costs	Two points each	2
Mitigation Effectivess Score		**4**
Total Score (STAPLEE Score+Mitigation Effectiveness Score)		**22**
Priority Level		
High (30+points)	0	
Medium (25-29 points)	0	
Low (less than 25 points)	22	
Completed by: Boonslick Regional Planning, Lincoln County Emergency Management Agency with concurrence from the HMPC		

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Appendix D – FIRM Maps

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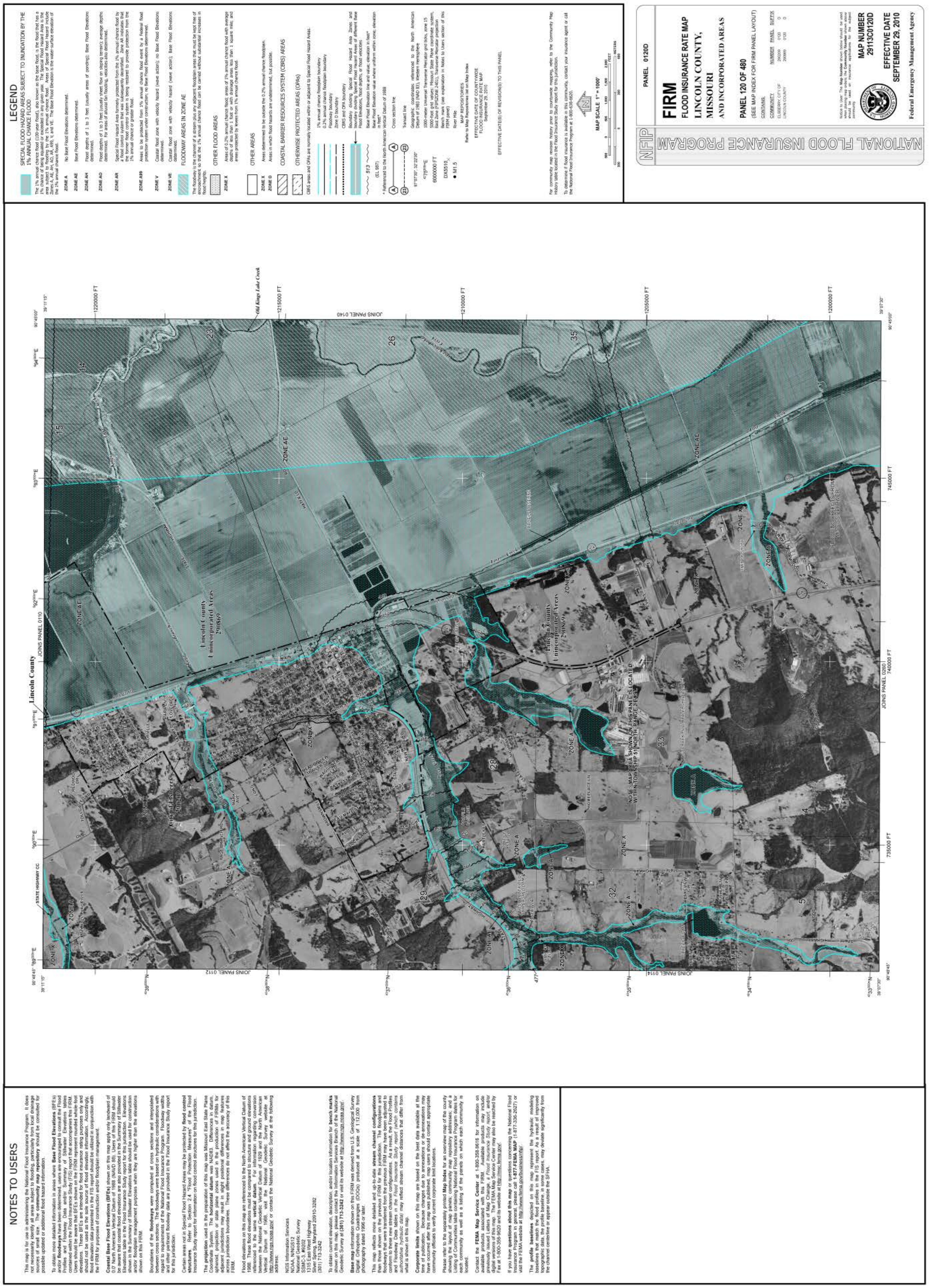

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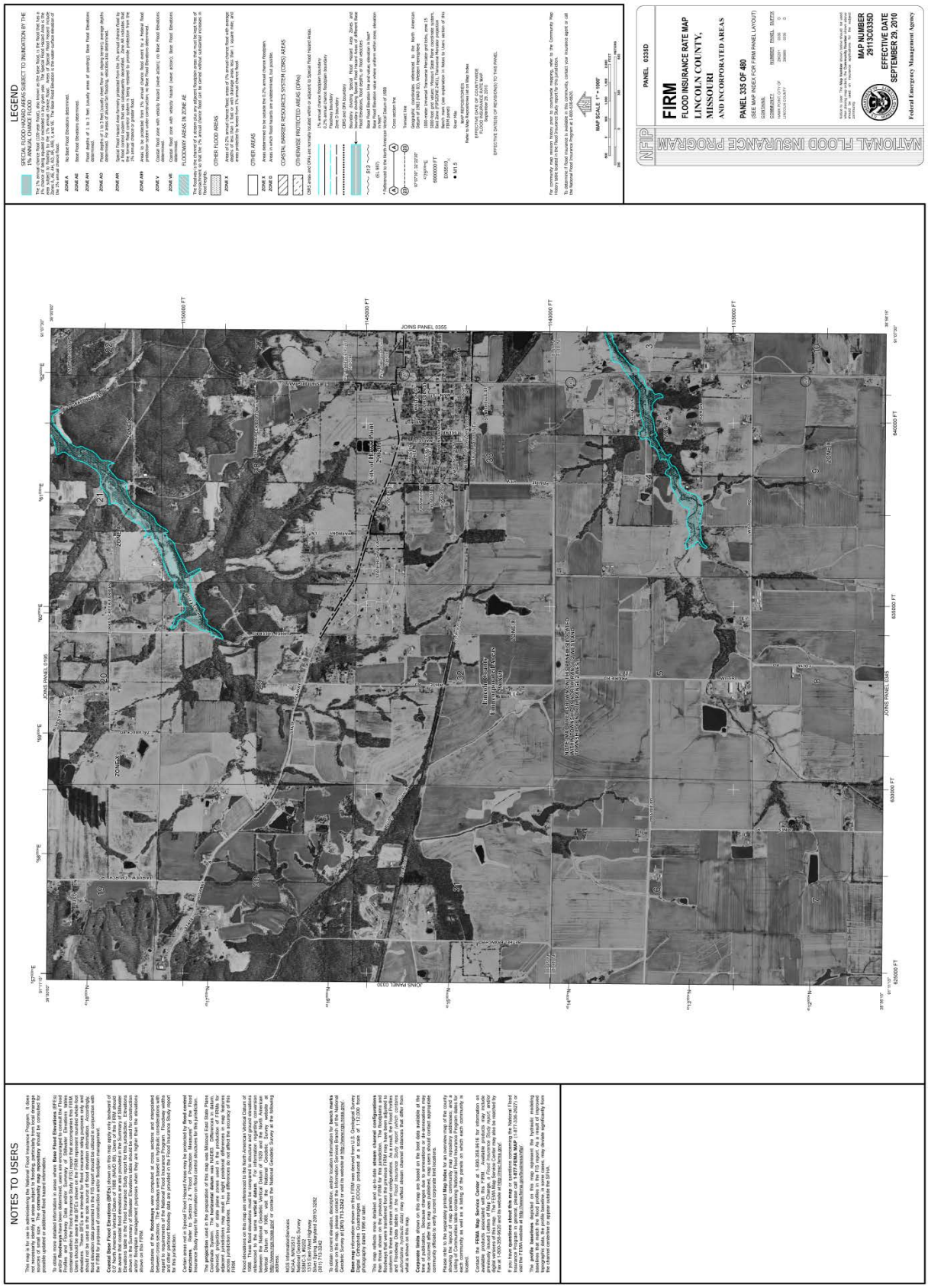

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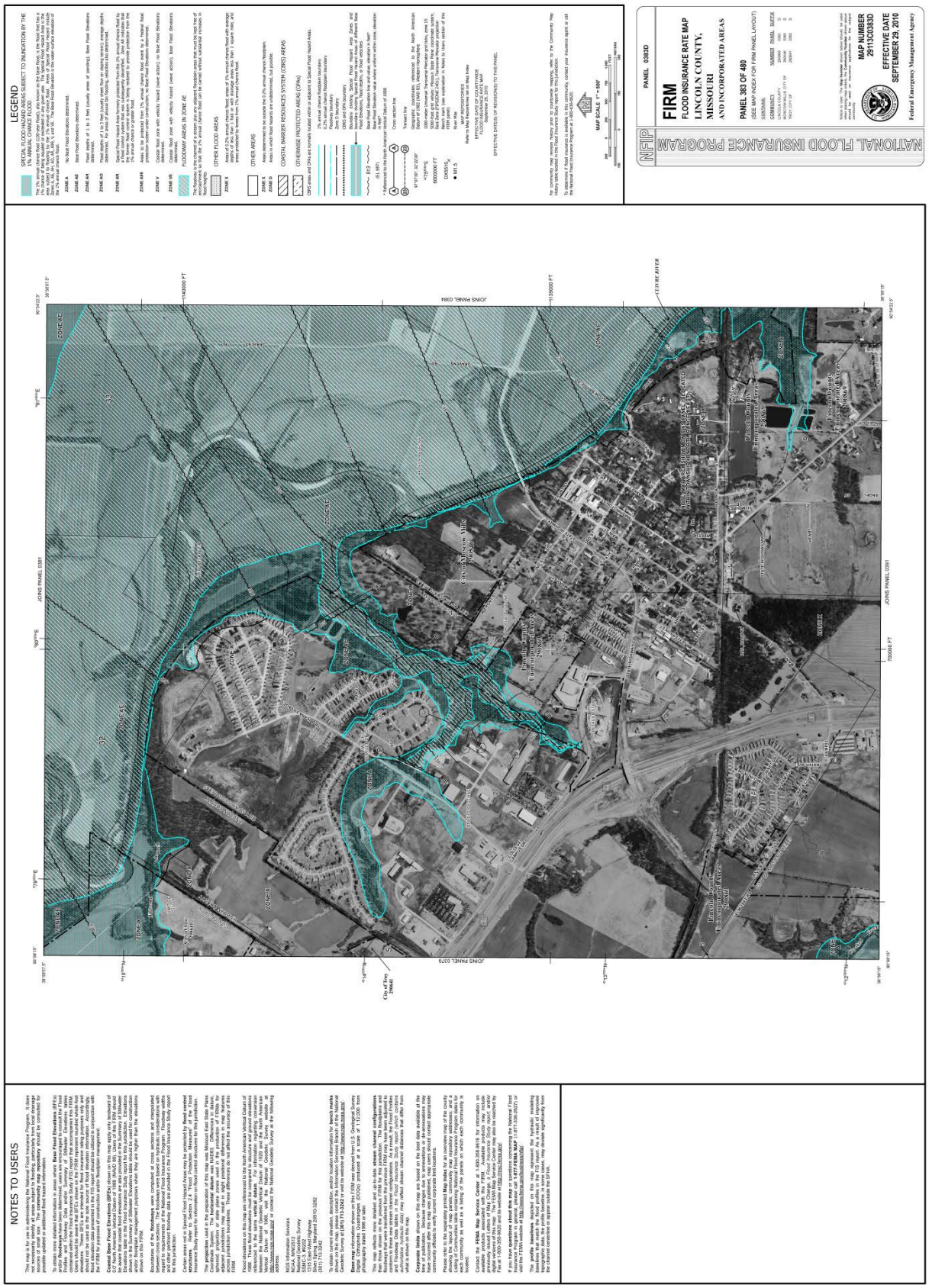

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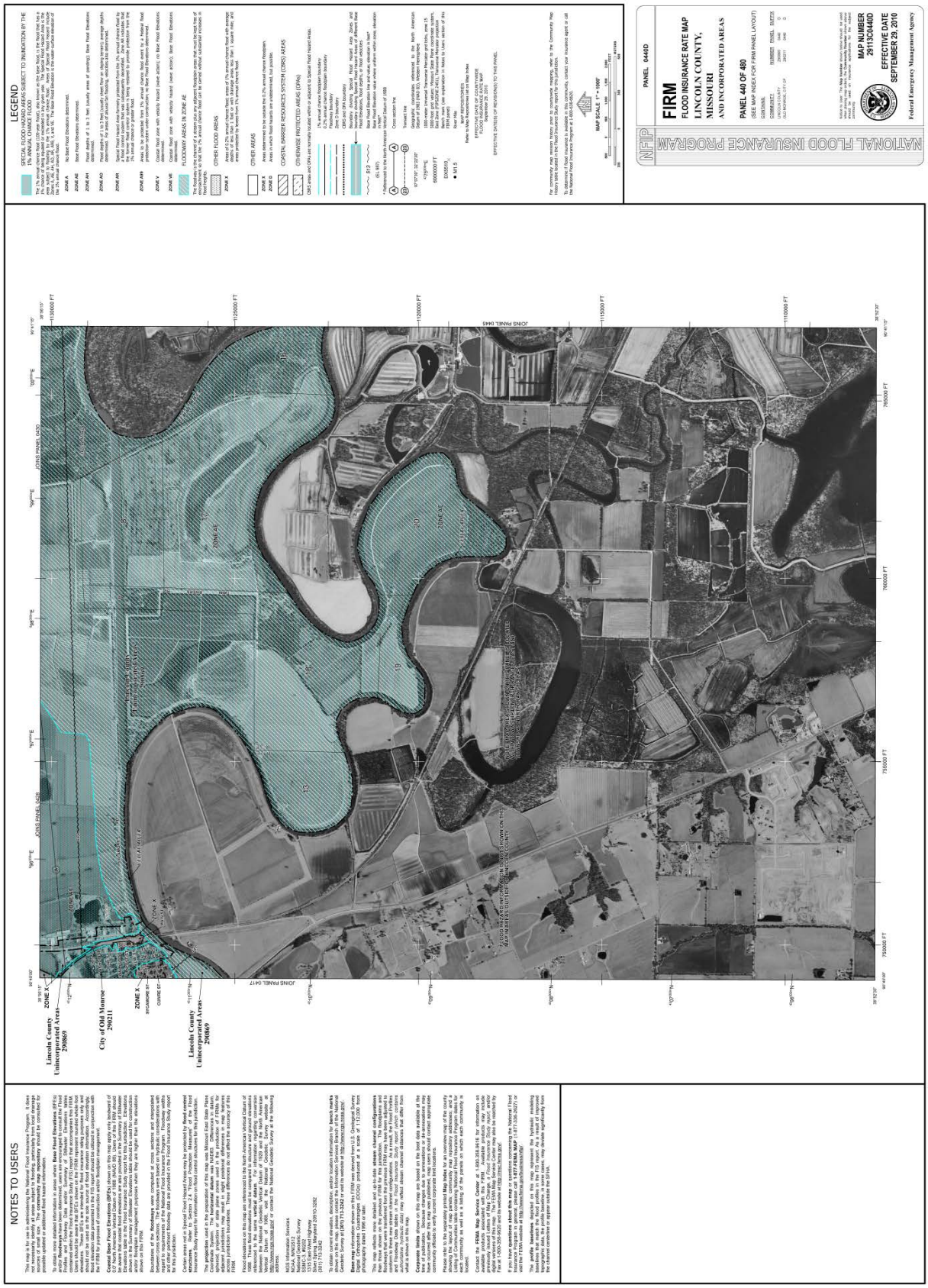

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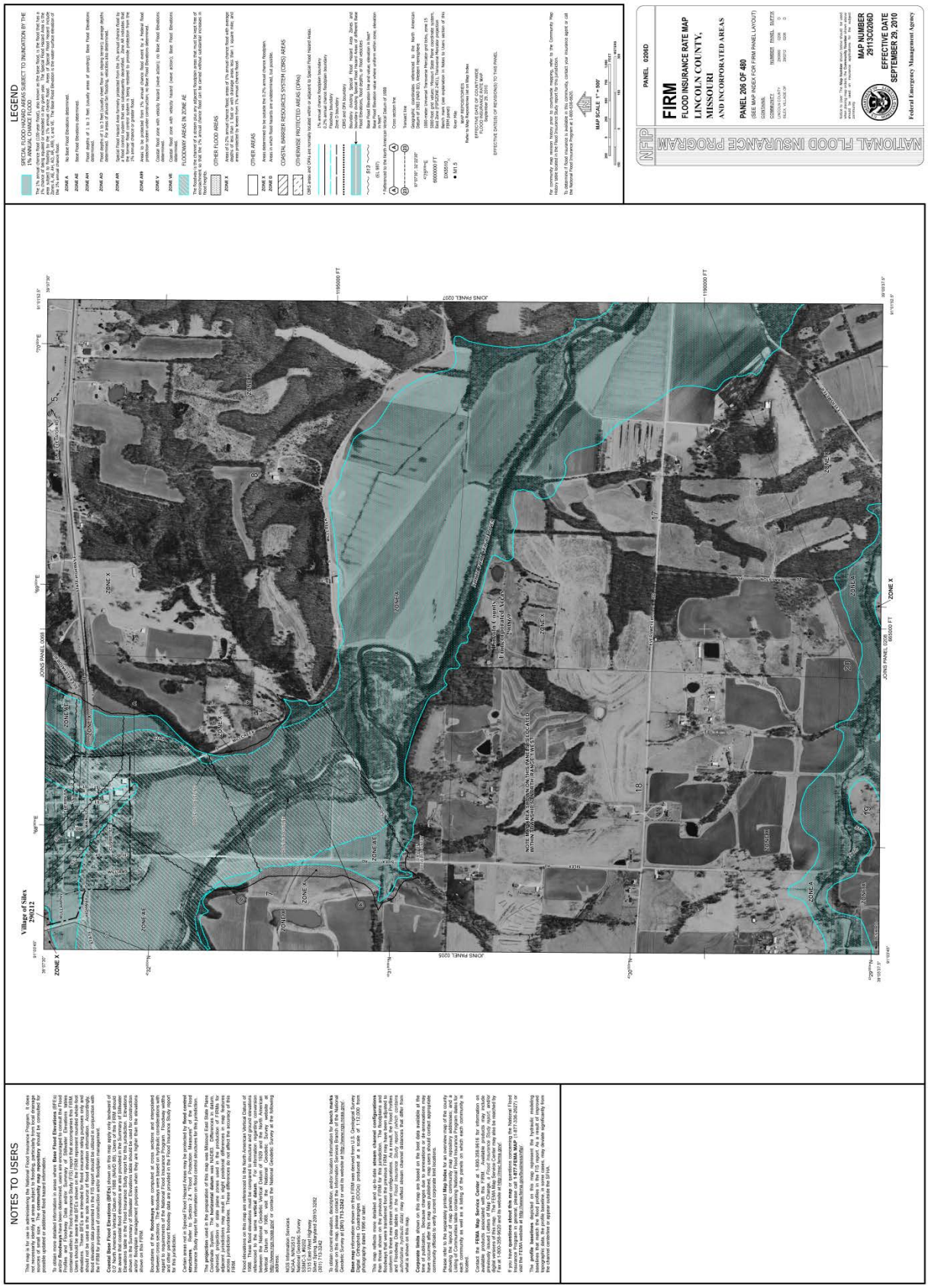

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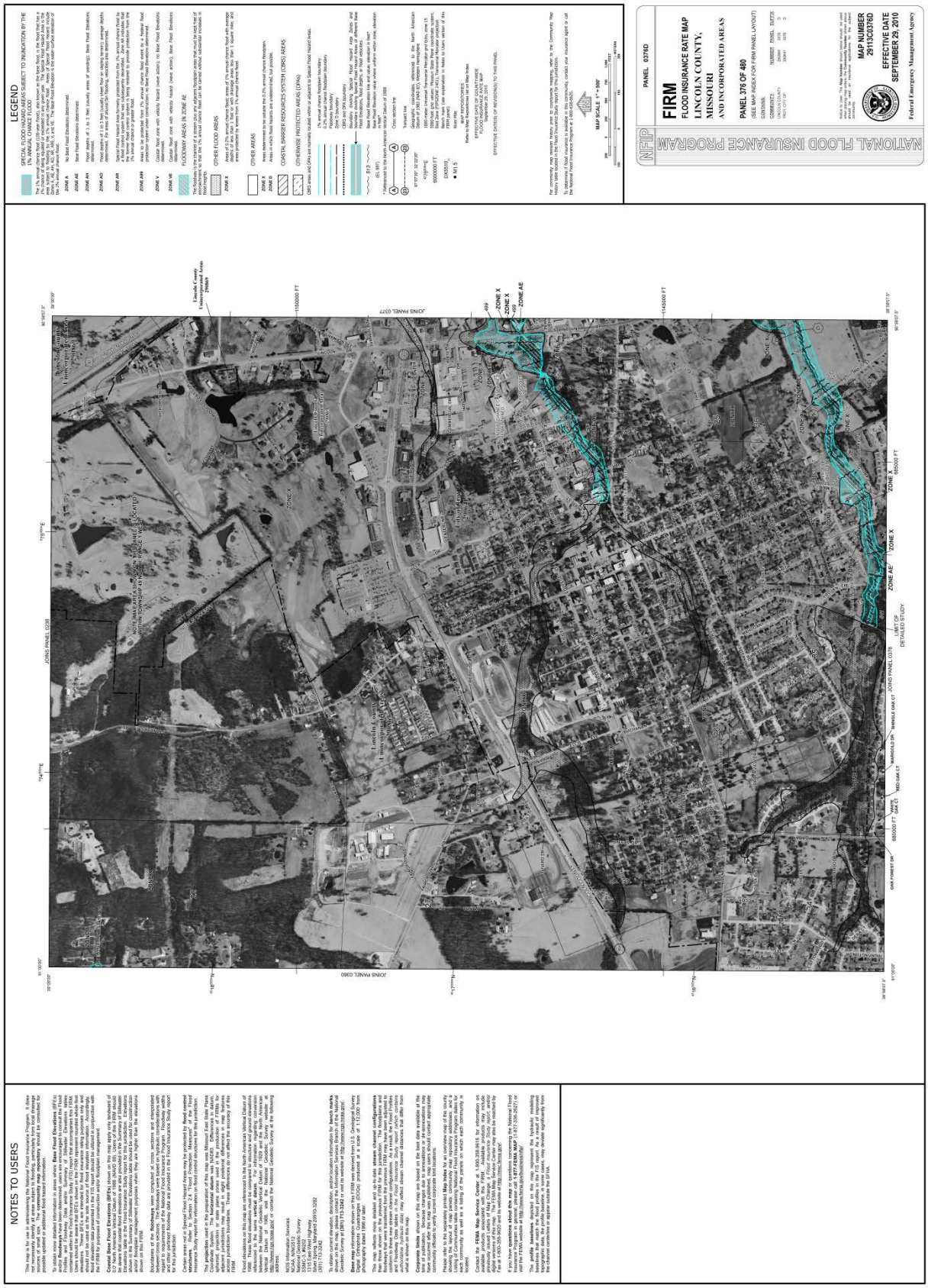

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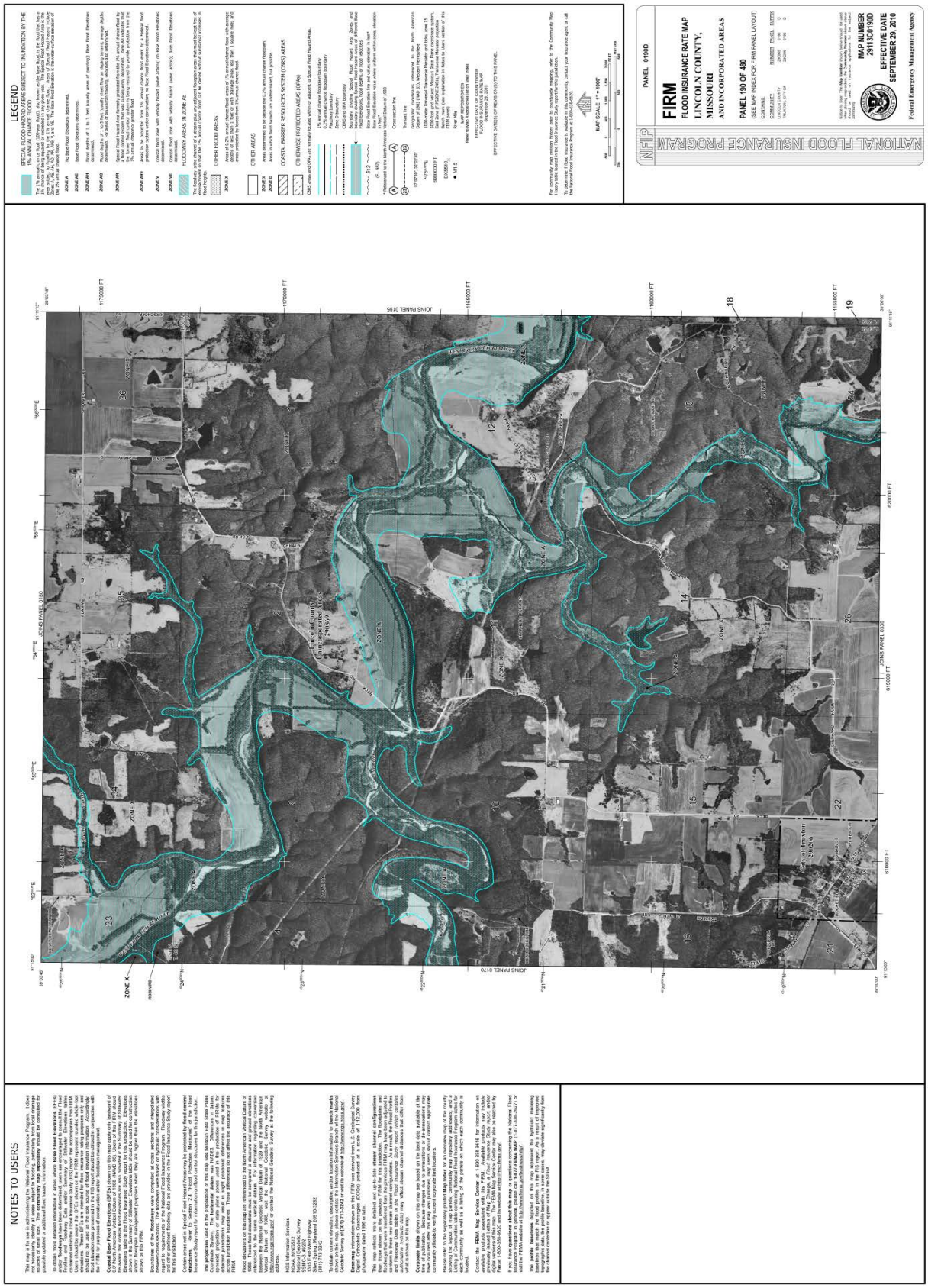

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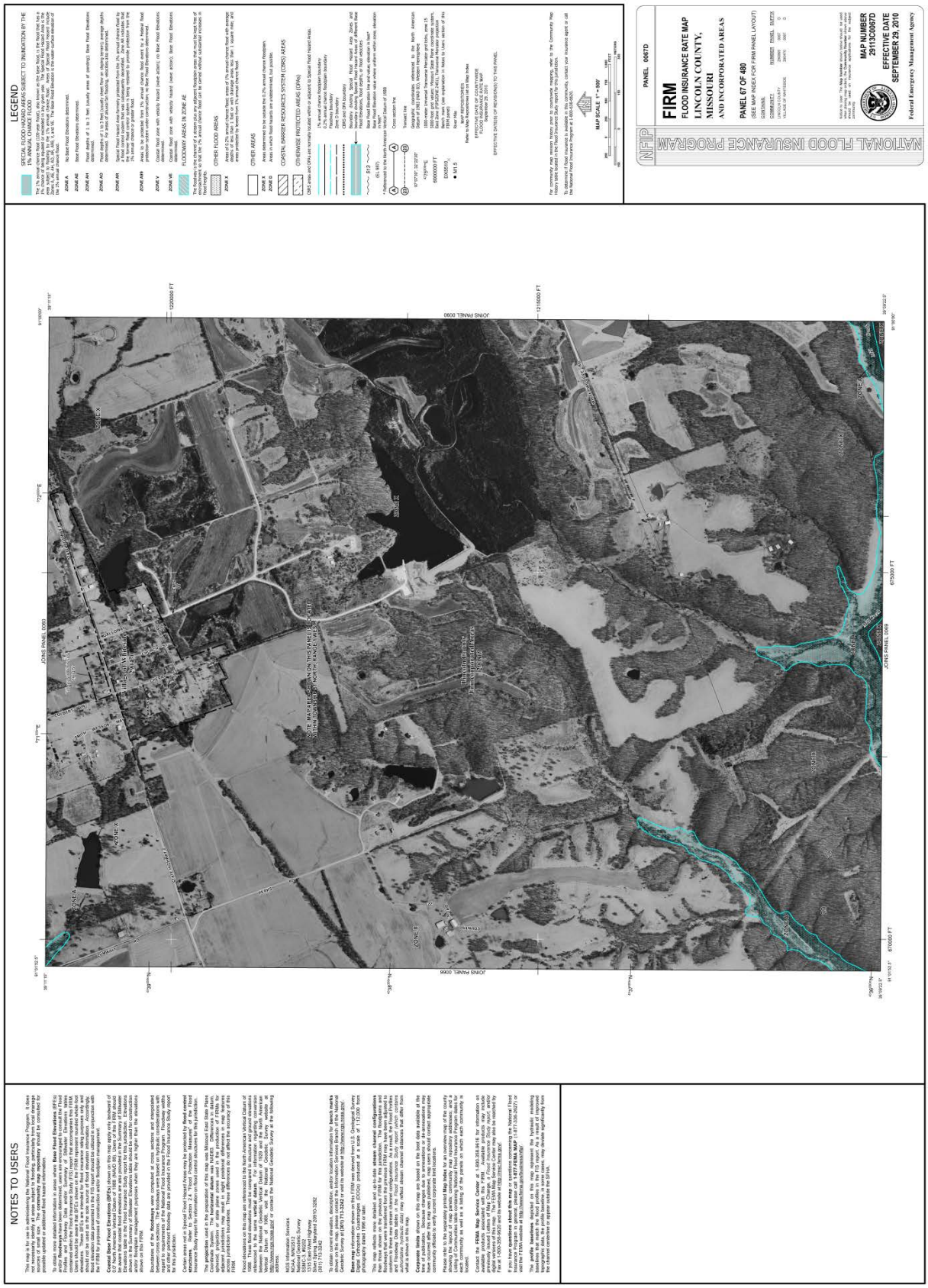

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