

Polk County Missouri 2023 Multi-Jurisdictional Natural Hazard Mitigation Plan

Approved July 12, 2023



Prepared by:





U.S. Department of Homeland Security
FEMA Region 7
11224 Holmes Road
Kansas City, MO 64131

FEMA

July 18, 2023

Director Remillard
State Emergency Management Agency
P. O. Box 116
Jefferson City, Missouri 65102

Subject: Approval of the Polk County Hazard Mitigation Plan

Director Remillard:

In accordance with applicable¹ laws, regulations and policy, the Risk Analysis Branch of the Federal Emergency Management Agency (FEMA) Region 7 has approved the Polk County Hazard Mitigation Plan. The attached Local Mitigation Plan Review Tool lists participants receiving approval that have submitted required adoption documentation.

The approval period for this plan is from July 12, 2023, through July 11, 2028. The same official plan expiration date applies to all participating jurisdictions, regardless of adoption date.

An approved mitigation plan is one of the conditions for applying for and receiving FEMA mitigation grants from the following programs:

- Hazard Mitigation Grant Program (HMGP)
- HMGP Post-Fire
- Building Resilient Infrastructure and Communities
- Flood Mitigation Assistance

Having an approved mitigation plan does not mean that mitigation grant funding will be awarded. Specific application and eligibility requirements for the programs listed above can be found in each FEMA grant program's respective policies and annual Notice of Funding Opportunities, as applicable.

To avoid a lapsed plan, the next plan update must be approved before the end of the approval period, including adoption by the participating jurisdictions. Before the end of the approval period, please allow sufficient time to secure funding for the update, including the review and approval process. Please include time for any revisions, if needed, and for the jurisdiction to formally adopt the plan after the review, if not adopted prior to submission. This will enable them to remain eligible to apply for and receive funding from FEMA's mitigation grant programs with a mitigation plan requirement. Local governments, including special districts, with a plan status of "Approvable

¹ Robert T. Stafford Disaster Relief and Emergency Assistance Act, as amended; the National Flood Insurance Act of 1968, as amended; and National Dam Safety Program Act, as amended; 44 CFR Part 201, Mitigation Planning; and the Local Mitigation Planning Policy Guide effective April 19, 2023.

Pending Adoption” are not eligible for FEMA’s mitigation grant programs with a mitigation plan requirement.

We look forward to discussing options for implementing this mitigation plan. If you should have any questions or concerns, please contact Joe Chandler, Planning Team Lead, at (816) 808-9016 or joe.chandler@fema.dhs.gov.

Sincerely,

Brian Woltz, Acting Director
Mitigation Division

Attachment: Local Mitigation Plan Review Tool

CONTRIBUTORS

Polk County Hazard Mitigation Planning Committee

Jurisdictional Representatives

Name	Title	Organization
Rick Davis	Emergency Management Director	Polk County
Melinda Robertson	Commissioner South District	Polk County
Michelle Morris	Administrator	Polk County
Shannon Hancock	Commissioner North District	Polk County
Brent Watkins	Emergency Management Director	City of Bolivar
Jill Way	Assistant Emergency Management Director	City of Bolivar
Lacy Hamby	Planning and Zoning/Floodplain Administrator	City of Bolivar
Andrew Ferguson	Superintendent	City of Fair Play
Beth Barnum	Fiscal Officer	City of Fair Play
Dewey Rumfelt	City Alderman	City of Fair Play
Donna Johnston	City Clerk	City of Fair Play
Ethan Grotheer	City Alderman	City of Fair Play
Larry Daniels	Mayor	City of Fair Play
Vi Pa Herson	City Alderman	City of Fair Play
Andrew Smith	Representative	City of Fair Play
John Hopkins	Superintendent/Fire Chief	City of Humansville
Dustin Kessler	Mayor	City of Morrisville
Leonard Hammons	Public Works Director	City of Morrisville
Joe Crawford	Chief	City of Morrisville
Lynn Esser	City Clerk	City of Pleasant Hope
Rick Davis	Representative	Village of Aldrich
John Hopkins	Operator	Village of Flemington
Tom Morris	Representative	Village of Halfway
Mike Pitts	Director of Business and Technology	Bolivar R-I School District
Richard Asbill	Superintendent	Bolivar R-I School District
David Geurin	Superintendent	Fair Play R-II School District
Tammy Erwin	Superintendent	Humansville R-IV School District
Josh Angel	Superintendent	Marion C Early R-V School District
Shaundra Ingram	Superintendent	Pleasant Hope R-VI School District
Neal Taylor	Director of Emergency Management	Citizens Memorial Hospital District
Rick Davis	Representative	Central Polk County Fire Protection District
Tom Morris	Officer	Central Polk County Fire Protection District
Rick Davis	Representative	Halfway Fire & Rescue Association
Tom Morris	Board President	Halfway Fire & Rescue Association
Ken Witt	Fire Chief	Morrisville Fire Protection District
Rick Davis	Representative	Pleasant Hope Fire Protection District

TABLE OF CONTENTS

<i>CONTRIBUTORS</i>	<i>i</i>
Polk County Hazard Mitigation Planning Committee.....	i
<i>TABLE OF CONTENTS</i>	<i>ii</i>
<i>EXECUTIVE SUMMARY</i>	<i>iii</i>
<i>PREREQUISITES</i>	<i>xix</i>
Model Resolution	<i>xx</i>
1 Introduction and Planning Process.....	1.1
2 Planning Area Profile and Capabilities.....	2.1
3 Risk Assessment	3.1
4 Mitigation Strategy	4.1
5 Plan Maintenance Process.....	5.1
Appendix A: References	
Appendix B: Planning Process	
Appendix C: Summary of Completed and Deleted Actions	
Appendix D: Adoption Resolutions	

EXECUTIVE SUMMARY

The purpose of hazard mitigation is to reduce or eliminate long-term risk to people and property from hazards. Polk County and the participating municipalities/schools/special districts developed this multi-jurisdictional local hazard mitigation plan update to reduce future losses from hazard events to the county and its communities. This plan is an update of the previous plan that was approved on June 19, 2018. The plan and the update were prepared pursuant to the requirements of the Disaster Mitigation Act of 2000 to result in eligibility for the Federal Emergency Management Agency (FEMA) Hazard Mitigation Assistance Grant Programs.

The County Multi-Hazard Mitigation Plan is a multi-jurisdictional plan that covers the following jurisdictions that participated in the planning process:

- Polk County
- City of Bolivar
- City of Fair Play
- City of Humansville
- City of Morrisville
- City of Pleasant Hope
- Village of Aldrich
- Village of Flemington
- Village of Halfway
- Bolivar R-I School District
- Fair Play R-II School District
- Humansville R-IV School District
- Marion C Early R-V School District
- Pleasant Hope R-VI School District
- Citizens Memorial Hospital District
- Central Polk County Fire Protection District
- Halfway Fire & Rescue Association
- Morrisville Fire Protection District
- Pleasant Hope Fire Protection District

Local jurisdictions that were invited to participate but did not include:

- Halfway R-III School District
- Blue Mound Special Road District
- Bolivar Special Road District
- Dunnegan Rural Fire Department
- Flemington Special Road District
- Humansville Special Road District
- Southwest Special Road District

When the future five-year update is developed for this plan, these jurisdictions will be invited again to participate.

The plan update process followed a methodology in accordance with FEMA guidance, which began with the formation of a Mitigation Planning Committee (MPC) comprised of representatives from Polk County and the participating jurisdictions. The MPC updated the risk assessment that identified and profiled hazards that pose a risk to the county and analyzed jurisdictional vulnerability to these hazards. The MPC also examined the capabilities in place to mitigate the hazard damages, with

emphasis on changes that have occurred since the previously approved plan was adopted. The MPC determined that the planning area is vulnerable to several hazards that are identified, profiled, and analyzed in this plan. Riverine and flash flooding, winter storms, severe thunderstorms, and tornadoes are among the hazards that historically have had a significant impact.

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

1. Protect the lives and livelihoods of all citizens
2. Reduce the potential impact of natural disasters to property, infrastructure, and the local economy
3. Ensure continued operation of government, emergency functions, and critical infrastructure in a disaster

To advance the identified goals, the MPC developed recommended mitigation actions, as summarized in the table on the following pages. The MPC developed an implementation plan for each action, which identifies priority level, background information, ideas for implementation, responsible agency, timeline, cost estimate, potential funding sources, and more. These additional details are provided in Chapter 4.

Table I below shows a Mitigation Action Matrix that provides details on the mitigation actions included in the plan by all participating jurisdictions. Knowledge of local issues, historical records of hazard events, FEMA documents, and insight by SMCOG staff were among the sources used when developing these actions. It should be noted that the numbering system used here differs from the numbering system of the previous plan. This table can also be found in chapter 4.

Table I. Mitigation Action Matrix

#	Action	Jurisdiction	Priority	Goal Addressed	Hazards Addressed	Addresses Current Development	Addresses Future Development	Continued Compliance with NFIP
Prevention								
1.12	Dam failure study	Polk County	25	Goal 1	Dam failure	-	-	-
3.2	Burn bans	Polk County	25	Goal 3	Wildfire	-	-	-
1.7	Resources, weatherization, and shelters	City of Bolivar	37	Goal 1	Extreme temperatures, severe winter weather, severe thunderstorms, tornado	X	X	-
2.1	Building codes	City of Bolivar	40	Goal 2	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado	X	X	-
2.6	NFIP enforcement	City of Bolivar	37	Goal 2	Flooding	X	X	X
1.3	Resources, weatherization, and shelters	City of Morrisville	24	Goal 1	Extreme temperatures, severe winter weather, severe thunderstorms, tornado	-	X	-
2.1	Building codes	City of Morrisville	39	Goal 2	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado	-	X	-
2.5	NFIP participation	City of Morrisville	28	Goal 2	Flooding	-	X	X
2.2	NFIP Enforcement	City of Pleasant Hope	37	Goal 2	Flooding	-	X	X
3.1	Hazard mitigation integration	City of Pleasant Hope	44	Goal 3	Flooding, severe winter weather, severe thunderstorm, tornado	X	X	-

#	Action	Jurisdiction	Priority	Goal Addressed	Hazards Addressed	Addresses Current Development	Addresses Future Development	Continued Compliance with NFIP
1.2	Smoke detectors	Pleasant Hope Fire Protection District	41	Goal 1	Wildfire	-	X	-
1.7	Fire codes	Pleasant Hope Fire Protection District	15	Goal 1	Wildfire	-	X	-
1.1	NOAA radios	Bolivar R-I	36	Goal 1	Dam failure, earthquake, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	X	X	-
1.2	Alert systems	Bolivar R-I	42	Goal 1	Tornado, severe thunderstorm	X	X	-
1.1	Alert systems	Humansville R-IV	36	Goal 1	Tornado, severe thunderstorms	X	X	-
1.1	NOAA radios	Marion C. Early	27	Goal 1	Dam failure, earthquake, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	-	X	-
1.2	Alert systems	Marion C. Early	36	Goal 1	Tornado, severe thunderstorm	-	X	-
1.1	Alert systems	Pleasant Hope R-VI	34	Goal 1	Tornado, severe thunderstorm	X	X	-
	Structure and Infrastructure Projects							
1.4	Low water crossing database	Polk County	37	Goal 1	Flooding	X	X	X
1.5	Low water crossing markers	Polk County	38	Goal 1	Flooding	X	X	X
1.6	Low water crossing replacement	Polk County	32	Goal 1	Flooding	-	X	X
1.10	Safe rooms	Polk County	30	Goal 1	Tornado, Severe Thunderstorm	-	X	-

#	Action	Jurisdiction	Priority	Goal Addressed	Hazards Addressed	Addresses Current Development	Addresses Future Development	Continued Compliance with NFIP
1.11	Retrofit	Polk County	32	Goal 1	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado	-	X	-
2.2	Back-up generator	Polk County	45	Goal 2	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado	-	X	-
1.6	Safe rooms	City of Bolivar	29	Goal 1	Tornado, severe thunderstorms	X	X	-
2.4	Storm water infrastructure	City of Bolivar	35	Goal 2	Flooding, severe thunderstorms	X	X	X
2.5	Back-up generator	City of Bolivar	33	Goal 2	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado	X	X	-
1.1	Safe room construction	City of Fair Play	38	Goal 1	Tornado, severe thunderstorm	-	X	-
1.2	Storm Siren	City of Fair Play	30	Goal 1	All	-	X	-
1.4	Retrofit	City of Humansville	47	Goal 1	Flooding, severe winter weather, severe thunderstorm, tornado	-	X	-
2.2	Back-up generator	City of Humansville	47	Goal 2	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado	X	X	-
1.6	Safe rooms	City of Morrisville	22	Goal 1	Tornado, severe thunderstorm	X	X	-
1.7	Retrofit	City of Morrisville	25	Goal 1	Flooding, severe winter weather, severe thunderstorm, tornado	X	X	-
2.3	Storm water infrastructure	City of Morrisville	40	Goal 2	Flooding, severe thunderstorms	-	X	-

#	Action	Jurisdiction	Priority	Goal Addressed	Hazards Addressed	Addresses Current Development	Addresses Future Development	Continued Compliance with NFIP
2.4	Back-up generator	City of Morrisville	40	Goal 2	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado	X	X	-
1.3	Safe rooms	City of Pleasant Hope	36	Goal 1	Tornado, severe thunderstorm	X	X	-
1.4	Retrofit	City of Pleasant Hope	24	Goal 1	Flooding, severe winter weather, severe thunderstorm, tornado	X	X	-
2.1	Back-up generator	City of Pleasant Hope	32	Goal 2	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado	X	X	-
1.1	Storm siren	Village of Aldrich	45	Goal 1	Severe thunderstorm, tornado	-	X	-
2.1	Ditch maintenance	Village of Aldrich	25	Goal 2	Flooding	X	X	-
1.1	Storm siren	Village of Flemington	45	Goal 1	Severe thunderstorm, tornado	-	X	-
2.1	Ditch maintenance	Village of Flemington	25	Goal 2	Flooding	X	X	-
1.1	Storm siren	Village of Halfway	45	Goal 1	Severe thunderstorm, tornado	-	X	-
2.1	Ditch maintenance	Village of Halfway	25	Goal 2	Flooding	X	X	-
3.1	Backup generator	Citizens Memorial Hospital District	24	Goal 3	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado	-	X	-
3.1	Back-up generator	Central Polk County Fire Protection District	35	Goal 3	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado	-	X	-
3.1	Back-up generator	Halfway Fire and Rescue Association	35	Goal 3	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado	-	X	-

#	Action	Jurisdiction	Priority	Goal Addressed	Hazards Addressed	Addresses Current Development	Addresses Future Development	Continued Compliance with NFIP
3.1	Back-up generator	Morrisville Fire Protection District	35	Goal 3	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado	-	X	-
1.6	Safe rooms	Pleasant Hope Fire Protection District	15	Goal 1	Tornado, severe thunderstorm	-	X	-
3.2	Backup generator	Pleasant Hope Fire Protection District	25	Goal 3	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado	X	-	-
1.5	Safe rooms	Bolivar R-I	36	Goal 1	Tornado, severe thunderstorm	X	X	-
1.6	Retrofit	Bolivar R-I	38	Goal 1	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	X	X	-
1.7	New FEMA safe room	Bolivar R-I	36	Goal 1	Tornado, severe thunderstorm	X	X	-
1.3	Safe rooms	Fair Play R-II	24	Goal 1	Tornado, severe thunderstorm	-	X	-
1.4	Retrofit	Fair Play R-II	26	Goal 1	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	X	X	-
1.5	Back-up generator	Fair Play R-II	26	Goal 1	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado	-	X	-
1.3	Safe rooms	Humansville R-IV	29	Goal 1	Tornado, severe thunderstorm	-	X	-
1.4	Retrofit	Humansville R-IV	28	Goal 1	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	X	X	-
1.5	Safe rooms	Marion C. Early	31	Goal 1	Tornado, severe thunderstorm	-	X	-

#	Action	Jurisdiction	Priority	Goal Addressed	Hazards Addressed	Addresses Current Development	Addresses Future Development	Continued Compliance with NFIP
1.6	Retrofit	Marion C. Early	29	Goal 1	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	X	X	X
1.4	Safe room	Pleasant Hope R-VI	36	Goal 1	Tornado, severe thunderstorm	-	X	-
1.5	Retrofit	Pleasant Hope R-VI	36	Goal 1	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	X	X	X
2.1	Back-up generator	Pleasant Hope R-VI	28	Goal 2	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado	-	X	-
Natural Systems Protection								
2.1	Debris cleanup	Polk County	45	Goal 2	Flooding, Severe Thunderstorms	X	X	X
2.3	Debris cleanup	City of Bolivar	38	Goal 2	Flooding, severe thunderstorms	X	X	X
2.1	Debris cleanup	City of Humansville	47	Goal 2	Flooding, severe thunderstorms	-	X	-
2.2	Debris cleanup	City of Humansville	40	Goal 2	Flood, severe thunderstorms	-	X	-
Emergency Services								
1.1	NOAA radios	Polk County	30	Goal 1	Dam failure, earthquake, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	X	-	-
1.3	Outdoor warning sirens	Polk County	35	Goal 1	Tornado, Severe Thunderstorms	-	X	-

#	Action	Jurisdiction	Priority	Goal Addressed	Hazards Addressed	Addresses Current Development	Addresses Future Development	Continued Compliance with NFIP
1.1	NOAA radios	City of Bolivar	27	Goal 1	Dam failure, earthquake, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	-	X	-
1.3	Outdoor warning sirens	City of bolivar	37	Goal 1	Tornado, severe thunderstorms	X	X	-
1.1	NOAA radios	City of Humansville	47	Goal 1	Dam failure, earthquake, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	-	X	-
1.1	NOAA radios	City of Morrisville	31	Goal 1	Dam failure, earthquake, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	-	X	-
1.1	NOAA radios	City of Pleasant Hope	39	Goal 1	Dam failure, earthquake, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	X	X	-
1.1	NOAA radios	Pleasant Hope Fire Protection District	37	Goal 1	Dam failure, earthquake, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	-	X	-
Education and Outreach								
1.2	Alert Systems	Polk County	30	Goal 1	Tornado, severe thunderstorms	-	X	-
1.6	Low water crossing alerts	Polk County	28	Goal 1	Flooding	-	X	X
1.8	Public information campaign	Polk County	40	Goal 1	Drought, sinkholes	-	X	-

#	Action	Jurisdiction	Priority	Goal Addressed	Hazards Addressed	Addresses Current Development	Addresses Future Development	Continued Compliance with NFIP
1.9	Information distribution	Polk County	47	Goal 1	Drought, earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	-	X	-
3.1	Multi-jurisdictional cooperation	Polk County	45	Goal 3	Dam failure, drought, earthquake, extreme temperatures, flooding, sinkholes, severe winter weather, severe thunderstorm, tornado, wildfire	-	X	-
1.2	Alert systems	City of Bolivar	35	Goal 1	Tornado, severe thunderstorms	X	X	-
1.4	Public information campaign	City of Bolivar	39	Goal 1	Drought, earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	X	X	-
1.5	Information distribution	City of Bolivar	39	Goal 1	Drought, earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	X	X	-
1.8	Hazard information and education	City of Bolivar	25	Goal 1	Drought, earthquakes	X	X	-
2.2	Fire codes	City of Bolivar	40	Goal 2	Wildfires	X	X	-
3.1	Multi-jurisdictional cooperation	City of Bolivar	30	Goal 3	Drought, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	X	X	-

#	Action	Jurisdiction	Priority	Goal Addressed	Hazards Addressed	Addresses Current Development	Addresses Future Development	Continued Compliance with NFIP
3.2	Hazard mitigation integration	City of Bolivar	38	Goal 3	Flooding, severe winter weather, severe thunderstorm, tornado	X	X	-
1.3	Public information campaign	City of Fair Play	25	Goal 1	Drought, earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	X	X	-
1.2	Alert systems	City of Humansville	47	Goal 1	Tornado, severe thunderstorms	-	X	-
1.3	Information distributions	City of Humansville	47	Goal 1	Drought, earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	-	X	-
1.5	Hazard information and education	City of Humansville	25	Goal 1	Drought, earthquakes	X	X	-
3.1	Multi-jurisdictional cooperation	City of Humansville	47	Goal 3	Drought, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	-	X	-
3.2	Hazard mitigation integration	City of Humansville	47	Goal 3	Flooding, severe winter weather, severe thunderstorm, tornado	-	X	-
1.2	Alert systems	City of Morrisville	33	Goal 1	Tornado, severe thunderstorm	-	X	-
1.4	Public information campaign	City of Morrisville	28	Goal 1	Drought, earthquake, sinkhole, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado	-	X	-

#	Action	Jurisdiction	Priority	Goal Addressed	Hazards Addressed	Addresses Current Development	Addresses Future Development	Continued Compliance with NFIP
1.5	Information distribution	City of Morrisville	34	Goal 1	Drought, earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	-	X	-
1.8	Public information campaign	City of Morrisville	25	Goal 1	Drought, sinkholes, earthquakes	X	X	-
3.1	Multi-jurisdictional cooperation	City of Morrisville	34	Goal 3	Drought, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	-	X	-
3.2	Hazard mitigation integration	City of Morrisville	41	Goal 3	Flooding, severe winter weather, severe thunderstorm, tornado	-	X	-
1.2	Information distribution	City of Pleasant hope	32	Goal 1	Drought, earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	X	X	-
1.5	Hazard information and education	City of Pleasant Hope	25	Goal 1	Drought, earthquake	X	X	-
1.2	Public information campaign	Village of Aldrich	25	Goal 1	Drought, earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado	X	X	-
1.2	Public information campaign	Village of Flemington	25	Goal 1	Drought, earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado	X	X	-

#	Action	Jurisdiction	Priority	Goal Addressed	Hazards Addressed	Addresses Current Development	Addresses Future Development	Continued Compliance with NFIP
1.2	Public information campaign	Village of Halfway	25	Goal 1	Drought, earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado	X	X	-
1.3	Public information campaign	Bolivar R-I	38	Goal 1	Extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado	X	X	-
1.4	Information distribution	Bolivar R-I	39	Goal 1	Earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado	X	X	-
3.1	Multi-jurisdictional cooperation	Bolivar R-I	47	Goal 3	Drought, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	X	X	-
3.2	Hazard mitigation integration	Bolivar R-I	44	Goal 3	Flooding, severe winter weather, severe thunderstorm, tornado	X	X	-
1.1	NOAA radios	Fair Play R-II	39	Goal 1	Dam failure, earthquake, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	X	X	-
1.2	Public information campaign	Fair Play R-II	36	Goal 1	Extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado	-	X	-
3.1	Multi-jurisdictional cooperation	Fair Play R-II	27	Goal 3	Drought, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	X	X	-

#	Action	Jurisdiction	Priority	Goal Addressed	Hazards Addressed	Addresses Current Development	Addresses Future Development	Continued Compliance with NFIP
3.2	Hazard mitigation integration	Fair Play R-II	40	Goal 3	Flooding, severe winter weather, severe thunderstorm, tornado	X	X	-
1.2	Information distribution	Humansville R-IV	34	Goal 1	Earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado	-	X	-
3.1	Multi-jurisdictional cooperation	Humansville R-IV	37	Goal 3	Drought, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	-	X	-
3.2	Hazard mitigation integration	Humansville R-IV	37	Goal 3	Flooding, severe winter weather, severe thunderstorm, tornado	X	X	-
1.3	Public information campaign	Marion C. Early	32	Goal 1	Extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado	-	X	-
1.4	Information distribution	Marion C. Early	31	Goal 1	Earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado	-	X	-
3.1	Multi-jurisdictional cooperation	Marion C. Early	32	Goal 3	Drought, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	X	X	-
3.2	Hazard mitigation integration	Marion C. Early	35	Goal 3	Flooding, severe winter weather, severe thunderstorm, tornado	X	X	-
1.2	Public information campaign	Pleasant Hope R-VI	38	Goal 1	Extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado	-	X	-

#	Action	Jurisdiction	Priority	Goal Addressed	Hazards Addressed	Addresses Current Development	Addresses Future Development	Continued Compliance with NFIP
1.3	Information distribution	Pleasant Hope R-VI	37	Goal 1	Earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado	-	X	-
3.1	Multi-jurisdiction cooperation	Pleasant Hope R-VI	24	Goal 3	Drought, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	X	X	-
3.2	Hazard mitigation Integration	Pleasant Hope R-Vi	34	Goal 3	Flooding, severe winter weather, severe thunderstorm, tornado	X	X	-
1.1	Preparing a defensible home in the wildland urban interface	Central Polk Fire Protection District	25	Goal 1	Wildfire	X	X	-
1.2	Burn ban knowledge	Central Polk Fire Protection District	25	Goal 1	Drought, extreme temperatures, wildfire	X	X	-
3.2	Water Inventory	Central Polk Fire Protection District	25	Goal 3	Wildfire, drought	-	-	-
1.1	Coordination with Polk County Emergency Management	Citizens Memorial Hospital District	24	Goal 1	Earthquake, flooding, sinkholes, severe winter weather, severe thunderstorm, tornado	-	-	-
1.1	Preparing a defensible home in the wildland urban interface	Halfway Fire and Rescue Association	25	Goal 1	Wildfire	X	X	-
1.2	Burn ban knowledge	Halfway Fire and Rescue Association	25	Goal 1	Drought, extreme temperatures, wildfire	X	X	-
3.2	Water Inventory	Halfway Fire and Rescue Association	25	Goal 3	Wildfire, drought	-	-	-

#	Action	Jurisdiction	Priority	Goal Addressed	Hazards Addressed	Addresses Current Development	Addresses Future Development	Continued Compliance with NFIP
1.1	Preparing a defensible home in the wildland urban interface	Morrisville Fire Protection District	42	Goal 1	Wildfire	-	X	-
1.2	Burn Bans	Morrisville Fire Protection District	34	Goal 1	Drought, extreme temperatures, wildfire	-	X	-
3.2	Water Inventory	Morrisville Fire Protection District	25	Goal 3	Wildfire, drought	-	-	-
1.2	Alert Systems	Pleasant Hope Fire Protection District	40	Goal 1	Tornado, severe thunderstorm	-	X	-
1.4	Public information campaign	Pleasant Hope Fire Protection District	47	Goal 1	Extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado	-	X	-
1.5	Information distribution	Pleasant Hope Fire Protection District	47	Goal 1	Drought, earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	-	X	-
3.1	Multi-jurisdictional cooperation	Pleasant Hope Fire Protection District	47	Goal 3	Drought, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	-	X	-
3.3	Water Inventory	Pleasant Hope Fire Protection District	25	Goal 3	Wildfire, drought	-	-	-

PREREQUISITES

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

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

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

Model Resolution

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

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

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

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

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

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

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

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

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

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

By (Sig): _____
Print name: _____

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

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

1 INTRODUCTION AND PLANNING PROCESS

1	INTRODUCTION AND PLANNING PROCESS	1.1
1.1	Purpose.....	1.1
1.2	Background and Scope	1.1
1.3	Plan Organization.....	1.2
1.4	Planning Process	1.3
1.4.1	Multi-Jurisdictional Participation.....	1.6
1.4.2	The Planning Steps	1.8

1.1 PURPOSE

Hazard Mitigation is the process of preparing for and taking action in order to reduce the long-term risk of natural disasters to financial and human consequences. Mitigation actions may be implemented prior to, during, or after a hazard event. However, it has been demonstrated that hazard mitigation is most effective when based on an inclusive, comprehensive, long-term plan that is developed before a disaster occurs (<https://www.fema.gov/grants/mitigation>).

By participating in the planning process and meeting the necessary requirements to do so, communities, school districts, and other special districts become eligible to apply for mitigation grant funding.

FEMA has implemented various hazard mitigation provisions through the Code of Federal Regulations (CFR) at 44 CFR Part 201. The CFR provisions set forth the mitigation plan requirements for local and tribal governments as a condition of receiving FEMA hazard mitigation assistance. Local governments, schools, or other publicly funded districts that do not participate or adopt a hazard mitigation plan will not be eligible to apply for grants as stated under the Robert T. Stafford Disaster Relief and Emergency Act (Public Law 93-288) as amended by the Disaster Mitigation Act of 2000 (Public Law 106-390) and the implementing regulations set forth by the Interim Final Rule published in the *Federal Register* on February 26, 2002, (44 CFR §201.6) and finalized on October 31, 2007.

1.2 BACKGROUND AND SCOPE

As required by 44 CFR §201.6(d)(3), a local jurisdiction must review and revise its plan to reflect changes in development, progress in local mitigation efforts and changes in priorities, and resubmit it for approval every five (5) years in order to continue to be eligible for mitigation project grant funding. The 2023 Polk County Multi-Jurisdictional Natural Hazard Mitigation Plan, from here on referred to as the Plan, is a revision of the previous five-year update adopted on March 12, 2018.

The 2023 Plan is a major rewrite of the previous plan and reflects changes in priorities and development, and the continued commitment of local governments to mitigate the impact of natural hazards in Polk County. Local participating jurisdictions include:

- Polk County
- City of Bolivar

- City of Fair Play
- City of Humansville
- City of Morrisville
- City of Pleasant Hope
- Village of Aldrich
- Village of Flemington
- Village of Halfway
- Bolivar R-I School District
- Fair Play R-II School District
- Humansville R-IV School District
- Marion C Early R-V School District
- Pleasant Hope R-VI School District
- Citizens Memorial Hospital District
- Central Polk County Fire Protection District
- Halfway Fire & Rescue Association
- Morrisville Fire Protection District
- Pleasant Hope Fire Protection District

All jurisdictions received email and phone communications notifying representatives of upcoming meetings and participation requirements.

The local mitigation plan is the representation of the jurisdictions' commitment to reduce risks from natural hazards, serving as a guide for decision makers as they commit resources to reducing the effects of natural hazards. Information in the Plan will be used to help guide and coordinate mitigation activities and decisions for local land use policy in the future.

1.3 PLAN ORGANIZATION

The Plan is organized into five chapters. The format of the Plan was changed to conform to the local hazard mitigation plan outline template released by the Missouri State Emergency Management Agency (SEMA). The Plan chapters include:

- Chapter 0: Executive Summary
- Chapter 1: Introduction and Planning Process
- Chapter 2: Planning Area Profile and Capabilities
- Chapter 3: Risk Assessment
- Chapter 4: Mitigation Strategy
- Chapter 5: Plan Implementation and Maintenance
- Appendices

Table 1.1 summarizes the changes made in the Plan by chapter.

Table 1.1. Changes Made in Plan Update

Plan Section	Summary of Updates
Chapter 1 - Introduction and Planning Process	<ul style="list-style-type: none"> • Updated list of participating jurisdictions and stakeholders • Updated list of mitigation planning committee members • Removed Department column from Table 1.2

	<ul style="list-style-type: none"> • Added Table 1.3 – MPC Capability with Six Mitigation Categories • An online community survey was conducted regarding hazard threats and mitigation activities in the community • Reworked the goals
Chapter 2 - Planning Area Profile and Capabilities	<ul style="list-style-type: none"> • Updated demographics information • Incorporated revisions to community profiles as draft sections were reviewed by local officials • Added table for Total and Per Farm Overview • Added a table for FEMA PA Grants • Added a summary table for Special District Mitigation Capabilities
Chapter 3 - Risk Assessment	<ul style="list-style-type: none"> • Changed the order of the hazards • Extreme heat and extreme cold were combined into extreme temperatures • Removed table showing total Public Assistance provided to each jurisdiction • Added school and special district development since previous update • Added maps for every dam • Added community comments section for every hazard
Chapter 4 - Mitigation Strategy	<ul style="list-style-type: none"> • Slightly reworded goals • Reformatted the STAPLEE and action worksheets • Action/project number was reworked to reflect the change in goal numbering • Added Mitigation Action Matrix table
Chapter 5 - Plan Implementation and Maintenance	<ul style="list-style-type: none"> • No significant changes were made

1.4 PLANNING PROCESS

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

The Southwest Missouri Council of Governments (SMCOG) was contracted to facilitate the plan development process. SMCOG staff met with the Polk County EMD during an initial scoping meeting to develop contact information for area stakeholders and local jurisdiction representatives to establish the Mitigation Planning Committee (MPC). Meeting locations and schedules were discussed, and the most effective way to inform and include the public was determined. Also discussed was previous plan maintenance and any updates made over the past five years. It was determined that the document had not been officially updated.

The planning process included the kick-off meeting and four subsequent MPC meetings. SMCOG staff were responsible for producing the draft and final plan update in a FEMA-approvable document, as well as coordinating with SEMA and FEMA plan reviewers. Specific information

about agenda items for the MPC meetings are presented in **Section 1.4.2**. SMCOG also assisted in soliciting public involvement in the planning process by creating a community survey. Notification of the MPC meetings on July 25, August 29, September 26, October 25, and November 29, 2022, were sent via mail and email to all jurisdictions within the county. Meeting dates were posted on the SMCOG website in advance. Appendix B provides documentation of the planning process including public involvement solicitations and meeting notices.

Input from jurisdiction officials was solicited through distribution of drafts of plan elements for discussion and review at scheduled meetings and other communications with individual community representatives and elected officials.

A complete listing of agencies invited to participate in the planning process and what meetings they were invited to attend is included in Appendix B.

Table 1.2 shows the MPC members and the entities they represent, along with their titles.

Table 1.2. Jurisdictional Representatives of the Polk County Mitigation Planning Committee

Name	Title	Organization
Rick Davis	Emergency Management Director	Polk County
Melinda Robertson	Commissioner South District	Polk County
Michelle Morris	Administrator	Polk County
Shannon Hancock	Commissioner North District	Polk County
Brent Watkins	Emergency Management Director	City of Bolivar
Jill Way	Assistant Emergency Management Director	City of Bolivar
Lacy Hamby	Planning and Zoning/Floodplain Administrator	City of Bolivar
Andrew Ferguson	Superintendent	City of Fair Play
Beth Barnum	Fiscal Officer	City of Fair Play
Dewey Rumfelt	City Alderman	City of Fair Play
Donna Johnston	City Clerk	City of Fair Play
Ethan Grotheer	City Alderman	City of Fair Play
Larry Daniels	Mayor	City of Fair Play
Vi Pa Herson	City Alderman	City of Fair Play
Andrew Smith	Representative	City of Fair Play
John Hopkins	Superintendent/Fire Chief	City of Humansville
Dustin Kessler	Mayor	City of Morrisville
Leonard Hammons	Public Works Director	City of Morrisville
Joe Crawford	Chief	City of Morrisville
Lynn Esser	City Clerk	City of Pleasant Hope
Rick Davis	Representative	Village of Aldrich
John Hopkins	Operator	Village of Flemington
Tom Morris	Representative	Village of Halfway
Mike Pitts	Director of Business and Technology	Bolivar R-I School District
Richard Asbill	Superintendent	Bolivar R-I School District
David Geurin	Superintendent	Fair Play R-II School District
Tammy Erwin	Superintendent	Humansville R-IV School District
Josh Angel	Superintendent	Marion C Early R-V School District
Shaundra Ingram	Superintendent	Pleasant Hope R-VI School District
Neal Taylor	Director of Emergency Management	Citizens Memorial Hospital District
Rick Davis	Representative	Central Polk County Fire Protection District
Tom Morris	Officer	Central Polk County Fire Protection District
Rick Davis	Representative	Halfway Fire & Rescue Association
Tom Morris	Board President	Halfway Fire & Rescue Association
Ken Witt	Fire Chief	Morrisville Fire Protection District
Rick Davis	Representative	Pleasant Hope Fire Protection District

Table 1.3. MPC Capability with Six Mitigation Categories

Community Department/Office	Preventive Measures	Structure and Infrastructure Projects		Natural Resource Protection	Public Information	Emergency Services
		Property Protection	Structural Flood Control Projects			
Polk County OEM	X	X	X	X	X	X
Polk County Commission	X	X			X	X
City of Bolivar OEM	X	X	X	X	X	X
City of Bolivar Planning Dept	X	X	X	X	X	X
City of Fair Play Administration	X	X			X	
City of Humansville Fire Department	X	X	X	X	X	X
Cit of Morrisville Administration	X	X			X	
City of Morrisville Public Works	X	X	X	X	X	
City of Pleasant Hope Administration	X	X			X	
Village of Aldrich Administration	X	X			X	
Village of Flemington Administration	X	X			X	
Village of Halfway Administration	X	X			X	
Bolivar R-I Superintendent					X	
Bolivar R-I Business and Technology					X	
Fair Play R-II Superintendent					X	
Humansville R-IV Superintendent					X	
Marion C Early R-V Superintendent					X	
Pleasant Hope R-Vi Superintendent					X	

Citizens Memorial Hospital District Emergency Management	X	X	X	X	X	X
Central Polk County Fire Protection District Administration	X	X		X	X	X
Halfway Fire & Rescue Association Administration	X	X		X	X	X
Morrisville Fire Protection District Fire Chief	X	X		X	X	X
Pleasant Hope Fire Protection District Administration	X	X		X	X	X

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 Plan serves as a written document of the planning process. Active participation of local jurisdiction representatives and stakeholders in the hazard mitigation planning process is essential if the Plan is to have value. To be eligible for mitigation funding, local governments must adopt the FEMA-approved update of the Plan. The participation of the local government stakeholders in the planning process is considered critical to successful implementation of this plan. Each jurisdiction that is seeking approval for the Plan must have its governing body adopt the updated plan, regardless of the degree of modifications. SMCOG collaborated with the local governments in Polk County to ensure participation in the planning process and the development of a plan that represents the needs and interests of the county and its local jurisdictions. Appendix D contains resolutions for jurisdictions adopting the Plan.

County Commissioners, incorporated communities, public schools, special districts, and various other stakeholders in mitigation planning were invited to a kick-off meeting for the Plan update on July 25, 2022, in Bolivar. At this meeting it was explained that the Disaster Mitigation Act (DMA) requires each jurisdiction participating in the planning process officially adopt the plan. The criteria for participation that each jurisdiction must meet in order to be considered a “participant” in the Plan was established at this meeting and includes the following:

- Participation in at least two MPC meetings, by either direct participation or authorized representation
- Each participating jurisdiction must provide to the MPC sufficient information to support plan development by completion and return of Data Collection Questionnaires
- Provide documentation to show time donated to the planning effort
- All participants should formally adopt the mitigation plan

In order to be included in the plan as a participating jurisdiction, each jurisdiction was required to send a representative to two meetings, complete the data collection questionnaire, complete in-kind time documentation (if applicable), and formally adopt the plan as minimum requirements.

Some jurisdictions were able to adopt the plan before it received final SEMA/FEMA approval, while others had to wait for SEMA/FEMA to first approve the plan before they could formally adopt it. Jurisdictions that met the minimum requirements are considered to have satisfactorily participated in the planning process. In addition to public outreach solicited through SMCOG, each participating jurisdiction was strongly encouraged to seek public input at an open public meeting or through various forms of input solicitation.

Table 1.4 shows the representation of each participating jurisdiction at the planning meetings and the provision of responses to the data collection questionnaire. All jurisdictions participating in the Plan either reviewed or commented on the draft Plan, participated in the update and development of mitigation actions, documented the donation of time, and passed an adoption resolution either before or after final SEMA/FEMA approval. Meeting sign-in sheets are located in Appendix B.

Table 1.4. Jurisdictional Participation in the Planning Process

Jurisdiction	Mtg 1	Mtg 2	Mtg 3	Mtg 4	Mtg 5	Data Collection Questionnaire Response	Documented Donated Time	Adoption Resolution	
								Before Approval	After Approval
Polk County	X	X	X	X	X	X	X	X	
City of Bolivar	X	X	X	X	X	X	X		X
City of Fair Play	X	X			X	X	X	X	
City of Humansville			X	X	X	X	X	X	
City of Morrisville	X	X	X		X	X	X	X	
City of Pleasant Hope	X	X			X	X	X	X	
Village of Aldrich			X	X		X	X	X	
Village of Flemington			X	X		X	X	X	
Village of Halfway		X	X			X	X	X	
Bolivar R-I	X		X	X	X	X	X	X	
Fair Play R-II			X	X		X	X	X	
Humansville R-IV	X	X				X	X	X	
Marion C Early R-V*						X	X	X	
Pleasant Hope R-VI	X	X			X	X	X	X	
Citizens Memorial Hospital District		X	X			X	X	X	
Central Polk County Fire Protection District		X	X	X		X	X	X	
Halfway Fire & Rescue Association		X	X	X		X	X	X	
Morrisville Fire Protection District		X	X			X	X	X	
Pleasant Hope Fire Protection District	X	X	X	X		X	X	X	

*Marion C Early was unable to attend the in-person meetings, so SMCOG staff conducted phone meetings in order to meet the attendance requirement.

1.4.2 The Planning Steps

FEMA's Local Mitigation Planning Handbook (March 1, 2013), Local Mitigation Plan Review Guide (October 1, 2011), and Integrating Hazard Mitigation into Local Planning: Case Studies and Tools for Community Officials (March 1, 2013) were used as the sources for developing the Plan update process. The development of the plan followed the 10-step planning process adapted from FEMA's Community Rating System (CRS) and Flood Mitigation Assistance programs. The 10-step process allows the Plan to meet funding eligibility requirements of the Hazard Mitigation Grant Program, Pre-Disaster Mitigation Program, Community Rating System, and Flood Mitigation Assistance Program.

Table 1.5 is a summary of how SMCOG staff used the Nine Task Process to develop the update to the Plan.

Table 1.5. County Mitigation Plan Update Process

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

Step 1: Organize the Planning Team

In February 2022, SMCOG entered into cooperative agreements with SEMA and Polk County to prepare this multi-jurisdictional plan for public entities in Polk County. Discussions on the development of the Polk County Multi-Jurisdictional Natural Hazard Mitigation Plan began in early 2022 with an introductory scoping meeting attended by SMCOG staff and the County Emergency

Management Director. This meeting was conducted to discuss the timeline for developing the hazard mitigation plan, the planning process, identification of stakeholders and community organizations to include in the planning process, and dates for five planning committee meetings, beginning with a kick-off meeting on July 25, 2022 to initiate participation of jurisdictions and public entities in the planning process. The Emergency Management Director (EMD) and SMCOG staff identified prospective participant representatives and stakeholders and a contact list was prepared for the kick-off meeting. The list of invitees included local elected officials, municipal government staff, county government staff, emergency services personnel, public school administrators, members from health and social services organizations, and utility providers. A complete list of invitees is in Appendix B.

The MPC met on several occasions from July through November 2022 to collaborate on the development of the Plan update. Participants assisted in data collection; reviewed and revised the Plan's goals and mitigation strategies; and provided reviews and comments on the Plan throughout the update process. Communication with MPC members occurred throughout the planning process through phone conversations, letters, and email correspondence in addition to committee meetings. **Table 1.6** shows the meeting schedule and items discussed for MPC meetings.

Table 1.6. Schedule of MPC Meetings

Meeting	Topic	Date
Kick-off Meeting	Introduction to hazard mitigation planning, participation requirements, and the planning process	07/25/2022
Planning Meeting #2	Participation overview, process recap, and risk assessment	08/29/2022
Planning Meeting #3	Mitigation goals and actions	09/26/2022
Planning Meeting #4	Mitigation goals and actions	10/25/2022
Planning Meeting #5	Funding and implementation mechanisms, plan adoption, and maintenance	11/29/2022

Step 2: Plan for Public Involvement

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

Options for soliciting public input on the Plan were discussed with the MPC at the kick-off meeting. SMCOG staff explained the importance of public involvement during the planning process. Meeting invitations were sent to all committee members around a month before each meeting took place. It was also discussed at the kick-off meeting that solicitation of public input would be sought by members of the MPC through announcements at gatherings and other public meetings, such as board of aldermen, county commission meetings, board of education meetings, and local emergency planning committee meetings. Progress on the plan was shared at each meeting in

order to keep the committee involved in the update process.

The MPC also decided that SMCOG staff would assist in developing an online community survey. The survey was posted on the SMCOG website and SMCOG staff encouraged jurisdictions to post it on their social media pages. 126 responses were received in the two-month timeframe the survey was open. A summary of responses to the survey can be found in chapter 3 in each hazard profile.

Step 3: Coordinate with Other Departments and Agencies and Incorporate Existing Information

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

As stated in **Section 1.4**, neighboring communities, businesses, academia, and other non-profit interests were notified via email, letters, and/or phone calls. A notification was sent to adjacent county Emergency Management Directors and local and regional agencies such as Health Departments and special districts. A complete listing of agencies invited to participate in the planning process and what meetings they were invited to attend is included in Appendix B.

This plan was developed prior to the release of FEMA's *Local Mitigation Planning Policy Guide, Effective April 19, 2023*. Future hazard mitigation plan update cycles will include outreach to non-profits for underserved communities as required under 44 CFR 201.6(b)(2).

Integration of Other Data, Reports, Studies, and Plans

A significant amount of information presented in the Plan has been updated and revised based on the review and incorporation of existing plans, studies, reports, and technical information. Appendix A contains a list of references to plans, studies, reports, and technical information to incorporate into hazard profiles, risk assessment, and profile and capability sections. Plan participants and stakeholders were asked to provide any relevant information and data for inclusion in the document. A few examples of information incorporated from the review of existing plans, etc. include:

- 2018 Missouri State Hazard Mitigation Plan
- The National Inventory of Dams (NID)
- Missouri Department of Conservation (MDC) wildfires statistics
- Wildland/Urban Interface and Intermix areas from the SILVIS Lab
- Previous Polk County Hazard Mitigation Plan

Step 4: Assess the Hazard: Identify and Profile Hazards

At the second MPC meeting, profiles of identified hazards from the previous Hazard Mitigation

Plan were presented. Storm event data from the National Centers for Environmental Information for the five-year period since the adoption of the previous Polk County Plan were included in the hazard profiles. The presentation incorporated data from studies, reports, and technical information available through internet research. During the process of identifying hazards the MPC reviewed:

- Previous disaster declarations in the county
- Hazards in the most recent State Hazard Mitigation Plan
- Hazards identified in the previously approved hazard mitigation plan
- Hazards identified in each jurisdictions' completed Data Collection Questionnaire

The MPC was asked to prioritize the identified hazards based on probability of occurrence, human impact, and property impact. Additional information about the conclusions drawn can be found in the Risk Assessment chapter of the Plan.

Step 5: Assess the Problem: Identify Assets and Estimate Losses

Identified assets in the planning area include population, structures, critical facilities and infrastructure, and other important assets that may be at risk to hazards. The inventory of assets for each jurisdiction was derived from parcel data from the County Assessor, the Polk County Structures GIS dataset from MSDIS, local jurisdiction data collection questionnaires, and the U.S. Census. Potential losses to existing development were estimated based on hazard event scenarios. In most cases the assessor values were used to estimate structure losses in impacted areas for structure occupancy types. The methodology for estimating losses varies by hazard. Loss estimates are included in each hazard profile of the Risk Assessment chapter.

Most jurisdictions estimated local capabilities and assets based on the best available data and staff knowledge. In some cases, MPC members were not able to fully complete questionnaires due to limited local information being available.

Step 6: Set Goals

The MPC conducted a discussion session during the third meeting to review the Plan goals. It was determined that the goals from the previous would be used.

The Plan update goals are as follows:

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

Goal 2: Reduce the potential impact of natural disasters to property, infrastructure, and the local economy.

Goal 3: Ensure continued operation of government, emergency functions, and critical infrastructure in a disaster.

These goals and the identified mitigation actions are discussed in more detail in Chapter 4.

Step 7: Review Possible Mitigation Actions and Activities

In addition to discussing the overall goals at the third and fourth meetings, the MPC also reviewed mitigation actions from the previous plan and any potential new actions. For a comprehensive range of mitigation actions to consider, the MPC reviewed the following information during the

meeting:

- A list of actions proposed in the previous mitigation plan
- Input during meetings
- Responses to Data Collection Questionnaires where jurisdictions had reported progress made on previous actions
- FEMA publications *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards (January 2013)* and *Hazard Mitigation Assistance Guidance (2015)*

Jurisdiction representatives on the MPC were encouraged to review the details of the risk assessment vulnerability analysis specific to their jurisdiction, as well as the previously identified mitigation actions prior to the meeting. Representatives were provided a link to FEMA's publication, *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards (January 2013)* prior to the meeting. This document was developed by FEMA as a resource for identification of a range of potential mitigation actions for reducing risk to natural hazards and disasters. Additionally, survey responses which identified community support for specific mitigation actions were reviewed and discussed. Extra emphasis was placed on long-term mitigation solutions, where the anticipated future cost savings outweigh the cost of the project.

During these meetings, few new actions were proposed by the committee and numerous actions were reworded. Much of the discussion surrounded making actions SMART: Specific, Measurable, Achievable, Relevant, and Time-bound.

Step 8: Draft an Action Plan

At the fourth MPC meeting, representatives were provided with blank STAPLEE scoring sheets. Those who could not attend the meeting were emailed the sheets. The method was used to develop a priority score for proposed actions. During the meeting, SMCOG staff provided an overview of scoring criteria and example scoring for an action. MPC members were encouraged to use the STAPLEE scoring to determine which actions applied to their jurisdiction. Some actions were eliminated due to non-applicability or low feasibility scores.

MPC members were also given action sheets that corresponded to the STAPLEE sheets. SMCOG staff reviewed the action sheets in detail and discussed what department or position would be responsible for implementing the action, potential funding sources, timeline for completion, and local planning mechanisms for implementation. The action plans are listed for each jurisdiction in the Mitigation Strategy chapter.

Step 9: Adopt the Plan

The final meeting provided a wrap-up and opportunity to answer any questions pertaining to plan adoption. The final plan must be approved by the governing body of each jurisdiction by resolution to be eligible for hazard mitigation assistance. Adoption resolutions are included in Appendix D.

Step 10: Implement, Evaluate, and Revise the Plan

At the final meeting, MPC members briefly reviewed potential funding sources for mitigation projects and the process for reviewing and monitoring the plan. It was determined that Polk County Emergency Management will be charged with scheduling and staffing annual meetings and keeping the plan updated. The overall strategy has been updated and is presented in the Plan Maintenance chapter.

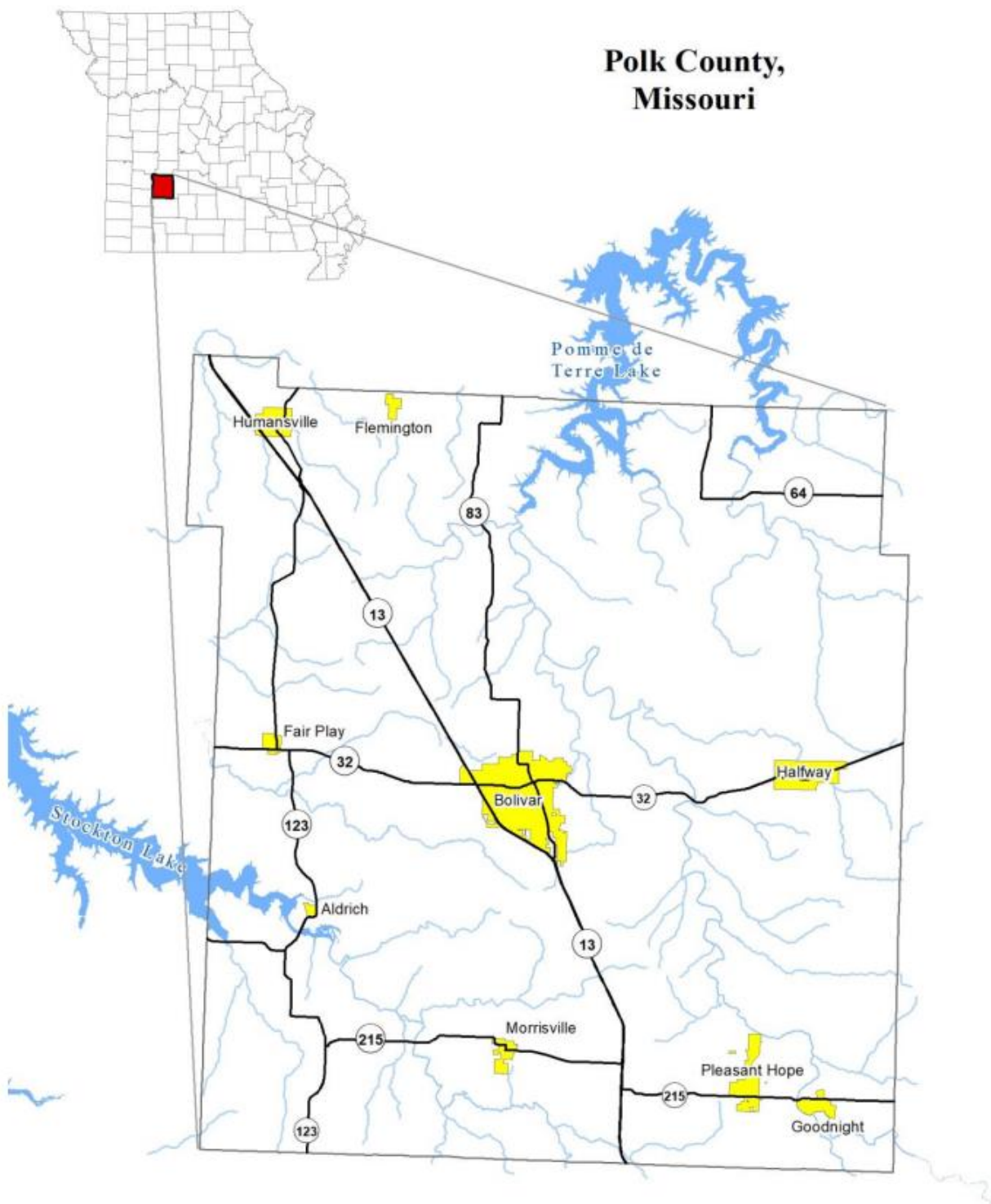
2 PLANNING AREA PROFILE AND CAPABILITIES

2	PLANNING AREA PROFILE AND CAPABILITIES	2.1
2.1	<i>Polk County Planning Area Profile</i>	2.2
2.1.1	Geography, Geology and Topography.....	2.3
2.1.2	Climate	2.5
2.1.3	Population/Demographics	2.5
2.1.4	History	2.6
2.1.5	Occupations	2.7
2.1.6	Agriculture.....	2.7
2.1.7	FEMA Hazard Mitigation Assistance (HMA) Grants in Planning Area	2.8
2.1.8	FEMA Public Assistance (PA) Grants in Planning Area	2.8
2.2	<i>Jurisdictional Profiles and Mitigation Capabilities.....</i>	2.13
2.2.1	County, City, and Village Jurisdictions.....	2.13
2.2.2	Public School District Profiles and Mitigation Capabilities.....	2.39
2.2.3	Special Districts	2.43

2.1 POLK COUNTY PLANNING AREA PROFILE

Polk County is bordered by Hickory, Dallas, Greene, Dade, Cedar, and St. Clair counties. **Figure 2.1** is a map of Polk County showing the cities, villages, and overall location of the County within the state.

Figure 2.1. Map of Polk County



The American Community Survey estimates the 2020 population of Polk County at 32,031. This is a 4.2% increase from 2010, which was estimated at 30,729. During this timeframe, the State of Missouri saw an increase of 3.4% and the nation saw an increase of 7.4%.

From 2010 to 2020, the median household income (MHI) increased 32.9% from \$35,831 to \$47,614. During this same time, MHI increased 23.8% statewide and 25.2% nationwide. The median household value (MHV) for Polk County increased 14.4% from \$141,900 to \$162,400. Lower than both the nationwide increase of 22% and the state increase of 18.8%.

2.1.1 Geography, Geology and Topography

Polk County covers 636 square miles of land and 7 square miles of water located in Southwest Missouri. Most residents, roughly 55%, live in unincorporated areas. There are two municipalities with a population greater than 1,000 – Bolivar and Humansville.

Polk County is located on the Ozarks Plateau of the Interior Highlands physiographic province. There are two main plateaus within the county: the Springfield Plateau in the southwest, and the Salem Plateau in the northeast. These plateaus are separated by the northwest-southeast trending Eureka Springs Escarpment, a narrow band of low hills. The landscape is characterized by steeply sloping wooded hills and narrow rocky valleys in the Pomme de Terre region, and smoothly rolling prairie uplands in western parts of the county (Kichler & Henderson, 2000, p. 12).

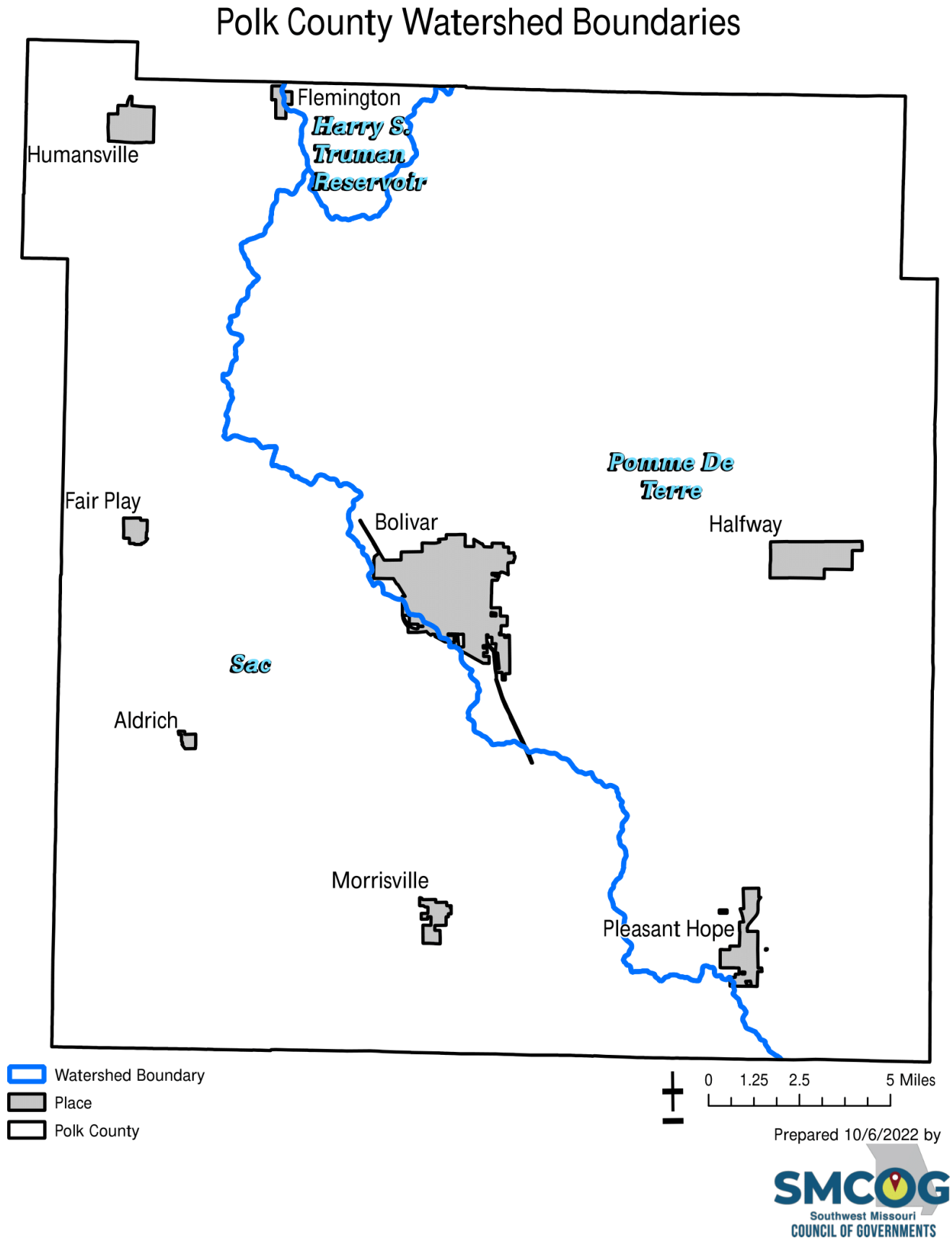
Polk County's topography is characterized by a rolling plain, which slopes gently to the northwest. Between the two major rivers, Pomme de Terre and the Little Sac, there is a broad, smooth upland that extends from the northwest part of the county near the City of Humansville southeastward into Greene County. The areas south and east of Halfway and small areas around the settlements of Polk, Huron, and Sentinel are also gently sloping uplands. The topography of the county is dissected in steeper slopes in belts along the streams, especially along the Pomme de Terre and Little Sac rivers.

The county is underlain by sedimentary rocks ranging from Ordovician age Jefferson City dolomite to Pennsylvanian age sandstone and conglomerate. There are several geologically old and inactive faults that pass through Polk County. One of the most prominent is the Fair Play fault that trends in a southeast-northwest direction across central Polk County.

There are six major soil formations in Polk County. The Viraton-Ocie-Gatewood is located on ridges and hills. Slopes range from 2 to 35 percent and comprise 42 percent of the land area in Polk County. The Gross-Alsup-Pomme is also located on ridges and hills, with a similar slope range as Viraton-Ocie-Gatewood, and comprises 35 percent of the land area. Another soil type located on ridges and hills is the Goodson-Credon-Barden, with a smaller slope percentage (1-15) and occupying 11 percent of land mass in Polk County. The Sturkie-Moniteau-Horsecreek is located on flood plains and stream terraces with a thin slope of 0 to 2 percent and comprises 2 percent of land mass. Bolivar-Cliquot is located on ridges and hills and comprises one percent of the land mass.

Figure 2.2 is a map of the watershed boundaries in Polk County.

Figure 2.2. Polk County Watersheds



2.1.2 Climate

Polk County has a continental climate with cool winters and hot summers. Based on information from the High Plains Regional Climate Center (<http://climod.unl.edu/>), Bolivar has an average annual temperature of 56.0 degrees Fahrenheit. The average high in July is 89.1 degrees Fahrenheit and the average low in January is 21.7 degrees Fahrenheit. It averages 46.38 inches of precipitation, with snow accounting for 9.96 inches annually.

2.1.3 Population/Demographics

Table 2.1 provides the total population for the county and each participating city and village for 2000, 2010, and 2020, as well as the number and percent change from 2010 to 2020.

Table 2.1. Polk County Population 2000-2020

Jurisdiction	2000 Population	2010 Population	2020 Population	# Change (2010-2020)	% Change (2010-2020)
Polk County	26,992	30,729	32,031	1,302	4.2%
City of Bolivar	8,965	10,222	11,000	778	7.6%
City of Fair Play	405	461	532	71	15.4%
City of Humansville	978	1,109	1,391	282	25.4%
City of Morrisville	309	427	581	154	36.1%
City of Pleasant Hope	558	522	668	146	28.0%
Village of Aldrich	71	104	66	-38	-36.5%
Village of Flemington	138	74	71	-3	-4.1%
Village of Halfway	200	182	140	-42	-23.1%

Source: 2000 population was based on US Census data and 2010/2020 was based on ACS 5-year estimates.

Table 2.2 provides a full breakdown of the age composition for Polk County, the State of Missouri, and the United States.

Table 2.2. Polk County, Missouri, and United States Population Age Composition

Age Group	Polk County Number	Polk County Percent	Missouri Percent	United States Percent
Under 5	1,968	6.1%	6.1%	6.0%
5 to 9	1,787	5.6%	6.1%	6.1%
10 to 14	2,271	7.1%	6.5%	6.5%
15 to 19	2,613	8.2%	6.5%	6.5%
20 to 24	2,752	8.6%	6.7%	6.7%
25 to 34	3,477	10.9%	13.4%	13.9%
35 to 44	3,552	11.1%	12.2%	12.7%
45 to 54	3,705	11.6%	12.3%	12.7%
55 to 59	2,422	7.6%	7.0%	6.7%
60 to 64	1,795	5.6%	6.5%	6.2%
65 to 74	3,143	9.8%	9.7%	9.4%
75 to 84	1,710	5.3%	5.0%	4.7%
85 and over	836	2.6%	2.1%	2.0%

Source: US Census Bureau American Community Survey 2020 5 Year Estimates <https://data.census.gov/>

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

The index is a comparative metric that facilitates the examination of the differences in social vulnerability among counties. SoVI® is a valuable tool for policy makers and practitioners. It graphically illustrates the geographic variation in social vulnerability. It shows where there is uneven capacity for preparedness and response and where resources might be used most effectively to reduce the pre-existing vulnerability. SoVI® also is useful as an indicator in determining the differential recovery from disasters.

Polk County's SoVI® score is 0.029999999, placing it in the 50.5 percentile when compared to the rest of the nation. This score means that 50.5% of the nation is more resilient to hazards and disasters. The main determinants of the score are qualities of the population based on race and class, wealth, elderly residents, Hispanic ethnicity, special needs individuals, Native American ethnicity, and the service industry employment.

Table 2.3 shows employment statistics for Polk County and the participating municipalities based on 2020 ACS 5-Year Estimates.

Table 2.3. Polk County Unemployment, Poverty, Education, and Language Percentage Demographics

Jurisdiction	Total in Labor Force	Percent of Population Unemployed	Percent of Families Below the Poverty Level	Percent of Population (High School graduate)	Percent of Population (Bachelor's degree or higher)	Percent of population with spoken language other than English
Polk County	14,792	2.5	10.3%	88.8%	21.9%	3.7%
City of Bolivar	4,823	3.0	12.1%	91.6%	23.2%	2.1%
City of Fair Play	153	9.2	47.7%	78.3%	3.8%	0.8%
City of Humansville	497	8.5	10.6%	73.0%	6.0%	3.6%
City of Morrisville	301	3.0	1.2%	85.4%	5.6%	3.3%
City of Pleasant Hope	315	0.6	5.5%	92.8%	13.8%	1.1%
Village of Aldrich	26	7.7	11.1%	88.9%	0.0%	0.0%
Village of Flemington	35	5.7	4.5%	100%	0.0%	0.0%
Village of Halfway	59	0.0	44.2%	50.0%	15.0%	19.5%
Missouri	3,090,253	4.5	8.9%	90.7%	30.2%	6.3%
United States	166,236,937	6.3	9.1%	88.6%	36.9%	21.5%

Source: US Census Bureau American Community Survey 2020 5 Year Estimates <https://data.census.gov/>

2.1.4 History

The Ozarks area, including Polk County, was claimed by France until purchased by the United States as part of the Louisiana Purchase in 1803. The Polk County area was first inhabited by the Osage and Delaware Indians. The first settlers possibly visited the Polk County area in 1820. However, historical records of the first settlement date to 1832-33 with Ezekiel Campbell, his brother, W. C. Campbell, and others from Tennessee. They settled in the Sac River basin southwest of the present site of Bolivar. Polk County officially became a Missouri county in 1835, and was named after James K. Polk, the State Representative from Tennessee who later became President. In 1845, portions of Polk County were incorporated into Dade, Cedar, St. Clair, Hickory, Dallas, and Webster counties, reducing the county to its present size (Kichler & Henderson, 2000, p. 12). The early settlers came to the area for its natural resources and abundance of game, and agriculture became the primary economic factor in the county. Before the Civil War, the farmers raised livestock and grew grain crops, particularly wheat and corn, selling their produce to the markets in Springfield (Kichler & Henderson, 2000, p. 12).

The county supported both sides during the war, but as soon as it was over, the residents concentrated on economic concerns. By 1870, the county's agricultural economy was flourishing (Missouri Agricultural Statistics Service, Polk County Agri-Facts). Diversified farming remained the mainstay of the Polk County farmers until the 1930s. Commercial dairying became the most significant agricultural industry in the county, peaking in 1940. Beef production also began to increase, eventually replacing dairying as the primary agricultural industry in the county. Grain production remained significant until the 1960s, but as beef production increased, more acreage was devoted towards hay and pasture (Kichler, 2000, p. 12).

2.1.5 Occupations

Occupation information for the Polk County labor force comes from the 2019 American Community Survey 5-year Estimates. Management, Business, Science, and Arts Occupations includes education and healthcare practitioner and technician occupations among others. Service Occupation includes healthcare support and protective services, such as firefighters and law enforcement in addition to food preparation and personal care services. The other occupation classifications are well defined. **Table 2.4** contains occupation statistics for the incorporated cities and county, as well as a comparison for Missouri and the United States.

Table 2.4. Polk County Occupation Statistics

Jurisdiction	Management, Business, Science, and Arts Occupations	Service Occupations	Sales and Office Occupations	Natural Resources, Construction, and Maintenance Occupations	Production, Transportation, and Material Moving Occupations
Polk County	33.8%	19.2%	21.1%	10.4%	15.6%
City of Bolivar	37.3%	21.0%	22.6%	8.4%	10.8%
City of Fair Play	21.6%	25.9%	17.3%	14.4%	20.9%
City of Humansville	21.3%	20.0%	13.8%	22.4%	22.4%
City of Morrisville	25.3%	9.6%	49.3%	9.2%	6.5%
City of Pleasant Hope	21.7%	23.3%	28.1%	13.1%	13.7%
Village of Aldrich	25.05%	25.0%	33.3%	0.0%	16.7%
Village of Flemington	0.0%	63.6%	21.2%	6.1%	9.1%
Village of Halfway	20.3%	13.6%	11.9%	13.6%	40.7%
Missouri	37.9%	16.8%	21.9%	8.8%	14.7%
United States	39.5%	17.4%	21.3%	8.7%	13.1%

Source: US Census Bureau American Community Survey 2020 5 Year Estimates <https://data.census.gov/>

2.1.6 Agriculture

According to the United States Department of Agriculture 2017 Agricultural Census, there are 1,562 farms covering 359,464 acres across Polk County. The average farm size is 230 acres, which is a 3% increase since 2012. **Table 2.5** provides further agriculture information.

Table 2.5. Total and Per Farm Overview, 2012 and 2017

	2017	Percent change since 2012
Number of farms	1,562	+4
Land in farms (acres)	359,464	+7
Average size of farm (acres)	230	+3

Total		
Market value of products sold	\$99,357,000	+17
Government payments	\$613,000	-29
Fam-related income	\$2,327,000	-5
Total farm production expenses	\$77,380,000	-4
Net cash farm income	\$24,917,000	+203
Per farm average		
Market value of products sold	\$63,609	+12
Government payments (average per farm receiving)	\$3,669	-1
Fam-related income	\$4,126	-15
Total farm production expenses	\$49,539	-7
Net cash farm income	\$15,952	+192

Source: https://www.nass.usda.gov/Publications/AqCensus/2017/Online_Resources/County_Profiles/Missouri/index.php

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

Since 2000, local jurisdictions in Polk County have been awarded a total of \$3,269,955 in FEMA HMA Grants. **Table 2.6** provides a full breakdown for each project.

Table 2.6. FEMA HMA Grants in Polk County from

Disaster Declaration	Program Area	Project Type	Sub-Grantee	Date Approved	Project Total
DR-1412-0014-R	HMGP	Safe Room (Tornado and Severe Wind Shelter) - Public Structures	Polk (County)	7/30/2004	\$53,928
DR-1980-0033-R	HMGP	Safe Room (Tornado and Severe Wind Shelter) - Public Structures	Marion C Early R-V	10/22/2012	\$1,414,059
DR-4552-0007-R	HMGP	Safe Room (Tornado and Severe Wind Shelter) - Public Structures	Bolivar Superintendent Office	9/13/2021	\$1,548,232
DR-1736-0005-P	HMGP	Local Multihazard Mitigation Plan	Statewide	12/4/2009	\$253,736
Total					\$3,269,955

Source: Federal Emergency Management Agency, date accessed 9-13-2022

2.1.8 FEMA Public Assistance (PA) Grants in Planning Area

Since 2002, jurisdictions in Polk County have received \$6,986,776.86 million in public assistance due to natural hazard damages. **Table 2.7** shows a full breakdown of the payments, as well as the applicant, project type, and matching disaster declaration. Data was retrieved from the FEMA public assistance dataset.

Table 2.7. FEMA PA Grants in Polk County 2002-2022

Disaster Number	Declaration Date	Project Title	Applicant	Project Amount
1412	5/6/2002	FLOOD GENERATED DEBRIS REMOVAL	Polk County	\$1,148.00
1412	5/6/2002	UTILITY DAMAGES	Southwest Electric Coop	\$23,208.80
1412	5/6/2002	REPAIR OF ELECTRICAL DISTRIBUTION SYSTEM	Southwest Electric Coop	\$13,638.45
1412	5/6/2002	CITY AIRPORT-WIND SOCK	City of Bolivar	\$1,000.00
1412	5/6/2002	ROAD REPAIR	Polk County	\$9,663.30

1412	5/6/2002	ROAD AND BRIDGE REPAIR	Polk County	\$35,215.15
1412	5/6/2002	ROAD DAMAGE	Providence Special Road District	\$1,317.98
1412	5/6/2002	ROAD & DITCH WASHOUT	City of Fair Play	\$10,577.18
1412	5/6/2002	DEBRIS REMOVAL	City of Bolivar	\$1,094.28
1412	5/6/2002	PARK DAMAGE	City of Bolivar	\$1,052.75
1412	5/6/2002	LIFT STATION DAMAGES	City of Fair Play	\$2,649.54
1412	5/6/2002	PROTECTIVE MEASURES	City of Bolivar	\$2,486.10
1463	5/6/2003	DEBRIS REMOVAL	Polk County Commission	\$27,370.40
1676	1/15/2007	DEBRIS REMOVAL	Marion C Early R-V	\$1,280.00
1676	1/15/2007	PUBLIC BUILDINGS AND FACILITIES	Marion C Early R-V	\$638.76
1676	1/15/2007	EMERGENCY PROTECTIVE MEASURES	City of Humansville	\$3,493.22
1676	1/15/2007	RECREATIONAL OR OTHER	Marion C Early R-V	\$1,245.98
1676	1/15/2007	DEBRIS REMOVAL	City of Fair Play	\$2,907.80
1676	1/15/2007	DEBRIS REMOVAL- MONITORING	City of Bolivar	\$17,362.50
1676	1/15/2007	EMERGENCY PROTECTIVE MEASURES	Polk County E911	\$5,297.42
1676	1/15/2007	EMERGENCY PROTECTIVE MEASURES	City of Bolivar	\$90,009.87
1676	1/15/2007	EMERGENCY PROTECTIVE MEASURES	City of Morrisville	\$3,120.88
1676	1/15/2007	EMERGENCY PROTECTIVE MEASURES	Village of Halfway	\$8,569.53
1676	1/15/2007	PUBLIC BUILDINGS AND FACILITIES	City of Humansville	\$500.00
1676	1/15/2007	DONATED RESOURCES	City of Morrisville	\$4,115.34
1676	1/15/2007	DEBRIS REMOVAL	Citizens Memorial Hospital	\$15,746.00
1676	1/15/2007	PUBLIC BUILDINGS AND FACILITIES	Marion C Early R-V	\$500.00
1676	1/15/2007	DEBRIS REMOVAL	City of Bolivar	\$369,531.41
1676	1/15/2007	EMERGENCY PROTECTIVE MEASURES	Citizens Memorial Hospital	\$22,552.10
1676	1/15/2007	DONATED RESOURCES	City of Bolivar	\$15,727.28
1676	1/15/2007	DEBRIS REMOVAL	City of Humansville	\$21,459.42
1676	1/15/2007	PUBLIC BUILDINGS AND FACILITIES	City of Humansville	\$500.06
1676	1/15/2007	DONATED RESOURCES	City of Fair Play	\$969.27
1676	1/15/2007	EMERGENCY PROTECTIVE MEASURES	Citizens Memorial Healthcare	\$32,784.10
1676	1/15/2007	DEBRIS REMOVAL	City of Bolivar	\$8,462.18
1676	1/15/2007	EMERGENCY PROTECTIVE MEASURES	Polk County	\$5,612.29
1676	1/15/2007	DEBRIS REMOVAL	Bolivar R-I Schools	\$6,775.62
1676	1/15/2007	PUBLIC BUILDINGS AND FACILITIES	City of Humansville	\$0.00
1676	1/15/2007	DONATED RESOURCES	Village of Halfway	\$546.65
1676	1/15/2007	DEBRIS REMOVAL	City of Pleasant Hope	\$9,888.40
1676	1/15/2007	DEBRIS REMOVAL	City of Bolivar	\$25,239.56
1676	1/15/2007	DEBRIS REMOVAL	City of Morrisville	\$15,519.11
1676	1/15/2007	DEBRIS REMOVAL	Polk County	\$129,767.53
1676	1/15/2007	DONATED RESOURCES	Morrisville Fire & Rescue	\$1,531.75
1676	1/15/2007	DONATED RESOURCES	Polk County	\$1,627.25

1676	1/15/2007	DONATED RESOURCES	Polk County House of Hope Inc	\$346.95
1676	1/15/2007	DONATED RESOURCES	Pleasant Hope Fire & Rescue	\$1,247.06
1676	1/15/2007	DONATED RESOURCES	City of Pleasant Hope	\$9,926.13
1676	1/15/2007	EMERGENCY PROTECTIVE MEASURES	Bolivar R-I Schools	\$1,223.10
1676	1/15/2007	EMERGENCY PROTECTIVE MEASURES	Polk County House of Hope Inc	\$1,040.86
1676	1/15/2007	EMERGENCY PROTECTIVE MEASURES	City of Pleasant Hope	\$19,890.02
1676	1/15/2007	EMERGENCY PROTECTIVE MEASURES	City of Bolivar	\$8,647.42
1676	1/15/2007	EMERGENCY PROTECTIVE MEASURES	Morrisville Fire & Rescue	\$5,513.48
1676	1/15/2007	EMERGENCY PROTECTIVE MEASURES	Central Polk County Fire/Rescue	\$4,906.82
1676	1/15/2007	EMERGENCY PROTECTIVE MEASURES	Pleasant Hope Fire & Rescue	\$3,741.19
1676	1/15/2007	DONATED RESOURCES	City of Humansville	\$8,317.54
1676	1/15/2007	DONATED RESOURCES	Central Polk County Fire/Rescue	\$1,635.61
1728	9/21/2007	ROAD/SHOULDER WASHOUT	Polk County	\$18,559.50
1728	9/21/2007	ROAD & SHOULDER EROSION	Polk County	\$0.00
1728	9/21/2007	ROAD WASHOUT	Polk County	\$48,925.50
1728	9/21/2007	ROAD / CULVERT WASHOUT	Polk County	\$48,330.80
1728	9/21/2007	ROAD / CULVERT DAMAGE	Polk County	\$1,991.00
1728	9/21/2007	ROAD & CULVERT WASHOUT	Polk County	\$0.00
1728	9/21/2007	EMBANKMENT/CMP WASHOUT	City of Pleasant Hope	\$1,611.31
1728	9/21/2007	ROAD / CULVERT DAMAGE	Polk County	\$0.00
1728	9/21/2007	CMP CULVERT REPLACEMENT	Polk County	\$1,462.15
1728	9/21/2007	UTILITY REPAIR	City of Pleasant Hope	\$10,192.29
1728	9/21/2007	ROAD WASHOUT	Polk County	\$0.00
1728	9/21/2007	ROAD / CULVERT WASHOUT	Polk County	\$4,529.00
1728	9/21/2007	ROAD WASHOUT	Polk County	\$1,226.46
1728	9/21/2007	FINDLER CHAPPELL BRIDGE DAMAGES	Polk County	\$0.00
1728	9/21/2007	ROAD / CULVERT DAMAGE	Polk County	\$22,239.40
1728	9/21/2007	PA PILOT - DEBRIS REMOVAL	Polk County	\$39,299.80
1728	9/21/2007	ROAD DAMAGE	City of Pleasant Hope	\$4,874.29
1728	9/21/2007	SPRING BRIDGE DAMAGES	Polk County	\$12,784.00
1728	9/21/2007	ROAD WASHOUT	Polk County	\$8,786.10
1728	9/21/2007	ROAD WASHOUT	Polk County	\$2,447.50
1728	9/21/2007	ROAD WASHOUT	Polk County	\$32,623.50
1728	9/21/2007	ROAD DAMAGES	City of Pleasant Hope	\$36,000.00
1728	9/21/2007	ROAD WASHOUT	Polk County	\$79,386.86
1728	9/21/2007	CULVERT DAMAGE	Polk County	\$1,582.90
1728	9/21/2007	ROAD EROSION	Polk County	\$51,222.13
1728	9/21/2007	ROAD WASHOUT	Polk County	\$53,717.74
1728	9/21/2007	ROAD WASHOUT	Polk County	\$2,818.10

1728	9/21/2007	ROAD / CULVERT WASHOUT	Polk County	\$54,786.80
1728	9/21/2007	ROAD WASHOUT	Polk County	\$59,319.00
1728	9/21/2007	ROAD WASHOUT	Polk County	\$72,764.03
1728	9/21/2007	DEBRIS REMOVAL	City of Pleasant Hope	\$8,000.00
1728	9/21/2007	ROAD WASHOUT	Polk County	\$5,847.20
1728	9/21/2007	PA PILOT -DEBRIS REMOVAL	City of Pleasant Hope	\$4,757.76
1728	9/21/2007	ROAD WASHOUT	City of Pleasant Hope	\$30,709.28
1728	9/21/2007	PA PILOT - DEBRIS REMOVAL	Polk County	\$15,534.00
1728	9/21/2007	ROAD / CULVERT DAMAGE	City of Pleasant Hope	\$1,691.24
1728	9/21/2007	ROAD WASHOUT	Polk County	\$8,851.20
1728	9/21/2007	BUILDING CONTENTS DAMAGES	City of Pleasant Hope	\$0.00
1728	9/21/2007	EMERGENCY PROTECTIVE MEASURES - MOVE TO TEMP FACILITIES	City of Pleasant Hope	\$6,116.00
1728	9/21/2007	BRIDGE REPLACEMENT	City of Pleasant Hope	\$161,408.61
1728	9/21/2007	BRIDGE REPAIRS	Polk County	\$181,803.51
1728	9/21/2007	DONATED RESOURCES	City of Pleasant Hope	\$4,252.58
1728	9/21/2007	BRIDGE REPAIR	Polk County	\$207,730.00
1728	9/21/2007	BRIDGE REPLACEMENT	Polk County	\$238,095.20
1773	6/25/2008	ROAD/CULVERT WASHOUT	City of Pleasant Hope	\$0.00
1773	6/25/2008	ROAD WASHOUT	Polk County	\$14,831.02
1773	6/25/2008	PA PILOT - DEBRIS REMOVAL	Polk County	\$4,469.40
1773	6/25/2008	ROAD WASHOUT	Polk County	\$15,641.14
1847	6/19/2009	PLE-B01 / Temp Generator for Lift Station	City of Pleasant Hope	\$500.00
1847	6/19/2009	PLE-C01- Murray St. LWC	City of Pleasant Hope	\$1,624.04
1847	6/19/2009	PLE-E01 / City Tractor	City of Pleasant Hope	\$500.00
1847	6/19/2009	PLE-B03 / Emergency Protective Measures	City of Pleasant Hope	\$1,763.16
1847	6/19/2009	PHS001 /Pleasant Hope Middle School Gymnasium	Pleasant Hope School Supt	\$1,000.00
1847	6/19/2009	MCE-G1 / Ballfields	Marion C Early R-V	\$1,000.00
1847	6/19/2009	PLE-A01/Debris - City Wide	City of Pleasant Hope	\$1,971.59
1847	6/19/2009	PC-A1 / Vegetative Debris	Polk County	\$24,254.00
1847	6/19/2009	POL-C05 - 11 County Roads	Polk County	\$10,632.87
1847	6/19/2009	JAT-004 / Co. Rd. S. 85th Road LWC	Flemington Special Road District	\$3,305.03
1847	6/19/2009	POL-C02 / 8ftx40ft CMP Pipe Culvert & East 336 Farm Rd	Polk County	\$0.00
1847	6/19/2009	POL-C04 - 14 County Roads	Polk County	\$18,715.00
1847	6/19/2009	POL-C06 / 8 County Roads	Polk County	\$11,479.58
1847	6/19/2009	POL-C01 /150th Road LWC	Polk County	\$0.00
1847	6/19/2009	JAT-005 / E. 340th Road LWC	Flemington Special Road District	\$2,542.58
1847	6/19/2009	POL-C03 - 244th Road LWC over Pomme de Terre River	Polk County	\$2,925.78
1847	6/19/2009	JAT-006 / Roads	Flemington Special Road District	\$4,895.37
1847	6/19/2009	MCE-E2 - School Gym	Marion C Early R-V	\$0.00
1847	6/19/2009	POL-C07 - 9 County Roads	Polk County	\$11,750.53

1847	6/19/2009	POL-A01 / Vegetative Debris	Polk County	\$2,628.80
1847	6/19/2009	PLE-B02 / Donated Resources	City of Pleasant Hope	\$7,151.00
1847	6/19/2009	PCFRB1 / Emergency Protective Measures	Central Polk County Fire/Rescue	\$1,121.32
1961	3/23/2011	PCDSB1-Emergency Protective Measures-48 Hour Snow Remov	City of Pleasant Hope	\$1,955.18
1961	3/23/2011	PCDS05-Donated Resources	City of Pleasant Hope	\$3,887.72
1961	3/23/2011	PCDS06-Emergency Protective Measures-48 Hour Snow Remov	Pleasant Hope School Supt	\$2,830.58
1961	3/23/2011	PCDS09-Donated Resources	Pleasant Hope School Supt	\$998.97
1961	3/23/2011	POJD-14 - Emergency Protective Measures-48 hour snow re	City of Humansville	\$3,091.78
1961	3/23/2011	PCDS11 - Emergency Protective Measures - 48 Hour Snow R	City of Bolivar	\$17,538.36
1961	3/23/2011	DCDS10-City Owned Equipment	City of Bolivar	\$5,736.43
1961	3/23/2011	PKFB-B1 - 48 hour snow emergency	Citizens Memorial Hospital	\$20,645.00
1961	3/23/2011	PODNB11 - EPM (Donated Resources)	Central Polk County Fire/Rescue	\$250.67
1961	3/23/2011	POCW-20 - Emergency Protective Measures	City of Bolivar	\$4,180.50
1961	3/23/2011	PODNB10-Emergency Protective Measures	Central Polk County Fire/Rescue	\$1,912.91
1961	3/23/2011	POJD-28 - Roads and Curbs	City of Bolivar	\$8,183.63
1961	3/23/2011	PKFB-B2 - City of Bolivar, Mo.	Citizens Memorial Healthcare	\$8,310.00
1961	3/23/2011	POTN-27-Emergency Protective Measures-48 Hour Snow Remo	Polk County	\$24,228.50
1961	3/23/2011	PORA-27-EPM - 48 Hour Snow Removal (Donated Resources)	Polk County	\$313.11
1961	3/23/2011	POCW-19 - Emergency Protective Measures	City of Bolivar	\$5,541.08
1980	5/9/2011	TPB-005 - Roads	Polk County	\$29,868.22
1980	5/9/2011	JKB-004 - Roads	Polk County	\$6,637.36
1980	5/9/2011	JKB-003 - Road and concrete pipe	Polk County	\$1,386.13
1980	5/9/2011	TPB-004 - Roads	Polk County	\$24,233.45
1980	5/9/2011	TPB-006 - Roads	Polk County	\$11,105.78
1980	5/9/2011	JKB-005 - Roads	Polk County	\$11,356.08
4238	8/7/2015	DAM018C Gravel Rd Damages	Polk County	\$35,055.02
4238	8/7/2015	DAM022C Gravel Rd Damages	Polk County	\$57,866.34
4238	8/7/2015	DAM023C Gravel Rd Damages	Polk County	\$54,203.73
4238	8/7/2015	DAM021C Gravel Rd Damages	Polk County	\$59,871.90
4238	8/7/2015	DAM019C Gravel Road damage	Polk County	\$39,031.41
4238	8/7/2015	DAM020C Gravel Road washout	Polk County	\$79,884.47
4238	8/7/2015	EDT006C - Rd 322 Huckaby Bridge	Polk County	\$7,071.17
4238	8/7/2015	EDT005C-Road 220 Low Water Crossing	Polk County	\$21,757.31
4490	3/26/2020	665673 - Citizens Memorial Health Care Foundation COVID	Citizens Memorial Healthcare	\$1,692,914.96
4490	3/26/2020	674872 - Hospital Agency Staffing Nov 21 - Mar 22	Citizens Memorial Hospital	\$1,181,525.86
4490	3/26/2020	681174 - Citizens Memorial Healthcare Foundation COVID-	Citizens Memorial Healthcare	\$852,284.91
Total				\$6,986,776.86

Source: Federal Emergency Management Agency, date accessed 9-13-2022

2.2 JURISDICTIONAL PROFILES AND MITIGATION CAPABILITIES

2.2.1 County, City, and Village Jurisdictions

Polk County

Mitigation Initiatives/Capabilities

Polk County's jurisdiction includes all unincorporated areas within the county boundaries. It is classified as a Class III County in Missouri and is governed by a Board of Commissioners consisting of a Presiding Commissioner, Northern Commissioner, and Southern Commissioner. The Board directs the general administration of county government and sets broad operating policies, enacts ordinances, and establishes budgets as mandated by State law. The county enters into contracts with other public agencies to ensure the smooth flow of services including law enforcement, construction and maintenance of public roads and bridges, and the operations of county offices, equipment and services.

The Emergency Management Department (EMD) coordinates with local government officials and cooperating private organizations to: 1) prevent avoidable disasters and reduce the vulnerability of the residents to any disaster that may strike; 2) establish capabilities for protecting citizens from the effects of disasters; 3) respond effectively to the actual occurrence of disasters; and 4) provide for recovery in the aftermath of any emergency involving extensive damage within the county. The EMD is responsible for the development and maintenance of the Local Emergency Operations Plan.

Table 2.8 provides a full summary of the county's planning and mitigation capabilities.

Table 2.8. Polk County Mitigation Capabilities

Element	Yes, No, N/A	Comments and/or Weblink
Planning Capabilities		
Comprehensive Plan	N	
Builder's Plan	N	
Capital Improvement Plan	N	
City Emergency Operations Plan	N/A	
County Emergency Operations Plan	Date: Y, 2017	Working on 2022 plan
Local Recovery Plan	N	
County Recovery Plan	N	
City Mitigation Plan	N/A	
County Mitigation Plan	Date: Y, 2018	
Debris Management Plan	N	
Economic Development Plan	N	
Transportation Plan	N	
Land-use Plan	N	
Flood Mitigation Assistance (FMA) Plan	N	
Watershed Plan	N	
Firewise or other fire mitigation plan	N	
Critical Facilities Plan (Mitigation/Response/Recovery)	N	
Policies/Ordinance		
Zoning Ordinance	N	
Building Code	Version: N/	
Floodplain Ordinance	Date: N	
Subdivision Ordinance	N	
Tree Trimming Ordinance	N	

Element	Yes, No, N/A	Comments and/or Weblink
Nuisance Ordinance	N	
Stormwater Ordinance	N	
Drainage Ordinance	N	
Site Plan Review Requirements	N	
Historic Preservation Ordinance	N	
Landscape Ordinance	N	
Program		
Zoning/Land Use Restrictions	N	
Codes Building Site/Design	N	
Hazard Awareness Program	N	
National Flood Insurance Program (NFIP)	N	
NFIP Community Rating System (CRS) program	N	If so, what is your current level rating?
National Weather Service (NWS) Storm Ready Certification	N	
Firewise Community Certification	N	
Building Code Effectiveness Grading (BCEGs)	N	
ISO Fire Rating	Rating:	Varies throughout county
Economic Development Program	N	
Land Use Program	N	
Public Education/Awareness	N	
Property Acquisition	N	
Planning/Zoning Boards	N	
Stream Maintenance Program	N	
Tree Trimming Program	N	
<u>Engineering Studies for Streams (Local/County/Regional)</u>	N	
Mutual Aid Agreements	Yes	Throughout the county
Studies/Reports/Maps		
<u>Hazard Analysis/Risk Assessment (City)</u>	N/A	
<u>Hazard Analysis/Risk Assessment (County)</u>	N	
Evacuation Route Map	N	
<u>Critical Facilities Inventory</u>	N	
<u>Vulnerable Population Inventory</u>	N	
<u>Land Use Map</u>	N	
Staff/Department		Full Time or Part Time?
Building Code Official	N	
Building Inspector	N	
Mapping Specialist (GIS)	N	
Engineer	N	
Development Planner	N	
Public Works Official	N	
Emergency Management Coordinator	Yes	Full time EMD, part time staff
NFIP Floodplain Administrator	N	
Emergency Response Team	N	
Hazardous Materials Expert	N	
Local Emergency Planning Committee	N/A	
County Emergency Management Commission	Yes	County Commissioners
Sanitation Department	N	
Transportation Department	N	
Economic Development Department	N	
Housing Department	N	
Historic Preservation	N	
Non-Governmental Organizations (NGOs)	Is there a local chapter? Yes or No	
American Red Cross	Y	
Salvation Army	Y	
Veterans Groups	N	

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

Source: Data Collection Questionnaire

City of Bolivar

Mitigation Initiatives/Capabilities

The City of Bolivar is located in the center of Polk County and is the county seat. It is a 4th Class City governed by a mayor/city administrator and eight Aldermen from four wards.

Hazard mitigation public education programs include Paint the Drain and Love Your Trail. There are seven outdoor warning sirens and two designated public tornado shelters (one at Dunnegan Park and one at Fullerton Ball Fields) located within city limits. Residents may register for the RAVE alert system to warn them of incoming hazardous weather. The city does participate in the National Flood Insurance Program.

Table 2.9 provides a full summary of the city's planning and mitigation capabilities.

Table 2.9. City of Bolivar Mitigation Capabilities

Element	Yes, No, N/A	Comments and/or Weblink
Planning Capabilities		
Comprehensive Plan	Date: Y	
Builder's Plan	Date: N	
Capital Improvement Plan	Date: Y	
City Emergency Operations Plan	Date: Y	
County Emergency Operations Plan	Date: N/A	
Local Recovery Plan	Date: Y	
County Recovery Plan	Date: N/A	
City Mitigation Plan	Date: Y	
County Mitigation Plan	Date: N/A	
Debris Management Plan	Date: Y	
Economic Development Plan	Date: Y	The EDP will be completing their Strategic plan in Fall of 2022 for years 22-25.
Transportation Plan	Date: Y	
Land-use Plan	Date: Y	
Flood Mitigation Assistance (FMA) Plan	Date: Y	
Watershed Plan	Date: N	MS-4 and Bolivar Watershed plan
Firewise or other fire mitigation plan	Date: N	
Critical Facilities Plan (Mitigation/Response/Recovery)	Date: N	
Policies/Ordinance		
Zoning Ordinance	Y	
Building Code	Version: Y, 2021	
Floodplain Ordinance	Date: Y	
Subdivision Ordinance	Y	
Tree Trimming Ordinance	Y	
Nuisance Ordinance	Y	
Stormwater Ordinance	Y	
Drainage Ordinance	Y	
Site Plan Review Requirements	Y	
Historic Preservation Ordinance	Y	Within building code
Landscape Ordinance	Y	Within building code
Program		
Zoning/Land Use Restrictions	Y	
Codes Building Site/Design	Y	
Hazard Awareness Program	N	
National Flood Insurance Program (NFIP)	Y	

Element	Yes, No, N/A	Comments and/or Weblink
NFIP Community Rating System (CRS) program	N	If so, what is your current level rating?
National Weather Service (NWS) Storm Ready Certification	N	
Firewise Community Certification	N	
Building Code Effectiveness Grading (BCEGs)	N	
ISO Fire Rating	Rating: 2	
Economic Development Program	Y	
Land Use Program	N	
Public Education/Awareness	Y	MS-4
Property Acquisition	N	
Planning/Zoning Boards	Y	
Stream Maintenance Program	Y	MS-4
Tree Trimming Program	Y	
Engineering Studies for Streams (Local/County/Regional)	Y	As needed
Mutual Aid Agreements	Y	
Studies/Reports/Maps		
Hazard Analysis/Risk Assessment (City)	Y	
Hazard Analysis/Risk Assessment (County)	Y	
Evacuation Route Map	Y	
Critical Facilities Inventory	Y	
Vulnerable Population Inventory	N	
Land Use Map	N	
Staff/Department		Full Time or Part Time?
Building Code Official	Y	Full
Building Inspector	Y	Full
Mapping Specialist (GIS)	N	Full
Engineer	N	
Development Planner	N	
Public Works Official	Y	Full
Emergency Management Coordinator	Y	Part
NFIP Floodplain Administrator	Y	Full
Emergency Response Team	N	
Hazardous Materials Expert	N	
Local Emergency Planning Committee	Y	Part
County Emergency Management Commission	N	
Sanitation Department	N	
Transportation Department	Y	Full
Economic Development Department	Y	Not a department of the city, however, the EDP is a not for profit housed in City Hall.
Housing Department	N	
Historic Preservation	N	
Non-Governmental Organizations (NGOs)	Is there a local chapter? Yes or No	
American Red Cross	N	
Salvation Army	Y	
Veterans Groups	Y	
Local Environmental Organization	N	
Homeowner Associations	N	
Neighborhood Associations	N	
Chamber of Commerce	Y	
Community Organizations (Lions, Kiwanis, etc.)	Y	
Financial Resources		Is your jurisdiction able to? Yes or No

Element	Yes, No, N/A	Comments and/or Weblink
Apply for Community Development Block Grants	N	
Fund projects thru Capital Improvements funding	Y	
Authority to levy taxes for specific purposes	Y	
Fees for water, sewer, gas, or electric services	N	
Impact fees for new development	N	
Incur debt through general obligation bonds	Y	
Incur debt through special tax bonds	Y	
Incur debt through private activities	N	
Withhold spending in hazard prone areas	N	

Source: Data Collection Questionnaire

City of Fair Play

Mitigation Initiatives/Capabilities

The City of Fair Play is located in the western part of Polk County. It is a 4th Class City and has a Mayor/City Council form of government with 4 elected aldermen.

There is one outdoor warning siren and one designated public tornado shelter located within city limits.

Table 2.10 provides a full summary of the city's planning and mitigation capabilities.

Table 2.10. City of Fair Play Mitigation Capabilities

Element	Yes, No, N/A	Comments and/or Weblink
Planning Capabilities		
Comprehensive Plan	Date: Y	Working with SMCOG & MIRWA
Builder's Plan	Date: N	
Capital Improvement Plan	Date: Y	Working with Bartlett & West Engineering Firm
City Emergency Operations Plan	Date: Y	Working with Rick Davis/Polk County
County Emergency Operations Plan	Date: Y	Working with Rick Davis/Polk County
Local Recovery Plan	Date: N	
County Recovery Plan	Date: N	
City Mitigation Plan	Date: Y	
County Mitigation Plan	Date: N	
Debris Management Plan	Date: N	
Economic Development Plan	Date: Y	
Transportation Plan	Date: N	
Land-use Plan	Date: N	
Flood Mitigation Assistance (FMA) Plan	Date: N	
Watershed Plan	Date: N	
Firewise or other fire mitigation plan	Date: Y	Through Central Polk County Fire Protection District
Critical Facilities Plan (Mitigation/Response/Recovery)	Date: N	
Policies/Ordinance		
Zoning Ordinance	No	
Building Code	Version: Y, IBC 2015	
Floodplain Ordinance	Date: N	Not in a Flood Plain
Subdivision Ordinance	N	
Tree Trimming Ordinance	N	
Nuisance Ordinance	Y	
Stormwater Ordinance	Y	
Drainage Ordinance	N	
Site Plan Review Requirements	Y	
Historic Preservation Ordinance	N	
Landscape Ordinance	N	
Program		
Zoning/Land Use Restrictions	N	
Codes Building Site/Design	Y	
Hazard Awareness Program	Y	Through Rick Davis/Polk County
National Flood Insurance Program (NFIP)	N	
NFIP Community Rating System (CRS) program	N	If so, what is your current level rating?
National Weather Service (NWS) Storm Ready Certification	N	
Firewise Community Certification	N	
Building Code Effectiveness Grading (BCEGs)	N	

Element	Yes, No, N/A	Comments and/or Weblink
ISO Fire Rating	Rating: 5	
Economic Development Program	N	
Land Use Program	N	
Public Education/Awareness	N	
Property Acquisition	N	
Planning/Zoning Boards	N	
Stream Maintenance Program	N	
Tree Trimming Program	Y	
<u>Engineering Studies for Streams (Local/County/Regional)</u>	N	
Mutual Aid Agreements	Y	Dunnegan Rural Fire Central Polk Co Fire Protection Dist.
Studies/Reports/Maps		
<u>Hazard Analysis/Risk Assessment (City)</u>	N	
<u>Hazard Analysis/Risk Assessment (County)</u>	N/A	
Evacuation Route Map	N	
<u>Critical Facilities Inventory</u>	N	
<u>Vulnerable Population Inventory</u>	N	
<u>Land Use Map</u>	N	
Staff/Department		Full Time or Part Time?
Building Code Official	Y	Part-time
Building Inspector	Y	Part-time
Mapping Specialist (GIS)	N	
Engineer	Y	Neil Brady/Bartlett & West
Development Planner	N	
Public Works Official	Y	Full-time
Emergency Management Coordinator	Y	Rick Davis
NFIP Floodplain Administrator	N	
Emergency Response Team	N	
Hazardous Materials Expert	N	
Local Emergency Planning Committee	N	
County Emergency Management Commission	Y	Rick Davis – Full-time
Sanitation Department	N	
Transportation Department	N	
Economic Development Department	N	
Housing Department	N	
Historic Preservation	N	
Non-Governmental Organizations (NGOs)	Is there a local chapter?	
American Red Cross	N	
Salvation Army	N	
Veterans Groups	N	
Local Environmental Organization	N	
Homeowner Associations	N	
Neighborhood Associations	N	
Chamber of Commerce	N	
Community Organizations (Lions, Kiwanis, etc.)	Y	Fair Play Betterment Association
Financial Resources		Is your jurisdiction able to?
Apply for Community Development Block Grants		Y
Fund projects thru Capital Improvements funding		Y
Authority to levy taxes for specific purposes		Y - by ballot vote
Fees for water, sewer, gas, or electric services		Y
Impact fees for new development		N
Incur debt through general obligation bonds		Y - by ballot vote
Incur debt through special tax bonds		Y - by ballot vote
Incur debt through private activities		N
Withhold spending in hazard prone areas		N

Source: Data Collection Questionnaire

City of Humansville

Mitigation Initiatives/Capabilities

The City of Humansville is located in the northwest portion of Polk County just off Highway 13. It is a 4th Class City and has a Mayor/City Council form of government with four elected aldermen from two wards and a mayor.

There is one outdoor warning siren located within city limits.

Table 2.11 provides a full summary of the city's planning and mitigation capabilities.

Table 2.11. City of Humansville Mitigation Capabilities

Element	Yes, No, N/A	Comments and/or Weblink
Planning Capabilities		
Comprehensive Plan	Date: N	
Builder's Plan	Date: N	
Capital Improvement Plan	Date: N	
City Emergency Operations Plan	Date: Y	
County Emergency Operations Plan	Date: Y	
Local Recovery Plan	Date: N	
County Recovery Plan	Date: Y	
City Mitigation Plan	Date: Y	
County Mitigation Plan	Date: Y	
Debris Management Plan	Date: N	
Economic Development Plan	Date: N	
Transportation Plan	Date: N	
Land-use Plan	Date: N	
Flood Mitigation Assistance (FMA) Plan	Date: N	
Watershed Plan	Date: N	
Firewise or other fire mitigation plan	Date: Y	
Critical Facilities Plan (Mitigation/Response/Recovery)	Date: N	
Policies/Ordinance		
Zoning Ordinance	N	
Building Code	Version: N	
Floodplain Ordinance	Date: N	
Subdivision Ordinance	N	
Tree Trimming Ordinance	N	
Nuisance Ordinance	N	
Stormwater Ordinance	N	
Drainage Ordinance	N	
Site Plan Review Requirements	N	
Historic Preservation Ordinance	N	
Landscape Ordinance	N	
Program		
Zoning/Land Use Restrictions	N	
Codes Building Site/Design	N	
Hazard Awareness Program	N	
National Flood Insurance Program (NFIP)	N	
NFIP Community Rating System (CRS) program	N	If so, what is your current level rating?
National Weather Service (NWS) Storm Ready Certification	N	
Firewise Community Certification	N	

Element	Yes, No, N/A	Comments and/or Weblink
Building Code Effectiveness Grading (BCEGs)	N	
ISO Fire Rating	Rating:9	
Economic Development Program	N	
Land Use Program	N	
Public Education/Awareness	N	
Property Acquisition	N	
Planning/Zoning Boards	N	
Stream Maintenance Program	N	
Tree Trimming Program	N	
<u>Engineering Studies for Streams (Local/County/Regional)</u>	N	
Mutual Aid Agreements	N	
Studies/Reports/Maps		
<u>Hazard Analysis/Risk Assessment (City)</u>	N	
<u>Hazard Analysis/Risk Assessment (County)</u>	N	
Evacuation Route Map	N	
<u>Critical Facilities Inventory</u>	N	
<u>Vulnerable Population Inventory</u>	N	
<u>Land Use Map</u>	N	
Staff/Department		Full Time or Part Time?
Building Code Official	N	
Building Inspector	N	
Mapping Specialist (GIS)	N	
Engineer	N	
Development Planner	N	
Public Works Official	N	
Emergency Management Coordinator	N	
NFIP Floodplain Administrator	N	
Emergency Response Team	N	
Hazardous Materials Expert	N	
Local Emergency Planning Committee	N	
County Emergency Management Commission	N	
Sanitation Department	N	
Transportation Department	N	
Economic Development Department	N	
Housing Department	N	
Historic Preservation	N	
Non-Governmental Organizations (NGOs)	Is there a local chapter? Yes or No	
American Red Cross	N	Springfield Office
Salvation Army	N	Bolivar Office
Veterans Groups	N	
Local Environmental Organization	N	
Homeowner Associations	N	
Neighborhood Associations	N	
Chamber of Commerce	N	
Community Organizations (Lions, Kiwanis, etc.)	N	
Financial Resources		Is your jurisdiction able to? Yes or No
Apply for Community Development Block Grants		Y
Fund projects thru Capital Improvements funding		Y
Authority to levy taxes for specific purposes		Y
Fees for water, sewer, gas, or electric services		Y
Impact fees for new development		Y
Incur debt through general obligation bonds		Y
Incur debt through special tax bonds		Y
Incur debt through private activities		N

Element	Yes, No, N/A	Comments and/or Weblink
Withhold spending in hazard prone areas		N

Source: Data Collection Questionnaire

City of Morrisville

Mitigation Initiatives/Capabilities

The City of Morrisville is located in the southern part of Polk County. It is a 4th Class City and has a Mayor/City Council form of government with 4 elected aldermen.

The mayor sends out a monthly letter advising residents of pertinent information, including hazard mitigation issues. There is one outdoor warning siren and one FEMA approved tornado shelter located within city limits.

Table 2.12 provides a full summary of the city's planning and mitigation capabilities.

Table 2.12. City of Morrisville Mitigation Capabilities

Element	Yes, No, N/A	Comments and/or Weblink
Planning Capabilities		
Comprehensive Plan	Date: N	
Builder's Plan	Date: N	
Capital Improvement Plan	Date: N	
City Emergency Operations Plan	Date: Y, From 2004	Big binder located at city hall
County Emergency Operations Plan	Date: Y, From 2004	Included with city plan
Local Recovery Plan	Date: N	
County Recovery Plan	Date: N	
City Mitigation Plan	Date: N	
County Mitigation Plan	Date: N	
Debris Management Plan	Date: N	
Economic Development Plan	Date: N	
Transportation Plan	Date: N	
Land-use Plan	Date: N	
Flood Mitigation Assistance (FMA) Plan	Date: N	
Watershed Plan	Date: N	
Firewise or other fire mitigation plan	Date: N	
Critical Facilities Plan (Mitigation/Response/Recovery)	Date: N	
Policies/Ordinance		
Zoning Ordinance	N	
Building Code	Version: N	
Floodplain Ordinance	Date: N	
Subdivision Ordinance	N	
Tree Trimming Ordinance	N	
Nuisance Ordinance	Y	Same as Bolivar
Stormwater Ordinance	N	
Drainage Ordinance	N	
Site Plan Review Requirements	N	
Historic Preservation Ordinance	N	
Landscape Ordinance	N	
Program		
Zoning/Land Use Restrictions	Y	Manufactured home ordinance
Codes Building Site/Design	Y	For manufactured homes
Hazard Awareness Program	N	

Element	Yes, No, N/A	Comments and/or Weblink
National Flood Insurance Program (NFIP)	N	Have requested information but no response. Interested in joining.
NFIP Community Rating System (CRS) program	N	If so, what is your current level rating?
National Weather Service (NWS) Storm Ready Certification	N	
Firewise Community Certification	N	
Building Code Effectiveness Grading (BCEGs)	N	
ISO Fire Rating	Rating: N	No city FD. I believe MVFPD is a 5 for inside the city.
Economic Development Program	N	
Land Use Program	N	
Public Education/Awareness	N	
Property Acquisition	N	
Planning/Zoning Boards	N	
Stream Maintenance Program	N	
Tree Trimming Program	N	
<u>Engineering Studies for Streams (Local/County/Regional)</u>	N	
Mutual Aid Agreements	N	
Studies/Reports/Maps		
<u>Hazard Analysis/Risk Assessment (City)</u>	N	
<u>Hazard Analysis/Risk Assessment (County)</u>	N	
Evacuation Route Map	N	
<u>Critical Facilities Inventory</u>	N	
<u>Vulnerable Population Inventory</u>	N	
<u>Land Use Map</u>	N	
Staff/Department		Full Time or Part Time?
Building Code Official	N	
Building Inspector	N	
Mapping Specialist (GIS)	N	
Engineer	Y	Working on water line upgrade grant and design (contracted)
Development Planner	N	
Public Works Official	Y	Full-Time
Emergency Management Coordinator	Y	Volunteer—mayor serves in this role
NFIP Floodplain Administrator	N	
Emergency Response Team	N	
Hazardous Materials Expert	N	
Local Emergency Planning Committee	N	
County Emergency Management Commission	N	
Sanitation Department	N	
Transportation Department	Y	Is included in with public works
Economic Development Department	N	
Housing Department	N	
Historic Preservation	N	
Non-Governmental Organizations (NGOs)	Is there a local chapter? Yes or No	
American Red Cross	N	
Salvation Army	N	
Veterans Groups	N	
Local Environmental Organization	N	
Homeowner Associations	N	
Neighborhood Associations	N	
Chamber of Commerce	N	
Community Organizations (Lions, Kiwanis, etc.)	Y	Various churches and a non-profit org.

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

Source: Data Collection Questionnaire

City of Pleasant Hope

Mitigation Initiatives/Capabilities

The City of Pleasant Hope is located in the southeast portion of Polk County on Highway 215. It is a 4th Class City and has a Mayor/Board of Aldermen form of government with four elected aldermen from two wards.

There are two outdoor warning sirens located within city limits.

Table 2.13 provides a full summary of the city's planning and mitigation capabilities.

Table 2.13. City of Pleasant Hope Mitigation Capabilities

Element	Yes, No, N/A	Comments and/or Weblink
Planning Capabilities		
Comprehensive Plan	Date: Y, 2012	
Builder's Plan	Date: N	
Capital Improvement Plan	Date: N	
City Emergency Operations Plan	Date: Y, July 2017	
County Emergency Operations Plan	Date: N	
Local Recovery Plan	Date: Y, Part of the emergency operations plan July 2017	
County Recovery Plan	Date: N	
City Mitigation Plan	Date: Y	I can only find the 2013 Polk County Plan as approved by SEMA
County Mitigation Plan	Date: Y	
Debris Management Plan	Date: Part of the emergency operations plan July 2017	
Economic Development Plan	Date: nothing official	Membership meetings with SMOG & occasional sit in on the Bolivar group
Transportation Plan	Date: No	
Land-use Plan	Date: aka Planning and Zoning Ordinance	Ordinance #294 1/20/2014
Flood Mitigation Assistance (FMA) Plan	Date: 2008, amended in 2010	Flood Plain Management Ordinance #237
Watershed Plan	Date: No	
Firewise or other fire mitigation plan	Date: No	
Critical Facilities Plan (Mitigation/Response/Recovery)	Date: Part of the emergency operations plan July 2017	
Policies/Ordinance		
Zoning Ordinance	Ordinance #294 1/20/2014	
Building Code	Version: IRC 2015	
Floodplain Ordinance	Date:	
Subdivision Ordinance	Ordinance #270, #271 and #272	
Tree Trimming Ordinance	Ordinance #294 1/20/2014	As part of landscaping and safe view
Nuisance Ordinance	Ordinance # 225 Criminal Codes – several places and kinds of nuisances are addressed	
Stormwater Ordinance	Ordinance #277 & #287	
Drainage Ordinance	Ordinance #277 & #287	
Site Plan Review Requirements	Ordinance #270, #271 and 272	
Historic Preservation Ordinance	No	

Element	Yes, No, N/A	Comments and/or Weblink
Landscape Ordinance	Ordinance #294 1/20/2014	
Program		
Zoning/Land Use Restrictions	Ordinance #294 1/20/2014	
Codes Building Site/Design	Ordinance #294 1/20/2014	
Hazard Awareness Program	No	
National Flood Insurance Program (NFIP)	Ordinance #237	
NFIP Community Rating System (CRS) program	??	If so, what is your current level rating?
National Weather Service (NWS) Storm Ready Certification	No	
Firewise Community Certification	No	
Building Code Effectiveness Grading (BCEGs)	No	
ISO Fire Rating	Rating:	Provided by the Pleasant Hope Fire and Rescue District
Economic Development Program	Already answered	
Land Use Program	Already answered	
Public Education/Awareness	None to my knowledge	
Property Acquisition	??	
Planning/Zoning Boards	Yes	
Stream Maintenance Program	No	
Tree Trimming Program	Already answered	
<u>Engineering Studies for Streams (Local/County/Regional)</u>	No	
Mutual Aid Agreements	None in writing	A lot of handshakes
Studies/Reports/Maps		
<u>Hazard Analysis/Risk Assessment (City)</u>	No	I'm working with Flood Plain Management group and this is on my list to do.
<u>Hazard Analysis/Risk Assessment (County)</u>	N	
Evacuation Route Map	N	We have four ways out of town. In a Flood event Pleasant Hope is an island.
<u>Critical Facilities Inventory</u>	N	I'm working with Flood Plain Management group and this is on my list to do.
<u>Vulnerable Population Inventory</u>	N	I'm working with Flood Plain Management group and this is on my list to do.
<u>Land Use Map</u>	Planning & Zoning Map	
Staff/Department		Full Time or Part Time?
Building Code Official	Yes	Full Time employee with other duties
Building Inspector	Yes	Full Time employee with other duties
Mapping Specialist (GIS)	Sort of - we know how to access and how to read the maps	
Engineer	Not on retainer	But we have two companies that we reach out to when needed.
Development Planner	No	
Public Works Official	Yes	Joe Thompson
Emergency Management Coordinator	Yes	Lynn Esser
NFIP Floodplain Administrator	Yes	Lynn Esser
Emergency Response Team	Needs to be updated – personnel has changed	

Element	Yes, No, N/A	Comments and/or Weblink
Hazardous Materials Expert	We rely on Pleasant Hope Fire and Rescue District	
Local Emergency Planning Committee	Needs to be updated	
County Emergency Management Commission	N	
Sanitation Department	N	
Transportation Department	Part of Public Works	Joe Thompson
Economic Development Department	We send a representative to SMCOG and branch out from there.	Tana McMurrey
Housing Department	Public Works	Joe Thompson Tana McMurrey
Historic Preservation	No	
Non-Governmental Organizations (NGOs)	Is there a local chapter? Yes or No	
American Red Cross	Springfield	
Salvation Army	Springfield	
Veterans Groups	N/A	
Local Environmental Organization	N/A	
Homeowner Associations	In some subdivisions	
Neighborhood Associations	In some neighborhoods	
Chamber of Commerce	Yes	
Community Organizations (Lions, Kiwanis, etc.)	Masonic Lodge	Not very community active
Financial Resources		Is your jurisdiction able to? Yes or No
Apply for Community Development Block Grants		No
Fund projects thru Capital Improvements funding		?
Authority to levy taxes for specific purposes		Vote of the people
Fees for water, sewer, gas, or electric services		We own water & sewer, we levy franchise fees on electricity
Impact fees for new development		Not defined
Incur debt through general obligation bonds		Vote of the people
Incur debt through special tax bonds		Vote of the people
Incur debt through private activities		Vote of the people
Withhold spending in hazard prone areas		?

Source: Data Collection Questionnaire

Village of Aldrich

Mitigation Initiatives/Capabilities

The Village of Aldrich is in the southwestern part of Polk County on Highway 123. It is governed by a mayor.

There are no outdoor warning sirens or tornado shelters located within the village limits.

Table 2.14 provides a full summary of the village's planning and mitigation capabilities.

Table 2.14. Village of Aldrich Mitigation Capabilities

Element	Yes, No, N/A	Comments and/or Weblink
Planning Capabilities		
Comprehensive Plan	Date: 2018	
Builder's Plan	Date: N	
Capital Improvement Plan	Date: N	
City Emergency Operations Plan	Date: N	
County Emergency Operations Plan	Date: 2018	
Local Recovery Plan	Date: N	
County Recovery Plan	Date: N	
City Mitigation Plan	Date: N	
County Mitigation Plan	Date: N	
Debris Management Plan	Date: N	
Economic Development Plan	Date: N	
Transportation Plan	Date: N	
Land-use Plan	Date: N	
Flood Mitigation Assistance (FMA) Plan	Date: N	
Watershed Plan	Date: N	
Firewise or other fire mitigation plan	Date: N	
Critical Facilities Plan (Mitigation/Response/Recovery)	Date: N	
Policies/Ordinance		
Zoning Ordinance	N	
Building Code	Version: N	
Floodplain Ordinance	N	
Subdivision Ordinance	N	
Tree Trimming Ordinance	N	
Nuisance Ordinance	N	
Stormwater Ordinance	N	
Drainage Ordinance	N	
Site Plan Review Requirements	N	
Historic Preservation Ordinance	N	
Landscape Ordinance	N	
Program		
Zoning/Land Use Restrictions	N	
Codes Building Site/Design	N	
Hazard Awareness Program	N	
National Flood Insurance Program (NFIP)	N	
NFIP Community Rating System (CRS) program	N	If so, what is your current level rating?
National Weather Service (NWS) Storm Ready Certification	N	
Firewise Community Certification	N	
Building Code Effectiveness Grading (BCEGs)	N	

Element	Yes, No, N/A	Comments and/or Weblink
ISO Fire Rating	Rating: 9	
Economic Development Program	N	
Land Use Program	N	
Public Education/Awareness	N	
Property Acquisition	N	
Planning/Zoning Boards	N	
Stream Maintenance Program	N	
Tree Trimming Program	N	
<u>Engineering Studies for Streams</u> <u>(Local/County/Regional)</u>	N	
Mutual Aid Agreements	N	
Studies/Reports/Maps		
<u>Hazard Analysis/Risk Assessment (City)</u>	N	
<u>Hazard Analysis/Risk Assessment (County)</u>	N	
Evacuation Route Map	N	
<u>Critical Facilities Inventory</u>	N	
<u>Vulnerable Population Inventory</u>	N	
<u>Land Use Map</u>	N	
Staff/Department		Full Time or Part Time?
Building Code Official	N	
Building Inspector	N	
Mapping Specialist (GIS)	N	
Engineer	N	
Development Planner	N	
Public Works Official	N	
Emergency Management Coordinator	N	
NFIP Floodplain Administrator	N	
Emergency Response Team	N	
Hazardous Materials Expert	N	
Local Emergency Planning Committee	N	
County Emergency Management Commission	N	
Sanitation Department	N	
Transportation Department	N	
Economic Development Department	N	
Housing Department	N	
Historic Preservation	N	
Non-Governmental Organizations (NGOs)	Is there a local chapter? Yes or No	
American Red Cross	N	
Salvation Army	N	
Veterans Groups	N	
Local Environmental Organization	N	
Homeowner Associations	N	
Neighborhood Associations	N	
Chamber of Commerce	N	
Community Organizations (Lions, Kiwanis, etc.)	N	
Financial Resources		Is your jurisdiction able to? Yes or No
Apply for Community Development Block Grants		N
Fund projects thru Capital Improvements funding		N
Authority to levy taxes for specific purposes		N
Fees for water, sewer, gas, or electric services		N
Impact fees for new development		N
Incur debt through general obligation bonds		N
Incur debt through special tax bonds		N
Incur debt through private activities		N
Withhold spending in hazard prone areas		N

Village of Flemington

Mitigation Initiatives/Capabilities

The Village of Flemington is in the northern part of Polk County near the Harry S. Truman Reservoir. It is governed by a mayor.

There are no outdoor warning sirens or tornado shelters located within the village limits.

Table 2.15 provides a full summary of the village's planning and mitigation capabilities.

Table 2.15. Village of Flemington Mitigation Capabilities

Element	Yes, No, N/A	Comments and/or Weblink
Planning Capabilities		
Comprehensive Plan	Date: Y, 2017	
Builder's Plan	Date: N	
Capital Improvement Plan	Date: N	
City Emergency Operations Plan	Date: N	
County Emergency Operations Plan	Date: Y	
Local Recovery Plan	Date: N	
County Recovery Plan	Date: N	
City Mitigation Plan	Date: N	
County Mitigation Plan	Date: N	
Debris Management Plan	Date: N	
Economic Development Plan	Date: N	
Transportation Plan	Date: N	
Land-use Plan	Date: N	
Flood Mitigation Assistance (FMA) Plan	Date: N	
Watershed Plan	Date: N	
Firewise or other fire mitigation plan	Date: N	
Critical Facilities Plan (Mitigation/Response/Recovery)	Date: N	
Policies/Ordinance		
Zoning Ordinance	N	
Building Code	N	
Floodplain Ordinance	Date: N	
Subdivision Ordinance	N	
Tree Trimming Ordinance	N	
Nuisance Ordinance	N	
Stormwater Ordinance	N	
Drainage Ordinance	N	
Site Plan Review Requirements	N	
Historic Preservation Ordinance	N	
Landscape Ordinance	N	
Program		
Zoning/Land Use Restrictions	N	
Codes Building Site/Design	N	
Hazard Awareness Program	N	
National Flood Insurance Program (NFIP)	N	
NFIP Community Rating System (CRS) program	N	If so, what is your current level rating?
National Weather Service (NWS) Storm Ready Certification	N	

Element	Yes, No, N/A	Comments and/or Weblink
Firewise Community Certification	N	
Building Code Effectiveness Grading (BCEGs)	N	
ISO Fire Rating	Rating: 9	
Economic Development Program	N	
Land Use Program	N	
Public Education/Awareness	N	
Property Acquisition	N	
Planning/Zoning Boards	N	
Stream Maintenance Program	N	
Tree Trimming Program	N	
<u>Engineering Studies for Streams (Local/County/Regional)</u>	N	
Mutual Aid Agreements	N	
Studies/Reports/Maps		
<u>Hazard Analysis/Risk Assessment (City)</u>	No	
<u>Hazard Analysis/Risk Assessment (County)</u>	No	
Evacuation Route Map	No	
<u>Critical Facilities Inventory</u>	No	
<u>Vulnerable Population Inventory</u>	No	
<u>Land Use Map</u>	No	
Staff/Department		Full Time or Part Time?
Building Code Official	No	
Building Inspector	No	
Mapping Specialist (GIS)	No	
Engineer	No	
Development Planner	No	
Public Works Official	No	
Emergency Management Coordinator	No	
NFIP Floodplain Administrator	No	
Emergency Response Team	No	
Hazardous Materials Expert	No	
Local Emergency Planning Committee	No	
County Emergency Management Commission	No	
Sanitation Department	No	
Transportation Department	No	
Economic Development Department	No	
Housing Department	No	
Historic Preservation	No	
Non-Governmental Organizations (NGOs)	Is there a local chapter? Yes or No	
American Red Cross	No	
Salvation Army	No	
Veterans Groups	No	
Local Environmental Organization	No	
Homeowner Associations	No	
Neighborhood Associations	No	
Chamber of Commerce	No	
Community Organizations (Lions, Kiwanis, etc.)	No	
Financial Resources		Is your jurisdiction able to? Yes or No
Apply for Community Development Block Grants		No
Fund projects thru Capital Improvements funding		No
Authority to levy taxes for specific purposes		No
Fees for water, sewer, gas, or electric services		Yes
Impact fees for new development		No
Incur debt through general obligation bonds		No
Incur debt through special tax bonds		No

Element	Yes, No, N/A	Comments and/or Weblink
Incur debt through private activities		No
Withhold spending in hazard prone areas		No

Source: Data Collection Questionnaire

Village of Halfway

Mitigation Initiatives/Capabilities

The Village of Halfway is located in the eastern part of Polk County. It is governed by a city council.

There are no outdoor warning sirens or tornado shelters located within the village limits.

Table 2.16 provides a full summary of the village's planning and mitigation capabilities.

Table 2.16. Village of Halfway Mitigation Capabilities

Element	Yes, No, N/A	Comments and/or Weblink
Planning Capabilities		
Comprehensive Plan	Date: N	
Builder's Plan	Date: N	
Capital Improvement Plan	Date: N	
City Emergency Operations Plan	Date: N	
County Emergency Operations Plan	Date: N	
Local Recovery Plan	Date: N	
County Recovery Plan	Date: N	
City Mitigation Plan	Date: N	
County Mitigation Plan	Date: N	
Debris Management Plan	Date: N	
Economic Development Plan	Date: N	
Transportation Plan	Date: N	
Land-use Plan	Date: N	
Flood Mitigation Assistance (FMA) Plan	Date: N	
Watershed Plan	Date: N	
Firewise or other fire mitigation plan	Date: N	
Critical Facilities Plan (Mitigation/Response/Recovery)	Date: N	
Policies/Ordinance		
Zoning Ordinance	N	
Building Code	Version: N	
Floodplain Ordinance	Date: N	
Subdivision Ordinance	N	
Tree Trimming Ordinance	N	
Nuisance Ordinance	N	
Stormwater Ordinance	N	
Drainage Ordinance	N	
Site Plan Review Requirements	N	
Historic Preservation Ordinance	N	
Landscape Ordinance	N	
Program		
Zoning/Land Use Restrictions	N	
Codes Building Site/Design	N	
Hazard Awareness Program	N	
National Flood Insurance Program (NFIP)	N	
NFIP Community Rating System	N	If so, what is your current level

Element	Yes, No, N/A	Comments and/or Weblink
(CRS) program		rating?
National Weather Service (NWS) Storm Ready Certification	N	
Firewise Community Certification	N	
Building Code Effectiveness Grading (BCEGs)	N	
ISO Fire Rating	N	
Economic Development Program	Rating: N	
Land Use Program	N	
Public Education/Awareness	N	
Property Acquisition	N	
Planning/Zoning Boards	N	
Stream Maintenance Program	N	
Tree Trimming Program	N	
<u>Engineering Studies for Streams</u> <u>(Local/County/Regional)</u>	N	
Mutual Aid Agreements	N	
Studies/Reports/Maps		
<u>Hazard Analysis/Risk Assessment (City)</u>	N	
<u>Hazard Analysis/Risk Assessment (County)</u>	N	
Evacuation Route Map	N	
<u>Critical Facilities Inventory</u>	N	
<u>Vulnerable Population Inventory</u>	N	
<u>Land Use Map</u>	N	
Staff/Department		Full Time or Part Time?
Building Code Official	N	
Building Inspector	N	
Mapping Specialist (GIS)	N	
Engineer	N	
Development Planner	N	
Public Works Official	N	
Emergency Management Coordinator	N	
NFIP Floodplain Administrator	N	
Emergency Response Team	N	
Hazardous Materials Expert	N	
Local Emergency Planning Committee	N	
County Emergency Management Commission	N	
Sanitation Department	N	
Transportation Department	N	
Economic Development Department	N	
Housing Department	N	
Historic Preservation	N	
Non-Governmental Organizations (NGOs)	Is there a local chapter? Yes or No	
American Red Cross	N	
Salvation Army	N	
Veterans Groups	N	
Local Environmental Organization	N	
Homeowner Associations	N	
Neighborhood Associations	N	
Chamber of Commerce	N	
Community Organizations (Lions, Kiwanis, etc.)	Y, Lions Club	
Financial Resources		Is your jurisdiction able to? Yes or No
Apply for Community Development Block Grants		Yes
Fund projects thru Capital Improvements funding		No
Authority to levy taxes for specific purposes		No
Fees for water, sewer, gas, or electric services		Yes

Element	Yes, No, N/A	Comments and/or Weblink
Impact fees for new development		No
Incur debt through general obligation bonds		Yes
Incur debt through special tax bonds		Yes
Incur debt through private activities		No
Withhold spending in hazard prone areas		No

Source: Data Collection Questionnaire

Summary of County, City, and Village Jurisdictional Capabilities

Table 2.17. Mitigation Capabilities Summary Table

CAPABILITIES	Polk County	City of Bolivar	City of Fair Play	City of Humansville	City of Morrisville	City of Pleasant Hope	Village of Aldrich	Village of Flemington	Village of Halfway
Comprehensive Plan	N	Y	Y	N	N	Y	Y	Y	N
Builder's Plan	N	N	N	N	N	N	N	N	N
Capital Improvement Plan	N	Y	Y	N	N	N	N	N	N
Local Emergency Plan	N/A	Y	Y	Y	Y	Y	Y	N	Y
County Emergency Plan	Y	N	Y	Y	Y	N	N	Y	N
Local Recovery Plan	N/A	Y	N	N	N	Y	N	N	N
County Recovery Plan	N	N/A	N/A	Y	No	N	N	N	N
Local Mitigation Plan	N/A	Y	Y	Y	N	N	N	N	N
County Mitigation Plan	Y	N/A	N/A	Y	N	Y	N	N	N
Debris Management Plan	N	Y	N	N	N	Y	N	N	N
Economic Development Plan	N	Y	Y	N	N	N	N	N	N
Transportation Plan	N	Y	N	N	N	N	N	N	N
Land-use Plan	N	Y	N	N	N	N	N	N	N
Flood Mitigation Assistance (FMA) Plan	N	Y	N	N	N	Y	N	N	N
Watershed Plan	N	N	N	N	N	N	N	N	N
Firewise or other fire mitigation plan	N	N	Y	Y	N	N	N	N	N
Critical Facilities Plan (Mitigation/Response/Recovery)	N	N	N	N	N	Y	N	N	N
Zoning Ordinance	N	Y	N	N	N	Y	N	N	N
Building Code	N	Y	Y	N	N	Y	N	N	N
Floodplain Ordinance	N	Y	N	N	N	Y	N	N	N
Subdivision Ordinance	N	Y	N	N	N	Y	N	N	N
Tree Trimming Ordinance	N	Y	N	N	N	Y	N	N	N
Nuisance Ordinance	N	Y	Y	N	Y	Y	N	N	N
Storm Water Ordinance	N	Y	Y	N	N	Y	N	N	N
Drainage Ordinance	N	Y	N	N	N	Y	N	N	N
Site Plan Review Requirements	N	Y	Y	N	N	Y	N	N	N
Historic Preservation Ordinance	N	Y	N	N	N	N	N	N	N
Landscape Ordinance	N	Y	N	N	N	Y	N	N	N
Zoning/Land Use Restrictions	N	Y	N	N	Y	Y	N	N	N
Codes Building Site/Design	N	Y	Y	N	Y	Y	N	N	N

CAPABILITIES	Polk County	City of Bolivar	City of Fair Play	City of Humansville	City of Morrisville	City of Pleasant Hope	Village of Aldrich	Village of Flemington	Village of Halfway
Hazard Awareness Program	N	N	Y	N	N	N	N	N	N
National Flood Insurance Program (NFIP)	N	Y	N	N	N	Y	N	N	N
NFIP Community Rating System (CRS) Participating Community	N	N	N	N	N	N	N	N	N
National Weather Service (NWS) Storm Ready	N	N	N	N	N	N	N	N	N
Firewise Community Certification	N	N	N	N	N	N	N	N	N
Building Code Effectiveness Grading (BCEGs)	N	N	N	N	N	N	N	N	N
ISO Fire Rating	Rating: N	Rating:2	Rating: 5	Rating:9	Ratin: N	Rating: N	Rating:9	Rating: 9	Rating: N
Economic Development Program	N	Y	N	N	N	N	N	N	N
Land Use Program	N	Y	N	N	N	Y	N	N	N
Public Education/Awareness	N	Y	N	N	N	N	N	N	N
Property Acquisition	N	N	N	N	N	N	N	N	N
Planning/Zoning Boards	N	Y	N	N	N	N	N	N	N
Stream Maintenance Program	N	Y	N	N	N	N	N	N	N
Tree Trimming Program	N	Y	Y	N	N	Y	N	N	N
Engineering Studies for Streams (Local/County/Regional)	N	Y	N	N	N	N	N	N	N
Mutual Aid Agreements	Y	Y	Y	N	N	N	N	N	N
Hazard Analysis/Risk Assessment (Local)	N	Y	N	N	N	N	N	N	N
Hazard Analysis/Risk Assessment (County)	N	Y	N	N	N	N	N	N	N
Evacuation Route Map	N	Y	N	N	N	N	N	N	N
Critical Facilities Inventory	N	Y	N	N	N	N	N	N	N
Vulnerable Population Inventory	N	N	N	N	N	N	N	N	N
Land Use Map	N	N	N	N	N	Y	N	N	N
Building Code Official	N	Y	Y	N	N	Y	N	N	N
Building Inspector	N	Y	Y	N	N	Y	N	N	N
Mapping Specialist (GIS)	N	N	N	N	N	Y	N	N	N
Engineer	N	N	Y	N	N	N	N	N	N
Development Planner	N	N	N	N	N	N	N	N	N
Public Works Official	N	Y	Y	N	Y	Y	N	N	N
Emergency Management Coordinator	Y	Y	Y	N	Y	Y	N	N	N
NFIP Floodplain Administrator	N	Y	N	N	N	Y	N	N	N
Emergency Response Team	N	N	N	N	N	Y	N	N	N

CAPABILITIES	Polk County	City of Bolivar	City of Fair Play	City of Humansville	City of Morrisville	City of Pleasant Hope	Village of Aldrich	Village of Flemington	Village of Halfway
Hazardous Materials Expert	N	N	N	N	N	N	N	N	N
Local Emergency Planning Committee	N	Y	N	N	N	Y	N	N	N
County Emergency Management Commission	Y	N	Y	N	N	N	N	N	N
Sanitation Department	N	N	N	N	N	N	N	N	N
Transportation Department	N	Y	N	N	Y	Y	N	N	N
Economic Development Department	N	Y	N	N	N	N	N	N	N
Housing Department	N	N	N	N	N	N	N	N	N
Historic Preservation	N	N	N	N	N	N	N	N	N
American Red Cross	Y	N	N	N	N	N	N	N	N
Salvation Army	Y	Y	N	N	N	N	N	N	N
Veterans Groups	N	Y	N	N	N	N	N	N	N
Local Environmental Organization	N	N	N	N	N	N	N	N	N
Homeowner Associations	N	N	N	N	N	Y	N	N	N
Neighborhood Associations	N	N	N	N	N	Y	N	N	N
Chamber of Commerce	N	Y	N	N	N	Y	N	N	N
Community Organizations (Lions, Kiwanis, etc.)	Y	Y	Y	N	N	Y	N	N	Y
Apply for Community Development Block Grants	Y	N	Y	Y	Y	N	N	N	Y
Fund projects through Capital Improvements funding	Y	Y	Y	Y	N	N	N	N	N
Authority to levy taxes for specific purposes	N	Y	Y	Y	Y	Y	N	N	N
Fees for water, sewer, gas, or electric services	N	N	Y	Y	Y	Y	N	Y	Y
Impact fees for new development	N	N	N	Y	N	N	N	N	N
Incur debt through general obligation bonds	N	Y	Y	Y	Y	Y	N	N	Y
Incur debt through special tax bonds	N	Y	Y	Y	N	Y	N	N	Y
Incur debt through private activities	N	N	N	N	N	Y	N	N	N
Withhold spending in hazard prone areas	N	N	N	N	N	N	N	N	N

Source: Data Collection Questionnaires

2.2.2 Public School District Profiles and Mitigation Capabilities

This section provides general information about the participating school district in the plan. There are six school districts with facilities in Polk County, but only five participated in this plan update. Hickory County R-I, Dallas County R-I, Fair Grove R-X, Walnut Grove R-V, and Dadeville R-II have district borders that overlap Polk County, but those school districts participate in other county hazard mitigation plans.

Figure 2.3 is a map of school district boundaries in Polk County.

Figure 2.3. Polk County School Districts

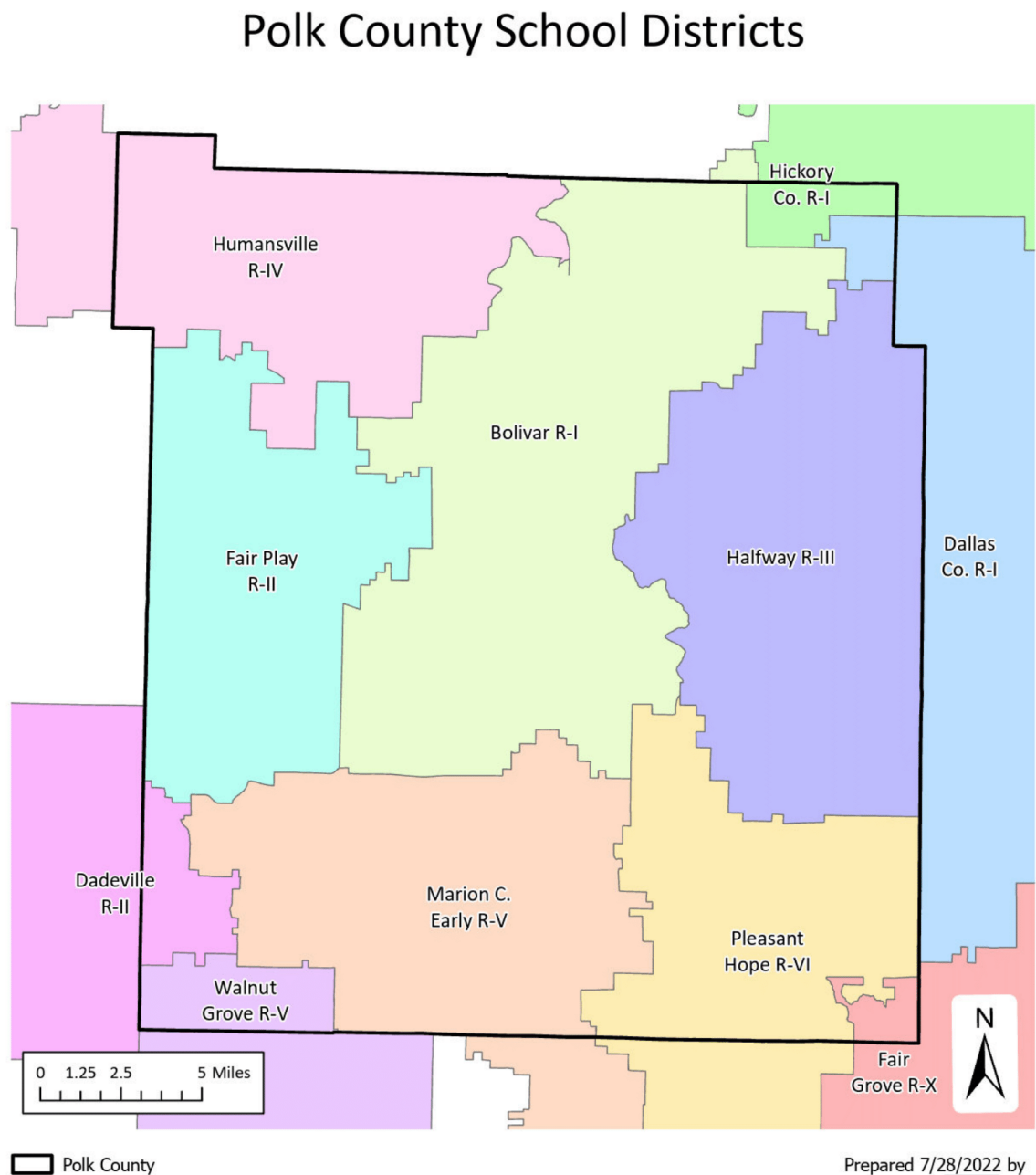


Table 2.18 shows the total enrollment numbers for each district.

Table 2.18. Polk County School District Enrollment 2022

District Name	District Enrollment
Bolivar R-I	2,706
Fair Play R-II	327
Halfway R-III	259
Humansville R-IV	347
Marion C Early R-V	541
Pleasant Hope R-VI	722

Source: <https://apps.dese.mo.gov/MCDS/Visualizations.aspx?id=22>

Bolivar R-I

Mitigation Initiatives/Capabilities

The Bolivar R-I school facilities are equipped with intercoms, emergency alarm systems, and NOAA weather radios. There are currently no FEMA approved saferooms on campus, but there are plans to add one to the middle school. The district expects enrollment to increase 2-4% over the next five years.

Refer to **Table 2.19** for a summary of the district's mitigation capabilities.

Fair Play R-II

Mitigation Initiatives/Capabilities

All Fair Play R-II school facilities are equipped with a PA system and NOAA weather radios. There is also an alert app on all staff phones that will notify staff of emergencies. Drills and training programs are held regularly to prepare for disaster situations. The facilities are designed in a way to provide shelter during hazards but are not FEMA approved. The district expects enrollment to remain stable over the next five years.

Refer to **Table 2.19** for a summary of the district's mitigation capabilities.

Humansville R-IV

Mitigation Initiatives/Capabilities

The Humansville R-IV school district uses the School Messenger notification system for alerts and to provide advanced warning of hazard events. The district also has a Facebook page and school website that may be used to alert the public. NOAA weather radios are located at the Pre K-5 and 6-12 offices. Recently exterior doors were replaced, carpet was replaced with tile, kitchen windows were replaced, trees were removed around buildings, and a new campus camera system was installed. Enrollment is projected to increase slightly over the next five years.

Refer to **Table 2.19** for a summary of the district's mitigation capabilities.

Marion C Early R-V

Mitigation Initiatives/Capabilities

All Marion C Early R-V facilities are equipped with intercom systems and NOAA weather radios. There

is one FEMA tornado shelter on campus. Enrollment is expected to increase by 5% over the next five years.

Refer to **Table 2.19** for a summary of the district's mitigation capabilities.

Pleasant Hope R-VI

Mitigation Initiatives/Capabilities

The elementary, middle, and high school buildings have PA systems, while the elementary and high school buildings also have phone announcement systems. The district utilizes Apptegy to send instant SMS and/or voice messages, as well as their website and social media page to alert the public of hazards. All buildings are equipped with NOAA weather radios. Recently, exterior doors and windows were replaced, carpet was replaced with tile, trees around the buildings were trimmed, a camera monitoring system was installed, and fences were upgraded. Enrollment is expected to increase slightly over the next five years.

Refer to **Table 2.19** for a summary of the district's mitigation capabilities.

Summary of Public School District Capabilities

Table 2.19. Summary of Public School District Mitigation Capabilities

Capability	Bolivar R-I	Fair Play R-II	Humansville R-IV	Marion C Early R-V	Pleasant Hope R-VI
Planning Elements					
Master Plan/ Date	Yes	No	No	No	No
Capital Improvement Plan/Date	Yes	No	Yes	Yes	Yes 6/27/2022
School Emergency Plan / Date	Yes	Yes	Yes	Yes	Yes 8/12/2022
Weapons Policy/Date	Yes	Yes	Yes	Yes	Yes 8/12/2022
Personnel Resources					
Full-Time Building Official (Principal)	Yes	Yes	Yes	Yes	Yes
Emergency Manager	Yes	Yes	Yes	Yes	Yes
Grant Writer	No	No	No	Yes	Yes
Public Information Officer	Yes	Yes	Yes	Yes	Yes
Financial Resources					
Capital Improvements Project Funding	Yes	No	Yes	Yes	Yes
Local Funds	Yes	Yes	Yes	Yes	Yes
General Obligation Bonds	Yes	No	Yes	Yes	Yes
Special Tax Bonds	No	No	Yes	Yes	Yes
Private Activities/Donations	Yes	Yes	Yes	Yes	Yes
State and Federal Funds/Grants	Yes	Yes	Yes	Yes	Yes
Other					
Public Education Programs	Yes	Yes	Yes	Yes	Yes
Privately or Self- Insured?	Yes	Yes	Yes	Yes	Yes
Fire Evacuation Training	Yes	Yes	Yes	Yes	Yes
Tornado Sheltering Exercises	Yes	Yes	Yes	Yes	Yes
Public Address/Emergency Alert System	Yes	Yes		Yes	Yes
NOAA Weather Radios	Yes	Yes	Yes	Yes	Yes
Lock-Down Security Training	Yes	Yes	Yes	Yes	Yes

Mitigation Programs	Yes	Yes	Yes	Yes	Yes
Tornado Shelter/Saferoom	No	Yes	No	Yes	No
Campus Police	Yes	Yes	Yes	Yes	No

Source: Data Collection Questionnaire

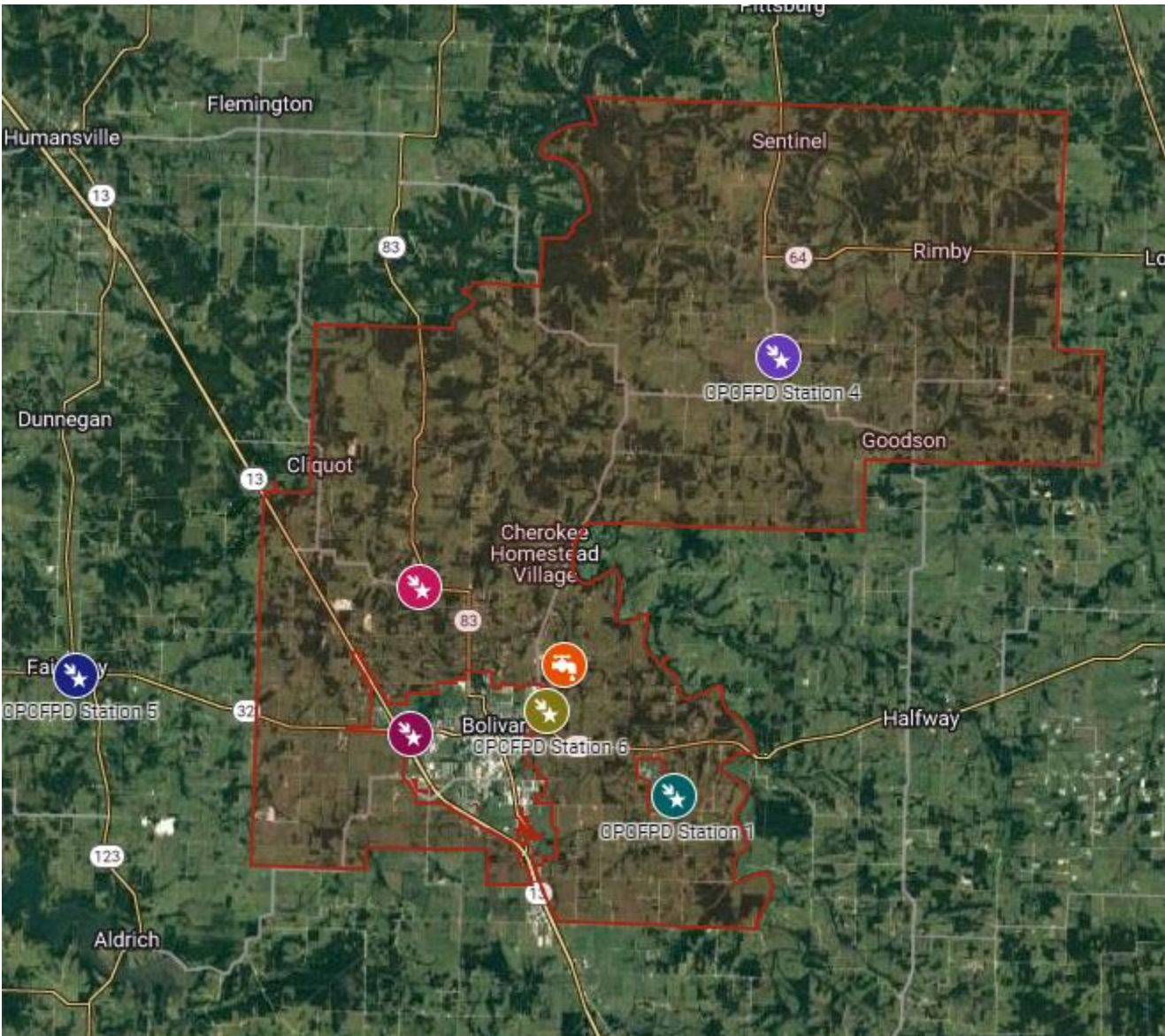
2.2.3 Special Districts

Central Polk County Fire Protection District

Mitigation Initiatives/Capabilities

Central Polk County Fire Protection District’s mission statement is to “preserve life and property, promote public safety, and foster economic growth through leadership, management, and actions as an all-risk life safety response provider.” The district has 6 fire stations. Meetings are held every Tuesday night at 7 pm at 1039 Hwy B in Bolivar. **Figure 2.4** below shows their coverage area.

Figure 2.4. Central Polk County Fire Protection District Coverage



Refer to **Table 2.20** for a complete summary of the district’s mitigation capabilities.

Citizens Memorial Hospital District

Mitigation Initiatives/Capabilities

Citizens Memorial Hospital is a Level III Trauma Center located in Bolivar that serves a rural, eight county area in Southwest Missouri. There are 34 primary and specialty physician clinics, seven long-term care facilities, and other ancillary services. The district works with the Polk County LEPC on public awareness programs and hosts health fairs and other community presentations. Currently, a hospital building addition and patient tower project is in the design process.

Refer to **Table 2.20** for a complete summary of the district's mitigation capabilities.

Halfway Fire and Rescue Association

Mitigation Initiatives/Capabilities

Halfway Fire and Rescue Association is a volunteer fire department with three fire stations located in and around the Halfway area.

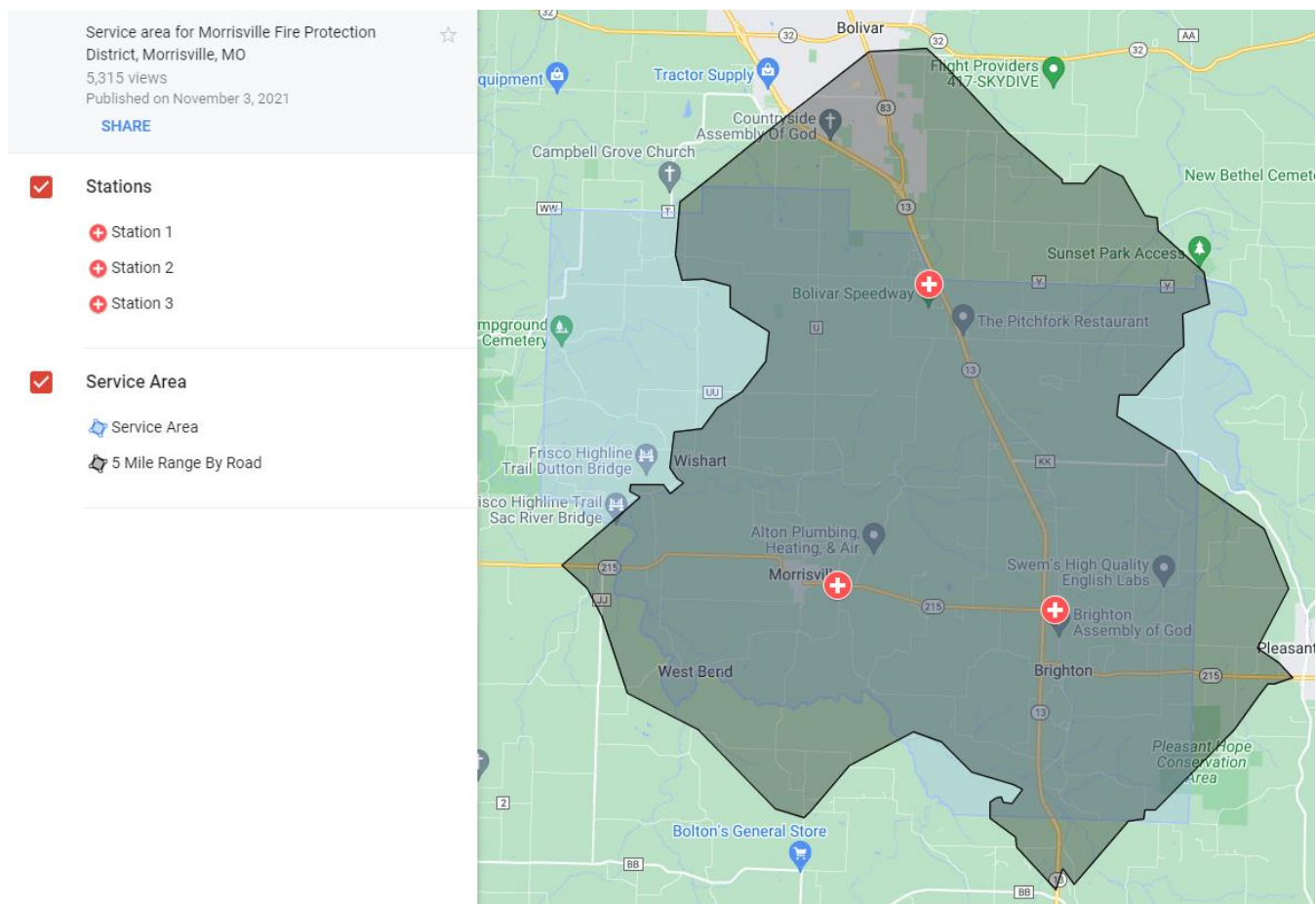
Refer to **Table 2.20** for a complete summary of the district's mitigation capabilities.

Morrisville Fire Protection District

Mitigation Initiatives/Capabilities

Morrisville Fire Protection District is a volunteer fire district serving the Morrisville, Brighton, Bolivar, Pleasant Hope, and Wishart areas. There are three stations located in the 89 square mile primary response area. The citizens elect the Board of Directors, then appoint the President, Vice President, Secretary, and Treasurer of the board. The board also appoints the Chief, Assistant Chief, Training Officer, and Safety Officer. The President is responsible for the administration of the overall operation of the organization. The Chief oversees the firefighting activities of the department and its firefighters. **Figure 2.5** shows the district coverage.

Figure 2.5. Morrisville Fire Protection District Coverage



Refer to **Table 2.20** for a complete summary of the district's mitigation capabilities.

Pleasant Hope Rural Fire District

Mitigation Initiatives/Capabilities

The Pleasant Hope Fire Protection District is a volunteer fire department with three fire stations governed by a seven-person Board of Directors.

Refer to **Table 2.20** for a complete summary of the district's mitigation capabilities.

Summary of Special District Mitigation Capabilities

Table 2.20. Summary of Special District Mitigation Capabilities

Element	Central Polk County Fire Protection District	Citizens Memorial Hospital District	Halfway Fire and Rescue Association	Morrisville Fire and Rescue Association	Pleasant Hope Rural Fire District
Planning Capabilities					
Capital Improvement Plan	N/A	Yes	No	Yes	N/A
Emergency Operations Plan	N/A	Yes	No	N/A	N/A
Continuity of Operations Plan	N/A	Yes	No	N/A	N/A
Community Wildfire Protection Plan	N/A	N/A	N/A	N/A	N/A

Programs					
Cross-Connection Program	N/A	N/A	No	N/A	Yes
Hydrant Flushing Program	N/A	N/A	N/A	Yes	Yes
Public Education/Awareness	N/A	N/A	N/A	Yes	Yes
Tree Trimming Program	N/A	N/A	N/A	N/A	N/A
Mutual Aid Agreements	N/A	Yes	N/A	Yes	Yes
Studies/Reports/Maps					
Evacuation Route Map	N/A	Yes	N/A	No	Yes
Critical Facilities Inventory	N/A	N/A	N/A	No	No
Financial Resources					
Fund projects through Capital Improvement funding	Yes	Yes	Yes	Yes	No
Fees for water, sewer, gas, or electric services	No	No	Yes	No	Yes
Incur debt through general obligation bonds	No	Yes	Yes	No	No
Incur debt through special tax bonds	No	Yes	Yes	No	No
Incur debt through private activities	No	No	No	We are able to do annually renewed equipment leases	No
Withhold spending in hazard prone areas	No	No	Yes	No	No

Source: Data Collection Questionnaire

3 RISK ASSESSMENT

3	RISK ASSESSMENT	3.1
3.1	HAZARD IDENTIFICATION.....	3.4
3.1.1	Review of Existing Mitigation Plans	3.4
3.1.2	Review Disaster Declaration History.....	3.5
3.1.3	Research Additional Sources	3.6
3.1.4	Hazards Identified	3.8
3.1.5	Multi-Jurisdictional Risk Assessment	3.9
3.2	ASSETS AT RISK	3.10
3.2.1	Total Exposure of Population and Structures	3.10
	Unincorporated County and Incorporated Cities	3.10
3.2.2	Critical and Essential Facilities and Infrastructure	3.12
3.2.3	Other Assets.....	3.15
3.3	LAND USE AND DEVELOPMENT.....	3.18
3.3.1	Development Since Previous Plan Update.....	3.18
3.3.2	Future Land Use and Development	3.22
3.4	HAZARD PROFILES, VULNERABILITY, AND PROBLEM STATEMENTS.....	3.25
	Hazard Profiles	3.25
	Vulnerability Assessments.....	3.26
	Problem Statements	3.27
3.4.1	Flooding (Riverine and Flash).....	3.28
	Hazard Profile	3.28
	Vulnerability.....	3.42
	Community Comments on Hazard.....	3.46
	Problem Statement.....	3.47
3.4.2	Dam Failure.....	3.48
	Hazard Profile	3.48
	Vulnerability.....	3.65
	Community Comments on Hazard.....	3.66
	Problem Statement.....	3.66
3.4.3	Earthquakes	3.67
	Hazard Profile	3.67
	Vulnerability.....	3.71
	Community Comments on Hazard.....	3.72
	Problem Statement.....	3.72
3.4.4	Land Subsidence/Sinkholes	3.74
	Hazard Profile	3.74
	Vulnerability.....	3.76
	Community Comments on Hazard.....	3.78
	Problem Statement.....	3.78
3.4.5	Drought.....	3.79
	Hazard Profile	3.79
	Vulnerability.....	3.81
	Community Comments on Hazard.....	3.82
	Problem Statement.....	3.82
3.4.6	Extreme Temperatures	3.83

Hazard Profile	3.83
Vulnerability.....	3.86
Community Comments on Hazard.....	3.87
Problem Statement.....	3.87
3.4.7 Severe Thunderstorms Including High Winds, Hail, and Lightning	3.89
Hazard Profile	3.89
Vulnerability.....	3.95
Community Comments on Hazard.....	3.96
Problem Statement.....	3.96
3.4.8 Severe Winter Weather	3.97
Hazard Profile	3.97
Vulnerability.....	3.100
Community Comments on Hazard.....	3.101
Problem Statement.....	3.101
3.4.9 Tornado.....	3.103
Hazard Profile	3.103
Vulnerability.....	3.107
Community Comments on Hazard.....	3.109
Problem Statement.....	3.109
3.4.10 Wildfire	3.110
Hazard Profile	3.110
Vulnerability.....	3.114
Community Comments on Hazard.....	3.115
Problem Statement.....	3.115

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

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

This is an update of the previous Polk County Hazard Mitigation Plan adopted on March 12, 2018. According to the U.S. Census Bureau, the 2020 population of Polk County is 31,519. This is a 0.64% decrease from the 2010 population estimate of 31,317.

This chapter is divided into four main parts:

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

3.1 HAZARD IDENTIFICATION

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

The Plan profiles all natural hazards that can affect Polk County. These hazards were identified in the previous county plan as well as the 2018 Missouri State Plan. Natural hazards are naturally occurring climatological, hydrological, or geologic events that have a negative effect on people and the built environment. Natural hazards identified include:

- Riverine and Flash Flood
- Dam Failure
- Earthquake
- Land Subsidence/ Sinkholes
- Drought
- Extreme Temperatures
- Severe Thunderstorm/ High Winds/ Lightning/ Hail
- Severe Winter Weather
- Tornado
- Wildfire

3.1.1 Review of Existing Mitigation Plans

The 2018 State Plan also includes levee failure. Levee failure was excluded from the mitigation planning process as there are no mapped levees nor associated levee protected areas within or immediately upstream of Polk County.

Human-caused and technological hazards identified in the State Plan include:

- CBRNE Attack
- Civil Disorder
- Cyber Disruption
- Structural and Urban Fires
- Hazardous Materials
- Mass Transportation Accidents
- Nuclear Power Plants
- Public Health Emergencies/Environmental Issues
- Special Events
- Terrorism
- Utility Interruptions and System Failures

In Missouri, local plans customarily include only natural hazards, as only natural hazards are required by federal regulations to be included. The MPC agreed that human-caused and technological hazards are addressed in a Regional Homeland Security Oversight Committee (RHSOC) Threat and Hazard Identification Risk Assessment (THIRA) and that including only natural hazards would meet the needs of local entities participating in the plan update.

3.1.2 Review Disaster Declaration History

From 1965 to present, Polk County has experienced a number of severe storms, severe ice storms, and floods. Federal and/or state declarations may be granted when the severity and magnitude of an event surpasses the ability of a 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.

The Robert T. Stafford Disaster Relief and Emergency Assistance Act, (PL 100-707) requires that all requests for a declaration by the president must be made by the governor of the affected state. State and federal officials conduct a Preliminary Damage Assessment (PDA) to show that the disaster is of such severity and magnitude that effective response is beyond state and local capabilities. Based on the governor's request, the president may declare that a major disaster or emergency exists, thus activating federal programs to assist in the response and recovery effort. Not all programs are activated for every disaster. Some declarations will provide only individual assistance or public assistance, while others provide both.

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, type of damages, and institutions or industrial sectors affected.

Since 1965, Polk County has been included in 23 federal disaster declarations. The most recent occurred in 2020. **Table 3.1** provides a summary.

Table 3.1. FEMA Disaster Declarations that include Polk County, Missouri, 1965-Present

Disaster Number	Description	Declaration Date	Incident Period	Individual Assistance (IA) Public Assistance
995	Flooding, Severe Storm	Jul 9 th , 1993	Jun 10 – Oct 25, 1993	IA and PA
1253	Severe Storms, Flooding, and Tornadoes	Oct 14, 1998	Oct 4 – Oct 11, 1998	PA
1412	Severe Storms, Tornadoes, and Flooding	May 6 th , 2002	Apr 24 – Jun 10, 2002	IA and PA
1463	Severe Storms, Tornadoes, and Flooding	May 6 th , 2003	May 4 – May 30, 2003	IA and PA
1524	Severe Storms, Tornadoes, and Flooding	Jun 11, 2004	May 18 – May 31, 2004	IA
3232	Hurricane Katrina Evacuation	Sep 10 th , 2005	Aug 29 – Oct 1, 2005	PA
1728	Severe Storms and Flooding	Sep 21 st , 2007	Aug 19 – Aug 21, 2007	PA
3281	Severe Winter Storms	Dec 12 th , 2007	Dec 8 – Dec 15, 2007	PA
1676	Severe Winter Storms and Flooding	Jan 15, 2007	Jan 12 – Jan 22, 2007	PA
1749	Severe Storms and Flooding	Mar 19, 2008	Mar 17 – May 9, 2008	PA
1773	Severe Storms and Flooding	Jun 25, 2008	Jun 1 – Aug 13, 2008	PA
1847	Severe Storms, Tornadoes, and Flooding	Jun 19, 2009	May 8 – May 16, 2009	IA and PA

3303	Severe Winter Storm	Jan 30, 2009	Jan 26 – Jan 28, 2009	PA
1980	Severe Storms, Tornadoes, and Flooding	May 9, 2011	Apr 19 – Jun 6, 2011	PA
3317	Severe Winter Storm	Feb 3, 2011	Jan 31 – Feb 5, 2011	PA
1961	Severe Winter Storm and Snowstorm	Mar 23, 2011	Jan 31 – Feb 5, 2011	PA
4238	Severe Storms, Tornadoes, Straight-Line Winds, Flooding	Aug 7, 2015	May 15 – Jul 27, 2015	PA
3374	Severe Storms, Tornadoes, Straight-Line Winds, Flooding	Jan 2, 2016	Dec 22, 2015 – Jan 9, 2016	PA
4250	Severe Storms, Tornadoes, Straight-Line Winds, Flooding	Jan 21, 2016	Dec 23, 2015 – Jan 9, 2016	PA
4317	Severe Storms, Tornadoes, Straight-Line Winds, Flooding	Jun 2, 2017	Apr 28 – May 11, 2017	PA
3482	COVID-19	Mar 13, 2020	Jan 20, 2020 – Continuing	PA
4490	COVID-19 Pandemic	Mar 26, 2020	Jan 20, 2020 – Continuing	PA
4552	Severe Storms, Tornadoes, Straight-Line Winds, Flooding	Jul 9, 2020	Mar 3 – May 4, 2020	PA

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

3.1.3 Research Additional Sources

A variety of sources were researched for data on natural hazards. Primary sources included FEMA, State Emergency Management Agency (SEMA), National Centers for Environmental Information (NCEI) and National Oceanic and Atmospheric Administration (NOAA). The U.S. Geological Survey (USGS) and the Center for Earthquake Research and Information (CERI) were major sources for earthquake information. The Missouri Department of Natural Resources (MDNR) Dam Safety Division provided information concerning dams and the Missouri Department of Conservation (MDC). Other information sources included county officials; existing city, county, regional and state plans; and information from local officials. The additional sources of data on locations and past impacts of hazards in Polk County include:

- Missouri Hazard Mitigation Plans (2018)
- Previously approved Polk County Hazard Mitigation Plan
- Federal Emergency Management Agency (FEMA)
- Missouri Department of Natural Resources
- National Drought Mitigation Center Drought Reporter
- US Department of Agriculture's (USDA) Risk Management Agency Crop Insurance Statistics
 - National Agricultural Statistics Service (Agriculture production/losses)
- Data Collection Questionnaires completed by each jurisdiction
- State of Missouri GIS data
- Environmental Protection Agency
- Flood Insurance Administration
- Hazards US (Hazus)
- Missouri Department of Transportation
- Missouri Public Service Commission
- National Fire Incident Reporting System (NFIRS)
- National Oceanic and Atmospheric Administration's (NOAA) National Centers for Environmental Information (NCEI)
- County and local Comprehensive Plans to the extent available
- County Emergency Management

- County Flood Insurance Rate Map, FEMA
- Flood Insurance Study, FEMA
- SILVIS Lab, Department of Forest Ecology and Management, University of Wisconsin
- U.S. Army Corps of Engineers
- U.S. Department of Transportation
- United States Geological Survey (USGS)

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

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

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

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

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

3.1.4 Hazards Identified

The natural hazards that may impact or have affected Polk County are profiled below. All hazards do not necessarily affect every jurisdiction participating in the same way. This table was developed based off a hazard analysis and input from the participating jurisdictions. Levee Failure was omitted from this plan as this hazard is not present in the county. **Table 3.2** provides a summary of the jurisdictions that may be affected by each hazard. An “X” in the table indicates that jurisdiction is affected by the hazard, and a “-” indicates the hazard is not applicable to that jurisdiction.

Table 3.2. Hazards Identified for Each Jurisdiction

Jurisdiction	Dam Failure	Drought	Earthquake	Extreme Temperatures	Flooding (Riverine and Flash)	Land Subsidence/Sinkholes	Severe Winter Weather	Severe Thunderstorm	Tornado	Wildfire
Polk County	X	X	X	X	X	X	X	X	X	X
City of Bolivar	-	X	X	X	X	-	X	X	X	X
City of Fair Play	-	X	X	X	-	-	X	X	X	-
City of Humansville	-	X	X	X	X	-	X	X	X	X
City of Morrisville	-	X	X	X	X	X	X	X	X	-
City of Pleasant Hope	-	X	X	X	X	-	X	X	X	X
Village of Aldrich	-	X	X	X	X	-	X	X	X	-
Village of Flemington	-	X	X	X	X	-	X	X	X	-
Village of Halfway	-	X	X	X	X	-	X	X	X	-
Bolivar R-I School District	-	-	X	X	X	-	X	X	X	-
Fair Play R-II School District	-	-	X	X	X	-	X	X	X	-
Humansville R-IV School District	-	-	X	X	X	-	X	X	X	-
Marion C Early R-V School District	-	-	X	X	X	-	X	X	X	-
Pleasant Hope R-VI School District	-	-	X	X	X	-	X	X	X	-
Citizens Memorial Hospital District	-	-	X	-	X	-	X	X	X	-
Central Polk County Fire Protection District	-	X	X	X	X	-	X	X	X	X
Halfway Fire and Rescue Association	-	X	X	X	X	-	X	X	X	X
Morrisville Fire Protection District	-	X	X	X	X	-	X	X	X	X
Pleasant Hope Fire Protection District	-	X	X	X	X	-	X	X	X	X

3.1.5 Multi-Jurisdictional Risk Assessment

The risk assessment assesses each participating jurisdiction's vulnerability to each hazard. Many of the hazards identified in the risk assessment have the same probability of occurrence throughout Polk County. The hazards that vary across the county in terms of risk include dam failure, flash/riverine flood, wildfire, and sinkholes/land subsidence. These differences are detailed in each hazard profile under geographic location and vulnerability.

Polk County has a continental climate with mild winters and hot summers. The Cities of Bolivar and Humansville are the most urbanized, experiencing more construction and development than most other portions of the county. Naturally, the urbanized areas of Polk County have a greater density of important assets, which are more vulnerable to weather-related hazards. As these communities continue to grow and expand, their vulnerability to natural hazards will increase. This increase, however, can be mitigated through updated building codes and code enforcement, as well as land use planning.

Agricultural uses are primarily located in rural, unincorporated Polk County. These areas are especially vulnerable to hail damage or drought.

These capabilities and resources to mitigate the impact of natural hazards vary across jurisdictions in Polk County. These differences will be discussed in greater detail in the vulnerability sections of each hazard.

3.2 ASSETS AT RISK

This section assesses Polk County's population, structures, critical facilities and infrastructure, and other important assets that may be at risk of hazards. The inventory of assets for each jurisdiction were derived from parcel data from the Polk County Assessor, the Polk County Structures dataset downloaded from Missouri Spatial Data Information Service (MSDIS), and local jurisdiction data collection questionnaires. The Missouri Mitigation Viewer was also referenced to ensure that total counts looked accurate.

3.2.1 Total Exposure of Population and Structures

Missouri Spatial Data Information Service (MSDIS) data was used for structure points and paired with Polk County Assessors data for values.

Unincorporated County and Incorporated Cities

In the following three tables, population data is based on 2020 Census Redistricting data. Building counts and building exposure values are based on parcel data provided by the State of Missouri Geographic Information Systems (GIS) database and Polk County Assessor.

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

Table 3.3 shows the total population, building count, estimated value of buildings, estimated value of contents, and estimated total exposure to parcels for the unincorporated county and each participating jurisdiction. **Table 3.4** provides the building value exposures for the county and each city in the planning area broken down by usage type. Finally, **Table 3.5** provides the building count total for the county and each participating jurisdiction in the planning area broken out by building usage types (residential, commercial, industrial, and agricultural). To accommodate for mixed-use parcels, the data has been based on the lowest class of use for each parcel (e.g., residential-agricultural mixture is considered residential).

Table 3.3. Maximum Population and Building Exposure by Jurisdiction

Jurisdiction	2020 Population	Building Count	Building Exposure (\$)	Contents Exposure (\$)	Total Exposure (\$)
Unincorporated Polk County	18,141	7,896	\$1,279,176,000	\$731,189,000	\$2,010,365,000
City of Bolivar	10,679	4,303	\$1,074,321,000	\$693,421,000	\$1,767,742,000
City of Fair Play	422	222	\$32,874,000	\$18,954,000	\$51,828,000
City of Humansville	907	500	\$107,142,000	\$68,001,000	\$175,143,000
City of Morrisville	376	171	\$33,036,000	\$17,669,000	\$50,705,000
City of Pleasant Hope	657	286	\$44,439,000	\$25,030,000	\$69,469,000
Village of Aldrich	76	43	\$6,208,000	\$3,103,000	\$9,311,000

Village of Flemington	110	70	\$7,797,000	\$3,899,000	\$11,696,000
Village of Halfway	151	81	\$12,023,000	\$7,655,000	\$19,678,000
Totals	31,519	13,572	\$2,597,016,000	\$1,568,921,000	\$4,165,937,000

Source: Population estimates gathered from 2020 US Census Bureau American Community Survey Estimate. Building county, building exposure, and contents exposure gathered from Hazus.

Table 3.4. Building Values/Exposure by Usage Type

Jurisdiction	Residential (\$)	Commercial (\$)	Industrial (\$)	Agricultural (\$)	Total (\$)
Unincorporated Polk County	\$1,678,181,000	\$180,248,000	\$93,876,000	\$58,060,000	\$2,010,365,000
City of Bolivar	\$1,237,233,000	\$459,960,000	\$60,143,000	\$10,406,000	\$1,767,742,000
City of Fair Play	\$42,654,000	\$6,670,000	\$186,000	\$2,318,000	\$51,828,000
City of Humansville	\$120,980,000	\$44,226,000	\$5,513,000	\$4,424,000	\$175,143,000
City of Morrisville	\$46,111,000	\$3,354,000	\$506,000	\$734,000	\$50,705,000
City of Pleasant Hope	\$58,229,000	\$9,326,000	\$1,782,000	\$132,000	\$69,469,000
Village of Aldrich	\$9,311,000	\$0	\$0	\$0	\$9,311,000
Village of Flemington	\$11,696,000	\$0	\$0	\$0	\$11,696,000
Village of Halfway	\$15,079,000	\$922,000	\$3,677,000	\$0	\$19,678,000
Totals	\$3,219,474,000	\$704,706,000	\$165,683,000	\$76,074,000	\$4,165,937,000

Source: Hazus

Table 3.5. Building Counts by Usage Type

Jurisdiction	Residential	Commercial	Industrial	Agricultural	Total
Unincorporated Polk County	7,388	264	122	122	7,896
City of Bolivar	3,912	323	52	16	4,303
City of Fair Play	208	10	1	3	222
City of Humansville	449	40	7	4	500
City of Morrisville	159	7	2	3	171
City of Pleasant Hope	274	10	2	0	286
Village of Aldrich	43	0	0	0	43
Village of Flemington	70	0	0	0	70
Village of Halfway	77	2	2	0	81
Total	12,580	656	188	148	13,572

Source: Hazus

The number of enrolled students at the participating public school districts is provided in **Table 3.6** below. Additional information includes the number of buildings, building values (building exposure) and contents value (contents exposure).

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

Public School District	Enrollment	Building Count	Building Exposure (\$)	Contents Exposure (\$)	Total Exposure (\$)
Bolivar R-I	2,706	20	\$85,307,416	\$14,120,651	\$99,428,064
Fair Play R-II	327	8	\$14,165,794	\$2,742,743	\$16,638,267
Humansville R-IV	347	11	\$11,806,059	\$2,580,304	\$14,386,363
Marion C Early R-V	541	7	\$19,172,479	\$3,659,930	\$22,832,409
Pleasant Hope R-VI	722	7	\$28,060,000	\$4,573,000	\$32,633,000

Total	4,643	53	\$158,511,748	\$27,646,628	185,918,103
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Source: Missouri Department of Elementary and Secondary Education <https://apps.dese.mo.gov/MCDS/Visualizations.aspx?id=22>. The Building Exposure, Contents Exposure, and Total Exposure amounts come from the completed Data Collection Questionnaires from Public School Districts.

3.2.2 Critical and Essential Facilities and Infrastructure

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

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

Table 3.7 includes a summary of the inventory of critical and essential facilities and infrastructure in the planning area.

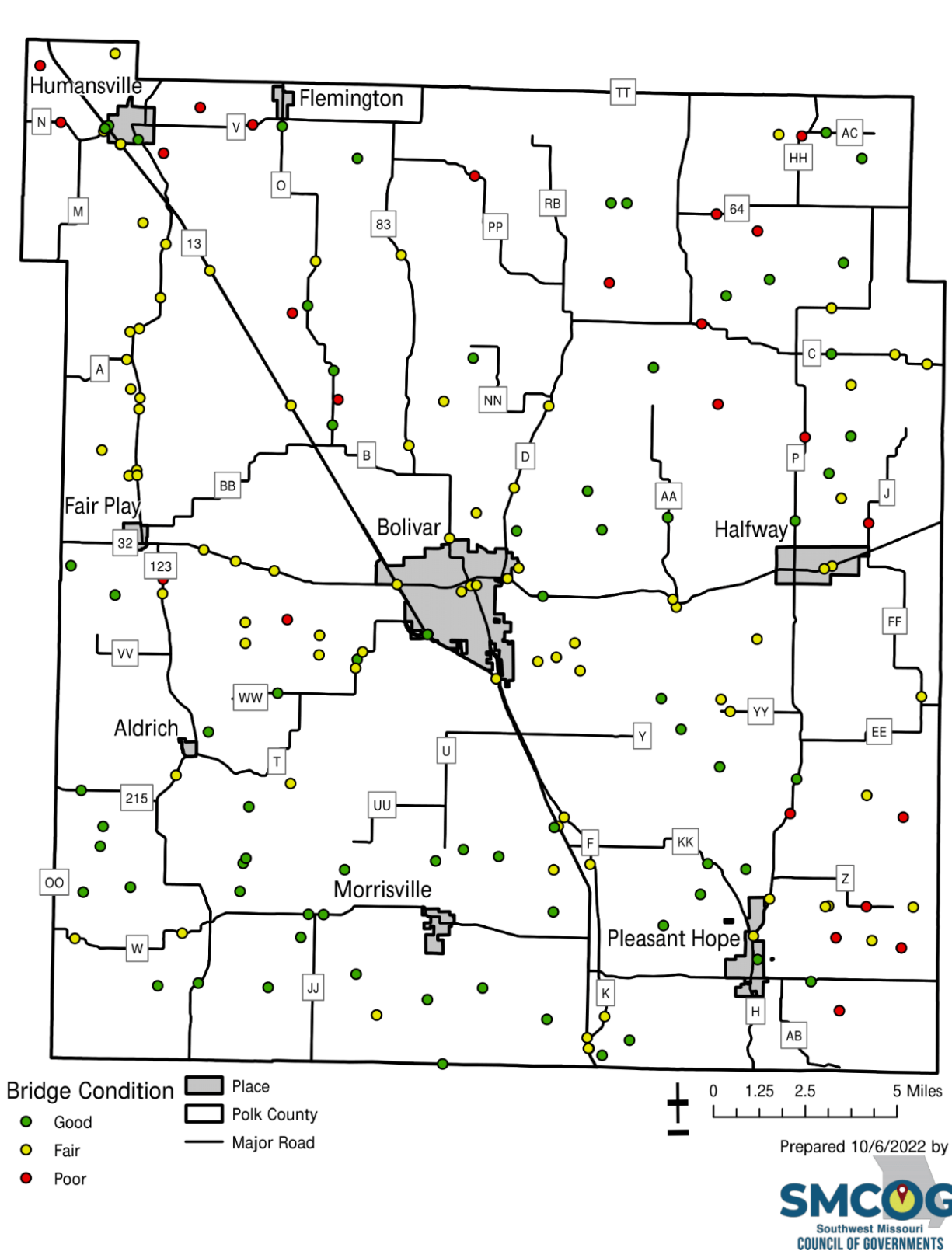
Table 3.7. Inventory of Critical/Essential Facilities and Infrastructure by Jurisdiction

Jurisdiction	Airport Facility	Bus Facility	Childcare Facility	Communications Tower	Electric Power Facility	Emergency Operations	Fire Service	Government	Housing	Shelters	Highway Bridge	Hospital/Health Care	Military	Natural Gas Facility	Nursing Homes	Police Station	Potable Water Facility	Rail	Sanitary Pump Stations	School Facilities	Stormwater Pump Stations	Tier II Chemical Facility	Wastewater Facility	TOTAL	
Unincorporated Polk County	1	2	-	1	-	1	21	-	7,552	-	180	1	-	-	-	5	-	-	-	22	-	-	-	1	7,787
City of Bolivar	-	-	-	-	-	1	4	-	4,441	-	5	1	-	-	-	2	-	-	-	8	-	-	-	-	4,462
City of Fair Play	-	-	-	-	-	-	1	-	286	-	-	-	-	-	-	1	-	-	-	2	-	-	-	-	290
City of Humansville	-	1	-	-	-	-	1	-	560	-	3	-	-	-	-	1	-	-	-	2	-	-	-	1	569
City of Morrisville	-	-	-	-	-	-	-	-	252	-	-	-	-	-	-	-	-	-	-	3	-	-	-	1	256
City of Pleasant Hope	-	-	-	-	-	-	1	-	306	-	2	-	-	-	-	1	-	-	-	3	-	-	-	1	314
Village of Aldrich	-	-	-	-	-	-	-	-	37	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	37
Village of Flemington	-	-	-	-	-	-	-	-	85	-	1	-	-	-	-	-	-	-	-	-	-	-	-	1	87
Village of Halfway	-	-	-	-	-	-	1	-	100	-	2	-	-	-	-	-	-	-	-	2	-	-	-	1	106
Totals	0	3	0	1	0	2	29	0	13,619	0	193	2	0	0	0	10	0	0	0	42	0	0	6	13,908	

Source: Hazus

Figure 3.1 is a map that shows the locations of bridges in Polk County included in the National Bridge Inventory (NBI) data set.

Figure 3.1. Polk County Bridges



3.2.3 Other Assets

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

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

Threatened and Endangered Species: **Table 3.8** displays Federally Threatened, Endangered, Proposed and Candidate Species in the county.

Table 3.8. Threatened and Endangered Species in Polk County

Common Name	Scientific Name	Status
Gray Bat	Myotis crissalensis	Endangered
Indiana Bat	Myotis sodalis	Endangered
Northern Long-eared Bat	Myotis septentrionalis	Endangered
Tricolored Bat	Perimyotis subflavus	Proposed Endangered
Niangua Darter	Etheostoma nianguae	Threatened
Ozark Cavefish	Amblyopsis rosae	Threatened
Spectaclecase (mussel)	Cumberlandia monodonta	Endangered
Monarch Butterfly	Danaus plexippus	Candidate
*No common name	Geococcyx minimum	Endangered

Source: US Fish and Wildlife Service <https://ipac.ecosphere.fws.gov/>

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

Table 3.9. Conservation Areas in Polk County

Park / Conservation Area	Location
Bolivar Forestry Office	412 S Killingsworth Ave, Bolivar.
Brush Creek Conservation Area	From Humansville, take Route N west 2 miles, then Farm Rd 7 north 0.8 miles.
La Petite Gemme Prairie Conservation Area	From Bolivar, take South Springfield Avenue south across Highway 13, then E 473 rd Road west 1 mile.
Pleasant Hope Conservation Area	From Pleasant Hope, take Route H south 1.75 miles, then west on Farm Road 564.
Pomme De Terre Lake Management Lands	Approximate 9 miles east of Humansville.

Sentinel Conservation Area	From Pittsburg, take Highway 64 south 4 miles, then County Road 328 west 1 mile, then turn north, the road becomes County Road 167. Take County Road 167 north about 0.75 mile, then turn west on County Road 320. This road turns into County Road 163 for about 0.50 mile. Continue on County Road 163 for about 0.50 mile to where it becomes County Road 325. Go about 0.25 mile to the area welcome sign.
Stockton Lake and Corps of Engineer Lands	Approximately 7 miles west of Bolivar
Sunset Park Access	From Bolivar, take Highway 13 south 1.50 miles, then Route Y east 4.50 miles, then E 475th Road north and east to the access entrance.
Twenty-Five Mile Prairie Conservation Area	E 330 th Road from Humansville, take Business Highway 123 south 0.50 mile, then Gravel Road E330 east 2 miles.

Source: Missouri Department of Conservation <https://mdc.mo.gov/discover-nature/places>

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.

There are four registered historic properties in Polk County. **Table 3.10** provides a summary.

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

Property	Address	City	Date Listed
Bolivar Public Library	120 E. Jackson St.	Bolivar	7/17/2003
First National Bank	103 E. Broadway	Bolivar	10/16/2013
North Ward School	201 W. Locust St	Bolivar	7/14/2011
Dimmit, George, Memorial Hospital	102 S. Bolivar Rd.	Humansville	3/12/2012

Source: National Park Service Register of Historic Places <https://www.nps.gov/subjects/nationalregister/index.htm>

Agriculture: **Table 3.11** provides an agricultural overview for Polk County.

Table 3.11. Agriculture in Polk County

	2017	% change since 2012
Number of farms	1,562	+4
Land in farms (acres)	359,464	+7
Average size of farm (acres)	230	+3
Totals		
Market value of products sold	99,357,000	+17
Government payments	613,000	-29
Farm-related income	2,327,000	-5
Total farm production expenses	77,380,000	-4
Net cash farm income	24,917,000	+203
Per farm average		
Market value of products sold	63,609	+12
Government payments	3,669	-1
Farm-related income	4,126	-15
Total farm production expenses	49,539	-7
Net cash farm income	15,952	+192

Source: 2017 Census of Agriculture, https://www.nass.usda.gov/Publications/AgCensus/2017/Online_Resources/County_Profiles/Missouri/index.php

Economic Resources: **Table 3.12** provides a summary of the major non-government employers in Polk County.

Table 3.12. Major Non-Government Employers in Polk County

Employer Name	Main Location	Product or Service	Employees
Citizens Memorial Hospital	Bolivar	Healthcare	1,500+
Southwest Baptist University	Bolivar	Education	383
Big Spring Care Center for Rehab and Healthcare	Humansville	Healthcare	270
Teters Floral Products Inc	Bolivar	Florists	225
Walmart Supercenter	Bolivar	Department Store	150
Snow Bluff Ski Area	Brighton	Skiing Facilities	147
Good Samaritan Boys Ranch	Brighton	Individual and Family Services	120

Source: EMSI, date accessed 3/6/2023

3.3 LAND USE AND DEVELOPMENT

3.3.1 Development Since Previous Plan Update

Table 3.13 provides population growth statistics for participating municipalities in Polk County.

Table 3.13. Polk County Population Growth, 2010-2020

Jurisdiction	Total Population 2010	Total Population 2020	2010-2020 # Change	2010-2020 % Change
Polk County	30,729	32,031	1,302	+4.24%
City of Bolivar	10,222	11,000	778	+7.61%
City of Fair Play	461	532	71	+15.40%
City of Humansville	1,109	1,391	282	+25.43%
City of Morrisville	427	581	154	+36.07%
City of Pleasant Hope	522	668	146	+27.97%
Village of Aldrich	104	66	-38	-36.54%
Village of Flemington	74	71	-3	-4.05%
Village of Halfway	182	140	-42	-23.08%

Source: US Census Bureau American Community Survey 2020 5 Year Estimates <https://data.census.gov/>

Population growth or decline is generally accompanied by increases or decreases in the number of housing units. Increases in population add to the built environment and increase risk and exposure to hazard events. Table 3.14 provides the change in numbers of housing units in Polk County from 2010 to 2020.

Table 3.14. Change in Housing Units, 2010-2020

Jurisdiction	Housing Units 2010	Housing Units 2020	2010-2020 # Change	2010-2020 % Change
Polk County	13,058	13,619	561	+4.30%
City of Bolivar	4,129	4,441	312	+7.56%
City of Fair Play	263	286	23	+8.75%
City of Humansville	479	560	81	+16.91%
City of Morrisville	206	252	46	+22.33%
City of Pleasant Hope	260	306	46	+17.69%
Village of Aldrich	53	37	-16	-30.19%
Village of Flemington	59	85	26	+44.07%
Village of Halfway	74	100	26	+35.14%

Source: US Census Bureau American Community Survey 2020 5 Year Estimates <https://data.census.gov/>

From 2010 to 2020, Polk County as a whole had a population increase of 4.24% and a 4.3% increase in the total number of housing units. The growth rate is not expected to change drastically in the near future.

Figures 3.2 and 3.3 are population density maps depicting block group population for 2010 and 2020.

Figure 3.2. Polk County Population Density (2010)

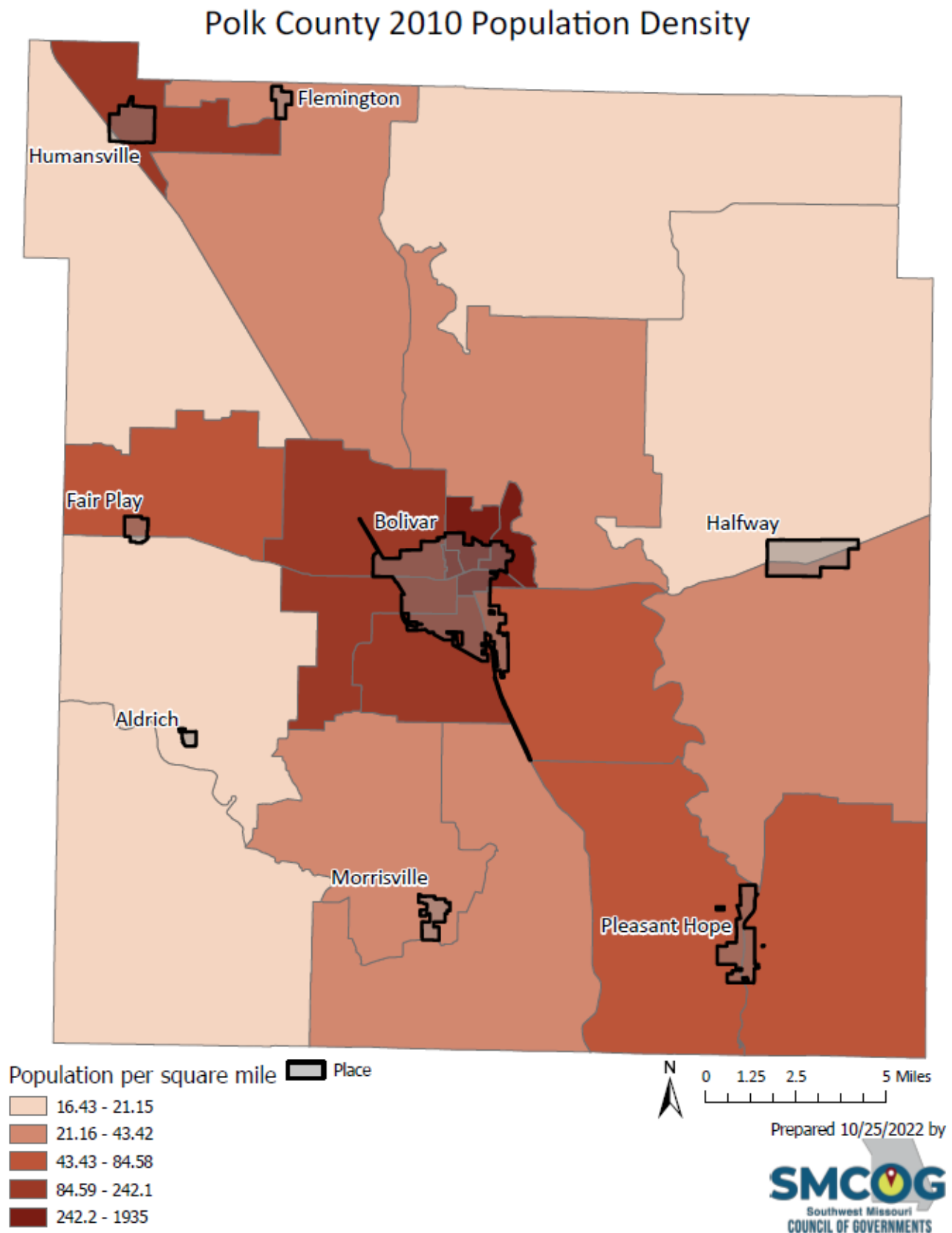
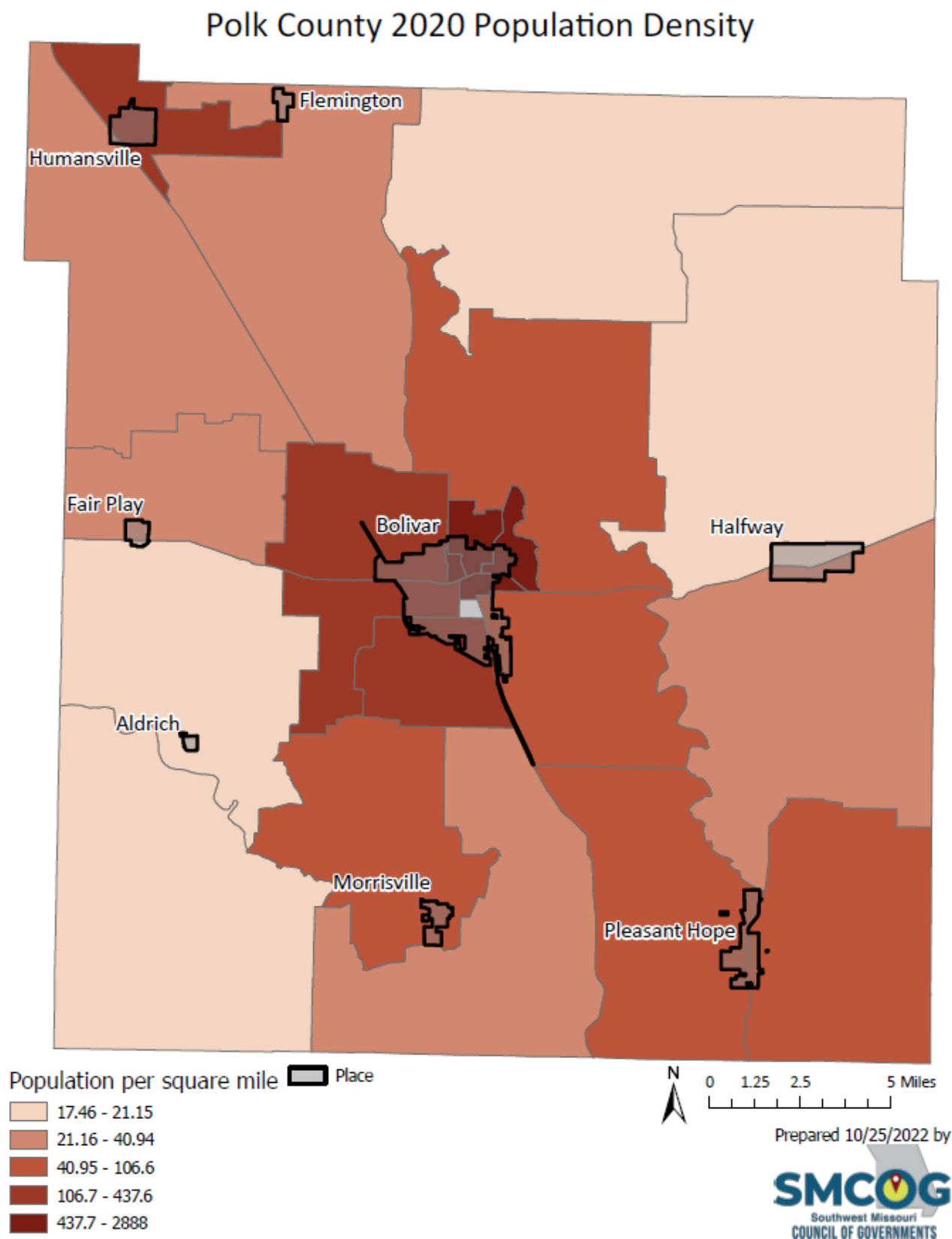


Figure 3.3. Polk County Population Density (2020)



The following section describes each participating jurisdiction's development since the previous plan update five years ago as indicated by their questionnaires. While none of this development took place in a known hazard area, new development, by its very nature, increases a community's total exposure and thus increases the overall vulnerability to hazards. Additionally, general construction trends are less equitable towards vulnerable populations (including the elderly, those under 5 years old, and low-income individuals).

Polk County

Polk County did not indicate any new significant development since the previous plan update.

City of Bolivar

Since the previous plan update, the city built a new BreakTime convenience store, Flat Creek restaurant, and multiple subdivisions.

City of Fair Play

A new Dollar General and County Corner Store were both added since the previous plan update.

City of Humansville

Humansville did not indicate any new development since the previous plan update.

City of Morrisville

Morrisville indicated approximately ten new homes and a Dollar General were built in the last five years.

City of Pleasant Hope

A new subdivision was added, and improvements were made to existing subdivisions. The city also indicated one new eatery (Amore Pizza House), three new retail locations (Longhorn Car Sales, Fancy Pantz Boutique, and Dollar General), and one commercial packing plant (Missouri Prime Beef Plant).

Village of Aldrich

The village did not indicate any new significant development since the previous plan update.

Village of Flemington

The village did not indicate any new significant development since the previous plan update.

Village of Halfway

The village did not indicate any new significant development since the previous plan update.

Bolivar R-I

The middle school was expanded, a new Early Childhood Learning Center was built, an additional track facility was built, and renovations were done on other existing facilities.

Fair Play R-II

The district built a new gym lobby, which includes new restrooms, a weight room, and a large space for meetings or events.

Humansville R-IV

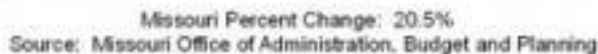
Multiple renovations took place over the previous five years including the replacement of glass/outdate exterior doors, renovation of middle school hallway in 1934 building, softball and baseball field renovations, baseball field lighting system, demo of building near baseball field, construction of equipment shed, kitchen window replacement, buzzer system entrance, rekey of campus, a new camera system was installed, new alarm keypads, and removal of tile.

The district indicated that a new FEMA shelter was constructed on campus.

The district completed construction of an indoor sports complex and conducted consistent renovations/updates to all buildings.

Polk County is expected to see an increase in population in the next decade. **Figure 3.4** shows the expected population change for each county in the state of Missouri.

Projected Percent Change in Population, 2000 to 2030



3.22

presumptions were made for future development based on past trends.

Polk County

Polk County would like to incorporate a safe room in all future government buildings.

City of Bolivar

The city indicated that they do not expect to see any new significant development over the next five years.

City of Fair Play

The city has plans for several projects to repair/upgrade the sewer system, including lift station rehabilitation and well house electrical/piping upgrades. They would also like to construct a safe room open to residents.

City of Humansville

The city plans to add a new park restroom.

City of Morrisville

The city plans to renovate the entire water system, including the installation of new water lines. They would also like to develop a comprehensive plan and include safe rooms in all future government buildings.

City of Pleasant Hope

The city wants to focus on adding new single-family homes. There is some talk of two new apartment complexes, but nothing is final yet.

Village of Aldrich

The village did not indicate that there is any planned construction for the next five years.

Village of Flemington

The village did not indicate that there is any planned construction for the next five years.

Village of Halfway

The village did not indicate that there is any planned construction for the next five years.

Bolivar R-I

The district has plans for a classroom expansion at Bolivar Intermediate School and general improvements at Bolivar High School/Primary School. They would also like to include the construction of a safe room in any new school facilities, including the Multipurpose Building.

Fair Play R-II

The district does not currently have any plans for new construction over the next five years.

Humansville R-IV

The district plans to construct a new gymnasium that will connect to the existing building.

Marion C Early R-V

The district does not currently have any plans for new construction over the next five years.

Pleasant Hope R-VI

The district plans to address roofing issues at both the elementary and high school buildings as well as add bathrooms to an elementary classroom and high school nurse's office. Brick maintenance, asbestos removal, and construction of a new paper/chemical storage building are also planned.

Citizens Memorial Hospital District

The district plans to install a backup generator at the planned hospital patient tower.

Central Polk County Fire Protection District

The district plans to install a backup generator to service the fire station.

Halfway Fire & Rescue Association

The district plans to install a backup generator to service the fire station.

Morrisville Fire Protection District

The district plans to install a backup generator to service the fire station.

Pleasant Hope Fire Protection District

The district plans to include safe room construction in all future fire station facilities.

3.4 HAZARD PROFILES, VULNERABILITY, AND PROBLEM STATEMENTS

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

Hazard Profiles

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

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

- **Hazard Description:** This section consists of a general description of the hazard and the types of impacts it may have on a community or school/special district.
- **Geographic Location:** This section describes the geographic areas in the planning area that are affected by the hazard. Where available, 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.
- **Strength/Magnitude/Extent:** This includes information about the strength, magnitude, and extent of a hazard. For some hazards, this is accomplished with description of a value on an established scientific scale or measurement system, such as an EF2 tornado on the Enhanced Fujita Scale. Strength, magnitude, and extent can also include the speed of onset and the duration of hazard events. Describing the strength/magnitude/extent of a hazard is not the same as describing its potential impacts on a community. Strength/magnitude/extent defines the characteristics of the hazard regardless of the people and property it affects.
- **Previous Occurrences:** This section includes available information on historic incidents and their impacts. Historic event records form a solid basis for probability calculations.
- **Probability of Future Occurrence:** The frequency of recorded past events is used to estimate the likelihood of future occurrences. Probability is determined by dividing the number of recorded events by the number of years of available data and multiplying by 100. This gives the percent chance of the event happening in any given year. For events occurring more than once annually, the probability is reported as 100% in any given year, with a statement of the average number of events annually. For hazards such as drought that may have gradual onset and extended duration, probability is based on the number of months in drought in a given time-period and expressed as the probability for any given month to be in drought.
- **Changing Future Conditions Considerations:** Changing future conditions are also considered, including the effects of long-term changes in weather patterns and climate on identified hazards.

Vulnerability Assessments

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

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

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

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

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

Following the hazard profile for each hazard will be the vulnerability assessment. The vulnerability assessment further defines and quantifies populations, buildings, critical facilities, and other community assets at risk to damages from natural hazards. The vulnerability assessments should be based on the best available data, including data collected from the 2018 State Hazard Mitigation Plan.

The vulnerability assessments in this 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
- Other sources as cited.

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

- **Vulnerability Overview:** An overall summary of each jurisdiction's vulnerability to the identified hazards. The overall summary of vulnerability identifies structures, systems, populations, or other community assets as defined by the community that are susceptible to damage and loss for hazard events.
- **Potential Losses to Existing Development:** Includes the types and numbers of building and critical facilities
- **Previous and Future Development:** This section will include information on how changes in development have impacted the community's vulnerability to this hazard. It also includes a description of how changes in development that occurred in known hazard prone areas since the previous plan have increased or decreased the community's vulnerability, and any anticipated future development in the county, and how that would impact hazard risk in the County.
- **Hazard Summary by Jurisdiction:** For hazard risks that vary by jurisdiction, this section will provide an overview of the variation and the factual basis for that variation. For example, a

community that has adopted more recent building codes and constructed safe rooms would be less vulnerable to the impact of tornados.

Problem Statements

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

3.4.1 Flooding (Riverine and Flash)

Hazard Profile

Hazard Description

A flood is partial or complete inundation of normally dry land areas. Riverine flooding is defined as the overflow of rivers, streams, drains, and lakes due to excessive rainfall, rapid snowmelt, or ice. There are several types of riverine floods, including headwater, backwater, interior drainage, and flash flooding. 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 **Section 3.4.2**. It will not be addressed in this section.

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

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

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

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

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

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

Geographic Location

Riverine flooding is most likely to occur in Special Flood Hazard Areas (SFHAs) where the 100-year floodplain has been mapped.

According to NCEI storm event data from 2003-2022, there were 122 flash flood events and 53 flood events recorded in the county. These events are typically regional in nature; however, flash floods can be contained to one area, specifically portions of highways or roads. **Figure 3.5** through **Figure 3.13** are mapped SFHAs for participating jurisdictions and unincorporated Polk County, with critical facilities identified.

Figure 3.5. Polk County SFHA

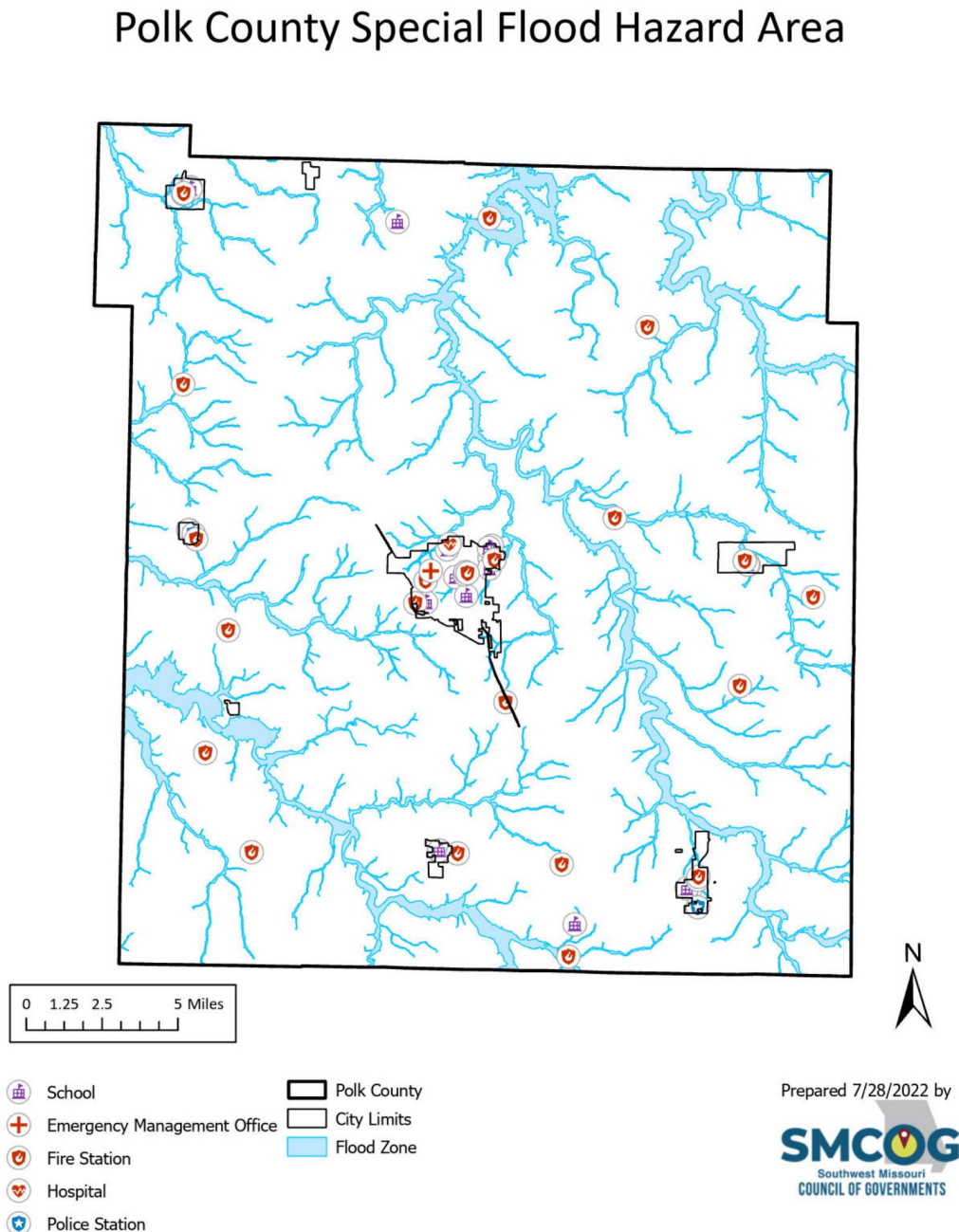


Figure 3.6. City of Bolivar SFHA

Bolivar Special Flood Hazard Area

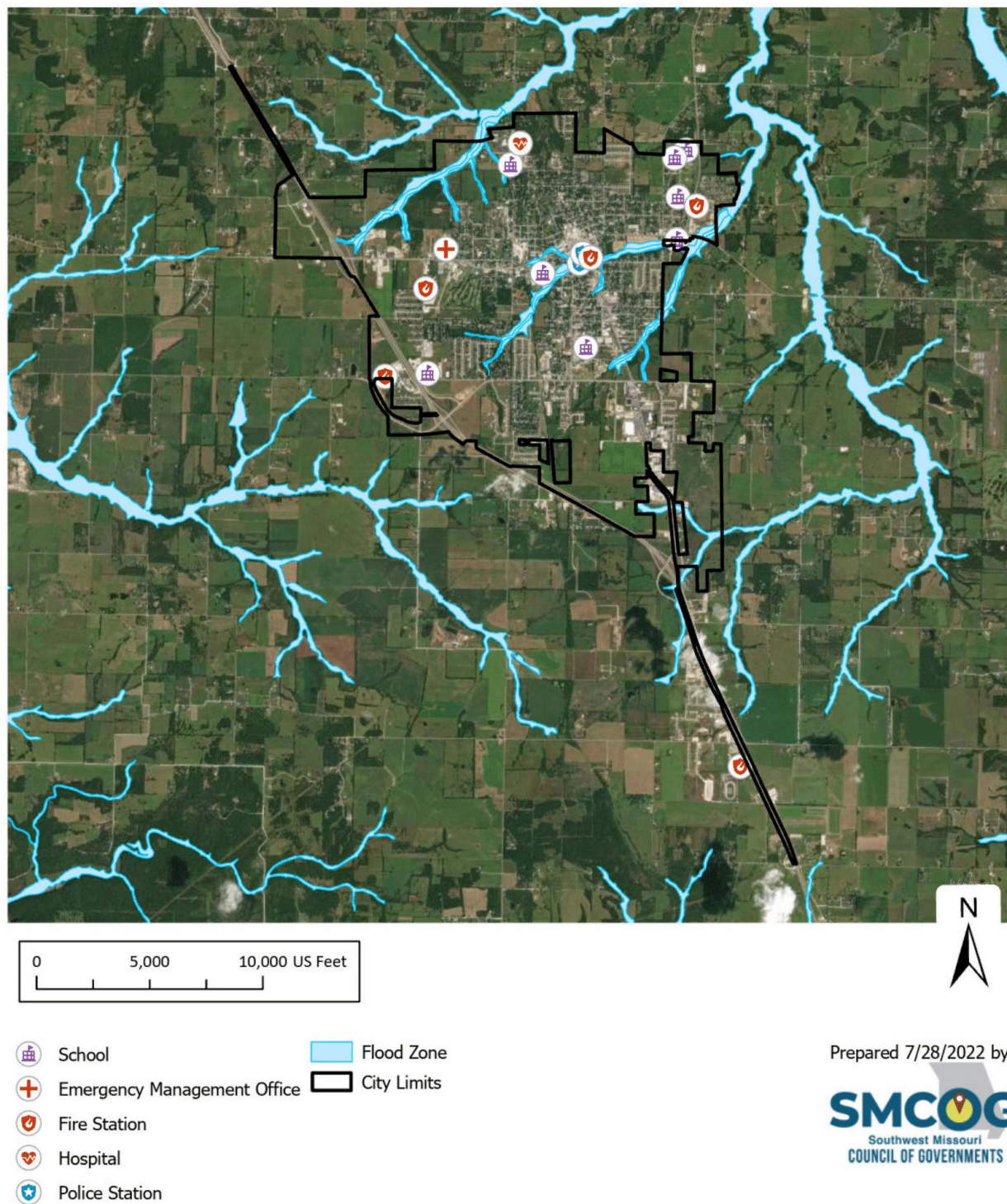


Figure 3.7. City of Fair Play SFHA

Fair Play Special Flood Hazard Area

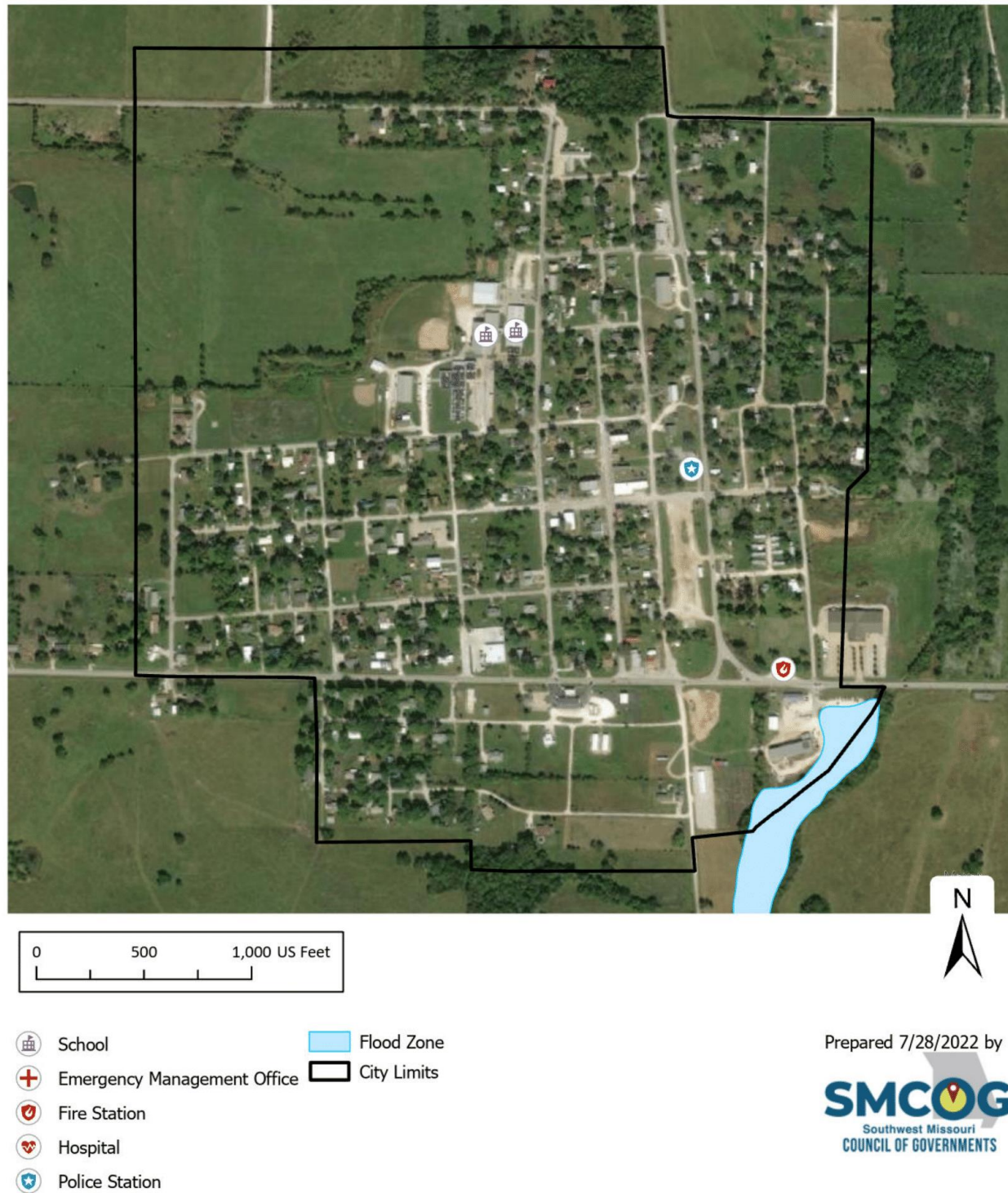


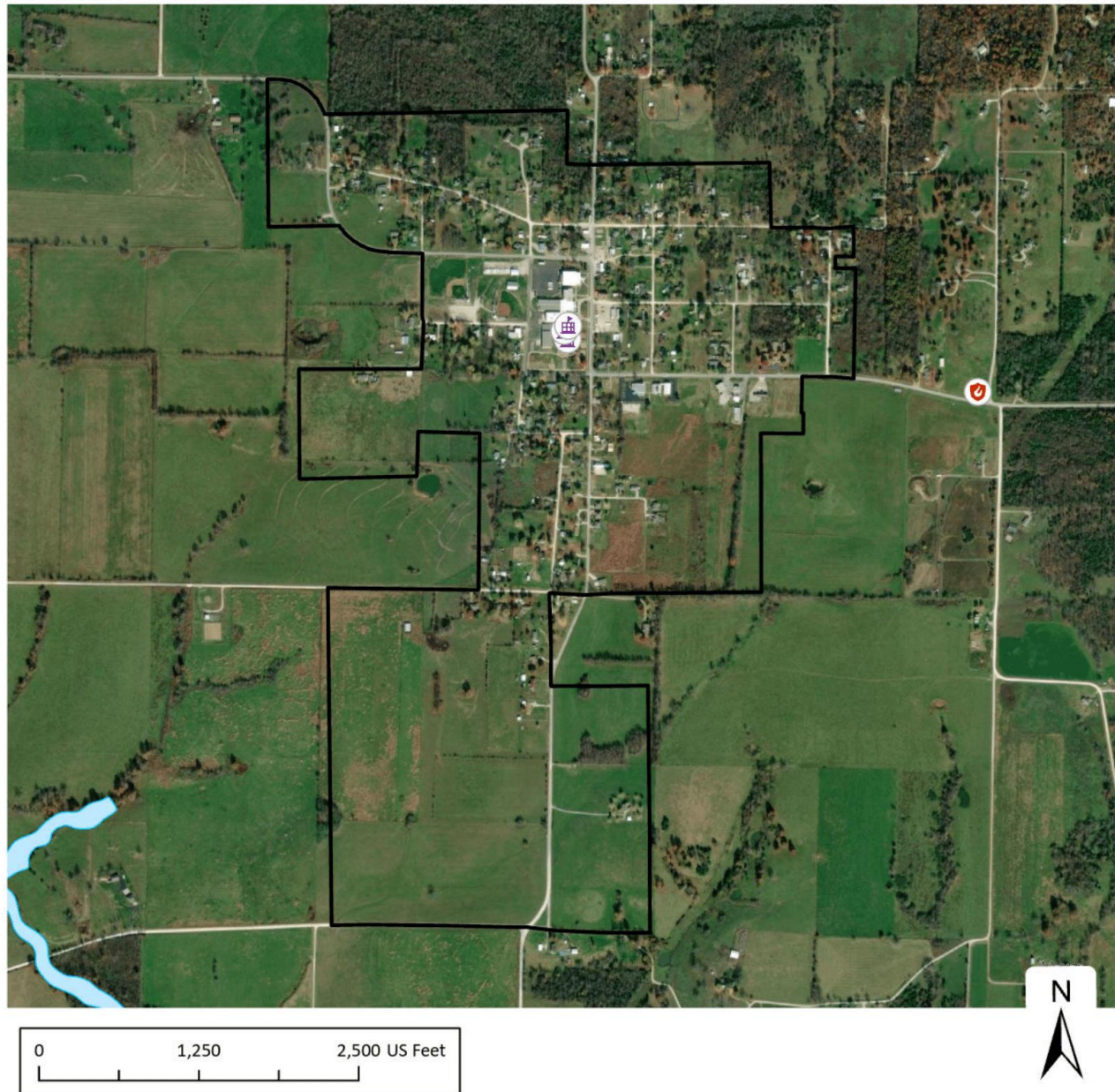
Figure 3.8. City of Humansville SFHA

Humansville Special Flood Hazard Area



Figure 3.9. City of Morrisville SFHA

Morrisville Special Flood Hazard Area



-  School
-  Emergency Management Office
-  Fire Station
-  Hospital
-  Police Station
-  Flood Zone
-  City Limits

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Figure 3.10. City of Pleasant Hope SFHA

Pleasant Hope Special Flood Hazard Area

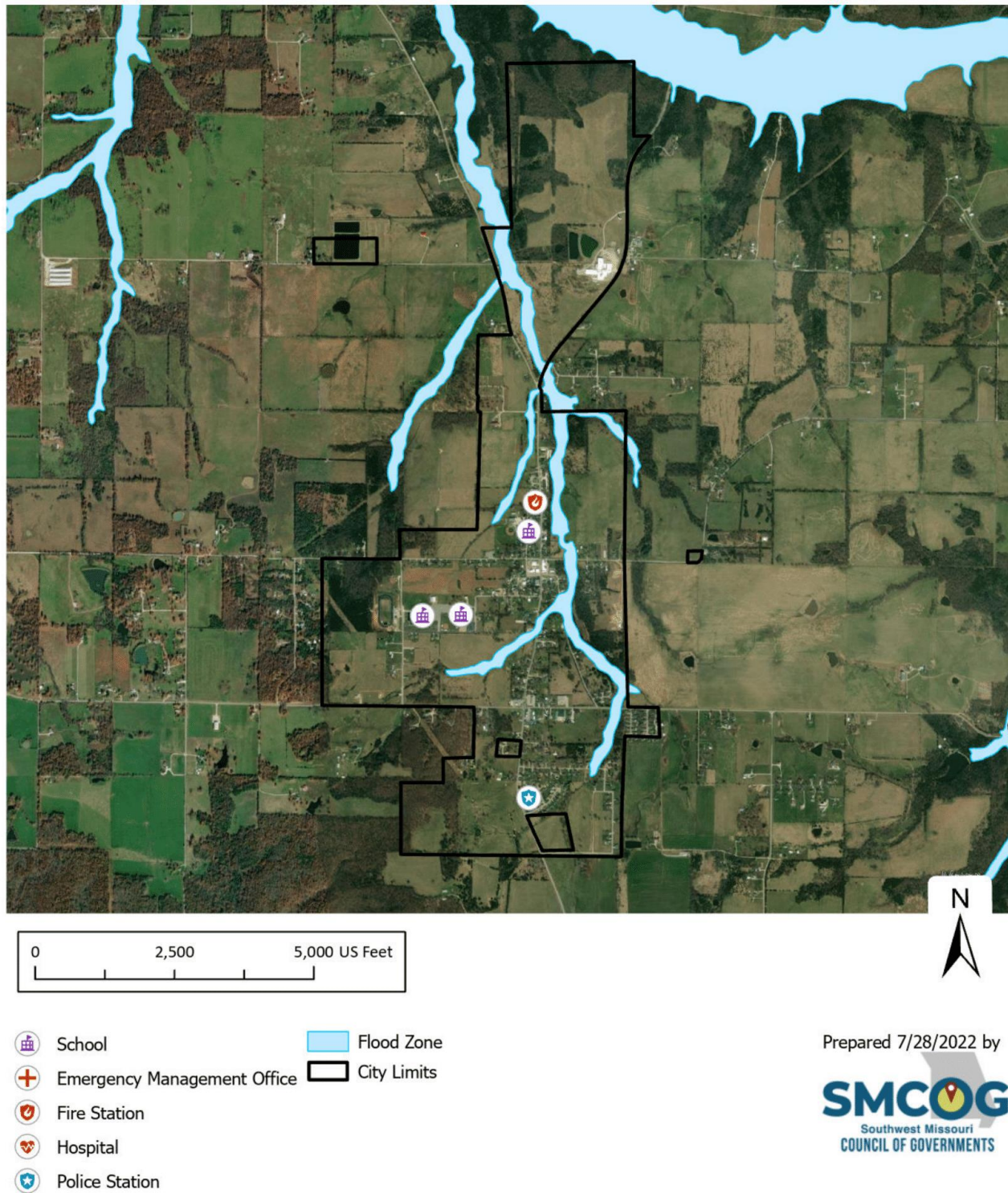


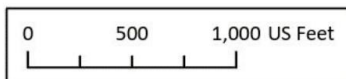
Figure 3.11. Village of Aldrich SFHA

Aldrich Special Flood Hazard Area



Figure 3.12. Village of Flemington SFHA

Flemington Special Flood Hazard Area



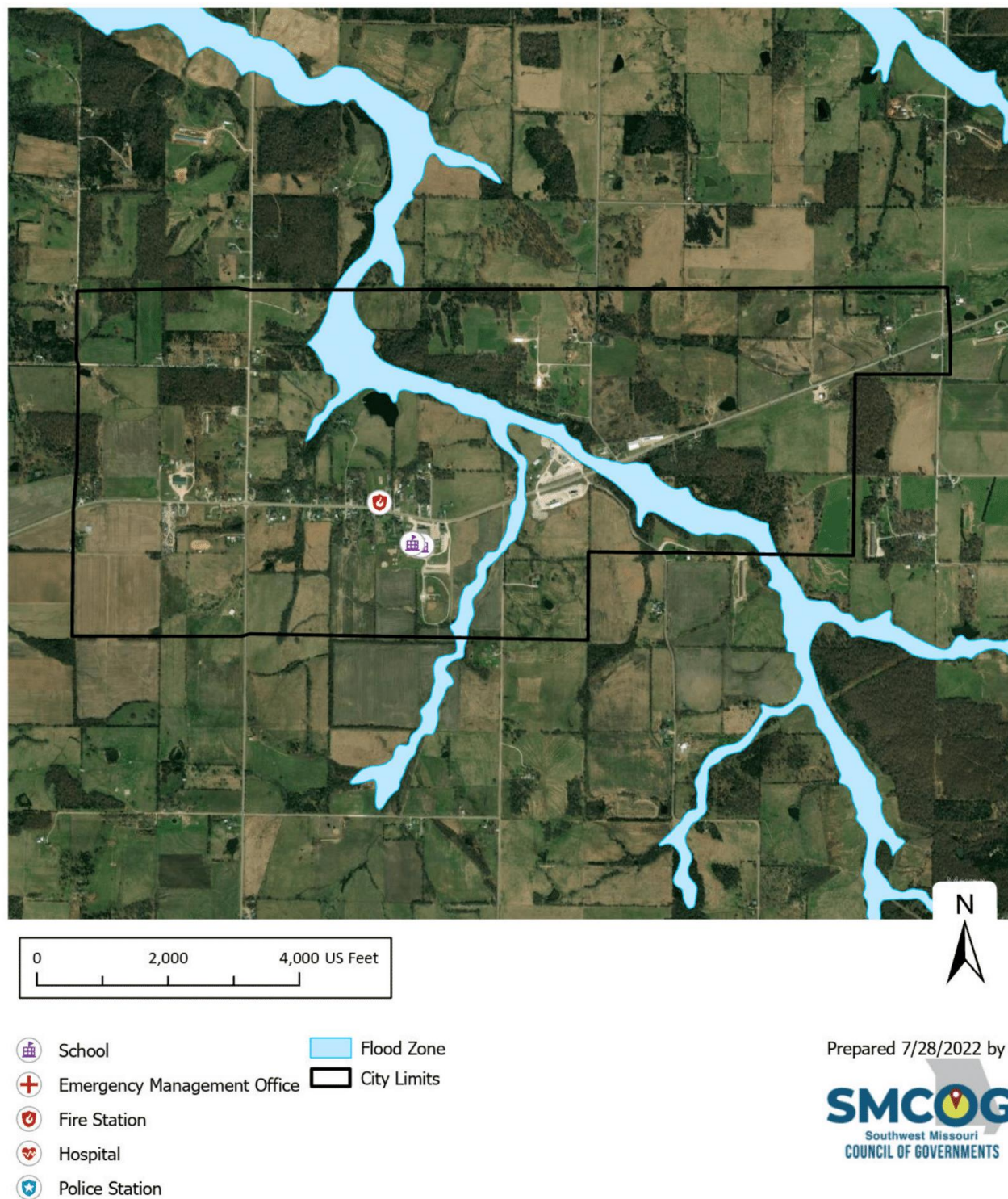
- | | |
|---|---|
|  School |  Flood Zone |
|  Emergency Management Office |  City Limits |
|  Fire Station | |
|  Hospital | |
|  Police Station | |

Prepared 7/28/2022 by



Figure 3.13. Village of Halfway SFHA

Halfway Special Flood Hazard Area



Flash flooding events pose the most pervasive hazard of the two flood types in the county due to permeability of soils, slopes, increasing urban development, and an extensive network of streams and rivers. Sustained rainfall or downpours at the rate of one inch per hour have caused street flooding in incorporated areas and made a significant number of low-water crossings impassable. Flash flooding occurs in the floodplain while low-lying areas in all jurisdictions are susceptible to flash floods outside the 100-year floodplain. They also occur in areas without adequate drainage to carry away the amount of water that falls during intense rainfall events.

The NCEI storm event data lists flash flood events according to the nearest community or place. Most of these events cover larger areas than the smaller geographic areas reported in the data. Although some events may not be inside the corporate limits of the community identified in the narrative, they are in such proximity that the community named would be the most affected by impassible roads. It is safe to assume that numerous low water crossings would be impacted by heavy rains that exacerbate flash flooding across the county. In addition, multiple records are related to the same event and vice versa.

Table 3.15 shows all flood and flash flood events within the county.

Table 3.15. Polk County NCEI Flood Events by Location, 2003-2022

Location	Number of Flood Events	Number of Flash Flood Events
Polk County	38	78
City of Bolivar	2	11
City of Fair Play	0	1
City of Humansville	1	14
City of Morrisville	0	0
City of Pleasant Hope	10	11
Village of Aldrich	0	2
Village of Flemington	2	3
Village of Halfway	0	2
Total	53	122

Source: National Centers for Environmental Information <https://www.ncdc.noaa.gov/stormevents/>

Strength/Magnitude/Extent

Missouri has a long and active history of flooding over the past century, according to the 2018 State Hazard Mitigation Plan. Flooding along Missouri's major rivers generally results in slow-moving disasters. River crest levels are forecast several days in advance, allowing communities downstream sufficient time to take protective measures, such as sandbagging and evacuations. Nevertheless, floods exact a heavy toll in terms of human suffering and losses to public and private property. By contrast, flash flood events in recent years have caused a higher number of deaths and major property damage in many areas of Missouri.

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

National Flood Insurance Program (NFIP) Participation

Table 3.16 provides details on NFIP participation for communities in Polk County. **Table 3.17** shows the number of policies in force, amount of insurance in force, number of closed losses, and total payments, where applicable.

Table 3.16. NFIP Participation in Polk County

Community ID #	Community Name	NFIP Participant (Y/N/Sanctioned)	Current Effective Map Date	Regular-Emergency Program Entry Date	Sanction Date
290825	Polk County	N	09/17/10	N/A	11/02/84
290299	City of Bolivar	Y	09/17/10	06/15/88	N/A
N/A	City of Fair Play	N	N/A	N/A	N/A
290715	City of Humansville	N	09/17/10	N/A	07//11/76
N/A	City of Morrisville	N	N/A	N/A	N/A
290537	City of Pleasant Hope	Y	09/17/10	01/29/08	N/A
N/A	Village of Aldrich	N	N/A	N/A	N/A
N/A	Village of Flemington	N	N/A	N/A	N/A
290955	Village of Halfway	N	09/17/10	N/A	08/18/05

Source: NFIP Community Status Book <https://www.fema.gov/flood-insurance/work-with-nfip/community-status-book>

Table 3.17. NFIP Policy and Claim Statistics as of January 2023

Community Name	Policies in Force	Insurance in Force	Closed Losses	Total Payments
Polk County	-	-	-	-
City of Bolivar	8	\$2,467,000	8	\$9,241.68
City of Fair Play	-	-	-	-
City of Humansville	-	-	-	-
City of Morrisville	-	-	-	-
City of Pleasant Hope	1	\$231,000	1	\$22,027.69
Village of Aldrich	-	-	-	-
Village of Flemington	-	-	-	-
Village of Halfway	-	-	-	-
Total	9	\$2,698,000	9	\$31,269.37

Source: FEMA

Each of the jurisdictions that participate in the NFIP will need to adopt by local regulation “minimum NFIP floodplain management criteria”. These criteria, for voluntary participants, are further described in 44 CFR § 60.3, as follows:

“(b) When the Federal Insurance Administrator has designated areas of special flood hazards (A zones) by the publication of a community's FHBM or FIRM, but has neither produced water surface elevation data nor identified a floodway or coastal high hazard area, the community shall:

- 1. Require permits for all proposed construction and other developments including the placement of manufactured homes, within Zone A on the community's FHBM or FIRM;*
- 2. Require the application of the standards in paragraphs (a) (2), (3), (4), (5) and (6) of this section to development within Zone A on the community's FHBM or FIRM;*
- 3. Require that all new subdivision proposals and other proposed developments (including proposals for manufactured home parks and subdivisions) greater than 50 lots or 5 acres, whichever is the lesser, include within such proposals base flood elevation data;*
- 4. Obtain, review and reasonably utilize any base flood elevation and floodway data available from a Federal, State, or other source, including data developed pursuant to paragraph (b)(3) of this section, as criteria for requiring that new construction, substantial improvements, or other development in Zone A on the community's FHBM or FIRM meet the standards in paragraphs (c)(2), (c)(3), (c)(5), (c)(6), (c)(12), (c)(14), (d)(2) and (d)(3) of this section;*
- 5. Where base flood elevation data are utilized, within Zone A on the community's FHBM or FIRM:*
 - a. Obtain the elevation (in relation to mean sea level) of the lowest floor (including basement) of all new and substantially improved structures, and*
 - b. Obtain, if the structure has been floodproofed in accordance with paragraph (c)(3)(ii) of this section, the elevation (in relation to mean sea level) to which the structure was floodproofed, and*

- c. *Maintain a record of all such information with the official designated by the community under § 59.22 (a)(9)(iii);*
6. *Notify, in riverine situations, adjacent communities and the State Coordinating Office prior to any alteration or relocation of a watercourse, and submit copies of such notifications to the Federal Insurance Administrator;*
7. *Assure that the flood carrying capacity within the altered or relocated portion of any watercourse is maintained;*
8. *Require that all manufactured homes to be placed within Zone A on a community's FHBM or FIRM shall be installed using methods and practices which minimize flood damage. For the purposes of this requirement, manufactured homes must be elevated and anchored to resist flotation, collapse, or lateral movement. Methods of anchoring may include, but are not to be limited to, use of over-the-top or frame ties to ground anchors. This requirement is in addition to applicable State and local anchoring requirements for resisting wind forces."*

The latest FIRMs have been adopted by both the City of Bolivar and the City of Pleasant Hope. Bolivar's floodplain management regulations and enforcement, including information on substantial improvements/substantial damages, can be found at <https://ecode360.com/27920030> and Pleasant Hope's can be found at <https://tinyurl.com/PlesantHopeFloodplanOrdinance>. Lacy Hamby is the Floodplain Administrator for Bolivar and Lynn Esser is the Floodplain Administrator for Pleasant Hope.

It should be noted that his plan was developed prior to the release of FEMA's Local Mitigation Planning Policy Guide, Effective April 19, 2023. Future hazard mitigation plan update cycles will require implementation of these policies, as required under 44 CFR 201.6(c)(3)(ii).

Repetitive Loss

Repetitive Loss Properties are those properties with at least two flood insurance payments of \$1,000 or more in a 10-year period. According to the Flood Insurance Administration, there are no Repetitive Loss properties in Polk County.

Severe Repetitive Loss (SRL)

A SRL property is defined it as a single family property (consisting of one-to-four residences) that is covered under flood insurance by the NFIP; and has (1) incurred flood-related damage for which four or more separate claims payments have been paid under flood insurance coverage with the amount of each claim payment exceeding \$5,000 and with cumulative amounts of such claims payments exceeding \$20,000; or (2) for which at least two separate claims payments have been made with the cumulative amount of such claims exceeding the reported value of the property. According to the Flood Insurance Administration, there are no Severe Repetitive Loss properties in Polk County.

Previous Occurrences

Table 3.18 and **Table 3.19** reflect storm event data for riverine flooding and flash flood events in Polk County since 2003. There were 53 riverine flood events and 122 flash flood events resulting in \$10,460,000 in property damages.

Table 3.18. Polk County Flash Flood Events Summary, 2003-2022

Year	Number of Events	Number of Deaths	Number of Injuries	Property Damages	Crop Damages
2003	0	0	0	\$0	\$0
2004	1	0	0	\$0	\$0
2005	5	0	0	\$50,000	\$0
2006	0	0	0	\$0	\$0
2007	12	0	1	\$9,010,000	\$0
2008	16	0	0	\$230,000	\$0
2009	4	0	0	\$0	\$0
2010	12	0	0	\$0	\$0
2011	9	0	0	\$250,000	\$0
2012	1	0	0	\$0	\$0
2013	8	0	0	\$0	\$0
2014	2	0	0	\$50,000	\$0
2015	14	1	0	\$700,000	\$0
2016	5	0	0	\$0	\$0
2017	6	0	0	\$100,000	\$0
2018	0	0	0	\$0	\$0
2019	6	0	0	\$0	\$0
2020	9	0	0	\$0	\$0
2021	10	0	0	\$60,000	\$0
2022	2	0	0	\$0	\$0
Total	122	1	1	\$10,450,000	\$0

Source: National Centers for Environmental Information <https://www.ncdc.noaa.gov/stormevents/>

Table 3.19. Polk County Riverine Flood Events Summary, 2003-2022

Year	Number of Events	Number of Deaths	Number of Injuries	Property Damages	Crop Damages
2003	0	0	0	\$0	\$0
2004	0	0	0	\$0	\$0
2005	2	0	0	\$0	\$0
2006	0	0	0	\$0	\$0
2007	2	0	0	\$0	\$0
2008	8	0	0	\$0	\$0
2009	4	0	0	\$0	\$0
2010	6	0	0	\$0	\$0
2011	8	0	0	\$0	\$0
2012	0	0	0	\$0	\$0
2013	1	0	0	\$0	\$0
2014	0	0	0	\$0	\$0
2015	5	0	0	\$0	\$0
2016	1	0	0	\$0	\$0
2017	2	0	0	\$10,000	\$0
2018	2	0	0	\$0	\$0
2019	5	0	0	\$0	\$0
2020	2	0	0	\$0	\$0
2021	4	0	0	\$0	\$0
2022	7	0	0	\$0	\$0
Total	53	0	0	\$10,000	\$0

Source: National Centers for Environmental Information <https://www.ncdc.noaa.gov/stormevents/>

Probability of Future Occurrence

There were a total of 175 flood events reported in Polk County from 2003-2020. Of the 175 total, 53 were riverine floods. In this 20-year time-period, there were 5 years without a riverine flood and 19 years without any property or crop damage. This equates to a 75% probability of a riverine flood in any

given year and a 10% probability that a damaging event will occur. Based on the number of events and years, the average number of riverine flood events is 2.65 per year and the average amount of damage caused is \$500.

During the same time-period, there were 122 flash floods reported in the county. These floods occurred in 18 of the 20 years, giving a 90% probability of occurrence in any given year. Damages occurred in 8 years, giving a 40% probability of occurrence in any given year. The average amount of flash floods per year was 6.1 and the average cost of damages was \$522,500. It should be noted that 86% of the total property damage occurred in one year. If that one outlier year is removed, the average damage per year lowers to \$72,000.

Changing Future Conditions Considerations

With changing climate conditions comes more uncertainty and less predictability for hazard events. An overall increasing global temperature is likely to lead to increased precipitation and intense rainstorms. Over the last fifty-years, the average annual precipitation in most of the Midwest has increased by 5-10%; however, rainfall during the four wettest days of the year has increased nearly 35%. The amount of water flowing in most streams during the worst flood of the year has increased by more than 20%.

The National Climate Assessment states that extreme rainfall events and flooding have increased in the last century and that those trends are expected to continue. Heavy rain events are likely to cause erosion, diminished water quality, and negative impacts on transportation, agriculture, human health, and infrastructure.

Vulnerability

Vulnerability Overview

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

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

When roads and bridges are inundated by water, damage can occur as the water scours materials around bridge abutments and gravel roads. Poor conditioned bridges identified in **Figure 3.1** show specific locations that might be more vulnerable to high- or fast-moving floods. Floodwaters can also cause erosion undermining roadbeds. In some instances, steep slopes that are saturated with water may cause mud or rockslides onto roadways. These damages can cause costly repairs for state, county, and city road and bridge maintenance departments. When sewer back-up occurs, this can result in costly clean-up for home and business owners as well as present a health hazard.

Potential Losses to Existing Development

The average annual loss determined from historical losses for riverine and flash flooding are indicators of the potential losses to existing development. **Table 3.20** provides a summary of these losses.

Table 3.20. Average Yearly Losses by Jurisdiction 2003-2022

Jurisdiction	Riverine Flooding	Flash Flooding
Unincorporated Polk County	\$500	\$470,000
City of Bolivar	0	\$19,250
City of Fair Play	0	0
City of Humansville	0	\$7,500
City of Morrisville	0	0
City of Pleasant Hope	0	\$25,500
Village of Aldrich	0	0
Village of Flemington	0	\$250
Village of Halfway	0	0
Total	500	\$522,500

Low Water Crossings

Damage to low water crossings due to flooding is a significant problem for communities. In 2017/18, an inventory of all low water crossings in Polk County was conducted. Data gathered included condition, type of structure, measurements, and flooding risk. The inventory showed that there are 326 county-maintained crossings of all types in Polk County. At the time of the inventory, there were 139 in good condition, 153 in fair condition, and 34 in poor condition. **Figure 3.14** shows the crossing type, while **Figure 3.15** shows the conditions of all crossings in Polk County at the time of the inventory.

The data from the inventory was used to determine the top ten priority crossings for replacement and/or upgrading based on several factors. **Figure 3.16** shows the location of the ten priority crossings and includes a picture of each crossing. Many of these crossings are repeatedly damaged during heavy rain events and need substantial improvements or upgrades in order to increase resiliency towards flooding.

Figure 3.14. Polk County Low Water Crossing Type

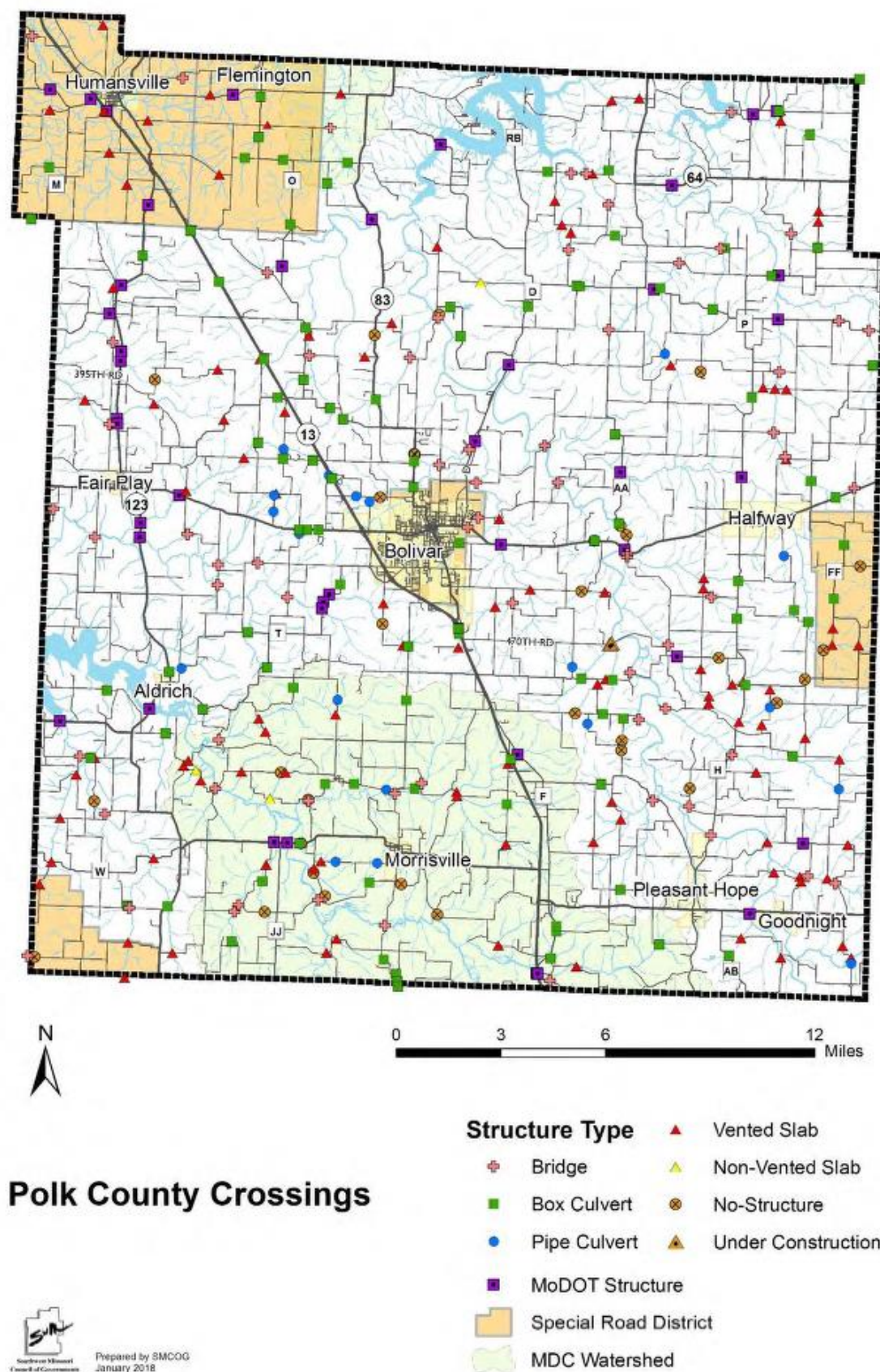
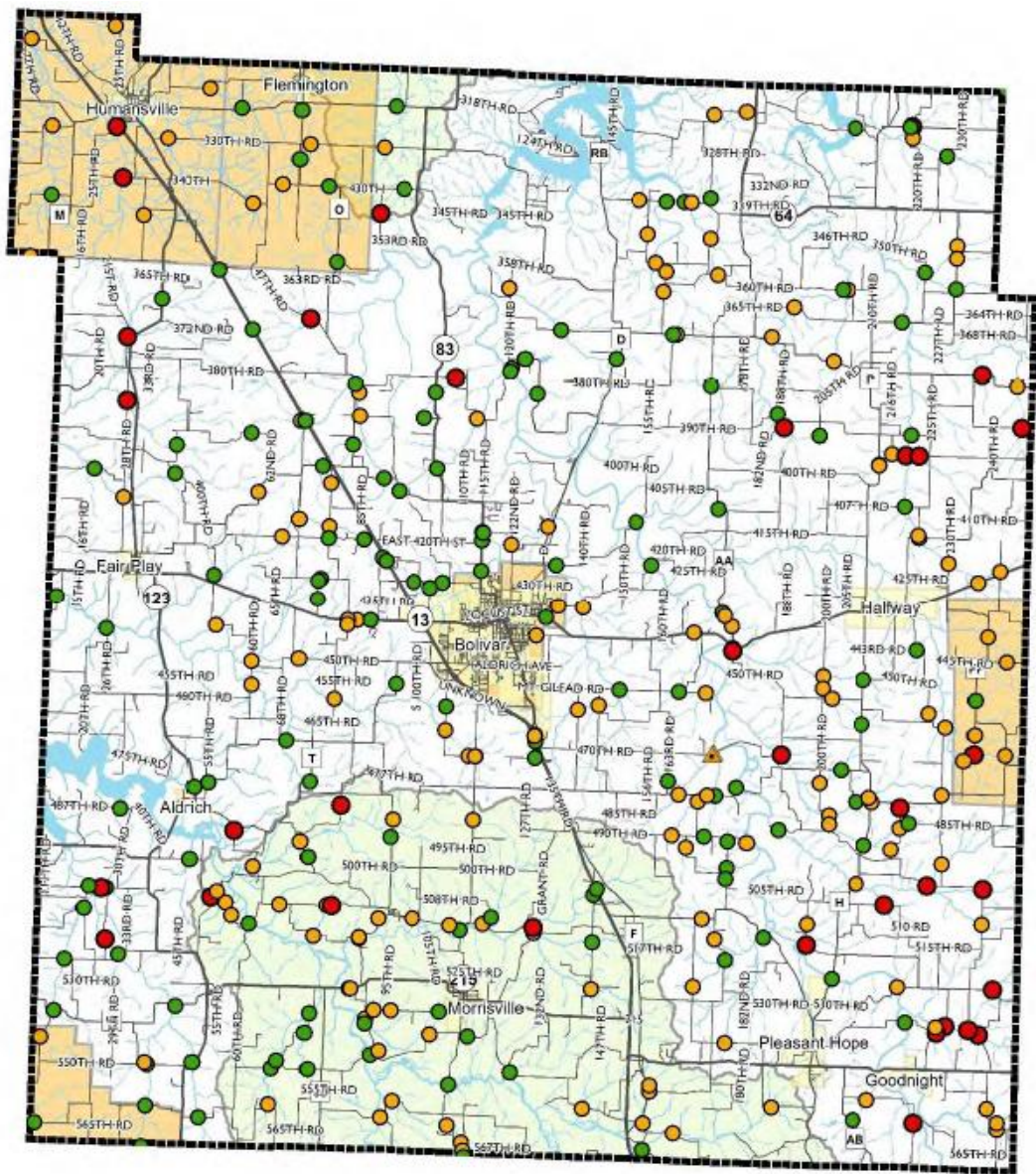


Figure 3.15. Polk County Low Water Crossing Condition



0 3 6 12 Miles

Polk County Crossings

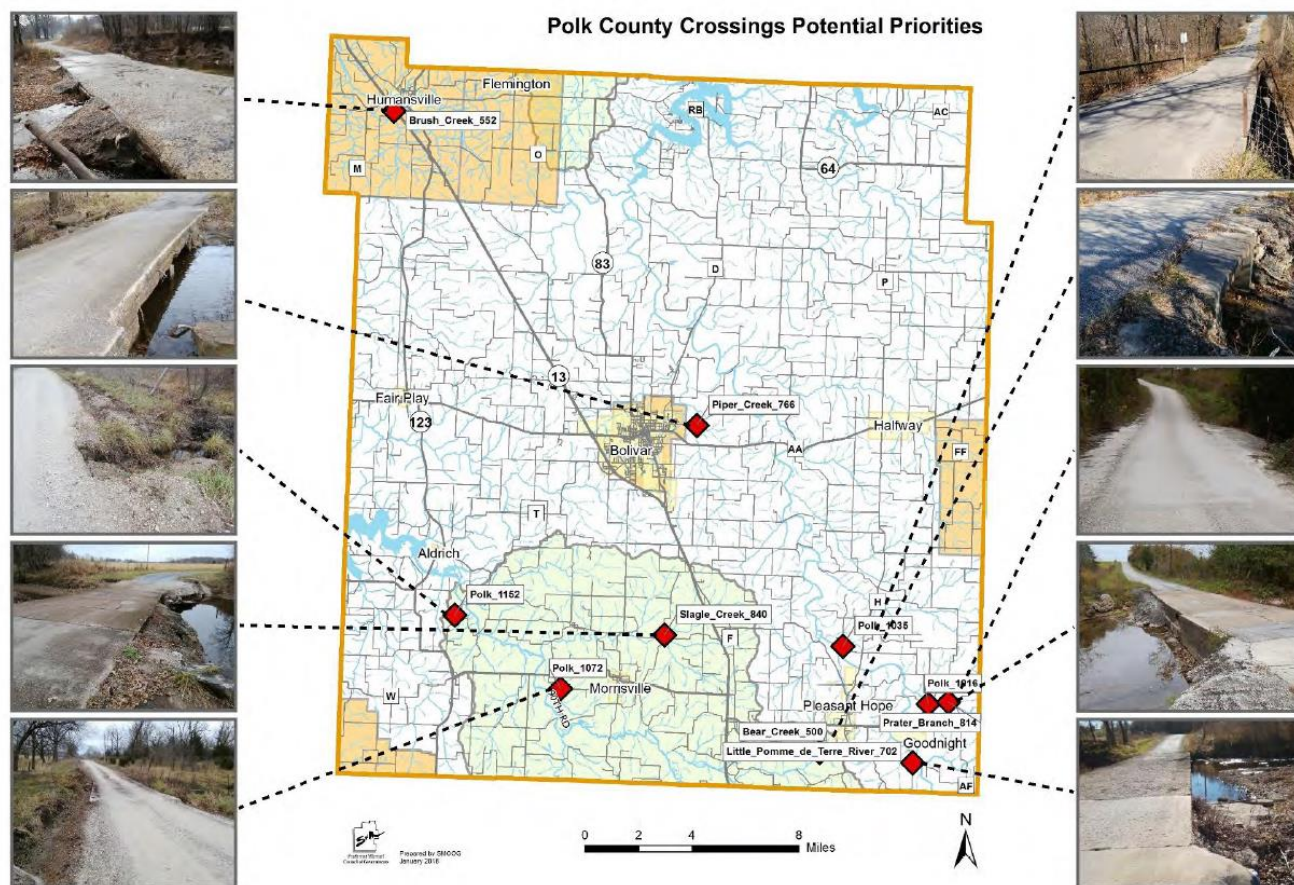
Structure Condition

- Poor
- Fair
- Good
- ▲ Under Construction
- Special Road District
- MDC Watershed



Prepared by SMCOG
January 2018

Figure 3.16. Polk County Low Water Crossing Priorities



Impact of Previous and Future Development

Future development could impact flash and riverine flooding in Polk County. Development in low-lying areas near rivers and streams or where interior drainage systems are not adequate to provide drainage during heavy rainfall events will be at risk to flash flooding. Future development would also increase impervious surfaces causing additional water run-off and drainage problems during heavy rainfall events.

Hazard Summary by Jurisdiction

All jurisdictions in the county are at risk of flood hazards. However, as demonstrated in **Table 3.20** exposure of assets near SFHAs vary among jurisdictions. Based on **Figures 3.5 – 3.13** demonstrating the flood areas for each jurisdiction, Bolivar, Humansville, Pleasant Hope, Halfway, and unincorporated portions of Polk County all have structures located within a floodplain and would potentially sustain the most damage during flood events.

Community Comments on Hazard

Out of the 126 respondents, 69.8% stated that flooding is likely to impact their community. 48.4% stated they are somewhat concerned about the impact of flooding on their community and 36.5% stated they are very concerned about the impact. 68.3% believe a flood would cause a critical to catastrophic impact on their community. When provided with a list of potential hazard mitigation projects,

respondents ranked minor localized flood reduction, flood-prone property acquisition, and flood-prone structure elevation in the third, fourth, and fifth spot, respectively.

Problem Statement

Floods are frequent events and have been listed in 16 out of 23 presidential disaster declarations that have included Polk County dating back to 1993. From 2003 to 2022, flooding (both riverine and flash) caused \$10,460,000 in property damage, as well as 1 death and 1 injury. Significant debris accumulation and damages at low water crossings are a regular occurrence due to flash flooding throughout the county.

The Cities of Bolivar and Pleasant Hope participate in the NFIP. These communities have passed floodplain management ordinances and have the ability to substantially regulate development in the floodplain. Their participation in the NFIP enables residents to purchase flood insurance. Street flooding in incorporated areas can be addressed through storm water management projects and enforcement of storm water management regulations, where applicable.

Several low water crossings at numerous locations throughout the county have been affected by floods and flash flooding. All warning signs and gauges should be installed and replaced at frequently flooded low water crossings to provide warning to motorists. Hazard awareness programs and education during and prior to flood events in the county broadcasted by the media can mitigate future risks to motorists at low water crossings.

3.4.2 Dam Failure

Hazard Profile

Hazard Description

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

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

According to the 2018 State Plan, Missouri has 5,113 total dams recording in the National Inventory of Dams. Dam owners are charged with the primary responsibility for the safe design, operation, and maintenance of their dams. They are also 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.

Missouri's topography allows lakes to be built easily and inexpensively, contributing to the high number of dams. Despite the large number of total dams in the state, there are only 685 (about 13.4 percent) state regulated dams, with an additional 57 federally regulated dams. The remaining 4,371 dams are un-regulated.

Dams that fall under state regulation are non-federally regulated dams that are more than 35 feet in height. Most nonfederal dams are privately owned structures built either for agricultural, water supply or recreational use. The Department of Natural Resources (MDNR) Water Resources Center maintains the Dam and Reservoir Safety Program in Missouri. The program ensures that dams over 35 feet in height are safely constructed, operated, and maintained pursuant to Chapter 236 of Revised Statutes of Missouri.

The Department of Natural Resources provides information about regulated and unregulated dams in Missouri. The information includes details of the dam dimensions, date of construction, approximate reservoir volume, contributing drainage basin area and hazard classification. In addition, USACE maintains the National Inventory of Dams (NID). The information in the NID database matches the list from the MDNR website with some additional details for dams in Polk County. Although both agencies provide a hazard classification for dams, the dam classification systems differ.

The Missouri Dam and Reservoir Safety Council Rules and Regulations uses three classes of downstream environmental zone used when considering permits. The downstream environment zone is the area below the dam that would become inundated should the dam fail. Inundation is defined as water two feet or more over the submerged ground outside of the stream channel. These classes are based on the number of structures and types of development contained within the inundation area as presented in **Table 3.21**. The downstream environment zone classification is also used to prescribe the frequency of inspection.

Table 3.21. MoDNR Dam Hazard Classification Definitions

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

Source: Missouri Department of Natural Resources <https://dnr.mo.gov/land-geology/dam-reservoir-safety>

Dams in the NID are classified according to hazard potential, an indicator of the consequences of dam failure. A dam's hazard potential classification, presented in **Table 3.22**, does not indicate its condition. Dams assigned the high hazard potential classification are those where failure will potentially result in loss of human life. Significant hazard potential are those dams where failure results in no probable loss of human life but can cause economic loss. Dams assigned the low hazard potential classification are those where failure or results in no probable loss of human life and low economic or environmental losses. Losses are principally limited to the owner's property.

Table 3.22. NID Dam Hazard Classification Definitions

Hazard Class	Definition
Low Hazard	Failure results in only minimal property damage
Significant Hazard	Failure could possibly result in the loss of life and appreciable property damage
High Hazard	If the dam were to fail, lives would be lost and extensive property damage could result

Source: National Inventory of Dams <https://nid.usace.army.mil/#/>

There is not a direct correlation between the State Hazard classification and the NID classifications. However, most dams that are in the State's Classes I and II are considered NID High Hazard Dams.

Geographic Location

Dams Located Within the Planning Area

There are 13 dams in Polk County – 1 high hazard, 2 significant hazard, and 10 low hazard. **Table 3.23** provides a summary of these dams and **Figures 3.17** through **3.30** provide the locations within the county.

Table 3.23. Dams in Polk County

Dam Name	Emergency Action Plan (EAP/AP)	Dam Height (Ft)	Normal Storage (Acre-Ft)	Last Inspection Date	River	Nearest Downstream City	Distance To Nearest City (Miles)	Dam Owner	NID classification
Mcnerney Lake Dam	Not Required	30	104	-	Tr-To Pomme De Terre River	Pleasant Hope	N/A	Larry Mcnerney	High
Sprowls Dam	No	25	20	-	Tr-Brush Creek	Humansville	N/A	J A Sprowls	Significant
Sergent Lake Dam	Not Required	23	42	-	Tr-Bush Creek	Hermitage	N/A	Raymond Sergent	Significant
Woods Lake Dam	No	38	186	-	Tr-To Pomme	Hermitage	N/A	H E Woods	Low
Hawk Lake Dam	Not Required	25	40	-	Tr-Piper Creek	Hermitage	N/A	Jerry Hawk	Low
Jensen Lake Dam	Not Required	25	31	-	Tr-Lindley Creek	Hermitage	N/A	Donald Jensen	Low
Gordon Lake Dam	Not Required	25	35	-	Tr-To Panther Creek	Goodson	N/A	Eddie Ben Gordon	Low
Owens Lake Dam-Sect 4	Not Required	25	21	-	Tr-To Panther Creek	Oscola	N/A	A M Owens	Low
Thieme Lake Dam	Not Required	25	14	-	Tr-To Asher Creek	Cave Spring	7	Ralph Thieme	Low
Ralph Brooks	Not Required	24	40	-	Tr Slagle Creek	Slagle	N/A	Unknown	Low
Warren Lake Dam	Not Required	22	40	-	Tr-Panther Creek	Hermitage	N/A	Eldon Warren	Low
Owens Lake Dam-Sect 8	Not Required	20	106	-	Tr To Slagle Creek	Slagle	1	A M Owens	Low
James Estes Dam	Not Required	10	36	-	Tr Asher Creek	Morrisville	N/A	Unknown	Low

Source: National Inventory of Dams <https://nid.usace.army.mil/#/>

Figure 3.17. Dam Locations in Polk County

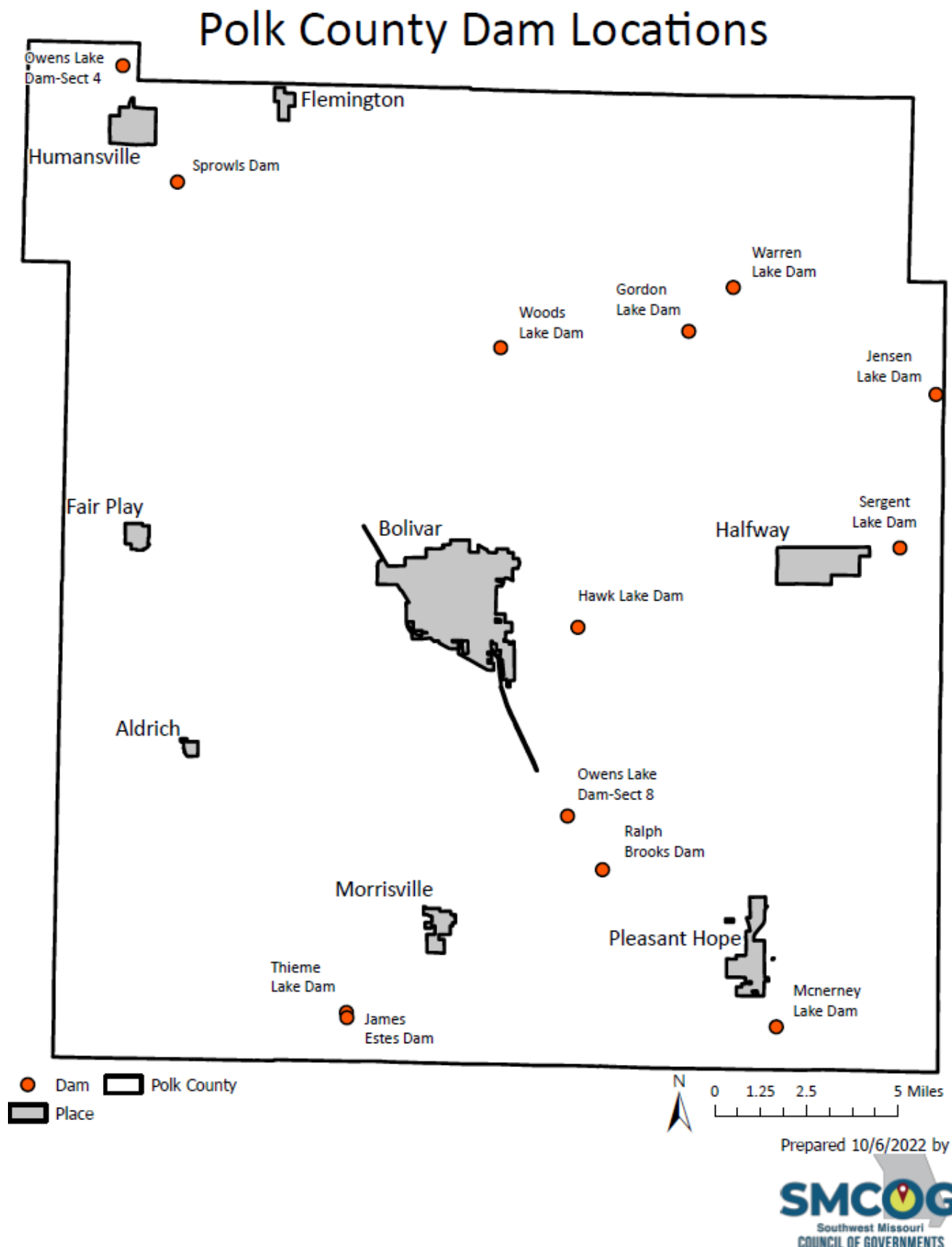
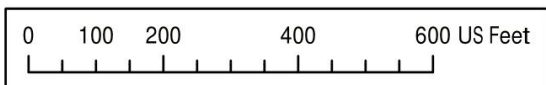


Figure 3.18. Gordon Lake Dam

Gordon Lake Dam



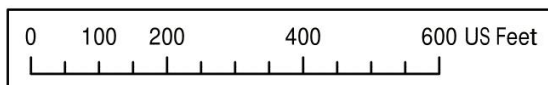
- Dam
- Single- Family Dwelling
- Mobile Home Park
- Agriculture or Livestock Structure
- Building General

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Figure 3.19. Hawk Lake Dam

Hawk Lake Dam



● Dam

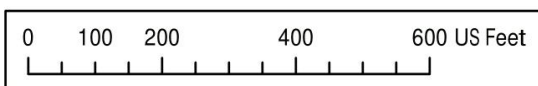


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Figure 3.20. James Estes Dam

James Estes Dam



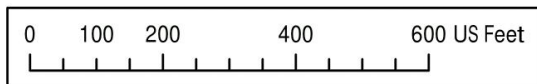
- Dam
- Single- Family Dwelling
- Agriculture or Livestock Structure

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Figure 3.21. Jensen Lake Dam

Jensen Lake Dam



- Dam
- Single- Family Dwelling
- Agriculture or Livestock Structure
- Building General

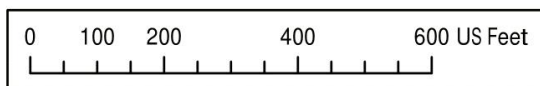


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Figure 3.22. Mcnerney Lake Dam (High Hazard)

Mcnerney Lake Dam



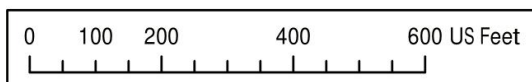
- Dam
- Single- Family Dwelling
- Mobile Home Park
- Agriculture or Livestock Structure
- Building General

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Figure 3.23. Owens Lake Dam Section 4

Owens Lake Dam-Sect 4



- Dam
- Single- Family Dwelling
- Agriculture or Livestock Structure
- Building General

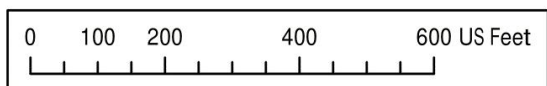


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Figure 3.24. Owens Lake Dam Section 8

Owens Lake Dam-Sect 8



- Dam
- Single- Family Dwelling
- Agriculture or Livestock Structure
- Building General



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Figure 3.25. Ralph Brooks Dam

Ralph Brooks Dam



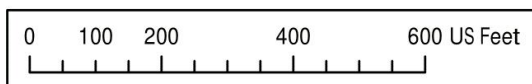
- Dam
- Single- Family Dwelling
- Mobile Home Park
- Agriculture or Livestock Structure
- Building General

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Figure 3.26. Sergent Lake Dam

Sergent Lake Dam



● Dam

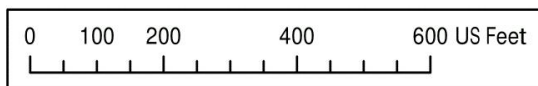


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Figure 3.27. Sprowls Dam

Sprowls Dam



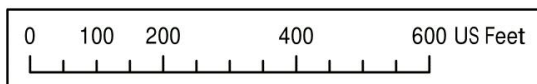
- Dam
- Single- Family Dwelling
- Building General

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Figure 3.28. Thieme Lake Dam

Thieme Lake Dam



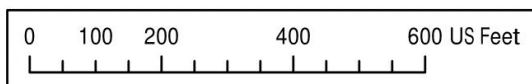
- Dam
- Single- Family Dwelling
- Agriculture or Livestock Structure

Prepared 10/6/2022 by



Figure 3.29. Warren Lake Dam

Warren Lake Dam



● Dam



Prepared 10/6/2022 by



Figure 3.30. Woods Lake Dam

Woods Lake Dam



- Dam
- Single- Family Dwelling
- Agriculture or Livestock Structure
- Building General

Prepared 10/6/2022 by



Upstream Dams Outside the Planning Area

There are no dams outside of Polk County that are upstream of Polk County communities that would have a significant impact on the county in the event of a failure.

Strength/Magnitude/Extent

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

Previous Occurrences

According to the 2018 State Hazard Mitigation Plan, there have been no recorded instances of dam failure within Polk County. From 1975 to 2016, there were 86 instances of dam failure statewide, with the vast majority occurring during the 1990s.

Probability of Future Occurrence

Since there have been no recorded events in Polk County in the past 20 years, a calculation of a probability percent would give a 0% probability of a dam failure. The age and ownership of dams are the most significant factors affecting the risk of dam failure. The likelihood of a dam failure is always possible, but the impact of the dams located in Polk County would be relatively low.

Changing Future Conditions Considerations

According to the 2018 State Plan, dam failure is tied to flooding and the increased pressure that flooding has on dams. Future condition projections imply an increase in precipitation and more extreme events, which may increase flood risk and put additional stress on dams.

Vulnerability

Vulnerability Overview

Vulnerability to dam failure in Polk County is very small due to the limited number of dams in the county, and the small size of the waterbodies those dams contain. The one high hazard dam, McNerney Lake Dam, is located within a floodplain. There are no significant structures within the floodplain that would be affected. The nearest structure is approximately 400ft from the dam. The two significant hazard dams, Sprowls Dam and Hawk Lake Dam, have small numbers of structures downstream and would cause little to no damage in the event of a failure.

Potential Losses to Existing Development:

In the event of a failure of the one high hazard and/or the two significant hazard dams in the county, losses would be minimal to none, because there are few structures downstream of the dams. It can be assumed that, in the event of a dam failure, the water would follow the downstream topography and most affect the 100-year floodplain. As shown in the figures depicting the one high hazard (**Figure 3.22**) and two significant hazard dams (**Figure 3.26** and **3.27**), there are no downstream structures within or near the floodplain, so it is unlikely that a failure of either of these dams would cause any

significant damage to existing development.

Impact of Previous and Future Development

Any future development in Polk County that occurs in low-lying areas downstream of dams would be impacted in the event of a dam failure. However, due to the rural locations the one high hazard dam and two significant hazard dams, substantial future development in potentially affected areas is not anticipated.

Hazard Summary by Jurisdiction

No jurisdictions or school districts would suffer damage in the event of a dam failure. All potential damage would occur in unincorporated parts of the county.

Community Comments on Hazard

88.9% of respondents stated that dam failure is unlikely to impact their community. Dam failure ranked last on concern for Polk County residents. 88.6% of respondents stated they are not concerned. 49.2% of residents believe that dam failure will have a limited impact on their community, while 35.7% believe there would be no impact.

Problem Statement

There are two dams in Polk County that have been designated as significant hazard potential and one as high hazard potential. Because none of the dams in the County are state regulated, there are no inundation maps for the County. Records do not indicate any inspections in recent years. Due to the number of unregulated dams in Missouri and the lack of manpower, inspections of these dams is unlikely in the coming years. Although the probability of dam failure in the county is very low, there is still a small potential for damage. All dams are earthen dams and prone to erosion/damage from floods. To mitigate this problem, dam owners should be contacted to set up inspections to evaluate the state of dams. Any damage caused by unregulated dams becomes the responsibility of the dam owner.

Residents near high/significant hazard dams should become familiar with the dam's emergency action plans, if available. Emergency plans written for dams include procedures for notification and coordination with local law enforcement and other governmental agencies, information on the potential inundation area, plans for warning and evacuation, and procedures for making emergency repairs.

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. The 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 energy to buildings and other structures on the earth's surface.

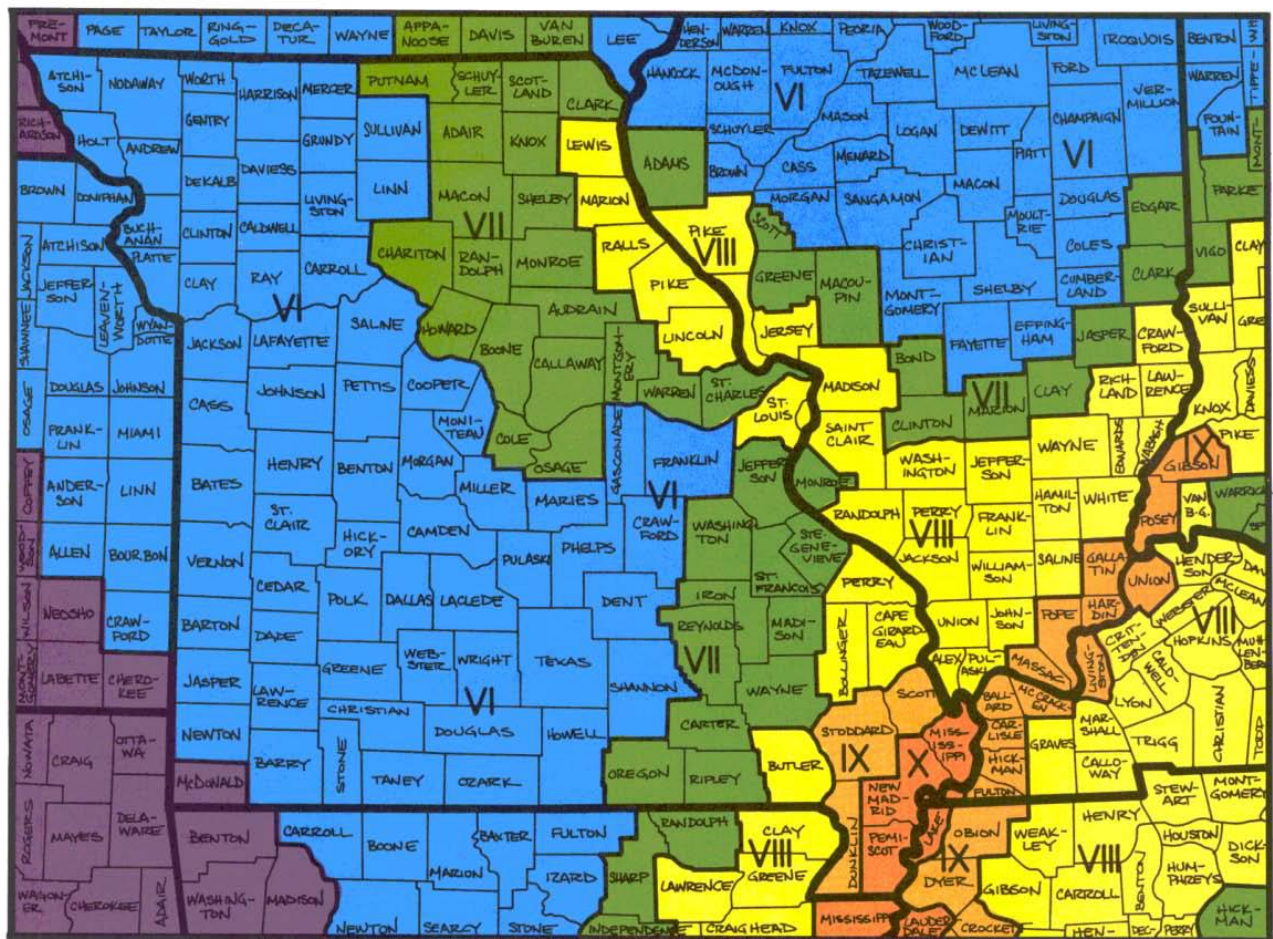
Subterranean faults were formed many millions of years ago on or near the surface of the earth. Subsequent to that time, these ancient faults subsided, while the areas adjacent were pushed up. As this fault zone (also known as a rift) lowered, sediments filled in the lower areas. Under pressure, the sediments hardened into limestones, sandstones, and shales – thus burying the rifts. The pressures on the North American plate and the movements along the San Andreas Fault by the Pacific plate have reactivated the buried rift(s) in the Mississippi embayment. This rift system is called the Reelfoot Rift and underlies the New Madrid Seismic Zone (Braile et al., 1986).

Geographic Location

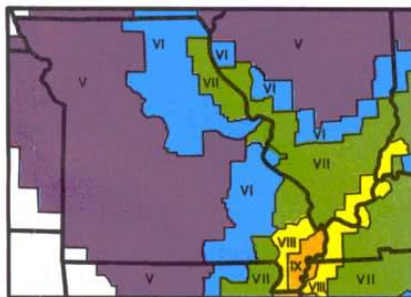
The greatest hazard from earthquakes in Polk County comes from the New Madrid Seismic Zone situated in the boot heel area of southeast Missouri. The potential of high magnitude earthquakes occurring along the New Madrid fault presents risk that does not vary across the county. The Nemaha uplift in central Kansas is also prone to seismic activity; however, the center of the Humbolt fault zone near the Nemaha Uplift is approximately 220 to 240 miles west of Polk County and produces lower magnitude seismic events.

Figure 3.31 shows the highest projected Modified Mercalli intensities by county from a potential magnitude 7.6 earthquake whose epicenter could be anywhere along the length of the New Madrid Seismic Zone. The secondary maps in **Figure 3.31** show the same regional intensities for 6.7 and 9.6 earthquakes, respectively. Polk County is located in zone VI from a potential magnitude 7.6 earthquake along the New Madrid fault. Residents would feel movement, there could be minimal damage to structures, and dishes and glassware would likely be broken.

Figure 3.31. Impact Zones for Earthquake Along the New Madrid Fault

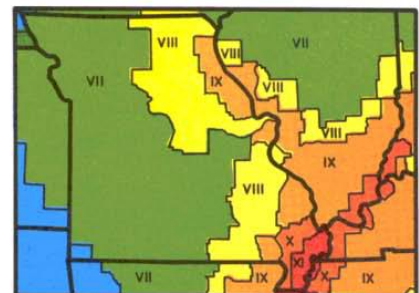


This map shows the highest projected Modified Mercalli intensities by county from a potential magnitude - 7.6 earthquake whose epicenter could be anywhere along the length of the New Madrid seismic zone.



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

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



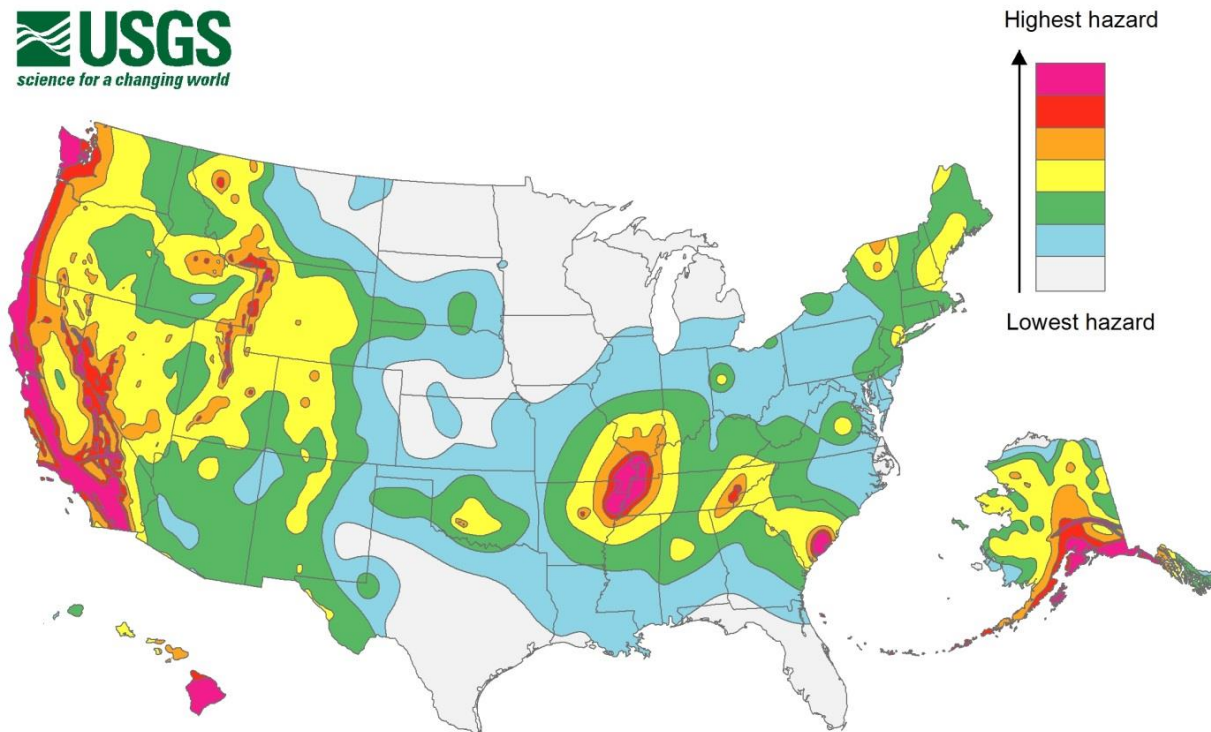
Source: https://sema.dps.mo.gov/docs/EQ_Map.pdf

The 2014 USGS National Seismic Hazard Maps display earthquake ground motions for various probability levels across the United States and are applied in seismic provisions of building codes, insurance rate structures, risk assessments, and other public policy. The update maps represent an assessment of the best available science in earthquake hazards and incorporates new findings on

earthquake ground shaking, faults, seismicity, and geodesy. The USGS National Seismic Hazard Mapping Project developed these maps by incorporating information on potential earthquakes and associated ground shaking obtained from interaction in science and engineering workshops involving hundreds of participants, review by several science organizations and state surveys, and advice from expert panels and Steering Committee.

Figure 3.32 illustrates seismicity in the United States.

Figure 3.32. United States Seismic Hazard Map



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

Strength/Magnitude/Extent

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

Richter Magnitude Scale

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

Modified Mercalli Intensity Scale

The intensity of an earthquake is measured by the effect of the earthquake on the earth's surface. The intensity scale is based on the responses to the quake, such as people awakening, movement of furniture, damage to chimneys, etc. The intensity scale currently used in the United States is the Modified Mercalli (MM) Intensity Scale, shown below in **Table 3.24**. It was developed in 1931 and is composed of 12 increasing levels of intensity. They range from imperceptible shaking to catastrophic destruction, and each of the twelve levels is denoted by a Roman numeral. The scale does not have a mathematical basis but is based on observed effects. Its use gives the laymen a more meaningful idea of the severity.

Table 3.24. Modified Mercalli Intensity Scale

Intensity Level	Description
I	People do not feel any 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, frames and structures creak; Liquids in open vessels are slightly disturbed; Parked cars rocked.
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	Almost everyone feels movement. Most people are awakened; Considerable quantities of dishes, glassware, and 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, and spires; Damage is slight to moderate in well-built buildings; Numerous windows are broken; Weak chimneys break at rooflines; 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 may shift on foundations; Tall structures such as towers and might chimneys twist and fall; Temporary or permanent changes in springs and wells; Sand and mud is ejected.
IX	Most buildings suffer damage; Houses not bolted down move off their foundations; Some underground pipes are broken; The ground cracks conspicuously; Reservoirs suffer damage.
X	Well-built wooden structures destroyed; most masonry and frame structures destroyed, including foundations; Rails bent; Dams seriously damaged; Cracks open in pavement.
XI	Few, if any masonry structures remain standing; Large well-built bridges destroyed; Rails bent greatly; Buried pipelines are rendered completely useless. Water mixed with sand and mud 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

Previous Occurrences

There is no historical record of an earthquake occurrence within Polk County. The southeastern portion of Missouri is most susceptible to earthquakes because it overlies the New Madrid Seismic Zone. Earthquake hazards in the western part of the State also exist because of the historical earthquakes in eastern Kansas and Nebraska. No area of Missouri is immune from the danger of earthquakes. Minor, but potentially damaging, earthquakes can occur anywhere in the state (SEMA, 2013).

Probability of Future Occurrence

Without a historical record for earthquakes in Polk County it is not possible to calculate a precise probability of earthquake occurrence. The Center for Earthquake Research and Information (CERI) at the University of Memphis has computed conditional probabilities of a magnitude 6.0 earthquake in the New Madrid seismic zone. According to a fact sheet prepared by SEMA in 2003, the probability of a magnitude 6.0 to 7.5 or greater earthquake along the New Madrid Fault is 25 to 40 percent over the next 50 years. At the 25% level, the likelihood of an earthquake happening in a given year is 1.0%. At the 40% level, the likelihood of an earthquake happening in a given year is 1.6%.

Changing Future Conditions Considerations

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

Vulnerability

Vulnerability Overview

Ground shaking is the most damaging effect from earthquakes. Ground shaking will impact all structures and critical infrastructure such as roads and electrical transmission systems. The greatest earthquake risk to Polk County is the New Madrid fault in the boot-heel region of Missouri. A 7.6 magnitude earthquake would result in damage to poorly built buildings; considerable quantities of dishes, glassware and windows breaking; people having trouble walking; pictures falling off walls; objects falling from shelves; plaster in walls cracking; and furniture overturning. Damage to structures will occur but will vary depending on the quality of construction. In addition, underground utilities may be damaged and some injuries may occur, but fatalities are unlikely.

Potential Losses to Existing Development

Potential losses to existing development are based on the total exposure for all communities in the planning area. The total exposure for each jurisdiction was used to estimate losses due to a 7.6 earthquake along the New Madrid Fault. A damage factor of 0.5% was applied to each jurisdiction's total building and contents based on the expected impact for Zone VI on the Modified Mercalli Scale. **Table 3.25** summarizes the estimated losses for each jurisdiction.

Table 3.25. Estimated Potential Earthquake Losses

Jurisdiction	Potential Earthquake Losses (\$)
Unincorporated Polk County	\$10,051,825
City of Bolivar	\$8,838,710
City of Fair Play	\$259,140
City of Humansville	\$875,715
City of Morrisville	\$253,525
City of Pleasant Hope	\$347,345
Village of Aldrich	\$46,555
Village of Flemington	\$58,480
Village of Halfway	\$98,390
Total	\$20,829,685

Source: Hazus

Impact of Previous and Future Development

Previous development that may have been constructed without adherence to building codes may be at a greater risk of damage during an event. If future development follows building codes, it is not expected to increase the risk other than contributing to the overall exposure of what could become damaged as a result of an earthquake event. The Cities of Fair Play, Pleasant Hope, and Bolivar enforce building codes.

Hazard Summary by Jurisdiction

Earthquake intensity is not likely to vary greatly throughout the county as the risk of occurrence is the same throughout. However, potential damages will be more significant in communities with a higher number of structures built in or prior to 1939. **Table 3.26** provides a summary.

Table 3.26. Housing Units Built in 1939 or Earlier

Jurisdiction	Built 1939 or earlier (#)	Built 1939 or earlier (%)
Polk County	1,469	10.8%
City of Bolivar	241	5.4%
City of Fair Play	60	21.0%
City of Humansville	182	32.5%
City of Morrisville	57	22.6%
City of Pleasant Hope	37	12.1%
Village of Aldrich	9	24.3%
Village of Flemington	23	27.1%
Village of Halfway	23	23.0%

Source: US Census Bureau American Community Survey 2020 5 Year Estimates <https://data.census.gov/>

Community Comments on Hazard

56.3% of residents believe that earthquakes are unlikely to impact their community and 65.9% are not concerned about the impact. When asked about the magnitude an earthquake would cause, 42.9% believe there will be a limited impact, while 35.7% stated a critical impact would occur.

Problem Statement

Based on likely damage from a 7.6 magnitude earthquake along the New Madrid fault, older poorly built structures will suffer slight damage. Of the participating cities, Humansville has the highest percentages of houses built before 1939 (32.5%), while Bolivar has the most (241). These jurisdictions

would likely experience the most damage to structures. Adopting, updating, and enforcing building codes would assist in mitigating damages associated with earthquake events. Introducing public awareness programs that teach residents of the risks to older structures in earthquake events may motivate the public to support such legislation, as well as cooperate with its enforcement.

3.4.4 Land Subsidence/Sinkholes

Hazard Profile

Hazard Description

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

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

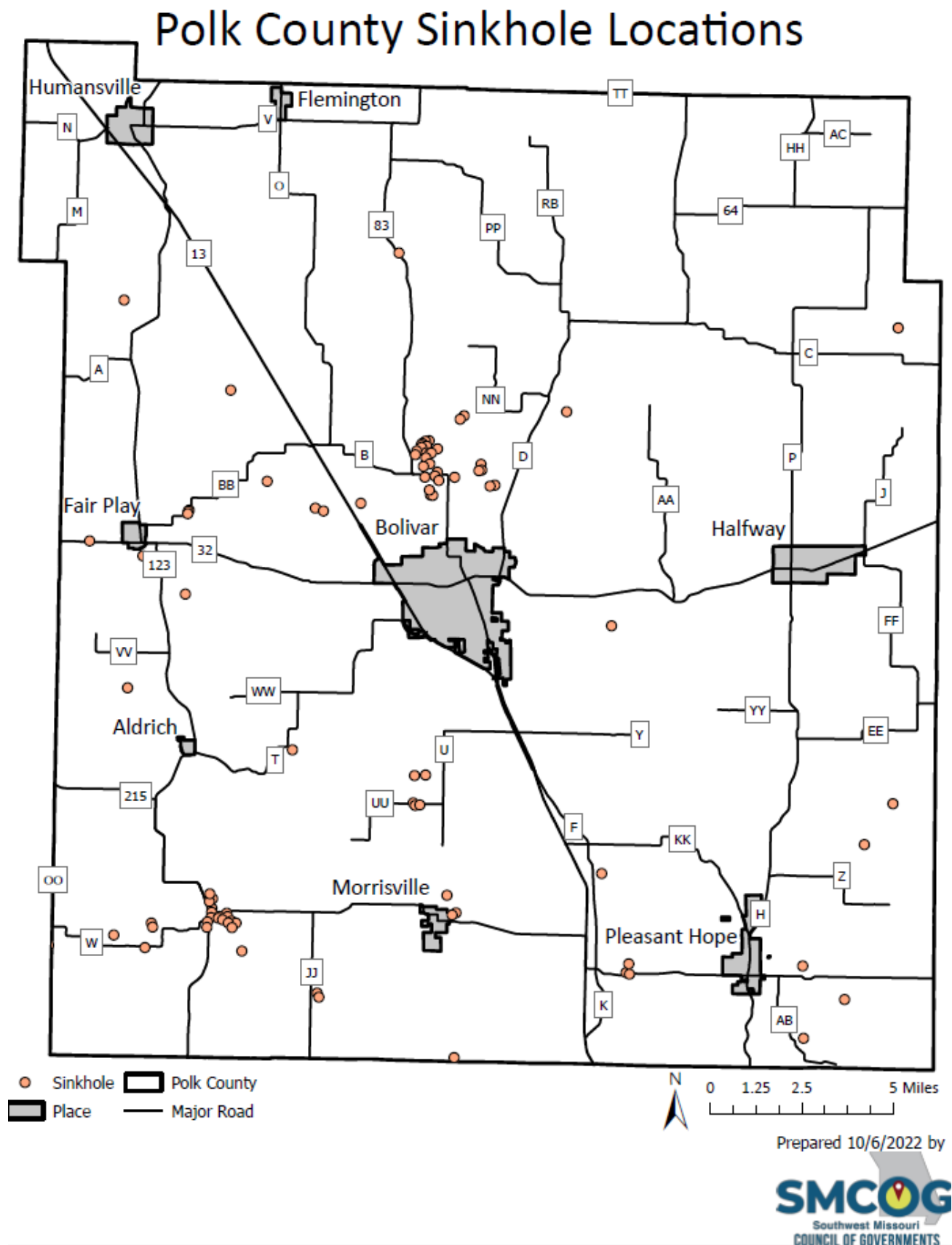
In the case of sinkholes, the rock below the surface is rock that has been dissolving by circulating groundwater. As the rock dissolves, spaces and caverns form, and ultimately the land above the spaces collapses. In Missouri, sinkhole problems are usually a result of surface materials above openings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

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

Geographic Location

According to the 2018 Missouri Hazard Mitigation Plan, 75 sinkhole formations and 52 mines have been identified in Polk County. There is a large cluster in the central portion of the county north of Bolivar, as well as the southwest portion of the county west of Morrisville. **Figure 3.33** shows the locations.

Figure 3.33. Sinkholes in Polk County



Strength/Magnitude/Extent

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

Previous Occurrences

As noted in the 2018 State Plan, sinkholes are a regular occurrence in Missouri, but rarely are the events of any significance. However, a KY3 article dated May 13, 2022 details a sinkhole that opened up just off Highway 83 in Bolivar and caused acres of flooding. USDA officials told the homeowners they had never seen a sinkhole turn into a wetland like this. More information can be found [here](#).

Probability of Future Occurrence

There is currently no database regarding sinkhole occurrences in Polk County. Because of this, no official estimation can be made regarding the probability of future occurrences. Historically across the state, sinkholes occur in areas away from development and typically do not cause serious damage.

Changing Future Conditions Considerations

Changes in climate conditions could increase the number of sinkhole occurrences throughout the County. Drought periods can reduce groundwater levels, making the sediments within a sinkhole-prone hazard area dry and unstable. Severe storms triggered by drought could bring torrential rainfall that washes out the supporting sediments, undercutting the ground and creating conditions conducive to sinkhole formation.

Vulnerability

Vulnerability Overview

Sinkholes in Missouri are a common feature where limestone and dolomite outcrop. Dolomite is a rock similar to limestone with magnesium as an additional element along with the calcium normally present in the minerals that form rocks. While some sinkholes may be considered a slow changing nuisance, other more sudden, catastrophic collapses can destroy property, delay construction projects, contaminate ground water resources, and damage underground utilities.

According to the 2018 Missouri State Hazard Mitigation Plan, Polk County rated low-medium on the sinkholes per county rating values. This category is comprised of counties that contain between 1-200 sinkholes.

This plan was developed prior to the release of FEMA's *Local Mitigation Planning Policy Guide, Effective April 19, 2023*. Future hazard mitigation plan update cycles will reference the latest State Plan, which will include quantifiers for ranked vulnerabilities as required under 44 CFR 201.6(c)(2)(i).

Potential Losses to Existing Development

Sinkhole loss estimates were established using GIS processes and appraised valuations. A sinkhole point shapefile was used to generate a half-mile buffer around each sinkhole. The buffer layer was

designated as the hazard-prone areas for sinkholes. The map layer of the sinkhole hazard-prone areas was used as an overlay on the parcel data to generate the loss estimates from this hazard by jurisdiction. Existing structure data was also used to determine which parcels contained structures that fell within the sinkhole hazard-prone area. The data presented was extracted solely from these select parcels.

Table 3.27 provides the building count by type and by jurisdiction based on the results of the sinkhole analysis. **Table 3.28** provides a dollar amount for total exposure by jurisdiction and estimated losses. To calculate the losses, a damage factor of 0.5% was applied to the total exposure.

Table 3.27. Sinkhole Exposure by Building Type

Jurisdiction	Residential	Commercial	Agricultural	Industrial	Total Building Count
Unincorporated Polk County	1,713	45	27	21	1,806
City of Bolivar	0	0	0	0	0
City of Fair Play	66	3	1	0	70
City of Humansville	0	0	0	0	0
City of Morrisville	108	6	3	2	119
City of Pleasant Hope	0	0	0	0	0
Village of Aldrich	0	0	0	0	0
Village of Flemington	0	0	0	0	0
Village of Halfway	0	0	0	0	0
Total	1,887	54	31	23	1,995

Source: Hazus

Table 3.28. Sinkhole Estimated Losses

Jurisdiction	Residential	Commercial	Agricultural	Industrial	Total Exposure
Unincorporated Polk County	\$193,064.12	\$16,151.15	\$4,837.55	\$4,099.84	\$218,152.66
City of Bolivar	\$0	\$0	\$0	\$0	\$0
City of Fair Play	\$2,893.21	\$738.78	\$49.20	\$0	\$3,681.17
City of Humansville	\$0	\$0	\$0	\$0	\$0
City of Morrisville	29,989.96	\$2,455.78	\$439.43	\$343.85	\$33,229.01
City of Pleasant Hope	\$0	\$0	\$0	\$0	\$0
Village of Aldrich	\$0	\$0	\$0	\$0	\$0
Village of Flemington	\$0	\$0	\$0	\$0	\$0
Village of Halfway	\$0	\$0	\$0	\$0	\$0
Total	\$225,947.29	\$19,345.71	\$5,326.18	\$4,443.69	\$255,062.84

Source: Hazus

Impact of Previous and Future Development

Future development over abandoned mines and in areas of known risk to sinkhole formation in the planning area will increase the vulnerability to this hazard. Population and development in these areas, particularly parts of the unincorporated county where sinkholes are most prevalent, will increase exposure to sinkhole occurrence. Future development may also change storm runoff patterns and cause expansion of existing or formation of new sinkholes.

Hazard Summary by Jurisdiction

The risk of sinkhole damage for individual communities and school districts is limited to the amount of exposure of buildings and infrastructure. Some parts of the county are more at risk for potential sinkhole formation, including the areas north of Bolivar and west of Morrisville where multiple sinkholes have been identified.

Community Comments on Hazard

Sinkholes are a low priority for the communities of Polk County. 42.9% of residents stated that land subsidence/sinkholes are unlikely to impact their communities, while 65.9% stated they are not concerned. When asked to state the magnitude of impact that land subsidence/sinkholes would cause, 57.9% stated there would be a limited impact.

Problem Statement

It is likely that more sinkholes will occur as development increases within the county. Sinkholes can be remediated with fill material. Once a sinkhole has been remediated, building should be prohibited at the site. Existing sinkholes can expand if surface runoff erodes the edges of the sinkhole. Storm water runoff should be diverted away from known sinkholes. Jurisdictions may adopt regulations prohibiting construction at least 30 feet from known sinkholes. Undeveloped land that is in a sinkhole risk area can be used for park space or other recreational purposes. Additionally, jurisdictions can utilize public awareness campaigns about sinkholes and risks associated with developing in prone areas. Maps of sinkholes and prone areas should be available to members of the public.

3.4.5 Drought

Hazard Profile

Hazard Description

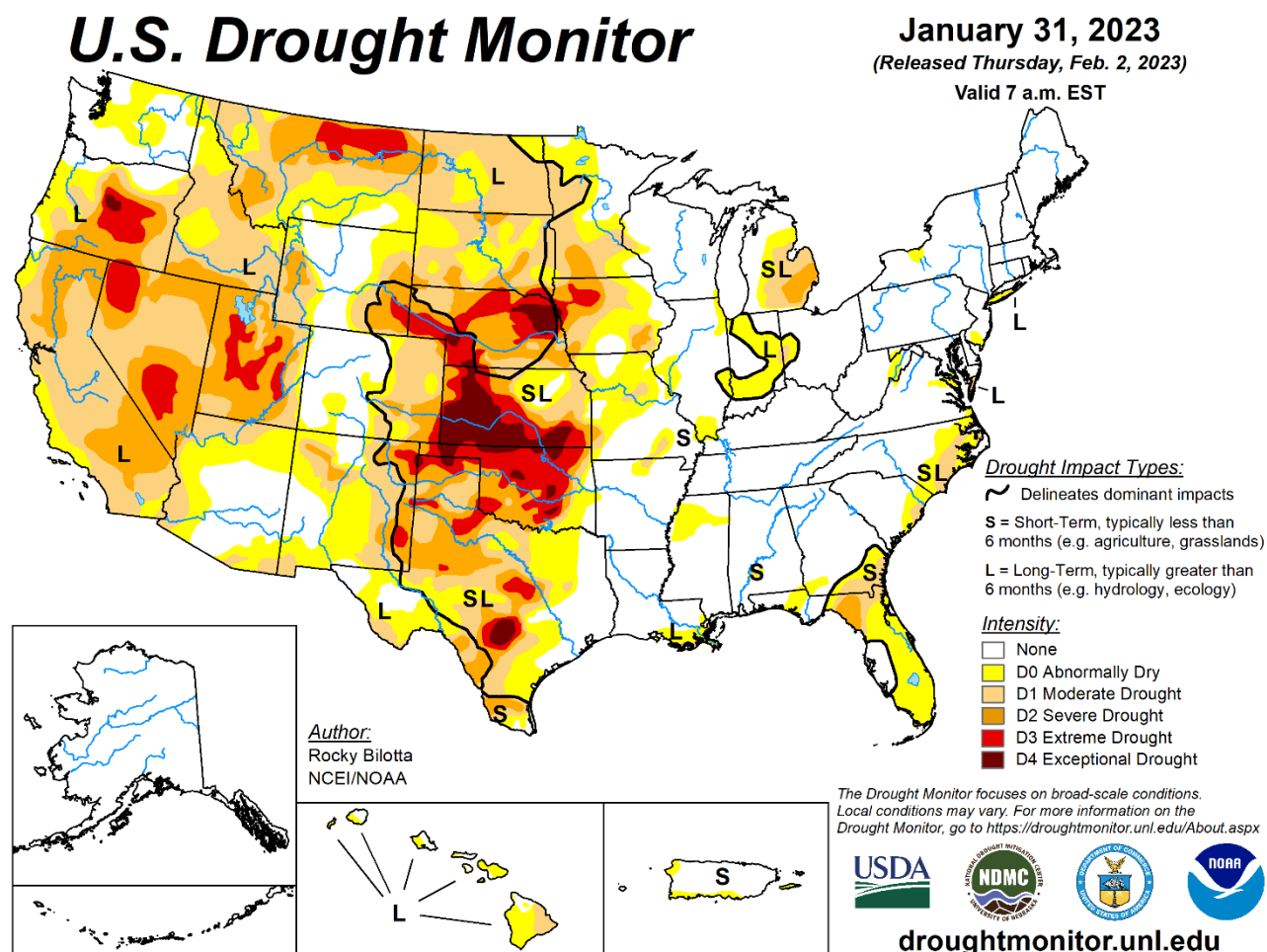
Drought is generally defined as a condition of moisture levels significantly below normal for an extended period of time over a large area that adversely affects plants, animal life, and humans. A drought period can last for months, years, or even decades. There are four types of drought conditions relevant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

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

Geographic Location

Droughts are regional climatic events that can impact large areas and multiple counties. The entire county is at risk of the impacts of drought. However, drought most directly impacts the agricultural sector, so areas within the county where there is extensive agricultural land use can experience significant impacts. **Figure 3.34** is a recent map from the U.S. Drought Monitor.

Figure 3.34. U.S. Drought Monitor Map



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

Strength/Magnitude/Extent

The most commonly used indicator of drought and drought severity is the Palmer Drought Severity Index (PDSI), jointly published by the NOAA and the United States Department of Agriculture. The Palmer Drought Indices measure dryness based on recent precipitation and temperature. The indices are based on a “supply-and-demand model” of soil moisture. Calculation of supply is relatively straightforward, using temperature and the amount of moisture in the soil. However, demand is more complicated as it depends on a variety of factors, such as evapotranspiration and recharge rates. These rates are harder to calculate. Palmer tried to overcome these difficulties by developing an algorithm that approximated these rates and based the algorithm on the most readily available data — precipitation and temperature.

The Palmer Index has proven most effective in identifying long-term drought of more than several months. However, the Palmer Index has been less effective in determining conditions over a matter of weeks. It uses a “0” as normal, and drought is shown in terms of negative numbers; for example, negative 2 is moderate drought, negative 3 is severe drought, and negative 4 is extreme drought. Palmer's algorithm is also used to describe wet spells, using corresponding positive numbers.

Palmer also developed a formula for standardizing drought calculations for each individual location

based on the variability of precipitation and temperature at that location. The Palmer index can therefore be applied to any site for which sufficient precipitation and temperature data is available.

Previous Occurrences

According to the NECI storm events database, there were a total of 14 months of drought in Polk County from 2003 – 2022. **Table 3.29** provides a summary of these events.

Table 3.29. Drought Occurrences 2003 – 2022

Drought Year	Months	Property Damage	Crop Damage
2006	January – April	\$0	\$0
2012	July – October, December	\$600,000	\$17,030,000
2013	January	\$0	\$0
2022	July – October	\$900,000	\$0
Total		\$1,500,000	\$17,030,000

Source: National Centers for Environmental Information <https://www.ncdc.noaa.gov/stormevents/>

Probability of Future Occurrence

Over the 20-year record period from 2003 – 2022, Polk County was in a drought for 14 months. There is a total of 240 months in the record period. Based on the number of months of drought and the total number of months in the record period, there is a 6% probability of drought occurrence in the county at any given month. Although drought is not predictable, long-range outlooks and predicated impacts of climate change could indicate an increased chance of occurrence and severity.

Changing Future Conditions Considerations

Drought frequently affects Missouri, including Polk County. Increasing temperatures due to a changing climate will inevitably accelerate evaporation rates and increase the frequency of droughts. It can be expected that rivers and groundwater reserves will experience significant reductions in available water with the increasing severity and frequency of droughts. It may be necessary in the future to restrict water usage in Polk County, which would mainly affect the county's agriculture industry and would diminish residents' quality of life.

Vulnerability

Vulnerability Overview

Southwest Missouri has moderate drought susceptibility. Groundwater resources are adequate to meet domestic and municipal water needs, but due to required well depths, irrigation wells are very expensive. The topography is generally unsuitable for row-crop irrigation. During extended time periods without precipitation, municipal water sources may be at risk for contamination as the concentration of natural minerals, such as lead, will increase with low water levels.

Potential Losses to Existing Development

The National Drought Monitor Center at the University of Nebraska at Lincoln summarized the potential impacts of drought as follows: Drought can create economic impacts on agriculture and related sectors, including forestry and fisheries, because of the reliance of these sectors on surface and subsurface water supplies. In addition to losses in yields in crop and livestock production, drought is associated with increases in insect infestations, plant disease, and wind erosion. Droughts also bring increased problems with insects and disease to forests and reduce growth. The incidence of forest and range fires increases substantially during extended droughts, which in turn place both human and wildlife

populations at higher levels of risk. Income loss is another indicator used in assessing the impacts of drought because so many sectors are affected. Finally, while drought is rarely a direct cause of death, the associated heat, dust, and stress can all contribute to increased mortality.

Impact of Previous and Future Development

Increases in acreage planted with crops would add to exposure of drought-related agricultural losses. In addition, as populations grow, increased demand is placed on treated water and wastewater discharge, adding additional strain on water systems.

Hazard Summary by Jurisdiction

Although the probability of drought is the same for the entire county, farming and livestock enterprises in the unincorporated parts of the county would feel the greatest impact. Although communities with wells are susceptible to water shortages due to groundwater reduction, other communities with no source are more at risk of extreme water shortages in the event of a drought. School districts would be the least impacted by drought; however, those districts in communities with single source wells or none at all may experience water shortages prior to those in larger communities. Special districts like Central Polk County Fire Protection District, Halfway Fire & Rescue Association, Morrisville Fire Protection District, and Pleasant Hope Fire Protection District would feel impacts in the form of increased risk for wildfire and reduced fire-fighting water sources.

Community Comments on Hazard

A majority of the Polk County community (67.5%) stated that droughts are likely to happen, while 80.9% stated they are concerned about drought impacting their communities. 51.6% believe a drought will cause a critical impact and 15.1% believed it will cause a catastrophic impact.

Problem Statement

Although drought most likely will not cause structural damage, the impact is greatest on the agriculture sector and, if persistent enough, could cause reductions in groundwater and water shortages in communities that provide potable water services. Potential actions to mitigate the impact of drought would be for communities to develop public information campaigns regarding water conservation techniques and measures and provide notification mechanisms for community members to know when drought conditions may occur. Some methods may include restricting the use of public water resources for non-essential usage, such as landscaping, washing cars, filling swimming pools, etc. during extreme drought periods. Schools and special districts can also implement water conservation measures at all district facilities as well. Additionally, Polk County should encourage the use of drought-resistant farming practices to help reduce the negative impacts on crops and municipal drinking water supplies.

3.4.6 Extreme Temperatures

Hazard Profile

Hazard Description

Extreme temperature events, both hot and cold, can impact human health and mortality, natural ecosystems, agriculture, and other economic sectors. According to information provided by FEMA, extreme heat is defined as temperatures that hover 10 degrees or more above the average high temperature for the region and last for several weeks. Ambient air temperature is one component of heat conditions, with relative humidity being the other. The relationship of these factors creates what is known as the apparent temperature. The Heat Index chart shown in **Figure 3.35** uses both factors to produce a guide for the apparent temperature or relative intensity of heat conditions.

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

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

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

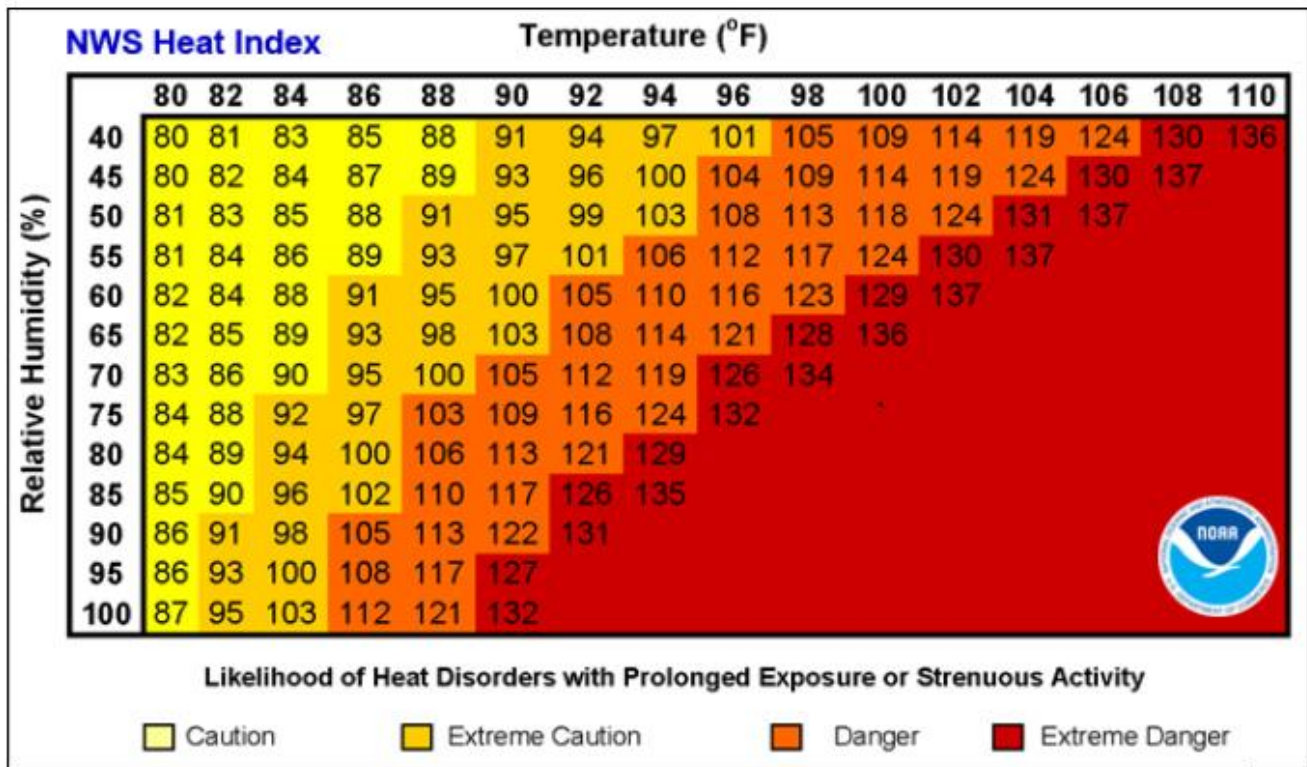
Geographic Location

Since extreme heat is an area-wide hazard event, the risk of does not vary across the county.

Strength/Magnitude/Extent

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

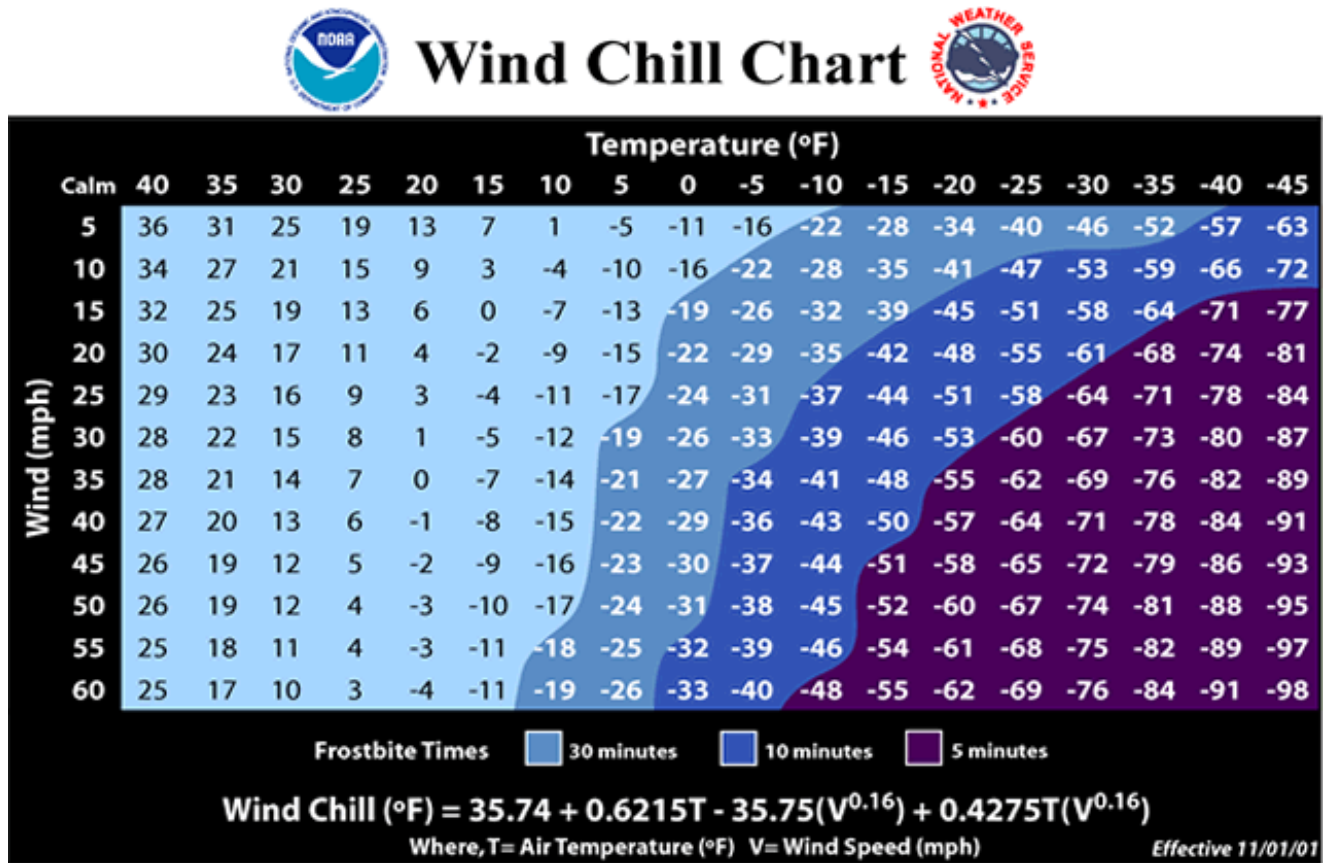
Figure 3.35. Heat Index (HI) Chart



Source: National Weather Service (NWS); <https://www.weather.gov/safety/heat-index> Note: Exposure to direct sun can increase Heat Index values by as much as 15°F. The shaded zone above 105°F corresponds to a HI that may cause increasingly severe heat disorders with continued exposure and/or physical activity.

The NWS Wind Chill Temperature (WCT) index uses advances in science, technology, and computer modeling to provide an accurate, understandable, and useful formula for calculating the dangers from winter winds and freezing temperatures. **Figure 3.36** below presents wind chill temperatures which are based on the rate of heat loss from exposed skin caused by wind and cold. As the wind increases, it draws heat from the body, driving down skin temperature and eventually the internal body temperature.

Figure 3.36. Wind Chill Chart



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

While temperatures across the county are generally uniform, there are some local variations. **Figures 3.35 and 3.36** can be applied to any jurisdiction in Polk County.

Previous Occurrences

According to the National Centers for Environmental Information (NCEI) database, there was one recorded heat event (June, July, and August 2012) from 2003 to 2022 in Polk County. There were no deaths or injuries associated with this event in Polk County, but it did cause 157 heat related injuries in neighboring Greene County.

There was one recorded extreme cold event in the National Centers for Environmental Information (NCEI) database from 2003 to 2022 in Polk County (February 2021). There were no deaths, injuries, property damage, or crop damage as a result of this even in Polk County. However, nearby Greene County suffered \$95,000 in property damage and Lawrence County suffered \$25,000 in property.

Probability of Future Occurrence

From 2003 to 2022, there was one recorded extreme heat event in Polk County that lasted three months. As a result, there is a 5% chance that an extreme heat event will occur in any given year. Over that same time-period, there was one total extreme cold event, which also gives a 5% chance for an extreme cold event in any given year.

It should be noted that there are limitations to the accuracy of these projections. The events recorded in the NCEI database describe extreme heat as prolonged periods where temperatures rose at least

10° above normal for at least 12 consecutive days, and extreme cold as prolonged periods where the temperature was at least 10° below normal for at least 12 consecutive days. Heat and cold advisories and warnings are issued for shorter periods of extreme heat and cold nearly every year and may not meet the threshold for consecutive days in the NCEI database. This data limitation indicates that extreme temperature events may be underreported in the NCEI.

Changing Future Conditions Considerations

Under a higher emissions pathway, historically unprecedented warming is projected by the end of the century. Even under a pathway of lower greenhouse gas emissions, average annual temperatures are projected to most likely exceed historical record levels by the middle of the 21st century. For example, in southern Missouri, the annual maximum number of consecutive days with temperatures exceeding 95 degrees F is projected to increase by up to 20 days. Temperature increases will cause future heat waves to be more intense, a concern for this region which already experiences hot and humid conditions. If the warming trend continues, future heat waves are likely to be more intense, and cold wave intensity is projected to decrease.

The impacts of extreme heat events are experienced most acutely by the elderly and other vulnerable populations. Higher demand for electricity as people try to keep cool amplifies stress on power systems and may lead to an increase in the number of power outages. Atmospheric concentrations of ozone occur at higher air temperatures, resulting in poorer air quality, while harmful algal blooms flourish in warmer water temperatures, resulting in poorer water quality.

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

Vulnerability

Vulnerability Overview

High humidity, which often accompanies heat in Missouri, can make the effects of heat even more harmful. While heat-related illness and death can occur from exposure to intense heat in just one afternoon, heat stress on the body has a cumulative effect. Consequently, the persistence of a heat wave increases the threat to public health. Those at greatest risk for heat-related illness include infants and children up to five years of age, people 65 years of age and older, people who are overweight, and people who are ill or on certain medications. However, even young and healthy individuals are susceptible if they participate in strenuous physical activities during hot weather. In agricultural areas, the exposure of farm workers, as well as livestock, to extreme temperatures is a major concern.

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

Table 3.30. Typical Health Impacts of Extreme Heat

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

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

Based on information from the 2018 Missouri State Hazard Mitigation Plan, Polk County has a total vulnerability description of Low Medium for both extreme heat and extreme cold.

This plan was developed prior to the release of FEMA's *Local Mitigation Planning Policy Guide, Effective April 19, 2023*. Future hazard mitigation plan update cycles will reference the latest State Plan, which will include quantifiers for ranked vulnerabilities as required under 44 CFR 201.6(c)(2)(i).

Potential Losses to Existing Development

Based on information from the 2018 Missouri State Hazard Mitigation Plan, Polk County has a Low chance of experiencing extreme heat and cold every year. Some crop or agricultural losses may also be expected, but amounts are difficult to estimate.

Impact of Previous and Future Development

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

Hazard Summary by Jurisdiction

Those at greatest risk for heat-related illness and deaths include children up to five years of age, people 65 years of age and older, people who are overweight, and people who are ill or on certain medications. Data from the 2020 American Community Survey was used to determine populations under 5 and over 65 years old. However, data was not available for overweight individuals and those on medications vulnerable to extreme heat. **Table 3.31** below summarizes vulnerable populations in the participating jurisdictions.

Table 3.31. Polk County Population Under Age 5 and Over Age 65

Jurisdiction	Population Under 5	Population 65 Years and Over	Percent of Total Population
Polk County	1,968	5,689	23.9%
City of Bolivar	718	1,991	24.6%
City of Fair Play	18	100	22.2%
City of Humansville	59	287	24.8%
City of Morrisville	34	133	28.8%
City of Pleasant Hope	25	65	13.4%
Village of Aldrich	4	23	40.9%
Village of Flemington	2	17	26.7%
Village of Halfway	7	12	13.6%

Source: US Census Bureau American Community Survey 2020 5 Year Estimates <https://data.census.gov/>

Community Comments on Hazard

85.7% of community survey respondents stated that extreme temperatures are likely to impact their communities. A majority of the residents are concerned with extreme temperatures impacting their community, with 58.7% stating extreme temperatures would cause a critical impact on their communities.

Problem Statement

Older and younger segments of the population are more vulnerable to the impact of extreme heat. In addition, people living below the poverty level may be more vulnerable during periods of extreme temperatures due to a lack of air conditioning or heating in their homes. Institutionalized populations, such as those living in nursing homes, become more vulnerable to extreme temperatures due to power

outages.

To help reduce the risk of death, heating and cooling centers should be promoted and known to the public, especially to those who have young children or are over the age of 65. Partnering with local community organizations to continue to donate fans and offer weatherization programs would mitigate the impact on vulnerable populations in the county. Additionally, backup generators should be installed in critical facilities, especially those housing vulnerable populations, to ensure property heating and cooling during extreme temperature events.

3.4.7 Severe Thunderstorms Including High Winds, Hail, and Lightning

Hazard Profile

Hazard Description

Thunderstorms

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

High Winds

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

Lightning

All thunderstorms produce lightning which can strike outside of the area where it is raining and 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

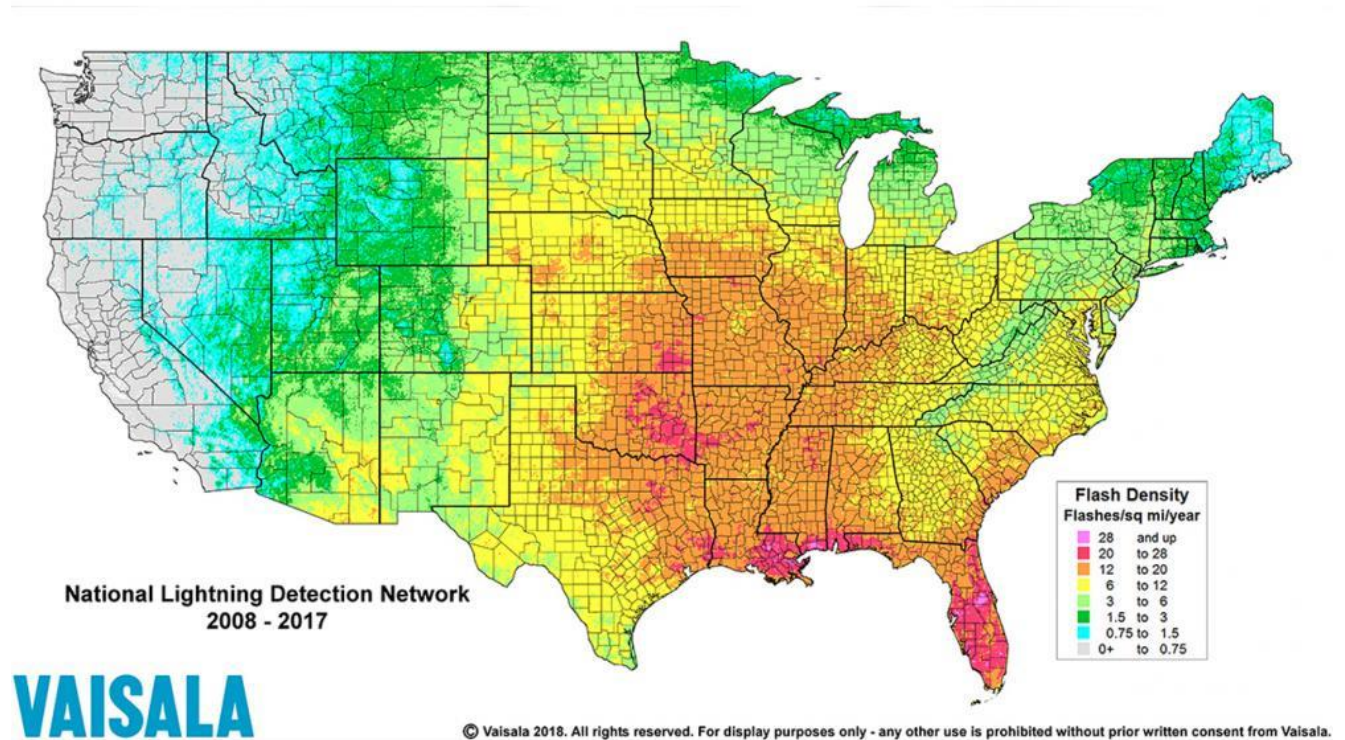
According to the National Oceanic and Atmospheric Administration (NOAA), hail is precipitation that is formed when thunderstorm updrafts carry raindrops upward into extremely cold atmosphere causing them to freeze. The raindrops form into small frozen droplets. They continue to grow as they come into 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 events are an area-wide hazard that can happen anywhere in Polk County. Although these events occur similarly throughout the County, they are more frequently reported in the urbanized areas. In addition, damages are more likely to occur in more densely developed areas. **Figure 3.37** shows lightning frequency in the United States. Polk County is located in an area with an average flash density of 12-20 flashes per square mile per year.

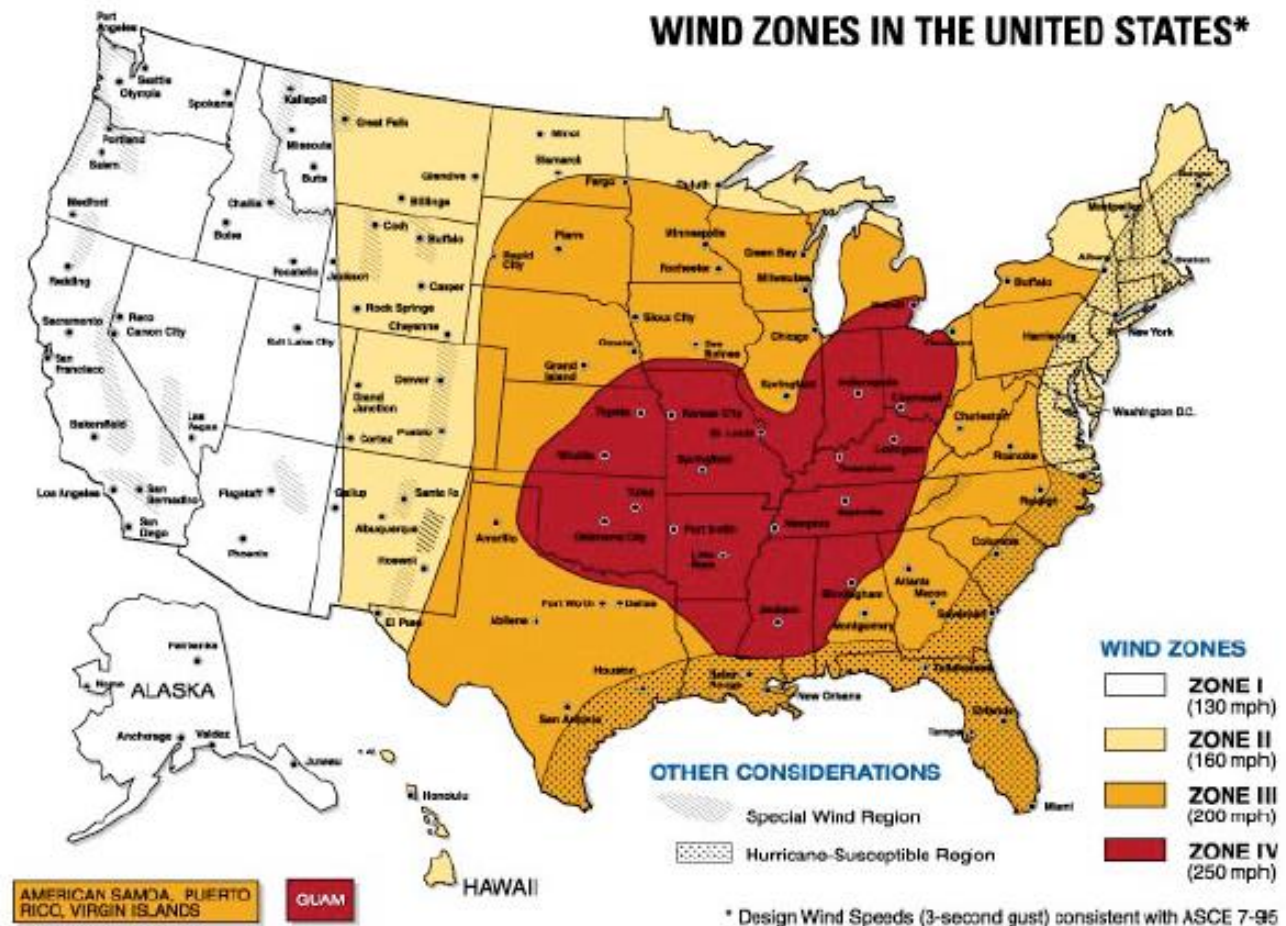
Figure 3.37. Location and Frequency of Lightning in Missouri



Source: National Weather Service <http://www.vaisala.com/en/products/thunderstormandlightningdetectionsystems/Pages/NLDN.aspx>

Figure 3.38 shows wind zones in the United States. Polk County lies in Zone IV, where wind speeds of up to 250 mph are possible. All jurisdictions are equally likely to be impacted by strong winds in the event of a severe thunderstorm.

Figure 3.38. Wind Zones in the United States



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

Strength/Magnitude/Extent

Based on information provided by the Tornado and Storm Research Organization (TORRO), **Table 3.32** below describes typical damage impacts of the various sizes of hail.

Table 3.32. Tornado and Storm Research Organization Hailstorm Intensity Scale

Scale	Intensity Category	Diameter (mm)	Size Description	Typical Damage Impacts
H0	Hard Hail	5	Pea	No damage
H1	Potentially Damaging	5-15	Mothball	Slight general damage to plants, crops
H2	Significant	10-20	Marble, grape	Significant damage to fruit, crops, vegetation
H3	Severe	20-30	Walnut	Severe damage to fruit and crops, damage to glass and plastic structures, paint and wood scored
H4	Severe	25-40	Pigeon's egg > squash ball	Widespread glass damage, vehicle bodywork damage
H5	Destructive	30-50	Golf ball > Pullett's egg	Wholesale destruction of glass, damage to tiled roofs, significant risk of injuries
H6	Destructive	40-60	Hen's egg	Bodywork of grounded aircraft dented; brick walls pitted
H7	Destructive	50-75	Tennis ball > cricket ball	Severe roof damage, risk of serious injuries

H8	Destructive	60-90	Large orange > softball	Severe damage to aircraft bodywork
H9	Super Hailstorms	75-100	Grapefruit	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open
H10	Super Hailstorms	>100	Melon	Extensive structural damage. Risk of severe or even fatal injuries to persons caught in the open

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

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

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

Previous Occurrences

Thunderstorm Winds

Table 3.33. Thunderstorm Wind Events in Polk County 2003-2022

Location	Occurrences	Deaths	Injuries	Property Damage	Crop Damage
Unincorporated Polk County	47	-	1	\$7,281,500	-
City of Bolivar	38	-	-	\$349,000	-
City of Fair Play	9	-	-	\$29,000	-
City of Humansville	22	-	-	\$100,000	-
City of Morrisville	16	-	-	\$45,000	-
City of Pleasant Hope	35	-	-	\$204,000	-
Village of Aldrich	2	-	-	\$5,000	-
Village of Flemington	6	-	-	\$8,000	-
Village of Halfway	6	-	-	\$15,500	-
Total	181	-	1	\$8,037,000	\$0

Source: National Centers for Environmental Information <https://www.ncdc.noaa.gov/stormevents/>

High Winds

Table 3.34. High Wind Events in Polk County 2003-2022

Location	Occurrences	Deaths	Injuries	Property Damage	Crop Damage
Unincorporated Polk County	2	-	-	-	-
City of Bolivar	-	-	-	-	-
City of Fair Play	-	-	-	-	-
City of Humansville	-	-	-	-	-
City of Morrisville	-	-	-	-	-
City of Pleasant Hope	-	-	-	-	-

Village of Aldrich	-	-	-	-	-
Village of Flemington	-	-	-	-	-
Village of Halfway	-	-	-	-	-
Total	2	0	0	\$0	\$0

Source: National Centers for Environmental Information <https://www.ncdc.noaa.gov/stormevents/>

Lightning

Table 3.35. Lightning Events in Polk County 2003-2022

Location	Occurrences	Deaths	Injuries	Property Damage	Crop Damage
Unincorporated Polk County	-	-	-	-	-
City of Bolivar	-	-	-	-	-
City of Fair Play	-	-	-	-	-
City of Humansville	-	-	-	-	-
City of Morrisville	-	-	-	-	-
City of Pleasant Hope	-	-	-	-	-
Village of Aldrich	-	-	-	-	-
Village of Flemington	-	-	-	-	-
Village of Halfway	-	-	-	-	-
Total	0	0	0	\$0	\$0

Source: National Centers for Environmental Information <https://www.ncdc.noaa.gov/stormevents/>

It should be noted that limitations to the use of NCEI reported lightning events include the fact that generally only significant lightning events that result in death, injury, and/or property and crop damage are reported in the NCEI.

Hail

Table 3.36. Hail Events in Polk County 2003-2022

Location	Occurrences	Deaths	Injuries	Property Damage	Crop Damage
Unincorporated Polk County	47	-	-	\$20,000	-
City of Bolivar	21	-	-	\$6,000,000	-
City of Fair Play	8	-	-	\$250,000	-
City of Humansville	7	-	-	-	-
City of Morrisville	15	-	-	\$60,000	-
City of Pleasant Hope	31	-	-	-	-
Village of Aldrich	4	-	-	-	-
Village of Flemington	9	-	-	-	-
Village of Halfway	12	-	-	-	-
Total	157	0	0	\$6,330,000	\$0

Source: National Centers for Environmental Information <https://www.ncdc.noaa.gov/stormevents/>

Probability of Future Occurrence

Thunderstorm Winds

From 2003-2022, there were 181 thunderstorm wind events in Polk County. Based on this, we can estimate that there is a 100% chance of an event occurring in any given year, with an average of 9 events per year.

High Winds

From 2003-2022, there were 2 high wind events in Polk County. Based on this, we can estimate that there is a 10% chance of an event occurring in any given year, with an average of 0.1 events per year.

Lightning

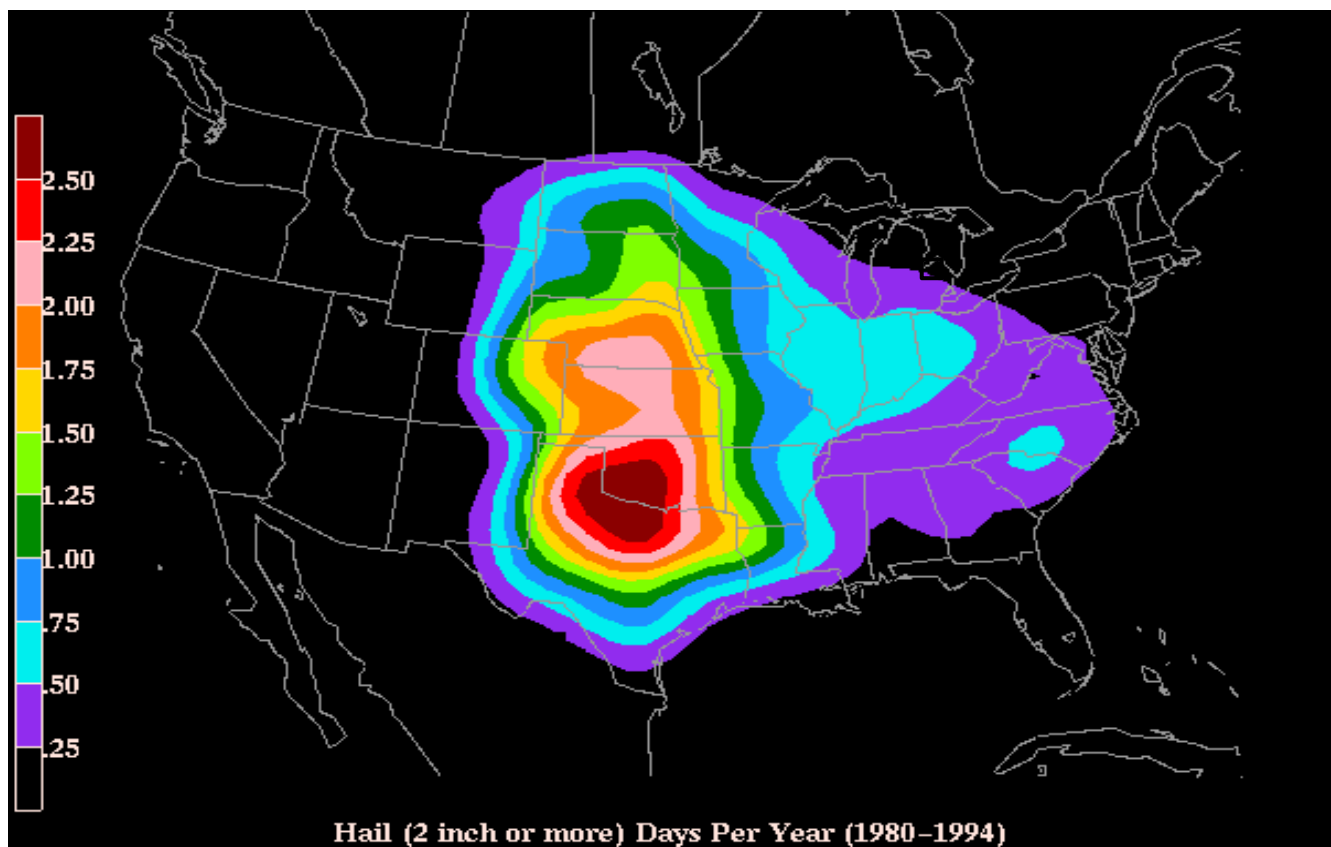
There were no recorded lightning events in Polk County from 2003-2022. It's hard to estimate future occurrences, though, since only significant lightning events are reported to the NCEI.

Hail

From 2003-2022, there were 157 hail events in Polk County. Based on this, we can estimate that there is a 100% chance of an event occurring in any given year, with an average of 7.55 events per year.

Figure 3.39 is a map based on hailstorm data from 1980-1994. It shows the probability of hailstorm occurrence (2" diameter or larger based on number of days per year). Polk County and all participating jurisdictions are located in a zone that should experience hail with a diameter of 2" or more up to 1.25 times per year.

Figure 3.39. Annual Hailstorm Probability (2" diameter or larger), 1980- 1994



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

Changing Future Conditions Considerations

Increases in temperature and more frequent droughts will accelerate the evaporation of water into the atmosphere, which will produce higher water concentrations. Elevated levels of moisture raise the

likelihood of severe thunderstorms and tornadoes. Lives and property are endangered when the risk of these events increases, especially in jurisdictions that do not have a community safe room or the funds to construct one. This kind of event also possesses the threat of increasing the magnitude and frequency of other hazard events like riverine flooding, sinkhole occurrence, and flash flooding, putting residents in even greater danger.

Vulnerability

Vulnerability Overview

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

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 damage to crops if fields or forested lands are set on fire. Communications equipment and warning transmitters and receivers can also be knocked out by lightning strikes.

Potential Losses to Existing Development

The average annual loss determined from historical losses for thunderstorm wind, high wind, hail and lightning are indicators of the potential losses to existing development. Potential annual losses throughout Polk County are:

Thunderstorm Wind - \$401,850
High Wind - \$0
Lightning - \$0
Hail - \$316,500

It's important to note that outlier events can potentially skew these numbers. One hail event in 2022 accounted for 87% of the overall property damage and one thunderstorm event in 2009 accounted for 87% of the overall property damage.

Impact of Previous and Future Development

Development and population growth within Unincorporated Polk County, as well as in specific jurisdictions, including school and special districts, results in an increase of population and buildings. Development occurring in these areas will result in more exposure that is vulnerable to damages from thunderstorms, heavy winds, lightning, and precipitation.

Hazard Summary by Jurisdiction

Thunderstorms, heavy winds, lightning, hail, and heavy precipitation can severely impact communities with more structures built prior to 1939. Fair Play, Morrisville, Aldrich, Flemington, and Halfway all have more than 20% of their housing units built prior to 1939, while Humansville is over 30%. Jurisdictions which have building plans or feature building codes/ordinances within their Comprehensive/Land Use plans will be more effective in mitigating the effects of these hazards.

Community Comments on Hazard

When asked the likelihood of thunderstorms (including high winds, hail, and lightning) impacting their communities, 69.8% of residents stated highly likely and 27.0% stated likely. No residents stated unlikely. When asked about the concern level, 51.6% are at least very concerned and 37.3% are somewhat concerned. 59.5% stated thunderstorms have a critical impact on communities and 12.7% stated a catastrophic impact. When asked to rank projects that may be funded by FEMA Hazard Mitigation Grants, storm water management and localized flooding projects were ranked among the highest.

Problem Statement

Poorly built structures, barns, and outbuildings are more vulnerable to the impact of high winds during thunderstorms. High winds can topple utility poles and lead to power outages. Both high winds and hail can damage roofs. Hail can also damage crops and dent cars and trucks. Additionally, people are at risk to injury and death during high wind events. Crop insurance mitigates the risk to farmers and the agriculture sector within the county. Lightning events have caused structural fires, can strike electrical utilities leading to power outages, or strike municipal water systems causing water supply outages.

The risk of property damage, injury, and death in the county can be mitigated by identifying safe refuge areas in public buildings, nursing homes and other facilities that house vulnerable populations that do not have a safe room. The purchasing and installation of NOAA weather radios in schools, government buildings and public areas may assist in providing early warning to allow for public to seek shelter during high wind events. Education and hazard awareness programs in public schools would also increase public safety in the event of severe thunderstorm events. Additionally, school systems with existing alert systems may utilize for severe weather notifications and the County may investigate a county-wide alert system to provide important severe weather information.

3.4.8 Severe Winter Weather

Hazard Profile

Hazard Description

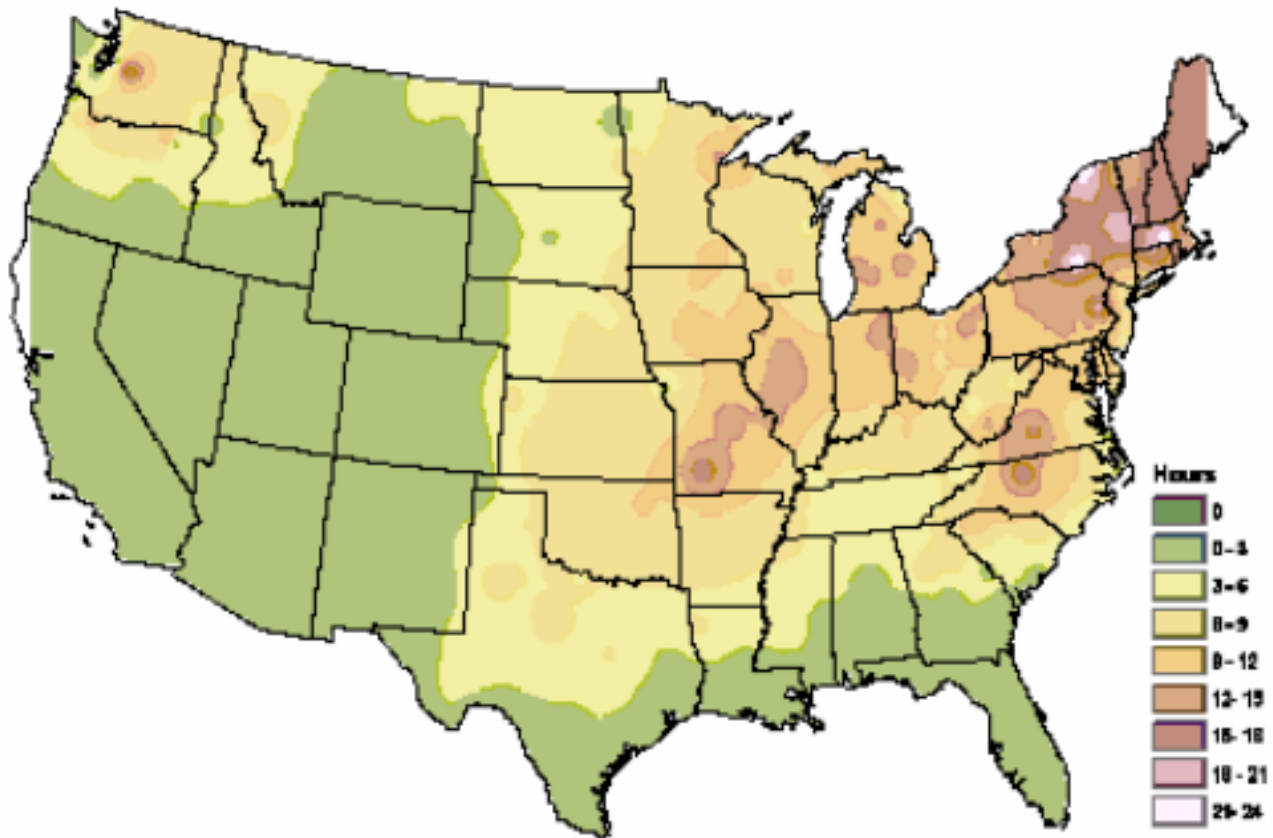
A major winter storm can last for several days and be accompanied by high winds, freezing rain or sleet, heavy snowfall, and cold temperatures. The National Weather Service describes different types of winter storm events as follows:

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

Geographic Location

The entire county is vulnerable to heavy snow, ice, extreme cold temperatures, and freezing rain. **Figure 3.40** depicts the average number of hours per year with freezing rain. Polk County and all participating jurisdictions are located in a zone that can expect 12-18 hours of freezing rain per year.

Figure 3.40. NWS Statewide Average Number of Hours per Year with Freezing Rain



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

Strength/Magnitude/Extent

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

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

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

- **Wind Chill Warning** – Wind chill temperatures of -35 degrees F or lower are expected. This is a life-threatening situation.

Previous Occurrences

Table 3.37 describes the NCEI reported winter events and damages from 2003-2022.

Table 3.37. Polk County Winter Weather Events Summary 2003 - 2022

Type of Event	Inclusive Dates	Injuries/Deaths	Property Damages	Crop Damages
Blizzard	(02/01/2011)	0/0	\$0	\$0
Extreme Cold/Wind Chill	(02/14/2021)	0/0	\$0	\$0
Heavy Snow	(12/10/2003), (02/05/2020)	0/0	\$0	\$0
Ice Storm	(01/25/2004), (01/12/2007), (12/09/2007) (02/11/2008), (02/21/2008), (01/13/2017)	0/0	\$1,050,000	\$0
Sleet	-	0/0	\$0	\$0
Winter Storm	(03/02/2002), (12/04/2002), (12/24/2002), (01/02/2003), (02/23/2003), (03/05/2003), (11/30/2006), (01/20/2007), (01/26/2009), (01/29/2010), (03/20/2010), (02/21/2013), (12/20/2013), (01/05/2014), (03/02/2014), (02/28/2015)	0/0	\$0	\$0
Winter Weather	(02/10/2018), (12/31/2020)	0/0	\$0	\$0

Source: National Centers for Environmental Information <https://www.ncdc.noaa.gov/stormevents/>

The most significant event was an ice storm that occurred in January 2007. Several counties, mainly along and north of the Interstate 44 corridor, experienced ice accumulations up to 2.5 inches. Power outages that lasted up to three weeks and catastrophic tree damage were the main impacts resulting from this historic event. Several indirect fatalities due to the extreme elements were documented. Carbon monoxide poisoning occurred within a few homes as gas generators were being used in garages, which allowed dangerous levels of carbon monoxide to seep into houses. In total, more than \$350,000,000 in property damage occurred in Missouri.

Probability of Future Occurrence

The probability for all of the different types of winter weather events is included as one probability, since one storm generally includes multiple types of events. There were 28 severe winter storm events in Polk County from 2003 to 2022. This equates to 100% probability of occurrence, with an average of 1.4 winter storm events occurring every year.

Changing Future Conditions Considerations

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

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

Vulnerability

Vulnerability Overview

Heavy snow can bring a community to a standstill by inhibiting transportation (in whiteout conditions), weighing down utility lines, and by causing structural collapse in buildings not designed to withstand the weight of the snow. Repair and snow removal costs can be significant. Ice buildup can collapse utility lines and communication towers, as well as make transportation difficult and hazardous. Ice can also become a problem on roadways if the air temperature is high enough that precipitation falls as freezing rain rather than snow.

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

Overhead power lines and infrastructure are also vulnerable to damages from winter storms. In particular ice accumulation during winter storm events damage to power lines due to the ice weight on the lines and equipment. Damages also occur to lines and equipment from falling trees and tree limbs weighted down by ice. Potential losses could include the 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 the 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.

In the 2018 State Plan, the five factors considered in determining overall severe winter storm vulnerability were housing density, building exposure, social vulnerability, likelihood of occurrence, and average annual property loss. The state ranked each of these criteria using a scale from one to five, one being lowest and five being the highest, to rank each county's vulnerability to severe winter weather. Polk County received the following vulnerability rating for each criterion:

- Housing Density Rating: Low
- Building Exposure: Low
- Social Vulnerability: Medium
- Likelihood of Occurrence: Low Medium
- Average Annual Property Loss: Low Medium

This equates to an overall vulnerability rating of Low Medium.

This plan was developed prior to the release of FEMA's *Local Mitigation Planning Policy Guide, Effective April 19, 2023*. Future hazard mitigation plan update cycles will reference the latest State Plan, which will include quantifiers for ranked vulnerabilities as required under 44 CFR 201.6(c)(2)(i).

Potential Losses to Existing Development

During the 20-year period from 2003-2022, Polk County suffered a total of \$1,050,000 in property damage due to severe winter weather events, for an average of \$52,500 per year. However, it's important to note that \$1,000,000 in damage occurred during a single ice storm event in 2007.

Impact of Previous and Future Development

Increased development and any resulting increases in population will increase exposure to damage from severe winter weather. Future commercial development can expect functional downtime and decreased revenues during periods of severe winter weather. Future construction of facilities that will serve vulnerable populations will need to be prepared for extreme weather conditions. Road construction in the county will increase the need for snow removal and salt to keep transportation lifelines open during periods of severe winter weather. Any increase in agriculture crop production will also increase the risk of exposure.

Hazard Summary by Jurisdiction

Severe winter weather can cause power outages and put structures at risk of fires when individuals in homes resort to fuel heaters. The risk of extreme cold deaths and frostbite varies among segments of the populations. People aged 65 and older and those living below the poverty level have an increased vulnerability to severe winter weather. **Table 3.38** provides a summary of these populations within Polk County.

Table 3.38. Population Over 65 and Percent Living Below the Poverty Level

Jurisdiction	Percent of Families Living Below the Poverty Line	Population 65 and Older	Population 65 and Older (Percentage)
Polk County	10.3	5689	17.7%
City of Bolivar	12.1	1991	18.1%
City of Fair Play	47.7	100	18.8%
City of Humansville	10.6	287	20.7%
City of Morrisville	1.2	133	23.0%
City of Pleasant Hope	5.5	65	9.6%
Village of Aldrich	11.1	23	34.9%
Village of Flemington	4.5	17	23.9%
Village of Halfway	44.2	12	8.5%

Source: US Census Bureau American Community Survey 2020 5 Year Estimates <https://data.census.gov/>

Community Comments on Hazard

85.8% of residents stated that winter weather is likely to impact their communities. 48.4% stated they were at least concerned about the impact caused by severe winter weather and 40.5% stated they were somewhat concerned. When asked the impact a severe winter weather could cause, 74.6 stated at least a critical impact would occur and 24.6% stated a limited impact would occur. Multiple comments referenced the ice storm of 2007.

Problem Statement

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. People over 65 and those living in poverty have an increased risk of hypothermia and frostbite due to extreme cold and wind chill.

Organizing outreach to at-risk populations, including establishing and promoting accessible heating and cooling centers can help reduce the potential exposure to harsh winter weather. Additionally, identifying debris disposal and burning locations can assist in facilitating recovery efforts after a significant winter storm or ice incident. An automated alert system could also be utilized to notify residents of incoming winter weather and warming locations in the community.

3.4.9 Tornado

Hazard Profile

Hazard Description

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

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

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

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

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

Geographic Location

There are no specific likely locations for future occurrences as the threat from this hazard is countywide.

Strength/Magnitude/Extent

Tornadoes are the most violent of all atmospheric storms and are capable of tremendous destruction. Wind speeds can exceed 250 miles per hour and damage paths can be more than one mile wide and

50 miles long. Tornadoes have been known to lift and move objects weighing more than 300 tons a distance of 30 feet, toss homes more than 300 feet from their foundations, and siphon millions of tons of water from water bodies. Tornadoes also can generate a tremendous amount of flying debris or “missiles,” which often become airborne shrapnel that causes additional damage. If wind speeds are high enough, missiles can be thrown at a building with enough force to penetrate windows, roofs, and walls. However, the less spectacular damage is much more common.

Tornado magnitude is classified according to the EF- Scale (or the Enhance Fujita Scale, based on the original Fujita Scale developed by Dr. Theodore Fujita, a renowned severe storm researcher). The EF- Scale (see **Table 3.39**) attempts to rank tornadoes according to wind speed based on the damage caused. This update to the original F Scale was implemented in the U.S. on February 1, 2007.

Table 3.39. Enhanced F Scale for Tornado Damage

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

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

The wind speeds for the EF scale and damage descriptions are based on information on the NOAA Storm Prediction Center as listed in **Table 3.40**. The damage descriptions are summaries. For the actual EF scale, it is necessary to look up the damage indicator (type of structure damaged) and refer to the degrees of damage associated with that indicator. Information on the Enhanced Fujita Scale's damage indicators and degrees of damage is located online at www.spc.noaa.gov/efscale/ef-scale.html.

Table 3.40. Enhanced Fujita Scale with Potential Damage

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

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

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

Previous Occurrences

There are limitations to the use of NCEI tornado data that must be noted. For example, one tornado may contain multiple segments as it moves geographically. A tornado that crosses a county line or state line is considered a separate segment for the purposes of reporting to the NCEI. Also, a tornado that lifts off the ground for less than 5 minutes or 2.5 miles is considered a separate segment. If the tornado lifts off the ground for greater than 5 minutes or 2.5 miles, it is considered a separate tornado. Tornadoes reported in Storm Data and the Storm Events Database are in segments. **Table 3.41** below provides details on tornadoes in Polk County from 2003-2022.

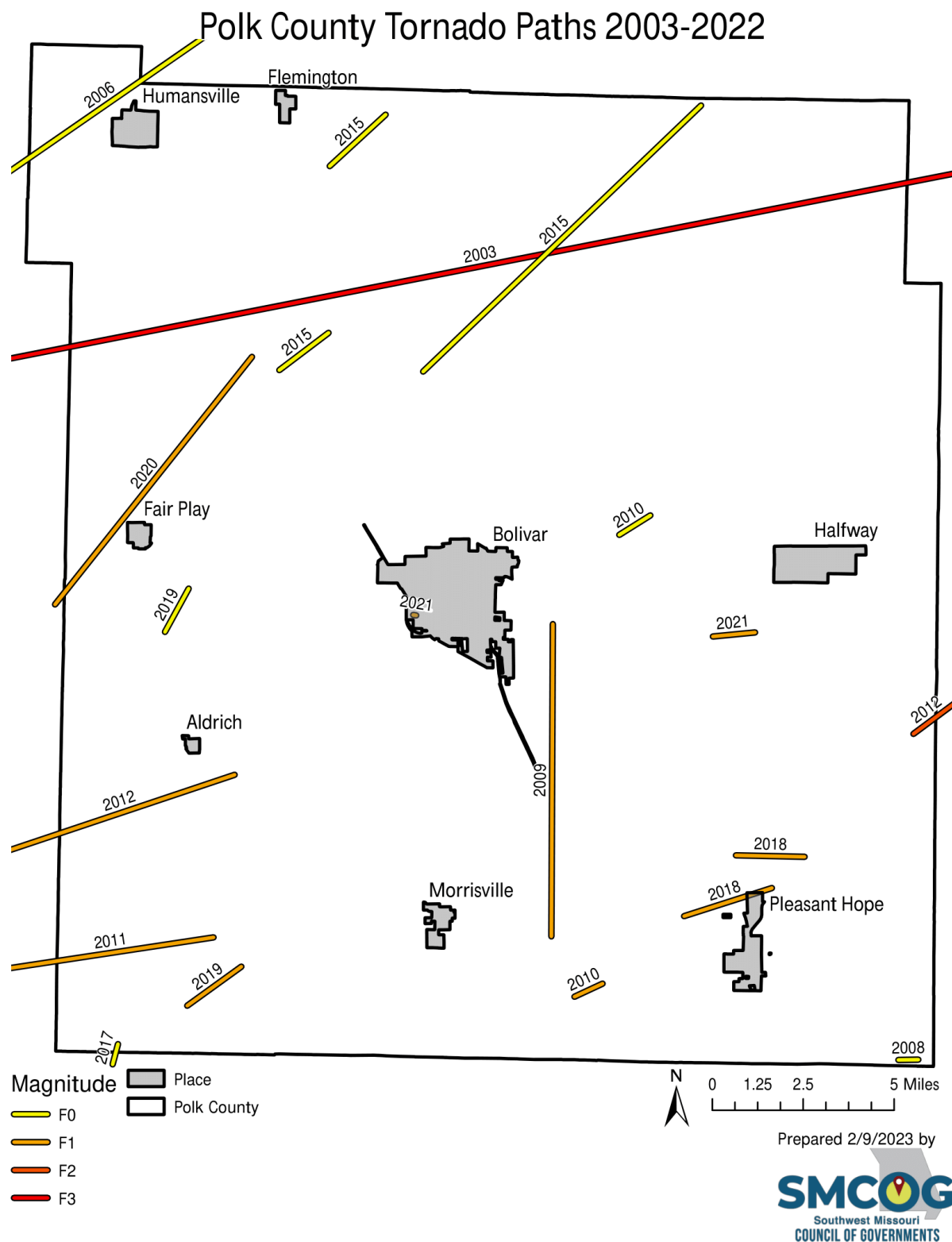
Table 3.41. Recorded Tornadoes in Polk County, 2003-2022

Date	Beginning Location	Ending Location	Length (miles)	Width (yards)	F/EF Rating	Death	Injury	Property Damage	Crop Damages
05/04/2003	Dunnegan	Dunnegan	23.00	400	F2	0	0	\$3,700,000	\$1,000,000
05/04/2003	Rondo	Rondo	0.20	20	F0	0	0	\$0	\$0
05/06/2003	Morrisville	Morrisville	0.20	20	F0	0	0	\$0	\$0
03/12/2006	Humansville	Humansville	8.00	35	F0	0	0	\$0	\$0
06/30/2007	Eudora	Eudora	0.75	50	EF0	0	0	\$5,000	\$0
03/31/2008	Tin Town	Tin Town	0.84	50	EF0	0	0	\$25,000	\$0
05/08/2009	Brighton	Burns	8.61	250	EF1	0	0	\$2,000,000	\$0
11/24/2010	Brighton	Brighton	0.85	200	EF1	0	0	\$75,000	\$0
12/31/2010	Burns	Violet	1.00	50	EF0	0	0	\$5,000	\$0
06/18/2011	Knox	Eudora	4.69	100	EF1	0	0	\$0	\$0
06/18/2011	Brighton	Brighton	0.07	100	EF0	0	0	\$0	\$0
02/28/2012	Knox	Aldrich	5.38	100	EF1	0	0	\$50,000	\$0
02/28/2012	Schofield	Schofield	0.50	100	EF1	0	0	\$0	\$0
05/17/2015	Cliquot	Cliquot	1.70	200	EF0	0	0	\$0	\$0
05/17/2015	Cliquot	Sentinel	10.57	100	EF0	0	0	\$15,000	\$0
05/17/2015	Rondo	Rondo	2.09	100	EF0	0	0	\$20,000	\$0
05/19/2017	Knox	Knox	0.58	100	EF0	0	0	\$5,000	\$0
05/19/2018	Pleasant Hope	Pleasant Hope	2.30	100	EF1	0	0	\$20,000	\$0
05/19/2018	Pleasant Hope	Pleasant Hope	2.00	100	EF1	0	0	\$20,000	\$0
04/30/2019	Graydon Spgs	Graydon Spgs	1.84	100	EF1	0	0	\$300,000	\$0
12/28/2019	Fair Play	Fair Play	1.36	75	EF0	0	0	\$55,000	\$0
01/10/2020	Fair Play	Cliquot	8.25	50	EF1	0	0	\$500,000	\$0
05/27/2021	Bolivar Mem Arpt	Bolivar Mem Arpt	0.08	50	EF1	0	0	\$300,000	\$0
05/27/2021	Van	Halfway	1.17	50	EF1	0	0	\$75,000	\$0
Total						0	1	\$7,170,000	\$1,000,000

Source: National Centers for Environmental Information <https://www.ncdc.noaa.gov/stormevents/>

Figure 3.41 below shows historic tornado paths in Polk County.

Figure 3.41. Polk County Map of Historic Tornado Events



Probability of Future Occurrence

Over a 20-year period from 2003-2022, there were a total of 24 tornado events record by the NCEI in Polk County, 17 of which were damaging events. This means there is a 100% chance there will be a tornado event and an 85% chance for a damaging tornado event in any given year.

Changing Future Conditions Considerations

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

Vulnerability

Vulnerability Overview

According to the 2018 State Plan, the following six factors were considered in determining overall tornado vulnerability: building exposure, population density, social vulnerability, percentage of mobile homes, likelihood of occurrence, and annual property loss. The state ranked each of these criteria using a scale from one to five, one being lowest and five being the highest, ranking each county's vulnerability to tornadoes.

Polk County received the following vulnerability rating for each factor:

Building Exposure – Low
Population Density – Low
Social Vulnerability – Medium
Percentage of Mobile Homes – Medium
Likelihood of Occurrence – Medium High
Annual Property Loss – Low

This equates to an overall vulnerability rating of Medium.

Figure 3.42 illustrates areas where dangerous tornadoes historically have occurred.

Figure 3.42. Tornado Alley in the U.S.



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

Potential Losses to Existing Development

Potential losses for each jurisdiction were estimated based on the total exposure with an applied damage factor of 1% - an estimate of the average damage a tornado could cause in a community. **Table 3.42** provides a summary of the estimated total losses for each participating jurisdiction.

Table 3.42. Estimated Potential Tornado Losses by Jurisdiction

Jurisdiction	Total Exposure	Estimated Losses
Unincorporated Polk County	\$2,010,365,000	\$20,103,650
City of Bolivar	\$1,767,742,000	\$17,677,420
City of Fair Play	\$51,828,000	\$518,280
City of Humansville	\$175,143,000	\$1,751,430
City of Morrisville	\$50,705,000	\$507,050
City of Pleasant Hope	\$69,469,000	\$694,690
Village of Aldrich	\$9,311,000	\$93,110
Village of Flemington	\$11,696,000	\$116,960
Village of Halfway	\$19,678,000	\$196,780
Total	4165937000	\$14,659,370

Source: Hazus

Impact of Previous and Future Development

Development across the county and within incorporated jurisdictions increases the potential for losses. From 2003-2022, the average annual loss countywide was \$358,500. This indicates the potential future

losses if the current development were to remain with no additional development. Future development and population increases will increase exposure to damage. It is anticipated that some communities may experience new development, but those communities that enforce building codes may help reduce the risk of building damage.

Hazard Summary by Jurisdiction

Although tornado events are an area-wide hazard, communities with a greater percentage of structures built prior to 1939 are considered to be more vulnerable to the impact of high wind and hail damage. Fair Play, Morrisville, Aldrich, Flemington, and Halfway all have more than 20% of their housing units built prior to 1939, while Humansville is over 30%.

Community Comments on Hazard

A majority of Polk County residents (75.4%) stated a tornado is likely to impact their community. 56.1% of residents are at least very concerned when asked about tornadoes impact their community. When asked what magnitude of impact a tornado would cause in their community, 40.5% stated a critical impact, while 49.2% stated a catastrophic impact. When asked to rank projects that may be funded, “new tornado safe room construction” and “structural retrofitting of existing buildings to add tornado safe rooms” were ranked first and second respectively.

Problem Statement

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. From 2003-2022, tornado events in Polk County resulted in 0 deaths, 0 injuries, and \$7,170,000 in property damage. Information in the 2018 State Plan indicates that the county has a Medium vulnerability to tornadoes.

The risk of property damage, injury, and death in the county can be mitigated by constructing FEMA saferooms in facilities that house vulnerable populations such as nursing homes, government buildings, and schools. Additionally, identifying safe refuge areas in public buildings, nursing homes and other facilities that house vulnerable populations that do not have a safe room can mitigate injury and loss of life. Retrofitting school district facilities with protective filming of windows and installation of storm proof doors will provide more protection for students and staff at school facilities. Promoting the installation of NOAA weather radios, and additional warnings and alerts systems such as Swift 911 or Nixle, will also provide the public and schools more time to find shelter during tornado events.

3.4.10 Wildfire

Hazard Profile

Hazard Description

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

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

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

Geographic Location

Damages due to wildfires are higher in communities with more Wildland-Urban Interface (WUI) areas. The term refers to the zone of transition between unoccupied land and human development and needs to be defined in the plan. Within the WUI, there are two specific areas identified: 1) Interface and 2) Intermix. The interface areas are those areas that abut wildland vegetation and the intermix areas are those areas that intermingle with wildland areas. **Figure 3.43** shows the WUI and **Figure 3.44** shows the wildfire hazard potential for the county. Polk County has an overall wildfire risk of very low to low. There are some moderate to high risk areas in the northern portion of the county near Adonis and the Sentinel Conservation Area. There is also a portion of moderate risk located in the Village of Halfway.

Figure 3.43. Polk County Wildland Intermix and Wildfire Prone Areas

Polk County Wildland Urban Interface

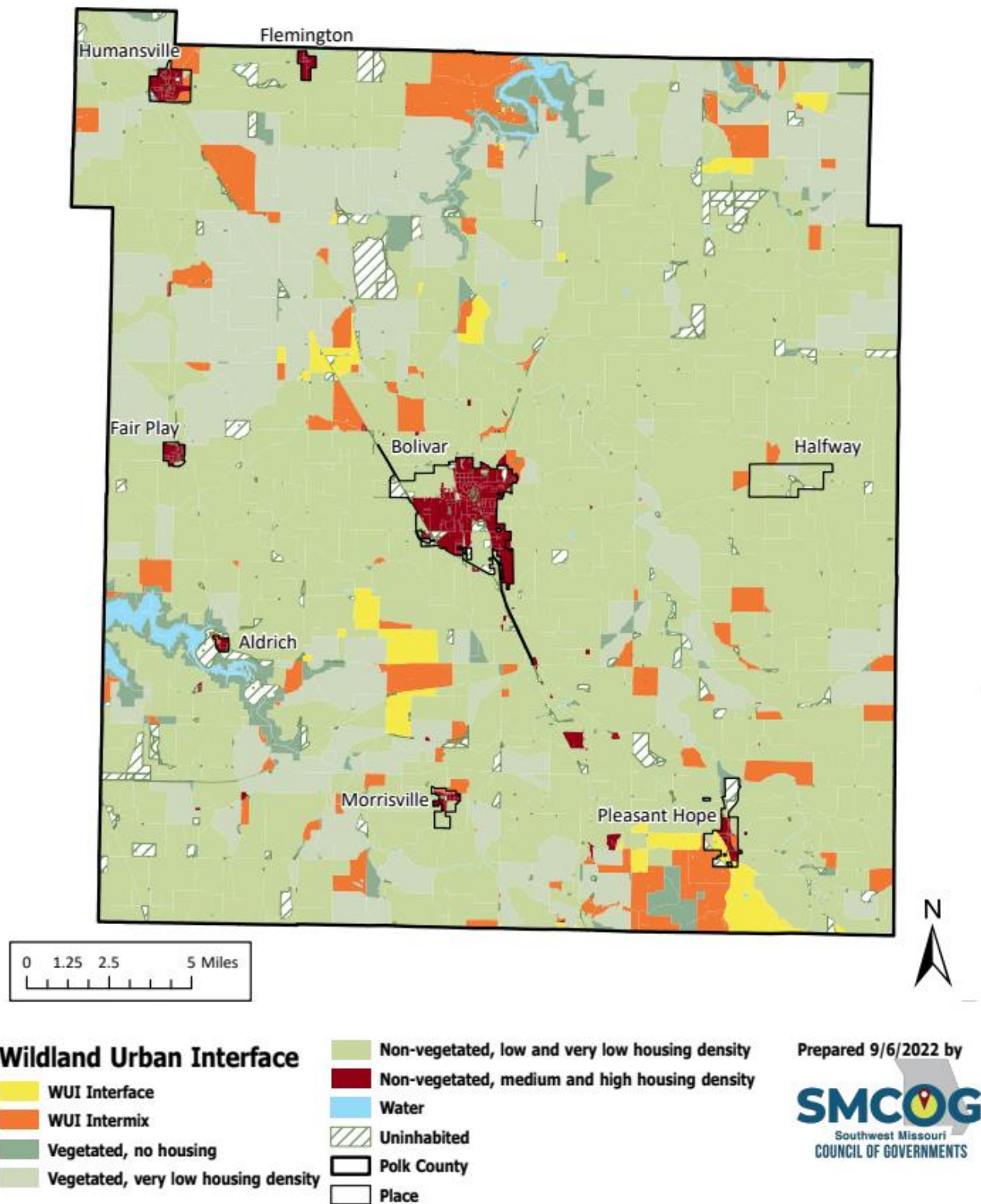
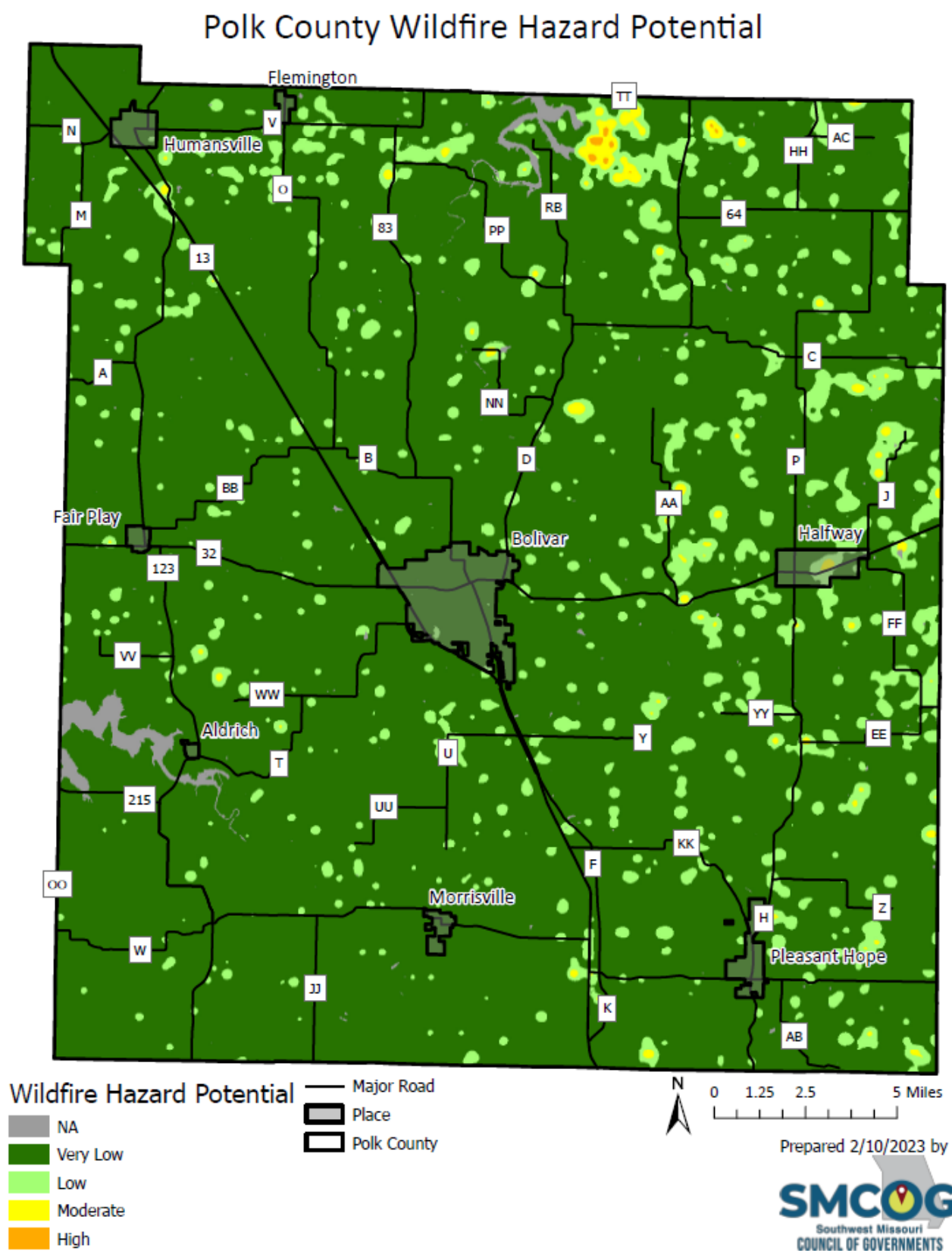


Figure 3.44. Polk County Wildfire Hazard Potential



Strength/Magnitude/Extent

Wildfires damage the environment, killing some plants and occasionally animals. Firefighters have been injured or killed, and structures can be damaged or destroyed. The loss of plants can heighten the risk of soil erosion and landslides. Although Missouri wildfires are not the size and intensity of those in the Western United States, they could impact recreation and tourism in and near the fires.

Wildland fires in Missouri have been mostly a result of human activity rather than lightning or some other natural event. Wildfires in Missouri are usually surface fires, burning dead leaves on the ground or dried grasses. They sometimes do “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 large fire storms.

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 the Missouri Department of Conservation (MDC) Wildfire Data, there were a total of 1,017 wildfires in Polk County from 2003 to 2022. 17,623 acres were burned, 914 buildings were threatened, 46 buildings were damaged, and 51 buildings were destroyed. The most damage occurred in 2012, which accounted for 14% of the total wildfires, 55% of the total acres burned, and 44% of all buildings threatened, damaged, and destroyed. **Table 3.43** shows MDC wildfire statistics by year.

Table 3.43. Polk County Wildfires 2003 – 2022

Year	Number of Wildfires	Buildings Destroyed	Buildings Damaged	Buildings Threatened	Acres Burned
2003	16	0	0	0	56
2004	44	0	0	0	279
2005	46	0	0	0	499
2006	52	5	0	11	645
2007	28	1	0	45	286
2008	30	0	3	17	250
2009	67	2	3	41	487
2010	25	0	1	9	394
2011	57	3	2	37	480
2012	144	15	14	417	9,629
2013	25	2	2	7	141
2014	88	3	5	60	587
2015	48	2	3	45	355
2016	98	4	4	74	1,209
2017	76	10	4	19	533
2018	39	4	3	17	177
2019	27	0	0	13	110
2020	27	1	0	5	109
2021	18	0	0	6	132
2022	62	0	2	91	1,265
Total	1,017	51	46	914	17,623

Source: Missouri Department of Conservation <https://mdc12.mdc.mo.gov/Applications/MDCFireReporting/Home/FireReportSearch>

Probability of Future Occurrence

There were a total of 1,017 reported wildfires from 2003 to 2022, with several events taking place each year. This equates to a 100% probability of a wildfire event in Polk County in any given year, with an average of 51 events per year.

Changing Future Conditions Considerations

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

Higher temperatures will also reduce the number of days prescribed burning can be performed. Reduction of prescribed burning will allow for growth of understory vegetation – providing fuel for destructive wildfires. Drought is also anticipated to increase in frequency and intensity during summer months under projected future scenarios. Drought can lead to dead or dying vegetation and landscaping material close to structures which creates fodder for wildfires within both the urban and rural settings.

Vulnerability

Vulnerability Overview

Wildfires occur throughout wooded and open vegetation areas of Missouri. They can occur any time of the year, but mostly occur during long, dry hot spells. Any small fire, if not quickly detected and suppressed, can get out of control. Most wildfires are caused by human carelessness or negligence. However, some are precipitated by lightning strikes and in rare instances, spontaneous combustion. Structures and people in WUI areas in the county and cities are more vulnerable to the impact of wildfires due to the level of fuel mixed with structures.

This plan was developed prior to the release of FEMA's *Local Mitigation Planning Policy Guide, Effective April 19, 2023*. Future hazard mitigation plan update cycles will reference the latest State Plan, which will include quantifiers for ranked vulnerabilities as required under 44 CFR 201.6(c)(2)(i).

Potential Losses to Existing Development

Based on historical data, we can estimate that, on average, 4.85 buildings are destroyed or damaged, 45.7 buildings are threatened, and 881.15 acres of land are burned per year in Polk County due to wildfires.

Impact of Previous and Future Development

It is anticipated that there will be limited future development in WUI areas throughout the unincorporated parts of the county. Future growth in WUI areas of the county will increase the risk and exposure to wildfires. WUI development in cities can be mitigated by development regulations reducing the risk of potential wildfires.

Hazard Summary by Jurisdiction

There are a few areas of moderate risk that fall within jurisdictional boundaries. However, many areas at risk are under the jurisdiction of Polk County. Much of the county consists of grasslands, however, and lower-risk areas could quickly become dangerous in the event of a wildfire.

This hazard is the primary focus of participating special fire protection districts in the county. Participating fire protection districts include Central Polk County Fire Protection District, Halfway Fire & Rescue Association, Morrisville Fire Protection District, and Pleasant Hope Fire Protection District. As many local jurisdictions do not have municipal fire departments, these special districts are important to all communities for protection against wildfire and assisting in reducing exposure to wildfire risk.

Community Comments on Hazard

A majority of community survey respondents (52.4%) stated wildfires are unlikely to impact their communities. 74.6% stated they are not concerned about wildfires impacting their communities. When asked the magnitude of impact that wildfires would cause, 42.1% stated a limited impact would occur. Wildfire mitigation ranked last (tenth place) when respondents ranked the different kinds of hazard mitigation projects that could benefit their communities.

Problem Statement

Wildfire occurrences are frequent within Polk County. These events can destroy, damage, and threaten structures in hazard prone areas. Populations and structures in WUI areas of the county have an increased risk of wildfires due to the level of fuel mixed with structures. Cities may adopt landscape ordinances that include fire safe landscape design requirements in these areas. They may also adopt building codes or design requirements that encourage non-combustible materials for new construction.

The unincorporated part of the county has the highest risk and exposure to wildfires. County officials and fire departments can implement burn restrictions during weather conditions conducive to the spread of wildfire. Additionally, understanding highest risk locations and developing safe evacuation routes that members of the public are aware of can reduce the risk of loss of life or injury.

4 MITIGATION STRATEGY 4.1

4.1 Goals..... 4.2

4.2 Identification and Analysis of Mitigation Actions..... 4.2

4.3 Implementation of Mitigation Actions 4.4

4.3.1 Polk County Mitigation Actions..... 4.8

4.3.2 City of Bolivar Mitigation Actions..... 4.24

4.3.3 City of Fair Play Mitigation Actions 4.40

4.3.4 City of Humansville Mitigation Actions 4.43

4.3.5 City of Morrisville Mitigation Actions..... 4.52

4.3.6 City of Pleasant Hope Mitigation Actions..... 4.66

4.3.7 Village of Aldrich Mitigation Actions 4.74

4.3.8 Village of Flemington Mitigation Actions 4.77

4.3.9 Village of Halfway Mitigation Actions 4.80

4.3.10 Bolivar R-I Mitigation Actions 4.83

4.3.11 Fair Play R-II Mitigation Actions 4.92

4.3.12 Humansville R-IV Mitigation Actions 4.99

4.3.13 Marion C Early R-V Hope Mitigation Actions 4.105

4.3.14 Pleasant Hope R-VI Mitigation Actions 4.113

4.3.15 Central Polk Fire Protection District Mitigation Actions 4.121

4.3.16 Citizens Memorial Hospital District Mitigation Actions 4.125

4.3.17 Halfway Fire and Rescue Association Mitigation Actions 4.127

4.3.18 Morrisville Fire Protection District Mitigation Actions 4.131

4.3.19 Pleasant Hope Fire Protection District Mitigation Actions 4.135

4.4 Mitigation Action Matrix 4.145

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

This section presents the mitigation strategy updated by the Mitigation Planning Committee (MPC) based on the risk assessment. The mitigation strategy was developed through a collaborative group process. The process included review of 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 Polk County's existing hazard mitigation plan approved by FEMA on June 19, 2018. Therefore, the goals from that plan were reviewed to see if they were still valid, feasible, practical, and applicable to the defined hazard impacts. The MPC conducted a discussion session during their second meeting to review and update the plan goals. To ensure that the goals developed for this update were comprehensive and supported State goals, the 2018 State Hazard Mitigation Plan goals were reviewed. The MPC also reviewed the goals from current surrounding county plans. During this update process, the MPC opted to adopt the same goals that were developed during the previous plan update. The plan goals are as follows:

- **Goal 1:** Protect the lives and livelihoods of all citizens.
- **Goal 2:** Reduce the potential impact of natural disasters to property, infrastructure, and the local economy.
- **Goal 3:** Ensure continued operation of government, emergency functions and critical infrastructure in a disaster.

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.

The plan includes a mitigation strategy that 1) analyzes actions and/or projects that the jurisdiction considered to reduce the impacts of hazards identified in the risk assessment, and 2) identifies the actions and/or projects that the jurisdiction intends to implement. Each jurisdiction has considered actions that reduce risk to existing buildings and infrastructure, as well as limiting risk to future development and redevelopment. These actions fall under several categories: prevention, structure and infrastructure projects, natural systems protection, emergency services, and education and outreach. The mitigation plan may include non-mitigation actions, such as actions that are emergency response or operational preparedness in nature.

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

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

Jurisdiction representatives on the MPC were encouraged to review the details of the risk assessment vulnerability analysis specific to their jurisdiction and the previously identified mitigation actions prior to Meeting #3. Representatives were provided a link to two FEMA publication, *Mitigation Ideas: A Resource for Reducing Risk to Natural Hazards (January 2013)* and *Hazard Mitigation Assistance Guidance: Hazard Mitigation Grant Program, Pre-Disaster Mitigation Program, and Flood Mitigation Assistance Program (February 2015)*. These documents

were developed by FEMA as a resource for identification of a range of potential mitigation actions for reducing risk to natural hazards and disasters.

The focus of meetings #3 and #4 was to update the mitigation strategy. For a comprehensive range of mitigation actions to consider, the MPC reviewed the following information during meeting #3:

- A list of actions proposed in the previous mitigation plan,
- Input during meetings
- Key issues from the risk assessments
- Responses to data collection questionnaires where jurisdictions had reported progress made on previous actions

The MPC reviewed the actions from the previously approved plan for progress made since the plan had been adopted. The list of previous actions was included in the data collection questionnaire for each jurisdiction. The questionnaires were sent via email prior to meeting #1 and reviewed at meetings #1 and #2 before discussion at meeting #3. Each jurisdiction was instructed to provide information regarding the “Action Status” with one of the following status choices:

- Completed, with a description of the progress
- Ongoing, with a description of the progress made to date
- Not Yet Started, with a discussion of the reasons for lack of progress

During meeting #3, discussion of action modification occurred in order to make actions SMART: specific, measurable, achievable, relevant, and time-bound. SMCOG staff provided recommended altered language for some items and general discussion. MPC members were also encouraged to identify repetitive loss locations or infrastructure where the potential cost of a project may be high, but over time would cost less than frequent repairs and public assistance claims.

Additionally, the future inclusion of each mitigation action in the plan update was identified as either keep, delete, or modify. Based on the status updates, there were 10 completed actions, 85 continuing actions (either ongoing or modified), and 13 deleted actions. **Table 4.1** provides a full summary.

Table 4.1. Action Status Summary

Jurisdiction	Completed Actions	Continuing Actions (ongoing or modified)	Deleted Actions
Polk County	0	11	5
City of Bolivar	0	14	1
City of Fair Play	-	-	-
City of Humansville	6	8	4
City of Morrisville	-	-	-
City of Pleasant Hope	0	6	0
Village of Aldrich	-	-	-
Village of Flemington	-	-	-
Village of Halfway	-	-	-
Bolivar R-I	2	9	0
Fair Play R-II	1	7	0
Humansville R-IV	0	6	3
Marion C Early R-V	0	8	0
Pleasant Hope R-VI	1	8	0
Central Polk County Fire Protection District	-	-	-
Citizens Memorial Hospital District	-	-	-
Halfway Fire & Rescue Association	-	-	-

Morrisville Fire Protection District	-	-	-
Pleasant Hope Fire Protection District	0	8	0
Total	10	85	13

Note: Fair Play, Morrisville, Aldrich, Flemington, Halfway, Central Polk County Fire Protection District, Citizens Memorial Hospital District, Halfway Fire & Rescue Association, and Morrisville Fire Protection District did not participate in the previous plan update.

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

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

Deleted Action Number	Action Name	Reason for Deletion
Polk County 2.1	Building Codes	No reason given
Polk County 2.4	Stormwater Infrastructure	No reason given
Polk County 2.7	NFIP Participation	No reason given
Polk County 2.8	Utilities Relocation	No reason given
Polk County 3.2	Hazard Mitigation Integration	No reason given
Bolivar 1.1	NOAA Radios	Became financially unfeasible
Humansville 1.1	Smoke Detectors	No reason given
Humansville 1.2	Public Information Campaign	No reason given
Humansville 2.1	Building Codes	No reason given
Humansville 2.7	NFIP Participation	No reason given
Humansville R-IV 1.1	NOAA Radios	Cost, focus on other areas
Humansville R-IV 1.9	Public Information Campaign	Focus on other areas
Humansville R-IV 2.6	Backup Generator	Cost
Completed Action Number	Action Name	Completion Details
Humansville 1.2	Alert System	Storm siren
Humansville 1.10	Information Distribution	No reason given
Humansville 1.13	Retrofit	No reason given
Humansville 2.3	Debris Cleanup	No reason given
Humansville 2.6	Backup Generator	Trailer generator for wells
Humansville 3.1	Multi-jurisdictional Cooperation	No reason given
Bolivar R-I 1.1	NOAA Radios	No reason given
Bolivar R-I 1.2	Alert System	No reason given
Fair Play R-II 1.1	NOAA Radios	No reason given
Pleasant Hope R-VI 2.9	Utilities Relocation	Utilities have been relocated and/or placed underground where possible

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

4.3 Implementation of Mitigation Actions

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

Jurisdictional MPC members were encouraged to meet with others in their community or within their organization to finalize the actions to be submitted for the updated mitigation strategy. The Disaster Mitigation Act requires benefit-cost review as the primary method by which mitigation projects should be prioritized. The MPC decided to pursue implementation according to when and where damage occurs, available funding, political will, jurisdictional priority, and priorities identified in the 2018 Missouri State Hazard Mitigation Plan. The benefit/cost review at the planning stage primarily consisted of a qualitative analysis and was not the detailed process required for grant

funding applications. 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 the projects. During the prioritization process, the jurisdictions used worksheets to assign scores. The worksheets posed questions based on the STAPLEE elements as well as the potential mitigation effectiveness of each action. High scores received a higher prioritization score. Extra emphasis was placed on projects that prioritize maximizing benefits while minimizing costs.

Scores were based on the responses to the questions as follows:

Definitely YES = 3 points

Maybe YES = 2 points

Probably NO = 1 points

Definitely NO = 0 points

The following questions were asked for each proposed action.

S: Is the action socially acceptable?

T: Is the action technically feasible and potentially successful?

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

P: Is the action politically acceptable?

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

E: Is the action economically beneficial?

E: Will the project have an environmental impact that is either beneficial or neutral?

Will the implemented action result in lives saved?

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

The final scores for each action are shown below in the Action Sheets on page 4.8, as are the estimated costs.

The worksheets are attached to this plan as Appendix B. The STAPLEE final score for each action, absent other considerations, such as a localized need for a project, determined the priority. Low priority action items were those that had a total score of between 0 and 24. Moderate priority actions were those scoring between 25 and 29. High priority actions scored 30 or above. A blank STAPLEE worksheet is shown in **Figure 4.1**.

Figure 4.1. Sample STAPLEE Worksheet

STAPLEE Worksheet		
Name of Jurisdiction:		
Action or Project		
Action/Project Number:	Insert a unique action number for this action for future tracking purposes. This can be a combination of the jurisdiction name, followed by the goal number and action number (i.e. Joplin1.1)	
Name of Action or Project:		
Mitigation Category:	Prevention; Structure and Infrastructure Projects; Natural Systems Protection; Education and Outreach; Emergency Services	
STAPLEE Criteria Evaluation Rating Definitely YES = 3 Maybe YES = 2 Probably NO = 1 Definitely NO = 0		Score
S: Is it Socially Acceptable		
T: Is it Technically feasible and potentially successful?		
A: Does the jurisdiction have the Administrative capacity to execute this action?		
P: Is it Politically acceptable?		
L: Is there Legal authority to implement?		
E: Is it Economically beneficial?		
E: Will the project have either a neutral or positive impact on the natural Environment ?		
Will historic structures be saved or protected?		
Could it be implemented quickly?		
STAPLEE SCORE		
Mitigation Effectiveness Criteria	Evaluation Rating	Score
Will the implemented action result in lives saved?	Assign from 5-10 points based on the likelihood that lives will be saved.	
Will the implemented action result in a reduction of disaster damages?	Assign from 5-10 points based on the relative reduction of disaster damages.	
MITIGATION EFFECTIVENESS SCORE		
TOTAL SCORE (STAPLEE + Mitigation Effectiveness)		
<input type="checkbox"/> High Priority (30+ points)	<input type="checkbox"/> Medium Priority (25 - 29 points)	<input type="checkbox"/> Low Priority (<25 points)

Completed by
(Name, Title, Phone Number)

In addition to the STAPLEE cost benefit review prioritization, an implementation plan for each action was discussed. An action worksheet was used to develop the implementation plan. The action worksheet format is shown in **Figure 4.2**.

Figure 4.2. Sample Action Worksheet

Action Worksheet	
Name of Jurisdiction:	
Risk / Vulnerability	
Hazard(s) Addressed:	List the hazard or hazards that will be addressed by this action
Problem being Mitigated:	Provide a brief description of the problem that the action will address. Utilize the problem statement developed in the risk assessment.
Action or Project	
Applicable Goal Statement:	Choose the goal statement that applies to this action
Action/Project Number:	Insert a unique action number for this action for future tracking purposes. This can be a combination of the jurisdiction name, followed by the goal number and action number (i.e. Joplin1.1)
Name of Action or Project:	
Mitigation Category:	Prevention; Structure and Infrastructure Projects; Natural Systems Protection; Education and Outreach; Emergency Services
Action or Project Description:	Describe the action or project.
Estimated Cost:	Provide an estimate of the cost to implement this action. This can be accomplished with a range of estimated costs.
Benefits:	Provide a narrative describing the losses that will be avoided by implementing this action. If dollar amounts of avoided losses are known, include them as well.
Plan for Implementation	
Responsible Organization/Department:	Which organization will be responsible for tracking this action? Be specific to include the specific department or position within a department.
Supporting Organization/Department:	Which organization/department will assist in implementation of this action?
Action/Project Priority:	Include the STAPLEE score and Priority (H, M, L)
Timeline for Completion:	How many months/years to complete.
Potential Fund Sources:	List specific funding sources that may be used to pay for the implementation of the action.
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status:	Indicate status as New, Continuing Not Started, or Continuing in Progress)
Report of Progress:	For Continuing actions only, indicate the report on progress. If the action is not started, indicate any barriers encountered to initiate the action. If the action is in progress, indicate the activity that has occurred to date.

4.3.1 Polk County Mitigation Actions

Action Worksheet	
Name of Jurisdiction:	Polk County
Risk / Vulnerability	
Hazard(s) Addressed:	Dam failure, earthquake, flooding, severe winter weather, severe thunderstorm, tornado, wildfire
Problem being Mitigated:	Lack of proper notification system for severe storms
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Polk County 1.1
Name of Action or Project:	NOAA Radios
Mitigation Category:	Emergency Services
Action or Project Description:	Use NOAA all-hazard weather radios in all homes, businesses, and critical/vulnerable facilities.
Estimated Cost:	\$10,000
Benefits:	It will save lives and also save money and possible structures.
Plan for Implementation	
Responsible Organization/Department:	911 and Polk County emergency management
Supporting Organization/Department:	OEM
Action/Project Priority:	30
Timeline for Completion:	1-2 years
Potential Fund Sources:	Fundraisers or grants
Local Planning Mechanisms to be Used in Implementation, if any:	Emergency Operations Plan, County Mitigation Plan
Progress Report	
Action Status:	Continuing Not Started,
Report of Progress:	Limited staff availability

Action Worksheet	
Name of Jurisdiction:	Polk County
Risk / Vulnerability	
Hazard(s) Addressed:	Tornado, severe thunderstorm
Problem being Mitigated:	Lack of proper notification system for severe storms
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Polk County 1.2
Name of Action or Project:	Alert Systems
Mitigation Category:	Prevention
Action or Project Description:	Utilize available alert systems to provide storm warning
Estimated Cost:	\$10,000
Benefits:	Prevent loss of lives
Plan for Implementation	
Responsible Organization/Department:	OEM
Supporting Organization/Department:	OEM
Action/Project Priority:	30
Timeline for Completion:	1-2 years
Potential Fund Sources:	grants
Local Planning Mechanisms to be Used in Implementation, if any:	Emergency Operations Plan, County Mitigation Plan
Progress Report	
Action Status:	Continuing not started
Report of Progress:	none

Action Worksheet	
Name of Jurisdiction:	Polk County
Risk / Vulnerability	
Hazard(s) Addressed:	Tornado, severe thunderstorm
Problem being Mitigated:	Citywide notification system for severe weather
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Polk County 1.3
Name of Action or Project:	Outdoor Warning Sirens
Mitigation Category:	Emergency Services
Action or Project Description:	Locate outdoor storm warning sirens in all areas of population concentration
Estimated Cost:	\$0
Benefits:	none
Plan for Implementation	
Responsible Organization/Department:	OEM
Supporting Organization/Department:	OEM
Action/Project Priority:	35
Timeline for Completion:	1-2 years
Potential Fund Sources:	grants
Local Planning Mechanisms to be Used in Implementation, if any:	Emergency Operations Plan, County Mitigation Plan
Progress Report	
Action Status:	Continuing not started
Report of Progress:	none

Action Worksheet	
Name of Jurisdiction:	Polk County
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding
Problem being Mitigated:	Tracking of low water crossings
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Polk County 1.4
Name of Action or Project:	Low Water Crossing Database
Mitigation Category:	Structure and Infrastructure Projects; Natural Systems Protection
Action or Project Description:	Continue to maintain a GIS database of low water crossings in the county.
Estimated Cost:	Can be completed with current staff
Benefits:	Save lives, It will assist all city communities and schools
Plan for Implementation	
Responsible Organization/Department:	Polk road and Bridge
Supporting Organization/Department:	OEM, county commissioner
Action/Project Priority:	37
Timeline for Completion:	ongoing
Potential Fund Sources:	State and Federal Grants
Local Planning Mechanisms to be Used in Implementation, if any:	Emergency Operations Plan, County Mitigation Plan
Progress Report	
Action Status:	Continuing in Progress
Report of Progress:	

Action Worksheet	
Name of Jurisdiction:	Polk County
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding
Problem being Mitigated:	Proper signage for low water crossings
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Polk County 1.5
Name of Action or Project:	Low water crossing markers
Mitigation Category:	Structure and Infrastructure Projects
Action or Project Description:	Install/replace low water crossing markers where needed.
Estimated Cost:	\$10,000 - \$50,000 per crossing
Benefits:	So many people try to drive through the low water crossing not knowing how deep it is. It will save lives.
Plan for Implementation	
Responsible Organization/Department:	Road and Bridge and Commissioner
Supporting Organization/Department:	Road and Bridge
Action/Project Priority:	38
Timeline for Completion:	6 months to 2 years per crossing
Potential Fund Sources:	State and Federal Grants
Local Planning Mechanisms to be Used in Implementation, if any:	Emergency Operations Plan, County Mitigation Plan
Progress Report	
Action Status:	Continuing in Progress
Report of Progress:	

Action Worksheet	
Name of Jurisdiction:	Polk County
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding
Problem being Mitigated:	Proper notification system for hazardous conditions at low water crossings
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Polk County 1.6
Name of Action or Project:	Low Water Crossing Alerts
Mitigation Category:	Education and Outreach; Emergency Services
Action or Project Description:	Develop a warning system for low water crossings and seek funding to implement the system.
Estimated Cost:	\$10k
Benefits:	Citizens will know when low water crossings are not safe to cross
Plan for Implementation	
Responsible Organization/Department:	Commissioner
Supporting Organization/Department:	Road and Bridge
Action/Project Priority:	28
Timeline for Completion:	1 year
Potential Fund Sources:	Grants Federal and State Funding
Local Planning Mechanisms to be Used in Implementation, if any:	Emergency Operations Plan, County Mitigation Plan
Progress Report	
Action Status:	Continuing Not Started
Report of Progress:	

Action Worksheet	
Name of Jurisdiction:	Polk County
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding
Problem being Mitigated:	Low water crossings that need to be repair/replaced
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Polk County 1.7
Name of Action or Project:	Low water crossing replacement
Mitigation Category:	Structure and Infrastructure Projects
Action or Project Description:	Replace low water crossings with flood resistant and improved flow infrastructure.
Estimated Cost:	\$100k+ per crossing
Benefits:	With this money could save lives and help the schools and US postal service.
Plan for Implementation	
Responsible Organization/Department:	County commissioner
Supporting Organization/Department:	Road and Bridge
Action/Project Priority:	32
Timeline for Completion:	6 months to 1 year per crossing
Potential Fund Sources:	State and Federal funding
Local Planning Mechanisms to be Used in Implementation, if any:	Emergency Operations Plan, County Mitigation Plan
Progress Report	
Action Status:	Continuing not started
Report of Progress:	

Action Worksheet	
Name of Jurisdiction:	Polk County
Risk / Vulnerability	
Hazard(s) Addressed:	Drought, sinkholes
Problem being Mitigated:	Limited public knowledge of hazard awareness and preparedness
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Polk County 1.8
Name of Action or Project:	Public information campaign
Mitigation Category:	Education and Outreach
Action or Project Description:	Develop public information campaigns on the risks of lesser known hazards like drought and sinkholes and preparedness activities that will mitigate negative impacts
Estimated Cost:	Can be completed with current staff and funding
Benefits:	Better public knowledge regarding hazard awareness and prep for drought and sinkholes
Plan for Implementation	
Responsible Organization/Department:	OEM
Supporting Organization/Department:	OEM
Action/Project Priority:	40
Timeline for Completion:	Ongoing
Potential Fund Sources:	grants
Local Planning Mechanisms to be Used in Implementation, if any:	Emergency Operations Plan, County Mitigation Plan
Progress Report	
Action Status:	Continuing not started
Report of Progress:	none

Action Worksheet	
Name of Jurisdiction:	Polk County
Risk / Vulnerability	
Hazard(s) Addressed:	Drought, earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire
Problem being Mitigated:	Lack of public knowledge on risk reduction
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Polk County 1.9
Name of Action or Project:	Information distribution
Mitigation Category:	Education and Outreach
Action or Project Description:	Work with the schools, human services organizations, and businesses to distribute information on hazard risks and resources or methods to reduce risk.
Estimated Cost:	Can be completed with current staff and funding
Benefits:	Increase in public knowledge regarding risk reduction
Plan for Implementation	
Responsible Organization/Department:	OEM
Supporting Organization/Department:	OEM
Action/Project Priority:	47
Timeline for Completion:	ongoing
Potential Fund Sources:	grants
Local Planning Mechanisms to be Used in Implementation, if any:	Emergency Operations Plan, County Mitigation Plan
Progress Report	
Action Status:	Continuing not started
Report of Progress:	none

Action Worksheet	
Name of Jurisdiction:	Polk County
Risk / Vulnerability	
Hazard(s) Addressed:	Tornado, severe thunderstorm
Problem being Mitigated:	No safe place to shelter during severe weather
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Polk County 1.10
Name of Action or Project:	Safe Rooms
Mitigation Category:	Structure and Infrastructure Projects; Emergency Services
Action or Project Description:	Include FEMA rated safe rooms in the construction of new public buildings.
Estimated Cost:	\$100,000+ per project
Benefits:	Safe place to shelter during hazard events
Plan for Implementation	
Responsible Organization/Department:	OEM
Supporting Organization/Department:	OEM
Action/Project Priority:	30
Timeline for Completion:	1-3 years
Potential Fund Sources:	grants
Local Planning Mechanisms to be Used in Implementation, if any:	Emergency Operations Plan, County Mitigation Plan
Progress Report	
Action Status:	Continuing not started
Report of Progress:	

Action Worksheet	
Name of Jurisdiction:	Polk County
Risk / Vulnerability	
Hazard(s) Addressed:	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado
Problem being Mitigated:	No safe place to shelter during hazard events
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Polk County 1.11
Name of Action or Project:	Retrofit
Mitigation Category:	Structure and Infrastructure Projects
Action or Project Description:	Where feasible, retrofit existing critical and vulnerable facilities to provide a safer environment during severe weather events
Estimated Cost:	\$10,000+ per project
Benefits:	It will save lives
Plan for Implementation	
Responsible Organization/Department:	OEM
Supporting Organization/Department:	OEM
Action/Project Priority:	32
Timeline for Completion:	6 months to 1 year per project
Potential Fund Sources:	grants
Local Planning Mechanisms to be Used in Implementation, if any:	Emergency Operations Plan, County Mitigation Plan
Progress Report	
Action Status:	Continuing not started
Report of Progress:	none

Action Worksheet	
Name of Jurisdiction:	Polk County
Risk / Vulnerability	
Hazard(s) Addressed:	Dam failure
Problem being Mitigated:	Extent of damage caused by dam failure in the county is unknown
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Polk County 1.12
Name of Action or Project:	Dam failure study
Mitigation Category:	Prevention
Action or Project Description:	Conduct a dam failure study for all dams located within the county
Estimated Cost:	\$5,000
Benefits:	Better understanding of the damage caused by dam failure
Plan for Implementation	
Responsible Organization/Department:	Polk County OEM
Supporting Organization/Department:	
Action/Project Priority:	25
Timeline for Completion:	1-2 years
Potential Fund Sources:	HMGP, BRIC
Local Planning Mechanisms to be Used in Implementation, if any:	Emergency Operations Plan, County Mitigation Plan
Progress Report	
Action Status:	New
Report of Progress:	Lack of funding

Action Worksheet	
Name of Jurisdiction:	Polk County
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding, severe thunderstorm
Problem being Mitigated:	Waterways being overloaded with debris from flooding
Action or Project	
Applicable Goal Statement:	Goal 2: Reduce the potential impact of natural disasters to property, infrastructure, and the local economy.
Action/Project Number:	Polk County 2.1
Name of Action or Project:	Debris Cleanup
Mitigation Category:	Natural Systems Protection
Action or Project Description:	Clean out debris from under bridges and drainage channels.
Estimated Cost:	Can be completed with current staff
Benefits:	Keep waterways free of debris to make them less prone to flooding
Plan for Implementation	
Responsible Organization/Department:	OEM
Supporting Organization/Department:	OEM
Action/Project Priority:	45
Timeline for Completion:	ongoing
Potential Fund Sources:	Grants, local funding
Local Planning Mechanisms to be Used in Implementation, if any:	Emergency Operations Plan, County Mitigation Plan
Progress Report	
Action Status:	Continuing in progress
Report of Progress:	

Action Worksheet	
Name of Jurisdiction:	Polk County
Risk / Vulnerability	
Hazard(s) Addressed:	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado
Problem being Mitigated:	Lack of backup power source
Action or Project	
Applicable Goal Statement:	Goal 2: Reduce the potential impact of natural disasters to property, infrastructure, and the local economy.
Action/Project Number:	Polk County 2.2
Name of Action or Project:	Back-up generator
Mitigation Category:	Structure and Infrastructure Projects
Action or Project Description:	Use back-up generators for all critical/vulnerable facilities and infrastructure.
Estimated Cost:	\$10,00+ per generator
Benefits:	Prevent complete loss of power
Plan for Implementation	
Responsible Organization/Department:	OEM
Supporting Organization/Department:	
Action/Project Priority:	45
Timeline for Completion:	1 year
Potential Fund Sources:	Grants, local funding
Local Planning Mechanisms to be Used in Implementation, if any:	Emergency Operations Plan, County Mitigation Plan
Progress Report	
Action Status:	Continuing not started
Report of Progress:	

Action Worksheet	
Name of Jurisdiction:	Polk County
Risk / Vulnerability	
Hazard(s) Addressed:	Drought, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire
Problem being Mitigated:	Lack of communication between jurisdictions
Action or Project	
Applicable Goal Statement:	Goal 3: Ensure continued operation of government, emergency functions, and critical infrastructure in a disaster.
Action/Project Number:	Polk County 3.1
Name of Action or Project:	Multi-jurisdictional cooperation
Mitigation Category:	Education and Outreach
Action or Project Description:	Strengthen multi-jurisdictional cooperation and communication among local governments, emergency services agencies, and entities responsible for critical and vulnerable facilities.
Estimated Cost:	Can be completed with current staff and funds
Benefits:	Better communication between jurisdictions
Plan for Implementation	
Responsible Organization/Department:	OEM
Supporting Organization/Department:	OEM
Action/Project Priority:	45
Timeline for Completion:	Ongoing
Potential Fund Sources:	Local funding
Local Planning Mechanisms to be Used in Implementation, if any:	Emergency Operations Plan, County Mitigation Plan
Progress Report	
Action Status:	Continuing not started
Report of Progress:	none

Action Worksheet	
Name of Jurisdiction:	Polk County
Risk / Vulnerability	
Hazard(s) Addressed:	Wildfire
Problem being Mitigated:	Damage caused by wildfires
Action or Project	
Applicable Goal Statement:	Goal 3: Ensure continued operation of government, emergency functions, and critical infrastructure in a disaster.
Action/Project Number:	Polk County 3.2
Name of Action or Project:	Burn bans
Mitigation Category:	Prevention
Action or Project Description:	Work with local fire departments and fire protection districts to enforce burn bans during dry conditions
Estimated Cost:	Can be completed with current staff and funds
Benefits:	Prevent wildfire damage
Plan for Implementation	
Responsible Organization/Department:	OEM
Supporting Organization/Department:	OEM
Action/Project Priority:	30
Timeline for Completion:	Ongoing
Potential Fund Sources:	Local funding
Local Planning Mechanisms to be Used in Implementation, if any:	Emergency Operations Plan, County Mitigation Plan
Progress Report	
Action Status:	new
Report of Progress:	none

4.3.2 City of Bolivar Mitigation Actions

Action Worksheet	
Name of Jurisdiction:	City of Bolivar
Risk / Vulnerability	
Hazard(s) Addressed:	Dam failure, earthquake, flooding, severe winter weather, severe thunderstorm, tornado, wildfire
Problem being Mitigated:	Lack of proper notification system for severe storms
Action or Project	
Applicable Goal Statement:	Protect lives and livelihood of all citizens
Action/Project Number:	City of Bolivar 1.1
Name of Action or Project:	NOAA Radios
Mitigation Category:	Emergency Services
Action or Project Description:	Use NOAA all-hazard weather radios in all homes, businesses, and critical/vulnerable facilities.
Estimated Cost:	\$1,000- \$125,000
Benefits:	Reduction in loss of life and injury during hazard events.
Plan for Implementation	
Responsible Organization/Department:	Emergency Management; Private Companies
Supporting Organization/Department:	
Action/Project Priority:	Medium: 27 points
Timeline for Completion:	5 years; ongoing
Potential Fund Sources:	Local funds, private funds
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process
Progress Report	
Action Status:	Continuing Not Started
Report of Progress:	Lack of funds, limited staff availability

Action Worksheet	
Name of Jurisdiction:	City of Bolivar
Risk / Vulnerability	
Hazard(s) Addressed:	Tornado, severe thunderstorm
Problem being Mitigated:	Lack of proper notification system for severe storms
Action or Project	
Applicable Goal Statement:	Protect lives and livelihood of all citizens
Action/Project Number:	City of Bolivar 1.2
Name of Action or Project:	Alert Systems
Mitigation Category:	Prevention
Action or Project Description:	Promote, educate, and encourage enrollment in the City's alert system to provide storm warning
Estimated Cost:	\$5,000-\$25,000
Benefits:	Improves communication during hazard events.
Plan for Implementation	
Responsible Organization/Department:	Emergency Management
Supporting Organization/Department:	
Action/Project Priority:	High: 35 points
Timeline for Completion:	5 years
Potential Fund Sources:	Capital funds
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process, EOP
Progress Report	
Action Status:	Revised, Continuing in Progress
Report of Progress:	The City was able to establish an alert system but needs to continue promotion of and education about the system and continue encouraging enrollment.

Action Worksheet	
Name of Jurisdiction:	City of Bolivar
Risk / Vulnerability	
Hazard(s) Addressed:	Tornado, severe thunderstorm
Problem being Mitigated:	Citywide notification system for severe weather
Action or Project	
Applicable Goal Statement:	Protect lives and livelihood of all citizens
Action/Project Number:	City of Bolivar 1.3
Name of Action or Project:	Outdoor Warning Sirens
Mitigation Category:	Emergency Services
Action or Project Description:	Update control panels on outdoor storm warning sirens in all areas of population concentration
Estimated Cost:	\$35,000
Benefits:	Reduction in loss of life and injury during tornado events.
Plan for Implementation	
Responsible Organization/Department:	Emergency Management
Supporting Organization/Department:	
Action/Project Priority:	High: 37
Timeline for Completion:	5 years
Potential Fund Sources:	Capital funds
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process
Progress Report	
Action Status:	Revised, Continuing in Progress
Report of Progress:	Some sirens and control panels have been replaced throughout the city, but there are more panels that need updated.

Action Worksheet	
Name of Jurisdiction:	City of Bolivar
Risk / Vulnerability	
Hazard(s) Addressed:	Drought, earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire
Problem being Mitigated:	Limited public knowledge of hazard awareness and preparedness
Action or Project	
Applicable Goal Statement:	Protect lives and livelihood of all citizens
Action/Project Number:	City of Bolivar 1.4
Name of Action or Project:	Public information campaign
Mitigation Category:	Education and Outreach
Action or Project Description:	Develop public information campaigns on the risks of natural hazards and preparedness activities that will mitigate negative impacts.
Estimated Cost:	\$5,000+
Benefits:	Reduction of loss of life, injury, and property during hazard events.
Plan for Implementation	
Responsible Organization/Department:	City administration
Supporting Organization/Department:	
Action/Project Priority:	High: 39
Timeline for Completion:	3-5 years
Potential Fund Sources:	Annual budget
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process
Progress Report	
Action Status:	Continuing in Progress
Report of Progress:	Recent addition of a PIO/media specialist to city staff has helped with the sharing of public information, but there are still time and staffing constraints.

Action Worksheet	
Name of Jurisdiction:	City of Bolivar
Risk / Vulnerability	
Hazard(s) Addressed:	Drought, earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire
Problem being Mitigated:	Provide a brief description of the problem that the action will address. Utilize the problem statement developed in the risk assessment.
Action or Project	
Applicable Goal Statement:	Protect lives and livelihood of all citizens
Action/Project Number:	City of Bolivar 1.5
Name of Action or Project:	Information distribution
Mitigation Category:	Education and Outreach
Action or Project Description:	Work with the schools, human services organizations, and businesses to distribute information on hazard risks and resources or methods to reduce risk.
Estimated Cost:	\$5,000+
Benefits:	Improved public safety during hazard events.
Plan for Implementation	
Responsible Organization/Department:	Building Department and Emergency Management
Supporting Organization/Department:	
Action/Project Priority:	High: 39
Timeline for Completion:	1-3 years
Potential Fund Sources:	Annual budget
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process
Progress Report	
Action Status:	Continuing in Progress
Report of Progress:	Continual education happens at all meetings, and updating local organizations of opportunities to build safer buildings.

Action Worksheet	
Name of Jurisdiction:	City of Bolivar
Risk / Vulnerability	
Hazard(s) Addressed:	Tornado, severe thunderstorm
Problem being Mitigated:	No safe place to shelter during severe weather
Action or Project	
Applicable Goal Statement:	Protect lives and livelihood of all citizens
Action/Project Number:	City of Bolivar 1.6
Name of Action or Project:	Safe Rooms
Mitigation Category:	Structure and Infrastructure Projects
Action or Project Description:	Include FEMA rated safe rooms in the construction of new public buildings.
Estimated Cost:	\$1.5 million
Benefits:	Reduction of loss of life and injury during tornado and severe storm events.
Plan for Implementation	
Responsible Organization/Department:	Emergency Management
Supporting Organization/Department:	School district
Action/Project Priority:	Medium: 29
Timeline for Completion:	5 years
Potential Fund Sources:	HMGP, PDM, local funds
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process, comprehensive plan
Progress Report	
Action Status:	Continuing in Progress
Report of Progress:	The Bolivar R-1 School District is currently building a FEMA shelter on school property. Always looking for opportunities to build additional shelters.

Action Worksheet	
Name of Jurisdiction:	City of Bolivar
Risk / Vulnerability	
Hazard(s) Addressed:	Extreme temperatures, severe winter weather, severe thunderstorms, tornado
Problem being Mitigated:	Vulnerable populations do not have proper resources to deal with hazard events
Action or Project	
Applicable Goal Statement:	Protect lives and livelihood of all citizens
Action/Project Number:	City of Bolivar 1.7
Name of Action or Project:	Resources, weatherization, and shelters
Mitigation Category:	Prevention
Action or Project Description:	Local community organizations continue to offer and augment programs that provide fans, air conditioners, winter weatherization, and shelters to those at risk
Estimated Cost:	\$5,000+
Benefits:	Reduce loss of life and injury during extreme heat and cold.
Plan for Implementation	
Responsible Organization/Department:	Emergency Management, Local community groups
Supporting Organization/Department:	
Action/Project Priority:	High: 37
Timeline for Completion:	1-3 years
Potential Fund Sources:	Local civic groups, health grants
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process
Progress Report	
Action Status:	Continuing in Progress
Report of Progress:	Continues during summer months in cooperation with local organizations.

Action Worksheet	
Name of Jurisdiction:	City of Bolivar
Risk / Vulnerability	
Hazard(s) Addressed:	Drought, earthquake
Problem being Mitigated:	Limited public knowledge of drought/earthquakes and the dangers they pose
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	City of Bolivar 1.8
Name of Action or Project:	Hazard information and education
Mitigation Category:	Education and Outreach
Action or Project Description:	Develop public information campaigns on the risks of droughts/earthquakes and preparedness activities that will mitigate negative impacts
Estimated Cost:	Can be completed with current staff and funding
Benefits:	Better public knowledge regarding hazard awareness and prep for drought
Plan for Implementation	
Responsible Organization/Department:	Emergency Management
Supporting Organization/Department:	
Action/Project Priority:	25
Timeline for Completion:	Ongoing
Potential Fund Sources:	Local tax revenue
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting Process, city emergency plan
Progress Report	
Action Status:	New
Report of Progress:	

Action Worksheet	
Name of Jurisdiction:	City of Bolivar
Risk / Vulnerability	
Hazard(s) Addressed:	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado
Problem being Mitigated:	Minimum design and construction requirements to ensure safe and resilient structures
Action or Project	
Applicable Goal Statement:	Reduce the potential impact of natural disasters to property, infrastructure, and the local economy.
Action/Project Number:	City of Bolivar 2.1
Name of Action or Project:	Building Codes
Mitigation Category:	Prevention
Action or Project Description:	Adopt building codes that include storm ready provisions, such as hurricane straps
Estimated Cost:	Responsibility of building owners
Benefits:	Protection of properties from natural hazards, reduced damage costs.
Plan for Implementation	
Responsible Organization/Department:	Board of Aldermen/Mayor
Supporting Organization/Department:	Community Development
Action/Project Priority:	High: 40
Timeline for Completion:	Continual
Potential Fund Sources:	Paid for within building costs
Local Planning Mechanisms to be Used in Implementation, if any:	Building code
Progress Report	
Action Status:	Continuing in Progress
Report of Progress:	The city has revised several building codes over recent years but needs to continue providing education on the importance of building codes.

Action Worksheet	
Name of Jurisdiction:	City of Bolivar
Risk / Vulnerability	
Hazard(s) Addressed:	Wildfires
Problem being Mitigated:	Limited public knowledge on fire safety and fire codes
Action or Project	
Applicable Goal Statement:	Reduce the potential impact of natural disasters to property, infrastructure, and the local economy.
Action/Project Number:	City of Bolivar 2.2
Name of Action or Project:	Fire codes
Mitigation Category:	Education and Outreach
Action or Project Description:	Educate the public on municipal fire codes.
Estimated Cost:	\$1,000
Benefits:	Protection of properties from natural hazards, reduced damage costs.
Plan for Implementation	
Responsible Organization/Department:	Bolivar Fire Department
Supporting Organization/Department:	Board of Aldermen/Mayor
Action/Project Priority:	High: 40
Timeline for Completion:	1-3 years
Potential Fund Sources:	Fire Department Budget
Local Planning Mechanisms to be Used in Implementation, if any:	Fire codes
Progress Report	
Action Status:	Continuing in Progress
Report of Progress:	A long-term plan has been adopted by the Bolivar Board of Aldermen to bring fire codes to current standards. This is a long term process that's been started and will continue into the foreseeable future.

Action Worksheet	
Name of Jurisdiction:	City of Bolivar
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding, severe thunderstorm
Problem being Mitigated:	Waterways being overloaded with debris from flooding
Action or Project	
Applicable Goal Statement:	Reduce the potential impact of natural disasters to property, infrastructure, and the local economy.
Action/Project Number:	City of Bolivar 2.3
Name of Action or Project:	Debris Cleanup
Mitigation Category:	Natural Systems Protection
Action or Project Description:	Clean out debris from under bridges and drainage channels.
Estimated Cost:	Built into continual maintenance costs
Benefits:	Mitigate future damage
Plan for Implementation	
Responsible Organization/Department:	Public works
Supporting Organization/Department:	
Action/Project Priority:	High: 38
Timeline for Completion:	Continual
Potential Fund Sources:	Local funds, public works funds
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting Process
Progress Report	
Action Status:	Continuing in Progress
Report of Progress:	Continues annually as each year debris collects. Have seen evidence of working as areas prone to flooding in the past have not flooded.

Action Worksheet	
Name of Jurisdiction:	City of Bolivar
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding, severe thunderstorms
Problem being Mitigated:	Outdated storm water infrastructure that needs to be repaired or replaced
Action or Project	
Applicable Goal Statement:	Reduce the potential impact of natural disasters to property, infrastructure, and the local economy.
Action/Project Number:	City of Bolivar 2.4
Name of Action or Project:	Storm water infrastructure
Mitigation Category:	Structure and Infrastructure Projects
Action or Project Description:	Repair and replace storm water drainage infrastructure in order to reduce localized flooding.
Estimated Cost:	\$1,000,000+
Benefits:	Protect property from flood events
Plan for Implementation	
Responsible Organization/Department:	City of Bolivar, community development
Supporting Organization/Department:	
Action/Project Priority:	High: 35
Timeline for Completion:	5+ years
Potential Fund Sources:	HMGP, PDM, Capital funds
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process, comprehensive plan
Progress Report	
Action Status:	Continuing in Progress
Report of Progress:	City of Bolivar now maintains MS4 requirements. Board of aldermen recently approved an engineer to examine the city's storm water infrastructure to determine needed improvements.

Action Worksheet	
Name of Jurisdiction:	City of Bolivar
Risk / Vulnerability	
Hazard(s) Addressed:	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado
Problem being Mitigated:	Lack of backup power source
Action or Project	
Applicable Goal Statement:	Reduce the potential impact of natural disasters to property, infrastructure, and the local economy.
Action/Project Number:	City of Bolivar 2.5
Name of Action or Project:	Back-up generator
Mitigation Category:	Structure and Infrastructure Projects
Action or Project Description:	Use back-up generators for all critical/vulnerable facilities and infrastructure.
Estimated Cost:	\$20,000+
Benefits:	Reduction in property and infrastructure loss.
Plan for Implementation	
Responsible Organization/Department:	City of Bolivar
Supporting Organization/Department:	
Action/Project Priority:	High: 33
Timeline for Completion:	3-5 years
Potential Fund Sources:	Annual Budget, HMGP
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process
Progress Report	
Action Status:	Continuing in Progress
Report of Progress:	Currently generators are in place at all critical facilities. Ongoing costs are minimal with maintenance, but replacement or upgrade will need to be considered in the near future.

Action Worksheet	
Name of Jurisdiction:	City of Bolivar
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding
Problem being Mitigated:	Proper floodplain management
Action or Project	
Applicable Goal Statement:	Reduce the potential impact of natural disasters to property, infrastructure, and the local economy.
Action/Project Number:	City of Bolivar 2.6
Name of Action or Project:	NFIP Enforcement
Mitigation Category:	Prevention
Action or Project Description:	NFIP communities of Bolivar and Pleasant Hope will enforce floodplain management requirements, including regulating all new and substantially improved construction in the Special Flood Hazard Areas (SPFAs).
Estimated Cost:	Included in existing staff costs
Benefits:	Reduction in damages due to flooding
Plan for Implementation	
Responsible Organization/Department:	City of Bolivar
Supporting Organization/Department:	
Action/Project Priority:	High: 37
Timeline for Completion:	Ongoing
Potential Fund Sources:	Local funds
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process
Progress Report	
Action Status:	Continuing in Progress
Report of Progress:	Codes and regulations continue for flood zones.

Action Worksheet	
Name of Jurisdiction:	City of Bolivar
Risk / Vulnerability	
Hazard(s) Addressed:	Drought, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire
Problem being Mitigated:	Lack of communication between jurisdictions
Action or Project	
Applicable Goal Statement:	Ensure continued operation of government, emergency functions, and critical infrastructure in a disaster.
Action/Project Number:	City of Bolivar 3.1
Name of Action or Project:	Multi-jurisdictional cooperation
Mitigation Category:	Education and Outreach
Action or Project Description:	Strengthen multi-jurisdictional cooperation and communication among local governments, emergency services agencies, and entities responsible for critical and vulnerable facilities.
Estimated Cost:	Included in existing staff costs
Benefits:	Improved communication during hazard events and mitigation activities.
Plan for Implementation	
Responsible Organization/Department:	Emergency management, city administration
Supporting Organization/Department:	
Action/Project Priority:	High: 30
Timeline for Completion:	Ongoing
Potential Fund Sources:	Local funds
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process
Progress Report	
Action Status:	Continuing in Progress
Report of Progress:	City now has designated PIO/media specialist to help with communication needs. Continue to work and plan with other community organizations to meet safety and communication needs in a disaster.

Action Worksheet	
Name of Jurisdiction:	City of Bolivar
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding, severe winter weather, severe thunderstorm, tornado
Problem being Mitigated:	Hazard mitigation is not always considered when developing other city plans
Action or Project	
Applicable Goal Statement:	Ensure continued operation of government, emergency functions, and critical infrastructure in a disaster.
Action/Project Number:	City of Bolivar 3.2
Name of Action or Project:	Hazard Mitigation Integration
Mitigation Category:	Education and Outreach
Action or Project Description:	Integrate hazard mitigation into comprehensive and long-range plans, capital improvement programs, zoning ordinances, subdivision and storm water management regulations, and school crisis management and school improvement plans where appropriate
Estimated Cost:	Included in existing staff costs
Benefits:	Plans will have included hazard mitigation principles, improving resilience during hazardous events.
Plan for Implementation	
Responsible Organization/Department:	Emergency Management, City Administration, Planning and Zoning
Supporting Organization/Department:	
Action/Project Priority:	High: 38
Timeline for Completion:	Ongoing
Potential Fund Sources:	Local funds
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process, comprehensive plan
Progress Report	
Action Status:	Continuing in Progress
Report of Progress:	City developed new 20-year comprehensive plan in 2020. Continue to work with other organizations for planning and response plans for all emergencies.

4.3.3 City of Fair Play Mitigation Actions

Action Worksheet	
Name of Jurisdiction:	City of Fair Play
Risk / Vulnerability	
Hazard(s) Addressed:	Tornado, severe thunderstorm
Problem being Mitigated:	No safe place to shelter during severe weather
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	City of Fair Play 1.1
Name of Action or Project:	Safe room construction
Mitigation Category:	Structure and Infrastructure Projects
Action or Project Description:	Construct a safe room to be used by citizens of Fair Play
Estimated Cost:	\$575,000
Benefits:	The construction of this new safe room will protect the lives of citizens, as well as, ensure the continued operation of government, emergency, police, and water, wastewater services.
Plan for Implementation	
Responsible Organization/Department:	The City of Fair Play, City Clerk & Public Works Supervisor
Supporting Organization/Department:	The City of Fair Play, Fiscal Office, City Clerk, Public Works Department
Action/Project Priority:	38
Timeline for Completion:	6 months – 1 year
Potential Fund Sources:	HMGP, BRIC, USDA Grants
Local Planning Mechanisms to be Used in Implementation, if any:	Comp plan, budgeting process, capital improvement plan, city emergency operations plan
Progress Report	
Action Status:	New
Report of Progress:	

Action Worksheet	
Name of Jurisdiction:	City of Fair Play
Risk / Vulnerability	
Hazard(s) Addressed:	Severe thunderstorm, tornado
Problem being Mitigated:	Proper notification system for residents of Fair Play during severe weather conditions
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	City of Fair Play 1.2
Name of Action or Project:	Storm Siren
Mitigation Category:	Structure and Infrastructure Projects
Action or Project Description:	Purchase a new storm siren for the southwest portion of the city
Estimated Cost:	\$20,000.00
Benefits:	Having an early warning system such as this storm siren will result in lives saves
Plan for Implementation	
Responsible Organization/Department:	City of Fair Play, Department of Public Works/Hazard
Supporting Organization/Department:	Which organization/department will assist in implementation of this action?
Action/Project Priority:	This is the final number from the STAPLEE sheet for the corresponding action
Timeline for Completion:	2-4 months
Potential Fund Sources:	List specific funding sources that may be used to pay for the implementation of the action.
Local Planning Mechanisms to be Used in Implementation, if any:	Comp plan, budgeting process, capital improvement plan, city emergency operations plan
Progress Report	
Action Status:	new
Report of Progress:	

Action Worksheet	
Name of Jurisdiction:	City of Fair Play
Risk / Vulnerability	
Hazard(s) Addressed:	Drought, earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire
Problem being Mitigated:	Limited public knowledge of hazard awareness and preparedness
Action or Project	
Applicable Goal Statement:	Protect lives and livelihood of all citizens
Action/Project Number:	City of Fair Play 1.3
Name of Action or Project:	Public information campaign
Mitigation Category:	Education and Outreach
Action or Project Description:	Develop public information campaigns on the risks of natural hazards and preparedness activities that will mitigate negative impacts.
Estimated Cost:	\$5,000+
Benefits:	Reduction of loss of life, injury, and property during hazard events.
Plan for Implementation	
Responsible Organization/Department:	Emergency Management
Supporting Organization/Department:	
Action/Project Priority:	25
Timeline for Completion:	Ongoing
Potential Fund Sources:	Local tax revenue
Local Planning Mechanisms to be Used in Implementation, if any:	Comp plan, budgeting process, capital improvement plan, city emergency operations plan
Progress Report	
Action Status:	New
Report of Progress:	

4.3.4 City of Humansville Mitigation Actions

Action Worksheet	
Name of Jurisdiction:	City of Humansville
Risk / Vulnerability	
Hazard(s) Addressed:	Dam failure, earthquake, flooding, severe winter weather, severe thunderstorm, tornado, wildfire
Problem being Mitigated:	Lack of proper notification system for severe storms
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	City of Humansville 1.1
Name of Action or Project:	NOAA Radios
Mitigation Category:	Emergency Services
Action or Project Description:	Use NOAA all-hazard weather radios in all homes, businesses, and critical/vulnerable facilities.
Estimated Cost:	\$20 per radio
Benefits:	This will let people know about the severe storms coming in and it will protect lives and structures.
Plan for Implementation	
Responsible Organization/Department:	City OEM
Supporting Organization/Department:	County OEM
Action/Project Priority:	47
Timeline for Completion:	Ongoing – purchase new radios as needed
Potential Fund Sources:	Local funds, HMA grants
Local Planning Mechanisms to be Used in Implementation, if any:	County HMP, budgeting process
Progress Report	
Action Status:	Continuing Not Started
Report of Progress:	

Action Worksheet	
Name of Jurisdiction:	City of Humansville
Risk / Vulnerability	
Hazard(s) Addressed:	Tornado, severe thunderstorm
Problem being Mitigated:	Lack of proper notification system for severe storms
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	City of Humansville 1.2
Name of Action or Project:	Alert Systems
Mitigation Category:	Prevention
Action or Project Description:	Utilize available alert systems to provide storm warning
Estimated Cost:	Can be completed with current budget
Benefits:	Better severe weather notification system
Plan for Implementation	
Responsible Organization/Department:	City OEM
Supporting Organization/Department:	County OEM
Action/Project Priority:	47
Timeline for Completion:	Ongoing
Potential Fund Sources:	Local funds, HMA grants
Local Planning Mechanisms to be Used in Implementation, if any:	County HMP, budgeting process
Progress Report	
Action Status:	Continuing Not Started
Report of Progress:	

Action Worksheet	
Name of Jurisdiction:	City of Humansville
Risk / Vulnerability	
Hazard(s) Addressed:	Drought, earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire
Problem being Mitigated:	Lack of public knowledge on risk reduction
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	City of Humansville 1.3
Name of Action or Project:	Information distribution
Mitigation Category:	Education and Outreach
Action or Project Description:	Work with the schools, human services organizations, and businesses to distribute information on hazard risks and resources or methods to reduce risk.
Estimated Cost:	Can be completed with current staff/budget
Benefits:	Increased public awareness on severe weather conditions
Plan for Implementation	
Responsible Organization/Department:	City OEM
Supporting Organization/Department:	County OEM
Action/Project Priority:	47
Timeline for Completion:	Ongoing
Potential Fund Sources:	Local funds, HMA grants
Local Planning Mechanisms to be Used in Implementation, if any:	County HMP, budgeting process
Progress Report	
Action Status:	Continuing Not Started
Report of Progress:	

Action Worksheet	
Name of Jurisdiction:	City of Humansville
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding, severe winter weather, severe thunderstorm, tornado
Problem being Mitigated:	No safe place to shelter during hazard events
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	City of Humansville 1.4
Name of Action or Project:	Retrofit
Mitigation Category:	Structure and Infrastructure Projects
Action or Project Description:	Where feasible, retrofit existing critical and vulnerable facilities to provide a safer environment during severe weather events
Estimated Cost:	\$10,000+ per project
Benefits:	Safer structures
Plan for Implementation	
Responsible Organization/Department:	City OEM
Supporting Organization/Department:	County OEM
Action/Project Priority:	47
Timeline for Completion:	1 year + per project
Potential Fund Sources:	Local funds, HMA grants
Local Planning Mechanisms to be Used in Implementation, if any:	County HMP, budgeting process, site plan review
Progress Report	
Action Status:	Continuing Not Started
Report of Progress:	

Action Worksheet	
Name of Jurisdiction:	City of Humansville
Risk / Vulnerability	
Hazard(s) Addressed:	Drought, earthquakes
Problem being Mitigated:	Limited public knowledge of drought and the dangers it poses
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	City of Humansville 1.5
Name of Action or Project:	Hazard information and education
Mitigation Category:	Education and Outreach
Action or Project Description:	Develop public information campaigns on the risks of drought/earthquakes and preparedness activities that will mitigate negative impacts
Estimated Cost:	Can be completed with current staff and funding
Benefits:	Better public knowledge regarding hazard awareness and prep for drought
Plan for Implementation	
Responsible Organization/Department:	City OEM
Supporting Organization/Department:	
Action/Project Priority:	25
Timeline for Completion:	Ongoing
Potential Fund Sources:	Local funds
Local Planning Mechanisms to be Used in Implementation, if any:	County HMP, budgeting process
Progress Report	
Action Status:	New
Report of Progress:	

Action Worksheet	
Name of Jurisdiction:	City of Humansville
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding, severe thunderstorm
Problem being Mitigated:	Waterways being overloaded with debris from flooding
Action or Project	
Applicable Goal Statement:	Goal 2: Reduce the potential impact of natural disasters to property, infrastructure, and the local economy.
Action/Project Number:	City of Humansville 2.1
Name of Action or Project:	Debris Cleanup
Mitigation Category:	Natural Systems Protection
Action or Project Description:	Clean out debris from under bridges and drainage channels.
Estimated Cost:	Can be completed with current budget
Benefits:	Waterways free of debris will be less prone to flooding and damage
Plan for Implementation	
Responsible Organization/Department:	City OEM
Supporting Organization/Department:	County OEM
Action/Project Priority:	47
Timeline for Completion:	Ongoing process
Potential Fund Sources:	Local funds, HMA grants
Local Planning Mechanisms to be Used in Implementation, if any:	County HMP, budgeting process
Progress Report	
Action Status:	Continuing Not Started
Report of Progress:	

Action Worksheet	
Name of Jurisdiction:	City of Humansville
Risk / Vulnerability	
Hazard(s) Addressed:	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado
Problem being Mitigated:	Lack of backup power source
Action or Project	
Applicable Goal Statement:	Goal 2: Reduce the potential impact of natural disasters to property, infrastructure, and the local economy.
Action/Project Number:	City of Humansville 2.2
Name of Action or Project:	Back-up generator
Mitigation Category:	Structure and Infrastructure Projects
Action or Project Description:	Use back-up generators for all critical/vulnerable facilities and infrastructure.
Estimated Cost:	\$10,000+
Benefits:	Prevent complete loss of power during severe weather
Plan for Implementation	
Responsible Organization/Department:	City OEM
Supporting Organization/Department:	County OEM
Action/Project Priority:	47
Timeline for Completion:	6 months to 1 year
Potential Fund Sources:	Local funds, HMA grants
Local Planning Mechanisms to be Used in Implementation, if any:	County HMP, budgeting process, site plan review
Progress Report	
Action Status:	Continuing Not Started
Report of Progress:	

Action Worksheet	
Name of Jurisdiction:	City of Humansville
Risk / Vulnerability	
Hazard(s) Addressed:	Drought, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire
Problem being Mitigated:	Lack of communication between jurisdictions
Action or Project	
Applicable Goal Statement:	Goal 3: Ensure continued operation of government, emergency functions, and critical infrastructure in a disaster.
Action/Project Number:	City of Humansville 3.1
Name of Action or Project:	Multi-jurisdictional cooperation
Mitigation Category:	Education and Outreach
Action or Project Description:	Strengthen multi-jurisdictional cooperation and communication among local governments, emergency services agencies, and entities responsible for critical and vulnerable facilities.
Estimated Cost:	Can be completed with current budget
Benefits:	Better communication between neighboring jurisdictions
Plan for Implementation	
Responsible Organization/Department:	City OEM
Supporting Organization/Department:	County OEM
Action/Project Priority:	47
Timeline for Completion:	ongoing
Potential Fund Sources:	Local funds, HMA grants
Local Planning Mechanisms to be Used in Implementation, if any:	County HMP, budgeting process
Progress Report	
Action Status:	Continuing Not Started
Report of Progress:	

Action Worksheet	
Name of Jurisdiction:	City of Humansville
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding, severe winter weather, severe thunderstorm, tornado
Problem being Mitigated:	Hazard mitigation is not always considered when developing other city plans
Action or Project	
Applicable Goal Statement:	Goal 3: Ensure continued operation of government, emergency functions, and critical infrastructure in a disaster.
Action/Project Number:	City of Humansville 3.2
Name of Action or Project:	Hazard Mitigation Integration
Mitigation Category:	Education and Outreach
Action or Project Description:	Integrate hazard mitigation into comprehensive and long-range plans, capital improvement programs, zoning ordinances, subdivision and storm water management regulations, and school crisis management and school improvement plans where appropriate
Estimated Cost:	Can be completed with current budget
Benefits:	Increased knowledge of hazard mitigation and the role it plays in city management
Plan for Implementation	
Responsible Organization/Department:	City OEM
Supporting Organization/Department:	County OEM
Action/Project Priority:	47
Timeline for Completion:	Ongoing
Potential Fund Sources:	Local funds, HMA grants
Local Planning Mechanisms to be Used in Implementation, if any:	County HMP, budgeting process
Progress Report	
Action Status:	Continuing Not Started
Report of Progress:	

4.3.5 City of Morrisville Mitigation Actions

Action Worksheet	
Name of Jurisdiction:	City of Morrisville
Risk / Vulnerability	
Hazard(s) Addressed:	Dam failure, earthquake, flooding, severe winter weather, severe thunderstorm, tornado, wildfire
Problem being Mitigated:	Lack of proper notification system for severe storms
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	City of Morrisville 1.1
Name of Action or Project:	NOAA Radios
Mitigation Category:	Emergency Services
Action or Project Description:	Use NOAA all-hazard weather radios in all homes, businesses, and critical/vulnerable facilities.
Estimated Cost:	\$500-\$2,000
Benefits:	Reduction in loss of life and injury during hazard events.
Plan for Implementation	
Responsible Organization/Department:	Emergency Management
Supporting Organization/Department:	Morrisville Police; Office staff; Private Companies
Action/Project Priority:	High; 31
Timeline for Completion:	3-5 years; ongoing
Potential Fund Sources:	Local funds; private funds
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting Process, city emergency plan
Progress Report	
Action Status:	New
Report of Progress:	Designing a method of management and organization to distribute the radios with limited staff resources to oversee the implementation could be challenging.

Action Worksheet	
Name of Jurisdiction:	City of Morrisville
Risk / Vulnerability	
Hazard(s) Addressed:	Tornado, severe thunderstorm
Problem being Mitigated:	Lack of proper notification system for severe storms
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	City of Morrisville 1.2
Name of Action or Project:	Alert Systems
Mitigation Category:	Prevention
Action or Project Description:	Utilize available alert systems to provide storm warning
Estimated Cost:	\$500-\$5,000
Benefits:	Improves communication during hazard events.
Plan for Implementation	
Responsible Organization/Department:	Emergency Management
Supporting Organization/Department:	Morrisville Police; Office staff
Action/Project Priority:	High; 33
Timeline for Completion:	3-5 years
Potential Fund Sources:	Individual subscriptions; Local funds; private donations
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting Process, city emergency plan
Progress Report	
Action Status:	New
Report of Progress:	Identifying a system that is easy to manage with limited staff and adaptable to a diverse community could be challenging.

Action Worksheet	
Name of Jurisdiction:	City of Morrisville
Risk / Vulnerability	
Hazard(s) Addressed:	Extreme temperatures, severe winter weather, severe thunderstorms, tornado
Problem being Mitigated:	Vulnerable populations do not have proper resources to deal with hazard events
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	City of Morrisville 1.3
Name of Action or Project:	Resources, weatherization, and shelters
Mitigation Category:	Prevention
Action or Project Description:	Local community organizations continue to offer and augment programs that provide fans, air conditioners, winter weatherization, and shelters to those at risk
Estimated Cost:	\$3,000+
Benefits:	Reduce loss of life and injury during extreme heat and cold
Plan for Implementation	
Responsible Organization/Department:	Emergency management; public works; Local community groups
Supporting Organization/Department:	Local community groups; churches
Action/Project Priority:	Low; 24
Timeline for Completion:	1-3 years; ongoing
Potential Fund Sources:	Local civic/community groups; individual grants or loans
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting Process, city emergency plan
Progress Report	
Action Status:	New
Report of Progress:	Potential challenge will be the limited number of civic/community groups in town and the resources needed to assist.

Action Worksheet	
Name of Jurisdiction:	City of Morrisville
Risk / Vulnerability	
Hazard(s) Addressed:	Drought, earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado
Problem being Mitigated:	Limited public knowledge of hazard awareness and preparedness
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	City of Morrisville 1.4
Name of Action or Project:	Public information campaign
Mitigation Category:	Education and Outreach
Action or Project Description:	Develop public information campaigns on the risks of natural hazards and preparedness activities that will mitigate negative impacts
Estimated Cost:	\$100-\$500
Benefits:	Reduction of loss of life, injury, and property during hazard events.
Plan for Implementation	
Responsible Organization/Department:	City Administration
Supporting Organization/Department:	Emergency Management; Police; Public Works
Action/Project Priority:	Medium; 28
Timeline for Completion:	1-2 years
Potential Fund Sources:	In-kind donations; Local funds; Annual budget
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting Process, city emergency plan
Progress Report	
Action Status:	New
Report of Progress:	Developing a continual program may be difficult due to staffing and time requirements.

Action Worksheet	
Name of Jurisdiction:	City of Morrisville
Risk / Vulnerability	
Hazard(s) Addressed:	Drought, earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire
Problem being Mitigated:	Lack of public knowledge on risk reduction
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	City of Morrisville 1.5
Name of Action or Project:	Information distribution
Mitigation Category:	Education and Outreach
Action or Project Description:	Work with the schools, human services organizations, and businesses to distribute information on hazard risks and resources or methods to reduce risk.
Estimated Cost:	\$1,000+
Benefits:	Improved public safety during hazard events.
Plan for Implementation	
Responsible Organization/Department:	Public works; Emergency Management
Supporting Organization/Department:	City Administration; Police
Action/Project Priority:	High; 34
Timeline for Completion:	1-3 years
Potential Fund Sources:	Annual budget; In-kind donations
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting Process, city emergency plan
Progress Report	
Action Status:	New
Report of Progress:	Buy-in and follow through from outside groups could be challenging to implement.

Action Worksheet	
Name of Jurisdiction:	City of Morrisville
Risk / Vulnerability	
Hazard(s) Addressed:	Tornado, severe thunderstorm
Problem being Mitigated:	No safe place to shelter during severe weather
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	City of Morrisville 1.6
Name of Action or Project:	Safe Rooms
Mitigation Category:	Structure and Infrastructure Projects; Emergency Services
Action or Project Description:	Include FEMA rated safe rooms in the construction of new public buildings.
Estimated Cost:	\$10,000+
Benefits:	Reduction of loss of life and injury during tornado and severe storm events
Plan for Implementation	
Responsible Organization/Department:	Emergency Management
Supporting Organization/Department:	City Administration; Public works
Action/Project Priority:	Low; 22
Timeline for Completion:	1-2 years; Ongoing
Potential Fund Sources:	HMGP; private funds; local funds
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting Process, city emergency plan
Progress Report	
Action Status:	New
Report of Progress:	Morrisville has a community storm shelter at Marion C. Early School that opens when a tornado warning for Polk County is issued. For the past several years, many people outside the city will drive to the school and wait in anticipation of a tornado and the shelter being unlocked which adds to their risk. Additional public locations that are open to for people to go to in advance would alleviate the current challenge. However, since Morrisville already has a FEMA shelter at the school, obtaining the funding and building addition structures may be difficult.

Action Worksheet	
Name of Jurisdiction:	City of Morrisville
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding, severe winter weather, severe thunderstorm, tornado
Problem being Mitigated:	No safe place to shelter during hazard events
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	City of Morrisville 1.7
Name of Action or Project:	Retrofit
Mitigation Category:	Structure and Infrastructure Projects
Action or Project Description:	Where feasible, retrofit existing critical and vulnerable facilities to provide a safer environment during severe weather events
Estimated Cost:	\$25,000-\$100,000
Benefits:	Reduce loss of life and injury
Plan for Implementation	
Responsible Organization/Department:	City Administration
Supporting Organization/Department:	Emergency Management
Action/Project Priority:	Medium; 25
Timeline for Completion:	5 years
Potential Fund Sources:	HMGP, CDBG, local funds
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting Process, city emergency plan
Progress Report	
Action Status:	New
Report of Progress:	This project would need to be included in conjunction with other projects as there are plans to relocate some city facilities in the future.

Action Worksheet	
Name of Jurisdiction:	City of Morrisville
Risk / Vulnerability	
Hazard(s) Addressed:	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado
Problem being Mitigated:	Minimum design and construction requirements to ensure safe and resilient structures
Action or Project	
Applicable Goal Statement:	Goal 2: Reduce the potential impact of natural disasters to property, infrastructure, and the local economy.
Action/Project Number:	City of Morrisville 2.1
Name of Action or Project:	Building Codes
Mitigation Category:	Prevention
Action or Project Description:	Adopt building codes that include storm ready provisions, such as hurricane straps
Estimated Cost:	Costs paid by building owner
Benefits:	Protection of properties from natural hazards, reduced damage costs.
Plan for Implementation	
Responsible Organization/Department:	Board of Aldermen/Mayor
Supporting Organization/Department:	Code enforcement (will need created)
Action/Project Priority:	High; 39
Timeline for Completion:	1-2 years
Potential Fund Sources:	Paid for within building costs
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting Process, city emergency plan
Progress Report	
Action Status:	New
Report of Progress:	City will need to hire a building inspector/code enforcement who would not be full-time. Additionally, public information and education about the need for building codes and why they are important would be challenging.

Action Worksheet	
Name of Jurisdiction:	City of Morrisville
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding, severe thunderstorm
Problem being Mitigated:	Waterways being overloaded with debris from flooding
Action or Project	
Applicable Goal Statement:	Goal 2: Reduce the potential impact of natural disasters to property, infrastructure, and the local economy.
Action/Project Number:	City of Morrisville 2.2
Name of Action or Project:	Debris Cleanup
Mitigation Category:	Natural Systems Protection
Action or Project Description:	Clean out debris from under bridges and drainage channels.
Estimated Cost:	Built into ongoing maintenance costs
Benefits:	Mitigate future damage
Plan for Implementation	
Responsible Organization/Department:	Public works
Supporting Organization/Department:	City Administration
Action/Project Priority:	High; 40
Timeline for Completion:	Continual
Potential Fund Sources:	HMGP, local funds
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting Process, city emergency plan
Progress Report	
Action Status:	New
Report of Progress:	Current challenges are lack of labor and aging equipment that tends to break down.

Action Worksheet	
Name of Jurisdiction:	City of Morrisville
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding, severe thunderstorms
Problem being Mitigated:	Outdated storm water infrastructure that needs to be repaired or replaced
Action or Project	
Applicable Goal Statement:	Goal 2: Reduce the potential impact of natural disasters to property, infrastructure, and the local economy.
Action/Project Number:	City of Morrisville 2.3
Name of Action or Project:	Storm water infrastructure
Mitigation Category:	Structure and Infrastructure Projects
Action or Project Description:	Repair and replace storm water drainage infrastructure in order to reduce localized flooding.
Estimated Cost:	\$5,000-\$50,000
Benefits:	Mitigate potential damage and protect property from flood events.
Plan for Implementation	
Responsible Organization/Department:	Public Works
Supporting Organization/Department:	City Administration
Action/Project Priority:	High; 40
Timeline for Completion:	3-5 years
Potential Fund Sources:	HMGP, USDA, local funds
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting Process, city emergency plan
Progress Report	
Action Status:	New
Report of Progress:	Project may be delayed due to the beginning phases of a water line replacement project fixing to begin.

Action Worksheet	
Name of Jurisdiction:	City of Morrisville
Risk / Vulnerability	
Hazard(s) Addressed:	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado
Problem being Mitigated:	Lack of backup power source
Action or Project	
Applicable Goal Statement:	Goal 2: Reduce the potential impact of natural disasters to property, infrastructure, and the local economy.
Action/Project Number:	City of Morrisville 2.4
Name of Action or Project:	Back-up generator
Mitigation Category:	Structure and Infrastructure Projects
Action or Project Description:	Use back-up generators for all critical/vulnerable facilities and infrastructure.
Estimated Cost:	\$50,000+
Benefits:	Ability to provide water and wastewater pumping during a power outage.
Plan for Implementation	
Responsible Organization/Department:	Public Works
Supporting Organization/Department:	City Administration
Action/Project Priority:	High; 40
Timeline for Completion:	1-5 years
Potential Fund Sources:	USDA, CDBG, local funds
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting Process, city emergency plan
Progress Report	
Action Status:	New
Report of Progress:	Potential barriers at the sewer lift stations would be the needed space for a generator and fuel source.

Action Worksheet	
Name of Jurisdiction:	City of Morrisville
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding
Problem being Mitigated:	Proper floodplain management
Action or Project	
Applicable Goal Statement:	Goal 2: Reduce the potential impact of natural disasters to property, infrastructure, and the local economy.
Action/Project Number:	City of Morrisville 2.5
Name of Action or Project:	NFIP Participation
Mitigation Category:	Prevention
Action or Project Description:	Consider joining the National Flood Insurance Program (NFIP)
Estimated Cost:	Absorbed into existing staff costs
Benefits:	Reduction in damages due to flooding.
Plan for Implementation	
Responsible Organization/Department:	Emergency Management
Supporting Organization/Department:	City Administration
Action/Project Priority:	Medium; 28
Timeline for Completion:	1-5 years
Potential Fund Sources:	Local funds
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting Process, city emergency plan
Progress Report	
Action Status:	New
Report of Progress:	Potential challenge will be the ongoing management and enforcement.

Action Worksheet	
Name of Jurisdiction:	City of Morrisville
Risk / Vulnerability	
Hazard(s) Addressed:	Drought, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire
Problem being Mitigated:	Lack of communication between jurisdictions
Action or Project	
Applicable Goal Statement:	Goal 3: Ensure continued operation of government, emergency functions, and critical infrastructure in a disaster.
Action/Project Number:	City of Morrisville 3.1
Name of Action or Project:	Multi-jurisdictional cooperation
Mitigation Category:	Education and Outreach
Action or Project Description:	Strengthen multi-jurisdictional cooperation and communication among local governments, emergency services agencies, and entities responsible for critical and vulnerable facilities.
Estimated Cost:	Absorbed into existing staff costs
Benefits:	Improved communication during hazard events and mitigation activities.
Plan for Implementation	
Responsible Organization/Department:	Emergency Management; Police
Supporting Organization/Department:	City Administration
Action/Project Priority:	High; 34
Timeline for Completion:	1 year; ongoing
Potential Fund Sources:	Local funds
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting Process, city emergency plan
Progress Report	
Action Status:	New
Report of Progress:	Radio communication between the various agencies will be a challenge due to the various types used within the county.

Action Worksheet	
Name of Jurisdiction:	City of Morrisville
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding, severe winter weather, severe thunderstorm, tornado
Problem being Mitigated:	Hazard mitigation is not always considered when developing other city plans
Action or Project	
Applicable Goal Statement:	Goal 3: Ensure continued operation of government, emergency functions, and critical infrastructure in a disaster.
Action/Project Number:	City of Morrisville 3.2
Name of Action or Project:	Hazard Mitigation Integration
Mitigation Category:	Education and Outreach
Action or Project Description:	Integrate hazard mitigation into comprehensive and long-range plans, capital improvement programs, zoning ordinances, subdivision and storm water management regulations, and school crisis management and school improvement plans where appropriate
Estimated Cost:	Included in existing staff costs
Benefits:	Plans will have included hazard mitigation principles, improving resilience to hazard events.
Plan for Implementation	
Responsible Organization/Department:	Emergency Management
Supporting Organization/Department:	City Administration
Action/Project Priority:	High; 41
Timeline for Completion:	1 year; ongoing
Potential Fund Sources:	Local funds
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting Process, city emergency plan
Progress Report	
Action Status:	New
Report of Progress:	For this to be more effective, we will first need to implement planning and zoning to assist with the future outlook of the community and long-range plans.

4.3.6 City of Pleasant Hope Mitigation Actions

Action Worksheet	
Name of Jurisdiction:	City of Pleasant Hope
Risk / Vulnerability	
Hazard(s) Addressed:	Dam failure, earthquake, flooding, severe winter weather, severe thunderstorm, tornado, wildfire
Problem being Mitigated:	Lack of proper notification system for severe storms
Action or Project	
Applicable Goal Statement:	Protect lives and livelihood of all citizens.
Action/Project Number:	City of Pleasant Hope 1.1
Name of Action or Project:	NOAA Radios
Mitigation Category:	Emergency Services
Action or Project Description:	Use NOAA all-hazard weather radios in all homes, businesses, and critical/vulnerable facilities.
Estimated Cost:	NOAA weather radios are not the most efficient. The new city website was implemented at a cost \$8000
Benefits:	The new website provides a Banner that is used for emergency management and updates on storms. Social media is highly used over radios. The Banner will provide links to NOAA and local weather stations for up to the minute reporting on cellphones.
Plan for Implementation	
Responsible Organization/Department:	City of Pleasant Hope Emergency Management and Public Works will be responsible for keeping the Banner refreshed.
Supporting Organization/Department:	City of Pleasant Hope Emergency Management and Public Works will be responsible for keeping the Banner refreshed.
Action/Project Priority:	39
Timeline for Completion:	The new website is still somewhat under construction but will be working by July 1, 2023
Potential Fund Sources:	Funding sources for the new web site was through the ARPA Fund
Local Planning Mechanisms to be Used in Implementation, if any:	Emergency Operations Plan will be updated, and the budgeting process will review annually
Progress Report	
Action Status:	Continuing in Progress
Report of Progress:	Continuing in Progress, indicate any progress that has been made over the past 5 years. Web site has been designed; training is under way.

Action Worksheet	
Name of Jurisdiction:	City of Pleasant Hope
Risk / Vulnerability	
Hazard(s) Addressed:	Drought, earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire
Problem being Mitigated:	Lack of public knowledge on risk reduction
Action or Project	
Applicable Goal Statement:	Protect lives and livelihood of all citizens.
Action/Project Number:	City of Pleasant Hope 1.2
Name of Action or Project:	Information distribution
Mitigation Category:	Education and Outreach
Action or Project Description:	Work with the schools, human services organizations, and businesses to distribute information on hazard risks and resources or methods to reduce risk.
Estimated Cost:	Cost of this action is payroll alone.
Benefits:	Provide action links and action documents on things to do at home to prepare for different types of disasters to be added to the City Web Site. A special tab may be added for a one stop look at various safety precautions that can be done at home.
Plan for Implementation	
Responsible Organization/Department:	Coordinated effort by the Pleasant Hope Emergency Management Team
Supporting Organization/Department:	Information provided by City Clerk and Public Works
Action/Project Priority:	32
Timeline for Completion:	1-3 years to develop an array of emergency preparedness toolkit documents
Potential Fund Sources:	Standard Budget Process
Local Planning Mechanisms to be Used in Implementation, if any:	Emergency Operations Plan, Budgeting Process
Progress Report	
Action Status:	Continuing in Progress
Report of Progress:	Continuing in Progress – reviewed annually and updated as needed

Action Worksheet	
Name of Jurisdiction:	City of Pleasant Hope
Risk / Vulnerability	
Hazard(s) Addressed:	Tornado, severe thunderstorm
Problem being Mitigated:	No safe place to shelter during severe weather
Action or Project	
Applicable Goal Statement:	Protect lives and livelihood of all citizens.
Action/Project Number:	City of Pleasant Hope 1.3
Name of Action or Project:	Safe Rooms
Mitigation Category:	Structure and Infrastructure Projects
Action or Project Description:	Include FEMA rated safe rooms in the construction of new public buildings.
Estimated Cost:	Estimate cost of this project is beyond the feasibility of the City of Pleasant Hope
Benefits:	The implementation of this project would definitely save lives as it takes people out of harm's way.
Plan for Implementation	
Responsible Organization/Department:	The entire staff of the City of Pleasant Hope as well as the Board of Alderman will continue to look for ways to make a difference. Grants offered by both Federal and State avenues.
Supporting Organization/Department:	Support from various businesses and church might be a better choice than to institution new infrastructure in such a small committee without any choices for places to build.
Action/Project Priority:	36
Timeline for Completion:	No way to know
Potential Fund Sources:	None available currently
Local Planning Mechanisms to be Used in Implementation, if any:	Emergency Operations Plan, Budgeting process
Progress Report	
Action Status:	Continuing Not Started
Report of Progress:	Continuing Not Started, lack of funds and lack of staff to do the research and preparation of grant projects.

Action Worksheet	
Name of Jurisdiction:	City of Pleasant Hope
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding, severe winter weather, severe thunderstorm, tornado
Problem being Mitigated:	No safe place to shelter during hazard events
Action or Project	
Applicable Goal Statement:	Protect lives and livelihood of all citizens.
Action/Project Number:	City of Pleasant Hope 1.4
Name of Action or Project:	Retrofit
Mitigation Category:	Structure and Infrastructure Projects
Action or Project Description:	Where feasible, retrofit existing critical and vulnerable facilities to provide a safer environment during severe weather events
Estimated Cost:	There are no currently feasible structures to retrofit
Benefits:	Retrofitting will need to happen in small increments in various locations around the city. Individuals and businesses will need to protect themselves, their businesses, and their customers.
Plan for Implementation	
Responsible Organization/Department:	Emergency Management and the Board of Alderman will continue to review ways and means to assist the public in retrofitting businesses and homes.
Supporting Organization/Department:	Emergency Management and Public Works
Action/Project Priority:	24
Timeline for Completion:	Ongoing
Potential Fund Sources:	Grants
Local Planning Mechanisms to be Used in Implementation, if any:	Emergency Operations and Public Works
Progress Report	
Action Status:	Continuing in Progress
Report of Progress:	The action is Continuing in Progress

Action Worksheet	
Name of Jurisdiction:	City of Pleasant Hope
Risk / Vulnerability	
Hazard(s) Addressed:	Drought, earthquakes
Problem being Mitigated:	Limited public knowledge of drought and the dangers it poses
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	City of Pleasant Hope 1.5
Name of Action or Project:	Hazard information and education
Mitigation Category:	Education and Outreach
Action or Project Description:	Develop public information campaigns on the risks of drought/earthquakes and preparedness activities that will mitigate negative impacts
Estimated Cost:	Can be completed with current staff and funding
Benefits:	Better public knowledge regarding hazard awareness and prep for drought
Plan for Implementation	
Responsible Organization/Department:	Emergency Management and Public Works
Supporting Organization/Department:	Emergency Management and Public Works
Action/Project Priority:	25
Timeline for Completion:	Ongoing
Potential Fund Sources:	Local funds
Local Planning Mechanisms to be Used in Implementation, if any:	Emergency Operations Plan, Budgeting Process
Progress Report	
Action Status:	New
Report of Progress:	

Action Worksheet	
Name of Jurisdiction:	City of Pleasant Hope
Risk / Vulnerability	
Hazard(s) Addressed:	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado
Problem being Mitigated:	Lack of backup power source
Action or Project	
Applicable Goal Statement:	Reduce the potential impact of natural disasters to property, infrastructure, and the local economy
Action/Project Number:	City of Pleasant Hope 2.1
Name of Action or Project:	Back-up generator
Mitigation Category:	Structure and Infrastructure Projects
Action or Project Description:	Use back-up generators for all critical/vulnerable facilities and infrastructure.
Estimated Cost:	Estimated Cost would be minimal under mutual aid agreements. The city would also need to purchase a generator to run an Emergency Operations Center
Benefits:	The City will be able to continue to provide water and sewer utilities to citizens and coordinate the recovery of the entire community.
Plan for Implementation	
Responsible Organization/Department:	Emergency Management and Public Works
Supporting Organization/Department:	Emergency Management and Public Works
Action/Project Priority:	32
Timeline for Completion:	1-3 years to budget a generator for City Hall
Potential Fund Sources:	Standard budget procedures
Local Planning Mechanisms to be Used in Implementation, if any:	Emergency Operations Plan, Budgeting Process
Progress Report	
Action Status:	Continuing in Progress
Report of Progress:	Continuing in Progress mutual aid has been discussed with various sources so that we have options. We have moved to our own building and now have the option of City Hall having its own generator

Action Worksheet	
Name of Jurisdiction:	City of Pleasant Hope
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding
Problem being Mitigated:	Proper floodplain management
Action or Project	
Applicable Goal Statement:	Reduce the potential impact of natural disasters to property, infrastructure, and the local economy.
Action/Project Number:	City of Pleasant Hope 2.2
Name of Action or Project:	NFIP Enforcement
Mitigation Category:	Prevention
Action or Project Description:	NFIP communities of Bolivar and Pleasant Hope will enforce floodplain management requirements, including regulating all new and substantially improved construction in the Special Flood Hazard Areas (SPFAs).
Estimated Cost:	Included in existing staff costs
Benefits:	Reduction in damages due to flooding
Plan for Implementation	
Responsible Organization/Department:	Emergency Management and Public Works
Supporting Organization/Department:	Emergency Management and Public Works
Action/Project Priority:	37
Timeline for Completion:	Ongoing
Potential Fund Sources:	Local funds
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process
Progress Report	
Action Status:	New
Report of Progress:	

Action Worksheet	
Name of Jurisdiction:	City of Pleasant Hope
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding, severe winter weather, severe thunderstorm, tornado
Problem being Mitigated:	Hazard mitigation is not always considered when developing other city plans
Action or Project	
Applicable Goal Statement:	Ensure continued operation of government, emergency functions, and critical infrastructure in a disaster
Action/Project Number:	City of Pleasant Hope 3.1
Name of Action or Project:	Hazard Mitigation Integration
Mitigation Category:	Prevention
Action or Project Description:	Integrate hazard mitigation into comprehensive and long-range plans, capital improvement programs, zoning ordinances, subdivision and storm water management regulations, and school crisis management and school improvement plan where appropriate
Estimated Cost:	Cost is estimated as part of payroll
Benefits:	Proper Planning Prevents Piss Poor Performance
Plan for Implementation	
Responsible Organization/Department:	City Clerk / Emergency Management
Supporting Organization/Department:	Public Works
Action/Project Priority:	44
Timeline for Completion:	Reviewed annually
Potential Fund Sources:	Local Budget
Local Planning Mechanisms to be Used in Implementation, if any:	comprehensive plan, emergency operations plan, budgeting process
Progress Report	
Action Status:	Continuing in Progress
Report of Progress:	Continuing in Progress

4.3.7 Village of Aldrich Mitigation Actions

Action Worksheet	
Name of Jurisdiction:	Village of Aldrich
Risk / Vulnerability	
Hazard(s) Addressed:	Severe thunderstorm, tornado
Problem being Mitigated:	No proper notification system for the village
Action or Project	
Applicable Goal Statement:	Goal 1: protect the lives and livelihoods of all citizens
Action/Project Number:	Village of Aldrich 1.1
Name of Action or Project:	Storm siren
Mitigation Category:	Structure and infrastructure projects
Action or Project Description:	Purchase a new storm siren to provide coverage for the village and the surrounding area
Estimated Cost:	\$30,000
Benefits:	Village-wide notification system for severe weather
Plan for Implementation	
Responsible Organization/Department:	Village Alderman
Supporting Organization/Department:	County OEM
Action/Project Priority:	45
Timeline for Completion:	1-2 years
Potential Fund Sources:	Federal grants
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process, grant writing process
Progress Report	
Action Status:	new
Report of Progress:	

Action Worksheet	
Name of Jurisdiction:	Village of Aldrich
Risk / Vulnerability	
Hazard(s) Addressed:	Drought, earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado
Problem being Mitigated:	Limited public knowledge of hazard awareness and preparedness
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Village of Aldrich 1.2
Name of Action or Project:	Public information campaign
Mitigation Category:	Education and Outreach
Action or Project Description:	Develop public information campaigns on the risks of natural hazards and preparedness activities that will mitigate negative impacts.
Estimated Cost:	\$1,000+
Benefits:	Reduction of loss of life, injury, and property during hazard events.
Plan for Implementation	
Responsible Organization/Department:	Village Aldermen
Supporting Organization/Department:	County OEM
Action/Project Priority:	25
Timeline for Completion:	Ongoing
Potential Fund Sources:	Local funds, HMA grants
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process, grant writing process
Progress Report	
Action Status:	New
Report of Progress:	

Action Worksheet	
Name of Jurisdiction:	Village of Aldrich
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding
Problem being Mitigated:	Damage to roadways during flood events
Action or Project	
Applicable Goal Statement:	Goal 2: Reduce the potential impact of natural disasters to property, infrastructure, and the local economy.
Action/Project Number:	Village of Aldrich 2.1
Name of Action or Project:	Ditch Maintenance
Mitigation Category:	Structure and infrastructure projects
Action or Project Description:	Maintain current roadway ditches and dig new ones where needed
Estimated Cost:	\$5,000 - \$10,000
Benefits:	Prevent damage to roads caused by flooding
Plan for Implementation	
Responsible Organization/Department:	Village aldermen
Supporting Organization/Department:	
Action/Project Priority:	25
Timeline for Completion:	Ongoing process
Potential Fund Sources:	Local funds, HMA grants
Local Planning Mechanisms to be Used in Implementation, if any:	County HMP, budgeting process
Progress Report	
Action Status:	New
Report of Progress:	

4.3.8 Village of Flemington Mitigation Actions

Action Worksheet	
Name of Jurisdiction:	Village of Flemington
Risk / Vulnerability	
Hazard(s) Addressed:	Severe thunderstorm, tornado
Problem being Mitigated:	No proper notification system for the village
Action or Project	
Applicable Goal Statement:	Goal 1: protect the lives and livelihoods of all citizens
Action/Project Number:	Village of Flemington 1.1
Name of Action or Project:	Storm siren
Mitigation Category:	Structure and infrastructure projects
Action or Project Description:	Purchase a new storm siren to provide coverage for the village and the surrounding area
Estimated Cost:	\$30,000
Benefits:	Village-wide notification system for severe weather
Plan for Implementation	
Responsible Organization/Department:	Village Alderman
Supporting Organization/Department:	County OEM
Action/Project Priority:	45
Timeline for Completion:	1-2 years
Potential Fund Sources:	Federal grants
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process, grant writing process
Progress Report	
Action Status:	new
Report of Progress:	

Action Worksheet	
Name of Jurisdiction:	Village of Flemington
Risk / Vulnerability	
Hazard(s) Addressed:	Drought, earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado
Problem being Mitigated:	Limited public knowledge of hazard awareness and preparedness
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Village of Flemington 1.2
Name of Action or Project:	Public information campaign
Mitigation Category:	Education and Outreach
Action or Project Description:	Develop public information campaigns on the risks of natural hazards and preparedness activities that will mitigate negative impacts.
Estimated Cost:	\$1,000+
Benefits:	Reduction of loss of life, injury, and property during hazard events.
Plan for Implementation	
Responsible Organization/Department:	Village Aldermen
Supporting Organization/Department:	County OEM
Action/Project Priority:	25
Timeline for Completion:	Ongoing
Potential Fund Sources:	Local funds, HMA grants
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process, grant writing process
Progress Report	
Action Status:	New
Report of Progress:	

Action Worksheet	
Name of Jurisdiction:	Village of Flemington
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding
Problem being Mitigated:	Damage to roadways during flood events
Action or Project	
Applicable Goal Statement:	Goal 2: Reduce the potential impact of natural disasters to property, infrastructure, and the local economy.
Action/Project Number:	Village of Flemington 2.1
Name of Action or Project:	Ditch Maintenance
Mitigation Category:	Structure and infrastructure projects
Action or Project Description:	Maintain current roadway ditches and dig new ones where needed
Estimated Cost:	\$5,000 - \$10,000
Benefits:	Prevent damage to roads caused by flooding
Plan for Implementation	
Responsible Organization/Department:	Village aldermen
Supporting Organization/Department:	
Action/Project Priority:	25
Timeline for Completion:	Ongoing process
Potential Fund Sources:	Local funds, HMA grants
Local Planning Mechanisms to be Used in Implementation, if any:	County HMP, budgeting process
Progress Report	
Action Status:	New
Report of Progress:	

4.3.9 Village of Halfway Mitigation Actions

Action Worksheet	
Name of Jurisdiction:	Village of Halfway
Risk / Vulnerability	
Hazard(s) Addressed:	Severe thunderstorm, tornado
Problem being Mitigated:	No proper notification system for the village
Action or Project	
Applicable Goal Statement:	Goal 1: protect the lives and livelihoods of all citizens
Action/Project Number:	Village of Halfway 1.1
Name of Action or Project:	Storm siren
Mitigation Category:	Structure and infrastructure projects
Action or Project Description:	Purchase a new storm siren to provide coverage for the village and the surrounding area
Estimated Cost:	\$30,000
Benefits:	Village-wide notification system for severe weather
Plan for Implementation	
Responsible Organization/Department:	Village Alderman
Supporting Organization/Department:	County OEM
Action/Project Priority:	45
Timeline for Completion:	1-2 years
Potential Fund Sources:	Federal grants
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process, grant writing process
Progress Report	
Action Status:	new
Report of Progress:	

Action Worksheet	
Name of Jurisdiction:	Village of Halfway
Risk / Vulnerability	
Hazard(s) Addressed:	Drought, earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado
Problem being Mitigated:	Limited public knowledge of hazard awareness and preparedness
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Village of Halfway 1.2
Name of Action or Project:	Public information campaign
Mitigation Category:	Education and Outreach
Action or Project Description:	Develop public information campaigns on the risks of natural hazards and preparedness activities that will mitigate negative impacts.
Estimated Cost:	\$1,000+
Benefits:	Reduction of loss of life, injury, and property during hazard events.
Plan for Implementation	
Responsible Organization/Department:	Village Aldermen
Supporting Organization/Department:	County OEM
Action/Project Priority:	25
Timeline for Completion:	Ongoing
Potential Fund Sources:	Local funds, HMA grants
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process, grant writing process
Progress Report	
Action Status:	New
Report of Progress:	

Action Worksheet	
Name of Jurisdiction:	Village of Halfway
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding
Problem being Mitigated:	Damage to roadways during flood events
Action or Project	
Applicable Goal Statement:	Goal 2: Reduce the potential impact of natural disasters to property, infrastructure, and the local economy.
Action/Project Number:	Village of Halfway 2.1
Name of Action or Project:	Ditch Maintenance
Mitigation Category:	Structure and infrastructure projects
Action or Project Description:	Maintain current roadway ditches and dig new ones where needed
Estimated Cost:	\$5,000 - \$10,000
Benefits:	Prevent damage to roads caused by flooding
Plan for Implementation	
Responsible Organization/Department:	Village aldermen
Supporting Organization/Department:	
Action/Project Priority:	25
Timeline for Completion:	Ongoing process
Potential Fund Sources:	Local funds, HMA grants
Local Planning Mechanisms to be Used in Implementation, if any:	County HMP, budgeting process
Progress Report	
Action Status:	New
Report of Progress:	

4.3.10 Bolivar R-I Mitigation Actions

Action Worksheet	
Name of Jurisdiction:	Bolivar R-I
Risk / Vulnerability	
Hazard(s) Addressed:	Dam failure, earthquake, flooding, severe winter weather, severe thunderstorm, tornado, wildfire
Problem being Mitigated:	Lack of proper notification system for severe storms
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Bolivar R-I 1.1
Name of Action or Project:	NOAA Radios
Mitigation Category:	Prevention
Action or Project Description:	Use NOAA all-hazard weather radios in all homes, businesses, and critical/vulnerable facilities.
Estimated Cost:	\$20 per radio
Benefits:	Although wide coverage would be expensive, the radios would provide valuable information.
Plan for Implementation	
Responsible Organization/Department:	School Board
Supporting Organization/Department:	
Action/Project Priority:	36 points
Timeline for Completion:	1-2 years
Potential Fund Sources:	Ours were funded through our normal budget.
Local Planning Mechanisms to be Used in Implementation, if any:	School emergency plan
Progress Report	
Action Status:	Continuing - in progress
Report of Progress:	Our buildings have access to a NOAA radio.

Action Worksheet	
Name of Jurisdiction:	Bolivar R-I
Risk / Vulnerability	
Hazard(s) Addressed:	Tornado, severe thunderstorm
Problem being Mitigated:	Lack of proper notification system for severe storms
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Bolivar R-I 1.2
Name of Action or Project:	Alert Systems
Mitigation Category:	Prevention
Action or Project Description:	Utilize available alert systems to provide storm warning
Estimated Cost:	This action, although important, will have no additional costs.
Benefits:	Using existing alert systems and outlets will increase awareness.
Plan for Implementation	
Responsible Organization/Department:	School board
Supporting Organization/Department:	
Action/Project Priority:	42
Timeline for Completion:	This is an ongoing action step.
Potential Fund Sources:	The funding for this step is complete.
Local Planning Mechanisms to be Used in Implementation, if any:	School emergency plan
Progress Report	
Action Status:	Continuing - in progress
Report of Progress:	This is an important and ongoing step.

Action Worksheet	
Name of Jurisdiction:	Bolivar R-I
Risk / Vulnerability	
Hazard(s) Addressed:	Extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado
Problem being Mitigated:	Limited public knowledge of hazard awareness and preparedness
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Bolivar R-I 1.3
Name of Action or Project:	Public information campaign
Mitigation Category:	Education and Outreach
Action or Project Description:	Develop public information campaigns on the risks of natural hazards and preparedness activities that will mitigate negative impacts.
Estimated Cost:	Estimated \$500 - \$2,500
Benefits:	A public information campaign would increase the general awareness and responsiveness.
Plan for Implementation	
Responsible Organization/Department:	School board
Supporting Organization/Department:	
Action/Project Priority:	38
Timeline for Completion:	This is an ongoing action step.
Potential Fund Sources:	This is a low-cost step and would likely be funded by the cooperating entities' normal budgeting process.
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting Process
Progress Report	
Action Status:	Continuing - in progress
Report of Progress:	This is an ongoing step.

Action Worksheet	
Name of Jurisdiction:	Bolivar R-I
Risk / Vulnerability	
Hazard(s) Addressed:	earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado
Problem being Mitigated:	Limited public knowledge of hazard awareness and preparedness
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Bolivar R-I 1.4
Name of Action or Project:	Information distribution
Mitigation Category:	Education and Outreach
Action or Project Description:	Work with the schools, human services organizations, and businesses to distribute information on hazard risks and resources or methods to reduce risk.
Estimated Cost:	Estimated \$500 - \$2,500
Benefits:	This action step would increase the general awareness and responsiveness.
Plan for Implementation	
Responsible Organization/Department:	School board/principals
Supporting Organization/Department:	
Action/Project Priority:	39
Timeline for Completion:	This is an ongoing action step.
Potential Fund Sources:	This is a low-cost step and would likely be funded by the cooperating entities' normal budgeting process.
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting Process
Progress Report	
Action Status:	Continuing - in progress
Report of Progress:	This is an ongoing step.

Action Worksheet	
Name of Jurisdiction:	Bolivar R-I
Risk / Vulnerability	
Hazard(s) Addressed:	Tornado, severe thunderstorm
Problem being Mitigated:	No safe place to shelter during severe weather
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Bolivar R-I 1.5
Name of Action or Project:	Safe Rooms
Mitigation Category:	Structure and Infrastructure Projects
Action or Project Description:	Include FEMA rated safe rooms in the construction of new public buildings.
Estimated Cost:	\$3.5 million
Benefits:	A FEMA building will provide a safe room during severe weather. It will include backup generators.
Plan for Implementation	
Responsible Organization/Department:	Bolivar R-1 School District
Supporting Organization/Department:	
Action/Project Priority:	36
Timeline for Completion:	1 year
Potential Fund Sources:	Grant, Budget, Fundraising, HMGP
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process, master plan, school emergency plan, capital improvement plan
Progress Report	
Action Status:	Continuing - in progress
Report of Progress:	We plan to start construction in January 2023.

Action Worksheet	
Name of Jurisdiction:	Bolivar R-I
Risk / Vulnerability	
Hazard(s) Addressed:	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado, wildfire
Problem being Mitigated:	Structural resiliency towards natural hazard events
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Bolivar R-I 1.6
Name of Action or Project:	Retrofit
Mitigation Category:	Structure and Infrastructure Projects
Action or Project Description:	Where feasible, retrofit existing critical and vulnerable facilities to provide a safer environment during severe weather events
Estimated Cost:	\$500,000 to \$3,000,000
Benefits:	Would provide a safer environment during severe weather.
Plan for Implementation	
Responsible Organization/Department:	Bolivar R-1 School District
Supporting Organization/Department:	
Action/Project Priority:	38
Timeline for Completion:	1-3 years
Potential Fund Sources:	Grants, Budget
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process, master plan, school emergency plan, capital improvement plan
Progress Report	
Action Status:	Continuing - not started
Report of Progress:	Lack of Funds

Action Worksheet	
Name of Jurisdiction:	Bolivar R-I
Risk / Vulnerability	
Hazard(s) Addressed:	Tornado, severe thunderstorm
Problem being Mitigated:	no safe place to shelter during severe weather
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Bolivar R-I 1.7
Name of Action or Project:	New FEMA Safe Room
Mitigation Category:	Structure and Infrastructure Projects
Action or Project Description:	Seek funding for and install a FEMA safe room in new construction of multipurpose building.
Estimated Cost:	\$3.5 million
Benefits:	A FEMA building will provide a safe room during severe weather. We will have a back-up generator at this facility.
Plan for Implementation	
Responsible Organization/Department:	Bolivar R-1 School District
Supporting Organization/Department:	Other members of the planning committee will support.
Action/Project Priority:	36
Timeline for Completion:	1 year
Potential Fund Sources:	Grant, Budget, Fundraising
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process, master plan, school emergency plan, capital improvement plan
Progress Report	
Action Status:	Continuing - in progress
Report of Progress:	We plan to start construction in January 2023.

Action Worksheet	
Name of Jurisdiction:	Bolivar R-I
Risk / Vulnerability	
Hazard(s) Addressed:	Drought, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire
Problem being Mitigated:	Lack of communication between jurisdictions
Action or Project	
Applicable Goal Statement:	Goal 3: Ensure continued operation of government, emergency functions, and critical infrastructure in a disaster.
Action/Project Number:	Bolivar R-I 3.1
Name of Action or Project:	Multi-jurisdictional cooperation
Mitigation Category:	Education and Outreach
Action or Project Description:	Strengthen multi-jurisdictional cooperation and communication among local governments, emergency services agencies, and entities responsible for critical and vulnerable facilities.
Estimated Cost:	This step would have no additional cost.
Benefits:	This is a general, but important, action step that will increase public awareness and safety.
Plan for Implementation	
Responsible Organization/Department:	School Board
Supporting Organization/Department:	This is a multi-jurisdictional initiative with shared organization and implementation.
Action/Project Priority:	47
Timeline for Completion:	This is an ongoing action step.
Potential Fund Sources:	This is a low-cost step and would likely be funded by the cooperating entities' normal budgeting process.
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting Process
Progress Report	
Action Status:	Continuing - in progress
Report of Progress:	This is an ongoing step.

Action Worksheet	
Name of Jurisdiction:	Bolivar R-I
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding, severe winter weather, severe thunderstorm, tornado
Problem being Mitigated:	Hazard mitigation is not always considered when developing other school plans
Action or Project	
Applicable Goal Statement:	Goal 3: Ensure continued operation of government, emergency functions, and critical infrastructure in a disaster.
Action/Project Number:	Bolivar R-I 3.2
Name of Action or Project:	Hazard Mitigation Integration
Mitigation Category:	Education and Outreach
Action or Project Description:	Integrate hazard mitigation into comprehensive and long-range plans, capital improvement programs, zoning ordinances, subdivision and storm water management regulations, and school crisis management and school improvement plans where appropriate
Estimated Cost:	This action, although important, will have no additional costs.
Benefits:	Would increase public awareness and promote safety.
Plan for Implementation	
Responsible Organization/Department:	Bolivar R-1 School District
Supporting Organization/Department:	Supported by others from a multi-jurisdictional standpoint.
Action/Project Priority:	44
Timeline for Completion:	This is an ongoing action step.
Potential Fund Sources:	This is a low-cost (but important) step and would likely be funded by the cooperating entities' normal budgeting process.
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting Process
Progress Report	
Action Status:	Continuing - in progress
Report of Progress:	This is an ongoing step.

4.3.11 Fair Play R-II Mitigation Actions

Action Worksheet	
Name of Jurisdiction:	Fair Play R-II
Risk / Vulnerability	
Hazard(s) Addressed:	Dam failure, earthquake, flooding, severe winter weather, severe thunderstorm, tornado, wildfire
Problem being Mitigated:	Lack of proper warning for severe weather
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Fair Play R-II 1.1
Name of Action or Project:	NOAA Radios
Mitigation Category:	Education and Outreach
Action or Project Description:	Use NOAA all-hazard weather radios in all homes, businesses, and critical/vulnerable facilities.
Estimated Cost:	Approximately \$350 to install in all school buildings.
Benefits:	This action would allow for quickly sheltering in the event of an approaching storm. It would also provide communication and might allow for actions to be taken that would help protect people or property.
Plan for Implementation	
Responsible Organization/Department:	Fair Play R-II Safety Committee
Supporting Organization/Department:	District and Building Administrators
Action/Project Priority:	High Priority 39
Timeline for Completion:	2-4 months
Potential Fund Sources:	District funds
Local Planning Mechanisms to be Used in Implementation, if any:	District Crisis Plan
Progress Report	
Action Status:	Continuing in Progress
Report of Progress:	Some radios are available. But we need to replace some and place them in auxiliary buildings.

Action Worksheet	
Name of Jurisdiction:	Fair Play R-II
Risk / Vulnerability	
Hazard(s) Addressed:	Extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado
Problem being Mitigated:	Limited public knowledge of hazard awareness and preparedness
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Fair Play R-II 1.2
Name of Action or Project:	Public information campaign
Mitigation Category:	Education and Outreach
Action or Project Description:	Develop public information campaigns on the risks of natural hazards and preparedness activities that will mitigate negative impacts.
Estimated Cost:	From \$250 to \$1000
Benefits:	Losses could be prevented by educating the school community on good storm preparedness.
Plan for Implementation	
Responsible Organization/Department:	This would be a good service project for the FFA or Student Council.
Supporting Organization/Department:	Building Admin can assist.
Action/Project Priority:	High Priority 36
Timeline for Completion:	4-6 months
Potential Fund Sources:	District resources, possible community grant funds?
Local Planning Mechanisms to be Used in Implementation, if any:	School communications plan
Progress Report	
Action Status:	Continuing Not Started
Report of Progress:	To our knowledge this has not started, but leadership transitions have occurred in the district. So it may have been something that was implemented.

Action Worksheet	
Name of Jurisdiction:	Fair Play R-II
Risk / Vulnerability	
Hazard(s) Addressed:	Tornado, severe thunderstorm
Problem being Mitigated:	No safe place to shelter during severe weather
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Fair Play R-II 1.3
Name of Action or Project:	Safe Rooms
Mitigation Category:	Structure and Infrastructure Projects
Action or Project Description:	Include FEMA rated safe rooms in the construction of new public buildings.
Estimated Cost:	\$1 million or more to add safe rooms
Benefits:	Would provide a safe place to shelter community in the event of a severe storm or tornado.
Plan for Implementation	
Responsible Organization/Department:	Superintendent and School Board
Supporting Organization/Department:	Facilities and School Finance Partners
Action/Project Priority:	24 low priority
Timeline for Completion:	5 year plan
Potential Fund Sources:	Bond issue, lease purchase, FEMA
Local Planning Mechanisms to be Used in Implementation, if any:	Long range facility planning
Progress Report	
Action Status:	NEW
Report of Progress:	The district has just completed some building projects and funding has been committed to those projects.

Action Worksheet	
Name of Jurisdiction:	Fair Play R-II
Risk / Vulnerability	
Hazard(s) Addressed:	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado, wildfire
Problem being Mitigated:	Structural resiliency towards natural hazard events
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Fair Play R-II 1.4
Name of Action or Project:	Retrofit
Mitigation Category:	Structure and Infrastructure Projects
Action or Project Description:	Where feasible, retrofit existing critical and vulnerable facilities to provide a safer environment during severe weather events
Estimated Cost:	\$5000-\$50,000
Benefits:	Possible reinforcement of outdated windows and roofing.
Plan for Implementation	
Responsible Organization/Department:	Superintendent and Board of Education
Supporting Organization/Department:	Facilities Planning Committee
Action/Project Priority:	26 medium priority
Timeline for Completion:	3-5 years possible
Potential Fund Sources:	Grant funds, district budget, FEMA?
Local Planning Mechanisms to be Used in Implementation, if any:	Facilities and Crisis Planning
Progress Report	
Action Status:	Continuing Not Started
Report of Progress:	New administration is assessing progress in this area.

Action Worksheet	
Name of Jurisdiction:	Fair Play R-II
Risk / Vulnerability	
Hazard(s) Addressed:	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado
Problem being Mitigated:	No back up power source
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Fair Play R-II 1.5
Name of Action or Project:	Back-up generator
Mitigation Category:	Structure and Infrastructure Projects
Action or Project Description:	Use back-up generators for all critical/vulnerable facilities and infrastructure.
Estimated Cost:	\$15,000-50,000
Benefits:	A backup generator would allow for the space to continue to be utilized in the event of an electric outage event. School would be able to continue or resume. Or the facility could be used as a shelter or staging area for a disaster situation.
Plan for Implementation	
Responsible Organization/Department:	Superintendent and Board of Education
Supporting Organization/Department:	City of Fair Play
Action/Project Priority:	26 medium
Timeline for Completion:	3-5 years
Potential Fund Sources:	District funds, Grant funds, FEMA?
Local Planning Mechanisms to be Used in Implementation, if any:	Facilities Planning and Crisis Mitigation Planning
Progress Report	
Action Status:	New
Report of Progress:	New project

Action Worksheet	
Name of Jurisdiction:	Fair Play R-II
Risk / Vulnerability	
Hazard(s) Addressed:	Drought, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire
Problem being Mitigated:	Lack of communication between jurisdictions
Action or Project	
Applicable Goal Statement:	Goal 3: Ensure continued operation of government, emergency functions, and critical infrastructure in a disaster.
Action/Project Number:	Fair Play R-II 3.1
Name of Action or Project:	Multi-jurisdictional cooperation
Mitigation Category:	Education and Outreach
Action or Project Description:	Strengthen multi-jurisdictional cooperation and communication among local governments, emergency services agencies, and entities responsible for critical and vulnerable facilities.
Estimated Cost:	\$100 to \$3000
Benefits:	Coordination of agencies would result in less loss of life or property in the event of a disaster.
Plan for Implementation	
Responsible Organization/Department:	Superintendent and Board of Education
Supporting Organization/Department:	City of Fair Play, Law Enforcement, Emergency Management
Action/Project Priority:	27 medium
Timeline for Completion:	6-12 months
Potential Fund Sources:	School or City Budget as needed
Local Planning Mechanisms to be Used in Implementation, if any:	School Emergency Plan
Progress Report	
Action Status:	Continuing in Progress
Report of Progress:	I'm not sure of current progress since I'm new administration.

Action Worksheet	
Name of Jurisdiction:	Fair Play R-II
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding, severe winter weather, severe thunderstorm, tornado
Problem being Mitigated:	Hazard mitigation is not always considered when developing other school plans
Action or Project	
Applicable Goal Statement:	Goal 3: Ensure continued operation of government, emergency functions, and critical infrastructure in a disaster.
Action/Project Number:	Fair Play R-II 3.2
Name of Action or Project:	Hazard Mitigation Integration
Mitigation Category:	Education and Outreach
Action or Project Description:	Integrate hazard mitigation into comprehensive and long-range plans, capital improvement programs, zoning ordinances, subdivision and storm water management regulations, and school crisis management and school improvement plans where appropriate
Estimated Cost:	Less than \$500
Benefits:	Coordinate responses to various crisis situations. Ensure preparedness.
Plan for Implementation	
Responsible Organization/Department:	Superintendent, Building Principals
Supporting Organization/Department:	Facilities Committee, Crisis Plan Committee
Action/Project Priority:	40 high priority
Timeline for Completion:	6-12 months
Potential Fund Sources:	School Budget
Local Planning Mechanisms to be Used in Implementation, if any:	Facilities Committee, Crisis Plan Committee
Progress Report	
Action Status:	Continuing in Progress
Report of Progress:	This will involve analyzing and revising the plan that is currently in place.

4.3.12 Humansville R-IV Mitigation Actions

Action Worksheet	
Name of Jurisdiction:	Humansville R-IV
Risk / Vulnerability	
Hazard(s) Addressed:	Tornado, severe thunderstorm
Problem being Mitigated:	Lack of proper notification system for severe storms
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Humansville R-IV 1.1
Name of Action or Project:	Alert Systems
Mitigation Category:	Prevention
Action or Project Description:	Utilize available alert systems to provide storm warning
Estimated Cost:	\$25-50 per unit NOAA Radio
Benefits:	Reduction in loss of life and injury during hazard events
Plan for Implementation	
Responsible Organization/Department:	Humansville R-IV School District
Supporting Organization/Department:	N/A
Action/Project Priority:	36
Timeline for Completion:	4-6 months
Potential Fund Sources:	District Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process, school emergency plan
Progress Report	
Action Status:	Continuing in Progress
Report of Progress:	Each office currently has NOAA Radios but newer, updated ones are needed

Action Worksheet	
Name of Jurisdiction:	Humansville R-IV
Risk / Vulnerability	
Hazard(s) Addressed:	Earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado
Problem being Mitigated:	Limited knowledge on hazard events and how they can be mitigated
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Humansville R-IV 1.2
Name of Action or Project:	Information distribution
Mitigation Category:	Education and Outreach
Action or Project Description:	Work with the schools, human services organizations, and businesses to distribute information on hazard risks and resources or methods to reduce risk.
Estimated Cost:	\$0-\$1,000
Benefits:	Reduction of loss of life and minimize injury of citizens
Plan for Implementation	
Responsible Organization/Department:	Administration
Supporting Organization/Department:	
Action/Project Priority:	34
Timeline for Completion:	0-4 years
Potential Fund Sources:	Grants or donations
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process, school emergency plan
Progress Report	
Action Status:	Continuing Not Started
Report of Progress:	Lack of funds, time

Action Worksheet	
Name of Jurisdiction:	Humansville R-IV
Risk / Vulnerability	
Hazard(s) Addressed:	Tornado, severe thunderstorm
Problem being Mitigated:	No safe place to shelter during severe weather
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Humansville R-IV 1.3
Name of Action or Project:	Safe Rooms
Mitigation Category:	Structure and Infrastructure Projects
Action or Project Description:	Include FEMA rated safe rooms in the construction of new public buildings.
Estimated Cost:	\$500,000 +
Benefits:	Reduction of loss of life and injury during tornado and severe storm events
Plan for Implementation	
Responsible Organization/Department:	School District Officials
Supporting Organization/Department:	
Action/Project Priority:	29
Timeline for Completion:	Ongoing
Potential Fund Sources:	Grant or District funds
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process, school emergency plan
Progress Report	
Action Status:	Continuing, Not Started
Report of Progress:	Lack of funding

Action Worksheet	
Name of Jurisdiction:	Humansville R-IV
Risk / Vulnerability	
Hazard(s) Addressed:	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado, wildfire
Problem being Mitigated:	Structural resiliency towards natural hazard events
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Humansville R-IV 1.4
Name of Action or Project:	Retrofit
Mitigation Category:	Structure and Infrastructure Projects
Action or Project Description:	Where feasible, retrofit existing critical and vulnerable facilities to provide a safer environment during severe weather events
Estimated Cost:	\$100,000 +
Benefits:	Reduce loss of life and injury
Plan for Implementation	
Responsible Organization/Department:	Humansville R-IV School District Officials
Supporting Organization/Department:	
Action/Project Priority:	28
Timeline for Completion:	4-6 years
Potential Fund Sources:	Grant
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process, school emergency plan
Progress Report	
Action Status:	New
Report of Progress:	Lack of Funding

Action Worksheet	
Name of Jurisdiction:	Humansville R-IV
Risk / Vulnerability	
Hazard(s) Addressed:	Drought, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire
Problem being Mitigated:	Lack of communication between jurisdictions
Action or Project	
Applicable Goal Statement:	Goal 3: Ensure continued operation of government, emergency functions, and critical infrastructure in a disaster.
Action/Project Number:	Humansville R-IV 3.1
Name of Action or Project:	Multi-jurisdictional cooperation
Mitigation Category:	Education and Outreach
Action or Project Description:	Strengthen multi-jurisdictional cooperation and communication among local governments, emergency services agencies, and entities responsible for critical and vulnerable facilities.
Estimated Cost:	\$10,000 +
Benefits:	Improved communication during hazard events and mitigation activities
Plan for Implementation	
Responsible Organization/Department:	Humansville R-IV
Supporting Organization/Department:	City of Humansville, Polk County, Polk County 911
Action/Project Priority:	37
Timeline for Completion:	1-2 years
Potential Fund Sources:	Grants and District Funds
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process, school emergency plan
Progress Report	
Action Status:	New
Report of Progress:	Lack of Funds

Action Worksheet	
Name of Jurisdiction:	Humansville R-IV
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding, severe winter weather, severe thunderstorm, tornado
Problem being Mitigated:	Hazard mitigation is not always considered when developing other school plans
Action or Project	
Applicable Goal Statement:	Goal 3: Ensure continued operation of government, emergency functions, and critical infrastructure in a disaster.
Action/Project Number:	Humansville R-IV 3.2
Name of Action or Project:	Hazard Mitigation Integration
Mitigation Category:	Education and Outreach
Action or Project Description:	Integrate hazard mitigation into comprehensive and long-range plans, capital improvement programs, zoning ordinances, subdivision and storm water management regulations, and school crisis management and school improvement plans where appropriate
Estimated Cost:	No additional cost
Benefits:	Plans will have included hazard mitigation principals, improving resilience to hazard events
Plan for Implementation	
Responsible Organization/Department:	Humansville R-IV Administration
Supporting Organization/Department:	
Action/Project Priority:	37
Timeline for Completion:	Ongoing
Potential Fund Sources:	District Funds, Grants
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process, school emergency plan
Progress Report	
Action Status:	Continuing in Progress
Report of Progress:	Plans are updated annually

4.3.13 Marion C Early R-V Hope Mitigation Actions

Action Worksheet	
Name of Jurisdiction:	Marion C Early
Risk / Vulnerability	
Hazard(s) Addressed:	Dam failure, earthquake, flooding, severe winter weather, severe thunderstorm, tornado, wildfire
Problem being Mitigated:	Lack of proper notification system for severe storms
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Marion C Early 1.1
Name of Action or Project:	NOAA Radios
Mitigation Category:	Prevention
Action or Project Description:	Use NOAA all-hazard weather radios in all homes, businesses, and critical/vulnerable facilities.
Estimated Cost:	\$20 per radio x 500 households estimate = \$10,000
Benefits:	Notification to all households of severe weather
Plan for Implementation	
Responsible Organization/Department:	Marion C. Early School District
Supporting Organization/Department:	FEMA, County or State Government Agency
Action/Project Priority:	27
Timeline for Completion:	1 year
Potential Fund Sources:	Grants
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process, school emergency plan
Progress Report	
Action Status:	Not Started
Report of Progress:	

Action Worksheet	
Name of Jurisdiction:	Marion C Early
Risk / Vulnerability	
Hazard(s) Addressed:	Tornado, severe thunderstorm
Problem being Mitigated:	Lack of proper notification system for severe storms
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Marion C Early 1.2
Name of Action or Project:	Alert Systems
Mitigation Category:	Prevention
Action or Project Description:	Utilize available alert systems to provide storm warning
Estimated Cost:	\$6000
Benefits:	Notification to all households of severe weather
Plan for Implementation	
Responsible Organization/Department:	Marion C. Early School District
Supporting Organization/Department:	FEMA, County or State Government Agency
Action/Project Priority:	36
Timeline for Completion:	2-3 months
Potential Fund Sources:	Grants
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process, school emergency plan
Progress Report	
Action Status:	Not Started
Report of Progress:	The school has a communication system set up for parents and guardians of students in the district.

Action Worksheet	
Name of Jurisdiction:	Marion C Early
Risk / Vulnerability	
Hazard(s) Addressed:	Extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado
Problem being Mitigated:	Limited public knowledge of hazard awareness and preparedness
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Marion C Early 1.3
Name of Action or Project:	Public information campaign
Mitigation Category:	Education and Outreach
Action or Project Description:	Develop public information campaigns on the risks of natural hazards and preparedness activities that will mitigate negative impacts.
Estimated Cost:	\$2000
Benefits:	Increase public awareness and preparedness of hazardous events.
Plan for Implementation	
Responsible Organization/Department:	Marion C. Early School District
Supporting Organization/Department:	FEMA, County or State Government Agency
Action/Project Priority:	32
Timeline for Completion:	1 year
Potential Fund Sources:	Local funds
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process, school emergency plan
Progress Report	
Action Status:	Not Started
Report of Progress:	

Action Worksheet	
Name of Jurisdiction:	Marion C Early
Risk / Vulnerability	
Hazard(s) Addressed:	Earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado
Problem being Mitigated:	Limited public knowledge of hazard awareness and preparedness
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Marion C Early 1.4
Name of Action or Project:	Information distribution
Mitigation Category:	Education and Outreach
Action or Project Description:	Work with the schools, human services organizations, and businesses to distribute information on hazard risks and resources or methods to reduce risk.
Estimated Cost:	\$2000
Benefits:	Increase public awareness and preparedness of hazardous events.
Plan for Implementation	
Responsible Organization/Department:	Marion C. Early School District
Supporting Organization/Department:	FEMA, County or State Government Agency
Action/Project Priority:	31
Timeline for Completion:	1 year
Potential Fund Sources:	Local funds
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process, school emergency plan
Progress Report	
Action Status:	Not Started
Report of Progress:	

Action Worksheet	
Name of Jurisdiction:	Marion C Early
Risk / Vulnerability	
Hazard(s) Addressed:	Tornado, severe thunderstorm
Problem being Mitigated:	No safe place to shelter during severe weather
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Marion C Early 1.5
Name of Action or Project:	Safe Rooms
Mitigation Category:	Structure and Infrastructure Projects
Action or Project Description:	Include FEMA rated safe rooms in the construction of new public buildings.
Estimated Cost:	\$2-5 million
Benefits:	Provide a safe place to shelter during severe weather
Plan for Implementation	
Responsible Organization/Department:	Marion C. Early School District
Supporting Organization/Department:	FEMA
Action/Project Priority:	31
Timeline for Completion:	NA
Potential Fund Sources:	Local money and grants
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process, school emergency plan
Progress Report	
Action Status:	Not Started N/A
Report of Progress:	

Action Worksheet	
Name of Jurisdiction:	Marion C Early
Risk / Vulnerability	
Hazard(s) Addressed:	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado, wildfire
Problem being Mitigated:	Structural resiliency towards natural hazard events
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Marion C Early 1.6
Name of Action or Project:	Retrofit
Mitigation Category:	Structure and Infrastructure Projects
Action or Project Description:	Where feasible, retrofit existing critical and vulnerable facilities to provide a safer environment during severe weather events
Estimated Cost:	\$10,000 - \$100,0000
Benefits:	Provide a safe place to shelter during severe weather
Plan for Implementation	
Responsible Organization/Department:	Marion C. Early School District
Supporting Organization/Department:	
Action/Project Priority:	29
Timeline for Completion:	2-5 years
Potential Fund Sources:	Local money and grants
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process, school emergency plan
Progress Report	
Action Status:	Not Started
Report of Progress:	

Action Worksheet	
Name of Jurisdiction:	Marion C Early
Risk / Vulnerability	
Hazard(s) Addressed:	Drought, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire
Problem being Mitigated:	Lack of communication between jurisdictions
Action or Project	
Applicable Goal Statement:	Goal 3: Ensure continued operation of government, emergency functions, and critical infrastructure in a disaster.
Action/Project Number:	Marion C Early 3.1
Name of Action or Project:	Multi-jurisdictional cooperation
Mitigation Category:	Education and Outreach
Action or Project Description:	Strengthen multi-jurisdictional cooperation and communication among local governments, emergency services agencies, and entities responsible for critical and vulnerable facilities.
Estimated Cost:	0
Benefits:	Strengthen multi-jurisdictional cooperation and communication among local governments, emergency services agencies, and entities responsible for critical and vulnerable facilities.
Plan for Implementation	
Responsible Organization/Department:	Marion C. Early R-V
Supporting Organization/Department:	County government agencies
Action/Project Priority:	32
Timeline for Completion:	3-6 months
Potential Fund Sources:	Local funds
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process, school emergency plan
Progress Report	
Action Status:	Continuing
Report of Progress:	

Action Worksheet	
Name of Jurisdiction:	Marion C Early
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding, severe winter weather, severe thunderstorm, tornado
Problem being Mitigated:	Hazard mitigation is not always considered when developing other school plans
Action or Project	
Applicable Goal Statement:	Goal 3: Ensure continued operation of government, emergency functions, and critical infrastructure in a disaster.
Action/Project Number:	Marion C Early 3.2
Name of Action or Project:	Hazard Mitigation Integration
Mitigation Category:	Education and Outreach
Action or Project Description:	Integrate hazard mitigation into comprehensive and long-range plans, capital improvement programs, zoning ordinances, subdivision and storm water management regulations, and school crisis management and school improvement plans where appropriate
Estimated Cost:	0
Benefits:	Clear plan and procedures for emergencies
Plan for Implementation	
Responsible Organization/Department:	Marion C. Early R-V
Supporting Organization/Department:	
Action/Project Priority:	35
Timeline for Completion:	2-6 months
Potential Fund Sources:	Local funds
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process, school emergency plan
Progress Report	
Action Status:	Continuing
Report of Progress:	New Crisis manual created and updated.

4.3.14 Pleasant Hope R-VI Mitigation Actions

Action Worksheet	
Name of Jurisdiction:	Pleasant Hope R-VI
Risk / Vulnerability	
Hazard(s) Addressed:	Tornado, severe thunderstorm
Problem being Mitigated:	Lack of proper notification system for severe storms
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Pleasant Hope R-VI 1.1
Name of Action or Project:	Alert Systems
Mitigation Category:	Prevention
Action or Project Description:	Utilize available alert systems to provide storm warning
Estimated Cost:	School District Notification System - \$8,000; Emergency Alert System - \$50,000-\$100,000
Benefits:	Loss of life, cattle, and personal property may be prevented through proper notification alert systems.
Plan for Implementation	
Responsible Organization/Department:	The Pleasant Hope R-VI School Board and District Office Administration will be responsible for tracking this action.
Supporting Organization/Department:	The Pleasant Hope R-VI School District will work in conjunction with the Pleasant Hope City and emergency services, as well as building administrators to support the action.
Action/Project Priority:	34; High Priority
Timeline for Completion:	1-2 years estimated
Potential Fund Sources:	FEMA, Department of Economic Development, Community Foundation, School District, other available grant funding
Local Planning Mechanisms to be Used in Implementation, if any:	Facilities & Technology Improvement Plans (part of the District's CSIP), Annual School District Budget, School District Crisis Plans
Progress Report	
Action Status:	Continuing, In-Progress
Report of Progress:	The School District currently utilizes an SMS text message and voice call, as well as application alert system to notify the school community of emergencies and other crisis. The district does not have an emergency alert system 24 hours/day due to limited staff availability and lack of funds.

Action Worksheet	
Name of Jurisdiction:	Pleasant Hope R-VI
Risk / Vulnerability	
Hazard(s) Addressed:	Extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado
Problem being Mitigated:	Limited public knowledge of hazard awareness and preparedness
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Pleasant Hope R-VI 1.2
Name of Action or Project:	Public information campaign
Mitigation Category:	Education and Outreach
Action or Project Description:	Develop public information campaigns on the risks of natural hazards and preparedness activities that will mitigate negative impacts.
Estimated Cost:	\$5,000-10,000
Benefits:	The losses prevented may include loss of life, health, and personal property due to education and awareness of natural hazards and preparedness activities.
Plan for Implementation	
Responsible Organization/Department:	The Pleasant Hope R-VI School Board and District Office Administration will be responsible for tracking this action.
Supporting Organization/Department:	The Pleasant Hope R-VI School District will work in conjunction with the Pleasant Hope City and emergency services, as well as building administrators to support the action.
Action/Project Priority:	38; High Priority
Timeline for Completion:	1-2 years estimated
Potential Fund Sources:	FEMA, Community Foundation, School District, Safety Education Curriculum funding, other available grant funding
Local Planning Mechanisms to be Used in Implementation, if any:	Curriculum Improvement Plans (part of the District's CSIP), Annual School District Budget, School District Crisis Plans
Progress Report	
Action Status:	Continuing Not Started
Report of Progress:	Lack of funds, limited staff availability, new administration

Action Worksheet	
Name of Jurisdiction:	Pleasant Hope R-VI
Risk / Vulnerability	
Hazard(s) Addressed:	Earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado
Problem being Mitigated:	Limited public knowledge of hazard awareness and preparedness
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Pleasant Hope R-VI 1.3
Name of Action or Project:	Information distribution
Mitigation Category:	Education and Outreach
Action or Project Description:	Work with the schools, human services organizations, and businesses to distribute information on hazard risks and resources or methods to reduce risk.
Estimated Cost:	\$5,000-10,000
Benefits:	The losses prevented may include loss of life, health, and personal property due to education and awareness of natural hazards and preparedness activities.
Plan for Implementation	
Responsible Organization/Department:	The Pleasant Hope R-VI School Board and District Office Administration will be responsible for tracking this action.
Supporting Organization/Department:	The Pleasant Hope R-VI School District will work in conjunction with the Pleasant Hope City and emergency services, as well as building administrators to support the action.
Action/Project Priority:	37; High Priority
Timeline for Completion:	1-2 years estimated
Potential Fund Sources:	FEMA, Community Foundation, School District, Safety Education Curriculum funding, other available grant funding
Local Planning Mechanisms to be Used in Implementation, if any:	Curriculum Improvement Plans (part of the District's CSIP), Annual School District Budget, School District Crisis Plans
Progress Report	
Action Status:	Continuing Not Started
Report of Progress:	Lack of funds, limited staff availability, new administration

Action Worksheet	
Name of Jurisdiction:	Pleasant Hope R-VI
Risk / Vulnerability	
Hazard(s) Addressed:	Tornado, severe thunderstorm
Problem being Mitigated:	No safe place to shelter during severe weather
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Pleasant Hope R-VI 1.4
Name of Action or Project:	Safe Rooms
Mitigation Category:	Structure and Infrastructure Projects
Action or Project Description:	Include FEMA rated safe rooms in the construction of new public buildings.
Estimated Cost:	\$500,000-\$1,000,000
Benefits:	Loss of life, health, and personal property may be prevented through proper emergency shelters.
Plan for Implementation	
Responsible Organization/Department:	The Pleasant Hope R-VI School Board and District Office Administration will be responsible for tracking this action.
Supporting Organization/Department:	The Pleasant Hope R-VI School District will work in conjunction with the Pleasant Hope City and emergency services, as well as building administrators to support the action.
Action/Project Priority:	36; High Priority
Timeline for Completion:	1-7 years estimated
Potential Fund Sources:	FEMA, Department of Economic Development, Community Foundation, School District, other available grant funding
Local Planning Mechanisms to be Used in Implementation, if any:	Facilities & Technology Improvement Plans (part of the District's CSIP), Annual School District Budget, School District Crisis Plans
Progress Report	
Action Status:	Continuing Not Started
Report of Progress:	Lack of funds, limited staff availability, new administration

Action Worksheet	
Name of Jurisdiction:	Pleasant Hope R-VI
Risk / Vulnerability	
Hazard(s) Addressed:	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado, wildfire
Problem being Mitigated:	Structural resiliency towards natural hazard events
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Pleasant Hope R-VI 1.5
Name of Action or Project:	Retrofit
Mitigation Category:	Structure and Infrastructure Projects
Action or Project Description:	Where feasible, retrofit existing critical and vulnerable facilities to provide a safer environment during severe weather events
Estimated Cost:	\$250,000-\$1,000,000
Benefits:	Loss of life, health, and personal property may be prevented through proper emergency shelters.
Plan for Implementation	
Responsible Organization/Department:	The Pleasant Hope R-VI School Board and District Office Administration will be responsible for tracking this action.
Supporting Organization/Department:	The Pleasant Hope R-VI School District will work in conjunction with the Pleasant Hope City and emergency services, as well as building administrators to support the action.
Action/Project Priority:	36; High Priority
Timeline for Completion:	1-7 years estimated
Potential Fund Sources:	FEMA, Department of Economic Development, Community Foundation, School District, other available grant funding
Local Planning Mechanisms to be Used in Implementation, if any:	Facilities & Technology Improvement Plans (part of the District's CSIP), Annual School District Budget, School District Crisis Plans
Progress Report	
Action Status:	Continuing Not Started
Report of Progress:	Lack of funds, limited staff availability, new administration

Action Worksheet	
Name of Jurisdiction:	Pleasant Hope R-VI
Risk / Vulnerability	
Hazard(s) Addressed:	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado
Problem being Mitigated:	No back up power source
Action or Project	
Applicable Goal Statement:	Goal 2: Reduce the potential impact of natural disasters to property, infrastructure, and the local economy.
Action/Project Number:	Pleasant Hope R-VI 2.1
Name of Action or Project:	Back-up generator
Mitigation Category:	Structure and Infrastructure Projects
Action or Project Description:	Use back-up generators for all critical/vulnerable facilities and infrastructure.
Estimated Cost:	\$50,000-\$100,000
Benefits:	Loss of life, health, and education may be prevented through proper emergency services.
Plan for Implementation	
Responsible Organization/Department:	The Pleasant Hope R-VI School Board and District Office Administration will be responsible for tracking this action.
Supporting Organization/Department:	The Pleasant Hope R-VI School District will work in conjunction with the Pleasant Hope City and emergency services, as well as building administrators to support the action.
Action/Project Priority:	28; Medium Priority
Timeline for Completion:	1-2 years
Potential Fund Sources:	FEMA, Department of Economic Development, Community Foundation, School District, other available grant funding
Local Planning Mechanisms to be Used in Implementation, if any:	Facilities & Technology Improvement Plans (part of the District's CSIP), Annual School District Budget, School District Crisis Plans
Progress Report	
Action Status:	Continuing Not Started
Report of Progress:	Lack of funds, limited staff availability, new administration

Action Worksheet	
Name of Jurisdiction:	Pleasant Hope R-VI
Risk / Vulnerability	
Hazard(s) Addressed:	Drought, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire
Problem being Mitigated:	Lack of communication between jurisdictions
Action or Project	
Applicable Goal Statement:	Goal 3: Ensure continued operation of government, emergency functions, and critical infrastructure in a disaster.
Action/Project Number:	Pleasant Hope R-VI 3.1
Name of Action or Project:	Multi-jurisdictional cooperation
Mitigation Category:	Education and Outreach
Action or Project Description:	Strengthen multi-jurisdictional cooperation and communication among local governments, emergency services agencies, and entities responsible for critical and vulnerable facilities.
Estimated Cost:	\$1,500-\$2,500
Benefits:	Loss of life, health, and personal property may be prevented through proper emergency coordination.
Plan for Implementation	
Responsible Organization/Department:	The Pleasant Hope R-VI School Board and District Office Administration will be responsible for tracking this action.
Supporting Organization/Department:	The Pleasant Hope R-VI School District will work in conjunction with the Pleasant Hope City and emergency services, as well as building administrators to support the action.
Action/Project Priority:	34; High Priority
Timeline for Completion:	1-2 years
Potential Fund Sources:	FEMA, Department of Economic Development, Community Foundation, School District, other available grant funding
Local Planning Mechanisms to be Used in Implementation, if any:	Facilities & Technology Improvement Plans (part of the District's CSIP), Annual School District Budget, School District Crisis Plans
Progress Report	
Action Status:	Continuing, In-Progress
Report of Progress:	The School District currently utilizes a Community Leaders Meeting monthly, emergency crisis simulations, and participation in the multi-jurisdictional Polk County meetings and planning, as well as Chief Information Officer meetings to coordinate emergency response. In addition, the district has shown significant progress in Crisis planning and preparedness. However, the District does not have sufficient funds and due to limited staff availability still needs to complete additional emergency coordination, preparation, and response steps.

Action Worksheet	
Name of Jurisdiction:	Pleasant Hope R-VI
Risk / Vulnerability	
Hazard(s) Addressed:	Flooding, severe winter weather, severe thunderstorm, tornado
Problem being Mitigated:	Hazard mitigation is not always considered when developing other school plans
Action or Project	
Applicable Goal Statement:	Goal 3: Ensure continued operation of government, emergency functions, and critical infrastructure in a disaster.
Action/Project Number:	Pleasant Hope R-VI 3.2
Name of Action or Project:	Hazard Mitigation Integration
Mitigation Category:	Education and Outreach
Action or Project Description:	Integrate hazard mitigation into comprehensive and long-range plans, capital improvement programs, zoning ordinances, subdivision and storm water management regulations, and school crisis management and school improvement plans where appropriate
Estimated Cost:	\$1,500-\$2,500
Benefits:	Loss of life, health, and personal property may be prevented through proper emergency coordination.
Plan for Implementation	
Responsible Organization/Department:	The Pleasant Hope R-VI School Board and District Office Administration will be responsible for tracking this action.
Supporting Organization/Department:	The Pleasant Hope R-VI School District will work in conjunction with the Pleasant Hope City and emergency services, as well as building administrators to support the action.
Action/Project Priority:	34; High Priority
Timeline for Completion:	1-2 years
Potential Fund Sources:	FEMA, Department of Economic Development, Community Foundation, School District, other available grant funding
Local Planning Mechanisms to be Used in Implementation, if any:	Facilities & Technology Improvement Plans (part of the District's CSIP), Annual School District Budget, School District Crisis Plans
Progress Report	
Action Status:	Continuing, In-Progress
Report of Progress:	The School District currently utilizes a Community Leaders Meeting monthly, emergency crisis simulations, and participation in the multi-jurisdictional Polk County meetings and planning, as well as Chief Information Officer meetings to coordinate emergency response. In addition, the district has shown significant progress in Crisis planning and preparedness. However, the District does not have sufficient funds and due to limited staff availability still needs to complete additional emergency coordination, preparation, and response steps.

4.3.15 Central Polk Fire Protection District Mitigation Actions

Action Worksheet	
Name of Jurisdiction:	Central Polk County Fire Protection District
Risk / Vulnerability	
Hazard(s) Addressed:	Wildfire
Problem being Mitigated:	Lack of Defensible Home awareness for those building homes in the current wildland urban interface
Action or Project	
Applicable Goal Statement:	Goal 1: Protect the lives and livelihoods of all citizens
Action/Project Number:	Central Polk County Fire Protection District 1.1
Name of Action or Project:	Preparing a Defensible Home in the Wildland Urban Interface
Mitigation Category:	Education and Outreach
Action or Project Description:	Provide more awareness and assistance on different type of measures for residents building homes within the current wildland urban interface.
Estimated Cost:	This material is available online and available for reprinting. Minimal Cost 300.00 or less.
Benefits:	Prevent damage caused by wildfire
Plan for Implementation	
Responsible Organization/Department:	Board of Directors
Supporting Organization/Department:	
Action/Project Priority:	25
Timeline for Completion:	Ongoing
Potential Fund Sources:	Local funds
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process, grant writing process
Progress Report	
Action Status:	New
Report of Progress:	

Action Worksheet	
Name of Jurisdiction:	Central Polk County Fire Protection District
Risk / Vulnerability	
Hazard(s) Addressed:	Drought, extreme temperatures, wildfire
Problem being Mitigated:	Burn ban knowledge
Action or Project	
Applicable Goal Statement:	Goal 1: Protect the lives and livelihoods of all citizens
Action/Project Number:	Central Polk County Fire Protection District 1.2
Name of Action or Project:	Burn Bans
Mitigation Category:	Education and Outreach
Action or Project Description:	Educate citizens within the district on acceptable burning activities during Burn Bans
Estimated Cost:	This education can be made public with minimal funds, 300.00 – 600 00 less and cost can be shared with the county fire association and benefit the entire county.
Benefits:	Prevent damage caused by wildfires
Plan for Implementation	
Responsible Organization/Department:	Board of Directors
Supporting Organization/Department:	
Action/Project Priority:	25
Timeline for Completion:	Ongoing
Potential Fund Sources:	Local funds
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process, grant writing process
Progress Report	
Action Status:	New
Report of Progress:	

Action Worksheet	
Name of Jurisdiction:	Central Polk County Fire Protection District
Risk / Vulnerability	
Hazard(s) Addressed:	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado
Problem being Mitigated:	Complete loss of power during hazard events
Action or Project	
Applicable Goal Statement:	Goal 3: Ensure continued operation of government, emergency functions, and critical infrastructure in a disaster
Action/Project Number:	Central Polk County Fire Protection District 3.1
Name of Action or Project:	Backup Generator
Mitigation Category:	Structure and Infrastructure Projects
Action or Project Description:	Purchase a backup generator to service the fire station
Estimated Cost:	\$15,000-30,000
Benefits:	Ensure no loss of power during hazard events
Plan for Implementation	
Responsible Organization/Department:	Board of Directors
Supporting Organization/Department:	
Action/Project Priority:	35
Timeline for Completion:	6 months to 1 year
Potential Fund Sources:	HMGP
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process, grant writing process
Progress Report	
Action Status:	New
Report of Progress:	

Action Worksheet	
Name of Jurisdiction:	Central Polk County Fire Protection District
Risk / Vulnerability	
Hazard(s) Addressed:	Wildfire, drought
Problem being Mitigated:	Drought conditions impacting firefighting operations
Action or Project	
Applicable Goal Statement:	Goal 3: Ensure continued operation of government, emergency functions, and critical infrastructure in a disaster
Action/Project Number:	Central Polk County Fire Protection District 3.2
Name of Action or Project:	Water Inventory
Mitigation Category:	Education and Outreach
Action or Project Description:	Identify alternative water sources for firefighting needs
Estimated Cost:	Can potentially be completed with current staff and budget levels. Might need to seek grants to expand project
Benefits:	Alternative sources of water for firefighting needs
Plan for Implementation	
Responsible Organization/Department:	Board of Directors
Supporting Organization/Department:	
Action/Project Priority:	25
Timeline for Completion:	Ongoing
Potential Fund Sources:	Local revenue, HMA grants, firefighting grants
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status:	New
Report of Progress:	

4.3.16 Citizens Memorial Hospital District Mitigation Actions

Action Worksheet	
Name of Jurisdiction:	Citizens Memorial Hospital District
Risk / Vulnerability	
Hazard(s) Addressed:	Earthquake, flooding, sinkholes, severe winter weather, severe thunderstorm, tornado
Problem being Mitigated:	the need to stay up to date on emergency management issues
Action or Project	
Applicable Goal Statement:	Goal 1: Protect the lives and livelihood of all citizens
Action/Project Number:	Central Memorial Hospital District 1.1
Name of Action or Project:	Coordination with Polk County Emergency Management
Mitigation Category:	Education and Outreach
Action or Project Description:	Coordinate with Polk County Emergency Management on all emergency management related issues
Estimated Cost:	\$2000-3000
Benefits:	The sharing of HVAs and coordination of EOPs and combined exercise will improve response to large scale emergencies and disasters which will benefit the community
Plan for Implementation	
Responsible Organization/Department:	Administration
Supporting Organization/Department:	Polk County and Bolivar OEM
Action/Project Priority:	24
Timeline for Completion:	12-24 months
Potential Fund Sources:	Local tax revenue
Local Planning Mechanisms to be Used in Implementation, if any:	Emergency operations plan
Progress Report	
Action Status:	New
Report of Progress:	In the next 24 months, joint meetings will be held with Polk County OEM and Bolivar EMA which have full time Ems. CHM added a full time EM 11 months ago. As we move into the new year and future, meeting and increased coordination will take place to move the project forward

Action Worksheet	
Name of Jurisdiction:	Citizens Memorial Hospital District
Risk / Vulnerability	
Hazard(s) Addressed:	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado
Problem being Mitigated:	Loss of power during hazard events
Action or Project	
Applicable Goal Statement:	Goal 3: Ensure continued operation of government, emergency functions, and critical infrastructure in a disaster
Action/Project Number:	Citizens Memorial Hospital District 3.1
Name of Action or Project:	Backup generator
Mitigation Category:	Structure and infrastructure projects
Action or Project Description:	Install a backup generator at the planned hospital patient tower
Estimated Cost:	New backup generator will be part of the new construction project to begin the fall of 2023 – cost \$250k - \$350k
Benefits:	Prevent complete loss of power during hazard events
Plan for Implementation	
Responsible Organization/Department:	Administration
Supporting Organization/Department:	
Action/Project Priority:	24
Timeline for Completion:	24-36 months
Potential Fund Sources:	USDA
Local Planning Mechanisms to be Used in Implementation, if any:	Strategic plan, comp plan, capital improvement plan
Progress Report	
Action Status:	New
Report of Progress:	

4.3.17 Halfway Fire and Rescue Association Mitigation Actions

Action Worksheet	
Name of Jurisdiction:	Halfway Fire and Rescue Association
Risk / Vulnerability	
Hazard(s) Addressed:	Wildfire
Problem being Mitigated:	Lack of Defensible Home awareness for those building homes in the current wildland urban interface
Action or Project	
Applicable Goal Statement:	Goal 1: Protect the lives and livelihoods of all citizens
Action/Project Number:	Halfway Fire and Rescue Association 1.1
Name of Action or Project:	Preparing a Defensible Home in the Wildland Urban Interface
Mitigation Category:	Education and Outreach
Action or Project Description:	Provide more awareness and assistance on different type of measures for residents building homes within the current wildland urban interface.
Estimated Cost:	This material is available online and available for reprinting. Minimal Cost 300.00 or less.
Benefits:	Prevent damage caused by wildfire
Plan for Implementation	
Responsible Organization/Department:	Board of Directors
Supporting Organization/Department:	
Action/Project Priority:	25
Timeline for Completion:	Ongoing
Potential Fund Sources:	Local funds
Local Planning Mechanisms to be Used in Implementation, if any:	Budget process
Progress Report	
Action Status:	New
Report of Progress:	

Action Worksheet	
Name of Jurisdiction:	Halfway Fire and Rescue Association
Risk / Vulnerability	
Hazard(s) Addressed:	Drought, extreme temperatures, wildfire
Problem being Mitigated:	Burn ban knowledge
Action or Project	
Applicable Goal Statement:	Goal 1: Protect the lives and livelihoods of all citizens
Action/Project Number:	Halfway Fire and Rescue Association 1.2
Name of Action or Project:	Burn Bans
Mitigation Category:	Education and Outreach
Action or Project Description:	Educate citizens within the district on acceptable burning activities during Burn Bans
Estimated Cost:	This education can be made public with minimal funds, 300.00 – 600 00 less and cost can be shared with the county fire association and benefit the entire county.
Benefits:	Prevent damage caused by wildfires
Plan for Implementation	
Responsible Organization/Department:	Board of Directors
Supporting Organization/Department:	
Action/Project Priority:	25
Timeline for Completion:	Ongoing
Potential Fund Sources:	Local funds
Local Planning Mechanisms to be Used in Implementation, if any:	Budget process
Progress Report	
Action Status:	New
Report of Progress:	

Action Worksheet	
Name of Jurisdiction:	Halfway Fire and Rescue Association
Risk / Vulnerability	
Hazard(s) Addressed:	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado
Problem being Mitigated:	Complete loss of power during hazard events
Action or Project	
Applicable Goal Statement:	Goal 3: Ensure continued operation of government, emergency functions, and critical infrastructure in a disaster
Action/Project Number:	Halfway Fire and Rescue Association 3.1
Name of Action or Project:	Backup Generator
Mitigation Category:	Structure and Infrastructure Projects
Action or Project Description:	Purchase a backup generator to service the fire station
Estimated Cost:	\$15,000-30,000
Benefits:	Ensure no loss of power during hazard events
Plan for Implementation	
Responsible Organization/Department:	Board of Directors
Supporting Organization/Department:	
Action/Project Priority:	35
Timeline for Completion:	6 months to 1 year
Potential Fund Sources:	HMGP
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process, grant writing
Progress Report	
Action Status:	New
Report of Progress:	

Action Worksheet	
Name of Jurisdiction:	Halfway Fire and Rescue Association
Risk / Vulnerability	
Hazard(s) Addressed:	Wildfire, drought
Problem being Mitigated:	Drought conditions impacting firefighting operations
Action or Project	
Applicable Goal Statement:	Goal 3: Ensure continued operation of government, emergency functions, and critical infrastructure in a disaster
Action/Project Number:	Halfway Fire and Rescue Association 3.2
Name of Action or Project:	Water Inventory
Mitigation Category:	Education and Outreach
Action or Project Description:	Identify alternative water sources for firefighting needs
Estimated Cost:	Can potentially be completed with current staff and budget levels. Might need to seek grants to expand project
Benefits:	Alternative sources of water for firefighting needs
Plan for Implementation	
Responsible Organization/Department:	Board of Directors
Supporting Organization/Department:	
Action/Project Priority:	25
Timeline for Completion:	Ongoing
Potential Fund Sources:	Local revenue, HMA grants, firefighting grants
Local Planning Mechanisms to be Used in Implementation, if any:	
Progress Report	
Action Status:	New
Report of Progress:	

4.3.18 Morrisville Fire Protection District Mitigation Actions

Action Worksheet	
Name of Jurisdiction:	Morrisville Fire Protection District
Risk / Vulnerability	
Hazard(s) Addressed:	Wildfire
Problem being Mitigated:	Lack of Defensible Home awareness for those building homes in the current wildland urban interface
Action or Project	
Applicable Goal Statement:	Goal 1: Protect the lives and livelihoods of all citizens
Action/Project Number:	Morrisville Fire Protection District 1.1
Name of Action or Project:	Preparing a Defensible Home in the Wildland Urban Interface
Mitigation Category:	Education and Outreach
Action or Project Description:	Provide more awareness and assistance on different type of measures for residents building homes within the current wildland urban interface.
Estimated Cost:	This material is available online and available for reprinting. Minimal Cost 300.00 or less.
Benefits:	Fortunately, we have had only a couple of outbuilding losses in the past two years. Estimated loss 8,000.00. However, with less manpower available we have to consider that there will be more losses in the future. So, educating our community on measures for preparing their homes to be more defensible, has to provide some benefit.
Plan for Implementation	
Responsible Organization/Department:	Morrisville FPD Admin Captain will be responsible for keeping track of this activity.
Supporting Organization/Department:	MFPD
Action/Project Priority:	42
Timeline for Completion:	We suggest that it will take 1 year to implement.
Potential Fund Sources:	MFPD Public Fire Education budgeted funds
Local Planning Mechanisms to be Used in Implementation, if any:	Initially, we will begin with training the select personnel who will be responsible for public education. Then we will develop a comprehensive plan of what groups to approach and in what priority areas that need this education.
Progress Report	
Action Status:	New
Report of Progress:	The only real barriers are the time that it takes to schedule these talks with the residents in our priority areas.

Action Worksheet	
Name of Jurisdiction:	Morrisville Fire Protection District
Risk / Vulnerability	
Hazard(s) Addressed:	Drought, extreme temperatures, wildfire
Problem being Mitigated:	Burn ban knowledge
Action or Project	
Applicable Goal Statement:	Goal 1: Protect the lives and livelihoods of all citizens
Action/Project Number:	Morrisville Fire Protection District 1.2
Name of Action or Project:	Burn Bans
Mitigation Category:	Education and Outreach
Action or Project Description:	Educate citizens within the district on acceptable burning activities during Burn Bans
Estimated Cost:	This education can be made public with minimal funds, 300.00 – 600.00 less and cost can be shared with the county fire association and benefit the entire county.
Benefits:	This education asks that property owners be aware of burn bans and what the ban is limiting them to do. It also, asks that they report their control burns to the County dispatch center so that the fire department isn't dispatched to a smoke scares.
Plan for Implementation	
Responsible Organization/Department:	MFPD Admin Captain will be responsible for maintaining records this.
Supporting Organization/Department:	MFPD and Polk Co Fire, Rescue & Training Association
Action/Project Priority:	34
Timeline for Completion:	How many months/years to complete. An estimated range is acceptable (2-4 months, 1-2 years, etc.)
Potential Fund Sources:	MFPD Budget and The Fire Association budget.
Local Planning Mechanisms to be Used in Implementation, if any:	Training will be provided to those who will be doing the training in our community;
Progress Report	
Action Status:	NEW
Report of Progress:	This program is being reintroduced to our communities, it was done successfully at that time 4 years ago.

Action Worksheet	
Name of Jurisdiction:	Morrisville Fire Protection District
Risk / Vulnerability	
Hazard(s) Addressed:	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado
Problem being Mitigated:	Complete loss of power during hazard events
Action or Project	
Applicable Goal Statement:	Goal 3: Ensure continued operation of government, emergency functions, and critical infrastructure in a disaster
Action/Project Number:	Morrisville Fire Protection District 3.1
Name of Action or Project:	Backup Generator
Mitigation Category:	Structure and Infrastructure Projects
Action or Project Description:	Purchase a backup generator to service the fire station
Estimated Cost:	\$15,000-30,000
Benefits:	Ensure no loss of power during hazard events
Plan for Implementation	
Responsible Organization/Department:	Board of Directors
Supporting Organization/Department:	
Action/Project Priority:	35
Timeline for Completion:	6 months to 1 year
Potential Fund Sources:	HMGP
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process, capital improvement plan
Progress Report	
Action Status:	New
Report of Progress:	

Action Worksheet	
Name of Jurisdiction:	Morrisville Fire Protection District
Risk / Vulnerability	
Hazard(s) Addressed:	Wildfire, drought
Problem being Mitigated:	Drought conditions impacting firefighting operations
Action or Project	
Applicable Goal Statement:	Goal 3: Ensure continued operation of government, emergency functions, and critical infrastructure in a disaster
Action/Project Number:	Morrisville Fire Protection District 3.2
Name of Action or Project:	Water Inventory
Mitigation Category:	Education and Outreach
Action or Project Description:	Identify alternative water sources for firefighting needs
Estimated Cost:	Can potentially be completed with current staff and budget levels. Might need to seek grants to expand project
Benefits:	Alternative sources of water for firefighting needs
Plan for Implementation	
Responsible Organization/Department:	Board of Directors
Supporting Organization/Department:	
Action/Project Priority:	25
Timeline for Completion:	Ongoing
Potential Fund Sources:	Local revenue, HMA grants, firefighting grants
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process, capital improvement plan
Progress Report	
Action Status:	New
Report of Progress:	

4.3.19 Pleasant Hope Fire Protection District Mitigation Actions

Action Worksheet	
Name of Jurisdiction:	Pleasant Hope Fire Protection District
Risk / Vulnerability	
Hazard(s) Addressed:	Dam failure, earthquake, flooding, severe winter weather, severe thunderstorm, tornado, wildfire
Problem being Mitigated:	Lack of proper notification system for severe storms
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Pleasant Hope Fire Protection District 1.1
Name of Action or Project:	NOAA Radios
Mitigation Category:	Emergency Services
Action or Project Description:	Use NOAA all-hazard weather radios in all homes, businesses, and critical/vulnerable facilities.
Estimated Cost:	\$5,000 looking for grants
Benefits:	With the weather radios they will save lives they will get to the people quicker.
Plan for Implementation	
Responsible Organization/Department:	Pleasant hope fire department
Supporting Organization/Department:	Pleasant hope fire
Action/Project Priority:	37
Timeline for Completion:	ongoing
Potential Fund Sources:	grants and donations
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process
Progress Report	
Action Status:	Continuing not started
Report of Progress:	none

Action Worksheet	
Name of Jurisdiction:	Pleasant Hope Fire Protection District
Risk / Vulnerability	
Hazard(s) Addressed:	Tornado, severe thunderstorm
Problem being Mitigated:	Lack of proper notification system for severe storms
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Pleasant Hope Fire Protection District 1.2
Name of Action or Project:	Alert Systems
Mitigation Category:	Prevention
Action or Project Description:	Utilize available alert systems to provide storm warning
Estimated Cost:	\$8,000-\$10,000
Benefits:	Prevent loss of lives loss of structures
Plan for Implementation	
Responsible Organization/Department:	Pleasant hope fire protection
Supporting Organization/Department:	Pleasant hope fire protection
Action/Project Priority:	40
Timeline for Completion:	ongoing
Potential Fund Sources:	Grants and donations
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process
Progress Report	
Action Status:	Continuing Not Started
Report of Progress:	none

Action Worksheet	
Name of Jurisdiction:	Pleasant Hope Fire Protection District
Risk / Vulnerability	
Hazard(s) Addressed:	Wildfire
Problem being Mitigated:	Notification for fires
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Pleasant Hope Fire Protection District 1.3
Name of Action or Project:	Smoke Detectors
Mitigation Category:	Prevention
Action or Project Description:	Continue to provide programs for smoke detectors in homes, businesses, and critical/vulnerable facilities
Estimated Cost:	\$8,000-\$10,000
Benefits:	Prevent loss of lives and loss of structures
Plan for Implementation	
Responsible Organization/Department:	Pleasant hope fire protection
Supporting Organization/Department:	Pleasant hope fire protection
Action/Project Priority:	41
Timeline for Completion:	ongoing
Potential Fund Sources:	Grants and donations
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process
Progress Report	
Action Status:	Continuing Not Started
Report of Progress:	none

Action Worksheet	
Name of Jurisdiction:	Pleasant Hope Fire Protection District
Risk / Vulnerability	
Hazard(s) Addressed:	Extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado
Problem being Mitigated:	Limited public knowledge of hazard awareness and preparedness
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Pleasant Hope Fire Protection District 1.4
Name of Action or Project:	Public information campaign
Mitigation Category:	Education and Outreach
Action or Project Description:	Develop public information campaigns on the risks of natural hazards and preparedness activities that will mitigate negative impacts
Estimated Cost:	\$8,000-\$10,000
Benefits:	Prevent loss of lives and loss of structures
Plan for Implementation	
Responsible Organization/Department:	Pleasant hope fire protection
Supporting Organization/Department:	Pleasant hope fire protection
Action/Project Priority:	47
Timeline for Completion:	ongoing
Potential Fund Sources:	Grants and donations
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process
Progress Report	
Action Status:	Continuing Not Started
Report of Progress:	none

Action Worksheet	
Name of Jurisdiction:	Pleasant Hope Fire Protection District
Risk / Vulnerability	
Hazard(s) Addressed:	Drought, earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire
Problem being Mitigated:	Lack of public knowledge on risk reduction
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Pleasant Hope Fire Protection District 1.5
Name of Action or Project:	Information distribution
Mitigation Category:	Education and Outreach
Action or Project Description:	Work with the schools, human services organizations, and businesses to distribute information on hazard risks and resources or methods to reduce risk.
Estimated Cost:	\$8,000-\$10,000
Benefits:	Loss of lives and loss of structures
Plan for Implementation	
Responsible Organization/Department:	Pleasant hope fire protection
Supporting Organization/Department:	Pleasant hope fire protection
Action/Project Priority:	47
Timeline for Completion:	ongoing
Potential Fund Sources:	Grants and donations
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process
Progress Report	
Action Status:	Continuing Not Started
Report of Progress:	none

Action Worksheet	
Name of Jurisdiction:	Pleasant Hope Fire Protection District
Risk / Vulnerability	
Hazard(s) Addressed:	Tornado, severe thunderstorm
Problem being Mitigated:	No safe place to shelter during severe weather
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Pleasant Hope Fire Protection District 1.6
Name of Action or Project:	Safe Rooms
Mitigation Category:	Structure and Infrastructure Projects; Emergency Services
Action or Project Description:	Include FEMA rated safe rooms in the construction of new public buildings.
Estimated Cost:	\$50,000+
Benefits:	Loss of lives and loss of structure
Plan for Implementation	
Responsible Organization/Department:	Pleasant hope fire protection
Supporting Organization/Department:	Pleasant hope fire protection
Action/Project Priority:	15
Timeline for Completion:	1-2 years per project
Potential Fund Sources:	HMGP, BRIC
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process
Progress Report	
Action Status:	Continuing Not Started
Report of Progress:	none

Action Worksheet	
Name of Jurisdiction:	Pleasant Hope Fire Protection District
Risk / Vulnerability	
Hazard(s) Addressed:	Wildfire
Problem being Mitigated:	Enforcement of fire codes
Action or Project	
Applicable Goal Statement:	Goal 1: Protect lives and livelihood of all citizens.
Action/Project Number:	Pleasant Hope Fire Protection District 1.7
Name of Action or Project:	Fire Codes
Mitigation Category:	prevention
Action or Project Description:	Adopt and enforce fire codes.
Estimated Cost:	\$8,000-\$10,000
Benefits:	Loss of lives and loss of structures
Plan for Implementation	
Responsible Organization/Department:	Pleasant hope fire protection
Supporting Organization/Department:	Pleasant hope fire protection
Action/Project Priority:	15
Timeline for Completion:	1 year
Potential Fund Sources:	Grants and donations
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process
Progress Report	
Action Status:	Continuing Not Started
Report of Progress:	. none

Action Worksheet	
Name of Jurisdiction:	Pleasant Hope Fire Protection District
Risk / Vulnerability	
Hazard(s) Addressed:	Drought, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire
Problem being Mitigated:	Lack of communication between jurisdictions
Action or Project	
Applicable Goal Statement:	Goal 3: Ensure continued operation of government, emergency functions, and critical infrastructure in a disaster.
Action/Project Number:	Pleasant Hope Fire Protection District 3.1
Name of Action or Project:	Multi-jurisdictional cooperation
Mitigation Category:	Education and Outreach
Action or Project Description:	Strengthen multi-jurisdictional cooperation and communication among local governments, emergency services agencies, and entities responsible for critical and vulnerable facilities.
Estimated Cost:	\$8,000-\$10,000
Benefits:	Loss of lives and loss of structures
Plan for Implementation	
Responsible Organization/Department:	Pleasant hope fire protection
Supporting Organization/Department:	Pleasant hope fire protection
Action/Project Priority:	47
Timeline for Completion:	ongoing
Potential Fund Sources:	Grants and donations
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process
Progress Report	
Action Status:	Continuing Not Started
Report of Progress:	none

Action Worksheet	
Name of Jurisdiction:	Pleasant Hope Fire Protection District
Risk / Vulnerability	
Hazard(s) Addressed:	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado
Problem being Mitigated:	Complete loss of power during hazard events
Action or Project	
Applicable Goal Statement:	Goal 3: Ensure continued operation of government, emergency functions, and critical infrastructure in a disaster
Action/Project Number:	Pleasant Hope Fire Protection District 3.2
Name of Action or Project:	Backup Generator
Mitigation Category:	Structure and Infrastructure Projects
Action or Project Description:	Purchase a backup generator to service the fire station
Estimated Cost:	\$15,000-30,000
Benefits:	Ensure no loss of power during hazard events
Plan for Implementation	
Responsible Organization/Department:	Pleasant hope fire protection
Supporting Organization/Department:	
Action/Project Priority:	25
Timeline for Completion:	6 months to 1 year
Potential Fund Sources:	HMGP
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process, grant writing process
Progress Report	
Action Status:	New
Report of Progress:	

Action Worksheet	
Name of Jurisdiction:	Pleasant Hope Fire Protection District
Risk / Vulnerability	
Hazard(s) Addressed:	Wildfire, drought
Problem being Mitigated:	Drought conditions impacting firefighting operations
Action or Project	
Applicable Goal Statement:	Goal 3: Ensure continued operation of government, emergency functions, and critical infrastructure in a disaster
Action/Project Number:	Pleasant Hope Fire Protection District 3.3
Name of Action or Project:	Water Inventory
Mitigation Category:	Education and Outreach
Action or Project Description:	Identify alternative water sources for firefighting needs
Estimated Cost:	Can potentially be completed with current staff and budget levels. Might need to seek grants to expand project
Benefits:	Alternative sources of water for firefighting needs
Plan for Implementation	
Responsible Organization/Department:	Board of Directors
Supporting Organization/Department:	
Action/Project Priority:	25
Timeline for Completion:	Ongoing
Potential Fund Sources:	Local revenue, HMA grants, firefighting grants
Local Planning Mechanisms to be Used in Implementation, if any:	Budgeting process, grant writing process
Progress Report	
Action Status:	New
Report of Progress:	

4.4 Mitigation Action Matrix

Table 4.3. Mitigation Action Matrix

#	Action	Jurisdiction	Priority	Goal Addressed	Hazards Addressed	Addresses Current Development	Addresses Future Development	Continued Compliance with NFIP
Prevention								
1.12	Dam failure study	Polk County	25	Goal 1	Dam failure	-	-	-
3.2	Burn bans	Polk County	25	Goal 3	Wildfire	-	-	-
1.7	Resources, weatherization, and shelters	City of Bolivar	37	Goal 1	Extreme temperatures, severe winter weather, severe thunderstorms, tornado	X	X	-
2.1	Building codes	City of Bolivar	40	Goal 2	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado	X	X	-
2.6	NFIP enforcement	City of Bolivar	37	Goal 2	Flooding	X	X	X
1.3	Resources, weatherization, and shelters	City of Morrisville	24	Goal 1	Extreme temperatures, severe winter weather, severe thunderstorms, tornado	-	X	-
2.1	Building codes	City of Morrisville	39	Goal 2	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado	-	X	-
2.5	NFIP participation	City of Morrisville	28	Goal 2	Flooding	-	X	X
2.2	NFIP Enforcement	City of Pleasant Hope	37	Goal 2	Flooding	-	X	X
3.1	Hazard mitigation integration	City of Pleasant Hope	44	Goal 3	Flooding, severe winter weather, severe thunderstorm, tornado	X	X	-
1.2	Smoke detectors	Pleasant Hope Fire Protection District	41	Goal 1	Wildfire	-	X	-

#	Action	Jurisdiction	Priority	Goal Addressed	Hazards Addressed	Addresses Current Development	Addresses Future Development	Continued Compliance with NFIP
1.7	Fire codes	Pleasant Hope Fire Protection District	15	Goal 1	Wildfire	-	X	-
1.1	NOAA radios	Bolivar R-I	36	Goal 1	Dam failure, earthquake, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	X	X	-
1.2	Alert systems	Bolivar R-I	42	Goal 1	Tornado, severe thunderstorm	X	X	-
1.1	Alert systems	Humansville R-IV	36	Goal 1	Tornado, severe thunderstorms	X	X	-
1.1	NOAA radios	Marion C. Early	27	Goal 1	Dam failure, earthquake, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	-	X	-
1.2	Alert systems	Marion C. Early	36	Goal 1	Tornado, severe thunderstorm	-	X	-
1.1	Alert systems	Pleasant Hope R-VI	34	Goal 1	Tornado, severe thunderstorm	X	X	-
	Structure and Infrastructure Projects							
1.4	Low water crossing database	Polk County	37	Goal 1	Flooding	X	X	X
1.5	Low water crossing markers	Polk County	38	Goal 1	Flooding	X	X	X
1.6	Low water crossing replacement	Polk County	32	Goal 1	Flooding	-	X	X
1.10	Safe rooms	Polk County	30	Goal 1	Tornado, Severe Thunderstorm	-	X	-
1.11	Retrofit	Polk County	32	Goal 1	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado	-	X	-
2.2	Back-up generator	Polk County	45	Goal 2	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado	-	X	-

#	Action	Jurisdiction	Priority	Goal Addressed	Hazards Addressed	Addresses Current Development	Addresses Future Development	Continued Compliance with NFIP
1.6	Safe rooms	City of Bolivar	29	Goal 1	Tornado, severe thunderstorms	X	X	-
2.4	Storm water infrastructure	City of Bolivar	35	Goal 2	Flooding, severe thunderstorms	X	X	X
2.5	Back-up generator	City of Bolivar	33	Goal 2	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado	X	X	-
1.1	Safe room construction	City of Fair Play	38	Goal 1	Tornado, severe thunderstorm	-	X	-
1.2	Storm Siren	City of Fair Play	30	Goal 1	All	-	X	-
1.4	Retrofit	City of Humansville	47	Goal 1	Flooding, severe winter weather, severe thunderstorm, tornado	-	X	-
2.2	Back-up generator	City of Humansville	47	Goal 2	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado	X	X	-
1.6	Safe rooms	City of Morrisville	22	Goal 1	Tornado, severe thunderstorm	X	X	-
1.7	Retrofit	City of Morrisville	25	Goal 1	Flooding, severe winter weather, severe thunderstorm, tornado	X	X	-
2.3	Storm water infrastructure	City of Morrisville	40	Goal 2	Flooding, severe thunderstorms	-	X	-
2.4	Back-up generator	City of Morrisville	40	Goal 2	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado	X	X	-
1.3	Safe rooms	City of Pleasant Hope	36	Goal 1	Tornado, severe thunderstorm	X	X	-
1.4	Retrofit	City of Pleasant Hope	24	Goal 1	Flooding, severe winter weather, severe thunderstorm, tornado	X	X	-
2.1	Back-up generator	City of Pleasant Hope	32	Goal 2	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado	X	X	-
1.1	Storm siren	Village of Aldrich	45	Goal 1	Severe thunderstorm, tornado	-	X	-

#	Action	Jurisdiction	Priority	Goal Addressed	Hazards Addressed	Addresses Current Development	Addresses Future Development	Continued Compliance with NFIP
2.1	Ditch maintenance	Village of Aldrich	25	Goal 2	Flooding	X	X	-
1.1	Storm siren	Village of Flemington	45	Goal 1	Severe thunderstorm, tornado	-	X	-
2.1	Ditch maintenance	Village of Flemington	25	Goal 2	Flooding	X	X	-
1.1	Storm siren	Village of Halfway	45	Goal 1	Severe thunderstorm, tornado	-	X	-
2.1	Ditch maintenance	Village of Halfway	25	Goal 2	Flooding	X	X	-
3.1	Backup generator	Citizens Memorial Hospital District	24	Goal 3	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado	-	X	-
3.1	Back-up generator	Central Polk County Fire Protection District	35	Goal 3	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado	-	X	-
3.1	Back-up generator	Halfway Fire and Rescue Association	35	Goal 3	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado	-	X	-
3.1	Back-up generator	Morrisville Fire Protection District	35	Goal 3	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado	-	X	-
1.6	Safe rooms	Pleasant Hope Fire Protection District	15	Goal 1	Tornado, severe thunderstorm	-	X	-
3.2	Backup generator	Pleasant Hope Fire Protection District	25	Goal 3	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado	X	-	-
1.5	Safe rooms	Bolivar R-I	36	Goal 1	Tornado, severe thunderstorm	X	X	-
1.6	Retrofit	Bolivar R-I	38	Goal 1	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	X	X	-
1.7	New FEMA safe room	Bolivar R-I	36	Goal 1	Tornado, severe thunderstorm	X	X	-

#	Action	Jurisdiction	Priority	Goal Addressed	Hazards Addressed	Addresses Current Development	Addresses Future Development	Continued Compliance with NFIP
1.3	Safe rooms	Fair Play R-II	24	Goal 1	Tornado, severe thunderstorm	-	X	-
1.4	Retrofit	Fair Play R-II	26	Goal 1	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	X	X	-
1.5	Back-up generator	Fair Play R-II	26	Goal 1	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado	-	X	-
1.3	Safe rooms	Humansville R-IV	29	Goal 1	Tornado, severe thunderstorm	-	X	-
1.4	Retrofit	Humansville R-IV	28	Goal 1	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	X	X	-
1.5	Safe rooms	Marion C. Early	31	Goal 1	Tornado, severe thunderstorm	-	X	-
1.6	Retrofit	Marion C. Early	29	Goal 1	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	X	X	X
1.4	Safe room	Pleasant Hope R-VI	36	Goal 1	Tornado, severe thunderstorm	-	X	-
1.5	Retrofit	Pleasant Hope R-VI	36	Goal 1	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	X	X	X
2.1	Back-up generator	Pleasant Hope R-VI	28	Goal 2	Earthquake, flooding, severe winter weather, severe thunderstorm, tornado	-	X	-
Natural Systems Protection								
2.1	Debris cleanup	Polk County	45	Goal 2	Flooding, Severe Thunderstorms	X	X	X
2.3	Debris cleanup	City of Bolivar	38	Goal 2	Flooding, severe thunderstorms	X	X	X

#	Action	Jurisdiction	Priority	Goal Addressed	Hazards Addressed	Addresses Current Development	Addresses Future Development	Continued Compliance with NFIP
2.1	Debris cleanup	City of Humansville	47	Goal 2	Flooding, severe thunderstorms	-	X	-
2.2	Debris cleanup	City of Humansville	40	Goal 2	Flood, severe thunderstorms	-	X	-
Emergency Services								
1.1	NOAA radios	Polk County	30	Goal 1	Dam failure, earthquake, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	X	-	-
1.3	Outdoor warning sirens	Polk County	35	Goal 1	Tornado, Severe Thunderstorms	-	X	-
1.1	NOAA radios	City of Bolivar	27	Goal 1	Dam failure, earthquake, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	-	X	-
1.3	Outdoor warning sirens	City of bolivar	37	Goal 1	Tornado, severe thunderstorms	X	X	-
1.1	NOAA radios	City of Humansville	47	Goal 1	Dam failure, earthquake, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	-	X	-
1.1	NOAA radios	City of Morrisville	31	Goal 1	Dam failure, earthquake, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	-	X	-
1.1	NOAA radios	City of Pleasant Hope	39	Goal 1	Dam failure, earthquake, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	X	X	-

#	Action	Jurisdiction	Priority	Goal Addressed	Hazards Addressed	Addresses Current Development	Addresses Future Development	Continued Compliance with NFIP
1.1	NOAA radios	Pleasant Hope Fire Protection District	37	Goal 1	Dam failure, earthquake, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	-	X	-
Education and Outreach								
1.2	Alert Systems	Polk County	30	Goal 1	Tornado, severe thunderstorms	-	X	-
1.6	Low water crossing alerts	Polk County	28	Goal 1	Flooding	-	X	X
1.8	Public information campaign	Polk County	40	Goal 1	Drought, sinkholes	-	X	-
1.9	Information distribution	Polk County	47	Goal 1	Drought, earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	-	X	-
3.1	Multi-jurisdictional cooperation	Polk County	45	Goal 3	Dam failure, drought, earthquake, extreme temperatures, flooding, sinkholes, severe winter weather, severe thunderstorm, tornado, wildfire	-	X	-
1.2	Alert systems	City of Bolivar	35	Goal 1	Tornado, severe thunderstorms	X	X	-
1.4	Public information campaign	City of Bolivar	39	Goal 1	Drought, earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	X	X	-

#	Action	Jurisdiction	Priority	Goal Addressed	Hazards Addressed	Addresses Current Development	Addresses Future Development	Continued Compliance with NFIP
1.5	Information distribution	City of Bolivar	39	Goal 1	Drought, earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	X	X	-
1.8	Hazard information and education	City of Bolivar	25	Goal 1	Drought, earthquakes	X	X	-
2.2	Fire codes	City of Bolivar	40	Goal 2	Wildfires	X	X	-
3.1	Multi-jurisdictional cooperation	City of Bolivar	30	Goal 3	Drought, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	X	X	-
3.2	Hazard mitigation integration	City of Bolivar	38	Goal 3	Flooding, severe winter weather, severe thunderstorm, tornado	X	X	-
1.3	Public information campaign	City of Fair Play	25	Goal 1	Drought, earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	X	X	-
1.2	Alert systems	City of Humansville	47	Goal 1	Tornado, severe thunderstorms	-	X	-
1.3	Information distributions	City of Humansville	47	Goal 1	Drought, earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	-	X	-
1.5	Hazard information and education	City of Humansville	25	Goal 1	Drought, earthquakes	X	X	-

#	Action	Jurisdiction	Priority	Goal Addressed	Hazards Addressed	Addresses Current Development	Addresses Future Development	Continued Compliance with NFIP
3.1	Multi-jurisdictional cooperation	City of Humansville	47	Goal 3	Drought, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	-	X	-
3.2	Hazard mitigation integration	City of Humansville	47	Goal 3	Flooding, severe winter weather, severe thunderstorm, tornado	-	X	-
1.2	Alert systems	City of Morrisville	33	Goal 1	Tornado, severe thunderstorm	-	X	-
1.4	Public information campaign	City of Morrisville	28	Goal 1	Drought, earthquake, sinkhole, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado	-	X	-
1.5	Information distribution	City of Morrisville	34	Goal 1	Drought, earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	-	X	-
1.8	Public information campaign	City of Morrisville	25	Goal 1	Drought, sinkholes, earthquakes	X	X	-
3.1	Multi-jurisdictional cooperation	City of Morrisville	34	Goal 3	Drought, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	-	X	-
3.2	Hazard mitigation integration	City of Morrisville	41	Goal 3	Flooding, severe winter weather, severe thunderstorm, tornado	-	X	-

#	Action	Jurisdiction	Priority	Goal Addressed	Hazards Addressed	Addresses Current Development	Addresses Future Development	Continued Compliance with NFIP
1.2	Information distribution	City of Pleasant hope	32	Goal 1	Drought, earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	X	X	-
1.5	Hazard information and education	City of Pleasant Hope	25	Goal 1	Drought, earthquake	X	X	-
1.2	Public information campaign	Village of Aldrich	25	Goal 1	Drought, earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado	X	X	-
1.2	Public information campaign	Village of Flemington	25	Goal 1	Drought, earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado	X	X	-
1.2	Public information campaign	Village of Halfway	25	Goal 1	Drought, earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado	X	X	-
1.3	Public information campaign	Bolivar R-I	38	Goal 1	Extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado	X	X	-
1.4	Information distribution	Bolivar R-I	39	Goal 1	Earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado	X	X	-
3.1	Multi-jurisdictional cooperation	Bolivar R-I	47	Goal 3	Drought, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	X	X	-

#	Action	Jurisdiction	Priority	Goal Addressed	Hazards Addressed	Addresses Current Development	Addresses Future Development	Continued Compliance with NFIP
3.2	Hazard mitigation integration	Bolivar R-I	44	Goal 3	Flooding, severe winter weather, severe thunderstorm, tornado	X	X	-
1.1	NOAA radios	Fair Play R-II	39	Goal 1	Dam failure, earthquake, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	X	X	-
1.2	Public information campaign	Fair Play R-II	36	Goal 1	Extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado	-	X	-
3.1	Multi-jurisdictional cooperation	Fair Play R-II	27	Goal 3	Drought, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	X	X	-
3.2	Hazard mitigation integration	Fair Play R-II	40	Goal 3	Flooding, severe winter weather, severe thunderstorm, tornado	X	X	-
1.2	Information distribution	Humansville R-IV	34	Goal 1	Earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado	-	X	-
3.1	Multi-jurisdictional cooperation	Humansville R-IV	37	Goal 3	Drought, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	-	X	-
3.2	Hazard mitigation integration	Humansville R-IV	37	Goal 3	Flooding, severe winter weather, severe thunderstorm, tornado	X	X	-
1.3	Public information campaign	Marion C. Early	32	Goal 1	Extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado	-	X	-

#	Action	Jurisdiction	Priority	Goal Addressed	Hazards Addressed	Addresses Current Development	Addresses Future Development	Continued Compliance with NFIP
1.4	Information distribution	Marion C. Early	31	Goal 1	Earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado	-	X	-
3.1	Multi-jurisdictional cooperation	Marion C. Early	32	Goal 3	Drought, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	X	X	-
3.2	Hazard mitigation integration	Marion C. Early	35	Goal 3	Flooding, severe winter weather, severe thunderstorm, tornado	X	X	-
1.2	Public information campaign	Pleasant Hope R-VI	38	Goal 1	Extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado	-	X	-
1.3	Information distribution	Pleasant Hope R-VI	37	Goal 1	Earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado	-	X	-
3.1	Multi-jurisdiction cooperation	Pleasant Hope R-VI	24	Goal 3	Drought, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	X	X	-
3.2	Hazard mitigation Integration	Pleasant Hope R-Vi	34	Goal 3	Flooding, severe winter weather, severe thunderstorm, tornado	X	X	-
1.1	Preparing a defensible home in the wildland urban interface	Central Polk Fire Protection District	25	Goal 1	Wildfire	X	X	-
1.2	Burn ban knowledge	Central Polk Fire Protection District	25	Goal 1	Drought, extreme temperatures, wildfire	X	X	-

#	Action	Jurisdiction	Priority	Goal Addressed	Hazards Addressed	Addresses Current Development	Addresses Future Development	Continued Compliance with NFIP
3.2	Water Inventory	Central Polk Fire Protection District	25	Goal 3	Wildfire, drought	-	-	-
1.1	Coordination with Polk County Emergency Management	Citizens Memorial Hospital District	24	Goal 1	Earthquake, flooding, sinkholes, severe winter weather, severe thunderstorm, tornado	-	-	-
1.1	Preparing a defensible home in the wildland urban interface	Halfway Fire and Rescue Association	25	Goal 1	Wildfire	X	X	-
1.2	Burn ban knowledge	Halfway Fire and Rescue Association	25	Goal 1	Drought, extreme temperatures, wildfire	X	X	-
3.2	Water Inventory	Halfway Fire and Rescue Association	25	Goal 3	Wildfire, drought	-	-	-
1.1	Preparing a defensible home in the wildland urban interface	Morrisville Fire Protection District	42	Goal 1	Wildfire	-	X	-
1.2	Burn Bans	Morrisville Fire Protection District	34	Goal 1	Drought, extreme temperatures, wildfire	-	X	-
3.2	Water Inventory	Morrisville Fire Protection District	25	Goal 3	Wildfire, drought	-	-	-
1.2	Alert Systems	Pleasant Hope Fire Protection District	40	Goal 1	Tornado, severe thunderstorm	-	X	-
1.4	Public information campaign	Pleasant Hope Fire Protection District	47	Goal 1	Extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado	-	X	-

#	Action	Jurisdiction	Priority	Goal Addressed	Hazards Addressed	Addresses Current Development	Addresses Future Development	Continued Compliance with NFIP
1.5	Information distribution	Pleasant Hope Fire Protection District	47	Goal 1	Drought, earthquake, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	-	X	-
3.1	Multi-jurisdictional cooperation	Pleasant Hope Fire Protection District	47	Goal 3	Drought, extreme temperatures, flooding, severe winter weather, severe thunderstorm, tornado, wildfire	-	X	-
3.3	Water Inventory	Pleasant Hope Fire Protection District	25	Goal 3	Wildfire, drought	-	-	-

5 PLAN MAINTENANCE PROCESS

5 PLAN MAINTENANCE PROCESS	5.1
<i>5.1 Monitoring, Evaluating, and Updating the Plan.....</i>	<i>5.1</i>
5.1.1 Responsibility for Plan Maintenance	5.1
5.1.2 Plan Maintenance Schedule	5.2
5.1.3 Plan Maintenance Process.....	5.2
5.2 Incorporation into Existing Planning Mechanisms	5.3
5.3 Continued Public Involvement.....	5.6

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 Mitigation Planning Committee (MPC) has served as an advisory body during the plan update process, but it is not a standing committee. Many MPC representatives and stakeholders are also represented on the Local Emergency Planning Committee (LEPC), as well as several other committees and groups in Polk County. The County Emergency Management Director oversees the LEPC and will be charged with reconvening the MPC, either as part of the already established LEPC or as a separate group, if necessary. However, it will be up to the County Commission, Office of Emergency Management, and the local jurisdictions to carry out the goals and actions outlined.

The process by which the plan can be evaluated for effectiveness lies in the maintenance of the plan over the next five years. In order to maximize effectiveness, participating jurisdictions (led by the County OEM) will:

- Meet annually and after disaster events to monitor and evaluate the implementation of the plan
- Act as a forum for hazard mitigation issues
- Disseminate hazard mitigation ideas and activities to all participants
- Pursue the implementation of high priority, low- or no-cost recommended actions
- Maintain vigilant monitoring of multi-objective, cost-share, and other funding opportunities to help the community implement the plan's recommended actions for which no current funding exists
- Monitor and assist in implementation and update of this plan
- Keep the concept of mitigation in the forefront of community decision making by identifying

plan recommendations when other community goals, plans, and activities overlap, influence, or directly affect increased community vulnerability to disasters

- Report on plan progress and recommended changes to the County Board of Supervisors and governing bodies of participating jurisdictions
- Inform and solicit input from the public

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

5.1.2 Plan Maintenance Schedule

It is recommended that the MPC meet annually and after a state or federally declared hazard event as appropriate to monitor progress and update the mitigation strategy. The Polk County Emergency Management Director will be responsible for initiating the plan reviews and will invite members of the MPC to the meeting.

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

5.1.3 Plan Maintenance Process

Progress on the proposed actions can be monitored by evaluating changes in vulnerabilities identified in the plan. During future meetings, the MPC (or other designated responsible entity) should review changes in vulnerability identified as follows:

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

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

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

5.2 Incorporation into Existing Planning Mechanisms

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

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

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

Jurisdictional representatives involved in updating these existing planning mechanisms will be responsible for integrating the findings and actions of the mitigation plan, as appropriate. The EMD and MPC are also responsible for monitoring this integration and incorporation of the appropriate information into the next five-year update of the multi-jurisdictional hazard mitigation plan.

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

Table 5.1 below lists the planning mechanisms by jurisdiction into which the Hazard Mitigation

Plan will be integrated. There is a column that describes the integration process for the previous plan (which was done five years ago) and the integration process for the current plan. This shows the change in integration over the years. Most jurisdictions continue utilizing the same processes year by year. Jurisdictions that did not participate in the previous plan are noted.

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

Jurisdiction	Planning Mechanisms	Integration Process for Previous Plan	Integration Process for Current Plan
Polk County	County emergency plan County mitigation plan Mutual aid agreements	Emergency operations plan Budging progress GIS	Emergency operations plan County mitigation plan
City of Bolivar	Comprehensive plan Capital improvement plan City emergency plan City mitigation plan Debris management plan Economic development plan Transportation plan Land use plan FMA plan Zoning ordinance Building code Floodplain ordinance Subdivision ordinance Tree trimming ordinance Nuisance ordinance Storm water ordinance Site plan review requirements Historic preservation ordinance Zoning/land use restrictions NFIP P&Z Mutual aid agreements	Budgeting process Emergency operations plan Building codes Fire codes	Budgeting process Emergency operations plan Comprehensive plan Building codes Fire codes
City of Fair Play	Comprehensive plan Capital improvement plan City emergency plan County emergency plan City mitigation plan Economic development plan Building codes Nuisance ordinance Storm water ordinance Site plan review requirements Hazard awareness program Mutual aid agreements	Did not participate in the previous plan update	Comprehensive plan Budgeting process Capital improvement plan Emergency operations plan
City of Humansville	City emergency plan County emergency plan County mitigation plan Firewise	Budgeting process Nixle CIP	Hazard mitigation plan Budgeting process Site plan review
City of Morrisville	City emergency plan County emergency plan Nuisance ordinance Zoning/land use restrictions	Did not participate in the previous plan update	Budgeting process Emergency operations plan
City of Pleasant Hope	Comprehensive plan City emergency plan County mitigation plan Debris management plan FMA plan Critical facilities plan Zoning ordinance Building code Floodplain ordinance	Budgeting process Capital improvement plan Emergency operations plan Comprehensive plan Zoning ordinance Subdivision ordinance Floodplain ordinance	Emergency operations plan Budgeting process Comprehensive plan

	Subdivision ordinance Tree trimming ordinance Nuisance ordinance Storm water ordinance Drainage ordinance Site plan review requirements NFIP		
Village of Aldrich	Comprehensive plan Village emergency plan	Did not participate in the previous plan update	Budgeting process Grant writing process
Village of Flemington	Comprehensive plan County mitigation plan	Did not participate in the previous plan update	Budgeting process Grant writing process
Village of Halfway	Local emergency plan	Did not participate in the previous plan update	Budgeting process Grant writing process
Bolivar R-I	Master plan Capital improvement plan School emergency plan Weapons policy Public education programs	Budgeting process School emergency plan District master plan	School emergency plan Budgeting process Master plan Capital improvement plan
Fair Play R-II	School emergency plan Weapons policy Capital improvement funding Public education programs	School emergency plan Capital improvement plan Budgeting process	District crisis plan School communications plan Long range facility planning Facilities and crisis planning School emergency plan
Humansville R-IV	Capital improvement plan School emergency plan Weapons policy Public education programs	School safety plan Budgeting process Capital improvement plan Critical facilities plan Crisis management plan	Budgeting process School emergency plan
Marion C Early R-V	Capital improvement plan School emergency plan Weapons policy Public education programs	Emergency plan Budgeting process Capital improvement plan	Budgeting process School emergency plan
Pleasant Hope R-VI	Capital improvement plan School emergency plan Weapons policy Public education programs	Budgeting process Emergency plan Capital improvement plan Master plan	Facilities and technology improvement plan Annual school district budget School district crisis plans Curriculum improvement plan
Central Polk County Fire Protection District	Capital improvement funding	Did not participate in the previous plan update	Budgeting process Grant writing process
Citizens Memorial Hospital District	Capital improvement plan Emergency operations plan Continuity of operations plan Mutual aid agreements Evacuation route map	Did not participate in the previous plan update	Emergency operations plan Strategic plan Comprehensive plan Capital improvement plan
Halfway Fire & Rescue Association	Capital improvement funding	Did not participate in the previous plan update	Budgeting process Grant writing process
Morrisville Fire Protection District	Capital improvement plan Hydrant flushing program Public education programs Mutual aid agreements	Did not participate in the previous plan update	Comprehensive plan Budgeting process Capital improvement plan
Pleasant Hope Fire Protection District	Cross-connection program Hydrant flushing programs Public education programs Mutual aid agreements	Budgeting process	Budgeting process

5.3 Continued Public Involvement

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

The hazard mitigation plan update process provides an opportunity to publicize success stories resulting from the plan's implementation and seek additional public comment. When the MPC reconvenes for the five-year update, the EMD 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.