

Figure 15.0
PDSI by Division

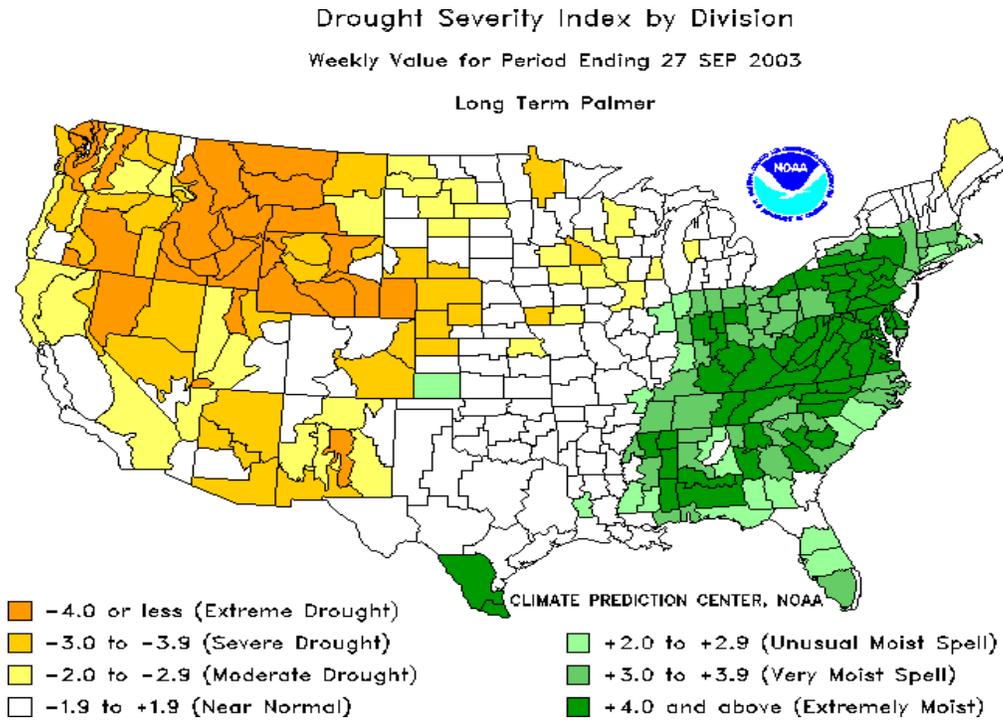
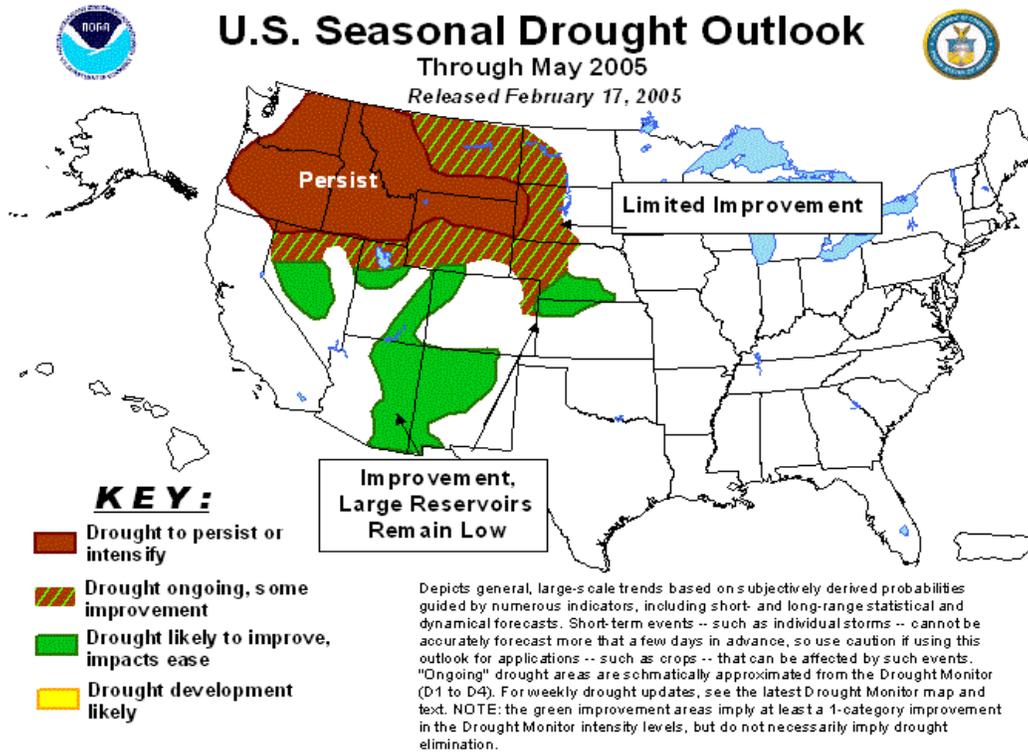


Figure 16.0



According to NOAA, heat is the number two killer among natural hazards. Only the opposite extreme temperature of winter takes a greater toll. Heat kills by overloading the human body's capacity to cool itself. In the disastrous heat wave of 1980, more than 1,250 people died nationwide. In a normal year, about 175 Americans die from heat related causes.

Air temperature is not the only factor to consider when assessing the likely effects of a heat wave. High humidity, which often accompanies heat in Southwest Missouri, can increase the harmful effects. Relative humidity must also be considered, along with exposure, wind and activity levels. The Heat Index developed by the NWS combines air temperature and relative humidity.

Also known as the apparent temperature, the Heat Index is a measure of how hot it actually feels. For example, the air temperature is 102 degrees and the relative humidity is 55%, then it feels as if it is truly 130 degrees; 28 degrees hotter than the actual ambient temperature. To find the Heat Index go to Figure 16.0 and find the air temperature along the left side of the table and the relative humidity along the top. Where the two intersect is the Heat Index for any given time of day.

In addition, the NWS recently has developed a method to warn of advancing heat waves for up to seven days. The new Mean Heat Index is a measure of how hot the temperatures actually feel to a person over the course of a full 24 hours. It differs from the traditional Heat Index in that it is an average of the Heat Index from the hottest and coldest times of each day.

Historical Statistics

Since 1994, Barton County has had 7 occurrences of heat and excessive heat. These heat waves caused 16 deaths, 55 injuries, \$0 in property damage, and \$50,000 in crop damage. Table 17.0 shows the statistics of the heat waves in Barton County since 1994.

Statement of Future Probable Severity

The levels of severity as determined by the Heat Index are:

- Extreme Danger (heat stroke or sunstroke highly likely at 130°F or higher);
- Danger (sunstroke, muscle cramps, and/or heat exhaustion likely at 105°F to 129°F);
- Extreme Caution (sunstroke, muscle cramps, and or heat exhaustion possible at 90°F to 104°F); and
- Caution (fatigue possible at less than 90°F).

The NWS uses these levels in their weather warning messages to alert the public of the dangers of exposure to extended periods of heat, especially when high humidity acts along with the high temperatures to reduce the body's ability to cool itself.

Although most heat related deaths occur in urban areas, residents of rural areas are at risk due to factors that include age, outdoor activity level, or the lack of air conditioning and proper circulation. While heat related illness and death occur due to exposure to intense heat in just one afternoon, heat stress on the body has a cumulative effect. The persistence of a heat wave increases the danger. Excessive heat can lead to illnesses and other stresses on people with prolonged exposure to these conditions.

In addition to the human toll, the Midwestern Climate Center in a paper on the 1999 heat wave, points up other possible impacts such as electrical infrastructure damage and failure, highway warping and damage, crop damage, water shortages, livestock deaths, fish kills, and lost productivity among outdoor oriented businesses. The future probable severity for Barton County in accordance with the severity levels is catastrophic for a Heat Index of 130°F or higher, critical for a Heat Index of 105°F to 129°F, limited for a Heat Index of 90°F to 104°F, and negligible for a Heat Index of less than 90°F.

Statement of Probable Risk

Based on NWS historical data, an actual extended heat wave may occur only once or twice per decade. Natural variances in heat and cold periods on a geological time scale put this time period to be in a generally warming trend. The months of July and August in Barton County have historically recorded temperatures into the 90°F or above. The probable risk of heat waves in accordance with the Heat Index severity levels is unlikely for Extreme Danger levels, possible for Danger levels, likely for Extreme Caution levels, and highly likely for Caution levels.

Statement of Next Disaster's Likely Adverse Impact on the Community

The likely adverse impacts of future heat waves affecting Barton County for the "Extreme Caution" level is shown below for the entire county.

Without mitigation measures:

Life: Critical
 Property: Limited
 Emotional: Limited
 Financial: Limited

With mitigation measures:

Life: Limited
 Property: Negligible
 Emotional: Negligible
 Financial: Limited

Recommendation

The HSTCC recommends that the Barton County Hazard mitigation Plan initiate a mitigation activity to provide heat relief for the needy and elderly. Usually the most affected by heat waves are those who need assistance due to age, handicapped access, and immobility. This mitigation activity would be a proactive measure to reach out to the community to provide fans, water, and even hydration stations.

Figure 17.0									
Heat Index Table									
Temperature (F) versus Relative Humidity (%)									
°F	90%	80%	70%	60%	50%	40%	30%	20%	10%
65	65.6	64.7	63.8	62.8	61.9	60.9	60.	59.1	58.1
70	71.6	70.7	69.8	68.8	67.9	66.9	66.	65.1	64.1
75	79.7	76.7	75.8	74.8	73.9	72.9	72.	71.1	70.1
80	88.2	85.9	84.2	82.8	81.6	80.4	79.	77.4	76.1
85	101.4	97.	93.3	90.3	87.7	85.5	83.5	81.6	79.6
90	119.3	112	105.8	100.5	96.1	92.3	89.2	86.5	84.2
95	141.8	131.1	121.7	113.6	106.7	100.9	96.1	92.2	89.2
100	168.7	154.	140.9	129.5	119.6	111.2	104.2	98.7	94.4
105	200	180.7	163.4	148.1	134.7	123.2	113.6	105.8	100.
110	235.	211.2	189.1	169.4	151.9	136.8	124.1	113.7	105.8
115	275.3	245.4	218	193.3	171.3	152.1	135.8	122.3	111.9
120	319.1	283.1	250.	219.9	192.9	169.1	148.7	131.6	118.2

HI	Possible Heat Disorder:
80°F - 90°F	Fatigue possible with prolonged exposure and physical activity.
90°F - 105°F	Sunstroke, heat cramps and heat exhaustion possible.
105°F - 130°F	Sunstroke, heat cramps, and heat exhaustion likely, and heat stroke possible.
130°F or greater	Heat stroke highly likely with continued exposure.

Table 17.0								
Barton County Heat Wave History								
Location or County	Date	Time	Type	Mag	Deaths	Injuries	Property Damage	Crop Damage
1 BARTON	06/12/1994	0000	Heat	N/A	4	55	0	50K
2 BARTON	07/23/1999	06:00 AM	Excessive Heat	N/A	6	0	0	0
3 BARTON	08/01/1999	12:00 AM	Excessive Heat	N/A	2	0	0	0
4 BARTON	08/27/2000	04:00 AM	Excessive Heat	N/A	1	0	0	0
5 BARTON	09/01/2000	12:00 AM	Excessive Heat	N/A	0	0	0	0
6 BARTON	12/12/2000	12:00 AM	Extreme Cold	N/A	0	0	125K	105K
7 BARTON	01/01/2001	12:00 AM	Extreme Cold	N/A	0	0	OK	OK
8 BARTON	07/17/2001	12:00 PM	Excessive Heat	N/A	1	0	0	0
9 BARTON	08/01/2001	12:00 AM	Excessive Heat	N/A	2	0	0	0
TOTALS:					16	55	125K	155K
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Earthquakes

According to SEMA, earthquakes can be defined as shifts in the Earth’s crust causing the surface to become unstable. This instability can manifest itself in intensity from slight tremors to large shocks. The duration can be from a few seconds up to five minutes. The period of tremors and shocks can last up to several months. The larger shocks can cause ground failure, uplifts, liquefaction, and sand blows.

The Earth’s crust is made up of gigantic tectonic plates. These plates form what is known as the lithosphere, and vary in thickness from 6.5 miles (beneath the oceans) to 40 miles (beneath mountain ranges) with an average thickness of 20 miles. These plates float over a partly melted layer of crust called the asthenosphere. The plates are in motion and where one plate joins another, they form boundaries. Pressures on the North Atlantic ridge affecting the eastern side of the North American plate and movements along the San Andreas Fault by the Pacific plate have reactivated the subterranean faults in the Mississippi embayment.

Historical Statistics

The New Madrid Seismic zone lies within the central Mississippi Valley, extending from northeast Arkansas, through southeast Missouri, western Tennessee, and western Kentucky to southern Illinois. Historically, this area has been the site of some of the largest earthquakes in North America. Between 1811 and 1812, 4 catastrophic earthquakes, with magnitude estimates greater than 7.0, occurred during a 3-month period. Hundreds of aftershocks followed over a period of several years. The largest earthquakes to have occurred since then were on January 4, 1843 and October 31, 1895 with magnitude estimates of 6.0 and 6.2 respectively. In addition to these events, seven events of magnitude ≥ 5.0 have occurred in the area. Instruments were installed in and around this area in 1974 to closely monitor seismic activity. Since then, more than 4000 earthquakes have been located, most of which are too small to be felt. On average one earthquake per year will be large enough to be felt in the area.

The New Madrid seismic zone is so named because the town of New Madrid, Missouri was the closest settlement to the epicenters of the 1811-1812 quakes. At that time, St. Louis and other major cities in the central U.S. were sparsely settled. At least 3 of the series of earthquakes were felt throughout much of the U.S. and as far away as Quebec. The potential for the recurrence of such earthquakes and their impact today on densely populated cities in and around the seismic zone has generated much research devoted to understanding earthquakes. By closely monitoring the earthquake activity, scientists can hope to understand their causes, recurrence rates, ground motion and disaster mitigation. The probability for an earthquake of magnitude 6.0 or greater is significant in the near future, with a 50% chance by the year 2000 and a 90% chance by the year 2040. A quake with a magnitude equal to that of the 1811- 1812 quakes could result in great loss of life and property damage in the billions of dollars. Scientists believe we could be overdue for a large earthquake and through research and public awareness may be able to prevent such losses. The Missouri seismic Safety Commission declares that smaller earthquakes are more likely in Missouri than larger ones.

Most significant earthquake events occur far away from Barton County, which is in the far reaches of Southwest Missouri. There have been no earthquakes on record for the County ever. However, aftershocks from a large event in Southeastern Missouri are likely when said event were to ever occur.

Statement of Future Probable Severity

There is no risk of the epicenter of an earthquake to be in or near Barton County. The severity of any ground movement in the area would come in the form of an aftershock from a major event happening in Southeastern Missouri. The estimated probability if a magnitude 6.0 and greater earthquake along the New Madrid Fault is 25-40% through the year 2053.

New Madrid Earthquake damage covers over more than 20 times the area compared to the typical San Andreas earthquake due to the underlying geology of the Midwest. Ground shaking affects structures close to the earthquake epicenter but also can affect those at great distance. Certain types of buildings at a significant distance from the earthquake epicenter may be damaged. Unreinforced masonry structures, tall structures without adequate lateral strength, and poorly maintained structures are specifically susceptible to large earthquakes. Based on the history and proximity to the New Madrid seismic zone, the future probable severity for any earthquake activity in Barton County is negligible.

Scientists from the U.S. Geological Survey (USGS) and the Center for Earthquake Research and Information at the University of Memphis have updated their expectation for earthquakes in the New Madrid Seismic Zone. The new forecasts estimate a 7 to 10 percent chance, in the next 50 years, of a repeat of a major earthquake like those that occurred in 1811-1812, which likely had magnitudes of between 7.5 and 8.0 on the Richter scale. There is a 25 to 40 percent chance, in a 50-year time span, of a magnitude 6.0 or greater earthquake.

The earthquake probabilities have changed considerable since the most commonly cited forecast published in 1985. The new probabilities show an increased chance of larger (7.5-8.0) magnitude earthquakes and a lesser chance of magnitude 6.0 and greater earthquakes. Meanwhile, estimates of the hazard, or potential for damage caused by shaking, have changed much less. A fact sheet with the new information is available on the web at: <http://pubs.usgs.gov/fs/fs-131-02/>.

“More than fifteen years of research has given us the information to allow us to update our forecasts. But even though the chances of a mid-sized earthquake are reduced, the chances of a devastating earthquake in the region have risen,” said USGS scientist Eugene Schweig. “Given this new information, people should absolutely not drop their guard. The threat of an earthquake to Mid-America is still very real.”

The New Madrid seismic zone is an area of frequent small earthquakes that stretches along the lower Mississippi Valley from just west of Memphis, Tennessee into southern Illinois. It also was the location of a sequence of three or four major earthquakes in 1811 and 1812.

Major earthquakes in the range of magnitude 7.5 to 8.0 are capable of causing widespread damage over a large region. Magnitude 6.0 earthquakes can cause serious damage in areas close to the earthquake’s location because the hazard (chance of damage in a given area) depends not only on earthquake probabilities, but also on where the earthquakes occur and local soil conditions.

Statement of Probable Risk

The recurrence interval for magnitude 6.0 earthquakes is 100 years. Estimates of the recurrence intervals of the large 1811-1812 earthquakes area bout 500 to 1000 years. Smaller earthquakes have persisted in Southeast Missouri, but the only probable risk to Barton County is from a significantly large seismic event.

In Memphis and throughout the Mid-America region, the USGS is improving its earthquake monitoring and reporting capabilities through the Advanced National Seismic System (ANSS), a nation-wide network of modern strong motion seismometers that will provide emergency response personnel with real-time “shaking” information within minutes of an earthquake.

ANSS stations will assist emergency responders within minutes of an event showing not only the magnitude and epicenter, but where damage is most likely to have occurred. Ten new ANSS instruments were recently installed in the Memphis area, 20 have been installed across the mid –America region, and more than 175 have been installed in other vulnerable urban areas outside the central US to provide real-time information on how the ground responds when a strong earthquake happens.

“The ultimate goal of ANSS is to save lives and ensure public safety,” said Dr. John Filson, US Geological Survey (USGS) Earthquake Program Coordinator. “This information, already available in Southern California, is generated by data from seismic instruments installed in urban areas and has revolutionized the response time of emergency managers to an earthquake, but its success depends on further deployment of instruments in other vulnerable cities.”

In 1997, during the reauthorization of National Earthquake Hazards Reduction Program, Congress asked for an assessment of the status and needs of earthquake monitoring. The result was the authorization of ANSS to be implemented by the USGS. The

system, when implemented, would integrate all regional and national networks with 7,000 new seismic instruments, including 6,000 new strong-motion sensors in 29 at-risk urban areas. To date, approximately 350 instruments have been installed.

New USGS National Seismic Hazard Maps depict these hazard or likelihood of ground shaking. The USGS and its partners in universities and state geological surveys are preparing more detailed hazard maps for Memphis and other areas that include the effects of local soil conditions. For more information see <http://geohazards.cr.usgs.gov/eq/>.

The goal of USGS earthquake monitoring is to mitigate risk- using better instruments to understand the damage shaking causes and to provide information to help engineers create stronger and sounder structures that ensure vital infrastructures, utility, water, and communication networks keep operating safely and efficiently.

Aftershocks traveling large distances from the New Madrid Fault are the only probable event to possibly affect the county. Figure 17.0 illustrates the extent of the 6.8 magnitude earthquake in 1895 on the New Madrid Fault to the 6.7 magnitude earthquake in 1994 located in southern California.

Statement of Next Disaster’s Likely Adverse Impact on the Community

The adverse impact of earthquakes in Barton County is minimal. Barton County Missouri does fit into the area identified by USGS as possible shaking damage incurred during a major (7.5-8.0) earthquake. The soil composition in the Mid-American region accounts for a larger range of “Shaking” damage. However, in the event of a major earthquake, Barton County would be well outside any possible epicenter, and feel only minimal shaking. The adverse impact of all structures in Barton County in the case of such an event would cause a 1% total of damages to all facilities.

The likely adverse impact of an earthquake in Barton County is shown below for the entire county.

Without mitigation measures:

Life:	Negligible
Property:	Limited
Emotional:	Negligible
Financial:	Negligible

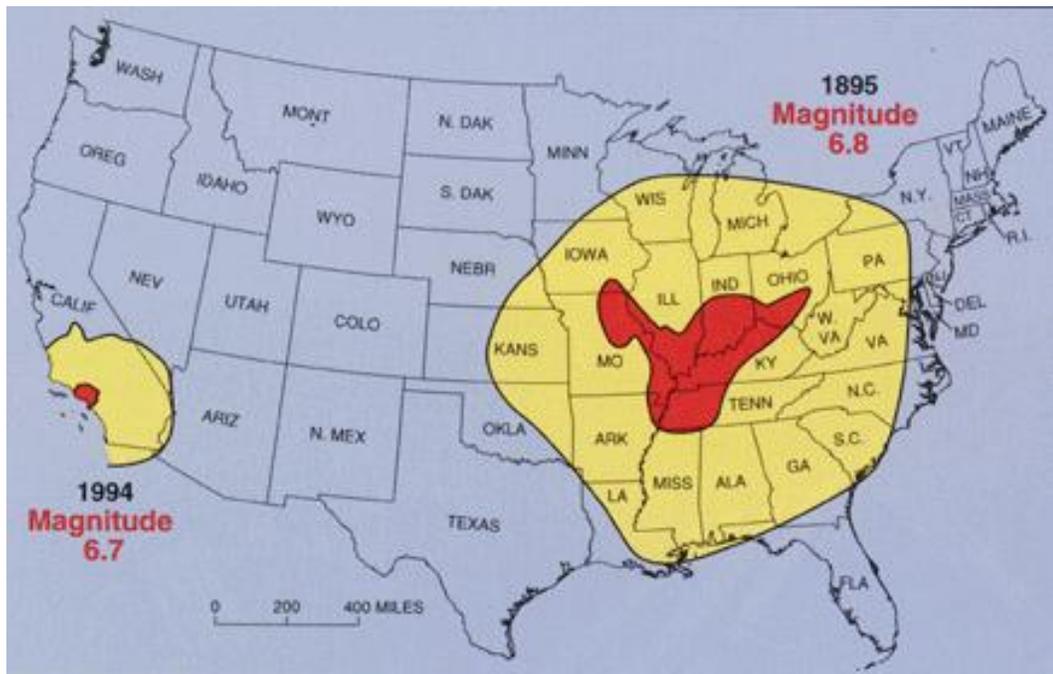
With mitigation measures:

Life:	Negligible
Property:	Limited
Emotional:	Negligible
Financial:	Negligible

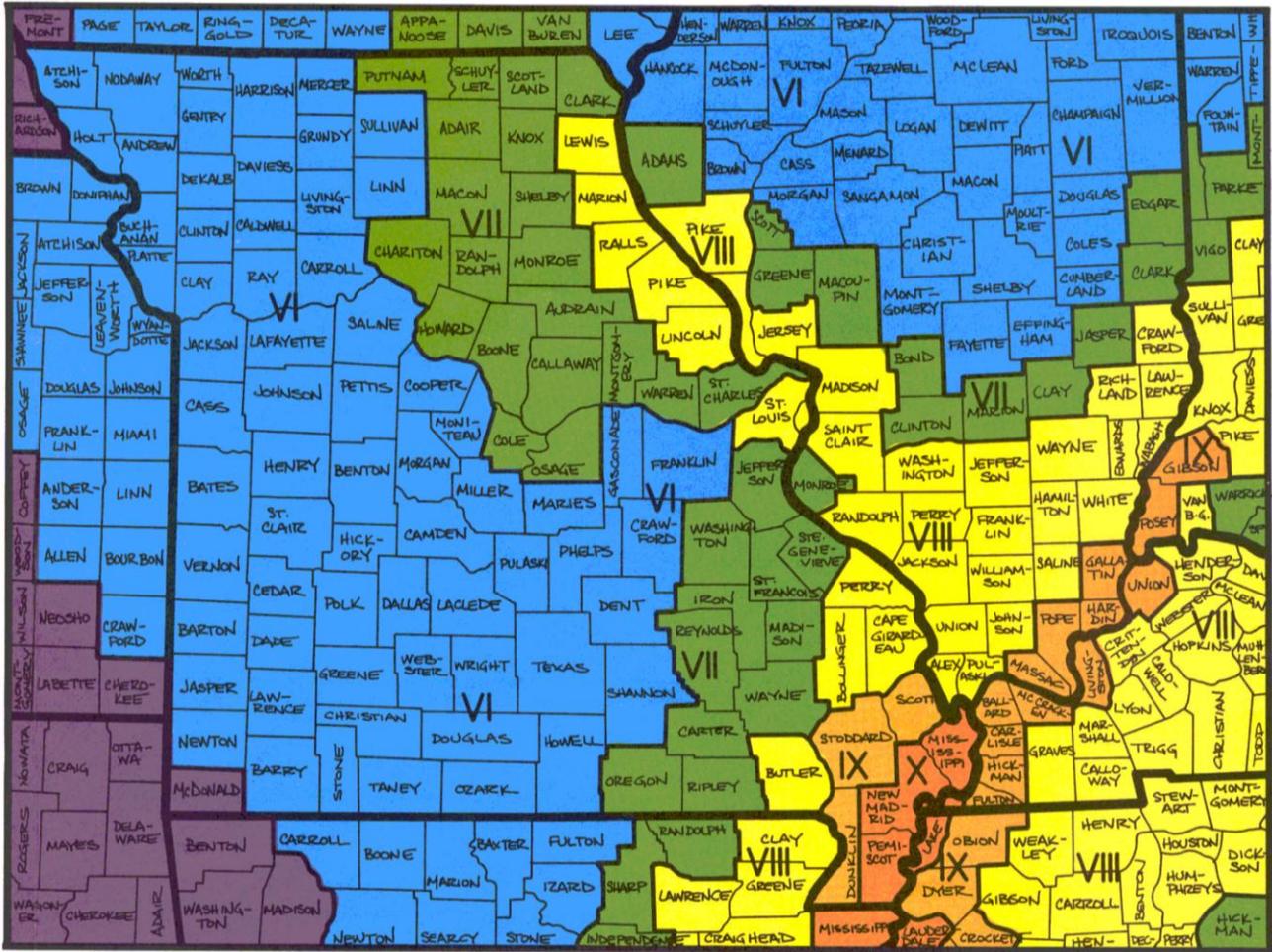
Recommendation

The HSTCC recommends that the Barton Hazard Mitigation Plan initiate mitigation activities to encourage ongoing education of probable danger from tremor aftershocks. This education includes the participation in the USGS ANSS program. The Advanced National Seismic System (ANSS) is an effort to upgrade seismic monitoring systems throughout the U.S. by improving hardware, management, operations, cooperation, and outreach.

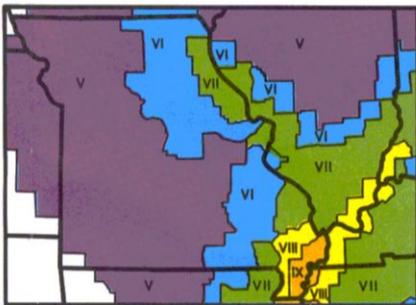
Figure 18.0
New Madrid Fault Earthquake Magnitude



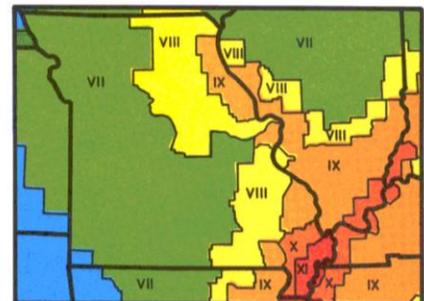
PROJECTED EARTHQUAKE INTENSITIES



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



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.

MODIFIED MERCALLI INTENSITY SCALE

- I People do not feel any Earth movement.
- II A few people might notice movement.
- III Many people indoors feel movement. Hanging objects swing.
- IV Most people indoors feel movement. Dishes, windows, and doors rattle. Walls and frames of structures creak. Liquids in open vessels are slightly disturbed. Parked cars rock.
- V Almost everyone feels movement. Most people are awakened. Doors swing open or closed. Dishes are broken. Pictures on the wall move. Windows crack in some cases. Small objects move or are turned over. Liquids might spill out of open containers.
- VI Everyone feels movement. Poorly built buildings are damaged slightly. Considerable quantities of dishes and glassware, and some windows are broken. People have trouble walking. Pictures fall off walls. Objects fall from shelves. Plaster in walls might crack. Some furniture is overturned. Small bells in churches, chapels and schools ring.
- VII People have difficulty standing. Considerable damage in poorly built or badly designed buildings, adobe houses, old walls, spires and others. Damage is slight to moderate in well-built buildings. Numerous windows are broken. Weak chimneys break at roof lines. Cornices from towers and high buildings fall. Loose bricks fall from buildings. Heavy furniture is overturned and damaged. Some sand and gravel stream banks cave in.
- VIII Drivers have trouble steering. Poorly built structures suffer severe damage. Ordinary substantial buildings partially collapse. Damage slight in structures especially built to withstand earthquakes. Tree branches break. Houses not bolted down might shift on their foundations. Tall structures such as towers and chimneys might twist and fall. Temporary or permanent changes in springs and wells. Sand and mud is ejected in small amounts.
- IX Most buildings suffer damage. Houses that are not bolted down move off their foundations. Some underground pipes are broken. The ground cracks conspicuously. Reservoirs suffer severe damage.
- X Well-built wooden structures are severely damaged and some destroyed. Most masonry and frame structures are destroyed, including their foundations. Some bridges are destroyed. Dams are seriously damaged. Large landslides occur. Water is thrown on the banks of canals, rivers, and lakes. Railroad tracks are bent slightly. Cracks are opened in cement pavements and asphalt road surfaces.
- XI Few if any masonry structures remain standing. Large, well-built bridges are destroyed. Wood frame structures are severely damaged, especially near epicenters. Buried pipelines are rendered completely useless. Railroad tracks are badly bent. Water mixed with sand, and mud is ejected in large amounts.
- XII Damage is total, and nearly all works of construction are damaged greatly or destroyed. Objects are thrown into the air. The ground moves in waves or ripples. Large amounts of rock may move. Lakes are dammed, waterfalls formed and rivers are deflected.

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

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

Dam Failure

A dam is defined by the National Dam Safety Act as an artificial barrier which impounds or diverts water and is at least 6 feet high and stores at least 50 acre-feet of water, or that it is at least 25 feet high and stores at least 15 acre-feet of water. Of the over 80,000 dams in the United States, less than 5% are under control of the federal government.

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

Oversight is extremely valuable to the owners as well as those people living downstream of the dam who could be flooded in the event that dam should fail. Dams can fail for many reasons. The most common causes of dam failure are piping (internal erosion caused by embankment leakage, foundation leakage and deterioration of pertinent structures appended to the dam), erosion (inadequate spillway capacity causing overtopping of the dam, flow erosion, and inadequate slope protection), and structural failure (earthquakes, slope instability, or faulty construction). These causes of failure are often interrelated. For example, erosion, either on the surface or internal, may weaken the dam or lead to structural failure. Additionally, a structural failure may shorten the seepage path and lead to piping failure.

Historical Statistics

Thousands of people have been injured, many killed, and billions of dollars in property damage has been caused by dam failure in the United States. Dam failures at Lawrencetown in 1968, Washington County in 1975, Fredericktown in 1977, and a near failure in Franklin County underscored the problem of unsafe dams in Missouri in 1978. No records of dam failure exist for Barton County.

Statement of Future Probable Severity

Dams are generally classified in three categories that identify the potential hazard to life and property should a failure occur:

High Hazard - If the dam was to fail, lives would be lost and extensive property damage could result.

Significant Hazard – Failure could result in the loss of life and appreciable property damage.

Low Hazard - Failure results in only minimal property damage.

The state has three classes that determine how often a state-regulated dam is inspected. They are:

Class 1—Inspection occurs once every two years if 10 or more structures are downstream of the dam.

Class 2—Inspection occurs once every three years if more than 1 or less than 10 structures are downstream of the dam.

Class 3—Inspection occurs once every five years if no structures are downstream of the dam.

According to Missouri DNR's Dam Safety Division, there are 41 dams located in Barton County. The probable severity of dam failure in Barton County is considered low to significant at this time.

Statement of Probable Risk

There are no High Hazard dams in Barton County, as defined by the Missouri Department of Natural Resources, Dam Safety Division. The Missouri Hazard Analysis reports the hazard potential classification of 31 dams in Barton County: 0 (Class 1), 4 (Class 2) and 27 (Class 3). Dams are listed on pages 71 & 72 and map of dams on page 73.

Statement of Next Disaster's Likely Adverse Impact on the Community

The likely adverse impacts of future dam failures in the areas down stream of dams in the entire county at the high hazard level are shown below.

Without mitigation measures:

Life:	Negligible
Property:	Limited
Emotional:	Negligible
Financial:	Limited

With mitigation measures:

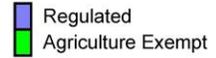
Life:	Negligible
Property:	Negligible
Emotional:	Negligible
Financial:	Negligible

Recommendation

The HSTCC recommends that the Barton County Hazard Mitigation Plan monitor these dams, especially those that would cause property damage if they were to fail.



Missouri Dam Report by County



BARTON

<u>ID Number</u>	<u>Location</u>	<u>Year Complete</u>	<u>Height (ft)</u>	<u>Length (ft)</u>	<u>Drainage Area (acre)</u>	<u>Lake Area (acre)</u>	<u>Hazard Class</u>	<u>Permit Number</u>
BEAN LAKE DAM								
MO20122	S33 T32N R32W	1968	11.00	Unknown	430.00	22.00	3	
BERRYHILL LAKE DAM								
MO20326	S03 T30N R31W	1966	15.00	Unknown	260.00	12.00	3	
BILL JOHNSON LAKE								
MO50009		1973	24.00	531.00	0.00	1.00		
BLANCHARD LAKE DAM								
MO50010	S02 T33N R30W	1969	23.00	800.00	400.00	17.00	3	
BOB RICE IRRIGATION DAM								
MO40155		0	39.00				3	
CASS'S DAM								
MO20329	S33 T33N R30W	1968	14.00	Unknown	140.00	8.00	3	
CHARLES MAYFIELD LAKE								
MO50011	S12 T32N R30W	1981	14.00	1,000.00	190.00	17.00		
CHARLES WOOD DAM								
MO20155	S11 T33N R03W	1967	13.00	Unknown	250.00	10.00	3	
CHARLES WOOD LAKE 1								
MO50012		1967	13.00	925.00	0.00	1.00		
CHARLES WOOD LAKE 2								
MO50013		1974	15.00	1,050.00	1.00	1.00		
CLIFTON MAYO DAM								
MO50014	S26 T33N R32W	1969	16.00	2,460.00	170.00	26.00	2	
CURLESS LAKE DAM								
MO20550	S03 T32N R31W	1977	14.00	Unknown	420.00	22.00	3	
DIGGS LAKE DAM								
MO20392	S05 T31N R31W	1968	22.00	Unknown	240.00	24.00	3	
DON BUNTON LAKE								
MO50015	S25 T33N R31W	1970	17.00	1,033.00	80.00	9.00	3	
DON MARTI LAKE								
MO50016	S25 T31N R32W	1970	11.00	760.00	380.00	26.00	3	
EARL DUMM DAM								
MO20050	S10 T32N R31W	1970	14.00	Unknown	120.00	2.00	3	
ED ONSTOTT LAKE DAM								
MO20790	S35 T32N R31W	1981	18.00	Unknown	80.00	4.00		
EMBERY LAKE DAM								
MO20121	S05 T32N R30W	1970	17.00	Unknown	280.00	13.00	2	
GARDNER FARMS LAKE DAM								
MO20018	S16 T31N R32W	1962	14.00	Unknown	270.00	17.00	3	
GARDNER FARMS LAKE DAM								
MO50018		1965	15.00	1,600.00	0.00	1.00		
GARFIELD LAKE DAM								
MO20548	S18 T31N R31W	1976	14.00	Unknown	390.00	20.00	3	
GARFIELD LAKE DAM								
MO50019		1976	14.00	2,354.00	0.00	1.00		
H. P. SHOCKEY LAKE								
MO50021		1976	17.00	1,588.00	0.00	1.00		
LAMAR LAKE DAM								
MO20002	S32 T32N R30W	1955	26.00	Unknown	3,100.00	150.00	2	
LOGUE LAKE DAM								
MO30045	S21 T32N R32W	1942	15.00	Unknown	440.00	14.00	3	

3/9/2007

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Missouri Dam Report by County

■ Regulated
■ Agriculture Exempt

BARTON

<u>ID Number</u>	<u>Location</u>	<u>Year Complete</u>	<u>Height (ft)</u>	<u>Length (ft)</u>	<u>Drainage Area (acre)</u>	<u>Lake Area (acre)</u>	<u>Hazard Class</u>	<u>Permit Number</u>
LYNN ACHEY LAKE								
MO50022		1977	18.00	1,982.00	1.00	1.00		
MONONAME 699								
MO20323	S11 T31N R31W	1956	14.00	Unknown	7.00	4.00	3	
MONONAME 700								
MO20324	S33 T31N R30W	1965	15.00	Unknown	800.00	5.00	3	
MONONAME 703								
MO20327	S34 T31N R31W	1966	10.00	Unknown	10.00	1.00	3	
MONONAME 704								
MO20328	S03 T31N R30W	1967	15.00	Unknown	65.00	9.00	3	
MONONAME 706								
MO20331	S35 T33N R29W	1970	18.00	Unknown	75.00	11.00	3	
MOSS LAKE DAM								
MO20123	S29 T31N R33W	1955	15.00	Unknown	610.00	27.00	3	
MURPHY DAM								
MO20811			25.00	350.00	96.00	2.60	3	
PRAIRIE CENTER FARM DAM								
MO20126	S36 T32N R33W	1970	16.00	Unknown	1,900.00	46.00	3	
RICHARDS LAKE DAM								
MO20716	S36 T31N R31W	1976	15.00	Unknown	30.00	10.00	3	
ROSE LAKE DAM								
MO30136	S24 T32N R33W	1967	20.00	Unknown	370.00	31.00	3	
SAGEHORN LAKE DAM								
MO20170	S04 T31N R30W	1936	20.00	Unknown	400.00	7.00	3	
SUITER'S DAM								
MO30187	S29 T32N R32W	1973	12.00	Unknown	320.00	16.00	3	
TIDBALL'S DAM								
MO20306	S33 T31N R31W	1966	18.00	Unknown	15.00	2.00	3	
VAUGHN DEAY LAKE								
MO50025		1974	25.00	600.00	0.00	1.00		
WOOD LAKE DAM								
MO20714	S12 T33N R30W	1800	15.00	Unknown	450.00	13.00	3	

SUMMARY

Regulated Dams: 1	Total:	12,790.00	605.60
Total Dams: 41	Average:	16.98	15.14

Barton Co.

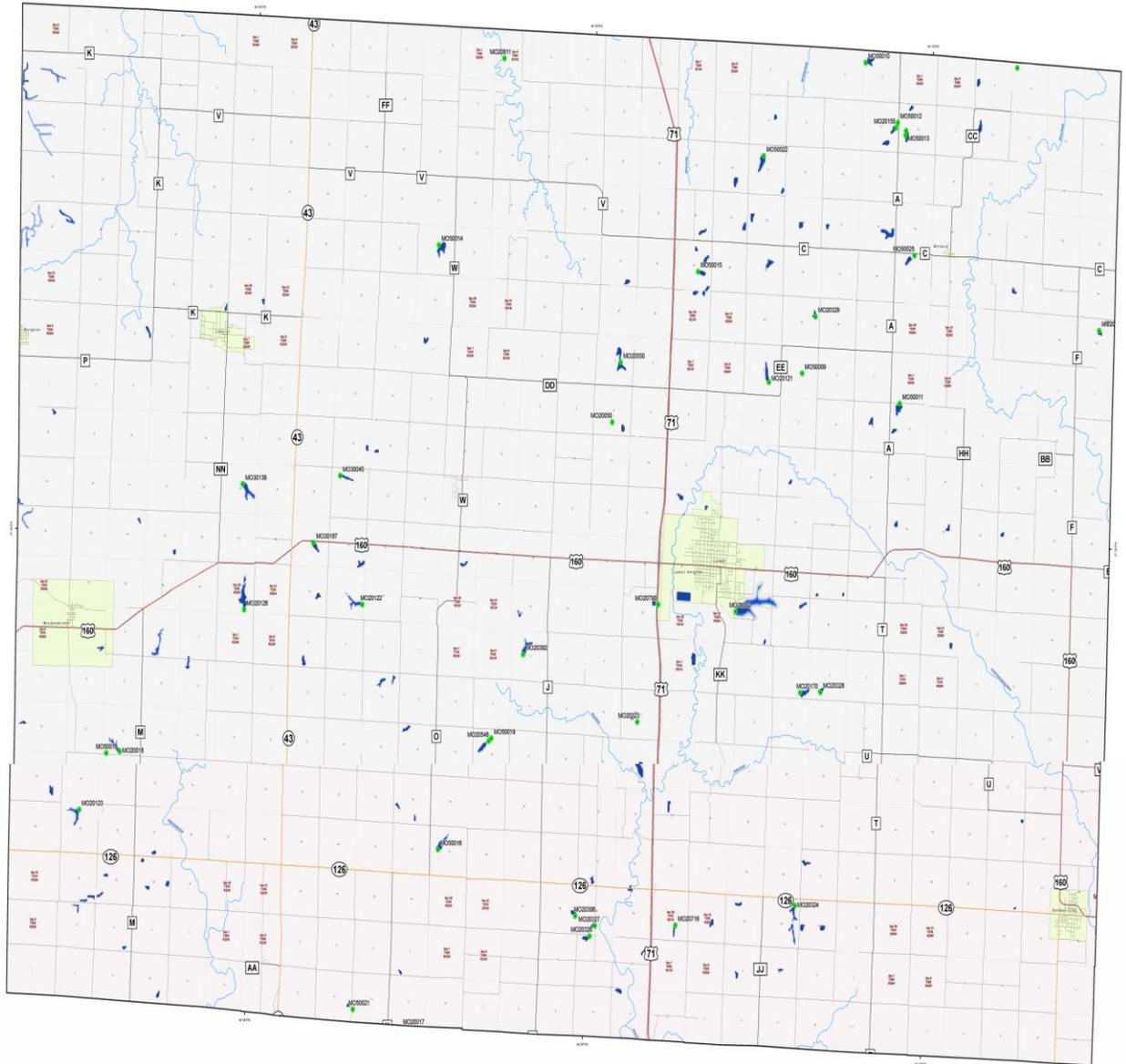
Dams of Missouri

- Non-Regulated
- Regulated
- Rivers and Streams
- Lakes

Digital Compilation and Cartography by Kevin James
Water Resource Center - Rolla, MO
March 2007



Although all data in this data set have been compiled by the Missouri Department of Natural Resources, no warranty, expressed or implied, is made by the department as to the accuracy of the data and related materials.



Wildfires

Forest and grassland fires can and have occurred on any day throughout the year. The majority of the fires, however, and the greatest acreage loss will occur during the spring fire season, which is normally between mid February to mid May. The length and severity of this burning period depends on weather conditions. Spring in Missouri is noted for its low humidity and high winds. In addition, spring is the time of year when rural residents normally burn their garden spots, brush piles, etc. These conditions, together with below normal precipitation and high temperatures, result in extremely high fire dangers. Depending on weather conditions, a sizable number of fires also can occur between mid October and late November.

According to SEMA's 2000 Hazard Analysis, wildfires are most common in the southern districts of the state. According to the MDC Forestry Division, the number one cause of wildfires is human activities. Incendiary fires, willfully set on another person's property, continue to rank second in the number of wildfires each year. Fires caused by natural ignition, such as lightning, are rare.

Historical Statistics

No Missouri fires are listed among the significant wildfires in the US since 1825. Fires covering more than 300 acres are considered large in Missouri. Missouri averages 3,500 fires a year with 45,000 acres burned. This averages out to about 12 acres burned per wildfire. The National Climatic Data Center (NCDC) reports no wild or forest fire events for Barton, County between 1/1/1950 and 10/31/2006.

Statement of Probable Severity

All wildfires have the potential to flare out of control with catastrophic results. Grass and brush grows back quickly, but the destruction of forest and cropland is more costly.

The FEMA website points out that as residential areas expand into previously undeveloped areas; forest fires increasingly threaten people living in these communities. Protecting structures from fire in the buffer areas poses special problems, and can stretch firefighting resources to its limits.

Fuel for wildfires are combustible materials like grass, leaves, ground litter, plants, shrubs, and trees. The forested areas, combined with dry weather conditions and/or human activity, represent the potential for a disastrous wildfire within the county. Based on the lack of historical major wildfires, the ample supply of combustible material, the rural character of the county, and the increased risk of being in the Southern Regions of Missouri, the probable severity of wildfires in Barton County is critical.

Statement of Probable Risk

The NCDC lack of a major historical or recorded wildfire in Barton County makes the probable risk of one as not likely. The probability of future risk of a wildfire in Barton County is highly likely for Low Fire Damage, highly likely for Moderate Fire Damage, likely for High Fire Danger, and possible for Extreme Fire Danger.

Statement of Next Disaster's Likely adverse Impact on the Community

The likely adverse impact of a wildfire in Barton County is shown below for the entire county.

Without mitigation measures:

Life:	Negligible
Property:	Critical
Emotional:	Critical
Financial:	Critical

With mitigation measures:

Life:	Negligible
Property:	Limited
Emotional:	Limited
Financial:	Limited

Recommendation

The HSTCC recommends that the Barton County Hazard mitigation Plan initiate the coordination of local and county fire departments in an action plan for wildfire events. A public information campaign identifying the dangers of wildfires, and the appropriate measures to reduce the effect of an accidental wildfire event should also be initiated.

Multi-Jurisdictional Risk Assessment

All of Barton County is equally susceptible to tornados, severe thunderstorms including lightning, downbursts, hail, heavy rains, & high winds, floods including both riverine and flash floods. Severe weather including snow, ice, extreme cold, droughts, heat waves, earthquakes including landslides, ground failures and slippage, wildfires, flooding and dam failures, which are primarily restricted to floodplains and down stream respectively, have the same county-wide geographical area of vulnerability. Several communities in Barton County (City of Burgess, City of Golden City, City of Milford, City of Mindenmines, City of Lamar Heights, and City of Liberal) contain designated floodplain areas inside their incorporated boundary. A map showing the location of the 100-year floodplain for each incorporated area is located in Appendix F: 100 Year Floodplain-Incorporated Areas of Barton County.

According to the Missouri State Hazard Mitigation Plan, disasters appear to be occurring more frequently than during previous years. Barton County overall had 25 major tornados; 91 major thunder storms; 138 hail events; 1 lighting event; 36 flood events, 13 of which were presidentially declared flood disasters between 1993 and 2006; 17 severe winter events; 7 drought events; 9 heat wave events.

WORKSHEET #1: BARTON COUNTY HAZARD IDENTIFICATION AND ANALYSIS

Hazards	Locations Previously Damaged	Frequency of Past Damage	Severity (i.e. damages relative to other hazards)	Probability (i.e. likelihood the hazard will strike your community)	Ranking of adverse impact on the County
Tornado/Severe Thunderstorms (Downbursts, Lightning, Hail, Heavy Rains, & Wind)	Mindenmines, Golden City, Liberal, Lamar, Milford, Countywide	25 Tornado in 52yrs .48 per yr F0 - .19 per yr F1 - .19 per yr F2 - .02 per yr F3 - .06 per yr F4 - .02 per yr 91 Thunder Storms in 49yrs 1.86 per yr 138 Hail Events in 50yrs 2.76 per yr 1 Lighting	Thunder-Limited Tornado-F0-Negligible F1 & F2-Limited F3-Critical F4 & F5- Catastrophic	Highly Likely	Life-Limited Property-Critical Emotional-Critical Financial-Catastrophic
Floods (Riverine and Flash Floods)	Mindenmines, Lamar, Milford, Countywide	36 events in 14yrs 2.57 per yr	Incorporated-Critical Un-incorporated-Limited	Highly Likely	Life-Limited Property-Critical Emotional-Critical Financial-Catastrophic
Severe Winter Weather (Snow, Ice, Extreme Cold)	Countywide	17 events in 8yrs 2.13 per yr	Critical	Highly Likely	Life-Negligible Property-Critical Emotional-Limited Financial-Critical
Drought	Countywide	7 events in 7yrs 1 per yr	Phase 1-Negligible Phase 3-Limited Phase 3-Limited Phase 4-Critical	Phase 1-Highly Likely Phase 2-Likely Phase 3-Possible Phase 4-Possible	Life-Negligible Property-Critical Emotional-Critical Financial-Critical
Heat Wave	Countywide	9 events in 13yrs 1.44 per yr	Extreme Danger Catastrophic Danger-Critical Extreme Caution-Limited Caution-Limited	Extreme Danger-Unlikely Danger-Possible Extreme Caution-Likely Caution-Highly Likely	Life-Critical Property-Limited Emotional-Limited Financial-Limited
Earthquake	None	None	Negligible	Unlikely	Life-Negligible Property-Limited Emotional-Negligible Financial-Limited
Dam Failure	None	None	Limited	Possible	Life-Negligible Property-Limited Emotional- Negligible Financial-Limited
Fire/ Wildfire	None	None	Limited	Likely	Life-Negligible Property-Critical Emotional-Critical Financial-Critical

Individual Hazard Profile Worksheet Method

Each individual Hazard Profile Worksheet was derived from the information given within the Section 2 of the Barton County Hazard Mitigation Plan. The worksheets are a quick synopsis of the introduction, historical statistics, statement of probable severity, statement of probable risk, statement of disaster’s likely adverse impact on the community, and the recommendation line items.

Hazard Profile Worksheets

Hazard Profile Worksheet #1	
Hazard:	Tornadoes/Severe Thunderstorms/Hail
Potential Magnitude:	Critical
Frequency of Occurrence:	Highly Likely
Seasonal Pattern:	Most likely in the Spring and Fall months
Areas Likely to be Affected Most:	Countywide
Probable Duration:	Storms can last from a few hours to a few days
Potential Speed of Onset:	Minimal (or nor) warning for tonadoes/6 to 12 hours warning for Severe Thunderstorms
Existing Warning Systems:	Severe weather sirens exist throughout most of the County (Map on page 37), media broadcasts warning
Complete Vulnerability Analysis:	Jurisdiction is vulnerable to disaster 20% affected area

Hazard Profile Worksheet #2	
Hazard:	Flood
Potential Magnitude:	Critical
Frequency of Occurrence:	Highly likely
Seasonal Pattern:	Flash floods are most likely in the Spring rainy months
Areas Likely to be Affected Most:	All floodplain areas of the County
Probable Duration:	Until receding of water, disaster is likely to last one week
Potential Speed of Onset:	Minimal (or no) warning
Existing Warning Systems:	County and City floodplain ordinances limit growth and danger in flood prone areas
Complete Vulnerability Analysis:	Jurisdiction is vulnerable to disaster 20% affected area

Hazard Profile Worksheet #3	
Hazard:	Severe Winter Weather
Potential Magnitude:	Critical
Frequency of Occurrence:	Highly Likely
Seasonal Pattern:	Most likely during late fall to early spring months
Areas Likely to be Affected Most:	Countywide
Probable Duration:	From a few hours to a few days
Potential Speed of Onset:	12 to 24 hours warning
Existing Warning Systems:	Doppler Radar can detect and media will broadcast warning
Complete Vulnerability Analysis:	Jurisdiction is vulnerable to disaster 25% affected area

Hazard Profile Worksheet #4	
Hazard:	Drought
Potential Magnitude:	Limited
Frequency of Occurrence:	Likely
Seasonal Pattern:	Summer months
Areas Likely to be Affected Most:	Countywide
Probable Duration:	Weeks to Months at a time/ the whole summer and into the fall season
Potential Speed of Onset:	More than 24 hours warning
Existing Warning Systems:	Weather Forecasting can only hypothesize for an average week at a time
Complete Vulnerability Analysis:	Jurisdiction is vulnerable to disaster Crop Damage

Hazard Profile Worksheet #5	
Hazard:	Heat Wave
Potential Magnitude:	Limited
Frequency of Occurrence:	Likely
Seasonal Pattern:	Summer and Fall months
Areas Likely to be Affected Most:	Countywide
Probable Duration:	Weeks to months at a time
Potential Speed of Onset:	More than 24 hours warning
Existing Warning Systems:	Weather Forecasting can only hypothesize for an average week at a time
Complete Vulnerability Analysis:	Jurisdiction is vulnerable to disaster People, Utilities, and Crop Damage

Hazard Profile Worksheet #6	
Hazard:	Earthquakes
Potential Magnitude:	Limited
Frequency of Occurrence:	Possible
Seasonal Pattern:	No seasonal pattern
Areas Likely to be Affected Most:	Countywide
Probable Duration:	Seconds to Minutes
Potential Speed of Onset:	Minimal (or no) warning
Existing Warning Systems:	ANSS station triangulate epicenter of earthquakes in New Madrid Fault Zone
Complete Vulnerability Analysis:	Jurisdiction is minimally vulnerable to disaster 1% affected area

Hazard Profile Worksheet #7	
Hazard:	Dam Failure
Potential Magnitude:	Limited
Frequency of Occurrence:	Unlikely
Seasonal Pattern:	No seasonal pattern
Areas Likely to be Affected Most:	Downstream of existing dams
Probable Duration:	Until water recedes, hours to days
Potential Speed of Onset:	Minimal (or no) warning
Existing Warning Systems:	None
Complete Vulnerability Analysis:	Jurisdiction is minimally vulnerable to disaster less than 10 Buildings down stream

Hazard Profile Worksheet #8	
Hazard:	Wildfires
Potential Magnitude:	Critical
Frequency of Occurrence:	Unlikely
Seasonal Pattern:	During dry summer and fall seasons
Areas Likely to be Affected Most:	Countywide/ rural areas
Probable Duration:	Hours to weeks
Potential Speed of Onset:	Minimal (or no) warning
Existing Warning Systems:	None
Complete Vulnerability Analysis:	Jurisdiction is vulnerable to disaster 10% affected area

Overview Hazard Profile Worksheet

Hazard Type	Probable Severity	Probable Risk	Impact with Mitigation Measures
Tornado/ Severs Thunderstorms	Negligible for F0 tornadoes, limited for F1 tornadoes, limited for F2 tornadoes, critical for F3 tornadoes, catastrophic for F4 tornadoes, and catastrophic for F5 tornadoes	High	Life: Negligible Property: Limited Emotional: Limited Financial: Limited
Floods	Critical in 100-year floodplain, critical in 500-year floodplains, moderate outside of floodplains with poor drainage, negligible outside floodplains with good drainage	High	Life: Negligible Property: Limited Emotional: Limited Financial: Limited
Severe Winter Weather	<p>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. The greatest hazard is often to motorists.</p> <p>WINTER STORM WATCH: Severe winter conditions, such as heavy snow and/or ice are possible within the next day or two.</p> <p>WINTER STORM WARNING: Severe winter conditions have begun or are about to begin in your area.</p> <p>BLIZZARD WARNING: Snow and strong winds will combine to produce a blinding snow (near zero visibility), deep drifts, and life threatening wind chill. Seek refuge immediately.</p> <p>FROST/FREEZE WARNING: Below freezing temperatures are expected and may cause significant damage to plants, crops, or fruit trees. In areas unaccustomed to freezing temperatures, people who have homes without heat need to take added precautions.</p>	High	Life: Negligible Property: Limited Emotional: Negligible Financial: Limited
Drought	The region is outside the designated persistent seasonal drought zone, but surface water in the area is not plentiful, therefore there is a moderate severity of drought.	Moderate	Life: Negligible Property: Limited Emotional: Limited Financial: Limited
Heat Wave	<p>Extreme Danger (heat stroke or sunstroke highly likely at 130°F or higher);</p> <p>Danger (sunstroke, muscle cramps, and/or heat exhaustion likely at 105°F to 129°F);</p> <p>Extreme Caution (sunstroke, muscle cramps, and or heat exhaustion possible at 90°F to 104°F); and</p> <p>Caution (fatigue possible at less than 90°F).</p>	High	Life: Limited Property: Negligible Emotional: Negligible Financial: Limited
Earthquake	There is a 25 to 40 percent chance, in a 50 year time span, of a magnitude 6.0 and greater earthquake. Estimates of the recurrence intervals of the large 1811-1812 earthquakes area bout 500 to 1000 years.	Low	Life: Negligible Property: Negligible Emotional: Negligible Financial: Negligible

Dam Failures	<p>High: Failure or mis-operation will probably cause loss of human life.</p> <p>Significant: Failure or mis-operation results in no probable loss of human life but can cause economic loss, environmental damage, disruption, of lifeline facilities, or impact other concerns. Significant hazard potential classification dams are often located in predominantly rural or agricultural areas but could be located in areas with population and significant infrastructure.</p> <p>Low: Failure or mis-operation results in no probable loss of human life and low economic and/or environmental losses. Losses are principally limited to the owner's property.</p>	Low	<p>Life: Negligible Property: Negligible Emotional: Negligible Financial: Negligible</p>
Wildfires	<p>All wildfires have the potential to flare out of control with catastrophic results. Grass and brush grows back quickly, but the destruction of forest and cropland is more costly</p>	Moderate	<p>Life: Negligible Property: Limited Emotional: Limited Financial: Limited</p>

Individual Hazard Vulnerability Worksheets Method

The Hazard Vulnerability Worksheets detail the loss estimates for each identified hazard affecting the County. The Vulnerability Summary Worksheets were compiled through extensive data gathering via the internet, other relevant documents, interviews, and requests from private and public entities. These entities included the County Assessor, the County Commission, the County Clerk, the Missouri Department of Transportation, the various school districts, individual city utility management operators, individual city agencies, and private industry. Once these numbers were tabulated, certain calculations were required to produce a dollar value that reflected the number of buildings and critical facilities.

First, the number of people was derived from the population statistics, the number on persons per household and/or population number in the inventory tables in the community profile. In commuting Census, statistics were added to establish the maximum number of people in the jurisdiction. Second, the number of buildings was estimated by totaling the building and residence listed in the community profile. After estimating the number of parcels involved in the above total, the remaining parcels were assigned at least one structure each. The number of listed buildings and residents plus the number of remaining parcels were added for a total number of structures. Third, the dollar figures were based upon the average valuation per Parcel and adjusted for a realistic market value. Last, projected figures were calculated using the above numbers and factoring in population projection percentages from the community profile.

Individual Hazard Vulnerability Worksheets

TORNADO/SEVERE THUNDERSTORM: BARTON COUNTY VULNERABILITY ASSESSMENT #1						
(The estimates below are based on an F4 tornado causing damage in 20% of the county.)						
DEVELOPED LAND				UNDEVELOPED LAND		
	# of People	# of Buildings	Approx. Value	# of People	# of Buildings	Approx. Value
Residential	1367	623	\$28,489,824.60	1141	459	\$40,479,748.80
Commercial and Industrial		223	\$16,651,498.00		0	0
Municipal buildings		4	\$2,528,648.00		0	0
Road and Bridge		3	\$192,052,000.00		1	\$230,666.60
Police and Fire Buildings		1	\$520,470.20		0	0
Schools/colleges		2	\$29,231,842.00		0	0
Utilities (Water, Sewer, Electric)		3	\$1,437,269,000.00		1	\$156,333.33
Hospital/medical/dental		1	\$3,612,000.00		0	0
Other		0	0		0	0
TOTAL	1367	860	\$1,698,483,283.80	1141	462	\$40,866,748.73

The entire County is vulnerable to the effects of tornadoes/severe thunderstorms. Based on 20% affected

FLOOD: BARTON COUNTY VULNERABILITY ASSESSMENT #2						
DEVELOPED LAND				UNDEVELOPED LAND		
	# of People	# of Buildings	Approx. Value	# of People	# of Buildings	Approx. Value
Residential	1367	623	\$28,489,824.60	1141	459	\$40,479,748.80
Commercial and Industrial		223	\$16,651,498.00		0	0
Municipal buildings		4	\$2,528,648.00		0	0
Road and Bridge		3	\$192,052,000.00		1	\$230,666.60
Police and Fire Buildings		1	\$520,470.20		0	0
Schools/colleges		2	\$29,231,842.00		0	0
Utilities (Water, Sewer, Electric)		3	\$1,437,269,000.00		1	\$156,333.33
Hospital/medical/dental		1	\$3,612,000.00		0	0
Other		0	0		0	0
TOTAL	1367	860	\$1,698,483,283.80	1141	462	\$40,866,748.73

Specific riverine and/or flash flood hazard areas include lands adjacent to Dry Wood Creek, Little Dry Wood Creek, and North Fork Spring River. Based on 20% affected

2008 BARTON COUNTY HAZARD MITIGATION PLAN

SEVERE WINTER WEATHER: BARTON COUNTY VULNERABILITY ASSESSMENT #3						
DEVELOPED LAND				UNDEVELOPED LAND		
	# of People	# of Buildings	Approx. Value	# of People	# of Buildings	Approx. Value
Residential	1709	779	\$35,612,280.75	1426	573	\$50,599,686.00
Commercial and Industrial		277	\$20,814,372.50		0	0
Municipal buildings		5	\$3,160,810.00		0	0
Road and Bridge		4	\$240,065,000.00		0	\$388,333.25
Police and Fire Buildings		1	\$650,587.75		0	0
Schools/colleges		2	\$36,539,802.50		0	0
Utilities (Water, Sewer, Electric)		4	\$179,658,625.00		1	\$195,416.67
Hospital/medical/dental		1	\$4,515,000.00		0	0
Other		0	0		0	0
TOTAL	1709	1073	\$521,016,478.00	1426	575	\$51,183,435.92

The entire County is vulnerable to the effects of winter weather. Basted on 25% affected

DROUGHT: BARTON COUNTY VULNERABILITY ASSESSMENT #4						
DEVELOPED LAND				UNDEVELOPED LAND		
	# of People	# of Buildings	Approx. Value	# of People	# of Buildings	Approx. Value
Residential		0	0	0	0	0
Commercial and Industrial		0	0	0	0	0
Municipal buildings		0	0	0	0	0
Road and Bridge		0	0	0	0	0
Police and Fire Buildings		0	0	0	0	0
Schools/colleges		0	0	0	0	0
Utilities (Water, Sewer, Electric)		0	0	0	0	0
Hospital/medical/dental		0	0	0	0	0
Crop Damage		0	0	0	0	\$660,000.00
TOTAL						\$660,000.00

The entire County is vulnerable to the effects of drought. Based on Past Crop Damage

2008 BARTON COUNTY HAZARD MITIGATION PLAN

HEAT WAVE: BARTON COUNTY VULNERABILITY ASSESSMENT #5						
DEVELOPED LAND				UNDEVELOPED LAND		
	# of People	# of Buildings	Approx. Value	# of People	# of Buildings	Approx. Value
Residential	6835	0	0	5706	0	0
Commercial and Industrial	0	0	0	0	0	0
Municipal buildings	0	0	0	0	0	0
Road and Bridge	0	0	0	0	0	0
Police and Fire Buildings	0	0	0	0	0	0
Schools/colleges	0	0	0	0	0	0
Utilities (Water, Sewer, Electric)	0	0	0	0	0	0
Hospital/medical/dental	0	0	0	0	0	0
Crop Damage	0	0	0	0	0	50,000.00
TOTAL	6835	0	0	5706	0	50,000.00

The entire County is vulnerable to the effects of heat wave Basted on People and past Crop Damage

EARTHQUAKE: BARTON COUNTY VULNERABILITY ASSESSMENT #6						
DEVELOPED LAND				UNDEVELOPED LAND		
	# of People	# of Buildings	Approx. Value	# of People	# of Buildings	Approx. Value
Residential	68	31	\$1,424,491.00	57	23	\$2,023,987.00
Commercial and Industrial		11	\$832,575.00	0	0	0
Municipal buildings		1	\$126,432.00	0	0	0
Road and Bridge		1	\$9,600.00	0	0	\$1,533.00
Police and Fire Buildings		1	\$26,023.00	0	0	0
Schools/colleges		1	\$1,461,592.00	0	0	0
Utilities (Water, Sewer, Electric)		1	\$71,863,450.00	0	0	\$287,817.00
Hospital/medical/dental		1	\$180,600.00	0	0	0
Other		0	0	0	0	0
TOTAL	68	48	\$85,391,331.00	57	23	\$2,312,337

The entire County is vulnerable to the effects of earthquake Basted on 1% affected

2008 BARTON COUNTY HAZARD MITIGATION PLAN

DAM FAILURE: BARTON COUNTY VULNERABILITY ASSESSMENT #7						
DEVELOPED LAND				UNDEVELOPED LAND		
	# of People	# of Buildings	Approx. Value	# of People	# of Buildings	Approx. Value
Residential	20	10	\$457,300.00	0	0	0
Commercial and Industrial		0	0	0	0	0
Municipal buildings		0	0	0	0	0
Road and Bridge		0	0	0	0	0
Police and Fire Buildings		0	0	0	0	0
Schools/colleges		0	0	0	0	0
Utilities (Water, Sewer, Electric)		0	0	0	1	0
Hospital/medical/dental		0	0	0	0	0
Other		0	0	0	0	0
TOTAL	20	10	\$457,300.00	0	0	0

The dam presenting the highest threat to life and property is located in the City of Lamar. The other dams present a low threat to life and property due to their agriculture use and rural locations. Less than 10 buildings affected

WILDFIRES: BARTON COUNTY VULNERABILITY ASSESSMENT #8						
DEVELOPED LAND				UNDEVELOPED LAND		
	# of People	# of Buildings	Approx. Value	# of People	# of Buildings	Approx. Value
Residential	683	311	\$14,244,912	570	229	\$20,239,874
Commercial and Industrial		111	\$8,325,749		0	0
Municipal buildings		2	\$1,264,324		0	0
Road and Bridge		2	\$96,000		0	\$15,333
Police and Fire Buildings		1	\$260,235		0	0
Schools/colleges		1	\$14,615,921		0	0
Utilities (Water, Sewer, Electric)		1	\$718,634,500		1	\$2,878,166
Hospital/medical/dental		1	\$91,800,000		0	0
Other		0	0		0	0
TOTAL	683	430	\$849,241,641	570	230	\$23,123,374

The entire County is vulnerable to the threat of wildfires. Based on 10% affected

WORKSHEET #2: BARTON COUNTY VULENRABILITY SUMMARY

ALL BARTON COUNTY HAZARD AREAS	Total Incorporated Land (Urban)			Total Unincorporated Land (Rural)		
	Total Number of People	Total Number of Buildings	Approximate Value (in dollars)	Total Number of People	Total Number of Buildings	Approximate Value (in Dollars)
Residential	6835	3115	\$142,449,123	5706	2294	\$202,398,744
Commercial and Industrial	3458	1109	\$83,257,490	0	0	0
Municipal buildings	60	19	\$12,643,240	0	0	0
Road and Bridge	0	16	\$960,000	12	0	\$153,333
Police and Fire Buildings	96	4	\$2,602,351	0	0	0
Schools/Colleges	2227	9	\$146,159,210	0	0	0
Utilities (Water, Sewer, Electric)	150	15	\$7,186,345,000	20	2	\$28,781,666
Hospital/medical/dental	75	3	\$918,000,000	0	0	0
Other	0	0	0	0	0	0
TOTAL		4,288	\$8,492,416,414		2,296	\$231,233,744

SECTION 3

CITY/COUNTY CAPABILITY ASSESSMENT

Mitigation Management Policies

The Barton County Commission, Barton County Sheriff's Department and Municipal Police and Fire departments are in charge of the preparation of emergency or disastrous events. These duty includes the writing of an Emergency Operations Plans, coordinating intergovernmental emergency response and preparedness agencies, and implementing measures identified in the Emergency Operations Plans that increase preparedness and response times. The joint communication between the agencies generally encourages cooperation between jurisdictions on all disaster response and preparedness.

Existing Plans

The Barton County Hazard Mitigation Plan identifies facilities of specific importance that require special protection and/or attention in case of a hazardous event. The plan promotes and maintains mutual assistance agreements among the various and usually overlapping agencies, the agencies participates in exercises and drills to maintain awareness, develops procedures to circumvent transportation and utility closures, and identifies vulnerability with the existing civic infrastructure

Mitigation Programs

The majority of Hazard Mitigation Planning emphasizes on floodplain management regulations and the participation in the National Flood Insurance Program (NFIP). As identified in the Community Profile Section of this plan, not every municipalities and incorporated areas have floodplain regulations. Other mitigation measures conducted throughout Barton County include:

- School students have received moderate training about hazards and emergency programs, conducting drills and organizing information intensive awareness. The average citizen lacks this training in hazard and emergency safety and common sense. The public sector has received substantial training due to exposure and exercises.
- As of the May 2003 tornadoes, awareness to the susceptibility and unpredictability of natural hazards, particularly tornados occurrences throughout the County, has increased the preparedness and response of residents of Barton County.

Capabilities (Organization, Staffing, Training)

The Capability of emergency response, fire protection, law enforcement, and emergency medical services are outlined in the Community Profile Section of this Hazard Mitigation Plan.

The Emergency Operations Center of Barton County 911 located in Lamar is in congruence with FEMA EOC standards. . Cities and the County have mobile and fixed communication abilities to coordinate the scene of an emergency. .

There is adequate fire, police, rescue, mass care, emergency medical, and information equipment is available to city and County agencies. The City of Joplin, MO to the south is a regional medical center, and there are substantial medical response services available in these regions.

The directors/supervisors of the different agencies have received training in professional development, emergency response planning, emergency response operations, exercises, disaster response and recovery, and disaster mitigation. Emergency response personnel, EOC staff, and volunteer staff have also received adequate training in emergency response. Overall, there have been limited training, education, and awareness initiatives for Hazard Mitigation.

Responsibilities and Authorities

City and County governments should have the following:

- The legal basis for authorization to order mandatory evacuation, redirect funds for emergency use, order a curfew, and commandeer facilities and/or equipment and materials;
- Authorized lines of succession for the chief elected officials with the to initiate necessary emergency activities;
- Substantially safeguarded vital records, although limited for records needed to reconstitute local government;

- A substantial analysis of the possible impacts of potential disasters;
- A multi-hazard emergency operations plan;
- An Emergency Alert System approved by the Federal Communications Commission;
- Limited completion of mutual aid agreements with neighboring jurisdictions; and
- Substantial protection of people with special needs.

Intergovernmental and Interagency Coordination

Representatives from the Barton County Commission, Barton County Sheriff's Department and Municipal Police and Fire departments meet periodically and serve to sustain coordination and responsibility among fire, law enforcement, emergency medical, and public health officers from incorporated areas and adjacent jurisdictions.

Vulnerability Assessment Overview

The local governments and County are committed to a Hazard Mitigation Program by their passage of resolutions approving this planning document. Through the course of the planning process, stakeholders have been educated at the dangers and the opportunities that this planning process will bring to the region to reduce loss of life and property.

In general, the only hazard mitigation policies of relevance to this hazard mitigation plan are floodplain ordinance in place at a local and county level, and the adherence to no-burning bans during certain periods of the dry season. Most of these burning bans pertain directly to Clean Air Act regulations, but are relevant to the mitigation of wildfires.

Vulnerability Assessment of County Policies and Development Trends

Commitments to a Comprehensive Mitigation Program

Barton County has a history of striving to protect the life and property of the public. In the aftermath of the May 4, 2003 tornados, which struck the neighboring Counties, the county has strengthened mitigation measures and policies, along with response coordination. On a comprehensive basis, the county has developed a Hazard Mitigation Plan that includes mitigation measures for all natural hazards.

County Laws, Regulations and Policies Related to Development in Hazard Prone Areas

The Barton County is discussing the possibility of creating a Floodplain ordinance to protect the general welfare and health of county residents and visitors. The ordinance was designed to safeguard health, safety, and property in times of flood by regulating construction in the floodplain.

Barton County maintains a septic ordinance to protect the health, safety and welfare of its residents.

Several communities have storm water regulations that are designed to minimize the negative effects of storm water runoff caused by development. The regulations outline proper mitigation measures for erosion, detention, discharge, and conveyance of storm water.

County Laws, Regulations and Policies Related to Hazard Mitigation in General

Barton County is discussing the possibility of creating a floodplain ordinance to safeguard health, safety, and property of their residents by regulating construction and development in the floodplains. The county has developed a Hazard Mitigation Plan that addresses the general concerns of mitigation.

How Local Risk Assessments Are Incorporated and Prioritized Into Local Planning

Flash flooding is the most reoccurring impact on the County, and an independent floodplain regulation exists among the body of other regulations. Community storm-water regulations have been written in several jurisdictions to accommodate storm runoff.

Barton County also recognizes the danger and economic impacts of sever storms, tornados, and severe winter storms. Clearing snow is a moderate priority for the County due to a lack of extensive and prolonged winter weather conditions in the area.

Current Criteria Used To Prioritize Mitigation Funding

Funding for mitigation measures is based on the combination of predicted damage to property and death/injury impacts. For example, certain areas are traditionally prone to flash flooding. Most natural disasters occur sporadically, like tornadoes, and the repetitive loss is hard to concentrate into specific geographical areas like a floodplain. Mitigation has not extensively been used in the area, but initiatives have been based on a case-by-case applicant basis.

Mitigation also becomes a concern with the rate, density, and intensity of development in the County. With the expansion of city limits and population areas, growth can stretch the city and county infrastructure and emergency measures.

Integration of Hazard Mitigation with the City/County Departments' Plans

Representatives from the Barton County Commission, Barton County Sheriff's Department and Municipal Police and Fire departments and community leaders have recognized the Hazard Mitigation Plan; some communities have considered the implementation of hazard mitigation strategies when updating city codes and ordinances. Their intentions are reflected in the city building and development, street, signage, land use, and floodplain codes and ordinances.

How the County Determines Cost Effectiveness of Mitigation Programs

Since Hazard Mitigation Funds are delegated on a case-by-case basis, it is difficult to calculate the cost-effectiveness of mitigation programs other than on a case-by-case basis. Mitigation funds are calculated through the scope of damages, estimated savings in future hazardous events, and the probability of future hazard to human life and property.

Mitigation Funding Options Including Current and Potential Sources of Federal, State, Local, Private

Barton County and the incorporated areas within have historically relied upon disaster declarations for financial and logistical support in case of large-scale disasters. Upon such declarations, sources of funding have included FEMA, SEMA, Missouri DNR, and Missouri CDBG, along with assistance from insurance and other private funding sources.

Mitigation programs are implemented on a case-by-case basis where the applicant submits their request in writing to the Missouri State Emergency Management Agency. Usually, the state agrees to fully or partially fund the initiative and begins an application process, or directs the applicant to other funding through governmental agencies. Private organizations have been integral in the hazard mitigation process in that they benefit by partially funding sirens, stream cleanups, or radio-weather warning system for positive Public Relations goals.

How County Government Meets Requirements for Hazard Mitigation Funding Programs

Barton County is currently developing a countywide Hazard Mitigation Plan that will allow the county to apply for hazard mitigation funding.

Recommendations for Improvement

The HSTCC recommends that mutual aid agreements among neighboring jurisdictions. These agreements will improve the capabilities of Barton County and their emergency operations. Additional warning sirens, community tornado shelters, adopt and implement storm water regulations, enforce and update floodplain regulations and increase floodplain buyout programs. Northeastern Barton County is located in Region B along with central, east-central Missouri and has moderate drought susceptibility due to required well depths, and irrigation wells are very expensive. The topography is generally unsuitable for row-crop irrigation.

The rest of the county is located in Region C, along with northern, west-central Missouri and St. Louis County, which have severe drought vulnerability. Surface water sources usually become inadequate during extended drought. The groundwater resources are normally poor, and typically supply enough water only for domestic needs. Irrigation is generally not feasible.

When irrigation is practical, groundwater withdrawal may affect other uses. Surface water sources are used to supplement irrigation supplied by groundwater sources. HSTCC recommends that drought resistant farming crops and techniques, be encouraged to implement design recommendations to reduce and limit impervious surfaces, which create runoff and flash floods, and generally increase overall awareness and education for public safety.

City/Town/Village Policies and Development Trends

Every incorporated area has near similar potential probability for tornado/severe thunderstorms; sever winter weather, heat wave, drought, wildfires, and earthquakes as the County. Communities with National Flood Insurance and that lie within the floodplains of the County as designated by the State Emergency Management Agency are the City of Lamar.

Communities that lie in the floodplain are City of Lamar, City of Lamar Heights, City of Golden City, and the City of Mindenmines. These communities are prone to more hazardous flood events than others because of their proximity to the floodplain.

There are no communities in Barton County in direct danger of a dam failure. However, a failure at the dam located in the City of Lamar could have an economic impact on the community.

SECTION 4

INTRODUCTION TO MITIGATION

Definition of Mitigation

Mitigation is defined as sustained action that reduces or eliminates long-term risk to people and property from natural hazards and their effects. It describes ongoing effort at Federal, State, local and individual levels to lessen the impact of disasters upon our families, homes, communities, and economy.

Mitigation includes not only avoiding the development of vulnerable sections of the community, but also making existing development in hazard prone areas safer. Incorporating mitigation into decisions related to our community's growth could result in a safer, more resilient community, and one that is more attractive to new facilities and businesses.

Categories of Mitigation

The State of Missouri is subject to many forms of natural hazards: floods, tornadoes, winter storms, landslides, earthquakes, droughts, winter storms and wildfires. All-hazard mitigation planning is called the process associated with devising strategies needed to mitigate the damages associated with this wide variety of potential natural disasters.

Since there are a wide variety of natural disasters to consider in hazard mitigation planning, there are many categories of mitigation. They are Prevention, Property Protection, Natural Resource Protection, Emergency Services, Structural Projects, and Public Information.

Prevention measures keep a hazard risk problem from getting worse. They ensure that future development does not increase hazard losses. Communities can achieve significant progress toward hazard resistance through prevention measures. This is particularly a threat in areas that have not been developed or where capital investment has not been substantial. By using prevention measures, future development can be guided away from hazards, while maintaining other community goals such as economic development and quality of life through planning and zoning, open space preservation, land development regulations, and/or storm water management.

Property protection measures modify buildings subject to hazard risk, or their surroundings, rather than to prevent the hazard from occurring. A community may find these to be inexpensive measures because often they are implemented or cost shared with property owners. These measures directly protect people and property at risk. Acquisition is the public procurement and management of lands that are vulnerable to damage from hazards. Relocation is the permanent evacuation of form prone areas through movement of existing hazard prone development and population to safer areas. Rebuilding includes modifying structures to reduce damage by future hazard events. Flood proofing involves protecting a flood prone building using one or more of several different methods to redirect or divert floodwaters.

Natural resources protection measures reduce the intensity of hazard effects as well as to improve the quality of the environment and wildlife habitats. Parks, Recreation, and Conservation agencies or organizations usually implement these activities. Examples of natural resource protection include Erosion and Sediment Control and Wetlands Protection.

Emergency services measures protect people before and after a hazard event. Most counties and many cities have emergency management offices to coordinate warning, response, and recovery during disaster. Emergency services include Warning, Capacity of Response (not a mitigation measure), Critical Facilities Protection, and Health and Safety Maintenance.

Structural measures directly protect people and property at risk. They are called "structural" because they involve construction of man-made structures to control hazards. Structural projects for flood control may include Reservoirs, Levees, Floodwalls, and Seawalls, Diversions, Channel Modifications, and Storm Sewers. A structural solution for landslides is the construction of a debris basin.

Public Information activities inform and remind people about hazardous areas and the measures necessary to avoid potential damage and injury. Public Information activities for mitigation are directed toward property owners, potential property owners, business owners, and visitors (tourists). A few examples of public information activities to achieve mitigation are providing hazard maps and other hazard information, outreach

programs that provide hazard and mitigation information to people, real estate disclosure, information in the public library or a library developed specifically for mitigation information, available technical assistance, and school age and adult educations programs (pamphlets, flyers, drills).

Mitigation versus Preparedness, Response and Recovery

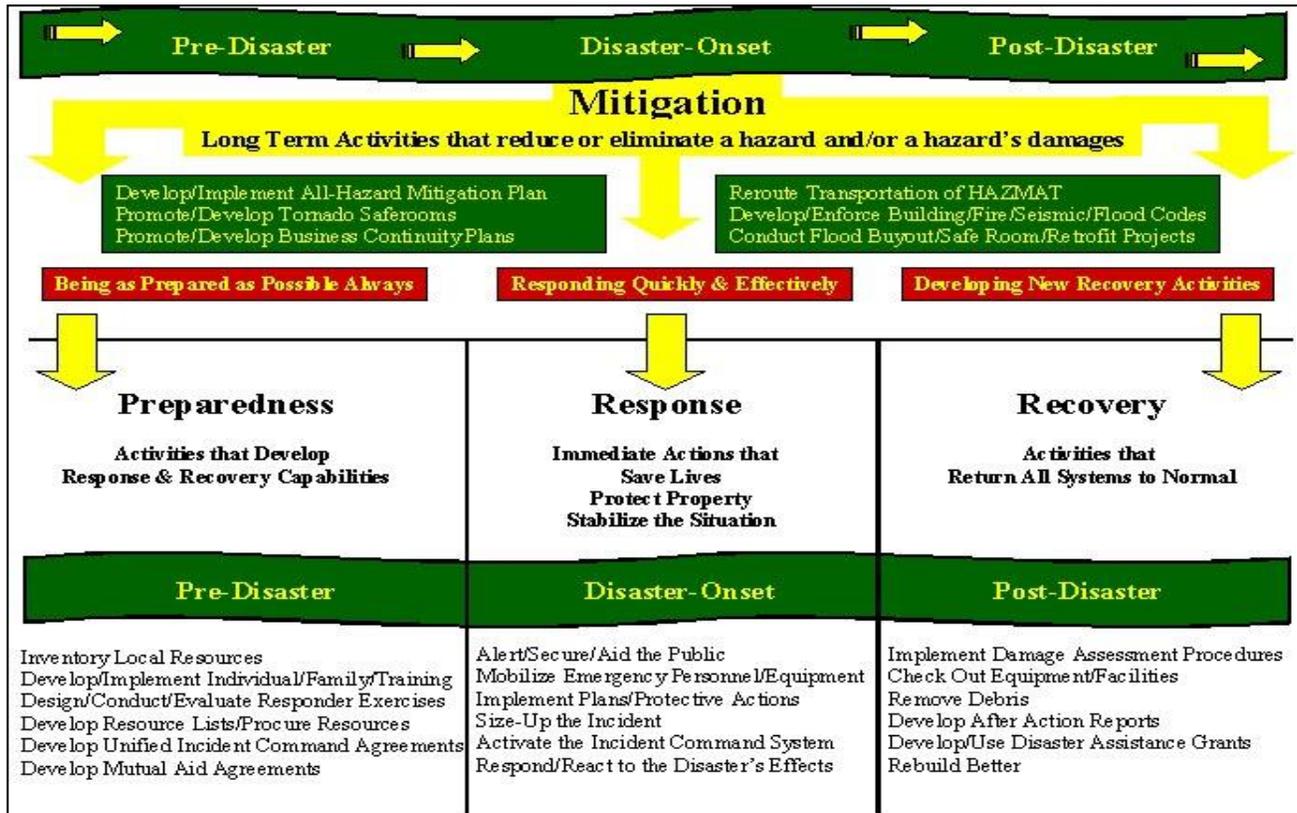
Preparedness, Response, and Recovery are not mitigation measures. Preparedness activities are those that develop response and recovery capabilities. Response activities are immediate actions that save lives, protect property, and stabilize the situation. Recovery is activities that return all systems to normal. Mitigation is long-term activities that reduce or eliminate a hazard and/or its subsequent damages.

Planners must keep in mind that mitigation includes long-term activities that reduce or eliminate a hazard's damages. Building codes, floodplain management, tornado safe rooms, flood buyouts, and planning are examples of mitigation. Preparedness activities are designed to develop individual and community capabilities to respond to and recover from disasters. Preparedness activities include training, exercises and stocking emergency supplies. Response actions include those immediate activities that save lives, protect property and stabilize the situation when disaster strikes. The activities that return the community to normal or pre-disaster conditions fall under the heading of recovery. Hazard Mitigation Planning offers many community benefits. Principally, it can save lives and property, meet the needs of the community, achieve multiple objectives, reduce vulnerability of future hazards, guide and speed post disaster recovery, enhances funding opportunities, and promotes public participation.

Communities can save lives and reduce property damage from natural hazards through mitigation actions, such as keeping families and homes out of harm's way. Each community is different in terms of its economics, size, geography, governance, demography, land uses, and hazards. Therefore, each community's mitigation plan will vary to some degree. Mitigation planning identifies problems and solutions that are specific to your community. Developing a multi objective plan that can help the community to better sustain itself will find the most appropriate solutions, address multiple problems with a single solution, maintain or improve local environmental and economic integrity, and demonstrate commitment to improving community health and safety. With a mitigation strategy in place, the community will be better prepared to take steps that will permanently reduce the risk of future losses for individuals and businesses. It is important to remember that individuals and business owners forge their power to reduce vulnerability to damage if we build the community without regard to natural hazards or if we rebuild after a disaster "just like it was before".

The planning process guides post disaster recovery in many ways. By identifying and ranking before the next disaster, the community will be in a better position to obtain post disaster funding because much of the background work necessary for applying for Federal funding will already be completed. The mitigation process works using various possible sources of federal, state, and local project funding. Successful completion of the Hazard Mitigation Plan can also fulfill the planning requirements for several federal programs such as the Hazard Mitigation Grant Program (only post-disaster mitigation grant program), the Pre-Disaster Mitigation (PDM) grant program, the Flood Mitigation Assistance (FMA) program, and the Community Rating System (CRS) program. This plan also may qualify the community for recognition for other federal programs such as the National Weather Service's Storm Ready program. Finally, the planning process promotes public participation by generating ideas for solutions ensuring recognition and local ownership of the plan, and providing groups and individuals concerned about the potential effects of disasters many opportunities to participate in problem solving and in plan implementation.

**Figure 19.0
Mitigation as Preparedness, Response, and Recovery**



SECTION 5 COUNTY HAZARD MITIGATION GOALS, OBJECTIVES, STRATEGY, AND COORDINATION

Mitigation Goals, Objectives, and Actions

The Barton County Hazard Mitigation Plan identifies five goal statements. Each goal is meant to be general and broad in nature, and can only be achieved through the long-term implementation of more specific objectives. It is intended that each Goal listed below will be more specifically addressed and realized through the implementation of short-term mitigation objectives and actions. These goals, objectives, and actions were developed through the planning process and the involvement of all local officials and stakeholders that participated.

The Mitigation Actions proposed for Barton County to undertake are listed on the pages that follow. Each has been designed to achieve the goals and objectives identified through this Hazard Mitigation Plan. Each proposed action is tailored to the mitigation technique category, the hazard it is designed to mitigate, and the objective it is intended to achieve. It is crucial for these mitigation actions to be understood as short-term, specific measures to be undertaken by Barton County. It is expected that this portion of the overall Hazard Mitigation Plan will be used as the primary indicator of the progress of the plan that will be routinely updated and revised through future planning efforts. There were no actions that were eliminated in this planning process.

MITIGATION GOALS

GOAL 1: Increase internal capabilities to mitigate the effects of natural hazards.

GOAL 2: Enhance existing or design new policies that will reduce the potential damaging effects of hazards without hindering other community goals through punitive constraints.

GOAL 3: Protect Barton County's most vulnerable populations, buildings, and critical facilities through the implementation of cost-effective and technically feasible mitigation projects.

GOAL 4: Protect public health, safety, and welfare by increasing the public awareness of existing hazards and by fostering both individual and public responsibility in mitigating risks due to those hazards.

GOAL 5: Improve Public Awareness through the coordination of all educational programs that promote the education of probable natural disasters and their probable severity in Barton County and those specific to each community.

MITIGATION OBJECTIVES & ACTIONS

GOAL 1: Increase internal capabilities to mitigate the effects of natural hazards.

Objective 1.1: Promote the future participation in FEMA's NFIP/CRS rating system through enhanced floodplain management.

Action 1.1.1: Revise Floodplain Ordinances to comply with the new SEMA and FEMA standards.

Action 1.1.2: Regularly calculate and document the amount of flood prone property that is preserved as open space for potential credit points under the Community Rating System (CRS).

Objective 1.2: Enhance the County's capability to conduct hazard risk assessments, demonstrate funding needs, and track mitigation activities throughout the county.

Action 1.2.1: Create a Countywide Hazard Mitigation Committee to coordinate and prioritize goals, objectives, and actions identified in this plan and its subsequent updates.

Action 1.2.2: Incorporate a Geographic Information System (GIS) to maintain current building and parcel data for purposes of conducting more detailed hazard risk assessments, for tracking permitting and land use patterns in hazard prone areas.

Objective 1.3: Ensure that current emergency services are adequate to protect public health and safety.
Action 1.3.1: Conduct an inventory survey for the county's emergency response services to identify any existing needs or shortfalls in terms of personnel, equipment or required resources.

GOAL 2: Enhance existing or design new policies that will reduce the potential damaging effects of hazards without hindering other community goals through punitive constraints

Objective 2.1: Increase control over development in the floodplain to ensure lives and properties are not at risk to future flood conditions.

Action 2.1.1: Develop and adopt a "no-rise (in base flood elevation)" clause for Floodplain Ordinances.

Action 2.1.2: Develop Floodplain Ordinances to comply with the new SEMA and FEMA standards.

Action 2.1.3: Research and design an appropriate stream buffer ordinance to further protect Barton County's water resources and to limit future flood damage adjacent to waterways.

Objective 2.2: Preserve the natural and beneficial functions of the county's floodplains and wetlands through continued support of natural resource protection policies and by discouraging growth in environmentally sensitive areas.

Action 2.2.1: Incorporate the inspection and management of hazardous natural debris into the County's routine drainage system maintenance process.

Action 2.2.2: Coordinate and conduct stream cleanup programs in populated flood hazard prone areas.

Action 2.2.3: Promote a policy for slope stabilization efforts to prevent erosion and slippage of hills located near populated areas either up or down slope.

Objective 2.3: Ensure that new construction is completed using severe weather/ high wind resistant design techniques and materials in accordance with the minimum requirements of the International Building Codes that will limit damage caused by high winds and reduce the amount of wind borne debris.

Action 2.3.1: Promote a mutual agreement among the County and all incorporated areas that establishes the minimum requirements of the International Building Codes.

Objective 2.4: Increase the amount and range of community severe weather/ tornado community shelters and private safe rooms throughout the County.

Action 2.4.1: Require community tornado shelters for any new manufactured/mobile home park.

Action 2.4.2: Promote community shelters in existing manufactured/mobile home parks

GOAL 3: Protect Barton County's most vulnerable populations, buildings, and critical facilities through the implementation of cost-effective and technically feasible mitigation projects

Objective 3.1: Maximize the use of available hazard mitigation grant programs to protect the County's most vulnerable populations and structures.

Action 3.1.1: Increase Warning System coverage to the most feasible extent.

Action 3.1.2: Investigate the feasibility and funding availability for the construction of Structural Projects to alleviate future flood hazard conditions.

Action 3.1.3: Seek funding to complete a storm water drainage study/plan for needy communities.

Objective 3.2: Decrease the number of properties located within the FEMA designated 100 year floodplain by 25% by the year 2020.

Action 3.2.1: Acquire and preserve parcels of land located within the FEMA designated 100 year floodplain from willing and voluntary property owners.

Action 3.2.2: Contact owners with property located within the FEMA designated 100 year floodplain and provide information about Federal Flood Mitigation Programs.

Objective 3.3: Ensure that all vital/ critical facilities are protected from the effects of natural hazards to the maximum extent possible.

Action 3.3.1: Establish a local reserve fund for repairing and/ or incorporating hazard mitigation measures for public facilities and infrastructure damaged by natural hazards.

Action 3.3.2: Identify the County's most at risk key community facilities, and execute the potential mitigation techniques for protecting each facility to the maximum extent possible.

GOAL 4: Protect public health, safety, and welfare by increasing the public awareness of existing hazards and by fostering both individual and public responsibility in mitigating risks due to those hazards

Objective 4.1: Increase the level of knowledge and awareness for Barton County residents on the hazards that threaten the area.

Action 4.1.1: Coordinate seasonal educational materials on individual and family preparedness/mitigation measures, and display and distribute routinely to county citizens and officials alike.

Action 4.1.2: Annually host a public hazards workshop for the residents of Barton County, in combination with another large-scale community/regional festival or event.

Action 4.1.3: Promote dam safety programs at community/regional festivals and events.

Action 4.1.4: Promote earthquake awareness programs at community/regional festivals and events.

Objective 4.2: Increase the number of county residents that maintain an active NFIP flood insurance policy by 10% by the year 2020.

Action 4.2.1: Advertise and promote the availability of flood insurance to county property owners by direct mail annually.

Action 4.2.2: Distribute an educational flyer targeting NFIP policyholders on the Increase Costs of Compliance (ICC) coverage, to be disseminated following a flood event that results in substantial damage determinations by the county.

GOAL 5: Improve Public Awareness through the coordination of all educational programs that promote the education of probable natural disasters and their probable severity in Barton County and those specific to each community

Objective 5.1: Educate property owners, financial institutions, and County residents on the affordable, individual mitigation and preparedness measures that can be taken before the next hazard event.

Action 5.1.1: Coordinate seasonal educational materials on individual and family preparedness/mitigation measures, and display and distribute routinely to county citizens and officials alike.

Action 5.1.2: Annually host a public hazards workshop for the residents of Barton County, in combination with another large-scale community/regional festival or event.

Evaluation

Table 18.1 provides a summary of the County’s proposed mitigation actions. The actions were reviewed according to the STAPLEE criteria. Table 18.0 explains the STAPLEE criteria. The asterisks in the columns to the right of Table 18.1 indicate the action would have a positive effect.

STAPLEE	Criteria Explanation
S – Social	Mitigation actions are acceptable to the community if they do not adversely affect a particular segment of the population, do not cause relocation of lower income people, and if they are compatible with the community’s social and culture values.
T - Technical	Mitigation actions are technically most effective if they provide long-term reduction of losses and have minimal secondary adverse impacts.
A - Administrative	Mitigation actions are easier to implement if the jurisdiction has the necessary staffing and funding.
P - Political	Mitigation actions can truly be successful if all stakeholders have been offered and opportunity to participate in the planning process and id there is public support for the action.
L - Legal	It is critical that the jurisdiction of implementing agency have the legal authority to implement and enforce a mitigation action.
E - Economical	Budget constraints can significantly deter the implementation of mitigation actions. Hence, It is important to evaluate whether an action is cost-effective, as determined by a cost benefit review, and possible to fund.
E - Environmental	Sustainable mitigation actions that do not have and adverse effect on the environment, that comply with Federal, State , and local environmental regulations, and that are consistent with the community’s environmental goals , have mitigation benefits while being environmentally sound.

Barton County Proposed Mitigation Action Evaluation							
Proposed Action	Criteria						
	S	T	A	P	L	E	E
Objective 1.1: Promote the County’s future participation in FEMA’s NFIP/CRS rating system through enhanced floodplain management.							
<i>Action 1.1.1:</i> Revise the county’s Floodplain Ordinances to be in compliance with the new SEMA and FEMA standards.	*	*	*	*	*	*	*
<i>Action 1.1.2:</i> Regularly calculate and document the amount of flood prone property that is preserved as open space for potential credit points under the Community Rating System (CRS).	*		*		*	*	*
Objective 1.2: Enhance the County’s capability to conduct hazard risk assessments, demonstrate funding needs, and track mitigation activities throughout the county.							
<i>Action 1.2.1:</i> Create a Countywide Hazard Mitigation Committee to coordinate and prioritize goals, objectives, and actions identified in this plan and its subsequent updates.	*		*	*			
<i>Action 1.2.2:</i> Incorporate a Geographic Information System (GIS) to maintain current building and parcel data for purposes of conducting more detailed hazard risk assessments, for tracking permitting and land use patterns in hazard prone areas.	*		*				*
Objective 1.3: Ensure that current emergency services are adequate to protect public health and safety.							
<i>Action 1.3.1:</i> Conduct an inventory survey for the county’s emergency response services to	*			*			*

identify any existing needs or shortfalls in terms of personnel, equipment or required resources.								
Objective 2.1: Increase the County’s control over development in the floodplain to ensure lives and properties are not at risk to future flood conditions.								
<i>Action 2.1.1:</i> Develop and adopt a “no-rise (in base flood elevation)” clause for the County’s Floodplain Ordinances.		*		*				
<i>Action 2.1.2:</i> Develop Floodplain Ordinances to be in compliance with the new SEMA and FEMA standards.	*	*	*	*	*	*	*	*
<i>Action 2.1.3:</i> Research and design an appropriate stream buffer ordinance to further protect Barton County’s water resources and to limit future flood damage adjacent to waterways.		*		*				
Objective 2.2: Preserve the natural and beneficial functions of the county’s floodplains and wetlands through continued support of natural resource protection policies and by discouraging growth in environmentally sensitive areas.								
<i>Action 2.2.1:</i> Incorporate the inspection and management of hazardous natural debris into the County’s routine drainage system maintenance process.	*		*		*			*
<i>Action 2.2.2:</i> Coordinate and conduct stream cleanup programs in populated flood hazard prone areas				*				*
<i>Action 2.2.3:</i> Promote a policy for slope stabilization efforts to prevent erosion and slippage of hills located near populated areas either up or down slope.	*	*						*
Objective 2.3: Ensure new construction is completed using severe weather/ high wind resistant design techniques and materials in accordance with the minimum requirements of the International Building Codes that will limit damage caused by high winds and reduce the amount of wind borne debris.								
<i>Action 2.3.1:</i> Promote a mutual agreement among the County and all incorporated areas that establishes the minimum requirements of the International Building Codes.		*	*	*				*
Objective 2.4: Increase the amount and range of community severe weather/ tornado community shelters and private safe rooms throughout the County.								
<i>Action 2.4.1:</i> Require community tornado shelters for any new manufactured/mobile home park.	*	*		*				
<i>Action 2.4.2:</i> Promote community shelters in existing manufactured/mobile home parks.	*	*		*				
Objective 3.1: Maximize the use of available hazard mitigation grant programs to protect the County’s most vulnerable populations and structures.								
<i>Action 3.1.1:</i> Increase Warning System coverage to the most feasible extent.	*							*
<i>Action 3.1.2:</i> Investigate the feasibility and funding availability for the construction of Structural Projects to alleviate future flood hazard conditions.	*							*
<i>Action 3.1.3:</i> Seek funding to complete a storm water drainage study/plan for needy communities	*	*		*				*
Objective 3.2: Decrease the number of properties located within the FEMA designated 100 year Floodplain by 25% by the year 2020.								
<i>Action 3.2.1:</i> Acquire and preserve parcels of land located within the FEMA designated 100 year floodplain from willing and voluntary property owners.	*	*	*	*	*	*	*	*
<i>Action 3.2.2:</i> Contact owners with property located within the FEMA designated 100 year floodplain and provide information about Federal Flood Mitigation Programs.	*		*					
Objective 3.3: Ensure that all vital/ critical facilities are protected from the effects of natural hazards to the maximum extent possible.								
<i>Action 3.3.1:</i> Establish a local reserve fund for repairing and/ or incorporating hazard mitigation measures for public facilities and infrastructure damaged by natural hazards.	*		*	*		*		
<i>Action 3.3.2:</i> Identify the County’s most at risk key community facilities, and execute the potential mitigation techniques for protecting each facility to the maximum extent possible.	*		*		*	*		
Objective 4.1: Increase the level of knowledge and awareness for Barton County residents on the hazards that threaten the area.								
<i>Action 4.1.1:</i> Coordinate seasonal educational materials on individual and family preparedness/mitigation measures, and display and distribute routinely to county citizens and	*	*	*	*		*	*	*

officials alike.								
<i>Action 4.1.2:</i> Annually host a public hazards workshop for the residents of Barton County, in combination with another large-scale community/regional festival or event.	*	*	*	*		*	*	
Objective 4.2: Increase the number of county residents that maintain an active NFIP flood insurance Policy by 10% by the year 2020.								
<i>Action 4.2.1:</i> Advertise and promote the availability of flood insurance to county property owners by direct mail annually.	*		*	*		*		
<i>Action 4.2.2:</i> Distribute an educational flyer targeting NFIP policyholders on the Increase Costs of Compliance (ICC) coverage, to be disseminated following a flood event that results in substantial damage determinations by the county.	*		*	*		*		
<i>Action 4.1.3:</i> Promote dam safety programs at community/regional festivals and events	*	*	*	*	*	*	*	*
<i>Action 4.1.4:</i> Promote earthquake awareness programs at community/regional festivals and events	*	*	*	*	*	*	*	*
Objective 5.1: Educate property owners, financial institutions, and County residents on the affordable, individual mitigation and preparedness measures that can be taken before the next hazard event.								
<i>Action 5.1.1:</i> Coordinate seasonal educational materials on individual and family preparedness/mitigation measures, and display and distribute routinely to county citizens and officials alike.	*	*	*	*	*	*	*	*
<i>Action 5.1.2:</i> Annually host a public hazards workshop for the residents of Barton County, in combination with another large-scale community/regional festival or event.	*	*	*	*	*	*	*	*

Prioritization

Table 18.2 provides a summary of all actions that were evaluated and prioritized by Barton County Hazard Mitigation Committee and all local officials and stakeholders that participated. This is the 5-Year Mitigation Action Plan for accomplishing goals and objectives.

Years	High Risk Hazards		Moderate Risk Hazards			Low Risk Hazards		
	Flooding	Tornados/ Severe Storms	Severe Winter Storms	Drought	Heat Wave	Wildfires	Earthquakes	Dam Failure
1	1.1.1, 1.1.2, 1.2.1, 1.3.1, 3.2.2, 4.1.1, 4.1.2, 4.2.1, 4.2.2, 5.1.1, 5.1.2	1.2.1, 1.3.1, 4.1.1, 4.1.2, 5.1.1, 5.1.2	1.2.1, 1.3.1, 4.1.1, 4.1.2, 5.1.1, 5.1.2	1.2.1, 1.3.1, 4.1.1, 4.1.2, 5.1.1, 5.1.2	1.2.1, 1.3.1, 4.1.1, 4.1.2, 5.1.1, 5.1.2	1.2.1, 1.3.1, 4.1.1, 4.1.2, 5.1.1, 5.1.2	1.2.1, 1.3.1, 4.1.1, 5.1.1, 5.1.2	1.2.1, 1.3.1, 4.1.1, 5.1.1, 5.1.2
2	2.1.1, 3.1.3, 3.2.2, 4.1.1, 4.1.2, 4.2.1, 4.2.2, 5.1.1, 5.1.2	2.4.1, 2.4.2, 4.1.1, 4.1.2, 5.1.1, 5.1.2	2.4.1, 2.4.2, 4.1.1, 4.1.2, 5.1.1, 5.1.2	4.1.1, 4.1.2, 5.1.1, 5.1.2	4.1.1, 4.1.2, 5.1.1, 5.1.2	4.1.1, 4.1.2, 5.1.1, 5.1.2	3.3.2, 4.1.1, 4.1.4, 5.1.1, 5.1.2	3.3.2, 4.1.1, 4.1.3, 5.1.1, 5.1.2
3	2.1.2, 1.2.2, 2.2.1, 3.1.1, 3.2.2, 4.1.1, 4.1.2, 4.2.1, 4.2.2, 5.1.1, 5.1.2	1.2.2, 3.1.1, 4.1.1, 4.1.2, 5.1.1, 5.1.2	1.2.2, 3.1.1, 4.1.1, 4.1.2, 5.1.1, 5.1.2	1.2.2, 4.1.1, 4.1.2, 5.1.1, 5.1.2	1.2.2, 4.1.1, 4.1.2, 5.1.1, 5.1.2	1.2.2, 4.1.1, 4.1.2, 5.1.1, 5.1.2	1.2.2, 4.1.1, 5.1.1, 5.1.2	1.2.2, 4.1.1, 5.1.1, 5.1.2
4	2.1.3, 2.2.2, 2.3.1, 3.2.2, 3.3.2, 4.1.1, 4.1.2, 4.2.1, 4.2.2, 5.1.1, 5.1.2	2.3.1, 3.3.2, 4.1.1, 4.1.2, 5.1.1, 5.1.2	2.3.1, 3.3.2, 4.1.1, 4.1.2, 5.1.1, 5.1.2	2.3.1, 3.3.2, 4.1.1, 4.1.2, 5.1.1, 5.1.2	2.3.1, 3.3.2, 4.1.1, 4.1.2, 5.1.1, 5.1.2	2.3.1, 3.3.2, 4.1.1, 4.1.2, 5.1.1, 5.1.2	4.1.1, 4.1.4, 5.1.1, 5.1.2	4.1.1, 4.1.3, 5.1.1, 5.1.2
5	2.2.3, 3.1.2, 3.2.1, 3.2.2, 3.3.1, 4.1.1, 4.1.2, 4.2.1, 4.2.2, 5.1.1, 5.1.2	3.3.1, 4.1.1, 4.1.2, 5.1.1, 5.1.2	3.3.1, 4.1.1, 4.1.2, 5.1.1, 5.1.2	3.3.1, 4.1.1, 4.1.2, 5.1.1, 5.1.2	3.3.1, 4.1.1, 4.1.2, 5.1.1, 5.1.2	3.3.1, 4.1.1, 4.1.2, 5.1.1, 5.1.2	3.3.1, 4.1.1, 5.1.1, 5.1.2	3.3.1, 4.1.1, 5.1.1, 5.1.2

Mitigation Action List and Evaluation

Barton County's mitigation actions promote and/or support the development of local hazard mitigation plans, projects and activities. Examples include encouraging local building codes, emergency operation plans, master plans, planning and zoning ordinances, floodplain ordinances, local disaster plans, local mitigation plans, and commercial/industrial plans. Certain hazards can impact incorporated areas more than the county as a whole, as a result the following matrix indicates which incorporated area could be specifically affected (or responsible for the action). County involvement is assumed for all actions. The incorporated areas are represented by a two letter code within the matrix. The following list indicates the code for each jurisdiction.

Bu = Burgess Md = Mindenmines
 Go = Golden City Lh = Lamar Heights
 Mi = Milford Li = Liberal
 La = Lamar A = Every incorporated area could be affected or involved

Action Number	Priority Rank	Area	Action	New, Revision, Ongoing	Probable Lead Organizer	Potential Funding Source	Evaluation/Monitoring
1.2.1	Action #1 (High)	A	Create a Countywide Hazard Mitigation Committee to coordinate and prioritize goals, objectives, and actions identified in this plan and its subsequent updates.	New	County EMA Director	Local	Create Committee
3.3.1	Action #2 (High)	A	Establish a local reserve fund for repairing and/or incorporating hazard mitigation measures for public facilities and infrastructure damaged by natural hazards.	New	County Commission, City officials	Local	Financial Records
1.3.1	Action #3 (High)	A	Conduct an inventory survey for the county's emergency response services to identify any existing needs or shortfalls in terms of personnel, equipment or required resources.	New	County EMA Director	Local	Complete Survey
2.4.1	Action #4 (High)	A	Require community tornado shelters for any new manufactured/mobile home park.	New	County EMA Director, City officials	Federal, State, Local	Inspection Records
2.4.2	Action #5 (High)	A	Promote community shelters in existing manufactured/mobile home parks.	New	County EMA Director, City officials	Federal, State, Local	Inspection Records
2.3.1	Action #6 (High)	A	Promote a mutual agreement among the County and all incorporated areas that establishes the minimum requirements of the International Building Codes.	New	County Commission, City officials	Local	Agreements Signed
1.2.2	Action #7 (High)	A	Incorporate a Geographic Information System (GIS) to maintain current building and parcel data for purposes of conducting more detailed hazard risk assessments, for tracking permitting and land use patterns in hazard prone areas.	New	County EMA Director, City officials	Local	Building Records
3.3.2	Action #8 (High)	A	Identify the county's most at risk key community facilities, and execute the potential mitigation techniques for protecting each facility to the maximum extent possible.	Ongoing	County Commission, City officials	Federal, State, Local	Complete Identification List
3.1.1	Action #9 (Medium)	A	Increase Warning System coverage to the most feasible extent.	New	County EMA Director	Federal, State, Local	System Assessment Report
2.1.1	Action #10 (Medium)	Md, La, Mi	Develop and adopt a "no-rise (in base flood elevation)" clause for the County's Floodplain Ordinances.	New	County Commission	Local	Adoption of Document
4.2.1	Action #11	Md, La,	Advertise and promote the availability of flood insurance to county property owners by direct	New	County EMA Director	Federal, State,	Material Distributed

	(Medium)	Mi	mail annually.			Local	
3.1.2	Action #12 (Medium)	An, La, Pi, No, So, Go	Investigate the feasibility and funding availability for the construction of Structural Projects to alleviate future flood hazard conditions.	Ongoing	County Commission, City officials	Federal, State, Local	Report Completed
3.1.3	Action #13 (Medium)	A	Seek funding to complete a storm water drainage study/plan for needy communities.	New	County Commission, City officials	Federal, State, Local	Amount of Funding Secured
3.2.1	Action #14 (Medium)	Md, La, Mi	Acquire and preserve parcels of land located within the FEMA designated 100 year floodplain from willing and voluntary property owners.	New	County Commission, City officials	Federal, State, Local	Number of Parcels Acquired
1.1.2	Action #15 (Medium)	Md, La, Mi	Regularly calculate and document the amount of flood prone property that is preserved as open space for additional credit points under the Community Rating System (CRS).	New	County EMA Director, City officials	Local	Acers Preserved
1.1.1, 2.1.2	Action #16 (Medium)	A	Revise the county's Floodplain Ordinances to be in compliance with the new SEMA and FEMA standards.	New	County EMA Director,	Local	Adoption of Ordinance
4.2.2	Action #17 (Low)	Md, La, Mi	Develop an educational flyer targeting NFIP policyholders on the Increase Costs of Compliance (ICC) coverage, to be disseminated following a flood event that results in substantial damage determinations by the county.	New	County EMA Director,	Federal, State, Local	Number of Flyers Distributed
2.2.1	Action #18 (Low)	A	Incorporate the inspection and management of hazardous natural debris into the County's routine drainage system maintenance process.	New	County EMA Director,	Local	Inspection Reports
3.2.2	Action #19 (Low)	A	Contact owners with property located within the FEMA designated 100 year floodplain and provide information about Federal Flood Mitigation Programs.	New	County EMA Director,	Local	Distribution Records
2.1.3	Action #20 (Low)	A	Research and design an appropriate stream buffer ordinance to further protect Barton County's water resources and to limit future flood damage adjacent to waterways.	New	County Commission, City officials	Local	Adoption of Ordinance
2.2.2	Action #21 (Low)	A	Coordinate and conduct stream cleanup programs in populated flood hazard prone areas.	Ongoing	County EMA Director	Local, Private	Attendance Records
2.2.3	Action #22 (Low)	A	Promote a policy for slope stabilization efforts to prevent erosion and slippage of hills located near populated areas either up or down slope.	New	County EMA Director	Federal, State, Local	Adoption of Policy
4.1.1, 5.1.1	Action #23 (Low)	A	Coordinate seasonal educational materials on individual and family preparedness/mitigation measures, and display and distribute routinely to county citizens and officials alike.	New	County EMA Director	Federal, State, Local	Material Distributed
4.1.2, 5.1.2	Action #24 (Low)	A	Annually host a public hazards workshop for the residents of Barton County, in combination with another large-scale community/regional festival or event	New	County EMA Director	Local	Attendance Records
4.1.3	Action # 25 (Low)	A	Promote dam safety programs at community/regional festivals and events	New	County EMA Director, City officials	Local	Material Distributed
4.1.4	Action # 26 (Low)	A	Promote earthquake awareness programs at community/regional festivals and events	New	County EMA Director, City officials	Local	Material Distributed

Mitigation Strategy and Coordination

In formulating the Barton County Hazard Mitigation Strategy, a wide range of activities were considered in order to help achieve the goals of the community and to lessen the vulnerability of the County to the effects of natural hazard events. The mitigation strategy is to accomplish all identified goals within the 5 years before the next update is scheduled. The community stakeholders should prioritize these actions as feasibly as possible, but the Hazard Mitigation 5-year Action Matrix provides the general aim of Barton County's Hazard Mitigation efforts, initiatives, and strategy to attain them. All unattended goals, objectives, and actions will be carried over to the next 5-year update unless there are more pressing priorities identified at that time. In general, all of these activities fall into one of the following categories of mitigation techniques.

MITIGATION STRATEGY

I. Prevention

Preventative activities are intended to keep damage from hazardous events from getting worse. They are intended to reduce a community's future vulnerability, especially in areas where development has not occurred or capital improvements have not been substantial.

Examples of prevention includes:

- A. Planning and Zoning
- B. Open Space Acquisition and Preservation
- C. Floodplain Regulation
- D. Storm water Regulation and Management
- E. Drainage Systems Maintenance and upgrades
- F. Capital Improvements Programming
- G. Hazard Prone area Preservation

II. Property Protection

Property protection measures protect existing structures by modifying the building to withstand and mitigate damage caused by hazardous events, or remove structures from hazardous locations. Examples of property protection include:

- A. Acquisition
- B. Relocation
- C. Building Elevation
- D. Critical Facilities Protection
- E. Retrofitting (i.e. wind proofing, flood proofing, seismic design standards, etc.)
- F. Insurance
- G. Community and Private Safe Rooms

III. Natural Resource Protection

Natural resource protection activities reduce the impact of natural hazards by preserving, restoring, and/or enhancing natural areas and their mitigative function. Such areas include floodplains, wetlands, and other environmentally sensitive areas. These measures are already an implementation tool of parks, recreation, and conservation agencies an/or organizations. Examples of natural resource protection are:

- A. Floodplain Protection and Buyout
- B. Riparian/Riverine Buffer Zones
- C. Fire Resistant Landscaping
- D. Fuel Breaks
- E. Erosion and Sediment Control
- F. Wetland Preservation and Restoration
- G. Wildlife Habitat Preservation
- H. Slope Stabilization

IV. *Structural Projects*

Mitigation through structural projects is intended to lessen the impact of hazardous events by modifying the natural progression of such an event. These measures are usually undertaken and designed by engineers and managed by public works staff. Most of these initiatives pertain to flood control. Examples of structural projects include:

- A. Reservoirs
- B. Levees/ Dikes/ Floodwalls
- C. Diversions/ Detention/ Retention
- D. Channel Modification
- E. Storm Sewers and Drainage

V. *Emergency Services*

Emergency service measures minimize the impact of a hazard on people and property immediately prior to, during, or in response to a hazard event. Examples of emergency service mitigation techniques include:

- A. Warning Systems
- B. Evacuation Planning and Management
- C. Sandbagging for Flood Protection
- D. Installing Shutters for Wind Protection

VI. *Public Information and Awareness*

Public information and awareness activities are engaged in to advise residents, business owners, potential property buyers, and visitors about hazards, hazardous areas, and mitigation techniques they can use and protect themselves and their property from hazardous events prone to this region. Examples of measures to educate and inform the general public include:

- A. Outreach Projects
- B. Speaker Series/ Demonstration Event
- C. Hazard Mapping
- D. Real Estate Disclosure
- E. Library Materials/ Handouts/ Pamphlets
- F. School Children Education and Drills
- G. Hazard Expositions

Table 19.0								
MITIGATION STRATEGY MATIRX								
Mitigation Technique	High Risk Hazards		Moderate Risk Hazards				Low Risk Hazards	
	Flooding	Tornados/ Severe Storms	Severe Winter Storms	Drought	Heat Wave	Wildfires	Dam Failure	Earthquake
<i>Prevention</i>	X					X	X	
<i>Property Protection</i>	X	X	X			X		X
<i>Natural Resource Protection</i>	X			X		X	X	
<i>Structural Projects</i>	X							
<i>Emergency Services</i>	X	X	X	X	X	X	X	X
<i>Public Information & Awareness</i>	X	X	X	X	X	X	X	X

WORKSHEET #3: BARTON COUNTY COMMUNITY GOALS

Source	Existing Goals
Comprehensive Plan	Currently non-existent
Capital Improvements Plan	Currently non-existent
Economic Development Plan Comprehensive Economic Development Strategy	A Comprehensive effort to protect and improve infrastructure, preserve and develop qualified workers, and protect the general quality of life in the Harry S Truman Coordinating Council region in order to further the economic well-being of the region.
Transportation Plan Missouri Department of Transportation (MoDOT) Long Range Transportation Direction	The long-range transportation plan is the overarching document under which MoDOT's plans take shape. It sets the tone for implementing and developing MoDOT's strategic business plans, and the 5 year Statewide Transportation Improvement Program.
Storm Water Management Community Storm water Regulations	Minimize the damages of storm water runoff caused by development. These damages include erosion, sedimentation, and flash flooding.
Parks and Open Space	Currently non-existent

WORKSHEET #4: BARTON COUNTY MITIGATION STRATEGY

Hazard Area Location	Type of Hazard(s)	Recommended Policy Changes	New Initiative (if appropriate)	Goals Addressed
Barton County	Drought	Encourage environmental responsibility among farmers and developers.	Promote best practices for drought resistant farming techniques and for a reduced usage of permeable surfaces.	Protect natural resources, namely ground water and topsoil.
Barton County	Heat Wave	Promote personal safety measures among outdoor activities and work.	Educate general public about adequate hydration and other safety messages during periods of extreme heat.	Save lives, minimize adverse health effects, maintain community activity
Barton County	Wildfires	Focus on the urban/rural buffer zone as the largest fire danger.		Save lives, minimize injury, protect property.
Barton County	Tornado/ Severe Thunderstorms	Promote code enforcement and weatherizing activities.	Increase warning system coverage across the County and encourage the building of community tornado shelters.	Save lives, minimize injury, protect property.
Barton County	Floods	Promote floodplain management, NFIP participation, and encourage growth outside of these areas.	Floodplain buyout and increased floodplain management regulation.	Save lives, minimize injury, protect property, and protect environmentally sensitive areas.
Barton County	Dam Failure	Promote proper construction and maintenance of earthen dams.	Work with the DNR Safety Program to carry out policy.	Save lives, minimize injury, protect property. Protect and promote natural resources.
Barton County	Earthquakes	Increase education and awareness.		Save lives, minimize injury
Barton County	Severe Winter Storm	Increase awards of transportation dangers in these events and promote weatherizing of structures and code enforcement.	Increase preparedness of street plows and de-icers.	Save lives, minimize injury.

WORKSHEET #5: BARTON COUNTY SUMMARIZED ACTION STEPS FOR MITIGATION STRATEGY

Hazard Type	Recommended Policy Change or New Initiative	Hazard Areas Affected (list all areas affected by policy changes)	Responsible Departments
Tomado/ Severs Thunderstorms	Add warning siren towers in areas not currently covered	Countywide, all jurisdictions	Barton County Emergency Management (NWS, NOAA Storm Warning)
Floods	Educate the public on flood safety, and increase floodplain buyout programs	Countywide, all jurisdictions	Barton County Emergency Management (FEMA, SEMA, USGS, Army Corps of Engineers)
Severe Winter Weather	Run a winter weather safety campaign during the winter season	Countywide, all jurisdictions	Barton County Emergency Management (NWS, NOAA Storm Warning)
Drought	Promote efficient practices for drought resistant farming and minimal water consumption and waste	Countywide, all jurisdictions	Barton County Emergency Management (NRCS, HBA, DNR, USDA)
Heat Wave	Educate outdoor activity participants during periods of extreme heat	Countywide, all jurisdictions	Barton County Emergency Management (Barton County Health Department, medical services, NRCS)
Earthquake	Educate the public on appropriate safety procedures and precautions in the case of an earthquake	Countywide, all jurisdictions	Barton County Emergency Management
Dam Failures	Work with the DNR Safety Program to promote maintenance	Areas near dams which includes: City of Lamar.	Barton County Emergency Management (DNR Dam Safety Program)
Wildfires	Work with MDC to educate residents in the buffer zone of fire safety.	Countywide, all jurisdictions	Barton County Emergency management (local fire departments)

SECTION 6

IMPLEMENTATION PROCESS

The Barton County Hazard Mitigation Stakeholders have proposed that the implementation process should be coordinated within an organization called the Barton County Hazard Mitigation Committee (which will consist of representatives from the County Commissioners, County Sheriff's Department, municipal public officials, fire protection, law enforcement, emergency, and public health officials). This Committee will convene to move through this plan so to implement and initiate the Hazard Mitigation Plan's actions. This Committee will coordinate all the grants through SEMA and recommend which projects warrant priority based upon the analysis of this Plan and their participation there within.

In order to review and update this plan on a regular basis, The Barton County Hazard Mitigation Committee will hold meetings throughout the year where objectives will be agenda items. As each objective is determined a priority, community input will be taken, and the subsequent actions will be publicized and broadcast across the region to heighten awareness of these initiatives.

An annual meeting where Hazard Mitigation monies will be awarded to the identified priorities will be organized by the Barton County Hazard Mitigation Committee. At this meeting, Barton County Hazard Mitigation Committee members will be responsible for monitoring and evaluating the progress of the plan. This includes annually submitting changes to the plan including goals, objectives, actions (including removing completed actions), and also any changes in the community profile and risk assessment sections. The parties responsible for direct implementation projects will report to the committee on their progress, completion of their respective projects, dilemmas in implementation, and revisions to the strategy they are in charge of.

The Barton County Hazard Mitigation Committee will then have a period of time to revise the Hazard Mitigation Plan and submit it to the State Hazard Mitigation Officer for the update review and approval.

The Barton County Hazard Mitigation Committee may request the assistance of the Harry S Truman Coordinating Council in holding public hearings, monthly and annual meetings, and with implementation strategies and priorities. The Barton County Hazard Mitigation Committee may also invite that The Harry S Truman Coordinating Council to be a part of the Committee representing regional interests.

A mandatory, complete, and comprehensive update of the plan must be completed every 5 years by an appropriate planning agency, so to ensure veracity and progress in the planning efforts and initiatives.

APPENDICES

Appendix A: Repetitive Loss Listings

Loss Statistics County-Wide					
From Jan. 1, 1978 through Nov. 30, 2006					
Community Name	Total Losses	Closed Losses	Open Losses	CWOP Losses	Total Payments
Barton County	1	1	0	0	18,059.00
Burgess	NA	NA	NA	NA	NA
Golden City	NA	NA	NA	NA	NA
Lamar	8	7	0	1	15,746.15
Milford	NA	NA	NA	NA	NA
Mindenmines	NA	NA	NA	NA	NA
Liberal	NA	NA	NA	NA	NA
Lamar Heights	NA	NA	NA	NA	NA
<p>Data Definitions:</p> <p>Total losses- All losses submitted regardless of the status.</p> <p>Closed losses- Losses that have not been paid.</p> <p>Open losses- Losses that have not been paid in full.</p> <p>CWOP losses- Losses that have been closed without payment.</p> <p>Total Payments- Total amount paid on losses.</p> <p>Source: FEMA National Flood Insurance Program http://bsa.nfipstat.com/reports/1040_200611.htm#29</p>					

Repetitive Losses in Barton County

According to the information in the “Missouri Repetitive Losses FEMA July 2003” list, there is one repetitive loss for Barton County as of July 31, 2003. The Repetitive loss was located within the City of Lamar, with a Total Building payment of \$0.00; Total Contents payment of \$11,852.84; Losses of 3; Total Paid \$11,852.84; and an Average Pay of \$3,950.95.

The other incorporated areas inside Barton County are: The City of Burgess, The City of Golden City, City of Milford, The City of Mindenmines, The City of Lamar Heights, and The City of Liberal and none of these incorporated areas are included on the “Missouri Repetitive Losses FEMA July 2003” lost list.

Appendix B: Acronyms

- ASM- Archeological Survey of Missouri
- BFE- Base Flood Elevation
- BLM- Bureau of Land Management
- CDBG- Community Development Block Grant
- CPC- Climate Prediction Center
- CRS- Community Rating System
- DMA- 2000 Disaster Mitigation Act
- EDA- Economic Development Association
- EPA- Environmental Protection Agency
- FEMA- Federal Emergency Management Agency
- FIRM- Flood Insurance Rate Map
- FTE- Full Time Equivalent
- GIS- Geographic Information System
- HMGP- Hazard Mitigation Grant Program
- HMST- Hazard Mitigation Survey Team
- HSTCC- Harry S Truman Coordinating Council
- HUD- Housing and Urban Development (US Federal Department)
- ICC- Increased Cost of Compliance
- LMI- Labor Market Information
- MACOG- Missouri Association of Council Of Governments
- MCC- Midwestern Climate Center
- MoDOT- Missouri Department of Transportation
- MPA- Missouri Press Association
- MPO- Metropolitan Planning Organization
- NCDC- National Climate Data Center
- NEHRP- National Earthquake Hazards Reduction Program
- NFIP- National Flood Insurance Program

- NFPA- National Fire Protection Associations
- NHMP- National Hazard Mitigation Plan
- NIBS- National Institute of Building Sciences
- NIFC- National Interagency Fire Center
- NOAA- National Oceanic Atmospheric Administration
- NHRP- National Register of Historic Places
- NRCS- National Resources Conservation Service
- NWS- National Weather Service
- PDM- Pre-Disaster Mitigation Program
- PDSI- Palmer Drought Severity Index
- SBA- Small Business Administration
- SEMA- State Emergency Management Agency
- SHMO- State Hazard Mitigation Officer
- SPC- Storm Prediction Center
- SHPPO- State Historic Preservation Program Organization
- SWMRC- Southwest Missouri Resource Conservation & Development
- U of M- University of Memphis
- USACE- US Army Corps of Engineers
- USDA- US Department of Agriculture
- USFA- US Fire Administration
- USFS- US Forest Service
- USFWS- US Fish and Wildlife Service
- USGS- US Geological Service

Appendix C: Definitions

BASE FLOOD ELEVATION

-An elevation, usually determined by an engineer, that represents the minimum level at which a structure on a specific site can be built to prevent from damage in the event of a 100 year flood.

DROUGHT

-A period of prolonged dryness. The three categories of drought are Agricultural Drought defined by soil moisture deficiencies, Hydrological Drought defined as declining surface and groundwater levels, and Meteorological Drought defined by precipitation deficiencies.

MITIGATION

-As determined by a FEMA report titled *Report on Costs and Benefits of Natural Hazard Mitigation*, mitigation is “sustained action taken to reduce or eliminate the long term risk to people and their property from hazards and their effect”.

SUSTAINABLE/SUSTAINABILITY

-Any policy, project, or action taken to meet the needs of the present without compromising the ability of future generations to meet their needs.

Appendix D: Multi-Hazard Mitigation Resource Directory and Bibliography

- Barton County Local Emergency Operation Plan
- 2000 Missouri Drought Plan
- Archeological Survey of Missouri
- City of Joplin Vision 2020, City of Joplin, MO
- Federal Emergency Management Agency, <http://fema.gov>

- Comprehensive Economic Development Strategy, Harry S Truman Coordinating Council
- Long Range Transportation Direction (LRTD), MoDOT
- Midwestern Climate Center
- Missouri Works! Labor Market Information, Department of Economic Development, Covered Employment and Wages Program (ES-202) Data
- Missouri Department of Conservation, <http://conservation.state.mo.us>
- Missouri Department of Natural Resources, <http://dnr.state.mo.us>
- Missouri Department of Natural Resources, Dam Safety Division, <http://dnr.state.mo.us/geology/damsft/bkgrd>
- Missouri Department of Transportation, State Transportation Improvement Program (STIP)
- Missouri Department of Primary and Secondary Education, <http://dese.mo.gov/directory/discnty.htm>
- National Climate Data Center, <http://www4.ncdc.noaa.gov>
- National Oceanic and Atmospheric Administration, <http://www.nws.noaa.gov>
- National Conservation Research Center, <http://www.nrcs.usda.gov>
- National Register of Historic Places, <http://www.nationalregisterofhistoricplaces.com>
- *Stemming the Tide of Flood Losses*, Missouri State Emergency Management Agency
- United State Army Corps of Engineers, <http://www.mvs.usace.army.mil>
- United States Department of Agriculture, <http://www.nass.usda.gov>
- United State Department of Commerce, US Census Bureau, <http://www.census.gov/>
- United States Fish and Wildlife Service, <http://midwest.fws.gov>

Appendix E:

**Missouri Department of Conservation--
MDC Heritage Database Results for Barton County**

MDC Heritage Database Results for Barton County					
Species and natural communities of conservation concern in Barton county					
Scientific Name	Common Name	State Rank (Code)	Global Rank (Code)	State Status (Code)	Federal Status (Code)
Acid seep		Imperiled S2	Not Ranked GNR		
Creeks and small rivers (prairie region)			Not Ranked GNR		
Prairie swale		Imperiled S2	Not Ranked GNR		
Dry-mesic chert prairie		Vulnerable S3	Not Ranked GNR		
Hardpan prairie		Imperiled S2	Not Ranked GNR		
Dry-mesic limestone/dolomite prairie		Imperiled S2	Not Ranked GNR		
Dry-mesic sandstone/shale prairie		Vulnerable S3	Not Ranked GNR		
Wet-mesic bottomland prairie		Critically Imperiled S1	Not Ranked GNR		
Headwaters (prairie region)			Not Ranked GNR		
Phyllobrotica lengi	A Leaf Beetle	Unrankable SU	Not Ranked GNR		
Phyllobrotica physostegiae	A Leaf Beetle	Apparently Secure Unranked S4?	Not Ranked GNR		
Leskea polycarpa	A Moss	Unrankable SU	Apparently Secure Secure G4G5		
Bruchia flexuosa	A Moss	Unranked S?	Apparently Secure G4		
Carex arkansana	A Sedge	Vulnerable S3	Apparently Secure G4		
Camassia angusta	A Wild Hyacinth	Vulnerable S3	Secure Questionable Taxonomy/Inexact Numeric Rank G5?Q		
Marshallia caespitosa var. caespitosa	Barbara's Buttons	Vulnerable S3	Apparently Secure G4T4		
Tyto alba More Information	Barn Owl	Vulnerable S3	Secure G5	Endangered E	
Lepus californicus	Black-tailed Jackrabbit	Critically Imperiled S1	Secure G5	Endangered E	
Cyprinella camura	Bluntnose Shiner	Imperiled Vulnerable S2S3	Secure G5		
Percina copelandi	Channel Darter	Vulnerable S3	Apparently Secure G4		
Perideridia americana	Eastern Eulophus	Unrankable SU	Apparently Secure G4		
Carex conoidea	Field Sedge	Critically Imperiled S1	Secure G5		
Notropis buchanani	Ghost Shiner	Imperiled S2	Secure G5		
Tympanuchus cupido	Greater Prairie-chicken	Critically Imperiled S1	Apparently Secure G4	Endangered E	
Agalinis viridis	Green False Foxglove	Critically Imperiled S1	Apparently Secure Inexact Numeric Rank G4?		
Rhynchospora harveyi	Harvey's Beak-rush	Critically Imperiled S1	Apparently Secure G4		
Sagittaria ambigua	Kansas Arrowhead	Critically Imperiled	Imperiled Inexact		

		S1	Numeric Rank G2?		
<i>Eleocharis lanceolata</i>	Lance-like Spike Rush	Critically Imperiled S1	Apparently Secure Secure G4G5		
<i>Phoetaliotes nebrascensis</i>	Large-headed Grasshopper	Vulnerable S3	Secure G5		
<i>Lanius ludovicianus</i>	Loggerhead Shrike	Imperiled S2	Apparently Secure G4		
<i>Asclepias meadii</i>	Mead's Milkweed	Imperiled S2	Imperiled G2	Endangered E	Threatened T
<i>Woodwardia areolata</i>	Netted Chain Fern	Imperiled S2	Secure G5		
<i>Rana areolata circulosa</i>	Northern Crawfish Frog	Vulnerable S3	Apparently Secure G4T4		
<i>Circus cyaneus</i>	Northern Harrier	Imperiled S2	Secure G5	Endangered E	
<i>Spilogale putorius interrupta</i>	Plains Spotted Skunk	Critically Imperiled S1	Apparently Secure Secure G5T4	Endangered E	
<i>Conocephalus saltans</i>	Prairie Meadow Katydid	Vulnerable S3	Not Ranked GNR		
<i>Gryllotalpa major</i>	Prairie Mole Cricket	Vulnerable S3	Vulnerable G3		
<i>Etheostoma whipplei</i>	Redfin Darter	Critically Imperiled S1	Apparently Secure G4	Endangered E	
<i>Speyeria idalia</i>	Regal Fritillary	Vulnerable S3	Vulnerable G3		
<i>Asio flammeus</i>	Short-eared Owl	Imperiled S2	Secure G5		
<i>Typha domingensis</i>	Southern Cattail	Critically Imperiled S1	ApparentlySecure Secure G4G5		
<i>Eumeces septentrionalis obtusirostris</i>	Southern Prairie Skink	Vulnerable S3	Secure G5T5		
<i>Sphagnum cuspidatum</i>	Sphagnum	Unrankable SU	Secure G5		
<i>Aster dumosus var. strictior</i>	Tradescant Aster	Imperiled S2	Apparently Secure Secure G5T4		
Source: http://mdc.mo.gov/cgi-bin/heritage/search.cgi?county=Barton					

Appendix F: 100 Year Floodplain-Incorporated Areas of Barton County

(Maps located on the following pages)

City of Burgess Floodplain Map



- | | | |
|---|---|---|
| <ul style="list-style-type: none"> County Boundaries 100/500-Year Floodplain (Q3) 100-Year Flood Zone 500-Year Flood Zone Excluded Areas No Flood Zone Data Available Incorporated Areas (cont) | <ul style="list-style-type: none"> City Town Village Census Designated Place Other |  |
|---|---|---|
- 2007 Aerial Photos (NAIP)**

Prepared by The Harry S. Truman Coordinating Council (HSTCC) 24943 DeMott, Webb City, Mo 64870	Source: C.A.R.E.S. Center for Agriculture, Resource, and Environmental Systems
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City of Golden City Floodplain Map



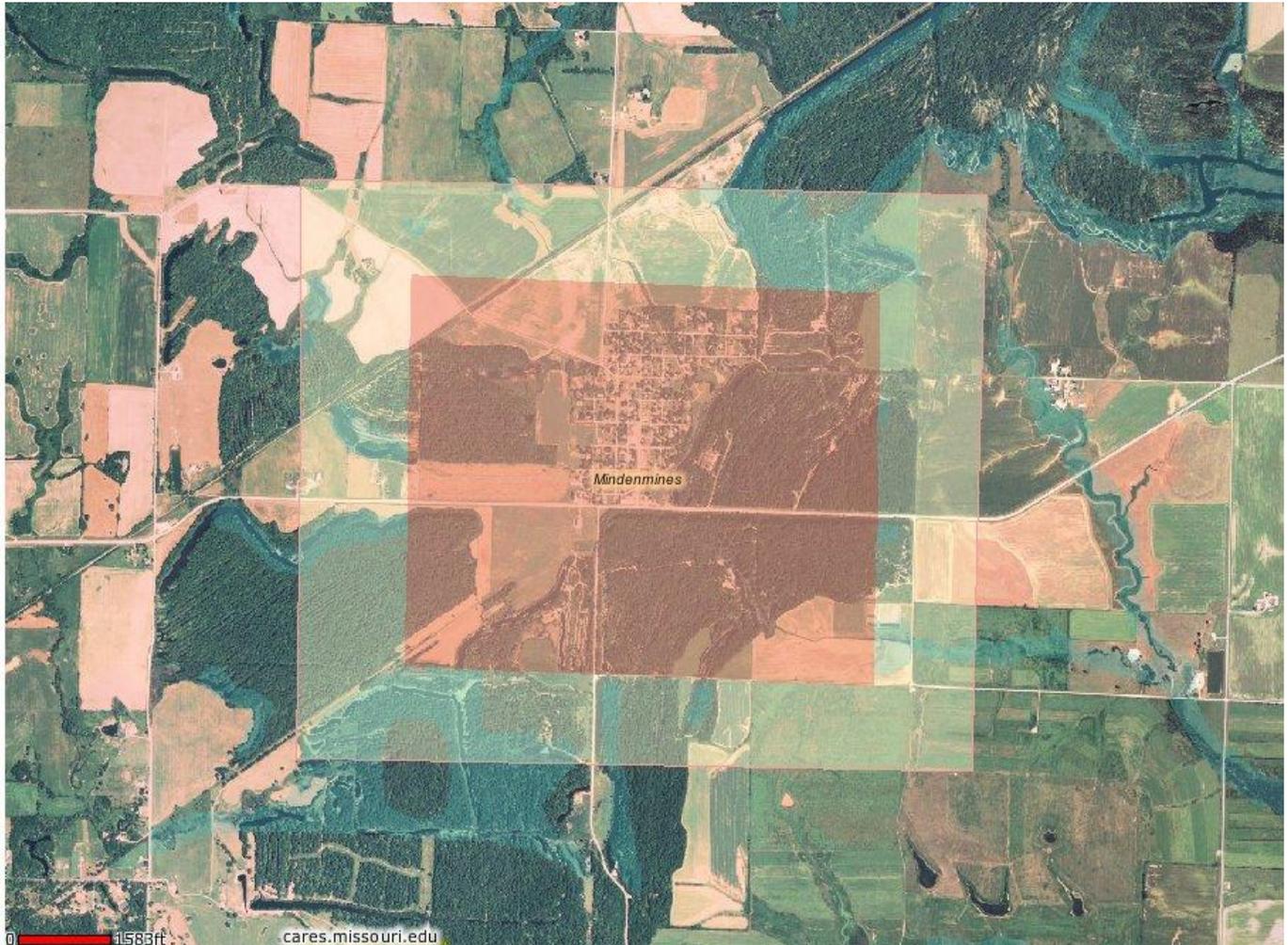
- | | |
|--|--|
| <ul style="list-style-type: none"> □ County Boundaries 100/500-Year Floodplain (Q3) 100-Year Flood Zone 500-Year Flood Zone Excluded Areas No Flood Zone Data Available Incorporated Areas (cont) | <ul style="list-style-type: none"> City Town Village Census Designated Place Other 2007 Aerial Photos (NAIP) |
|--|--|



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The Harry S. Truman Coordinating Council (HSTCC)
24943 DeMott, Webb City, Mo 64870

Source: C.A.R.E.S. Center for Agriculture, Resource, and Environmental Systems

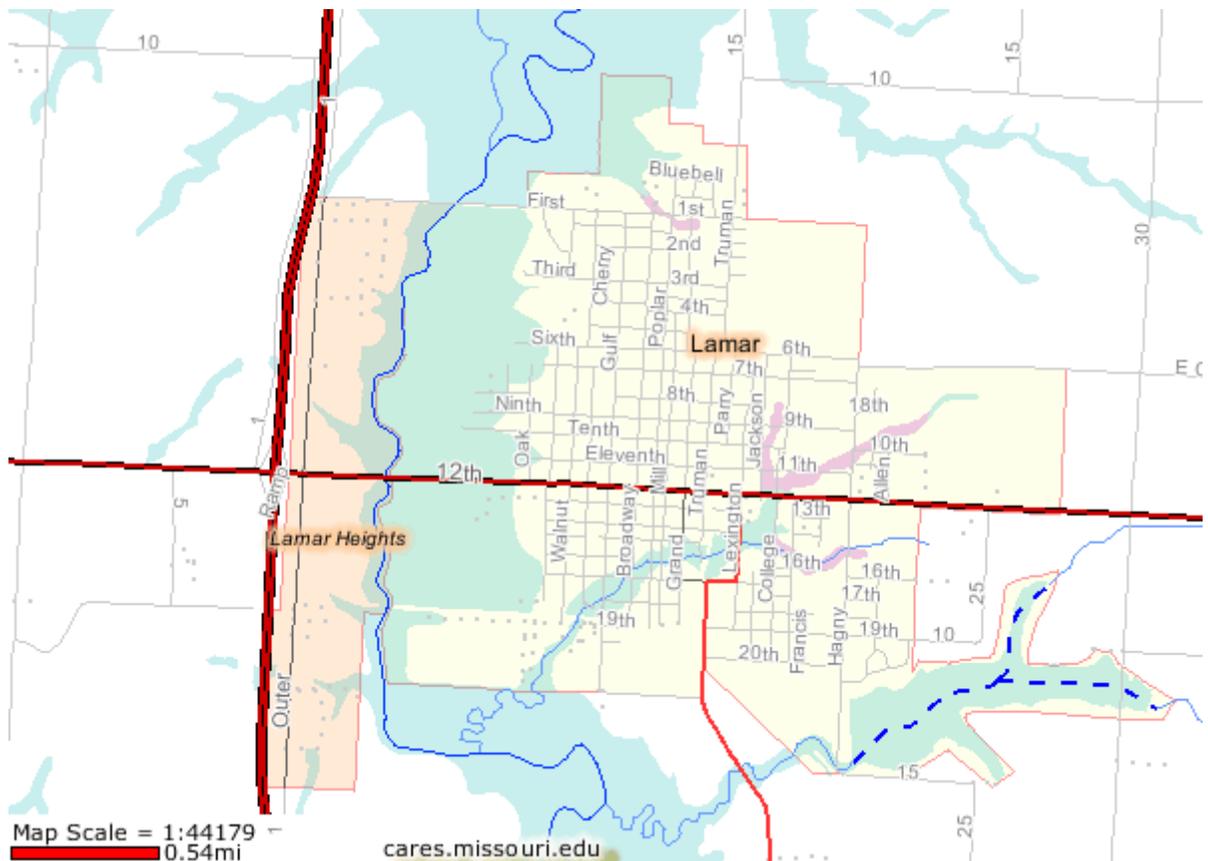
**City of Mindenmines
Floodplain Map**



- | | |
|----------------------------------|----------------------------------|
| County Boundaries | City |
| 100/500-Year Floodplain (Q3) | Town |
| 100-Year Flood Zone | Village |
| 500-Year Flood Zone | Census Designated Place |
| Excluded Areas | Other |
| No Flood Zone Data Available | 2007 Aerial Photos (NAIP) |
| Incorporated Areas (cont) | |



City of Lamar and Lamar Heights County Floodplain Map



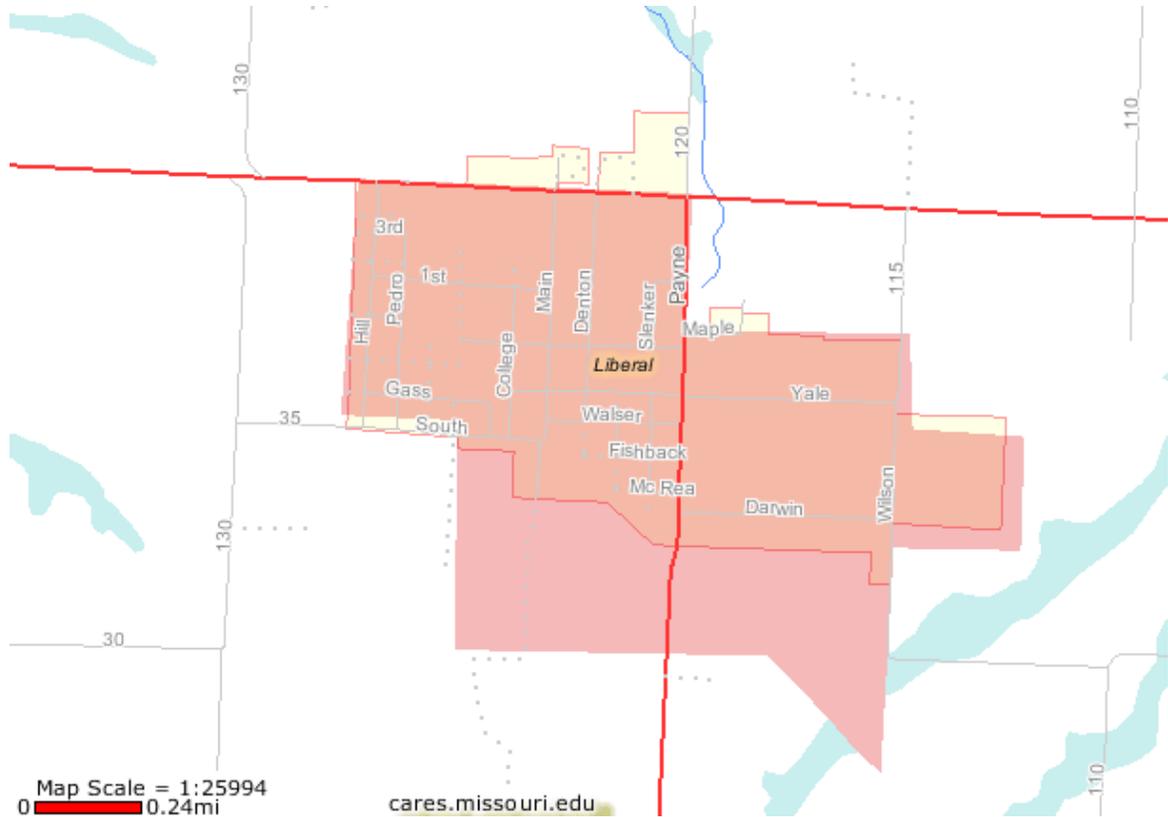
- Roads and Highways**
- Interstate
 - U.S. Highway
 - State Numbered Highway
 - State Lettered Highway
 - Principal Road
 - Road or Street
 - Private Road or Drive
- County Boundaries**
- County Boundaries
- NHD Rivers and Streams**
- Perennial Stream/River
 - Intermittent Stream/River
 - Canal or Ditch
 - Artificial Path (Approx. Centerline)
 - Other Hydrologic Feature

- 100/500-Year Floodplain (Q3)**
- 100-Year Flood Zone
 - 500-Year Flood Zone
 - Excluded Areas
 - No Flood Zone Data Available
- Incorporated Areas**
- City
 - Town
 - Village
 - Census Designated Place
 - Other



Prepared by The Harry S. Truman Coordinating Council (HSTCC) 24943 DeMott, Webb City, Mo 64870	Source: C.A.R.E.S. Center for Agriculture, Resource, and Environmental Systems
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City of Liberal Floodplain Map

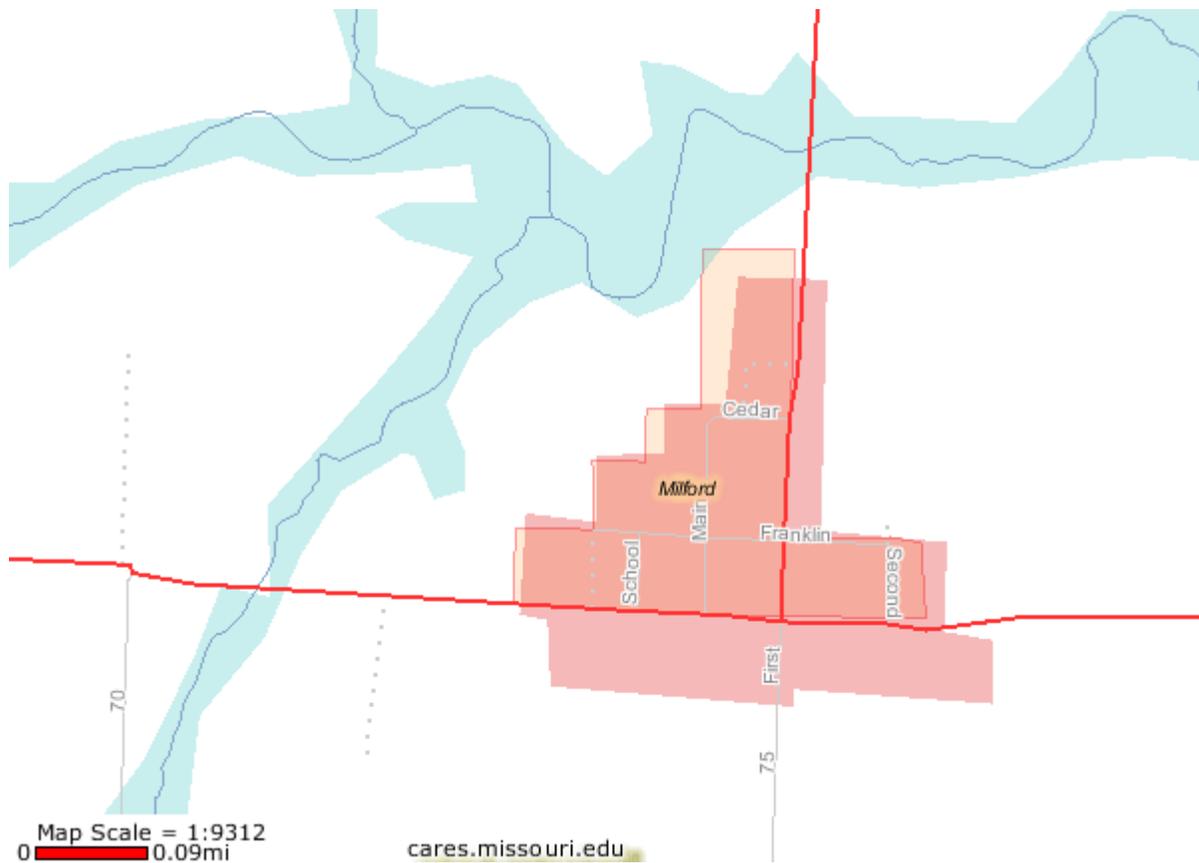


- | | |
|---|---|
| <p>Roads and Highways</p> <ul style="list-style-type: none"> Interstate U.S. Highway State Numbered Highway State Lettered Highway Principal Road Road or Street Private Road or Drive County Boundaries <p>NHD Rivers and Streams</p> <ul style="list-style-type: none"> Perennial Stream/River Intermittent Stream/River Canal or Ditch Artificial Path (Approx. Centerline) Other Hydrologic Feature | <p>100/500-Year Floodplain (Q3)</p> <ul style="list-style-type: none"> 100-Year Flood Zone 500-Year Flood Zone Excluded Areas No Flood Zone Data Available <p>Incorporated Areas</p> <ul style="list-style-type: none"> City Town Village Census Designated Place Other |
|---|---|



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City of Milford Floodplain Map



- | | |
|---|---|
| <p>Roads and Highways</p> <ul style="list-style-type: none"> Interstate U.S. Highway State Numbered Highway State Lettered Highway Principal Road Road or Street Private Road or Drive County Boundaries <p>1:24,000 Rivers and Streams</p> <ul style="list-style-type: none"> Perennial Stream/River Intermittent Stream/River Artificial Path (Approx. Centerline) Undifferentiated Stream/River Canal or Ditch Other Hydrologic Feature | <p>100/500-Year Floodplain (Q3)</p> <ul style="list-style-type: none"> 100-Year Flood Zone 500-Year Flood Zone Excluded Areas No Flood Zone Data Available <p>Incorporated Areas</p> <ul style="list-style-type: none"> City Town Village Census Designated Place Other |
|---|---|

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