Contents: West Central Electric

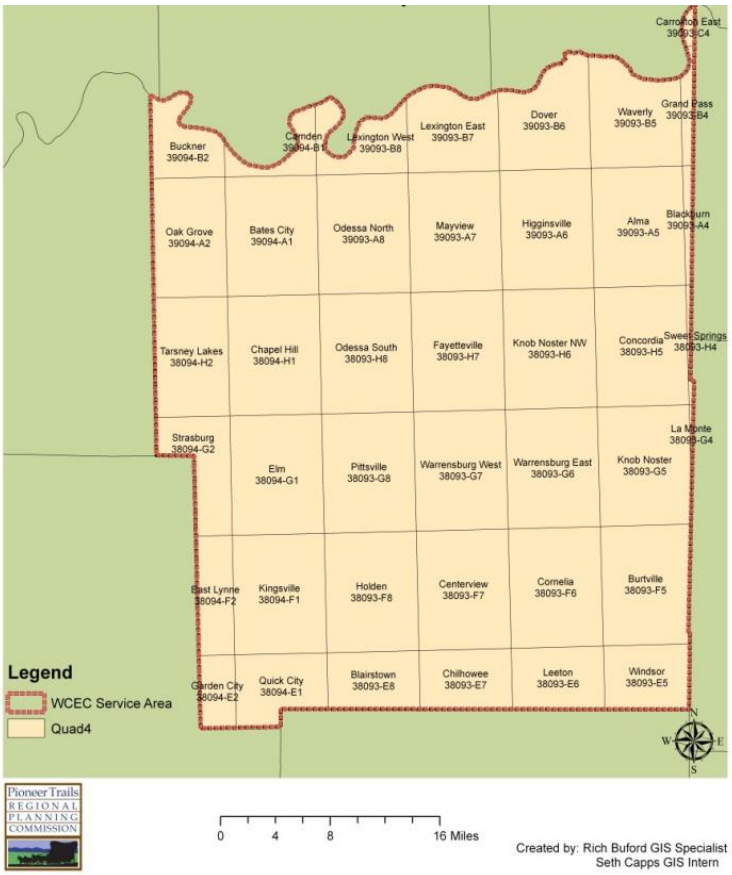
Section 1: Introduction

A member-owned nonprofit cooperative, West Central Electric Cooperative (WCEC) was formed in 1939 to bring electricity to rural areas. Rural Missourians began the co-op when existing utilities believed that energizing the countryside was not a profitable venture. There are 40 rural electric cooperatives in the state of Missouri. WCEC now provides power to more than 14,600 meters through 2,600 miles of line in five counties, including Lafayette, Johnson, Eastern Jackson and a small part of Cass and Pettis counties. The company's headquarters is in Higginsville, Missouri, with a branch office in Oak Grove, Missouri. West Central Electric Cooperative is governed by a board of nine directors elected from among the members. The board meets monthly to make decisions concerning the cooperative's business.

WCEC's service boundaries are completely within the state of Missouri and include Johnson and Lafayette counties in their entirety as well as the eastern portion of Jackson County, the northeastern portion of Cass County and a very small area in Pettis County.

The cooperative owns 2,602 miles of service line within these counties. Figure 1 depicts the geographic boundaries of the cooperative in relation to USGS local quadrangles within the state of Missouri. *(Map sources:* www.misdis.missouri.edu, *West Central Electric Cooperative)*

Figure 1 *<u>WCEC Service Area Map</u>*



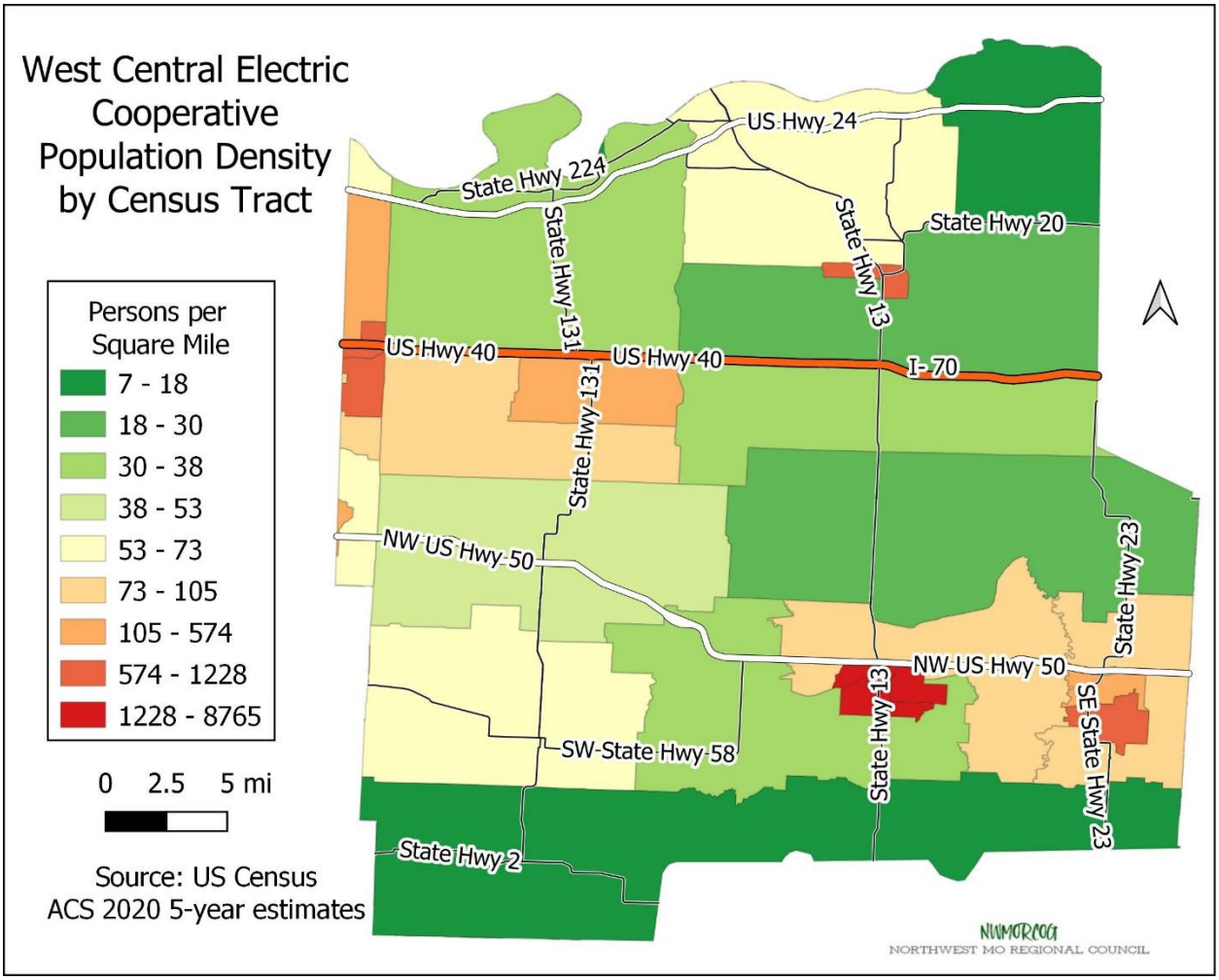
The customer base of WCEC currently is 12,481 members covering five counties in the state of Missouri. Table 1 provides the summary of metered customers by county.

Table 1 *Meters by Missouri County*

County	Number of Meters
Johnson	8,423
Lafayette	5,640
Cass	102
Jackson	2,356
Pettis	12
Total	16,533

The average daily customer usage for WCEC is 51.92 kilowatt-hours (kWh). Annual total usage of WCEC customers in 2021 was 275,827,000 kWh of service. Population density for the cooperative service area is depicted in Figure 2 (*Map source: U.S. Census 2020*).

Figure 2 *WCEC Population Density Map*



Critical Facilities

It is important in mitigation planning for the electric cooperatives to identify the critical facilities in each area and to be able to prioritize reconnection and back-up power needs. WCEC does not provide service to any critical facilities (hospitals, emergency services, etc.), higher education institutions, or large industrial centers.

Future Development

West Central Electric provided no information about plans for future development in their service area. Table 2 below illustrates the population trend for the counties served by WCEC.

Table 2 *County Population Trend, 1990-2030*

County	1990	2000	2010	2020	2030 Projected
Cass	63,808	82,092	99,478	106,806	136,933
Jackson	633,232	654,880	674,158	705,925	714,467
Johnson	42,514	48,258	52,595	54,219	61,668
Lafayette	31,107	32,960	33,381	33,006	32,947
Pettis	35,437	39,403	42,201	42,490	47,349
Source: U.S. Census Data					

Planning Process

Since the planning process is the same for each of the electric cooperative plans, the details of the planning process are presented in the Statewide Summary section of the plan.

Appendices

Three appendices are included at the end of each plan:

Appendix A contains the Adoption Resolution; a document signed by the Cooperative's governing official showing that the Board of Directors has adopted the mitigation plan.

Appendix B contains the Documentation of Participation; copies of press releases, website postings and other public outreach that was made to request public comment.

Appendix C contains the Surveys; the Data Survey that is the source of data for the 2023 plan update; the Goals and Actions Survey is the updated review of the mitigation strategies

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Section 2: Asset Inventory

West Central Electric Cooperative has a wide variety of assets by type. Real estate owned by the company includes office buildings, warehouses, garages, and other outbuildings throughout the service area. Thirty-one vehicles provide access to customers and infrastructure. WCEC does not own any electric generation or transmission infrastructure, but it owns and maintains 2,568 miles of distribution line. Table 3 provides information concerning total asset valuation.

Table 3 *WCEC Asset Inventory Valuation Summary*

Asset	Total Replacement Cost	Cost Breakdown
Total WCEC Assets	$216,268,488	Buildings and vehicles - $17,024,370 Overhead assets(OH) - $184,147,563 Underground assets(UG) - $15,096,555
Distribution Lines	OH $92,331,360 UG $11,119,680	OH Single-phase lines - $45,724,800 UG Single-phase lines - $7,983,360 OH Three-phase lines - $44,880,000 UG Three-phase lines - $2,217,600 OH Secondary lines - $1,726,560 UG Secondary lines - $918,720
Supporting Infrastructure	OH $91,816,203 UG $3,976,875	Meters - $9,572,607 Poles - $47,072,575 OH Transformers - $10,276,266 UG Transformers - $3,976,875 Guys/Anchors - $16,144,180 Cross-arms - $2,928,288 Regulators - $1,089,716 SP Oil-Circuit Reclosures - $3,856,815 3phase Oil-Circuit Reclosures -$800,236 Capacitors - $75,520
Office Buildings	$10,000,000	
Warehouses	$3,000,000	
Vehicles	$4,024,370	
Source: Internal West Central Electric Coop Accounting and Maintenance records		

Ensuring quality distribution to its customers, West Central maintains not only distribution lines, but also the supporting infrastructure as well. This information is detailed on the following page.

Table 4 includes a list of asset types, emergency replacement cost per unit or mile, the asset inventory by Service County, and total infrastructure numbers.

Table 4 *WCEC Asset Inventory by Service County*

Asset	Emergency Replacement Cost per unit or mile	Number of units or miles: JOHNSON	Number of units or miles: JACKSON	Number of units or miles: LAFAYETTE	Number of units or miles: CASS	Number of units or miles: PETTIS	Total number of units or miles:
Meters	$579/Unit	8423	2356	5640	102	12	16533
Poles	$935/Unit	26618	4988	18166	529	44	50345
SP*** distribution line	$26,400/Mile $5/Foot OH	971	146	594	20	1	1732
	$42,240/Mile $8/Foot UG	85	34	70	0	0	189
TP**** distribution line	$89,760/Mile $17/Foot OH	252	44	199	5	0	500
	$147,840/Mile $28/Foot UG	3	8	4	0	0	15
Secondary Distribution Line	$15,840/Mile $3/Foot OH	55	13	41	1	0	109
	$15,840/Mile $3/Foot UG	24	12	23	0	0	58
Transformers	$957/Unit OH $1,875/UnitUG	6633	1842	4282	91	11	12859
Guys/anchors	$620/Unit	13791	2943	9045	233	27	26039
Crossarms	$352/Unit	4025	836	3359	92	7	8319
Regulators	$12,244/Unit	45	10	34	0	0	89
Oil Circuit Reclosers	$7,209 SP $21,628 TP	289 12	56 14	190 11	0 0	0 0	535 37
Capacitors	$590/Unit	68	8	52	0	0	128
Total Replacement Value by County	OH	$97,258,465	$18,397,042	$66,595,347	$1,808,330	$104,219	$184,163,403
	UG	$6,139,080	$3,506,460	$5,463,105	$3,750	$0	$15,112,395

*OH = overhead **UG = underground ***SP = Single phase ****TP – Three phase
Source: Internal West Central Electric Coop Accounting and Maintenance records

Section 3: Risk Assessment

Risk Assessment Methodology

The risk assessment methodology used in the following section was utilized for both the statewide aggregation as well as for each individual cooperative chapter. Section 4 of the Statewide Summary details this methodology. Some variation in the availability of data exists between the electric cooperatives as each utilizes a different system of recording the impact of natural disasters. Any differentiation from the process below is explained in the individual cooperative's chapter as necessary.

For the purpose of the risk assessment, the identified hazards for the West Central Electric Cooperative service area have been divided into two categories: **historical and non-historical hazards**. Based on the data collected for the update, the hazards have been reclassified to reflect the actual data available and those hazards with no data available have been reclassified as non-historical. This does not mean that a non-historical hazard will never cause damage; it just means there have been no impacts prior to this report. The potential still exists, but the probability of the occurrence is numerically near zero. For the analysis in this plan non-historical hazard probability is stated as less than one.

> **Historical Hazards** are those hazards with a measurable previous impact upon the service area. Damage costs per event and a chronology of occurrences are available. The associated vulnerability assessments utilize the number of years of data and cost of each event to establish an average annual cost per year. For WCEC, hazards with historical data include tornadoes, severe thunderstorms/high wind/hail, flood/levee failure, and severe winter weather.
>
> **Non-historical Hazards** are hazards with no previous record of impact upon the local service area. As such, the associated vulnerability assessments for each of these hazards will have an occurrence probability of less than 1% in any given year, but the extent of damage will vary considerably. For WCEC, hazards without historical data include earthquakes and dam failure and wildfire.

Each hazard has a unique impact upon the service area, requiring each hazard to utilize a different valuation amount depending upon the level of impact. Non-historical hazards assume damage to all general assets. For Historical Hazards, assets were divided into two groups based upon historical impact which were utilized in the hazard damage analysis:

- Overhead infrastructure assets and buildings
  - Used for:
    - Tornado damage assessments
      - Valued at $199,244,118
- Overhead infrastructure assets only
  - Used for:
    - Severe Thunderstorm / High Wind / Hail
    - Flood
    - Severe Winter Weather
      - Valued at $184,147,563

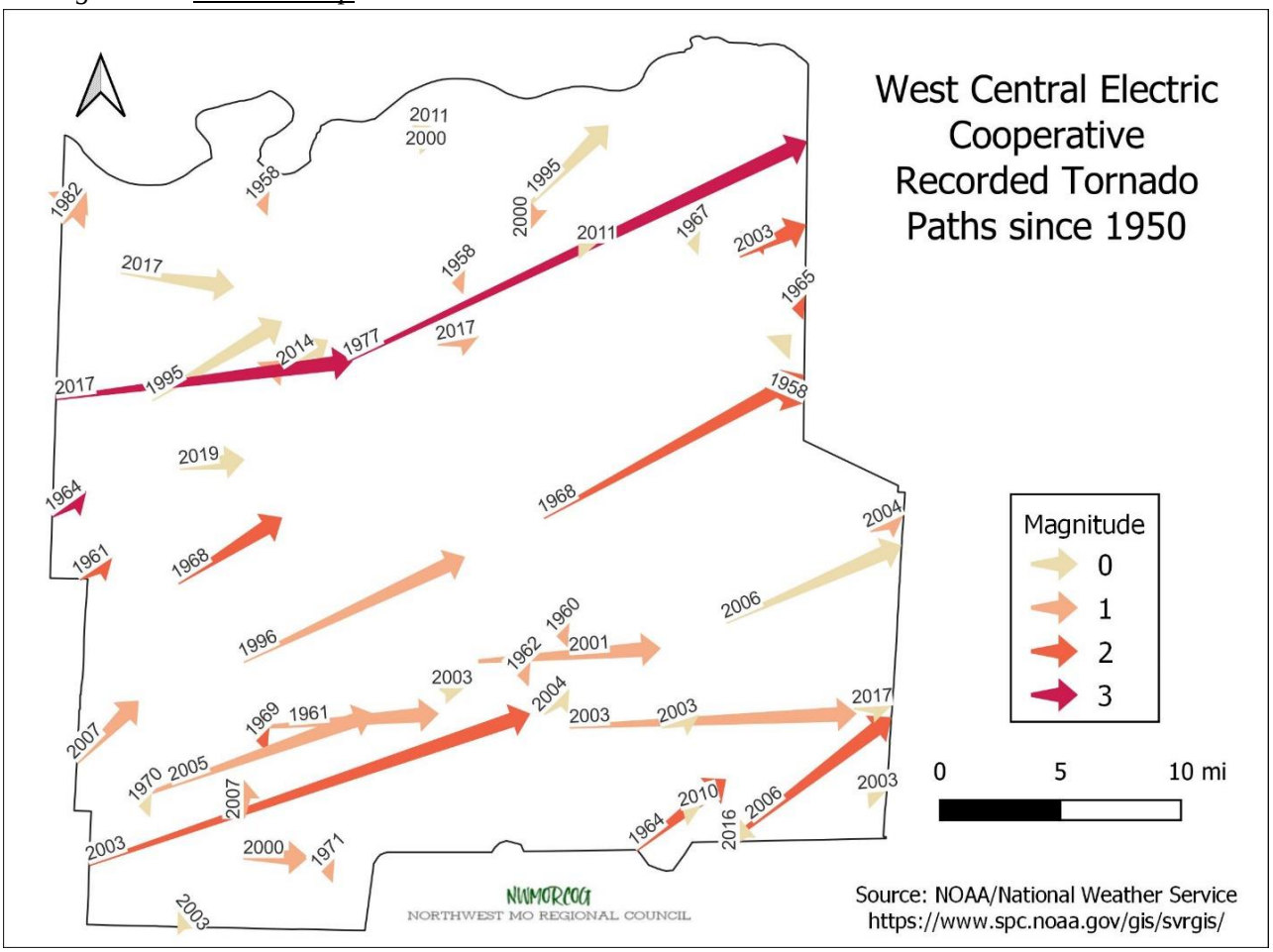
A. Historical Hazards

Tornadoes

Previous Occurrences

In the period, 1950-2020, 54 tornadoes have been reported within the West Central cooperative boundaries. On March 6, 2017, an EF3 tornado developed over Lake Lotawana and moved through the city of Oak Grove. Permanent foundation houses were removed from the foundation and toppled over. Twelve reported injuries occurred as the tornado continued into Lafayette County. *(Source: National Oceanic and Atmospheric Administration, NOAA.)* Figure 3 provides a pictorial representation of all recorded tornado touchdown sites and recorded paths. *(Data for map collected from NOAA.)*

Figure 3 *Tornado Map*



Information from cooperative records concerning damage estimates is only available starting in 1995. From 1995 through June of 2020, 30 tornadoes were reported in the WCEC service area.

Probability of Future Occurrence and Vulnerability

The probability of a tornadic event in the West Central service area in any given year is 100% (30 events / 27 years) with an average annual of 1.1. Seven events resulted in damage to cooperative assets during the

years existing in cooperative records. Based on this information, there is a 26% probability of a tornadic occurrence will produce damage in any given year. Table 5 provides a summary of event dates, damage cost estimates and outages reported.

Table 5 *WCEC Tornadic Event Summary*

Date Of Event	EF Scale Rating	Damage Estimates	Outages Reported
10/29/2004	F1	$1,600.00	205
6/4/2005	F1	$22,400.00	480
3/12/2006	F2	$29,400.00	191
2/24/2007	EF1	$800.00	94
6/5/2008	EF0	$13,000.00	1,024
5/20/2010	EF0	$300.00	2
3/6/2017	EF3	$98,200	3,296
	Total	$165,700.00	5,292
Data provided based on internal WCEC records which reflect cost from the referenced event year.			

Based upon the data above, the average tornado to affect the cooperative will range from an EFO to EF3 rating, causing an annual average damage cost of $6,137 ($165,700 / 27 years). This averaged amount accounts for less than 1% of WCEC's total overhead assets and building valuation ($199,244,118).

An average annual 196 customers reported outages during recorded tornadoes since 1995. When compared with the total number of customers served by WCEC, it can be projected that 2% of all customers may report outages during any given tornadic event.

Problem Statement

The random nature of tornadoes, coupled with their potential for devastating destruction, make this an important hazard to mitigate. Although expensive and impractical for some applications, placing assets underground is an effective method to protect assets from tornadoes.

Severe Thunderstorms, High Wind, and Hail

Previous Occurrences

To access the effects of thunderstorms on the West Central service area, the NOAA Storm Events Database days of events for the Counties of Johnson, Lafayette, and Jackson were used. These three counties account for 99.3% of the meters served by WCEC. From 1997 through 2016, these counties experienced a total 284 thunderstorm/high wind event days.

For this update, it was possible to look at the bounds of the West Central Electric Cooperative using GPS, finding 391 hail events and 323 high wind/thunderstorm events from 1955-2020.

Probability of Future Occurrence and Vulnerability

WCEC was unable to distinguish between damage caused by hail, thunderstorms, or high wind events. As a result, these three hazards have been combined as thunderstorm events. Therefore, the probability of a thunderstorm event in the West Central service area in any given year is 100% (323 events / 25 years) which is an annual average of 12.9 thunderstorm event days.

Estimated material damages associated with each of these events were compiled by WCEC staff. Table 6 provides a summary of those thunderstorm events which caused damage to cooperative infrastructure by date, cost estimate of damage, and reported outages. Fifty-one occurrences caused some damage to cooperative assets, resulting in an 100% probability that a thunderstorm event occurrence will produce damage in any given year and an annual average damaging storm of 2

Table 6 *WCEC Thunderstorm Event Summary*

Event Date	Damage Estimates	Outages Reported
6/12/2004	$10,000	141
7/10/2004	$4,000	104
8/23/2004	$5,600	704
10/29/2004	$4,800	204
6/3/2005	$5,600	400
6/4/2005	$4,200	480
6/7/2005	$9,600	114
6/8/2005	$7,000	1,125
7/3/2005	$3,000	18
9/13/2005	$2,400	48
3/12/2006	$4,000	273
3/30/2006	$15,200	1,043
4/6/2006	$3,000	27
8/6/2006	$5,000	974
8/18/2006	$2,400	58
8/27/2006	$700	72
2/28/2007	$4,800	115
4/24/2007	$7,200	261
9/7/2007	$16,800	632
10/17/2007	$200	60
6/3/2008	$5,000	500
6/5/2008	$33,800	1,024
6/12/2008	$9,600	57
7/2/2008	$12,000	150
8/28/2008	$9,600	200
12/27/2008	$400	1
6/9/2009	$7,200	200
6/15/2009	$5,000	1,100
7/25/2009	$200	1
4/2/2010	$200	46
4/6/2010	$200	19
6/19/2010	$3,200	262

Event Date	Damage Estimates	Outages Reported
7/16/2010	$800	168
7/20/2010	$9,800	1,426
9/10/2010	$800	660
9/18/2010	$3,200	212
8/8/2011	$4,342	780
8/19/2011	$3,160	2,096
3/4/2013	$6,955	170
5/3/2013	$17,565	3,700
5/20/2013	$24,369	1,000
6/17/2013	$6,028	74
6/5/2014	$5,267	244
9/2/2014	$12,267	227
6/26/2015	$8,584	300
07/21/2015	$1,866	40
11/12/2015	$2,543	450
5/18/2016	$897	17
05/26/2016	$5,792	560
7/7/2016	$8,493	398
3/6/2017	$98,222	3,296
1/1/2021	$75,000	2768
06/11/2021	$60,000	3378
Total	$557,850	32,377
Data provided based on internal WCEC records which reflect cost from the referenced event year.		

Based upon historical records for the past 25 years, the thunderstorm/high wind events have caused total damages of $557,850. The average annual amount is $22,314 which accounts for less than 1% of WCEC's overhead asset valuation ($184,147,563).

A total of 32,377 outages were recorded during hail, thunderstorm, and high wind events since 1997. This is an annual average of 1,295 outages. When compared with the total number of customers served by WCEC (12,481), it can be projected that 10% of all customers may report outages during a hail, thunderstorm, or high wind event in any given year.

Problem Statement

Looking at the data, a trend towards more damages and more outages is evident over the last five years. With the intensity of thunderstorm events increasing during recent years, an analysis of which assets are damaged in these events and an implementation of steps to minimize the damage to the infrastructure and outages to members should be initiated.

Flood and Levee Failure

Flood and levee failure are very important to the WCEC service area as its northern border sits on the Missouri River. This can be seen as an ongoing potential threat to the existing infrastructure of the West Central Electric Cooperative. In Lafayette County, the entire northern county line is the Missouri River

which can leave low lying areas vulnerable to flood and levee failure. The map below (Figure 4) demonstrates that much of the Missouri river and the Blackwater River constitutes the majority of the flooding issues that may arise in the service area. Figure 4 depicts the 100-year floodplain in relation to the cooperative's boundaries. *(Map sources: FEMA HAZUS-MH)*

Figure 4 *WCEC Service Area Flood Map*

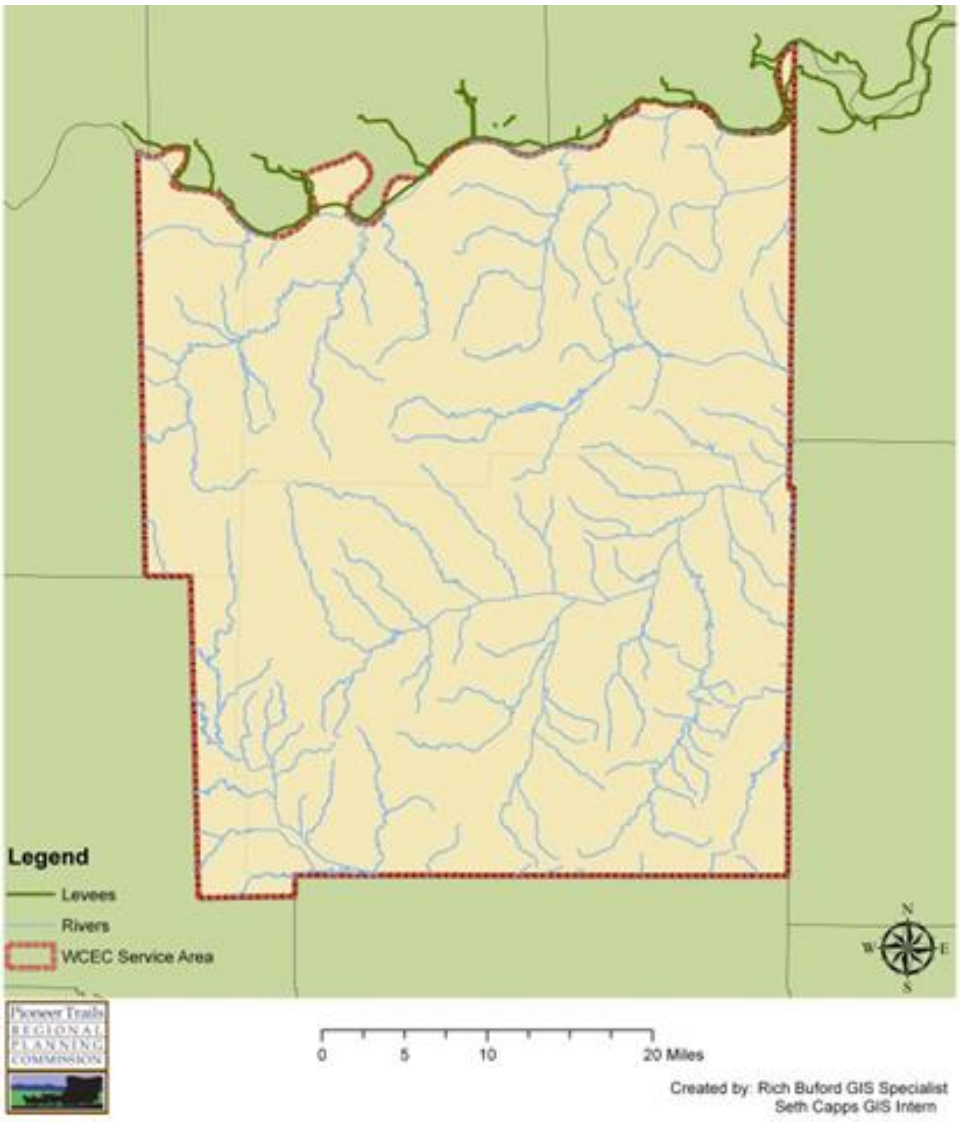
Previous Occurrences

West Central's service area has experienced many flooding events in the past. Data accessed from NOAA shows there were 143 days with flooding events in Johnson and Lafayette Counties from 1997-2016. In May of 2002, a flash flood resulted in over $800,000 in property damage in Lafayette County. To update this data, NCEI reported 31 flood events occurring during the past five years in the area. WCEC did not report any additional damages or outages since the last update. To date, neither this nor any other flooding

events have resulted in reported damage or outages to cooperative assets. Currently, no data concerning levee failure damage can be separated from flood damage data.

Only levees that were regulated were used in this plan as no data was found for unregulated dams, or dikes. Currently, inundation data for levee failure is lacking due to issues surrounding mapping, appropriate models, and its close association with flooding events. Figure 5 below provides the location of known state and federal levees within the cooperative's boundaries. *(Map sources: MSDIS, Army Corp of Engineers, USDA.)*

Figure 5 WCEC Service Area Levees



Probability of Future Occurrence and Vulnerability

The probability of a flood/levee failure event in the cooperative service area is 100% (31 events / 5 years) with an average annual of 6.2 flooding events. To date, none of these events have resulted in damage or

outages to cooperative assets, resulting in a less than 1% probability of that any given event will produce damages.

Flood and levee failure events vary widely based upon numerous factors including, but not limited to, annual precipitation and extent of levee damage. Based upon historical records, the average flood/levee failure event has not impacted cooperative assets.

WCEC data shows that none of its customers reported outages during recorded flooding events since 1997. When compared with the total number of customers served by WCEC, it can be projected that less than 1% of all customers (12,481) may report outages during any given flooding event.

Problem Statement

The data from West Central suggests that the cooperative is doing a great job at avoiding the effects of flooding events on the assets and the members they serve. The placement of assets so to avoid the major floodplains should be continued.

Severe Winter Weather

Previous Occurrences

From 1997-2016, West Central's service area has experienced a total of 40 severe-winter weather events, including blizzards, heavy snowfall and ice storms. The most damaging storm to WCEC was an ice storm in 2002. More recently, in 2013, a winter storm dumped up to 15 inches of wet snow which downed power lines throughout the area. To update this data, NCEI reported 13 winter weather events occurring during the past five years in the area. WCEC did not report any additional damages or outages since the last update.

Probability of Future Occurrence and Vulnerability

The probability of a severe winter weather event in the West Central service area in any given year is 100% with an average annual of 2.6 events. Estimated material damages associated with each of these events were compiled by WCEC staff. Table 7 provides a summary of event dates, types, associated damage estimates, and reported outages. Nine occurrences caused damage to cooperative assets, resulting in a 36% probability that a severe winter weather occurrence will produce damage in any given year.

Table 7 *WCEC Severe Winter Weather Event Summary*

Event Date	Event Type	Damage Estimates	Outages Reported
2/25/2002	Ice Storm	$1,734,254	10,000
11/23/2004	Heavy Snow	$50,400	1,500
1/4/2005	Winter Storm	$67,200	1,700
1/31/2005	Heavy Snow	$14,000	500
12/8/2005	Heavy Snow	$600	38
12/1/2006	Heavy Snow	$600	58
1/12/2007	Winter Storm	$1,200	10
2/27/2013	Winter Storm	$19,387	5,200

Event Date	Event Type	Damage Estimates	Outages Reported
1/13/2019	Ice Storm	$228,847	750
	Total	$2,116,488	19,756
Data provided based on internal WCEC records which reflect cost from the referenced event year.			

Based upon these historical records, a damaging severe winter weather event to affect the cooperative will result in damages of $235,165 ($1,887,641 / 9 events) or an average annual amount of $84,660. This averaged amount accounts for less than 1% of WCEC's total overhead asset valuation ($184,147,563).

An average annual of 790 reported outages occurred during severe winter weather events since 1997. When compared with the total number of customers served by WCEC (12,481), it can be projected that in any given year, 6% of all customers may report outages due to a severe winter weather event.

B. Non-historical Hazards

Wildfire

Previous Occurrences

The incidence of wildfire in the WCEC service area presents a unique risk assessment. Data on wildfires is available only on a county basis. Wildfire events have occurred in the service area, but damage to electrical cooperatives is rare. Table 8 summarizes the incidences of wildfire within three counties of the WCEC service area. Since assets in Cass and Pettis account for less than 1% of WCEC total, those counties were omitted from this hazard's assessment.

Table 8 *Wildfire Summary by County*

County	# of Wildfires, 2004-16	Average Annual # of Wildfires	Acres Burned	Average Annual Acres Burned
Jackson	355	27	462	36
Johnson	754	58	3,778	291
Lafayette	279	21	1,487	114
Totals	1,388	106	5,727	441
Source: Missouri State Hazard Mitigation Plan, 2018				

Probability of Future Occurrence and Vulnerability

The probability of a wildfire event in the West Central service area in any given year is 100% (1,388 events / 13 years). The average annual number of wildfires for the WCEC service is 87 with the average annual 343 acres burned. The potential extent of damage caused by wildfire is difficult to determine. Like earthquakes and dam failure, wildfires have had no measurable impact upon the WCEC service area. WCEC sustained no damage related to wildfires in its service area during this time period. Cooperative assets are located throughout the service area rather than being located at a single central site. With a yearly average of 441 acres burned in the service area, and a total area of the three counties at 1,336,320 acres, it is unlikely that infrastructure damage would exceed 1% based upon asset location and unlikeliness of an uncontrollable wildfire.

No customers have reported outages during recorded wildfires between 2004 and 2016. When compared with the total number of customers served by WCEC, it can be projected that less than 1% of all customers may report outages during any given wildfire event.

Problem Statement

There have not been any reported damages or outages related to wildfires in the WCEC service area. However, for the purposes of this assessment, wildfire and its associated impacts cannot be eliminated from the realm of possibility. The possibility of effects from this hazard should be considered in planning strategies for this cooperative.

Earthquakes

Previous Occurrences

The closest source of earthquake risk in West Central Missouri is the Nemaha Fault, which runs roughly from Oklahoma City, Oklahoma north to Lincoln, Nebraska. In 1993, the Nemaha fault produced a discernable earthquake that was felt in the region, rating a 2.9 magnitude on the Richter Scale. Additional quakes took place February 11, 1995 (3.1 magnitude); July 16, 2004 (3.5 magnitude); March 23, 2003 (3.1 magnitude) and an earthquake measuring 3.6 magnitude was recorded on December 17, 2009. In 2016, on September 3, a 5.8 magnitude earthquake centered near Pawnee, Oklahoma was felt in the area. Although a relatively quiet fault system, the Nemaha fault has the potential to produce a damaging earthquake, profoundly impacting the West Central Electric Cooperative.

The region is also subject to effects of the New Madrid Fault located in extreme southeast Missouri, which has, according to many experts, the potential to produce the largest earthquakes in North America. Undoubtedly, this fault has the potential to affect the WCEC service area in its entirety. In addition, there have been several small, virtually undetectable earth movements in the region in recent history, which may or may not be attributed to the aforementioned fault lines or other, very small faults located nearby.

Probability of Future Occurrence and Vulnerability

While the NeMaha fault is geographically closer and geologically active, C.E.R.I. records demonstrate the limited impact of said earthquakes, with no quakes to date exceeding a 5.5 on the Modified Mercalli Scale. Its cascading effects have been largely restricted to more localized regions, but even then, the damage caused has been minimal. By contrast, the New Madrid fault has the potential to cause damage throughout the state of Missouri, including the WCEC service area. Scientists from the U.S. Geological Survey (USGS) and the Center for Earthquake Research and Information (CERI) at the University of Memphis have estimated the probability of a magnitude 6.0 or greater earthquake from the New Madrid Fault is 25-40 percent through the year 2053.

The projected earthquake intensity ratings for the cooperative region changes based upon the Modified Mercalli Scale. Given a New Madrid earthquake with a 6.7 magnitude, the region would experience Level V intensity characteristics. In the event of an earthquake with a 7.6 magnitude, the region would experience Level VI intensity characteristics while an earthquake with an 8.6 magnitude would most likely cause Level VII intensity characteristics.

In the event of an earthquake with a 7.6 magnitude, the WCEC service area would most likely experience minor building damage as well as damage to the electrical distribution system. This damage, however, would most likely be relatively minimal and localized when compared with the southeast corner of the state. Distribution lines overhead and underground could become disconnected or severed, and transformers could be damaged. Though the probability of occurrence is very small, the potential extent of damage could significantly impact both the cooperative and its customers.

Based upon information from CERI, FEMA, and SEMA, it may be estimated that 1,185 customers could report outages related to an earthquake event. When compared with the total number of customers served by WCEC, it can be projected that up to 10% of all customers may report outages during any given seismic event.

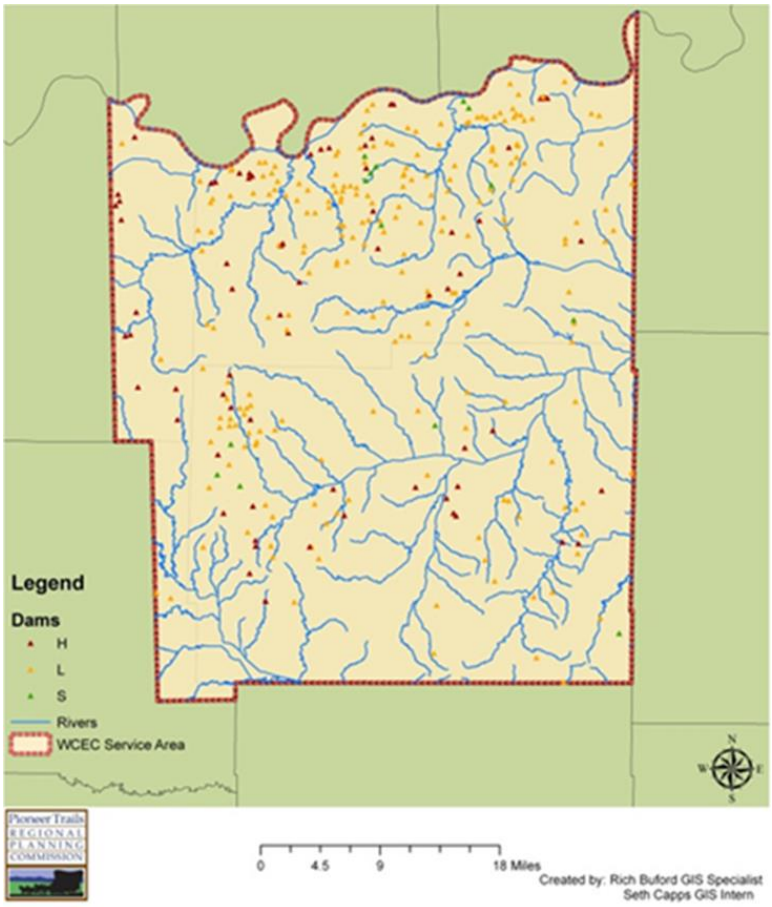
Problem Statement

WCEC should strive to meet seismic design standards for electrical substation equipment and other overhead assets susceptible to damage from earthquake events.

Dam Failure

Like earthquakes, dam failures have had no measurable impact upon the WCEC service area to date. According to Missouri DNR's Dam Safety Division, 303 dams currently exist within the cooperative boundaries: 96 in Johnson County, 192 in Lafayette County, 13 in Jackson, and 2 in Cass County. Of these dams, 35 in Lafayette County and 7 in Johnson County and 1 in Jackson County are regulated by the state due to the fact that they are non-agricultural, non-federal dams which exceed 35 feet in height. Figure 6 shows the locations of all known dams located within West Central's service area. *(Map sources: www.msdis.missouri.edu; www.dnr.mo.gov/env/wrc.)*

Figure 6 *WCEC Service Area Dam Location Map*



Previous Occurrences

The 2018 Missouri State Hazard Mitigation plan states "For the 42-year period from 1975 to 2016 for which dam failure statistics are available, 19 dam failures and 68 incidents are recorded. According to this data, annual probability calculates to a 45 percent annual probability of a dam failure somewhere in the

state and a 100 percent annual probability of dam incidents. In should be noted that historical dam failures and incidents include events from all hazard classes and all dams (whether regulated or un-regulated). Failures and incidents for regulated dams that have higher inspection frequencies should be less probable. The probability of future events is 45%." However, no such event has occurred within or near the cooperative's boundaries.

Probability of Future Occurrence and Vulnerability

For the purposes of this assessment, dam failure and its associated impacts cannot be eliminated from the realm of possibility. In order to allow for a risk assessment, the probability of this event has been included as less than 1%.

Determining the potential extent of dam failure is currently impossible due to a lack of data concerning inundation zones. This assessment assumes a limited impact upon downstream electric distribution infrastructure of less than 10% for both infrastructure damage and service interruption.

Problem Statement

Further study concerning existing dams and the impact of their failure is required to make a more comprehensive assessment of potential damages and mitigation strategies to address this potential damage. The presence of numerous state-regulated dams makes it necessary for WCEC to acknowledge their presence when deciding on the location of assets. Since WCEC has assets along the Missouri River, the presence of numerous upriver dams with millions of acre-feet of storage, should be considered when developing mitigation strategies.

C. Risk Assessment Summary

Most of the historical hazards have had an impact on the electric cooperatives. Table 9 below shows the annual damages associated with each hazard for WCEC. The table is ranked by the highest Average Annual Damages which is an indication of the vulnerability to each hazard.

Table 9 *WCEC Hazard Risk Summary*

Hazard	Average Annual Damages
Severe Winter Weather	$84,660
Severe Thunderstorms, Hail and High Winds	$22,314
Tornadoes	$6,137
Dam Failure	$0
Earthquakes	$0
Flood and Levee Failure	$0
Wildfire	$0

Each of the non-historical hazards Wildfire, Earthquakes and Dam Failure has the potential for causing catastrophic damages in any given year. To date there have been zero damages to the assets of the West Central Electric Cooperative from the non-historical events. Nonetheless, this set of hazards should be considered in mitigation strategies because of the damage potential.

Section 4: Mitigation Strategies

Previous Mitigation Efforts

For organizations like WCEC, mitigation is considered to be part of prudent business operations. In order to ensure the delivery of a quality product and minimize service interruptions, a number of mitigation strategies are continually utilized. Routine maintenance and upgrades to existing equipment are completed as part of daily tasks. Vegetation management is utilized to limit the cascading effects of natural hazards. Safety and reporting information are disseminated to the public through various types of media. Mutual aid agreements and partnerships create relationships which provide for future support in the event of a natural disaster.

Additionally, mitigation is considered prior to any expansion of service into special hazard areas. Before any service is built, it is first "staked out" in coordination with local builders and property owners. This process, completed by the Line Superintendent and contracted engineers, identifies and addresses foreseeable hazards and safety issues before any new service lines area constructed. USDA-RUS specifications regarding operation and safety are utilized in every step of the process. Steps are taken to practically minimize the exposure of equipment to loss due to foreseeable hazards, particularly flooding.

Existing and Potential Resources

As stated above, mitigation is a key component of good business practices. West Central Electric Cooperative includes mitigation strategies as part of regular work activities to ensure service with minimal interruptions. Funding for these activities is provided through the cooperative's normal budgetary process for maintenance.

In order to expand mitigation efforts beyond normal maintenance, it is likely that WCEC will need to seek outside funding sources. These may include private, state, or federal programs which provide grant and loan funding. Upon passage of this plan, WCEC will be eligible for funding through FEMA in the following categories:

- Hazard Mitigation Grant Program
- Flood Mitigation Assistance Program
- Pre-Disaster Mitigation Program
- 406 Stafford Act
- USDA Economic Development Grants

Review of Goals and Actions

To focus on the mitigation actions for the 2023 update to this plan, it was decided to reach consensus on four goals that would address the needs of every cooperative member of AMEC and eliminate the objectives from previous updates. The WCEC mitigation staff reviewed these goals and the actions from the previous update which addressed hazard mitigation issues. They evaluated each action to decide if it was completed, will be continued, or should be deleted. There also was the opportunity to add new actions.

The staff considered which type of actions will maximize benefits and minimizes costs, how mitigation strategies will be implemented, and how the plan will be maintained and updated. Table 10 lists the goals as reviewed in the 2023 plan update.

Table 10 *WCEC Goals 2023*

Identified Goals	Reassessment of the Goal 2023
Goal 1: Protect the health and safety of the community.	Accept, as is
Goal 2: Reduce future losses due to natural hazard events.	Accept, as is
Goal 3: Improve emergency management capabilities and enhance local partnerships.	Accept, as is
Goal 4: Continue to promote public awareness and education.	Accept, as is

Traditionally, the STAPLEE (Social, Technical, Administrative, Political, Legal, Environmental, and Economic) method is used to prioritize mitigation actions. These categories, however, do not necessarily align with the private sector in the same way they are applicable to governmental agencies. Several action items could be included with multiple goals, for example. As a result, the cooperatives chose to use a different method to prioritize their mitigation strategy.

The chosen method of reviewing the proposed and existing mitigation strategies was to perform a cost-benefit analysis of all mitigation actions. The analysis was based on past experiences of performing certain actions and the potential number of beneficiaries. The following matrix, Table 11, was used to rate each mitigation action. Cooperative staff was asked in the Goals and Actions Survey to review the cost-benefit rating and change if necessary.

Table 11 *Cost Benefit Matrix*

COST	BENEFIT		
	High	Medium	Low
High	7	4	1
Medium	8	5	2
Low	9	6	3

The following tables represent the completed review of current and potential mitigation strategies. Each strategy has assigned a cost benefit score assigned by the cooperative staff based on prior experience and professional opinions. Table 12 shows review the actions and the results of the cost-benefit analysis. The table has been updated through the Goals and Actions Survey that was sent to facilitate the staff update review. The Survey can be found in Appendix C. Staff members reviewed each item on the original tables and determined the status of the item.

Table 12 *Prioritized Mitigation Actions for West Central Electric Cooperative – 2023*

Goal-Action #	Action Item	Status Update	Progress on Continued Actions	Hazards Addressed	Completion Date	Cost/ Benefit
1-1	Use vegetation management to prevent interference with delivery of power and limit public danger of downed lines	Continue (In-progress)	Vegetation management continues through the service area on an annual rotating basis.	Thunderstorms Tornado Winter Weather	2027 or later	8
1-2	Increase number of generators owned for use in critical asset outages	Continue (Not started)	No new generators have been purchased.	Flooding Thunderstorms Tornado Winter Weather	2027 or later	3
1-3	Partner with county emergency management agencies to ensure power for local shelters, fuel stations, and public safety.	Continue (In-progress)	Public safety is supported by partnering with county emergency management agencies.	Thunderstorms Tornado Winter Weather	2027 or later	8
1-3	Utilize GIS technology to reduce site identification and response time.	Continue (In-progress)	Updating GIS technology to improve site identification time.	Thunderstorms Tornado Winter Weather	2027 or later	5
1-4	Consider implementation of automated voice response systems to improve outage reporting.	Continue (In-progress)	Evaluating automated voice response systems.	Flooding Thunderstorms Tornado Winter Weather	2027 or later	5
2-1	Addition of lightning arresters, electronic reclosures, conductors, guidewires. Raising padmount transformers in flood prone areas.	Continue (In-progress)	Routine maintenance and upgrading of equipment is an ongoing process.	Flooding Thunderstorms Tornado Winter Weather	2027 or later	8
2-2	Upgrade to concrete or steel poles where possible.	Continue (In-progress)	Upgrading to stronger poles is an ongoing action.	Flooding Thunderstorms Tornado Winter Weather	2027 or later	8
2-3	Add alternate source wiring to eliminate or reduce time of outages.	Continue (In-progress)	Adding alternate source wiring is a continuing activity.	Thunderstorms Tornado Winter Weather	2027 or later	7
2-4	Convert overhead lines to underground lines or vice versa in troubled areas based on vulnerability.	Continue (In-progress)	Assessing vulnerability of overhead or underground lines is an ongoing action.	Flooding Thunderstorms Tornado Winter Weather	2027 or later	7
2-5	Research methods for waterproofing meters in flood-prone areas.	Continue (In-	Working to find better ways to waterproof meters in flood	Flooding Levee Failure	2027 or later	3

Goal-Action #	Action Item	Status Update	Progress on Continued Actions	Hazards Addressed	Completion Date	Cost/ Benefit
		progress)	prone areas.			
2-6	Monitor developments in data availability concerning the impact of dam failure and wildfire upon the WCEC service area through local, state, and federal agencies.	Continue (In-progress)	Connecting with local, state, and federal agencies to monitor information about impact of dam failure and wildfire.	Dam Failure Wildfire	2027 or later	3
3-1	Maintain mutual aid agreements with other rural electric cooperatives.	Continue (In-progress)	Maintaining mutual aid agreements is an ongoing action.	Flooding Thunderstorms Tornado Winter Weather	2027 or later	8
3-2	Cooperate with local law enforcement and government officials to reduce the impact of power outages.	Continue (In-progress)	Continued cooperation other agencies to reduce impact of power outages is an ongoing action.	Flooding Thunderstorms Tornado Winter Weather	2027 or later	3
4-1	Provide safety and reporting information to the general public through varying methods: • Company website • Social media sites • Local newspapers • Presentations • Publications	Continue (In-progress)	Reporting to the general public is an ongoing activity.	Flooding Thunderstorms Tornado Winter Weather	2027 or later	3

After review, there was one action deleted. All other actions are continued in the 2023 plan update. There are no additional actions added to the plan.

Table 13 *Actions Removed from the 2023 Update*

Action Item	Status Update	Explanation
Complete annual inspections of lines and poles.	Delete this action	Lines and poles inspections are routine maintenance.

Section 5: Plan Implementation and Maintenance

Plan Incorporation

The goals and actions of the previous section identify both ongoing efforts at mitigation and potential methods for expanding efforts. The updated plan has been reviewed and adopted by the Board of Directors as part of the company's operations policy. This mitigation plan necessitates involvement from every WCEC employment level as the organization strives to ensure quality service to their customers.

Local Planning Capabilities

Some internal planning capabilities do exist at WCEC. The Hazard Mitigation Plan can be considered and/or incorporated into regular budgetary planning, the four-year work plan for capital improvements, and the maintenance planning policy. Planning capabilities per se for the electric cooperatives are limited. What is important is that the Action Items developed through the mitigation planning process are incorporated into the daily activities of the cooperative.

The four-year work plans embrace the mitigation efforts that are in the mitigation plan. The electric cooperatives across Missouri are always working to strengthen their systems. This would include installing stronger/larger poles when smaller ones need to be changed out, installing stronger/larger conductors that can carry more weight and decreasing span lengths between poles, installing larger anchors, relocating structures out of flood plains, and installing structures to stop cascading during ice storms.

Other capabilities are unique to the electric cooperative's business of providing reliable electricity to their members. Many of the Action Items listed in the plan include tree trimming plans, use of GPS to locate outages, service upgrades to lines and poles, warning systems and use of weather radios, collection of GIS data and utility specific software for locating and rerouting outages to restore power, all contribute to local capabilities. Integration of WCEC planning with local law enforcement, mutual aid agreements, and partnerships with local emergency management resources ensures power to critical facilities during a hazard event. This coordination and cooperation broaden the capabilities of the local cooperative.

Beyond the West Central Electric Hazard Mitigation Plan, regional planning capabilities exist at the local level. The Missouri counties of Johnson, Lafayette, Jackson, Cass, and Pettis each have a FEMA-approved Natural Hazard Mitigation Plan in place. County emergency management directors have Local Emergency Operations Plans which seek to mitigate the same hazards for residents. These same counties are also included in the Regional Transportation Plan (RTP) as well as a Comprehensive Economic Development Strategy (CEDS). WCEC's plan can be easily incorporated into these local plans and allow for coordination across agencies in the event of an emergency.

WCEC is located within the rural portions of third-class counties which are prohibited from enforcing building codes and zoning by the state of Missouri. They do not provide service to any municipality within these counties. Comprehensive plans and Capital Improvement plans do not exist inside of the WCEC service areas.

Plan Maintenance

West Central will follow the requirements coordinated by the Association of Missouri Electric Cooperatives (AMEC) for monitoring, evaluating, and updating the plan.

Continued Public Involvement Opportunities

Public notice was given in the form a notice in the *Rural Missouri*, a publication of the Association of Missouri Electric Cooperatives, distributed to all cooperative members. The updated 2023 plans were posted on the website of the Northwest Missouri Regional Council of Governments for public review and comment. Comments were considered and addressed. Once all co-op plans were completed, they were assembled into one plan and submitted to the State Emergency Management Agency and the Federal Emergency Management Agency for review and approval. The documentation for public involvement and comments can be found in Appendix B of each cooperative's section of the plan.

West Central will follow the requirements coordinated by the Association of Missouri Electric Cooperatives (AMEC) for continued public involvement. Opportunities for public comment will continue to be offered through various media outlets and the physical office of WCEC.

Appendix: A - Adoption Resolution

RESOLUTION

HAZARD MITIGATION PLAN

(CORPORATE SEAL)

Appendix: B - Documentation of Participation

This ad was published in the *Rural Missouri*, a monthly publication of the Missouri Association of Missouri Electric Cooperatives, giving public notice to all subscribing members of AMEC.

Appendix: C - Surveys

Data Survey

The following is the returned survey from GEC which was used by NWMORCOG staff to update the Plan:

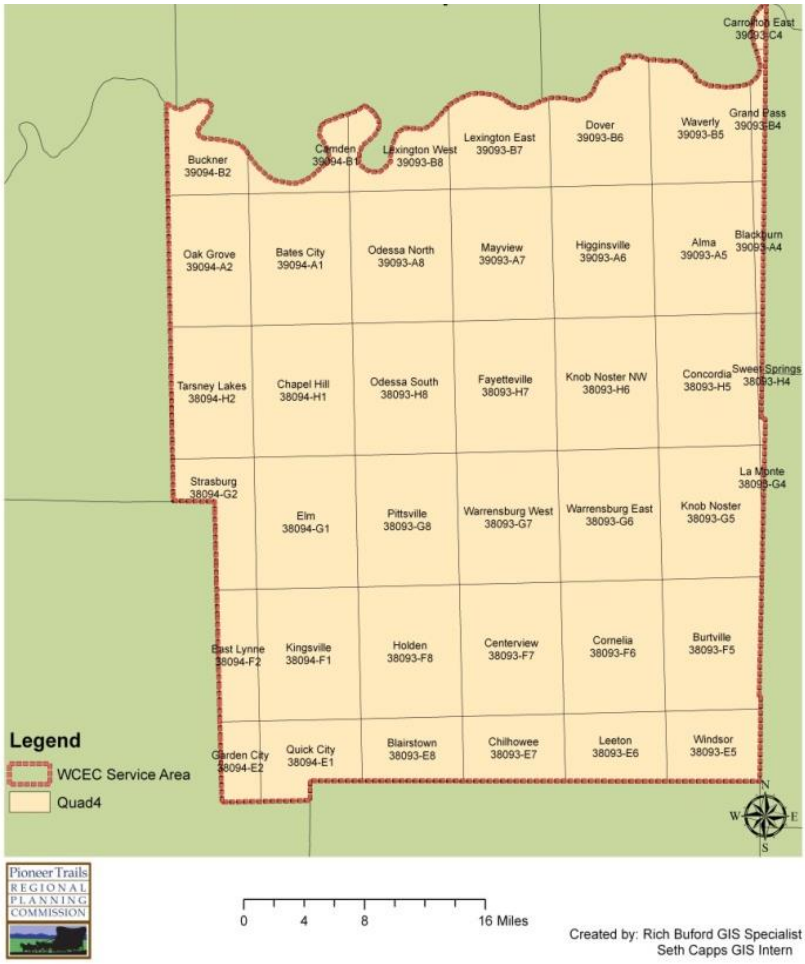
Please correct/update the following information from the previous plan.

A member-owned nonprofit cooperative, West Central Electric Cooperative (WCEC) was formed in 1939 to bring electricity to rural areas. Rural Missourians began the co-op when existing utilities believed that energizing the countryside wasn't a profitable venture. There are 40 rural electric cooperatives in the state of Missouri. WCEC now provides power to more than 14,600 meters through 2,600 miles of line in five counties, including Lafayette, Johnson, Eastern Jackson and a small part of Cass and Pettis counties. The company's headquarters is in Higginsville, Missouri, with a branch office in Oak Grove, Missouri. West Central Electric Cooperative is governed by a board of nine directors elected from among the members. The board meets monthly to make decisions concerning the cooperative's business.

WCEC's service boundaries are completely within the state of Missouri and include Johnson and Lafayette counties in their entirety as well as the eastern portion of Jackson County, the northeastern portion of Cass County and a very small area in Pettis County.

The cooperative owns 2,602 miles of service line within these counties.

if needed, please replace or attach a different map if available or provide info on changes so a new map can be made.



The customer base of WCEC currently is 12,481 members covering five counties in the state of Missouri. Table ? provides the summary of metered customers by county.

Meters by Missouri County

County	Number of Meters
Johnson	8,423
Lafayette	5,640
Cass	102
Jackson	2,356
Pettis	12
Total	16,533

The average daily customer usage for WCEC is 51.92 kilowatt-hours (kWh). Annual total usage of WCEC customers in 2021 was 275,827,000 kWh of service.

Population Density Map will be updated by staff at NWMORCOG

Critical Facilities It is important in mitigation planning for the electric cooperatives to identify the critical facilities in each area and to be able to prioritize reconnection and back-up power

needs. WCEC does not provide service to any critical facilities (hospitals, emergency services, etc.), higher education institutions, or large industrial centers.

Future Development The info wanted here is if any of your members you serve have future development plans that would potentially affect your operation.

The FEMA reviewers that approved the previous update suggested including current operating budget information, any capital improvements, or strategic initiatives in this update. Please add or attach if possible.

Asset Inventory Please update the figures below to the most current information

West Central Electric Cooperative has a wide variety of assets by type. Real estate owned by the company includes office buildings, warehouses, garages, and other outbuildings throughout the service area. Thirty-four vehicles provide access to customers and infrastructure. WCEC does not own any electric generation or transmission infrastructure, but it owns and maintains 2,602 miles of distribution line. Table ? provides information concerning total asset valuation.

Table 14 *WCEC Asset Inventory Valuation Summary*

Asset	Total Replacement Cost	Cost Breakdown
Total WCEC Assets	$216,268,488	Buildings and vehicles - $17,024,370 Overhead assets(OH) - $184,147,563 Underground assets(UG) - $15,096,555
Distribution Lines	OH $92,331,360 UG $11,119,680	OH Single-phase lines - $45,724,800 UG Single-phase lines - $7,983,360 OH Three-phase lines - $44,880,000 UG Three-phase lines - $2,217,600 OH Secondary lines - $1,726,560 UG Secondary lines - $918,720
Supporting Infrastructure	OH $91,816,203 UG $3,976,875	Meters - $9,572,607 Poles - $47,072,575 OH Transformers - $10,276,266 UG Transformers - $3,976,875 Guys/Anchors - $16,144,180 Cross-arms - $2,928,288 Regulators - $1,089,716 SP Oil-Circuit Reclosures - $3,856,815 3phase Oil-Circuit Reclosures -$800,236 Capacitors - $75,520
Office Buildings	$10,000,000	
Warehouses	$3,000,000	
Vehicles	$4,024,370	
Source: Internal West Central Electric Coop Accounting and Maintenance records		

Ensuring quality distribution to its customers, West Central maintains not only distribution lines, but also the supporting infrastructure as well. This information is detailed on the following page.

Table ? below includes a list of asset types, emergency replacement cost per unit or mile, the asset inventory by Service County, and total infrastructure numbers.

WCEC Asset Inventory by Service County

Asset	Emergency Replacement Cost per unit or mile	Number of units or miles: JOHNSON	Number of units or miles: JACKSON	Number of units or miles: LAFAYETTE	Number of units or miles: CASS	Number of units or miles: PETTIS	Total number of units or miles:
Meters	$579/Unit	8423	2356	5640	102	12	16533
Poles	$935/Unit	26618	4988	18166	529	44	50345
SP*** distribution line	$26,400/Mile $5/Foot OH	971	146	594	20	1	1732
	$42,240/Mile $8/Foot UG	85	34	70	0	0	189
TP**** distribution line	$89,760/Mile $17/Foot OH	252	44	199	5	0	500
	$147,840/Mile $28/Foot UG	3	8	4	0	0	15
Secondary Distribution Line	$15,840/Mile $3/Foot OH	55	13	41	1	0	109
	$15,840/Mile $3/Foot UG	24	12	23	0	0	58
Transformers	$957/Unit OH $1,875/Unit UG	6633	1842	4282	91	11	12859
Guys/anchors	$620/Unit	13791	2943	9045	233	27	26039
Crossarms	$352/Unit	4025	836	3359	92	7	8319
Regulators	$12,244/Unit	45	10	34	0	0	89
Oil Circuit Reclosers	$7,209 SP $21,628 TP	289 12	56 14	190 11	0 0	0 0	535 37
Capacitors	$590/Unit	68	8	52	0	0	128
Total Replacement Value by County	OH	$97,258,465	$18,397,042	$66,595,347	$1,808,330	$104,219	$184,163,403
	UG	$6,139,080	$3,506,460	$5,463,105	$3,750	$0	$15,112,395

*OH = overhead **UG = underground ***SP = Single phase ****TP – Three phase

Source: Internal West Central Electric Coop Accounting and Maintenance records

Risk Assessment

Please add any known information related to each of the natural hazards that follow: Flooding (Major and Flash), Levee Failure, Dam Failure, Earthquake, Land Subsidence/Sinkholes, Drought, Extreme Temperature, Severe Thunderstorms, Severe Winter Weather, Tornadoes, Wildfire

NWMORCOG will add information to the narrative from the National Weather Service that has occurred since 2016

Tornadic Event Summary

Date Of Event	EF Scale Rating	Damage Estimates	Outages Reported
10/29/2004	F1	$1,600.00	205
6/4/2005	F1	$22,400.00	480
3/12/2006	F2	$29,400.00	191
2/24/2007	EF1	$800.00	94
6/5/2008	EF0	$13,000.00	1,024
5/20/2010	EF0	$300.00	2
3/6/2017	EF3	$98,200	3,296
	Total		
Data provided based on internal WCEC records which reflect cost from the referenced event year.			

Thunderstorm/High Wind, Hail Event Summary

Event Date	Damage Estimates	Outages Reported
6/12/2004	$10,000	141
7/10/2004	$4,000	104
8/23/2004	$5,600	704
10/29/2004	$4,800	204
6/3/2005	$5,600	400
6/4/2005	$4,200	480
6/7/2005	$9,600	114
6/8/2005	$7,000	1,125
7/3/2005	$3,000	18
9/13/2005	$2,400	48
3/12/2006	$4,000	273
3/30/2006	$15,200	1,043
4/6/2006	$3,000	27
8/6/2006	$5,000	974
8/18/2006	$2,400	58
8/27/2006	$700	72
2/28/2007	$4,800	115
4/24/2007	$7,200	261
9/7/2007	$16,800	632

Event Date	Damage Estimates	Outages Reported
10/17/2007	$200	60
6/3/2008	$5,000	500
6/5/2008	$33,800	1,024
6/12/2008	$9,600	57
7/2/2008	$12,000	150
8/28/2008	$9,600	200
12/27/2008	$400	1
6/9/2009	$7,200	200
6/15/2009	$5,000	1,100
7/25/2009	$200	1
4/2/2010	$200	46
4/6/2010	$200	19
6/19/2010	$3,200	262
7/16/2010	$800	168
7/20/2010	$9,800	1,426
9/10/2010	$800	660
9/18/2010	$3,200	212
8/8/2011	$4,342	780
8/19/2011	$3,160	2,096
3/4/2013	$6,955	170
5/3/2013	$17,565	3,700
5/20/2013	$24,369	1,000
6/17/2013	$6,028	74
6/5/2014	$5,267	244
9/2/2014	$12,267	227
6/26/2015	$8,584	300
07/21/2015	$1,866	40
11/12/2015	$2,543	450
5/18/2016	$897	17
05/26/2016	$5,792	560
7/7/2016	$8,493	398
3/6/2017	$98,222	3,296
1/1/2021	$75,000	2768
06/11/2021	$60,000	3378
Totals		
Data provided based on internal WCEC records which reflect cost from the referenced event year.		

The hazards of flood and levee failure have been separated in the Missouri State Hazard Mitigation Plan. If possible, separate any damage/outages data into the appropriate hazard's table.

The probability of a flood/levee failure event in the cooperative service area is 100% (143 events / 20 years) with an average annual of over seven days of flooding events (NOAA data). To date, none of these

events have resulted in reported damage or outages to cooperative assets, resulting in a less than 1% probability of that any given event will produce damages.

Flood Event Summary

Event date	Damage estimates	Outages reported

Levee failure,

Event date	Damage estimates	Outages reported

Severe Winter Weather Event Summary

Event Date	Event Type	Damage Estimates	Outages Reported
2/25/2002	Ice Storm	$1,734,254	10,000
11/23/2004	Heavy Snow	$50,400	1,500
1/4/2005	Winter Storm	$67,200	1,700
1/31/2005	Heavy Snow	$14,000	500
12/8/2005	Heavy Snow	$600	38
12/1/2006	Heavy Snow	$600	58
1/12/2007	Winter Storm	$1,200	10
2/27/2013	Winter Storm	$19,387	5,200
1/13/2019	Ice Storm	$228,847	750
	Total		
Data provided based on internal WCEC records which reflect cost from the referenced event year.			

Please add any dates, known damage, and outages since the last plan due to

dam failure,

Event date	Damage estimates	Outages reported

drought,

Event date	Damage estimates	Outages reported

earthquake,

Event date	Damage estimates	Outages reported

extreme temperatures (hot & cold)

Event Date	Event Type	Damage Estimates	Outages reported

land subsidence,

Event date	Damage estimates	Outages reported

or wildfire.

Event date	Damage estimates	Outages reported

Goals and Actions Survey

The original survey is an interactive Excel file that could not be inserted without stabilizing the formatting. All of the data submitted is included in the tables below.

	A	B	C	D	
1	**Complete each row left to right. Click on each box to receive instructions for that box.**	**Goals**	**Reassess the goal**	**Instructions**	**Justifications**
2	→	**Goal 1**: Protect the health and safety of the community	accept, as is ☑ yes	If you chose to remove or modify the goal, please give your reasons in the box to the right.	
3	→	**Goal 2**: Reduce future losses due to natural hazard events.	accept, as is ☑ yes	If you chose to remove or modify the goal, please give your reasons in the box to the right.	
4	→	**Goal 3**: Improve emergency management capabilities and enhance partnerships.	accept, as is ☑ yes	If you chose to remove or modify the goal, please give your reasons in the box to the right.	
5	→	**Goal 4**: Continue to promote public awareness and education.	accept, as is ☑ yes	If you chose to remove or modify the goal, please give your reasons in the box to the right.	
6	↘	**After completing this sheet, please click the "actions" tab at the bottom**			
7	risk summary table Information to consider when updating				

Table 1 *WCEC Hazard Risk Summary*

Hazard	Average Annual Damages
Severe Winter Weather	$84,660
Severe Thunderstorms, Hail and High Winds	$22,314
Tornadoes	$6,137
Dam Failure	$0
Earthquakes	$0
Flood and Levee Failure	$0
Wildfire	$0

goals | actions

Read each row left to right. Click on each box to receive instructions for that box.	Goal-Action#	Action Items Specify locations when able	Status Update	Report progress on continued actions	Select Hazard(s) addressed by this action	Completion Date	COST/BENEFIT SCORE
→	2-1	Addition of lightning arresters, electronic reclosures, conductors, guidewires. Raising padmount transformers in flood prone areas.	Continue (In-progress)	upgrading of equipment is an ongoing process	Dam Failure Earthquakes Flooding Land Subsidence Levee failure Thunderstorms Tornado Wildfire Winter Weather	2027 or later	8
→	2-2	Upgrade to concrete or steel poles where possible.	Continue (In-progress)	Upgrading to stronger poles is an ongoing action.	Dam Failure Earthquakes Flooding Land Subsidence Levee failure Thunderstorms Tornado Wildfire Winter Weather	2027 or later	8
→	1-1	Use vegetation management to prevent interference with delivery of power and limit public danger of downed lines	Continue (In-progress)	Vegetation management continues through the service area on an annual rotating basis.	Dam Failure Earthquakes Flooding Land Subsidence Levee failure Thunderstorms Tornado Wildfire Winter Weather	2027 or later	8
→	2-3	Add alternate source wiring to eliminate or reduce time of outages.	Continue (In-progress)	Adding alternate source wiring is a continuing activity.	Dam Failure Earthquakes Flooding Land Subsidence Levee failure Thunderstorms Tornado Wildfire Winter Weather	2027 or later	7
→	2-4	Convert overhead lines to underground lines or vice versa in troubled areas based on vulnerability.	Continue (In-progress)	Assessing vulnerability of overhead or underground lines is an ongoing action	Dam Failure Earthquakes Flooding Land Subsidence Levee failure Thunderstorms Tornado Wildfire Winter Weather	2027 or later	7
→	4-1	Provide safety and reporting information to the general public through varying methods: • Company website • Social media sites • Local newspapers • Presentations • Publications	Continue (In-progress)	Reporting to the general public is an ongoing activity.	Dam Failure Earthquakes Flooding Land Subsidence Levee failure Thunderstorms Tornado Wildfire Winter Weather	2027 or later	3
→	1-2	Increase number of generators owned for use in critical asset outages	Continue (In-progress)	No new generators have been purchased.	Dam Failure Earthquakes Flooding Land Subsidence Levee failure Thunderstorms Tornado Wildfire Winter Weather	2027 or later	3
→	3-1	Maintain mutual aid agreements with other rural electric cooperatives.	Continue (In-progress)	Maintaining mutual aid agreements is an ongoing action.	Dam Failure Earthquakes Flooding Land Subsidence Levee failure Thunderstorms Tornado Wildfire Winter Weather	2027 or later	8
→	1-3	Partner with county emergency management agencies to ensure power for local shelters, fuel stations, and public safety.	Continue (In-progress)	Public safety is supported by partnering with county emergency management agencies.	Dam Failure Earthquakes Flooding Land Subsidence Levee failure Thunderstorms Tornado Wildfire Winter Weather	2027 or later	8

	3-2	Cooperate with local law enforcement and government officials to reduce the impact of power outages.	Continue (In-progress)	Continued cooperation other agencies to reduce impact of power outages is an ongoing action.	Dam Failure Earthquakes Flooding Land Subsidence Levee Failure Thunderstorms Tornado Wildfire Winter Weather	2027 or later	3	
	2-5	Research methods for waterproofing meters in flood-prone areas.	Continue (In-progress)	Working to find better ways to waterproof meters in flood prone areas.	Dam Failure Earthquakes Flooding Land Subsidence Levee Failure Thunderstorms Tornado Wildfire Winter Weather	2027 or later	3	
	1-3	Utilize GIS technology to reduce site identification and response time.	Continue (In-progress)	Updating GIS technology to improve site identification time.	Dam Failure Earthquakes Flooding Land Subsidence Levee Failure Thunderstorms Tornado Wildfire Winter Weather	2027 or later	5	
	1-4	Consider implementation of automated voice response systems to improve outage reporting.	Continue (In-progress)	Evaluating automated voice response systems.	Dam Failure Earthquakes Flooding Land Subsidence Levee Failure Thunderstorms Tornado Wildfire Winter Weather	2027 or later	5	
	2-6	Monitor developments in data availability concerning the impact of dam failure and wildfire upon the WCEC service area through local, state, and federal agencies.	Continue (In-progress)	Connecting with local, state, and federal agencies to monitor information about impact of dam failure and wildfire.	Dam Failure Earthquakes Flooding Land Subsidence Levee Failure Thunderstorms Tornado Wildfire Winter Weather	2027 or later	3	
		Complete annual inspections of lines and poles.	Delete this action	Lines and poles inspections are routine maintenance.				
NEW Action (optional)			NEW Not Started	NEW	Dam Failure Earthquakes Flooding Land Subsidence Levee Failure Thunderstorms Tornado Wildfire Winter Weather	2027 or later		**Thank you. Be sure you have completed all cells. Please save and return the file.**
NEW Action (optional)			NEW Not Started	NEW	Dam Failure Earthquakes Flooding Land Subsidence Levee Failure Thunderstorms Tornado Wildfire Winter Weather			