Adair County Hazard Mitigation Plan Update 2026

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CHAPTER ONE: INTRODUCTION

1.1 Overview

Overview of Plan Purpose:

The Adair County 2026-2030 Hazard Mitigation Plan was developed consistently with the state hazard mitigation planning requirements outlined in the Code of Federal Regulation (44CFR Part 201.4 and 201.5). This plan evaluates the county's potential exposure to natural hazards and identifies appropriate mitigation strategies.

Completion of this plan will assist Adair County emergency management personnel in identifying areas of risk, assessing the magnitude of the risk, and developing strategies for reducing this risk. Through this process, Adair County can address issues related to incompatible land uses; the identification and protection of critical facilities; and the reduction of costs associated with natural disaster relief and rescue efforts. Completion and approval of this plan make Adair County eligible to apply for future disaster relief and mitigation project funds to implement some of the recommended mitigation strategies.

This plan establishes three major visions in fulfilling the requirements established through the Disaster Mitigation Act of 2000:

Reduce Hazard Risks and Impacts- This multi-hazard mitigation plan assessed vulnerability of life and property from potential natural hazards and prioritized corresponding mitigation strategies to reduce the risk and impact from the hazard.

Build on Existing Efforts – Adair County, Oklahoma, and county and local entities have engaged in mitigation and response planning efforts over the year. The intent of this plan is to maximize these efforts by inventorying, coordinating, and building on these efforts where possible, and developing new strategies from existing emergency response plans and other relevant efforts.

Share Information and Raise Awareness – Public engagement methods used in the preparation of this plan sought input from a diverse range of stakeholders including the public, and various public, private, and non-profit sector representatives. Mitigation strategies identified in this plan address public information, communication, and outreach in a universal manner regardless of hazard type, and within a hazard-specific context, as applicable.

Overview of Planning Area:

Physical Characteristics: Adair County is in northeastern Oklahoma, approximately 90 minutes southeast of Tulsa and forty-five minutes west of Fayetteville, Arkansas. It covers approximately 577 square miles. As of the 2016 Census, there are approximately 22,098 residents of the county, of which 43% are registered Cherokee Nation tribal members. As of the 2020 Census, there are approximately 19,495 residents of the county, of which 44% are American Indian and Alaska Native.

Historical Background: Located in northeastern Oklahoma, Adair County is bounded on the east by the state of Arkansas. Cherokee County borders Adair to the west, to the north is Delaware County, and to the south is Sequoyah County. The county's major highways are U.S. Highway 62, an east-west route, and U.S. Highway 59, a north-south road. Other east-west routes include State Highways 51 and 100. Adair County has 577.03 square miles of land and water. The region is part of the Ozark Plateau uplift, which comprises the tree-covered foothills of the Boston Mountains. The north and central portions of Adair County are drained by the Illinois River and by Barren Fork, Evansville, and Caney creeks. Near Stilwell are Sallisaw and Little Lee creeks.

Prehistoric Adair County was inhabited by Archaic and Woodland peoples. Later the Caddoan and Osage peoples lived in the present county. The first whites to arrive in the region were Creole trapper-traders, and after 1812 white pioneers pushed into the area. In 1825 the Osage sold the land that is now Adair County to the United States. As early as 1828 the Western Cherokee arrived from Arkansas. In the 1830s the Eastern Cherokee appeared, this time from Georgia, Tennessee, and North Carolina. By the turn of the twentieth century whites outnumbered Cherokees in their nation, and by 1910 whites doubled American Indians in the county. Demographics changed even more over time, and in 2000 there were 8,938 American Indians, 10,207 whites, 38 African Americans, and 20 Asians. As of the 2020 Census, there were 8,570 American Indians, 7.645 whites, 41 African Americans, 162 Asians, 12 Native Hawaiian and Pacific Islander, and 452 listed as other race. Of the population, 2613 identified as two or more races.

At the Oklahoma Constitutional Convention in 1906 Adair County was created from the Going Snake and Flint districts of the Cherokee Nation. The county received its name from the influential mixed-blood Cherokee Adair family. In 1901, anticipating Oklahoma's upcoming statehood, the battle for the county seat began when the *Stilwell Standard* stated that its town would be the seat. Westville also declared its intent to host the government offices. The state's constitutional convention delegates selected Westville. In 1908 the battle began again. In an election on June 2, 1908, Stilwell won by 101 votes, but the Westville newspaper protested. A referee, Judge De Ross Baily, reported Westville as the permanent location. The Oklahoma Supreme Court rejected his report. Stilwell also won the second election. Then in the third election, in 1910, Stilwell won by a mere thirty votes. Westville protested again. The second referee, O. J. Hubbel, found no fault with the election, and Gov. Charles Nathaniel Haskell made the decision that Stilwell would remain the seat of government.

Two railroads have served the area. In 1895–96 E. L. Martin and Arthur E. Stilwell brought the Kansas City Southern Railway Company to Adair County. The line passed through Watts, Westville, and Stilwell, helping to boost the communities' economies. On January 29, 1962, the Kansas City Southern Railway merged with Kansas City Industries. From 1901 to 1903 Charles N. Haskell and William Kenefick constructed another line through the area. The purpose of their Ozark and Cherokee Central Railroad was to carry produce to market. In July 1942 crews began dismantling the line.

Agriculture has been a key to the economy. In 1907 county farmers planted 16,299 acres of corn, 4,883 acres of wheat, 2,257 acres of oats, and 1,213 acres of cotton. By 1934 corn still dominated, with 4,173 acres planted, followed by wheat (4,173) and oats (2,740). By 1959 the main crop was sorghums (6,200 acres), with oats (2,100) and corn (2,300) the other principal products. In 2000 wheat led with 2,000 acres planted, and 35,000 acres of hay was harvested. According to the 2022 Census of Agriculture, while harvested hay remained steady at 26,728 acres, wheat production drastically dropped to 168 planted acres. Cattle raising assumed increasing importance over the twentieth century. In 1907, 4,799 cattle and 1,691 horses were on hand. By 1935 there were 14,908 heads of cattle. In 1960 and 1961 farmers began to convert large amounts of land to dairy and livestock pastures. In 1961 the number of cattle increased to 26,000 and by 2000 stood at 55,000 head. As of the 2022 Census of Agriculture, there were 52,205 heads of cattle and calves in Adair County. The county had a flourishing poultry industry with 6,423,479 Broilers in 2022. Laying hens have almost doubled since the 2017 Census totaling 478,553. The inventory of Pullets has grown to 178,208 which is approximately 50,000 more than 2017.

Other economic developments affected the county. In 1942 Stilwell Canning Company (after 1974 Stilwell Foods) opened, providing employment. Nonetheless, in 1960 Adair County reported the lowest per capita income in Oklahoma. In the 1960s citizens began to promote tourism and economic development. In 1974 Baldor Electric built a factory in Westville, manufacturing electric motors.

Numerous historic sites are located in the county. Fort Wayne, constructed in 1838, was moved to present Delaware County in 1840. The site was abandoned from 1842 until 1862 when a Civil War battle occurred there. Adair County was also known to bandits and outlaws such as the Starrs, the James brothers, and Charles Arthur "Pretty Boy" Floyd. Local sites listed in the National Register of Historic Places include the Adair County Courthouse (NR 84002927) in Stilwell, Golda's Mill (NR 72001049) near Stilwell, and the Buffington Hotel (NR 84002929) and Opera Block (NR 84002934) in Westville. Adair State Park is located near Stilwell. Adair County also hosts the annual Strawberry Festival at Stilwell.

In this predominantly rural county, the population has remained small. In 1910 the census counted a total of 10,535 residents. In 1930 the population had risen to 14,756. In the 1940s, 15,755 people lived in the county, and then the number began to decline. By 1960 it stood at 13,112. In the 1970s it began to rise, peaking in 1980 at 18,575 before dropping to 18,421 in 1990. In 2000 the census counted 21,038 and in 2010, 22,683, of whom 43.3 were American Indian, 43.0 percent white, 0.6 Asian, and 0.2 percent African American. Hispanic ethnicity was identified as 5.3 percent. The incorporated towns were Stilwell, Watts, and Westville.

Noteworthy residents have included Ned Christie (1852–92), a controversial figure sometimes labeled an outlaw. Likewise, Ezekial Proctor (d. 1907) was an alleged outlaw charged with killing an Indian woman. He was acquitted by the Cherokee courts, but he never passed through the U.S. legal system. Contemporary figures include former Speaker of the Oklahoma House of Representatives Larry Adair (1946–), a Stilwell native. Adair County was also the home to Wilma Mankiller (1945–2010), the first woman to be principal chief of the Cherokees. Another

local personality was Sam Claphan (1956–2001), who played football for Stilwell High School, for the University of Oklahoma, and for the San Diego Chargers.

Demographics: As of the census[16] of 2016, Adair County had a small population relative to its surrounding counties, with only 22,098 people, a large percentage of them, 43.3 percent, Native American. The remainder of the population was 43 percent white, 10.5 percent of more than one race, and 5.3 percent Hispanic or Latino. Less than 1 percent of the population was either Black or African American, Asian, or Pacific Islander, and 2.3 percent were identified as other. This makes it the only majority-minority county in Oklahoma.

The median age of the population was 36.2 years and two-thirds of the county's population were either under the age of 18 (28 percent) or between the ages of 25 to 44 (24.8 percent). Of the remaining population, 25.9 percent were ages 45 to 64, 12.9 percent were 65 years of age or older, and 13.2 percent were ages 18 to 24. For every 100 females there were 100.1 males. For every 100 females age 18 and over, there were 98.3 males.

There were a total of 8,156 households and 5,982 families in the county in 2010. There were 9,142 housing units. Of the 8,156 households, 31.4 percent included children under the age of 18 and slightly more than half (52.7 percent) included married couples living together. 26.7 percent were non-family, 14.2 percent had a female householder with no husband present, and 26.8 percent contained a single individual of 65 years of age or older. The average household size was 2.77 and the average family size was 3.25.

The median income for a household in the county was $27,258, and the median income for a family was $32,930. Males had a median income of $28,370 versus $23,384 for females. The per capita income for the county was $13,560. About 25.3 percent of families and 27.8 percent of the population were below the poverty line, including 36.8 percent of those under age 18 and 18.7 percent of those age 65 or over.

As of the census of 2020, the racial makeup of the county was 39.2% White, 0.2% Black or African American, 44.0% American Indian and Alaska Native, 0.8% Asian, 2.3% from some other race, and 13.4% from two or more races. Hispanic or Latino residents of any race comprised 6.4% of the population. This makes it the only majority-minority county in Oklahoma.

Of the residents, 26.0% were under the age of 18 and 17.2% were 65 years of age or older; the median age was 39.4 years. For every 100 females there were 97.2 males, and for every 100 females age 18 and over there were 95.4 males.

There were 7,076 households in the county, of which 33.2% had children under the age of 18 living with them and 26.6% had a female householder with no spouse or partner present. About 25.1% of all households were made up of individuals and 11.5% had someone living alone who was 65 years of age or older.

There were 8,059 housing units, of which 12.2% were vacant. Among occupied housing units, 71.0% were owner-occupied and 29.0% were renter-occupied. The homeowner vacancy rate was 1.9% and the rental vacancy rate was 9.7%.

In 2020, the most reported ancestries were Cherokee (33.5%), Cherokee Nation (12.8%), English (10.2%), Irish (7.4%), German (6.2%), and Mexican (5.3%).

In 2020, the median income for a household in the county was $34,375, and the median income for a family was $45,660. Married-couple families had a median income of $53,647 and $18,834 for nonfamily households. The per capita income for the county was $17,729. About 22.2 percent of families and 26.6 percent of the population were below the poverty line, including 36.1 percent of those under age 18 and 18.3 percent of those age 65 or over.

The 2024 Census Survey and the 2024 American Community Survey 1-year estimates reflected a population total of 19,821. The largest portion being represented by 7,894 white individuals and 6,935 Native Americans. The rest of the population consisted of 257 Black or African American, 121 Asian, 62 Pacific Islander, and 1656 Hispanic or Latino. There was a small grouping, 307, that identified as some other race. In addition, there were 2,589 people listed as being two or more races.

The median age of the population was 37.1 years. The county's population was 5,306 under the age of 18, 1,482 between the ages of 18 to 24, and 5,344 between 25 to 44 years of age. Of the remaining population, 4,559 were ages 45 to 64, and 3,130 were 65 years of age or older. There was a total of 10,164 females and 9,657 males in the county.

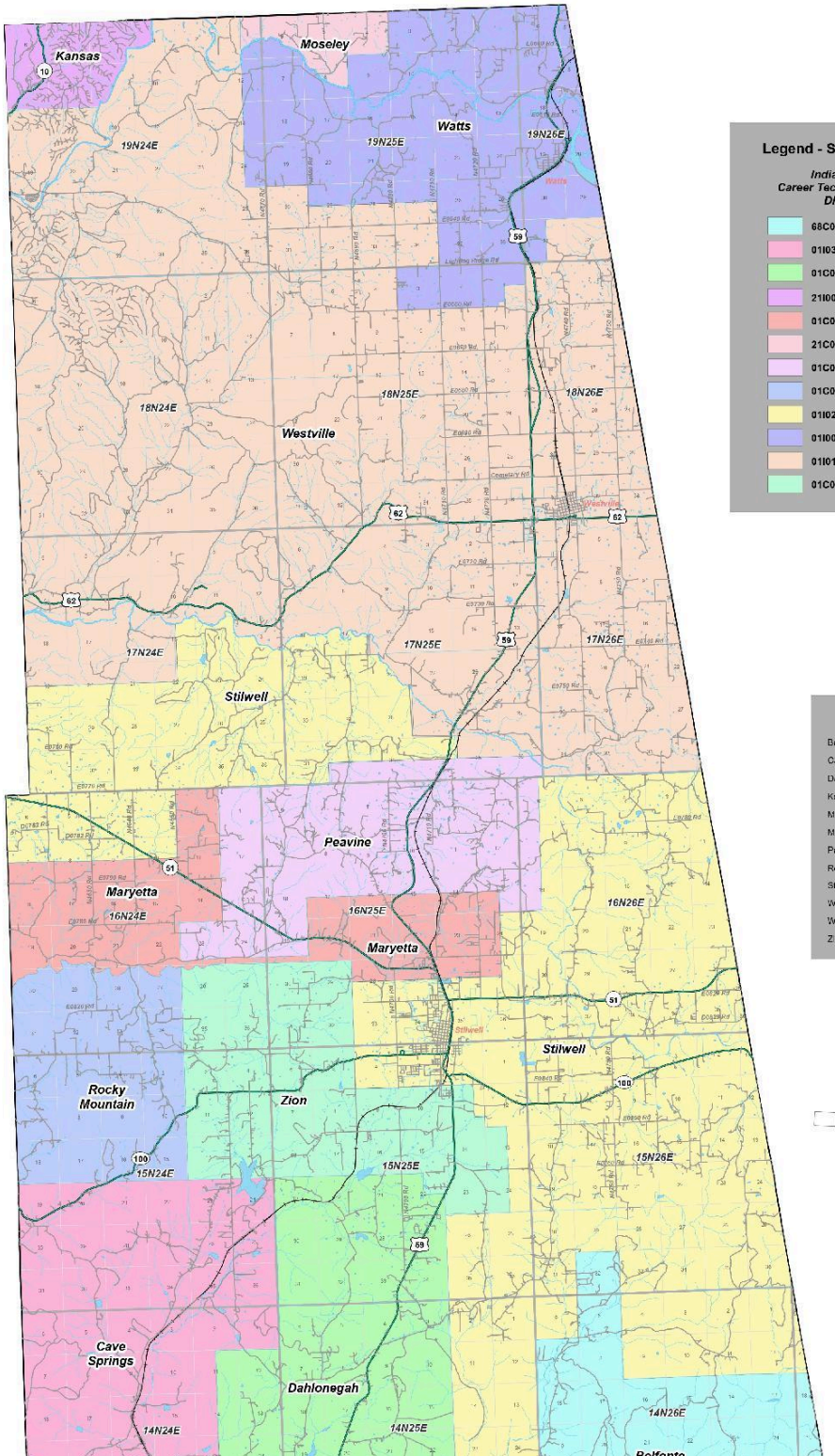
There were a total of 7,637 households and 5,245 families in the county in 2024. Of the 7,637 households, 3,481 were married couple families, and 2,392 were non-family. There were 1,104 female householders with no husband present and 660 male householders with no wife present. Regarding the non-family units, 2,089 householders lived alone and 303 did not live alone. The average household size was close to 2.5 and the average family size was 3.06.

In 2024 (inflation-adjusted dollars), the median income for a household in the county was $46,371 and the median income for a family was $63,013. For non-family units, the median income was $24,861. Males (worked full time, year-round) had a median income of $45,369 versus $37,574 for females (worked full time, year-round). About 4,722 of the population were below the poverty line, including 1,695 of those under age 18 and 823 of those age 65 or over.

Land Use: Within Adair County, lands constitute residential, agricultural, commercial, industrial, transportation, communication, outdoor recreation, woodlands/natural areas, and water used for the betterment of the public.

School Districts

Adair County



1.2 Participating Jurisdictions

There are eleven (11) Public Schools and four (4) municipalities located throughout Adair County that are participating in the Adair County Hazard Mitigation Plan Update. The school districts consist of Pre-Kindergarten through 12th Grade. The average overall attendance is approximately 2,150 students annually.

Adair County
City of Stilwell
Town of Westville
Town of Watts
Belfonte Bell Elementary
Cave Springs Public School
Dahlonegah Public School
Cherokee Immersion ES-Greasy
Maryetta Public School
Peavine Public School
Rocky Mountain Public School
Stilwell Public School
Watts Public School
Westville Public School
Zion Public School

In this plan, the jurisdictions listed above will be referred to as the "Planning Area."

CHAPTER TWO: PLANNING PROCESS

2.1 Overview of Planning Process

Development of the Adair County 2026-2030 Hazard Mitigation Plan began in November 2025 and will be approved by the County Commissioners after pending approval from FEMA. The Planning Committee comprised of county officials, emergency management personnel, and organizations, guided the plan development process over a 12-month timeframe. Development of the plan was structured along a five-phase planning process:

Phase I: Pre-planning and establishing Planning Committee
Phase II: Identify and assess risks
Phase III: Develop mitigation action plan
Phase IV: Identify policies and procedures for plan implementation
Phase V: Document the planning process and plan adoption

Phase I involved conversations and meetings aimed at establishing a Planning Committee and outlining the planning process and responsibilities of the Steering Committee. The first meeting for the plan brought together representative from many of Adair County's various departments to provide information about the plan and process and seek Steering Committee members.

Phase II was comprised of several meetings with the Planning Committee to identify and select natural hazards and assess potential risks to the Adair County.

Phase III involved the development of a mitigation action plan to address identified risks.

Phase IV identified policies that affect plan implementation and defined the procedures that would be followed to implement the plan.

Phase V involved documenting the planning process and developing a complete draft of the plan. The planning committee consisted of representatives from across Adair County's Government, political subdivisions, and educational districts. Also included in the planning process were individuals representing a variety of stakeholders. The team met monthly on the 1st Monday of each month at the Mid-County/Baron Community Center in Baron, Oklahoma. Many of the committee's verbal comments were incorporated into this document. The Planning Committee was responsible for providing input, guiding the planning process, and reviewing and commenting on each section of the plan. Under the direction of Adair County Emergency Management, the Steering Committee facilitated meetings, collected and distributed information for the meetings, and drafted the plan.

2.2 Planning Committee Members

Adair County Jurisdictional Representatives			
Jurisdiction Represented	**Name**	**Title**	**Contributions to Planning Process**
Adair County	Alan Starr Charles Boecher Larry Wood	County Commissioners	Provided overall support for the planning process and sponsored the plan through Adair County Commissioners Office
Adair County Mid Cty Stilwell Westville	Billy Willis Dianne Yell Jean Ann Wright Billy Ames	Emergency Manager Assistant EM Emergency Manager Emergency Manager	Provided support for the planning process, coordinated meetings, and gave input from Emergency Manager's view point and responsibilities. Assimilated collected data, provided County hazard information, mitigation actions, and provided capability assessment
City of Stilwell	Jean Ann Wright	Mayor	Provided Town hazard information, mitigation actions, and capability assessment
City of Stilwell	Charley Coombes	Fire Chief	Provided Town hazard information, mitigation actions, and capability assessment
City of Stilwell	Chad Smith	Chief of Police	Provided Town hazard information, mitigation actions, and capability assessment
Westville	Adam Mckenzie	Mayor	Provided Town hazard information, mitigation

			actions, and capability assessment
Westville	Jake Johnson	Fire Chief	Provided Town hazard information, mitigation actions, and capability assessment
Westville	Open	Chief of Police	Provided Town hazard information, mitigation actions, and capability assessment
Watts	John Ford	Mayor	Provided Town hazard information, mitigation actions, and capability assessment
Watts	Bridget Beavers*	Town Administrator	Provided input from small town perspective and financial obligations during emergencies
Watts	Ralph Colantuono	Chief of Police	Provided Town hazard information, mitigation actions, and capability assessment. And challenges faced during emergency operations
Chance	Joe Bateman	Fire Chief	Provided Town hazard information, mitigation actions, and capability assessment. And challenges faced by the Fire Chief during emergency operations
Mid-County/Baron	Red Yell	Fire Chief	Provided community hazard information, mitigation actions, and capability assessment.
Greasy	Jody Fletcher	Fire Chief	Provided community hazard information, mitigation actions, and capability assessment.
Stilwell Public Schools	Matthew Brunk	Superintendent	Provided school district hazard information and mitigation actions, assembled public comments from staff and parents, provided capability assessments
Westville Public School	Ryan Swank	Superintendent	Provided school district hazard information and mitigation actions, assembled public comments from staff

			and parents, provided capability assessments
Watts Public Schools	Thomas Yeager	Superintendent	Provided school district hazard information and mitigation actions, assembled public comments from staff and parents, provided capability assessments
Peavine Public Schools	Amanda Long	Superintendent	Provided school district hazard information and mitigation actions, assembled public comments from staff and parents, provided capability assessments
Maryetta Public Schools	Lori Means	Superintendent	Provided school district hazard information and mitigation actions, assembled public comments from staff and parents, provided capability assessments
Belfonte Bell Public Schools	Bobbie Weddle	Superintendent	Provided school district hazard information and mitigation actions, assembled public comments from staff and parents, provided capability assessments
Cherokee Immersion ES-Greasy	Ramona Ketcher	Superintendent	Provided school district hazard information and mitigation actions, assembled public comments from staff and parents, provided capability assessments
Zion Public Schools	Clayton Yeager	Superintendent	Provided school district hazard information and mitigation actions, assembled public comments from staff and parents, provided capability assessments
Dahlonegah PS	Steven Cain	Superintendent	Provided school district hazard information and mitigation actions, assembled public comments from staff and parents, provided capability assessments
Cave Springs Public Schools	CD Thompson	Superintendent	Provided school district hazard information and mitigation actions, assembled public comments from staff

			and parents, provided capability assessments
Rocky Mountain Public Schools	Alicia Ketcher	Superintendent	Provided school district hazard information and mitigation actions, assembled public comments from staff and parents, provided capability assessments

* Primary Jurisdictional POC

2.3 Stakeholders

Stakeholders - Neighboring Communities, Businesses, and Non-Profit Agencies Contacted

Name	Title	Agency Represented	How Agency Was Contacted/Invited to Participate
Brad Taylor	Emergency Director	Sequoyah County Emergency Mgmt.	Telephone
John Walker	Stilwell-Westville Director of Operations	Northeast Oklahoma Public Facilities Authority	Telephone
Cassie Shores	Stilwell-Campus Director	Indian Capital Tech Center	Telephone
Mechele Cruz	Director	Pafford EMS	Telephone
Christie Harris	Administrator	Wilma P. Mankiller Health Clinic	Telephone
Joe Bateman	Fire Chief	Chance Community Volunteer Fire Dept.	Telephone
Russell Yell	Fire Chief	Mid-County Volunteer Fire Dept.	Telephone
James Barnett	Fire Chief	Christy/Proctor Community Volunteer Fire Dept.	Telephone
Joe Dugger	Fire Chief	Hwy 51 Volunteer Fire Dept.	Telephone
Brent Girdner	Fire Chief	Hwy 100 Volunteer Fire Dept.	Telephone
Scott O'Neal	Fire Chief	Tri-Community Volunteer Fire Dept.	Telephone
Jody Fletcher	Fire Chief	Greasy Community Volunteer Fire Dept.	Telephone
David Jones	Fire Chief	Bell Community Volunteer Fire Dept.	Telephone
Roy Johnson	President	Mid-County Community Organization	Telephone
Dianna Yell	Secretary/Treasurer	Mid-County Community Organization	Telephone

Amy Tanner	Director	Cherokee Nation Emergency Mgmt.	Telephone
Melanie Livers	Director	Cherry Tree Headstart	
Michelle Gonzales	Director	Cherokee Nation Child Development Center	
Chelsea Kester	Director	Tiny Tots Child Development Center	
	Director	New-Early Child Dev. Center	On N 2nd Stilwell
Christie Kirk	Director	Keetoowah Child Development Center	

State and Federal Agencies Contacted

Name	Title	Agency Represented	How Agency Was Contacted
Tracey Bender	Community Preparedness & Public Outreach Coordinator	ODEMHS	Email/telephone
Matt Rollins	State Hazard Mitigation Officer	ODEMHS	Email/telephone
Ed Barton	Rural Fire Director	EODD	Email/telephone
Myka Saltsman	Interim County Director	Oklahoma State Dept. of Health and Human Services	Telephone
Haylie Dobbs	Soil Conservationist	NRCS-Stilwell	Telephone
Laird Pitz	Sr. Vice Pres. & Chief Risk Officer	CPKC	Email
Brian Edwards	Executive VP/ Chief of LE & Lake Operations	Grand River Dam Authority	Email

2.4 Public Involvement

Citizens of the Adair County were asked to participate in hazard selection and identification at various times through community events, such as weekly Board of Adair County Commissioner meetings, the monthly volunteer fire department meetings, and various community meetings in which all residents of the community were invited. A community meeting was held in District 2, Adair County, at the beginning of the planning process. Our target audience was the public. In addition, the draft plan was posted online so it could be reviewed by the public.

During the meetings intended strictly for the public, attendees were provided a Kaiser Permanente survey form to rank the hazards in order of most likely to occur. Oral feedback was provided during the initial “open to the public” meeting. The public feedback received included possible actions for flood mitigation in northern Adair County, along the Illinois River, which aided the Planning Team in their review of mitigation actions for this plan update.

2.5 Plans, Documents, and Literature Reviewed

Through the process of developing the Adair County Hazard Mitigation Plan, previous plans, studies, reports, and technical information were reviewed into this plan where applicable. The following includes a list of some of the primary documents that were reviewed and incorporated into this plan.

Agency/Document-	**Relevant Information Incorporated into Plan**
Adair County HM Plan 2010	Historical Data, Hazard Priorities, Maps
Cherokee Nation Multi-County HM Plan, 2019	Historical Data, Mitigation Strategies
National Weather Service/NOAA	Historical and Current Weather data
Adair Co laws, policies, and procedures	County Insurance Policy, applicable laws
Kansas City Southern Railroad Hazardous Materials List	List of possible environmental hazards transported through county; Railroad procedures for incidents, accidents, and emergency situations.
Adair County HM Plan 2022 Update	Historical Data, Hazard Priorities, Maps
FEMA/ Disaster declarations	Historical Data
Natural Resources Conservation District	Dam Hazard projections
Oklahoma Geological Survey, Earthquake Catalog	Historical and Current Weather data
Oklahoma Climatological Survey Mesonet Data	Historical and Current Weather data
Vaisala Lightning Report	Historical / Current Weather data, Maps
Wildfire Risk to Communities	Historical data, Maps

2.6 Continued Public Involvement

The Planning Team will continue to seek public involvement after plan approval by soliciting public feedback through social media and quarterly public meetings. Social media will be utilized to post updates on mitigation activity and to solicit public feedback regarding the effectiveness of mitigated hazards throughout the county. Quarterly public meetings will be held to update status of current mitigation projects, address current and future projects, and to provide seasonal weather-related education. Both social media and quarterly meetings will be used to update the public regarding progress and impediments to progress in their respective jurisdictions and all for questions and answers.

2.7 Plan Monitoring, Evaluating, and Updating

The Adair County Emergency Management Director will be responsible for monitoring, evaluating, and updating all aspects and components of the Hazard Mitigation Plan in accordance with 44 CFR.

Monitoring

Monitoring the plan is the responsibility of the Adair County Emergency Manager. The ACEM will request quarterly progress reports from each jurisdiction representative and provide an annual countywide progress report to the planning committee. The progress report, and/or impediments to progress, of the mitigation measures will be discussed with the planning

committee, county commissioners, jurisdictional representatives, and public during the quarterly Adair County 911/Emergency Management/First Responders/Fire Fighters meeting.

Evaluating

The Adair County Emergency Manager and Planning Committee will evaluate the Hazard Mitigation Plan and Quarterly Jurisdiction Reports quarterly. The evaluation will assess:

- Progress or impediments to progress of mitigation goals and objectives
- Changes in magnitude or frequency of hazards
- If completed mitigation actions were effective
- Issues which prevented the completion of mitigation actions

The plan's hazards and mitigation actions will be evaluated during all post-disaster reviews, and any proposed changes to hazard mitigation actions will be provided to the Planning Committee.

Updating

The Adair County Hazard Mitigation Plan's hazard profile data will be updated annually, as needed, by the Emergency Manager. The purpose of this update will be to incorporate new and/or relevant information obtained during the plan evaluation process. The Adair County Hazard Mitigation Plan will be updated every 5 years according to the following schedule:

- The Planning Committee will reconvene to discuss plan updates one year before plan expiration. The Adair County Emergency Manger will be responsible for scheduling all Planning Committee Meetings.
- The Emergency Manager will incorporate revisions to the plan document identified during the monitoring and evaluation period.
- The Adair County Emergency Manager will submit the revised plan to ODEMHS and FEMA for review and approval.

CHAPTER THREE: HAZARD IDENTIFICATION AND RISK ASSESSMENT

3.1 List of Identified Hazards

The following hazard profile categories have been updated for this plan update. The purpose of these changes was to more effectively profile individual hazards and to include only natural hazards in the plan update.

Hazards Profiled

Previous Adair Co HM Plan	2022 Adair Co HM Plan Update	2026 Adair Co HM Plan Update (changes?)
Dam Failure	Dam Failure	Dam Failure
Drought	Drought	Drought
Earthquake	Earthquake	Earthquake
Expansive Soils	Expansive Soils	Expansive Soils
Extreme Heat	Extreme Temperatures	Extreme Temperatures
Flood	Flood	Flood

Severe Thunderstorm (High Wind, Lightning, Hail)	Hail	Hail
Tornados	High Wind	High Wind
Wildfire	Landslide	Landslide
Severe Winter Storm	Lightning	Lightning
Hazard Materials Events	Tornado	Tornado
	Wildfire	Wildfire
	Winter Storm	Winter Storm
		Railroad

Note: Expansive Soils are not profiled in the 2022 Adair Co HM Plan Update. There are no known areas of Adair County being affected by Expansive Soils. In addition, the State of Oklahoma Hazard Mitigation Plan shows Adair County to be in a low risk area.

3.2 Disaster History

Example of Federally-Declared Disaster History from 2020 to 2025

Disaster #	Declaration Date	Incident Type
DR4530	2020	COVID-19 Pandemic
DR4575	2020	Severe Winter Storms
DR4587	2021	Severe Winter Storms
DR4657	2022	Severe Storms, Tornados, and Flooding
DR4706	2023	Severe Storms, Straight-line Winds, and Tornadoes
DR4721	2023	Severe Storms, Straight-line Winds, and Tornadoes
DR4776	2024	Severe Storms, Tornados, Straight-line Winds, and Flooding
DR4791	2024	Severe Storms, Tornados, Straight-line Winds, and Flooding
DR4862	2025	Severe Storms, Tornados, Straight-line Winds, and Flooding
DR4866	2025	Wildfires and Straight-line Winds

https://www.fema.gov/disaster/declarations

3.3 Hazard Probability Rating

Probability will be determined by calculating the:

$$\frac{\text{Total number of events}}{\text{Total number of years}} = \text{Probability \% of event occurring each year}$$

Based on the above calculation, probability is quantified as follows:

High = > 90%
Medium = 30 - 89%
Low = 10 - 29%
Very Low = < 10%

3.4 Profiled Hazards

3.4.1 Dam Failure

Description

Dam - In hydrologic terms, any artificial barrier which impounds or diverts water. The dam is generally hydrologically significant if it is: 1. 25 feet or more in height from the natural bed of the stream and has storage of at least 15 acre-feet. 2. Or has an impounding capacity of 50 acre-feet or more and is at least six feet above the natural bed of the stream.

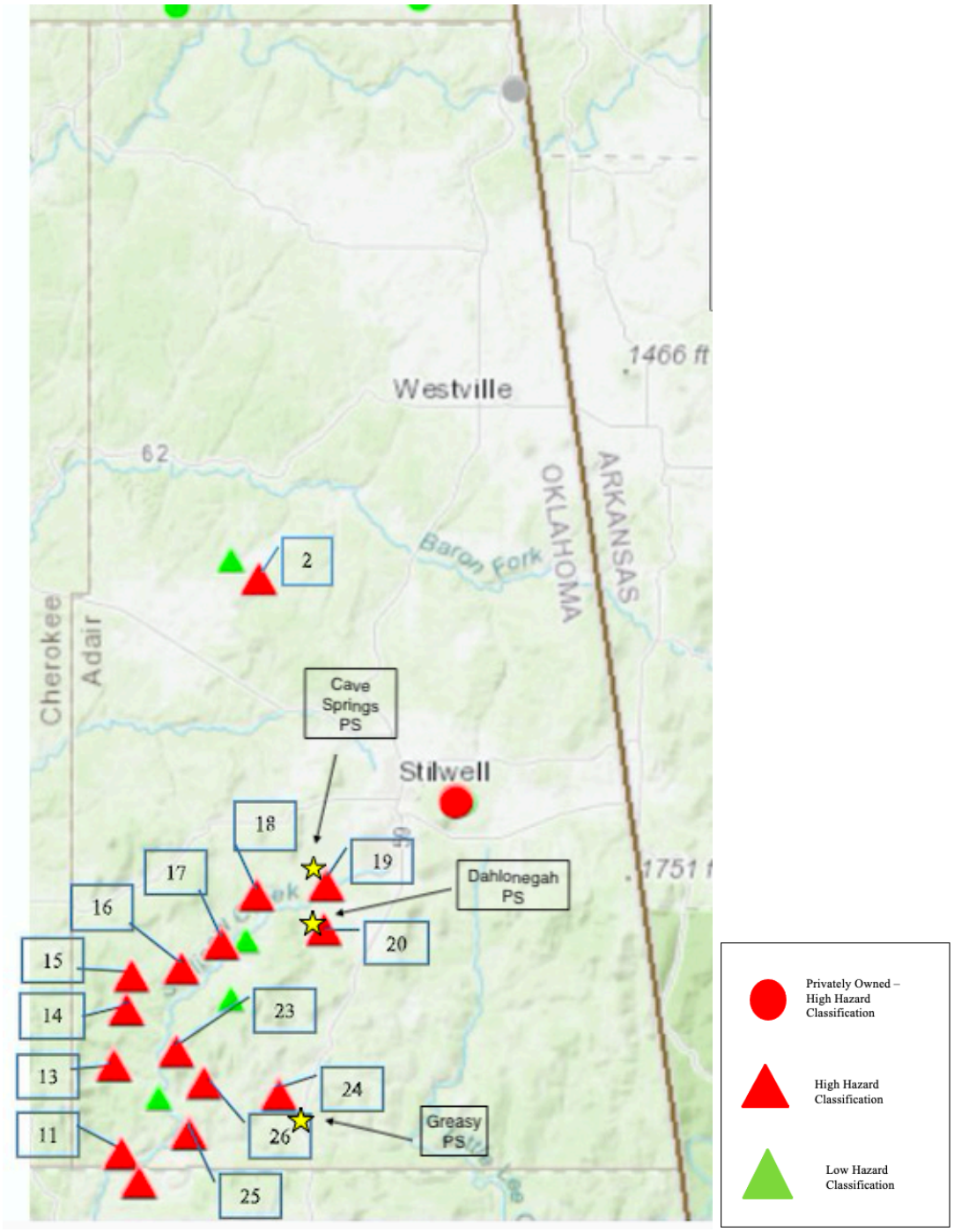
Dam Failure- In hydrologic terms, catastrophic event characterized by the sudden, rapid, and uncontrolled release of impounded water.

Location

According to the Natural Resources Conservation District (NRCS) Adair County has 18 flood control dams as part of the Sallisaw Creek Watershed Project, 14 of which are considered high hazard dams.

Dam Name/Number	Est. Time of Impact	Jurisdiction(s) Affected
Sallisaw Creek 2	< 15 min.	Unincorporated Adair Co.
Sallisaw Creek 11	Immediate	Unincorporated Adair Co.
Sallisaw Creek 13	< 5 min.	Unincorporated Adair Co.
Sallisaw Creek 14	< 5 Min.	Unincorporated Adair Co. Cave Springs PS
Sallisaw Creek 15	Immediate	Unincorporated Adair Co. Cave Springs PS
Sallisaw Creek 16	< 5 Min.	Unincorporated Adair Co. Cave Springs PS
Sallisaw Creek 17	< 5 min.	Unincorporated Adair Co. Cave Springs PS
Sallisaw Creek 18	< 5 min.	Unincorporated Adair Co. Cave Springs PS
Sallisaw Creek 19	Immediate	Unincorporated Adair Co. Dahlonegah PS
Sallisaw Creek 20	Immediate	Unincorporated Adair Co. Dahlonegah PS
Sallisaw Creek 23	< 10 min	Unincorporated Adair Co.
Sallisaw Creek 24	< 10 Min.	Unincorporated Adair Co.
Sallisaw Creek 25	< 10 min.	Unincorporated Adair Co.
Sallisaw Creek 26	< 5 min.	Unincorporated Adair Co./ Cherokee Immersion ES-Greasy

The following map of dams was provided by Oklahoma Water Resource Board (OWRB): (



(More maps in binder-pgs 20-33)
Extent

The Planning Area categorizes Dam Failure extent by time of flood onset. The information for each dam is on the Location table. If a dam failure occurs, the speed onset would range from immediate to 15 minutes.

Previous Occurrence
There have been no recorded dam failures from 2020-2025.

Probability of Future Events
The Probability of Dam Failure is VERY LOW.

Vulnerability and Impact

Dam Name/Number	Jurisdiction(s) Affected	Vulnerability/Impact
Sallisaw Creek 2	Unincorporated Adair Co.	This dam is in a sparsely populated area, where there are approximately 20 or less residential areas that include farms and ranches. This agricultural area is vulnerable to flood inundation should a dam failure occur. This inundation would potentially result in a loss of residential property, crops, and livestock, which would significantly impact the local economy and beyond.
Sallisaw Creek 11/13/23/24/25	Unincorporated Adair Co.	Unincorporated Adair Co is vulnerable to inundation should dam failure occur. There are many dams along Sallisaw Creek in southwestern Adair Co. There are rural, residential homes in this area which would experience immediate flooding. This speed of onset would result in many individuals not having time to seek refuge.
Sallisaw Creek 14/15/16/17/18	Unincorporated Adair Co. Cave Springs PS	Unincorporated Adair Co and Cave Springs PS are vulnerable to inundation should dam failure occur. In addition to the Cave Springs PS facilities, there are rural, residential homes in this area which would experience immediate flooding. This speed of onset would result in many individuals not having time to seek refuge and could result in a significant interruption to school operations if the facilities sustained damage due to flooding.
Sallisaw Creek 19/20	Unincorporated Adair Co. Dahlonegah PS	Unincorporated Adair Co and Dahlonegah PS are vulnerable to inundation should dam failure occur. In addition to the Dahlonegah PS facilities, there are rural, residential homes in this area which would experience immediate flooding. This speed of onset would result in many individuals not having time to seek refuge and could result in a significant

		interruption to school operations if the facilities sustained damage due to flooding.
Sallisaw Creek 26	Unincorporated Adair Co. Cherokee Immersion ES-Greasy PS	Unincorporated Adair Co and Cherokee Immersion ES-Greasy PS are vulnerable to inundation should dam failure occur. In addition to the Cherokee Immersion ES-Greasy PS facilities, there are rural, residential homes in this area which would experience immediate flooding. This speed of onset would result in many individuals not having time to seek refuge and could result in a significant interruption to school operations if the facilities sustained damage due to flooding.

3.4.2 Drought

Description

A drought is a period when there is not enough precipitation to support agricultural, urban, human, or environmental water needs. A drought usually refers to an extended period of below normal rainfall but can also be caused by drying bores or lakes, or anything that reduces the amount of liquid water available. Drought is usually difficult to recognize at the onset. Drought analysis is more subjective than that for floods, because droughts do not occur suddenly. A drought evolves over time and is spread over a large geographical area. Drought severity depends on its duration, intensity, geographic extent, and the regional water supply demands of human activities and vegetation. This multi-dimensional nature event makes it difficult to define a drought and to perform comprehensive risk assessments. Some secondary hazards associated with drought are increased migration of locusts and grasshoppers during dry spells which can result in severe crop damage.

Location

The entire Planning Area is affected by Drought.

Extent

The Planning Area uses the Palmer Drought Severity Index to classify Drought conditions. The Planning Area can experience any value on the index.

Palmer Drought Severity Index

	< -4.0	Extreme Drought
	-3.99 to -3.0	Severe Drought
	-2.99 to -2.0	Moderate Drought
	-1.99 to -1.0	Mild Drought
	-0.99 to -0.5	Incipient Drought

	-0.49 to 0.49	Near Normal
	0.5 to 0.99	Incipient Moist Spell
	1.0 to 1.99	Moist Spell
	2.0 to 2.99	Unusual Moist Spell
	3.0 to 3.99	Very Moist Spell
	> 4.0	Extreme Moist Spell

Previous Occurrences

Adair County has experienced drought events frequently. The table below outlines Drought occurrences in the Planning Area.

Drought Events, 2020-2025

Year	Description
2022 July	A prolonged period of unseasonably dry weather with very few rain events, combined with unseasonably hot weather, resulted in severe drought (D2) conditions developing by the end of July across all of eastern Oklahoma. Extreme drought (D3) conditions developed across much of northeastern Oklahoma north of Highway 412 and east of Highway 75, including portions of Washington, Nowata, Rogers, and Mayes Counties, as well as all of Delaware, Craig and Ottawa Counties. Extreme drought (D3) conditions also developed across much of southeastern Oklahoma, including Choctaw, Pushmataha, and Latimer Counties, as well as portions of Pittsburg, Okfuskee, McIntosh, Haskell and Le Flore Counties. Monetary damage estimates as a result of the drought were not available.
2022 Aug	Isolated rainfall events across eastern Oklahoma during the month resulted in below normal precipitation across much of the region. Much of northeastern Oklahoma only received between 10 and 25 percent of normal average rainfall amounts for the month. The prolonged period of unseasonably dry weather, combined with unseasonably hot weather, resulted in a continuance of severe drought (D2) conditions across all of eastern Oklahoma, and an expansion of extreme drought (D3) conditions across northeastern Oklahoma. By the end of the month, extreme drought (D3) conditions existed across all of Ottawa, Craig, Mayes, Nowata, and Washington Counties, and across portions of Osage, Tulsa, Rogers, Wagoner, and Delaware Counties. Extreme drought (D3) conditions continued across much of southeastern Oklahoma, including Choctaw, Pittsburg, and Latimer Counties, as well as portions of Pushmataha, Okfuskee, Okmulgee, McIntosh, Haskell and Le Flore Counties. Monetary damage estimates as a result of the drought were not available.
2022 Sept	Another dry and unseasonably warm month occurred across eastern Oklahoma in September. All of eastern Oklahoma experienced below average rainfall for the month, and a large portion of the area received less than 10 percent of monthly average precipitation amounts. The continued dry weather, combined with unseasonably hot temperatures during the month, resulted in an expansion of drought conditions across the area. Exceptional drought (D4) conditions developed across portions of Osage, Washington, Nowata, Craig, Ottawa, Okfuskee, Okmulgee, McIntosh, Pittsburg, Haskell, Latimer, and Pushmataha Counties. Extreme drought (D3) conditions developed across much of the remainder of eastern Oklahoma during the month. Monetary damage estimates as a result of the drought were not available.

2022 Oct	Several widespread, heavy rain events during October helped ease the drought across much of far eastern Oklahoma during the month. However, the remainder of eastern Oklahoma, especially areas north of I-40 and west of Highway 69, received below average precipitation for the month, much of that area only receiving between 25 and 50 percent of average rainfall amounts. As a result, exceptional drought (D4) conditions expanded across portions of northeastern Oklahoma to include all of Washington, Nowata, and Rogers Counties, as well as portions of Cherokee, Wagoner, Tulsa, Mayes, Ottawa, Craig, and Osage Counties. Exceptional drought (D4) conditions also continued across portions of Pittsburg, McIntosh, Okmulgee, and Okfuskee Counties. Severe (D2) to extreme (D3) drought conditions persisted across the remainder of eastern Oklahoma through the month, although as noted previously, some improvement did occur across far eastern Oklahoma. Monetary damage estimates as a result of the drought were not available.
2022 Nov	Several widespread rain events, and even a winter event, during November helped to continue to ease the drought across portions of far eastern and southeastern Oklahoma during the month. However, the remainder of eastern Oklahoma, especially areas west of Highway 69, received below average precipitation for the month, much of that area only receiving between 50 and 75 percent of average rainfall amounts. As a result, exceptional drought (D4) conditions continued across portions of Osage, Pawnee, Nowata, Craig, Ottawa, Rogers, Mayes, Tulsa, Wagoner, Cherokee, Okfuskee, Okmulgee, McIntosh and Pittsburg Counties. Severe (D2) to extreme (D3) drought conditions persisted across much of the remainder of eastern Oklahoma through the month, with the exception of Adair, Sequoyah, and Choctaw Counties, which had improved to moderate drought (D1) or abnormally dry (D0). Monetary damage estimates as a result of the drought were not available.
2024 Sept	Much of eastern Oklahoma received between one and three inches of rain during September, with isolated areas of nearly five inches observed in east central Oklahoma. The exceptions were in southeastern Oklahoma, where areas received less than one and a half inches of rain for the month, and across much of northeastern Oklahoma, where less than one half inch occurred. The rainfall across far southeastern Oklahoma and much of northeastern Oklahoma during September corresponded to less than 25 percent of the normal average precipitation for the month. Portions of northeastern Oklahoma received less than 5 percent of the normal average precipitation for the month. As a result of this large rainfall deficit and seasonally typical hot weather, severe (D2) drought conditions expanded across much of Choctaw and Pushmataha Counties, and developed across much of northeastern Oklahoma north of Highway 412. Extreme (D3) drought conditions developed during the month across portions of Osage, Washington, Nowata, Craig, Rogers, and Mayes Counties. Monetary damage estimates as a result of the drought were not available.
2024 Oct	Much of eastern Oklahoma received below average monthly rainfall for October, as generally less than three inches of rain fell across the region during the month. This corresponded to less than 50 percent of the normal average precipitation for the month, and large portions of the area received less than 25 percent of the normal average precipitation for the month. As a result, severe (D2) drought conditions continued to expand across much of eastern Oklahoma during the month, and extreme (D3) drought conditions expanded across more of southeastern Oklahoma, as well as northeastern Oklahoma. Monetary damage estimates as a result of the drought were not available.

2024 Nov	Multiple widespread heavy rainfall events occurred across eastern Oklahoma in early to mid November, resulting in above normal rainfall across the entire region during the month, with the exception of small portions of Choctaw and Pushmataha Counties. Rainfall amounts of between five and ten inches were common across the area, with portions of the region receiving as much as fifteen inches during the month. This corresponded to at least 150 percent of the normal average precipitation for the month across most of the region, with portions of the region receiving more than 400 percent of normal average rainfall. The exception was across portions of Choctaw and Pushmataha Counties where as little as two to five inches fell during the month, corresponding to 50 to 100 percent of normal average precipitation for the month. As a result of this widespread heavy rainfall, extreme (D3) to severe (D2) drought conditions that had expanded across the majority of eastern Oklahoma in October, had improved to moderate (D1) drought or better across the entire area except portions of Choctaw and Pushmataha Counties, where severe (D2) drought conditions remained. Monetary damage estimates as a result of the drought were not available.

Source: NOAA Storm Events Database

Probability of Future Events
Historical data and the climatic location indicate a frequent probability of experiencing some level of drought conditions anywhere within the Planning Area.

The probability of future Drought events in the Planning Area is MEDIUM.

Vulnerability and Impact
Areas of Adair County have seasonal crops such as strawberries, huckleberries, blueberries, blackberries, grapes and a wide range of vegetables. A drought can happen anywhere within Adair County and can have serious health, social, economic and political impacts with far-reaching consequences. The town of Westville has seasonal crop festivals which some citizens depend on for income.

Drought results in a lack of fresh water, which is damaging to livestock, crops, and the public. During the summer months, temperatures in Adair County can easily reach over 100 degrees Fahrenheit. Often these high temperatures will persist for weeks. Drought conditions also increase wildfire risk.

Jurisdiction	Vulnerability	Impact
Adair County Stilwell Westville Watts	There are no fire hydrants in unincorporated Adair Co, which means that fire trucks must bring tanker trucks to a fire. Fire stations fill their trucks with water from fire detention ponds and other local water sources, which are susceptible to depletion during Drought events.	The impact of diminished water resources for fire departments could result in longer response times when responding to fire events. The impact of having primary and secondary water sources that can experience depletion during Drought means that crops and livestock will be directly affected

	Unincorporated Adair Co., and the communities of Stilwell, Westville, and Watts have a significant amount of farming and ranching. Regarding ranching, there are many cattle, poultry, and goat businesses. Most farmers and ranchers rely on streams and ponds to water livestock. During Drought events, their water resources are at risk of depletion. When these sources are depleted, ranchers must rely on private wells to supply their water needs, which are also vulnerable to water table depletion. A major vulnerability is the lack of innovative water-capture systems which would allow for rainwater collection to help offset the water used from traditional sources.	should an extended water shortage occur. Not only will this affect crop yield and livestock health, but it has the potential to devastate the primary economy of the Planning Area. In addition, a lack of crops could mean that farmers would not produce enough hay for themselves and others who rely on their products.
Cave Springs PS Dahlonegah PS Cherokee Immersion ES-Greasy Maryetta PS Peavine PS Rocky Mountain PS Stillwell PS Watts PS Westville PS Zion PS	One vulnerability is the lack of any water usage evaluation and savings plan. Not having a thorough water usage evaluation plan means that each school district is unaware of the ways in which they could minimize water usage during times of Drought.	Without proper evaluation on how to reduce water usage during Drought, school districts cannot proactively mitigate the effects of Drought and take action to lower their consumption.

3.4.3 Earthquake

Description

An Earthquake is a sudden, rapid shaking of the Earth caused by the breaking and shifting of rock beneath the Earth's surface. For hundreds of millions of years, the forces of plate tectonics have shaped the Earth, huge plates that form the Earth's surface move slowly over, under and past each other. Sometimes the movement is gradual, but other times, the plates are locked together, unable to release the accumulating energy. When the accumulated energy grows strong enough, the plates break free causing the ground to shake. Most earthquakes occur at the boundaries where the plates meet, however, some earthquakes occur in the middle of plates. Earthquakes strike suddenly and without warning.

Location
The entire Planning Area is affected by earthquakes.

Extent
The Planning Area uses the Modified Mercalli Scale with Richter Magnitude Approximations to classify the extent of earthquakes. Due to the unpredictable nature of Earthquakes, the Planning Area can experience an Earthquakes of any Mercalli value but does not expect to experience one greater than Mercalli value III.

The Modified Mercalli Scale with Richter Magnitude Approximations

Richter Magnitude	Mercalli	Description	Earthquake Effects
1-2	I	Instrumental	Not felt except by a very few under especially favorable conditions.
2-3	II	Feeble	Felt only by a few persons at rest, especially on upper floors of buildings.
3-4	III	Slight	Felt quite noticeably by persons indoors, especially on upper floors of buildings. Many people do not recognize it as an earthquake. Standing motor cars may rock slightly. Vibrations similar to the passing of a truck. Duration estimated.
4	IV	Moderate	Felt indoors by many, outdoors by few during the day. At night, some awakened. Dishes, windows, doors disturbed; walls make cracking sound. Sensation like heavy truck striking building. Standing motor cars rocked noticeably.
4-5	V	Rather Strong	Felt by nearly everyone; many awakened. Some dishes, windows broken. Unstable objects overturned. Pendulum clocks may stop.
5-6	VI	Strong	Felt by all, many frightened. Some heavy furniture moved; a few instances of fallen plaster. Damage slight.
6	VII	Very Strong	Damage negligible in buildings of good design and construction; slight to moderate in well-built ordinary structures; considerable damage in poorly built or badly designed structures; some chimneys broken.
6-7	VIII	Destructive	Damage slight in specially designed structures; considerable damage in ordinary substantial buildings with partial collapse. Damage great in poorly built structures. Fall of chimneys, factory stacks, columns, monuments, walls. Heavy furniture overturned.
7	IX	Ruinous	Damage considerable in specially designed structures; well-designed frame structures thrown out of plumb. Damage great in substantial buildings, with partial collapse. Buildings shifted off foundations.
7-8	X	Disastrous	Some well-built wooden structures destroyed; most masonry and frame structures destroyed with foundations. Rails bent.
8	XI	Very Disastrous	Few, if any (masonry) structures remain standing. Bridges destroyed. Rails bent greatly.
8+	XII	Catastrophic	Damage total. Lines of sight and level are distorted. Objects thrown into the air.

Source: http://earthquake.usgs.gov/learn/topics/mercalli.php

Previous Occurrence:
The Planning Area has infrequent Earthquake activity. It has experienced slight tremors from seismic activity in other locations; however, no collapse losses reported, or structural integrity diminished, and no physical or bodily injuries sustained.

Year	Number of Earthquakes	Richter Magnitude
2020	0	
2021	0	
2022	0	
Jun 2023	1	1.5
Oct 2023	1	1.6
May 2024	1	1.7
Aug 2024	1	1.4
Oct 2025	1	1.8

Source: Oklahoma Geological Survey, Earthquake Catalog.

Probability of Future Events
The probability of earthquake events in the Planning Area is LOW.

Vulnerability and Impact –
Structures in all jurisdictions of the Planning Area were not built to comply with earthquake-resistant building codes. A massive earthquake near one of the towns or cities could cause structural failure, financial losses and possibly loss of life. Due to the low-level threat of earthquake occurrence in the Planning Area, building codes that enhance Earthquake resistance have not yet been enacted in this part of the country. Of special concern are the design and construction of the County's critical facilities such as hospitals, health clinics, water and gas pipelines, communication facilities/towers, electrical lines/plants, water supply and water treatment facilities.

Since earthquakes do not occur often in the Planning Area, jurisdictions do not actively look for ways to mitigate the hazard. One major vulnerability is the lack of earthquake preparedness and proactive mitigation. None of the jurisdictions' critical facilities, to include school districts, use tie-down straps to secure tall equipment, and municipal and school personnel do not practice Earthquake drills. The impact of this lack of preparedness means that many would be caught unprepared should a significant Earthquake occur. If a strong Earthquake were to occur and widespread structural damage occurred, it could result in a disruption to critical services, devastating economic impacts, and an interruption to school operations.

3.4.4 Extreme Temperature

Description
An extreme temperature condition is defined as a situation wherein the citizens and property of the Adair County are threatened by the effects of an extreme temperature condition resulting from extreme heat or extreme cold weather. Extreme temperatures are calculated based on temperature, humidity and wind.

Extreme Heat: 10 degrees above average temperature combined with high humidity, and/or consecutive days in a row of high temperatures.

Extreme Cold: 10 degrees below average temperature, and/or consecutive days in a row for record setting temperatures several degrees below zero for just one day.

Location
The entire Planning Area is affected by Extreme Temperatures.

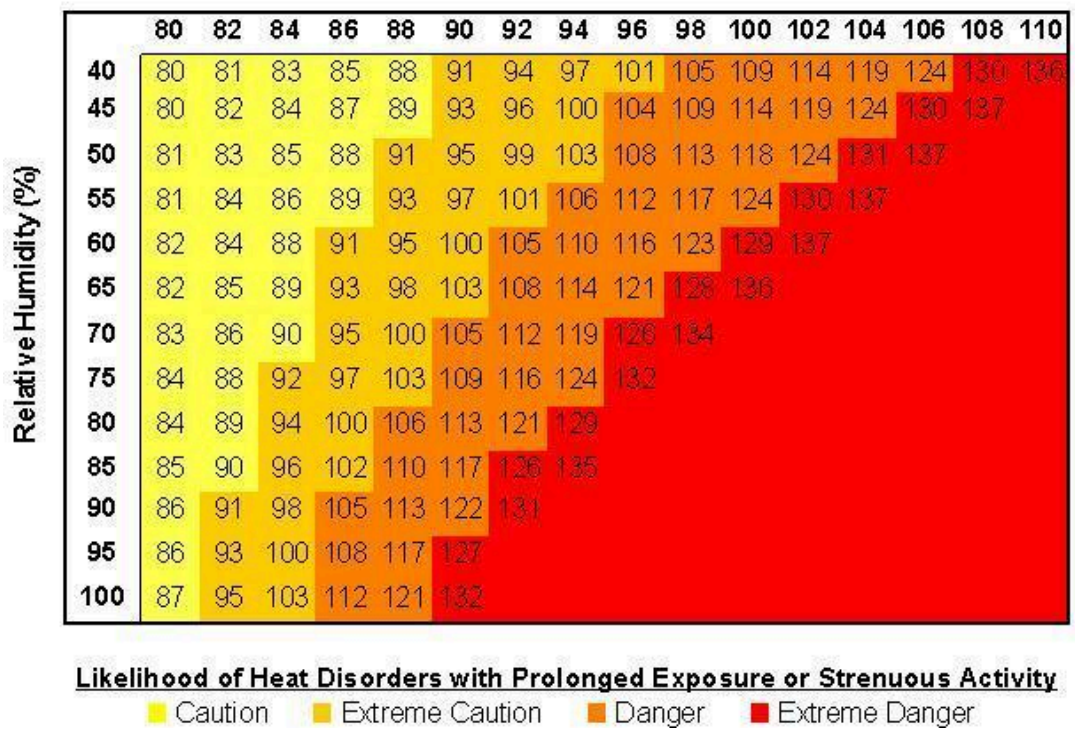
Extent

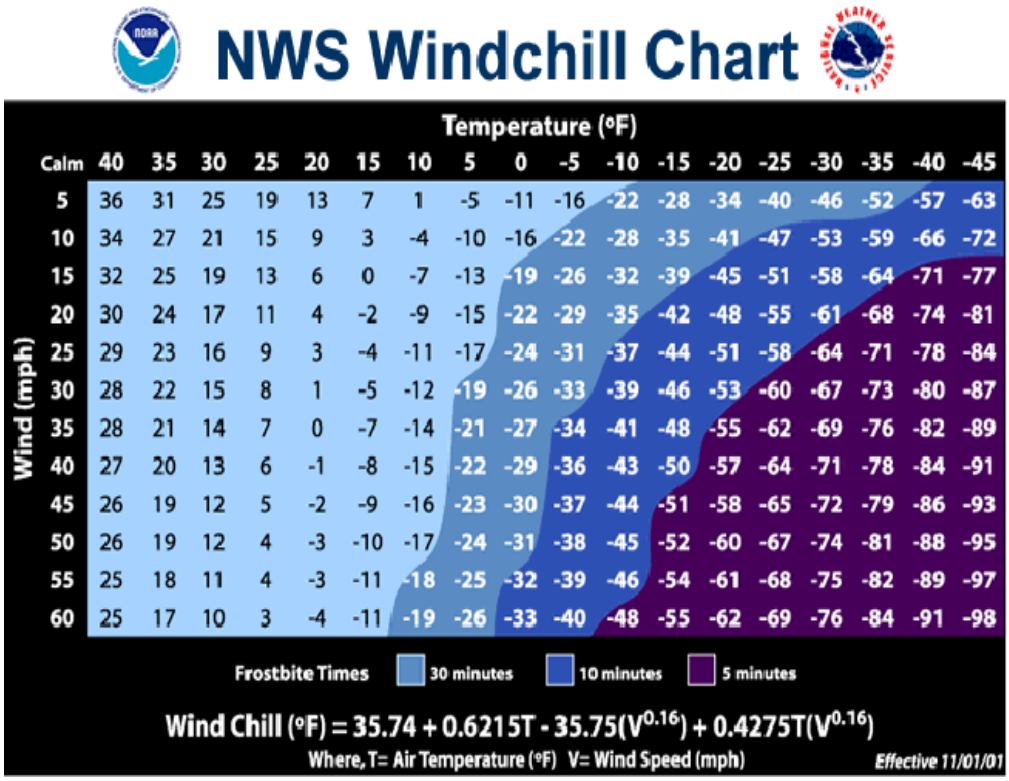
The Planning Area uses the Heat Index Scale and the NWS Windchill Chart to categorize Extreme Heat and Cold, (see below).

According to the 2024 Oklahoma Climatological Survey, the Planning Area typically experiences 43 days annually of temperatures 90 degrees or greater, 4 days annually of temperatures 100 degrees or greater, 6 days annually of max temperatures 32 degrees or lower, and 77 days annually of minimum temperatures 32 degrees or lower. The Planning Area can experience Extreme High temperatures in the Caution to the Danger range on the Heat Index Scale, and Extreme Cold temperatures of -10 or warmer on the NWS Windchill Chart.

https://climate.ok.gov/county_climate/Products/QuickFacts/adair.pdf

Heat Index Scale





Previous Occurrence

Year	Number of Days with Temps 100 deg F or Higher	Number of Days with Temps 0 deg F or Lower
2011	25	1
2012	17	0
2013	0	0
2014	0	2
2015	0	0
2016	0	0
2017	0	0
2018	2	1
2019	0	0
2020	0	0
2021	0	2
2022	13	2
2023	5	0
2024	1	3
2025	0	1

Source: Oklahoma Climatological Survey Mesonet Data

Probability

The probability of Extreme Temperatures in the Planning Area is MEDIUM.

Vulnerability and Impact-

The Planning Area experiences extreme temperatures. There are communities, critical facilities, health clinics, government offices, businesses, elderly/disabled housing sites and early childhood centers located throughout Adair County. Record high temperatures of over 105 degrees have been recorded. Extremely cold temperatures have caused major damages to Adair County buildings. Temperatures that cause adverse reaction to human, animals and mechanical devices can be defined as extreme.

Extreme temperatures can have a serious economic impact on any community within Adair County. In times of extreme heat, the increased demand for water and electricity may result in shortages of resources. Freezing cold weather can cause pipes to burst in buildings and residential housing causing thousands of dollars' worth of damage. Changes in temperature also impact both our elders and the very young. Elders on a fixed income identified the temperature change as one of the hazards that impact them the most; some going as far as not using heat or cooling units due to lack of money.

One vulnerability that affects all jurisdictions, including school jurisdictions, is the dependence on above ground power lines. The Planning Area does not have any buried power lines. The Planning Area experiences storms in the winter, and these power lines are susceptible to damage due to ice accumulation. In addition, Ozark Electric and Grand River Dam Authority (GRDA) supply power to the Planning Area. During times of Extreme Temperatures, the power grid is susceptible to periods of outages do to overuse. A widespread and lengthy outage has the potential to disrupt critical services and school operations, interrupt commerce, and puts a strain on the community as it seeks alternative energy sources and backup power sources.

One additional vulnerability of Extreme Temperatures that affects the residents of unincorporated Adair County, Stilwell, Westville, and Watts is the social vulnerability of the Planning Area. Adair Co is considered one of the "poorest" counties in the nation and they have many people in both incorporated and unincorporated communities that have difficulty paying their utility bills during times of heavy use during Extreme Temperatures. When residents cannot afford these expenses, they curb their usage which further exposes them to Extreme Temperatures. This can have negative health impacts for older residents and those with additional health concerns.

3.4.5 Flood

Description

A flood is described as a general and temporary condition of partial or complete inundation of normally dry land area from an overflow of inland or tidal waters, or unusual and rapid accumulation or runoff of surface waters from any source, or mudflow, or collapse or subsidence of land along the shore of a lake or similar body of water as a result of erosion or undermining caused by waves or currents of water exceeding anticipated cyclical levels. Floods often happen when bodies of water overflow or tides rise due to heavy rainfall or thawing snow. You don't have to live near water to be at risk of flooding. A flash flood, which can strike anywhere without

warning, occurs when a large volume of rain falls within a short time. There are three major types of floods experienced in Adair County:

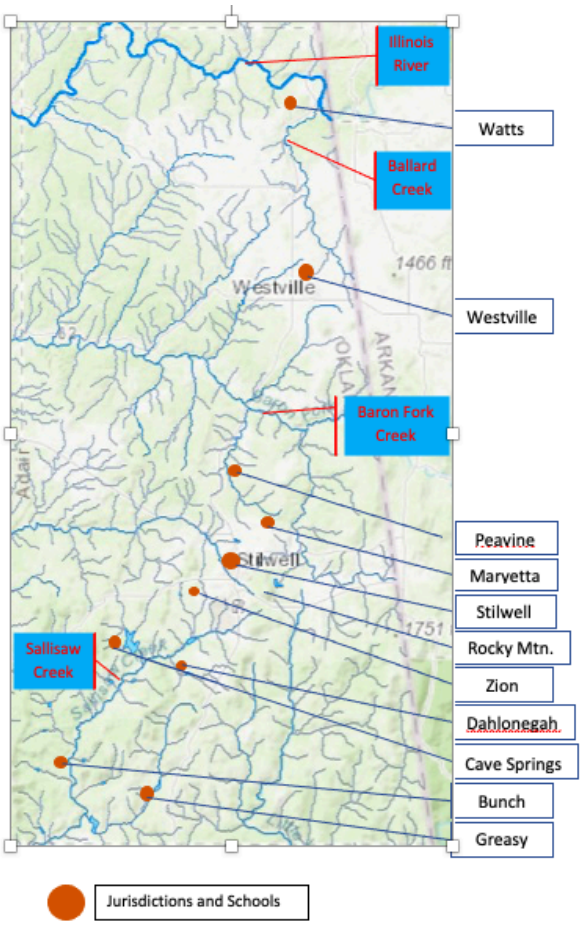
Flood - Any high flow, overflow, or inundation by water which causes or threatens damage.

Flash flood - A rapid and extreme flow of high water into a normally dry area, or a rapid water level rise in a stream or creek above a predetermined flood level; begins within six hours of the causative event (e.g., intense rainfall, dam failure, ice jam). However, the actual time threshold may vary in different parts of the county. Ongoing flooding can intensify to flash flooding in cases where intense rainfall results in a rapid surge of rising water.

Urban flooding - Flooding of streets, underpasses, low lying areas, or storm drains. This type of flooding is mainly an inconvenience and is generally not life threatening.

Location

The entire Planning Area is susceptible to flooding. Flooding occurs in low lying areas adjacent to the Illinois River, Baron Fork Creek, Ballard Creek, Sallisaw Creek. Flooding occurs along the rural hilly roads, making them impassable for residents and emergency vehicles. During times of heavy rain our towns are very susceptible to street and intersection flooding. There are varying extents for flooding in Adair County from a range of 2 hours of constant rainfall to accumulations of 5 or more inches in low lying areas, with isolated amounts reaching up to 8 to 10 inches during multi-day events. When this happens, events can be considered severe.



MAPS ADDED BELOW

Extent

Jurisdiction	Type of Flooding that Affects Jurisdiction	Range of Flood Depth
Adair County	Flood, Flash Flood, Urban Flooding	0.5 ft to 3 ft.
Stilwell	Urban Flooding	0 to 2 ft
Westville	Urban Flooding	0.5 ft to 3 ft
Watts	Urban Flooding	0 to 1 ft.
Cave Springs PS	Flash Flood	0.5 to 3 ft.
Dahlonegah PS	Flash Flood	0.5 to 3 ft.
Cherokee Immersion ES-Greasy	Flash Flood	0.5 to 3 ft.
Maryetta PS	Flash Flood	0.5 to 3 ft.
Peavine PS	Flash Flood	0.5 to 3 ft.
Rocky Mountain PS	Flash Flood	0.5 to 3 ft.
Stillwell PS	Flash Flood, Urban Flooding	0.5 to 3 ft.
Watts PS	Flash Flood, Urban Flooding	0 to 1 ft.

Westville PS	Flash Flood, Urban Flooding	0.5 to 3 ft
Zion PS	Flash Flood	0 to 1 ft.

Previous Occurrence

Storm Events Database

Search Results for Adair County, Oklahoma

Event Types: Flood

Adair county contains the following zones:
Adair

26 events were reported between 01/01/2011 and 12/31/2020 (3653 days)

Summary Info:

Number of County/Zone areas affected:	1
Number of Days with Event:	20
Number of Days with Event and Death:	1
Number of Days with Event and Death or Injury:	1
Number of Days with Event and Property Damage:	0
Number of Days with Event and Crop Damage:	0
Number of Event Types reported:	1

Storm Events Database

Search Results for Adair County, Oklahoma

Event Types: Flash Flood

10 events were reported between 01/01/2011 and 12/31/2020 (3653 days)

Summary Info:

Number of County/Zone areas affected:	1
Number of Days with Event:	9
Number of Days with Event and Death:	0
Number of Days with Event and Death or Injury:	0
Number of Days with Event and Property Damage:	1
Number of Days with Event and Crop Damage:	0
Number of Event Types reported:	1

Storm Events Database

Search Results for Adair County, Oklahoma

Event Types: Flood

5 events were reported between 01/01/2021 and 12/09/2025 (1804 days)

Summary Info:

Number of County/Zone areas affected:	**1**
Number of Days with Event:	**4**
Number of Days with Event and Death:	**0**
Number of Days with Event and Death or Injury:	**0**
Number of Days with Event and Property Damage:	**0**
Number of Days with Event and Crop Damage:	**0**
Number of Event Types reported:	**1**

Storm Events Database **Search Results for Adair County, Oklahoma**
Event Types: Flash Flood
4 events were reported between 01/01/2021 and 12/09/2025 (1804 days)

Summary Info:

Number of County/Zone areas affected:	**1**
Number of Days with Event:	**4**
Number of Days with Event and Death:	**1**
Number of Days with Event and Death or Injury:	**1**
Number of Days with Event and Property Damage:	**0**
Number of Days with Event and Crop Damage:	**0**
Number of Event Types reported:	**1**

Significant Flood/Flash Flood Events in Planning Area Jurisdictions, 2011-2020

Year	Event Narrative
2011	Apr 24: The Illinois River near Watts rose above its flood stage of 13 feet at 1:45 am CDT on April 24th. The river crested at 28.60 feet at 3:00 am CDT on the 26th, resulting in a record flood. Recent heavy rains had saturated the ground and the additional heavy rainfall with this activity resulted in widespread flash flooding. Large hail was also observed with the stronger storms as well as two brief tornadoes. The activity continued into the early morning hours of the 25th. Several water rescues were necessary due to flooding near Watts and Westville. Apr 25: Many roads were flooded and impassable across the county. Traveling into and around the county was discouraged by the emergency manager after two to four inches of rain fell in less than two hours on already saturated soil. Highway 59 was closed between Westville and Stilwell due to high water covering the roadway. Several cars were stranded in the flood water. May 23: The Illinois River near Watts rose above its flood stage of 13 feet at 8:15 pm CDT on May 23rd. The river crested at 25.19 feet at 7:00 am CDT on the 24th, resulting in major flooding. This was the 3rd highest recorded level of the river at Watts to date.
2013	May 10: The Illinois River near Watts rose above its flood stage of 13 feet at 9:00 am CDT on May 10th. The river crested at 18.77 feet at 7:00 pm CDT on the 10th, resulting in moderate flooding.
2015	May 28: Widespread thunderstorms moved across eastern Oklahoma during the morning and early afternoon hours of the 28th. A tornado and flash flooding resulted from the storms as they passed through the region. Stilwell: Portions of the E 820 Road were flooded.

	Jun 19: The Illinois River near Watts rose above its flood stage of 13 feet at 9:00 am CDT on June 19th. The river crested at 19.28 feet at 7:00 pm CDT on the 19th, resulting in moderate flooding. Dec 27: The Illinois River near Watts rose above its flood stage of 13 feet at 12:15 am CST on December 27th. The river crested at 28.64 feet at 2:00 am CST on the 28th, resulting in record flooding.
2017	Apr 21: The Illinois River near Watts rose above its flood stage of 13 feet at 11:30 pm CDT on April 21st. The river crested at 19.41 feet at 1:00 pm CDT on the 22nd, resulting in moderate flooding. Apr 26: The Illinois River near Watts rose above its flood stage of 13 feet at 7:45 pm CDT on April 26th. The river crested at 19.58 feet at 2:00 am CDT on the 27th, resulting in moderate flooding. Apr 29: The Illinois River near Watts rose above its flood stage of 13 feet at 11:00 am CDT on April 29th. The river crested at 30.16 feet at 7:00 am CDT on the 30th, resulting in record flooding. May 20: The Illinois River near Watts rose above its flood stage of 13 feet at 3:00 pm CDT on May 20th. The river crested at 17.32 feet at 10:00 pm CDT on the 20th, resulting in moderate flooding.
2018	Feb 21: A 53-year-old man drove his vehicle into a flooded, low-water crossing about three miles east of Stillwell in Adair County, where he drowned.
2019	Jun 7: The Illinois River near Watts rose above its flood stage of 13 feet at 10:45 am CDT on June 7th. The river crested at 17.48 feet at 3:30 pm CDT on the 7th, resulting in moderate flooding. Farmland and permanent campgrounds were flooded from the Arkansas border to near Fidler's Bend. Jun 23: The Illinois River near Watts rose above its flood stage of 13 feet at 3:15 pm CDT on June 23rd. The river crested at 19.99 feet at 5:30 am CDT on the 24th, resulting in moderate flooding. Farmland and permanent campgrounds were flooded from the Arkansas border to Fidler's Bend. Sept 24: Slow-moving thunderstorms produced heavy rainfall repeatedly across the same areas, resulting in flash flooding across portions of northeastern Oklahoma. Portions of Highway 59 north of Watts were closed due to flooding. Oct 6: The Illinois River near Watts rose above its flood stage of 13 feet at 4:30 pm CDT on October 6th. The river crested at 24.11 feet at 9:30 pm CDT on the 6th, resulting in major flooding. Very severe flooding occurred from the Arkansas border to Fidler's Bend.

	Permanent buildings and cabins were flooded to a depth of several feet. Nov 7: The Illinois River near Watts rose above its flood stage of 13 feet at 3:30 pm CST on November 7th. The river crested at 17.06 feet at 10:00 pm CST on the 7th, resulting in moderate flooding. Farmlands and permanent campgrounds were flooded from the Arkansas border to Fidler's Bend.
2020	Jan 11: The Illinois River near Watts rose above its flood stage of 13 feet at 7:00 am CST on January 11th. The river crested at 17.90 feet at 4:00 pm CST on the 11th, resulting in moderate flooding. Farmland and permanent campgrounds were flooded from the Arkansas border to near Fidler's Bend. Mar 19: The Illinois River near Watts rose above its flood stage of 13 feet at 2:45 pm CDT on March 19th. The river crested at 22.00 feet at 2:30 am CDT on the 20th, resulting in moderate flooding. Severe flooding occurred from the Arkansas border to Fidler's Bend, with numerous cabins and permanent campgrounds flooded.

Source: NOAA National Center for Environmental Info

Note: When “near Watts” is used in the above table, it refers to areas of unincorporated Adair Co which are located near Watts.

Significant Flood/Flash Flood Events in Planning Area Jurisdictions, 2021-2025

2021	Apr 28: The Illinois River near Watts rose above its flood stage of 13 feet at 10:30 am CDT on April 28th. The river crested at 23.97 feet at 8:00 pm CDT on the 28th, resulting in major flooding.
2022	May 4: The Illinois River near Chewey rose above its flood stage of 12 feet at 7:15 pm CDT on May 4th. The river crested at 28.85 feet at 8:30 pm CDT on the 5th, resulting in major flooding. May 5: The Illinois River near Watts rose above its flood stage of 13 feet at 1:45 am CDT on May 5th. The river crested at 27.50 feet at 2:30 pm CDT on the 5th, resulting in major flooding. This was the fourth highest crest on record at this site. Disastrous flooding occurred from the Arkansas border to Fidler's Bend, with many permanent campgrounds and cabins overtopped. Nov 4: Locally heavy rainfall resulted in the flooding of portions of several county roads. A vehicle was driven into a flooded low water crossing west of Stilwell, where it was washed downstream. Four people were inside the vehicle at the time. A 14-year-old boy and a 9-year-old girl in the vehicle were taken to the hospital, treated, and released. A 6-year-old girl drowned in the vehicle. A 43-year-old man was also drowned, and was recovered eleven miles downstream, two days after the incident.

2023	Feb 8: Portions of Highway 59 were flooded south of Stilwell.
2024	Aug 17: Widespread flooding was reported near Bunch, after an estimated 5 to 6 inches of rain fell in the area.

Source: NOAA National Center for Environmental Info

Probability

The probability of Flood in the Planning Area is HIGH.

Vulnerability and Impact

Jurisdiction	Vulnerability	Impact
Adair County	Routinely flooded portions of state highways 59, 100 and 51, as well as paved and unpaved rural roads in unincorporated areas, prevent and/or cause delays in emergency response times, closure of transportation routes. Having dirt and/or chip seal roads is common in unincorporated Adair Co. Flooding along an unimproved road exacerbates issues of roadway flooding. Agricultural lands along routinely flooded streams, creeks, and rivers. Loss of livestock in unincorporated areas along rivers, creeks and streams. Low water bridge damage from debris.	All modes of flooding have affected Adair County. Due to hilly terrain, low lying portions of Highways 59, 100, 51 are often impassable, or pose a significant threat to travel. Paved and unpaved roads in unincorporated areas of the county are routinely damaged or closed; thus, preventing students, business owners, and residents from getting to or home from school or work. Emergency response times are lessened due to inability to cross over damaged or flooded roadways and/or low water bridges. Low water bridges are collection points for debris from fast moving water. Rural businesses in unincorporated areas experience temporary closures of business, or loss of business due to flooded parking areas. Old and outdated water lines near or crossing through creeks, drainage ditches, and/or streams in unincorporated areas break or crack which results in long term water loss to residents.
Stilwell	City streets, parking lots, and businesses are vulnerable to urban flooding because the drainage infrastructure cannot adequately handle heavy precipitation that	Urban and flash flooding cause short temp delays and disruptions to travel and business operations. These occurrences are more of an inconvenience, and rarely are there any major damage or disruptions.

	occurs over a short duration.	
Westville	City streets, parking lots, and businesses are vulnerable to urban flooding because the drainage infrastructure cannot adequately handle heavy precipitation that occurs over a short duration.	Flash and urban flooding can be quite severe. Buildings in this town are quite old and due to inadequate drainage systems, prolong periods of urban flooding contribute to the decay and erosion of sidewalks and streets, as well as affecting the structural integrity of buildings located in low lying areas of town. Minor flooding of businesses has occurred, causing businesses to close; thus, losing income.
Watts	Watts sits on a high hilltop. They are susceptible to extreme runoff from floods. The runoff floods manholes and overwhelms their town's septic systems. The City Park is in a low-lying area of town that floods and damages the gravel and concrete slabs that stabilize the playground equipment.	This type of flooding can occur unexpectedly and catch citizens unaware. When the septic systems become overwhelmed, it has the potential to create a widespread sanitation issue.
Cave Springs PS Dahlonegah PS Cherokee Immersion ES-Greasy PS Rocky Mountain PS	School bus routes, parking lot, and athletic fields are vulnerable to Flooding. These unincorporated areas experience school closures and/or delays due to flooded and/or washed-out roadways along the bus route. Athletic fields are often flooded and saturated for long periods of time due to flooding.	Due to the hilly terrain, school bus routes are often closed preventing teachers and students from attending regularly scheduled classes. Flooding of the athletic fields also causes events to be cancelled or delayed, and results in damage to playing field.
Maryetta PS Peavine PS Stilwell PS Westville PS	School bus routes, parking lot, and athletic fields are vulnerable to Flooding. Flooded and/or washed-out roadways along the school's rural bus route often cause delays in arrival time for students	Flooded transportation routes put students and staff at risk for injury as they travel to school and causes disruptions of school operations. Flooding of the athletic fields also causes events to be cancelled or

	and teachers. Athletic fields are often flooded and saturated for long periods of time. Stilwell PS: The schools are situated withing the City of Stilwell; therefore, are also affected by urban flooding. Westville PS: The schools are situated withing the City of Westville; therefore, are also affected by urban flooding due to inadequate drainage systems. Zion PS: Zion Public School is situated at a higher elevation; therefore, is not greatly affected by any type of flooding event. Rural bus routes are, however, greatly affected and typically cause delays and disruptions to class schedules and attendance rates.	delayed, and results in damage to playing fields. On many occasions, of Maryetta PS, Peavine PS, Stilwell PS, and Westville PS have implemented its virtual/distance learning for those students and teachers unable to travel.
Watts PS	Watts Public Schools are situated at a high elevation. While school facilities are not greatly affected by Flood, the rural bus roads located in lower elevation areas can become unpassable.	When school bus routes are flooded, it can cause delays and disruptions to class schedules and attendance rates. In addition, sudden flooding can cause increased driving safety risks for students and staff.

3.4.6 Hail

Description

Hail is frozen water droplets formed inside a thunderstorm cloud. They are formed during the strong updrafts of warm air and downdrafts of cold air, when the water droplets are carried well above the freezing level to temperatures below 32 degrees F, and then the frozen droplet begins to fall, carried by cold downdrafts, and may begin to thaw as it moves into warmer air toward the bottom of the thunderstorm. This movement up and down inside the cloud, through cold, then warmer temperatures, causes the

droplet to add layers of ice and can become quite large, sometimes round or oval shaped and sometimes irregularly shaped, before it finally falls to the ground as hail.

Location
The entire Planning Area is affected by Hail.

Extent
The Planning Area uses the Hail Diameter/Description Scale to categorize Hail. The Planning Area can experience any value on this scale but typically experiences hail 2" or less in diameter.

Hail Diameter/Description Scale

Hail Diameter (Inches)	Description
1/4"	Pea
1/2"	Small Marble
3/4"	Penny or Large Marble
7/8"	Nickel
1"	Quarter
1 1/4"	Half Dollar
1 1/2"	Walnut or Ping Pong Ball
1 3/4"	Golf Ball
2"	Hen's Egg
2 1/2"	Tennis Ball
2 3/4"	Baseball
3"	Teacup Size
4"	Grapefruit
4 1/2"	Softball

Previous Occurrence (Need update)

Year	Number of Hail Events	Hail Size Range
2011	11	0.74 - 2.00
2012	1	1.25
2013	0	-
2014	4	0.88 – 1.00
2015	8	0.88 – 2.50
2016	4	1.00 – 2.75
2017	3	1.00 – 1.75
2018	0	-
2019	0	-
2020	1	1.00
2021	0	-

2022	2	1.00-1.50
2023	1	2.00
2024	1	0.75
2025	2	0.88-1.00

Source: NOAA Storm Events Database

Probability

The probability of Hail in the Planning Area is HIGH.

Vulnerability and Impact

Jurisdiction	Vulnerability	Impact
Adair County	Inadequate number of storage facilities cause many county vehicles and equipment to sustain minor to severe cosmetic damages. Vacant and inadequately maintained older and historical buildings in both the city and towns suffer roof damage, as well as subsequent water damage from inadequate maintenance. Rural agricultural producers experience minor to severe roof damage to poultry houses and dairy barns. Livestock losses due to lack of shelter. Inadequately maintained rural roads covered with only chip & seal in unincorporated jurisdictions are damaged (large potholes).	County vehicle and equipment repair due to hail damage strains an already tight county budget resulting in money being diverted from other projects to cover repairs. Delays in road repairs when equipment and vehicles are takin offline for repairs cause damage to personal vehicles who travel on damaged rural roads. Many buildings throughout the county are over 50 years old and inadequately maintained due to financial disability. Roof damage is most common and results in minor to severe water damage from leaks. Damage to poultry houses and dairy barns, as well as loss of livestock from hail damage affects the counties overall economic health.

Stilwell Westville Watts	Inadequate number of storage facilities cause many city and town owned vehicles, as well as personal vehicles, and equipment to sustain minor to severe cosmetic damages. Vacant and inadequately maintained older and historical buildings suffer roof damage, as well as subsequent water damage from inadequate maintenance.	City and town vehicles and equipment repair due to hail damage strains already tight municipal budgets resulting in money being diverted from other projects to cover repairs or no repairs made due to lack of funds. Delays in municipal repairs when equipment and vehicles are taken offline for repairs. Many buildings of businesses in incorporated jurisdictions are over 50 years old and inadequately maintained due to financial disability. Roof damage is most common and results in minor to severe water damage from leaks.
Cave Springs PS Dahlonegah PS Cherokee Immersion ES-Greasy PS Maryetta PS Peavine PS Rocky Mountain PS Stillwell PS Watts PS Westville PS Zion PS	Inadequate number of storage facilities cause school buses, personal vehicles, and outside field equipment to sustain minor to severe cosmetic damage.	School owned buses and outside athletic equipment do sustain minor damage from hail. If a significant hail event were to occur, it has the potential to reduce the transportation resources of the school. Damage to personally owned vehicles of facility, staff, and students causes a substantial hardship on the families due to low and/or no income.

3.4.7 High Winds

Description

Sustained wind speeds of 40 mph or greater last for 1 hour or longer, or winds of 58 mph or greater for any duration. While high winds are commonly associated with severe thunderstorms, hurricanes, or tornados, they may also occur because of differences in air pressure, such as when a cold front passes across the area. These high winds do not have to accompany a storm to be dangerous. High winds, whether accompanied by a storm or not, can cause death, injury, and crop or property damages.

Extent

The Planning Area uses the Beaufort Wind Chart to categorize High Wind. The Planning Area can expect to experience any wind magnitude on the chart.

Beaufort Wind Chart – Estimating Winds Speeds

Beaufort Number	MPH Range	MPH Average	Terminology	Description
0	0	0	Calm	Calm. Smoke rises vertically.
1	1-3	2	Light air	Wind motion visible in smoke.
2	4-7	6	Light breeze	Wind felt on exposed skin. Leaves rustle.
3	8-12	11	Gentle breeze	Leaves and smaller twigs in constant motion.
4	13-18	15	Moderate breeze	Dust and loose paper is raised. Small branches begin to move.
5	19-24	22	Fresh breeze	Smaller trees sway.
6	25-31	27	Strong breeze	Large branches in motion. Whistling heard in overhead wires. Umbrella use becomes difficult.
7	32-38	35	Near gale	Whole trees in motion. Some difficulty when walking into the wind.
8	39-46	42	Gale	Twigs broken from trees. Cars veer on road.
9	47-54	50	Severe gale	**Light structure damage.**
10	55-63	60	Storm	**Trees uprooted. Considerable structural damage.**
11	64-73	70	Violent storm	**Widespread structural damage.**
12	74-95	90	Hurricane	**Considerable and widespread damage to structures.**

Webpage: http://www.weather.gov/iwx
Twitter: @nwsiwx
Facebook: NWSNorthernIndiana

Previous Occurrence

Year	Number of Days with Maximum Wind Speed of 40 mph or Higher	Max Speed (mph)
2011	10	50.13
2012	7	50.78
2013	5	53.71
2014	10	72.19
2015	7	51
2016	6	47.66
2017	8	54.87
2018	6	49.68
2019	13	65.41
2020	7	55.45
2021	8	52.1
2022	4	42.3
2023	10	62.3
2024	5	75.6

2025	10	61.6

Source: Source: Oklahoma Climatological Survey Mesonet Data

Probability

The probability of High Wind in the Planning Area is HIGH.

Vulnerability and Impact

Adair County is situated in a heavily forested and wooded area at the foothills of the Ozark Mountains. The primary vulnerability from high/straight-line winds are the roads and above-ground lines. Most rural county roads are alongside private property with unmanaged wooden areas, and trees and large limbs are felled by high winds and straight-line winds across roadways, which blocks passage. In most areas of the county, there are very few alternate routes; therefore, people must wait for a county-crew to come to remove the tree and clear the road. Another vulnerability is that oak trees in northeast Oklahoma are infested with the "oak beetle" which is killing trees quickly. These dead and dying trees are not being treated, and when they are weakened by decay, they are not being removed; therefore, are more susceptible to being downed by winds.

Jurisdiction	Vulnerability	Impact

Adair County Stilwell Westville Watts	Above ground electrical lines and telephone lines that run alongside rural county roads and areas of Highways 51, 100, and 59 are vulnerable to damage from felled trees and limbs due to lack of regular trimming or removal. Due to lack of funding, historical and older buildings sustain mostly minor damage, such as loss of protective tarping and shingles from roofs, due to straight-line winds. Rural homes and agricultural buildings, such as barns and storage facilities regularly sustain costly damage from felled trees and limbs. During winter months and times of drought, high winds increase the rate at which fires spread throughout the county, putting rural and urban homes and businesses in danger of damage or destruction, and putting a significant burden on understaffed rural volunteer fire departments and emergency services.	Adair County is a heavily wooded and forested area located in the foothills of the Ozark Mountains; therefore, strong winds, especially straight-line winds, regularly fall trees and large limbs causing roof and structural damage to both rural and urban homes and businesses. Straight-line winds cause trees and large limbs to fall and take down above ground electrical and telephone lines resulting in power outages and a disruption in communications and internet service. This disruption in power and communications drastically affects our limited emergency services and first responders' ability to respond to incidents for long periods of time putting the health and welfare of rural and urban residents at risk. Fallen trees and large limbs regularly fall across rural transportation routes throughout the county blocking access to emergency responders, and delaying and/or preventing passage
Cave Springs PS Dahlonegah PS Cherokee Immersion ES-Greasy PS Maryetta PS Peavine PS Rocky Mountain PS Stillwell PS Watts PS Westville PS Zion PS	Due to being in unmanaged forested and wooded areas, public schools are subject to short-term power outages and internet access due to trees and limbs falling on above-ground electrical lines and telephones lines. Rural bus transportation routes are routinely impassable by felled trees and limbs across roadways.	Above-ground electrical lines and telephone lines taken out by felled trees from high winds cause temporary disruptions to school administration offices and class schedules (both in class and distance learning). Due to limited financial resources to employ adequate road crews, removal of felled trees and limbs by the county across rural roadways is slow and delays faculty and staff, as well as students, from attending class or returning home.

3.4.8 Landslide

Description

Landslides are defined as the movement of a mass of rock, debris, or earth down a slope. According to the U.S. Geological Survey, almost every landslide has multiple causes. Slope movement occurs when forces acting down-slope exceed the strength of the earth material that composes the slope. Landslides can initiate in slopes already on the verge of movement by rainfall, snowmelt, changes in water level, stream erosion, changes in ground water, earthquakes, volcanic activity, disturbance by human activities, or any combination of these factors.

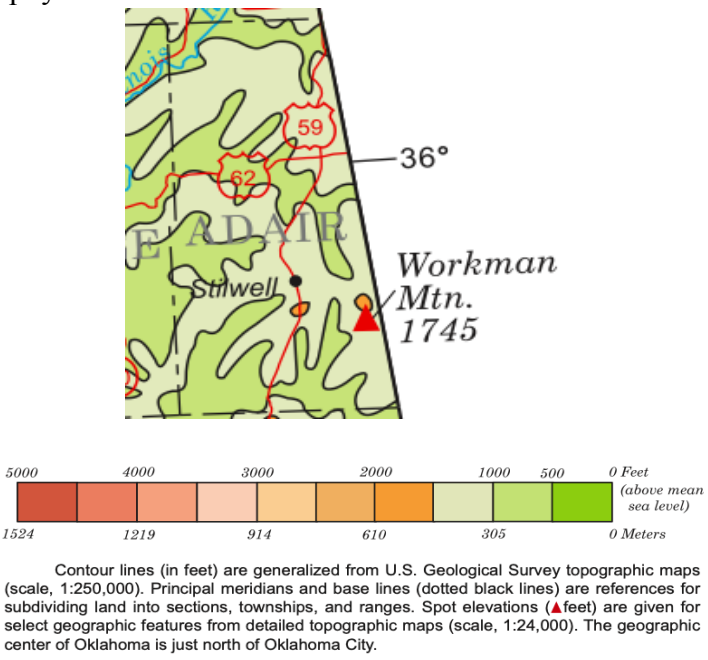
Location

Unincorporated Adair Co and the Town of Watts are the only jurisdictions susceptible to Landslide.

The Planning Area is a very hill/mountainous area of the state, but not generally prone to widespread landslides due to the natural slope stabilization provided by the many trees and dense vegetation. Stilwell, Westville, and Public Schools are located on level plains; therefore, these towns would not be affected by landslides.

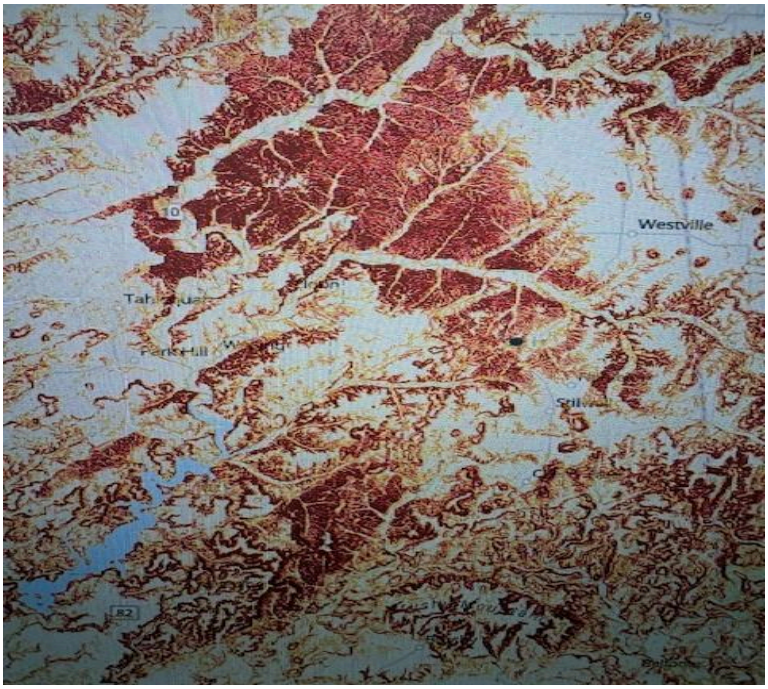
The only real area of concern is in unincorporated Adair County and near the Town of Watts. Of note, the Department of Transportation has completed a project to stabilize this area, which has helped mitigated the risk of Landslide.

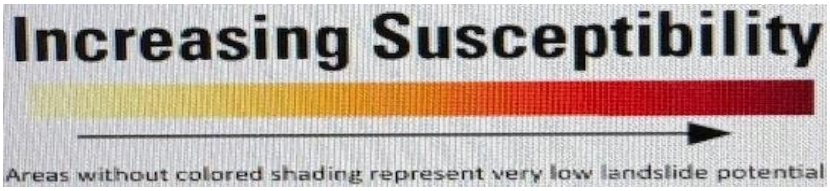
Adair Co Topography:



Contour lines (in feet) are generalized from U.S. Geological Survey topographic maps (scale, 1:250,000). Principal meridians and base lines (dotted black lines) are references for subdividing land into sections, townships, and ranges. Spot elevations (▲feet) are given for select geographic features from detailed topographic maps (scale, 1:24,000). The geographic center of Oklahoma is just north of Oklahoma City.

Extent
The Planning Area categorizes Landslide through risk susceptibility. According to U.S. Landslide Inventory and Susceptibility information provided by the U.S. Geological Survey, the following map illustrates the risk for Adair County. Based off this risk susceptibility map, the Planning Area can expect to experience a Low to Moderate susceptibility for Landslides.





Previous Occurrence

The only notable Landslide event from 2011-2020 occurred in 2019. A Flood event in May and June 2019 caused rockslides along several county roads and state highways 59, 100, and 51. Since 2019, there have been no major or notable events. See Vulnerability and Impact section for more information.

Probability
The probability of Landslide in the Planning Area is LOW.

Vulnerability and Impact

Jurisdiction	Vulnerability	Impact
Adair County	Low lying areas along state highways 59, 100, and 51; and	Adair County has areas in unincorporated jurisdictions that

	many rural county roads, are vulnerable to minor landslides due to excessive rainfall in the 100-year flood event category.	have extremely high and steep mountainous terrain. Portions of State highways 59, 51, 100; and, many rural roads in unincorporated jurisdictions are located at the base of hills with slopes ranging from 10 to 80 degrees. During times of excessive rainfall, low lying areas are affected by minor landslides that cause rocks and soil to dislodge and collect alongside and on major transportation routes that pose a significant threat to travel safety. Most steep slopes along transportation routes are stabilized by forest and heavily wooded areas, soil netting, and heavy vegetation.
Watts	Low lying municipal streets and roads. During times of excessive rainfall, low lying areas are affected by minor landslides that cause rocks and soil to dislodge and collect alongside and on municipal streets and roads routes that pose a significant threat to travel safety. Most steep slopes along these streets and roads are stabilized by best management practices.	A Landslide event could block roadways and make transportation routes impassable.

3.4.9 Lightning

Description

Lightning is a discharge of intense atmospheric electricity, accompanied by a vivid flash of light, from one cloud to another or from a cloud to the ground. Lightning is formed by the separation of positive and negative charges that occur when ice crystals collide high up in a thunderstorm cloud. As lightning passes through the atmosphere, the air immediately surrounding it is heated, causing the air to expand rapidly. The resulting sound wave produces thunder.

Location

The entire Planning Area is affected by Lightning.

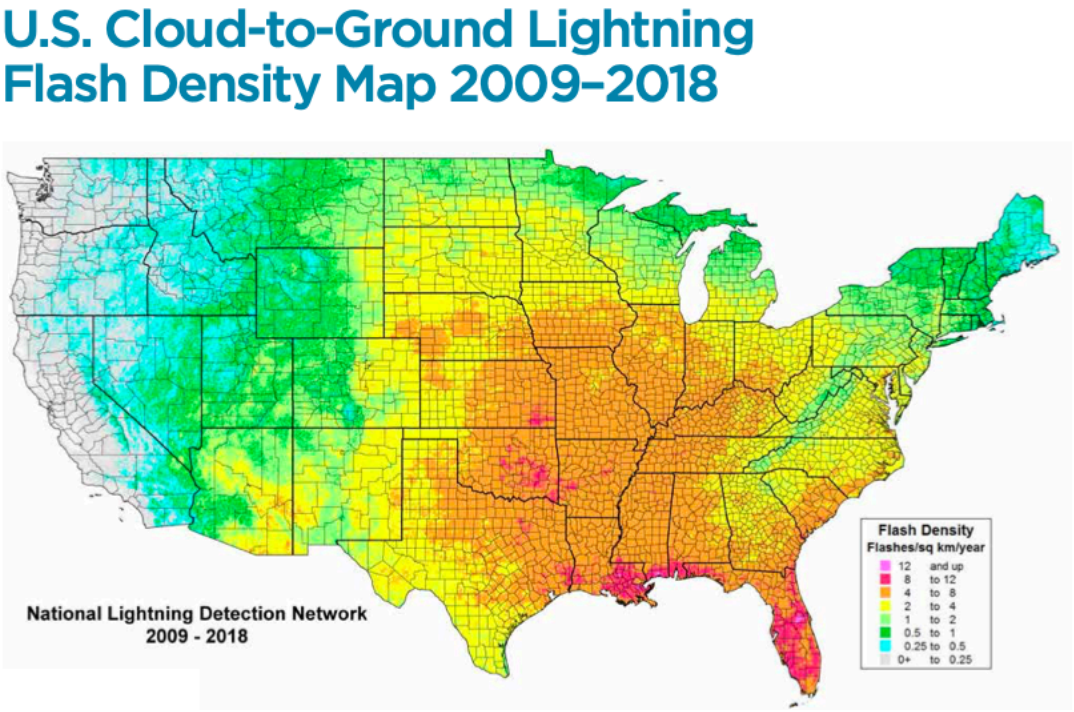
Extent

The Planning Area uses Vaisala Lightning Report data to categorize Lightning, which is included in the Previous Occurrence section below. For 2024, Oklahoma was

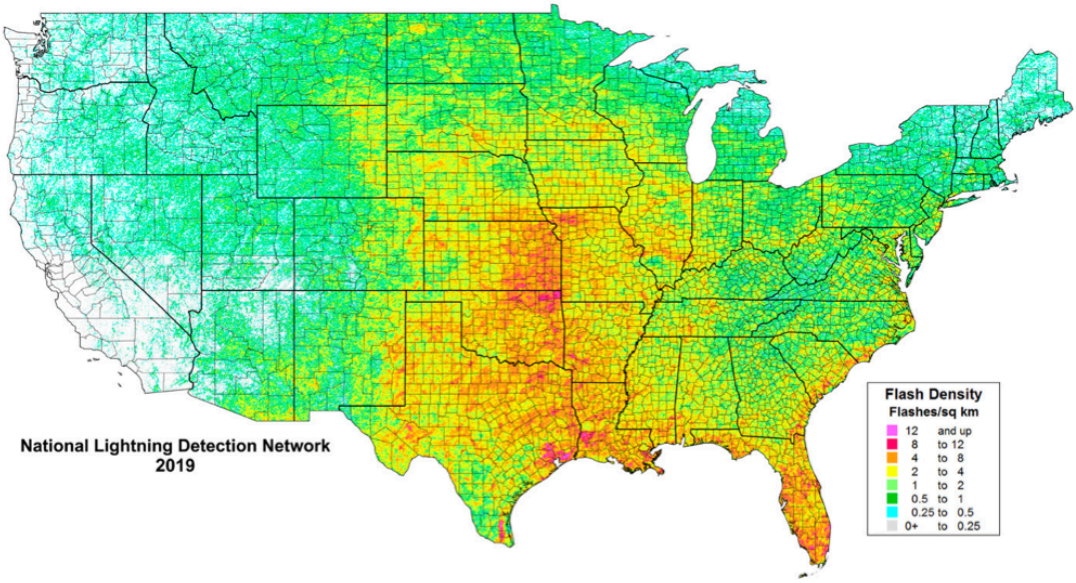
ranked third in the U.S. for total lightning events, and it was second in lightning density (strikes per square mile).

Previous Occurrences

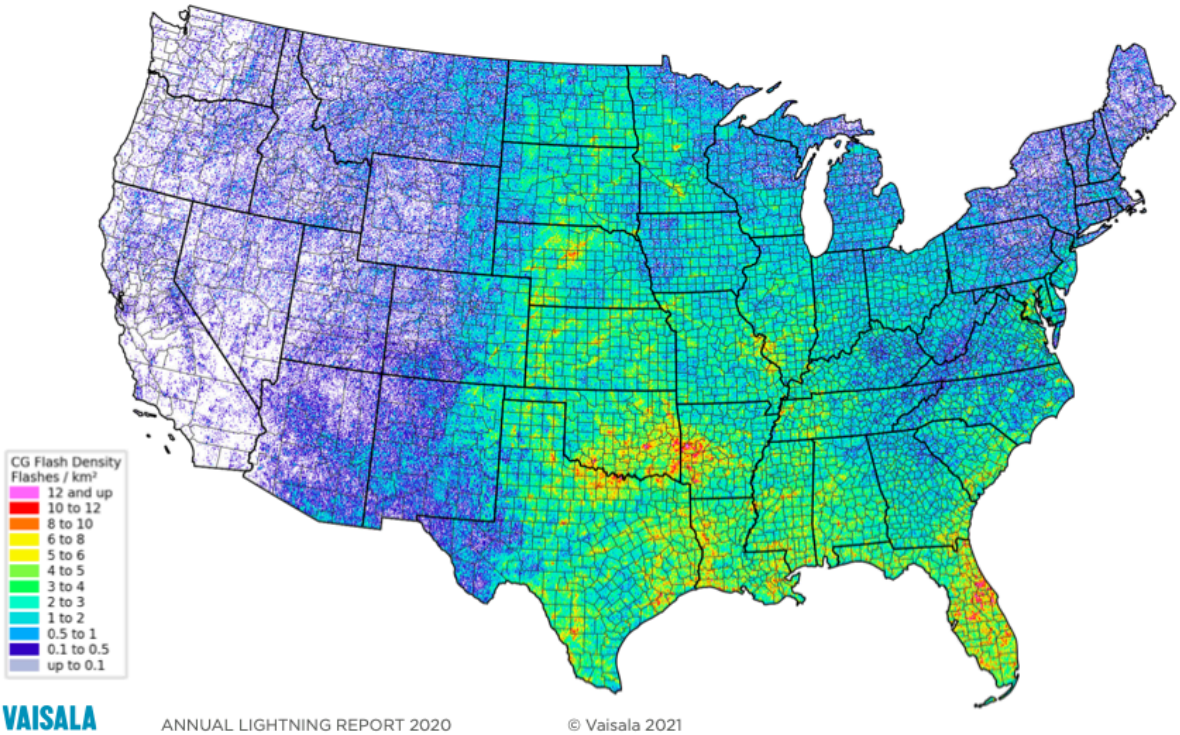
The following annual Vaisala Lightning Report data illustrates Cloud-to-Ground Lightning Flash Density Map, per flash/square km/per year. Recent data reflects that the Planning Area experiences approximately 80 lightning flashes per square km per year.

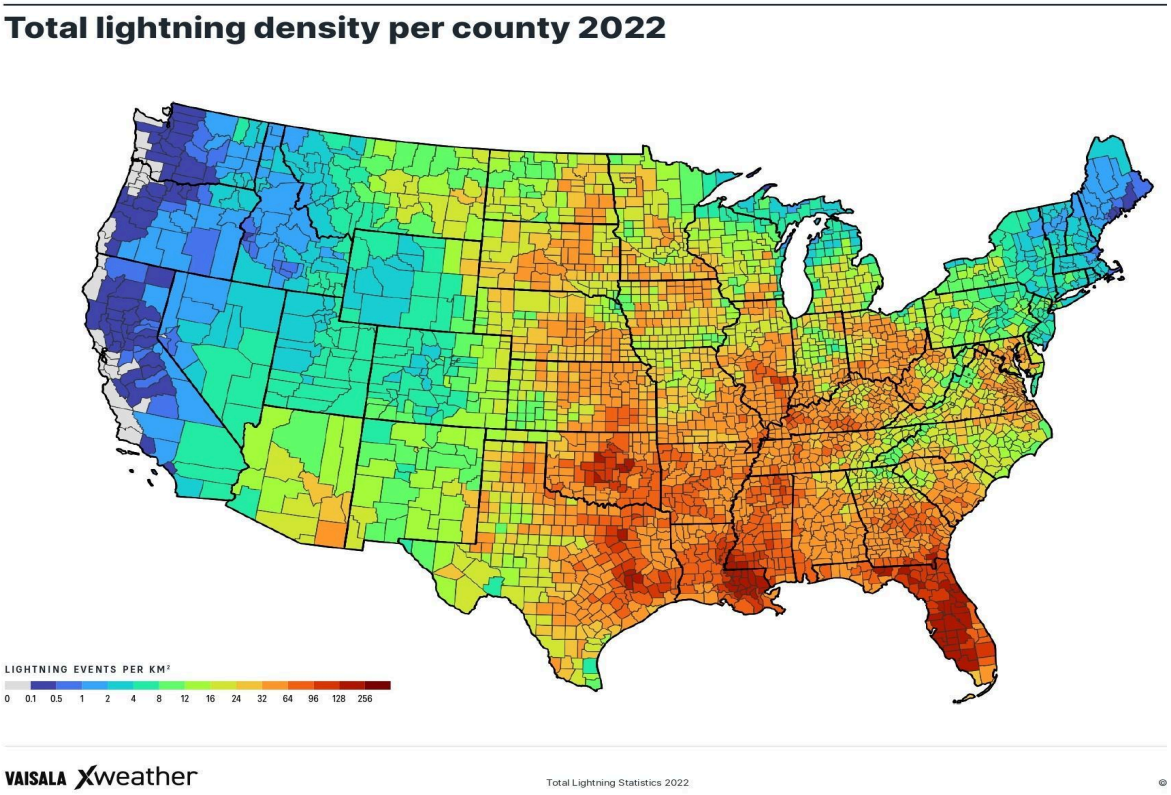


U.S. Cloud-to-Ground Flash Density in 2019

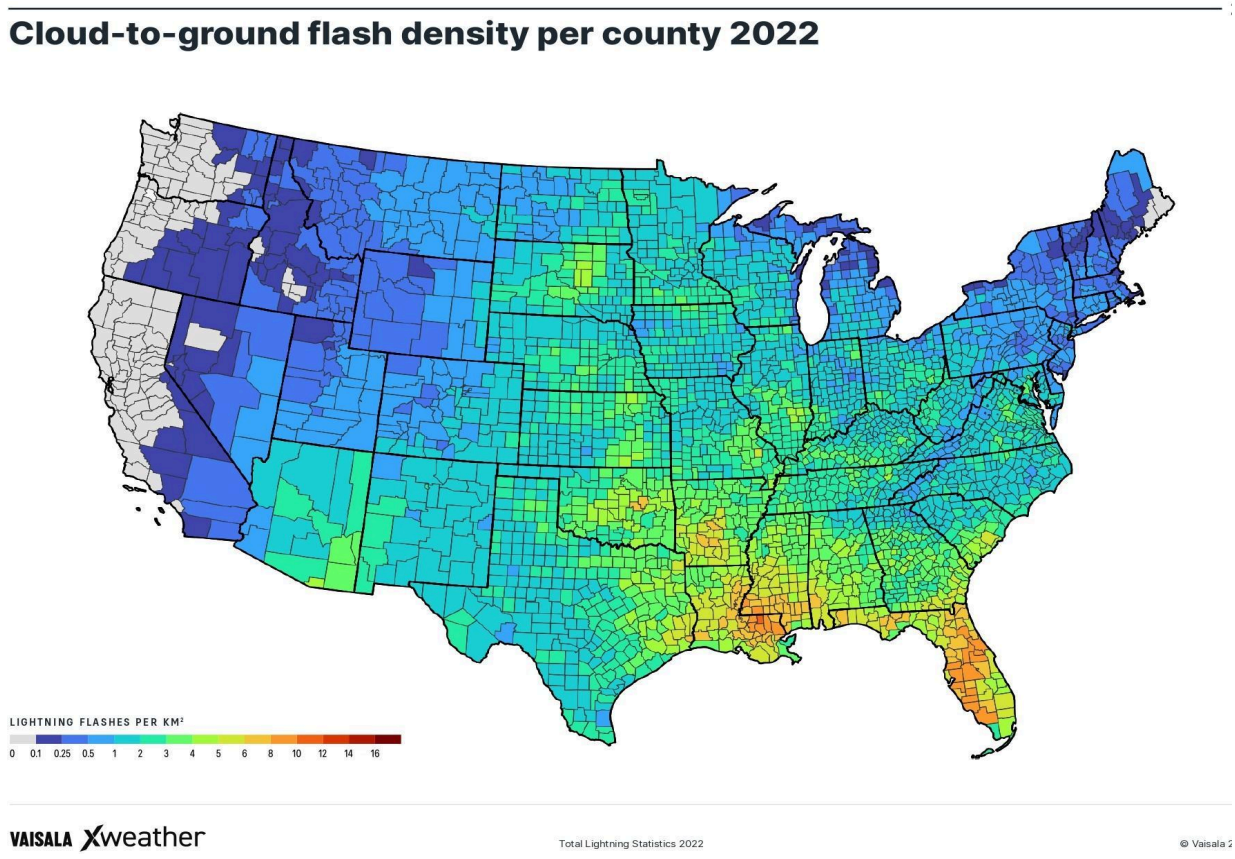


U.S. cloud-to-ground flash density in 2020





Source: Vaisala Lightning Report



Source: Vaisala Lightning Report

Probability

The probability of Lightning in the Planning Area is HIGH.

Vulnerability and Impact

Lightning strikes to electronic and computer equipment within Adair County can cause damage and shut down businesses and other critical facilities, such as health clinics and administrative buildings; it also affects emergency operations such as law enforcement and ambulance services. The risk of electrical fires, electricity loss, and equipment damage are a prominent threat. Damage to any of the County's facilities can cause a disruption of services and jobs, plus the cost of repairs or replacement of damaged structures. While our schools meet safety standards, many of our schools and clinics do not have lighting rods, or backup generators large enough for the entire facility.

Jurisdiction	Vulnerability	Impact
Adair County and all Jurisdictions	Adair Co, and all other planning jurisdictions, do not have a central 911 system. The emergency communication radios are analog-based, and during lightning events they are routinely vulnerable to outages and interruptions.	When the 911 system is interrupted, emergency personnel lose the ability to effectively communicate with other critical service agencies, and their ability to provide response to the community is critically impaired.
Stilwell	Stilwell lacks a lightning warning system at its community splash pad. In addition, some residents do not take effective precautions during lightning events. In addition to a lack of lightning warning at the community splash pad, there is also no educational signage to assist residents with lightning safety protocols.	When residents are unaware of the reach and danger of lightning during inclement weather, they increase their risk for personal harm and injury.
Westville Watts	These municipalities lack education on how to protect electronic equipment against power surges during a Lightning event. In addition, there is a need for more surge protection devices in critical facilities.	Lightning events can result in a significant loss of electronic equipment during power surges. For smaller communities like Watts and Westville, this could result in financial hardship as these municipalities replace damaged equipment at critical facilities. It also results in an interruption to critical services for the community.

Cave Springs PS Dahlonegah PS Cherokee Immersion ES-Greasy PS Maryetta PS Peavine PS Rocky Mountain PS Stillwell PS Watts PS Westville PS Zion PS Stilwell PS	Although these schools have safety response protocols for Lightning, they lack hand-held Lightning Detection devices to assist coaches and staff during outdoor athletic events. This makes each school district vulnerable because there is a hesitancy to cancel athletic events during inclement weather, and it is difficult to visually gauge the distance of Lightning.	Without Lightning Detection systems, coaches and staff must rely on personal judgement to gauge Lightning proximity, which leads to inconsistent application of safety protocols.

3.4.10 Tornado

Description

Tornadoes are violently rotating columns of air that reach from the bottom of a cumulonimbus cloud to the ground. Tornadoes are found in severe thunderstorms, but not all severe thunderstorms produce tornadoes. While all tornadoes touch both the ground and the bottom of a cloud, it is possible for only part of the tornado to be visible. A tornado may be on the ground for only a few seconds, or last for over an hour. They can appear in a variety of shapes and sizes, ranging from thin, rope-like circulations to large, wedge-shapes greater than one mile in width. However, a tornado's size is not necessarily related to its wind speed. The strongest tornadoes can have wind speeds more than 200mph. In Oklahoma, most tornadoes occur between 4PM and 9PM, during the months of April through June, but may occur anytime the necessary atmospheric conditions of wind shear, lift, instability, and moisture are present.

Location

The entire Planning Area is affected by Tornadoes.

Extent

The Planning Area uses the EF Scale to categorize tornadoes. Due to the unpredictability of tornadoes, the Planning Area can experience any value on this scale.

Enhanced F Scale for Tornado Damage

FUJITA SCALE (Used Prior to 2007)			**ENHANCED FUJITA SCALE**	
F Number	Fastest 1/4-mile (mph)	3 Second Gust (mph)	**EF Number**	**3 Second Gust (mph)**
0	40-72	45-78	**0**	**65-85**
1	73-112	79-117	**1**	**86-110**
2	113-157	118-161	**2**	**111-135**
3	158-207	162-209	**3**	**136-165**

4	208-260	210-261	**4**	**166-200**
5	261-318	262-317	**5**	**Over 200**

http://www.spc.noaa.gov/faq/tornado/ef-scale.html

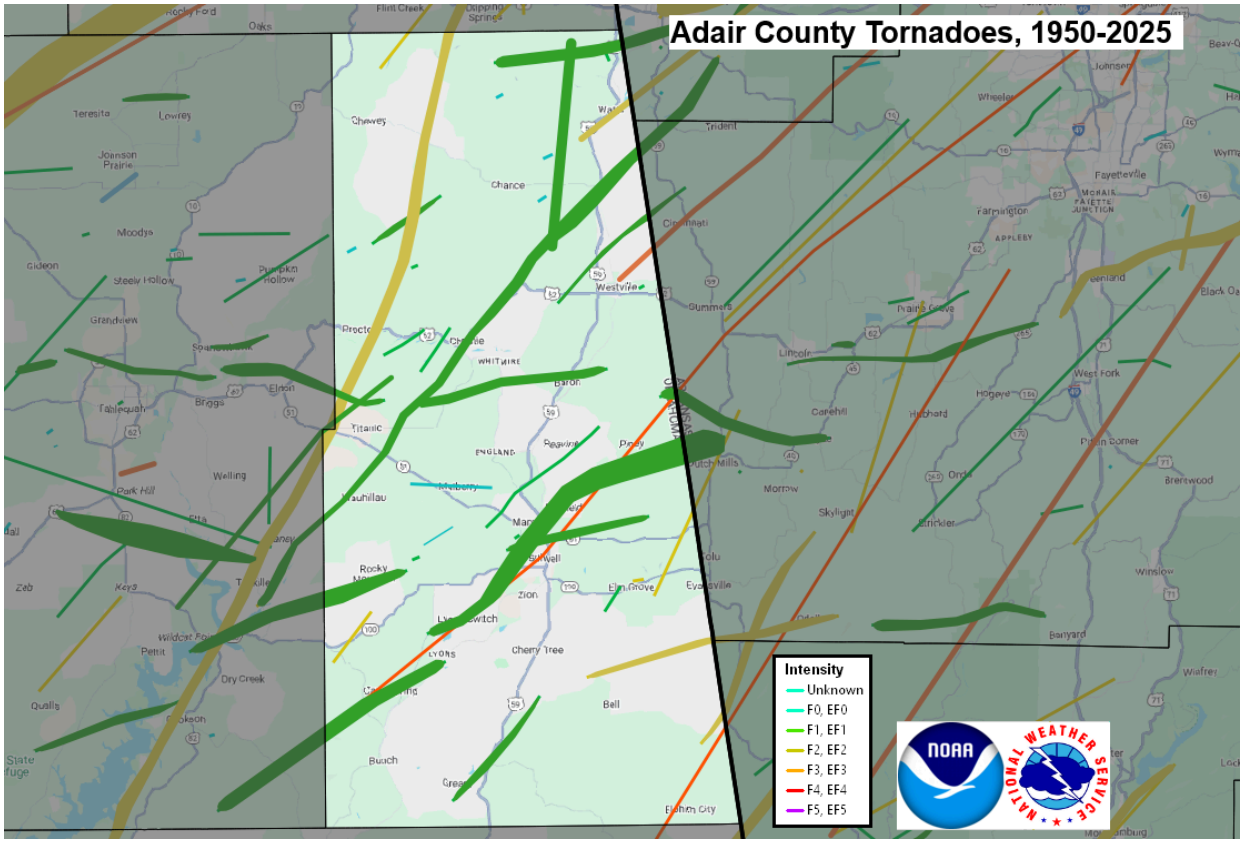
NOTE ABOUT ENHANCED F-SCALE WINDS: The Enhanced F-scale still is a set of wind estimates (not measurements) based on damage. Its uses three-second gusts estimated at the point of damage based on a judgment of 8 levels of damage to the 28 indicators listed below. These estimates vary with height and exposure. Important: The 3 second gust is not the same wind as in standard surface observations. Standard measurements are taken by weather stations in open exposures, using a directly measured, "one minute mile" speed.

Previous Occurrence

Although Oklahoma is situated within the heart of tornado alley most of the tornadoes that have occurred within the boundaries of Adair County from 2021-2025 have been EF2 or lower on the Enhanced Fujita Tornado Scale. Historically, tornadoes that were categorized as F3 and greater have been infrequent. The earliest and closest such event was in May of 1920 when an F4 touched down near Peggs, OK (40 miles NW of Stilwell, Adair Co., OK). Over one hundred people suffered injuries and seventy-one were left dead due to the storm. The most recent large-scale storm to hit within a 50-mile radius of Adair County occurred in May of 1973 in Muskogee, OK that left 5 dead and twenty-five injured.

Year	Tornado Events	EF Level
2011	1	EF1
2012	2	EF0
2013	3	EF1
2014	0	-
2015	2	EF0/EF1
2016	1	EF1
2017	1	EF1
2018	2	EF1/EF2
2019	1	EF1
2020	1	EF1
2021	2	EFU/EF1
2022	1	EF1
2023	0	-
2024	2	EF2
2025	6	EFU/EF1

Source: NOAA Storm Events Database



Probability
The probability of Tornadoes in the Planning Area is HIGH.

Vulnerability and Impact

Jurisdiction	Vulnerability	Impact
Adair County	There are no sirens in Unincorporated Adair County. In addition, Adair County is located at the foothills of the Ozark Mountains with sloping terrain, which makes it difficult to effectively place sirens. Many individuals in Unincorporated Adair County are economically vulnerable, and they lack the ability to install a residential storm shelter.	A lack of siren capability means that communities members might not have adequate warning to alert them to seek shelter during hazardous weather events. Lack of adequate shelter results in an increased risk to residents and significantly limits their ability to seek timely refuge during tornado events.
Stilwell Westville	There is only one warning siren in each of these communities, which means that some residents on the	A lack of siren capability means that communities members might not have adequate warning to alert them to seek shelter

	outskirts of each town may not receive adequate warning during a tornado. In addition, Westville lacks community shelter for those residents who do not have home-based shelters.	during hazardous weather events. A lack of community shelters puts residents at higher risk for injury during a tornado event.
Watts	This community does not have a storm siren to warn residents of an impending tornado.	A lack of siren capability means that communities members might not have adequate warning to alert them to seek shelter during hazardous weather events.
Cave Springs PS Dahlonegah PS Cherokee Immersion ES-Greasy PS Maryetta PS Peavine PS Rocky Mountain PS Stillwell PS Watts PS Westville PS Zion PS Stilwell PS	Each public school district does not have adequate shelter for students and staff. Except for Stilwell PS, there are no other designated shelters in the other school districts. Stilwell PS has a large capacity shelter at the High School, but it lacks shelter at three other schools within the district. Students who attend these other schools must be transported if they are to use this shelter.	Lack of adequate shelter results in an increased risk to students and staff and significantly limits their ability to seek timely refuge during Tornado events.

3.4.11 Wildfire

Description

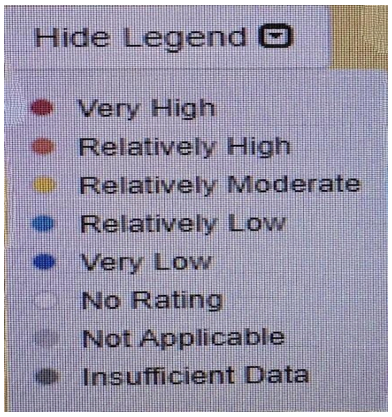
Wildfire is known as an uncontrolled fire often occurring in wild land areas, but which can also consume houses or agricultural resources. Weather conditions can directly contribute to the occurrence of wildfires such as through lightning strikes, or indirectly such as by an extended dry spell or drought that contributes to the availability of fuel.

There are three different classes of wildfire. A surface fire is common in grasslands, or areas with open vegetation, and can spread quickly. A ground fire is a dense, very hot fire that has a thick fuel source and significantly damages the soil health where it occurs. Crown fires are those that move by jumping along the tops of trees. Wildfire often begins unnoticed but is usually signaled by dense smoke that fills the area for miles around.

Location

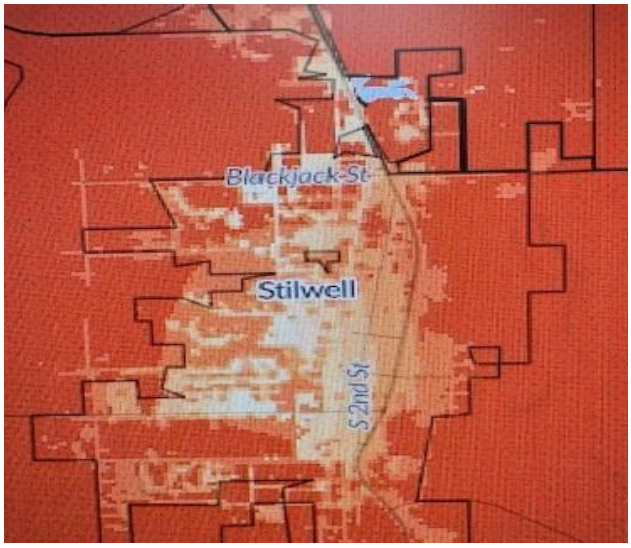
All jurisdictions within the Planning Area are vulnerable to wildfire.

Below are the following *Wildfire Risk to Communities (2024)* maps for the Planning Area:



Adair Co

Stilwell/Stilwell PS



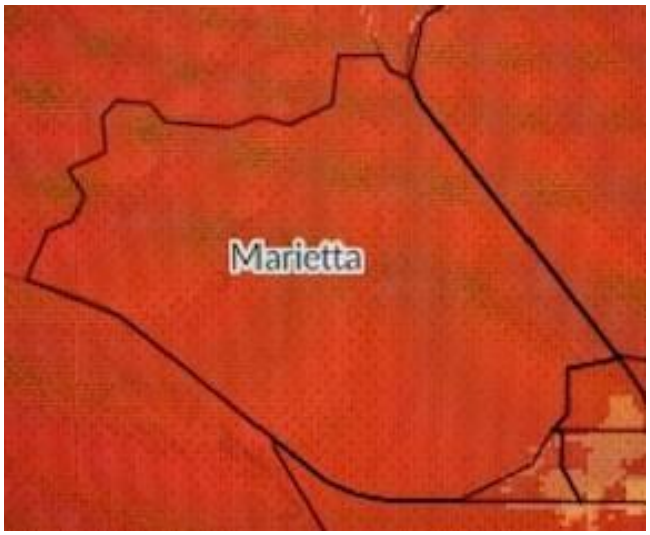
Watts/Watts PS

Westville/Westville PS

Cave Springs PS/ Cherokee Immersion ES-Greasy PS

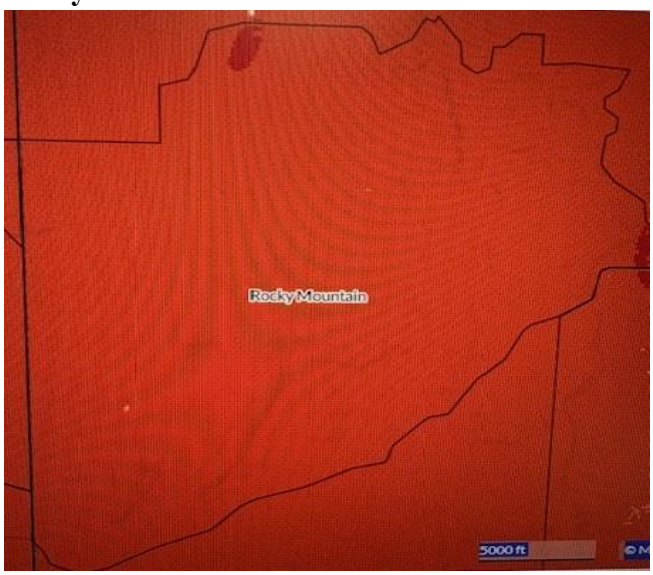
Dahlonega PS (Lyons Switch)

Maryetta PS



Peavine PS

Rocky Mountain PS



Zion PS

Extent

The Planning Area uses the Keetch-Byram Drought Index and the Fire Danger Rating System to categorize Wildfire. The Planning Area can experience any value on these scales.

The Keetch-Byram Drought Index with Fire Danger Rating Data Incorporated	
0 – 200	Soil and fuel moisture are high. Most fuels will not readily ignite or burn. However, with sufficient sunlight and wind, cured grasses and some light surface fuels will burn in spots and patches.
200 - 400	Fires more readily burn and will carry across an area with no gaps. Heavier fuels will still not readily ignite and burn. Also, expect smoldering and the resulting smoke to carry into and possibly through the night.
400 - 600	Fire intensity begins to significantly increase. Fires will readily burn in all directions exposing mineral soils in some locations. Larger fuels may burn or smolder for several days creating possible smoke and control problems.
600 - 800	Fires will burn to mineral soil. Stumps will burn to the end of underground roots and spotting will be a major problem. Fires will burn thorough the night and heavier fuels will actively burn and contribute to fire intensity

Fire Danger Rating System		
Rating	**Basic Description**	**Detailed Description**
CLASS 1: Low Danger (L) COLOR CODE: Green	fires not easily started	Fuels do not ignite readily from small firebrands. Fires in open or cured grassland may burn freely a few hours after rain, but wood fires spread slowly by creeping or smoldering and burn in irregular fingers. There is little danger of spotting.
CLASS 2: Moderate Danger (M) COLOR CODE: Blue	fires start easily and spread at a moderate rate	Fires can start from most accidental causes. Fires in open cured grassland will burn briskly and spread rapidly on windy days. Woods fires spread slowly to moderately fast. The average fire is of moderate intensity, although heavy concentrations of fuel – especially draped fuel -- may burn hot. Short-distance spotting may occur, but is not persistent. Fires are not likely to become serious and control is relatively easy.

Fire Danger Rating System		
CLASS 3: High Danger (H) COLOR CODE: Yellow	fires start easily and spread at a rapid rate	All fine dead fuels ignite readily and fires start easily from most causes. Unattended brush and campfires are likely to escape. Fires spread rapidly and short-distance spotting is common. High intensity burning may develop on slopes or in concentrations of fine fuel. Fires may become serious and their control difficult, unless they are hit hard and fast while small.
CLASS 4: Very High Danger (VH) COLOR CODE: Orange	fires start very easily and spread at a very fast rate	Fires start easily from all causes and immediately after ignition, spread rapidly and increase quickly in intensity. Spot fires are a constant danger. Fires burning in light fuels may quickly develop high-intensity characteristics - such as long-distance spotting - and fire whirlwinds, when they burn into heavier fuels. Direct attack at the head of such fires is rarely possible after they have been burning more than a few minutes.
CLASS 5: Extreme (E) COLOR CODE: Red	fire situation is explosive and can result in extensive property damage	Fires under extreme conditions start quickly, spread furiously and burn intensely. All fires are potentially serious. Development into high-intensity burning will usually be faster and occur from smaller fires than in the Very High Danger class (4). Direct attack is rarely possible and may be dangerous, except immediately after ignition. Fires that develop headway in heavy slash or in conifer stands may be unmanageable while the extreme burning condition lasts. Under these conditions, the only effective and safe control action is on the flanks, until the weather changes or the fuel supply lessens.
Source: http://www.wfas.net/content/view/34/51/		

Previous Occurrence

Wildfire has destroyed homes, buildings, farmlands and forests causing millions of dollars in damage over the past 10 years. Adair County experiences unfavorable conditions on a yearly basis.

Year	Wildfire Events	Details
2011	2	Strong wind, low relative humidities, warm temperatures, and dormant vegetation promoted the spread of wildfire on the 20th. Around 70 wildfires were reported this day across eastern Oklahoma burning more than 4000 acres. Some of the larger wildfires occurred in Pittsburg, Latimer, Haskell, Adair, and Pushmataha Counties. Local fire departments along with Oklahoma Forestry Services, the Bureau of Indian Affairs and the Oklahoma Army National Guard battled those blazes, many of which threatened structures. Several outbuildings were burned but no homes were lost. Very dry, hot, and breezy conditions, along with extremely dry fuels because of the long-term drought the region has experienced, promoted the rapid spread of wildfire in southern Adair County on the 4th. This fire burned about 400 acres before being extinguished by multiple fire departments and Oklahoma Forestry Services units.
2012	1	Hot temperatures, low relative humidity, and gusty wind resulted in the spread of two large wildfires in Adair County. State and local agencies responded to these wildfires, which burned more than 400 acres.
2013	0	
2014	0	
2015	0	
2016	2	Unseasonably warm temperatures, strong gusty wind, low relative humidity, and very dry vegetation promoted the rapid spread of several wildfires in eastern Oklahoma on the 17th. The largest fires were in Haskell and Adair Counties, where fires burned about 300 acres each before they were contained.

		Unseasonably warm temperatures, low relative humidity, and strong and gusty southerly wind combined with drought-stricken, dormant vegetation to promote the rapid spread of several wildfires across eastern Oklahoma on the 30th and 31st. Wildfire consumed over 150 acres in Adair County.
2017	4	Unseasonably warm temperatures, very low relative humidity, and gusty wind combined with drought-stricken, dormant vegetation to promote the rapid spread of several wildfires across eastern Oklahoma on the 30th and 31st of January 2017. A large wildfire occurred in Adair County. Unseasonably warm temperatures, very low relative humidity, and gusty wind combined with drought-stricken, dormant vegetation to promote the rapid spread of several wildfires across eastern Oklahoma during early February 2017, and Adair County had over 300 acres burned. Unseasonably warm temperatures, very low relative humidity, and gusty wind combined with drought-stricken, dormant vegetation to promote the rapid spread of several wildfires across eastern Oklahoma during early March 2017. Sequoyah and Adair Counties had over 400 acres burned. Later in March 2017, over 2200 acres burned in Adair Co.
2018	0	
2019	0	
2020	1	Strong wind, low relative humidity, warm temperatures, and dormant vegetation promoted the spread of wildfire on the 20th. Around 70 wildfires were reported this day across eastern Oklahoma burning more than 4000 acres. Some of the larger wildfires occurred in Pittsburg, Latimer, Haskell, Adair, and Pushmataha Counties. Local fire departments along with Oklahoma Forestry Services, the Bureau of Indian Affairs and the Oklahoma Army National Guard battled those blazes, many of which threatened structures. Several outbuildings were burned but no homes were lost.
2021	2	Unseasonably warm temperatures and strong, gusty wind, combined with very low humidity and dormant, dry fine fuels to promote conditions that supported the rapid spread of wildfire across eastern Oklahoma during early March. Numerous wildfires occurred across the region during this period including Adair County where over 1100 acres were burned. The end of March 2021, Adair and Latimer Counties had over 150 acres burn.
2022	0	
2023	2	Unseasonably warm temperatures, strong wind, and very low humidity combined with dormant, drought-stricken fuels to promote conditions that supported the rapid spread of wildfire across portions of eastern Oklahoma during early April. Adair County had over 350 acres burned. Early to mid-April, Adair County had over 1000 acres and a home burn.
2024	2	Unseasonably warm temperatures, very strong wind, and very dry air, combined with dormant fuels to promote conditions that supported the rapid spread of wildfire across portions of eastern Oklahoma beginning on the 19th of February, and continuing through the end of the month. Adair County had over 1200 acres burned.

		The fires continued to burn through to March 2nd.
2025	2	Unseasonably warm temperatures, strong wind, and very low humidity combined with dormant fuels to promote conditions that supported the rapid spread of wildfires across southeast and east central Oklahoma in early March. Adair County had over 500 acres burned. Unseasonably warm temperatures, high wind, and low relative humidity combined with dormant fuels to promote conditions that supported the rapid spread of wildfire across portions of eastern Oklahoma in mid to late March. Some of the worst wildfires occurred on the 14th, with near record warm temperatures, very dry air behind a dry line, and very strong wind gusting to near 70 mph locally. Adair County had approximately 3000 acres burned.

Source: NOAA Storm Events Database

Probability
The probability of Wildfire in the Planning Area is HIGH.

Vulnerability and Impact
The Planning Area has hundreds of thousands of acres of land. In addition to critical facilities, businesses, clinics and tribal and non-tribal housing; the lands are used for grazing, crops, forestry, hay fields and tourism. Wildfire is a serious and growing hazard over much of the Planning Area, posing a great threat to life and property, particularly when it moves from forest or rangeland into developed areas. Wildfires can happen anywhere within the Planning Area. Adair County is concerned with both wild land urban interface areas as well as rural areas. The Planning Area has critical facilities within both areas of concern.

The impact of wildfire could have serious economic effect on Adair County and its tribal and non-tribal citizens. Adair County is in the area known as Green Country. Businesses and citizens depend on the tourist visits to the many lakes, rivers and streams. Loss of income and loss of land use could take years for recovery.

Steep slopes

Jurisdiction	Vulnerability	Impact
Adair County	Unincorporated Adair Co is reliant on volunteer fire departments. In addition, there are no water sources or water storage available for use during Wildfire response, so all water must be transported in on water trucks.	Although these volunteer fire departments have been effective in providing emergency response services, they are susceptible to fluctuating manning levels. This can impact their response capability. The lack of water resources available to respond to Wildfire events can limit the response

		capability and the ability to quickly control the Wildfire.
Stilwell Watts	Some wildfires in this jurisdiction have occurred due to improperly disposed cigarettes, or through human malfeasance. The fire department routinely provides education to citizens, but some public apathy exists. There is also a lack of automated signage to warn residents of daily fire danger conditions, which might increase awareness and education.	Public apathy towards Wildfire mitigation can increase the risk to whole communities. Not having automated signage for fire danger potential increases the likelihood that citizens are not aware of the current conditions.
Westville	Some wildfires in this jurisdiction have occurred due to improperly disposed cigarettes, or through human malfeasance. The fire department routinely provides education to citizens, but some public apathy exists. This jurisdiction also lacks automated signage to warn residents of daily fire danger conditions, which might increase awareness and education. There are also a limited number of transportation routes into and out of this jurisdiction.	Public apathy towards Wildfire mitigation can increase the risk to whole communities. Not having automated signage for fire danger potential increases the likelihood that citizens are not aware of the current conditions. Having a limited number of transportation routes increases the community vulnerability during Wildfire events and can limit essential emergency services.
Cave Springs PS Dahlonegah PS Cherokee Immersion ES-Greasy PS Peavine PS Rocky Mountain PS Zion PS	This school district is in a heavily forested area, with cedar and other deciduous trees. This forestation requires continued maintenance and upkeep of fire break boundaries to reduce Wildfire occurrences and intensity. This school district is also dependent on limited	Lack of forest maintenance can result in increased frequency of Wildfires, and their intensity. Having a limited number of transportation routes increases the community vulnerability during Wildfire events and can limit essential emergency services.

	transportation lines for staff and students to travel.	
Maryetta PS	This school district is in Stilwell. Although it is not located near forested areas, there is a hay field along Hwy 59, which can be subject to Wildfire if there is improper cigarette disposal along the highway.	Public apathy towards Wildfire mitigation can increase the risk to whole communities. Not having automated municipal signage for fire danger potential increases the likelihood that citizens are not aware of the current conditions.
Stillwell PS	Although it is not located near forested areas, Stilwell HS is located near agricultural areas which can be subject to Wildfire if there is improper cigarette disposal along transportation routes.	Public apathy towards Wildfire mitigation can increase the risk to whole communities. Not having automated municipal signage for fire danger potential increases the likelihood that citizens are not aware of the current conditions.
Watts PS	This school district is located on top of a mountain, and there is only one transportation route into and out of the school district.	Having a limited number of transportation routes increases the community vulnerability during Wildfire events and can limit essential emergency services. In addition, the surrounding terrain of this school district makes it more difficult to respond to Wildfire events.
Westville PS	There are limited number of transportation routes into and out of the school district.	Having a limited number of transportation routes increases the community vulnerability during Wildfire events and can limit essential emergency services.

3.4.12 Winter Storm

Description

A winter storm can range from moderate snow over a few hours to blizzard conditions with high winds, freezing rain or sleet, heavy snowfall with blinding wind-driven snow and extremely cold temperatures that can last several days. A winter storm is one that drops 4 or more inches of snow during a 12–hour period, or 6 or more inches during a 24- hour span. An ice storm occurs when damaging accumulations of ice form from falling rain that freezes on impact. Significant ice storms are those with ice accumulations of ¼ inch or greater. A winter storm can range from a moderate snowfall over a few hours to blizzard conditions with possibly blinding, wind-driven snow lasting several days. Many winter depressions give rise to exceptionally heavy rain and

widespread flooding. Conditions worsen if the precipitation falls in the form of snow, because it occupies seven to ten times more space than the same quantity of rain. The aftermath of a winter storm can impact a community or region for weeks, and even months.

An ice storm is used to describe occasions when damaging accumulations of ice are expected during freezing rain situations. Significant accumulations of ice pull down trees and utility lines resulting in loss of power and communication. These accumulations of ice make walking and driving extremely dangerous. Significant ice accumulations are usually accumulations of ¼" or greater.

Location
The entire Planning Area is affected by Winter Storm.

Extent
The Planning Area categorizes snow accumulation totals and the Sperry-Piltz Ice Accumulation Index to categorize Winter Storm. Adair County government and business are affected by snow when accumulation is over 6 inches. Roadways and sidewalks become slick and become dangerous with .10 inches of ice. The Planning Area can experience up to 1 foot of snow on occasion but typically experiences between 0-4 inches of snow per Winter Storm event. It can also experience any value on the Sperry-Piltz Ice Index.

The Sperry-Piltz Ice Accumulation Index, or "SPIA Index" – Copyright, February, 2009

ICE DAMAGE INDEX	DAMAGE AND IMPACT DESCRIPTIONS
0	Minimal risk of damage to exposed utility systems; no alerts or advisories needed for crews, few outages.
1	Some isolated or localized utility interruptions are possible, typically lasting only a few hours. Roads and bridges may become slick and hazardous.
2	Scattered utility interruptions expected, typically lasting 12 to 24 hours. Roads and travel conditions may be extremely hazardous due to ice accumulation.
3	Numerous utility interruptions with some damage to main feeder lines and equipment expected. Tree limb damage is excessive. Outages lasting 1 – 5 days.
4	Prolonged & widespread utility interruptions with extensive damage to main distribution feeder lines & some high voltage transmission lines/structures. Outages lasting 5 – 10 days.
5	Catastrophic damage to entire exposed utility systems, including both distribution and transmission networks. Outages could last several weeks in some areas. Shelters needed.

(Categories of damage are based upon combinations of precipitation totals, temperatures and wind speeds/directions.)

Previous Occurrence
According to the NOAA Storm Event Database, between 2021 and 2025, the Planning Area had 8 Winter Storm events, and no ice storms.

Major Winter Storm Events (2021-2025)

2021: Historic Arctic Blast and Winter Storms

The most impactful winter event in recent years occurred in February 2021, part of a generational arctic outbreak that affected much of the Southern Plains.

- **Timeline:** The extremely cold air mass settled in around February 11th and persisted through the 20th.

- **Conditions:**

    - Temperature Extremes: Stilwell recorded an all-time low of -10°F on February 15, while Westville reached -13°F. Temperatures remained below freezing (32°F) for two consecutive weeks.
    - Snowfall: A total of 6 inches of snow blanketed Adair County during this event.
    - Impact: The prolonged freeze caused widespread power outages, burst water pipes, and significant road damage (potholes). Law enforcement provided emergency assistance to stuck motorists and opened warming shelters in Stilwell.

2022-2024: Less Significant Activity
The period between major storms featured less severe winter weather in Adair County.

- **2023:** An accumulating snowfall event in January primarily affected western Oklahoma along the I-40 corridor.
- **2024** Polar Vortex: A strong cold front brought extremely low temperatures and icing across eastern Oklahoma starting January 18.
    - Conditions: The storm produced freezing rain and ice accretion, leading to slick and hazardous road conditions through January 21.

2025: Multiple Winter Events
The year 2025 saw multiple winter storms, particularly in January and February.

- **January 10, 2025 (Winter Storm Cora):** This storm brought heavier snow than anticipated to many parts of Oklahoma, with some areas in the southeast potentially seeing 8 to 12 inches of snow.
- **February 2025 (Extreme Cold and Snow):** A winter storm moved through the region in mid-February, creating slick and hazardous road conditions across much of eastern Oklahoma, including the Adair County area. An "Extreme Cold Watch" was in effect, with wind chill values of -10 to -25 degrees possible statewide.

Probability
The probability of Winter Storm in the Planning Area is HIGH.

Vulnerability and Impact
A winter storm can happen and pose a threat anywhere within the Planning Area. Adair County consists of large rural areas with many residents living miles from the nearest town. Any clinic, hospital, critical facility, business and citizens located throughout the county can be affected by the effects of a winter storm. Adair County government and business are affected by snow when accumulation is over 6 inches.

One vulnerability that affects all jurisdictions, including school jurisdictions, is the dependence on above ground power lines. The Planning Area does not have any buried power lines. The Planning Area experiences ice storms in the winter, and these power lines are susceptible to damage due to ice accumulation. A widespread and lengthy outage has the potential to disrupt critical services and school operations, interrupt commerce, and puts a strain on the community as it seeks alternative energy sources and backup power sources.

Another vulnerability that affects all jurisdictions is the lack of sufficient county road crews and equipment to properly pre-condition roadways prior to snow/ice events. The impact of not having enough road crews to clear transportation routes in a timely manner can result in a loss of emergency response capability, loss of commerce, and a disruption to school operations. Considering there are many jurisdictions with limited routes into and out of the area, the impact of not having timely pre-treatment and post-storm clearing of roads means some communities can become cutoff from emergency response services and critical supplies.

A vulnerability that is particular to unincorporated Adair Co is that many residents are economically vulnerable, and their residential structures are not properly maintained. This results in increased instances of water pipes bursting during Winter Storm events, which leads to many residents being without water for lengthy periods of time.

3.5 Repetitive and Severe Repetitive Loss Structures in Planning Area

There are no Repetitive and Severe Repetitive Loss Structures in Planning Area.

CHAPTER FOUR: MITIGATION STRATEGY

4.1 Capabilities Assessment

4.1.1 Existing Institutions, Plans, and Ordinances

Jurisdiction	Building Code	Zoning Ordinance	Subdivision Ordinance	Special Purpose Ordinance	Floodplain Ordinance	Site Plan Review Requirements	Comprehensive Plan	Capital Improvement Plan	Economic Development Plan	Emergency Response Plan	Post-Disaster Recovery Plan
Adair Co					x					x	x
Westville	x				x					x	x

Watts	x				x						
Stilwell	x	x	x		x		x			x	x

4.1.2 **Administrative and Technical Capability**

Jurisdiction	Planner(s) or Engineer(s) with knowledge of land development and management practices	Engineer(s) or professional(s) trained in construction practices related to buildings and fire	Planner(s) or Engineer(s) with an understanding of natural and/or human caused hazards	Floodplain Manager	Surveyors	Staff with education or expertise to assess the communities vulnerability to hazards	Personnel skilled in GIS and/or HAZUS	Scientists familiar with the hazards of the community	Emergency Manager	Grant writers
Adair Co				x					x	x
Westville				x					x	x
Watts				x					Adair Co EM overseas Watts	
Stilwell				x					x	x

Currently, the Planning Area has a limited number of trained incident management team members; however, it has a partnership with the Cherokee Nation who, if needed, will assist with providing professional level staff such as carpenters to surgeons. They have in excess of 800 vehicles in their fleet which 40 passenger buses to water trucks; they also have heavy equipment and skilled operators.

4.1.3 **Financial Capabilities**

Jurisdiction	Capital Improvements Project Funding	Authority to levy taxes for specific purposes (Must be approved through community vote.)	Water, Sewer, Gas, or Electric service Fees	Incur fees for new development	Incur debt through general obligation funds and/or special tax bonds	Community Development Block Grant	Federal funding programs	State funding programs
Adair Co		x			x	x	x	x
Westville		x						x
Watts		x	x					x
Stilwell		x		x			x	x

4.1.4 **Education and Outreach Capabilities**

Jurisdiction	Local citizen groups/Non-profit organizations willing to assist with mitigation activities	Ongoing public education or information programs	Natural disaster or safety related programs	StormReady Certification	Firewise Communities Certification	Public-Private partnership initiatives addressing disaster-related issues
Adair Co	x	x	x		x	
Westville	x	x	x			
Watts	x					
Stilwell	x	x	x	x	x	

4.1.5 **How Can Adair Co, Stilwell, Westville, and Watts Build Upon Their Capabilities**

Unincorporated Adair Co and all municipalities could build upon their capabilities by increasing the area coverage of warning sirens, and by having additional ways to leverage automated warning communication systems. Each community could also benefit from additional community safe rooms.

4.1.6 **School District Capability Assessment**.

Jurisdiction	Capital Improvement Plan	Emergency Management Plan and/or procedures in place	Budget to raise funds for mitigation (bond)	Ways to raise funds through public partnerships, corporate donations etc.	Designated emergency manager (even as a secondary position)	PTO/PTA	Training for teachers to practice natural hazard response	Training for teachers/ coaches to ensure consistency in evaluating lightning	Post-Disaster Recovery Plan
Cave Springs School		x		x	x				
Dahlonegah Public School		x		x	x				
Greasy Public School		x		x	x				
Maryetta Public School		x		x	x				x
Peavine Public School		x		x	x				
Rocky Mountain Public School		x		x	x				
Stilwell Public School		x		x	x				x
Watts Public School		x		x	x				
Westville Public School		x		x	x				
Zion Public School		x		x	x				

4.1.7 **How Public School Districts Could Build Upon Their Capabilities**

Each public school district can build upon their capabilities by having a Capital Improvement Plan, so they can more effectively plan and execute mitigation actions to reduce the vulnerabilities and impacts of natural hazards on each school community.

4.2 **NFIP Participation**

Adair Co, Westville, Watts, and Stilwell participate in the NFIP. They will continue to remain compliant by enforcing floodplain ordinance, seeking opportunities for continuing education in floodplain management, and by continuing to educate residents on the benefits of NFIP.

4.3 **Mitigation Goals**

This plan aims to fulfill these three major hazard mitigation goals:

1. Reduce Hazard Risks and Impacts.

2. Build on Existing Mitigation Efforts.

3. Share Information and Raise Awareness.

4.4 **Action Items**

Mitigation Action 1: INCREASE PUBLIC AWARENESS AND EDUCATION CAMPAIGNS IN ADAIR COUNTY COMMUNITIES
Identified Hazards: All Hazards*
Jurisdictions Affected: All Jurisdictions*
* Not all jurisdictions are affected by Dam Failure.
Action/Comments: Create and implement public awareness campaigns for each hazard identified, methods for preventing damages resulting from hazardous conditions, and developing Community Preparedness Plans. Encourage citizens to get involved in educating their community; establish trained community strike teams; create and distribute informative brochures/flyers, design and update web pages, develop and administer school training activities and functions; host and/or conduct workshops; assist community members in creating family disaster plans; create trainings and distribute emergency supply kits; develop partnerships with different types of media; i.e. newspaper, website, community, meetings, and radio to assist in spreading the message of how to mitigate hazards and the actions individuals and communities can take.
Responsible Party/Implementation Team: Adair County Emergency Management, Community Services, Natural Resources, Environmental Programs, Cherokee Nation Tribal Services, Human Services, Information Systems, Communications, Emergency Management, Public Education System.
Time Frame: 18 months from funding date
Cost/Potential Funding Sources: $5,000.00 / Adair County Emergency Management and Cherokee Nation Tribal Services Funds
Mitigation Type: Education

Mitigation Action 2: ADVANCE WARNING DEVICES
Identified Hazards: Hail, High Wind, Tornado, and Winter Storm
Jurisdictions Affected: Unincorporated Adair Co, Stilwell, Watts, and Westville
Actions/Comments: Obtain and install outdoor audible or visual warning devices throughout our rural communities. Provide advance notification to the occupants of critical facilities, permanent structures and outdoor events which are located within the county. Install weather observation cameras around critical facilities with monitors and viewing screens in EM office, Sheriff's Office, and community type Safe Rooms located at educational and community facilities. This will allow observance of weather from safe shelter as well as provide shelter.

Responsible Party/Implementation Team: Adair County Emergency Management, Human Services, Tribal Services, GeoData, Community Services, Planning & Development, Tribal Facilities
Time Frame: 18 months from date of funding
Cost/Potential Funding Sources: TBD / Cherokee Nation Donations and Grants, Local Resources
Mitigation Type: 5%

Mitigation Action 3: AUTOMATED INDOOR WARNING ABILITY
Identified Hazards: All Hazards*
Jurisdictions Affected: All Jurisdictions*
* Not all jurisdictions are affected by Dam Failure.
Actions/Comments: Emergency Early Warning tool, such as Blackboard or another mass communications tool, which will warn municipal employees, school staff, and citizens of danger in their immediate area.
Responsible Party/Implementation Team: Adair County Emergency Management, Municipal Sheriffs, School Superintendent
Time Frame: 12 months from date of funding
Cost/Potential Funding Sources: TBD/ HMGP, Cherokee Nation Donations and Grants, Local Resources
Mitigation Type: 5%

Mitigation Action 4: BACK-UP DEVICE FOR ELECTRICAL EQUIPMENT AND/OR DATA
Identified Hazards: All Hazards*
Jurisdictions Affected: All Jurisdictions*
* Not all jurisdictions are affected by Dam Failure.
Actions/Comments: Obtain and install back-up generators in all critical facilities for use during power outages caused by natural hazards. The generators would ensure the integrity of all critical municipal and school information, (i.e., county citizenship, medical records, natural resources, financial resources, business records, school records), and ensure the continuation of critical functions and activities.
Responsible Party/Implementation Team: Municipal Emergency Managers and School Superintendents
Time Frame: 24 months from date of funding
Cost/Potential Funding Sources: TBD / Fire Grants, Community Organization Groups, Cherokee Nation Resources
Mitigation Type: 5%

Mitigation Action 5: DIGITAL MAPPING
Identified Hazards: All Hazards*
Jurisdictions Affected: All Jurisdictions*
* Not all jurisdictions are affected by Dam Failure.
Actions/Comments: Develop a tool/acquire software for digital mapping, which will be used to identify the potential and frequency of hazards so effective mitigation measures can be implemented.
Responsible Party/Implementation Team: Adair Co Emergency Manager, Floodplain Managers, and County Commissioners.
Time Frame: 24 months from funding date
Cost/Potential Funding Sources: TBD / Adair County 911 Board Funds

Mitigation Type: Local Plans and Regulations

Mitigation Action 6: CREATE DATABASE/MAP OF VULNERABLE **CITIZENS**
Identified Hazards: Dam Failure*, Drought, Earthquake, Extreme Temperatures, Flood, Hail, High Wind, Landslide, Lightning, Tornado, Wildfire, Winter Storm.
* Not all jurisdictions are affected by Dam Failure.
Jurisdictions Affected: Unincorporated Adair Co, Stilwell, Watts, and Westville
Actions/Comments: Create a database/map vulnerable individuals (elderly, chronically ill and special needs), so emergency responders can proactively assist them during hazard events.
Responsible Party/Implementation Team: Adair Co Emergency Manager.
Time Frame: 12 months from funding date
Cost/Potential Funding Sources: TBD / Cherokee Nation Resources and Grants, 911 Board
Mitigation Type: Local Plans and Regulations

Mitigation Action 7: RESIDENTIAL STORM SHELTERS
Identified Hazards: Hail, High Winds, Lightning, and Tornado
Jurisdictions Affected: Unincorporated Adair Co, Stilwell, Watts, and Westville
Actions/Comments: Implement a residential storm shelter grant program to assist homeowners with the cost of installing a storm shelter in their home.
Responsible Party/Implementation Team: Municipal Emergency Managers
Time Frame: 24 months from funding date
Cost/Potential Funding Sources: TBD / HMGP, Cherokee Nation Resources
Mitigation Type: Local Plans and Regulations

Mitigation Action 8: COMMUNITY STORM SHELTERS INSTALLATION AND EDUCATION, AND CREATE A DATABASE OF SHELTERS
Identified Hazards: Hail, High Winds, Lightning, and Tornado
Jurisdictions Affected: All Jurisdictions
Actions/Comments: Install storm shelters at community centers, critical facilities, and schools. Educate the potential occupants on the use and location of the shelters to help reduce the loss of life during severe weather. Provide GPS coordinates to local law enforcement officials so emergency personnel are aware of their locations.
Responsible Party/Implementation Team: Municipal Emergency Managers, School Superintendents, and County Commissioners.
Time Frame: 36 months from funding date
Cost/Potential Funding Sources: TBD / Cherokee Nation Resources, Fire Grants, Local Resources
Mitigation Type: Structure, Education, and Local Plans and Regulations.

Mitigation Action 9: FLOOD REDUCTION PROGRAM OF WATERWAYS, CREEKS, AND STREAMS
Identified Hazard: Flood
Jurisdictions Affected: All Jurisdictions
Actions/Comments: Create a program to address a major clean-up of area creeks, streams and waterways. This will focus on long-term monitoring of all waterways to ensure that problematic build-up of debris and brush does not reoccur.
Responsible Party/Implementation Team: Floodplain Managers

Time Frame: TBD
Cost/Potential Funding Sources: TBD / NRCS, Oklahoma Conservation Commission, Cherokee Nation Tribal Resources, Local Resources
Mitigation Type: Local Plans and Regulations

Mitigation Action 10: DRAINAGE CONDUITS
Identified Hazard: Flood
Jurisdictions Affected: Unincorporated Adair Co
Actions/Comments: Identify and upgrade the size of culverts in rural communities to prevent repetitive flooding during and following heavy rain; may involve installing or re-routing capacity of a storm drainage system that may involve detention and retention ponds, drainage easements, creeks or steams.
Responsible Party/Implementation Team: Adair Co Emergency Manager.
Time Frame: 18 months from funding date
Cost/Potential Funding Sources: TBD / NRCS, County and State Resources, Cherokee Nation Tribal Resources
Mitigation Type: Structure

Mitigation Action 11: PROVIDE COOLING/WARMING STATIONS
Identified Hazards: Extreme Temperatures and Winter Storms
Jurisdictions Affected: Stilwell, Watts, and Westville
Actions/Comments: Designate and equip public cooling and warming stations to mitigate Extreme Temperature events. Install misting systems outdoors and outdoor water fountains in public gathering areas.
Responsible Party/Implementation Team: Mayors, Municipal Administrative Staff
Time Frame: 18 months from funding date
Cost/Potential Funding Sources: TBD / Local Resources, Cherokee Nation Resources
Mitigation Type: Structure

Mitigation Action 12: INSTALLATION OF DRY HYDRANTS IN FIRE PRONE AREAS
Identified Hazards: Wildfires
Jurisdictions Affected: Unincorporated Adair Co
Actions/Comments: Install dry hydrants in fire prone areas to provide water source for Wildfire response throughout the county.
Responsible Party/Implementation Team: Adair Co Emergency Manager and Volunteer Fire Dept Chiefs.
Time Frame: Undetermined
Cost/Potential Funding Sources: TBD / HMGP, State & Local Resources, Cherokee Nation Resources
Mitigation Type: Structure

Mitigation Action 13: WATER RESERVOIRS
Identified Hazards: Drought
Jurisdictions Affected: Unincorporated Adair Co, Stilwell, Watts, and Westville
Actions/Comments: Build reservoirs in rural communities to contain rain and run-off water for agriculture use with cattle, other farm animals and irrigation needs. Develop a “Wetland Oasis”

area for citizens to use for recreational/fitness purposes such as a walking/running track, picnic area, fishing dock, etc.; as well as maintain a water supply and serve as a wildlife refuge.
Responsible Party/Implementation Team: Adair County Emergency Management ion
Time Frame: 24 months from funding
Cost/Potential Funding Sources: TBD / Private Resources, State & Federal Grants
Mitigation Type: Structure and Natural System Protection

Mitigation Action 14: XERISCAPE
Identified Hazards: Drought
Jurisdictions Affected: All Jurisdictions
Actions/Comments: Create education program for citizens and school administrators on Xeriscape, vegetation which requires less hydration than normal vegetation.
Responsible Party/Implementation Team: Adair County OSU Cooperative Extension Service
Time Frame: 30 months from funding
Cost/Potential Funding Sources: TBD/Local resources
Mitigation Type: Education

Mitigation Actions 15: FIRE BREAKS
Identified Hazards: Wildfires
Jurisdictions Affected: All Jurisdictions
Actions/Comments: Install fire breaks to impede the progress of wildfires around critical facilities
Responsible Party/Implementation Team: Oklahoma Department of Forestry
Time Frame: 24 months after funding date
Cost/Potential Funding Sources: TBD/ Oklahoma Forestry Services and Cherokee Nation Resources
Mitigation Type: Natural System Protection

Mitigation Action 16: SUPPRESSION / LIGHTNING RODS
Identified Hazard: Lightning
Jurisdictions Affected: All Jurisdictions

Actions/Comments: Provide THORGuard, lightning prediction and warning systems throughout the Planning Area. Install lightning rods on critical facilities.
Responsible Party/Implementation Team: Adair County Emergency Management, Mayors, County Commissioners, and School Superintendents
Time Frame: 12 months from funding date
Cost/Potential Funding Sources: TBD/ Local and State resources, Electric Cooperatives
Mitigation Type: Structure

4.5 Action Item Prioritization

Several hazard mitigation actions were identified and analyzed that would benefit the Adair County area. Input from Adair County's Hazard Mitigation Technical Advisory Planning Committee (TAPC), community meetings with the tribal public and non-tribal public, and interaction with other tribal and non-tribal emergency managers and county emergency managers was used to determine action item prioritization. Final decision was based on social impact,

technical feasibility, administrative capabilities, political, legal effects, economic, and environmental issues (S.T.A.P.L.E.E. Method).
Of utmost importance was the cost benefit analysis on the actions proposed, The Planning Area does not have a budget to fund Hazard Mitigation projects at this time, so many of the actions undertaken must be actions which can be completed internally and demonstrate clear benefit to the community. Internal resources can be utilized to develop legislative acts, enact building code, increase partnerships with shareholder communities, and increase public outreach efforts with the tools we have on hand at this time. That said, the Planning Area has demonstrated a strong ability to perform and document in-kind match for larger grant projects which will increase their mitigation capability.

4.6 Integration of Data, Goals, and Action Items into Other Planning Mechanisms

The adoption of the Hazard Mitigation Plan will enable formal integration with the Adair Co, Westville, Watts, and Stilwell Emergency Response Plans and the Post-Disaster Recovery Plans. These plans are updated on an annual basis by the municipal emergency manager. Westville and Stilwell have their own emergency managers. Adair Co has an emergency manager and this person also provides emergency manager support for Watts. The Adair Co HM Plan will be reviewed prior to these Emergency plans being updates, and data from the HM plan will be used to update hazard expectations and response actions. In addition, the Adair Co HM Plan will be used in many informal avenues of municipal planning, as each town administration seeks opportunities to execute mitigation actions. The HM plan will be used to help each community prioritize mitigation actions based off their relevancy and benefit to the community population.

The adoption of the Hazard Mitigation Plan will also enable formal integration with each school district's Emergency Management Plans. Each school superintendent, or designated staff administrator, is responsible for this plan integration. The Emergency Management Plans are reviewed annually, and the data from the HM plan will be used to refine response actions.

Since the last plan update, the Adair Co HM plan has not been widely integrated into the planning mechanisms of each jurisdiction. The exception to this is Stilwell PS. The Adair Co HM Plan has been utilized by the Stilwell PS Superintendent, who has consistently used the document to plan and execute mitigate actions for the Stilwell PS community.

CHAPTER FIVE: PLAN UPDATE PRIORITIZATION AND REVIEW

5.1 Changes in Jurisdictional Development

Since the previous plan update, one major change to jurisdictional development has been the influx of crop growth and farming in unincorporated Adair Co. This is due to the legalization of marijuana growing and the influx of new farming ventures. This has increased unincorporated Adair Co's risk to tornado and high wind events, because there are not enough warning sirens to cover the geographical area, and many new residents are not withing warning siren range.
In addition to the increase in farming, in 2020 unincorporated Adair Co was impacted by a 100 year flood event that cause significant rural road damage in the southern unincorporated area. Flash flood hazard likelihood increased in this area after that event. Adair Co applied for FEMA assistance and received it. This money has been used, and continues to be used, to repair roads and create deeper drainage paths with concrete lining along critical roadways to prevent loss of

soil from under paved roadways. Of note, the unpaved roads in all unincorporated areas were previously constructed poorly and they run at lower elevations than the drainage ditches. The recent repairs have now decreased Adair Co's vulnerability to flood.
There have been no other noteworthy changes in jurisdictional development for the other planning jurisdictions.

5.2 **Status of Previous Mitigation Action Items**

Action Item	Completed Y/N	Is Action Item Still Relevant?	Is Action Item Included in 2022 Adair Co HM Plan Update?
F1: Elevate At Risk Structure in Flood Plain	Ongoing	Y	Y
F2: Study of Possible Repetitive Loss Properties	N	Y	Y
F3: Countywide Communications System	Ongoing	Y	Y
F4: Raising Low Roads and Erosion Assistance on County Roads	Ongoing	Y	Y
F5: Educate School Age Children in "Survival Techniques"	N	Y	Y (Combined into an overall education action item)
F6: Enlarging Capacity of Drainage Conduits	Ongoing	Y	Y
F7: Raise and Strengthen Bridges to allow School Buses to Cross	Ongoing	Y	Y
F8: Public Information and Educational Efforts	N	Y	Y (Combined into an overall education action item)
F9: Continued Participation in the National Flood Insurance Program	Y	Y	Y
EC1: Database and Map of Special Needs Population	N	Y	Y
EC2: Public Education of Dangers Associated With Extreme Cold Events	Ongoing	Y	Y (Combined into an overall education action item)
EC3: Provide equipment to support warming stations to allow citizens to come in out of the cold and warm up	Ongoing	Y	Y

SWS4: Purchase and Installation of Generators to Power Critical Facilities	Ongoing	Y	Y
SWS4: Tree Management	Ongoing	Y	Y
T1: Developing Emergency Operation Plan for Tornados	Ongoing	Y	Y
T2: Educate the public in the benefits of installing residential and commercial storm shelters and safe rooms	Ongoing	Y	Y
T3: Mobile Communications System	Ongoing	Y	Y
T4: Installation of NOAA Receivers in Public Facilities	N	Y	Y
T5: Install residential and commercial storm shelters	Ongoing	Y	Y
T6: Additional County-Wide Outdoor Warning Devices	Ongoing	Y	Y
T7: Countywide Communications System	Ongoing	Y	Y
T8: Educate Public in "Survival Techniques"	Ongoing	Y	Y (Combined into an overall education action item)
T9: Construct Safe Rooms in County Schools	Ongoing	Y	Y
T10: Provide NOAA Weather radios	Ongoing	Y	Y
ST1: Additional County-Wide Outdoor Warning Devices	Ongoing	Y	Y
ST2: Countywide Communications System	Ongoing	Y	Y
ST3: Erosion Assistance on County Roads	Ongoing	Y	Y
ST4: Educate Public in "Survival Techniques"	Ongoing	Y	Y (Combined into an overall education action item)
ST5: Enlarge Drainage Conduits	N	Y	Y

ST6: Installation of NOAA Receivers in Public Facilities	Ongoing	Y	Y
ST7: Tie Down – Mobile Homes & Other Structures Education Program	N	Y	Y
ST8: Educating the Public about Various Dangers Associated with Natural Hazards	Ongoing	Y	Y (Combined into an overall education action item)
ST9: Review the Adair County Severe Weather Response Plan and Warning System on an Annual Basis	Y	Y	Y
ST10: Additional County-Wide Outdoor Warning Devices	Ongoing	Y	Y
ST11: Purchase Lightning Prediction Systems for Adair County	N	Y	N
ST12: Determine why Lightning has increased in frequency and intensity in Adair County	N	N	N
ST13: Lightning Suppression Systems At Critical Facilities	N	Y	N
ST14: Building Material Awareness - Insurance Agents, Contractors and Citizens	Ongoing	Y	Y
ST15: Educational Program – Crop Insurance, Preventing Losses	N	Y	Y
ST16: Provide shelters for county owned vehicles to protect from hail damage	Ongoing	Y	Y
ST17: Protective Film on windows in all county buildings.	N	Y	N
ST18: Install a steel roof on the Adair County Court House	N	N	N

ST19: Additional County-Wide Outdoor Warning Devices	Ongoing	Y	Y
WF1: Purchase of Tanker Fire Trucks – Wildfire Protection	N	N	N
WF2: Provide Dry Hydrants for Wildfire Protection	N	Y	Y
WF3: Implement the Fire Wise program to provide Wildfire Protection by making the public aware of the need for defensible spaces	N	Y	Y
WF4: Provide Fire Breaks	Ongoing	Y	Y
WF5: Provide Outdoor Message System	N	Y	Y
DR1: Drill Additional Water Wells	N	Y	Y
DR2: Water Management and Drought Planning	N	Y	Y
DR3: Build Reservoirs	N	Y	Y
DR4: Public Education	Ongoing	Y	Y (Combined into an overall education action item)
EH1: Database and Map of Special Needs Population	N	Y	Y
EH2: Public Education of Dangers Associated With Extreme Temperature Events	Ongoing	Y	Y (Combined into an overall education action item)
EH3: Provide cooling stations to allow citizens to come in out of the heat to cool down	Ongoing	Y	Y
DF1: Identify vulnerable structures susceptible flooding from dam failures	Ongoing	Y	Y
DF2: Creation of Flood Inundation Maps for the county	Ongoing	Y	Y
DF3: Provide dam monitoring equipment	N	N	N

DF4: Additional County-Wide Outdoor Warning Devices	Ongoing	Y	Y
DF5: Countywide Communications System	Ongoing	Y	Y
DF6: Public Education on Dam Failure	Ongoing	Y	Y (Combined into an overall

5.3 Changes in Jurisdictional Priorities

Since the previous Adair Co HM Plan, more concern has been expressed regarding the lack of tornado sirens outside city limits of the county seat, lack of funding, communications, and trained personnel. There has been much discussion in the plan steering committee about the possibility of partnering on Hazard Mitigation projects to best leverage local resources and capitalize on receipt of federal/state funding. The concern expressed repeatedly was the lack of severe weather advanced warning systems for rural areas.