4.11 Wildfires

4.11.1 Hazard Profile

As more people make their homes in wild land settings in close proximity to large tracts of grasslands or forests, the number of citizens and structural improvements at risk to the impacts of wildfire increases. Wildfires often begin unnoticed and spread quickly, igniting grass, brush, trees, and homes.

Wildfire is mainly a hazard for homes and properties in the rural/urban interface zone

Wildfires can move on three different levels. A *surface fire* is the most common type and burns along the surface of grasslands or forests, usually moving quickly through an area. A *ground fire* is usually started by lightning and burns on or below the forest floor in the humus layer down to the mineral soil, mostly by smoldering combustion. A *crown fire* has ascended from the ground into the forest canopy, spreads rapidly by wind and moves by jumping along the tops of trees.

According to FEMA, as stated in the report *Multihazard Identification and Risk Assessment*, there are four categories of wildfires experienced throughout the United States:

- **Interface or intermix fires** are fires that are fueled by both wildland vegetation and the built-environment.
- **Firestorms** are events of such extreme intensity that effective suppression is virtually impossible. They occur during extremely dry weather and generally burn until conditions change or available fuel is exhausted.
- **Prescribed fires** are those that are intentionally set or selected natural fires that are allowed to burn for beneficial purposes.
- **Wildland fires** are fueled by natural vegetation and typically occur in national forests and parks.

Location

Within the Canadian County jurisdiction development in more remote and wooded areas, also referred to as the Wildland Urban Interface (WUI) continues to take place. Residential and business structures developed in close proximity to grassy and woody fuels will be natural risks for this event. In addition, wildland/grassland fires are a strong threat to agricultural areas such as farms and/or ranches, especially during the high risk fire season.

Lightning can cause particularly difficult fires when dry thunderstorms move across an area that is suffering from seasonal drought. Multiple fires can be started simultaneously. In dry fuels, these fires can cause massive damage before containment. Hazard events other than lightning have the potential to cause wildfires, such as earthquakes and high winds. For example, in the dry autumn of 2005, gusting winds downed power lines in south central Oklahoma, sparking wildfires.

Another factor of some importance to the wildfire risk is the spread of Eastern Red Cedar in Canadian County. Eastern Red Cedar grows close to the ground, has fine foliage, thin bark and

contains volatile oils. When it catches fire, it explodes into flame, showering sparks to the wind. There are about 20 areas in the county that have significant amounts of Eastern Red Cedar. These can be grouped into six general areas: (1) in the southwest corner of the county between the Canadian River and Caddo County in the Niles and Cedar Lake areas; (2) east of Geary in the Canyon View Creek drainage and in the North Canadian drainage north and south of Karns; (3) along the North Canadian River on the northwest and northeast of El Reno from Memorial Rd. in the northwest to Radio Rd. in the northeast; (4) in the Richland area and in the Uncle John's Creek drainage southwest of Piedmont; (5) along the Canadian River south of Union City, from Country Club Rd. east to Gregory Rd.; and (6) south of Mustang, in the extreme southeast corner of the county, between OK Hwy 4 and County Line Rd.

Measurement

Wildfire danger is measured using indexes that relate longer-term soil and vegetation conditions to shorter-term weather patterns. The most explosive conditions occur when dry, gusty winds blow across dry vegetation. These factors are contained in the Keetch-Byram Drought Index (KDBI), the Fire Danger Rating System, and the Burning Index (BI). The **Keetch-Byram Index**, Table 4-34, relates weather conditions to potential or expected fire behavior, using numbers from 0 to 800 to represent the amount of moisture that is present in soil and vegetation. A Zero rating would indicate no moisture deficiency, while 800 would indicate maximum drought conditions. The **Burning Index**, Table 4-35, relates temperature, relative humidity, wind speed and solar radiation to the "relative greenness" of vegetation (taken from satellite measurements) and fuel models for native vegetation (assigned on a 1-kilometer grid across the State). These factors are used to derive four indices: Spread Component, Energy Release Component, Ignition Component, and Burning Index. The Burning Index is a synthesis of the Spread and Energy Release components, and is used to predict fire line intensity and flame length. The **Fire Danger Rating System**, Table 4-36, combines the combustibility of vegetation and weather conditions to derive the easily understood Green-Blue-Yellow-Orange-Red fire danger alerts. These three wildfire measures are summarized in the following tables. The higher the number, the more difficult the wildfire is to fight.

Table 4–34: The Keetch-Byram Drought Index (KBDI)

Rating	Description
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 through the night and heavier fuels will actively burn and contribute to fire intensity.

Source: Oklahoma Hazard Mitigation Plan

Table 4–35: Burning Index

Flame Length (ft)	Fire Line Intensity (Btu/(ft-s)	Interpretations
<4 (BI <40)	<100	Fires can generally be attacked at the head or flanks by persons using hand tools. Hand line should hold the fire.
4 – 8 (BI 40 – 80)	100 – 500	Fires are too intense for direct attack on the head by persons using hand tools. Hand line cannot be relied on to hold the fire. Equipment such as dozers, pumpers and retardant aircraft can be effective.

Flame Length (ft)	Fire Line Intensity (Btu/(ft-s)	Interpretations
8 – 11 (BI 80 – 110)	500 – 1,000	Fires may present serious control problems, such as torching out, crowning and spotting. Control efforts at the fire head will probably be ineffective.
>11 (BI >110)	>1,000	Crowning, spotting and major fire runs are probable. Control efforts at head of fire are ineffective.

Table 4–36: 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.
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 vary 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.

Extent/Severity

Wildfires have been increasing in number and causing a greater economic impact nationwide, largely due to the rapid spread of rural estates on the peripheries of most American cities. Canadian County is no exception. From 2000 to 2009 Canadian County fire departments made 1,838 wildfire runs that burned a total of 22,662 acres, and did $1,129,720 in damage.

The extent of the hazard for Canadian County varies with landscape and weather conditions, with the relatively more open, grassy lands being the most vulnerable. A higher likelihood of ignition exists in the wildland/urban interface, particularly around certain commercial structures, railroad

tracks, stands of dry trees, and fields of CRP grass. Generally speaking, wildfires will range from a very small flame to flames of six or seven feet in height (Burning Index of 4-8). Most of these wildland fires can be extinguished with hand tools and pumper trucks.

Although all of Canadian County is at some risk of wildfire, the communities, structures and critical facilities located in the wildland/urban interface and surrounded by dry grass and trees are clearly the most vulnerable. Since wildfire risk can be dramatically reduced by landscaping and debris clearance, a detailed wildfire risk assessment should be made of all critical facilities located in the wildland/urban fringe. Wildfire risk is shown in Figure 4-28 and in Appendices F and G for incorporated communities and schools.

Canadian County considers a reading of moderate and below on the Fire Danger Rating system (Table 4-36) to be a minor severity level and a rating of high and above to be of major severity.

Frequency

As stated above, Canadian County fire departments made 1,838 wildfire runs that burned a total of 22,662 acres and did $1,129,720 in damage. Based on this limited data, Canadian County can expect about 184 wildfires each year that burn 2,266 acres and do approximately $112,972 in damage. This data is summarized in Table 4-37.

Table 4–37: Canadian County Wildfires, 2000-2009

Year	Wildfire Runs	Acres Burned	Losses
2000	245	1,551	43,320
2001	204	697	130,935
2002	238	992	122,310
2003	167	1,731	106,180
2004	171	706	47,985
2005	244	899	35,170
2006	50	3,970	593,350
2007	128	578	14,550
2008	233	1,130	28,920
2009	158	10,398	7,000
Total	1,838	22,662	1,129,720

Oklahoma State Fire Marshal

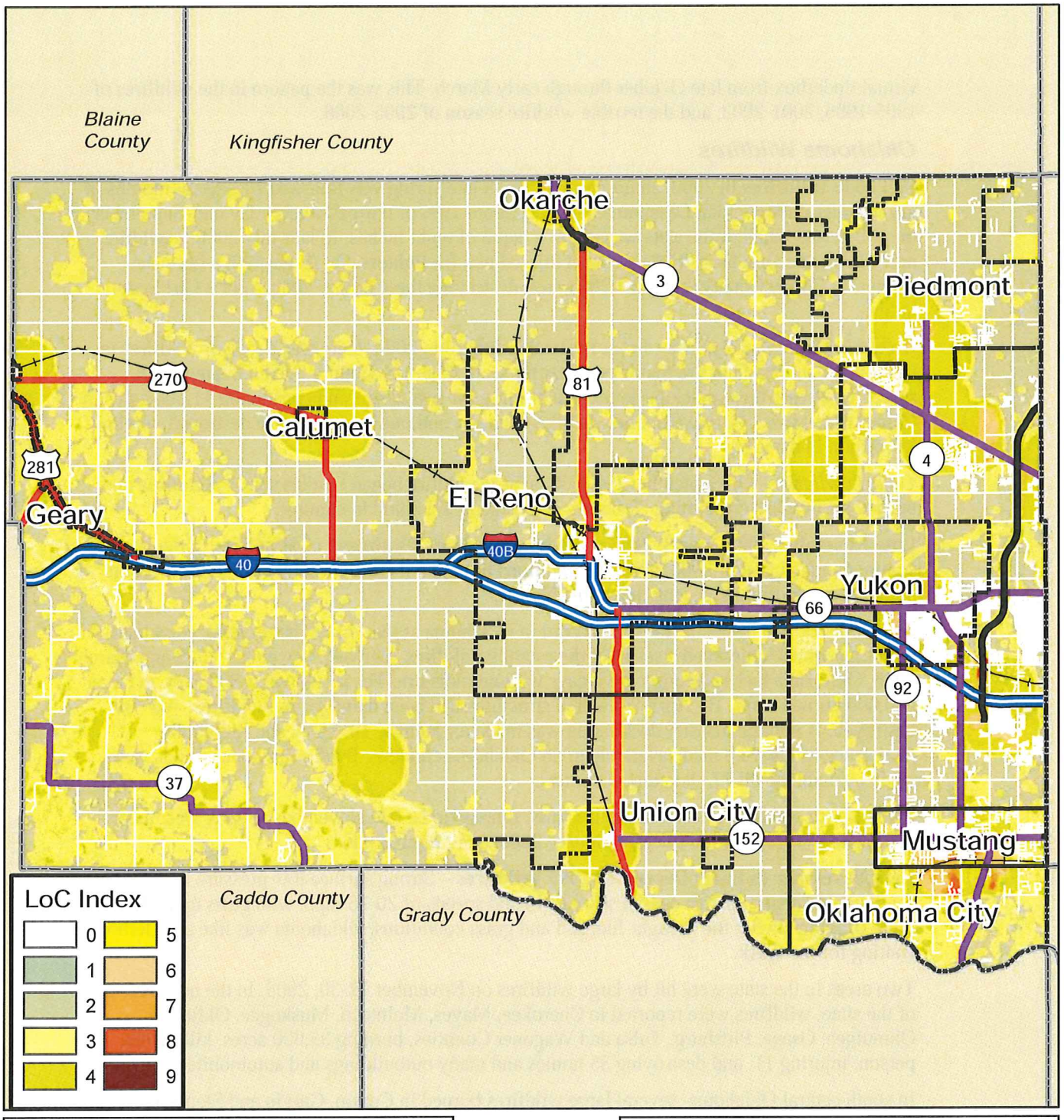
Canadian County has three wildland fire seasons. The worst is February through April, when grass fuels are dead, the humidity low, temperatures elevated, and winds as high as 50-70 mph. A moderate wildfire season occurs in July or August, when some grasses are dormant or dead from the mid-summer heat. The third wildfire season, also moderate, is in the fall, after frost has killed the annual grasses.

Impact

The impact of the wildfire hazard can increase during times of drought, high wind and extreme heat. Wildfire can cause loss of life, loss of homes, loss of business, and devastating economic impacts to individual homeowners, ranchers and farmers, and communities.

4.11.2 History/Previous Occurrences

Wildfires are neither a constant nor continuously rising phenomena, but vary from year to year in frequency and destructiveness, depending on such factors as rainfall patterns, drought, high wind and extreme heat. The most dangerous years are those in which spring rains bring lush growth of grasses in wildlands, followed by drought and heat that dries up the grasses, turning them into a



LEGEND

- Interstate
- US Highway
- State Highway
- Turnpike
- Railroads
- City Limits

0 2.5 5 Miles

Flanagan & Associates, LLC
Planning Consultants

Figure 4-28

Canadian County

Level of Concern Index

virtual tinderbox from late October through early March. This was the pattern in the wildfires of 1995-1996, 2001-2002, and the terrible wildfire season of 2005-2006.

Oklahoma Wildfires

Fall 2000 Wildfires In 2000, an unseasonably wet late spring was followed by several months of dry weather during which Oklahoma averaged about 19% of normal rainfall. By mid-September, the soil across much of the state was dry to a depth of eight inches. In late July 2000, a wildfire near Oklahoma City burned 80 acres and injured two firefighters. On August 20, a fire near Binger, in Caddo County, burned 3,200 acres, destroying three homes and part of a Girl Scout lodge.

Arbuckle Mountains Wildfire - From September 8th-19th, 2000, there was a rash of wildfires in Central Oklahoma. One fire that began near the Carter/Murray County line on September 8 spread north into the Arbuckle Mountains, burning for two weeks and consuming 11,500 acres in Carter, Murray and Garvin Counties. In all, six homes and one business were destroyed, totaling $1 million in damage.

Guthrie Wildfire – On September 19, 2000, a large wildfire began 9 miles south of Guthrie and burned for 6 miles, consuming 35 homes and causing $750,000 in damage.

Late November 2005-March 2006: Oklahoma's Worst Outbreak of Wildfires In the late summer and autumn of 2005, drought conditions throughout the state set the stage for the worst outbreak of wildfires in recent Oklahoma history.

The winter of 2005 was the driest on record in Oklahoma at that time. The drought, combined with high winds, unleashed a series of devastating wildfires. Between November 2005 and March 2006, Oklahoma had 120 consecutive days without moisture. The result was 2,800 fires and over 560,000 burned acres. By April 2006, 869 structures had been damaged by wildfires, and 300 destroyed. A Federal disaster declaration was made on January 10, 2006, and Individual Assistance funds were made available to 26 Oklahoma counties. Public Assistance funds were made available to all 77 Oklahoma counties.

The wildfire outbreaks clustered around three time periods: late November to early December 2005, late December 2005 to early January 2006, and March, 2006.

Late November to Early December 2005 Wildfires – Strong surface low pressure in the southern and central plains caused sustained wind speeds of 20-35 mph, with gusts up to 45-65 mph. Combined with the drought-like soil and grass conditions, Oklahoma was like a tinderbox waiting for the spark.

Two areas in the state were hit by large wildfires on November 27-30, 2005. In the northeast part of the state, wildfires were reported in Cherokee, Mayes, McIntosh, Muskogee, Okfuskee, Okmulgee, Osage, Pittsburg, Tulsa and Wagoner Counties, burning 35,000 acres, killing one person, injuring 11, and destroying 35 homes and many outbuildings and automobiles.

In south central Oklahoma, several large wildfires burned in Cotton, Garvin and Stephens Counties. A 15-mile area near Velma in Stephens County caught fire on November 27 and continued to burn into early December, forcing the evacuation of the town. Twenty fire departments responded to the blaze. Altogether, the Stephens County fire destroyed 16 homes, two barns and many outbuildings, leaving $1 million in damage. In Cotton County, a wildfire near Walters destroyed six homes and several barns, causing $650,000 damage. In Garvin County, two wildfires burned 6,000 acres. Fourteen fire departments and 100 firefighters responded. Three homes and several outbuildings were destroyed. Losses were $350,000. Near Pauls Valley, 500 acres burned causing $50,000 in damage. On November 29, a fire near Wilson in Carter County killed one woman.

Late December 2005 to Early January 2006 Wildfires - Another rash of wildfires began on December 25, 2005, and continued, more or less without interruption through the first week of 2006. A string of wildfires began on Christmas Day in Choctaw, Creek and Sequoyah Counties, but others were soon raging throughout the state. On January 8, 2006, the Oklahoma Department of Emergency Management set up an Incident Command Post at Shawnee to coordinate firefighters who were coming in from Alabama, Tennessee, Florida and North Carolina. On January 10, Oklahoma was declared a wildfire disaster area. Among the many fires were the following:

- **December 27, 2005** – 10,000 acres burned in Hughes County, killing one person and destroying 8 homes, 14 barns and 20 outbuildings.
- A wildfire in Choctaw County burned 1,000 acres, destroyed four homes and injured two people.
- In Tulsa County, a wildfire burned three homes, three structures and left $300,000 in damage.
- In Muskogee County, 2,000 acres west of Muskogee burned causing $225,000 in damage. Grassfires were also reported in Rogers, Okmulgee and McIntosh Counties.
- **January 1, 2006** – In Oklahoma County, northeast of Oklahoma City, several homes were destroyed by wildfire and two neighborhoods evacuated. In Muskogee County, 16,000 acres caught fire southwest of Muskogee causing an estimated at $500,000 in damage. In Creek County, 10,000 acres burned near Bristow, causing $200,000 in damage. There were also wildfires in Pittsburg, Okfuskee, Haskell and Tulsa Counties.
- **January 3, 2006** – In Beaver County, two fires burned 14,000 acres, while in Creek County, near Shamrock, a wildfire destroyed an abandoned school and vacant house and damaged two homes.
- **January 8, 2006** – In McIntosh County, 7,000 acres burned, doing $50,000 in damage. In Payne County a grassfire ignited red cedar trees. Fires were reported at Davis, Welty, Bristow, Okemah, Slick, Stroud, Guthrie, Sapulpa, Sparks, Bethel, Skiatook, Wainright, Prague, Stigler, Prue, and Mayesville. The State established an ICP at Shawnee.
- **February 4, 2006** – In Okmulgee County, a wildfire killed one person.
- **February 27, 2006** – In Muskogee County, 750 acres burned and dozens of homes were threatened.

March 2006 Wildfires - On March 1, 2006, high winds, drought conditions, and temperatures in the 90s caused another rash of wildfires across the state. In Stephens County, a wildfire eight miles long injured several firefighters and killed one. In all, 10,000 acres were burned, 65 homes destroyed, 21 houses badly damaged, and numerous outbuildings, farm equipment and vehicles lost. Damage was estimated at $15 million. In Lincoln County, three firefighters were injured when blazing

A citizen waters his lawn to protect his home from wildfire

grass caused a propane tank to explode. In Creek County, southwest of Mannford, a wildfire burned hundreds of acres, destroying four homes and causing $250,000 in damage. Wildfires were also reported in Wagoner and Sequoyah Counties. Fires continued to plague the state throughout the month.

- **March 7, 2006** – Wildfires were reported in Muskogee, Wagoner and Nowata Counties.
- **March 8, 2006** – In Osage County, 1,000 acres burned near Burbank.
- **March 10, 2006** – In Texas County, 7,000 acres burned east of Guymon, while in Tulsa County, a wildfire caused $150,000 damage.
- **March 15, 2006** – Wildfires broke out in Osage, Rogers, Creek, Wagoner and Cherokee Counties.
- **March 26, 2006** – Despite recent rains, warm and windy conditions led to wildfire outbreaks near Bristow, and at Scipio in Pittsburg County, as well as in Muskogee, Okfuskee, Okmulgee and Wagoner Counties.
- **April 2, 2006** – A Texas County wildfire burned 600 acres.

Canadian County Wildfires

The NCDC data base is of little help in determining the incidence of wildfires in Canadian County, as it does not mention any wildfires for the county from 1950 through 2009. The best resource is the State Fire Marshal's data base. According to this source, during the period 2000 through 2009, Canadian County fire departments made 1,838 wildfire runs, which burned 22,662 acres and did a total of $1,129,720 in damage. In terms of acres burned, the most puzzling year is 2009. Wildfires in April 2009 did cause great damage in Central Oklahoma, particularly in the Oklahoma City Metro Area and Lincoln County, but there were no large fires in Canadian County. The El Reno fire department is listed as making runs to 41 wildfires that burned 10,113 acres. These could have been in support of Oklahoma City's fire departments. It is not clear from the data in the Fire Marshal's web files. By far the worst year, in terms of damage, was 2006, when 50 wildfires resulted in $593,350 in losses. This wildfire frequency is summarized in the Table 4-37.

The terrible wildfire outbreak of 2005-2006 is captured for several Canadian County fire districts in the CityData.com archive, which contains fire run data for major towns in the county, including Calumet, El Reno, Mustang, Okarche, Piedmont and Union City. These are summarized below, with highlights.

Calumet VFD

During 2006, the Calumet VFD made 41 wildfire runs to fires that burned 5,070 acres and caused $100,000 in damage. Fourteen fires burned less than 1 acre, while 20 scorched 5 acres or more, with the average fire being about 20 acres in size. Two fires, however, were much larger and deserve special mention:

- **March 12, 2006** – a brush and grass fire burned 3,500 acres at OK Hwy 37 and Maple Rd., causing $80,000 in damage. The fire began at 3:00 p.m. on the 12th and was not extinguished until 6:00 p.m. on the 13th.
- **March 15, 2006** – A fire at SW 29th and Maple Rd. burned 1,000 acres but did no reported damage. The fire began at 1:30 p.m. on the 15th and was not cleared until 8:30 p.m. on the 16th.

El Reno FD

During 2006, the El Reno Fire Department made 86 wildfire runs to fires that burned 703 acres and caused $300 in damage. Most were small fires, quickly extinguished, but 22 fires burned an acre or more, with two fires over 100 acres in size:

- **April 20, 2006** – a wildland fire burned 100 acres along Memorial Rd. in El Reno. The fire began around 2:30 p.m. and was extinguished at 11:00 p.m.
- **July 4, 2006** – A fire at Black Kettle burned 350 acres, beginning at about 1:00 p.m. and cleared at 10:32 p.m.

Mustang FD

During 2006, Mustang's Fire Department made 56 wildfire runs. No acreage or values of losses were recorded.

Okarche VFD

During 2006, Okarche's VFD made 26 wildfire runs to fires that burned 465 acres and caused $7,200 in damage. Fourteen fires burned more than 1 acre, most between 20-40 acres in size. One fire consumed over 100 acres:

- **March 5, 2006** – a grass fire burned 120 acres at an unspecified location, doing $1,500 in damage. The fire began around 12:00 p.m. and was out by 2:45 p.m.

Piedmont VFD

During 2006 Piedmont's Fire Department made 8 wildfire runs. Six were along Cimarron Rd. and one on Edmond Rd.

Union City VFD

During 2006 the Union City Fire Department made 11 runs to wildfires that burned 1,034 acres and did $43,000 damage. Three of these were large fires that deserve special mention.

- **March 15, 2006** – a forest and wildland fire burned 350 acres at Caddo Jake Bridge and 59th St. Losses were $2,000. The fire began about 2:45 p.m. and was out by 5:00 p.m. on the 16th.
- **March 15, 2006** – A forest and wildland fire at 37th and Maple Rd. burned 320 acres and did $12,500 in damage. The fire began at 4:23 p.m. and was cleared 8:00 p.m.
- **April 13, 2006** – A forest and wildland fire at Maberry and 44th St. burned 350 acres and did $17,000 in damage. The fire began at 6:24 p.m. and was out at 11:54 p.m.

Probability/Future Events

The alarming spread of Eastern Red cedar in open grassland and the abundant fuel load in place from heavy rains and other naturally occurring events, combined with the historical data available demonstrate that the threat of wildland/grass fires will continue to be a regularly occurring event in Canadian County, its communities and public school systems. In addition, suburban growth in the wildland interface will be a significant factor in the potential increase in number of wildfire events.

Canadian County, its Communities and Public School systems have a High probability of a future wildfire event, unless otherwise specified in Appendix F or Appendix G.

4.11.3 Vulnerability

This section summarizes information about Canadian County's vulnerability to wildfires, including the impact on people, structures and buildings, critical facilities, and infrastructure. This information, as well as information provided by the County, Incorporated Communities and

Public Schools, was used to determine the Vulnerability Criteria identified in Tables 4-2 and 4-3. Canadian County was determined to be at moderate risk to the wildfire hazard. (See Table 4-2 Hazard Risk Analysis, and Table 4-3, Summary of Hazard risk Analysis Ranking Criteria for an explanation of how the rankings were derived.) Appendices F and G identify where the Incorporated Communities and Public School Systems differ from Canadian County.

Because more people are choosing to build expensive homes on acreage in rural settings, surrounded by grasslands and forest, the danger of wildland/urban interface fires has increased. Canadian County is not an exception to this national trend. The wildland fire danger is made even higher by the spread of the Eastern Red Cedar, which grows close to the ground, has fine foliage, thin bark and contains volatile oils. When it catches fire, it explodes into flame, showering sparks to the wind.

Vulnerable Urban-Wildland Interface areas in Canadian County are shown in Figure 4-28.

Population

Populations living in the rural and urban/wildland interface areas of Canadian County are vulnerable to the wildfire hazard. Deaths and injuries with wildfires have been very low in the state, and largely confined to firefighters. Vulnerability of the population, residential structures, and critical facilities in Canadian County are summarized in the following table.

Table 4–38: Wildfire Population & Building Vulnerability

LOC	Population	Residential Structures	Critical Facilities
Low	5,746	2,763	24
Moderate	0	0	0
High	0	0	0
Total	5,746	2,763	24

Structures/Buildings

Any structures/buildings in the wildland/urban interface area or on ranches/farms situated in grassy/wooded areas should be considered at risk to the effects of a wildfire event.

Schools are vulnerable to minor damage to fascia and landscaping to complete destruction from wildfire. Wildfires can prevent a facility from fulfilling its assigned mission. Depending on the severity of the damage, schools may need to be temporarily housed in an alternate location until the campus can be rebuilt and reopen. Canadian County schools vulnerable to wildfires are included in Table 4-39.

Critical Facilities

Critical facilities such as medical care facilities, resident care homes, daycare facilities, and utility out-stations located in these high-risk areas should be considered vulnerable to the effects of wildfires. Critical facilities at risk are listed in the following table. There is one facility at Very High risk, the water tower in Calumet. Other facilities with High or Moderate/High vulnerability are listed in the following table. (For information on individual communities and public schools, see Appendices F and G.)

Table 4–39: Unincorporated and County Critical Facilities Vulnerability to Wildfire Events

ID	Name	LOC Threat
C01	Banner Public Schools	Low

ID	Name	LOC Threat
C02	Canadian Co Rural Water District	Low
C03	Canadian County Rural Water District #4 Water Tower #1	Low
C04	Canadian County Rural Water District #4 Water Tower #2	Low
C05	Canadian County Rural Water District #1 Water Tower and Booster Station	Low
C06	Cedar Lake Volunteer Fire Dept #1	Low
C07	Cedar Lake Volunteer Fire Dept #2	Low
C08	Cedar Lake Volunteer Fire Dept #3	Low
C09	County Shop District No 3	Low
C10	Darlington Public School	Low
C11	Federal Correctional Institution	Low
C12	Maple Public Schools	Low
C13	Methodist Camp	Low
C14	Mustang Creek Elementary	Low
C15	Mustang North Middle School	Low
C16	Mustang Trails Elementary	None
C17	Mustang Valley Elementary	Low
C18	Northwood Elementary	Low
C19	Okarche Water Supply Tank	Low
C20	Richland Fire Department	Low
C21	Stone Ridge Elementary	Low
C22	Canadian County Courthouse	None
C23	Canadian County Sheriff	None
C24	Canadian County Assessor	None
C25	Gary Miller Children's Justice Center	Low
C26	County Shop Dist. 1	Low
C27	County Shop District No 2	Low
C28	Canadian County Fairgrounds	None
C29	Canadian County DHS	None
C30	Canadian County Judicial Building/ County Clerk	None
C31	Canadian County Election Board	None
C32	Canadian County Health Department	None
C33	Canadian Valley Technology Center – Cowan Campus	Low

Infrastructure

Water Treatment – Most significant effect during most major events would be from loss of electrical power. Additional threat from wildfire is not currently documented for facilities of this nature.

Wastewater Treatment – Most significant effect during most major events would be from loss of electrical power. Additional threat from wildfire is not currently documented for facilities of this nature.

Utilities:

Electricity: The largest threat to the delivery of electrical service would be the destruction/damage of power poles/lines, and flashovers from line to ground via smoke.

Gas: As most gas delivery lines are below ground, this critical system is not highly vulnerable to wildfires.

Transportation Systems (Highways, Public Transportation, Railway, Airports) – Roadway inaccessibility would be the largest vulnerability posed to the transportation system during a wildfire event. During a wildfire located near a major highway, it may become necessary to close a section of highway or divert traffic along that route. Roads and bridges in Canadian County would be at risk during a widespread event as many are located in close proximity to fields/grasslands that could become involved in a wildfire.

Emergency Services- Fire, Police and Medical Services would all be similarly at risk to effects of a wildfire event. During a severe outbreak of wildfire, roads may become impassable, potentially isolating portions of the community to vital services and/or supplies. Residential developments in the wildland/urban interface areas of Canadian County, along with any businesses/utilities supporting them in the immediate area, are especially at risk in the event of a large wildfire event.

4.11.4 Wildfire Scenario

A worst-case wildfire scenario for Canadian County would be an outbreak of grassfires caused by lightning from a dry thunderstorm during a period of drought, high temperatures, gusting winds, and peak water use, in an area of rural estates where there are significant amounts of Eastern Red Cedar. A rash of wildfires could stretch fire fighting resources thin, particularly in areas where tanker trucks would have to be used to protect homes and outbuildings. A worst-case scenario would involve the burning of more than 500 acres, the injury of one civilian and one firefighter, and damage to 4 to 5 structures, with no more than one or two receiving major damage before the event was brought under control.

4.11.5 Future Trends

Population

Because of the frequency of seasonal drought in Canadian County, and the amount of land given to pasturage for livestock, the rural areas of the county will continue to be vulnerable to wind-driven wildfire, as will the estate developments planned or underway in the wildland/urban interface areas.

Structures/Buildings

As development in areas identified as "at risk" in the wildland/urban interface continues, any structures and/or buildings in these areas will be at risk of a wildfire event, particularly if there is a substantial amount of Eastern Red Cedar. All developers and homeowners in these areas should be made aware of how construction materials and landscaping measures can dramatically reduce vulnerability.

Critical Facilities

Special care should be exercised to ensure the appropriate location of any new critical facilities, such as medical care facilities, day care centers, utility outstations, etc., and that such facilities are

constructed/retrofitted using proper fire-resistant building and landscaping practices, with particular attention to removing Eastern Red Cedar.

Infrastructure

As sections of Canadian County develop, roadways, utility access, emergency services and other support businesses will also be at risk for a wildfire event and should be planned for appropriately.

4.11.6 Conclusion

Wildfires are a serious and growing hazard because people continue to move their homes into grassland and woodland areas. The value of the property exposed to wildfires is increasing rapidly, especially in the western states.

Methods of fire suppression used in the past often resulted in an even greater fire hazard, because ground cover that would normally burn at natural intervals was able to build up. Western ecosystems have adapted to and have become dependent on wildfires, which play an essential role by thinning forests and creating stands of different plant species. Land management agencies are beginning to change their policies concerning the control of naturally occurring wildfires.

Like much of the Western and Midwestern United States, and almost all of Oklahoma, Canadian County's properties on community fringes are at moderate to high risk of wildfires in the late fall and winter (particularly following a wet spring and dry summer), and at severe risk during times of high wind and drought. Of particular concern are areas where there is a significant presence of Eastern Red Cedar, such as along the Canadian and North Canadian rivers, on the north side of El Reno, south of Mustang, in the extreme southwestern quadrant, between the Canadian River and Caddo County, east of Geary and southwest of Piedmont.

Data Limitations

Data to the State Fire Marshal's office is frequently turned in well after the events occurred—often as much as a year later. Consequently, complete data is frequently 1 to 2 years old by the time it is published. In addition, the Fire Marshal's office does not list the actual number of wildfires, but number of "fire department runs." In addition, it does not distinguish between fires within a community and in the outlying district.

Update Changes

Identified significant changes made from previous Multi-Hazard Mitigation Plans from Canadian County, Calumet, El Reno, Mustang, Piedmont, and Union City are outlined in Appendix E. Changes are based on criteria outlined for Plan Updates in the Local Multi-Hazard Mitigation Planning Guidance document of July 1, 2008.

4.11.7 Sources

Multi-Hazard Identification and Risk Assessment, p. 234, 236, 239. Federal Emergency Management Agency, 1997.

Oklahoma State Fire Marshal, "Fire Statistics 1997-2000," at web address: http://www.state.ok.us/~firemar/index.htm. Office of the Oklahoma State Fire Marshal

Talking About Disaster: Guide for Standard Messages, "Wildfire," p. 135. National Disaster Coalition, Washington, D.C., 1999.

USGS Wildland Fire Research, at Web address: http://www.usgs.gov/themes/Wildfire/fire.html. U.S. Geological Survey, August 23, 2000.