



**EL DORADO COUNTY
OFFICE OF EDUCATION**

**EL DORADO COUNTY
OFFICE
OF EDUCATION**

Annex "E"

El Dorado County Hazard Mitigation Plan
(Revised May 2019)

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El Dorado County Office of Education

INTRODUCTION

This Annex details the hazard mitigation planning elements specific to public schools in El Dorado County that are under the umbrella of the El Dorado County Office of Education (EDCOE); and a participating jurisdiction of the El Dorado County Local Hazard Mitigation Plan (LHMP) update. This Annex is not intended to be a standalone document, but appends to and supplements the information contained in the base document. All sections of the base plan, including the planning process and other procedural requirements apply to and were met by EDCOE. This Annex provides additional information specific to EDCOE and will focus on providing additional details on the risk assessment and mitigation strategy for this special district.

PLANNING TEAM AND PROCESS

As described above, EDCOE followed the planning process of El Dorado County's base plan. In addition to providing representation on the El Dorado County Hazard Mitigation Planning team, EDCOE formulated their own internal planning team to support the broader planning process requirements. The table below provides the internal planning participants, their positions, and how they participated in the planning process.

Table E-1 Planning and Review Team

Name	Position/Title	How Participated
Dr. Ed Manansala	County Superintendent of Schools	Reviewed identified hazards and mitigation measures to ensure all school issues were addressed.
Robbie Montalbano	Deputy Superintendent	Oversaw review process.
Kathy Daniels, Point of contact for the Plan	Director of Facilities	Attended meetings, Updated plan and mitigation measures.

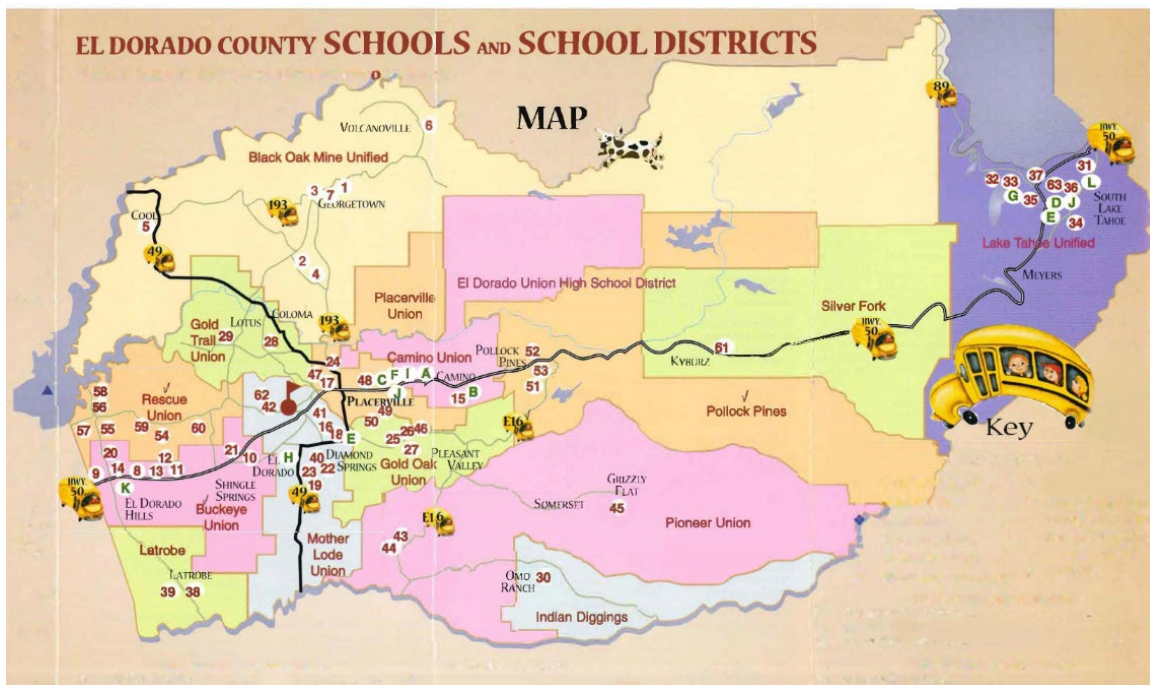
Coordination with other community planning efforts is paramount to the successful implementation of this plan. The chart below provides information on how EDCOE integrated the previously approved 2009 Plan into existing planning and programs.

Table E-2 Other Planning Integration

Jurisdiction	Planning Mechanism 2009 EDC Hazard Mitigation Plan Was Incorporated/Implemented In
El Dorado County Office of Education	EDCOE did not integrate the 2009 Plan into other planning mechanisms, as no other major planning was done in the interim. We did participate with all public agencies in El Dorado County to complete the Multi-Jurisdictional Hazard Mitigation Plan.

EL DORADO COUNTY SCHOOLS PROFILE

El Dorado County school district boundaries are illustrated in the map below.



Source: El Dorado County GIS system

EL DORADO COUNTY SCHOOL DISTRICTS AND SCHOOLS

- **EL DORADO COUNTY OFFICE OF EDUCATION**
6767 GREEN VALLEY ROAD
PLACERVILLE, CA 95667
- **BLACK OAK MINE UNIFIED SCHOOL DISTRICT**
 - American River Charter School
 - Divide High School
 - Georgetown School
 - Golden Sierra Jr. Sr. High School
 - Northside School
 - Otter Creek School

- **BUCKEYE UNION SCHOOL DISTRICT**
 - Blue Oak School
 - William Brooks School
 - Buckeye School
 - Camerado Springs School
 - Oak Meadow School
 - Rolling Hills School
 - Silva Valley School
 - Valley View, Charter Montessori
- **CAMINO UNION SCHOOL DISTRICT**
 - Camino School
 - Camino Science & Natural Resources Charter
- **EL DORADO UNION HIGH SCHOOL DISTRICT**
 - El Dorado High School
 - Independence High School
 - Oak Ridge High School
 - Ponderosa High School
 - EDUHSD Virtual Academy
 - Union Mine High School
- **GOLD OAK UNION SCHOOL DISTRICT**
 - Gold Oak School
 - Pleasant Valley School
- **GOLD TRAIL UNION SCHOOL DISTRICT**
 - Gold Trail School
 - Sutter's Mill School
- **INDIAN DIGGINGS SCHOOL DISTRICT**
 - Indian Diggings School
- **LAKE TAHOE UNIFIED SCHOOL DISTRICT**
 - Bijou School
 - Independent Learning Academy
 - Lake Tahoe Env. Science Magnet School
 - Mt. Tallac High School
 - Sierra House School
 - South Take High School
 - South Tahoe Middle School
 - Tahoe Valley School
 - Transitional Learning Center

- **LATROBE UNION SCHOOL DISTRICT**
 - Latrobe School
 - Miller's Hill School
- **MOTHER LODE UNION SCHOOL DISTRICT**
 - Herbert Green Middle School
 - Indian Creek School
 - Charles Brown Elementary School
- **PIONEER UNION SCHOOL DISTRICT**
 - Walter Tyler Elementary School
 - Mountain Creek School
 - Pioneer School
- **PLACERVILLE UNION SCHOOL DISTRICT**
 - Edwin Markham School
 - Louisiana Schnell School
 - Sierra School
- **POLLOCK PINES SCHOOL DISTRICT**
 - Pinewood School
 - Sierra Ridge Middle School
- **RESCUE UNION SCHOOL DISTRICT**
 - Green Valley School
 - Jackson School
 - Lake Forest School
 - Lakeview Elementary
 - Marina Village School
 - Pleasant Grove School
 - Rescue School
- **SILVER FORK SCHOOL DISTRICT**
 - Silver Fork School

EL DORADO COUNTY INFORMATION

El Dorado County is located just northeast of Sacramento and stretches from the foothills of El Dorado Hills and Folsom Lake, over the Sierra Mountains to Lake Tahoe. With elevations ranging from 200 feet to well over 10,000 feet, El Dorado County offers a unique natural splendor and environmental diversity. Seventy-eight percent of the population of 145,000 lives in unincorporated areas outside the city limits.

El Dorado County Consists of 10,000 square miles of vastly diverse and rugged geography. In the heart of California's Gold Rush Country, the western slope borders Placer, Sacramento and Amador Counties. We are divided into eight rural population centers. Placerville is located near the center of the county. Pollock Pines and Camino are the largest populated communities to the east. Georgetown is the largest to the north. Pleasant Valley is the largest to the south; while Shingle Springs, Cameron Park and El Dorado Hills are the three main communities to the west. The western side of the county is the fastest growing area and the closest to the Sacramento metropolitan area.

In a world full of change and uncertainty, El Dorado County has recognized the need to pursue local and state support which is appropriate to maintain and provide safe schools throughout our county. El Dorado County Office of Education is one of several agencies that participate in the Local Disaster Planning Council which focuses on ensuring that our communities, including our students, are safe during a disaster and/or emergency.

Emergencies or disasters may occur anywhere and at any time. With El Dorado County's varying topography, mix of urban and rural areas and rapidly growing population, we are subject to a wide variety of natural and technological hazards.

EI DORADO COUNTY OFFICE OF EDUCATION'S MISSION STATEMENT

The El Dorado County Office of Education will provide excellence in education for the 21st century through quality service to school districts, students, parents and community, while promoting educational excellence for all learners through the following means:

- Providing leadership and advocacy support on behalf of public education.
- Developing and implementing student programs, as requested by school districts or in response to community needs.
- Serving as an intermediate educational agency between school districts and state control agencies as mandated through legislative or administrative acts.
- Coordinating educational programs and services to maximize effectiveness and resources to reduce duplication of efforts and provide technical assistance as needed.
- Acting as a catalyst for innovative and engaging educational practices.

EDCOE operates from the core principle that children hold the future of the nation, and their education is its greatest responsibility. In El Dorado County, children come first so resources are maximized with the commitment to recruiting innovative educators, building better schools and developing stronger partnerships with government, private industry, community-based organizations, non-profits and small businesses. At the same time, EDCOE and its school districts are fiercely

committed to providing excellence in education for the 21st Century, while maintaining sound management practices and care in how tax dollars are spent. As demonstrated by our comprehensive student programs, EDCOE always has and will continue to passionately advocate on behalf of El Dorado County students, families, and community.

HAZARD IDENTIFICATION AND SUMMARY

During the process of participating in the plan revision, all school facilities throughout the county were included in identifying hazards county-wide and our highest vulnerabilities are:

Table E-3 Hazard Identification – Highest Vulnerabilities

Hazard	Geographic Extent	Probability of Future Occurrences	Magnitude/Severity	Significance
Wildland Fire	Extensive	Very likely	Catastrophic	Extremely High
Severe Weather	Extensive	Very likely	Catastrophic	High

Other hazards that may pose a threat are listed below, but have lower vulnerabilities:

Table E-4 Hazard Identification – Lower Vulnerabilities

Hazard	Geographic Extent	Probability of Future Occurrences	Magnitude/Severity	Significance
Avalanche	Limited	Occasional	Limited	Low
Earthquake	Limited	Occasional	Limited	Low
Hazardous Material Transport	Limited	Occasional	Limited	Low
Flooding	Limited	Occasional	Limited	Low

Table E-5 Definitions for Classifications

Hazard	Geographic Extent	Probability of Future Occurrences	Magnitude/Severity	Significance
Geographic Extent Limited: Less than 10% of planning area Significant: 10-50% of planning area Extensive: 50-100% of planning area Probability of Future Occurrences Highly Likely: Near 100% chance of occurrence in next year, or happens every year. Likely: Between 10 and 100% chance of occurrence in next year, or has a recurrence interval of 10 years or less. Occasional: Between 1 and 10% chance of occurrence in the next year, or has a recurrence interval of 11 to 100 years. Unlikely: Less than 1% chance of occurrence in next 100 years, or has a recurrence interval of greater than every 100 years.			Magnitude/Severity Catastrophic—More than 50 percent of property severely damaged; shutdown of facilities for more than 30 days; and/or multiple deaths Critical—25-50 percent of property severely damaged; shutdown of facilities for at least two weeks; and/or injuries and/or illnesses result in permanent disability Limited—10-25 percent of property severely damaged; shutdown of facilities for more than a week; and/or injuries/illnesses treatable do not result in permanent disability Negligible—Less than 10 percent of property severely damaged, shutdown of facilities and services for less than 24 hours; and/or injuries/illnesses treatable with first aid Significance Low: minimal potential impact Medium: moderate potential impact High: widespread potential impact	

Vulnerability Assessment

Wildland Fire

Probability of Future Occurrence - Very Likely

Significance - Extremely High

A wildfire responds to the weather, topography, and fuels in its area. Under extreme burning conditions, the behavior of a wildfire can be so powerful and unpredictable that fire protection agencies can only wait until conditions lessen before suppression actions can be taken. Since the fire itself, weather and topography cannot be mitigated, this leaves us with the fuel to mitigate. Wildland fire fuel can be anything from the forest, to residential structures and fortunately they can be modified to mitigate the wildland fire hazard.

Wildfire is our highest concern as these disaster events have impacted our county on numerous occasions, and as recently as 2014 with two separate devastating fires. The Sand Fire in South County burned 4,240 acres of land, destroyed 19 homes, and 47 outbuildings before it was contained. The King Fire was in the Pollock Pines area burning 97,717 acres of forest, destroying 15 homes, and 86 outbuildings including 2 historical cabins.

Our wildland fire threat is so severe that the El Dorado County Hazard Mitigation Plan devoted an entire section of this plan to that one specific hazard.

Future Development

Development in areas identified as high wildfire risk areas should plan appropriately and consider previous occurrences of fire and fire behavior in the State. Planning for evacuation routes should be considered with any new development projects.

Hazard/Problem Description

California is recognized as one of the most fire-prone and consequently fire-adapted landscapes in the world. The combination of complex terrain, climate, natural plant communities, along with ample natural and aboriginal ignition sources, has created conditions for extensive wildfires. Wildland fire is an ongoing concern for El Dorado County. Generally, the fire season extends from early spring through late fall of each year during the hotter, dryer months. Fire conditions arise from a combination of high temperatures, low moisture content in the air and fuel, an accumulation of vegetation, and high winds. Potential losses from wildfire include human life and structures, natural and cultural resources, quality and quantity of water supplies, cropland, timber, and recreational opportunities. Economic losses could also result. Smoke and air pollution from wildfires can create a severe health hazard. In addition, catastrophic wildfire can create favorable conditions for other hazards such as flooding, landslides, and erosion during the rainy season.

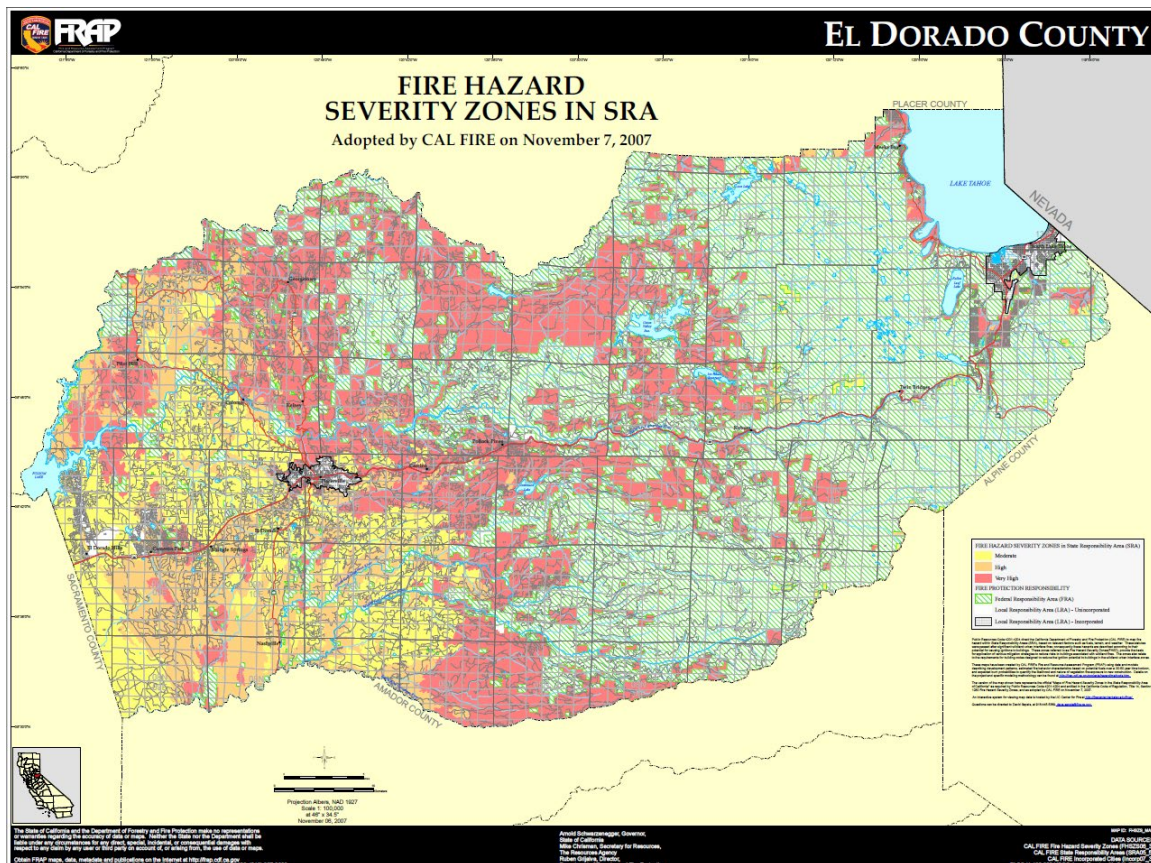
Wildland Urban Interface

Throughout California, communities are increasingly concerned about wildfire safety as increased development in the foothills. While wildfire risk is predominantly associated with wildland urban interface (WUI) areas, significant wildfires can also occur in heavily populated areas. The wildland urban interface is a general term that applies to development adjacent to landscapes that support wildland fire. The WUI describes those communities that are mixed in with grass, brush and timbered covered lands (wildland). These are areas where wildland fire once burned only vegetation but now burns homes as well. The WUI for El Dorado County consists of communities at risk as well as the area around the communities that pose a fire threat. Wildland urban intermix communities are difficult to defend because they are sprawling communities over a large geographical area with wild fuels throughout. This profile makes access, structure protection, and fire control difficult as fire can freely run through the community.

Wildland urban interface fires occur where the natural and urban development intersect. Even relatively small acreage fires may result in disastrous damages. WUI fires occur where the natural forested landscape and urban-built environment meet or intermix. The damages are primarily reported as damage to infrastructure, built environment, loss of socio-economic values and injuries to people.

El Dorado County Wildfires

Wildland fires affect grass, forest, and brush lands, as well as any structures located within them. Where there is human access to wildland areas, such as the Sierra Nevada and foothills areas, the risk of fire increases due to a greater chance for human carelessness and historical fire management practices. Within the County, the area starting in the foothills just east of El Dorado Hills and extending east, as well as north and south to the County lines is most vulnerable and prone to wildfire due to the climate, topography, and vegetation. The Fire Hazard Severity Zone Map (California Department of Forestry and Fire Protection) outlines the areas most vulnerable to wildfire and the extent of wildfire in El Dorado County.



http://www.fire.ca.gov/fire_prevention/fhsz_maps_eldorado

Wildfires may occur in all areas of El Dorado County, including the most populated areas of El Dorado Hills, Cameron Park/Shingle Springs, Placerville, Camino/Pollock Pines and South Lake Tahoe. El Dorado County also has a large area of National Forest Service land that is also vulnerable to wildfire. The Community Wildfire Protection Plan (CWPP) outlines the vulnerability and extent of wildfire in El Dorado County. El Dorado County uses National Weather Service red flag warnings, advisories and watches to address planning for wildfire in collaboration with Fire Prevention agencies and Fire Safe Councils. Generally, there are four major factors that sustain wildfires and allow for predictions of a given area's potential to burn. These factors include fuel, topography, weather, and human actions.

Fuel – Fuel is the material that feeds a fire and is a key factor in wildfire behavior. Fuel is generally classified by type and by volume. Fuel sources are diverse and include everything from dead tree 3-86 leaves, twigs, and branches to dead standing trees, live trees, brush, and cured grasses. Also to be considered as a fuel source are manmade structures, such as homes and other associated combustibles. The type of prevalent fuel directly influences the behavior of wildfire. Fuel is the only factor that is under human control. As a result of effective fire suppression since the 1930s, vegetation throughout the county has continued to grow and accumulate, and hazardous fuels have increased. As such, certain areas in and surrounding El Dorado County are extremely vulnerable to fires as a result of dense vegetation combined with a growing number of structures being built near and within rural lands. These high fuel hazards, coupled with a greater potential for ignitions, increases the susceptibility of the County to a catastrophic wildfire.

Topography – An area's terrain and land slopes affect its susceptibility to wildfire spread. Both fire intensity and rate of spread increase as slope increases due to the tendency of heat from a fire to rise via convection. The arrangement of vegetation throughout a hillside can also contribute to increased fire activity on slopes.

Weather – Weather components such as temperature, relative humidity, wind, and lightning also affect the potential for wildfire. High temperatures and low relative humidity dry out fuels that feed wildfires, creating a situation where fuel will ignite more readily and burn more intensely. Thus, during periods of drought, the threat of wildfire increases. Wind is the most treacherous weather factor. The greater a wind, the faster a fire will spread and the more intense it will be. Winds can be significant at times in El Dorado County. North winds in El Dorado County are especially conducive to hot, dry conditions, which can lead to "red flag" days indicating extreme fire danger. In addition to wind speed, wind shifts can occur suddenly due to temperature changes or the interaction of wind with topographical features such as slopes or steep hillsides. Lightning also ignites wildfires, often in difficult to reach terrain for firefighters.

Human Actions – Most wildfires are ignited by human action, the result of direct acts of arson, carelessness, or accidents. Many fires originate in populated areas along roads and around homes, and are often the result of arson or careless acts such as the disposal of cigarettes, use of equipment or debris burning. Recreation areas that are located in high fire hazard areas also result in increased human activity that can increase the potential for wildfires to occur. Electrical hazards have also been known to ignite wildfires.

Factors contributing to the wildfire risk in El Dorado County include:

Overstocked forests, severely overgrown vegetation, and lack of defensible space around structures;

Excessive vegetation along roadsides and hanging over roads, fire engine access, and evacuation routes;

Drought and overstocked forests with increased beetle infestation or kill in weakened and stressed trees;

Narrow and often one-lane and/or dead-end roads complicating evacuation and emergency response as well as the many subdivisions that have only one means of ingress/egress;

Inadequate or missing street signs on private roads and house address signs;

Nature and frequency of lightning ignitions; and

Increasing population density leading to more ignitions.

Power transmission and distribution lines run throughout the county

Past Occurrences - Disaster Declaration History

A search of FEMA and Cal OES disaster declarations turned up multiple events. State disaster declarations occurred in 2007, 2014. Federal disaster declarations occurred in 2007 and 2014.

National Climatic Data Center (NCDC) Events

The NCDC has tracked wildfire events in the County dating back to 1990. Significant Events in El Dorado County from 1992 – 2016 are shown below:

Table E-6 Wildfire Events from 1992 - 2016

Date	Event	Injuries (direct)	Deaths (direct)	Property Damage
9/29/1992	Wildfire	2	2	\$240,207,000
9/17/2006	Wildfire	0	0	\$13,100,000
6/24/2007	Wildfire	0	0	\$153,000,000
7/25/2014	Wildfire	0	0	\$13,000,000
9/13/2014	Wildfire	12	0	\$162,500,000
6/28/2016	Wildfire	3	0	\$4,500,000
10/14/2016	Wildfire	0	0	\$327,000
TOTAL		17	2	\$586,634,000

Source: NCDC

September 1992 Cleveland Fire – The Cleveland Fire was a large arson fire that started just north of Hwy 50 off Ice House Road. On the third day of the fire, an Air Tanker crash claimed the lives of two pilots. 41 structures were destroyed, millions of dollars of private Sierra Pacific Industry timber were destroyed, Hwy 50 was closed for over a week, and the El Dorado Canal (water supply for Pollock Pines and Camino) was severely damaged. A total of 22,485 acres were destroyed.

September 2006 Ralston Fire – The Ralston Fire was a large wildland fire in the area of the North Fork of the Middle Fork of the American River. Approximately 8,400 acres burned.

June 2007 Angora Fire –The Angora fire (in the Lake Tahoe Basin) burned 3,100 acres of forest and wooded subdivisions and destroyed more than 250 homes as well as 75 commercial and other structures.

July 2014 Sand Fire – On July 25, the Sand Fire was ignited five miles north of the Amador County town of Plymouth by a vehicle driving over dry vegetation. A total of 4,240 acres were burned, claiming 19 residences and 47 outbuildings.

September 2014 King Fire–The King Fire started in Pollock Pines and eventually crossed into Placer County. 97,717 acres were estimated to have burned. 12 residences were destroyed, as well as 68 other minor structures. 12 injuries occurred that can be attributed to the fire.

2016 Trailhead Fire – On June 28, the Trailhead Fire was ignited in the Middle Form American River canyon in both Placer and El Dorado Counties.

2016 Emerald Fire– The Emerald Fire started October 14, near the Cascade Lake area and Emerald Bay off Highway 89. Wind gusts and sustained wind contributed to the spread of this fire.

Assets at Risk

This section considers the County Office’s assets at risk. All facilities owned by EDCOE would be categorized as critical facilities. Damage to these facilities would have a large impact on students, personnel, and members of the community. In addition to the social costs associated with the identified hazard, there is potential for extremely high monetary costs as well. Damage as a result of a natural hazard can range from minor repairs that can be performed with minimal maintenance staff time to catastrophic, requiring major repair, replacement, and reconstruction of buildings and their components. These costs can range from minimal staff salary expenditures to entire building replacement.

Table E-7 lists particular critical facilities and other community assets identified by the District’s planning team as important to protect in the event of a disaster.

Table E-7 El Dorado County Office of Education's Critical Facilities, Infrastructure, and Other Assets

LIST OF ASSETS AND ESTIMATE OF POTENTIAL LOSS

**EL DORADO COUNTY OFFICE OF EDUCATION
ONSITE BUILDINGS OWNED**

Building	Location	Total S.F.	Cost of Replacement
"A"	6767 Green Valley Rd	7,400	\$673,400
"B"	Placerville, CA	2,945	\$267,995
"C"		4,075	\$370,825
"D"		4,498	\$409,318
"E"		2,304	\$209,664
"F"		4,970	\$452,270
"G"		960	\$87,360
"H"		960	\$87,360
"I"		960	\$87,360
"J"		14,108	\$1,283,828
"K"		4,052	\$368,732
"L"		5,600	\$509,600
"M"		12,251	\$1,114,841
Storage Shed		576	\$52,416

Functional value for schools is defined by FEMA as \$91.00 per square foot.

The replacement amount is a VALUE amount only, and does not include costs for site work, utilities, or the contents of the buildings.

**EL DORADO COUNTY OFFICE OF EDUCATION
OFFSITE BUILDINGS OWNED**

Building	Location	Total S.F.	Cost of Replacement
Al Tahoe	Lake Tahoe	960	\$87,360
Bliss	Placerville	4,546	\$413,686
Bliss	Placerville	960	\$87,360
Blue Oak	Cameron Park	960	\$87,360
Buckeye	Cameron Park	960	\$87,360
Brooks	Cameron Park	960	\$87,360
Camerado Springs	Cameron Park	1,440	\$131,040
Camerado Springs	Cameron Park	1,440	\$131,040
Camino	Camino	960	\$87,360
Charles Brown	El Dorado	960	\$87,360
NCCT	El Dorado	4,891	\$445,081
Gallion	Mt. Aukum	930	\$84,630
Georgetown	Georgetown	960	\$87,360
Georgetown	Georgetown	960	\$87,360
Gold Oak	Pleasant Valley	5,605	\$510,055
Gold Oak	Pleasant Valley	960	\$87,360
Gold Trail	Placerville	960	\$87,360
Markham	Placerville	960	\$87,360
Melendez	Placerville	1,120	\$101,920
Oak Meadow	El Dorado Hills	960	\$87,360
Pacific Street	Placerville	4,083	\$371,553
Pinewood	Pollock Pines	960	\$87,360
Pollock Pines	Pollock Pines	960	\$87,360
Ponderosa	Shingle Springs	1,440	\$131,040
ROP	Yerington, NV	3,600	\$327,600
Silva Valley	El Dorado Hills	960	\$87,360
Silva Valley	El Dorado Hills	640	\$58,240
Smith Flat	Placerville	4,588	\$417,508
Smith Flat	Placerville	1,152	\$104,832
Smith Flat	Placerville	960	\$87,360
Tahoe House	Lake Tahoe	1,089	\$99,099
Tahoe Multi-Use	Lake Tahoe	7,000	\$637,000
Tunnel Street	Placerville	1,394	\$126,854
Veerkamp Park	Placerville	880	\$80,080
Winnie Wakeley	Camino	8,360	\$760,760

Functional value for schools is defined by FEMA as \$91.00 per square foot.

The replacement amount is a VALUE amount only, and does not include costs for site work, utilities, or the contents of the buildings.

**EL DORADO COUNTY OFFICE OF EDUCATION
OFFSITE BUILDINGS LEASED**

Building	Location	Total S.F.	Cost of Replacement
Gold Trail D.O.	Placerville	1,500	\$136,500
Golden Center	Placerville	7,000	\$637,000

Functional value for schools is defined by FEMA as \$91.00 per square foot.

The replacement amount is a VALUE amount only, and does not include costs for site work, utilities, or the contents of the buildings.

It is important to reiterate that El Dorado County school buildings and equipment are utilized by the community during disasters and severe weather. School facilities are used for emergency shelters and staging areas for emergency equipment. The importance of maintaining the facilities and providing a safe environment goes far beyond the students, personnel, and community.

Likelihood of Future Occurrence

Extremely Likely — From May to October of each year, El Dorado County faces a serious wildland fire threat. Fires will continue to occur on an annual basis in El Dorado County. The threat of wildfire and potential losses are constantly increasing as human development and population increase and the wildland urban interface areas expand. Due to its high fuel load and long, dry summers, most of El Dorado County continues to be at risk from wildfire.

Climate Change and Wildfire

Warmer temperature can exacerbate drought conditions. Drought often kills plants, which serve as fuel for wildfires. Warmer temperatures could increase the number of wildfires and pest outbreaks, such as the western pine beetle.

Severe Weather

Severe weather is generally any destructive weather event, but usually occurs in all areas of El Dorado County as storms that bring heavy rain, hail, lightning, and strong winds. While the storms may be localized, they can be extensive in their damage and impact.

The National Oceanic and Atmospheric Administration's National Climatic Data Center (NCDC) has been tracking severe weather since 1950, including all weather events from 1993 to current (except from 6/1993-7/1993); and additional data from the Storm Prediction Center, which includes tornadoes (1950-1992),

thunderstorm winds (1955-1992), and hail (1955-1992). This database contains 549 severe weather events that occurred in El Dorado County (El Dorado County is included in the following zones: Southern Sacramento Valley, Motherlode, West Slope Northern Sierra Nevada, Greater Lake Tahoe Area) between July 1, 2009, and December 31, 2017.

Table E-8 NCDC events effecting El Dorado County

Event Type	Number of Events	Deaths	Deaths (indirect)	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Avalanche	8	5	0	0	0	\$0	\$0
Blizzard	1	0	0	0	0	\$0	\$0
Debris Flows	9	0	0	0	0	\$6,540,000	\$0
Dense Fog	11	0	3	0	0	\$200,000	\$0
Dense Smoke	2	0	0	0	0	\$0	\$0
Drought	45	0	0	0	0	\$0	\$0
Excessive Heat	4	6	2	1	0	\$0	\$0
Extreme	1	0	0	0	0	\$0	\$0
Flood	7	0	0	0	0	\$1,750,000	\$0
Frost/Freeze	2	0	0	0	0	\$0	\$0
Hail	10	0	0	0	0	\$1,000	\$0
Heat	3	15	0	0	0	\$0	\$0
Heavy Rain	72	0	1	0	0	\$0	\$0
Heavy Snow	173	1	3	0	1	\$25,000	\$0
High Wind	20	1	0	1	0	\$1,480,000	\$0
Strong Wind	36	1	2	2	1	\$3,857,000	\$0
Tornado	3	0	0	0	0	\$1,002,000	\$0
Wildfire	11	0	0	17	0	\$500,225,000	\$0
Winter Storm	80	1	2	0	0	\$400,000	\$0
Winter Weather	45	1	0	0	0	\$0	\$0
Total	549	34	43	4	2	\$515,480,000.	\$0.00

Source: NCDC

Due to size of the County and changes in elevation from approximately 760 feet to more than 10,886 feet, weather conditions can vary greatly across the County. For purposes of this hazard profile, the County will be divided into two distinct sections, as applicable: western El Dorado County, which is predominantly below an elevation of 4,000 feet, is generally below the snowfall line (although snow has fallen at lower elevations), and includes the community of Camino and all land to the west (including all incorporated cities and towns); and eastern slope of El Dorado County, which is generally above 4,000 feet, receives snowfall, and includes all of the County east of Pollock Pines.

Severe Weather and Climate Change

Climate change is a natural occurrence in which the earth has warmed and cooled periodically over geologic-time. The recent and rapid warming of the earth over the past century has been cause for concern, as this warming has been associated with the accumulation of human-caused greenhouse gases such as CO₂, in the atmosphere. This warming has taken place almost everywhere over the continents which strongly suggest that there is a global cause, rather than a mere coincidence of weather patterns that would result in patches of warming and cooling. The effects of climate change are varied: warmer and more varied weather patterns, melting ice caps, and poor air quality, for example.

The 2013 State of California Multi-Hazard Mitigation Plan stated that climate change is already affecting California. Sea levels have risen by as much as seven inches along the California coast over the last century, increasing erosion and pressure on the state's infrastructure, water supplies, and natural resources. The State has also seen increased average temperatures, more extreme hot days, fewer cold nights, a lengthening of the growing season, shifts in the water cycle with less winter precipitation falling as snow, and both snowmelt and rainwater running off sooner in the year. Extreme temperatures (hot) are often found in the Western part of El Dorado County (El Dorado Hills, Cameron Park, Placerville) and extreme temperatures (cold) are often found in east of Camino/Pollock Pines and in the Tahoe Basin. El Dorado County uses the National Weather Service's heat index to measure the extent and duration of heat events. El Dorado County uses the National Weather Service's forecast, advisories, watches and warnings to prepare for and respond to extreme cold and heat events. In addition to changes in average temperatures, sea level, and precipitation patterns, the intensity of extreme weather events is also changing.

Thunderstorms/Tornadoes

Storms in El Dorado County are generally characterized by heavy rain often accompanied by strong winds and sometimes lightning and hail. Approximately 10 percent of the thunderstorms that occur each year in the United States are classified as severe. A thunderstorm is classified as severe when it contains one or more of the following phenomena: hail that is three-quarters of an inch or greater, winds in excess of 50 knots (57.5 mph), or a tornado. Heavy precipitation in the El Dorado County area falls mainly in the fall, winter, and spring months.

Heavy Rain and Thunderstorms

The NWS reports that thunderstorms result from the rapid upward movement of warm, moist air. They can occur inside warm, moist air masses and at fronts. As the warm, moist air moves upward, it cools, condenses, and forms cumulonimbus

clouds that can reach heights of greater than 35,000 ft. As the rising air reaches its dew point, water droplets and ice form and begin falling the long distance through the clouds towards earth's surface. As the droplets fall, they collide with other droplets and become larger. The falling droplets create a downdraft of air that spreads out at Earth's surface and causes strong winds associated with thunderstorms.

Short-term, heavy storms can cause both widespread flooding as well as extensive localized drainage issues. With the increased growth of the area, the lack of adequate drainage systems has become an increasingly important issue. In addition to the flooding that often occurs during these storms, strong winds, when combined with saturated ground conditions, can down very mature trees.

Hail

Hail is formed when water droplets freeze and thaw as they are thrown high into the upper atmosphere by the violent internal forces of thunderstorms. Hail is sometimes associated with severe storms within the El Dorado County Planning Area. Hailstones are usually less than two inches in diameter and can fall at speeds of 120 miles per hour (mph). Severe hailstorms can be quite destructive, causing damage to roofs, buildings, automobiles, vegetation, and crops.

Lightning

Lightning is defined by the NWS as any and all of the various forms of visible electrical discharge caused by thunderstorms. Thunderstorms and lightning are usually (but not always) accompanied by rain. Cloud- to-ground lightning can kill or injure people by direct or indirect means. Objects can be struck directly, which may result in an explosion, burn, or total destruction. Or, damage may be indirect, when the current passes through or near an object, which generally results in less damage.

Winds

High winds, often accompanying severe thunderstorms, can cause significant property and crop damage, threaten public safety, and have adverse economic impacts from business closures and power loss.

El Dorado County is subject to significant, non-tornadic (straight-line), winds. High winds, as defined by the NWS glossary, are sustained wind speeds of 40 mph or greater lasting for 1 hour or longer, or winds of 58 mph or greater for any duration. These winds may occur as part of a seasonal climate pattern or in relation to other severe weather events such as thunderstorms. Straight-line winds may also exacerbate existing weather conditions by increasing the effect on temperature and decreasing visibility due to the movement of particulate matters through the air, as in dust and snow storms. The winds may also exacerbate fire conditions by

drying out the ground cover, propelling fuel around the region, and increasing the ferocity of exiting fires. These winds may damage crops, push automobiles off roads, damage roofs and structures, and cause secondary damage due to flying debris.

Past Occurrences - Disaster Declaration History

A search of FEMA and Cal/OES disaster declarations turned up multiple events.

STATE disaster declarations occurred:	FEDERAL disaster declarations occurred:
1958 (x2)	1958
1964 (x2)	1964
1969	1969
1973	1983
1983	1986
1986	1995 (x2)
1993	1997
1997	2006 (x2)
2006 (x2)	2017 (x3)
2008	

National Climatic Data Center (NCDC) Events

The NCDC data recorded 189 hail, heavy rain, wind, and tornado incidents for El Dorado County since 2004. A summary of these events are shown in Table E-9. Specific events in the NCDC database showing damages, deaths, or injuries are detailed below the table.

Table E-9 National Climatic Data Center Events from 2004 – 2018

Event Type	Number of Events	Deaths	Deaths (indirect)	Injuries	Injuries (indirect)	Property Damage	Crop Damage
Hail	10	0	0	0	0	\$1,000	\$0
Heavy Rain	83	0	1	0	0	\$0	\$0
High Wind	51	1	1	1	0	\$10,790,000	\$11,000
Strong Wind	42	1	1	2	2	\$4,022,600	\$0
Thunderstorm Wind	0	0	0	0	0	\$0	\$0
Tornado	3	0	0	0	0	\$1,002,000	\$0
Total	189	2	3	3	2	\$15,815,600	\$11,000

Source: NCDC

December 9, 1996 – Damage was observed in South Lake Tahoe from strong gusty winds during the morning hours. Trees fell on a couple of homes, causing \$50,000 in damage. From surrounding data, winds were estimated in the 55 to 65 mph range. No deaths or injuries were reported.

November 7, 2002 – Wind gusts estimated at over 80 mph blew down trees in the South Lake Tahoe, CA area. Falling trees severely damaged one home and two vehicles. Tree limbs damaged four other homes and downed several power lines, causing scattered power outages. Sparking electric lines caused two brush fires, the largest of which scorched 30 acres. No injuries or deaths were reported. Damages of \$300,000 were reported.

December 14, 2002 – strong cold front moving through northern California on December 14 brought near-record high winds to northeast California and western Nevada. Wind gusts reports in the 60-80 mph range were common throughout the day across the entire region, with a few gusts near 100 mph. Remote wind sensors along the Sierra Crest measured wind gusts in excess of 130 mph. The strongest winds occurred just before the cold front moved into the area at about 5:30 p.m. Hundreds of trees and thousands of tree limbs were blown down across the region. In addition, there was widespread damage to roofs, fences, commercial billboards and signs, and power lines. Numerous power outages occurred, some lasting for several days after the event in rural areas. A few relatively minor traffic accidents resulted from the low visibilities. From these, a few minor injuries were reported but fortunately no serious injuries or deaths were reported. The regional electric utility lost 140 power poles and 18 transmission line due to the strong winds, with damages and repair costs estimated at over \$3M. Total regional wind damage costs were estimated at ~\$10M.

December 26, 2006 – A wind gust estimated at 61 knots (70 mph) knocked over a 6-ft diameter pine tree in South Lake Tahoe. The high winds also took down power lines across the area.

August 18, 2010 – South-southwest to southwest winds on Lake Tahoe were sustained between 20 to 25 mph from late morning to early evening on the 18th. The winds (and waves it generated) were sufficient to sink 3 boats. \$100,000 in damages were reported.

December 11, 2014 – Winds gusted to 60 and 70 mph at the Truckee and South Lake Tahoe airports, respectively, on the morning of the 11th. Over the Sierra ridges, winds gusted as high as 135 mph. Numerous trees and power lines were downed, along with damage to several homes and vehicles due to fallen trees. The power outages, some lasting up to 2 days, caused South Lake Tahoe schools to be closed through the 12th. Finally, winds downed a tree which caused the death of a teenager in a heavily wooded area. Damages from this event were estimated at \$700,000.

Repetitive Loss Information

El Dorado County Office of Education is a special district, and as such, does not participate in the NFIP and does not have repetitive loss information.

Capability Assessment

Thus far, the planning process has identified the natural hazards posing a threat to the Planning Area and described, in general, the vulnerability of the County to these risks. The next step is to assess what loss prevention mechanisms are already in place. This part of the planning process is the mitigation capability assessment. Combining the risk assessment with the mitigation capability assessment results in the County's net vulnerability to disasters, and more accurately focuses the goals, objectives, and proposed actions of this plan.

Mitigation Capabilities

The chart below lists regulatory mitigation capabilities, including planning and land management tools, typically used by local jurisdictions to implement hazard mitigation activities and indicates those that are in the place for EDCOE.

Table E-10 Mitigation Capabilities

Plans	Y/N Year	Does the plan/program address hazards? Does the plan identify projects to include in the mitigation strategy? Can the plan be used to implement mitigation actions?
Comprehensive/Master Plan	No	All General Plans are under the jurisdiction of El Dorado County
Capital Improvement Plan	Yes	EDCOE has Schedules for planned building improvements
Economic Development Plan	No	Jurisdiction of El Dorado County, City of Placerville and City of South Lake Tahoe
Local Emergency Operations Plans	Yes	The Plans that EDCOE is involved in are run through El Dorado County OES' along with local fire responders and other public agencies
Continuity of Operations Plan	No	
Transportation Plan	No	
Stormwater Plan/Program	No	
Community Wildfire Protection Plan	No	
Building Code, Permitting, and Inspections	Y/N	Are codes adequately enforced?
Building Code	No	Jurisdiction of El Dorado County, City of Placerville and City of South Lake Tahoe
Building Code Effectiveness Grading Schedule	No	
Fire Department ISO rating	No	El Dorado County Fire and other local fire agencies
Site plan review requirement	No	

Land Use Planning & Ordinances	Y/N	Is the ordinance an effective measure for reducing hazard impacts? Is the ordinance adequately administered and enforced?
Zoning Ordinance	No	Jurisdiction of El Dorado County, City of Placerville and City of South Lake Tahoe
Subdivision Ordinance	No	Jurisdiction of El Dorado County, City of Placerville and City of South Lake Tahoe
Floodplain Ordinance	No	Jurisdiction of El Dorado County, City of Placerville and City of South Lake Tahoe
Natural hazard specific ordinance (stormwater, etc.)	No	
Flood insurance rate maps	No	
Elevation Certificates	No	
Acquisition of land for open space & public recreation	No	
Erosion control program	No	
How can these capabilities be expanded and improved to reduce risk?		

As indicated above, EDCOE has programs, plans, policies and Ed Code that guide hazard mitigation. Some of these are described below:

School District Master Plans

School Districts in El Dorado County have master plans that address the current and future facility needs of the District. Plans include information on student demographics, existing school facilities, conditions of the facilities, short and long range planning needs, routine and deferred maintenance needs for facilities.

School Safety Plans

Each District in El Dorado County has a schools safety plan, and those plans are updated annually. Comprehensive School Safety Plans are created and enforce policies and procedures that promote a safe, caring, and disciplined environment for students and staff. EDCOE works closely with El Dorado County Sheriff's Office of Emergency Service and local fire to ensure plans meet their needs in providing emergency response.

Administrative/Technical Mitigation Capabilities

Table E-11 Administrative/Technical Mitigation Capabilities

Administration	Y/N	Describe capability Is coordination effective?
Planning Commission	N	
Mitigation Planning Committee	N	
Maintenance to reduce risk (tree trimming, clearing drainage etc.)	Y	
Mutual Aid Agreements	Y	

Other		
Staff	Y/N FT/PT	Is staffing adequate to enforce regulations? Is staff trained on hazards and mitigations? Is coordination between agencies and staff effective?
Chief Building Official	N	
Floodplain Administrator	N	
Emergency Manager	Y	Director of Facilities
Community Planner	N	
Other		
Technical		
Warning systems (Reverse 911, communication speakers)	Y	IT and Communications Director
Hazard Data and Information	N	
Grant Writing	N	
Other		
How can these capabilities be expanded and improved to reduce risk?		

Fiscal Mitigation Capabilities

Table E-12 Fiscal Mitigation Capabilities

Funding Resource	Access/ Eligibility (Y/N)	Has the funding resource been used in past and for what type of activities? Could the response be used to fund future mitigation actions?
Capital improvements	Y	State school building program
Authority to levy taxes	Y	School impact fees, districts only, not EDCOE
Fees for water, sewers gas or electric	N	
Impact fees for new development	Y	Districts only, not EDCOE
Storm water utility fee	N	
Incur debt through general obligations bonds	Y	Districts only, not EDCOE
Incur debt through private activities	N	
Community Development Block Grant	N	
Other Federal funding	Y	Grants
Other		
How can these capabilities be expanded and improved to reduce risk?		

Mitigation Outreach and Partnerships

Program/Organization	Yes/No	Describe program/organization and how relates to disaster resilience and mitigation. Could the program/organization help implement future mitigation activities?
Local citizen groups or non-profit organizations focused on environmental protection, emergency preparedness, access and functional needs populations, etc.	N	
Ongoing public education or information program (e.g., responsible water use, fire safety, household preparedness, environmental education)	Y	This has been done through educational resources available through the schools, as well as information contained on the District's website.
Natural disaster or safety related school programs	Y	All of the schools participate in regular safety drills, and the District works regularly on our natural disaster plan.
StormReady certification		
Firewise Communities certification		
Public-private partnership initiatives addressing disaster-related issues		
Other		

Other Mitigation Efforts

Wildfire Actions - Public Education

Hazards Addressed: Wildfire

Issue/Background: Public education through community outreach is a must in El Dorado County. This is an ongoing strategy and included in all mitigation efforts. El Dorado County, fire agencies, Animal Services, FireSafe councils and other stakeholders work with as many residents as possible to provide information on defensible space and living with fire.

Other Alternatives: Each property owner or land manager needs to manage properties and infrastructure within their responsibility. While public service messages and media helps tell the public of their responsibility for defensible space and fire mitigation, specific and direct communications and training information increases the chance of reaching the public.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Work with the current property owner or land manager to implement fuels management and fire prevention projects identified in the Western Slope CWPP WUI area. Apply for local, State, or Federal funding to implement these plans.

Project Priority: High

Responsible Office: El Dorado County Office of Emergency Services, fire agencies, animal services, cities, fire safe councils, special districts, community service districts, public/private partners in fire safety.

Partners: Cities of Placerville and South Lake Tahoe, El Dorado County Office of Education, El Dorado Irrigation District, South Tahoe Public Utility District, Fire Prevention Districts, Fire Safe Councils, Georgetown Public Utility District, Community Service Districts and Other Special Districts

Cost Estimate: Staff time

Benefits (Losses Avoided): Provide the tools and resources to develop, purchase, and maintain needed public education material to educate El Dorado County residents on wildfire prevention and Firewise Community techniques.

Potential Funding: County, State, and Federal funding.

Schedule: Ongoing

Wildfire - Defensible Space

Defensible Space Programs

Issue/Background: These projects address the ongoing need to manage fuels in and around privately owned homes, businesses and communities, freeways and roadways, and "Assets at Risk" in El Dorado County. Small communities, individual property owners and infrastructure assets can be impacted by roadside fire starts and fire starts moving into or out of private property.

When complete, these projects will protect Assets at Risk and projects the communities have identified in the CWPP.

The El Dorado County Fire Safe Councils have worked with County, State, and individual property owners to identify areas within their jurisdictions to provide fuels management projects to reduce the risk of wildfire starts and spread along roadways and into or out of individual properties.

Other Alternatives: Each property owner or land manager needs to manage properties and infrastructure within their responsibility. Spread from fire starts within their property can only be prevented or contained by the fire prevention and fuel management work done by the owner.

Existing Planning Mechanism(s) through which Action Will Be Implemented: Work with the current property owner or land manager to implement fuels management and fire prevention projects identified in the Western Slope CWPP WUI area. Apply for local, State, or Federal funding to implement these plans.

Project Priority: High

Responsible Office: El Dorado County Office of Emergency Services, fire agencies, cities, fire safe councils, special districts, community service districts, public/private partners in fire safety.

Partners: Cities of Placerville and South Lake Tahoe, El Dorado County Office of Education, El Dorado Irrigation District, South Tahoe Public Utility District, Fire Prevention Districts, Fire Safe Councils, Georgetown Public Utility District, Community Service Districts and Other Special Districts

Cost Estimate: Dependent on project.

Benefits (Losses Avoided): Reduced risk of loss of life and property from catastrophic wildfire in developed communities, towns, and city's within the County. Loss of assets at risk can have significant impact on those outside of the County. Communication links and interstate transportation can be significantly impact by wildfire along the Highway 50 corridor.

Potential Funding: County, State, and Federal funding

Schedule: Ongoing

Severe Weather/Extreme Temperatures

Increase Awareness of Extreme Temperature Risk and Safety.

Through public education campaigns, El Dorado County will work with agencies that serve vulnerable populations to prepare for extreme temperatures.

Hazards Addressed: Severe Weather/Extreme Temperature

Issue/Background: Continue to raise awareness and planning regarding extreme temperatures and addressing needs of vulnerable populations.

Other Alternatives: No action.

Existing Planning Mechanism(s) through which Action Will Be Implemented:

Funding through public health preparedness grants.

Responsible Office/Partners: El Dorado County, healthcare facilities
Partners: Cities of Placerville and South Lake Tahoe, El Dorado County Office of Education, El Dorado Irrigation District, South Tahoe Public Utility District, Fire Prevention Districts, Fire Safe Councils, Georgetown Public Utility District, Community Service Districts and Other Special Districts.
Project Priority: Medium

