

# Ignition Workload Assessment

## Fire Cause

*It is extremely important to determine how fires are caused, where fires occur, and whether the Unit is meeting the Department’s goal of containing 95 percent of all wildfires at 10 acres or less. Determining causal trends can direct the Unit to specific prevention efforts to change that causal trend. The location where the majority of fires occur can help determine where prevention and pre-fire efforts might produce the greatest result.*

The ignition workload assessment is derived from data collected from CAL FIRE’s Emergency Activity Reporting System (EARS). This fire reporting system utilizes the National Fire Protection Association (NFPA) Standard 901 coding convention. CAL FIRE has historically classified fire causes into twelve General Causes while the NFPA causal data is collected as causal factors. EARS reports extrapolate the causal factors into the twelve general causes. This results in some differences in fire cause totals.

The Fire Plan data only uses ignitions that have caused a vegetation fire. The Shasta Trinity Unit collects data for all ignitions including non-vegetation fires such as structure or vehicle fires. Many of these ignitions could have spread to the wildland vegetation, but suppression activity contained the fire to the original material ignited. This Unit data includes only State Responsibility Area (SRA) fires.

This plan utilizes both sets of ignition data. Percentage of causes in the two data sets very nearly mirrors one another. There is a discrepancy in the Equipment-Use category. This is partially because many of the non-vegetation type fires are equipment-use caused. EARS data under reported arson caused fires in 2003. Fire cause data entered as “suspicious – probable arson” were reported as “other miscellaneous” in EARS.

## Unit Wide Incident Data

*Ears Fire Cause data extrapolated from NFPA 901 causal factor data.*

### 10 Year Vegetation Fire Cause

Fire Cause	Number of fires by cause										10 year percentage	
	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	Totals	10 yr avg.
Unidentified	14	18	15	26	41	30	39	31	39	38	291	10.23%
Lightning	13	20	40	42	73	13	30	9	15	40	295	10.37%
Campfire	6	11	4	3	10	2	4	6	4	2	52	1.83%
Smoking	30	31	27	29	23	12	20	30	17	13	232	8.15%
Debris	27	30	45	10	44	19	35	35	22	33	300	10.54%
Arson	51	44	36	44	74	22	35	29	11	21	367	12.90%
Use of Equipment	43	58	28	45	57	41	43	37	57	48	457	16.06%
Vehicle	25	45	26	18	27	18	24	29	25	30	267	9.38%
Railroad	0	3	0	3	3	0	1	1	0	0	11	0.39%
Powerline	11	11	6	2	7	11	16	11	8	6	89	3.13%
Playing with Fire	28	20	29	6	18	8	16	14	7	13	159	5.59%
Other/Misc.	41	32	28	25	62	31	31	26	31	18	325	11.42%
<b>Totals</b>	<b>289</b>	<b>323</b>	<b>284</b>	<b>253</b>	<b>439</b>	<b>207</b>	<b>294</b>	<b>258</b>	<b>236</b>	<b>262</b>	<b>2845</b>	

*Unit Fire Cause data including non-vegetation fire data.*

**5 Year Shasta - Trinity Fire Cause**

<b>Fire Cause</b>	<b>2000</b>	<b>2001</b>	<b>2002</b>	<b>2003</b>	<b>2004</b>	<b>Totals</b>	<b>Avg #</b>	<b>% Cause</b>
Undetermined	46	47	29	42	20	<b>184</b>	<b>36.80</b>	<b>11.56%</b>
Lightning	13	42	12	14	49	<b>130</b>	<b>26.00</b>	<b>8.17%</b>
Campfire	7	3	12	5	10	<b>37</b>	<b>7.40</b>	<b>2.32%</b>
Smoking	11	18	18	20	10	<b>77</b>	<b>15.40</b>	<b>4.84%</b>
Debris Burning	27	47	33	36	42	<b>185</b>	<b>37.00</b>	<b>11.62%</b>
Arson	39	40	40	24	28	<b>171</b>	<b>34.20</b>	<b>10.74%</b>
Use Of Equipment	57	74	45	68	85	<b>329</b>	<b>65.80</b>	<b>20.67%</b>
Vehicle	15	28	34	20	59	<b>156</b>	<b>31.20</b>	<b>9.80%</b>
Railroad	0	1	0	0	0	<b>1</b>	<b>0.20</b>	<b>0.06%</b>
Powerline	22	23	19	17	9	<b>90</b>	<b>18.00</b>	<b>5.65%</b>
Playing W/ Fire	23	24	18	18	17	<b>100</b>	<b>20.00</b>	<b>6.28%</b>
Other/Misc.	12	21	29	25	45	<b>132</b>	<b>26.40</b>	<b>8.29%</b>
<b>Totals</b>	<b>272</b>	<b>368</b>	<b>289</b>	<b>289</b>	<b>374</b>	<b>1592</b>	<b>318.40</b>	

*Comparison of Unit fire cause data and EARS data. Unit data includes non-vegetation fires.*

	<b>EARS</b>	<b>UNIT #</b>
<b>Undetermined</b>	<b>10.23%</b>	<b>11.56%</b>
<b>Lightning</b>	<b>10.37%</b>	<b>8.17%</b>
<b>Campfire</b>	<b>1.83%</b>	<b>2.32%</b>
<b>Smoking</b>	<b>8.15%</b>	<b>4.84%</b>
<b>Debris</b>	<b>10.54%</b>	<b>11.62%</b>
<b>Arson</b>	<b>12.9%</b>	<b>10.74%</b>
<b>Use of Equipment</b>	<b>16.05%</b>	<b>20.67%</b>
<b>Playing with Fire</b>	<b>5.59%</b>	<b>6.28%</b>
<b>Misc.</b>	<b>11.42%</b>	<b>8.29%</b>
<b>Vehicle</b>	<b>9.38%</b>	<b>9.80%</b>
<b>Railroad</b>	<b>.39%</b>	<b>.06%</b>
<b>Powerline</b>	<b>3.13%</b>	<b>5.65%</b>

Unwanted vegetation fires damaged approximately 71,240 acres of land during the last ten years (1995 – 2004 inclusive), causing an estimated \$91,336,617 property loss. **Use of equipment** was the leading fire cause during this time period.

The majority of equipment-use caused fires result from lawn mowers cutting dry grass. 53% of mower caused fires resulted from sparks when a mower blade struck a rock. Mower engine exhaust caused 47%; both faulty exhaust systems and exhaust contact with vegetation.

Efforts are under way to educate persons not to mow on hot dry afternoons when fire start conditions are highest. These education efforts should continue as well as efforts to ensure equipment exhaust systems are properly maintained and compliant with Public Resources Code 4442.

The remaining equipment caused vegetation fires vary from small-motorized tools to heavy equipment where no specific equipment type caused a substantial number of fires.

**Arson** is the second leading fire cause in the Unit. Historically one or two years may experience a high number of arson caused fires and the following years have minimal arson activity due to prevention efforts including arrest and conviction of arsonist.

**Miscellaneous** fire causes are those fires started by events or activities that cannot be logically placed in any of the other cause classes.

**Debris** burning caused fires still account for a sizable amount of fire incidents. These usually result because of inadequate clearance, weather conditions, a lack of attendance or a combination of these factors. Since the mid 1980's a statewide debris burn suspension has been in effect during the active fire season. This has resulted in fewer debris burn escapes. In 2004 the Air Quality Management Board instituted a ban on incinerator usage that may impact ignitions. There is a possibility of fewer ignitions because of reduced debris burning but also a potential of more escaped fires as some people may burn refuse in open fires in an attempt to avoid the incinerator use ban. Current fire prevention methods to control debris burn escapes are homeowner education and enforcement of the burn suspension and regulations.

**Vehicle**-caused fires are the result of the vehicle burning and spreading to the wildland or fires caused by the operation or some mechanical failure of vehicles. These fires usually start along the road edge. *(Some of the vehicle fires in this data set may be fires that were confined to the vehicle.)*

**Smoking**-caused fires are generally located along the roadside. Education and awareness programs should continue and possibly target specific areas. Roadside fuel treatments may often slow the fire spread.

**Undetermined** fires are those where no specific causal factor was discovered after investigation. Most often multiple fire causes cannot be eliminated and the fire is given an unidentified cause until further investigation can pinpoint the exact cause.

**Playing with fire** is a fire caused by children or adults with diminished mental capacity and do not understand the consequences of their actions. Involved children are counseled following FEMA's Juvenile Fire Setters /Arson Prevention Program guidelines

**Powerline**-caused fires may be started by vegetation touching the powerline, fallen wires, animals or other objects coming in contact with the wires, or mechanical failure of transmission connectors and equipment. Utility companies clear the vegetation near the powerlines in accordance with Public Resources Code 4293 – 4296.

**Campfire**-caused fires are not a major cause of vegetation fires, however they have caused fires within the Unit resulting in substantial damage.

**Railroad fires** are those fires caused by railroad equipment. The Unit has enforced railroad right of way clearance that has kept these fire starts at a minimum.

**Lightning** causes numerous fires throughout the year. Wildland vegetation, structures, and improvements such as power poles are affected. The majority of lightning caused vegetation fires are contained while small, however severe weather and the total number of ignitions can lead to large fires.

## Fire Incidents by Land Use

The majority of fires originate in the wildlands, along side roads, or on residential property. Wildland fires are not necessarily located in a remote area but are often fires that start outside the perimeter of residential property or open areas within the wildland urban interface. Plotting fire locations on Unit maps shows what one would expect; the majority of fires occur where the majority of people are concentrated

Approximately 22% of fires starting on domestic properties resulted from equipment-use, followed by debris burning, 21%, miscellaneous, 18 %, and playing with fire, 11%. Leading fire causes along roads are vehicle and equipment-use, 35%, arson 22%, and smoking, 17%.

Number of Fires by Land Use -- Shasta Trinity							
	2000	2001	2002	2003	2004	total	
Domestic	72	92	69	98	83	414	26.80%
Ranch/Farm	12	26	14	22	20	94	6.08%
Dump	3	2		1	2	8	0.52%
Road	90	111	106	84	86	477	30.87%
RXR	2	2	6	0	1	11	0.71%
Electric	0	0	2	0	0	2	0.13%
Utilities	0	1	2	1	0	4	0.26%
Forest Industry	7	3	12	9	9	40	2.59%
Recreation	4	4	3	6	1	18	1.17%
Commercial - Industrial	2	5	6	5	0	18	1.17%
Wildland	79	117	68	61	123	448	29.00%
Non-Wildland	0	3	0	0	2	5	0.32%
Other	1	2	1	2	0	6	0.39%
total	272	368	289	289	327	1545	100.00%

*Land Use determined by Unit Daily Fire Record, FC16 SHU 2000 – 2004*

Acreage by Fuel Type -- Shasta - Trinity							
	2000	2001	2002	2003	2004	total	
Timber	29	2747	627	1024	15276	19703	48.83%
Woodland	305	482	153	55	12274	13269	32.88%
Brush	40	536	121	118	1405	2220	5.50%
Grass	161	479	75	296	4036	5047	12.51%
Ag-Prod	2	0	0	0	111	113	0.28%
total	537	4244	976	1493	33102	40352	100.00%

*Data from Unit Daily Fire Record, FC16 SHU 2000 - 2004*