Appendix F

Fire Risk

Fire risk is the chance of a fire starting. Generally, risk increases with drier, hotter seasonal climate changes. This is determined by using the frequency of past fire starts. Fire frequency is expressed statistically as the number of fires per one thousand acres per year.

Low risk = 0 to 0.49. At least one fire expected every 20 or more years per thousand acres.

Moderate risk = 0.50 to 0.99. At least one fire expected in 11 to 20 years per thousand acres.

High risk = 1.0 or greater. At least one fire expected in 0 to 10 years per thousand acres.

For the Galena watershed, and the Project Area, fire frequency is 1.3 fires, per one thousand acres. For the project area it is 1.7 per one thousand acres. Lightning causes about 87 percent of the fire starts in the watershed—the remaining 13 per cent are human caused.

Fire Hazard for Surface Fires

Fire hazard relates to fuel accumulation and loadings. These hazards are seasonal in nature. Fire hazard is determined by combinations of slope, aspect, and ground fuels. The amount, type, and arrangement of ground fuels are classified by using fuel models developed by the National Forest Fire Laboratory.

Most of the project area is characterized by a fire behavior Fuel Model 9 (Timber, loosely compacted litter), and Fuel Model 10 (Timber, heavy litter) . Other fuel models present, include Fuel Models 1, 5, 8, 11 and 13. The following table displays the percent of each fuel model present.

Table 1 Fuel Models in the Project Area.

Fuel Model/ Description	Existing Fuel Models
1/Short Grass	8
2/ Timber-Grass Understory	0
6/ Shrubs	3
8/Timber-Compacted Litter	4
9/Timber-Loosely Compacted Litter	41
10/ Timber-Heavy Litter	38
11/Activity Created Slash	7
13/Blow down Generated Fuels	1

Fuel Models

Fuel Model 1: This fuel model is used to describe most of the non-forested areas with short grasses and shrub vegetation. It generally results in low to moderate severity fire with a low resistance to control and high spread rates.
Fuel Model 2: This fuel model is representative of the area burned by the Summit Fire and the Dry Forest type, where the canopy is open enough to allow grass. In Fuel Model 2, there can be high spread rate through the fine ground fuels.
Fuel Model 6: This fuel model represents shrub lands. Fires can spread quickly with increased flame lengths when winds exceed eight miles per hour. Lower wind speeds will help keep the fire on the ground.
Fuel Model 8: This fuel model represents timber with compacted litter. The fire spread rates are usually low. Torching and spotting results from downed woody concentrations where fire behavior would resemble Fuel Model 10.
Fuel Model 9: This fuel model is typical of dense ponderosa pine. Fires can run through surface litter at a high rate because of the loose arrangement. Concentrations of dead and down woody material will contribute to possible torching, spotting and crowning.
Fuel Model 10: This fuel model is typical of late succession, moist and Dry Forest types that are mixed conifer, including lodgepole pine. Fires in this fuel model can result in crowning, spotting, and torching of individual trees, particularly in sub-alpine fir.
In Fuel Model 11: In this fuel model the activity that generated the slash are thiamins and partial removals, not regeneration harvests. Fire potential is limited by typical light slash and shading from overstory.
Fuel Model 13: This fuel model represents the 300 acre area of almost complete blow down in Vinegar Creek. Heavy fuels in all size classes are present. The resistance to

control is high and the loosely compacted fuels makes it a safety hazard to fire fighters. The following table displays the percentage of each fuel model by subwatershed.

Potential Wildfire Susceptibility

The following table displays the acres of fire hazard and fire starts by subwatershed.

Table 2 Fire Frequency and Fire Starts by Subwatershed

SWS	Fire Starts				Fire Frequency
	1980-1989	1990-1998 all	1990-1998 lightning	1990-1998 human	1980-1998
Davis/Placer 30201	5	10	8	2	1.0
Vinegar 30203	8	14	13	1	1.5
Vincent 30205	3	11	11	0	2.0
L. Boulder/ Deerhorn 30207	7	18	18	0	1.2
Tincup/LButte 30209	8	19	17	2	1.9
Butte 30211	6	5	4	1	1.2
Granite Boulder 30213	5	12	9	3	1.2
Total	42	89	80	9	1.7

Appendix F Fuel Models page 4---Low intensity/high intensity wildfire

1 Historically, periodic low intensity fire was the typical behavior in forests, before Euro-American settlement, the open park-like forests were shaped by relatively cool surface fires.

2. Without periodic low intensity fires, which naturally thin forest stands, dense tree stocking develops in what was formerly open forests with large fire resistant trees.

3 Overstocking in multi-storied stands, provide ladder fuels allowing surface fires to move into the tree crowns, killing even fire resistant overstory trees such as Ponderosa pine and western larch.

4 Crown fires in trees are not easily contained, and cause stand destruction and severe burning of soils, with loss of native vegetation which could otherwise survive low intensity fires. The Summit Fire 1996 (this photo) was an example of this type of fire behavior.