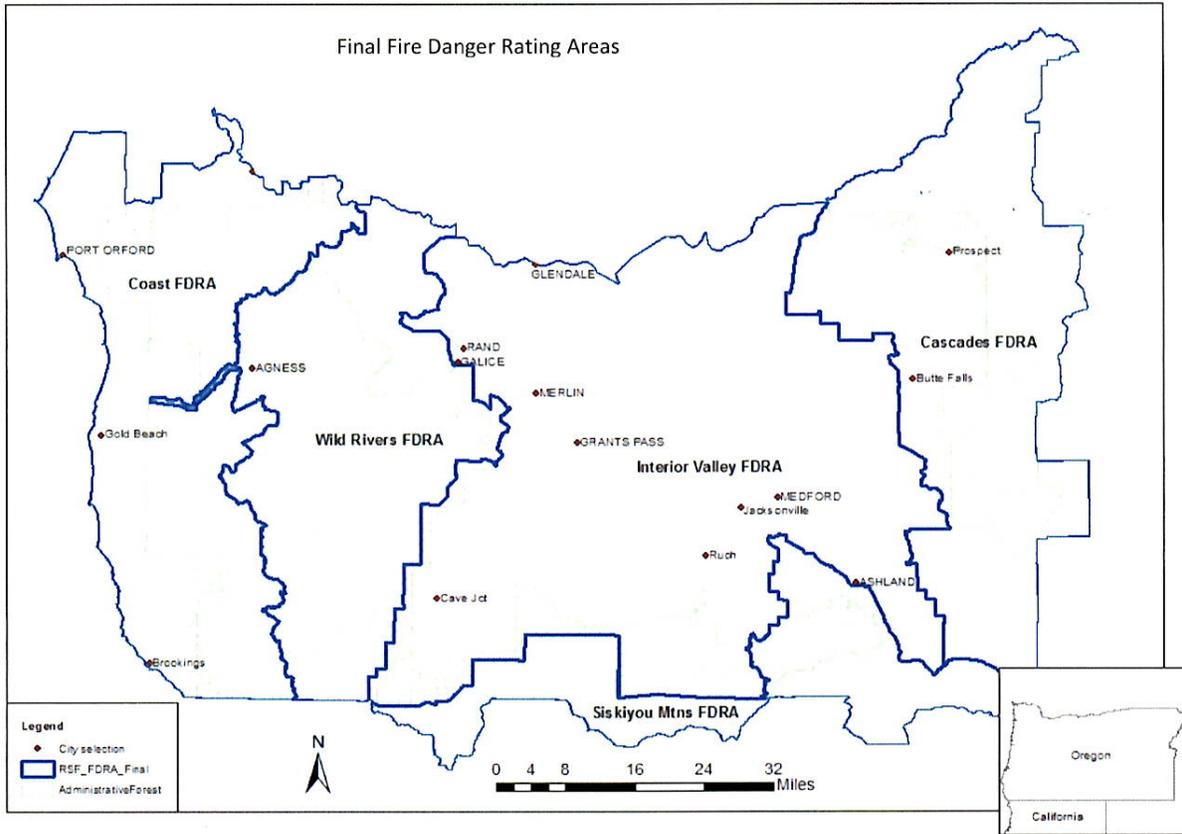


# Fire Danger Operating Plan

Rogue River –Siskiyou National Forest



2017 Plan Approval

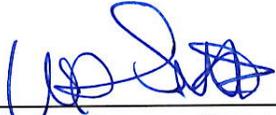
This Fire Danger Operating Plan is approved and will remain in effect until rescinded or revised.



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## Contents

Signatures .....	2
Contents .....	3
I.    Introduction .....	4
A. Administrative unit .....	5
B. Objectives.....	5
II.   Fire Danger Inventory .....	6
A. Fire Danger Rating Area Development .....	6
B. Fire Danger Rating Area Descriptions .....	7
C. Fire Occurrence .....	8
D. Weather.....	9
E. Vegetation .....	11
F. Topography .....	12
III.  Fire Business Analysis .....	14
A. Process .....	14
B. Settings .....	15
C. Results .....	15
IV.  Fire Danger Based Decisions .....	16
A. Staffing Level.....	16
B. Dispatch Level.....	17
C. Preparedness Level .....	18
D. Industrial Fire Precautions Level.....	23
E. Public Use Restrictions .....	23
F. Adjective Rating .....	24
V.   Operational Procedures .....	25
A. Weather Information Management System .....	25
VI.  Roles and Responsibilities .....	27
A. NFRDS Program Manger .....	27
B. Weather Station Manger .....	27
C. Data Manager .....	28
D. Duty Officer .....	28
E. Fire Planner .....	28
References .....	29
Appendix A: Fire Danger Rating Development/Analysis .....	30
Appendix B: Fire History .....	33
Appendix C: Industrial Fire Precautions Levels .....	36
Appendix D: Fire Danger Worksheet Instructions .....	37
Appendix E: Glossary .....	39

## I. Introduction

This plan is intended to document an operational planning and decision making process for agency administrators, fire managers, dispatchers and firefighters for the Rogue River – Siskiyou National Forest. The process used to develop this plan is consistent with what is taught in the National Wildfire Coordinating Group courses and is based upon available scientific methods incorporating historical fire and weather analysis.

The development process generally involves:

1. Acquire and quality control historic weather and fire history data.
2. Delineate Fire Danger Rating Areas based on vegetation, climate and topography.
3. Assign historic fire and weather data to fire danger rating areas.
4. Perform analysis for statistical correlation of historic fire occurrence with historic NFDRS outputs by FDRA and identify basis for future decisions.
5. Develop decision thresholds based on the NFDRS outputs and historic fire occurrence that best matches the intent of the decision.
6. Document the analysis, operation, communication, and maintenance re-evaluation process in a Fire Danger Operating Plan.

On July 6, 1994, the South Canyon Fire resulted in the deaths of 14 firefighters in Colorado. In 1995, an Interagency Management Review Team for the South Canyon Fire charged the National Advisory Group for Fire Danger Rating with developing an implementation plan to improve technical transfer of fire danger technology. On July 10, 2001, four firefighters lost their lives on the Thirtymile Fire in Washington. The Thirtymile tragedy prompted an Accident Prevention Plan which contained specific actions to enhance firefighter safety, including the need to identify thresholds for critical fuels and weather conditions that lead to extreme burning conditions and publishing these on pocket cards for use by firefighters. On July 22, 2003, two firefighters lost their lives in the Cramer Fire in central Idaho. OSHA levied serious violations which included the failure to recognize fire danger thresholds for large fires and respond accordingly. In addition, a remote automated weather station (RAWS) near the fire had not received maintenance and calibration before the start of the fire season. This plan addresses action items identified in these tragic fires by providing the direction necessary to convey fire danger awareness to fire management personnel of escalating fire potential.

Guidance and policy for development of a Fire Danger Operating Plan can be found in the Interagency Standards for Fire & Aviation Operations (Red Book) and Forest Service Manual 5120.

## A. Administrative Unit

The analysis area encompasses approximately 4.3 million acres in southwestern Oregon and extreme northern California covering portions of Oregon counties Coos, Curry, Josephine, Klamath, Douglas and Jackson and California counties Del Norte and Siskiyou. This plan incorporates approximately 1.5 million acres within the Rogue River – Siskiyou National Forest and lands within their initial attack responsibility. It also includes the Rogue River – Siskiyou National Forest’s response in mutual aid dispatch blocks for SW Oregon. Oregon Department of Forestry (ODF) has a separate Fire Danger Operating Plan which incorporates areas under their protection, as well as approximately 155,000 acres on the Rogue River – Siskiyou National Forest, that were analyzed but not included within this plan (see page 7 for further explanation).

Suppression resources within the plan area are dispatched out of the Rogue Valley Interagency Communication Center (RVICC) in Medford, Oregon. Rogue Valley Interagency Communication Center tracks and assigns personnel to initial attack incidents within lands administered by the Rogue River – Siskiyou National Forest and Oregon Caves National Monument and Preserve. The center is interagency with Medford District BLM and provides dispatch services for the BLM and fire dispatch services for the National Park Service. The center dispatch area is coincident with the forest boundary and ODF mutual aid dispatch blocks.

The following federal and state units have formal rating areas adjacent to this plan boundary.

1. Southwest Oregon Department of Forestry, OR (includes Coos Bay, Roseburg and Medford BLM)
2. South Central Oregon (includes Fremont-Winema National Forest, Lakeview District BLM, Crater Lake National Park, Klamath-Lake District ODF)
3. Six Rivers National Forest, CA
4. Klamath National Forest, CA
5. Umpqua National Forest, OR
6. Coos Forest Protective Association, OR

## B. Objectives

1. Provide a tool for agency administrators, fire managers, dispatcher, agency cooperators and firefighters to correlate fire danger ratings with appropriate fire business decisions.
2. Delineate fire danger rating areas with similar climate, vegetation and topography.
3. Establish and maintain an interagency fire weather monitoring network consisting of Remote Automated Weather Stations which comply with National Fire Danger Rating System standards (PMS 426-3).
4. Determine fire business thresholds using the Weather Information System, National Fire Danger Rating System and Fire Family Plus software through analysis of an integrated database of historical fire weather and fire occurrence data.
5. Define roles and responsibilities to make fire preparedness decisions, manage weather information, manage weather stations, and brief fire personnel regarding current and potential fire danger.
6. Develop and distribute fire danger pocket cards to all personnel involved with fire suppression activities within the Rogue River – Siskiyou NF portion of the plan area.
7. Identify program needs and suggest improvements for the plan.

## II. Fire Danger Inventory

### A. Fire Danger Rating Area Development

A Fire Danger Rating Area is defined as: “A geographic area relatively homogenous in climate, fuels and topography, tens of thousands of acres in size, within which the fire danger can be assumed to be uniform. Its size and shape is primarily based on influences of fire danger, not political boundaries. It is the basic on-the-ground unit for which unique fire management decisions are made based on fire danger ratings. Weather is represented by one or more National Fire Danger Rating System weather stations” (National Fire Danger Working Group, 2002). More detailed information can be found at <https://www.nwcg.gov/sites/default/files/products/pms932.pdf>.

An analysis of the plan area was completed using a GIS and spatial data sourced from various locations. Data used for analysis was developed consistently across the analysis area. Data analyzed includes; 30-meter Digital Elevation Model (DEM), NFDRS Slope Class (DEM derived), Bio Physical Settings (LANDFIRE, n.d.) and climate data produced by the PRISM Climate Group (Oregon State University, 2013) including 30 year normalized average annual precipitation and 30 year normalized average annual maximum temperature spanning 1981-2010. An analysis of weather station 10 year average daily observations (Fosberg, 1973) was also considered during the development of fire danger rating areas.

FDRAs were initially delineated based on the degree of affect that separating the fire environment component (topography, vegetation, and climate) would have on NFDRS indices and components. They were adjusted to an administrative and dispatch block boundary based on the desire to apply different fire management decisions and to keep consistency within the dispatch blocks. This initially resulted in eight FDRAs.

A desire to reduce the number of FDRAs along with similarities in vegetation, fire business, climate, and topography led to the combination of three of the FDRAs. Analysis of fire business showed no benefit in keeping the FDRAs separated out.

<u>Initial FRDAs</u>		<u>Final FDRAs</u>
1. Siskiyou Mountains	}	1. Siskiyou Mountains
2. Monument		
3. Valley West	}	2. Interior Valleys
4. Valley East		
5. Cascade Foothills	}	3. Cascade
6. High Cascades		
7. Wild Rivers		4. Wild Rivers
8. Coast		5. Coast

Dispatch block boundaries are currently under review and proposed changes are anticipated to be minimal along boundaries that are shared with FDRAs. FDRA boundaries were adjusted slightly after the analysis was completed and may be readjusted to new dispatch block boundaries once those are established.

## B. Fire Danger Rating Area Descriptions

Table 1: Fire Danger Rating Area selected spatial statistics

FDRA	Acres	Mean Elevation	Median Slope Class	Mean Precipitation	Mean Temperature	Median Climate Class
Siskiyou Mountains	375,000	3,933	2	27	82	2
<i>Siskiyou Mountains Monument</i>		4,315	2	33	79	2
		3,550	1	21	85	2
Interior Valleys	1,622,135	2,343	1	27	86	1
<i>Valley West</i>		2,320	2	26	86	2
<i>Valley East</i>		2,366	1	28	85	1
Cascades	837,021	4,300	1	46	80	3
<i>Cascade Foothills</i>		3,645	1	40	82	3
<i>High Cascades</i>		4,955	1	53	78	3
Wild Rivers	705,103	2,452	3	55	83	4
Coast	803,113	1,474	2	84	76	4

### Siskiyou Mountains

This FDRA encompasses the Klamath-Siskiyou Mountain Range and includes lands in California. It follows an administrative boundary with the Klamath National Forest on the southern edge and a change in vegetation and topography on the northern edge.

Reasons for combining the initial Siskiyou Mountain and Monument FDRA included a desire to reduce the number of FDRAs; similar topography, climate, vegetation; and similar fire occurrence.

### Interior Valleys

The Interior Valleys FDRA consists of approximately 1.6 million acres which is primarily under the protection of ODF. ODF has a separate FDOP covering this area using their criteria and business rules. Along the south and west boundary of this FDRA lies approximately 155,000 acres under USFS protection. A decision was made to utilize the ODF pocket cards for the USFS protected areas in this FDRA to reduce confusion and maintain consistency with our partners. Pocket cards for this area can be found at [http://www.oregon.gov/ODF/Documents/Fire/FEWG/PC\\_2014\\_SWO.pdf](http://www.oregon.gov/ODF/Documents/Fire/FEWG/PC_2014_SWO.pdf)

### Cascade

The FDRA encompasses the Cascade Range. It follows the forest boundary with the Fremont-Winema and Umpqua on the eastern and northern edges and changes in vegetation and climate on the western edge. It is the highest FDRA in elevation and has a greater snowpack than the rest of the analysis area.

Reasons for combining the initial High Cascades and Cascade Foothills FDRAs included a desire to reduce the number of FDRAs; similar topography, climate, vegetation; and similar fire occurrence.

### Wild Rivers

On the western edge, this FDRA covers the area from near the top of the Coastal Range to the valley bottom on the eastern edge. Significant climate and vegetation changes separate this out from neighboring FDRAs. It is dominated by Douglas-fir and the steepest slopes in the analysis area.

### Coast

This FDRA covers the area from the Pacific Ocean on the western edge up the Coastal Range on the eastern edge where there is a significant climate change and the marine influence is lost. Vegetation in

this area is predominantly tanoak. The Coast FDRA is wetter than the rest of the analysis area with a mean annual precipitation of 84 inches. It is also the lowest in elevation.

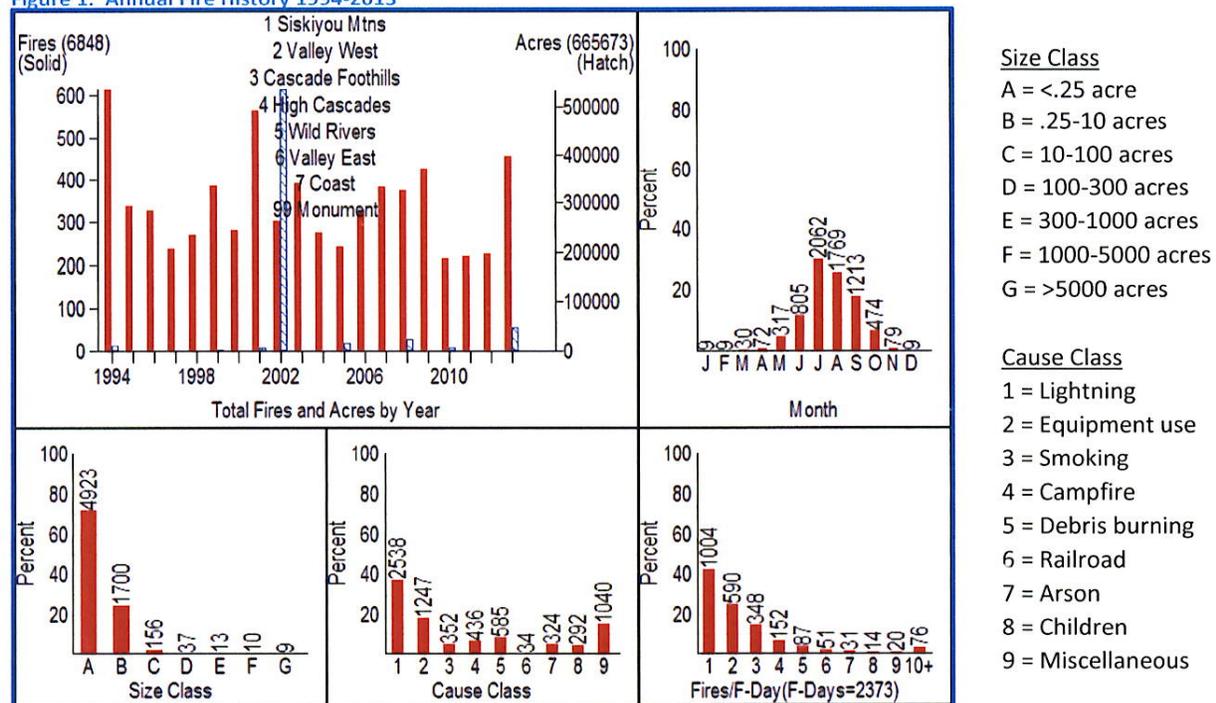
### C. Fire Occurrence

Interagency fire occurrence records for this analysis were obtained from the Fire Program Analysis (FPA) Fire Occurrence Database. "The data product contains a spatial data base of wildfires that occurred in the United States from 1994-2013, generated for the national (FPA) system. The wildfire records were acquired from the reporting systems of federal, state and local fire organizations. Basic error checking was performed and redundant records were identified and removed to the degree possible". (Short, 2015)

Fire occurrence used for the analysis was limited to the years for which quality weather data was available, 1994-2013. Lightning was the primary cause for ignitions requiring a suppression response (59%), followed by human caused ignitions including campfires (8%) and equipment (8%). The months of May through October accounted for 97% of all ignitions. July, August and September (generally historical fire season) accounted for 80% of all fires requiring a suppression response. July and August have the highest median monthly fire sizes at 1,998 acres and 113 acres respectively, as well as the highest number of responses (July 809 and August 791) for the analysis period (Figure 1). See the Appendix B for additional fire history tables and figures.

Fire points were assigned a Fire Danger Rating Area based on the location of the fire origin.

Figure 1: Annual Fire History 1994-2013



## D. Weather

### Weather Data

Historic weather observations from the Weather Information Management System (WIMS) were retrieved for weather stations within and adjacent to the plan area and were examined for quality and completeness for the period of interest (fire season) using Fire Family Plus software. Obvious outliers were examined and corrected where presumed to be erroneous. Approximately 30 days of missing observations for the analysis period were entered using western Regional Climate Center data. Quality weather data begins in 1996. May 1<sup>st</sup> through October 31<sup>st</sup> was used for analysis to capture the majority of suppression responses (97%).

### Remote Automated Weather Stations

Fifteen Remote Automated Weather Stations (RAWS) exist within the analysis area and were considered in the analysis; 8 stations are managed by the Rogue River-Siskiyou National Forest and the remaining 7 are managed by the BLM (Table 2). All are National Fire Danger Rating compliant. Data years for all stations is from 1994 through the present, however all stations have somewhat spotty observations for the years 1994-1995.

There is a RAWS station at Merlin Seed Orchard located within the analysis area but was not considered due to a recent relocation. Agness 2, Calvert, and Evans Creek were considered but not used in final analysis and were dropped due to statistical confidence.

Table 2: Remote Automated Weather Stations

Station	Owner	Station ID	Average Precip (in)	Elevation (ft)	Slope Position	Aspect	County	NWS Fire Weather Zone	Sub GACC Region	Percent Data Complete*
Crazy Peak	USFS (OR-RSF)	40106	60	3970	Peak/Ridge Top	SW	Del Norte	MFR620	NW04-W4	90
Squaw	USFS (OR-RSF)	353213	28	4964	Peak/Ridge Top	S	Jackson	MFR621	NW04-W4	95
Buckhorn Springs	BLM (OR-MED)	353230	20	2900	Peak/Ridge Top	Flat/None	Jackson	MFR622	NW04-W4	95
Provolt	BLM (OR-MED)	353120	28	1176	Valley Bottom/Flat	S	Josephine	MFR620	NW04-W4	96
Stella	USFS (OR-RSF)	353209	52	4715	Peak/Ridge Top	NE	Jackson	MFR623	NW04-W4	94
Zim	USFS (OR-RSF)	353227	50	4106	Peak/Ridge Top	SW	Jackson	MFR623	NW04-W4	95
Parker Mountain	State (Oregon)	353344	24	5250	Peak/Ridge Top	S	Klamath	MFR623	NW04-W4	92
Onion2	USFS (OR-RSF)	353114	35	4438	Peak/Ridge Top	S	Josephine	MFR620	NW04-W4	95
IV Airport	BLM (OR-MED)	353115	40	1389	Valley Bottom/Flat	Flat	Josephine	MFR620	NW04-W4	98
Bald2	USFS (OR-RSF)	352813	54	3630	Peak/Ridge Top	S	Coos	MFR619	NW04-W4	98
Quail2	USFS (OR-RSF)	352915	120	3033	Peak/Ridge Top	S	Curry	MFR619	NW04-W4	98
Red Mountain	BLM (OR-MED)	352920	95	1753	Peak/Ridge Top	Flat/None	Curry	MFR618	NW04-W4	93

\*For the period between 1994-2013

### Special Interest Groups

Special Interest Groups (SIG) were developed using the geographical process described in Section II in combination with an analysis of station 1-hour time lag fuel moisture (Fosberg, 1973). These station groups were used as a starting point for the fire business analysis process described in Section III.

Generally, once a best fit fuel model and indices were determined an iterative process of testing stations within groups was used to find the best station combination within a rating area. The best fit station combination, fuel model, and indices were then tested against station in adjacent SIGs to see if there was a significant statistical contribution.

RAWS stations were all weighted equally and grouped in SIGs as follows:

- Siskiyou Mountains: Crazy Peak, Squaw, Buckhorn Springs RAWS
- Interior Valleys: Provolt RAWS

- Cascades: Stella, Zim, Parker Mtn RAWS
- Wild Rivers: Onion2 (also called Onion Mountain Lookout), IV Airport RAWS
- Coast: Bald 2 (also called Bald Knob), Quail 2, Red Mountain RAWS

## Climatology

Climate within the FDOP changes with elevation and proximity to the coast. The Coast Range is a temperate rain forest where rainfall averages 175 inches at higher elevations. Further inland, annual precipitation is 16 inches in the lower elevations of the Siskiyou Mountains. Much of the precipitation comes in the form of rain at the low elevations and snow in the higher elevations.

Temperatures are coolest near the coast and warmest in the interior valley

Table 3: Annual Precipitation and Temperature

FDRA	PRISM Average Annual Precipitation (inches) 1981-2010					PRISM Average Maximum Annual Temperature (degrees F) 1981-2010			
	Min	Max	Range	Mean	NDFRCC	Min	Max	Range	Mean
Siskiyou Mountains	16	56	40	36	2	66	90	24	78
<i>Siskiyou Mountains Monument</i>	16	56	40	36	2	66	89	23	78
<i>Monument</i>	16	36	20	36	1	78	90	12	84
Interior Valleys	16	91	75	54	1	68	91	23	78
<i>Valley West</i>	17	91	74	54	1	68	92	24	80
<i>Valley East</i>	16	56	40	36	1	71	91	20	81
Cascades	18	76	58	47	3	65	90	25	78
<i>Cascade Foothills</i>	18	76	58	47	3	74	90	16	83
<i>High Cascades</i>	37	75	38	56	4	65	84	19	75
Wild Rivers	19	121	102	70	4	73	92	19	83
Coast	34	175	141	105	4	59	90	31	75

## E. Vegetation

The LANDFIRE Biophysical Settings (BpS) layer was used for delineation of vegetation within the FDOP area. The layer “represents the natural plant communities that may have been present during the reference period and is based on both the current biophysical environment and an approximation of the historical disturbance regime.” (LANDFIRE.gov)

There are 56 unique identified vegetation types that fall within the FDOP analysis area. Douglas-fir-Tanoak-Pacific Madrone forests make up the majority of the entire FDOP area at 28%, concentrated in the Western most FDRAs. Ponderosa pine-incense cedar is the next most abundant vegetation type (21%) occurring in high proportions in all FDRAs except the coast FDRA. Followed by the mid elevation forest types including; Douglas-fir-white fir-sugar pine (14 %) and Ponderosa Pine-California Black Oak (8 %) and Douglas Fir-Incense Cedar (7%). Table 2 is the distribution of vegetation types within each individual FDRA.

Table 4: LANDFIRE Biophysical Setting

<b>LANDFIRE: Biophysical Setting Groups &gt;= 5% of the rating area</b>			
<b>FDRA</b>	<b>Bps Group Name</b>	<b>Acres</b>	<b>Percent Area</b>
<b>Siskiyou Mtns. 375,000 ac</b>	Douglas Fir-White Fir-Sugar Pine	144,270	38%
	Ponderosa Pine-Incense Cedar	92,083	25%
	Red Fir	41,528	11%
	Douglas Fir-Tanoak-Pacific Madrone	26,173	7%
	Douglas Fir-Incense Cedar	20,135	5%
<b>Cascades 837,021 ac</b>	Douglas Fir-White Fir-Sugar Pine	331,075	40%
	Ponderosa Pine-Incense Cedar	201,349	24%
	Red Fir	98,352	12%
	Douglas Fir-Western Hemlock	59,910	7%
<b>Wild Rivers 705,103 ac</b>	Douglas Fir-Tanoak-Pacific Madrone	441,623	63%
	Douglas Fir-Incense Cedar	151,036	21%
	Douglas Fir-White Fir-Sugar Pine	51,506	7%
<b>Interior Valleys 1,622,135 ac</b>	Ponderosa Pine-Incense Cedar	618,253	38%
	Ponderosa Pine-California Black Oak	325,722	20%
	Douglas Fir-Tanoak-Pacific Madrone	186,211	11%
	Oregon White Oak-Romers Fescue-Oatgrass	112,704	7%
	Ponderosa Pine-Oregon White Oak	83,098	5%
	Douglas Fir-White Fir-Sugar Pine	76,829	5%
<b>Coast 803,113 ac</b>	Douglas Fir-Tanoak-Pacific Madrone	542,899	68%
	Douglas Fir-Western Hemlock	90,391	11%
	Douglas Fir-Incense Cedar	52,380	7%

## F. Topography

Southwest Oregon is one of the more topographically diverse locations in the area due to the convergence of ecological provinces. The FDOP analysis area contains three dominate geologic and topographic features in the form of mountain ranges (Cascade Mountains, Klamath-Siskiyou Mountains, and the Coast Range) and major river valleys (Rogue River, Illinois River, Applegate River, Chico River) that are highly influential on weather patterns (precipitation, temp etc.) and subsequent distribution of vegetative communities.

Bound on the eastern portion of the analysis area is the relatively young volcanically derived Cascade Mountain Range that administratively separates the Rogue River-Siskiyou NF National Forest from the Fremont-Winema and Umpqua National Forests to the north and east. This western slope of the cascade crest runs north-south with moderately steep and rugged terrain characterized by gently rolling mountains with high volcanic peaks such as Mt. McLoughlin, Brown Mtn., and Union Peak and encompasses the entire High Cascades Ranger District.

Another feature is the major transverse ridge running east-west in the northwest corner of the analysis area is known as the Rogue-Umpqua divide which separates the headwaters of the Rogue River from the north and south forks of the Umpqua river drainage and Umpqua National Forest. The Rogue-Umpqua divide is also the administrative boundary for the forest.

At the south end of the analysis area lies the Klamath-Siskiyou Mountains with Mt. Ashland being the highest peak at 7,533 feet. This rugged range straddles the Oregon-California border and goes from the Cascade Range to the coast.

Elevation within the FDOP ranges from sea level to 9,495 at the top of Mt. McLoughlin, a volcanic peak in the Cascade Range.

Table 5: Elevation and Slope Class

FDRA	Elevation in Feet (DEM)				NFDRS Slope Class (DEM)	
	Min	Max	Range	Mean	Majority	Median
Siskiyou Mountains	1,532	7,487	5,955	3,933	2	3
<i>Siskiyou Mountains</i>	<i>1,532</i>	<i>7,487</i>	<i>5,955</i>	<i>4,315</i>	<i>2</i>	<i>3</i>
<i>Monument</i>	<i>2,231</i>	<i>6,089</i>	<i>3,858</i>	<i>3,550</i>	<i>1</i>	<i>2</i>
Interior Valleys	492	6,745	6,253	2,298	1	1
<i>Valley West</i>	<i>492</i>	<i>6,745</i>	<i>6,253</i>	<i>2,230</i>	<i>1</i>	<i>2</i>
<i>Valley East</i>	<i>919</i>	<i>5,906</i>	<i>4,987</i>	<i>2,366</i>	<i>1</i>	<i>1</i>
Cascades	1,427	9,495	8,048	4,300	1	1
<i>Cascade Foothills</i>	<i>1,427</i>	<i>6,325</i>	<i>4,898</i>	<i>3,645</i>	<i>1</i>	<i>1</i>
<i>High Cascades</i>	<i>2,769</i>	<i>9,475</i>	<i>6,706</i>	<i>4,955</i>	<i>1</i>	<i>1</i>
Wild Rivers	30	5,295	5,266	2,452	3	3
Coast	3	4,659	4,656	4,474	2	2

### III. Fire Business Analysis

#### A. Process

Fire business thresholds are values of one or more fire weather/fire danger indices that have been statistically related to occurrence of fires (fire business). Generally, the threshold defines a range of fire weather/fire danger values where fire activity has significantly increased or decreased. Fire business thresholds more closely predict fire activity than climatological breakpoints.

A comprehensive Fire Family Plus analysis of historic weather and fire occurrence was completed using the fire history and weather data described in Section II above to find the combination of station(s), indices and fuel model that had the best statistical goodness of fit to the fire problem using a logistic regression model. Fire Day and Large Fire Day goodness of fit were the primary considerations; Multi Fire Day was examined but not a significant driver in final selection.

Analysis was completed based on fire season starting May 1<sup>st</sup> and running through October 31<sup>st</sup>. Large fires were determined to be five or more acres for all FDRAs except the Interior Valley which was determined to be 20 acres. Multi-fire days were considered to be those that had three or more starts. This was based on fire distribution and local knowledge.

The following general analysis process was used for each Fire Danger Rating Area:

1. Spatial climate, vegetation, topography and historical weather data were used to combine weather stations into rating areas used as a starting point for testing possible combinations of indices and National Fire Danger Rating System fuel models against historical fire business for Goodness of Fit.
2. Best fit combinations of indices and fuel model were then tested against different combinations of stations within and adjacent to individual Fire Danger Rating Areas.
3. Best fit combinations of station, indices, and fuel model were then re tested against other top ranking indices and fuel model combinations from step 1.
4. Adjacent Fire Danger Rating Areas were compared to examine statistical results. This led to the combination of three of the initial FDRAs.
5. Station groups and Fire Danger Rating Areas resulting from the above process were then used to develop thresholds for 5 classes of fire danger and fire business.

Using the five FDRAs delineated during the analysis, fuel model J (slash) and Energy Release Component (ERC) proved to be the best statistical fit for Cascade, Wild Rivers, and Coast FDRAs. Burning index (BI) proved to be the best statistical fit for Siskiyou Mountains and Interior Valleys.

Concerns from field personnel and fire managers were raised over changing the fuel model from a G for the pocket cards. Primary concerns included consistency with our partners and neighboring areas who are all using a fuel model G. Past pocket cards in the area have been based on a fuel model G. Local resources are most familiar with the indices produced from fuel model G and have a better correlation between those indices and past experience than with a fuel model J. NFDRS fuel models are also currently undergoing a revision to reduce to four fuel models which will require a change in the near future. A fuel model G was carried forward for those reasons for the pocket cards only.

## B. Settings

The following parameters were used for analysis in Fire Family Plus. Settings were based on the spatial and weather data analysis discussed in Section III and an analysis of recent year catalog green up dates in the Weather Information Management System.

Table 6: Settings used in the Fire Family Plus analysis process.

FDRA	Years Analyzed	Dates Analyzed	Green Up Date	Slope Class	Climate Class	Grass Type
Siskiyou Mountains	1994-2014	5/1-10/31	4/29	2	2	Perennial
Interior Valleys	1994-2014	5/1-10/31	4/3	1	1	Perennial
Cascade	1994-2014	5/1-10/31	5/5	1	3	Perennial
Wild Rivers	1994-2014	5/1-10/31	4/21	3	4	Perennial
Coast	1994-2014	5/1-10/31	3/9	2	4	Perennial

## C. Results

Goodness of Fit results from the statistical analysis. Chi squared values represent the differences between the expected and observed frequencies and values less than 13 are considered an excellent fit for this regression model (8 degrees of freedom). P values represent the probability of obtaining a result equal to or more extreme than what was observed and are associated with Chi squared, values greater than .05 indicate a good Chi squared fit. R(L) squared values represent how well observed outcomes are replicated by the model and values closer to 1 are better (1.0 is a perfect fit). Probability range was also considered in this analysis.

Table 7: Statistical results and settings from the Fire Family Plus analysis process.

Statistical Results - Staffing Level									
FDRA	Indices	Fuel Model	Large Fire Day (acres)	Fire Day Fit Results			Large Fire Day Fit Results		
				Chi <sup>2</sup>	P	R <sup>2</sup>	Chi <sup>2</sup>	P	R <sup>2</sup>
Coast	ERC	J	5	13.4	0.0973	0.83	6.3	0.6177	0.33
Wild Rivers	ERC	J	5	12.6	0.126	0.68	3.3	0.9127	0.49
Interior Valleys	BI	J	20	9.8	0.2796	0.98	5.1	0.7445	0.79
Siskiyou Mountains	BI	J	5	8.4	0.3987	0.85	7.9	0.443	0.46
Cascades	ERC	J	5	11.3	0.1867	0.94	3.9	0.8673	0.74

## IV. Fire Danger Based Decisions

The National Fire Danger Rating System utilizes the Weather Information Management System processor to work with weather data stored in the National Interagency Fire Management Integrated Database producing fire danger outputs for Remote Automated Weather Station Special Interest Groups which represent Fire Danger Rating Areas defined in this plan. The system is designed to calculate worst-case scenario fire danger for the Rating Area.

National Fire Danger Rating System outputs will be utilized in the following ways for the purpose of this plan. The **Staffing Level**, computed by Fire Danger Rating Area will assist agency resources in maintaining awareness regarding daily potential for large fire growth. The **Preparedness Level**, an aggregate of the Staffing Levels within the analysis area combined with the fire potential outlook and local resource availability, will help agency personnel determine an appropriate state of readiness at the unit level. The **Dispatch Level**, a function of Staffing Level and computed by Rating Area, is a decision tool for dispatchers to assign initial attack resources to reported fires. The Staffing Level and subsequent derivations are based on fire business thresholds, Special Interest Groups, indices, and components, described above in Section III. The **Industrial Fire Precautions Level** is computed by the WIMS processor and based on an historic analysis of Energy Release Component and Ignition Component, and then combined with professional knowledge. **Public Use Restrictions** are based on discussions with Fire Management Officers with input from Line Officers.

### A. Staffing Level

Staffing Level can be thought of as readiness level where the fire danger continuum is divided into classes to which management actions can be tied. Staffing Level classes also provide insight to where on the fire danger continuum you are today. Staffing Levels are traditionally expressed as numeric values where 1 represents the low end of the fire danger continuum and 5 represents the high end. Staffing Level represents a way of linking fire danger information to fire management decisions.

Staffing Level in this plan is based on the best fit indices for Fire Day and Large Fire Day for fuel model J which is ERC for Cascade, Wild Rivers, and Coast FDRAs and BI for Siskiyou Mountains and Interior Valleys. Thresholds were developed such that approximately 60% of Large Fire Days fit into Staffing Level 5, 30% of Large Fire Days fit into Staffing level 4, 10% of large Fire Days fit into Staffing Level 3. Breakpoints were further adjusted to generally reflect an increase in Fire Days as the indices increased.

Staffing Level will be used as a communication tool to inform fire response personnel of the daily potential for Large Fire occurrence (Fire Danger), provide Line Officers and Fire Managers guidance for fire business decisions, and provide an aggregate level of readiness as a starting point for determining Preparedness Level.

Table 8: Staffing Level Breakpoints, Historical Statistics, and Model Outputs.

FDRA	Indices	Staffing Level	Staffing Level Breakpoints	Percent Historic Fire Season	Model Probability of a Fire Day	Percent Historic Fire Days*	Model Probability of Large Fire Day	Percent Historic Large Fire Days*
Siskiyou Mountains	BI (Fuel Model J)	1	0-28	5	8-13	0	0	0
		2	29-61	12	13-20	5	0-1	5
		3	62-78	16	20-26	15	1-2	9
		4	79-101	38	26-34	45	2-3	29
		5	102+	29	34-68	35	3-19	57
Interior Valleys	BI (Fuel Model J)	1	0-29	5	8-15	2	0	0
		2	30-59	9	15-27	3	0	1
		3	60-89	27	28-45	8	0-1	12
		4	90-109	29	46-57	45	1-2	27
		5	110+	30	58-91	42	2-30	60
Cascade	ERC (Fuel Model J)	1	0-50	9	5-8	1	0	0
		2	51-90	8	9-13	3	0-1	1
		3	91-139	19	13-20	12	1	9
		4	140-188	30	20-30	35	1-3	31
		5	189+	33	30-50	49	3-10	59
Wild River	ERC (Fuel Model J)	1	0-50	9	2	4	0	0
		2	51-101	13	2-3	12	0-1	4
		3	102-141	21	3	14	0-1	13
		4	142-179	29	3-4	36	1	26
		5	180+	28	4-6	34	1	57
Coast	ERC (Fuel Model J)	1	0-13	10	9-10	2	0-1	0
		2	14-44	9	10-14	3	0-1	2
		3	45-82	13	14-19	9	1-2	10
		4	83-132	33	19-28	37	2-3	29
		5	133+	35	19-55	49	3-10	59

\*Fire Days and Large Fire Days based on records from 1994-2013.

## B. Dispatch Level

Dispatch Level represents a way of linking fire danger information to a preplanned response to reported incidents. Logic says that the higher the fire danger the more personnel and equipment will be needed to contain a new fire. Rogue Valley Interagency Communications Center uses a four tiered run-card system within WildCad to assign resources to emerging incidents until an Incident Commander arrives on scene and establishes command.

Dispatch Level in this plan is a function of Staffing Level and based on the best fit indices (ERC or BI). It is to be used as a guideline with consideration given to adjacent dispatch centers dispatch levels. Dispatch Level will be used to send resources commensurate with the potential for Large Fires to emerging incidents and to inform Incident Commanders of what resources they can expect to be in route to the incident on a given day.

Run Cards are maintained by, and can be found on file with, the Rogue Valley Interagency Communications Center.

Table 9: Dispatch Levels

FRDA	Indices	Dispatch Level			
		Low (Staffing Level=1)	Moderate (Staffing Level=2-3)	High (Staffing Level=4)	Extreme (Staffing Level=5)
Siskiyou Mountains	BI	0-28	29-78	79-101	102+
Interior Valleys	BI	0-29	30-89	90-109	110+
Cascade	ERC	0-50	51-139	140-188	189+
Wild River	ERC	0-50	51-141	142-179	180+
Coast	ERC	0-13	14-82	83-132	133+

### C. Rogue River-Siskiyou National Forest Preparedness Level

Forest Preparedness Levels are established by the Forest Duty Officer and FMO group during fire season, generally May through October. Preparedness Levels identify suggested actions to be taken or curtailed by the Agency Administrator, Forest Duty Officer, District Duty Officer, and Rogue Valley Interagency Coordination Center to ensure an appropriate level of response.

Preparedness Levels are influenced by aggregate Staffing Level, the Northwest Coordination Center Seven Day Significant Fire Potential Outlook product (<https://gacc.nifc.gov/nwcc/content/products/fwv/guidance/DL.pdf>), and resource availability/commitment. Situations and activities described within the Preparedness Levels consider wildland and prescribed fire activity.

Table 10: Preparedness Level Worksheet

Staffing Level Average	1		2		3		4		5	
	Minimal or Normal Risk	Elevated or High Risk	Minimal or Normal Risk	Elevated or High Risk	Minimal or Normal Risk	Elevated or High Risk	Minimal or Normal Risk	Elevated or High Risk	Minimal or Normal Risk	Elevated or High Risk
(1) ✓										
NWCC 7 Day Significant Fire Potential Outlook*										
(2) ✓										
Majority of IA resources and numerous overhead off forest	No	Yes								
(3) ✓										
RSF Preparedness Level	I	I II	I II	II III	II III	III IV	III IV	IV V	IV V	V

\* NWCC 7 Day Significant Fire Potential Outlook for Fire Environment (FEN) in PSA NW04.

Table 11: Preparedness Level Description

Preparedness Level	Description
I	Aggregate response area fire danger is low, historically ~7% of fire days occur under these conditions and there has been no large fire occurrence. NWCC fire potential is null or if potential exists then significant resource commitment is null.
II	Aggregate response area fire danger is moderate, historically ~11% of fire days occur under these conditions and there has been minimal large fire occurrence. NWCC fire potential is null and significant resources are committed or NWCC fire potential exists and resource commitment are available.
III	Aggregate response area fire danger is high, historically ~19% of fire days occur under these conditions and ~11% large fire have occurred under these conditions. NWCC fire potential is null and significant resources are committed or NWCC fire potential exists and resource commitment are available.
IV	Aggregate response area fire danger is very high, historically ~32% of fire days occur under these conditions and ~29% large fire have occurred under these conditions. NWCC fire potential is null and significant resources are committed or NWCC fire potential exists and resource commitment are available.
V	Aggregate response area fire danger is extreme, historically ~31% of fire days occur under these conditions and ~59% large fire have occurred under these conditions. NWCC fire potential exists or significant resource commitment are committed.

“The fire danger rating of an area gives the manager a tool to assist in the day-to-day “fire business” decisions. The emphasis is on tool because fire danger rating information is not the answer by itself; it must be considered along with the manager’s local knowledge of the area and consequences of the decision when arriving at the best solution to a fire business decision or problem” (National Fire Danger Working Group, 2002). The following tables contain suggested actions to be considered in each preparedness level.

Table 12: Suggested Agency Administrator Preparedness Actions

Responsible Official	Item	Suggested Actions	Preparedness Level				
			I	II	III	IV	V
RSF - Agency Administrator	Staff Availability	Ensure that one Line Officer per District is available by cell	<input type="radio"/>				
		Consider having one or more Advanced Line Officers available				<input type="radio"/>	<input type="radio"/>
		Consider a PIO			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
		Consider having PIO on FMO conference call				<input type="radio"/>	<input type="radio"/>
		Ensure Resource Advisors are designated and available			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
		Consider making WFDSS support available locally			<input type="radio"/>		
	Ensure that local WFDSS support is available				<input type="radio"/>	<input type="radio"/>	
	Issue guidance to forest staff regarding the severity of the season and increased need for available fire support personnel					<input type="radio"/>	
	Closures	Consider the need for closures/restrictions and discuss with forest FMO			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Table 13: Suggested Forest Duty Officer Preparedness Actions

Responsible Official	Item	Suggested Actions	Preparedness Level				
			I	II	III	IV	V
RSF - Forest Duty Officer	Minimum draw down (IA module = 1 engine w/3 or IA squad with leadership)	Ensure 2 or more IA modules are on forest and strategically located where fire activity is most likely	○	○			
		Ensure 4 or more IA modules are on forest and strategically located where fire activity is most likely			○		
		Ensure 6 or more IA modules are on forest and strategically located where fire activity is most likely				○	○
		Consider holding/ordering additional resources if current fire activity is significant			○	○	○
		Consider holding/ordering additional resources if at the minimum drawdown level or based on predicted activity				○	○
	Overhead Support	Forest duty officer available 7 days/week. Must be qualified as DIVS and ICT3 or RXB2, or ASGS and ICT3 (currency not required) Consider additional forest duty officer support	○	○	○	○	○
		Consider requesting a dedicated aviation officer Request dedicated aviation officer			○	○	○
		Consider ordering a minimum of 2 DIVS, 1 SOFR for District/SO support				○	○
		Consider ordering additional ICT3/SOF2/DIVS/PIO2 support – multiple resources as needed				○	○
		Consider ordering additional SITL/GISS support – multiple resources as needed					○
		Consider prepositioning a T3 IMT				○	○
		IA Support	Consider 1 or more additional hand crews (T2IA preferred) Order 1 or more additional hand crews (T2IA preferred) Order 2 or more additional hand crews (T2IA preferred)			○	○
	Consider ordering 5 or more additional engines Consider ordering 10 or more additional engines					○	○
	Consider ordering one or more water tenders				○	○	○
	Consider ordering one or more dozers					○	○
	Aviation support		Consider ordering medium helicopter with rappel module if lightning has occurred or is forecasted				○
		Consider ordering light or medium helicopter				○	○
		Consider ordering a heavy helicopter				○	○
	Severity	Consider submitting a fire severity request if no fire activity			○	○	○
	Detection	Consider AOBS with platform if lightning has occurred			○	○	
		Order ATGS with platform if lightning has occurred					○
	Other	Consider implementing mini MAC				○	○
		Consider daily SWOCG conference calls				○	○
		Review regional and national PL's and evaluate prescribed fire activities			○	○	○

Table 14: Suggested District Duty Officer Preparedness Actions

Responsible Official	Item	Suggested Actions	Preparedness Level				
			I	II	III	IV	V
RSF - District Duty Officer	Situational Awareness	Ensure IA personnel are briefed on Staffing Level, Preparedness Level, local burning conditions, and availability of initial attack resources	<input type="radio"/>				
	Management Availability	District Duty Officer available 7 days/week during periods of predicted or actual incident activity. Must be qualified as DIVS and ICT3 or RXB2, or ASGS and ICT3 (currency required)	<input type="radio"/>				
		Identify Line Officer	<input type="radio"/>				
		Advise Forest Duty Officer when sending resources off forest	<input type="radio"/>				
	Overhead Considerations	Consider the need for overhead support (ICT3/TFLD)	<input type="radio"/>				
	Staffing	Consider holding local unit resources if like kind of resources are ordered on severity for the unit				<input type="radio"/>	<input type="radio"/>
		Consider requesting extended staffing				<input type="radio"/>	<input type="radio"/>
		Consider requesting additional staffing					<input type="radio"/>
	Prevention	Consider the need for restrictions, closures, and patrols			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Detection	Lookouts staffed as needed (High Cascades, Siskiyou Mountains)	<input type="radio"/>				
		Consider requesting an aerial detection flight if lightning occurred or is forecasted or there is increased public activity			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

Table 15: Suggested Communication Center Manger Preparedness Actions

Responsible Official	Item	Suggested Actions	Preparedness Level				
			I	II	III	IV	V
RSF – Center Manager	Conference Calls	Schedule fire management conference call every other week	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
		Schedule weekly fire management conference call			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
		Consider 2 fire management conference calls per week				<input type="radio"/>	<input type="radio"/>
	Fire Danger	Ensure that PL is calculated, broadcast, and posted daily during fire season	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
	Extended Hours & Support	Consult with Forest and District Duty Officers concerning potential for extended staffing beyond normal shift length Hours of operation 0800-1800, extend as needed for PL=3,4,5			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
		Consider need for local buying team			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
		Consider expanded dispatch depending on activity			<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
		Consider having grants and agreements contracting support available				<input type="radio"/>	<input type="radio"/>
		Consider logistical support Logistical support available			<input type="radio"/>		<input type="radio"/>
		Other	Communicate with Forest Duty Officer regarding local contract resource availability				<input type="radio"/>

This staffing guide is the recommended minimum needs for the Rogue River – Siskiyou NF from June 1<sup>st</sup> – October 1<sup>st</sup>. It is to be used as a tool considered along with local knowledge of the area and foreseeable consequences of the decision when arriving at the best solution to a fire business decision.

## D. Industrial Fire Precautions Level (IFPL)

USFS Region 6 uses the Industrial Fire Precaution Level (IFPL) system to regulate activities to minimize risks associated with industrial operations. Industrial operation restrictions increase as IFPL Precaution Values increase. IFPL is calculated by the WIMS processor and based on an historic analysis of ERC and IC in fuel model G (Deeming, 1978).

IFPL will be determined on a district by district basis. Considerations in assigning the IFPL include:

- Current and predicted IFPLs in WIMS
- Recent changes increasing or lowering the IFPL
- Predicted weather
- IFPLs with our partners and adjacent lands
- Frequency of operator fires
- Professional judgement
- Discussions with district rangers, fire management officers, and timber sale administrators

Specific Industrial Restrictions at each level can be found at

<http://www.oregon.gov/ODF/Fire/Documents/IFPLs.pdf>. Any waivers to the IFPL will be prepared and signed by the District FMO and District Ranger.

## E. Public Use Restrictions (PUR)

Public Use Restrictions are put into place when the fire danger reaches a point where there is high potential for human starts, an increase in human starts, or an event which would create a high likelihood of large fires. Restrictions are put into place to restrict smoking, driving vehicles off of system roads, building campfires, use of internal combustion engines, welding or cutting torches. These restrictions are put in place using a Forest Supervisor's Order, which are tied to CFRs.

There are three levels of Public Use Restrictions and they are based on discussions with Fire Management Officers, with input from Line Officers. Key to the decision are regular forest fire group conference calls. During fire season, each District FMO will evaluate NFDRS outputs and coordinate with their fire cooperators regarding perspectives on public use restrictions. During the call, the group will discuss current fire danger, anticipated trends, and interagency partner perspectives resulting in decisions for the week regarding public use restrictions.

Within the Wild Rogue Scenic River Corridor, the PUR will be coordinated to match the PUR put in place by ODF. There are also several wilderness areas that are shared between forests and coordination between Forest FMOs must take place when changing PURs. These include:

- Sky Lake Wilderness – shared with the Fremont-Winema NF
- Rogue Umpqua Divide Wilderness – shared with the Umpqua NF
- Red Butte Wilderness – shared with the Klamath NF
- Siskiyou Wilderness – shared with the Klamath NF and Six Rivers NF

A Forest Fire Staff Officer or Forest Duty Officer will have the fire restriction orders signed by the Forest Supervisor. Examples of past restrictions can be found in the Rogue River-Siskiyou National Forest Fire Prevention Plan (2016 draft). After the fire restriction order is signed or terminated, a Forest Fire Staff Officer notifies all forest personnel and adjacent Fire Staffs by email. A Forest Public Affairs Officer posts to the forest's website and social media.

## F. Adjective Rating

An Adjective Rating (Smokey’s arm) is calculated by the WIMS processor and based on fuel model, indices, and climatological breakpoints. Adjective Ratings are divided into five categories - low, moderate, high, very high, and extreme (National Fire Danger Working Group, 2002). The Rogue River – Siskiyou National Forest utilizes four levels (low, moderate, high, and extreme) in efforts to keep uniformity with adjacent land management agencies.

Efforts will be made to maintain consistency with ODF in determining the Adjective Rating as well as minimizing the number of changes to the Adjective Rating during the fire season. Key to the decision on when to change Adjective Rating are regular forest fire group conference calls. Adjective Ratings may vary by Ranger District. The Public Affairs Officer will be notified of changes in Adjective Rating and prepare a press release.

**Table 16: Adjective Class Ratings (from the National Fire Danger Working Group)**

Adjective Rating	Color Code	Description
Low	Green	Fuels do not ignite readily from small firebrands although a more intense heat source, such as lightning, may start fires in duff or punky wood. Fires in open cured grasslands may bum freely a few hours after rain, but woods fires spread slowly by creeping or smoldering, and burn in irregular fingers. There is little danger of spotting.
Moderate	Blue	Fires can start from most accidental causes, but with the exception of lightning fires in some areas, the number of starts is generally low. Fires in open cured grasslands will burn briskly and spread rapidly on windy days. Timber 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.
High	Yellow	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 fuels. Fires may become serious and their control difficult unless they are attacked successfully while small.
Very High	Orange	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. <b>Very High is not used on the Rogue River – Siskiyou National Forest.</b>
Extreme	Red	Fires 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 fire danger class. 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.

## V. Operational Procedures

### A. Weather Information Management System (WIMS)

#### Seasonal Schedule

The Rogue Valley Interagency Communications Center Lead Intelligence Dispatcher will coordinate with the Fire Weather Station Managers to set green-up. Annual cycle would be to begin entering observations ~1 month prior to green-up, pre-green stations ~2 weeks prior to green-up, green-up stations ~2 weeks prior to the peak of greenness, freeze stations after 3 consecutive days of minimum temperatures less than 28 degrees Fahrenheit (>09/01).

Rogue Valley Interagency Communications Center Lead Intelligence should monitor Normalized Difference Vegetation Index satellite imagery found on the Wildland Fire Assessment System (WFAS), <http://maps.wfas.net/> and initiate annual contacts with Station Managers if needed as peak green up approaches. Station Managers will make the final decision when to set the herbaceous state to green. Stations within Fire Danger Rating Areas should be greened individually if appropriate.

Appropriate thousand-hour startup values should be considered on an annual basis, the same site used to monitor greenness can also be used to enter 1000-hr startup values (<http://maps.wfas.net/>) if samples from the field are not available.

Table 17: Weather Information System approximate seasonal management schedule for NFDRS stations.

Approximate Date	RAWS	Task
February 9 <sup>th</sup>	Bald2, Quail2, Red Mountain	Begin entering daily observations, determine if start up values are appropriate
March 3 <sup>rd</sup>	Provolt	
March 21 <sup>st</sup>	IV Airport, Onion2	
March 29 <sup>th</sup>	Crazy Peak, Squaw, Buckhorn Springs	
April 5 <sup>th</sup>	Stella, Zim, Parker Mountain	
February 23 <sup>rd</sup>	Bald2, Quail2, Red Mountain	Pre-green stations
March 17 <sup>th</sup>	Provolt	
April 4 <sup>th</sup>	IV Airport, Onion2	
April 12 <sup>th</sup>	Crazy Peak, Squaw, Buckhorn Springs	
April 19 <sup>th</sup>	Stella, Zim, Parker Mountain	
March 9 <sup>th</sup>	Bald2, Quail2, Red Mountain	Green up individual stations as indicated by NVDI and station manager
April 3 <sup>rd</sup>	Provolt	
April 21 <sup>st</sup>	IV Airport, Onion2	
April 29 <sup>th</sup>	Crazy Peak, Squaw, Buckhorn Springs	
May 5 <sup>th</sup>	Stella, Zim, Parker Mountain	
September 1 <sup>st</sup> or later, 3 or more consecutive days of min temps <28F	All	Freeze individual stations as indicated by Daily observations and station manager

### Daily Schedule

Intelligence personnel at the Rogue Valley Interagency Communications Center (RVICC) will access the Weather Information Management System (WIMS) daily and provide:

1. Quality Control Station Data - weather readings for the previous 24 hours will be checked by looking at hourly observations for abnormal or inappropriate readings. Notify Station Owners of suspect or missing readings.
2. Enter Observations - all Observations will be for the hourly record closest to 1300 hours. For stations that transmit later than 30 minutes after the hour a 1200 record should be used. State of the Weather will be based on 1400 conditions for the majority of the Fire Danger Rating Area, not necessarily just the station. The Wet Flag will be set when appropriate based on the latest Tech Note or Help Desk guidance. Observations should be entered no later than 1500 daily so that they are available to the National Weather Service for forecasting.
3. Fire Danger Daily Product - Station Observations, NFDR Observations, Station Forecast, and NFDR Forecast will be loaded daily into a spreadsheet using the XML function from WIMS. The spreadsheet will calculate Staffing and Dispatch Level as well as update the fire danger charts and Observation/Forecast tables. Preparedness Level, Dispatch Level, and updated fire danger tables will be posted to the Communications Center website preferable no later than 17:30.
4. Briefing - Staffing Level, Dispatch Level, and Preparedness Level should be communicated daily with the morning and afternoon fire weather forecast during fire season, generally May through October.

## Station Catalog Settings

The following represents ideal station catalog settings based on geospatial and fire business analysis completed. Keetch-Byram Drought Index startup values were not considered for this plan.

Table 18: Optimum settings for use in Weather Information System station catalogs.

FDRA	NWS ID	Station Name	Owner	Herbaceous	Slope Class	Climate Class	Fuel Model
Siskiyou Mountains	40106	Crazy Peak	USFS	Perennial	3	3	G
	353213	Squaw	USFS	Perennial	3	2	G
	353230	Buckhorn	BLM	Perennial	2	2	G
Interior Valleys	353120	Provolt	BLM	Perennial	2	2	G
Cascades	353209	Stella	USFS	Perennial	3	3	G
	353227	Zim	USFS	Perennial	2	3	G
	353344	Parker Mountain	State	Perennial	2	2	G
Wild Rivers	353114	Onion 2	USFS	Perennial	3	3	G
	353115	IV Airport	BLM	Perennial	1	2	G
Coast	352813	Bald 2	USFS	Perennial	3	3	G
	352915	Quail 2	USFS	Perennial	3	3	G
	352920	Red Mountain	BLM	Perennial	1	3	G

## VI. Roles and Responsibilities

### A. NFDRS Program Manager – Forest Fire Management Officer

The Forest Fire Management Officer and Forest Duty Officer will use this Fire Danger Operating Plan and fire danger outputs as a tool to coordinate resources and to make informed fire management decisions. The Forest Fire Management Officer is ultimately responsible for ensuring that this plan is maintained, utilized, understood, and communicated.

### B. Fire Weather Station Managers – District Fire Management Officer or Designee

RVICC provides the lead for the forest's RAWs program. The District Fire Management Officers will assign a designee who is responsible for the USFS fire weather stations within their district. Their responsibilities include:

- Appropriate site selection and placement of fire weather stations, maintenance, and assurance that accurate observations are taken and transmitted. This includes assuring appropriate response to station malfunctions.
- Notifying the Data Manager when erroneous or suspect data is transmitted.
- Ensure the station is physically secure and maintained to standards, routine station maintenance is completed, including documentation in the Wildland Fire Management Information (WFMI) system. Respond to emergency breakdowns in a timely manner.
- Annually determine transition dates for live fuels (green-up) and notify the Data Manager to make changes within Weather Information Management System.

### C. Data Manager

RVICC is responsible for the operation and maintenance of the Weather Information Management System and is delegated Data Manager. Responsibilities include:

- Ensuring that daily weather observations are edited as needed and published, preferably no later than 1600 hours.
- Monitoring data to ensure quality. This includes scanning the prior 24 hours of observations and reporting missing or suspicious data to the District FMO.
- Periodically checking the observations database to make sure that all observations have been edited for calculations. Working with District FMOs to fill data gaps, fix known bad data, and submit corrections to the FAMWEB helpdesk for application to the Weather Information Management System database.
- Making station level adjustments as requested by District FMOs to live fuels and recalculating indices as needed.
- Disseminating Fire Danger information to include calculating, broadcasting, and posting daily indices and trends, updating and posting fire danger charts, and posting restrictions and closures to the website.

### D. Duty Officers

Duty Officers responsibilities include:

- Coordinating with appropriate staff to evaluate if fire danger indices are appropriate and adjusting fire business accordingly.
- Assuring that their resources are aware of and understand National Fire Danger Rating System outputs and that pocket cards are distributed to all local and incoming resources.

### E. Fire Planner

The Forest Fire Planner is responsible for updating the pocket cards, submitting for approval, and posting to the RVICC website. Pocket cards should be updated following a significant fire season or every 3 years (based on having 15+ years of a quality database).

## References

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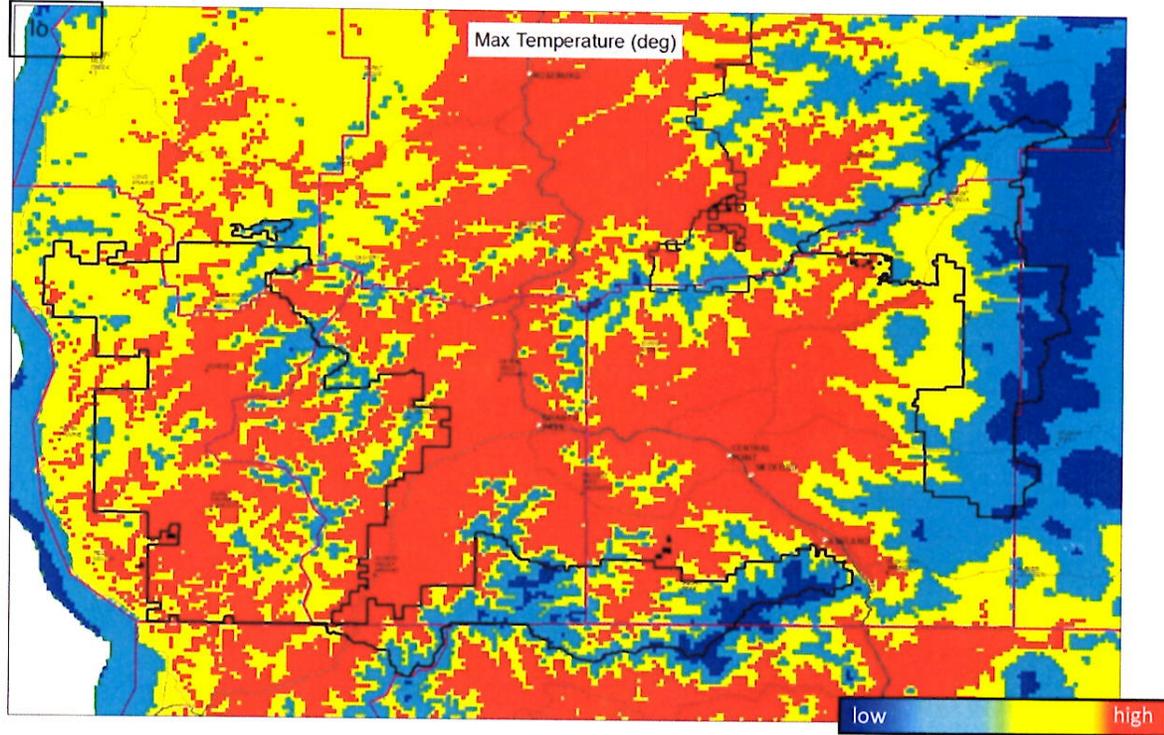
NWCC 7 day Outlook. Retrieved from <https://gacc.nifc.gov/nwcc/content/products/fwx/guidance/DL.pdf>

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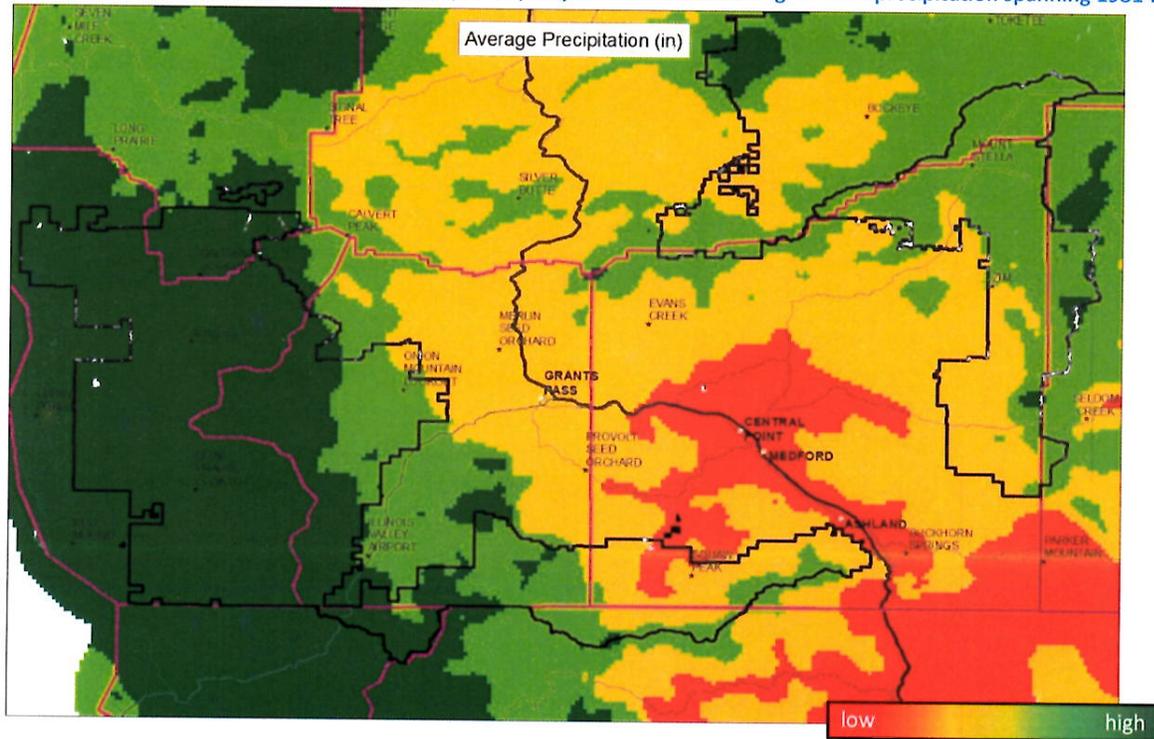
Short, Karen C. 2015. *Spatial wildfire occurrence data for the United States 2nd Edition, 1992-2011*. Fort Collins, CO. USDA Forest Service, Rocky Mountain Research Station. Retrieved from <https://www.fs.usda.gov/rds/archive/Product/RDS-2013-0009.3/>

## Appendix A: Fire Danger Rating Area Development/Analysis

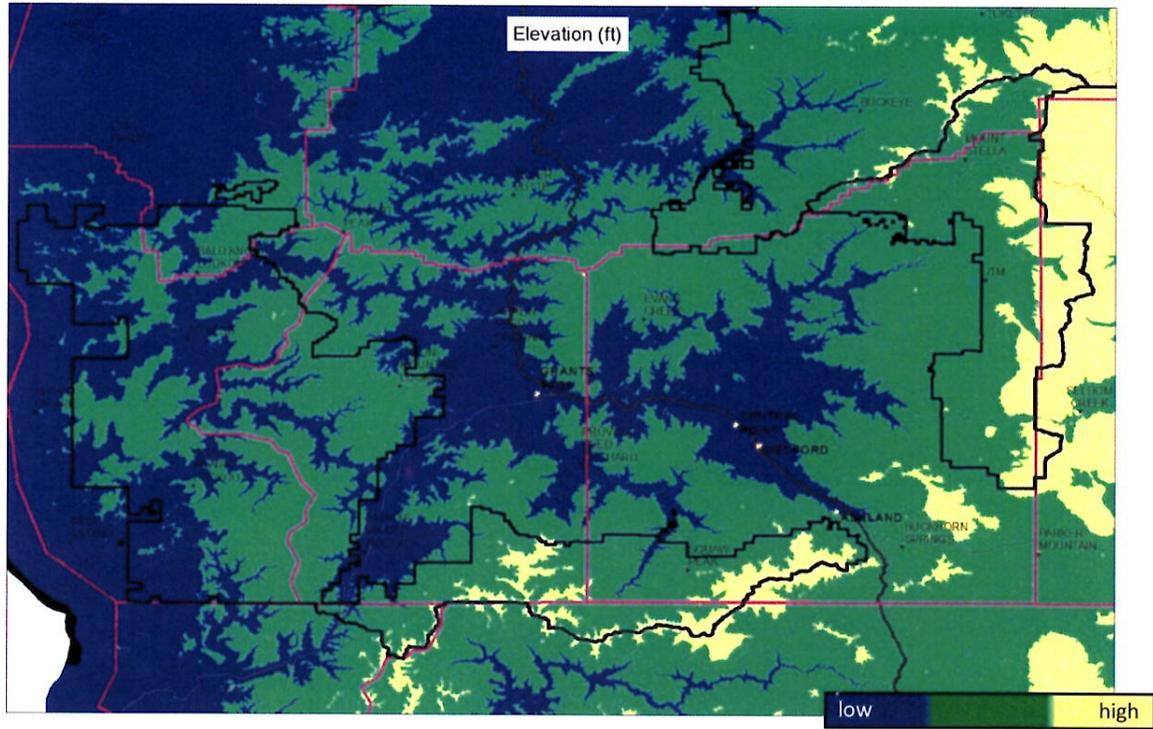
PRISM Climate Group (Oregon State University, 2013) 30 year normalized average annual maximum temperature spanning 1981-2010.



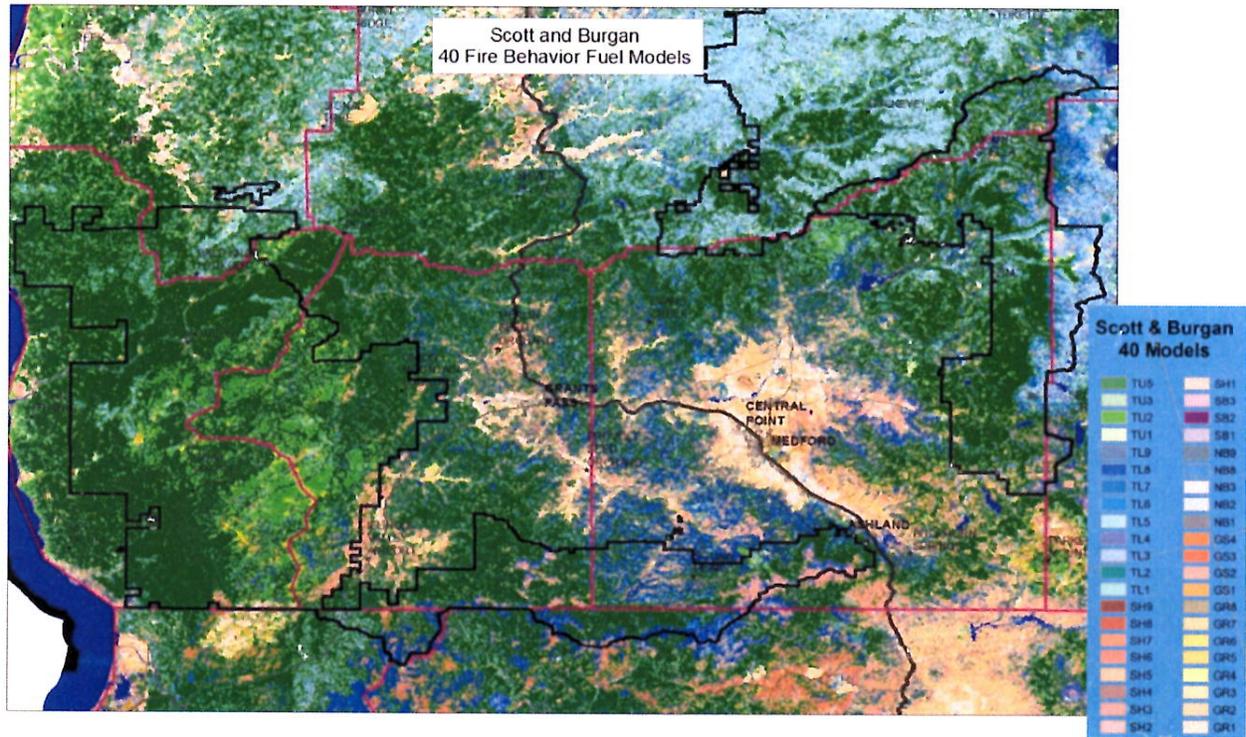
PRISM Climate Group (Oregon State University, 2013) 30 year normalized average annual precipitation spanning 1981-2010.



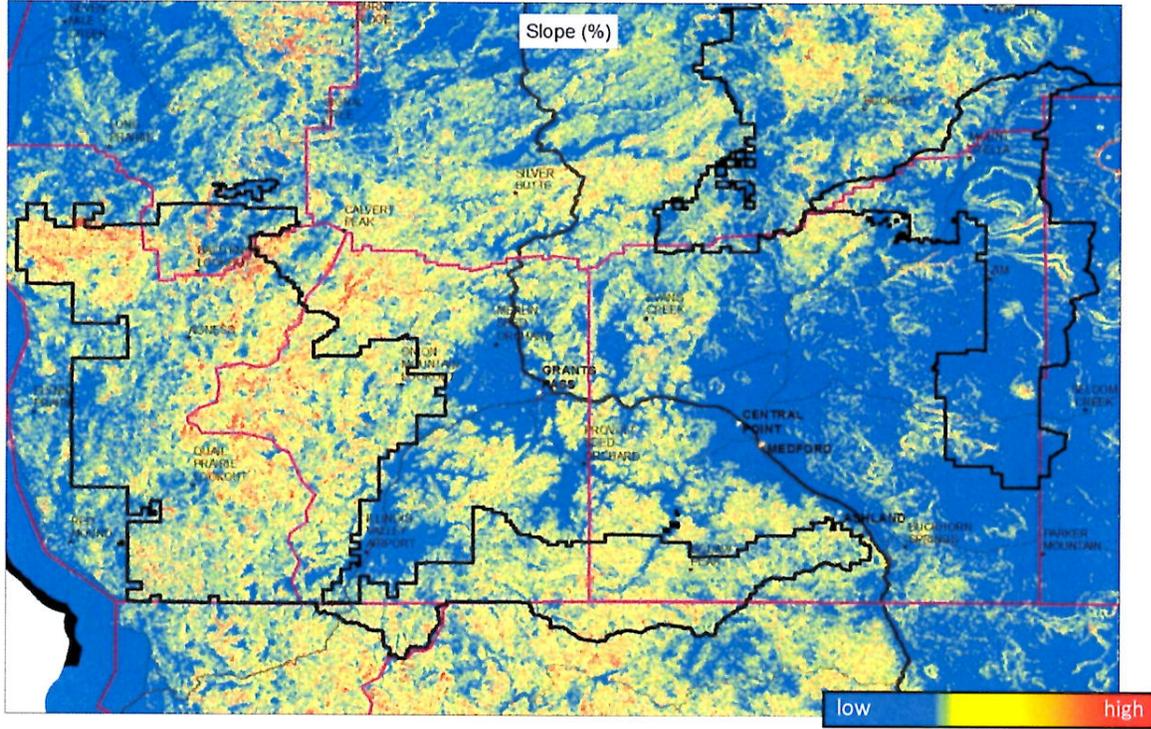
30-meter Digital Elevation Model (DEM)



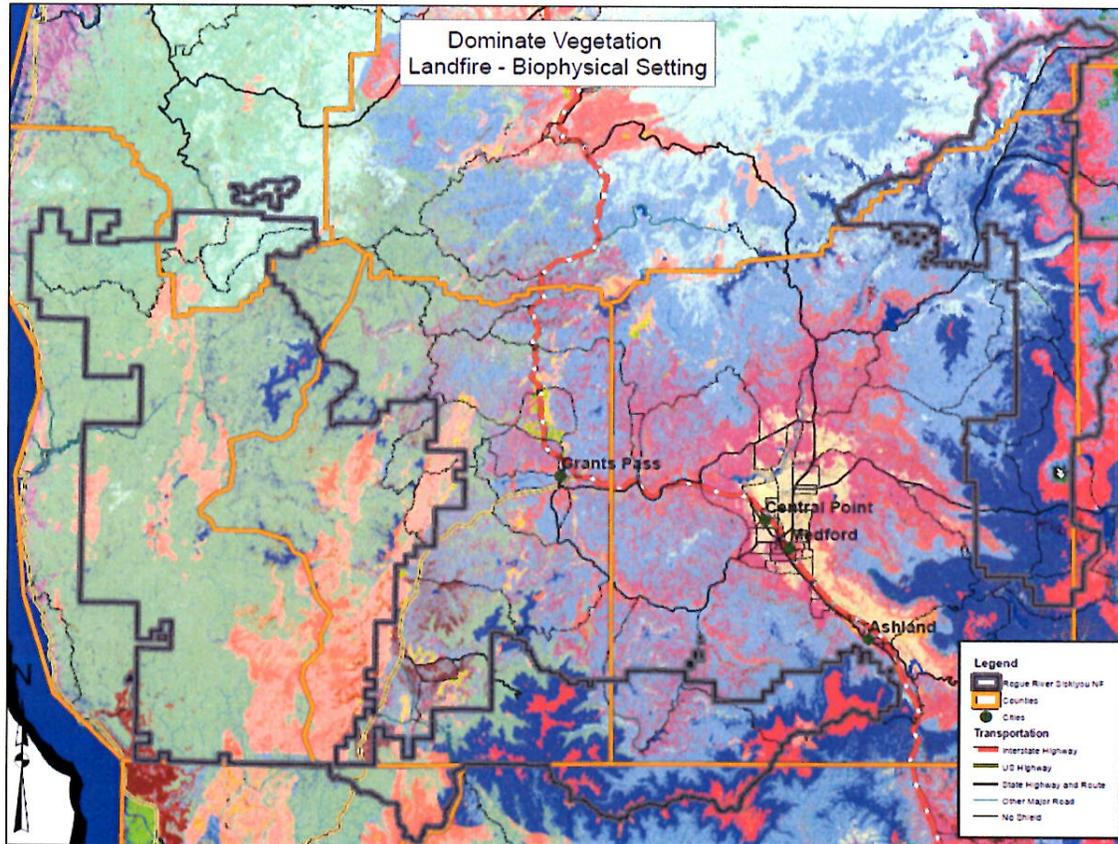
Scott and Burgan 40 Fire Behavior Fuel Models



Slope Class (DEM derived)



Bio Physical Settings (LANDFIRE, n.d.)



## Appendix B: Fire History

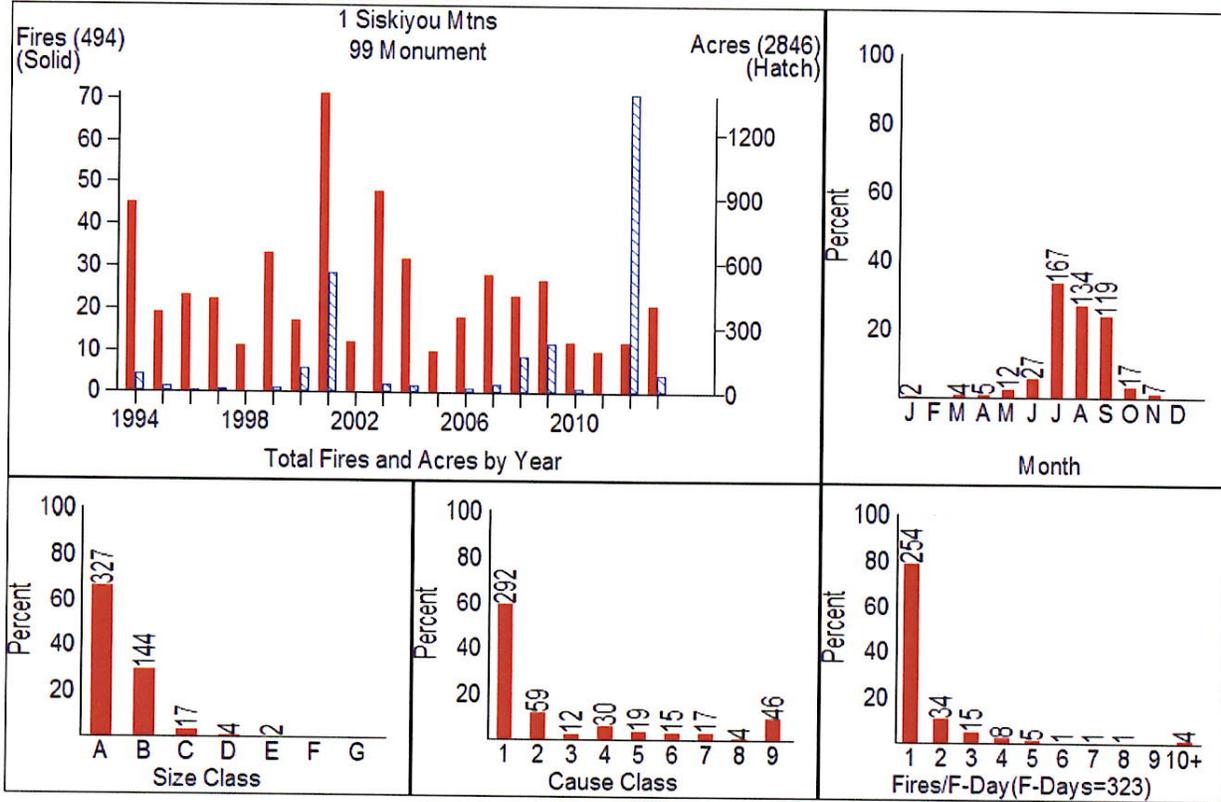
### Size Class

A = <.25 acre  
 B = .25-10 acres  
 C = 10-100 acres  
 D = 100-300 acres  
 E = 300-1000 acres  
 F = 1000-5000 acres  
 G = >5000 acres

### Cause Class

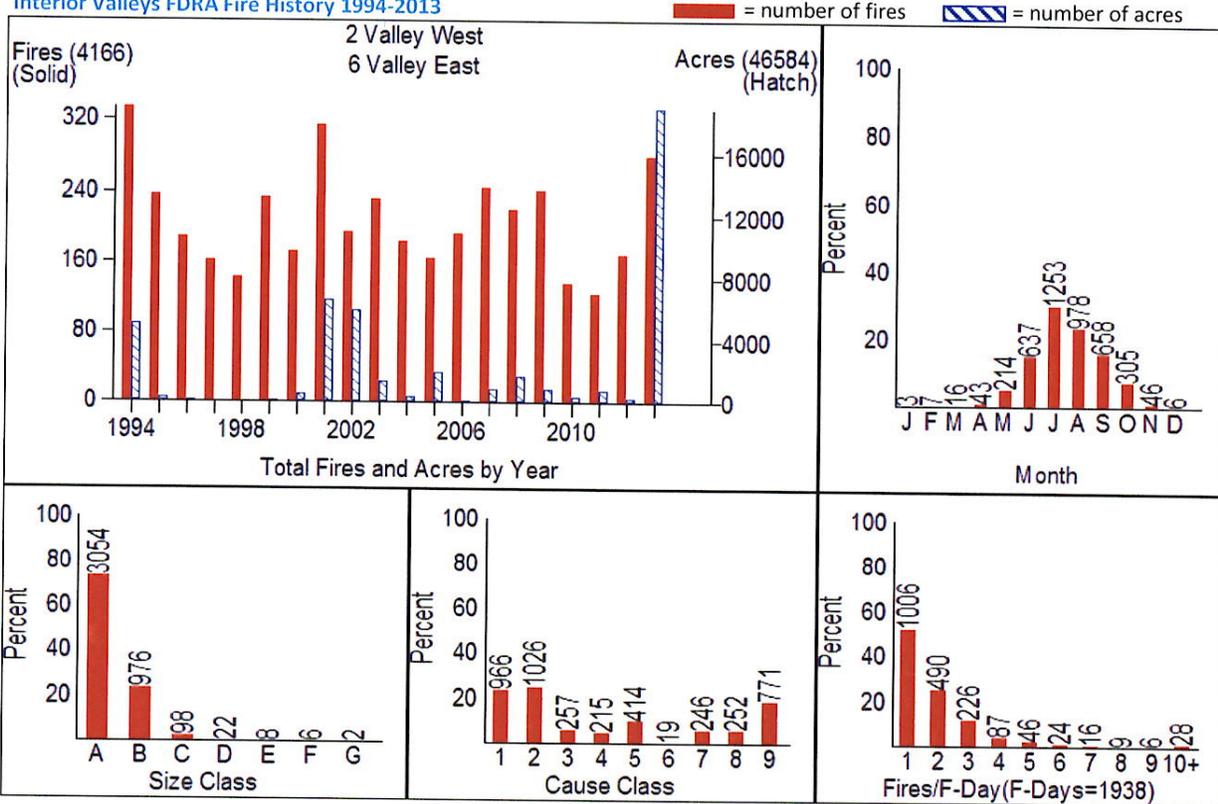
1 = Lightning  
 2 = Equipment use  
 3 = Smoking  
 4 = Campfire  
 5 = Debris burning  
 6 = Railroad  
 7 = Arson  
 8 = Children  
 9 = Miscellaneous

### Siskiyou Mountains FDRA Fire History 1994-2013

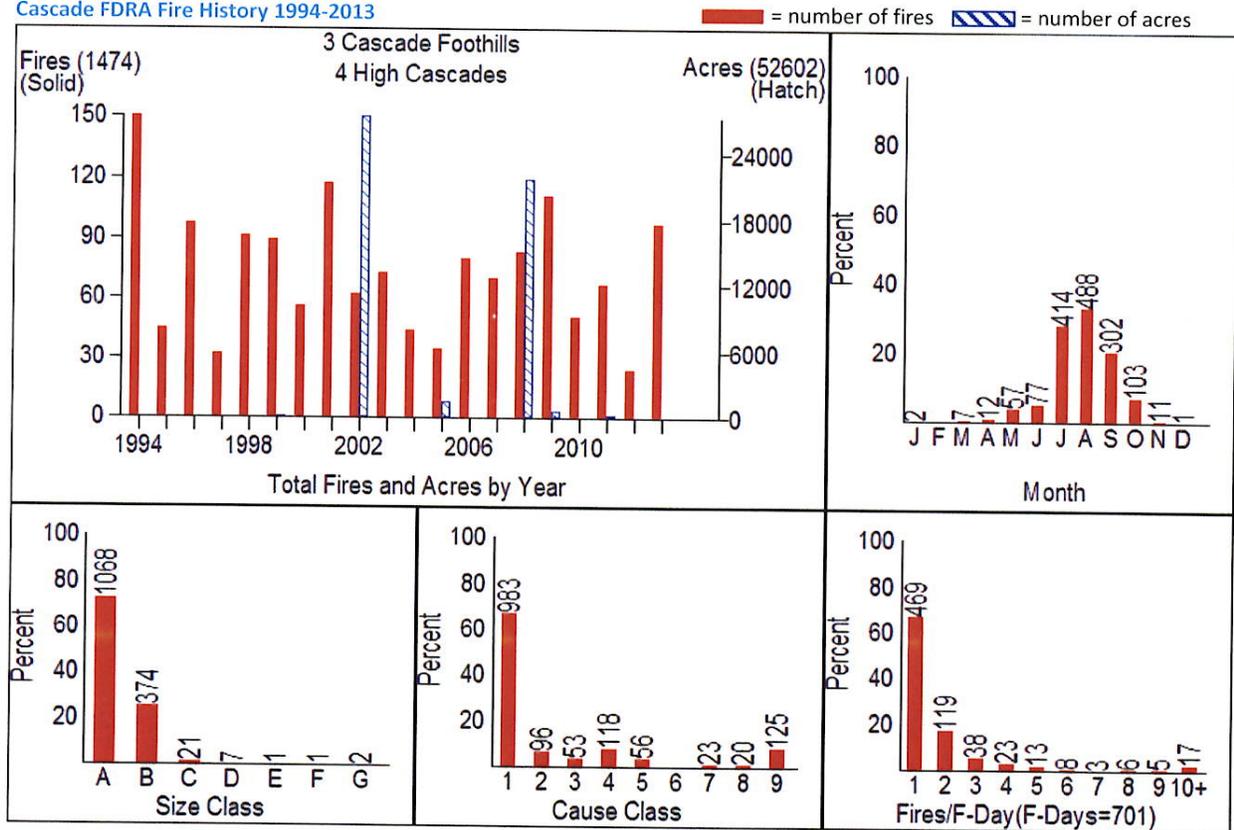


■ = number of fires  
 ▨ = number of acres

Interior Valleys FDRA Fire History 1994-2013

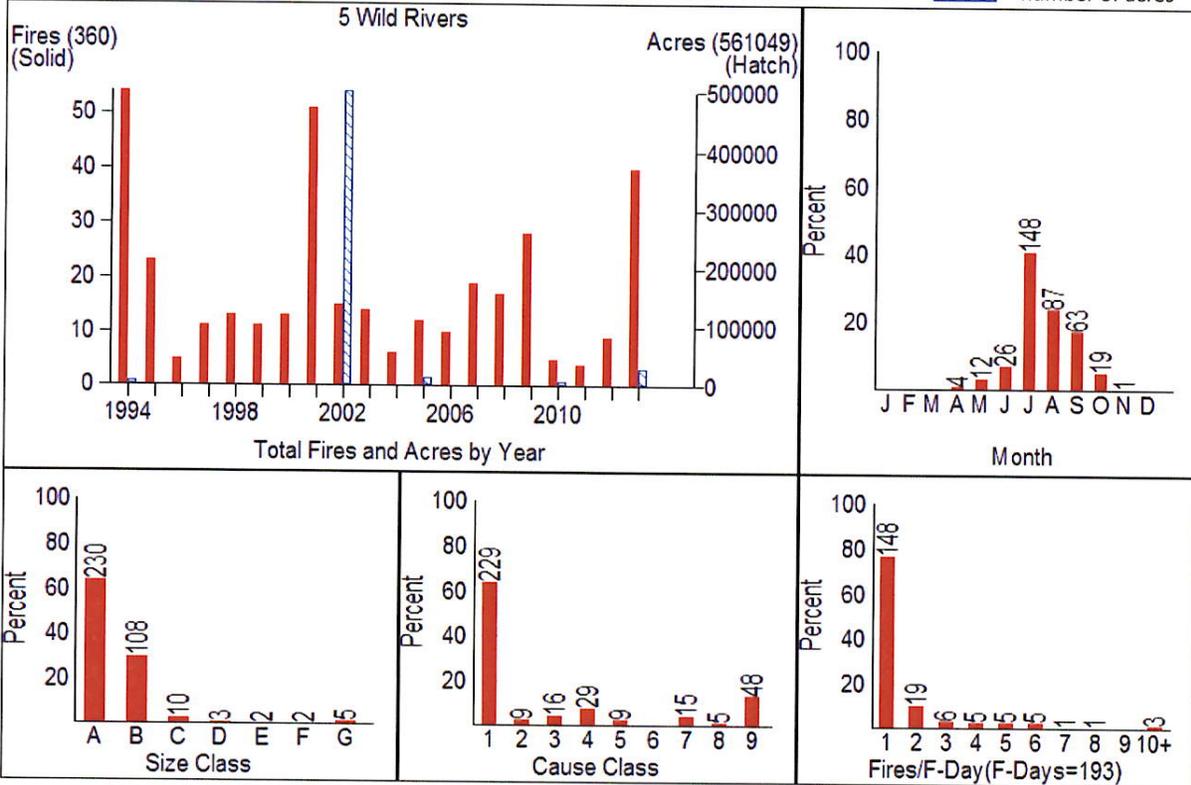


Cascade FDRA Fire History 1994-2013



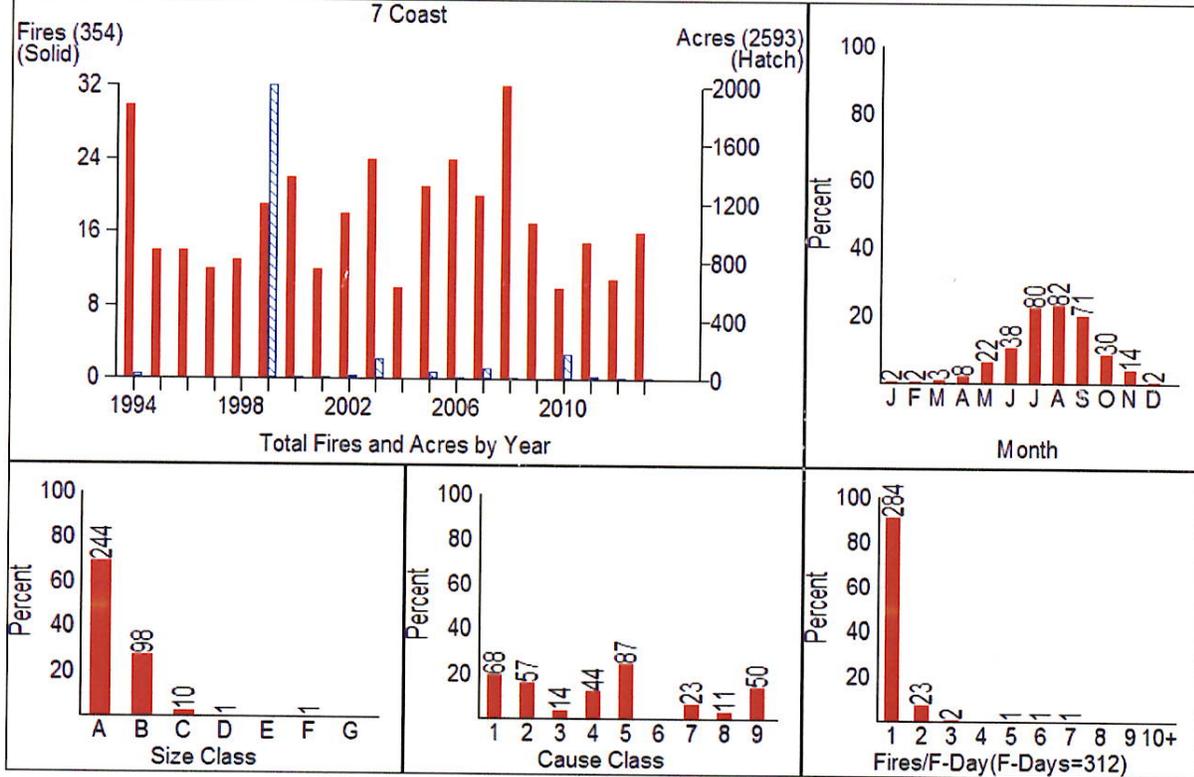
Wild River FDRA Fire History 1994-2013

■ = number of fires    ▨ = number of acres



Coast FDRA Fire History 1994-2013

■ = number of fires    ▨ = number of acres



## Appendix C: Industrial Fire Precaution Levels

More information can be found at [http://www.orrvc.org/fire\\_danger.shtml](http://www.orrvc.org/fire_danger.shtml)

- I. **Closed Season** - Fire precaution requirements are in effect. A Fire Watch/Security is required at this and all higher levels unless otherwise waived.
  
- II. **Partial Hoot owl** - The following may operate only between the hours of 8 p.m. and 1 p.m. local time:
  - Power saws except at loading sites;
  - Cable yarding;
  - Blasting;
  - Welding or cutting of metal.
  
- III. **Partial Shutdown** - the following are prohibited except as indicated:
  - Cable yarding - except that gravity operated logging systems employing non-motorized carriages may operate between 8 p.m. and 1 p.m. when all blocks and moving lines are suspended 10 feet above the ground except the line between the carriage and the chokers.
  - Power saws - except power saws may be used at loading sites and on tractor/skidder operations between the hours of 8 p.m. and 1 p.m. local time.

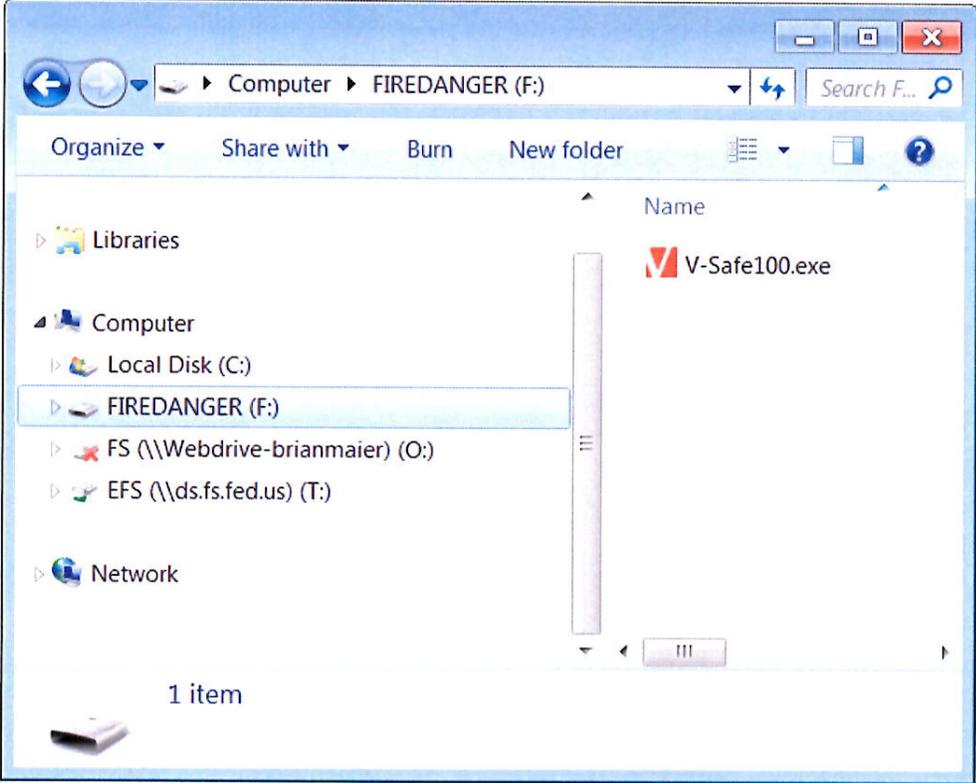
**In addition**, the following are permitted to operate between the hours of 8 p.m. and 1 p.m. local time:

  - Tractor, skidder, feller-buncher, forwarder, or shovel logging operations where tractors, skidders, or other equipment with a blade capable of constructing fire line are immediately available to quickly reach and effectively attack a fire start;
  - Mechanized loading or hauling of any product or material; blasting;
  - Welding or cutting of metal
  - Any other spark emitting operation not specifically mentioned.
  
- IV. **General Shutdown** - All operations are prohibited.

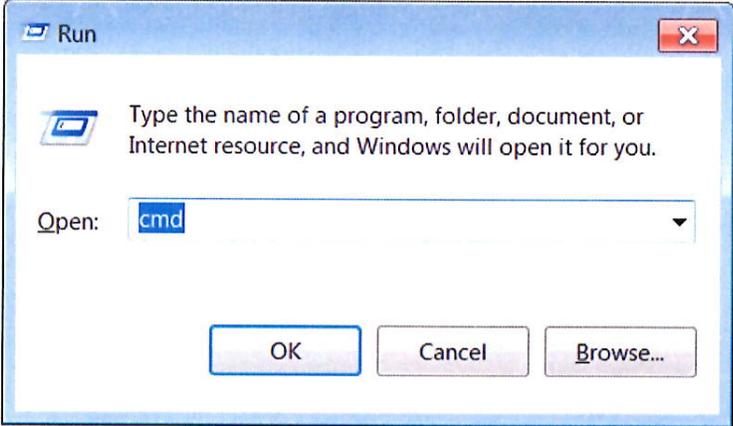
**NOTE:** Where hauling involves transit through more than one shutdown/regulation use area, the precaution level at the woods loading site shall govern the level of haul restriction, unless otherwise prohibited by other than the industrial precaution level system.

Appendix D: Fire Danger Worksheet Instructions

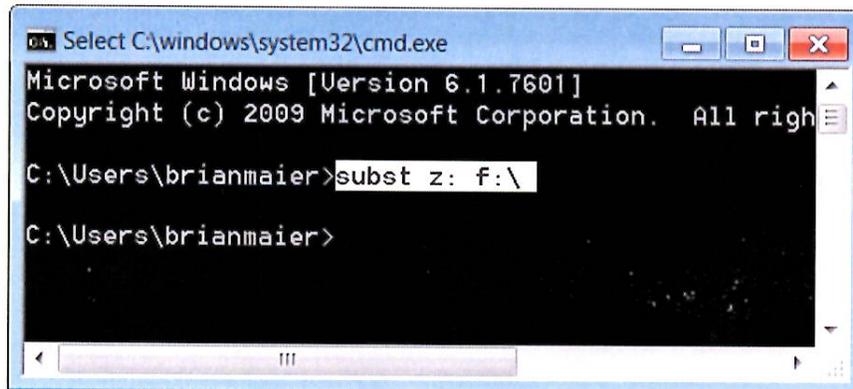
- 1. Insert FIREDANGER jump drive into a USB port
- 2. Perform a drive substitution (this allows the files to talk when moved between computers)
  - a. Open an Explorer window and note the letter of the drive where the jump drive is located. In this example F:



- b. Click Start and Run, type **cmd** and hit OK



- c. Type the following into the command line window (where f: is the location of the jump drive in your computer) **subst z: f:\** and hit Enter

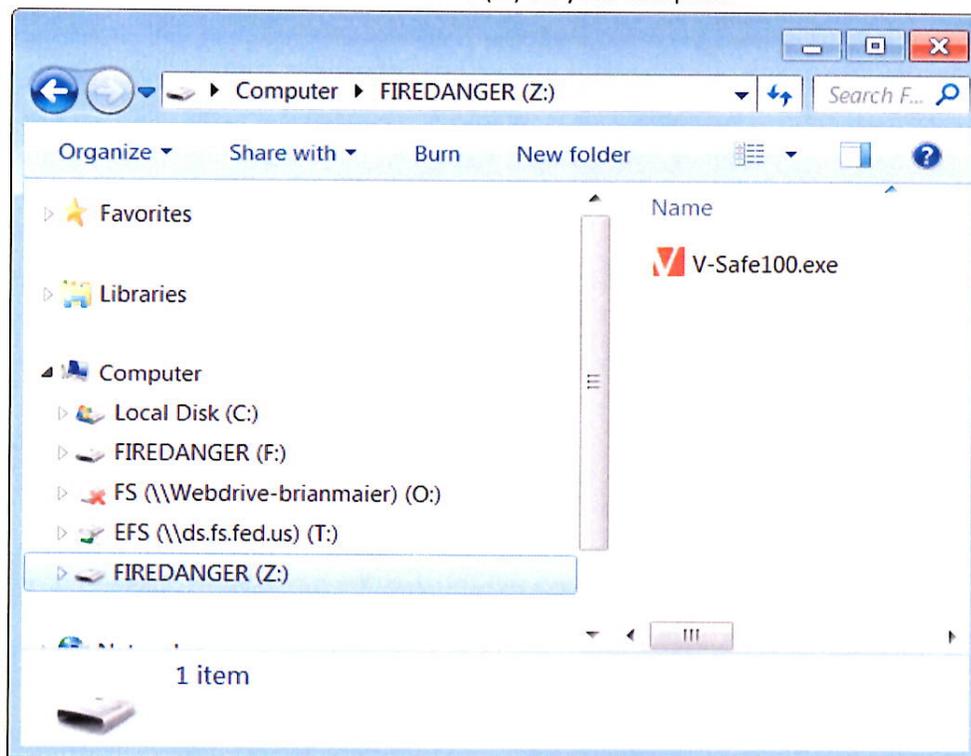


```
Select C:\windows\system32\cmd.exe
Microsoft Windows [Version 6.1.7601]
Copyright (c) 2009 Microsoft Corporation. All rights reserved.

C:\Users\brianmaier>subst z: f:\

C:\Users\brianmaier>
```

- d. Confirm that there is now a Virtual drive (Z:) on your computer



3. Open the FIREDANGER.xlsx file **from the Z drive**
4. On the Excel Data Tab, click Refresh All and wait for the data to refresh
5. Save and Close the FIREDANGER spreadsheet
6. Open the FIREDANGER.docx file **from the Z drive**, choose Yes when asked about updating information from linked files
7. **Save As** the FIREDANGER as file type **.pdf** using the following format (ex. FIREDANGER\_20140530)
8. Save and Close the Word document

## Appendix E: Glossary

- Biophysical Settings (BPs):** The vegetation that may have been dominant on the landscape prior to Euro-American settlement and is based on both the current biophysical environment and an approximation of the historical disturbance regime.
- Burning Index (BI):** An estimate of the potential difficulty of fire containment as it relates to the flame length at the head of the fire.
- Digital Elevation Model (DEM):** Digital model or 3D representation of a terrain's surface created from terrain elevation data.
- Energy Release Component (ERC):** The computed total heat release per unit area (British thermal units per square foot) within the flaming front at the head of a moving fire.
- Fire Danger Operating Plan (FDOP):** A guide to collection, communication, and application of fire danger ratings at the local level.
- Fire Danger Rating Area (FDRA):** A geographic area of relatively homogenous climate, fuels and topography, tens of thousands of acres in size, within which the fire danger can be assumed to be uniform. The basic on-the-ground unit for which unique fire management decisions are made based on fire danger ratings. Weather is represented by one or more NFDRS weather stations.
- Fire Program Analysis (FPA):** A (retired) system whose intent was to provide managers a common, interagency process for strategic fire management planning and budgeting
- Industrial Fire Precautions Level (IFPL):** Computed by WIMS processor and based on an historic analysis of ERC and IC. An application of fire danger rating to support regulation of contractors involved in land management activities for fire prevention purposes in the Pacific Northwest.
- National Fire Danger Rating System (NFDRS):** A uniform fire danger rating system that focuses on the environmental factors that control the moisture content of fuels. The complete program necessary to produce and apply fire danger ratings, including data collection, data processing, fire danger modeling, communications, and data storage.
- Preparedness Level (PL):** Increments of planning and organizational readiness dictated by burning conditions, fire activity, and resource availability.
- Public Information Officer (PIO):** This ICS position is responsible for developing and releasing information about the incident to the news media, incident personnel, and to other appropriate agencies and organizations.
- Remote Automated Weather Station (RAWS):** A weather station that transmits weather observations via GOES satellite to the Wildland Fire Management Information system.
- RVICC:** Rogue Valley Interagency Communications Center
- Staffing Level (SL):** The basis for decision support for daily staffing of initial attack resources and other activities. A level of readiness and an indicator of daily preparedness.

**Special Interest Group (SIG):** A group of weather stations in WIMS

**Weather Information Management System (WIMS):** A centralized weather data processing system at which daily fire danger ratings are produced.

**Wildland Fire Decision Support system (WFDSS):** A system that assists fire managers and analysts in making strategic and tactical decisions for fire incidents.

**Wildland Fire Management Information (WFMI):** A web site providing current weather and lightning data, as well as historic fire occurrence data.