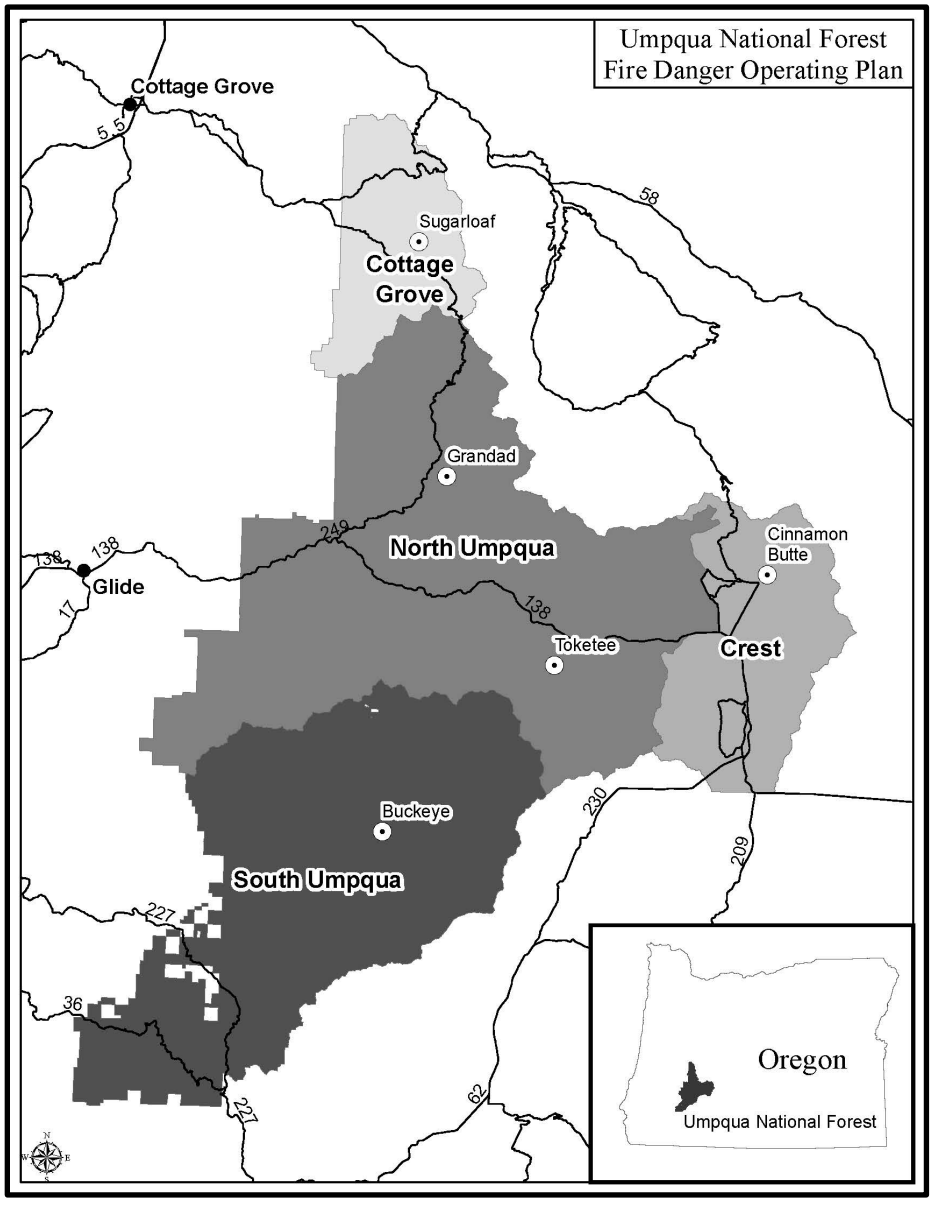
USDA Forest Service - Umpqua National Forest

Fire Danger Operating Plan



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Signatures

/s/ ALICE CARLTON Digitally signed by ALICE CARLTON Date: 2021.06.18 09:10:57 -07'00' 6/18/2021

FOREST SUPERVISOR DATE

/s/ CARLA KING Digitally signed by CARLA KING Date: 2021.06.17 16:53:49 -07'00' 6/17/2021

DISPATCH CENTER MANAGER DATE

/s/ JOHN SZULC Digitally signed by JOHN SZULC Date: 2021.06.18 07:43:29 -07'00' 6/18/2021

FOREST FIRE STAFF OFFICER DATE

I. Introduction

This document is intended to assist in planning and operational decisions related to fire danger, operational preparedness, resource needs, personnel briefings, and overall situational awareness for agency administrators, fire managers, dispatchers, and firefighters. This plan has been developed for use by the Umpqua National Forest (UPF) and Roseburg Interagency Communication Center (RICC) and does not establish rules, but rather serves as a decision support tool to reinforce professional judgement. The intent is to form a framework that results in safe, efficient, and effective responses to fire situations.

Guidance and policy for development of a Fire Danger Operating Plan (FDOP) can be found in the Interagency Standards for Fire & Aviation Operations (Red Book), and Forest Service Manual 5120. The process used to develop this plan is consistent with direction from the National Wildfire Coordinating Group (NWCG) and is based upon available scientific methods incorporating historical fire and weather analysis. The 2016 Revisions to the National Fire Danger Rating System (NFDRS) have been incorporated into this this plan.

The development process involves the following steps:

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

II. Objectives

1. Provide a tool for agency administrators, fire managers, dispatchers, and firefighters to correlate fire danger with appropriate fire management decisions on the Umpqua National Forest.
2. Document fire business and climatological thresholds developed using the Weather Information System (WIMS), NFDRS and Fire Family Plus (FF+) software through analysis of an integrated database of historical fire weather and fire occurrence data.
3. 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.
4. Ensure that agency administrators, fire managers, firefighters and the public are notified of the potential fire danger.
5. Develop fire danger pocket cards and identify distribution method for all personnel involved with fire suppression activities within the plan area.
6. Identify seasonal risk analysis criteria and establish large fire growth thresholds.
7. Maintain an interagency fire weather monitoring network consisting of Remote Automated Weather Stations (RAWS) which comply with NFDRS Weather Station Standards (PMS 426-3).

III. Fire Danger Planning Area Inventory

A. Administrative Unit

This plan encompasses approximately one million acres in southwestern Oregon covering portions of Lane, Douglas, and Jackson counties. The plan boundary is coincident with the Umpqua National Forest boundary.

Suppression resources within the plan area are dispatched out of the Roseburg Interagency Communication Center (OR-RICC), Roseburg Oregon. RICC tracks and assigns personnel to initial attack incidents within lands administered by the Umpqua National Forest as well as adjacent BLM lands. The center is interagency, and the dispatch area extends beyond the Forest boundary; however, this FDOP refers only to the Umpqua National Forest administered lands.

The Central Oregon FDOP area is adjacent to the east of the Umpqua National Forest's FDOP area. The Rogue River – Siskiyou FDOP area is adjacent to the South. The Northwest FDOP is still in development and will cover areas to the North. There is not currently a FDOP for areas west of the Umpqua.

Plans within Region 6: https://gacc.nifc.gov/nwcc/predict/fire_fuel.aspx
Central Oregon: https://gacc.nifc.gov/nwcc/content/products/Plans/Central%20Oregon%20FDOP.pdf)
Rogue River – Siskiyou NF: (https://gacc.nifc.gov/nwcc/content/products/Plans/RSF_FDOP_2017.pdf)

B. Fire Danger Rating Areas

Fire Danger Rating Area (FDRA) 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 NFDRS weather stations." (National Wildfire Coodrinating Group, 2002)

Development

An analysis of the area and spatial delineation was completed in previous versions of this document that will not be updated in this version. The previous plan involved a comprehensive analysis using a GIS and spatial data. including: 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. Although the potential exists for changing climate or vegetation, the areas described are consistent with current observations and continue to represent the spatial boundaries developed in the previous plan. FDRAs were delineated based on topography, vegetation, and climate which affect NFDRS indices and components, as well as consideration of administrative boundaries.

FDRAs utilized in this plan were developed by the Fire Management Group during the winter of 2014/15 and were assessed for continued use in March of 2021.

Fire Danger Rating Area Descriptions

The planning area analysis suggests the delineation of 4 FDRAs; Cottage Grove (district boundary), North Umpqua (includes western portion of Diamond Lake district), South Umpqua (Tiller District boundary) and Crest. *(Figure 1: FDRA Map)* These delineations were based on vegetation, slope, elevation, average annual precipitation, and average annual maximum temperature (*Figure 9: FDRA Delineation Decision Supporting Figures*)

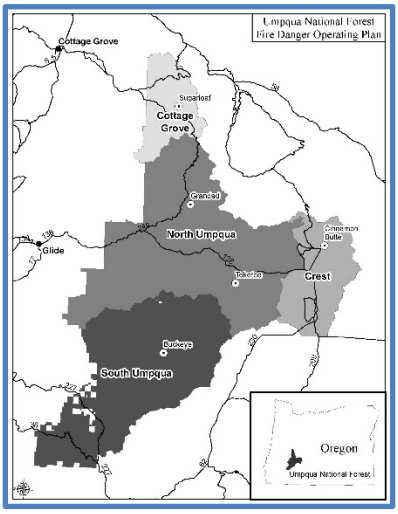


Figure 1: FDRA Map

Cottage Grove

The Cottage Grove FDRA is steeper (*Table 4: Slope Class*) and wetter (*Figure 5: Average Minimum Relative Humidity*) than other FDRAs. During fire season the Cottage Grove FDRA is also the coldest (*Figure 6: Average Maximum Temperature*). Sugarloaf is the only RAWS for this FDRA.

Crest

The Crest FDRA is differentiated from the other FDRAs by its high elevation (*Table 3: Elevation*), flat terrain (*Table 4: Slope Class*) cool temperatures (*Figure 6: Average Maximum Temperature*) and, vegetation type dominated by hemlock, fir, and lodgepole pine. (*Table 2: LANDFIRE Biophysical Setting*) Cinnamon is the only RAWS for this FDRA.

North Umpqua

The North Umpqua FDRA is transitional, located between and sharing similarities with, the other FDRAs. Vegetation is similar to Cottage Grove (*Table 2: LANDFIRE Biophysical Setting*), but experiences warmer, drier weather conditions compared to Crest or Cottage Grove. (*Figure 6: Average Maximum Temperature* and *Figure 5: Average Minimum Relative Humidity*) Slope class (*Table 4: Slope Class*) and fire history (*Figure 3: Fire History Map 2000-2019*) are similar to South Umpqua. Median elevation is similar to both the Cottage Grove and South Umpqua (*Table 3: Elevation*). There are two equally weighted RAWS in this FDRA, Grandad and Toketee.

South Umpqua

The South Umpqua FDRA is warmer (*Figure 6: Average Maximum Temperature*) and drier (*Figure 5: Average Minimum Relative Humidity*) and vegetation is unique compared to other FDRAs in this plan with a relatively large component of ponderosa pine and incense cedar BpS (*Table 2: LANDFIRE Biophysical Setting*). Buckeye is the only RAWS for this FDRA.

C. Fire History

Interagency fire occurrence records for this analysis were obtained from the Fire and Aviation Management (FAMWEB) Data Warehouse and USFS fire history spatial layers. Fire occurrence analysis for this plan utilized fires administered by the Umpqua National Forest for the years 2000-2019. Lightning was the primary cause for ignitions (77%), followed by campfires (15%). July, August, and September accounted for the majority (89%) of ignitions, while June through October which is typically considered fire season accounted for 96% of responses (*Figure 2: Fire Summary 2000-2019*).

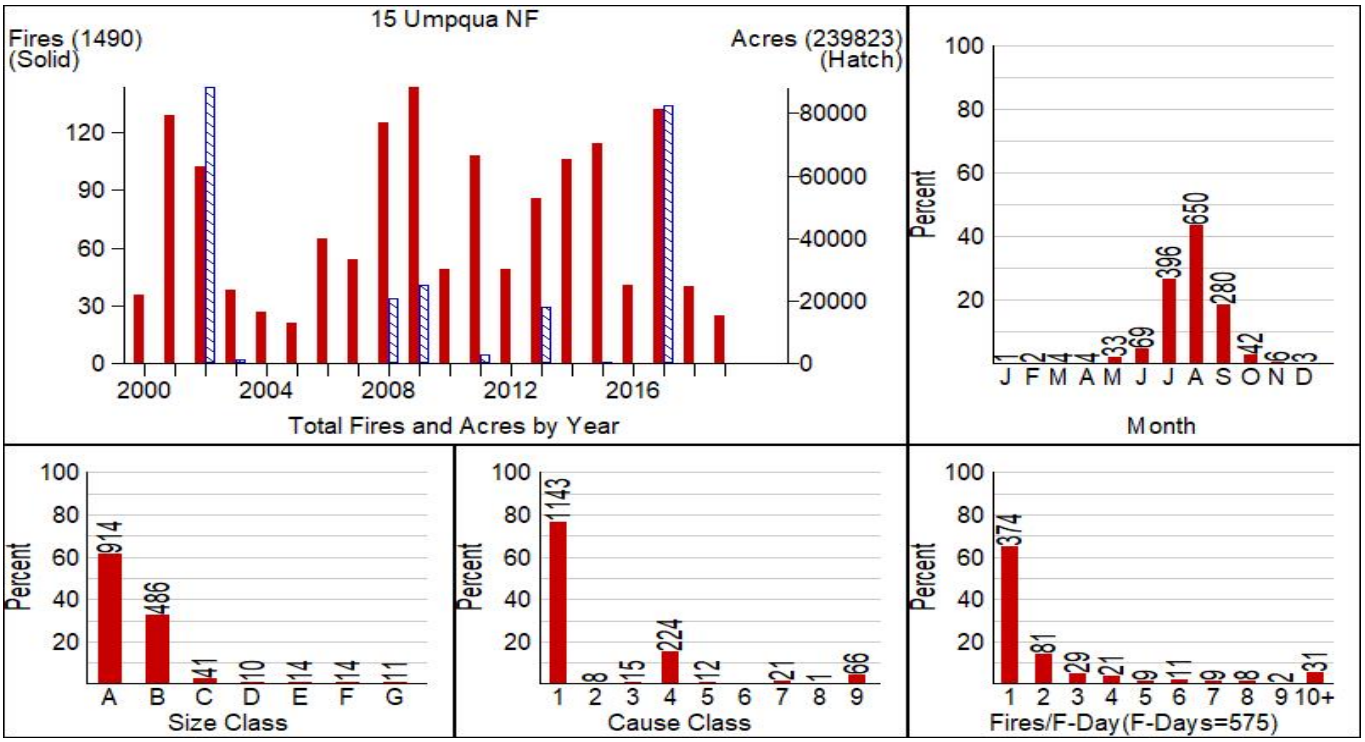


Figure 2: Fire Summary 2000-2019

Fire ignition patterns are relatively widespread across all areas of all FRDAs. Large fires have occurred at a higher frequency at lower elevation, with the majority of large fires occurring on South Umpqua and North Umpqua FDRAs (*Figure 3: Fire History Map 2000-2019*).

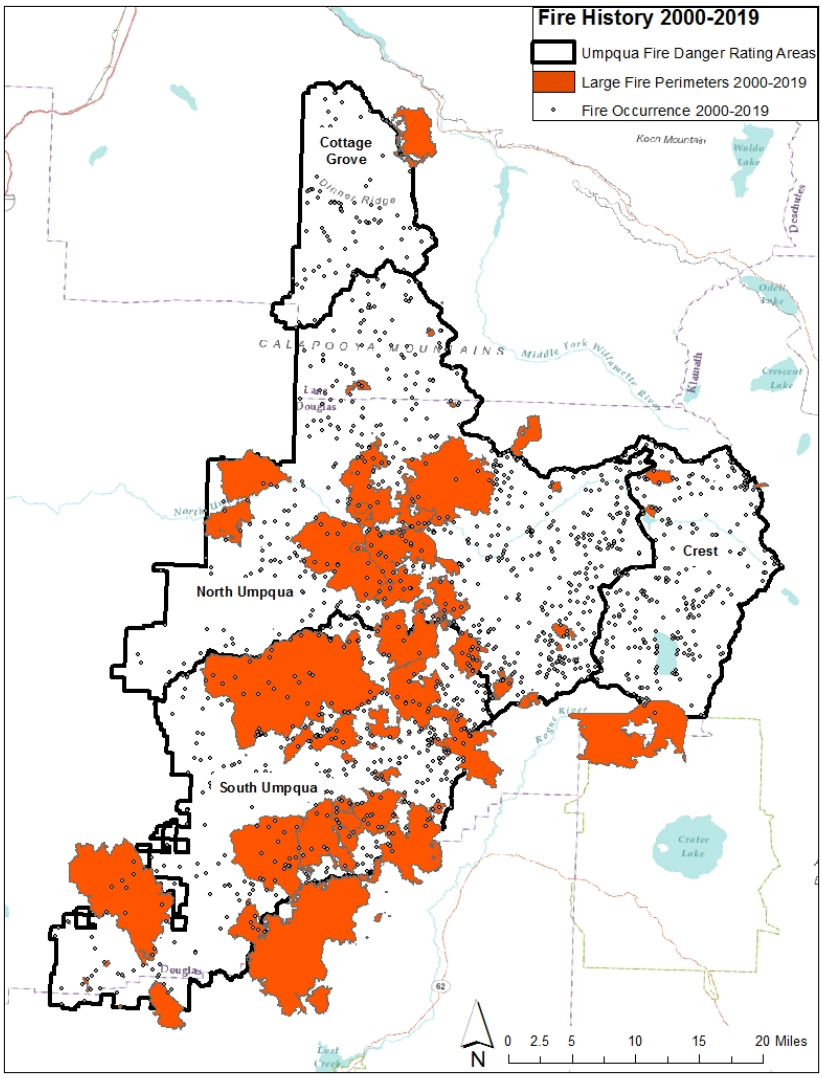


Figure 3: Fire History Map 2000-2019

The Cottage Grove FDRA rarely experiences fires which total few acres and the majority are lightning caused. The Crest FDRA has both more fires and acres burned than Cottage Grove. The cause of fires is split almost equally between human and lightning. The North Umpqua FDRA has the highest total number of fires with a large proportion of the fires being human caused. The South Umpqua FDRA has the highest total acres burned with human caused fires accounting for nearly twice as many of those caused by lightning. (See ***Table 1: Fire Cause and Total Acres*** **and** ***Figure 4: Fire Cause and Total Acres***)

Table 1: Fire Cause and Total Acres

FDRA	Lightning Caused	Human Caused	Total Fires	Total Acres
Cottage Grove	57	33	90	62
Crest	149	113	262	1,624
North Umpqua	187	449	636	105,426
South Umpqua	145	314	459	136,306

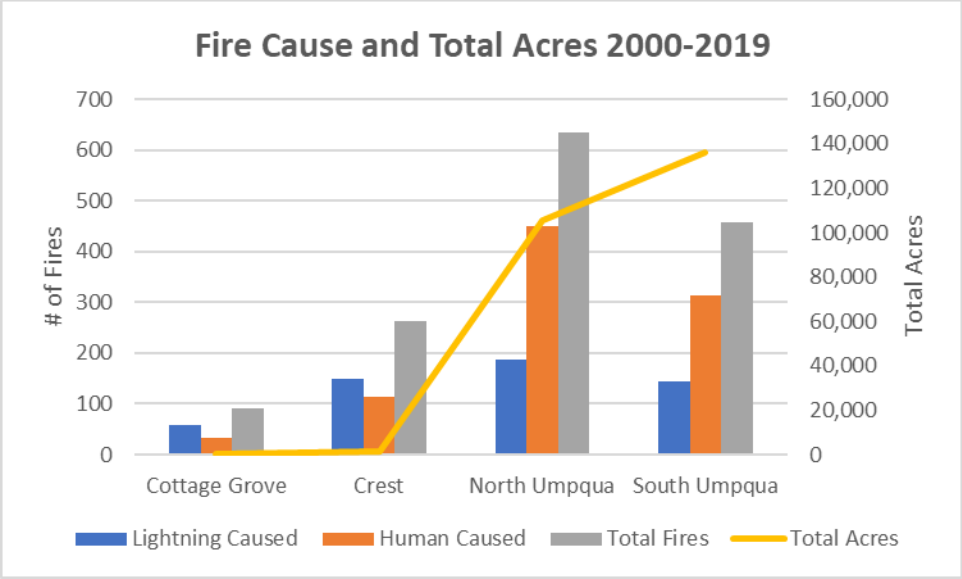


Figure 4: Fire Cause and Total Acres

D. Weather Stations

Five Remote Automated Weather Stations (RAWS) exist within the plan area (*Table 1: Remote Automated Weather Stations*). All five are managed by the Umpqua National Forest and are National Fire Danger Rating System compliant. Observations from before 1996 reported from these stations have been determined to be unreliable. For the purposes of this plan, only data from 2000-2019 was used.

Table 2: Remote Automated Weather Stations

Station ID	Name	Latitude	Longitude	Elevation	State	County	Agency	Unit	NFDRS fuel model
352546	SUGARLOAF_RAWS	43.66361	-122.62917	4328	OR	Lane	USFS	UMPQUA_NF	Y
353031	CINNAMON RAWS	43.32083	-122.10667	4834	OR	Douglas	USFS	UMPQUA_NF	Y
353036	GRANDAD RAWS	43.41583	-122.57722	2900	OR	Douglas	USFS	UMPQUA NF	Y
353038	TOKETEE RAWS	43.21833	-122.40972	3360	OR	Douglas	USFS	UMPQUA NF	Y
353040	BUCKEYE RAWS	43.03639	-122.65528	2264	OR	Douglas	USFS	UMPQUA NF	Y

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)

Douglas-fir-western hemlock forests make up the majority of the FDOP area (59%). Ponderosa pine-incense cedar is the next most abundant vegetation type (12%) occurring in the South Umpqua drainage. Followed by the high elevation forest types found on the Cascade Crest including Douglas-fir-white fir-sugar pine and red fir (6% each) and silver fir-western hemlock and mountain hemlock-huckleberry (5% each). A summary of vegetation groups limited to values greater than 5% of the FDRA is shown in *(Table 2: LANDFIRE Biophysical Setting)*.

Table 3: LANDFIRE Biophysical Setting

LANDFIRE Biophysical Setting Groups >/= 5% of the rating area		
FDRA	**BpS Group Name**	**Percent**
Cottage Grove	Douglas Fir-Western Hemlock	90%
North Umpqua	Douglas Fir-Western Hemlock	79%
	Silver Fir-Western Hemlock	8%
South Umpqua	Douglas Fir-Western Hemlock	46%
	Ponderosa Pine-Incense Cedar	34%
Crest	Red Fir	33%
	Mountain Hemlock-Huckleberry	27%
	Douglas Fir-White Fir-Sugar Pine	19%
	Lodgepole Pine-Kinnikinnick	5%

F. Topography

The Cascade Mountain Crest forms the eastern extent of the FDOP area; administratively separating the Umpqua National Forest from the Fremont-Winema and Deschutes National Forests. Two major transverse ridges run east-west, the Calapooya and the Rogue-Umpqua.

The Calapooya Divide separates the Middle Fork Willamette from the Row and North Umpqua rivers and forms the northern extent of the FDOP area; administratively separating the Willamette and Umpqua National Forests. The Rogue-Umpqua Divide separates the South Umpqua from the North Fork Rogue River and forms the southern extent of the FDOP area; administratively separating the Umpqua and the Rogue River Siskiyou National Forests. The Calapooya splits to divide the Row River from the North Umpqua and the Rogue-Umpqua splits to divide the North and South Umpqua rivers.

Elevation on the forest, not including administrative sites outside the forest boundary proper, ranges from 889’ where the North Umpqua leaves the forest boundary to 9,127 feet at the top of Mt. Thielsen. (*Table 3: Elevation*). Moving west away from the Cascade Crest is a broad expanse of relatively flat terrain broken by scattered peaks and cliff bands before terrain becomes steeper and more dissected. The Cottage Grove Ranger District is notably steeper than the rest of the forest while the Cascade Crest (eastern portion of the Diamond Lake RD) is notably flatter (*Table 4: Slope Class*).

Table 4: Elevation

DEM Elevation (ft)				
FDRA	**Min**	**Max**	**Range**	**Median**
Cottage Grove	1,188	5,961	4,774	3,120
North Umpqua	889	7,001	6,112	3,465
South Umpqua	1,089	6,759	5,669	3,100
Crest	4,062	9,085	5,023	5,495

Table 5: Slope Class

Slope Class		
FDRA	**Majority**	**Median**
Cottage Grove	3	3
North Umpqua	1	2
South Umpqua	1	2
Crest	1	1

G. Climatology

The RAWS associated with each FDRA show similar trends throughout fire season in terms of minimum humidity and maximum temperature. (*Figure 5: Average Minimum Relative Humidity* and *Figure 6: Average Maximum Temperature*) Cottage Grove is notably wetter than other FDRAs and the South Umpqua is significantly warmer than other FDRAs. Crest is somewhat unique as it maintains the lowest average relative humidity across all FRDAs, but has comparatively cool summertime temperatures.

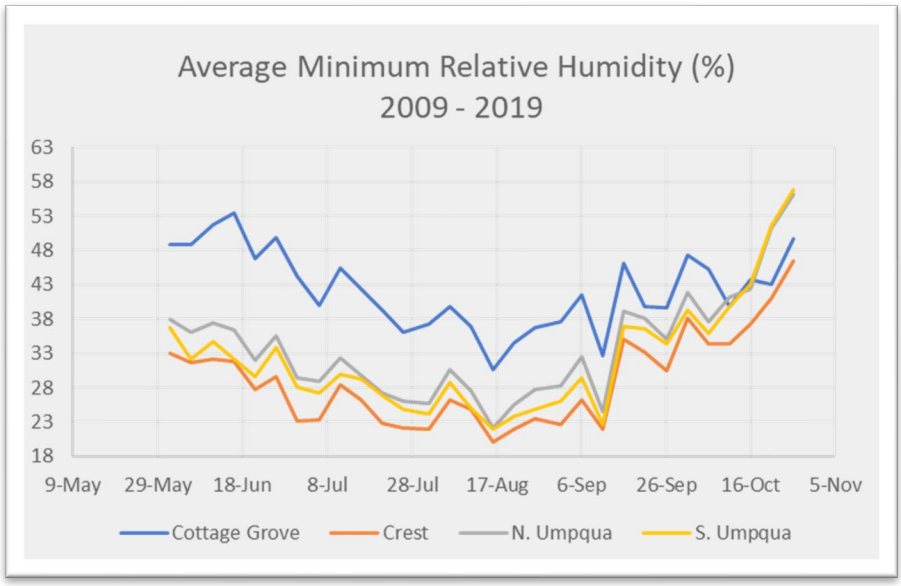


Figure 5: Average Minimum Relative Humidity

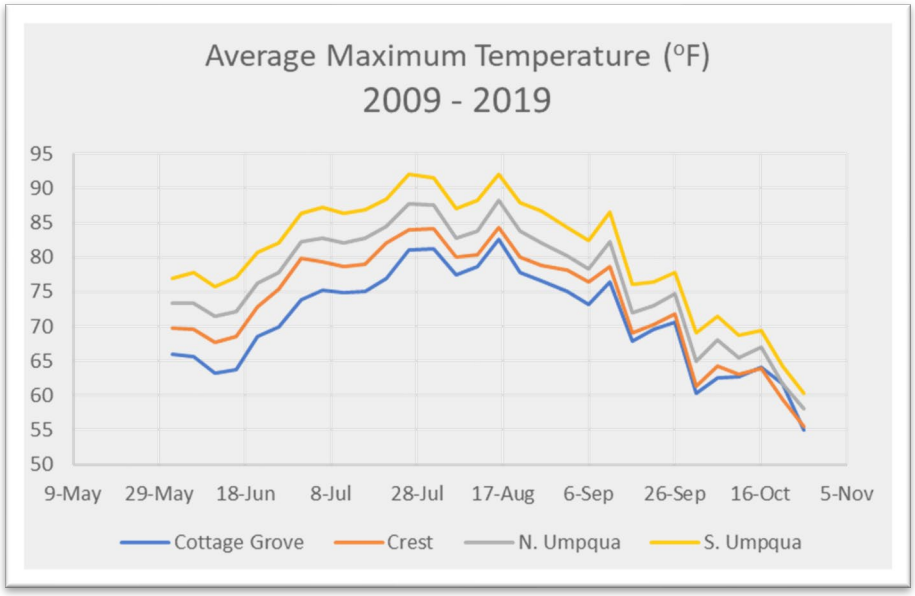


Figure 6: Average Maximum Temperature

IV. Fire Danger Thresholds Analysis

A. Weather Data

Weather data from the Fire and Aviation Management Web Applications (FAMWEB) and Climate, Ecosystem and Fire Applications (CEFA) was used for the analysis. A complete quality assurance review was performed for this analysis. Quality weather data begins in 1996; however, for the purposes of this plan, with consideration of long-term changing weather patterns, data from 2000-2019 was used. June 1 through October 31 was used for analysis to capture the majority of suppression responses.

B. Fire Data

Fire occurrence data was obtained from the Interagency Fire Program Analysis Fire Occurrence Database. "The data product contains a spatial data base of wildfires that occurred in the United Stated from 1992-2015, generated for the national (FPA) system. The wildfire records were acquired from the reporting systems of federal, state and local fire organizations and local fire organizations. Basic error checking was performed, and redundant records were identified and removed to the degree possible" (Short, 2017) Additional records from 2015-2019 were obtained from the FAMWEB applications database.

C. Analysis Settings

Slope class for the analysis is based on a GIS analysis of percent slope (*Table 4: Slope Class*). Previously set precipitation values for each rating area were used for analysis. Herbaceous was set to perennial. The Umpqua Fire Management Group decided, in the winter of 2015, that 2+ acres should be used for Large Fires and that 5+ fires should be used for Multi-Fire Day analysis, based on when local resources within the analysis area would likely be overextended and a fire becomes a problem.

D. Statistical Correlations

BI and ERC were evaluated to determine the best NFDRS index for setting decision points. Each FDRA was examined using the NFDRS16 timber fuel model Y. Both BI and ERC fall into acceptable values with a Chi^2 with a value less than 15 in the statistical correlation (*Table 5: Statistical Correlations*). ERC was selected for determining fire business thresholds due to having a wider P value range for both large fire days and multiple fire days in most cases.

Table 6: Statistical Correlations

SIG/Station	Years	Annual_Filter	Variable	Model	FD_Chi^2	FD_P-Range	LFD_Chi^2	LFD_P-Val	LFD_P-Range	MFD_Chi^2	MFD_P-Range
Cottage Grove	2002 - 2019	6/1 - 10/31	BI	Y3P4	9.3	0.00 - 0.08	0	0	0.01 - 0.15	0	0.00 - 0.07
Cottage Grove	2002 - 2019	6/1 - 10/31	ERC	Y3P4	5.77	0.00 - 0.10	1.39	0	0.01 - 0.22	0	0.01 - 0.05
Crest	2001 - 2019	6/1 - 10/31	BI	Y1P4	28.05	0.01 - 0.29	7.55	0.1827	0.00 - 0.33	1.34	0.01 - 0.11
Crest	2001 - 2019	6/1 - 10/31	ERC	Y1P4	30.05	0.01 - 0.26	5.41	0.6104	0.01 - 0.40	0.8	0.01 - 0.06
North Umpqua	2000 - 2019	6/1 - 10/31	BI	Y3	5.29	0.02 - 0.21	4.74	0.785	0.01 - 0.30	5.09	0.03 - 0.21
North Umpqua	2000 - 2019	6/1 - 10/31	ERC	Y3	8.9	0.02 - 0.31	10.52	0.2304	0.02 - 0.29	12.52	0.02 - 0.30
South Umpqua	2002 - 2019	6/1 - 10/31	BI	Y2P3	10.17	0.02 - 0.14	4.63	0.7962	0.01 - 0.54	10.24	0.01 - 0.33
South Umpqua	2002 - 2019	6/1 - 10/31	ERC	Y2P3	9.64	0.02 - 0.18	4.3	0.8293	0.01 - 0.75	5.11	0.01 - 0.50

E. Fire Business Thresholds

Fire business thresholds were developed for each FDRA such that approximately 60, 30, and 10 percent of All Days fit into Staffing Levels 3, 4, and 5 respectively. Values were further adjusted from that point to optimize (Maximize the number of problem fire days in Staffing Level 4 and 5. Thresholds were based on June 1 through October 31 (*Table 7: FDRA Staffing Level ERC-Y Ranges*).

Table 7: FDRA Staffing Level ERC-Y Ranges

Staffing Level Ranges (ERC-Y)					
FDRA	**1**	**2**	**3**	**4**	**5**
Cottage Grove	0-11	12-24	25-36	37-44	45+
Crest	0-13	14-23	24-36	37-46	47+
North Umpqua	0-10	11-23	24-35	36-44	45+
South Umpqua	0-13	14-25	26-40	41-50	51+

The table below (*Table 8: ERC 90th and 97th Percentile Thresholds*) shows the 90th and 97th percentile energy release component thresholds for each FDRA. This threshold is a commonly used fire danger metric that classifies the top 10 and 3 percent of fire weather days, which can aid in identifying the potential for intense fire behavior.

Table 8: ERC 90th and 97th Percentile Thresholds

Fire Season Only (June 1st - October 31st)		
FDRA	**ERC-Y 90th %**	**ERC-Y 97th %**
Cottage Grove	48	54
Crest	44	51
N. Umpqua	43	50
S. Umpqua	48	54

Year Round		
FDRA	**ERC-Y 90th %**	**ERC-Y 97th %**
Cottage Grove	41	50
Crest	37	46
N. Umpqua	37	45
S. Umpqua	43	50

V. Fire Danger Based Decisions

A. Fire Problem Inventory

The NFDRS utilizes the WIMS processor to manipulate weather data stored in the National Interagency Fire Management Integrated Database to produce fire danger outputs for RAWS, which represent FDRAs defined in this plan. The system is designed to calculate near worst-case scenario fire danger for the rating area. In order to apply a system which will assist managers with fire management decisions, the problems must be inventoried and analyzed to determine the most appropriate management control mechanism which will adequately address the issues.

This plan will affect a wide range of entities. However, these entities can be grouped into three primary categories:

- Agency: Employees of the federal, state, and local governments involved in the cooperative effort to suppress wildland fires. This includes BLM, USFS, NPS, BIA, FWS, State and County employees, along with volunteer fire departments.
- Industry: Organizations that either utilize the natural resources or have permits to conduct activities on federal, state, or private lands for commercial purposes. These entities or activities include ranchers, wilderness camps, railroads, mines, timber harvesting, filming, building construction, oil and gas, electric generation, guiding services, etc.
- Public: Individuals who use the land for recreational purposes such as off-highway vehicle (OHV) use, camping, hiking, hunting, fishing, skiing, firewood gathering, agricultural burning, mountain biking, or general travel. This group also includes those living within the wildland/urban interface (WUI). Agricultural burning has caused an increase in workload as early as February.

The table on the following page demonstrates the differences between the target groups (Agency, Industry, and Public). The ability to regulate, educate, or control a user group will be based upon the interface method and how quickly they can react to the action taken. In addition, each action will result in positive and/or negative impacts to the user groups. Consequently, the decision tool which would be most appropriate would depend upon the sensitivity of the target group to the implementation of the action. In selecting a component and/or index, several factors must be considered:

- Problem/Issue: This is the problem specific to the area of concern and includes ignition causes. The problem is framed to focus on the wildland fire management issue, such as the point when fire activity becomes a burden to the local suppression forces.
- Management Action (Application): This is the decision(s) which will affect the public, industry, or agency personnel. This includes fire management applications which can be used to formulate decisions regarding the potential issues which have been identified for the specific area. Management actions represent a way to link fire danger information with fire management decisions which affect specific target groups. Consider the appropriate set of decision thresholds to address the issue (i.e., Dispatch Level, Staffing Level, Preparedness Level, Adjective Rating, Public/Industrial Restrictions, etc.).
- Target Group: The group of people commonly associated with the problem (Agency, Industry, or Public).
- Degree of Control: This is a general description of how much control the agencies have over these entities (High > Low) and how quickly a target group can respond to management actions.

Problem Analysis							Management Action	
	AFFECTED TARGET GROUP							
FRAMING THE PROBLEM	**AGENCY**	**PUBLIC**	**INDUSTRIAL**	**RELATIVE CONTROL OF TARGET GROUP**	**ANTICIPATED COMMUNICATION WITH TARGET GROUP**	**PROBABLE IMPACTS**	**INDEX / COMPONENT**	**MANAGEMENT TOOL**
Problem: Multiple lightning ignitions that exceed resource capabilities to respond. *Suppression resources committed to multiple IA fires.*	**X**			High	***Dispatch*** retrieves the days forecast NFDRS values; processes, posts & broadcasts **Staffing Level** & **Lightning Activity Level** daily.	Positive: fewer fires exceed IA reducing expenditures & risk. Acres moved towards DFC in LRMP. Negative: Money spent on mobilization & staffing if no workload.	ERC-Y LAL	***Zone Duty Officers*** plan for and request additional/extended staffing based on the Staffing Level-**Staffing Plan.**
Problem: Problem fire(s) that exceed the capabilities of overhead to manage incident(s) effectively or make local suppression resources unavailable for IA. *Overhead and/or Suppression resources committed to problem fires or multiple IA fires.*	**X**			High	***Dispatch*** retrieves actual & forecast NFDRS values; processes, posts & broadcasts values for **Preparedness Level** daily.	Positive: incidents managed safely & effectively as possible through increased operational & logistical support. Additional IA support results in fewer problem fires. Negative: Money spent on mobilization & staffing if no IA workload.	ERC-Y	***Forest Duty Officer, Dispatch Center Manager, Agency Administrator*** plan for and request additional/extended staffing and release resources based on Preparedness Level-**Staffing Plan.**
Problem: *Initial fire response with little or no information available.*	**X**			High	***Dispatch*** retrieves the observed or forecasted NFDRS values; processes & posts values for **Dispatch Level** daily.	Positive: fewer fires become a problem. Negative: fires overstaffed, staffing cost exceeds suppression cost.	ERC-Y	***Dispatch*** sends pre attack plan (**Run Card**) resources based on Dispatch Level/Dispatch Zone.
Problem: Unattended or escaped campfires in developed & undeveloped recreation areas which *commit IA resources*.		**X**		Moderate (developed) Low (undeveloped)	***Dispatch*** retrieves observed & forecast NFDRS values; processes, posts & broadcasts values for **Preparedness Level** daily.	Positive: reduced resource commitment to abandoned campfires. Negative: public perception when conditions do not match restrictions.	ERC-Y	***Zone Duty Officer*** staff changes **Roadside Prevention Signs** daily as needed based on Preparedness Level. ***Forest Duty Officer*** considers restrictions/actions based communications with Zone Duty Officers & Preparedness Level-**Staffing Plan.**
Problem: Fires resulting from industrial operations including timber sale operations, fuelwood cutting, electric company operations, or other industrial actions that *commit IA resources.*			**X**	Moderate	***Dispatch*** retrieves observed & forecast NFDRS values; processes & posts values for **IFPL** daily.	Positive: reduced potential for problem fire resulting from industrial operations. Negative: industry perception when conditions do not match restrictions, loss of industry revenue & trust.	ERC-Y IC	***Forest Duty Officer*** sets Precaution Value based on communications with partners and consideration of **Industrial Fire Precaution Level. COR/TSO involvement**

B. Management Tools

National Fire Danger Rating System (NFDRS) outputs will be utilized to aid in determining when to adjust Staffing Levels, Dispatch Levels, Preparedness Levels, Industrial Restrictions, and Public Use Restrictions.

Staffing Level (SL)

Staffing Level (SL) represents a way of linking fire danger to fire management decisions. SL is computed daily for each FDRA and are expressed as numeric values where 1 represents the low end of the fire danger continuum and 5 represents the high end. Staffing Level is based on ERC and represents the potential occurrence of problem fires (*Table 7: FDRA Staffing Level ERC-Y Ranges*). Staffing Level is often confused with Preparedness Level which also considers the NWCC 7 Day Significant Fire Potential Outlook and resource availability in addition to fire danger.

Staffing Level can assist zone resources in maintaining awareness regarding seasonal severity and inform zone readiness decisions regarding initial attack (IA) and support resources. Zone Fire Management will utilize the SL in conjunction with the Staffing Plan to inform decisions about extended and additional staffing.

Dispatch Level

Dispatch Level represents a way of linking fire danger information to a preplanned response, or prioritized response, to reported incidents. Dispatch Level is based off of Staffing Level (*Table 8: Dispatch Level*). For initial daily responses, when multiple ignitions are not expected and little information is available regarding the IA, the Dispatch Level will be used to send IA resources based on the pre-planned response (run card) and Dispatch Zone.

Table 9: Dispatch Level

Staffing Level	Dispatch Level
1	1
2	
3	
4	2
5	3

Preparedness Level (PL)

Preparedness Level, represents the degree of readiness at the forest level and is based on an aggregate of the Staffing Levels, expected fire activity, and resource commitment. Preparedness Level will be used to determine if resource placement is sufficient to meet anticipated needs or if further adjustments are needed. Preparedness Level in this plan will also be utilized for restrictions and prevention signs.

Forest Preparedness Levels are established by the Forest Fire Management Officer during fire season, generally June 1st through October 1st. Preparedness Levels identify actions in the Staffing Plan to be taken or curtailed by the Forest Fire Duty Officer, Agency Administrator and RICC to ensure an appropriate level of readiness (*Figure 7: Preparedness Level Worksheet*).

Preparedness Levels are dictated by aggregate Staffing Level, the Northwest Coordination Center (NWCC) Seven Day Significant Fire Potential Outlook product (NW04), and resource availability/commitment. Situations and activities described within the PLs consider wildland and prescribed fire activity.

UPF Staffing Level Average	1		2		3		4		5	
(1) ✓ ⇨										
NWCC 7 Day Significant Fire Potential Outlook*	No	Yes	No	Yes	No	Yes	No	Yes	No	Yes
(2) ✓ ⇨										
Resources Committed/ Limitations**	⇩	No	Yes	No	Yes	No	Yes	No	Yes	⇩
(3)✓ ⇨										
UPF Preparedness Level	I		II		III		IV		V	

*NWCC 7 Day Significant Fire Potential Outlook	High Risk Triggers (Abundant Lightning, Heavy Recreation, or Critical Burn Environment) in the 7 Day Outlook in PSA NW04 will trigger a YES. http://www.nwccweb.us/predict/outlook.aspx
**Resources Committed/Limitations	Majority of IA resources and numerous overhead off the forest/unavailable.

Figure 7: Preparedness Level Worksheet

Industrial Restrictions

USFS Region 6 uses the Industrial Fire Precaution Level (IFPL) system to regulate activities to minimize risks associated with industrial operations based on the Fire Danger Rating Area (*Figure 8: IFPL Level Worksheet*). Industrial operation restrictions increase as IFPL Precaution Values increase. IFPL is calculated by the WIMS processor and based on historic analysis of Energy Release Component and Ignition Component. Fuel model Y will be used to regulate industrial operations within the forest.

This form outlines the general methods for determining IFPL for the Umpqua National Forest, by utilizing current and predicted IFPL. Changes to the IFPL are based on predicted weather and using an average of the four fire danger response areas. Other issues that may be considered prior to the final IFPL determination are discussions with District Rangers/S.O./Timber shop, and IFPL levels of neighboring federal/non-federal partners.

Specific Industrial Restrictions at each level can be found here:
http://www.orric.org/intelreport.shtml
Additional Information defining what occurs at each IFPL can be found here:
https://www.oregon.gov/odf/fire/documents/industrial-fire-precaution-levels.pdf

FOREST AVG IFPL	1		2			3			4	
Enter 'X' as appropriate ⇨										
a. Forecasted IFPL Level	1	2	1	2	3	2	3	4	3	4
Enter 'X' as appropriate ⇨										
b. Has IFPL changed over the last 7 days?		YES	NO	YES	YES	NO	YES	YES	NO	YES
Enter 'X' as appropriate ⇨	↓			↓			↓			↓
c. 3-5 Day Predicted fire weather trending to hotter and drier			NO	YES		NO	YES		NO	YES
Enter 'X' as appropriate ⇨										
SUGGESTED FINAL IFPL	1		2			3			4	

*If **IFPL** is predicted 2 points above or below current levels, use the next adjacent level for the "Forecasted IFPL Level".

Figure 8: IFPL Level Worksheet

How WIMS determines IFPL calculations for USFS Region 6

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 values increase. WIMS calculates daily Precaution Values (PV) using one of the equations below:

West of the Cascades (assumes Fuel Model G)

$$PV = \left(ERC/22\right) + \left((IC-5)/20\right)$$

If PV > 3, then

$$PV = 3.0 + 2\left(PV - 3.0\right)$$

**At the time of the writing of this plan (May 2021), No updates to IFPL calculations have been provided by the Regional Office. Current direction is to continue using ERC-G until further notice.*

Public Use Restrictions

Restrictions are based on a consideration of Forest Preparedness Level and discussions with Fire Management, with input from Line Officers, during the weekly conference calls or other methods of communication.

Public Use Restrictions
To build, maintain, attend, or use a fire with the following **exceptions:** a. Commercial stoves fired by liquid fuel or propane are permitted. b. Within Forest Service constructed concrete or metal fire rings or fireplaces in designated recreation sites listed in **Exhibit A**. c. Wilderness areas within the Umpqua National Forest are exempt from this order. d. Fireplaces inside buildings with approved spark arresters/screens on top of the chimney. [36 C.F.R. § 261.52(a)] To smoke, with the following **exceptions**: e. Within an enclosed vehicle. f. Stopped in an area at least three feet in diameter that is barren or cleared of all flammable material. g. While aboard a watercraft while navigating or at rest on a waterway. [36 C.F.R. 261.52(d)] To operate an internal combustion engine, with the following **exceptions**: h. On a motor vehicle on Forest Development Roads or within designated parking areas. i. Aboard watercraft while navigating or at rest on a waterway. j. Generators, with approved spark arrestors, in designated recreation sites as listed in **Exhibit A**. k. On a motor vehicle, with approved spark arrestors, on roads, trails or ATV area addressed in the "**Umpqua National Forest Motor Vehicle Use Map**". [36 C.F.R. § 261.52(h)] Welding or operating an acetylene or other torch with open flame [36 CFR § 261.52(i)]

EXEMPTIONS:
Pursuant to 36 CFR § 261.50(e), the following persons are exempt from this order:
1. Persons with a permit specifically authorizing the otherwise prohibited act or omission.
2. Any Federal, State, or local officer, or member of any organized rescue or fire fighting force in the performance of an official duty.

To be consistent, changes to Public Use Restrictions should be considered in conjunction with current ERCs in the following manner.

Table 10: Public Use Restrictions Breakpoints

PUR	ERC
No PUR	0 to 35
PUR	36+
Forest Closure	TBD

These break points were determined, as a forest average ERC, to be associated with changes in fire growth and behavior. Generally, PUR will be set and changed as a forest, however exceptions may be warranted and considered for individual districts, FDRAs, or other areas (i.e. Wilderness), based on fire weather conditions. This situation should be a rare occurrence and strong preference should be given to forest level changes. Consider fire weather forecasts, time of season, and other related factors to avoid rapid changes between PUR levels.

PUR Level 1: No dispersed campfires allowed except in wilderness

PUR Level 2: No campfires allowed

VI. WIMS Operational Procedures

WIMS Station Catalog Settings

Station catalog settings in WIMS and used in Fire Family Plus for the analysis for this plan are shown in the table below (*Table 9: Station Catalog Settings*).

Table 11: Station Catalog Settings

Station ID	Name	Fuel Model	Slope Class	Herb Annual	Humid
352546	Sugarloaf	Y - Timber	3	No	No
353031	Cinnamon	Y - Timber	1	No	No
353036	Grandad	Y - Timber	3	No	No
353038	Toketee	Y - Timber	2	No	No
353040	Buckeye	Y - Timber	2	No	No

WIMS Seasonal Schedule

The Roseburg Interagency Communication Center (RICC) will coordinate with the Zone Fire Management Officers (ZFMOs) to determine activation and deactivation of snow flags. Activation of snow flags should not be considered for short duration events, but rather to indicate persistent season-long snow conditions. Snow flags should be activated once snow levels cover surface fuels and are estimated to remain for numerous weeks or months and should be deactivated once fuels become exposed without expectations for snow to return within a reasonable timeframe.

WIMS Daily Schedule

The Dispatch Center will access WIMS daily and complete the following procedures:

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 ZFMOs of suspect or missing readings.
2. Enter Daily 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. 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 (NWS) for forecasting.
3. Fire Danger Product - From June 1st through season end the Fire Danger Product using WXML output from WIMS will be refreshed daily after the forecast from the NWS becomes available. The product will be posted in pdf format to the Center website preferably no later than 1730.

VII. Roles and Responsibilities

A. Forest Fire Management Officer & Staff

The Forest Fire Management Officer and staff will use this FDOP 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 current, signed, maintained, utilized, understood, and communicated.

B. Zone FMOs are responsible for the following:

- Appropriate site selection and placement of fire weather stations (including portables) 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.
- Annually determine transition dates for live fuels (green-up) and notify the Data Manager to make changes within WIMS.
- Assuring that their resources are aware of and understand NFDRS outputs and that pocket cards are distributed to all local and incoming resources.
- Ensuring that the station is physically secure and that the site is maintained to standards.

C. Data Manager

The Dispatch Center 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 ZFMO.
- Periodically checking the observations database to make sure that all observations have been edited for calculations. Working with ZFMOs to fill data gaps, fix known bad data, and submit corrections to the FAMWEB helpdesk for application to the WIMS database.
- Making station level adjustments as requested by ZFMOs to live fuels and recalculating indices as needed.
- Disseminating fire danger information to include calculating, broadcasting, and posting daily indices and forecasts, updating and posting fire danger charts and tables, and posting restrictions and closures to the website.
- Update fire danger pocket cards on a biannual base, submit for approval, and submit for posting to the NWCG website.

APPENDICES

A1. Staffing Plan

The purpose of the fire staffing guide is to outline a draw-down plan and to provide guidance for committing personnel and other resources to off-Forest fire assignments and to ensure the Forest has the necessary resources available to meet fire danger and fire management work load.

Responsibilities

Authority:
The responsibility to implement the Forest draw-down policy lies with each unit Line Officer and District/Zone Fire Management Officer, with Forest-wide coordination provided by the Forest Fire Staff / Duty Officer and Roseburg Interagency Communication Center (RICC). Final authority for decisions relative to Zone fire resource commitment will reside with the District/Zone Fire Management Officer / Zone duty officer, in consultation with Forest Fire Staff Officer / Duty Officer.

Coordination: At Staffing Level 1, Level 2 and Level 3 Zone Duty Officers are expected to coordinate with the Forest Duty Officer to manage the Forest Fire draw-down policy. Zone Duty Officers will inform RICC of resource availability after coordinating with Forest Duty Officer. At Staffing Level 4 and 5, coordination of resource draw-down will be provided by the Forest Duty Officer by maintaining daily contact with each Zone Duty Officer to assess units fire suppression ability, personnel and resource commitments and anticipated needs, and provide Forest and Region-wide information useful for decision making.

At Regional Planning Level 4 and 5 The PNW Region Multi-Agency Coordination (MAC) Group will become influential in the forest staffing decision making process and priority-setting role for wildland fire and prescribed fire activities and resource allocations.

Standards

Leadership: During the Forest's official fire season, June 1st through October 1st, each District and the Supervisor's Office will ensure the availability of a Qualified Agency Administrator, Line Officer or designated acting, a Forest Duty Officer, and Zone Duty Officer, to provide necessary direction and oversight to the fire management program for which they are responsible.

Duty Officers at both the Zone and Forest level will meet the qualification requirements as per the FSFAQG, Chapter 4. Minimum requirements for Zone or Forest Duty Officer are Division Group Supervisor and ICT 3 or RXB2 – currency required for Zone.

Initial Attack Resource Availability: Initial attack resources are provided by the Forest utilizing the closest forces concept to support all Wildland fire incidents for any agency or cooperator that requests them. Zone FMOs must determine which resources, if any, will be available for off-unit assignment. That determination will be made in consideration of local fire management workload and fire danger. If broader considerations are imposed (e.g. by regional preparedness levels), coordination and direction will be provided to districts by the Forest Duty Officer through RICC.

Local Preparedness Levels 1 &2: The Forest must maintain at least two engine modules on the forest during local preparedness levels 1 &2. An engine module should be a minimum of three-person effective, including at least two primary fire personnel. The third module member may be a fire-qualified employee from another functional area on the unit who is available for dispatch with the engine, but may not be physically attached to the module on a given day. An engine assigned to an on-unit incident or pre-positioned to another unit or area on the Forest, and that may be reassigned to a higher priority, will be considered "available" meeting the engine availability goal. This goal will be flexible and responsive to local conditions and forecasted activity. Before a unit commits to draw-down below this level consideration should be given to the availability of resources on adjacent units, including cooperators, and the need and opportunity to preposition resources from one unit to another. That consideration will be made through discussion of the overall Forest and local cooperator situation between the Zone Duty Officer and RICC.

Pre-positioning: movement of engine modules between zones, both to meet minimum availability standards and to augment resource capability on high risk areas during high-risk periods, should be a pro-active part of this plan.

Modules: Each fire suppression module will have an “Officer in Charge” with Red Card Qualifications appropriate to provide supervision of personnel on a daily basis, If qualified individuals are not available, the affected module will be considered unavailable and its status indicated as such. During the fire season each fire suppression module will be staffed to applicable standards for the kind and type of resource for off-Forest responses. **An initial attack squad is defined as a minimum of 1-ICT5 with 3 firefighters.**

Single Resource Qualified Individuals: Individuals with fire job qualifications may be dispatched to on-Forest or off-Forest incidents according to their status, provided by unit availability lists submitted to RICC. Decisions to dispatch single resources off-forest should consider the individual's contribution to program effectiveness and the forest's ability to meet its fire management responsibilities in their absence.

Back up Support: At any time, the Forest or a zone is unable to meet its fire management leadership and resource needs the Duty Officer should request assistance through temporary assignment of personnel or other resources from outside the Forest. This need should be determined by the Zone Duty Officer and Line Officer and communicated to the Forest Duty Officer in a timely manner. Specific requirements and the anticipated duration of the temporary assignment should be provided with the request. Back-up support may be provided as program leadership or specific wildfire suppression, prescribed fire, or Wildland fire management single resources or modules. During periods of actual fire activity when local resources are inadequate to meet the volume of business, suppression resources may be requested and prepositioned for discretionary initial attack and extended attack support assignments by local management. All requests for fire program support from off-forest will be coordinated and acted on by the Forest Duty Officer through RICC.

Additional Standards: Each district/zone is expected to conduct their fire management operations in accordance with the minimum guidelines provided by this draw-down plan. Zones may provide enhanced standards or specificity to meet their program objectives or organizational requirements. Any additional draw-down guidelines so developed will be approved by the Forest Fire Management Group and included as an attachment to this plan.

Summary: This staffing guide is the recommended **minimum needs** for the Umpqua NF during fire season (June 1 to October 31). Communication between the Zone Duty Officers, the Center Manager, and Forest Fire Staff / Forest Duty Officer is critical. Weekly Conference calls are planned, and will increase when activity increases. Line Officers are invited to join weekly conference calls as activity increases.

- Zone duty officers will be in service and/or available by cell phone when fire personnel are in service.
- Forest Duty Officer will verify/concur the decision based on the needs as the forest as a whole.
- Forest Duty Officer will be advised when sending resources off Forest.
- During Staffing Level 3, 4 & 5 daily staffing reports will be inputted by the district duty officer into REBOL by 1000.

Parameters	PNW PL 1	PNW PL 2	PNW PL 3	PNW PL 4	PNW PL 5
Predictive Services PSA E4	Moist	Moist	Dry	Very Dry	Very Dry With High Risk
IA Resources Committed %	<50% On forest	<50% On forest	>50% On forest	>80% On forest	>80% On forest
Fire Occurrence	Little to None	Minimal Fire Activity/Single Fire Days	Multiple Fire Days	Multiple Fire Days with some Extended Attacks	Heavy IA Incidents
Fire Wx/Red Flag Warning	Normal	Normal	Lightning Forecasted next 48 hours	No break in weather, Red Flag	No break in weather, Red Flag

Based off the PNW Preparedness Level (PL) Description

In general we follow the regional preparedness levels guidelines as shown in the table above, however the Forest Fire Staff or the Forest Duty Officer has the discretion to adjust accordingly based on actual conditions in the area.

- **PSA info is found at https://gacc.nifc.gov/nwcc/content/products/fwx/guidance/NFDR.pdf**
- **PSA specifics is found: https://gacc.nifc.gov/nwcc/content/products/intelligence/PNW%20Fuel%20Status.pdf.**
- **The national Fire Assessment Fire Danger page can be found here: https://www.wfas.net/**

Suggested Actions

Table 12: Forest Supervisor Actions

			Staffing Level				
Responsible Party	**Item**	**Suggested Actions**	**I**	**II**	**III**	**IV**	**V**
Forest Supervisor/ Acting Forest Supervisor	Staff Availability	**Ensure** that one Designated Agency Administrator per District is available by cell/notify dispatch	○	○	○	○	○
		Consider additional Agency Administrator support				○	
		Ensure additional Agency Administrator support					○
		Consider making WFDSS support available locally		○			
		Ensure that local WFDSS support is available			○	○	○
		Consider a PIO			○		
		PIO is identified and invited on FMO conference call				○	○
	Forest Closures/Restrictions	When thresholds are reached, coordinate decision making process regarding changes to IFPL and PUR and inform FFMO of decision and timeframe. If a decision is made contrary to FDOP recommendations, document the rationale for this decision.	○	○	○	○	○

Table 13: Forest Fire Management Officer Actions

			Staffing Level				
Responsible Party	**Item**	**Suggested Actions**	**I**	**II**	**III**	**IV**	**V**
FFMO (DIVS & either ICT3 or RXB2	Fire Management Conference Call	**Manage** bi weekly Conference Call	○				
		Manage weekly Conference Call		○	○	○	○
		Consider 2 calls per week				○	○
	Severity	*Consider* a fire severity request if no ABC				○	○

Table 14: Forest Duty Officer Actions

			Staffing Level				
Responsible Party	**Item**	**Suggested Actions**	**I**	**II**	**III**	**IV**	**V**
FFMO/FDO (DIVS & either ICT3 or RXB2)	Minimum Draw Down OR-UPF Resources (Module = 1 Engine or IA Squad	**Ensure** 2 or more IA Modules are on Forest	○	○			
		Ensure 7 or more IA Modules are on Forest			○		
		Ensure 11 or more IA Modules are on Forest				○	
		Ensure 13 or more IA Modules are on Forest					○
		Consider holding/ordering additional resources if current fire activity is significant			○	○	○
		Consider holding/ordering additional resources if current fire minimum draw down level or based on predicted fire activity				○	○
	Overhead Support	*Consider* Forest Duty Officer support			○	○	○
		Consider requesting dedicated Aviation Officer		○	○	○	
		Ensure availability of dedicated Aviation Officer			○	○	○
		Consider Ordering ICT3/SOFT2/DIVS/Multiple TFLD			○	○	○
		Consider pre-positioning T3 IMT				○	○
	IA Support Staging – Crews, Engines, Fellers, Tenders	**Order** additional IA Crew (PL4 = 1 Crew and PL5 = 2 Crews)				○	○
		Consider Dozer Availability				○	
		Ensure 1 Dozer on Forest					○
		Consider Water Tender availability				○	○
	IA Support Staging - Aviation	*Consider* ordering a med Heli w/ Rappel Module or Smokejumpers				○	○
		Consider ordering light or med Heli				○	
		Order 1 light or med Heli and *consider* 2nd helicopter					○
		Consider ordering heavy Heli				○	○
	Detection	**Recommend** staffing lookouts on district			○	○	○
		Lightning? *Consider* Air Patrol			○	○	○
		Lightning? *Consider* Air Attack w/ Platform			○		
		Order Air Attack w/ Platform				○	○
	Other Support Functions	*Consider* Availability of Local Buying Team			○		
		Ensure Availability of Local Buying Team				○	○

Table 15: Zone Fire Management Officer Actions

			Staffing Level				
Responsible Party	**Item**	**Suggested Actions**	**I**	**II**	**III**	**IV**	**V**
ZFMO	Management Availability	**Identify** Zone Duty Officer (TFLD & ICT4)	◯	◯			
		Identify Zone Duty Officer (DIVS & ICT3 or RXB2)			◯	◯	◯
	Prevention	*Consider* the need for restrictions, closures.			◯	◯	◯

Table 16: Zone Duty Officer Actions

			Preparedness Level				
Responsible Party	**Item**	**Suggested Actions**	**I**	**II**	**III**	**IV**	**V**
Zone Duty Officer	Management Availability	**Identify** District Line Officer/Forest Agency Administrator	◯	◯	◯	◯	◯
	Overhead Considerations	*Consider* the need for overhead support (ICT3/DIVS) if current fire activity is significant			◯		
		Consider the need for overhead support (ICT3/DIVS)				◯	◯
	Staffing	*Consider* extended staffing				◯	◯
		Consider additional staffing					◯
	Prevention	*Consider* an aerial detection flight			◯	◯	◯

Table 17: Communications Center Actions

			Preparedness Level				
Responsible Party	**Item**	**Suggested Actions**	**I**	**II**	**III**	**IV**	**V**
Communications Center Manager	Fire Danger	Ensure IA personnel are briefed on SL, PL, local burning conditions, and availability of IA resources	◯	◯	◯	◯	◯
	Extended Hours and Support	*Consult* with FFMO concerning potential for extended staffing beyond normal shift length or days			◯	◯	◯
		Consider expanded dispatch if current fire activity is significant			◯		
		***Ensure** expanded dispatch is in place*				◯	◯
		Consider logistical support			◯		
		Ensure logistical support is available				◯	◯

A2. FDRA Delineation Decision Supporting Figures

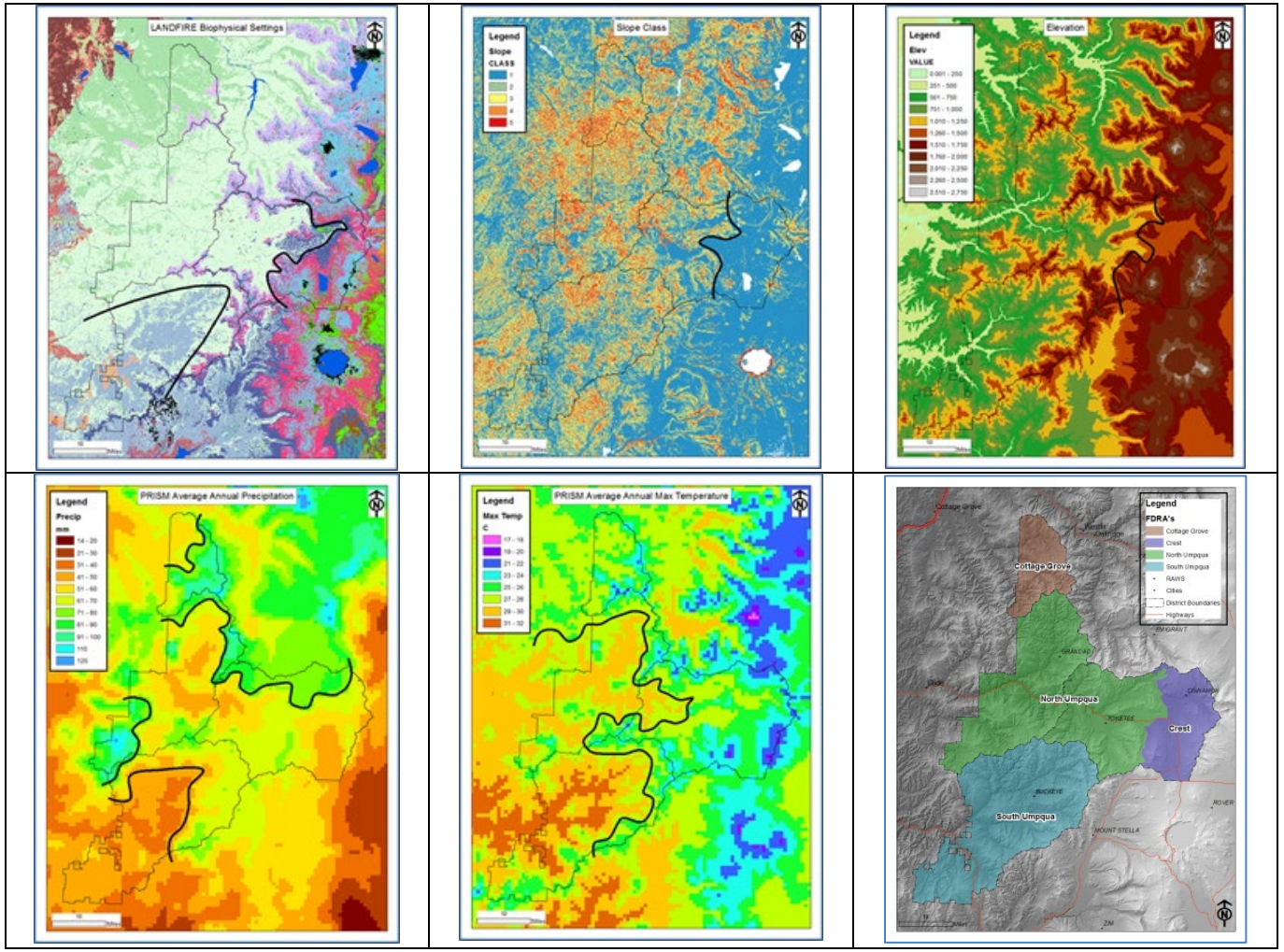


Figure 9: FDRA Delineation Decision Supporting Figures

A3. Fire Danger Rating Area Staffing Level Class Summary

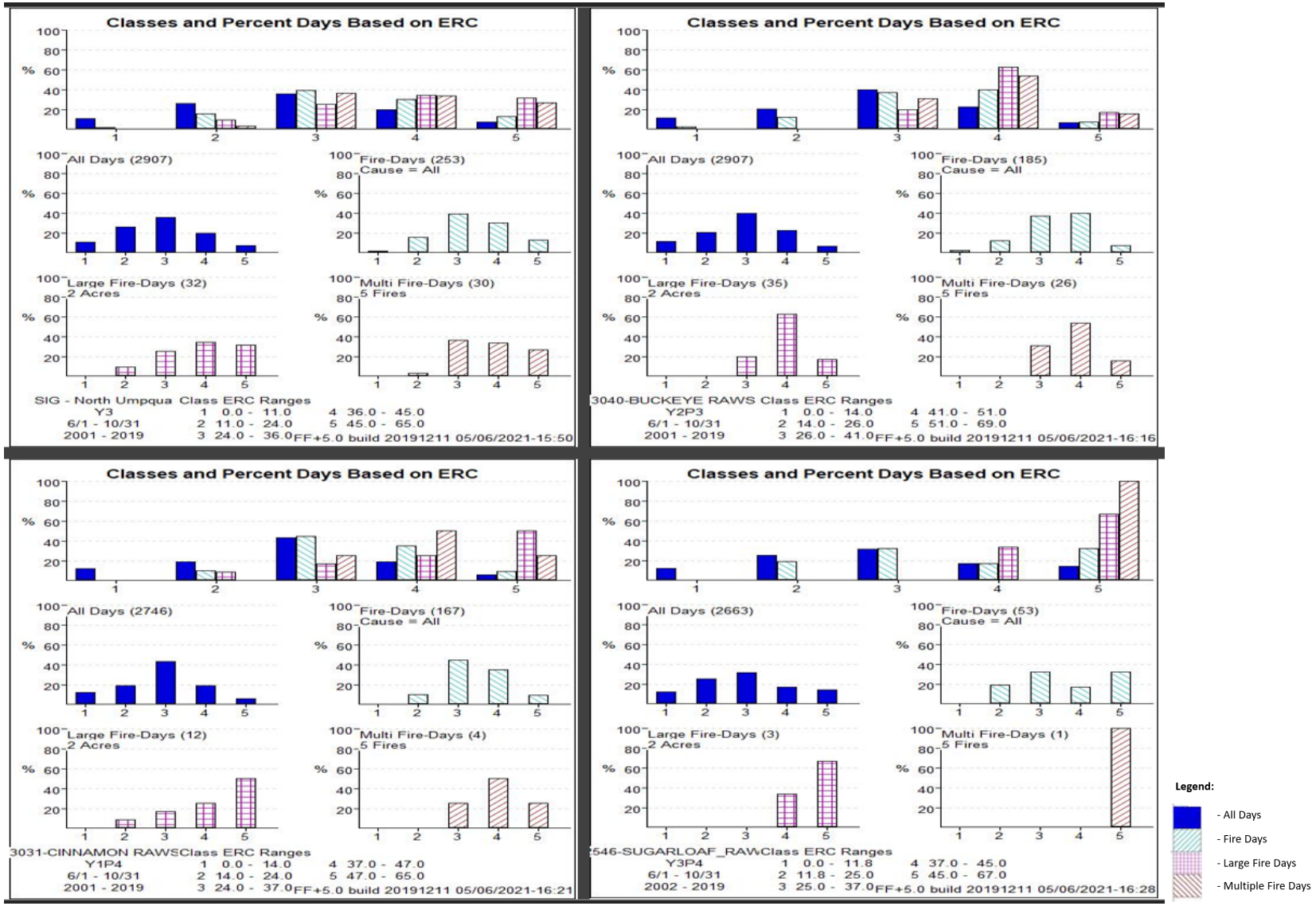
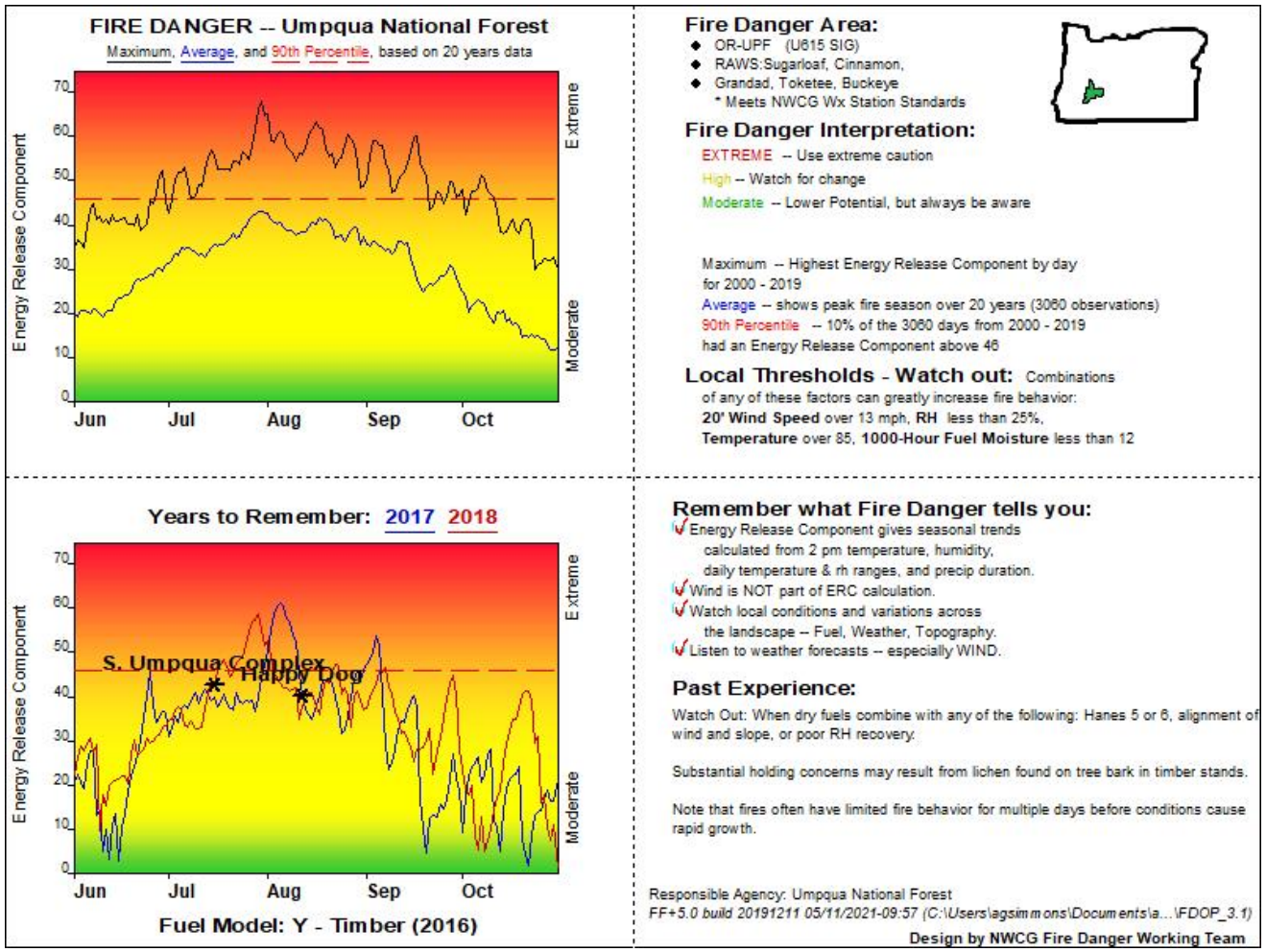


Figure 10: Fire Danger Rating Area Staffing Level Class Summary

A4. Pocket Card



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