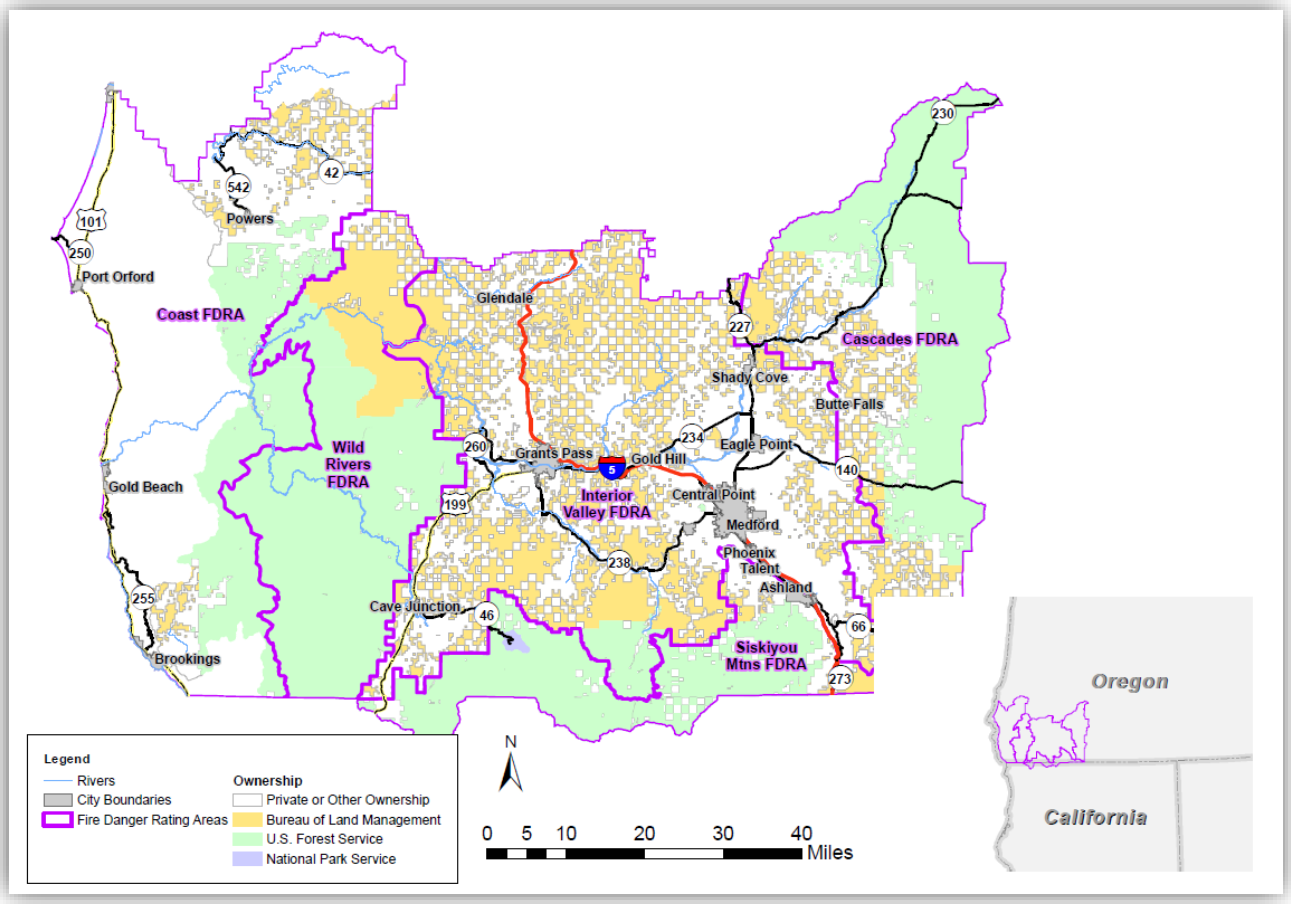
Southwest Oregon Federal Interagency Fire Danger Operating Plan



June 2021

Southwest Oregon
Federal Interagency Fire Danger Operating Plan

This Fire Danger Operating Plan is approved and will remain in effect until rescinded or revised. Signatories to this plan include the following agencies:

- Bureau of Land Management, Medford District
- Bureau of Land Management, Coos Bay District, Myrtlewood Resource Area
- National Park Service, Oregon Caves National Monument and Preserve
- U.S. Forest Service, Rogue River – Siskiyou National Forest

Each agency will be responsible for maintaining a signed hardcopy on file.

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1. Introduction

1.1 Purpose

This Fire Danger Operating Plan (FDOP) is intended to document an operational planning and decision-making process for federal agency administrators, fire managers, communication center personnel, and firefighters by establishing interagency planning and response levels based upon an assessment of vegetation, climate, and topography utilizing the National Fire Danger Rating System (NFDRS).

The public, industry, and our own agency personnel expect the interagency wildland fire management agencies to implement appropriate and timely decisions which ultimately result in safe, efficient, and effective wildland fire management actions.

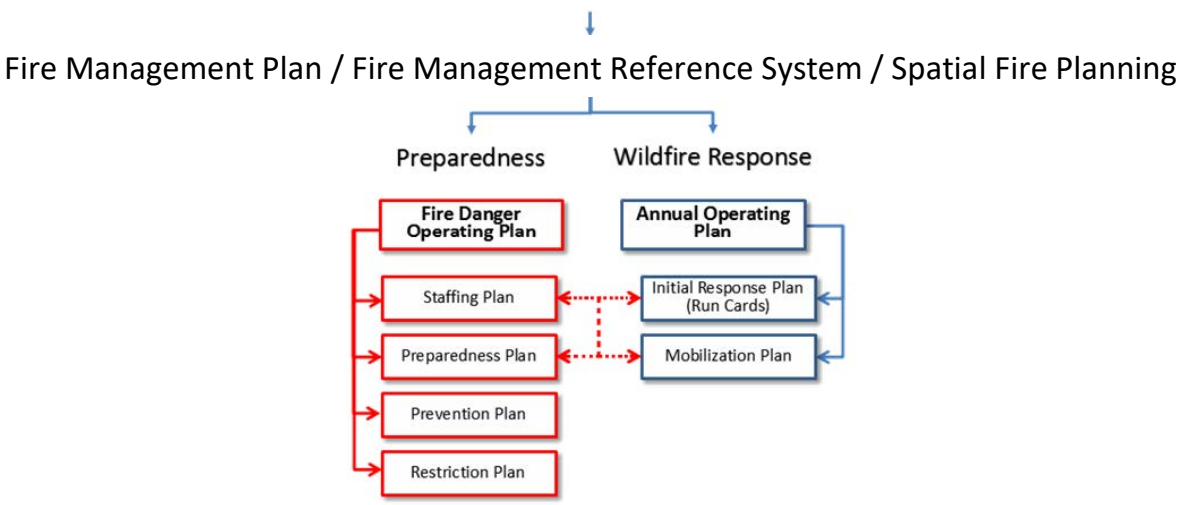
This plan provides a science-based tool for incorporating a measure of risk associated with decisions which have the potential to significantly compromise safety and control of wildland fires. This is achieved using the best available scientific methods and an analysis of historical weather and fire data.

The FDOP development process involved:

1. Acquire and quality control historic weather and fire history data.
2. Delineate Fire Danger Rating Areas (FDRA) based on vegetation, climate, topography, and jurisdictional boundaries.
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 bases for future decisions.
5. Develop fire business thresholds based on the NFDRS outputs and historic fire occurrence to apply to local unit fire management decisions.
6. Document the analysis, operation, communication, and maintenance re-evaluation process.

1.1.1 Fire Danger Operating Plan

Interagency policy and guidance require numerous unit plans and guides in order to meet preparedness and response objectives. Some of these plans and guides are inter-related or provide the basis for others, as depicted on the next page.



NFDRS utilizes the Weather Information Management System (WIMS) to produce fire danger outputs and is designed to calculate the worst-case scenario. This FDOP guides the application of information from NFDRS at the local level and describes how fire danger ratings will be applied to local unit fire management decisions. The actual implementation of the fire business thresholds is described in the following supplemental action plans.

1.1.2 Staffing Plan

The staffing plan describes daily resource availability/capability to respond to unplanned ignitions. Staffing levels (1 to 5) can be thought of as readiness levels to which management actions can be tied. Mitigating actions are designed to enhance the unit's fire management capability during short periods, one burn period, holidays or other pre-identified events, where normal staffing cannot meet initial attack, prevention, or detection needs. The decision points are identified and documented in this FDOP. The associated decisions and planned actions are located with the individual Agency/Unit Staffing Plan.

1.1.3 Preparedness Plan

Preparedness plans provide management recommendations given identified levels of burning conditions, fire activity, and resource commitment. Preparedness levels (1 to 5) are determined by incremental measures of fire danger, fire activity, and resource commitment. The decision points are identified and documented in this FDOP. The associated decisions and planned actions are located with the individual Agency/Unit Preparedness Plan.

1.1.4 Prevention Plan

Prevention plans document the wildland fire problems identified by a prevention analysis. Components of the plan include mitigation (actions initiated to reduce impacts of wildland fire to communities), prevention (of unwanted human-caused fires),

education (facilitating and promoting awareness and understanding of wildland fire), enforcement (actions necessary to establish and carry out regulations, restrictions, and closures), and administration of the prevention program. The analysis of fire problems and associated target groups are documented in this FDOP. The associated decisions and planned actions are located with the individual Agency/Unit Prevention Plan.

1.1.5 Restriction Plan

A restriction plan outlines coordination efforts regarding fire restrictions and closures. An interagency approach for initiating restrictions or closures helps provide consistency among the land management partners, while defining the restriction boundaries so they are easily distinguishable to the public. Based on the fire danger, managers may impose fire restrictions or emergency closures to public lands. Decision points when restrictions and/or closures should be considered are identified and documented in this FDOP. The associated decisions and planned actions are located with the individual Agency/Unit Restriction Plan.

1.1.6 Initial Response Plan (run cards)

Initial response plans, also referred to as run cards or pre-planned response plans, specify the fire management response to an unplanned ignition within a defined geographic area based on fire danger, fire management objectives, and resource availability. Response levels are identified and documented in this FDOP. The number and type of suppression resources dispatched to a reported fire is documented in the associated initial Response Plan (located at the respective Communications Center).

1.1.7 Mobilization Plan

The mobilization plan identifies standard procedures, which guide the operations of multi-agency logistical support activity throughout the coordination system. The mobilization plan is intended to facilitate interagency dispatch coordination, ensuring the timeliest and most cost-effective incident support services available are provided. Communication between units, GACCs, state, regional offices and other cooperative agencies are addressed. Mobilization guides can be found at the individual Communications Centers and at the Northwest Interagency Coordination Center.

1.2 Policy and Guidance

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. Guidance and policy for development of a Fire Danger Operating Plan can be found in

- Interagency Standards for Fire & Aviation Operations (Red Book)
- Forest Service Manual 5120
- Bureau of Land Management Fire Planning Manual MS-9211
- National Park Service Reference Manual 18, chapter 5

1.3 Operating Plan Objectives

1. Provide a **tool** for agency administrators, fire managers, dispatchers, agency co-operators, and firefighters to correlate fire danger ratings with fire business decisions.
2. Delineate fire danger rating areas (FDRA) with similar climate, vegetation, and topography.
3. Establish an interagency fire weather monitoring network consisting of Remote Automated Weather Stations (RAWS) which comply with NFDRS weather station standards (PMS 426-3).
4. Determine fire business thresholds using the Weather Information Management 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, and brief fire suppression personnel regarding current and potential fire danger.
6. Determine the most effective communication methods for fire managers to communicate potential fire danger to cooperating agencies, industry, and the public.
7. Provide guidance to interagency personnel outlining specific daily actions and considerations at each preparedness level.
8. Identify seasonal risk analysis criteria and establish general fire intensity thresholds.
9. Identify the development and distribution of fire danger pocket cards to all personnel involved with fire suppression within the Fire Danger Operating Plan area.
10. Identify program needs and suggest improvements for implementation of the Fire Danger Operating Plan.

2. Fire Danger Operating Plan Area

2.1 Administrative Units

The analysis area encompasses approximately 4.7 million acres in southwestern Oregon and extreme northern California. Oregon counties include Coos, Curry, Josephine, Douglas, and Jackson while California counties include Del Norte and Siskiyou. This document supports consistent application of fire danger decisions applied across multiple federal jurisdictional boundaries. Wildland fire management and suppression responsibilities are shared among Federal, State, and local cooperators. Federal agencies participating in this plan include Bureau of Land Management, National Park Service, and U.S. Forest Service.

Oregon Department of Forestry (ODF) has a separate Fire Danger Operating Plan which incorporates areas under their protection including areas analyzed in this plan.

Where analysis areas overlap, fire danger-based decisions lie with the protection agency.

The Bureau of Land Management has an Operating Plan with ODF and area Protective Associations. Oregon Caves National Monument and Preserve has a cooperative protection agreement with the Rogue River-Siskiyou National Forest. Agencies will follow the direction outlined in the individual agreements/plans.

2.2 Weather Stations

All RAWS used in this plan to produce NFDRS outputs comply with the National Wildfire Coordinating Group (NWCG) weather station standards and guidelines. Each RAWS receives, at a minimum, one annual on-site maintenance visit by either the local user or contracted personnel to ensure sensors are within calibration standards and to verify site and station conditions.

Each agency is responsible for the annual maintenance and calibration of their RAWS used in this plan. NWCG standards for fire weather stations can be found in PMS 426-3.

2.3 Fire Danger Rating Area Development

A 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 National Fire Danger Rating System weather stations” (National Fire Danger Working Group, 2002). More detailed information can be found in Gaining an Underdstanding of the National Fire Danger Rating System, PMS 932.

FDRAs were initially delineated based on the range of effect that separating the fire environment component (topography, vegetation, and climate) would have on NFDRS indices. Previously utilized FDRA boundaries were the foundation. They were then edge matched to administrative and dispatch block boundaries based on the desire to keep consistency within the dispatch blocks and apply different fire management decisions between the blocks. The statewide ODF dispatch blocks and proposed 2020 dispatch block boundaries for the Rogue River-Siskiyou N.F. were utilized for the process. This resulted in five FDRAs.

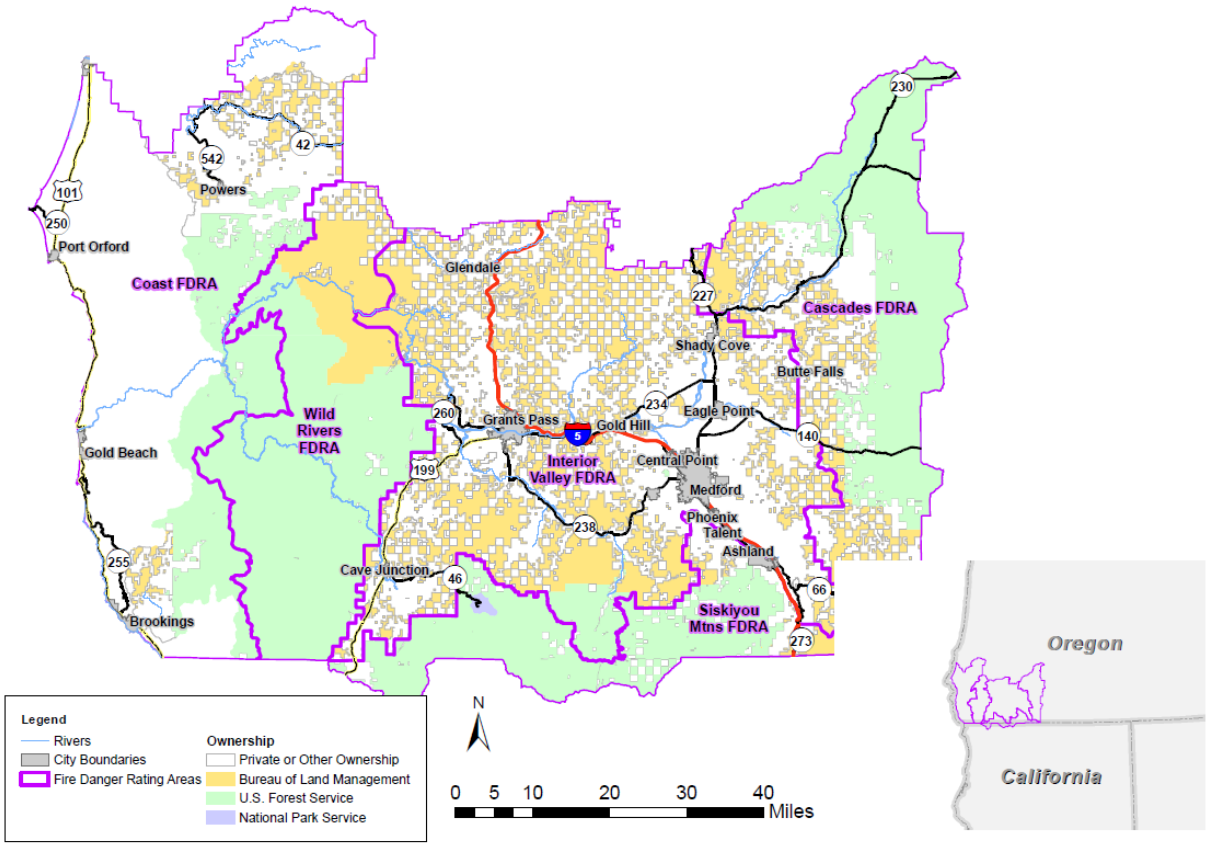


Figure 1. Fire Danger Rating Areas and vicinity map

2.3.1 Topography

Southwest Oregon is one of the more topographically diverse areas in the entire Pacific Northwest Region due to the convergence of ecological provinces. The FDOP analysis area contains three dominant 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, Chetco River) that are highly influential on weather patterns (precipitation, temperature, etc.) and subsequent distribution of vegetative communities. The eastern boundary of the analysis area is the volcanically derived Cascade Mountain Range. See Appendix A for FDRA overlay with Digital Elevation Model.

2.3.2 Climatology

Climate within the FDOP is variable across elevation gradients and from the coast to the Cascade crest. The Coast Range is a temperate rain forest where the mean annual rainfall (1981–2010) averages 191 inches (PRISM climate data). Further inland, annual precipitation averages 18 inches (PRISM climate data – 1981–2010) 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. Summer temperatures are

coolest near the coast and warmest in the interior valleys. See Appendix A for FDRA overlay with PRISM data.

2.3.3 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-Tanoak-Pacific madrone forests make up approximately one third of the entire FDOP area, concentrated in the Western-most FDRAs. Ponderosa pine-Incense cedar is the next most abundant vegetation type making up approximately 21% of the FDOP area. Other forest types including Douglas fir-white fir-sugar pine, Ponderosa pine-California black oak, and Douglas fir-Western hemlock are abundant in the FDOP area. See Appendix B for FDRA overlay with BpS data.

Table 1. FDRA selected statistics

FDRA	Acres	Mean Elevation (feet)	Median Slope Class[1]	Annual Precipitation (inches)[2]		August Temperature[2]		Median Climate Class[1]
				Mean	Range	Mean	Range	
Siskiyou Mountains	417,316	4,157	3	48	20-105	82	66-89	2
Interior Valleys	1,555,205	2,215	2	36	18-91	86	70-92	2
Cascades	838,411	4,046	2	45	18-78	80	65-89	3
Wild Rivers	673,319	2,574	2	85	38-167	83	72-92	3
Coast	1,230,851	1,380	3	94	43-191	76	60-90	3

[1] Data collected from RAWS station catalogues.
[2] Climate data produced by the PRISM Climate Group - 30 year normalized average annual precipitation and average annual temperature spanning 1981-2010.

2.4 Fire Danger Rating Area Descriptions

2.4.1 Coast Fire Danger Rating Area

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. Coos Forest Protective Association provides protection for the BLM managed lands within the FDRA which is covered in a separate FDOP using their criteria and business rules.

2.4.2 Wild Rivers Fire Danger Rating Area

On the western edge, this FDRA covers the area from near the top of the Coastal Range to the Illinois Valley bottom on the eastern edge. Significant climate and vegetation changes separate this out from neighboring FDRAs. It is dominated by Douglas fir and steep, rugged terrain.

2.4.3 Interior Valleys Fire Danger Rating Area

This FDRA includes lower elevations and highly populated valleys. It is bisected by the Rogue River and Interstate 5 corridor. ODF provides protection for the majority of the FDRA and has a separate FDOP covering the state protected lands in this area using their criteria and business rules.

2.4.4 Cascade Fire Danger Rating Area

This FDRA encompasses the western slope of the Cascade Range with moderately steep and rugged terrain. It follows the Rogue River – Siskiyou NF boundary with the Fremont-Winema NF, Umpqua NF, and Crater Lake NP on the eastern and northern edges and changes in vegetation and climate on the western edge. It is the highest elevation FDRA and has a greater snowpack than the rest of the analysis area. Another feature is the major transverse ridge running east-west in the northwest corner of the analysis area that is known as the Rogue-Umpqua divide which separates the headwaters of the Rogue River from the north and South Umpqua River drainage.

2.4.5 Siskiyou Mountains Fire Danger Rating Area

This FDRA encompasses the Klamath-Siskiyou Mountain Range and includes some 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. Oregon Caves National Monument and Preserve is located within this FDRA. The Siskiyou Mountain Range forms a barrier between the watersheds of the Klamath River to the south and the Rogue River to the north. There is considerable biodiversity within the Siskiyou Mountains.

3. Fire Danger Problem Analysis

In order to apply a fire danger system which will assist managers with fire management decisions, ignition problems need to be identified, quantified, framed, and associated with a specific target group to determine the most appropriate fire danger-based decision tool to mitigate the given issue.

3.1 Fire Occurrence

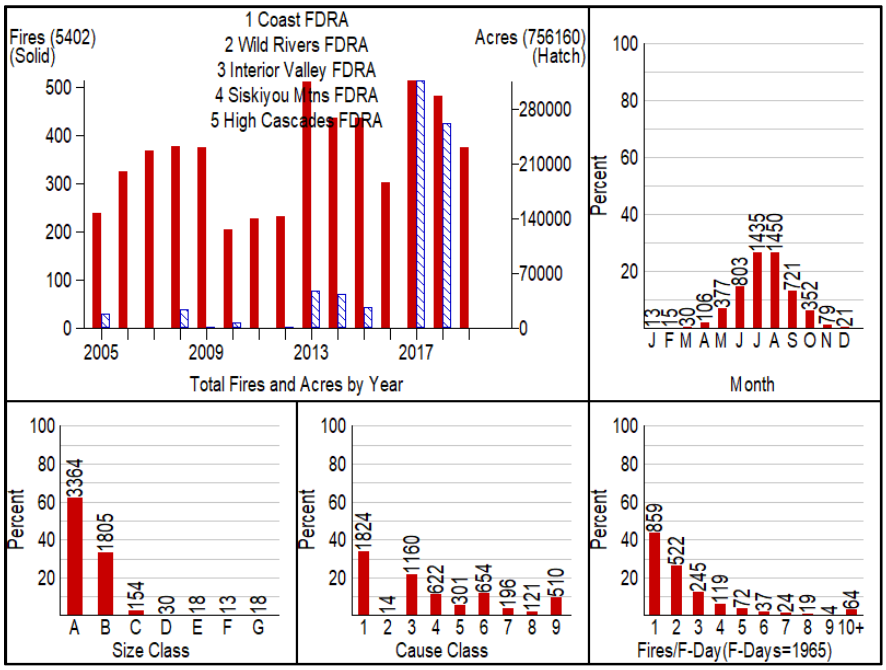
Fire occurrence data for the past 15 years (2005 - 2019) was used for the analysis in this FDOP. Data was obtained from the ODF State Office and the USFS Citrix database. Many duplicate fires were found and removed between the data bases.

June thru September accounted for 81% of all fire responses. Fire season was determined to run from May 1st thru October 31st which accounted for 95% of the fires. The majority of all fires (96%) were less than 10 acres. Leading fire causes include:

- Lightning – 34% of all fires
- Smoking – 21% of all fires
- Railroad – 12% of all fires
- Campfires – 12% of all fires

See Appendix C for additional fire occurrence charts broken out by FDRA.

Table 2. 12-month fire summary 2005-2019 for all FDRAs



Size Classes:
A: <= 0.25 acres
B: 0.26 to 9.9 acres
C: 10 to 99.9 acres
D: 100 to 299 acres
E: 300 to 999 acres
F: 1000 to 4999 acres
G: >= 5000 acres

Cause Classes:
1 - Lightning
2 - Equipment Use
3 - Smoking
4 - Campfire
5 - Debris Burning
6 - Railroad
7 - Arson
8 - Children
9 - Miscellaneous

3.2 Fire Problem Identification/Definition

The ability to regulate, educate, or control a user group is based upon the interface method and how quickly they can react to the action taken. Consequently, the most appropriate decision tool would depend upon the sensitivity of the target group to the implementation of the action. In addition, each action will result in positive and/or negative impacts to a user group.

In selecting a component and/or index, several factors must be considered:

- Affected Target Group: The group of people commonly associated with the problem (e.g., agency, industry, or public).
    - Agency: Employees of the federal, state, and local governments involved in the cooperative effort to suppress wildland fires. This includes Federal, State, and County land management employees, along with volunteer fire

departments who share a similar protection mission to manage wildland fires.
    - Industry: Employees affiliated with organizations which utilize natural resources and/or obtain permits or leases to conduct commercial activities on federal, state, or private lands. These entities or activities could include ranchers, wilderness camps, railroads, mines, timber harvesting, filming, building construction, oil and gas, electric generation, guiding services, etc.
    - Public: Individuals who use public lands for non-commercial purposes such as off-highway vehicle use, camping, hiking, hunting, fishing, skiing, firewood gathering, agriculture, mountain biking, general travel, and recreation. This group also includes those living within the wildland urban interface.
- Problem Definition: 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 associated with a specific target group.
- Degree of Control: This is a general description of how much control the fire management agencies have over the target group (High to Low). This is a measure of how quickly the affected target group can respond to changing fire danger levels.
- Communication: Various methods of communication are utilized to influence an affected target group to change their behavior. Depending upon the specific target group, communication may include face-to-face verbal conversations, radio, telephone, email, newspaper, television, signing/posting, text messages, etc.
- Component/Index: Sensitivity of the NFDRS outputs should be commensurate with the ability to react (or communicate) to the target group.
- Management Action: The actions or applications are pre-defined and taken at breakpoints determined through an analysis of fire danger indices and fire occurrence. Collectively the decision points represent levels of fire danger applied as a communication mechanism to specific target groups. The intent is to minimize the risk of a fire ignition problem by controlling or influencing a specific target group (Agency, Public, and Industry).

Table 3. Fire problem identification and definition

Target Group		Ignitions Cause		Relative Degree of Control	Communication Methods	Problem
General	Specific	General	Specific			
Agency	Suppression resources and fire managers	Lightning	Lightning or dry lighting	High	Dispatch communicates LAL and Fire Danger (BI and ERC)	Fires which exceed the unit's capability to manage due growth on the discovery day
Agency	Suppression resources and fire managers	Lightning	Abundant lightning	High	Dispatch communicates LAL and Fire Danger (BI and ERC)	Fires which exceed the unit's capability to manage because they cannot be staffed on discovery and escape initial or extended attack days later
Public	Use of developed recreation sites	Campfire	Unattended (and escaped) campfire	High	Public information/prevention messaging, radio, media broadcast, news release, internet, adjective (Smokey) signs, prevention patrols	Campfires in developed recreation areas that escape or tie up agency resources allowing other fires to grow
Public	Day use and undeveloped sites	Campfire	Unattended (and escaped) campfire	Low	Public information/prevention messaging, radio, media broadcast, news release, internet, adjective (Smokey) signs, prevention patrols	Campfires in undeveloped recreation areas that escape or tie up agency resources allowing other fires to grow
Public	Private Landowners	Debris burning	Escaped debris burns	Low	PIO/prevention messaging, radio, media broadcast, news release, post to dispatch website and internet	Escaped debris burns which become large fires or tie up agency resources
Industry	Industrial forest users operating on public lands	Equip-ment	Railroads, yarding, welding, saws, etc.	Mod-erate	Dispatch communicates IFPL on website, media broadcast, news release, IFPL signs	Ignitions which become large fires resulting from industrial forest operations (equipment and/or railroad)
All	Forest Users	Smoking	Discarded/ unattended smoking devices	Low	Public information/prevention messaging, radio, media broadcast, news release, internet, adjective (Smokey) signs, prevention patrols	Smoking related fires that escape or tie up agency resources allowing other fires to grow

4. Fire Danger Decision Analysis

The FDOP will be used to support fire management decisions made at specific decision points. A decision point is a point along the range of possible output values where a decision shifts from one choice to another. When conditions, or a combination of events and conditions, signal that it is time to do something different a decision point has been reached. Decision points are identified for selected indices and levels within each FDRA.

Decision points can be based upon either climatological breakpoints or fire business thresholds.

4.1 Climatological Breakpoints

Climatological breakpoints are points on the cumulative distribution curve of a fire danger index computed from climatology (weather). For example, the value at the 90th percentile ERC is the climatological breakpoint at which only 10 percent of the ERC values are greater in value. When using climatology, it is important to identify the period of record used to determine the agency percentiles. Climatological percentiles were originally developed for budgetary decisions by federal agencies, *without regard for associated fire occurrence*, and are predetermined by agency directive, as listed below:

- BLM: 80th and 95th percentiles
- NPS: 90th and 97th percentiles
- USFS: 90th and 97th percentiles

Percentile values were determined for all rating areas for severity requests and planning purposes. All climatological values are for the period 2005-2019 during fire season (May 1st – October 31st) using fuel model Y.

Table 4. Climatological percentile values for Energy Release Component (ERC) and Burning Index (BI) by FDRA

FDRA	Index	80th	90th	95th	97th	Index	80th	90th	95th	97th
Coast	ERC	41	46	50	52	BI	28	31	34	35
Cascades	ERC	47	53	57	59	BI	31	33	36	38
Interior Valley	ERC	46	51	56	58	BI	29	31	33	34
Siskiyou Mountains	ERC	48	54	59	62	BI	33	35	38	40
Wild Rivers	ERC	42	47	50	53	BI	28	30	32	33

The decision thresholds identified in this FDOP are based upon the statistical correlation of historical fire occurrence and weather data.

4.2 Weather Station Analysis

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 using Fire Family Plus software. Obvious outliers were examined and corrected where presumed to be erroneous and gaps in

data were interpolated where possible. Two stations have significant gaps (Onion is missing 2 years and Zim is missing 6 months) within the 15-year analysis period. Snow flags were added where appropriate and missing (2017-2019).

Provolt RAWS was ruled out due to prior location in a nursery where it was affected by watering. Merlin RAWS was ruled out due to numerous random readings with anomalous precipitation. Silver Butte RAWS was ruled out due to lack of wind gusts prior to 2014. Agness RAWS was ruled out due to generally poor correlations to other stations.

4.2.1 Special Interest Groups

Remote Automated Weather Stations in different geographical locations with common sensitivity to NFDRS model inputs can be grouped together to form a special interest group (SIG). The SIG selector online tool, which is designed to help determine which RAWS to group together, was referenced to consider SIGs used in the plan. The tool is available here (RAWS Selector (nifc.gov)). Three stations were not available in the tool. The tool was found to group stations together that did not have good correlations and created a group with a single station. Small changes in the analysis boundary also made large changes in groupings. For these reasons, the suggested groupings from the SIG tool were disregarded. Values in the correlation matrix were considered in the groupings for the stations available and all were above 0.935. See Appendix D for the correlation matrix.

RAWS stations were all weighted equally and grouped in SIGs as follows (See Figure 2 for Map):

- Coast: Bald 2, Quail 2, Red Mound
- Wild Rivers: Onion2 (also called Onion Mountain Lookout), IV Airport
- Interior Valleys: Calvert, Evans Creek, Buckhorn, and IV Airport
- Cascades: Stella, Zim, Parker Mtn
- Siskiyou Mountains: Crazy Peak, Squaw, Buckhorn Springs

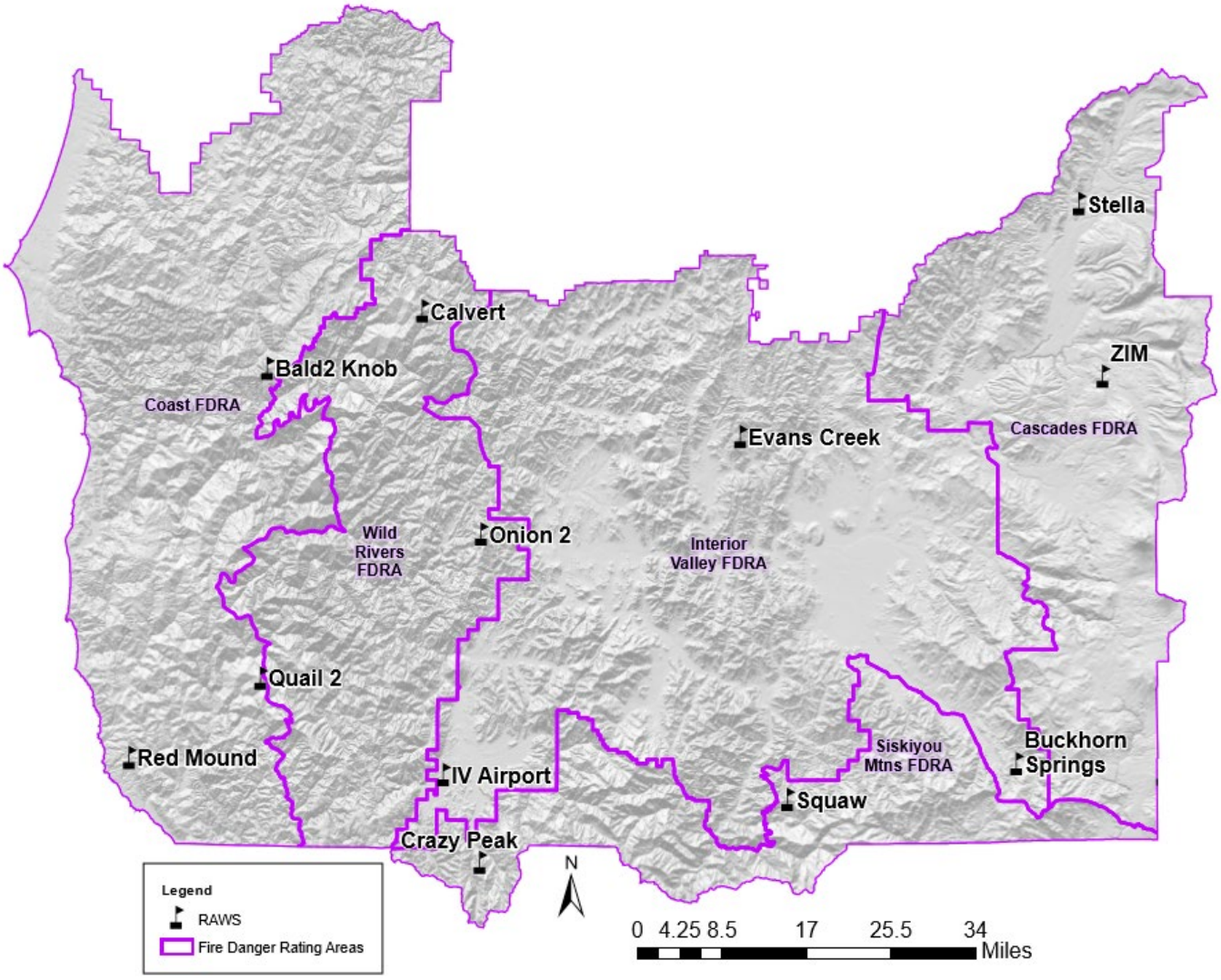


Figure 2. Map showing FDRA and RAWS locations

Table 5. Remote Automatic Weather Stations and Special Interest Group Data

Station Name	Owner	WIMS Station ID	Annual Precip (in)	Elevation (ft)	Slope Position	Aspect	County	NWS Fire Weather Zone	FDRA
Crazy Peak	USFS (OR-RSF)	40106	62	3970	Peak/ Ridge Top	SW	Del Norte	MFR620	Siskiyou Mtns
Squaw	USFS (OR-RSF)	353213	30	4964	Peak/ Ridge Top	S	Jackson	MFR621	Siskiyou Mtns
Buckhorn Springs	BLM (OR-MED)	353230	23	2900	Peak/ Ridge Top	Flat/ None	Jackson	MFR622	Siskiyou Mtns & Interior Valley
Calvert	BLM (OR-MED)	352919	52	3822	Peak/ Ridge Top	S	Jackson	MFR622	Interior Valley
Evans Creek	BLM (OR-MED)	353228	38	3200	Mid-slope	Flat	Curry	MFR620	Interior Valley
IV Airport	BLM (OR-MED)	353115	64	1389	Valley Bottom/Flat	Flat	Josephine	MFR620	Interior Valley & Wild Rivers
Onion2	USFS (OR-RSF)	353114	48	4438	Peak/ Ridge Top	S	Josephine	MFR620	Wild Rivers
Stella	USFS (OR-RSF)	353209	54	4715	Peak/ Ridge Top	NE	Jackson	MFR623	Cascades
Zim	USFS (OR-RSF)	353227	47	4106	Peak/ Ridge Top	SW	Jackson	MFR623	Cascades
Parker Mountain	State (Oregon)	353344	20	5250	Peak/ Ridge Top	S	Klamath	MFR623	Cascades
Bald2	USFS (OR-RSF)	352813	92	3630	Peak/ Ridge Top	S	Coos	MFR619	Coast
Quail2	USFS (OR-RSF)	352915	119	3033	Peak/ Ridge Top	S	Curry	MFR619	Coast
Red Mound	BLM (OR-ROD)	352920	101	1753	Peak/ Ridge Top	Flat/ None	Curry	MFR618	Coast

4.3 Fire Business Analysis

A statistical correlation of fire occurrence with fire danger indices, weather stations, and fuel models was used in conjunction with the fire problem analysis (Table 3 in Section 3.2) to determine the best combination for predicting the fire problem in each FDRA. At the time this analysis was completed a separate analysis was not considered for lighting versus human ignitions.

All five NFDRS fuel models were given a cursory examination. Fuel models Y and Z, along with ERC and BI were looked at more in depth as potential fire business candidates. Higher R^2 values and lower Chi^2 values were used in determining best statistical fit which showed fuel model Y had a slightly better statistical fit with large fire days and multiple fire days. Statistical results of the possible combinations are in Appendix E.

4.4 Fire Business Decision Points

Using Fire Family Plus software (5.0, build 2/11/2019), NFDRS decision points were identified where recommended changes in fire business should occur, as shown in the table below. Threshold graphs and charts for all FDRAs are included in Appendix F. Based on this analysis, Energy Release Component and Burning Index were carried forward for use in this plan as the basis for setting fire danger levels.

All Fire Days were identified as having the best statistical fit for comparative analysis and participant input to inform fire business decision breakpoints. Burning Index and Energy Release Component thresholds were developed to roughly correlate with 97th percentile (Level 5), 90th percentile (Level 4), 80th percentile (Level 3), ½ of 97th percentile (Level 2) and ¼ 97th percentile (Level 1). See Appendix G for historical statistics and model outputs.

Table 6. Fire business decision breakpoints

FRDA	Decision Breakpoint	BI	ERC
Coast	1	0-5	0-11
	2	6-19	12-23
	3	20-29	24-42
	4	30-34	43-51
	5	35+	52+
Cascades	1	0-9	0-13
	2	10-22	14-27
	3	23-31	28-47
	4	32-37	48-58
	5	38+	59+
Interior Valley	1	0-11	0-18
	2	12-20	19-29
	3	21-29	30-47
	4	30-33	48-57
	5	34+	58+
Siskiyou Mtn	1	0-13	0-18
	2	14-24	19-33
	3	25-33	34-49
	4	34-39	50-61
	5	40+	62+
Wild Rivers	1	0-8	0-12
	2	9-18	13-26
	3	19-28	27-43
	4	29-33	44-52
	5	34+	53+

4.4.1 Fire Business Decision Summary Table

Indices were selected considering the target group and degree of control (see also Table 3).

- Burning Index is an estimate of the potential difficulty of fire containment as it relates to the flame length at the head of the fire. It was the preferred index to use for the Staffing and Response plans as it accounts for daily fluctuations such as wind speed.
- Energy Release Component relates to the available energy (BTU) per unit area (square foot) within the flaming front at the head of a fire. It is a cumulative or "build-up" type of index that does not change rapidly over time. As live fuels cure and dead fuels dry, the ERC values provide a good reflection of drought conditions. ERC is a relatively stable evaluation tool for planning decisions that might need to be made 24 to 72 hours ahead of an expected fire decision or action since wind is not included in the calculation, meaning the daily variation is relatively small. Therefore, it is the preferred index for use in Preparedness plans and Public Use Restrictions.
- Ignition Component (IC) is a rating of the probability that a firebrand will cause a fire requiring suppression action. It is more than the probability of a fire starting; it must have the potential to spread, therefore Spread Component values are entered into the calculation of IC. Ignition Component index by itself is not used as a business decision point in this plan, but it is a factor into other calculations, such as Industrial Fire Precaution Level, which is calculated from the IC and ERC.

Local knowledge also plays a very important role in making fire business decisions. Local knowledge considers factors such as drought, days since last measurable precipitation, resource fatigue, fire activity in the local area, availability of resources, preparedness levels (regional and national), large gatherings (eclipse, Rainbow family, holidays), etc.

Table 7. Fire business decision summary

Target Group	Decision Points	Index	Fuel Model	Plan
Agency	5	Burning Index	Y	Staffing Plan
Agency	3	Burning Index	Y	Response Plan
Agency	5	Energy Release Component	Y	Preparedness Plan
Public	4	ERC / local knowledge	Y	Prevention Plan
Public	3	Energy Release Component	Y	Public Use Restrictions
Industry	4	IFPL / local knowledge	Y	Prevention Plan

5. Fire Danger Rating Level Decisions

The NFDRS utilizes the WIMS processor to manipulate weather and forecast data stored in the National Interagency Fire Management Integrated Database (NIFMID) to produce fire danger ratings for corresponding weather stations. The NFDRS outputs from the WIMS processor can be used to determine various levels of fire danger rating to address the fire problems identified previously in the Fire Problem Identification Table (Section 3.2, Table 3). The system is designed to model worst-case fire danger scenario. The NFDRS, along with other decision support tools, will be utilized to produce levels (thresholds) of fire business to address local fire problems by targeting public, industrial, or agency groups.

The NFDRS will be utilized to produce outputs to assist fire managers with six sets of decisions.

- **Response Levels** will be used as a decision tool for dispatchers to assign initial attack resources to a fire reported in a specific dispatch zone.
- **Staffing Levels** will be used as a decision tool for appropriate day-to-day fire management resource staffing.
- **Preparedness Levels** will assist fire managers with more long-term (or seasonal) decisions with respect to fire danger.
- **Adjective Rating Level** will be used to communicate fire danger to the public.
- **Industrial Fire Precaution Level** will be used to curtail preventable industrial ignitions.
- **Public Use Restriction Level** will be used to curtail public ignitions.

5.1 Response Level

Response (or dispatch) levels are pre-planned actions which identify the number and type of resources (engines, crews, aircraft, etc.) initially dispatched to a reported wildland fire based upon fire danger criteria. Dispatch levels are established to assist fire managers with decisions regarding the most appropriate response to an initial fire report until a qualified Incident Commander arrives at the incident. Response level in this plan is a direct function of staffing level.

Table 8. Response level

BI Decision Breakpoint (table 6)	Response Level
1	1
2	
3	
4	2
5	3

5.2 Staffing Level

The Staffing Level forms the basis for decisions regarding the degree of readiness for initial attack and support resources. Staffing levels are expressed as numeric values where 1 represents the low end of the fire danger continuum and 5 the high end. Staffing level is intended to provide fire managers with day-to-day decision support

regarding staffing of fire management resources such as employee overtime associated with working people beyond their normal schedules and extended staffing of shared resources such as air tankers, helicopters, hotshot crews and other large fire support resources.
The process for determining local staffing levels is not the same as staffing level calculated directly from WIMS. WIMS calculates staffing level on climatological breakpoints. Staffing level will be based on aggregate decision points defined in this plan from Table 6 and incorporate a measure of ignition risk using the worksheet below.

Table 9. Staffing level

Burning Index (BI) Decision Breakpoint (from Table 6)	1 □	2 □		3 □		4 □		5 □	
Red Flag Warning, Fire Weather Watch, Increase in IA Activity?	↓	No □	Yes □	No □	Yes □	No □	Yes □	No □	Yes □
Staffing Level Output Value	I	II		III		IV		V	

The primary input is the forecast or observed staffing level based on the Burning Index decision points defined in this plan. The secondary input is the occurrence of a Red Flag Warning or Fire Weather Watch within the respective dispatch area.

5.3 Preparedness Level

The Preparedness Level is a fire danger rating decision tool that is based on NFDRS outputs (Energy Release Component of fuel model Y) and other mid- to long-term indicators of fire business such as drought or NWCC significant Fire Potential Outlook. Preparedness levels are established to assist fire managers with weekly or monthly planning decisions.

Preparedness Levels are influenced by an aggregate Decision Point and the Northwest Coordination Center Seven Day Significant Fire Potential Outlook product (https://gacc.nifc.gov/nwcc/content/products/fwx/guidance/DL.pdf) using the worksheet below. Other considerations may be drought, availability of resources or uncharacteristic forest conditions.

Table 10. Preparedness level

ERC Decision Breakpoint (from Table 6)	1 □	2 □		3 □		4 □		5 □	
NWCC Outlook Elevated or High Risk for PSA4?	↓	No □	Yes □	No □	Yes □	No □	Yes □	No □	Yes □
Preparedness Output Value	I	II		III		IV		V	

5.4 Adjective Fire Danger Rating Level

Efforts will be made to maintain consistency between agencies in determining the Adjective Rating as well as minimizing the number of changes to the Adjective Rating during the fire season. Although WIMS automatically calculates the Adjective Rating based on climatology, units participating in this plan will use FDRA Preparedness Level (Energy Release Component in fuel model Y) thresholds/breakpoints defined in this plan as the basis for discussions with cooperators for setting FDRA Adjective Rating level. Ignition component was removed as an input variable to reduce the output sensitivity (reduce frequency of rating changes).

Key to the decision on when to change Adjective Rating are regular calls between fire staff officials. Adjective Ratings may vary by unit or district.

Table 11. Adjective rating

ERC Decision Points (from Table 6)	Adjective Rating
1	Low
2	Moderate
3	
4	High
5	Extreme

Fire Danger Level: Low (green)

When the fire danger is low, fuels do not ignite easily from small embers, but a more intense heat source, such as lightning, may start fires in duff or dry rotten wood. Fires in open, dry grasslands may burn freely a few hours after a rain, but most timber fires will spread slowly by creeping or smoldering and burn in irregular fingers. There is little danger of spotting.

Fire Danger Level: Moderate (blue)

When the fire danger is moderate, fires can start from most accidental causes, but the number of the starts is usually low. If a fire does start in an open, dry grassland, it will burn and spread quickly on windy days. Timber fires will spread slowly to moderately fast. The average fire is of moderate intensity, although in heavy concentrations of fuel, especially needle draped fuel, fire may burn hot. Short distance spotting may occur but is not persistent. Fires are still not likely to become large and control is relatively easy.

Fire Danger Level: High (yellow)

When the fire danger is high, all dead fuels ignite readily, and fires can start easily from most causes. Unattended campfires and brush fires 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 can become serious and their control difficult unless they are attacked successfully while small.

Fire Danger Level: Extreme (red)

When the fire danger is extreme, fires start quickly, spread rapidly, and burn intensely. All fires may potentially become large. Development into high intensity burning will usually be faster and occur from smaller fires than in the high fire danger class. Direct attack is rarely possible and may be dangerous except immediately after ignition. Fires that become established 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.

5.5 Public Use Restrictions

Public use restrictions are implemented and set by the individual agencies. Currently there is not a coordinated interagency set of restrictions/levels (or actions) used by participants in this plan.

Ideally units will set public use restrictions based on, or informed by, Adjective Rating or Preparedness Level. Number of levels, actions and the basis for decision making will be defined in unit prevention plans or public use restriction plans. Efforts will be made to maintain consistency between agencies in determining the levels of public use restrictions. Key to the decision on when to change public use restrictions are regular calls between fire staff officials. Public use restrictions may vary by unit.

5.6 Industrial Fire Precaution Level

The Industrial Fire Precaution Level (IFPL) system helps prevent wildfires by regulating work in the forest. The U.S. Forest Service, Bureau of Land Management and Oregon Department of Forestry all use a four-level industrial regulation system. However, there are different restrictions in place at the various levels between the agencies. The National Park Service does not have industrial activities or industrial precaution levels but refers to USFS levels for fuels activities.

An Industrial Fire Precautions Level is computed by the WIMS processor based on a historic analysis of Energy Release Component and Ignition Component. The WIMS output is estimated to continue thru 2022 while discussions are ongoing for a new replacement incorporating Oregon, California, and Washington.

Industrial Fire Precaution Levels may vary by unit; however, efforts will be made to maintain consistency between agencies in determining the Industrial Fire Precaution Levels. Public Use Restrictions will be coordinated by agency fire staff through regular calls to maintain consistency.

6. Fire Danger Operating Procedures

6.1 Roles and Responsibilities

Agency Administrators

Agency Administrators will use this plan to coordinate with Fire Management Officers on fire business related decisions.

Fire Management Officers

Fire Management Officers (FMOs) will use this FDOP along with NFDRS outputs as a tool to coordinate and to make informed fire business decisions. The fire program manager is ultimately responsible for ensuring this plan is maintained, utilized, and communicated.

Fire program managers will ensure that their weather stations (RAWS) are maintained to NFDRS standards.

Fire Danger Technical Group

Each participating agency will be responsible for providing a NFDRS technical specialist to participate in the maintenance, review, and update of this plan. The following are specific individuals which have participated in plan development or review to date.

- Bureau of Land Management – Jena Volpe, Krisann Kosel
- U.S. Forest Service – Ruth Johnson (retired), Brett Brown
- National Park Service – John Donahue

Members of the Fire Danger Technical Group will monitor NFDRS to ensure validity, coordinate/communicate any problems identified, review plan implementation, coordinate plan revisions, present the plan, and be available for NFDRS technical consultation. The technical group will coordinate with FMOs from their unit for updates and additions to the plan as well as coordinate annually to review plan implementation, decide if revisions are necessary, and accomplish revisions.

Fire Weather Station Owners/Managers
The WIMS coordinator or station owner will ensure appropriate editing of the RAWS catalogues to match this plan and maintain contacts for stations. The RAWS coordinator or station owner will maintain stations in accordance with NWCG PMS 426-3 and ensure a timely response when notified of an unexpected need for repair. Snow flags will need to be set when appropriate.

Communication Centers
The Communication Centers will ensure that the daily NFDRS indices are retrieved and that the daily staffing and preparedness levels are calculated, communicated, and made available during fire season, May 1st through October 31st or as requested due to extenuating factors. See **Daily Schedule** for additional details.

The Communication Center will monitor RAWS daily for unusual readings that may suggest an issue which needs attention and contact the station owners or RAWS coordinator to arrange resolution.

The Communication Center or station owner will set the proper seasonal settings in WIMS required to run NFDRS 2016, including setting snow flags.

Duty Officers
It is the duty officer role to interpret the daily response, staffing and preparedness levels. If warranted due to extenuating factors not addressed by this plan, modify the levels in order to make informed fire business decisions.

National Weather Service
Weather forecasts and products for the area are provided by the National Weather Service, Medford office. The annual Northwest Fire Weather Operating Plan contains contact information and product listing (including NFDRS point and trend forecast products) and can be found on the Northwest Coordination Center Website (here).

Daily Schedule

Communication centers should be prepared to obtain the outputs from WIMS and to use the tables and worksheets in this plan. Morning broadcasts will use the daily forecast indices and will be effective until the afternoon broadcast. Afternoon broadcasts will use the day's observed indices and be effective until the morning broadcast. Broadcasts should include the observed and predicted BI and ERC values when available.

6.2 Critical Fire Danger

Critical fire danger events such as a wind event, trough aloft, subsidence inversion, and dry cold front winds will be typically captured by National Weather Service meteorologists in Red Flag Warnings or Fire Weather Watches.

Strong offshore wind events that are coincident with warming and drying west of the Cascade Crest, and the combination of warm, dry, windy weather often leads to extreme burning conditions. While valley locations often improve at night during offshore

events, coastal mountains and adjacent coastal areas can experience these conditions through the night. Conditions for these events are favorable during the fall and are generally uncommon (but not unheard of) before September. Further descriptions of critical weather patterns can be found on the NWCC website (here).

Other critical fire danger elements contributing to explosive fire growth aside from wind, high temperatures and low relative humidity, include abnormally low seasonal snowpack/streamflow, drought, and periods of poor overnight humidity recoveries.

6.3 Season Ending Event

The NWCC conducted a season ending event analysis by predictive services area which can be found on their fire analysis page.

6.4 Fire Danger Pocket Cards/Seasonal Risk Analysis

The fire danger pocket card is a tool which can aid fire management personnel to interpret NFDRS outputs and understand local fire danger thresholds for a local area. Pocket cards can relate current NFDRS outputs with the historical average and worst-case values in a specific geographic location. Resources can use the pocket card to familiarize themselves with local fire danger conditions. The pocket cards that meet NWCG guidelines are posted on the Fire and Aviation Management Information Technology (FAMIT) portal.

Seasonal risk analysis (graphs with updated daily values) can be found on the unit.

Appendix A – Fire Danger Rating Area Development

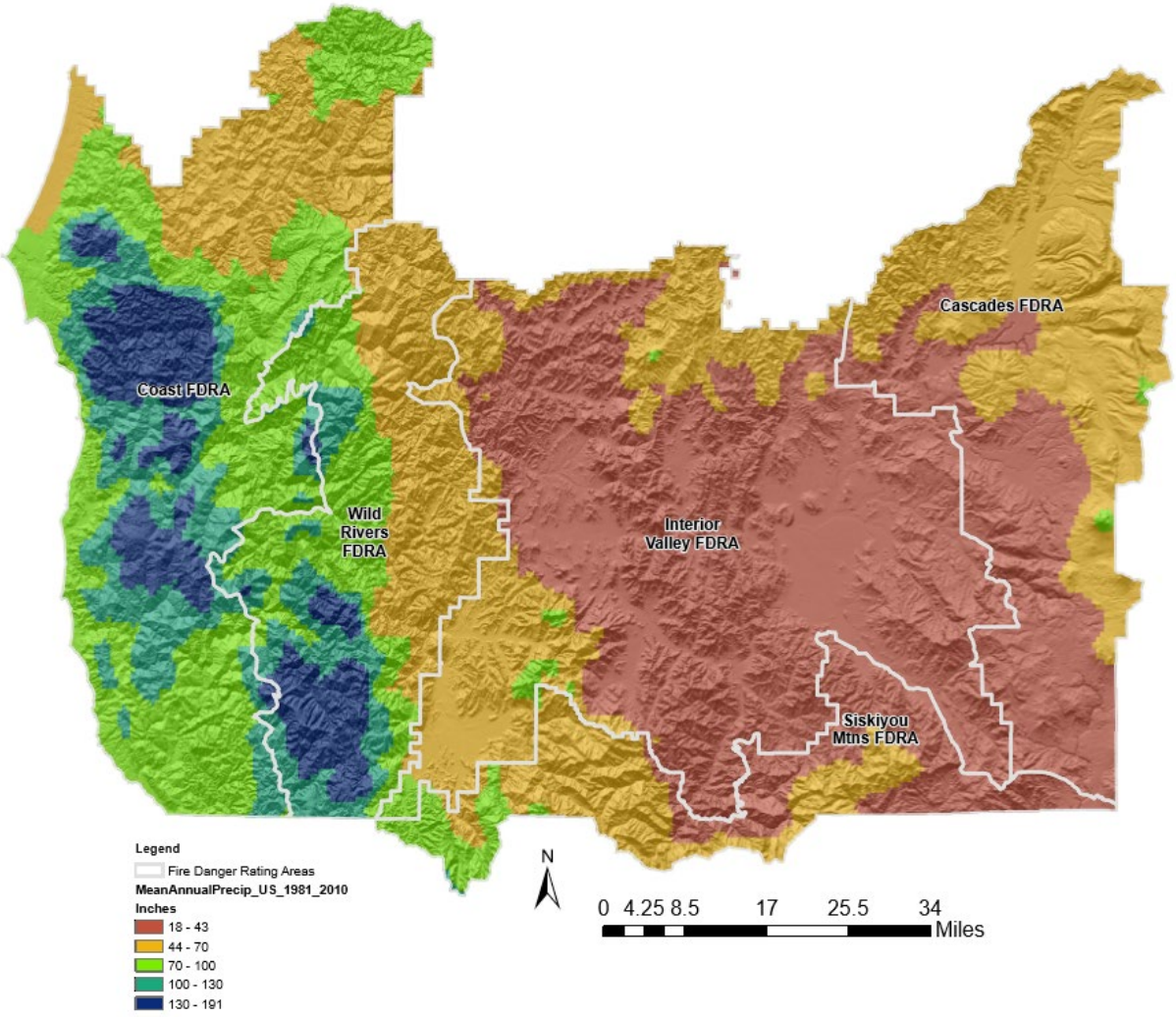


Figure 3. PRISM Climate Group (Oregon State University, 2013) 30 year normalized average annual precipitation (inches) spanning 1981-2010

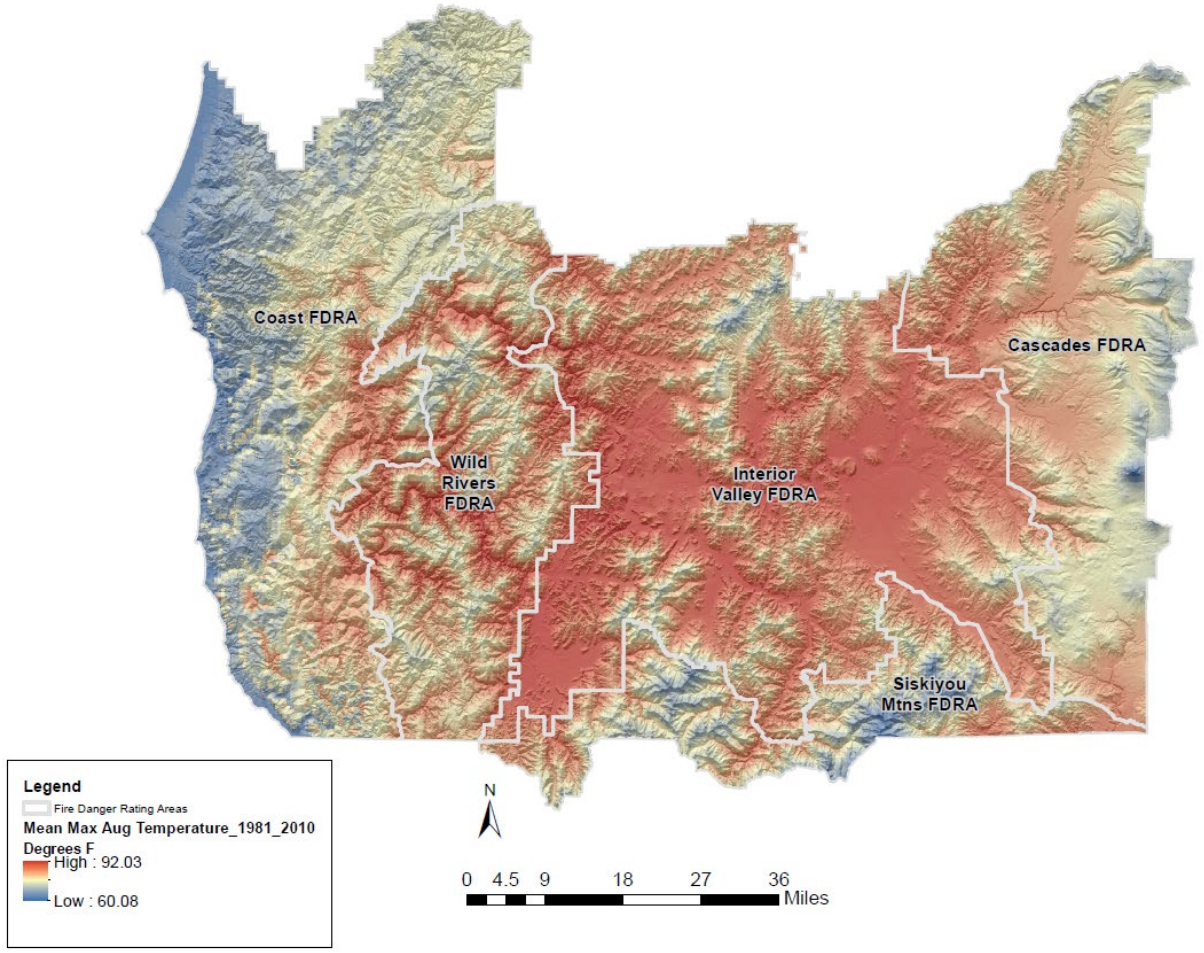


Figure 4 PRISM Climate Group (Oregon State University, 2013) 30 year normalized average August maximum temperature (F^{o}) spanning 1981-2010

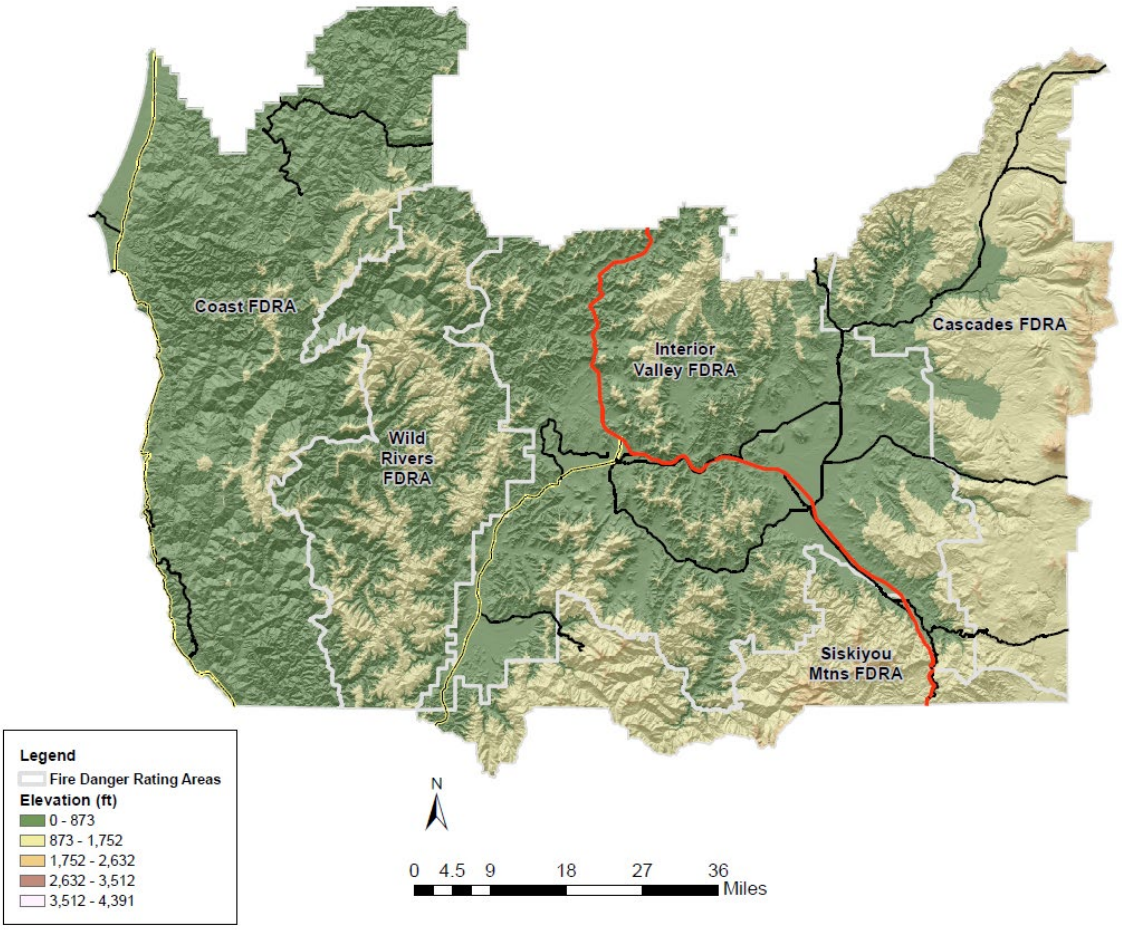


Figure 5 Elevation level in FDRAs (USGS 10m Digital Elevation Model (DEM))

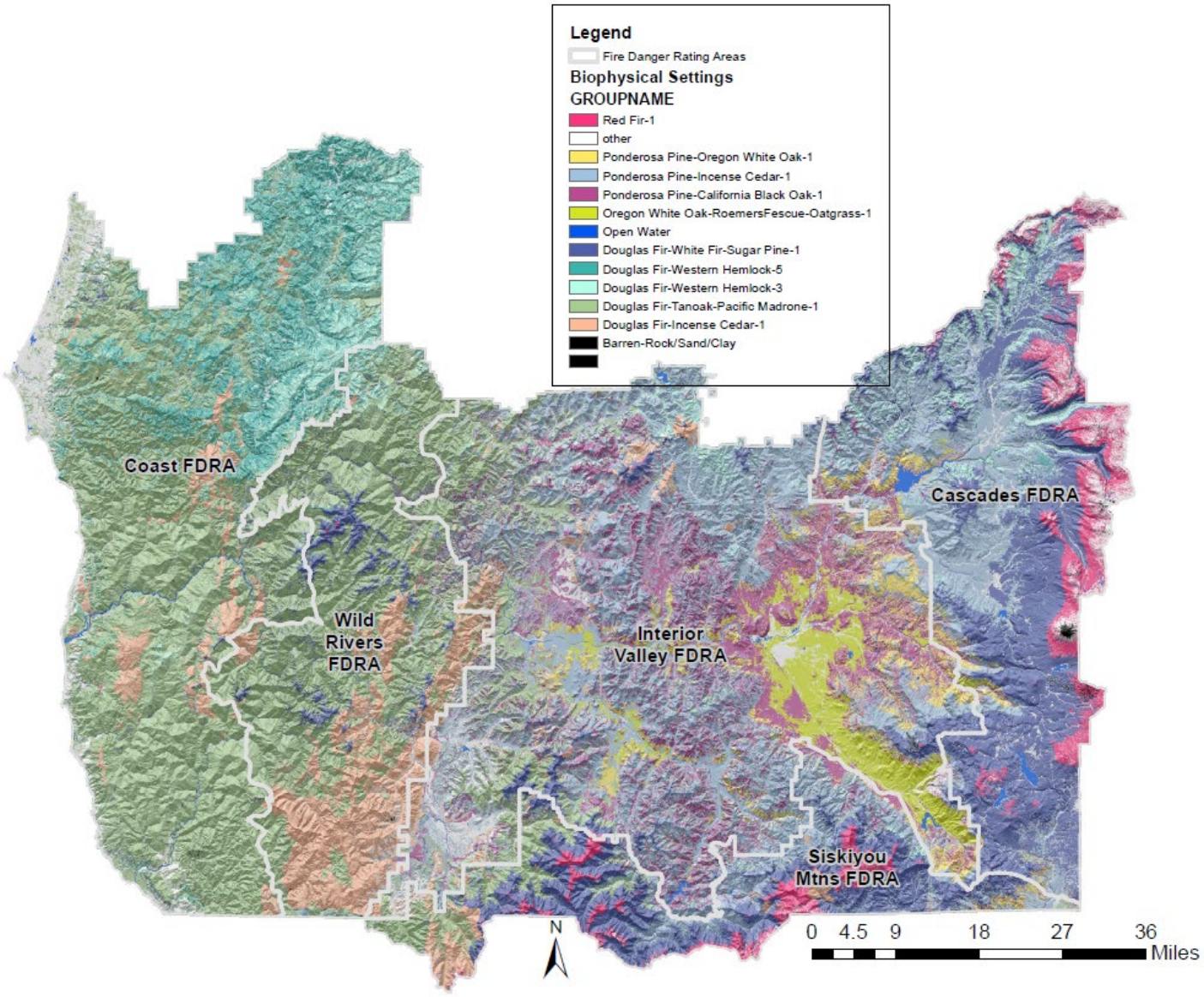


Figure 6 Bio Physical Settings (LANDFIRE)

Table 12. FDRA, Biophysical Setting Group Name, Acres

FDRA	Biophysical Setting Group Names (≥ 3%)	Acres	Percent of FDRA
Cascades FDRA	Douglas Fir-Western Hemlock-3	34,025	7%
	Douglas Fir-White Fir-Sugar Pine-1	281,847	54%
	Ponderosa Pine-Incense Cedar-1	133,829	26%
	Red Fir-1	57,293	11%
Coast FDRA	Douglas Fir-Incense Cedar-1	60,638	5%
	Douglas Fir-Tanoak-Pacific Madrone-1	688,587	62%
	Douglas Fir-Western Hemlock-3	113,290	10%
	Douglas Fir-Western Hemlock-5	223,870	20%
Interior Valley FDRA	Douglas Fir-Incense Cedar-1	37,179	3%
	Douglas Fir-Tanoak-Pacific Madrone-1	180,291	13%
	Douglas Fir-White Fir-Sugar Pine-1	38,917	3%
	Oregon White Oak-RoemersFescue-Oatgrass-1	111,734	8%
	Ponderosa Pine-California Black Oak-1	293,220	22%
	Ponderosa Pine-Incense Cedar-1	595,635	44%
	Ponderosa Pine-Oregon White Oak-1	70,236	5%
Siskiyou Mtns FDRA	Douglas Fir-Incense Cedar-1	24,944	6%
	Douglas Fir-Tanoak-Pacific Madrone-1	50,816	13%
	Douglas Fir-White Fir-Sugar Pine-1	158,892	40%
	Ponderosa Pine-California Black Oak-1	16,633	4%
	Ponderosa Pine-Incense Cedar-1	93,242	23%
	Red Fir-1	44,622	11%
Wild Rivers FDRA	Douglas Fir-Incense Cedar-1	164,226	26%
	Douglas Fir-Tanoak-Pacific Madrone-1	389,600	61%
	Douglas Fir-White Fir-Sugar Pine-1	47,641	7%

Appendix C- Fire Occurrence Charts

Size Classes:
A: <= 0.25 acres
B: 0.26 to 9.9 acres
C: 10 to 99.9 acres
D: 100 to 299 acres
E: 300 to 999 acres
F: 1000 to 4999 acres
G: >= 5000 acres

Cause Classes:
1 - Lightning
2 - Equipment Use
3 - Smoking
4 - Campfire
5 - Debris Burning
6 - Railroad
7 - Arson
8 - Children
9 - Miscellaneous

Table 13. Coast fire occurrence chart

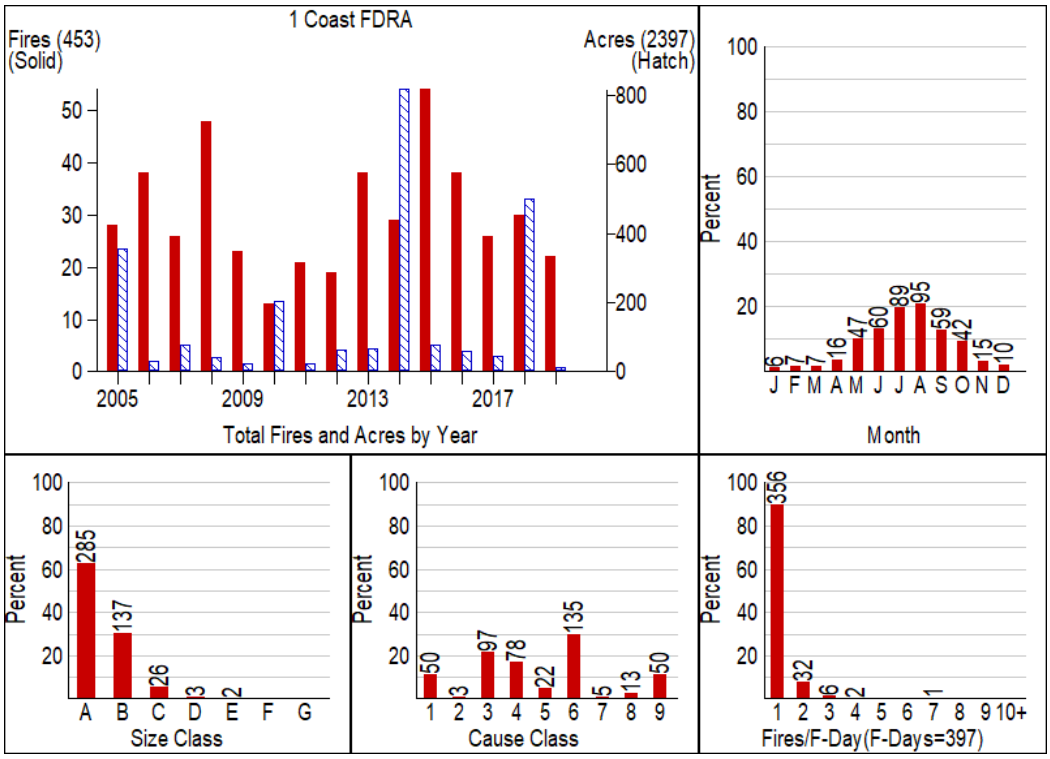


Table 14. Cascades fire occurrence chart

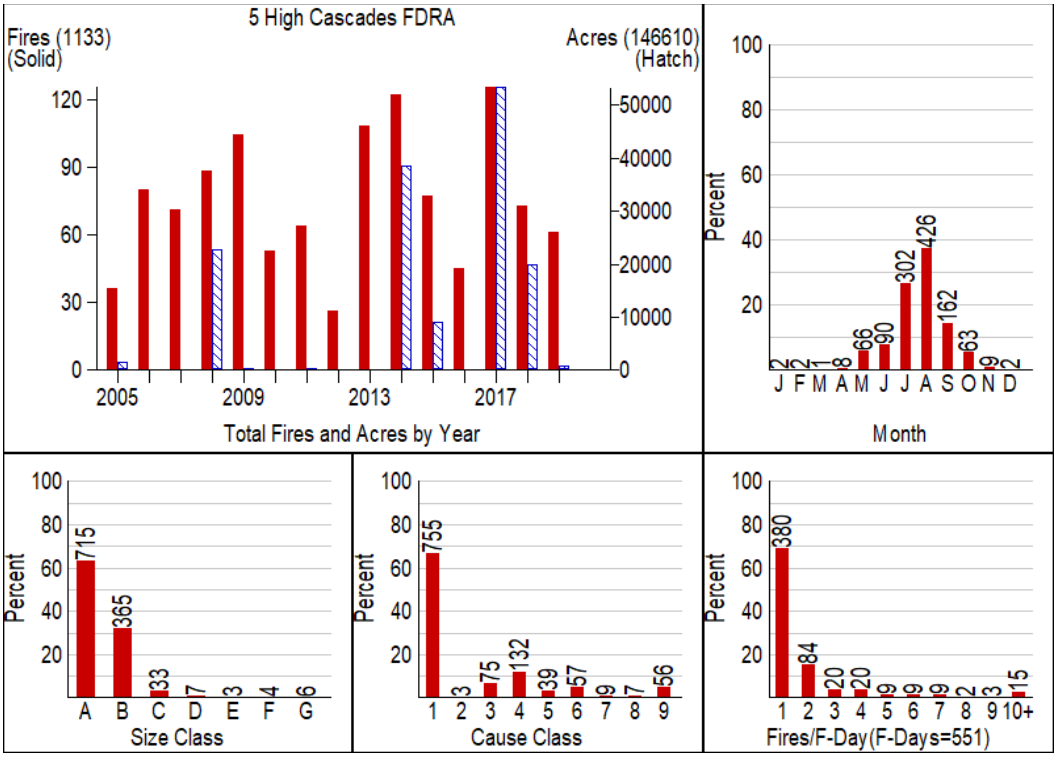


Table 15. Interior Valley fire occurrence chart

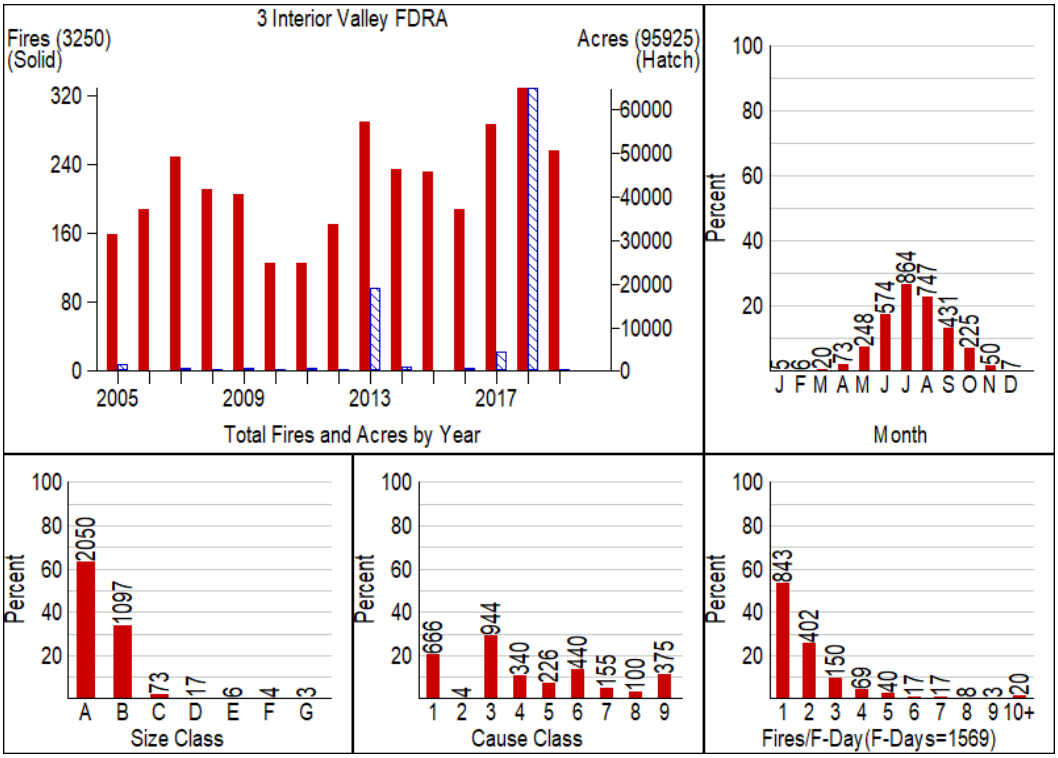


Table 16. Siskiyou Mountains fire occurrence chart

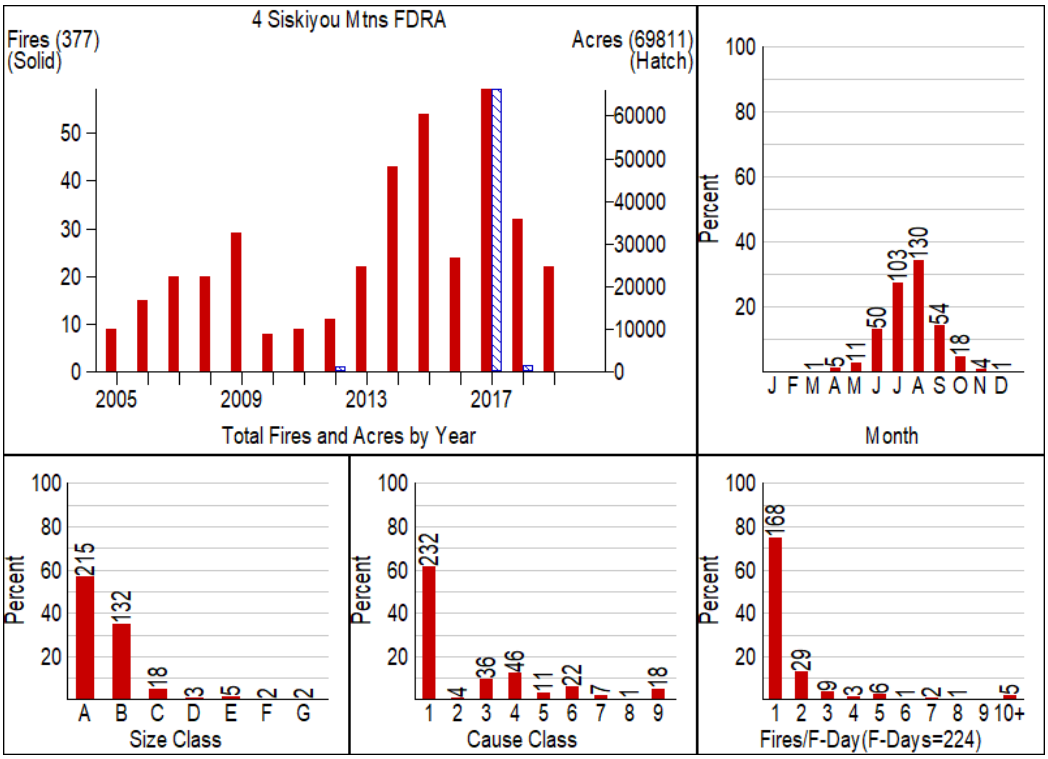
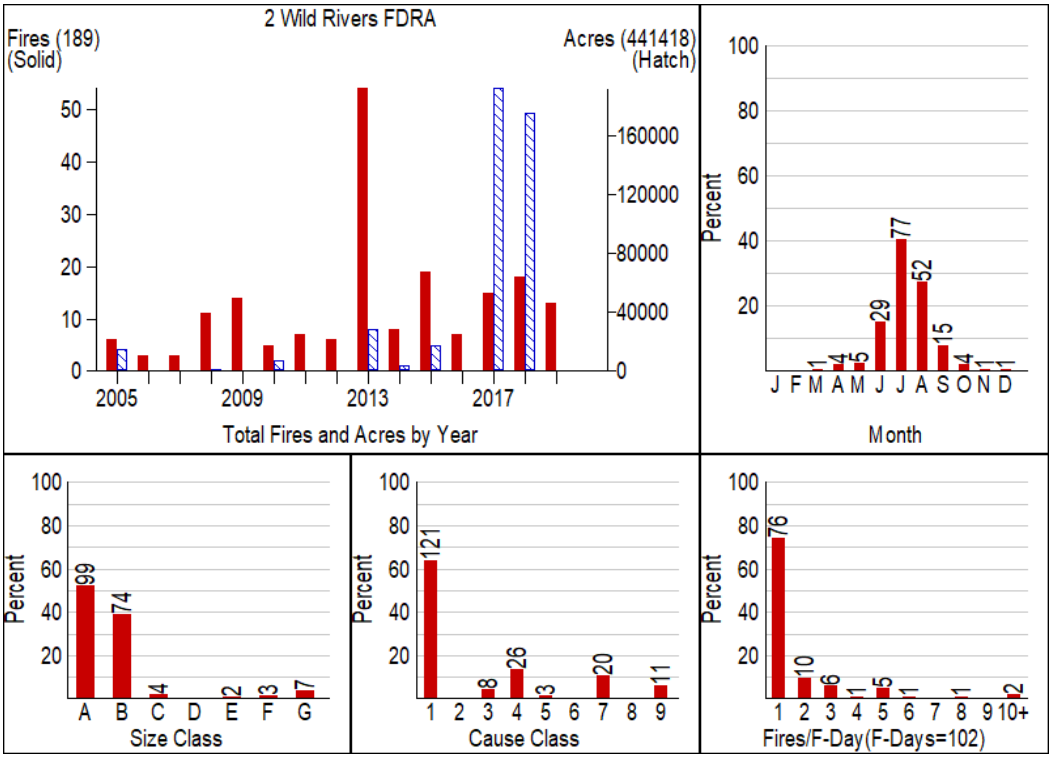
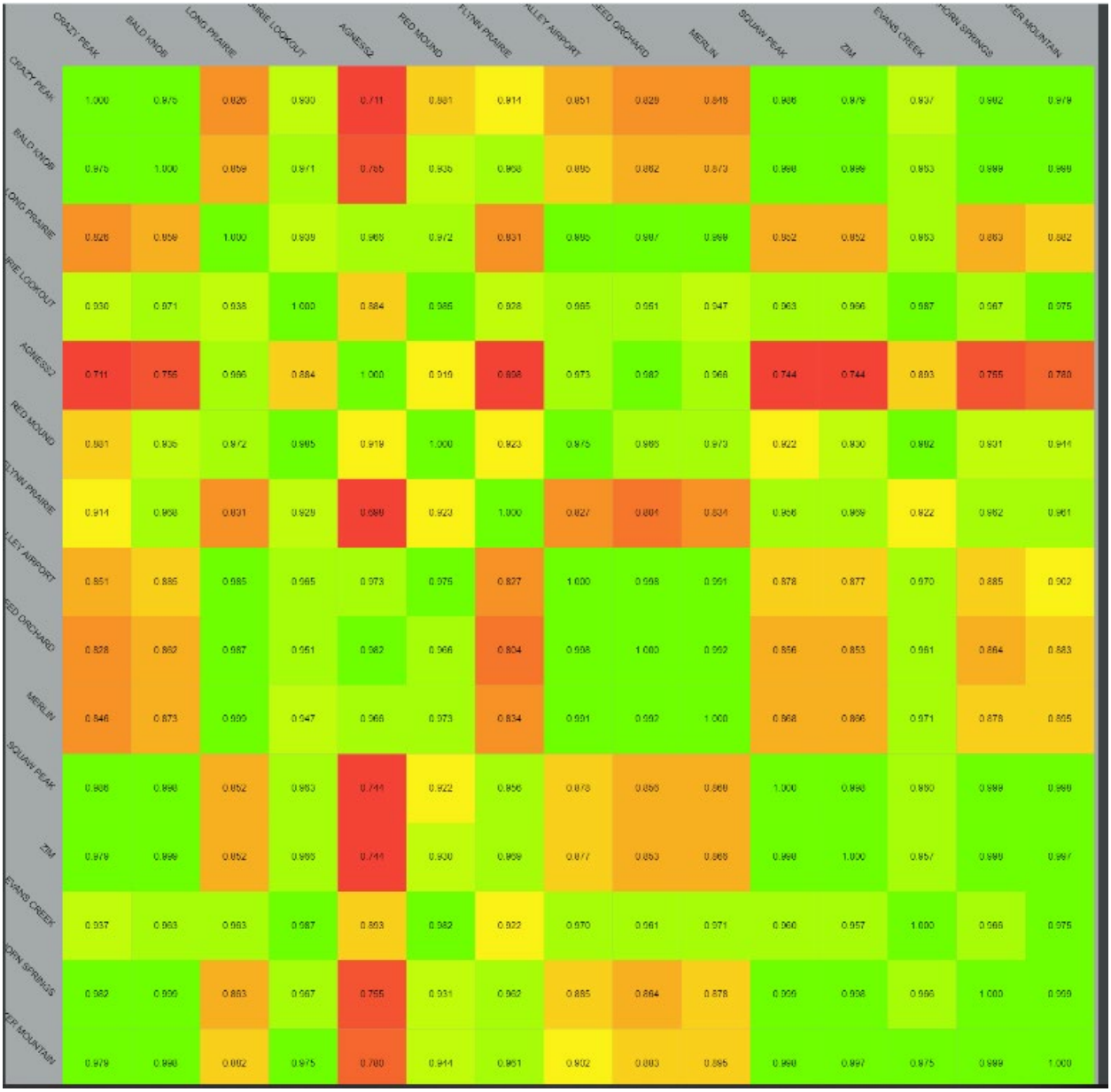


Table 17. Wild Rivers fire occurrence chart



Appendix D – RAWS Correlation Matrix

Table 18. RAWS Correlation Matrix from SIG Selector Tool (https://gacc.nifc.gov/gbcc/predictive/rawsSelector/) color coded by correlation strength: green represents high correlation (R values greater than 0.9) and red low correlation.

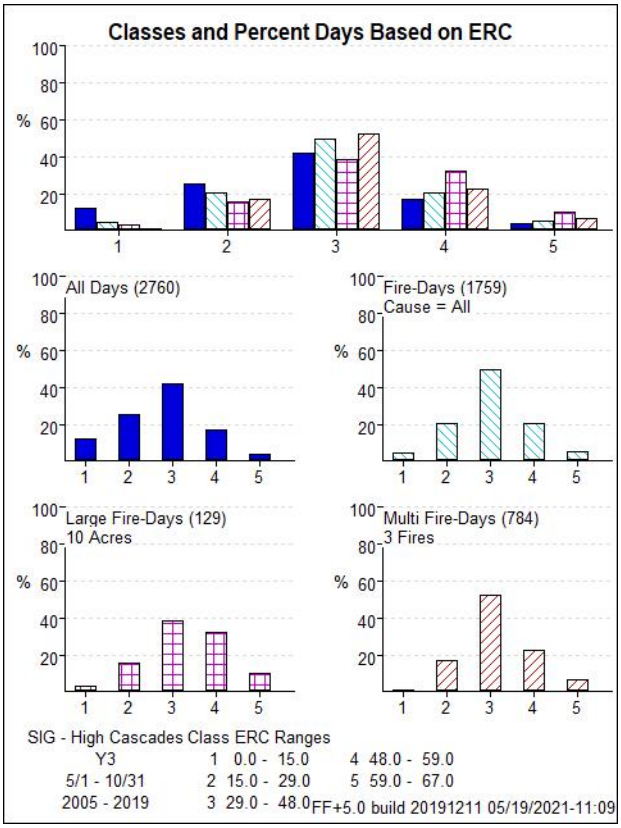


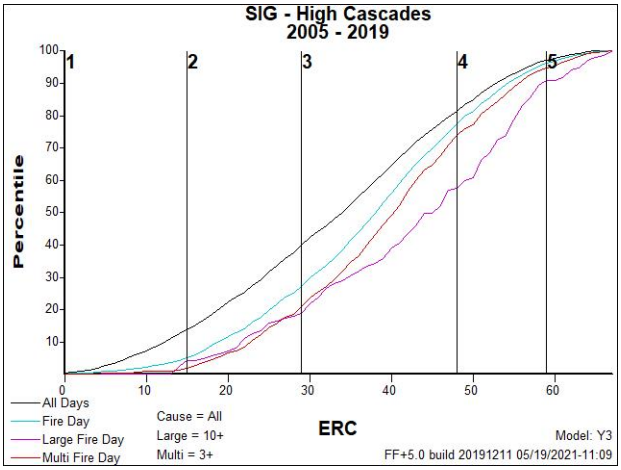
Appendix E – SIG Statistics

Table 19. Statistical Results from FireFamily+ by SIG for NFDRS Model and Variable (Fire Day (FD), Large Fire Day (LFD), and Multi Fire Day (MFD, where better model fit is illustrated by higher R2 values and lower Chi2 values.

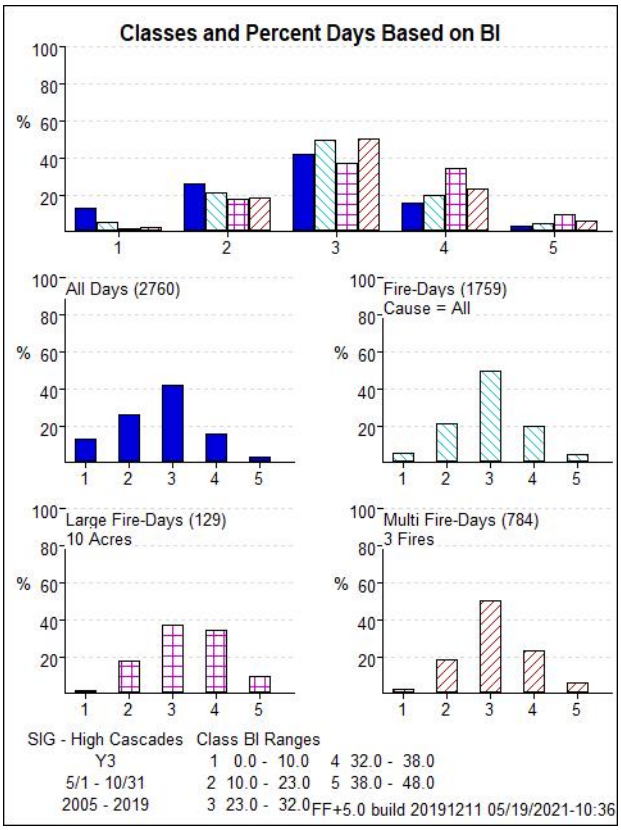
Fuel Model Y 2005-2019		All Fire Days (FD)			Large Fire Days 10+ Acres (LFD)			Multiple Fire Days 3+ (MFD)		
SIG	Var	R^2	Chi^2	P-Range	R^2	Chi^2	P-Range	R^2	Chi^2	P-Range
Cascade	BI	0.95	21.21	0.21 - 0.94	0.56	14.21	0.02 - 0.20	0.83	9.18	0.21 - 0.67
Coast	BI	0.88	20.48	0.09 - 0.63	0.34	14.25	0.02 - 0.21	0.58	8.23	0.44 - 0.75
Interior Val	BI	0.96	15.58	0.09 - 0.91	0.49	11	0.01 - 0.12	0.66	16.25	0.21 - 0.69
Siskiyou Mtns	BI	0.89	14.95	0.03 - 0.47	0.53	8.18	0.01 - 0.29	0.15	15.07	0.30 - 0.54
Wild Rivers	BI	0.92	23.15	0.16 - 0.81	0.88	2.3	0.02 - 0.20	0.53	20.43	0.14 - 0.48
Coast	ERC	0.87	23.74	0.08 - 0.71	0.65	8.05	0.01 - 0.25	0.78	7.14	0.32 - 0.80
Cascade	ERC	0.85	69.49	0.21 - 0.93	0.56	17.88	0.02 - 0.16	0.85	8.79	0.22 - 0.64
Interior Val	ERC	0.9	42.82	0.11 - 0.90	0.63	4.81	0.02 - 0.10	0.64	19.73	0.26 - 0.67
Siskiyou Mtns	ERC	0.83	29.98	0.03 - 0.47	0.75	3.75	0.02 - 0.28	0.5	5.88	0.28 - 0.58
Wild Rivers	ERC	0.8	56.73	0.19 - 0.79	0.82	5.82	0.02 - 0.22	0.94	1.85	0.13 - 0.50

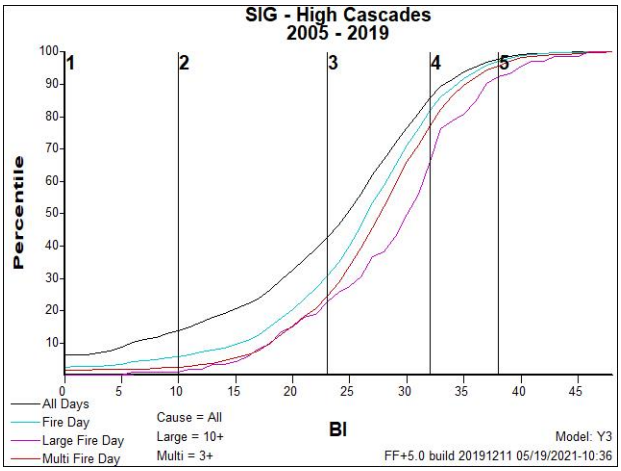
Appendix F – Decision Points Analysis



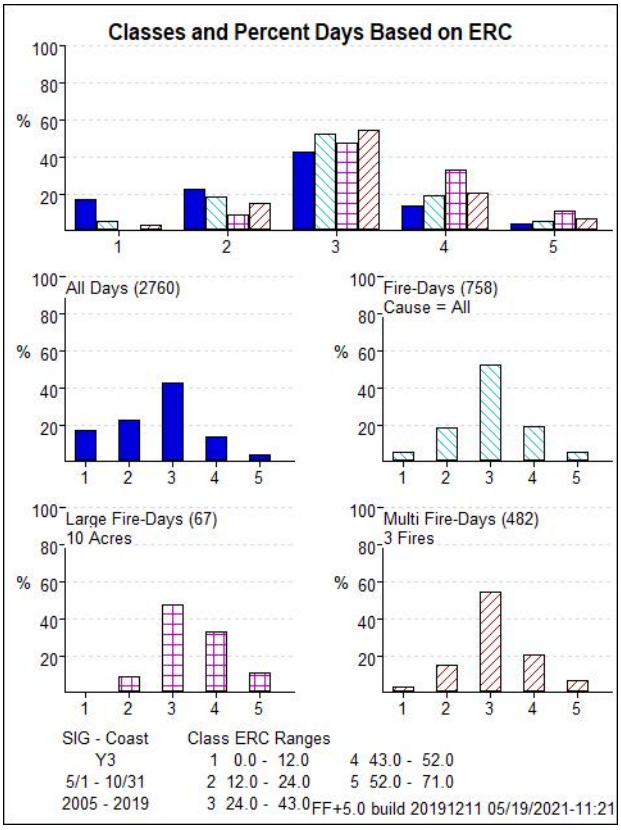


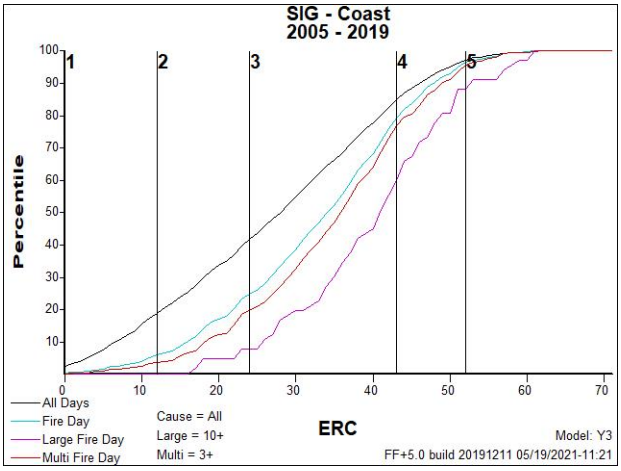
Cascade FDRA ERC Break Points		
Class	Range	% of All Fire Days
1	0-14	4%
2	15-28	21%
3	29-47	50%
4	48-58	20%
5	59+	5%



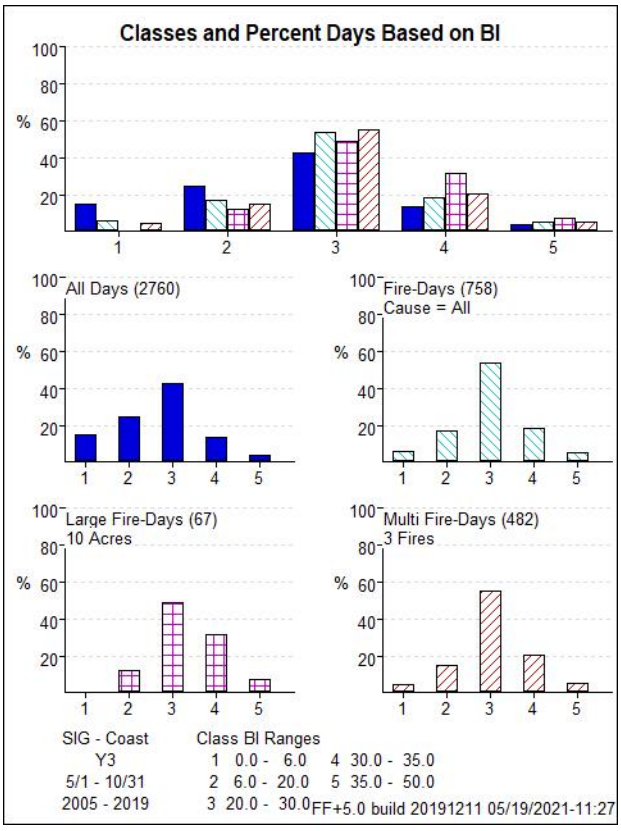


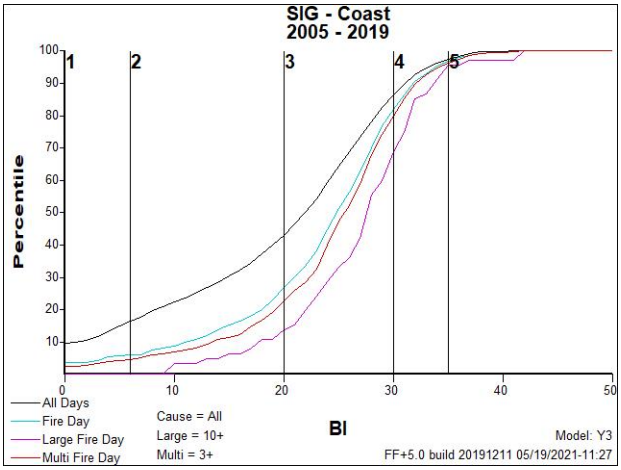
Cascade FDRA BI Break Points		
Class	Range	% of All Fire Days
1	0-9	5%
2	10-21	21%
3	22-31	50%
4	32-37	20%
5	38+	4%



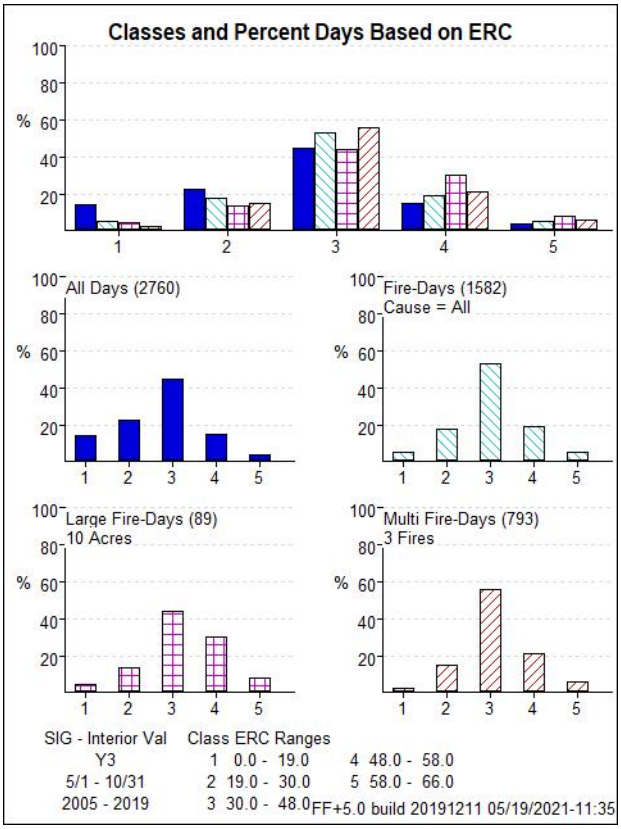


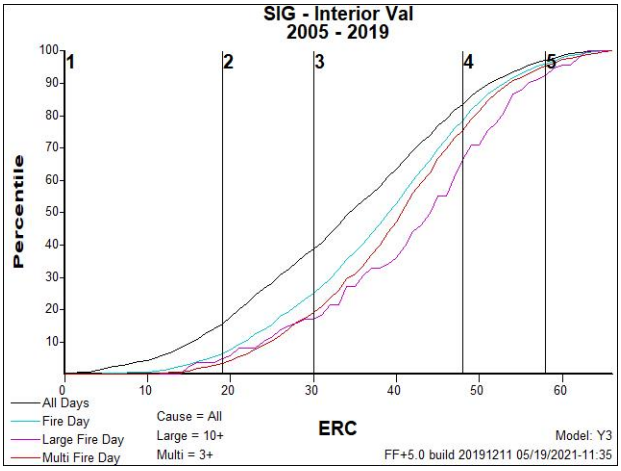
Coast FDRA ERC Break Points		
Class	Range	% of All Fire Days
1	0-11	5%
2	12-23	18%
3	24-42	53%
4	43-51	19%
5	52+	5%



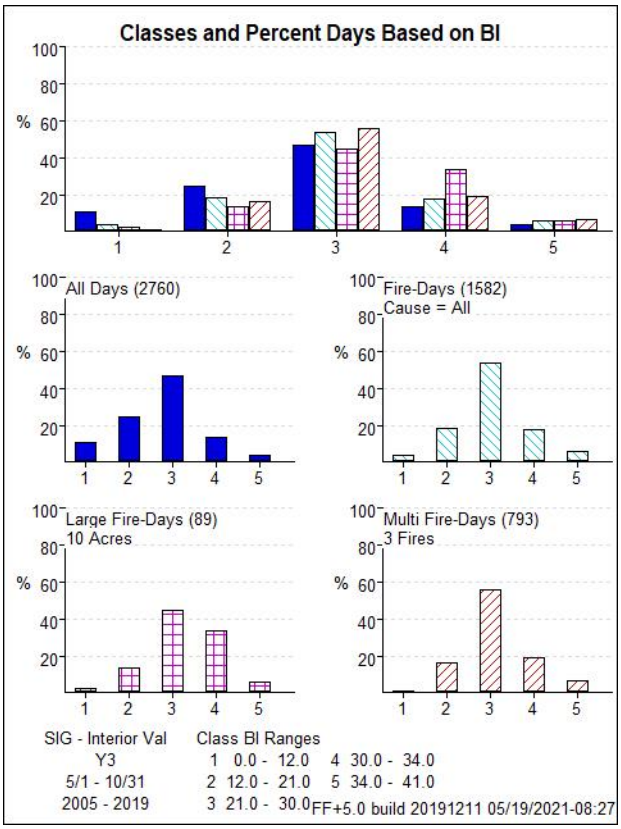


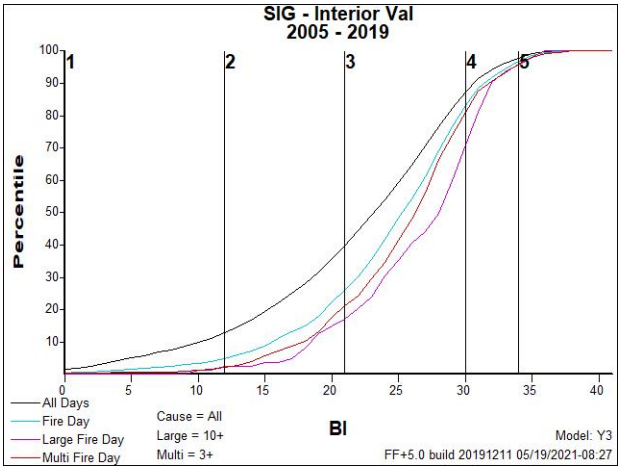
Coast FDRA BI Break Points		
Class	Range	% of All Fire Days
1	0-5	6%
2	6-19	17%
3	20-29	54%
4	30-34	18%
5	35+	5%



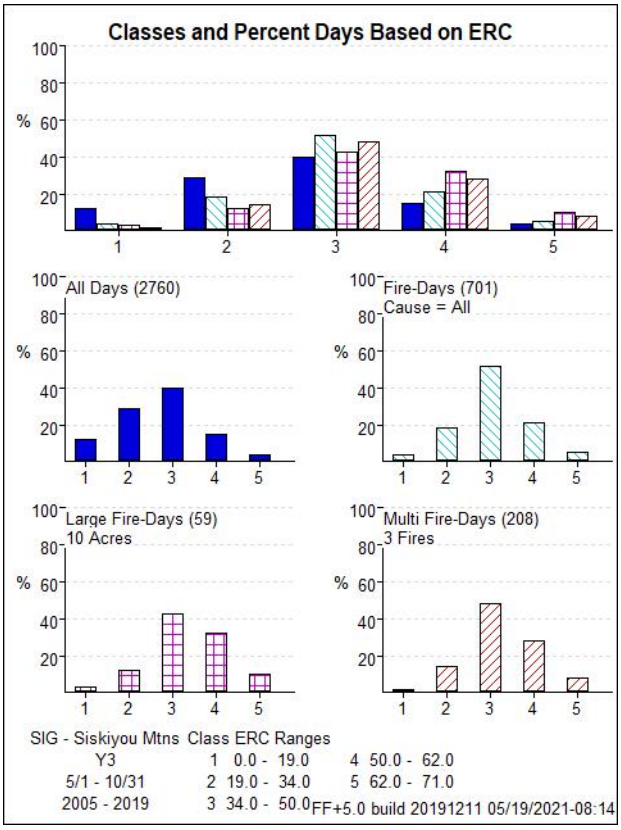


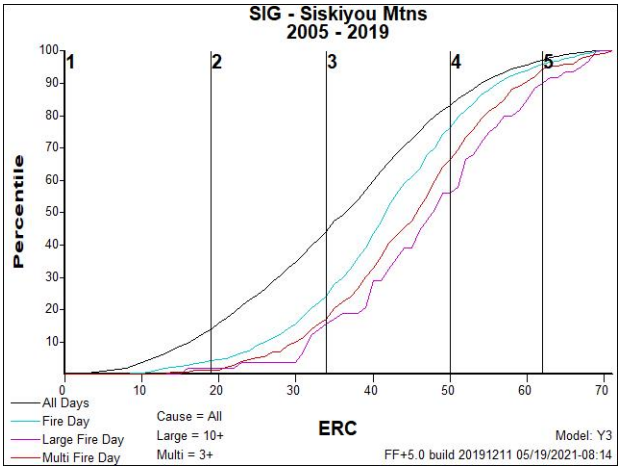
Interior Valley FDRA ERC Break Points		
Class	Range	% of All Fire Days
1	0-18	5%
2	19-29	18%
3	30-47	53%
4	48-57	19%
5	58+	5%



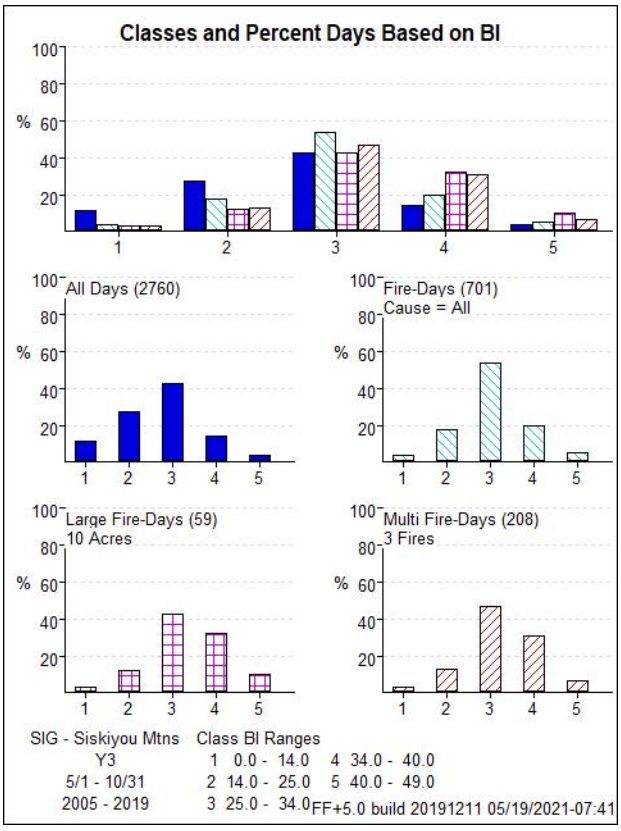


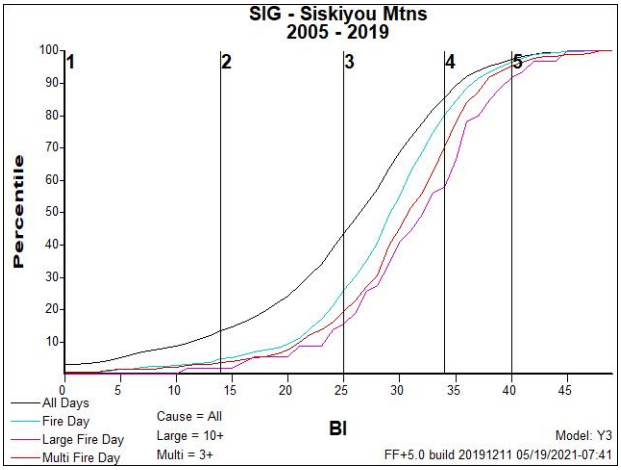
Interior Valley FDRA BI Break Points		
Class	Range	% of All Fire Days
1	0-11	4%
2	12-20	19%
3	21-29	54%
4	30-33	18%
5	34+	6%



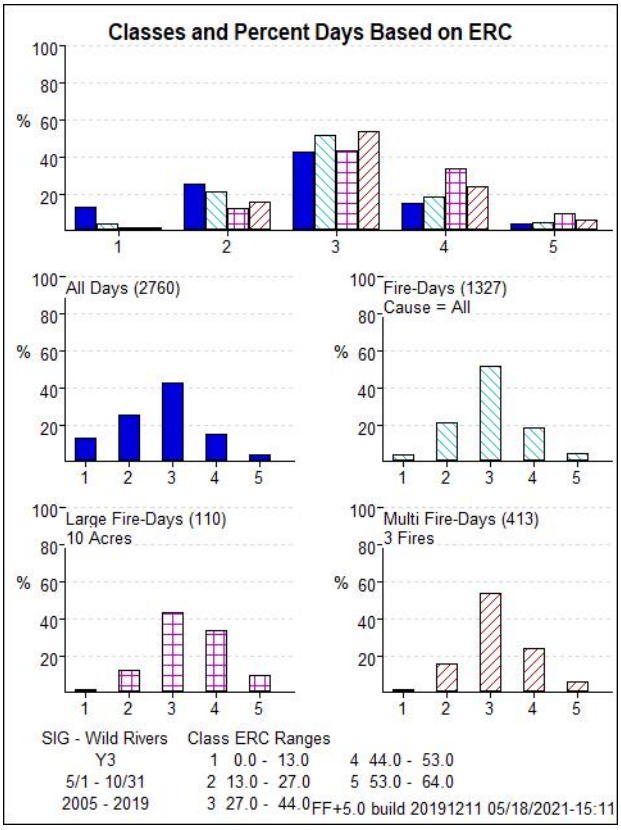


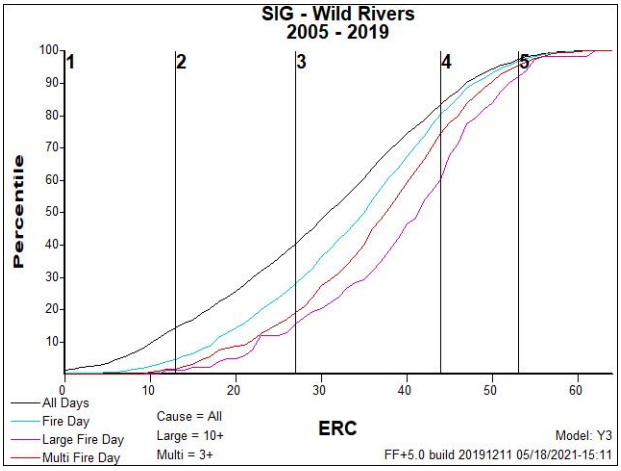
Siskiyou Mtns FDRA ERC Break Points		
Class	Range	% of All Fire Days
1	0-18	4%
2	19-33	18%
3	34-49	53%
4	50-61	20%
5	62+	5%



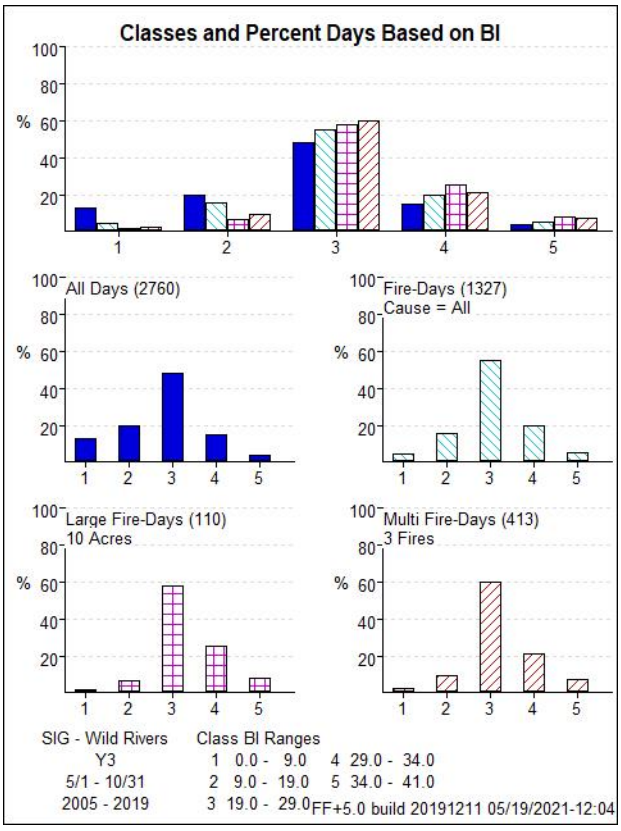


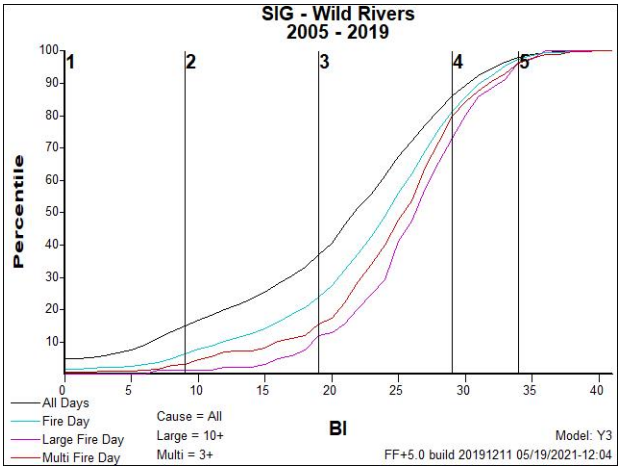
Siskiyou Mtns FDRA BI Break Points		
Class	Range	% of All Fire Days
1	0-13	4%
2	14-24	18%
3	25-33	53%
4	34-39	20%
5	40+	5%





Wild Rivers FDRA ERC Break Points		
Class	Range	% of All Fire Days
1	0-12	4%
2	13-26	21%
3	27-43	52%
4	44-52	18%
5	53+	5%





Wild Rivers FDRA BI Break Points		
Class	Range	% of All Fire Days
1	0-8	5%
2	9-18	16%
3	19-28	55%
4	29-33	20%
5	34-40	5%

Appendix G – Decision Points Historic vs. Modeled Probability

Table 20. Fire Danger Rating Area, Burning Index (BI) Decision Breakpoints and proportional distribution in Observed Historic (15 year) fire season, fire days, large (> 10 acres) fire days, multiple (>3 fires) days and modeled probability for same Decision Breakpoints (FireFamily+). Percent of All Fire Days (FD) were used to guide Decision Breakpoints.

FDRA	Index	Decision Breakpoint		Percent of Historic				Model Probability Percent		
				Fire Season	Fire Days	Large Fire Days	Multiple Fire Days	Fire Day	Large Fire Day	Multiple Fire Day
Coast	BI	1	0-5	15	6	0	4	11-14	0-0	5-7
		2	6-19	25	17	12	15	14-25	1-2	7-15
		3	20-29	43	54	49	55	26-37	2-4	16-25
		4	30-34	14	18	31	21	38-43	4-6	26-31
		5	35+	4	5	7	5	44-63	6-18	32-53
Cascades	BI	1	0-9	13	5	2	2	21-37	1-1	6-11
		2	10-22	26	21	18	18	39-63	1-3	12-25
		3	23-31	42	50	37	51	65-78	4-7	26-39
		4	32-37	16	20	34	23	80-86	7-10	40-50
		5	38+	3	4	9	6	97-93	11-21	51-67
Interior Valley	BI	1	0-11	11	4	2	1	12-30	0-1	4-11
		2	12-20	25	19	13	16	32-52	1-2	12-22
		3	21-29	47	54	45	56	55-73	2-5	24-40
		4	30-33	14	18	34	19	75-81	5-7	43-50
		5	34+	4	6	6	7	82-90	7-12	52-66
Siskiyou Mountains	BI	1	0-13	12	4	3	3	6-13	0-1	1-3
		2	14-24	27	18	12	13	13-22	1-1	3-6
		3	25-33	43	53	42	47	23-33	2-3	6-11
		4	34-39	14	20	32	31	35-42	3-5	11-16
		5	40+	4	5	10	6	44-56	5-10	17-27
Wild River	BI	1	0-8	13	5	2	3	16-26	0-1	3-5
		2	9-18	20	16	6	9	27-43	1-2	6-11
		3	19-28	49	55	58	60	45-61	3-6	12-21
		4	29-33	15	20	25	21	63-70	7-9	23-28
		5	34+	4	5	8	7	71-80	10-16	30-41

Table 21. Fire Danger Rating Area Energy Release Component (ERC) Decision Breakpoints and proportional distribution in Observed Historic (15 year) fire season, fire days, large (> 10 acres) fire days, multiple (>3 fires) days and modeled probability for same Decision Breakpoints (FireFamily+)

FDRA	Index	Decision Breakpoint		Percent of Historic				Model Probability Percent		
				Fire Season	Fire Days	Large Fire Days	Multiple Fire Days	Fire Day	Large Fire Day	Multiple Fire Day
Coast	ERC	1	0-11	17	5	0	3	11-16	0-1	5-8
		2	12-23	22	18	9	15	16-23	1-1	8-13
		3	24-42	43	53	48	55	23-38	1-4	14-26
		4	43-51	14	19	33	21	39-46	4-7	27-34
		5	52+	4	5	10	6	47-64	8-21	35-55
Cascades	ERC	1	0-14	12	4	3	1	23-39	1-2	8-13
		2	15-28	25	21	16	17	40-58	2-3	14-22
		3	29-47	42	50	39	52	60-80	3-7	23-39
		4	48-58	17	20	33	23	81-88	7-11	40-51
		5	59+	4	5	10	6	89-92	11-15	52-60
Interior Valley	ERC	1	0-18	14	5	4	3	15-35	1-1	6-14
		2	19-29	23	18	13	15	36-50	1-2	15-22
		3	30-47	45	53	44	56	52-75	2-5	23-41
		4	48-57	15	19	30	21	76-84	5-7	42-53
		5	58+	4	5	8	6	85-90	8-10	54-63
Siskiyou Mountains	ERC	1	0-18	12	4	3	1	7-13	0-1	1-2
		2	19-33	29	18	12	14	13-22	1-1	3-5
		3	34-49	40	52	42	49	22-35	1-3	5-11
		4	50-61	15	21	32	28	36-46	3-6	12-19
		5	62+	4	5	10	8	47-55	7-10	20-27
Wild River	ERC	1	0-12	13	4	2	1	20-29	1-1	4-6
		2	13-26	25	21	12	15	30-43	1-2	6-11
		3	27-43	43	52	44	54	44-61	3-6	12-22
		4	44-52	15	18	34	24	62-70	7-10	22-29
		5	53+	4	5	9	6	71-79	11-18	30-41