

Central Oregon

Interagency Fire Danger Operating Plan



April 2021

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Central Oregon

Interagency Fire Danger Operating Plan

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I. Introduction

A. Purpose

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 is intended to document a decision-making process for agency administrators, fire program managers, fire operations specialists, dispatchers, agency cooperators, and firefighters by establishing interagency planning and response levels using the best available scientific methods and historical weather/fire data.

An appropriate level of preparedness to meet wildland fire management objectives is based upon an assessment of vegetation, climate, and topography utilizing the National Fire Danger Rating System (NFDRS). This plan provides a science-based tool for interagency fire managers to incorporate a measure of risk associated with decisions which have the potential to significantly compromise safety and control of wildland fires.

1. Fire Danger Operating Plan

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

This Fire Danger Operating Plan (FDOP) guides the application of information from decision support tools (such as NFDRS) at the local level. This FDOP is supplemental to the Fire Management Plan; it documents the establishment and management of a fire weather station network and describes how fire danger ratings will be applied to local unit fire management decisions.

1a. Preparedness Plan

Preparedness plans provide management direction given identified levels of burning conditions, fire activity, and resource commitment, and are required at national, state/regional, and local levels. Preparedness Levels (1-5) are determined by incremental measures of burning conditions, fire activity, and resource commitment. Fire danger rating is a critical measure of burning conditions. Preparedness level inputs related to fire danger are identified and documented in the Central Oregon Fire Danger Operating Plan; the associated preparedness levels and planned actions are located in the Central Oregon Interagency Mobilization and Operations Guide Chapter 60 – Predictive Services.

1b. Staffing Plan

The staffing plan describes daily resource availability/capability to respond to unplanned ignitions. Mitigating actions are designed to enhance the unit’s fire management capability during short periods, one burning period, Fourth of July, or other pre-identified events, where normal staffing cannot meet



initial attack, prevention, or detection needs. Staffing level inputs related to fire danger are documented in the Central Oregon Fire Danger Operating Plan. The federal agencies of Central Oregon Fire Management Service (COFMS) and the Oregon Department of Forestry (ODF) maintain separate staffing level plans.

1c. Prevention Plan

Prevention plans document the wildland fire problems identified by a prevention analysis. This analysis will not only examine human-caused fires, but also the risks, hazards, and values for the planning unit. 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 in Central Oregon are documented in this Fire Danger Operating Plan; the associated decisions and planned actions are located in the plans of the individual agency/unit.

1d. Restriction Plan

A restriction plan is an interagency document that outlines interagency 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. The Central Oregon Fire Danger Operating plan may serve as a guide to when restrictions and/or closures should be considered; the associated decisions and planned actions are in the plans of the individual agency/unit.

2. Wildfire Response

2a. Initial Response Plan (Dispatch Level)

Initial response plans, also referred to as run cards or pre-planned response plans, specify the fire management response (e.g. number and type of suppression assets to dispatch) within a defined geographic area to an unplanned ignition, based on fire weather, fuel conditions, fire management objectives, and resource availability. Response levels are identified and documented in the Central Oregon Fire Danger Operating Plan. The number and type of suppression resources dispatched to a reported fire is documented in the Run Cards at Central Oregon Interagency Dispatch Center (COIDC).

2b. Local Mobilization Plan

The Central Oregon Interagency Mobilization and Operations Guide 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. The mobilization plan is maintained by COIDC and can be located on the COIDC FireNet SharePoint site.

B. Policy and Guidance

Interagency policy and guidance regarding the development of Fire Danger Operating Plans can be found in the Interagency Standards for Fire & Aviation Operations (Red Book). Agency-specific direction can be found in:

- U.S. Department of Agriculture Forest Service - Manual 5120
- U.S. Department of the Interior, Bureau of Land Management - Manual 9211-1
- U.S. Department of the Interior, National Park Service - Manual 18, Chapter 5
- Fish and Wildlife Service - Fire Management Handbook, Chapter 10
- Bureau of Indian Affairs - Wildland Fire and Aviation Program Management Operations Guide

C. Operating Plan Objectives

1. Provide a tool for agency administrators, fire managers, dispatchers, agency cooperators, and firefighters to correlate fire danger ratings with appropriate fire business decisions in fire danger planning area.
2. Delineate fire danger rating areas (FDRAs) 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 climatological breakpoints and fire business thresholds using the Weather Information Management System (WIMS), NFDRS, and FireFamily Plus software to analyze and summarize 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 severity thresholds.
9. Identify the development and distribution of fire danger pocket cards to all personnel involved with fire suppression within the fire danger planning area.
10. Identify program needs and suggest improvements for implementation of the Fire Danger Operating Plan.

II. Fire Danger Planning Area Inventory and Analysis

A. Administrative Units

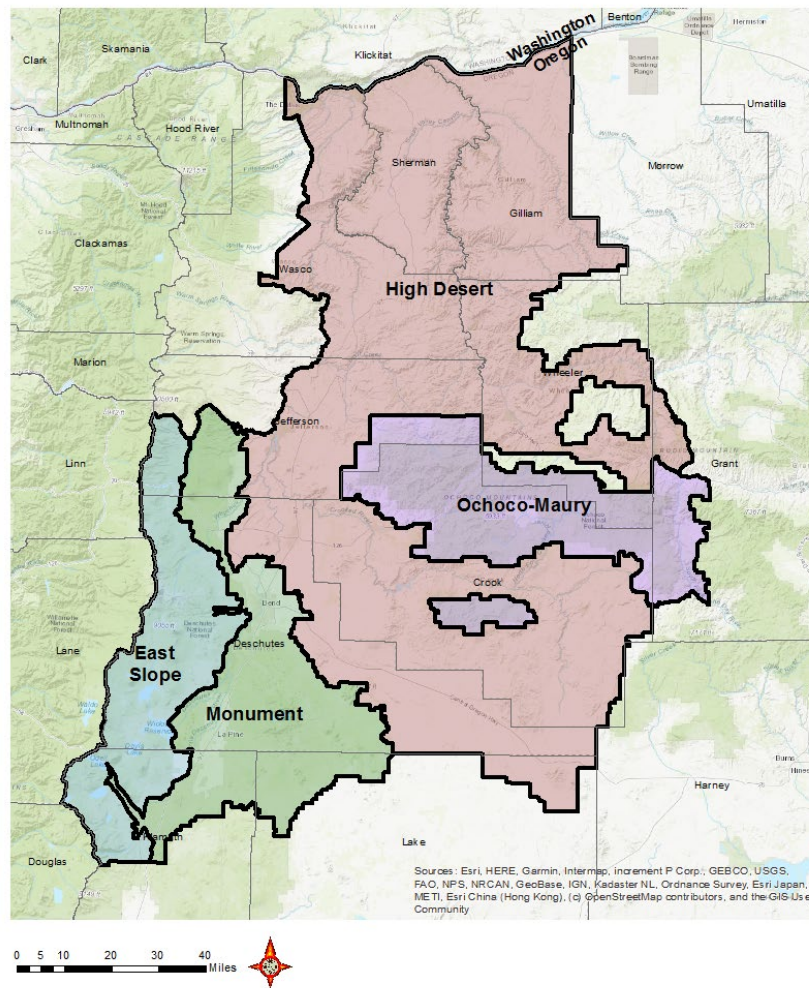
This document serves as an interagency example of consistent and effective application of fire danger decisions applied across multiple jurisdictional boundaries. The plan encompasses an area of approximately 8.3 million acres in Central Oregon. Agencies with wildfire protection responsibilities covered by this plan include:

- USFS, Deschutes National Forest (DEF)
- USFS, Ochoco National Forest (OCF)
- BLM, Prineville District (PRD)
- ODF, Central Oregon District, Prineville and Sisters Units
- NPS, John Day Fossil Beds National Monument (protection delegated to COFMS through reciprocal agreement)

B. Fire Danger Rating Areas

A Fire Danger Rating Area (FDRA) is defined as a large geographic area relatively homogenous with respect to climate, vegetation, and topography. Because of these similarities, it can be assumed that the fire danger within a FDRA is relatively uniform. FDRAs were delineated for Central Oregon in 2014 based upon an analysis of those factors. For this update the 2014 FDRAs were edge-matched to existing dispatch response areas. It is important that existing response areas are not split by FDRAs to avoid additional workload and confusion for operational personnel. The final FDRA delineation is depicted here:

FDRAs



FDRA Descriptions

East Slope

General Location: The East Slope FDRA extends from the summit of the Cascade Range eastward to lower elevations and the edge of the Wildland Urban Interface. The Mount Jefferson, Mount Washington, Three Sisters, Waldo Lake and Diamond Peak Wilderness Areas are included in the FDRA.

While these Wilderness areas reside in a separate ecoregion than the lower slopes, there are no representative RAWS for that area to allow for separation.

Vegetation: Mostly moist forest types (fir and hemlock) at higher elevations transitioning to pine forest and regeneration as elevation decreases to the east.

Climate: Annual precipitation amounts vary greatly within this FDRA from around 22" on the lower east slopes to 70-100" on the prominent volcanic peaks of the high Cascades. Snowpack is typical through the winter months lasting well into the late spring at higher elevations.

Topography: Elevation ranges from around 4,000' MSL to the over 10,000' peaks of the Three Sisters Mountains. The area is generally sloped to the east with a number of cinder cone buttes breaking up the gentle topography.

Monument

General Location: The Monument FDRA includes the Newberry National Volcanic Monument and the forested Wildland Urban Interface lands surrounding Sisters, Bend, La Pine, and Crescent.

Vegetation: Mostly ponderosa pine and lodgepole pine forest types on pumice soils, with a significant amount of pine forest regeneration. Understory vegetation commonly consists of brush such as manzanita or antelope bitterbrush and/or grasses. Thick deposits of pumice and volcanic ash means soils are deep, highly permeable, and droughty at higher elevations, while the basins to the south capture cold air through the winter and have higher water table creating marshes and forested wetlands.

Climate: Annual precipitation generally less than 22" though the higher elevations of the Newberry Monument to the south and Green Ridge to the north receive more. The majority of precipitation is received in the fall, winter, and spring. Snowpack is commonly sustained for weeks to months during winter.

Topography: The Newberry Volcano is a drier eastern extension of the Cascade Range. The Deschutes River and La Pine Basin separate it from the East Slope. The Monument FDRA ranges from around 3,000' MSL in the urban interface of Bend and Sisters to nearly 8,000' at Paulina Peak.

High Desert

General Location: The High Desert FDRA is generally the drier and lower elevation lava plains of the Blue Mountain Ecoregion north to the Columbia Plateau dissected by the Lower Deschutes and John Day River valleys. Higher elevation lava plains and semi-arid foothills make up the southern extent of the FDRA, but shrub vegetation types and lower annual precipitation separate this area from Monument and Ochoco-Maury FDRAs.

Vegetation: Primary vegetation is grass, sagebrush, and juniper. Dryland wheat fields (both active and fallow) often provide continuous fine fuels on the northern plateaus. There are some large blocks of irrigated agricultural land within the FDRA; these are included for convenience but are not part of the analysis.

Climate: The area receives generally less than 16" annual precipitation with some areas receiving less than 8". Periods of snow are common in winter and accumulations are sometimes heavy, though a sustained snowpack is not guaranteed and is often short duration.

Topography: Elevations range from around 2000' MSL along the Columbia River to over 5000' on the southern lava plains. The northern portion of the FDRA has plateaus deeply cut by river canyons up to 2000' deep.

Ochoco-Maury

General Location: The Ochoco-Maury FDRA is generally the highland elevations of the western extent of the Blue Mountains Ecoregion, with higher elevations and greater annual precipitation than the surrounding desert but generally drier than the east slope of the Cascades.

Vegetation: Predominantly ponderosa pine forest and woodland with some mixed conifer forest interspersed at higher elevation. Understory vegetation commonly consists of small trees, brush, and grasses.

Climate: Annual precipitation averages around 20" with a range of mid-teens to mid-twenties. Sustained snowpack commonly lasts for months in the winter though in some mild years only at higher elevations.

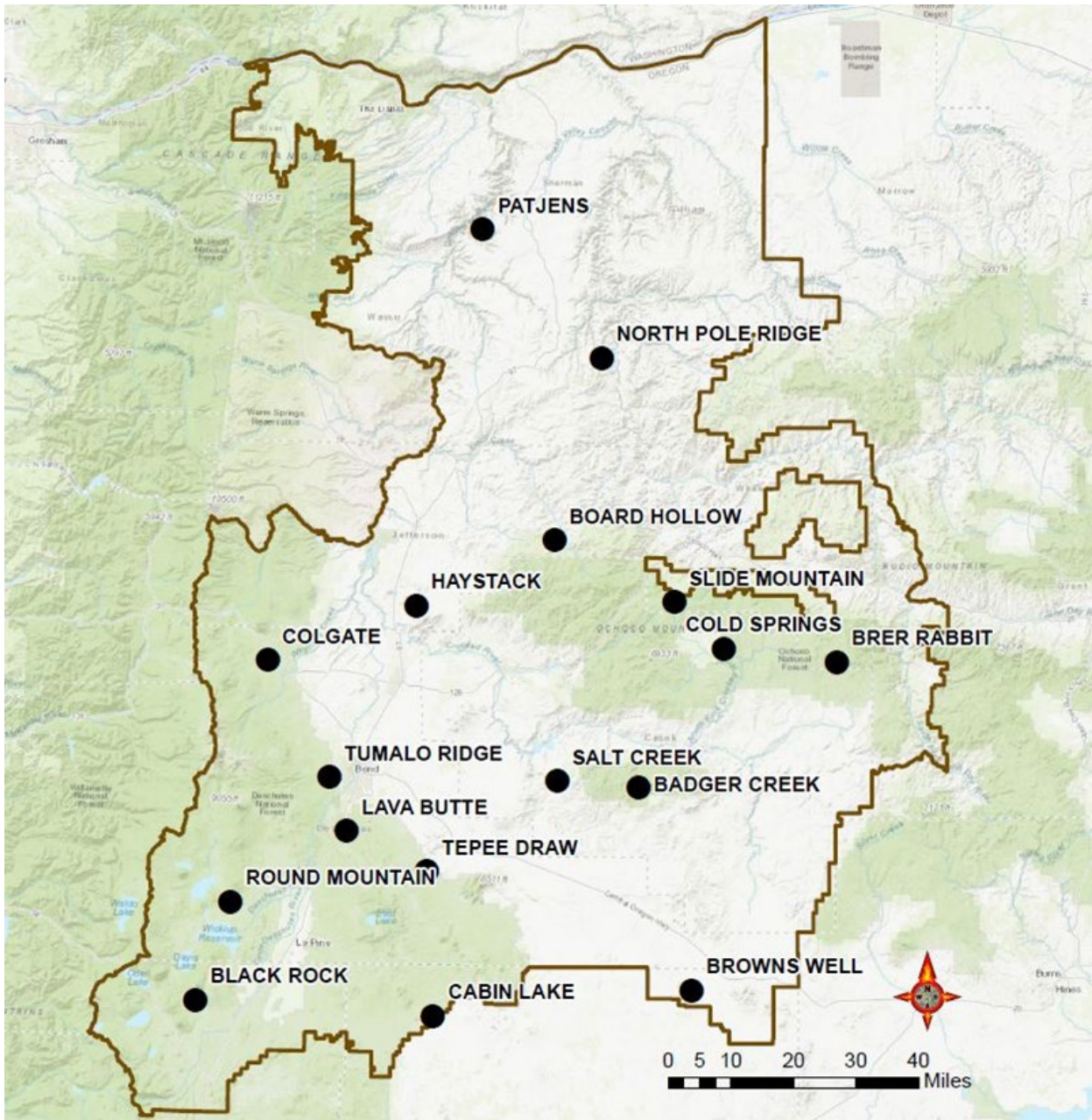
Topography: Elevation is generally greater than 4000' MSL ranging to over 6500'. The Ochoco Mountains are unique in their east-west orientation which often creates different fuel and moisture conditions on north vs south aspects.

C. Weather Stations

All Remote Automated Weather Stations (RAWS) comply with the National Wildfire Coordinating Group (NWCG) weather station standards ([PMS 426-3](#)).

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 verify site and station conditions.

1. RAWS Map



2. RAWS Catalog Table

| STATION NAME | WIMS ID | NESDIS ID | AGENCY / | | AVAIL DATA | | | REPORTING |
|-------------------------|---------|-----------|----------|-----------|------------|----------|-----------|-----------|
| | | | OWNER | YEARS* | ELEV | LATITUDE | LONGITUDE | TIME |
| North Pole Ridge | 350915 | 325291CE | BLM | 1998-2019 | 3480 | 45.0275 | -120.5361 | 48:40 |
| Patjens | 351001 | 3253562A | BLM | 1998-2019 | 2170 | 45.3219 | -120.9292 | 48:50 |
| Haystack | 352107 | 326071B8 | FS | 2005-2019 | 3168 | 44.4497 | -121.1297 | 02:00 |
| Board Hollow | 352109 | 6000B1E0 | ODF | 2005-2019 | 4188 | 44.6039 | -120.6847 | 14:30 |
| Slide Mountain | 352207 | 32604422 | FS | 2004-2019 | 5589 | 44.4622 | -120.2944 | 06:20 |
| Brer Rabbit | 352208 | 326062CE | FS | 2006-2019 | 5719 | 44.3239 | -119.7692 | 02:10 |
| Round Mountain | 352605 | 324782E6 | FS | 2005-2019 | 5813 | 43.7569 | -121.7103 | 06:30 |
| Lava Butte | 352618 | 323582BE | FS | 2003-2019 | 4650 | 43.9252 | -121.3431 | 24:50 |
| Colgate | 352620 | 32600728 | FS | 2006-2019 | 3231 | 44.3169 | -121.6069 | 03:50 |
| Tumalo Ridge | 352621 | 6000A296 | ODF | 2005-2019 | 3945 | 44.0494 | -121.4003 | 14:20 |
| Teepee Draw | 352622 | 3235723A | FS | 2005-2019 | 4735 | 43.8351 | -121.0834 | 19:50 |
| Cold Springs | 352701 | 326032B2 | FS | 2005-2019 | 4640 | 44.3551 | -120.1336 | 07:30 |
| Badger Creek | 352711 | 32605754 | FS | 2005-2019 | 5710 | 44.0339 | -120.4073 | 06:10 |
| Salt Creek | 352712 | 327D85C4 | BLM | 1998-2019 | 4155 | 44.0467 | -120.6696 | 49:10 |
| Black Rock | 353342 | 3260145E | FS | 2006-2019 | 4891 | 43.5281 | -121.8158 | 15:00 |
| Cabin Lake | 353402 | 3240202A | FS | 2005-2019 | 4560 | 43.4993 | -121.0584 | 06:40 |
| Browns Well | 353428 | 32505124 | BLM | 1997-2019 | 4565 | 43.5628 | -120.2362 | 49:00 |
| | | | | | | | | |

*this table lists available data years suitable for use with NFDRS 2016

The analysis in this FDOP will utilize weather data beginning in 2007 as it is the first complete year available across all RAWS

3. Special Interest Groups (SIGs)

Individual weather stations can be combined into SIGs to represent what may be a range of conditions across the broader FDRA. The following SIGs were selected as statistical analysis of their data and NFDRS outputs have shown the best correlation with fire occurrence.

| East Slope FDRA | | |
|------------------------|----------------|---------------|
| <i>Station Name</i> | <i>WIMS ID</i> | <i>Weight</i> |
| Round Mountain | 352605 | 1.00 |
| Black Rock | 353342 | 1.00 |

| Monument FDRA | | |
|----------------------|----------------|---------------|
| <i>Station Name</i> | <i>WIMS ID</i> | <i>Weight</i> |
| Lava Butte | 253618 | 1.00 |
| Colgate | 352620 | 1.00 |
| Cabin Lake | 353402 | 1.00 |

| High Desert FDRA | | |
|-------------------------|----------------|---------------|
| <i>Station Name</i> | <i>WIMS ID</i> | <i>Weight</i> |
| North Pole Ridge | 350915 | 1.00 |
| Haystack | 352107 | 1.00 |
| Browns Well | 353428 | 1.00 |

| Ochoco-Maury FDRA | | |
|--------------------------|----------------|---------------|
| <i>Station Name</i> | <i>WIMS ID</i> | <i>Weight</i> |
| Board Hollow | 352109 | 1.00 |
| Brer Rabbit | 352208 | 1.00 |

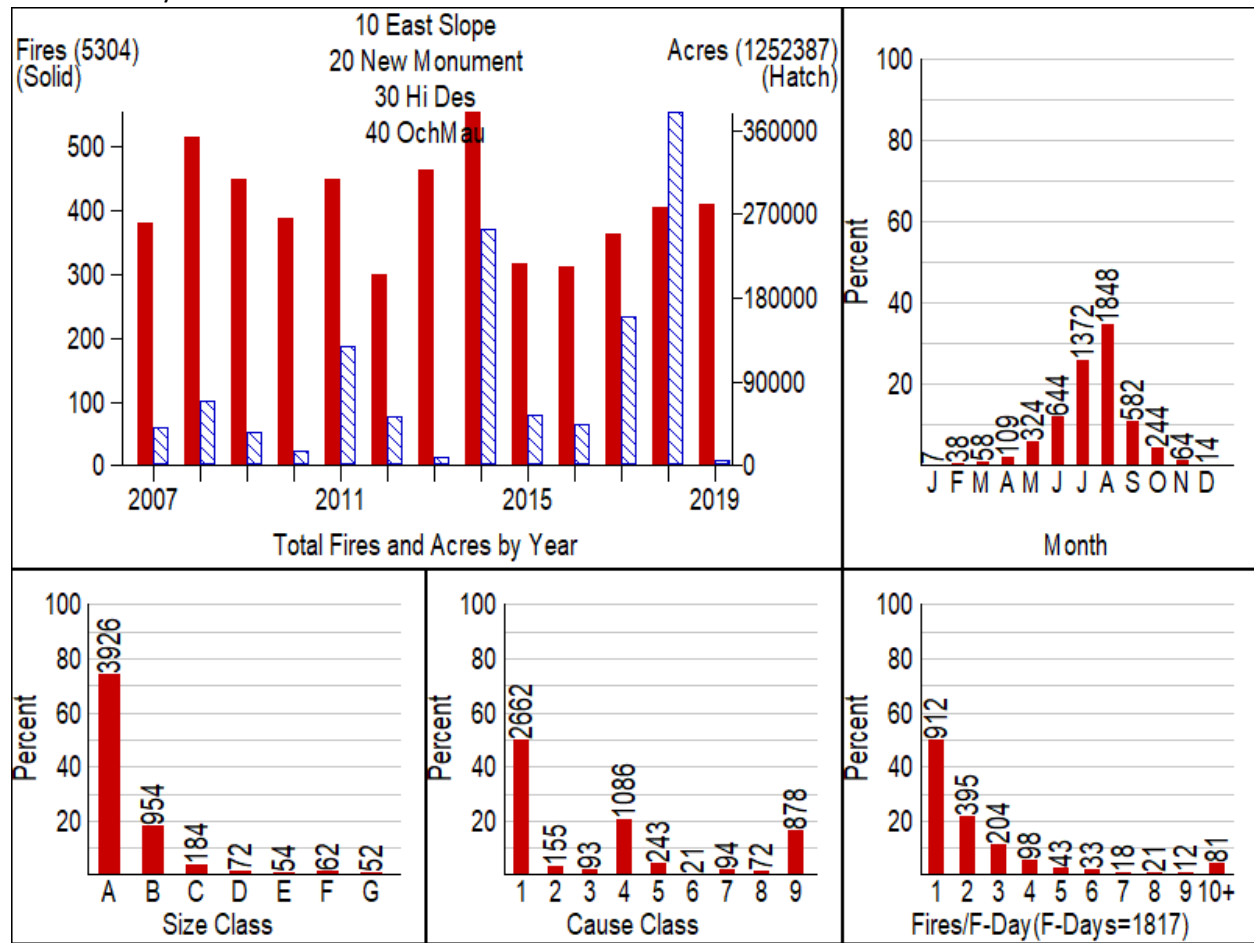
III. Fire Danger Workload Analysis

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.

A. Fire Occurrence

Thirteen years (from 2007 to 2019) of fire occurrence data were used for the analysis in this FDOP. Fire occurrence files were built with combined data from the [spatial wildfire occurrence data for the United States dataset](#) for the years 2007-2015 and local fire data recorded by COIDC through the WildCAD system for 2017-2019. Fires are considered without regard to agency affiliation. Fire occurrence charts by FDRA can be found in Appendix B.

Fire summary Jan 2007-December 2019



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

From Jan-Dec fire 50/50 lightning vs human cause across the entire planning area. For further analysis of fire business, the fire season will be considered May-October. Fire summaries for individual FDRAs with analysis of in-season fire causes included in Appendix B.

B. Identification/Framing of the Fire Occurrence Workload

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. 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

1. Affected Target Group

The group of people commonly associated with the problem (Agency, Industry, or Public).

1a. 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.

1b. 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.

1c. Public

Individuals who use public lands for non-commercial purposes such as off-highway vehicle (OHV) 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 (WUI).

2. Workload Description

This is the fire unit's suppression workload. Human-caused fires are usually described in terms of an ignition cause related to public and industrial target groups. Natural-caused (or lightning) fire workload is usually described as the agency's workload. For example, lightning is not "the problem"; rather, the problem is the local unit's ability to respond to multiple ignitions, exceeding the staffing capabilities.

3. Degree of Control

This is a general description of how much control the fire management agencies have over the target group (Low to Very High). This is a measure of how quickly the affected target group can respond to changing fire danger levels.

4. 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.

5. Component/Index

Sensitivity of the NFDRS outputs should be commensurate with the ability to react (or communicate) to the target group. For example Energy Release Component (ERC) is relatively stable, displays a seasonal trend, and is indicative of conditions in which fires exhibit high resistance to control while Spread Component (SC) is very sensitive to wind and is weighted to fine fuel moistures which can both change quickly hour to hour. Burning Index (BI) is a combination of ERC and SC. BI can fluctuate from day to day but does tend to have an underlying seasonal trend.

6. 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).

C. Fire Workload Analysis Table

| TARGET GROUP | | IGNITION CAUSE | | RELATIVE DEGREE OF CONTROL | COMMUNICATION METHODS | WORKLOAD DESCRIPTION |
|---------------|--|----------------|---|----------------------------|---|--|
| GENERAL | SPECIFIC | GENERAL | SPECIFIC | | | |
| Agency | Agency suppression resources and fire managers | 1 - Lightning | Lightning with high temperatures, wind, and dry fuels. | High | COIDC communicates fire weather forecast (LAL) and Fire Danger Ratings | Fires which exceed initial attack forces capability to manage due to growth on the discovery day. |
| Agency | Agency suppression resources and fire managers | 1 - Lightning | Abundant Lightning with limited corresponding precipitation. | High | COIDC communicates fire weather forecast, Red Flag Warnings, and Fire Danger Ratings | Fires which exceed initial attack capability to manage because they cannot be staffed on discovery and escape initial attack on subsequent days |
| Agency | Agency Administrators, Fire Management Officers, Duty Officers | 1 - Lightning | Natural ignitions strategically managed to meet resource objectives | Very High | Documentation of management decision published in WFDSS. A published Relative Risk Assessment is required including considerations of fire danger and resource commitments. | The decision to manage a lightning-caused wildfire to meet resource objectives is allowed by the Federal Agencies Land and Resource Management Plans. Fires managed with a confine or contain strategy may require suppression resources for an extended time. |

| TARGET GROUP | | IGNITION CAUSE | | RELATIVE DEGREE OF CONTROL | COMMUNICATION METHODS | WORKLOAD DESCRIPTION |
|-----------------|---|----------------|---|----------------------------|---|---|
| GENERAL | SPECIFIC | GENERAL | SPECIFIC | | | |
| Public | Public using overnight developed recreation sites (with host) | 4 - Campfire | Unattended (and escaped) campfires | High | PIO/Prevention press releases for radio, media broadcast, and internet. Fire Danger (Smokey) signs and patrols. | Campfires in developed recreation areas that escape and become large fires or tie up agency resources allowing other fires to grow and escape initial attack. |
| Public | Public using dispersed or undeveloped sites for day or overnight use | 4 - Campfire | Unattended (and escaped) campfires and warming fires. | Low | PIO/Prevention Radio, media broadcast, news release and internet. Smokey Arm, adj. signs and prevention patrols | Campfires in undeveloped or day use recreation sites that escape and become large fires or tie up agency resources allowing other fires to grow and escape initial attack |
| Industry | Timber sale operators, firewood cutters, and agency contracted workers. | 2 - Equipment | Any ignition associated with the target group from chainsaws and mechanized cutting equipment to yarding. | Moderate | IFPL communicated through Agency press release, internet, contract administrators, and prevention patrols | Ignitions resulting from industrial forest operations which become large fires or tie up agency resources. |

IV. Fire Danger Threshold/Decision Analysis

Decision points can be based upon either:

- Climatological Breakpoints, or
- Fire Business Thresholds.

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.

A. Climatological Breakpoints

Climatological breakpoints are points on the cumulative distribution curve of a fire danger indices 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. Climatological percentiles were originally developed for budgetary decisions by federal agencies, without regard for associated fire occurrence, and are predetermined by agency directive, as exemplified below:

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

When using climatology, it is important to identify the period of record used to determine the agency percentiles. The percentile values for the calendar year will be different from the percentile values for the fire season. The following table shows the ERC and BI for each FDRA at the agency directed critical percentiles for the calendar year for the time period 2007-2019.

| NFDRS Index | East Slope | | Monument | | High Desert | | Ochoco Maury | |
|-------------|------------|-----|----------|-----|-------------|-----|--------------|-----|
| | 90% | 97% | 90% | 97% | 80% | 95% | 90% | 97% |
| ERC (FM-Y) | 39 | 46 | 45 | 51 | 45 | 58 | 50 | 58 |
| BI (FM-Y) | 27 | 30 | 25 | 28 | 31 | 37 | 33 | 37 |

The decision thresholds identified in this Fire Danger Operating Plan are based upon the statistical correlation of historical fire occurrence and weather data and therefore do not utilize standard climatological percentiles for decision points.

B. 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 workload analysis table above to determine the best combination indices and thresholds to communicate fire danger. At this time a separate analysis was not considered for lightning versus human ignitions.

C. Decision Points

Using FireFamily Plus software (5.0, build 2/11/2019), NFDRS decision points have been identified where changes in fire business should occur. NFDRS Fuel Model Y provided the best statistical correlation across all FDRAs and fire danger ratings. ERC and BI were carried forward from the analysis for use in this plan as the basis for setting fire danger levels. Decision point analysis for all FDRAs are included in Appendix C.

D. Fire Business Decision Summary Table

| Target Group | Statistical Cause | Climatological Breakpoints or Fire Business Thresholds | Index / Comp | NFDRS2016 Fuel Model | Management Tool | Number of Decision Points | Preparedness Plan(s) to Modify Target Group Behavior |
|--------------|-------------------|--|--------------|----------------------|------------------------------------|---------------------------|--|
| Public | 4 - Campfire | Fire Business Thresholds | ERC | Y | Adjective Fire Danger Rating Level | 4 | Prevention Plan and Public Use Restriction Plan |
| Agency | 1 - Lightning | Fire Business Thresholds | BI | Y | Dispatch Level | 4 | Run Cards |
| Industry | 2 - Equipment | Fire Business Thresholds | ERC | Y | Industrial Fire Precaution Level | 4 | Industrial Restriction Plan |

V. 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 Analysis Chart. 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.

- **Dispatch Level** will be used as a decision tool for dispatchers to assign initial attack resources to a fire reported in a specific dispatch zone.
- **Staffing Level** will be used for appropriate day-to-day suppression resource staffing.
- **Preparedness Level** 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.

A. Dispatch Level (Run Cards)

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.

A coordinated dispatch level based on fire danger will be utilized by all agencies dispatched by COIDC using a four-level system described by colors, delineated by FDRA. The dispatch level color categories indicate expected differences in fire business. As dispatch levels change, production capabilities of firefighting resources should change. Specific number or resources to be dispatched will be addressed with run cards maintained at COIDC.

Burning Index (BI) was used to set dispatch levels because it considers wind and is indicative of initial attack fire business, both with daily fluctuations in fine fuels and wind, and in the seasonal trend and potential for high resistance to control fires. A forecasted BI value, available in the afternoon, will be used to set dispatch levels for the next day. Dispatch levels may be updated based on BI calculations from actual observations nearest 1300 hours.

For each Fire Danger Rating Area, the column on the left describes the dispatch level threshold value and the value on the right is the percentage of days between May 1-October 31 during the analysis period (2007-2019) that had a value within that range.

| FDRA | 1 | | 2 | | 3 | | 4 | |
|--------------|-----------------------------|--------|-------------------------------------|--------|---|--------|-----------------------------|--------|
| FDRA Name | East Slope | | Monument | | High Desert | | Ochoco-Maury | |
| Stations/SIG | Round Mountain Blackrock | | Lava Butte Colgate Cabin Lake | | North Pole Ridge Haystack Browns Well | | Brer Rabbit Board Hollow | |
| Fuel Model | Y | | Y | | Y | | Y | |
| Index | BI | % DAYS | BI | % DAYS | BI | % DAYS | BI | % DAYS |
| GREEN | 0-16 | 24 | 0-16 | 17 | 0-23 | 24 | 0-22 | 28 |
| BLUE | 17-25 | 46 | 17-23 | 49 | 24-31 | 41 | 23-29 | 33 |
| YELLOW | 26-30 | 24 | 24-27 | 26 | 32-38 | 29 | 30-36 | 29 |
| RED | 31+ | 7 | 28+ | 8 | 39+ | 6 | 37+ | 10 |

B. Staffing Level

Staffing levels will be used to make daily internal fire preparedness and operational decision. At the protection unit level, the staffing level can form a basis for decisions regarding the “degree of readiness” for initial attack resources and support resources. Specific preparedness actions are defined at each staffing level.

- **Personnel and Initial attack Resources:** Staffing Levels are currently determined by agency/unit. The dispatch levels or adjective ratings identified in this Central Oregon Fire Danger Operating Plan may serve as a guide in making this determination.
- **Aircraft – detection:** Detection aircraft and aerial observer(s) are utilized as needed and ordered by the agency/unit Duty Officer through COIDC. Fire danger levels can aid in identifying conditions and areas at most risk for large fires where aerial detection may be most beneficial following ignition events.
- **Lookouts:** Lookout staffing is determined by agency/unit. Fire danger ratings identified in this Central Oregon Fire Danger Operating Plan may serve as a guide in making this determination.

C. Preparedness Level

The preparedness level is a five-tier (1-5) rating decision tool that is based on NFDRS output and other mid to long-term indicators of fire business such as Regional and National Preparedness and local fire activity. Preparedness levels are established to assist fire managers with weekly or monthly planning decisions.

Preparedness level decisions are based on descriptions in the Central Oregon Interagency Mobilization and Operations Guide. Adjective Fire Danger Rating Levels from this plan are used as inputs to overall Preparedness Level according to the following table.

| Adjective Fire Danger Rating | Preparedness Level |
|------------------------------|--------------------|
| Low | I |
| Moderate | II |
| High | III |
| | IV |
| Extreme | V |

D. Adjective Fire Danger Rating Level

In 1974, the Forest Service, Bureau of Land Management and State Forestry organizations established five standard Adjective Fire Danger Rating Levels descriptions for public information and signing. This plan does not follow the national standard descriptions. The level “VERY HIGH” is not used because agencies involved in this plan currently use a four-level system; many signs in Central Oregon (and across Oregon) will only work with four levels.

A coordinated adjective level based on fire danger will be utilized by all agencies within the Central Oregon area using a four-level system displayed on signs throughout the area. Signs will be set based on adjective rating for the particular fire danger rating area best represented by the sign.

Energy Release Component (ERC) was selected because it is relatively stable, displays a seasonal trend, and is indicative of fires that exhibit high resistance to control. Signs for each fire danger rating area will be changed when the observed ERC falls within a different level than currently displayed and weather forecast trends indicate that the ERC is likely to remain in that level.

For each Fire Danger Rating Area, the column on the left describes the adjective class threshold value. The value on the right is the percentage of days between May 1-October 31 during the analysis period (2007-2019) that had a value within that range.

| FDRA | 1 | | 2 | | 3 | | 4 | |
|--------------|-----------------------------|--------|-------------------------------------|--------|---|--------|-----------------------------|--------|
| FDRA Name | East Slope | | Monument | | High Desert | | Ochoco-Maury | |
| Stations/SIG | Round Mountain Blackrock | | Lava Butte Colgate Cabin Lake | | North Pole Ridge Haystack Browns Well | | Brer Rabbit Board Hollow | |
| Fuel Model | Y | | Y | | Y | | Y | |
| Index | ERC | % DAYS | ERC | % DAYS | ERC | % DAYS | ERC | % DAYS |
| LOW | 0-21 | 26 | 0-24 | 14 | 0-31 | 24 | 0-26 | 22 |
| MODERATE | 22-33 | 38 | 25-36 | 37 | 32-44 | 35 | 27-41 | 39 |
| HIGH | 34-42 | 23 | 37-46 | 33 | 45-57 | 30 | 42-52 | 24 |
| EXTREME | 43+ | 14 | 47+ | 16 | 58+ | 11 | 53+ | 16 |

E. Industrial Fire Precaution Level (IFPL)

Industrial Fire Precaution Level is a four-level regulation system used by the National Forests in the Pacific Northwest Region of the FS, the Bureau of Land Management in Oregon and Washington, the Washington DNR, and the Oregon Department of Forestry (west of the summit of the Cascades.)

Industrial Fire Precaution Levels are stages that apply to permitted work activities, including timber sales, service contracts, and personal use firewood cutting, on Forest Service or BLM lands in order to reduce the risk of a wildfire starting from the operation.

Prior to the adoption of NFDRS 2016 and the updated fuel models, a precaution value corresponding to IFPL I through IV was calculated based on indices derived from the 1978 fuel model C. Discussions are ongoing regarding how precaution value will be calculated using NFDRS 2016 as the previous analysis calculation is no longer applicable.

For the federal agencies in Central Oregon, past seasonal analysis shows fire danger indices that triggered changes in IFPL generally correlate with changes in the Adjective Fire Danger Rating. IFPL I, II, and III have corresponded to Moderate, High, and Extreme. IFPL IV is generally entered when ERC is near the 97th percentile.

F. Public Use Restrictions

Public use restrictions are determined by agency/unit. The adjective fire danger ratings identified in this FDOP may serve as a guide in making this determination. Participating agencies may coordinate implementation of public use restrictions to increase public awareness regarding current fire danger potential and to deliver a consistent fire prevention message to the public. Number of levels, actions, and basis for decision making will be defined in unit prevention plans or public use restrictions plans.

VI. Fire Danger Operating Procedures

A. Roles and Responsibilities

1. Agency Administrators

Agency Administrators will use this plan to coordinate with fire management officers on fire business related decisions.

2. Fire Program Managers

Fire program managers (Fire Staff, Unit Foresters) will use this FDOP and 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 stations are maintained to NFDRS standards.

3. Fire Danger Technical Group

Each participating agency will be responsible for providing an 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; Sheldon Rhoden, Fire Prevention Specialist
- US Forest Service; Barry Kleckler, Fire Management Planning Specialist
- Oregon Department of Forestry; Gordon Foster, Unit Forester
- Central Oregon Interagency Dispatch; Samantha Sellner, Lead Aircraft Dispatcher

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 fire managers from their unit for updates and additions to the plan. The technical group will coordinate annually to review plan implementation, decide if revisions are necessary, and accomplish revisions.

4. Weather Station Owners/Managers

The station owners will ensure appropriate editing of the RAWs catalogs to match this plan and maintain current primary and secondary contacts for stations. Station owners will maintain stations in

accordance with NWCG PMS 426-3 and ensure a timely response when notified of an unexpected need for repair.

5. Central Oregon Interagency Dispatch Center

COIDC 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 31 or season end, and as requested by participants in this plan due to extenuating factors.

COIDC will monitor RAWs daily for unusual readings that may suggest an issue which needs attention and contact the station owners to arrange resolution and notify agency fire program managers (FMO).

COIDC will give WIMS the proper seasonal care and feeding required to run NFDRS 2016, including setting snow flags and starting KBDI.

6. Field Operations Managers

COFMS Division Fire Management Officers, ODF Unit Foresters, and their assistants, known collectively as Field Operations Managers, will assure that their personnel understand NFDRS outputs and how they are to be used. The DFMOs/Unit Foresters are responsible for implementing this plan and ensuring decisions are made consistent with the intent of the plan.

7. National Weather Service

Weather forecasts and products for the area are provided by the National Weather Service, Pendleton 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.

B. Daily Schedule

Quality Control Station Data

Personnel at Central Oregon Interagency Dispatch Center (COIDC) will review observations and NFDRS outputs daily, either through WIMS or other sites, for abnormal or inappropriate readings which could possibly indicate instrument errors.

Weather Forecasts and NFDRS

The National Weather Service (NWS) Pendleton Office Fire Weather Forecasters will enter forecast data for each RAWs into WIMS by 1540 each day during fire season. WIMS will create forecasted NFDRS outputs for the following day.

Monitoring and Communication of NFDRS outputs

At the beginning of each operational period, Dispatch Level will be entered into the Computer Aided Dispatch (CAD) system based on the forecast BI for the day. Between 1400-1500 hours the observed BI will be reviewed (based on observation closest to 1300) and Dispatch Level will be updated to reflect changes if warranted for the remainder of the day.

Preparedness level, dispatch level, adjective rating, and pertinent NFDRS indices will be broadcast twice daily during the morning and afternoon readings of the fire weather forecast at 1100 and 1600. Forecast outputs will be read in the morning, observed outputs in the afternoon.

Real-time monitoring of forecast and observed NFDRS outputs, associated fire danger rating level inputs, and charts that track trends in BI and ERC can be viewed at any time during the fire season through links on the COIDC website <https://gacc.nifc.gov/nwcc/districts/COIDC/>

C. Critical Fire Danger

Critical fire danger events such as abundant lightning, presence of a thermal trough, west side “marine push”, frontal passages, or high winds accompanied by dry fuel conditions will be typically captured by National Weather Service meteorologists in Red Flag Warnings or Fire Weather Watches. For more information see the publication Critical Weather Patterns of the United States which can be found on the NWCC website [here](#).

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

D. Season Ending Event

The Northwest Coordination Center conducted a season ending event analysis by Predictive Services Area (PSA) which can be found on their [fire analysis page](#). PSA NW06 (Cascade, Rivers, and Prairie Divisions of COFMS) can be found [here](#). PSA NW07 (Newberry and Crescent Divisions of COFMS) can be found [here](#). Experience has shown locally that season ending analysis conducted in the traditional manner for individual fires or by FDRA come within a week or so either side of the NWCC analysis.

E. Fire Danger Pocket Cards

The fire danger pocket card is a tool which can aid fire suppression 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. Visiting resources can use the pocket card to familiarize themselves with local fire danger conditions. Official pocket cards undergo a regional and national certification process to ensure they meet NWCG guidelines and are then posted on the NWCG website. Draft pocket cards for Central Oregon are attached in Appendix D of this plan. Seasonal risk analysis (charts similar to those on pocket cards but with updated daily values) can be found in links on the COIDC website.

F. Weather Station Maintenance

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

Appendices

Appendix A: Delineation of Fire Danger Rating Areas

Appendix B: Fire Occurrence 2007-2019 by Fire Danger Rating Area

Appendix C: Fire Business Analysis (May-Oct) by Fire Danger Rating Area

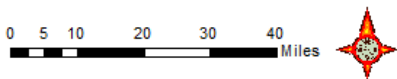
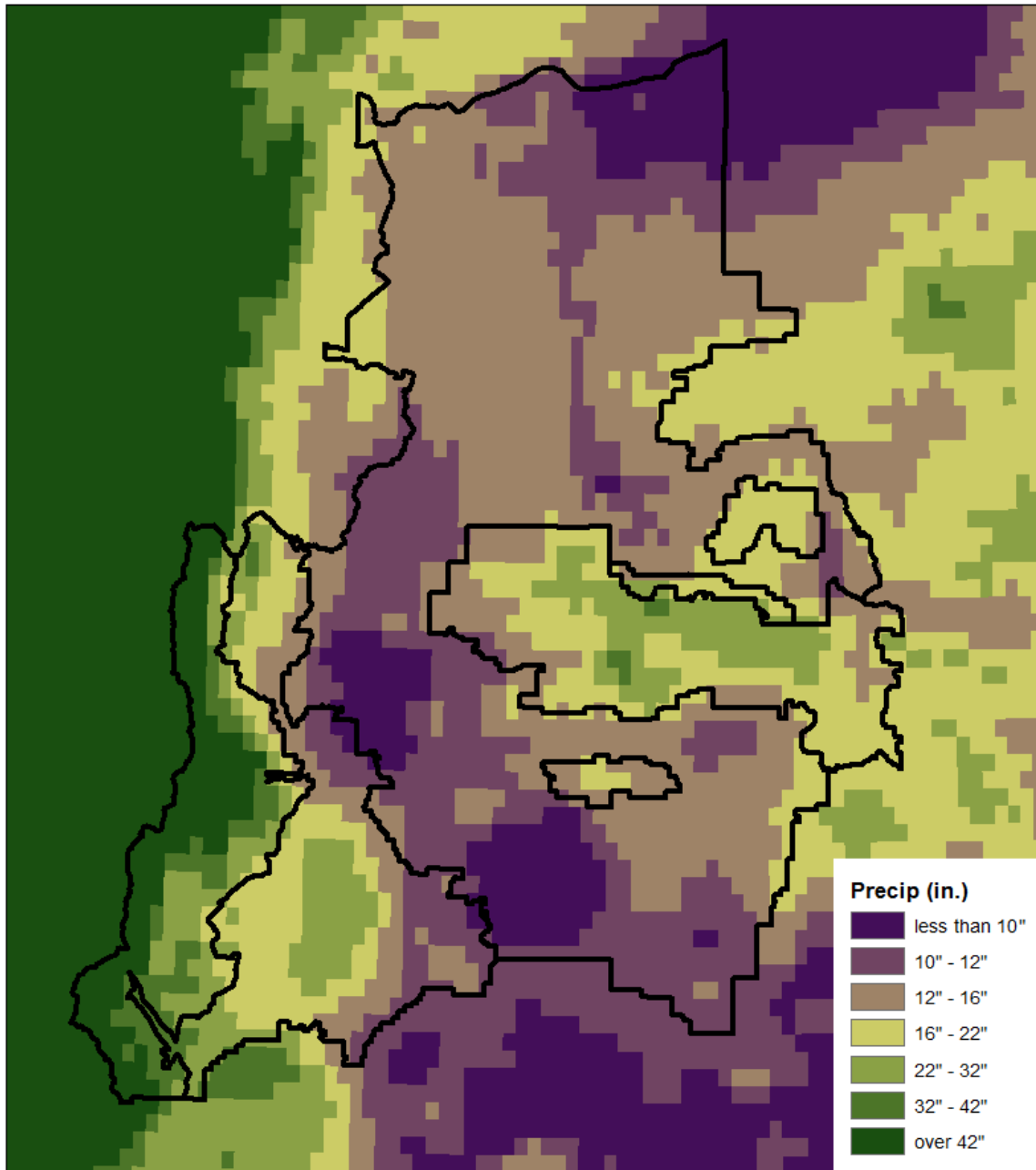
Appendix D: Pocket Cards

Appendix A: Delineation of Fire Danger Rating Areas

Climate

Annual Precipitation taken from PRISM climate data

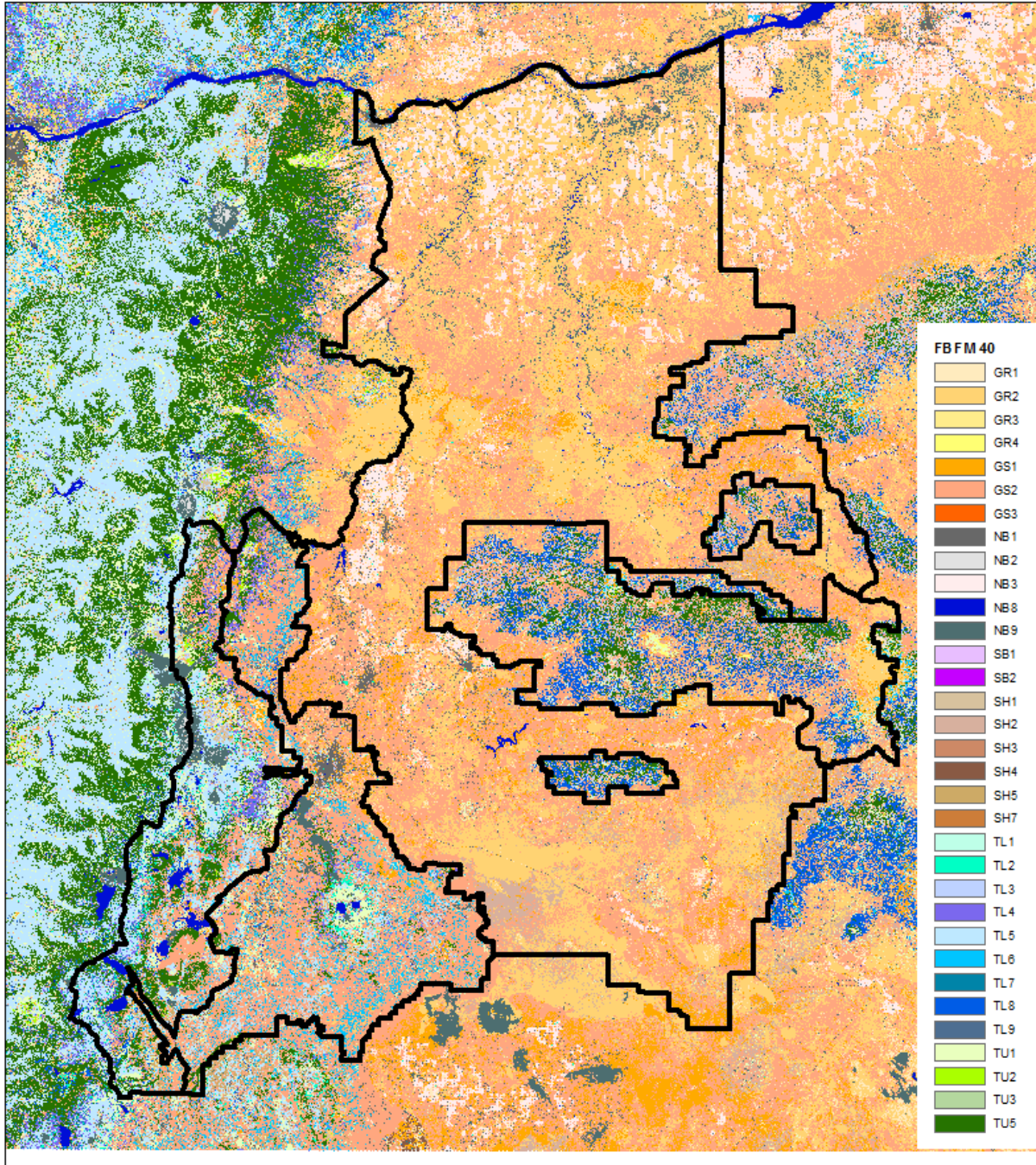
FDRAs and Annual Precip



Vegetation

Vegetation represented by Fire Behavior Fuel Model (Scott and Burgan, 2005)

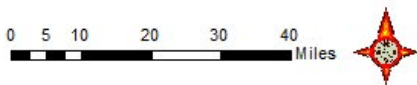
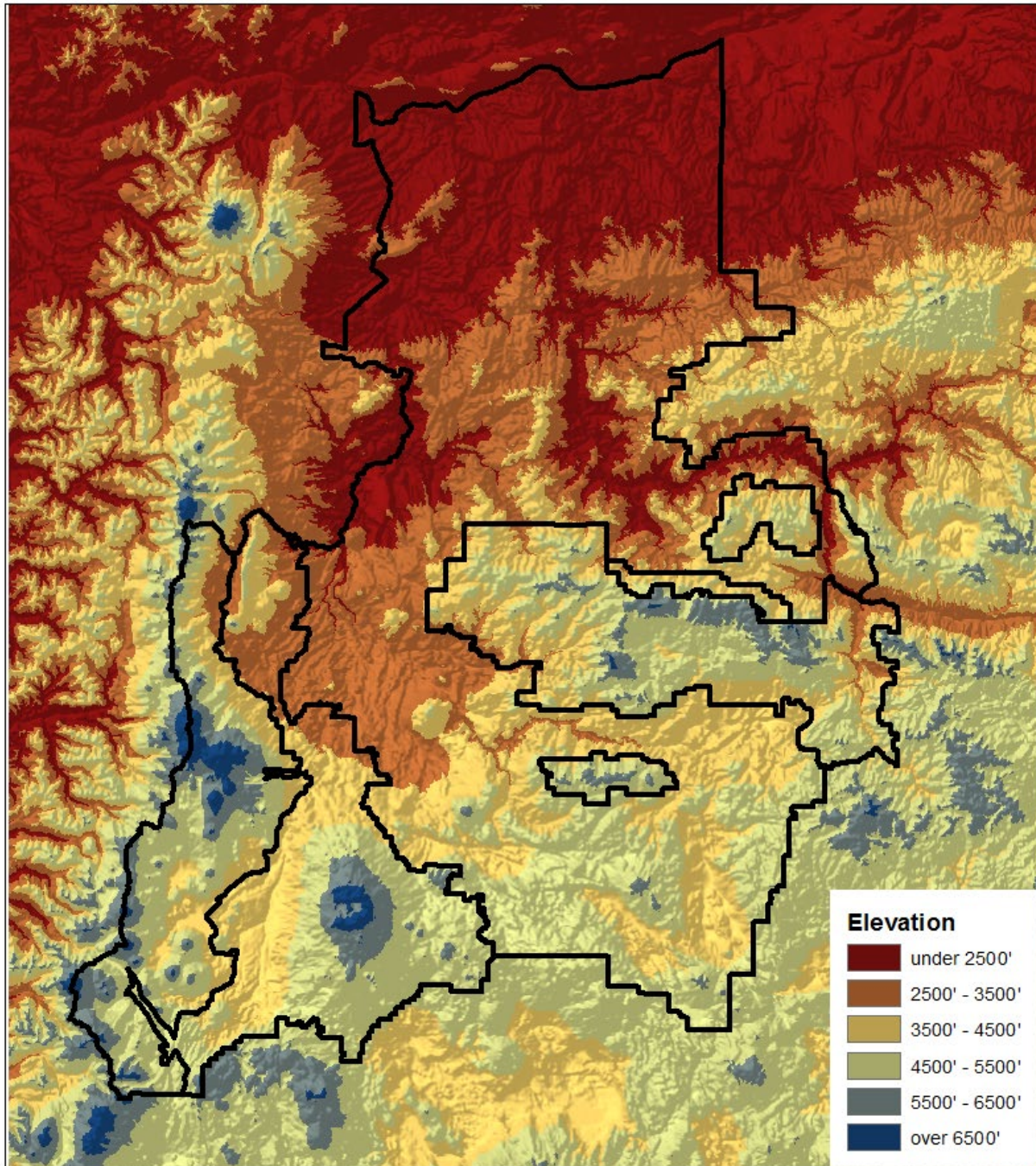
FDRAs and Vegetation



Topography

Topography represented by 10m grid elevation

FDRAs and Elevation



Appendix B: Fire Occurrence 2007-2019 by Fire Danger Rating Area

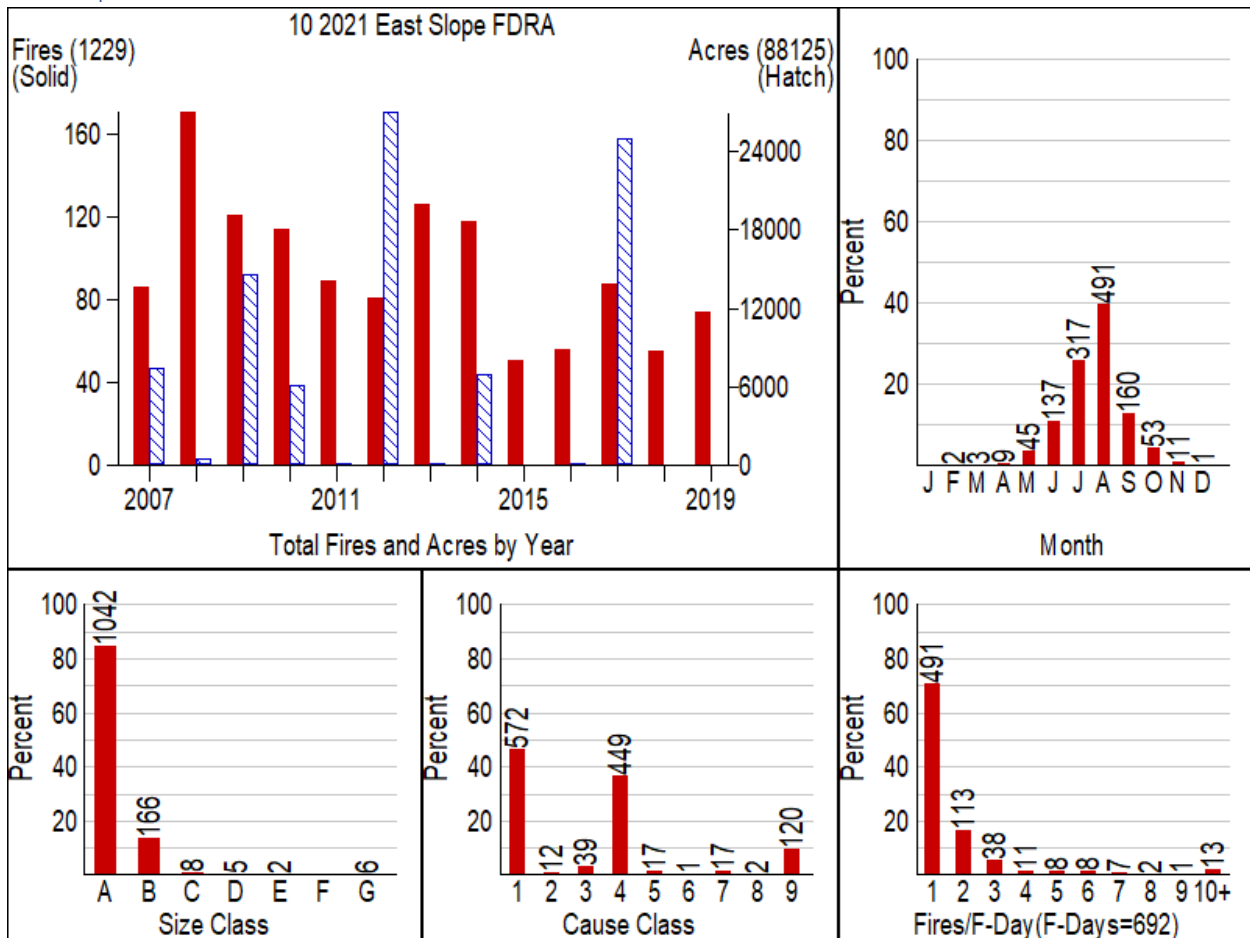
Size Classes:

- A. A: <= 0.25 acres
- B. B: 0.26 to 9.9 acres
- C. C: 10 to 99.9 acres
- D. D: 100 to 299 acres
- E. E: 300 to 999 acres
- F. F: 1000 to 4999 acres
- G. 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

East Slope FDRA



Fires: 1,229 (98% May-October)

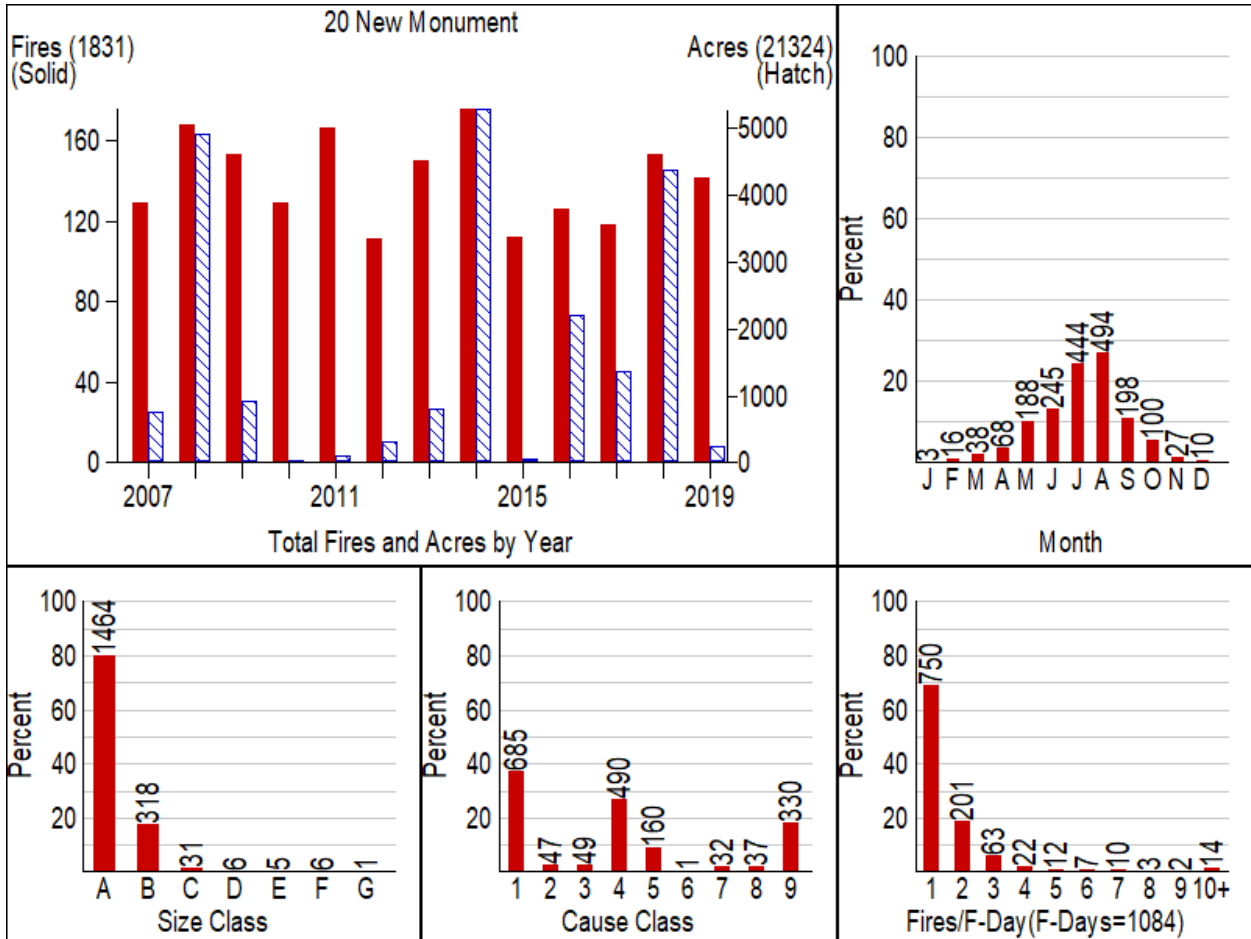
Acres: 88,125

Primary Fire Cause: Lightning

Secondary Fire Cause: Campfire

Human Caused: 53%

Percentile Fire Size 90% - 0.4 ac 95% - 1 ac 97% - 2 ac



Fires: 1,831 (91% May-October)

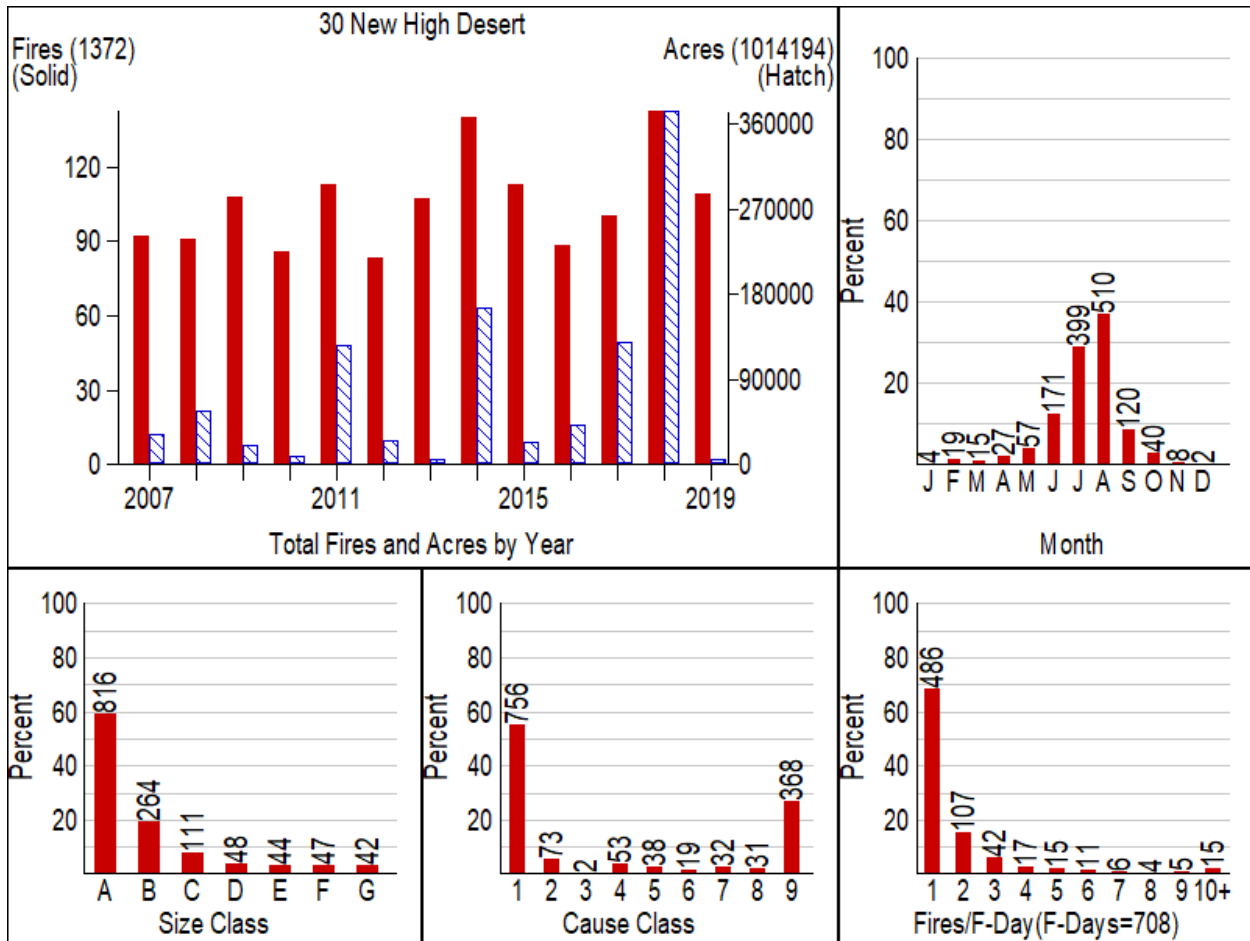
Acres: 21,324

Primary Fire Cause: Lightning

Secondary Fire Cause: Campfire

Human Caused: 63%

Percentile Fire Size 90% - 0.7 ac 95% - 2 ac 97% - 8 ac



Fires: 1,372 (95% May-October)

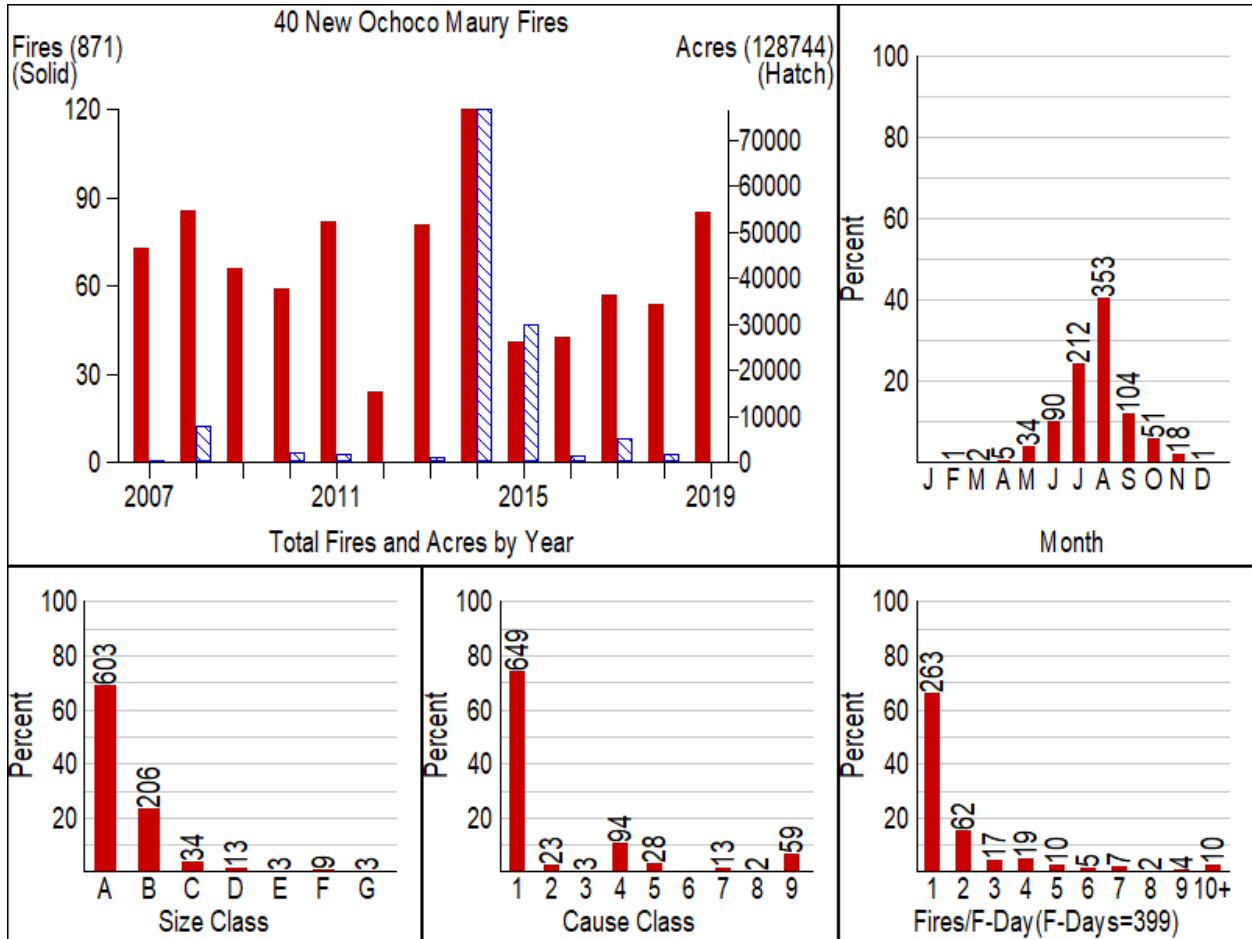
Acres: 1,014,194

Primary Fire Cause: Lightning

Secondary Fire Cause: Miscellaneous

Human Caused: 45%

Percentile Fire Size 90% - 266 ac 95% - 1,512 ac 97% - 4,740 ac



Fires: 871 (97% May-October)

Acres: 128,744

Primary Fire Cause: Lightning

Secondary Fire Cause: Campfire

Human Caused: 25%

Percentile Fire Size 90% - 3 ac 95% - 25 ac 97% - 102 ac

Appendix C: Fire Business Analysis (May – Oct) by Fire Danger Rating Area

For All FDRAs:

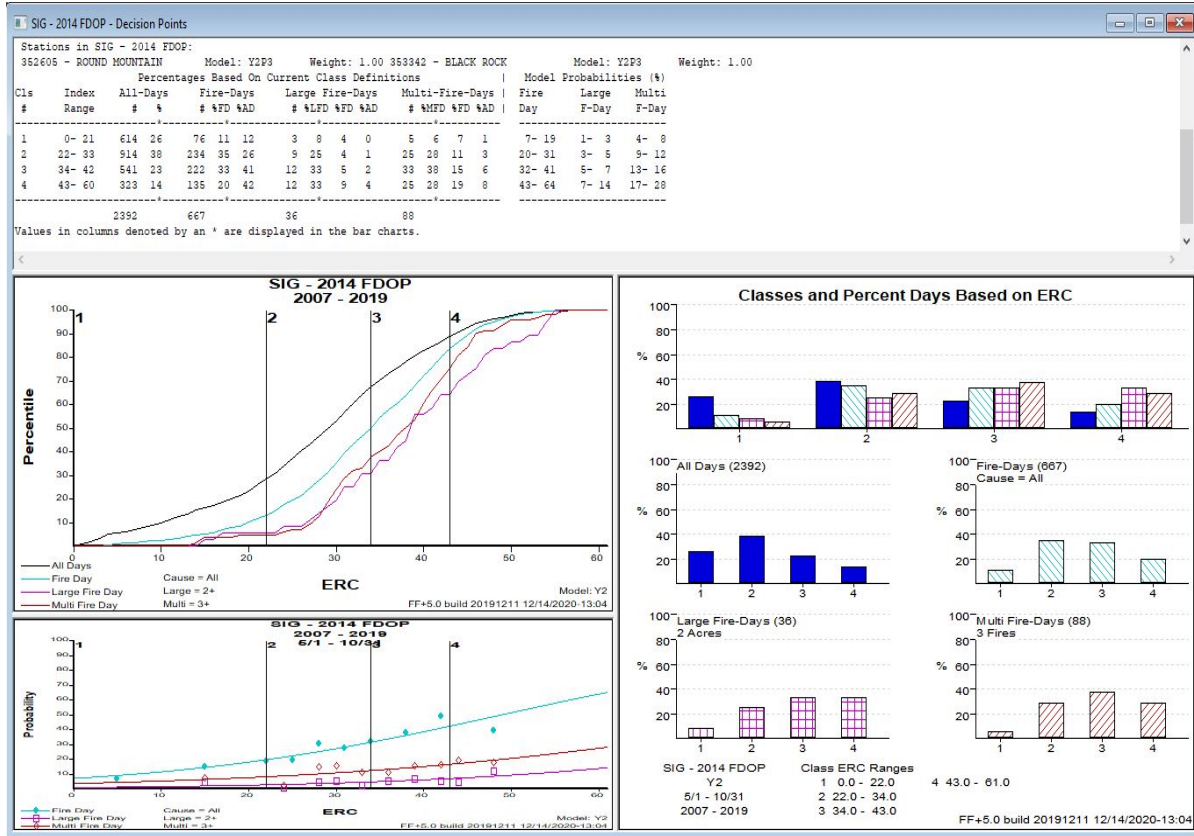
- Fire Season used in analysis May 1 – Oct 31
 - NFDRS Fuel Model Y
 - Multiple Fire Day = 3 fires
1. RAWs Special Interest Groups (SIGS) were selected for each FDRA from stations that demonstrated the best statistical correlation with fire occurrence (chi squared value). Adjective rating thresholds were determined based on ERC correlation with fire occurrence.
 - a. The breakpoint from low to moderate was selected at the point where a significant rate increase occurs in the number of fire days. This point is depicted by a slope change in the Cumulative Percentile Graph in FireFamily Plus. Additional sideboards included keeping the percentage of fire days in low below 19% .
 - b. The breakpoint from moderate to high was selected at the point where approximately 50% of the fire days occurred.
 - c. The breakpoint from high to extreme was generally selected when approximately 80% of the fire days occurred.
 2. The process used for selecting Dispatch Levels was similar to that used for adjective rating but using BI rather than ERC and large fire days rather than all fire days. The threshold into high and extreme attempted to capture a larger percent of the Large Fire Days than the Adjective Class thresholds. Red dispatch level was generally set when 18-24% of the Large Fire Days occurred and yellow dispatch level when 30 – 40% of the Large Fire Days occurred.

FDRA Comparison Table

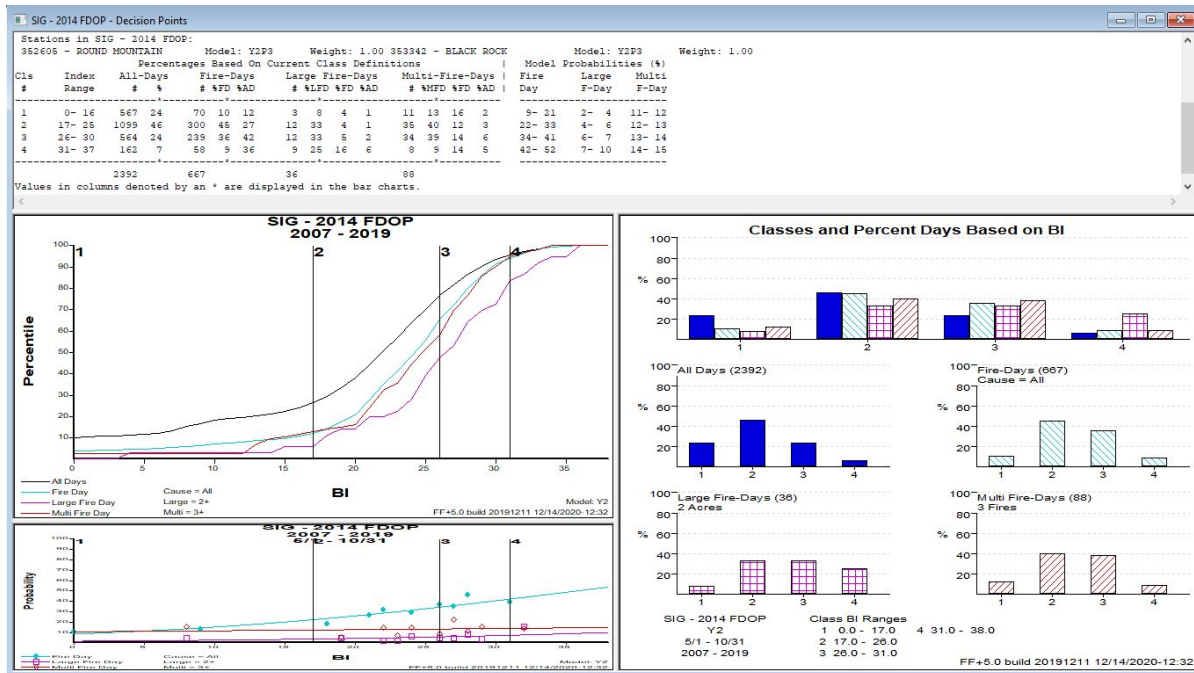
| | | East Slope FDRA | Monument FDRA | High Desert FDRA | Ochoco- Maury FDRA |
|---|----------|--------------------|------------------|---------------------|-----------------------|
| Large Fire size (% of all fires) | | 2 ac (3%) | 10 ac (3%) | 1,000 ac (7%) | 40 ac (4%) |
| Dispatch Level Threshold BI (Annual Climatological %) | Green | N/A | | | |
| | Blue | 17 (59%) | 17 (58%) | 24 (63%) | 20 (56%) |
| | Yellow | 26 (89%) | 23 (84%) | 31 (86%) | 28 (79%) |
| | Red | 31 (98%) | 28 (98%) | 39 (98%) | 36 (95%) |
| Adjective Rating Threshold ERC (Annual Climatological %) | Low | N/A | | | |
| | Moderate | 22 (61%) | 25 (54%) | 32 (61%) | 27 (59%) |
| | High | 34 (84%) | 38 (79%) | 45 (81%) | 43 (83%) |
| | Extreme | 43 (94%) | 47 (93%) | 58 (96%) | 53 (93%) |
| 97 th ERC (guide for IFPL 4) | | 46 | 51 | 60 | 58 |

East Slope FDRA

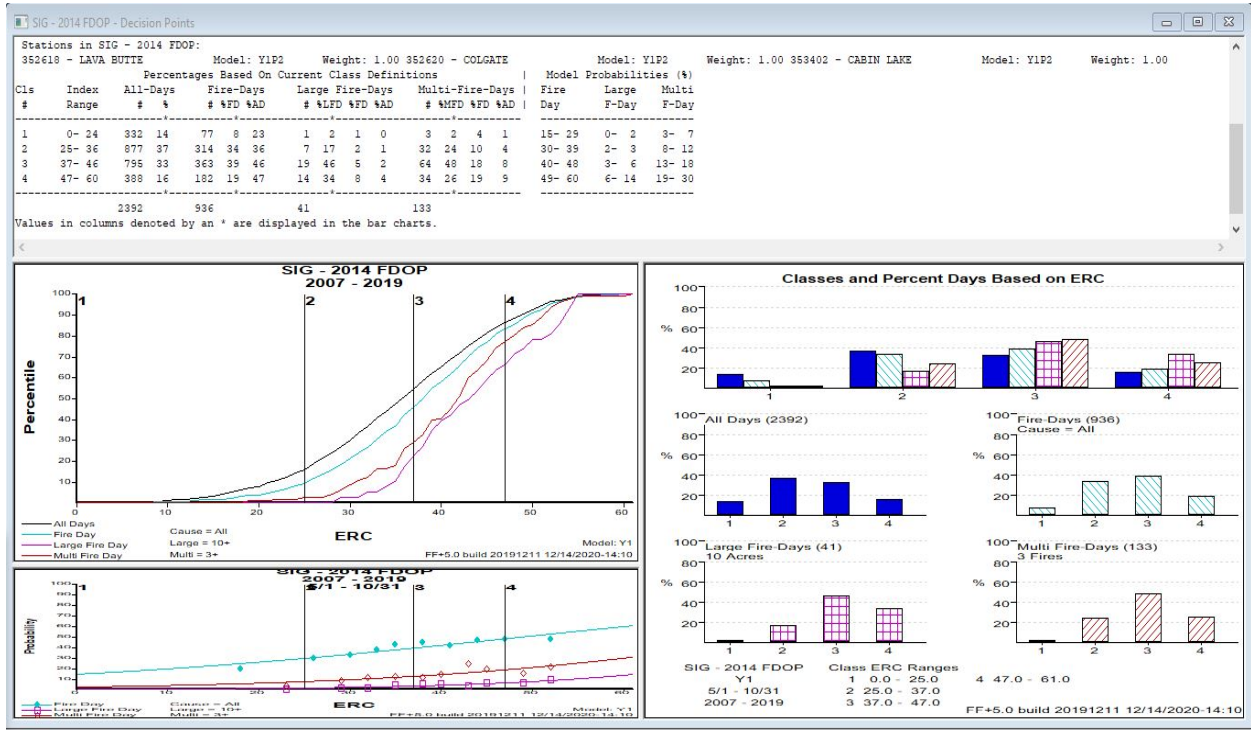
Adjective Rating Decision Point Analysis



Dispatch Level Decision Point Analysis



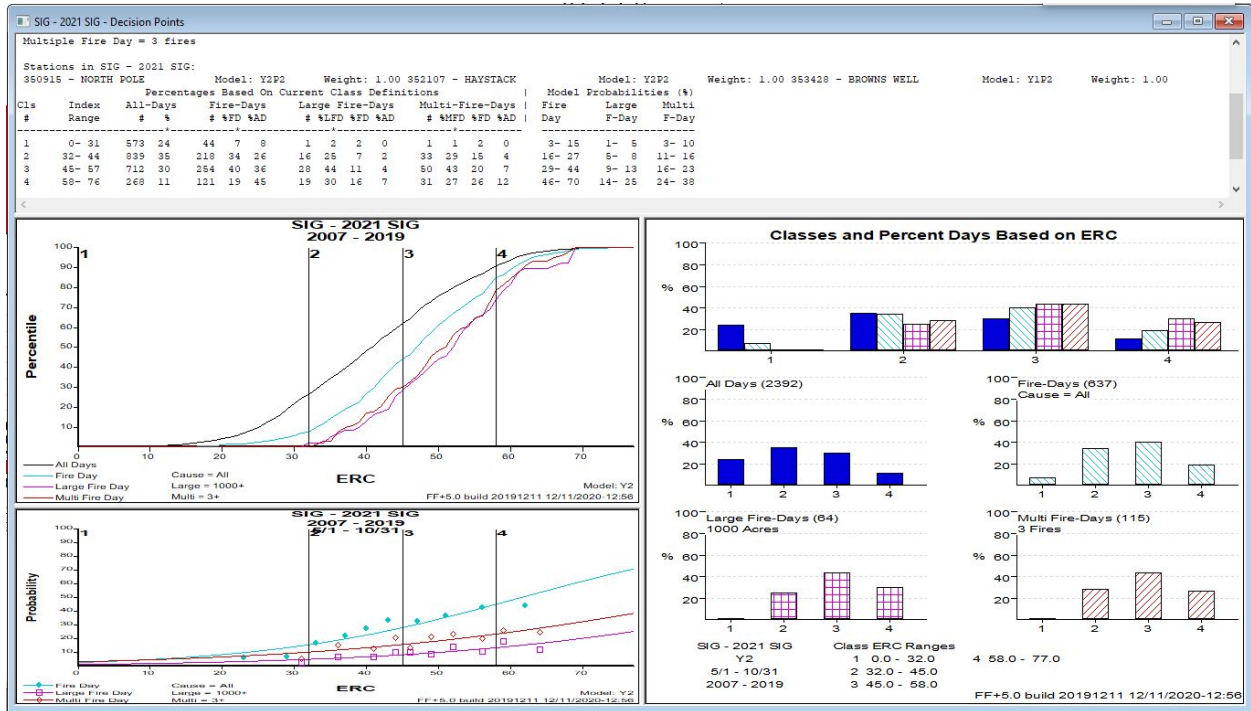
Adjective Rating Decision Point Analysis



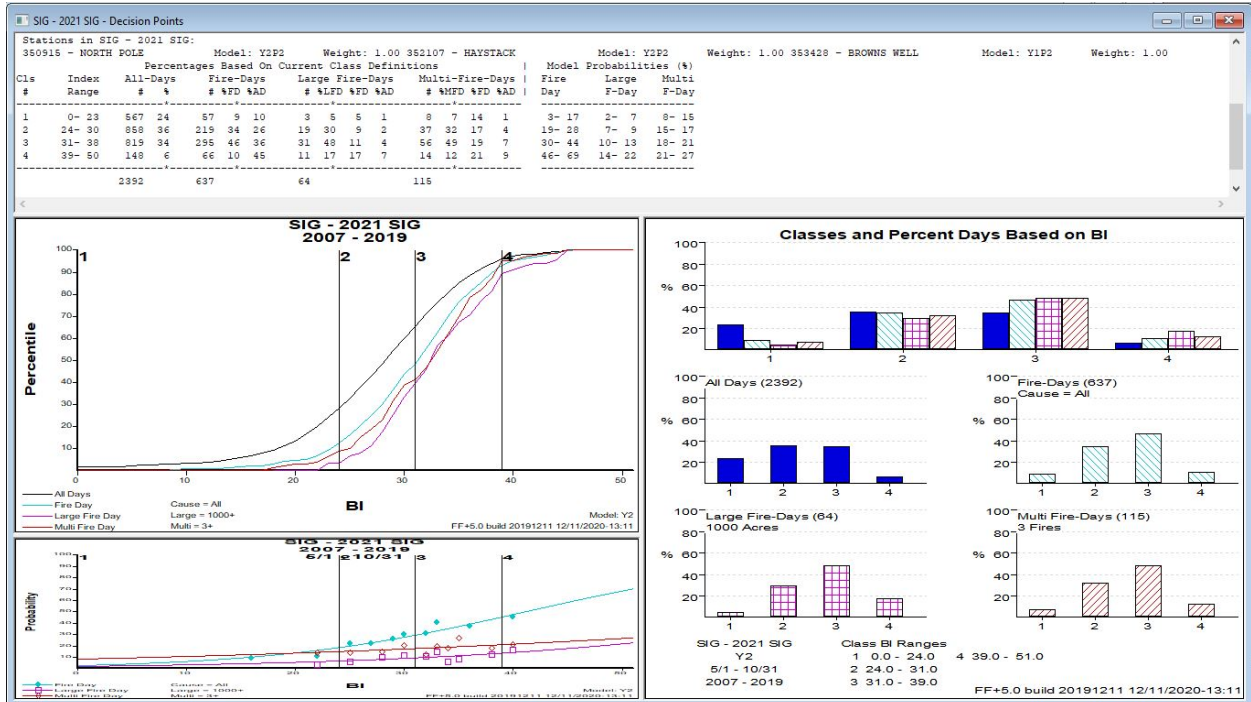
Dispatch Level Decision Point Analysis



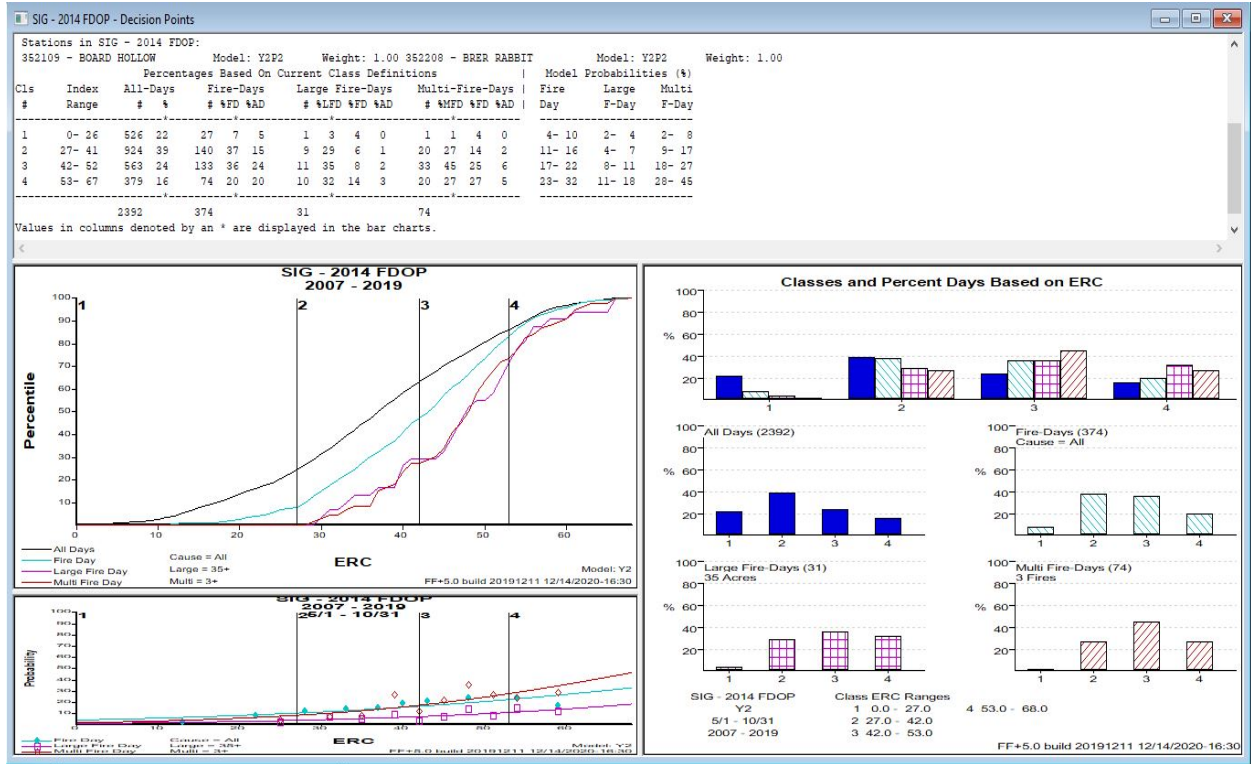
Adjective Rating Decision Point Analysis



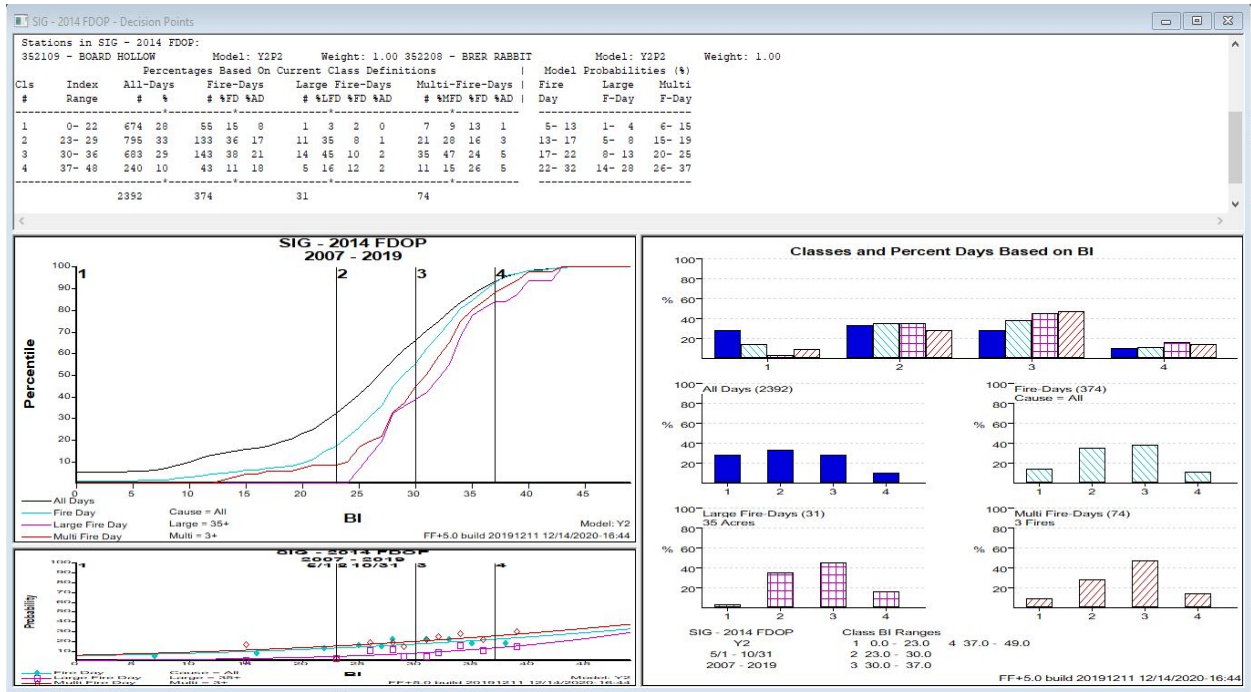
Dispatch Level Decision Point Analysis



Adjective Rating Decision Point Analysis



Dispatch Level Decision Point Analysis



Appendix D: Pocket Cards

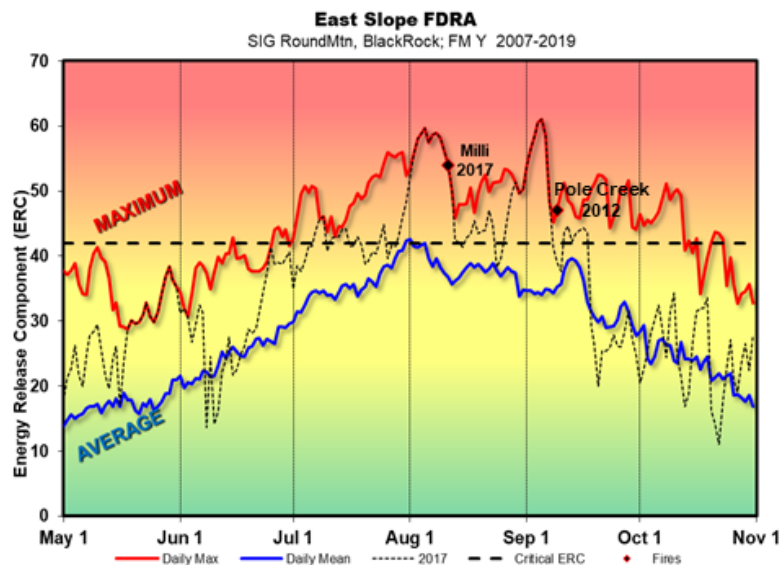
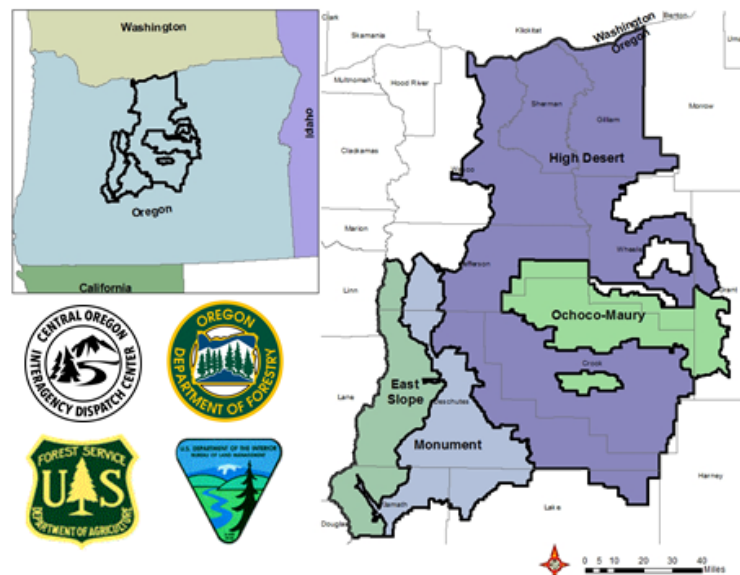
Central Oregon Interagency Fire Danger Pocket Card 2021

- National Forests: Ochoco NF, Deschutes NF
- Bureau of Land Management: Prineville District
- Oregon Department of Forestry: Prineville/Sisters Unit
- 4 Fire Danger Rating Areas
 - *East Slope* – Crest of the Cascades east to WUI boundaries
 - *Monument* – Newberry Volcanic Monument, Green Ridge, and WUI
 - *High Desert* – Lower Deschutes and John Day River canyons, shrub and grasslands
 - *Ochoco-Maury* – Western extent of the Blue Mountains

Local Thresholds for All FDRAs – *Watchout*

Combinations of any of these factors may greatly increase fire behavior!

- ✓ Sustained 20-foot Wind Speed over 10 mi/hr
- ✓ Relative humidity less than 20% (or overnight recovery less than 45%)
- ✓ Temperature over 80 degrees
- ✓ 1000 hr fuel moisture less than 11%



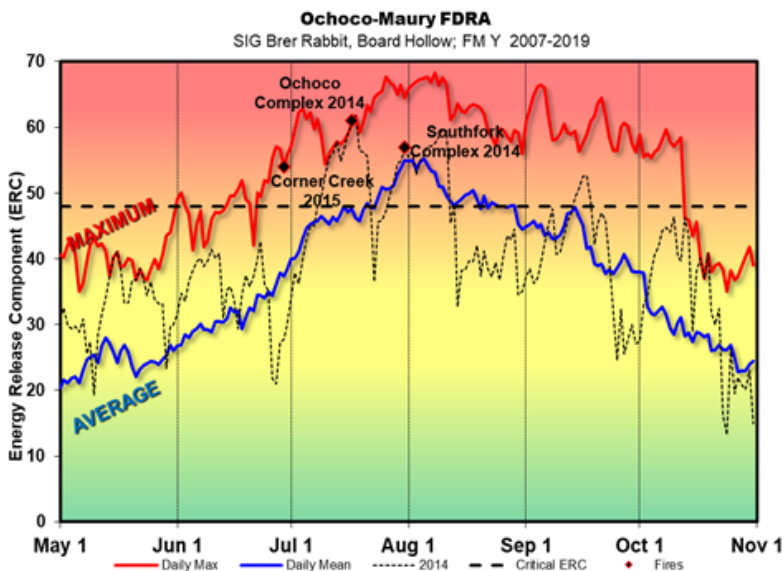
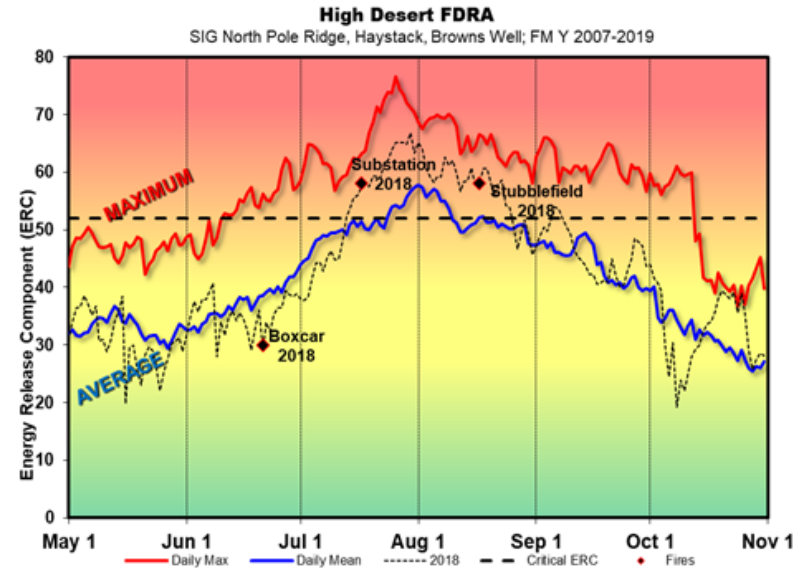
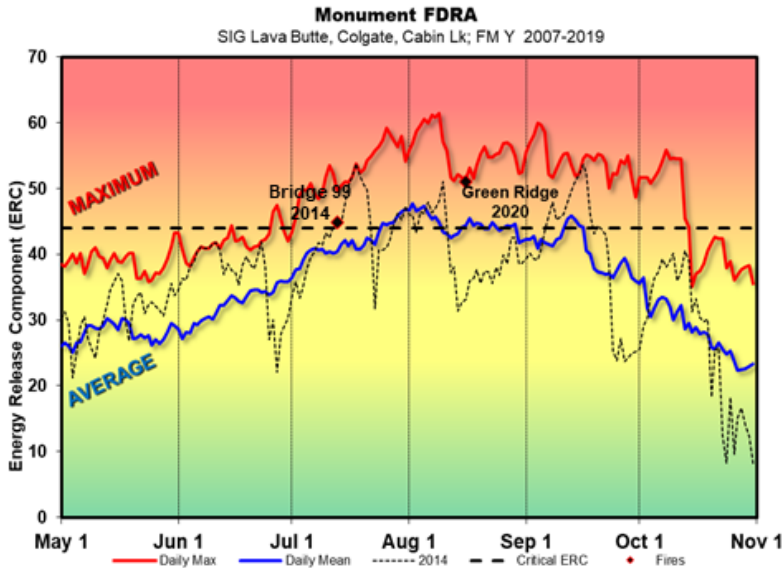
Interpretation of Charts:

- Title—Describes the Fire Danger Rating Area (FDRA) the chart applies to.
- Subtitle—Identifies weather stations (RAWS) utilized*, NFDRS fuel model, and years analyzed.
- **MAXIMUM**—Highest ERC recorded for that day during the analysis period.
- **AVERAGE**—Average ERC recorded for that day during the analysis period.
- Critical ERC—Threshold that captures the largest percentage of large fires in the lowest percentage of days as analyzed in FireFamily Plus.
- Year – Each FDRA chart graphs one recent year to remember.
- Fire name/year—ERC for the discovery date of a memorable fire.
- NFDRS 2016 Fuel Model Y—Timber



- Extreme** – Use extreme caution
- Caution** – Watch for change, especially WIND
- Moderate** – Lower potential, but always be aware

*All stations comply with NWCG weather station standards



Remember what Fire Danger tells you:

- ERC displays seasonal fire danger trends calculated from temperature, RH, solar radiation, and precipitation
- Wind speed is NOT part of the ERC calculation
- Watch local conditions and variations across the landscape (e.g., Fuels, Weather, and Topography)
- Obtain local weather forecasts, note the WIND forecast

Past Experience

- Large Fires are often the result of fire danger combined with abundant lightning caused fires overwhelming the capabilities of initial attack
- Late afternoon/evening downslope west winds off the Cascades often push large fires to the east.
- Rugged terrain, fine fuel loading from previous year grass, and wind channeled through river canyons all contribute to large fire growth.

Developed 2/25/21 using FF+5.0 Build 12/11/19

