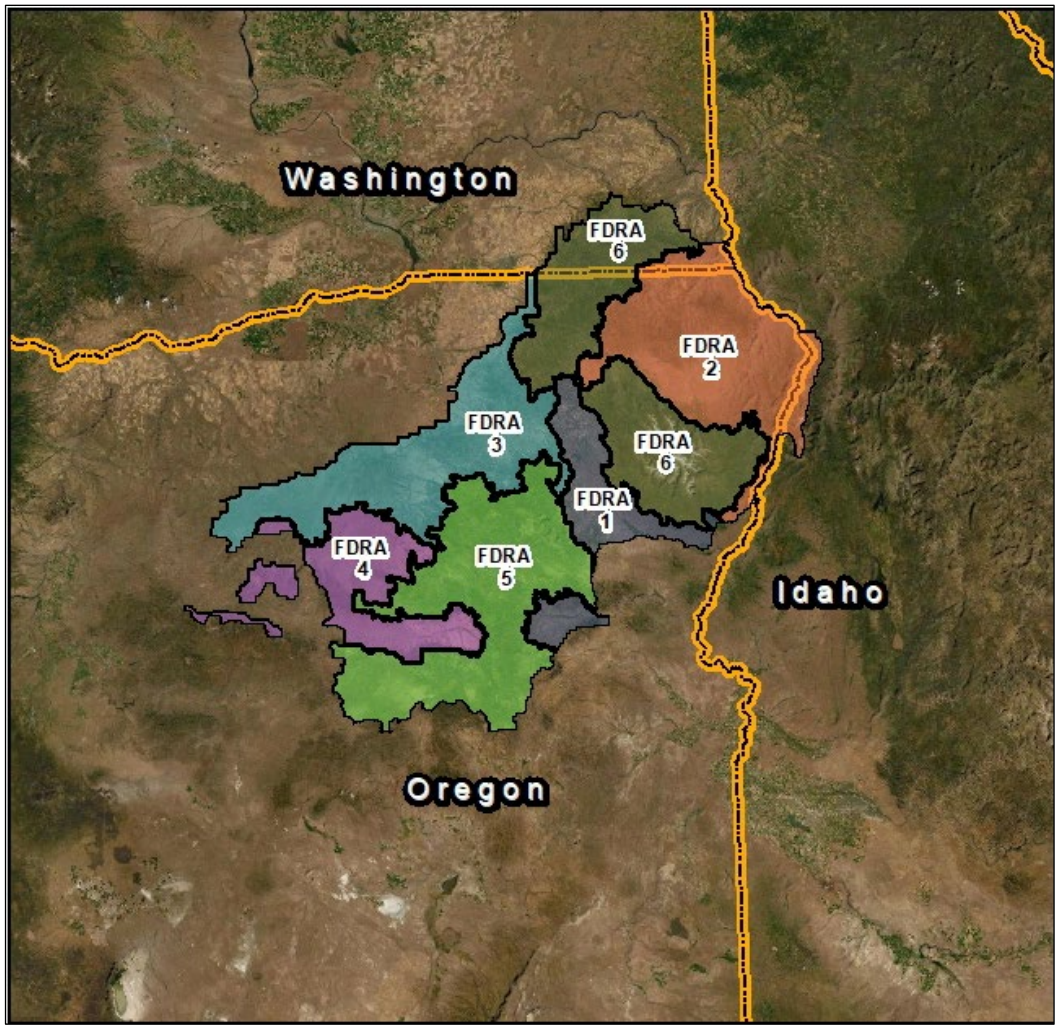
Blue Mountain Fire Danger Operating Plan

Interagency Fire Danger Operating Plan



January 2021

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Approved By: ***Fire Program Managers***

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1.0 *Introduction*

1.1 *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.

1.1.1 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; some plans and guides provide the basis for other plans/guides as shown in this schematic.

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. The actual implementation of the fire business thresholds is described in the following supplemental action plans. The decision points are identified and documented in the Blue Mountain Fire Danger Operating Plan.

1.1.1.1 Staffing Plan

The Staffing Plan describes escalating responses that are usually noted in the FMP. 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. Each units staffing plan and associated decisions are located in their respective fire management plans tiered from this Fire Danger Operating Plan.

1.1.1.2 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. The Preparedness Levels are identified and documented in the Blue Mountain Fire Danger Operating Plan; the associated decisions and planned actions are located in *each units Fire Management Planning Documentation.*

1.1.1.3 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 the Blue Mountain Fire Danger Operating Plan are documented in this Fire Danger Operating Plan; the associated decisions and planned actions are located in each units Fire Management Planning Documents.

1.1.1.4 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. Decision points when restrictions and/or closures should be considered are identified and documented in the Blue Mountain Fire Danger Operating Plan; the associated decisions and planned actions are located in *each units Fire Management Planning Documents.*

1.1.2 Wildfire Response

1.1.2.1 Initial Response Plan

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 Blue Mountain Fire Danger Operating Plan. The number and type of suppression resources dispatched to a reported fire is documented in the associated initial Dispatch / Response Plan located in each dispatch centers mobilization plan.

1.1.2.2 Local Mobilization Plan

The Blue Mountain Fire Danger Operating Plan 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 Plans are available at each dispatch center.

1.2 *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. Forest Service – Manual 5120 - Fire Management - Preparedness
- Bureau of Land Management – Manual 9211 - 1 - Fire Planning Handbook
- National Park Service – Manual 18, Chapter 5 – Preparedness
- Fish and Wildlife Service – Fire Management Handbook, Chapter 10 - Preparedness
- Bureau of Indian Affairs – Wildland Fire and Aviation Program Management Operations Guide

1.3 *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) in fire danger planning area 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), National Fire Danger Rating System (NFDRS), FireFamilyPlus software to analyse 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.

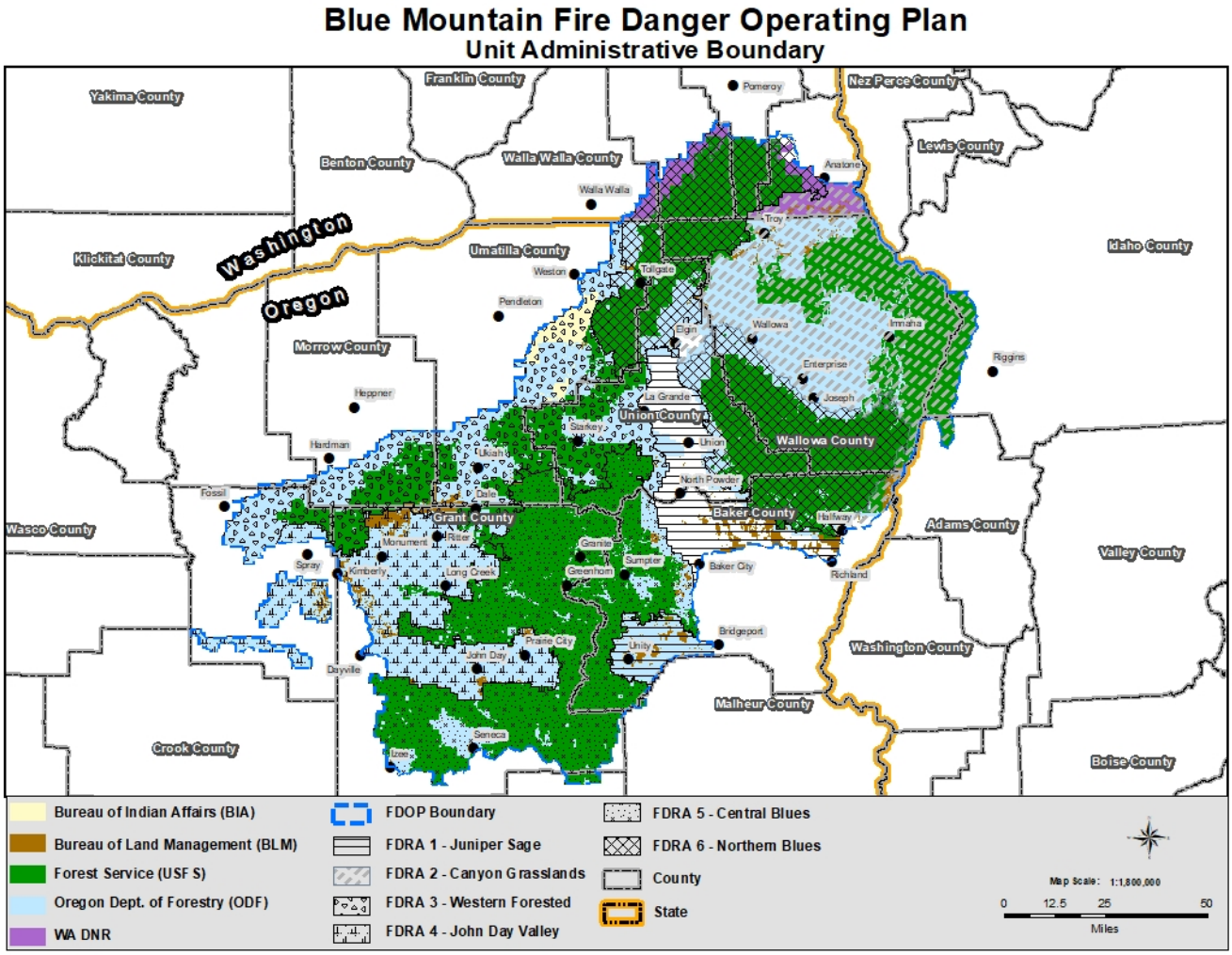
9. Identify the development and distribution of fire danger pocket cards to all personnel involved with fire suppression within the fire danger planning area.

10. Identify program needs and suggest improvements for implementation of the Fire Danger Operating Plan.

2.0 Fire Danger Planning Area Inventory and Analysis

2.1 *Administrative Units*

This document supports consistent application of fire danger decisions applied across multiple jurisdictional boundaries. Wildland fire management and suppression responsibilities are shared among Federal, State, and local cooperators. Administrative units participating in this plan can be found on the signature page.



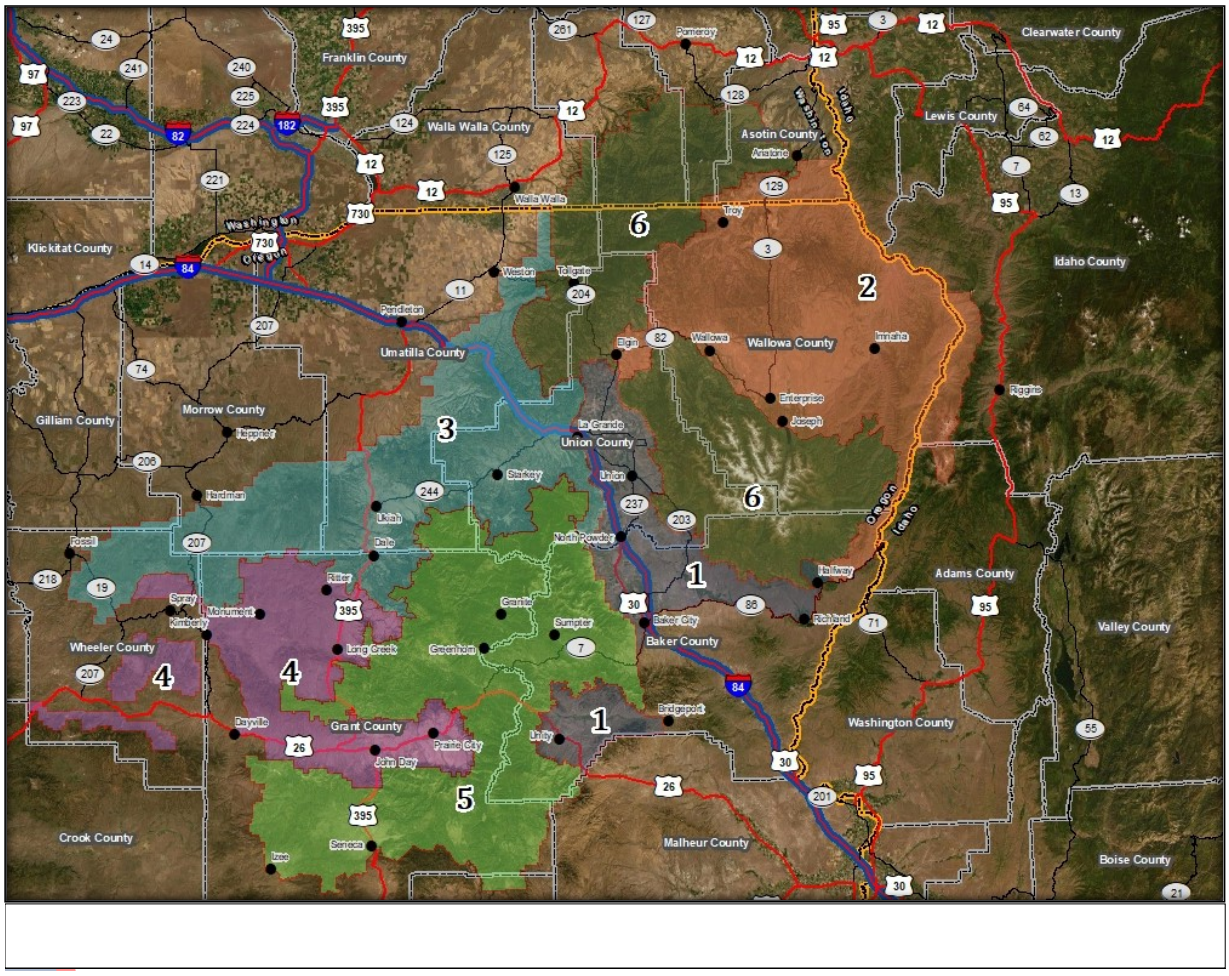
2.2 *Fire Danger Rating Areas*

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. Fire Danger Rating Areas were delineated based upon an analysis of these three factors: climate (Appendix H:), vegetation (Appendix G:), and topography (Appendix F:). After these environmental factors were considered, the draft FDRAs were *edge-matched* to existing administrative boundaries using Response Areas (Appendix A:). It is important that existing Response Areas are not split by FDRAs; a Response Area must not have two FDRAs to avoid additional workload and confusion for operational personnel.

Compared to the 2013 plan, the 2020 plan has removed a portion of FDRA 4 (Southern Blues) from this version; the adjustment of the FDRA boundary for the Blue Mtn FDOP encompassed the Dispatch boundary for the Blue Mountain and John Day Interagency Dispatch Centers. The portion of FDRA 4 removed includes the Malheur National Forest, Emigrant Creek Ranger District which is managed through Burns Interagency Dispatch Center and different fire danger decisions were made in the past. Portions of the historic FDRA 4 (Southern Blues) were moved into FDRA 5 Central Blues.

FDRA 1 was split into two FDRAs separating John Day, OR from FDRA 1 to make its own unique FDRA. The final FDRA delineation is depicted here:

2.2.1 FDRA Map



2.2.2 FDRA Table

Fire Danger Rating Area	Local Area	Acreage	% of Total
FDRA #1 – JUNIPER SAGE	Unity	173,866	8%
	La Grande/Baker	605,387	
FDRA #2 – CANYON GRASSLANDS	Wallowa/Joseph	1,768,361	19%
FDRA #3 – WESTERN FORESTED	Fossil/Ukiah/Weston	1,708,453	18%
FDRA #4 – JOHN DAY VALLEY	Spray/Kimberly	112,729	11%
	John Day/Monument/Ritter	857,160	
	Slide Mountain	63,490	
FDRA #5 – CENTRAL BLUES	Elk Horns/Desolation/Strawberry's	2,107,737	23%
FDRA #6 – NORTHERN BLUES	Eagle Caps	987,406	21%
	Pomeroy/Tollgate	974,086	
FDRA BOUNDARY TOTAL		9,358,675	

2.2.3 FDRA Description

2.2.3.1 FDRA 1 – Juniper Sage

General Location: FDRA 1 is primarily located in Unity, Baker and La Grande within Grande Ronde and Baker Valley's.

Vegetation: Primary vegetation is Juniper and sagebrush, mostly fine fuel. There are some large blocks of agricultural area within the FDRA; these are included for convenience and not part of the analysis.

Climate: The area varies widely in temperature across the four seasons. This FDRA is characterized with warm summers, and cold winters with most of the precipitation occurring fall to late spring months. Temperatures range from max temperatures near 90 degrees in the summer to below freezing in the winter. Annual Precipitation is estimated at < 15" per year.

Topography: FDRA 1 ranges in elevation 2,000 to 4,500 feet.

2.2.3.2 FDRA 2 – Canyon Grasslands

General Location - FDRA 2 is located in the general vicinity of Wallowa, Enterprise, Troy and Imnaha, Oregon. The prominent features include Hells Canyon, Grand Ronde and Imnaha Rivers.

Vegetation: Vegetation consists of perianal grass with strips of forested areas intermixed with closed canopy Douglas-fir and ponderosa pine. Timber is predominately located on the steeper slopes; at lower elevations and in the larger valley's with flat slopes, perianal grasses predominate vegetation.

Climate: Warm summers and cold winters; average summer high temperature 85 degrees though hotter in the lower drainage bottoms of Hells Canyon. Typically, in the summer precipitation is accompanied with thunderstorms; during the winter months, snow covers the FDRA. Average precipitation < 16" with the majority occurring during the late fall through late spring months.

Topography: Elevation ranges from 1,100 feet within the Canyon Drainages to 6,700 feet within Hells Canyon Wilderness. Generally, elevation averages across the majority of the FDRA at 4,000 to 4,500 feet. Four prominent drainages: Hells Canyon, Imnaha, Joseph and Grande Ronde mainly run in a North to South alignment with many smaller drainage intersecting.

2.2.3.3 FDRA 3 – Western Forested

General Location: Western Blue Mountains of Oregon; Weston, Ukiah, Tupper and Fossil.

Vegetation: Mix of grass and brush along the western portion of the FDRA and broad ridgelines; timber vegetation is predominately Ponderosa Pine with grass understories with higher elevations in the FDRA intermixing Douglas-Fir and Lodgepole Pine.

Climate: Warm summers and cold winters; precipitation < 15"; precipitation generally occurs in the Fall through Spring months; summertime precipitation generally occurs with Thunderstorms. Snowfall covers much of the FDRA during the winter months. Summer maximum temperatures average 80 degrees; several periods of hot days in the upper 90-degree range are typical.

Topography: Elevation ranges from 3,000 to 5,500 feet. Predominately mountainous terrain dissected by drainages and valleys.

2.2.3.4 FDRA 4 – John Day Valley

General Location: This area includes located in the southern foothills of the Blue Mountains and the John Day River. The FDRA includes one large contiguous block (John Day, Long Creek, Monument) and 2 separate boundaries (Slide and Iron Mountain).

Vegetation: Lower elevations include grass and shurbs; as elevation increases in the FDRA boundary, trees intermix in open stands of Juniper and Sage and Ponderosa Pine.

Climate: Warm to hot summer temperatures and cold winters; average summertime high temperatures near 90 degrees although it is not uncommon to have days near 100 degrees. Winter temperatures are cold with average max temperatures in the mid-twenties. Average annual precipitation <14" with most precipitation occurring during the fall through spring months. It is not uncommon for the FDRA to be covered in snow during the winter periodically.

Topography: Elevations range from 1,000 feet along the John Day River to 5,000 feet at the highest point in the FDRA. Elevation averages 4,000 foot. The North Fork and Main Fork of the John Day River is the predominate topographic feature in the FDRA running west to east.

2.2.3.5 FDRA 5 – Central Blues

General Location: This FDRA stretches from La Grande to the south in Seneca. The FDRA includes North Fork John Day and Strawberry Wilderness areas and the Elk Horn Mountain Range.

Vegetation: FDRA is composed mainly of drier Ponderosa Pine forest in the lower elevations and closed moist forests in the higher elevations which includes mix-conifer Douglas-fir, Ponderosa and Lodgepole pine along with sub-alpine fir at the highest elevations.

Climate: Cool summers and cold winters. Average maximum temperatures in the summer 77 degrees and 15 degrees in the winter months. Precipitation <24" annually; the area is generally snow-covered late fall to mid-spring.
Topography: Elevations range from 4000 to 9,000 feet along the highest mountain peaks; mountainous terrain dissected by river canyons and drainages.

2.2.3.6 FDRA 6 – Northern Blues

General Location: Northern Blues FDRA is located in two separate large boundary area of the FDOP; on location includes the Wenaha-Tucannon Wilderness near Pomeroy, WA and Tollgate, OR and the other boundary contains the Eagle Cap Wilderness near Enterprise, OR.

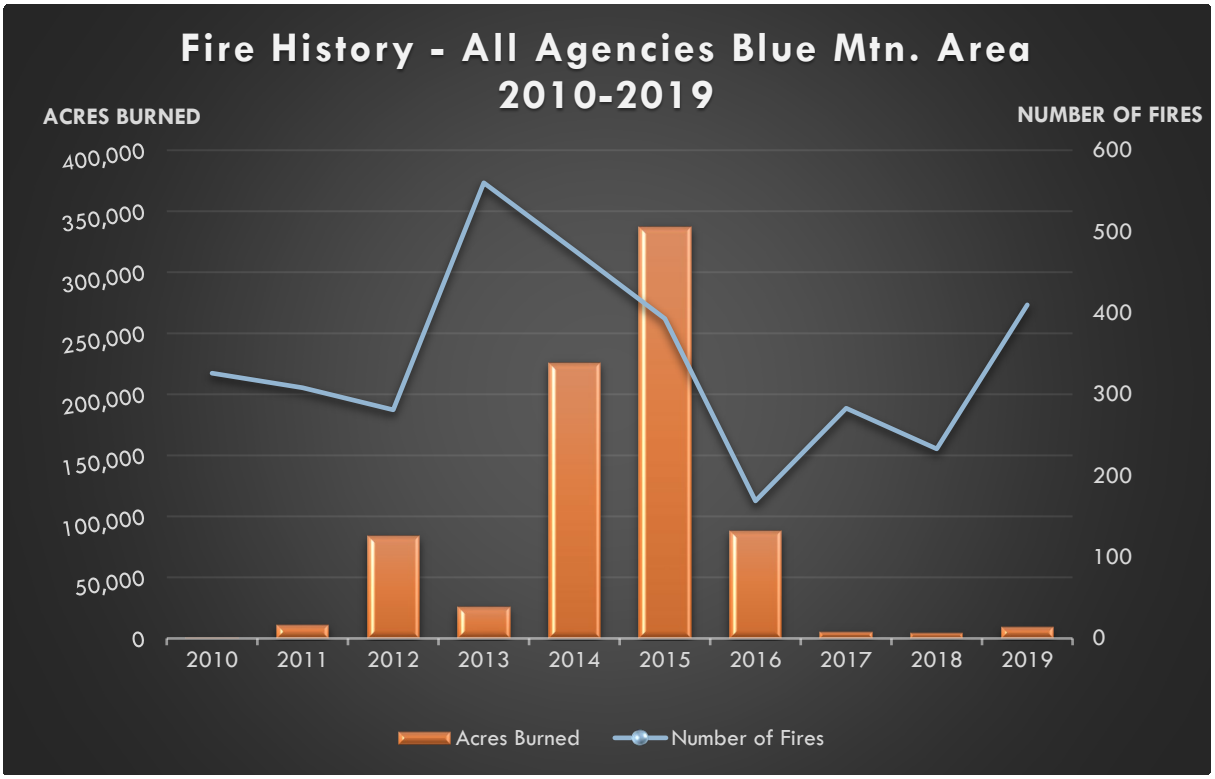
Vegetation: Lower elevations of the FDRA include Ponderosa Pine Forests with shrub and grasses; moist forest types which include predominately closed canopy Douglas-fir, White-fir and Lodgepole and Ponderosa Pine Forest as elevations increase. Highest elevations of the FDRA consist of pockets of non-vegetation and sub-alpine fir.

Climate: Cool summers and cold winters; average summer maximum temperatures 75 degrees with winter max temperature 20 degrees with higher elevations experiencing much colder temperatures. This FDRA experiences the most moisture with annual precipitation 40". Snow covers much of the FDRA late fall lasting through late spring to early summer in some locations.

Topography: Elevations Range from 3,500 to 9,800 feet elevation; mountainous terrain dissected by river canyons and drainages.

2.2.3.7 FDRA Fire Summary

The Charts below represent 10 years of historical data utilized for this analysis. Detailed fire summary graphs are displayed for each FDRA in Appendix A.

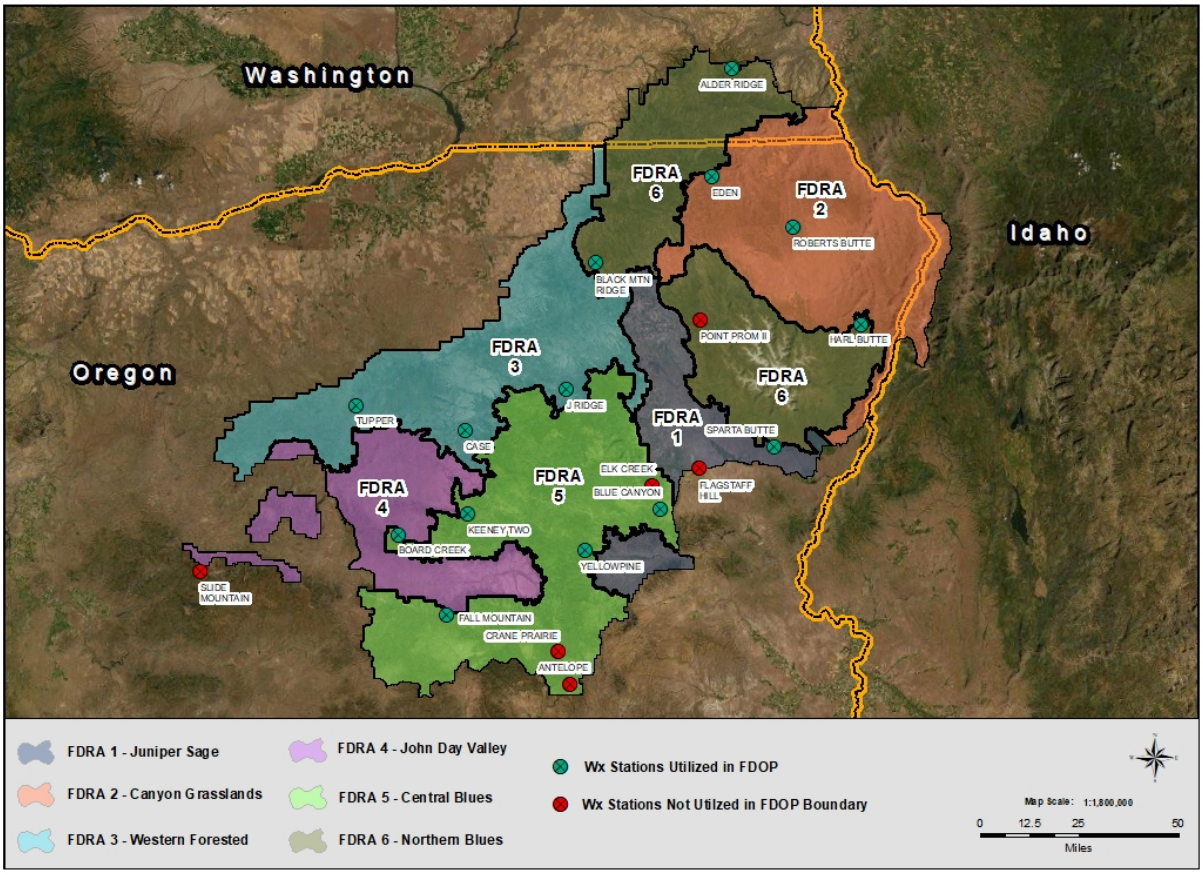


2.2.3.8 Weather Stations

All RAWS used in this plan to produce NFDR outputs comply with the National Wildfire Coordinating Group (NWCG) weather station standards and guidelines (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 to verify site and station conditions. Summary data table and hourly missing data analysis are contained in the Appendix D.

2.2.3.8.1 RAWS Map

Blue Mountain Fire Danger Operating Plan
Remote Automated Weather Station Locations

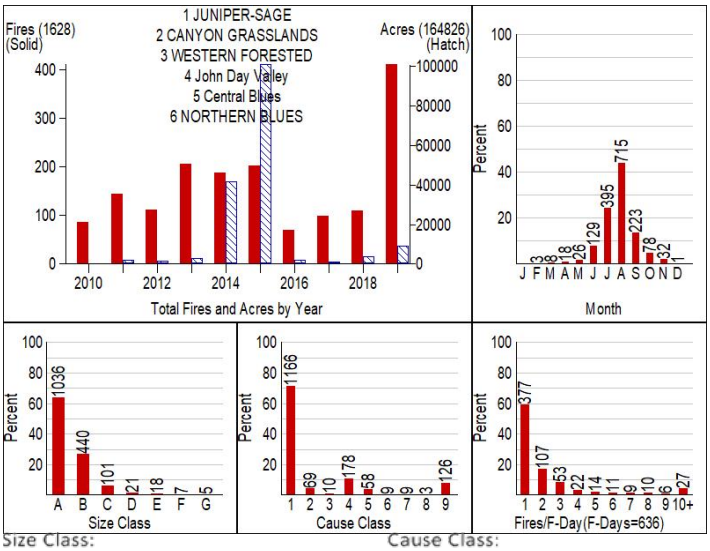


3.0 *FIRE DANGER PROBLEM ANALYSIS*

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*

Ten years (2009-2019) of fire data occurrence were used for the analysis in the FDOP. Data was attained from *spatial wildfire occurrence data from the United States dataset* through 2015; additional fire history was collected through each agencies fire reporting systems, merged into ArcGIS dataset, and reviewed for duplicate data entries. Fire Occurrence for each FDRA is located in Appendix A.



Size Class:

A =	0 —	.25	acres
B =	.30 —	9	acres
C =	10 —	99	acres
D =	100 —	299	acres
E =	300 —	999	acres
F =	1000 —	4999	acres
G =	5000 +		acres

Cause Class:

1 = Lightning	6 =Railroad
2 = Equipment	7 =Arson
3 = Smoking	8 =Children
4 = Campfire	9 =Misc
5 = Debris Burning	

Fire Season: June – October (94% of fires)
Top 4 Statistical Fire Causes:

1. Lightning (73%)
2. Campfire (10%)
3. Debris Burning (4%)
4. Equipment (3.5%)

Fire Size Percentile:

1. 80th: 1acre
2. 90th: 7.5 acres
3. 97th: 156 acres

3.2 *Identification / Definition of the Fire Problem(s)*

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:

Affected Target Group: The group of people commonly associated with the problem (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 (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).

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.

3.3 *Fire Problem Analysis Table*

The ability to regulate, educate, or control a user group will be based upon the interface method and how quickly they can react to the action taken. In addition, each action will result in positive and/or negative impacts to the user groups. Consequently, the decision tool which would be most appropriate would depend upon the sensitivity of the target group to the implementation of the action. The following table illustrates the differences between target groups (Agency, Industry, and Public) and the associated fire cause.

Table 1: Planning Area Fire Problems

TARGET GROUP		IGNITION CAUSE		RELATIVE DEGREE OF CONTROL	COMMUNICATION METHODS	PROBLEM DEFINITION
GENERAL	*SPECIFIC*	*GENERAL*	*SPECIFIC*			
Agency	Fire Management Staff, Initial Attack Resources, Agency Administrators.	1 - Lightning	Lightning	High	Dispatch Centers – Communicate Weather Forecast(s) and fire danger indices; units monitor SL and PL.	Fire spread exceeds capacity of local unit staffing due to ignition location and/or fuel conditions, and/or weather conditions which contribute to problem/extreme fire behavior.
Agency	Fire Management Staff, Initial Attack Resources, Agency Administrators.	1 - Lightning	Abundant Lightning	High	Dispatch Centers – Communicate Weather Forecast(s) and fire danger indices; units monitor SL and PL.	Unstaffed fires due to the number of fires on the landscape; fires burn free for an extended period of time without resources.
Industry	Woods workers, industrial operations.	2 - Equipment	Unplanned ignition from industrial operations including, chainsaw, yarding, masticating.	Moderate	Dispatch Centers and Units communicate Precaution Levels on Websites and telecommunication systems. Timber CO contact industrial operators.	Unplanned ignition which becomes large fires resulting from equipment and/or smoking).

TARGET GROUP		IGNITION CAUSE		RELATIVE DEGREE OF CONTROL	COMMUNICATION METHODS	PROBLEM DEFINITION
GENERAL	*SPECIFIC*	*GENERAL*	*SPECIFIC*			
Public	Non-Commercial Woodcutting	2 - Equipment	Unplanned ignition from chainsaw, vehicle off-road or smoking.	Low	Dispatch and local units post fire danger adjective and woodcutting restrictions on websites and telephone recordings.	General Forest User at an unknown location in the forest igniting a fire.
Public	Overnight Camping in Developed/Dispersed Sites.	4 - Campfire	Unplanned ignition abandoned campfires.	Low	Dispatch and local units post fire danger adjective levels. Units update Adjective signs (Smokey's Arm) at main entrance points to public land. PIOs communicate via Media outlets (broadcast news, newsprint, websites)	Campfires starts during cold, dry, windy conditions. Generally, occurs during the late fall months.
Public	Private landowners	5 - Debris Burning	Unplanned ignition from escaped debris piles	Low	Dispatch and local units post fire danger adjective levels. Units update Adjective signs (Smokey's Arm) at main entrance points to public land. PIOs communicate via Media outlets (broadcast news, newsprint, websites)	Escaped debris burns generally occur on the shoulder of fire season when agency resources are not at full capacity as a result of windy, dry conditions.

4.0 *Fire Danger Decision Analysis*

Decision points can be based upon either:

- Climatological Breakpoints, or
- Fire Business Thresholds.

The following table provides a summary of the planning area's fire danger problems and concerns. In addition, each problem is associated with a specific target group whose activities can be influenced through effective communication and implementation of specific control measures.

This Fire Danger Operating Plan will be used to support preparedness, staffing and response decisions which are 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 the combination of events and conditions signal that it is time to do something different, a "decision point" has been identified for each Fire Danger Rating Level within each Fire Danger Rating Area.

4.1 *Climatological Analysis*

Climatological breakpoints are points on the cumulative distribution curve of one fire weather/danger index computed from climatology (weather) without regard for associated fire occurrence/business. 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.

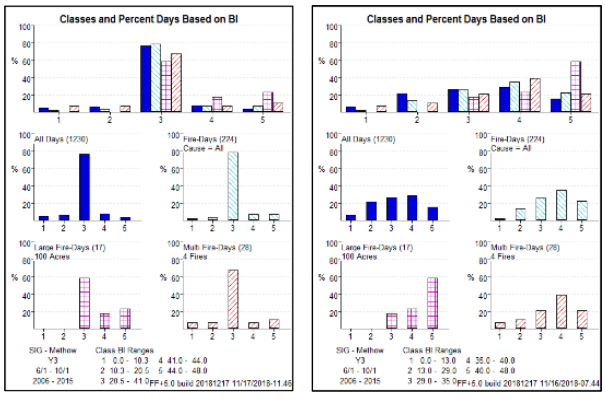
It is equally important to identify the period or range of data analysis used to determine the agency percentiles. The percentile values for the calendar year (Jan – Dec) will be different from the percentile values for the fire season (Jun – Sept). Each agency will have specific (and perhaps different) direction for use of climatological percentiles.

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 climatological (percentiles) for decision points.

4.2 *Fire Business Analysis*

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

Where possible the decision thresholds identified in this FDOP avoid climatological breakpoints and are based upon the statistical correlation of historical fire occurrence and weather data to determine fire business decisions.



Note the fire business charts below, climatological breakpoints on the left and fire business thresholds on the right. Increased preparedness actions taken at levels 4/5 have little potential to affect outcomes using traditional climatological breakpoints since most of the fire problems occur at level 3.

4.3 *Weather Station Analysis*

Remote Automated Weather Stations (RAWS) in different geographical locations with common sensitivity to NFDRS model inputs can be grouped to form a Special Interest Group (SIG). Appendix D details weather analysis performed and subsequent data quality for each station included in this analysis. Weather observation data along with fire danger outputs were graphed for each weather station using excel. The graphical data provided the ability to review similar weather and fire danger variables for each weather station. SIGs were developed for each FDRA. Some weather stations were used in multiple FDRAs as these weather stations fit well in each area and were located near the FDRA Boundary.

Solar Radiation sensor limited the use of historical data that has been utilized in previous FDOPs. Generally, weather data is consistent and good quality for the last 10 years; prior to 2009, several stations either, had no solar radiation sensor installed, or were missing large gaps of data for a year-round analysis. Future consideration to stations not used in this analysis but are recording weather as well as NFDRS compliant, should be considered in future analyses.

RAWS Catalogue Table (Active Stations Only)

STATION NAME	WIMS ID	NESDIS ID	AGENCY | OWNER	AVAILABLE DATA*	ELEVATION	LATITUDE	LONGITUDE	REPORT TIME
ALDER RIDGE	453803	3245E2F4	USFS | UMF	2002-2020	4,500	46.268333	-117.498333	00:10:20
ANTELOPE	353524	32652604	USFS | MAF	2009-2020	6,460	44.039722	-118.416389	00:12:00
BLACK MTN RIDGE	351319	327F70B4	USFS | UMF	2007-2020	4,965	45.573611	-118.238611	00:17:00
BLUE CANYON	352416	325DA2C6	USFS | WWF	2004-2020	4,200	44.67	-117.933611	00:55:30
BOARD CREEK	352330	325D4134	USFS | MAF	2009-2020	5,000	44.593333	-119.277778	00:25:45
CASE	352329	3245F182	USFS | UMF	2004-2020	3,800	44.971111	-118.929722	00:13:00
CRANE PRAIRIE	352305	32622430	USFS | MAF	2009-2020	5,500	44.157222	-118.471389	00:11:15
EDEN	351518	3246157E	USFS | UMF	2009-2020	4,200	45.876389	-117.616389	00:09:50
ELK CREEK	352126	323EB48C	USFS |WWF	2005-2020	6,576	44.757778	-117.971111	00:06:00
FALL MOUNTAIN	352327	3262F258	USFS | MAF	2009-2020	5,949	44.296944	-119.036944	00:11:30
FLAGSTAFF HILL	352123	3257D504	BLM | VALE	2007-2020	3,945	44.814167	-117.728889	00:55:30
HARL BUTTE	351502	3262B152	USFS | WWF	2000-2020	6,071	45.319167	-116.8675	00:55:40
J RIDGE	351414	3262673A	USFS | WWF	2001-2020	5,180	45.113889	-118.403889	00:04:30
KEENEY TWO	352332	326C6352	USFS | MAF	2009-2020	5,120	44.666111	-118.921944	00:11:45
POINT PROM II	351419	326B7210	USFS | WWF	2001-2020	6,607	45.354722	-117.704444	00:04:45
ROBERTS BUTTE	351520	3234D038	USFS | WWF	2002-2020	4,263	45.681667	-117.206389	00:55:50

STATION NAME	WIMS ID	NESDIS ID	AGENCY | OWNER	AVAILABLE DATA*	ELEVATION	LATITUDE	LONGITUDE	REPORT TIME
SLIDE MOUNTAIN	352207	32604422	USFS | OCF	2004-2020	5,682	44.462222	-120.294444	00:06:20
SPARTA BUTTE	352418	3234E5A2	USFS | WWF	2000-2020	4,278	44.885	-117.338333	00:55:20
TUPPER	351202	3245D76E	USFS | UMF	2007-2020	4,260	45.066389	-119.491111	00:12:50
YELLOWPINE	352124	323E9260	USFS | WWF	2002-2020	4,600	44.526389	-118.323056	00:57:15

* Station Available Data start year is based on solar radiation sensor data.

4.4 *Parameters Used to Calculate Fire Danger*

The tables below list each FDRA and associated Special Interest Group (SIG) in which parameters for fire danger calculations are used. Each table provides the weather stations for each SIG and associated parameters used for setup in WIMS. A Default value of 100 for KBDI should be used.

FDRA #1 – Juniper Sage

Station Name	WIMS ID	Slope Class	Climate Class	Herb Type	Estimated Green-up	Estimated Freeze Data	SIG Station Weight	Large Fire Day	NFDR Fuel Model
YELLOWPINE	352124	2	2	P	5/15	12/15	1	300	Y
BLUE CANYON	352416								
SPARTA BUTTE	352418								

FDRA # 2 – Canyon Grasslands

Station Name	WIMS ID	Slope Class	Climate Class	Herb Type	Estimated Green-up	Estimated Freeze Data	SIG Station Weight	Large Fire Day	NFDR Fuel Model
EDEN	351518	2	2	P	5/15	12/15	1	300	Y
ROBERTS BUTTE	351520								
ALDER	453803								

FDRA # 3 – Western Forested

Station Name	WIMS ID	Slope Class	Climate Class	Herb Type	Estimated Green-up	Estimated Freeze Data	SIG Station Weight	Large Fire Day	NFDR Fuel Model
TUPPER	351202	2	2	P	5/15	12/15	1	300	Y
J RIDGE	351414								
CASE	352329								

FDRA #4 – John Day Valley

Station Name	WIMS ID	Slope Class	Climate Class	Herb Type	Estimated Green-up	Estimated Freeze Data	SIG Station Weight	Large Fire Day	NFDR Fuel Model
KEENEY TWO	352332	2	2	P	5/15	12/15	1	300	Y
BOARD CREEK	352330								
FALL MOUNTAIN	352327								

FDRA #5 – Central Blues

Station Name	WIMS ID	Slope Class	Climate Class	Herb Type	Estimated Green-up	Estimated Freeze Data	SIG Station Weight	Large Fire Day	NFDR Fuel Model
J RIDGE	351414	2	2	P	5/15	12/15	1	300	Y
YELLOWPINE	352124								
FALL MOUNTAIN	352327								
BLUE CANYON	352416								

FDRA #6 – Northern Blues

Station Name	WIMS ID	Slope Class	Climate Class	Herb Type	Estimated Green-up	Estimated Freeze Data	SIG Station Weight	Large Fire Day	NFDR Fuel Model
BLACK MTN RIDGE	351319	2	2	P	5/15	12/15	1	300	Y
HARL BUTTE	351502								
ALDER	453803								

4.5 *Decision Points*

Using Fire Family Plus Software, NFDRS decision points have been identified where changes in fire business should occur. The example provided here ERC is used to establish thresholds for fire business decisions using historical fires to associate with weather and fire danger outputs. Threshold Charts for all FDRAs are included in Appendix E. These thresholds are utilized to support fire business in Section 5.0 below.

4.6 *Decision Summary Table*

Target Group	Decision Points	Index	NFDRS Fuel Model	Plan Intended to Modify Target Group Behavior
Agency	4	Energy Release Component	Y	Staffing/Draw Down Plan
Agency	4	Burning Index	Y	Dispatch Response Plan
Agency	Unit Discretion	Energy Release Component	Y	Preparedness Plan
Public	4	Energy Release Component	Y	Fire Danger Adjective Rating
Public	TBD by Unit	Energy Release Component	Y	Public Use Restrictions
Industry	4	IFPL	TBD	Industrial Operations Public Lands

5.0 *Fire Danger Rating Levels*

The NFDRS utilizes the WIMS processor to manipulate weather data and forecasted data stored in the National Interagency Fire Management Integrated Database (NIFMID) to produce fire danger ratings for corresponding weather stations. 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.

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.

1. **Response (Dispatch) Level** – Decision Tool agreed upon by all agencies to assign initial attack resources to a fire reported in a specific dispatch zone. The thresholds determine will be the breakpoint for each incremental decision point of increasing fire danger. Fire Managers for each agency within the dispatch zone will meet, at a minimum, annually to identify the kinds and amount of resources to send at each threshold.

2. **Staffing (Drawdown) Level** – Each administrative unit (Forest, Unit, Region) will coordinate their respective staffing plans within their Fire Management Reference System (Fire management Plan). Fire business decision points for ERC can be used to support staffing level plans.

3. **Preparedness Level** - Each administrative unit (Forest, Unit, Region) will coordinate their respective preparedness plans within their fire management reference system. Fire business decision points for ERC can be used to support individual unit's decision matrix for determining Preparedness Levels.

4. **Adjective Rating** – Agencies agree to communicate fire danger to the public; each FDRA has associated ERC breakpoints for changes in Fire Danger Adjective Levels.

5. **Public Use Restrictions** – will be used to minimize the threat of unintended human ignitions. Agencies are encouraged to coordinate activities to reduce public confusion where feasible.

6. **Industrial Fire Precaution Level** – Will be used to reduce ignition potential from industrial activities. Each agency/unit is responsible for their respective jurisdiction to implement Industrial Restrictions.

5.1 *Response* (or Dispatch) 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.

FDRA	1		2		3		4		5		6	
FDRA NAME	Juniper Sagebrush		Canyon Grasslands		Western Forested		John Day Valley		Central Blues		Northern Blues	
Station/SIG	Yellowpine	Board Creek	Eden	Alder	Tupper	J-Ridge	Keeney Two	Board Creek	J-Ridge	Yellowpine	Harl Butte	Alder
	Sparta Butte		Roberts Butte		Case		Fall Mountain		Fall Mountain	Blue Canyon	Black Mtn. Ridge	
Index	BI	% Days	BI	% Days	BI	% Days	BI	% Days	BI	% Days	BI	% Days
LOW	0	23%	0	20%	0	25%	0	20%	0	24%	0	29%
MODERATE	22	38%	20	30%	20	35%	21	32%	25	31%	22	30%
HIGH	30	26%	27	32%	27	25%	29	24%	33	26%	29	30%
EXTREME	36	13%	34	18%	32	16%	34	24%	39	19%	37	11%

5.2 *Staffing (Drawdown) 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. Although Staffing Level can be a direct output in WIMS, the WIMS output is only based upon weather observations and climatological percentiles. The use of climatological percentiles for daily staffing decisions is optional. The preferred method to delineate Staffing Level thresholds is based on statistical correlation of weather AND fire occurrence.

5.3 Preparedness Level

The Preparedness Level is a five-tier (1-5) fire danger rating decision tool that is based on NFDRS output(s) and other indicators of fire business (such as projected levels of resource commitment). Preparedness Levels will assist fire managers with more long-term (seasonal) decisions with respect to fire danger.

5.4 Fire Danger Adjective 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.

As with Staffing Level, the Adjective Fire Danger Rating Level can be obtained as a direct output in WIMS; however, the Adjective Rating from WIMS is strictly based on weather and climatological percentiles (80th / 95th) with no regard to historical fire occurrence. The use of agency-specific climatological percentiles is not mandatory. Actually, the preferred method to determine Adjective Fire Danger Rating thresholds based on statistical correlation of weather observations AND fire occurrence. This FDOP will implement Adjective Fire Danger Rating based upon fire business thresholds, not climatological percentiles.

A coordinated adjective level based on fire danger will be utilized by all agencies withing the Blue Mountain FDOP

FDRA	1		2		3		4		5		6	
FDRA NAME	Juniper Sagebrush		Canyon Grasslands		Western Forested		John Day Valley		Central Blues		Northern Blues	
Station/SIG	Yellowpine	Board Creek	Eden	Alder	Tupper	J-Ridge	Keeney Two	Board Creek	J-Ridge	Yellowpine	Harl Butte	Alder
	Sparta Butte		Roberts Butte		Case		Fall Mountain		Fall Mountain	Blue Canyon	Black Mtn. Ridge	
Index	ERC	% Days	ERC	% Days	ERC	% Days	ERC	% Days	ERC	% Days	ERC	% Days
LOW	0	26%	0	30%	0	25%	0	29%	0	27%	0	29%
MODERATE	32	26%	34	31%	28	31%	33	25%	31	35%	30	32%
HIGH	42	24%	47	27%	40	31%	43	27%	45	22%	44	25%
EXTREME	52	24%	62	12%	54	14%	56	19%	54	16%	57	14%

5.5 Public Use Restrictions

Public use restrictions are implemented and set by the individual agencies participating in this plan. Currently there is not a coordinated interagency set of restrictions/levels (or actions) used by participants in this plan. Units are encouraged to communicate and coordinate implementation of PURs when possible.

Ideally units will set public use restrictions based on, or informed by, adjective rating (less risk tolerant) or unit calculated preparedness level (more risk tolerant). Number of levels, actions, and basis for decision making will be defined in unit fire management, prevention, or public use restrictions plans.

5.6 Industrial Restrictions/Closures

Agency/Unit will determine Industrial restrictions on their respective protection areas. Forest Service and WA DNR utilize Industrial Fire Precaution Level (IFPL), a 4-tier regulation system to regulate industrial woods activities.

Current and prior IFPL are based on the precaution value, a function of indices calculated by the 1978 NFDRS model. Discussions are ongoing regarding how IFPL will be calculated using NFDR 2016 as the analysis used for developing the IFPL calculation is no longer applicable (different fuel model, live and dead fuel moisture models, etc.). In the interim, units managing regulations with IFPL will continue to utilize the 78 Model system of outputs until a new system is developed to manage industrial restrictions.

6.0 *Fire Danger Operating Procedures*

6.1 Roles and Responsibilities

6.1.1 Agency Administrators

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

6.1.2 Fire Program Managers

Fire program managers (FMOs) 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.

6.1.3 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 by agency or dispatch center:

- USFS
    - Umatilla – Tyson Albrecht
    - Wallowa Whitman – Francis Tyler
    - Malheur – Sarah Bush
- ODF
    - Northeast Oregon – Justin Lauer
    - John Day Unit – Unit Forester
- WA DNR
    - Southeast Region, Snake River Unit – Unit Manager
- Dispatch Centers
    - BMIDC – Jerry Garrett
    - JDIDC – Center Manager

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. Some specific elements to monitor and coordinate are ensuring observations are monitored appropriately checking for transmit data errors (Observations, Solar Radiation, Wet Flag, Snow Flag) station management in WIMS (herb stat, catalog), station maintenance (instrument errors, tx time), station siting (eliminate redundant/inappropriate, propose new sites where appropriate).

6.1.4 Fire Weather Station Owners/Managers

The station owners will ensure appropriate editing of the RAWS catalogues 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.

Each unit with responsibility for a RAWS station within the FDOP boundary, will coordinate annual maintenance and have individuals available to support emergency repairs if needed.

6.1.5 Dispatch/Communication Center

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, June 1st through October or season end, and as requested by participants in this plan due to extenuating factors.

The communication center 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). The communication center will give WIMS the proper seasonal care and feeding required to run NFDR 2016, including setting snow flags and starting KBDI.

6.1.6 Duty Officers

USFS District Fire Management Officers (DFMOs)/ODF Unit Foresters and their assistants will assure that their personnel understand NFDRS outputs and how they are to be used. Duty officers are responsible for implementing this plan, and ensuring decisions are mad consistent with the intent of the plan.

6.1.7 National Weather Service

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

6.1.8 Geographic Area Predictive Service / Meteorologist

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

6.1.9 *Seasonal* Schedule

Each station needs to have seasonal conditions managed within the WIMS model. WIMS is in the process of continually being updated to remove the need for user interface actions daily; however, it is important to review WIMS periodically throughout the season to ensure observations and associate fire danger calculations are being accurately recorded.

6.1.9.1 Winter

- ✓ Monitor weather observations to ensure observations are being recorded.
- ✓ NFDRS outputs
    - Based on weather conditions, are fuels wet flagged or is snow covering the ground but NFDRS outputs are still being recorded?

6.1.9.2 Spring

- ✓ Approximately mid-May, initiate station green-up based on the expectation that the peak of green-up across the landscape is generally in early June. Normalized Difference in Vegetative Index (NDVI) imagery can be used.

6.1.9.3 Summer

- ✓ Fuels generally cure across the in mid-to-late July.

6.1.9.4 Fall

- ✓ Once a killing frost has occurred in the fall, the station herb state should be set to frozen. A curing forest involves several days with minimum temperatures at approximately 28 degrees or less, for several hours.

6.2 *Daily Schedule*

Personnel at the Blue Mountain Interagency Dispatch Center (BMIDC) and John Day Interagency Dispatch Center (JDIDC) will access WIMS daily and enter observations for stations in their respective dispatch area.

- Data – Quality Control
  - Weather reading for the previous 24 hours will be checked by review hourly reading for abnormal readings, potentially indicating an instrument error.
  - WIMS no longer requires the user to "publish" (change the R to an O) in the WIMS program.
  - Review of data should be accomplished prior to 1500 each day to ensure NWS trend forecasts can entered allowing for next day forecasted indices to be available.

- Fire Danger Chart
  - DIDX and DOBS will be downloaded from WIMS daily after forecasted indices become available then the Microsoft Excel Workbook for BMT_NFDRS_Tracking will be opened, the "Import_DIDX_DOBS" macro executed, automatically updating the workbook. Instructions will be stored with the Excel Workbook.

7.0 Weather Station Monitoring and Maintenance

Each agency is responsible for the annual maintenance and calibration of their RAWS. The Remote Sensing Laboratory located at the National Interagency Fire Center (NIFC) maintains and calibrates the BLM RAWS annually.

8.0 *Fire Danger Program Needs*

8.1 *Weather Stations*

Weather station siting, maintenance, and data management is to be evaluated annually to ensure the stations are meeting the intent and needs of the fire danger rating and weather forecasting. At a minimum prior to each fire season, 1 onsite visit is needed to perform annual maintenance which includes, visual inspection of station, changing appropriate sensors per maintenance schedule, and clearing vegetation from the station to ensure data observation integrity.

8.2 *Computer / Equipment*

No equipment is required to maintain existing Weather Stations in the network. All RAWS stations in the network have hardware installed with the station to perform maintenance checks.

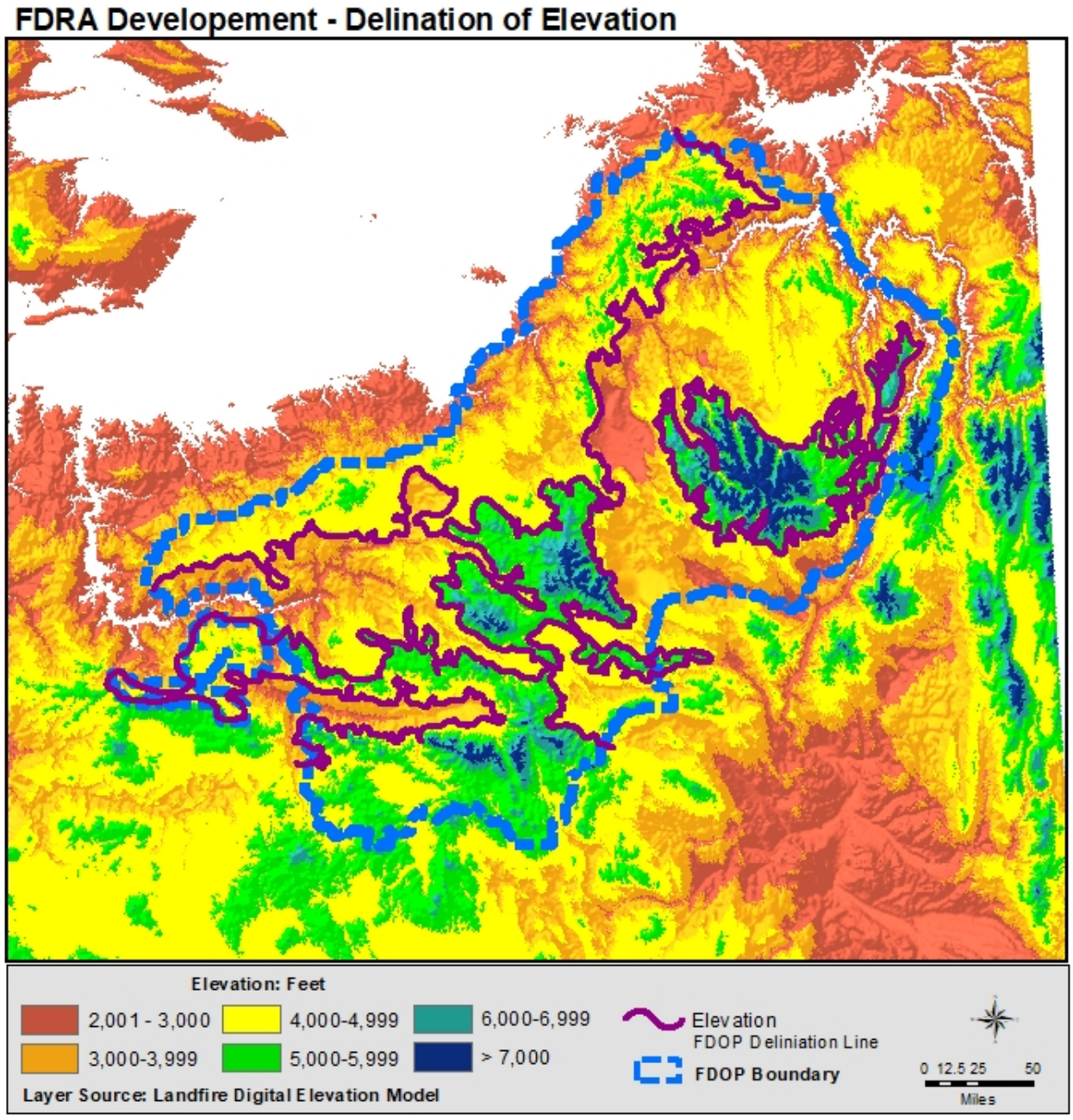
8.3 *Training*

Fire Danger Technical Specialists – Development of Fire Danger Technical Specialists takes several years to become proficient. Developing technical specialists requires forethought so that they are available when needed.

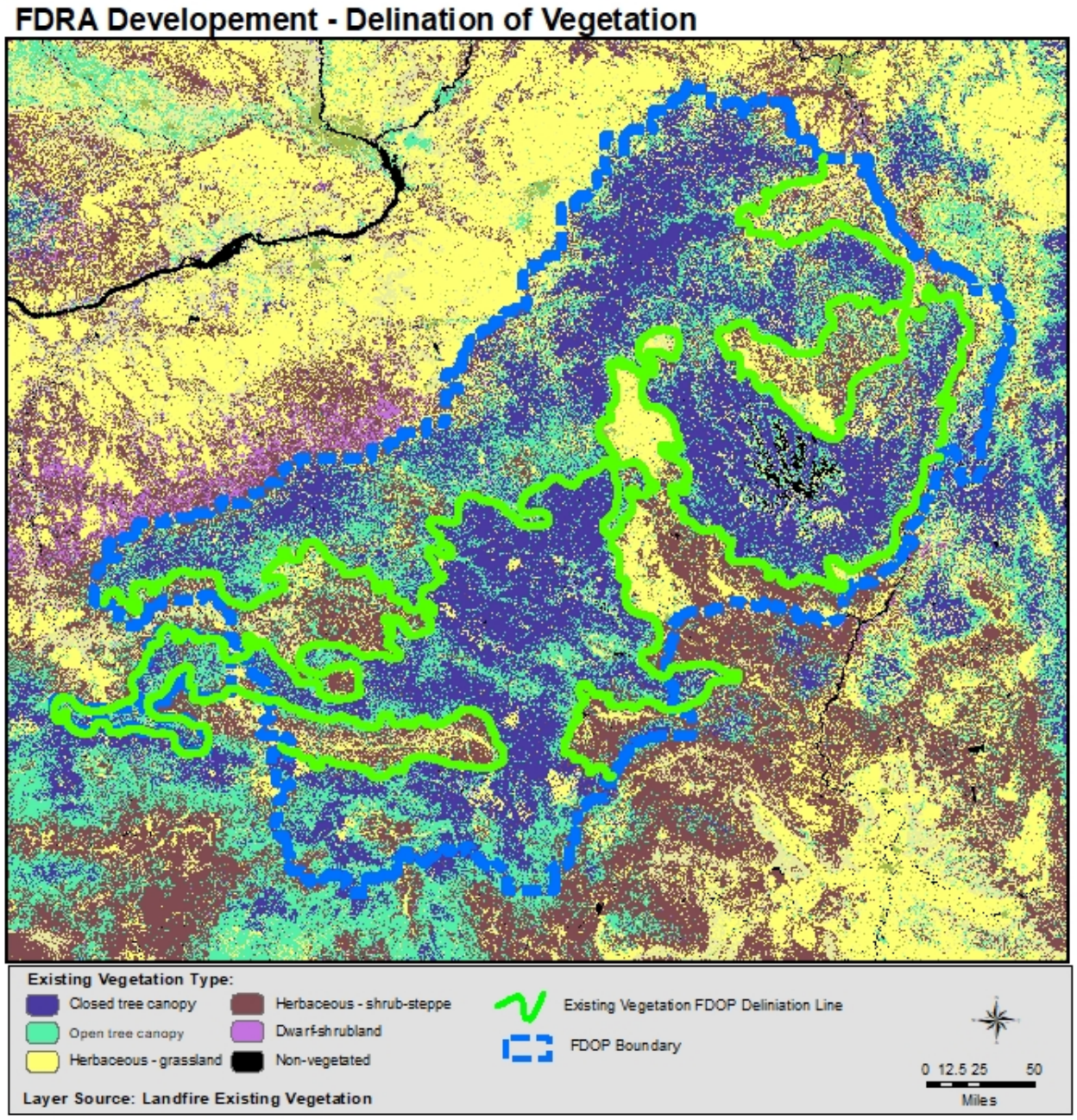
Fire managers – interpreting NFDRS data appropriately and utilizing NFDRS to make decisions within a fire program requires some understand of NFDRS. S-491is recommended for all area fire managers.

APPENDICES

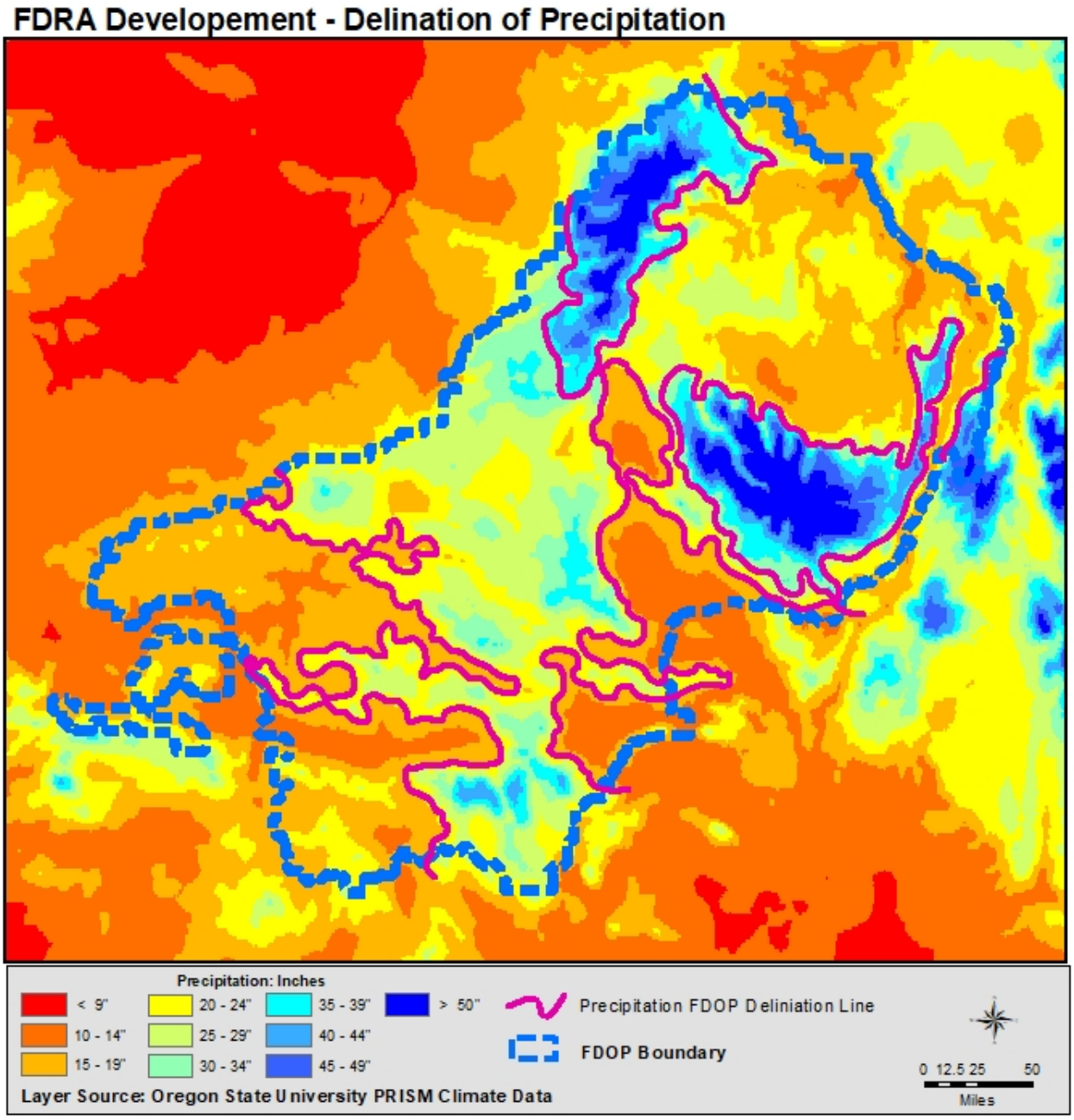
Appendix A: ***TOPOGRAPHY***



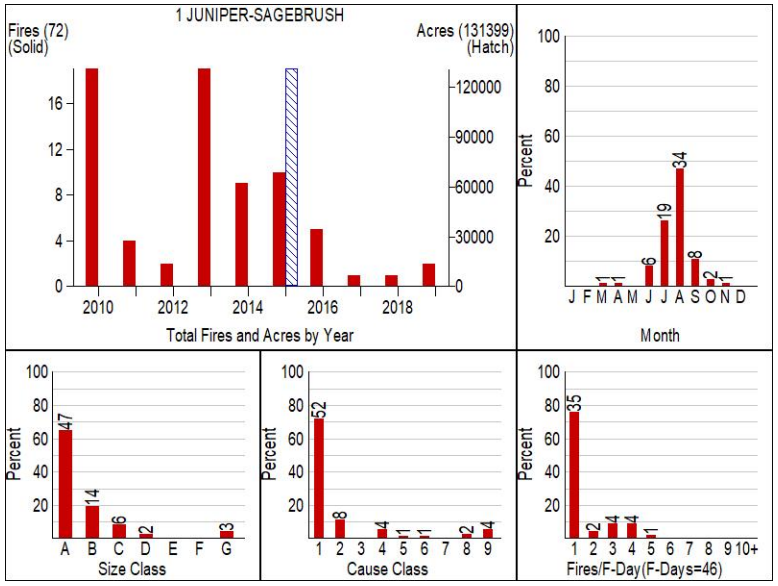
Appendix B: ***VEGETATION***



Appendix C: ***CLIMATE***

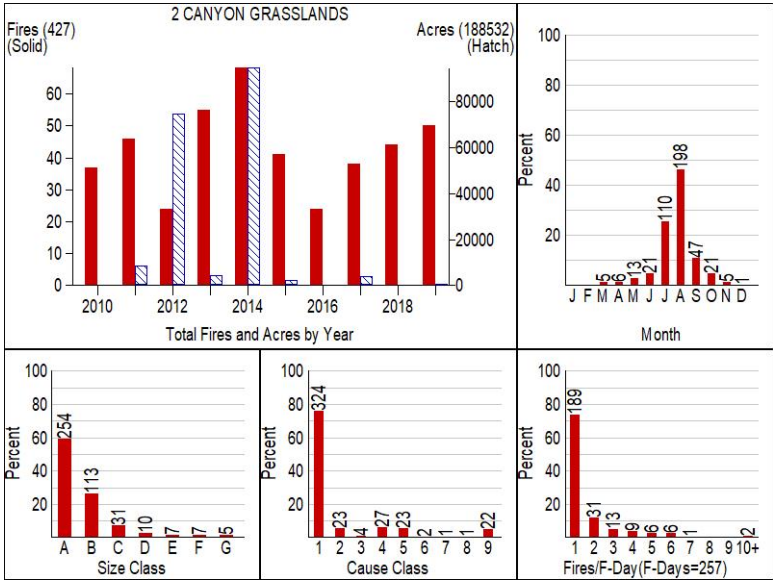


Appendix D: **FIRE SUMMARY**



FDRA #1 – JUNIPER SAGE – Fire Summary Graph

Fires: 72
Acres: 131,399
Primary Fire Cause: Lightning (72%)
Secondary Cause: Equipment (11%)
Fire Size (ac.) Percentile 80th|90th|97th: 1.5|24|17,823
First 100 ac. | First 300 ac. Fire: 8/1/2011(Maiden Gulch – 157 ac.) | 9/15/2020 (Dry Gulch – 17,823 ac.)



FDRA #2 – CANYON GRASSLANDS – Fire Summary Graph

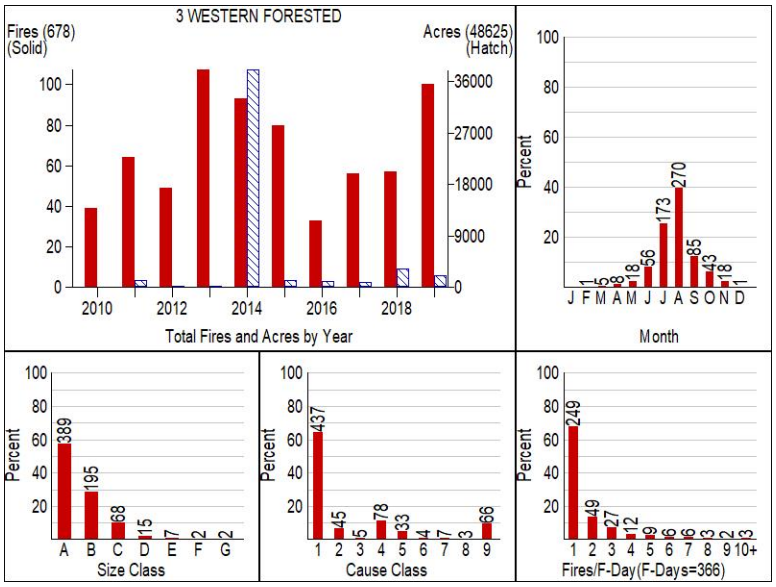
Fires: 427
Acres: 188,532
Primary Fire Cause: Lightning (75%)
Secondary Cause: Campfire (11%)
Fire Size (ac.) Percentile 80th|90th|97th: 2.5|22|630
First 100 ac. | First 300 ac. Fire: 6/8/2013 (Mail Trail – 2,450 ac.)

Size Class:

A =	0	— .25	acres
B =	.30	— 9	acres
C =	10	— 99	acres
D =	100	— 299	acres
E =	300	— 999	acres
F =	1000	— 4999	acres
G =	5000	+	acres

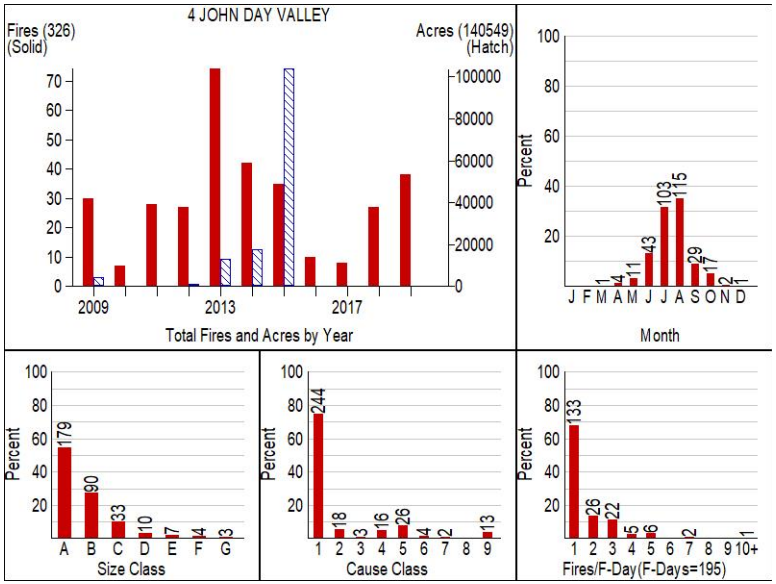
Cause Class:

1 = Lightning	6 =Railroad
2 = Equipment	7 =Arson
3 = Smoking	8 =Children
4 = Campfire	9 =Misc
5 = Debris Burning	



FDRA #3 – Western Forested – Fire Summary Graph

Fires: 678
Acres:48,525
Primary Fire Cause: Lightning (65%)
Secondary Cause: Campfire (11%)
Fire Size (ac.) Percentile 80th|90th|97th: 3|20|130
First 100 ac. | First 300 ac. Fire: 6/29/2015 (Rocky Flat – 127 ac.) | 7/13/2014 (Service Creek – 385 ac.)



FDRA # 4 – John Day Valley Fire Summary Graph

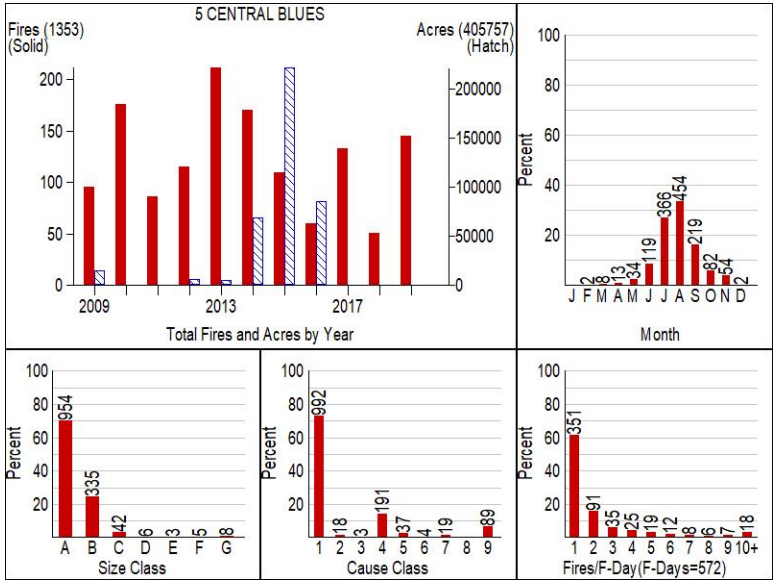
Fires: 325
Acres:140,549
Primary Fire Cause: Lightning (74%)
Secondary Cause: Debris Burning (9%)
Fire Size (ac.) Percentile 80th|90th|97th: 5|30|107
First 100 ac. | First 300 ac. Fire: 6/15/2016 (Gillman Flat – 107 ac.) | 6/28/2015 (Jones Canyon – 840 ac.)

Size Class:

A =	0	— .25	acres
B =	.30	— 9	acres
C =	10	— 99	acres
D =	100	— 299	acres
E =	300	— 999	acres
F =	1000	— 4999	acres
G =	5000	+	acres

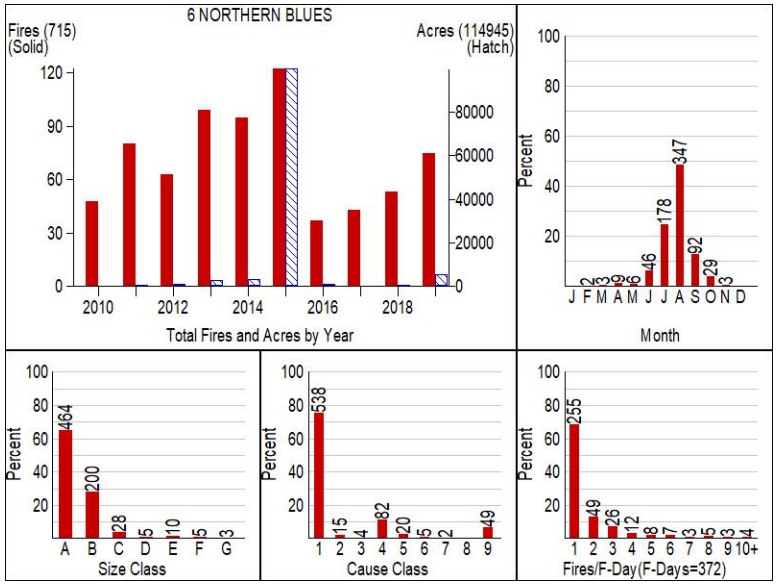
Cause Class:

1 = Lightning	6 =Railroad
2 = Equipment	7 =Arson
3 = Smoking	8 =Children
4 = Campfire	9 =Misc
5 = Debris Burning	



FDRA #5 – Central Blues Fire Summary Graph

Fires: 1,353
Acres:405,757
Primary Fire Cause: Lightning (76%)
Secondary Cause: Campfire (12%)
Fire Size (ac.) Percentile 80th|90th|97th 0.3|1.5|24
First 100 ac. | First 300 ac. Fire: 6/7/2016 (Wolf – 241 ac.) | 6/29/2015 (West Fork – 928 ac.)



FDRA #6 – Northern Blues Fire Summary Graph

Fires: 715
Acres:114,945
Primary Fire Cause: Lightning (75%)
Secondary Cause: Campfire (11%)
Fire Size (ac.) Percentile 80th|90th|97th 0.7|4|100
First 100 ac. | First 300 ac. Fire: 7/1/2015 (Dennis Creek – 157 ac.) | 7/28/2015 (Warner Gulch – 470 ac.)

Size Class:

A =	0	— .25	acres
B =	.30	— 9	acres
C =	10	— 99	acres
D =	100	— 299	acres
E =	300	— 999	acres
F =	1000	— 4999	acres
G =	5000	+	acres

Cause Class:

1 = Lightning	6 =Railroad
2 = Equipment	7 =Arson
3 = Smoking	8 =Children
4 = Campfire	9 =Misc
5 = Debris Burning	

Appendix E: ***FIREFAMILYPLUS*** **Analysis**

Fire Family Analysis Settings
The following parameters were used to prepare each of the analysis runs:

RAWS stations were placed into SIGs based on comparing weather and fire danger outputs for each station using Microsoft Excel to graph seasonal data to compare: Temperature, Fuel Moisture (1, 10, 100, 1000 hr, live, etc) ERC and BI.

- Fire Season: June 1 – October 31.
- Data Years: 10-years was selected for all FDRAs unless good quality data was available for the entire calendar year.
- Analysis Period: 1 Day
- Large Fire Day: 300 acres.
    - During threshold develop for each breakpoint, fire business analysis was performed on 1, 10, 50, 100, 300, 1000 and 5,000 acres.
- Multiple Fire Day: 5
- Fuel Models: Reviewed all 5 NFDRS2016 fuel models. Selected Fuel Model Y for analysis which generally performed the best.
- Variables: Analyzed ERC and BI as these are the historical values used in previous FDOPs and have worked well to support fire business decisions historically.

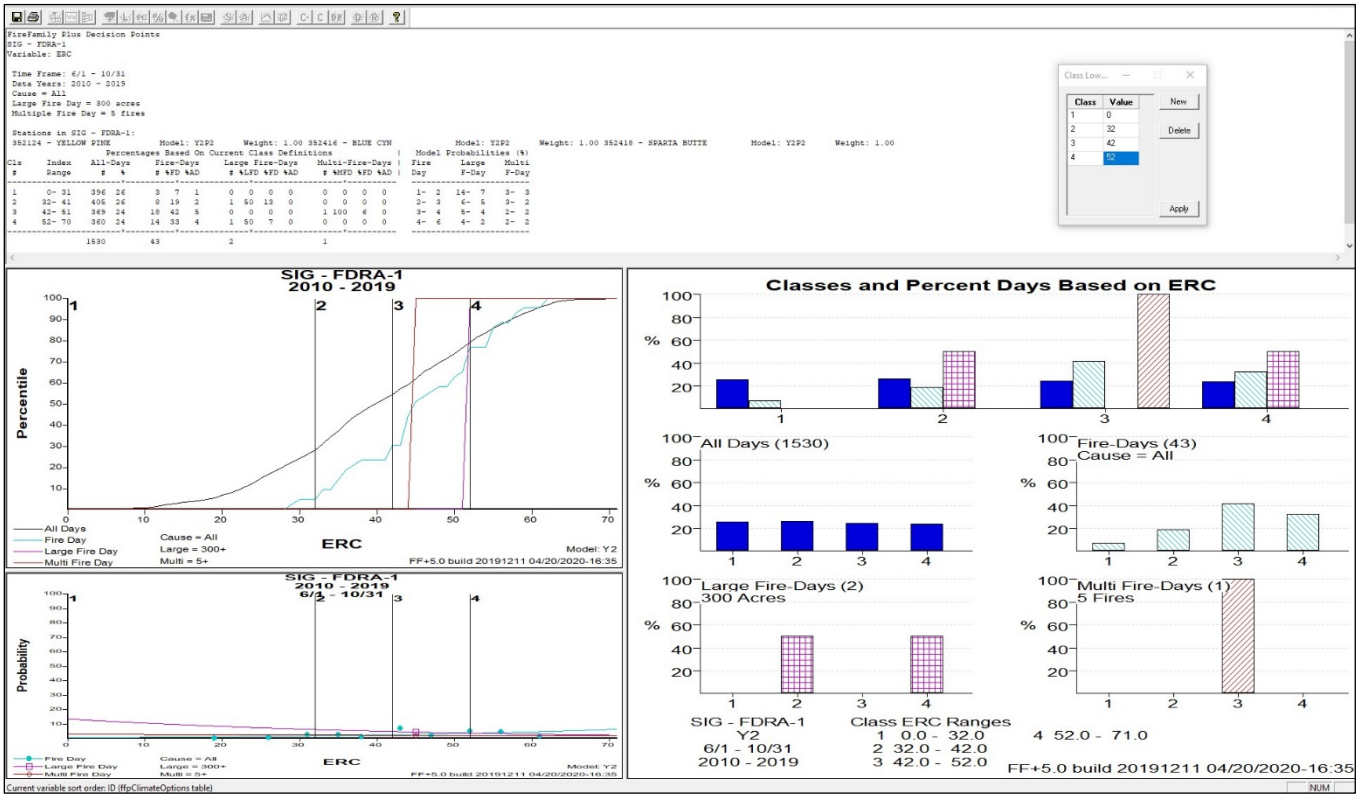
Threshold Setting
Using Fire Family Plus, statistical analysis was performed on several weather stations and SIGs for each FDRA. The 2013 SIGs were used to start with; incorporated new stations and SIGs based on analysis and feedback from unit program managers. Reviewed correlations between ERC and fire history.

Reviewing thresholds for a variety of size classes resulted in determining that 300 acres was generally produced similar results for 100-, 1,000- and 5,000-acre during analysis. These size classes were chosen to be analyzed in review of resource availability in footprint and potential resource commitment of extended incidents. The break point chosen generally align when an increase in probably was observed in the graph for each of the 4 decisions. Low – Generally less than 1 acres fires; Moderate – Generally less than 50 acre fires occur with a small percentage of larger fires, High – Generally 300 acres fires occurred, Extreme – Generally fires greater than 5,000 acres along with days where large fires on the landscape experience significant growth days.

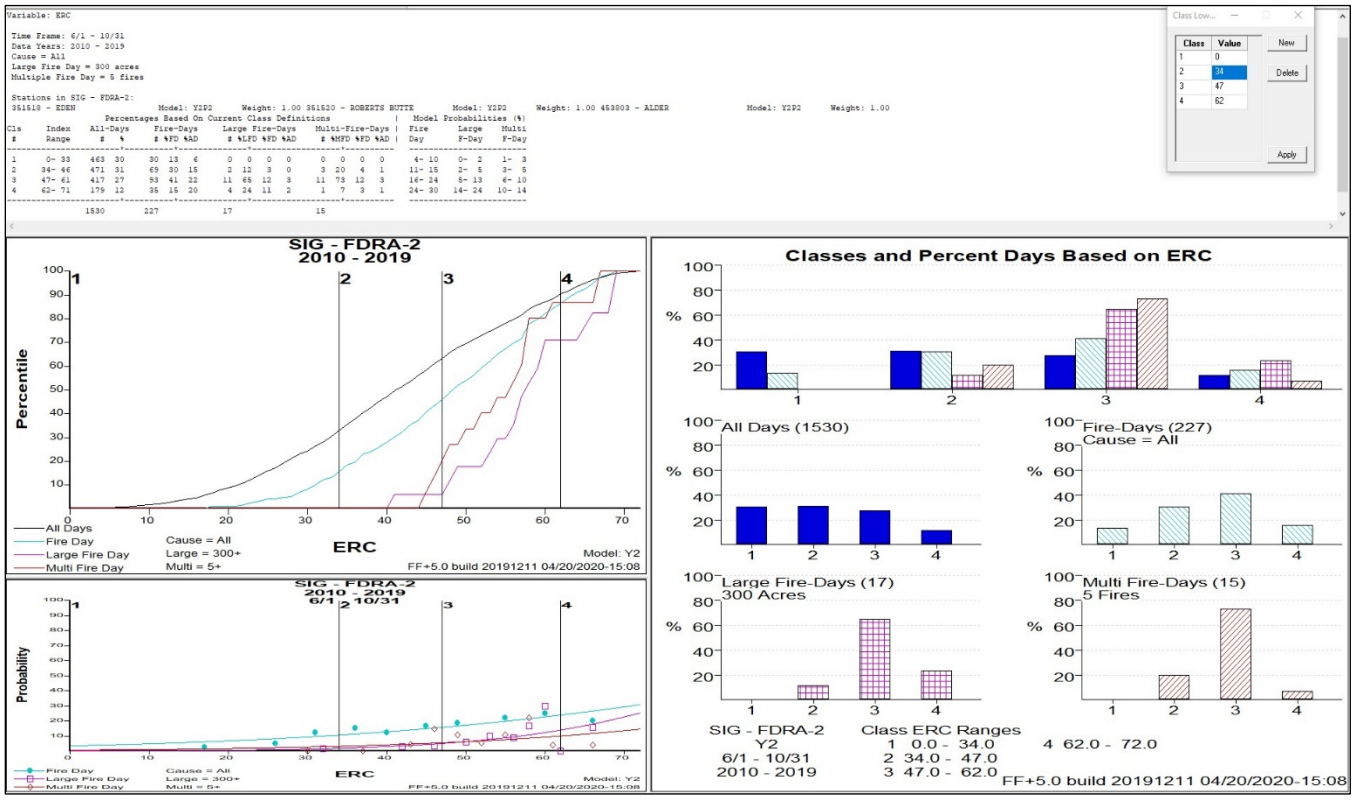
This process was used for both Dispatch Response Levels and Fire Danger Adjective Decision Classes.

Fire Danger Adjective Thresholds

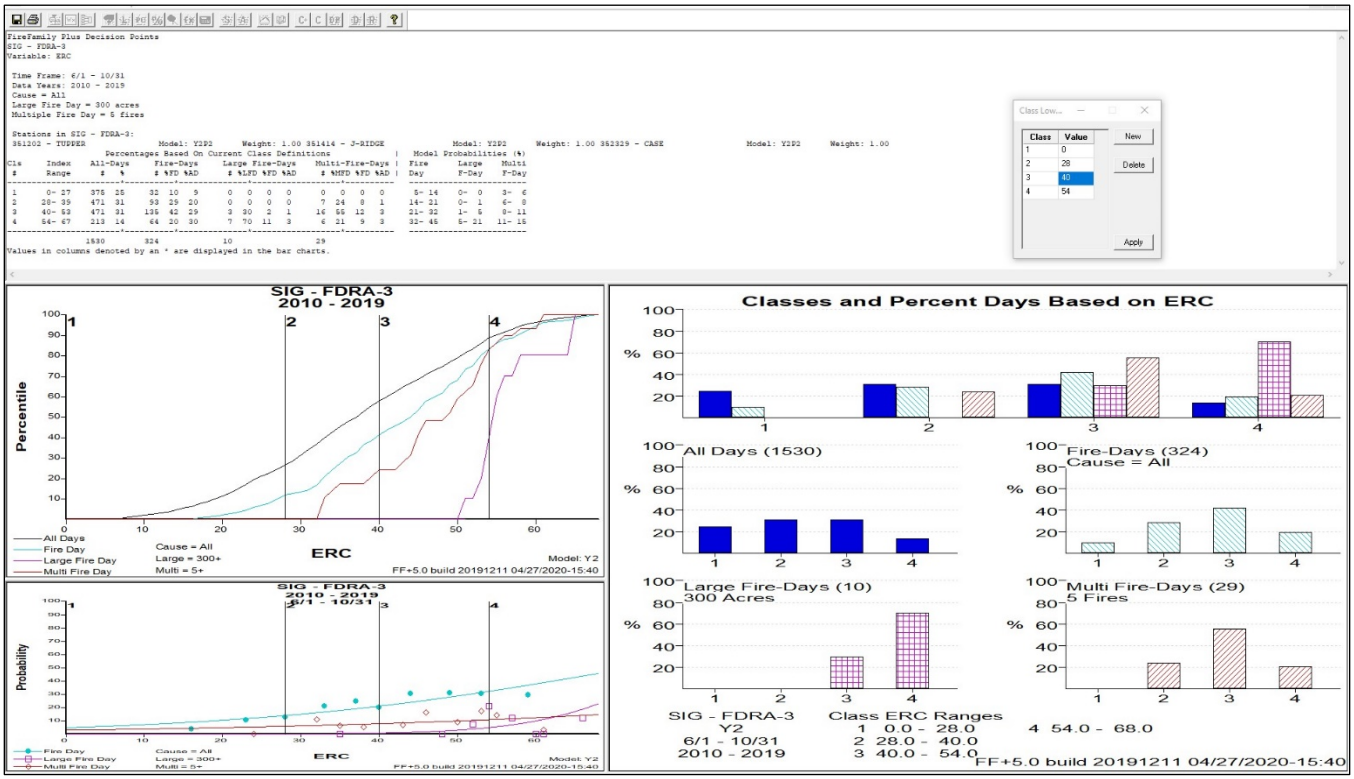
FDRA 1 – Juniper Sagebrush



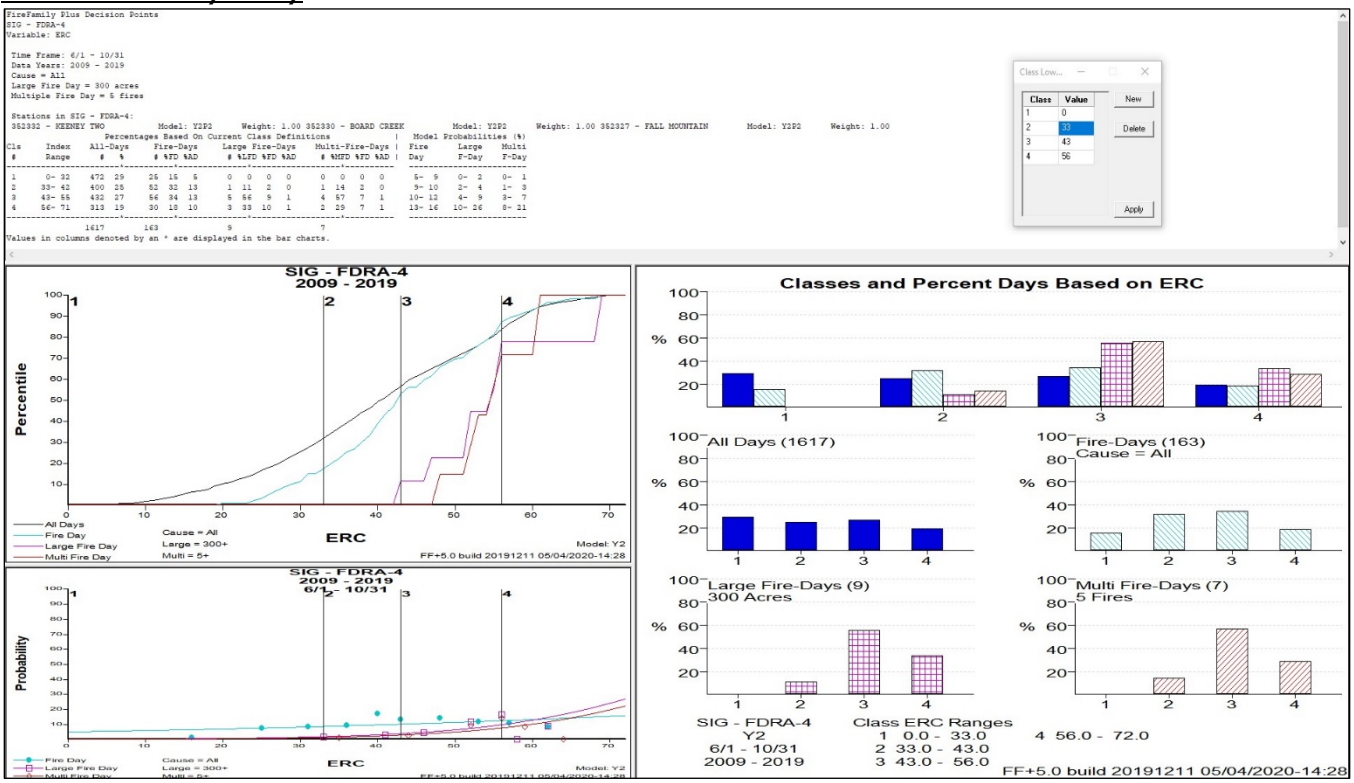
FDRA 2 – Canyon Grasslands



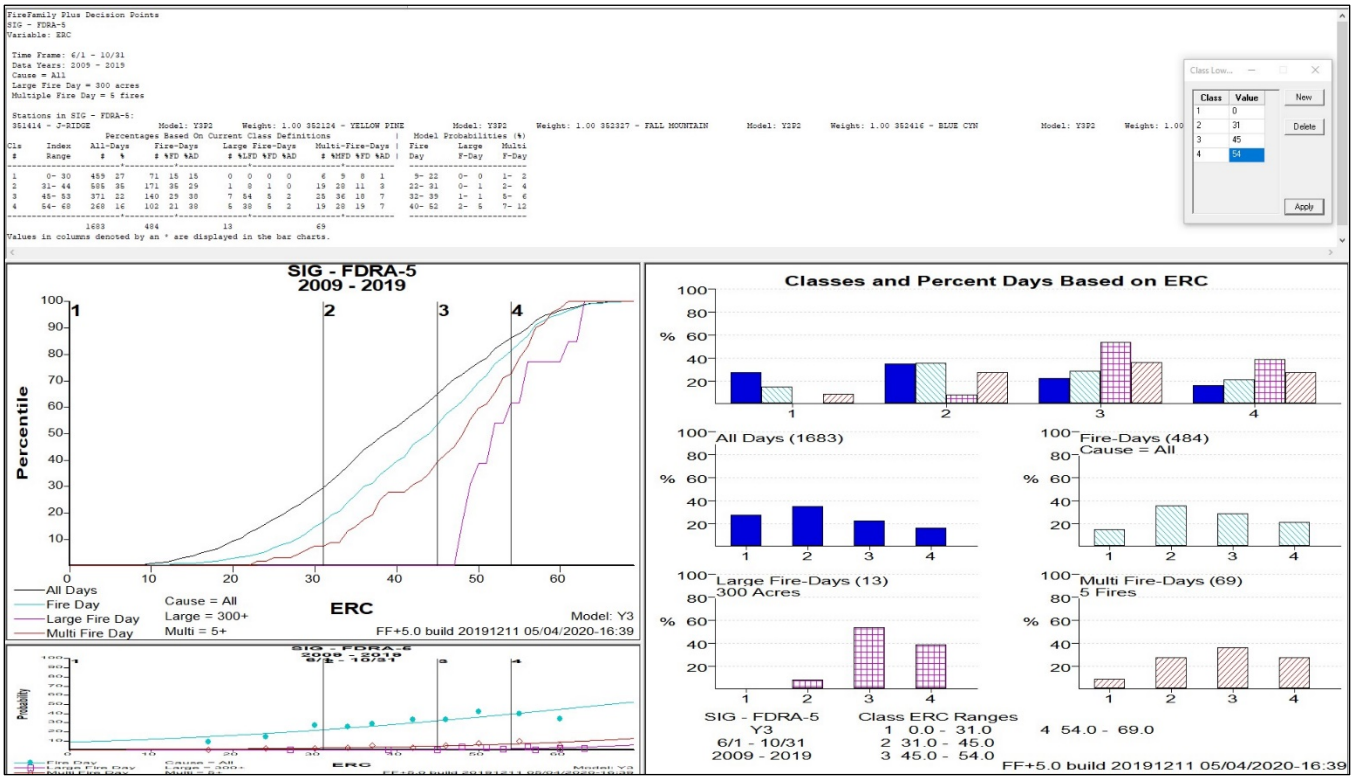
FDRA 3 – Western Forested



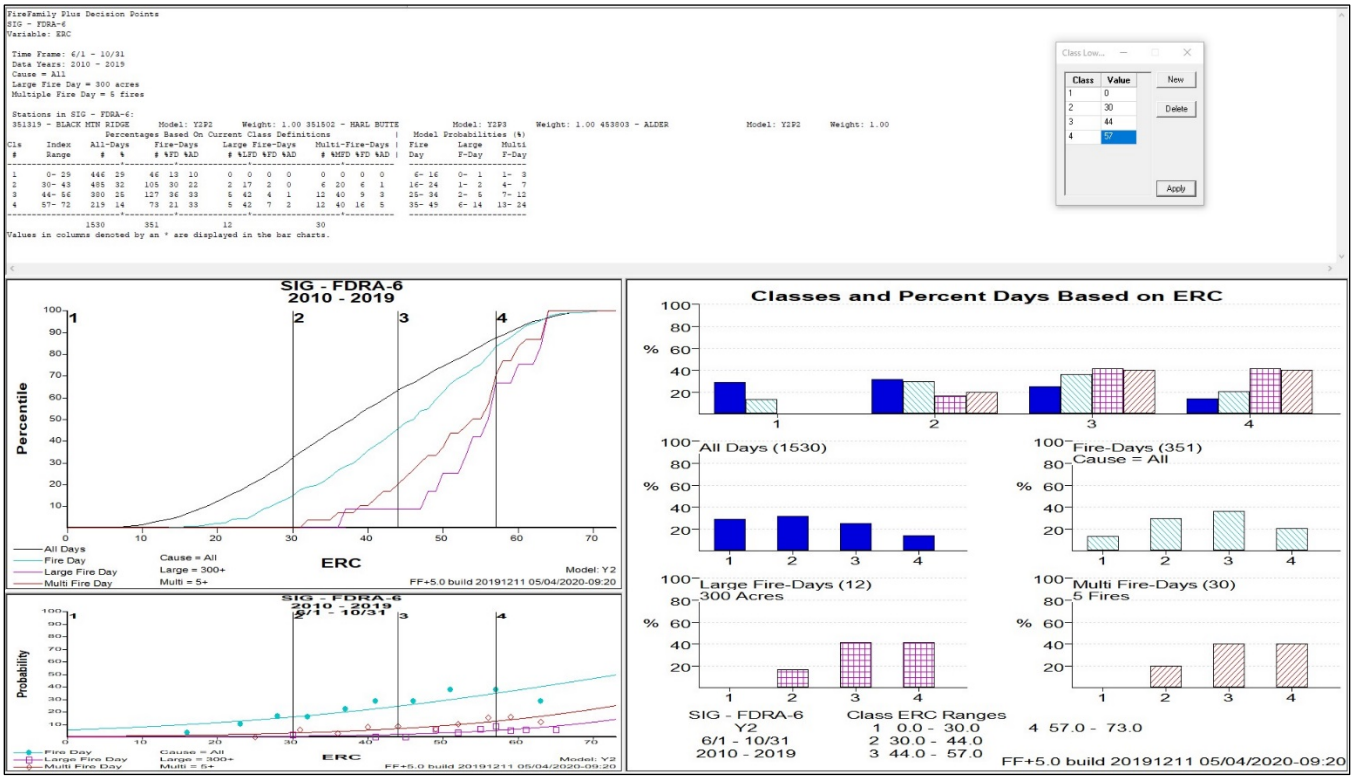
FDRA 4 – John Day Valley



FDRA 5 – Central Blues

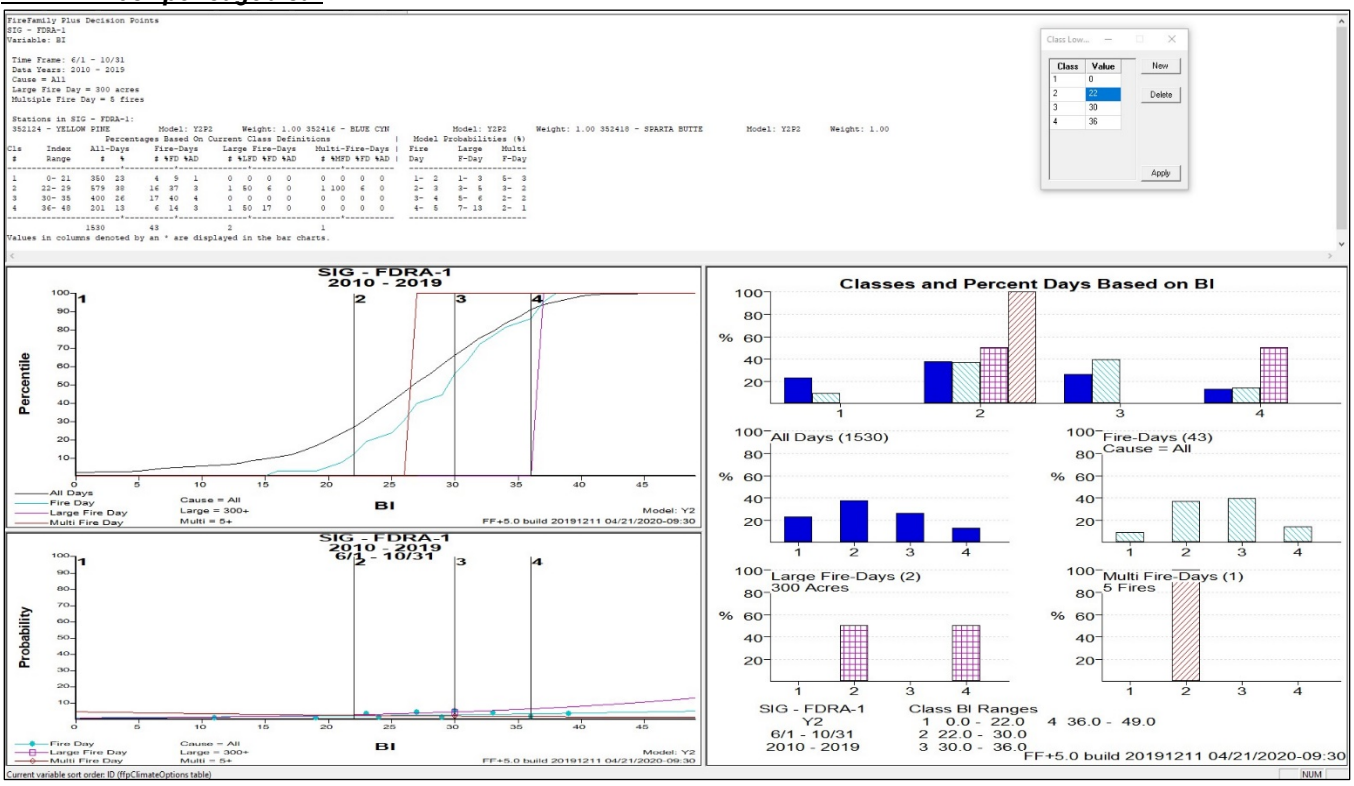


FDRA 6 – Northern Blues

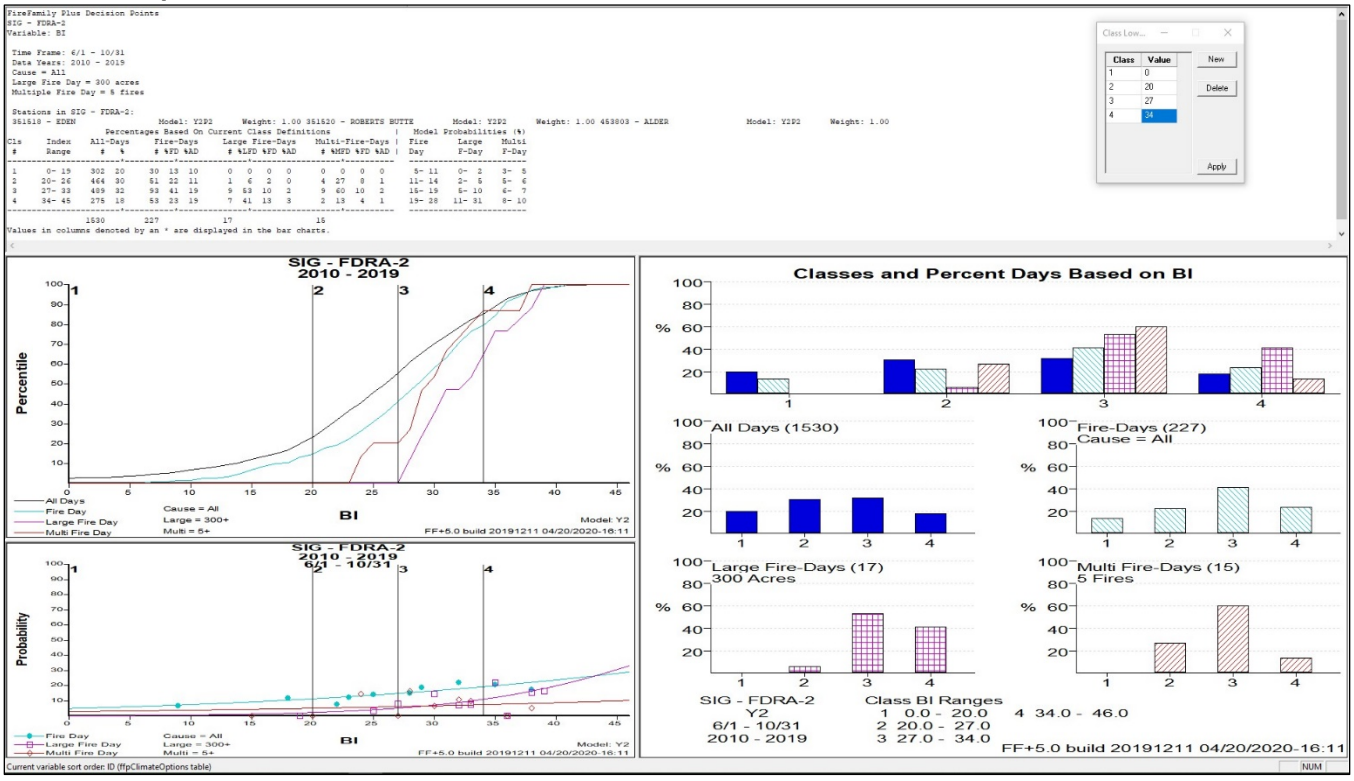


Dispatch Response Level Thresholds

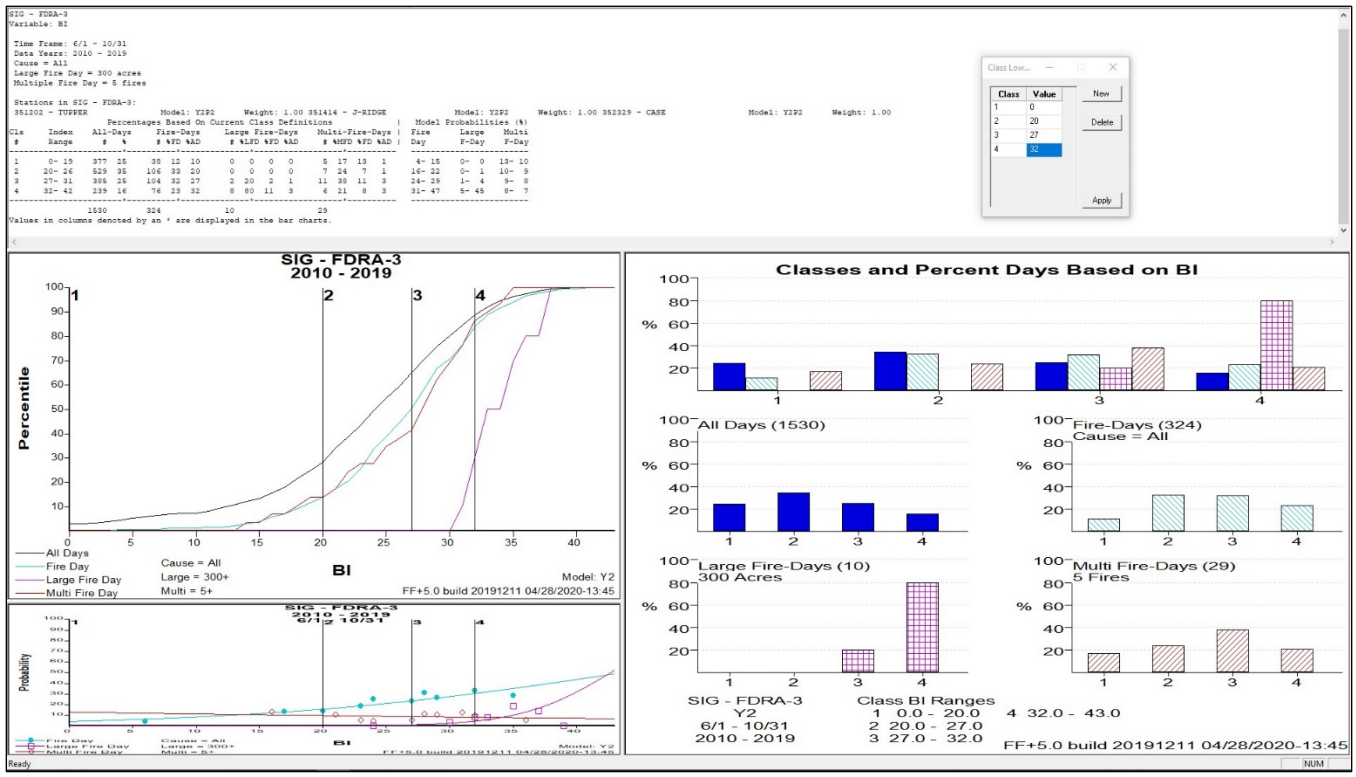
FDRA 1 – Juniper Sagebrush



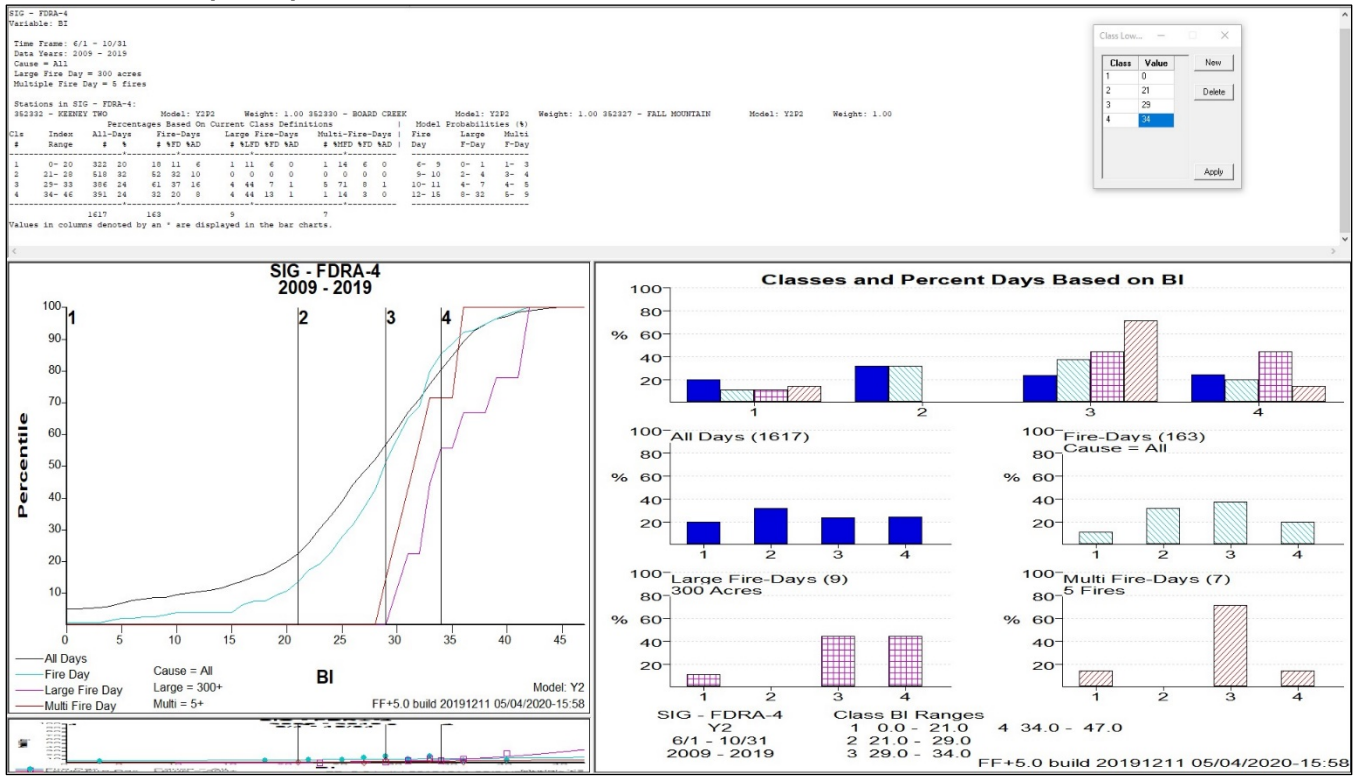
FDRA 2 – Canyon Grasslands



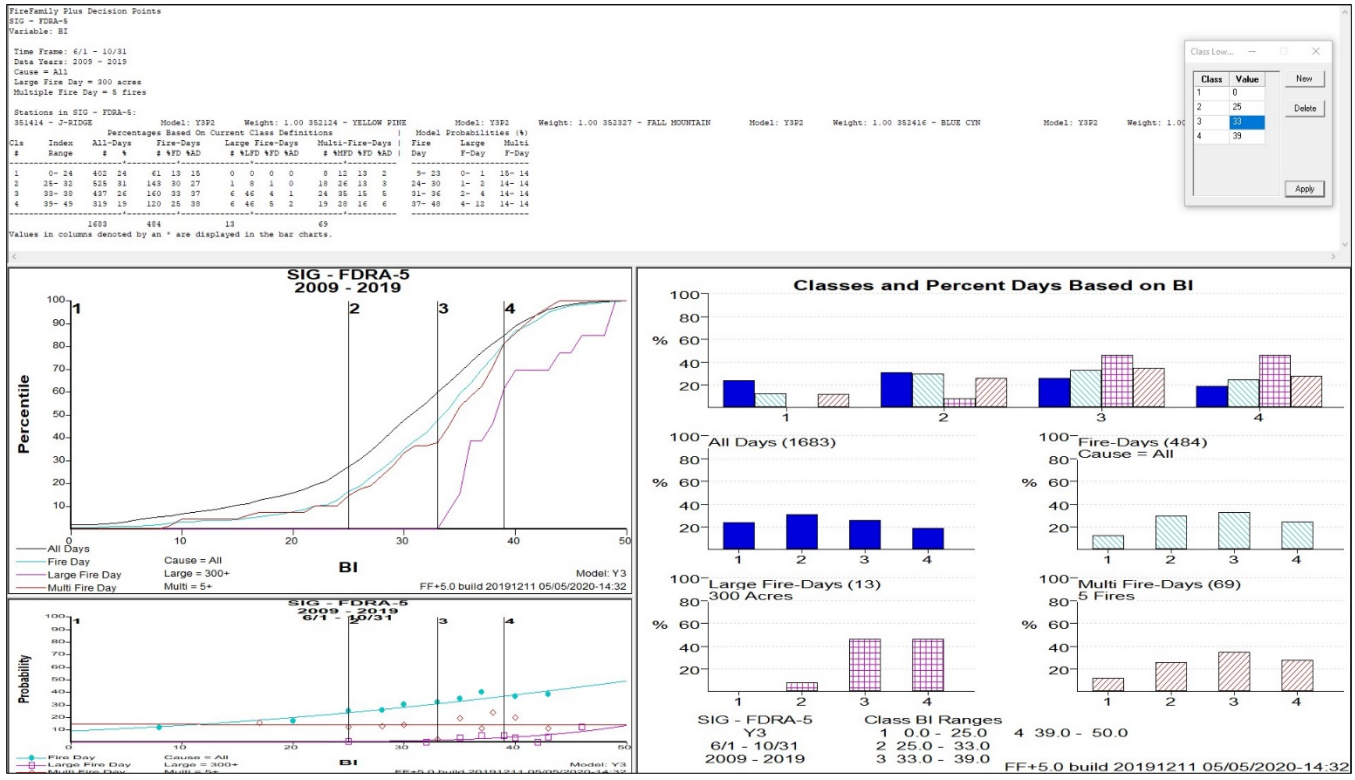
FDRA 3 – Western Forested



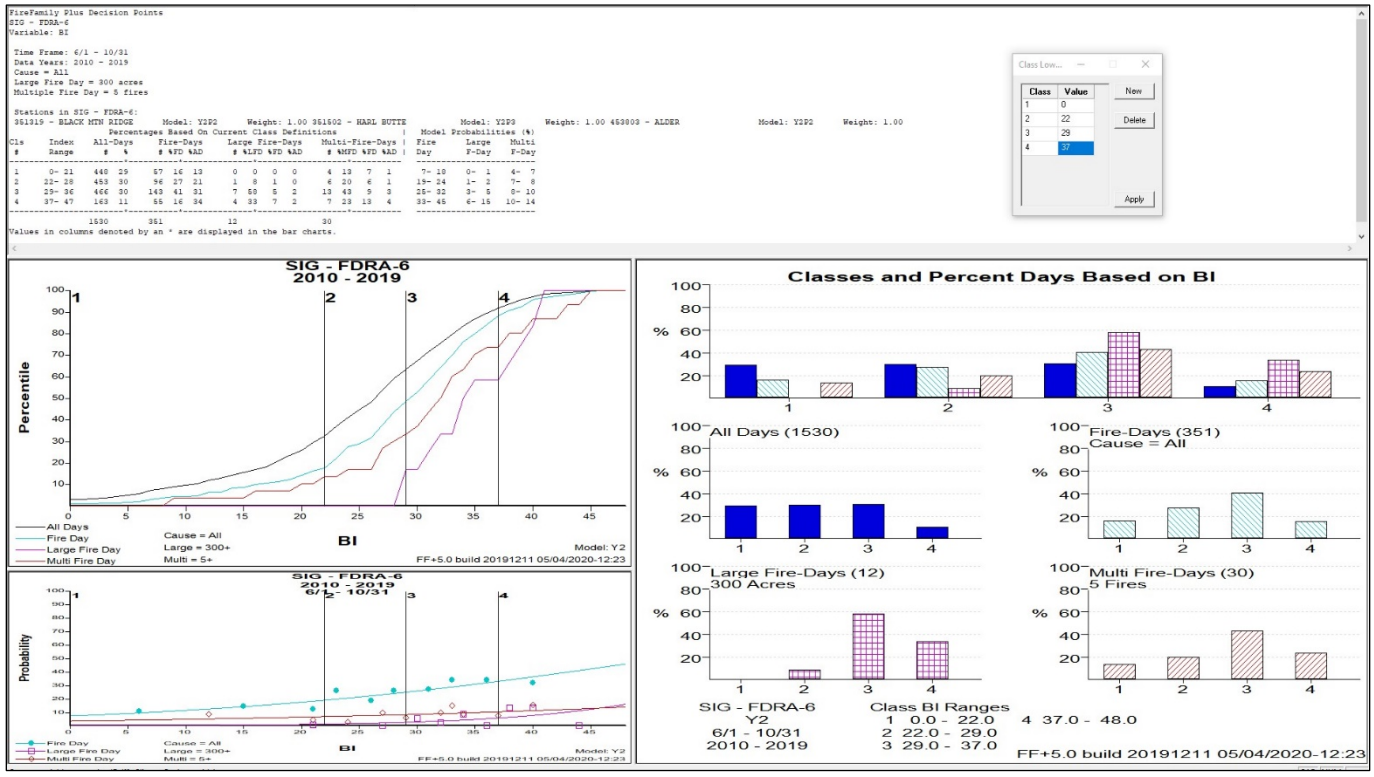
FDRA 4 – John Day Valley



FDRA 5 – Central Blues



FDRA 6 – Northern Blues

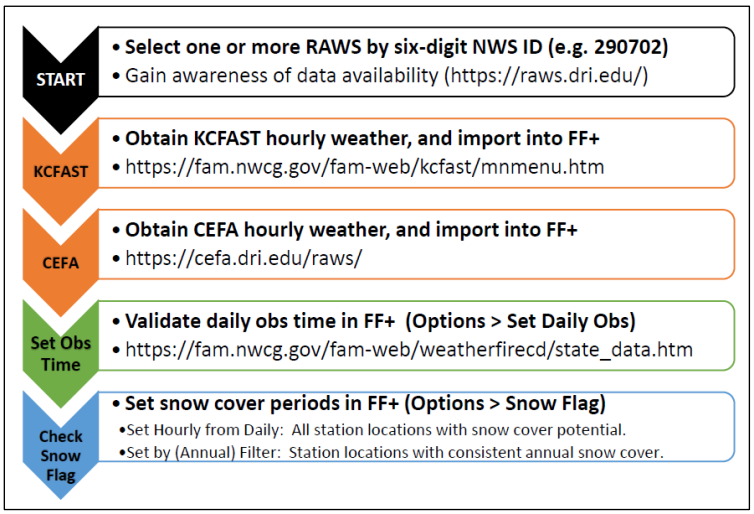


Fire Statistics Results

FDRA	SIG/Station#	Years	Annual Filter	Variable	Model	Greenup	Freeze	FD Type	FD R^2	FD Chi^2	FD P-Val	FD P-Range	LFD	LFD R^2	LFD Chi^2	LFD P-Val	LFD P-Range	MFD	MFD R^2	MFD Chi^2	MFD P-Val	MFD P-Range
1	SIG - FDRA-1	2010 - 2019	6/1 - 10/31	BI	Y2	25-May	31-Dec	All	0.25	10.00	0.0000	0.01 - 0.05	300 (C)	0.00	0.00	0.0000	0.01 - 0.07	5 (C)	0.00	0.00	0.0000	0.02 - 0.05
1	SIG - FDRA-1	2010 - 2019	6/1 - 10/31	ERC	Y2	25-May	31-Dec	All	0.25	20.04	0.0000	0.01 - 0.07	300 (C)	0.00	0.00	0.0000	0.03 - 0.08	5 (C)	0.00	0.00	0.0000	0.02 - 0.03
2	SIG - FDRA-2	2010 - 2019	6/1 - 10/31	BI	Y2	15-May	31-Dec	All	0.73	8.13	0.4211	0.05 - 0.29	0000 (C	0.97	0.07	0.0000	0.00 - 0.07	5 (C)	0.03	14.97	0.0597	0.03 - 0.09
2	SIG - FDRA-2	2010 - 2019	6/1 - 10/31	ERC	Y2	15-May	31-Dec	All	0.75	15.14	0.0564	0.04 - 0.31	0000 (C	0.00	1.12	0.0000	0.00 - 0.09	5 (C)	0.18	13.38	0.0995	0.02 - 0.13
3	SIG - FDRA-3	2010 - 2019	6/1 - 10/31	BI	Y2	15-Apr	31-Dec	All	0.87	10.08	0.2594	0.04 - 0.49	300 (C)	0.71	4.59	0.4681	0.00 - 0.39	5 (C)	0.06	3.84	0.8710	0.07 - 0.13
3	SIG - FDRA-3	2010 - 2019	6/1 - 10/31	ERC	Y2	15-Apr	31-Dec	All	0.76	20.20	0.0096	0.05 - 0.46	300 (C)	0.44	16.36	0.0120	0.00 - 0.23	5 (C)	0.14	9.21	0.3246	0.04 - 0.15
4	SIG - FDRA-4	2010 - 2019	6/1 - 10/31	BI	Y2	5-Jun	31-Dec	All	0.21	25.18	0.0014	0.06 - 0.16	300 (C)	0.87	0.99	0.9636	0.00 - 0.22	5 (C)	0.12	3.45	0.3278	0.01 - 0.07
4	SIG - FDRA-4	2010 - 2019	6/1 - 10/31	ERC	Y2	5-Jun	31-Dec	All	0.24	26.00	0.0010	0.06 - 0.17	300 (C)	0.44	3.29	0.6549	0.01 - 0.23	5 (C)	0.42	2.88	0.5780	0.00 - 0.19
5	SIG - FDRA-5	2010 - 2019	6/1 - 10/31	BI	Y2	15-May	31-Dec	All	0.88	7.77	0.4564	0.09 - 0.52	300 (C)	0.49	5.04	0.4112	0.00 - 0.14	5 (C)	0.00	5.64	0.6872	0.14 - 0.15
5	SIG - FDRA-5	2010 - 2019	6/1 - 10/31	ERC	Y2	15-May	31-Dec	All	0.72	23.67	0.0026	0.10 - 0.53	300 (C)	0.33	14.35	0.0453	0.00 - 0.10	5 (C)	0.53	4.78	0.7812	0.06 - 0.24
6	SIG - FDRA-6	2010 - 2019	6/1 - 10/31	BI	Y2	15-May	15-Oct	All	0.80	12.97	0.1130	0.07 - 0.46	300	0.53	8.15	0.3197	0.00 - 0.07	5	0.80	2.42	0.9654	0.00 - 0.07
6	SIG - FDRA-6	2010 - 2019	6/1 - 10/31	ERC	Y2	15-May	15-Oct	All	0.75	25.99	0.0011	0.07 - 0.50	300	0.47	9.76	0.2821	0.00 - 0.05	5	0.73	6.86	0.5523	0.00 - 0.11

Appendix F: ***WEATHER***

With the transition to NFDRS2016, the historical dataset utilized by the 2013 Blue Mtn. FDOP was not able to be utilized with the NFDRS2016 model. This is due to the need for weather observations to include hourly data for each full year which included the same weather observations historically needed; however, the data also must include Solar Radiation values. Historical dataset from the 2013 is archived; for this FDOP, new weather data was attained for all available station years following the guidelines recommend by the NWCG Fire Danger Subcommittee:

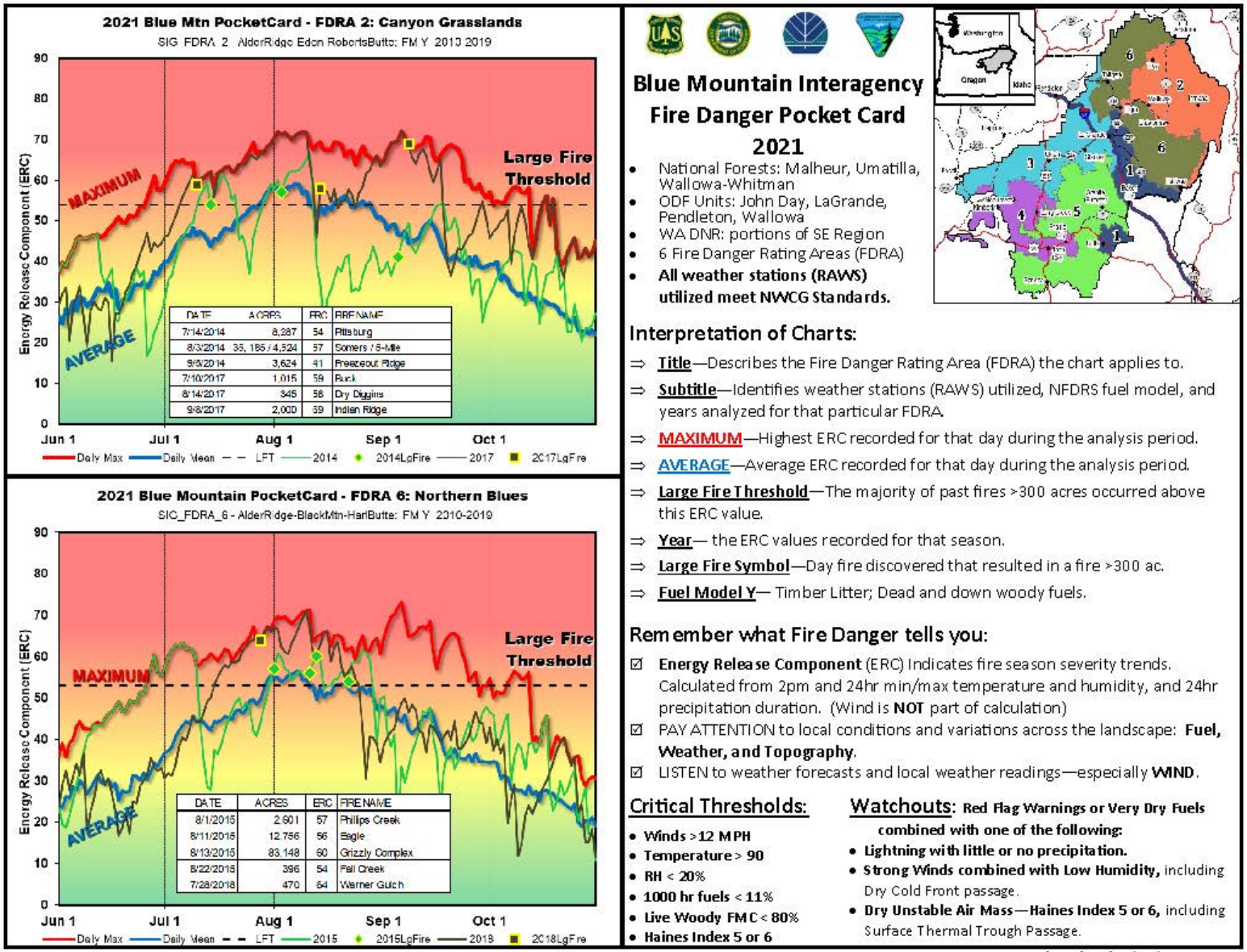


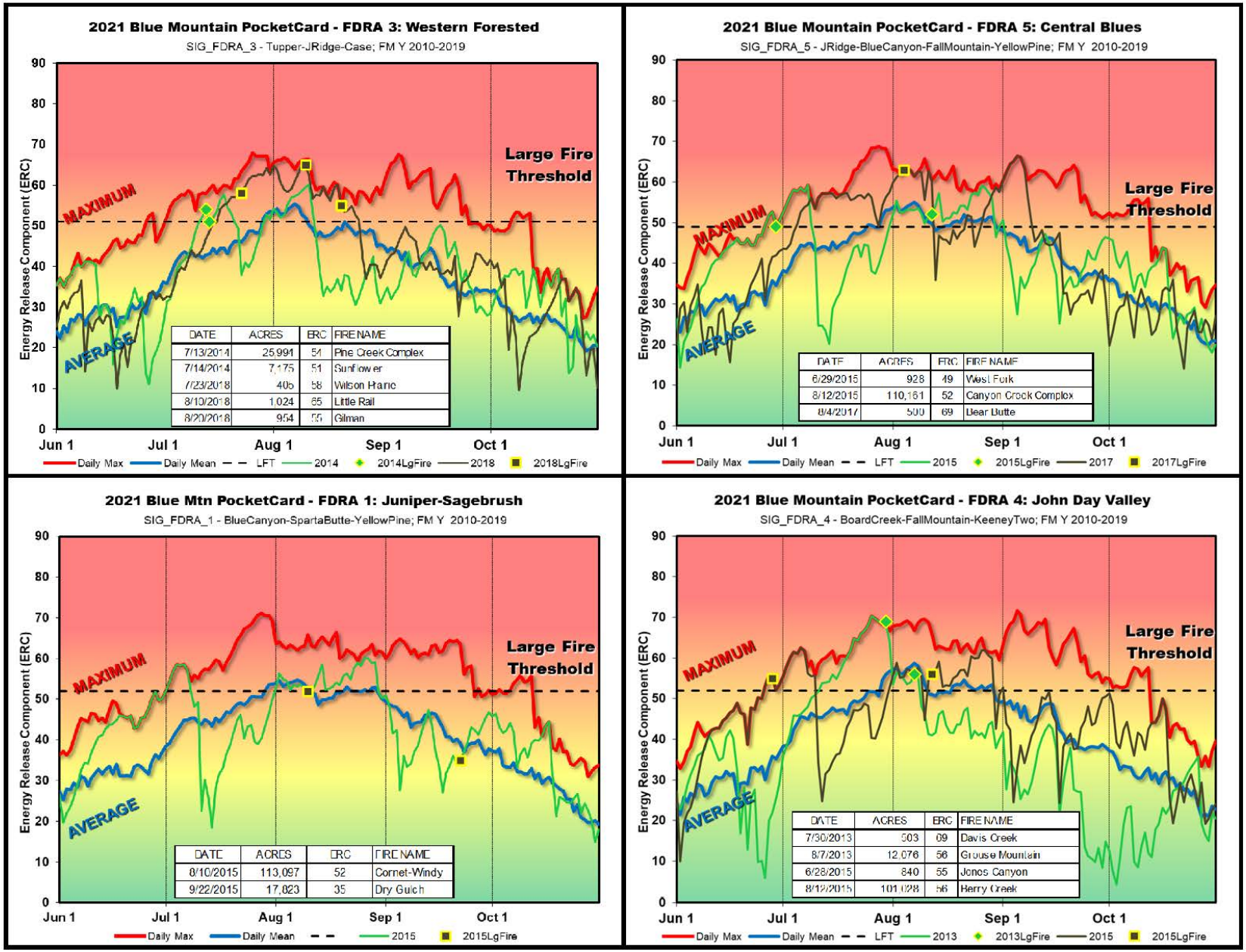
In review of Snow Flags, all stations and data years used in the analysis were reviewed. Snow Flags were set utilizing google earth and associated NWS snow coverage analysis from: https://www.nohrsc.noaa.gov/nsa. For each year data was available for use in the analysis.

Overall data was reviewed to determine large gaps (missing data) and obvious errors by sorting on the high and low ends of observations; additionally, individual months during fire season was reviewed to review overall data quality. Missing data was correlated with other nearby RAWS stations and/or other NWS weather stations to ensure data was available for the core fire season months.

STATION NAME	WIMS ID	NESDIS ID	AGENCY | OWNER	AVAILABLE DATA	ELEVATION	LATITUDE	LONGITUDE	REPORT TIME	QC	Comments
ALDER RIDGE	453803	3245E2F4	USFS | UMF	2002-2020	4,500	46.268333	-117.498333	00:10:20	Y	Good Data
ANTELOPE	353524	32652604	USFS | MAF	2009-2020	6,460	44.039722	-118.416389	00:12:00	N	Not Used
BLACK MTN RIDGE	351319	327F70B4	USFS | UMF	2007-2020	4,965	45.573611	-118.238611	00:17:00	Y	Good Data
BLUE CANYON	352416	325DA2C6	USFS | WWF	2004-2020	4,200	44.67	-117.933611	00:55:30	Y	Good Data
BOARD CREEK	352330	325D4134	USFS | MAF	2009-2020	5,000	44.593333	-119.277778	00:25:45	Y	Good Data
CASE	352329	3245F182	USFS | UMF	2004-2020	3,800	44.971111	-118.929722	00:13:00	Y	Good Data
CRANE PRAIRIE	352305	32622430	USFS | MAF	2009-2020	5,500	44.157222	-118.471389	00:11:15	N	Not Used
EDEN	351518	3246157E	USFS | UMF	2009-2020	4,200	45.876389	-117.616389	00:09:50	Y	Good Data
ELK CREEK	352126	323EB48C	USFS | WWF	2005-2020	6,576	44.757778	-117.971111	00:06:00	N	Not Used
FALL MOUNTAIN	352327	3262F258	USFS | MAF	2009-2020	5,949	44.296944	-119.036944	00:11:30	Y	Good Data
FLAGSTAFF HILL	352123	3257D504	BLM | VALE	2007-2020	3,945	44.814167	-117.728889	00:55:30	N	Not Used
HARL BUTTE	351502	3262B152	USFS | WWF	2000-2020	6,071	45.319167	-116.8675	00:55:40	Y	Good Data
J RIDGE	351414	3262673A	USFS | WWF	2001-2020	5,180	45.113889	-118.403889	00:04:30	Y	Good Data
KEENEY TWO	352332	326C6352	USFS | MAF	2009-2020	5,120	44.666111	-118.921944	00:11:45	Y	Good Data
POINT PROM II	351419	326B7210	USFS | WWF	2001-2020	6,607	45.354722	-117.704444	00:04:45	N	Not Used
ROBERTS BUTTE	351520	3234D038	USFS | WWF	2002-2020	4,263	45.681667	-117.206389	00:55:50	Y	Good Data
SLIDE MOUNTAIN	352207	32604422	USFS | OCF	2004-2020	5,682	44.462222	-120.294444	00:06:20	N	Not Used
SPARTA BUTTE	352418	3234E5A2	USFS | WWF	2000-2020	4,278	44.885	-117.338333	00:55:20	Y	Good Data
TUPPER	351202	3245D76E	USFS | UMF	2007-2020	4,260	45.066389	-119.491111	00:12:50	Y	Good Data
YELLOWPINE	352124	323E9260	USFS | WWF	2002-2020	4,600	44.526389	-118.323056	00:57:15	Y	Good Data

Appendix G: ***POCKET CARD***





Card Produced: 4/21/2021 FF+5.0