# Northern Rockies Southwest Zone

## *Interagency Fire Danger Operating Plan*

2024-2026

United States Forest Service, Lolo & Bitterroot National Forests; Montana Department of Natural Resources, Missoula & Clearwater Units; Bureau of Indian Affairs; Confederated Salish & Kootenai Tribes, U.S. Fish & Wildlife Service, Bureau of Land Management

# Northern Rockies Southwest Zone

## *Interagency Fire Danger Operating Plan*

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# Northern Rockies Southwest Zone

## *Interagency Fire Danger Operating Plan*

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# Northern Rockies Southwest Zone

## *Interagency Fire Danger Operating Plan*

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# Major Updates


ERC and BI Thresholds

RUN CARDS

Developed Run Cards available

RAWS and SIGs

Changes in RAWS and SIGs within the FDOP

# TABLE OF CONTENTS

*Edits made to appendices within the FDOP will not require re-signature. A notice will be sent out to the SW Zone MAC Group of edits made.

# I. INTRODUCTION

## A. PURPOSE

The Northern Rockies Southwest Zone Interagency Fire Danger Operating Plan (FDOP) is intended to document a decision making process for agency administrators, fire program managers, fire operation specialists, dispatchers, agency cooperators, and firefighters by establishing interagency planning and response levels using the best available scientific methods and historical weather/fire data. 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.

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. Preparedness:

Interagency policy and guidance require numerous unit plans and guides 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 Figure 1.

This 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 Reference System (FMRS); 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

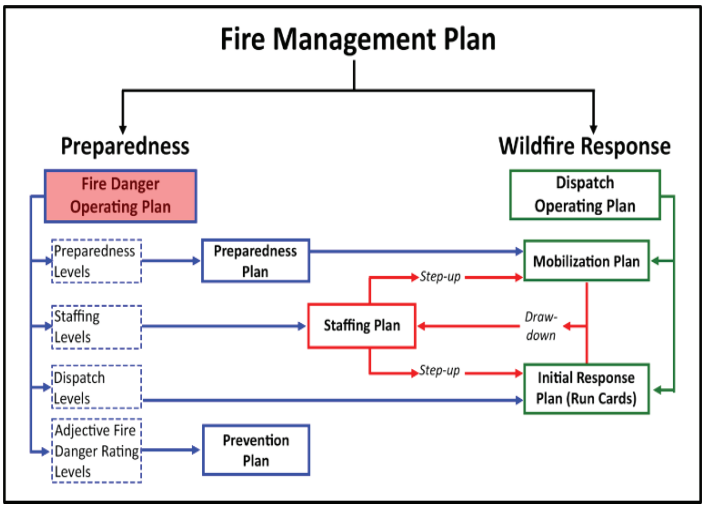



Figure 1: Preparedness Plan Relationship

management decisions. The actual implementation of the fire business thresholds is described in the following supplemental action plans.

The decision thresholds are identified and documented in the appendices of Southwest Zone Fire Danger Operating Plan.

**a. 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 Northern Rockies Southwest Zone Fire Danger Operating Plan; the associated decisions and planned actions are in the Preparedness Plan, located in Appendix A.

**b. Staffing Plan**

The Staffing Plan describes escalating responses that are usually noted in the FMRS. 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. The decision thresholds are identified and documented in the Northern Rockies Southwest Zone Fire Danger Operating Plan. The recommended staffing actions for the Lolo and Bitterroot National Forests, Montana DNRC, and CSKT (pending) are located in Appendix B.

**c. Fire Prevention Plan** – Fire Danger Components

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 objective of the prevention program is the reduction of public exposure and fire fighter risk, fire suppression expenditures, and damages from human-caused fires. The prevention team aims to foster leadership and integrate fire prevention activities and education through public outreach programs that coordinate fire prevention and education activities across the Southwest Zone.

The CSKT Prevention Plan is available upon request; please contact Jack Currie, Ronan Fire Dispatch Center Manager, Confederated Salish and Kootenai Tribes.

The Montana DNRC Prevention Plan is available upon request; please contact the Southwestern Land Officer Fire Program Manager.

The Lolo and Bitterroot National Forest Prevention Plans are available upon request; please contact the Lolo or Bitterroot National Forest Prevention Officers. Links to these plans can also be found in Appendix C.

### d. Fire Restrictions and Closures 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 Restrictions and Closures Plan for the Missoula Area is written in cooperation with all interagency partners. This plan provides standardized wording, criteria, and process for implementing and rescinding fire restrictions and small-scale closures. It also provides clear direction and responsibility for the coordination and implementation of fire restrictions and area closures within the Missoula Area. The Missoula Area Restrictions and Closure Plan includes lands owned by the Lolo and Bitterroot National Forests, Montana DNRC, BLM, US Fish and Wildlife, and CSKT. A link to this plan is located in Appendix D.

The Bitterroot NF also has lands covered under the Dillon Area Restrictions and Closure Plan for the Anaconda-Pintler Wilderness and the Idaho Fire Restrictions Plan for the portion of Idaho lands on the Bitterroot NF.

## 2. Wildfire Response

### a. 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. Dispatch response levels are identified and documented in the Northern Rockies Southwest Zone Fire Danger Operating Plan and Response Plan. The number and type of suppression resources dispatched to a reported fire will be documented in the associated Response Plans for the Lolo DNRC East, Lolo DNRC West, Bitterroot Low, and

Bitterroot High FDRA's. These Response Plans, run cards, can be found in Appendix E if developed.

The CSKT Dispatching Response Plan for CSKT East and CSKT West FDRA's is available upon request; please contact Ronan Fire Dispatch Center Manager.

### b. Local Mobilization Plan

The Northern Rockies Interagency Mobilization 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 link to the Northern Rockies Interagency Mobilization Guide is in Appendix F.

## 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. Forest Service –Manual 5120 - Fire Management - Preparedness
- Montana DNRC – Fire and Aviation Manual
- Bureau of Indian Affairs – Wildland Fire and Aviation Program Management Operations Guide
- U.S. Fish and Wildlife Service – Contact US Fish and Wildlife
- Bureau of Land Management– Manual 9211-1-Fire Planning Handbook

## C. OPERATING PLAN OBJECTIVES

1. Provide a tool for agency administrators, fire managers, dispatchers, agency co-operators, and firefighters to correlate fire danger ratings with appropriate fire business decisions in fire danger planning area.
2. Delineate Fire Danger Rating Areas (FDRAs) within the fire danger planning area with similar climate, vegetation, and topography.
3. Document the interagency fire weather-monitoring network consisting of Remote Automated Weather Stations (RAWS) which comply with the NWCG Interagency Wildland Fire Weather Station Standards and Guidelines (PMS 426-3).

4. Determine climatological and fire business thresholds using the Weather Information Management System (WIMS), National Fire Danger Rating System (NFDRS), and 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 current and expected 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. Develop and distribute fire danger pocket cards to all personnel involved with fire management within the fire danger planning area.
10. Identify program needs and suggest improvements for implementation of the Fire Danger Operating Plan.

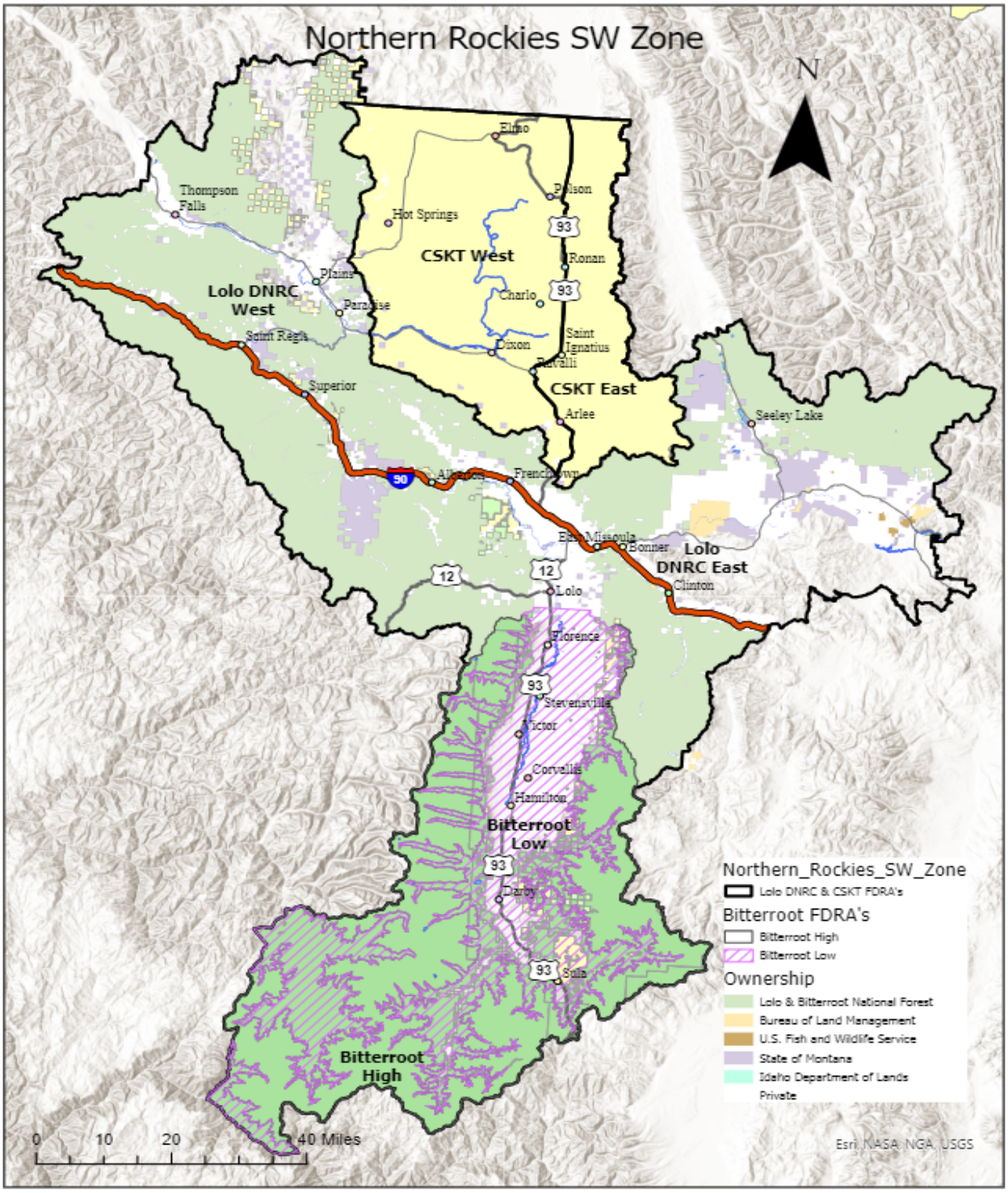
# II. FIRE DANGER PLANNING AREA INVENTORY AND ANALYSIS

## A. ADMINISTRATIVE UNITS

This document serves as an *interagency* example of consistent and effective application of fire danger decisions being applied across multiple jurisdictional boundaries.

This plan encompasses a fire danger planning area of approximately 7 million, 41 thousand acres (7,041,180) in southwest Montana including land owned by the Lolo and Bitterroot National Forests, US Forest Service (USFS); Montana Department of Natural Resource Conservation (MT DNRC); Confederated Salish and Kootenai Tribes (CSKT), Bureau of Indian Affairs (BIA); Bureau of Land Management (BLM); Montana, Fish, Wildlife and Parks (MT FWP); U.S. Fish and Wildlife Service (USFWS); local Government; and private and commercially owned lands. Reference Map 1 for ownership overview in the fire danger planning area. Wildland fire management responsibilities are shared among these entities through the Montana Cooperative Fire Management and Stafford Act Response Agreement (locally known as the six-party agreement).

## 1. Overview Map



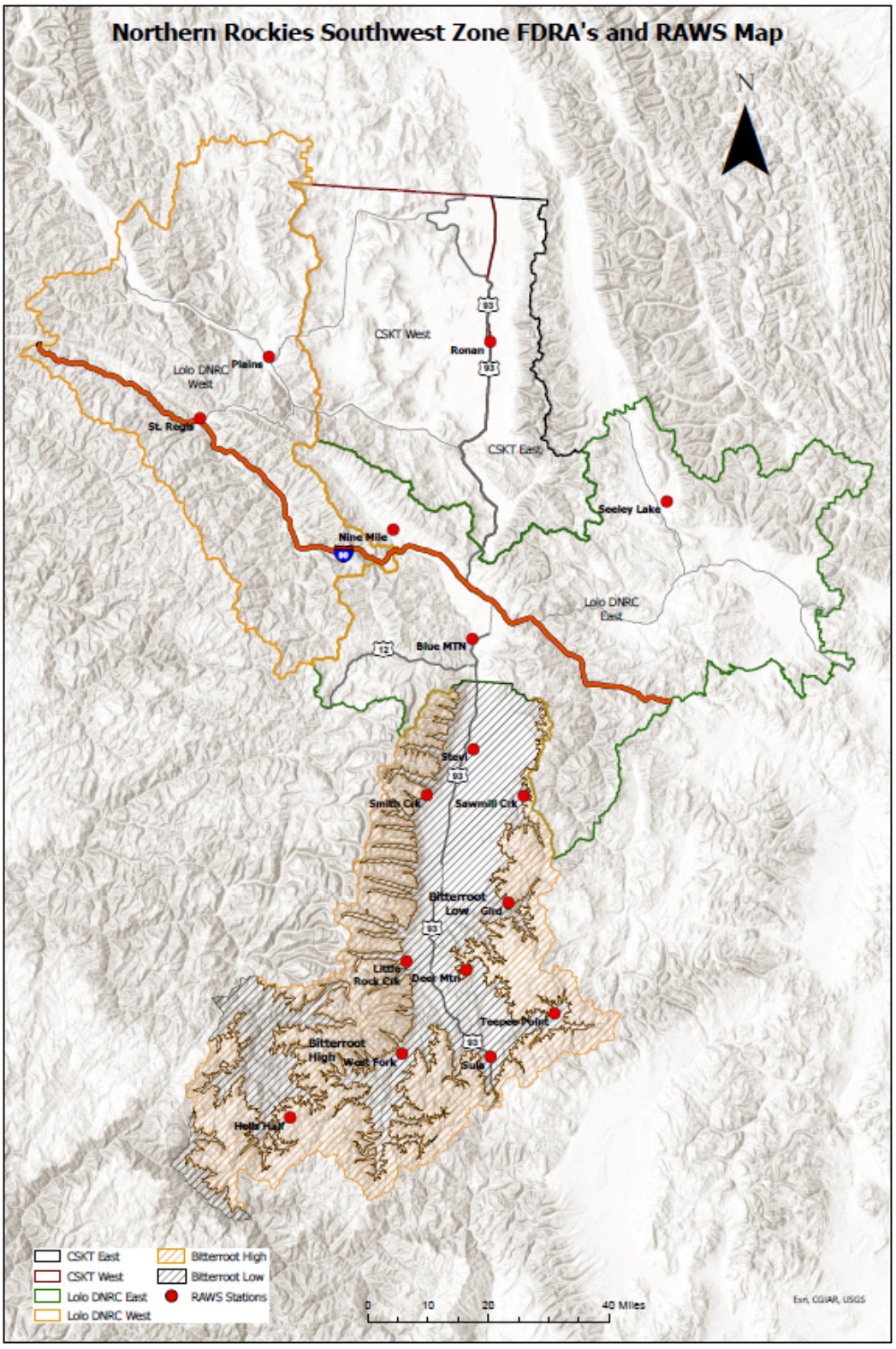

Map 1: Fire Danger Planning Area Overview

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

The Northern Rockies Southwest Zone Fire Danger Operating Plan has been delineated into six FDRAs**:** Lolo DNRC East, Lolo DNRC West, CSKT East, CSKT West, Bitterroot Low, and Bitterroot High. Map 2 displays the final FDRA delineation and RAWS locations included in this analysis. Table 1 displays acres and percentage of the area each FDRA covers.

## 1. Northern Rockies Southwest Zone FDRA's and RAWS Map




Map 2: FDRAs and RAWS Locations

### 2. Northern Rockies Southwest Zone FDRA Table

| Fire Danger Rating Area | Acreage | % of Total Area |
|---|---|---|
| **Lolo DNRC East (LDE)** | 2,071,510 | 29% |
| **Lolo DNRC West (LDW)** | 1,622,589 | 23% |
| **CSKT East (CE)** | 397,937 | 6% |
| **CSKT West (CW)** | 917,928 | 13% |
| **Bitterroot Low (BRL)** | 1,004,594 | 14% |
| **Bitterroot High (BRH)** | 1,026,622 | 15% |

Table 1: Fire Danger Rating Areas (FDRAs)

## C. WEATHER STATIONS

All Remote Automated Weather Stations (RAWS) comply with the National Wildfire Coordinating Group (NWCG) weather station standards. http://www.nwcg.gov/pms/pubs/PMS426-3.pdf.

There are many options available for managers to consider when selecting permanent RAWS for use in this analysis. Fifteen RAWS were used across the fire danger rating areas which can be referenced in Appendix L. The longevity of their data and the diverse bio physical settings where the RAWS are located, including the lowest elevations possible which dry out the soonest, alerting fire managers of the threat, and representing the areas where human populations are located, were all criteria for selecting the RAWS used.

### 1. Special Interest Groups (SIGs)

Special Interest Groups are when two or more RAWS are grouped and their data compiled to run together in a single analysis. There are five SIGs within this Fire Danger Operating Plan: Lolo DNRC East (LDE), Lolo DNRC West (LDW), Bitterroot Low (BRL), Bitterroot High (BRH), and CSKT West (CW). The CSKT East (CE) FDRA does not use a SIG but rather uses only one RAWS. See the listing of SIGs and their associated RAWS in Table 7 and Appendix L.

# III. FIRE DANGER WORKLOAD ANALYSIS

To apply fire danger rating as a viable decision support tool, fire managers must be able to associate fire suppression workload with specific target groups. An understanding of the specific target groups from which the suppression workload originates will help determine the appropriate communication methods and deterrence measures which may effectively change the behavior of the respective target groups.

## A. 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).
    a. **Agency**: Employees of the federal, state, and local governments involved in the cooperative fire management efforts with wildland fires. This includes Federal, State, and County land management employees, along with volunteer fire departments who share a similar protection mission regarding wildland fires.
    b. **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.
    c. **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.

## B. FIRE WORKLOAD ANALYSIS

Fire history data was downloaded from the Fire Program Analysis Fire Occurrence Database (FPA FOD) and the InFORM website for an analysis time frame that complements the available weather data. The FPA FOD spans from 2009 up to and including 2020, while the InFORM data spans from 2021 to 2023. Analysis period of 2009 through 2023 (15 years) was used for all FDRAs

A yearly summary of historical fire data for all agency fires within each FDRA was created using FireFamilyPlus. These yearly summary reports indicate the majority of fires within the FDRA's occur during the months of April through October. Therefore, the analysis parameters included April through October as the fire season filter setting. This decision was made so indices created represent the time of year with the greatest probability of fire occurrence. Yearly and April through October fire occurrence analysis can be referenced in Appendix K.

During April through October across all FDRA's, an average of **445** fires occurred per year burning an average of **53,444 acres** per year. Acreage numbers are skewed due to large fire years occurring in **2012, 2013, 2017,** and **2023** that collectively accounted for **70%** of the total burned area during the **15-year** time frame.
Fire activity is seasonal with the majority of fires occurring in the spring through fall months and few to no fires occurring in the winter months. Fires reported from April through October accounted for **93%** of all ignitions while the remaining **7%** occurred between November and March. Approximately **73%** of the fires are less than **¼ acre** in size (size class A). Lightning is the ignition source for approximately **39%** of the fires with the remaining **61%** of the fires being human caused.

Lightning, campfires, debris burning, equipment, railroad, arson, and miscellaneous human caused fires combine for the total fires for each FDRA. Table 2 displays the statistical cause data for each FDRA during their analysis period**.**

| FDRA | Total # of Fires | Lightning | Campfire | Debris Burning | Equipment | Railroad | Arson | Misc Human | Acres Burned |
|---|---|---|---|---|---|---|---|---|---|
| Lolo DNRC East | 3092 | 831 | 270 | 433 | 131 | 11 | 21 | 1395 | 294,112 |
| Lolo DNRC West | 1418 | 630 | 142 | 150 | 101 | 67 | 14 | 314 | 180,364 |
| CSKT East | 489 | 111 | 125 | 86 | 38 | 2 | 29 | 98 | 53,178 |
| CSKT West | 781 | 219 | 172 | 75 | 99 | 10 | 67 | 139 | 107,178 |
| Bitterroot Low | 913 | 361 | 97 | 208 | 26 | 0 | 4 | 217 | 62256 |
| Bitterroot High | 476 | 424 | 21 | 2 | 2 | 0 | 0 | 27 | 105796 |
| **Totals** | 7169 | 2576 | 827 | 954 | 397 | 90 | 135 | 2190 | 802884 |

**Table 2: FDRA Fire Statistics and Causes within each FDRA.**
**Lolo DNRC East: 2009-2023.**
**Lolo DNRC West: 2009-2023.**
**CSKT West: 2009-2023.**
**CSKT East: 2009-2023.**
**Bitterroot Low: 2009-2023.**
**Bitterroot High: 2009-2023.**

## IV. FIRE DANGER DECISION ANALYSIS

Decision thresholds can be based upon either:

- Climatological Thresholds, or
- Fire Business Thresholds.

This Fire Danger Operating Plan will be used to support preparedness, staffing and response decisions which are made at specific decision thresholds. A “decision threshold” is a threshold along the range of possible output values where a decision shifts from one

choice to another. When the combination of events and conditions signal it is time to do something different, a "decision threshold" has been identified for each Fire Danger Rating Level within each Fire Danger Rating Area.

## A. CLIMATOLOGICAL ANALYSIS

Climatological thresholds are ranges 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 threshold at which only 10 percent of the ERC values are greater in value.

Table 3 displays the calculated decision thresholds for ERC across all FDRA's.

ERC thresholds are based upon default percentile settings in FireFamilyPlus using the **40th, 80th, 90th**, and **97th** percentile breaks. PL1 and PL2 are typically during times when there are generally minimal fires occurring. PL3 uses the **80th** percentile to represent the threshold at which we begin to see fires occurring. This is represented well in the class percentage charts in Appendix M for each FDRA. The 90th percentile represents the fire danger value where only **10%** of the fire weather days historically have been higher than that value and the **97th** percentile represents the top **3%** of fire weather days.

| | Lolo DNRC East | Lolo DNRC West | CSKT East | CSKT West | Bitterroot Low | Bitterroot High |
|---|---|---|---|---|---|---|
| Decision Threshold Ranges | | | | | | |
| Low - PL 1 0% - <40% | 0 - 20.9 | 0 - 23.9 | 0 - 20.9 | 0 - 22.9 | 0 - 19.9 | 0 - 15.9 |
| Moderate - PL 2 >40% - <80% | 21 - 39.9 | 24 - 40.9 | 21 - 32.9 | 23 - 37.9 | 20 - 43.9 | 16 - 40.9 |
| High - PL 3 >80% - <90% | 40 - 45.9 | 41 - 47.9 | 33 - 37.9 | 38 - 43.9 | 44 - 48.9 | 41 - 46.9 |
| Very High - PL 4 >90% - <97% | 46 - 50.9 | 48 - 53.9 | 38 - 42.9 | 44 - 49.9 | 49 - 54.9 | 47 - 52.9 |
| Extreme - PL 5 >97% | 51+ | 54+ | 43+ | 50+ | 55+ | 53+ |

**Table 3: Preparedness Levels and ERC Decision Threshold Ranges in all FDRA's using Fuel Model Y.**

The BI threshold Low and Moderate is set based upon the relationship with MODIS observations of fire activity while the High threshold his set based upon the 97th percentile. Table 4 displays the decision threshold ranges for BI across all FDRA's.

| | Lolo DNRC East | Lolo DNRC West | CSKT East | CSKT West | Bitterroot Low | Bitterroot High |
|---|---|---|---|---|---|---|
| Decision Threshold Ranges | | | | | | |
| Low | 0 - 28.9 | 0 - 21.9 | 0 - 24.9 | 0 - 20.9 | 0 - 32.9 | 0 - 30.9 |
| Moderate | 29-35.9 | 22-43.9 | 25 - 32.9 | 21 - 40.9 | 33 - 46.9 | 31 - 41.9 |
| High >97% | 36+ | 44+ | 33+ | 41+ | 47+ | 42+ |

**Table 4: BI Decision Threshold Ranges in all FDRA's using fuel model Y.**

The decision matrix, in Table 5, uses the combination of ERC (weekly trend) and BI (daily trend) levels to determine the overall Dispatch Response Level. This table provides a connection between the preparedness plan and response plan while incorporating staffing plan needs. This Dispatch Response Level will be calculated daily to assist fire managers with resource staffing and response decisions.

**+ represents the 1% days when the combined ERC and BI percentiles are above 99%.**

| | Dispatch Response Level | | | | |
|---|---|---|---|---|---|
| **Response Level** | | | | | |
| **BI (Y)** | | | | | |
| H | Low | Low | Mod | High | High + |
| M | Low | Low | Mod | Mod | High |
| L | Low | Low | Low | Mod | Mod |
| | 1 | 2 | 3 | 4 | 5 |

**Preparedness Levels**

**ERC (Y)**

**Table 5: Dispatch Response Level Matrix**

## B. FIRE BUSINESS ANALYSIS

The primary target groups are agency, public, and industry. The main fire issues are lightning, campfires, debris burning, equipment, railroad, arson, and miscellaneous human caused fires.

Lightning caused fires require Agencies to prepare themselves for predicted storms. Agency personnel become the target group where fire preparedness and appropriate staffing levels are essential. Lightning has the potential for multiple starts in challenging terrain. The majority of our multiple fire days are the result of lightning.

Campfire, debris burning, equipment, railroad, smoking, arson, children, and other miscellaneous human caused fires require interactions with the public and industry, as they are the target groups. All non-lightning fires can be addressed through fire prevention programs, which includes restriction and closures, across agencies. Table 6, Fire Decision Summary Table, identifies the target group and the appropriate plan for addressing the fire cause.

The indices analysed for each FDRA were Energy Release Component (ERC) and Burning Index (BI). ERC and BI are commonly chosen in this forested, mountainous region as fire season indicators depending on climate, predictability, fuel type/condition, and fire occurrence association. ERC is a good predictor of seasonal trends in areas of heavy fuels whereas BI, with a wind component, is a good indice for response functions. (See Appendix M for Fire Business Decision Points)

| Target Group | FDRA | Statistical Cause | Workload Definition | Climatological or Fire Business Thresholds | Number of Decision Points | Index/ Comp | Fuel Model | Preparedness Plan to Modify Target Group Behaviour |
|---|---|---|---|---|---|---|---|---|
| Agency | All FDRA's | 1 - Lightning | Lightning caused ignitions which can quickly exceed the capability of the local units initial attack resources. | Fire Business Thresholds | 5 | ERC, BI, Fire Danger Rating Level | Y | Staffing Plan |
| Public | All FDRA's | 4 - Campfire | Increased reports of escaped campfires. | Fire Business Thresholds | 5 | ERC, BI, Fire Danger Rating Level | Y | Prevention Plan |
| Public | All FDRA's | 9 - Miscellaneous | Increased fire starts from smoking, children, and unknown ignition sources. | Fire Business Thresholds | 5 | ERC, BI, Fire Danger Rating Level | Y | Prevention Plan |
| Public | All FDRA's | 5 – Debris Burning | Increase in escaped fires resulting from debris burning activities. | Fire Business Thresholds | 5 | ERC, BI, Fire Danger Rating Level | Y | Restrictions/ Closure plan |
| Industry | All FDRA's | 2- Equipment | Fires along roadways or right of ways resulting from machinery and/or mechanical activities. | Fire Business Thresholds | 5 | ERC, BI, Fire Danger Rating Level | Y | Restrictions/ Closure Plan |
| Public | All FDRA's | 7 - Arson | Increase in fire starts from arson activities. | Fire Business Thresholds | 5 | ERC, BI, Fire Danger Rating Level | Y | Prevention Plan |
| Industry | CSKT East<br>CSKT West<br>Lolo DNRC East<br>Lolo DNRC West | 6 - Railroad | Fires along railroad corridors resulting from railway maintenance or train passage. | Fire Business Thresholds | 5 | ERC, BI, Fire Danger Rating Level | Y | Prevention Plan |

Table 6: Fire Decision Summary Table.

## C. PARAMETERS USED TO CALCULATE FIRE DANGER

Parameters for each FDRA analysis are listed below in Table 7.

| Parameters Used to Calculate Fire Danger<br>Parameters for each FDRA analysis are listed below | | | | | | | |
|---|---|---|---|---|---|---|---|
| Fire Danger Rating Area | SIG | Station ID | Name | Slope Class | Analysis Period | Large Fire Size | Multiple Fire Day |
| Lolo DNRC East | LDE | 241507 | Ninemile | 3 | 1 | 10 | 3 |
| | | 241508 | Seeley Lake | 3 | | | |
| | | 241513 | Blue Mtn | 3 | | | |
| Lolo DNRC West | LDW | 241302 | St. Regis | 4 | 1 | 10 | 3 |
| | | 241507 | Ninemile | 3 | | | |
| | | 241206 | Plains | 4 | | | |
| CSKT West | CW | 241403 | Ronan | 3 | 1 | 40 | 3 |
| | | 241206 | Plains | 4 | | | |
| CSKT East | CE | 241403 | Ronan | 3 | 1 | 15 | 3 |
| Bitterroot Low | BRL | 242905 | Sula | 4 | 1 | 10 | 5 |
| | | 242907 | West Fork | 4 | | | |
| | | 242914 | Little Rock Creek | 4 | | | |
| | | 242912 | Smith Creek | 4 | | | |
| | | 242915 | Sawmill Creek | 3 | | | |
| Bitterroot High | BRH | 242911 | Gird | 3 | 1 | 10 | 5 |
| | | 242910 | Teepee Point | 3 | | | |
| | | 242902 | Deer Mtn | 4 | | | |
| | | 101019 | Hells Half | 4 | | | |

Table 7: FDRA Analysis Parameters.

## D. CORRELATION WITH FIRE OCCURRENCE

The analysis using the above parameters provided an adequate correlation with fire occurrence. Fire business decisions can be made with confidence utilizing the identified decision thresholds for associated plans.

Indices for each FDRA were evaluated to determine the most representative index and fuel model to use as the primary fire danger indicator.

### E. DECISION SUMMARY NARRATIVE

In summary, the FDOP will utilize ERC and BI as both correlate well with fire occurrence. However, ERC stands out as a better overall fire danger indicator for Preparedness Levels, Staffing Levels, and Adjective Fire Danger Ratings because it tracks well with fire season and has very few fire occurrences at low ERC values. BI works well for setting Daily Dispatch Response Levels to capture daily variations in wind and fuel moistures.

Fuel model Y was selected for analysis with each of the indices because it best represents the fuels found within the Southwest Zone. Fuel model Y includes both open timber/grass and closed, short-needle conifer, and heavy dead fuels. It represents fine dead fuels, which respond quickly to changes in weather and tend to have a lower energy output than heavier fuels. Fuel Model Y also contains a large load of heavy dead fuels. Because heavy fuels react very slowly to changes in weather, fuel model Y reflects longer term weather trends.

An overview of the analysis results are as follows. These fuel model/indice pairs will be used to determine the climatological thresholds.

| Fire Danger Rating Area | Index (Fuel Model) | Climatological Thresholds Used For: |
|---|---|---|
| All FDRA's | ERC(Y) | - Adjective Fire Danger Rating<br>- Staffing Levels<br>- Preparedness Levels<br>- Pocket Cards<br>- Severity Requests |
| | BI(Y) & ERC(Y) | - Dispatch Response Levels |

Table 8: Climatological Thresholds for all FDRA's.

## V. 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. 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.

## A. RESPONSE (OR DISPATCH) PLAN

Response (or Dispatch) Levels (low, moderate, and high) 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.

Local-level initial pre-planned Response Plans, also referred to as "Run Cards" or "Dispatch Strategy", specify the fire management response (e.g., number and type of suppression resources to dispatch) within a defined geographic area to an unplanned ignition, based on weather, fuel conditions, fire management objectives, and resource availability.

The Response Plans will outline actions to be taken for each initial attack response. These actions are to be considered guidelines and Duty Officer coordination is encouraged to inform initial response actions based on risk assessments and local factors.

The CSKT Dispatching Response Plan is available upon request; please contact Ronan Fire Dispatch Center Manager.

Reference Appendix E for the Response Plans.

## B. STAFFING LEVEL

Staffing Levels will be used to make daily internal fire preparedness and operational decisions. 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.

The CSKT Staffing Levels are available upon request; please contact Ronan Fire Dispatch Center Manager, Confederated Salish and Kootenai Tribes.

The Montana DNRC Staffing Levels are defined in the Southwestern Fire Mobilization Guide; please contact the Southwestern Land Officer Fire Program Manager.

Staffing Levels for personnel and initial attack resources will vary throughout the year by the Fire Danger Rating Area. When fire danger rating is low, typically during pre/post and early season, no or limited initial attack capability is required. Reference Appendix B for Staffing Level Tables for the Lolo and Bitterroot National Forests, Montana DNRC, and CSKT (Available upon request).

## C. FIRE DANGER ADJECTIVE RATING

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. Table 9 describes the Fire Danger Adjective Rating Levels.

| Fire Danger Rating Adjective | Description |
|---|---|
| Low | Fuels do not ignite readily from small firebrands although a more intense heat source, such as lightning, may start fires in duff or punky wood. Fires in open cured grasslands may burn freely a few hours after rain, but woods fires spread slowly by creeping or smoldering, and burn in irregular fingers. There is little danger of spotting. |
| Moderate | Fires can start from most accidental causes, but with the exception of lightning fires in some areas, the number of starts is generally low. Fires in open cured grasslands will burn briskly and spread rapidly on windy days. Timber fires spread slowly to moderately fast. The average fire is of moderate intensity, although heavy concentrations of fuel, especially draped fuel, may burn hot. |
| High | All fine dead fuels ignite readily and fires start easily from most causes. Unattended brush and campfires are likely to escape. Fires spread rapidly and short distance spotting is common. High intensity burning may develop on slopes or in concentrations of fine fuels. Fires may become serious and their control difficult unless they are attacked successfully while small. |
| Very High | Fires start easily from all causes and, immediately after ignition, spread rapidly, and increase quickly in intensity. Spot fires are a constant danger. Fires burning in light fuels may quickly develop high intensity characteristics such as long distance spotting and fire whirlwinds when they burn into heavier fuels. |
| Extreme | Fires start quickly, spread furiously, and burn intensely. All fires are potentially serious. Development into high intensity burning will usually be faster and occur from smaller fires than in the very high fire danger class. Direct attack is rarely possible and may be dangerous except immediately after ignition. Fires that develop headway in heavy slash or in conifer stands may be unmanageable while the extreme burning condition lasts. Under these conditions the only effective and safe control action is on the flanks until the weather changes or the fuel supply lessens. |

Table 9: Fire Danger Adjective Rating Levels

## D. PREPAREDNESS LEVEL

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

Reference Appendix A for the Southwest Zone Preparedness Plan.

**Severity**

Fire severity funding is the authorized use of suppression operations funds for extraordinary preparedness activities required due to:

- FMP, FDOP, or Annual Operating Plan criteria that indicate the need for additional preparedness/suppression resources. The plan(s) should identify thresholds for severity needs;
- Anticipated fire activity will exceed the capabilities of local resources;
- Fire season that either starts earlier or lasts longer than identified in a FDOP;
- An abnormal increase in fire potential or danger not planned for in existing preparedness plans.

Forest Service established decision thresholds will be used to determine severity funding needs. Severity Requests are partially based on the 90th and 97th percentiles derived from year-round climate data; however, the need for severity funding can be evaluated once seasonal averages are exceeded.

CSKT severity needs are determined on a seasonal basis, for more information contact Jack Currie, Ronan Fire Dispatch Center Manager, Confederated Salish and Kootenai Tribes.

Montana DNRC will enter into discussion upon reaching Preparedness Level 3 and their severity information can be referenced through the Southwestern Land Office Fire Mobilization Guide. Contact Southwestern Land Office Fire Program Manager.

Reference Appendix B for Severity Staffing Levels in the Northern Rockies Southwest Zone Staffing Plan.

# VI. FIRE DANGER OPERATING PROCEDURES

## A. ROLES AND RESPONISBILITIES

### 1. Agency Administrators

Agency Administrators will ensure this Fire Danger Operating Plan is a guide used by Fire Management Officers to make informed fire related decision.

### 2. Fire Management Officers

Forest, District, Tribal, and Montana DNRC Fire Management Officers are responsible for implementing, ensuring decisions are made consistent with the intent of the plan, and providing input for updating this plan. They are ultimately responsible for ensuring this plan is maintained, utilized, and communicated.

Fire Management Officers will also provide support for their Local RAWS Technicians and necessary training to assist the Missoula, Bitterroot, and Ronan Dispatch Centers for any local needs that may occur.

**3. Duty Officers**

Coordinate with appropriate staff and Duty Officers across the zone to evaluate daily fire danger, ensure staffing levels are appropriate and adjust accordingly.

Share resources across the zone as feasible.

Provide input regarding preparedness, staffing, and response plans. Manage staffing appropriately based on established preparedness levels.

Assure that all local fire resources and other unit staff are aware of the fire danger and preparedness levels.

**4. Local RAWS Technicians-Fire Danger Technical Group**

An individual from each Lolo NF Ranger District, Bitterroot NF Ranger District, Missoula Dispatch Center, Bitterroot Dispatch Center, and the Confederated Salish and Kootenai Tribes has been identified as members of the Fire Danger Technical Group. A Montana DNRC individual has not been identified because they do not manage any of the RAWS used in this analysis.

Lolo NF members of the Fire Danger Technical Group are responsible for coordinating with Lolo NF RAWS Coordinators for annual maintenance and replacement of RAWS equipment and parts.

Bitterroot NF members of the Fire Danger Technical Group are responsible for coordinating with Bitterroot NF RAWS Coordinator for annual maintenance and replacement of RAWS equipment and parts.

The Confederated Salish and Kootenai RAWS maintenance is contracted to Forest Technology Systems (FTS).

Appropriate training and team support will be provided to members of this technical working group.

Table 10 lists the specific personnel who may be RAWS technicians or constitute the Fire Danger Technical Group:

| Location | Contact | Station | Station ID | Agency |
|---|---|---|---|---|
| Supervisors Office, LNF | Travis Pfister, Jacob Martin | N/A | N/A | FS |
| Missoula Ranger District, LNF | Tyler Rowe | Blue Mtn | 241513 | FS |
| Ninemile Ranger District, LNF | Sam Brownlee | Ninemile | 241507 | FS |
| Plains/Thompson Falls Ranger District, LNF | Trevor Unsworth | Plains | 241206 | FS |
| Seeley Lake Ranger District, LNF | Donovan Suko | Seeley Lake | 241508 | FS |
| Superior Ranger District, LNF | Dan Cambell | St. Regis | 241302 | FS |
| Missoula Dispatch Center: | Rachel Simpson (primary) | N/A | N/A | FS |
| Ronan Dispatch Center, CSKT<br>CSKT RAWS Coordinator | Jack Currie, Nick Mays | Ronan | 241211<br>241403 | CSKT<br>CSKT |
| Stevensville Ranger District, BRF | Dave Renton | Smith Creek | 242912 | FS |
| Darby/Sula Ranger District, BRF | Cory Rennaker<br>Kory Garrie | Gird<br>Deer Mt<br>Little Rock Creek<br>Sula<br>Tepee Point | 242911<br>242902<br>242914<br>242905<br>242910 | FS<br>FS<br>FS<br>FS<br>FS |
| West Fork Ranger District, BRF<br>BRF RAWS Coordinator | Bret Lewis, Clint Mendenhall | West Fork<br>Hells Half | 242907<br>101019 | FS<br>FS |
| Bitterroot Dispatch Center | Cobey Williamson | N/A | N/A | FS |

Table 10: RAWS Technicians and/or Fire Danger Technical Group Representatives.
LNF-Lolo National Forest; BRF-Bitterroot National Forest, CSKT-Confederated Salish & Kootenai Tribes

**5. Dispatch/Communication Center**

The NFDRS2016 model does not require daily collection of State of the Weather (SOW) as was the practice in NFDRS78 formally used in this area. During fire season, each day the previous evenings indices will be broadcast with the morning weather forecast. Indices will be posted on the Missoula Dispatch Center web page by 1600 daily. The Bitterroot Dispatch Center will post indices and a local Situation Report by 1800 daily.

**6. Fire Weather Station Owners**

All Lolo NF RAWS will be managed by the LNF RAWS Coordinator, Travis Pfister (primary) and Jacob Martin (secondary). All Bitterroot NF RAWS will be managed by the BRF RAWS Coordinator, Bret Lewis and Clint Mendenhall. They are the contacts for all issues regarding data and station maintenance. These coordinators will assure identified problems with hardware or data are either corrected or assure that someone else corrects the problem.

Only one RAWS used in this FDOP (Ronan) is owned and maintained by the Confederated Salish and Kootenai Tribes. These stations will be managed by Ronan Dispatch Center Manager.

The Montana DNRC does not have responsibility for any RAWS used in the analysis, therefore they do not have a representative listed.

7. **Agency GIS Specialists**

   Serve as data stewards for updating and maintaining ArcGIS fire history data.

8. **Education / Mitigation / Prevention Specialists**

   Changes in adjective ratings will be communicated to Agency PIO's to be communicated with the public through appropriate channels: website, media releases, signs, contacts, Facebook, etc.

   Fire Prevention Technicians will be responsible for assuring signs display the appropriate fire danger levels. They will also be involved with updates/revisions to the Prevention and Restriction plans.

9. **Fire Planners**

   Fire Planners will continue interagency coordination and provide updates to the FDOP.

10. **Wildland Fire Resources**

    It is the responsibility of all wildland fire resources to be aware of the preparedness/staffing levels, dispatch response levels, daily fire indices, and their responsibilities or actions to be taken at each level.

    Supervisors have the responsibility to provide and brief their personnel on the information contained in the pocket cards.

## B. SEASONAL SCHEDULE

1. **Snow Flag**

   Beginning March 1st start monitoring snow flag data and conduct weekly quality control to ensure data is reporting correctly on the hour.

2. Station Greenup and Freeze Dates are automated under the new NFDRS2016 program with the GSI (Growing Season Index) replacing the need to manual enter this information.

# VII. FIRE DANGER PROGRAM NEEDS

## A. WEATHER STATIONS

1. Utilize the NFDRS weather station handbook to ensure weather station annual maintenance is completed. RAWS POC will be responsible for coordinating RAWS maintenance with the LNF and BRF RAWS Coordinators. CSKT RAWS maintenance is contracted to Forest Technology Systems (FTS).

## B. COMPUTER/EQUIPMENT

1. In coordination with the LNF, BRF, and CSKT RAWS Coordinators, complete annual RAWS maintenance.

## C. TRAINING

1. Identify and provide training to new RAWS POCs. The Lolo National Forest, Bitterroot National Forest, and Confederated Salish and Kootenai Tribes will identify RAWS POC for their respective stations. Alternate POC can also be identified to build depth and training.
2. Support the development and provide opportunities for employees to attend, coach, or instruct RAWS Maintenance, S-491 (Intro to NFDRS) and Advanced National Fire Danger Rating System (ANFDRS).
3. Provide opportunities for fire dispatchers to become trained on WIMS.
4. Provide refreshers on WIMS, FireFamilyPlus, and NFDRS as necessary to stay current with policy and technology.
5. Provide training on the Fire Danger Operating Plan and pocket cards.

## D. SEASONAL FIRE DANGER RISK ASSESSMENTS

1. Continue with pre-season and monthly outlooks.
2. Evaluate conditions for prescribed burning as well.

## E. OTHER PROGRAM NEEDS

1. Update Missoula, Bitterroot, and Ronan Dispatch Center SOP's to incorporate changes in the revised FDOP and associated plans in the Appendices.
2. Maintain existing and establish new fuel moisture monitoring sites.
3. Establish SOP's for interagency fuel moisture sampling protocols.

4. Update Prevention Plans to include explanations of any new criteria used to determine Fire Danger Rating Adjectives.

5. Add an Adjective Fire Danger Rating Determination Section with corresponding tables.

# Appendix A:

## Preparedness Plan

### I. Introduction

#### A. Purpose

Preparedness plans provide management direction given identified levels of burning conditions, fire activity, and resource commitment. 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 Northern Rockies Southwest Zone Fire Danger Operating Plan and the complete Preparedness Plan is in Appendix A.

#### B. Preparedness and Staffing Levels

1. **Preparedness and Staffing Levels**

   Preparedness Levels incorporate local fire occurrence, suppression resources committed, and stable variables (e.g. ERC, Live Fuel Moisture, 100-hr Fuel Moisture, etc.) to help with long-term decisions, such as the need to request severity funding or activation of public-use restrictions. Staffing Levels only consider fire danger and are intended to help with short-term decisions. Both can be set to the same levels (1-5) with the recognition they have different functions.

#### C. Policy and Guidance

Policy and guidance regarding the development of Preparedness Level Plans can be found in Chapter 10 of the Interagency Standards for Fire & Aviation Operations (Red Book).

Preparedness Level Plans are required at the national, state/regional, and local levels. These plans address the five Preparedness Levels (1-5) and provide management direction based on identified levels of burning conditions (fire danger), fire activity, resource commitment/availability, such as incident management teams assigned, and other considerations (in contrast to Staffing Levels, which typically only consider fire danger). Preparedness Level Plans may be developed by a state/regional office for agency-specific use.

Supplemental preparedness actions to consider include, but are not limited to, the following items:

- Management briefings, direction, and considerations; Support function: consideration given to expanded dispatch activation and other support needs (procurement, supply, ground support, and communication;

- Support staff availability outside of fire organization;
- Fire danger/behavior assessment;
- Fire information – internal and external;
- Multi-agency coordination group/Area command activation; and
- Prescribed fire direction and considerations.

Refer to the National Interagency Mobilization Guide and GACC Mobilization Guides for more information on Preparedness Level Plans.

Specific agency directives and interagency guidance requires numerous unit plans and guides to meet fire preparedness and wildfire response objectives. Some of these plans and guides are inter-related; one or more plans/guides provide the basis for other plans/guides. The Preparedness Plan is an operational plan tiered from the Fire Danger Operating Plan as shown below:

Preparedness Levels are established to assist fire managers with weekly or monthly planning decisions based upon seasonal fire danger elements. FireFamilyPlus is used to establish fire business thresholds. A statistical analysis of fire occurrence and historical weather needs to be completed for each FDRA. The final Preparedness Level determination may incorporate a measure of current and projected levels of resource commitment due to fire activity and a measure of ignition risk. Each agency will consider management actions identified in the FDOP appendix based upon the five local Preparedness Levels.

## III. Preparedness Levels and Recommended Actions Guide

Preparedness Level (PL) Actions are guidelines, and as such are discretionary in nature, for agency personnel to refer to when preparedness level thresholds are reached. If an agency does not have a specific position listed within the Preparedness Level table, that agency will utilize discretion as to what position will assume those roles.

| A. Agency Administrators | | | | | | | |
|---|---|---|---|---|---|---|---|
| **Responsible Party** | **Suggested Action** | **PL 1** | **PL 2** | **PL 3** | **PL 4** | **PL 5** | **Affected Entity** |
| **Agency Administrator, District Ranger** | Ensure Resource Advisors (READ/REAF) are designated and available for fire assignments. | | | X | X | X | Agency |
| | Ensure Public Affairs Staff are identified and available as needed for coordination with fire programs and incident information. | | | X | X | X | Agency |
| | Consider needs for fire restrictions or area closures. | | | X | X | X | Public, Industry |
| | Evaluate work/rest needs of fire staff. | | | | X | X | Agency |
| | Provide appropriate support to fire staffs regarding the implementation of preparedness level actions (i.e. severity requests, restrictions and closure planning). | | | | X | X | Agency |
| | Issue guidance to staff indicating severity of the season and increased need and availability for fire support personnel (i.e. availability for large fire support). | | | | X | X | Agency |
| | If applicable, ensure administrative staff is prepared for fire activity business support. | | | X | X | X | Agency |
| | Consider ordering additional Line Officers for support. | | | X | X | X | Agency |
| | Approve prescribed burning projects Regional (FS, BIA) or State (DNRC) approval. | | | | X | X | Agency |

## B. FS, MT DNRC, FWS, BLM, & CSKT Fire Management Officers & Assistant Fire Management Officers

| Responsible Party | Suggested Action | PL 1 | PL 2 | PL 3 | PL 4 | PL 5 | Affected Entity |
|---|---|---|---|---|---|---|---|
| FS, CSKT, MT DNRC, FWS, BLM, Fire Staff, FS District, CSKT, FWS, BLM, & MT DNRC Unit FMO's & AFMO's. | Evaluate season severity data (NFDRS indices for the season, fuel loading, fuel moisture, drought indices, and long-term forecasts). | X | X | X | X | X | Agency |
| | Brief Agency Administrators and staff personnel on burning conditions and fire activity. | | X | X | X | X | Agency |
| | Review geographical and national preparedness levels and evaluate need to suspend local Rx fire activities. | | | X | X | X | Agency |
| | Consider consulting with or ordering an FBAN or WFDSS Support. | | | X | X | X | Agency |
| | Consider ordering a SOPL or LTAN to provide expertise and support to fire management strategy decisions regarding long-term fires. | | | X | X | X | Agency |
| | Ensure Prevention Technicians have initiated media contacts and public education contacts. | | X | X | X | X | Agency |
| | Communicate with Missoula, Bitterroot, and Ronan Dispatch Managers on resource availability. | | X | X | X | X | Agency |
| | Consider fire severity request and pre-positioning of resources including: suppression resources, aerial support, aerial supervision, command positions, expanded dispatch, logistical support, and prevention technicians. | | | X | X | X | Agency |
| | Consider ordering additional Duty Officer support. | | | X | X | X | Agency |
| | If preparedness level is decreasing, consult with Duty Officer, Missoula, Bitterroot, and Ronan Dispatch Managers and consider release of pre-positioned or detailed personnel. | | | X | X | X | Agency |
| | Evaluate crew and staff work/rest requirements. | | | X | X | X | Agency |
| | Evaluate the need for fire restrictions, area closures, and closed open burning. | | | X | X | X | Public<br>Industry |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **FS, CSKT, MT DNRC, FWS, BLM, Fire Staff, FS District, CSKT, FWS, BLM, & MT DNRC Unit FMO's & AFMO's.** | Consider beginning SW Zone MAC calls. | | | X | X | X | Agency |
| | Coordinate with interagency partners on the need for fire restrictions or closures. | | | X | X | X | Agency |
| | Communicate with Missoula, Bitterroot, and Ronan Dispatch Center Managers on geographical conditions and resources availability. | | | X | X | X | Public Industry |
| | Request the agency administrator to issue guidance to agency staff regarding the need for increased availability in support positions. | | | X | X | X | Agency |
| | Contact local Fire Chiefs and communicate staffing levels, fire danger, and unified command. | | | X | X | X | Agency |

## C. Dispatch Centers

| Responsible Party | Suggested Action | PL 1 | PL 2 | PL 3 | PL 4 | PL 5 | Affected Entity |
|---|---|---|---|---|---|---|---|
| **Missoula, Bitterroot, & Ronan Dispatch Centers** | If preparedness level is decreasing, consider release of pre-positioned or detailed dispatchers and logistical support personnel. | | | X | X | X | Agency |
| | Begin weekly SW Zone MAC conference calls with FS FMOs/Duty Officers, FWS, BLM, CSKT, & MT DNRC Fire Management. | | | X | X | X | Agency |
| | Consider pre-positioning or detail of off-unit IA dispatchers and logistical support personnel. | | | X | X | X | Agency |
| | Evaluate work/rest needs of Missoula, Bitterroot, and Ronan Dispatch staff. | | | X | X | X | Agency |
| | Consider having expanded dispatch and buying team in place. | | | X | X | X | Agency |

## D. FS, MT DNRC, FWS, BLM, & CSKT Duty Officers & Dispatch Centers

| Responsible Party | Suggested Action | PL 1 | PL 2 | PL 3 | PL 4 | PL 5 | Affected Entity |
|---|---|---|---|---|---|---|---|
| FS, MT DNRC, FWS, BLM, CSKT Duty Officers, Missoula, Bitterroot, & Ronan Dispatch Centers | Coordinate with FS, MT DNRC, CSKT, FWS, BLM, and local RFD's on resource sharing across the Zone. | | | X | X | X | Agency |
| | Coordinate amongst agencies, on SW Zone MAC conference calls, to set incident priorities and adjust resources accordingly. | | | X | X | X | Agency |
| | Consider extra LEO presence during times of increased human caused fires, closures, and/or suspicious activity. | | | | X | X | Agency |
| | Coordinate the need for ordering a local or out of area Fire Prevention Team. | | | X | X | X | Agency |
| | Communicate when the transition to 7-day coverage across agencies will occur. | | | X | X | X | Agency |
| | Coordinate the need for submitting severity requests. | | | X | X | X | Agency |
| | If preparedness level is decreasing, consider releasing pre-positioned and detailed resources. | | | X | X | X | Agency |
| | Ensure incoming severity, pre-position or detailed personnel receive a thorough in-brief on local conditions and are pre-positioned accordingly. | | | X | X | X | Agency |
| | Evaluate work/rest needs of IA crews, dispatchers, severity resources, and aviation bases. | | | X | X | X | Agency |

| | | | | | | | |
|---|---|---|---|---|---|---|---|
| **FS, MT DNRC, FWS, BLM, CSKT Duty Officers, Missoula, Bitterroot, & Ronan Dispatch Centers** | Consider patrols and pre-positioning of local IA resources in high risk areas. | | | X | X | X | Agency |
| | Consider pre-positioning and/or detailing of additional IA resources from off-unit. | | | X | X | X | Agency |
| | Evaluate the need for aerial detection flights. | | | X | X | X | Agency |
| | Consider bringing in local resources from scheduled days off. | | | X | X | X | Agency |
| | Consider suspending prescribed burning operations. | | | | X | X | Agency |

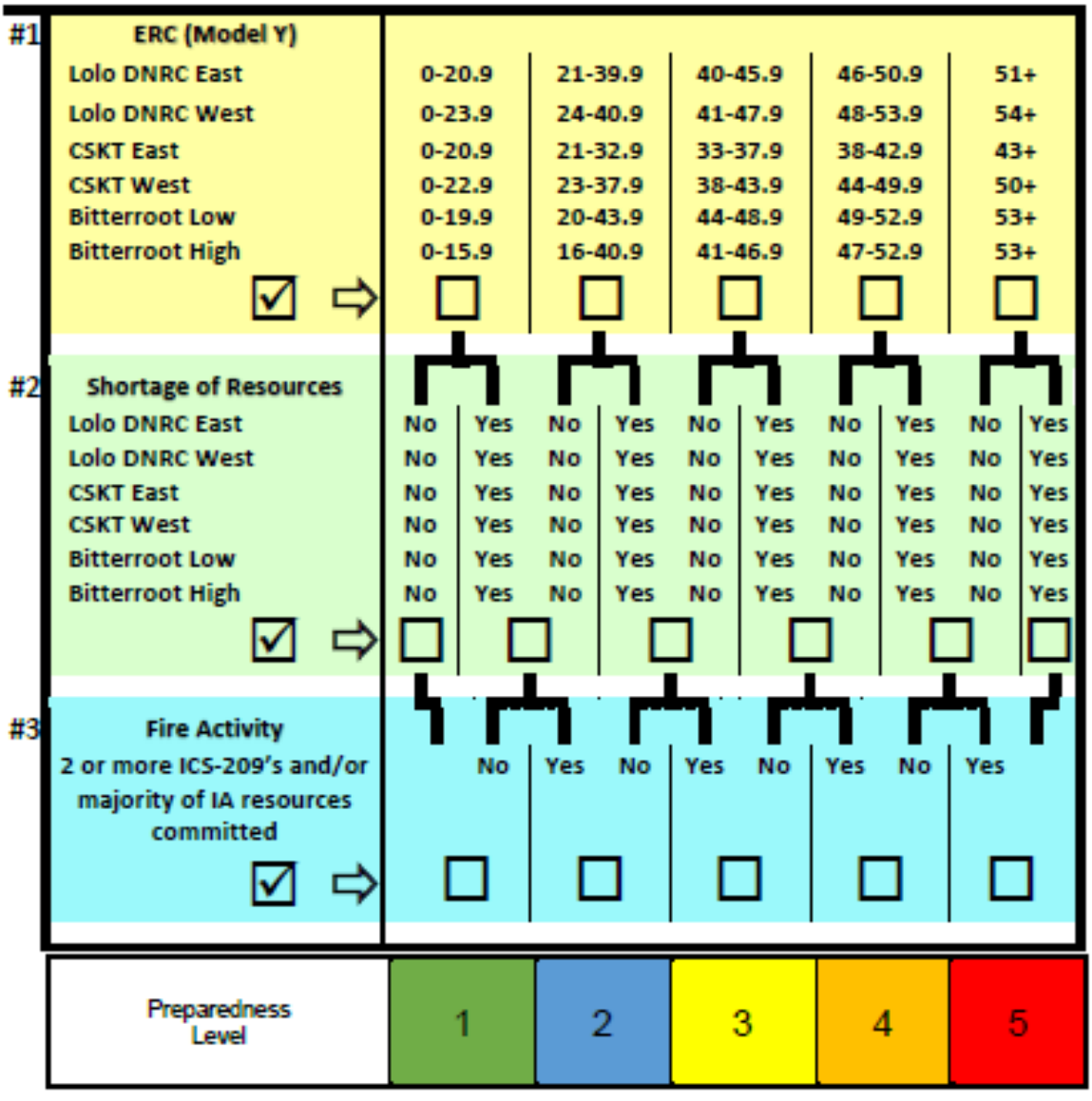
## E. Fire Prevention Technicians/Education/Mitigation

| Responsible Party | Suggested Action | PL 1 | PL 2 | PL 3 | PL 4 | PL 5 | Affected Entity |
|---|---|---|---|---|---|---|---|
| **Fire Prevention Technicians** | Contact Public Information Officer and local media to inform of the start of fire season and the potential for local fire danger to increase. | | | X | X | X | Agency<br>Public |
| | Provide public and industry with access to fire danger information, closures, restrictions, and warnings. | | | X | X | X | Agency<br>Public<br>Industry |
| | Post signs and warnings in approved camping, dispersed camping sites, trailheads, and recreation areas. | | | X | X | X | Public |
| | Consider need for increased fire prevention patrols. | | | X | X | X | Agency |
| | Notify local media if Very High/Extreme fire danger and the need for increased public caution. | | | | X | X | Public |
| | Contact local fire chiefs and inform of increased fire danger. | | | X | X | X | Agency |
| | Consult with FMO, Duty Officer, and/or Agency Administrator regarding need for fire restrictions or closures. | | | X | X | X | Agency |
| | Consider ordering additional fire prevention personnel to assist with restrictions or closures. | | | X | X | X | Agency |
| | Consider forming a local Fire Prevention Team | | | X | X | X | Agency |

## Appendix A: Local Preparedness Level Worksheet – Example to try

The preparedness level is a five-tier fire danger rating system based on ERC's, resource status, and fire activity. Fire business indicators used to help determine the preparedness level may include the current level of fire activity in the zone, or the number of resources committed to suppression activities. ***It is up to each dispatch zone to develop a methodology or tool that works best for them to assist in determining the preparedness levels for their zone.***

The illustration below is an example of a "plinko chart" that uses a combination of ERC values for each FDRA, potential resource shortages in each FDRA, and the level of fire activity.



# Appendix B:

## *Staffing Plan*

## I. Introduction

### A. Purpose

This Staffing Plan is intended to provide a day-to-day guidance for decisions regarding the "degree of readiness" of fire management resources. The Staffing Plan is designed to address Initial Attack readiness across the Forest. The Staffing Level (SL) is used as a basis to make daily internal fire operational decisions affecting our Agency personnel. At each SL, this plan identifies:

- *Daily Staffing*
- *Draw-Down Levels*
- *Step-Up Actions*

This plan will function most effectively when decisions are made in preparation for escalating fire danger and potential fire activity. Waiting until the day of a critical event during extreme fire danger will prove this plan ineffective.

***"You need a fire danger system that will help you make a judgment decision today on what kind and number of fires you can expect tomorrow." (Lancaster, 2004)***

### B. Terminology

#### 1. Preparedness Level and Staffing Level

Preparedness Levels incorporate local fire occurrence, suppression resources committed, and stable variables (e.g. ERC, Live Fuel Moisture, 100-hr Fuel Moisture, etc.) to help with long-term decisions, such as the need to request severity funding or activation of public-use restrictions. Staffing Levels only consider fire danger and are intended to help with short-term decisions. Both can be set to the same levels (1-5) with the recognition they have different functions.

2. **Step-up Plan**
   A Step-Up Plan includes supplemental staffing actions designed to enhance the unit's fire management capability during short periods (usually one burn period in anticipation of wind events, dry cold fronts, and lightning events) where normal staffing cannot foreseeably meet initial attack, prevention, or detection needs.

   Step-Up actions are incorporated into the Staffing Plan, as identified below in Figure 1.

3. **Draw-Down Level**
   "Draw-Down" is the degree of response capabilities of an agency due to the impact of fire management activity within their home jurisdiction and/or their commitment of resources to the mutual aid system for incident response outside of their jurisdiction. Draw-Down is expressed as either (1) the predetermined number/type of suppression resources, or (2) the percentage of remaining capacity of suppression resources required to maintain viable initial attack capability.

### C. Policy and Guidance

Policy and guidance regarding the development of Staffing Plans can be found in Chapter 10 of the *Interagency Standards for Fire and Aviation Operations* (Red Book). Agency directives and interagency guidance may require numerous unit plans and guides to meet fire preparedness and wildfire response objectives. Some of these plans and guides are inter-related; one or more plans/guides provide the basis for other plans/guides. The Staffing Plan is an operational plan tiered from the Fire Danger Operating Plan as shown below in Figure 1.

### D. Scope

This Staffing Plan has tables recommending resource staffing for the Lolo National Forest, Bitterroot National Forest, Montana DNRC, and CSKT (pending) fire management programs.
The Staffing Levels for CSKT are available upon request; please contact Ronan Fire Dispatch Center Manager, Confederated Salish and Kootenai Tribes.
The Montana DNRC staffing levels are defined in the Southwestern Fire Mobilization Guide; please contact Southwestern Land Office Fire Program Manager.

## *II. Staffing Levels*

Staffing Levels can be derived directly from the Weather Information Management System (WIMS), or preferably, from an analysis of historical weather observations and fire occurrence data using the FireFamilyPlus software to determine ERC thresholds.

### A. Staffing Index

This Staffing Plan is based upon the following Staffing Index: Energy Release Component (ERC).

## *III. Draw-Down*

Draw-Down is the predetermined number and type of resources required to maintain viable initial attack (IA) capability at either the local or geographic area. Draw-Down resources are considered unavailable outside the local or geographic area for which they have been identified. Draw-Down is intended to:

- *Ensure adequate fire management capability for local and/or geographic area managers; and*
- *Enable sound planning and preparedness at all management levels.*

### A. Factors Affecting Draw Down

Draw-Down Levels can change dramatically in a short period of time. A few factors which can affect staffing and resource commitment/availability are:

**1. Response (or Dispatch) Level**

Staffing Levels have a direct effect on the ability to send pre-determined suppression resources to wildland fires, depending upon the Response Level (and vice versa). Even under normal threat levels, a routine call for service can deplete the availability of a unit's resources and result in a degree of drawdown. If an incident becomes prolonged or requires the commitment of resources beyond the initial response, the agencies capabilities can be affected.

**2. Unit Size**

The size of an agency has a direct impact on its ability to manage its Draw-Down status. The deeper the resource pool allows more flexibility for maintaining adequate coverage within the home jurisdiction. Agencies of medium to smaller size can be challenged to maintain geographical coverage at times of increased wildland fire activity. In the case of smaller agencies, a single resource committed to an incident can result in extreme Draw-Down and challenge their ability to meet their basic jurisdictional coverage responsibilities.

**3. 5-Day versus 7-Day Resource Staffing**

The Lolo and Bitterroot National Forests, Montana DNRC, and CSKT staff wildland fire engines/water tenders, initial attack modules, prevention technicians, fire lookouts, dispatchers, and helicopters with enough personnel to maintain 7-day staffing through the majority of the fire season. Typically, 7-day staffing begins around the 4$^{th}$ of July and/or when environmental conditions warrant the need and when the districts can appropriately staff 7-day coverage. Similarly, in the fall, Forest/District/Unit/Tribal Fire Management Officers will make the decision to go back to 5-day staffing based on the waning fire potential as well as the lack of personnel due to employees returning to school. Regardless of the staffing schedules, the expectation is that the minimum draw-down levels will be maintained throughout the fire season.

4. **Interagency Cooperation & Commitment**

The Missoula Interagency Dispatch Center provides dispatching services to multiple agencies. When multiple agencies respond to incidents on each other's jurisdiction – usually based on the closest available resource(s) –coordination amongst the affected agencies is essential to maintain interagency relationships and provide effective and efficient response to incidents.

5. **Multiple Fires**

Maintaining capacity to respond to a reported incident is the intended outcome of a Staffing Plan. However, when more than one incident occurs concurrently within the respective unit's response area, a unit's capacity can be diminished or exhausted.

## B. Determination of Draw-Down Levels

Local Draw-Down is established by the local unit and implemented by the local interagency dispatch office. The local dispatch office will notify the Geographic Area Coordination Center (GACC) of local Draw-Down decisions and actions.

The term Draw-Down is generally used to describe the level of commitment of an agency's resources at a certain point in time. Most importantly, it defines the agency's ability to perform its basic service levels. Once a level has been reached where basic service levels cannot be provided, actions should be taken to "step up" the capacity to a level sufficient to provide anticipated services.

Draw-Down levels are to be managed between the FDRA's to meet the total resources needed at the Unit level. There will be circumstances when deviations from the staffing plan will occur such as occasions when the unit experiences multiple fire starts and/or when a fire exceeds initial attack capabilities. In these situations, Forest Service, DNRC, and CSKT Fire Staff, FMO's/Duty Officers, and Missoula, Bitterroot, and Ronan Dispatch Centers will coordinate to ensure relief resources are ordered as needed. Additionally, local counties and adjacent federal land management units can be utilized to enhance staffing. When resources are in high demand, certain situations may dictate the need to allow for additional flexibility in our staffing plan where some of the identified Draw-Down levels may be met by sharing resources between our Unit's and potentially an IMT. This should only be used as a temporary fix to meet staffing needs until additional resources arrive.

## C. NORTHERN ROCKIES SOUTHWEST ZONE STAFFING PLANS

Staffing levels for personnel and initial attack resources needed will vary throughout the year and by Agency. When we are in Preparedness Level 1 and 2, typically during pre/post season, no or limited initial attack capability is required. The staffing tables below reflect recommendations for resource staffing on the Lolo NF, Bitterroot NF, Montana DNRC, and CSKT (pending). These tables recommend the minimum staffing levels needed for each

preparedness level with the recognition additional resources may need to be ordered to sustain staffing levels once resources become committed to incidents.

**2024 Lolo National Forest Staffing Plan**
**Based on Northern Rockies Southwest Zone Lolo/DNRC East and Lolo/DNRC West FDRA's, Fuel Model Y**

| **Preparedness Level Fire Danger Rating** | **1 Low** | **2 Moderate** | **3 High** | **4 Very High** | **5 Extreme** |
|---|---|---|---|---|---|
| **Fire Danger ERC Percentile** | **0-<40%** | **>40-<80%** | **>80-<90%** | **>90-<97%** | **>97%** |
| **Suppression Resources** | | | | | |
| | **1** | **2** | **3** | **4** | **5** |
| **Days per week** | Established Work Schedule | Established Work Schedule | Consider 7 Day | 7 Day | 7 Day |
| **Length of work day** | Established Work Schedule Hours | Established Work Schedule Hours | Extended Hours as Needed | Extended Hours (District DO Discretion) | Extended Hours (District DO Discretion) |
| **Forest Fire Duty Officer- DIVS & ICT3 or RXB2; or ASGS & ICT3 Qualified** | 1 | 1 | 1 | 1 | 1 |
| **Forest Aviation Officer** | 0 | 0 | 1 | 1 | 1 |
| **District Fire Duty Officer- TFLD & ICT3 or RXB2; or HEBM & ICT3 Qualified** | 3/Forest | 3/Forest | 5<br>1/District | 5<br>1/District | 5<br>1/District |
| **Dispatch Duty Officer** | 1 | 1 | 1 | 1 | 1 |
| **Initial Attack Dispatcher** | 1 | 2 | 2 | 3 | 3 |
| **Aircraft Dispatcher** | 1 | 1 | 1 | 1 | 1 |
| **Fire Investigator** | 1 | 1 | 1 | 1 | 1 |
| **Forest Fire Lookouts** | 0 | 0 | Key Lookouts Staffed | Key Lookouts Staffed | Key Lookouts Staffed |
| **Engines** | 3/Forest | 3/Forest | 5/Forest | 8/Forest | 8/Forest |
| **IA Module** | 0 | 0 | 5/Forest | 5/Forest | 5/Forest |
| **Helicopter Module** | 0 | 0 | 0 | 1 | 1 |
| **Fire Prevention** | 1/Forest | 1/Forest | 3/Forest | 4/Forest | 4/Forest |
| **Aerial Detection** | DO request | DO request | Consider Following lightning and/or DO request | Consider Following lightning and/or DO request | Consider Following lightning and/or DO request |

*Forest Draw-Down resources will be determined through discussions with District and Forest DO's. Daily Staffing Levels on the Lolo NF often exceed Draw-Down Levels. Duty Officers have the discretion to adjust these Draw-Down Levels to efficiently move resources where needed across the Forest and dispatch area.

**2024 Montana DNRC Staffing Plan**
**Based on Northern Rockies Southwest Zone Lolo/DNRC East FDRA,**
**Southwestern Land Office, Missoula, Clearwater and Anaconda Unit**
**Fuel Model Y**

| **Preparedness Level Fire Danger Rating** | **1 Low** | **2 Moderate** | **3 High** | **4 Very High** | **5 Extreme** |
|---|---|---|---|---|---|
| **Fire Danger ERC Percentile** | **0-<40%** | **>40-<80%** | **>80-<90%** | **>90-<97%** | **>97%** |
| | | | | | |
| | **1** | **2** | **3** | **4** | **5** |
| **Days per week** | **5 day** | **5 day** | **7 day** | **7 day** | **7 day** |
| **Length of work day Fire Staff, Dispatch, Aviation, and Engine Crews** | 8 hours | 8 hours | Discuss Extended Hours approaching PL4 | Extended Hours **Unit DO Discretion** | Extended Hours **Unit DO Discretion** |
| **Aerial Detection** | Unit Request | Daily Discussion: Unit Request | Daily Discussion: Unit Request | Daily Discussion: after lightning & increased fire activity and unit request | Daily Discussion: after lightning & increased fire activity and Unit request |
| **Unit IA Engine Availability per day** | | | | | |
| **Missoula** | One | 3 | 4 | 4 | Additional Engines As needed * |
| **CLW/Lincoln** | | 3 | 4 | 5 | |
| **ANA/Garrison** | | 2 | 4 | 5 | |
| **Additional Staffing** | | | | | |
| **Deer Lodge crew or IA hand crew** | | Available | Available | Consider prepositioning * | Consider prepositioning * |
| **Overhead** | | | | 1-ICT3 2-TFLD * | 1-ICT3 2-TFLD * |
| **Additional Helicopters** | | | | Consider Preposition * | Preposition * |
| **Prevention** | | | Fire Prevention Messaging | Local team * | Local or National team * |
| **Support Staff** | | | | Finance* Logistics * | Full type 3 organization * |
| **Task Force** | | | | Consider | 1 Task Force* |
| **Heavy Equipment** | | | | preposition as needed * | Pre Position As Needed* |
| | | | | | |

*Indicates actions requiring severity funding

Note: FWS lands in portions of western Montana are protected through off-set language outlined within the Montana Statewide agreement by the Montana DNRC. Fire Managers may choose to utilize the FWS Montana Fire Zone step-up and preparedness plan (See Appendix 1) to add additional FWS resources if DNRC resources are not adequate during staffing levels 4 and 5.

**2024 Bitterroot National Forest Staffing Plan**
**Based on Northern Rockies Southwest Zone**
**Fuel Model Y**

| Preparedness Level Fire Danger Rating | 1 Low | 2 Moderate | 3 High | 4 Very High | 5 Extreme |
|---|---|---|---|---|---|
| Fire Danger ERC Percentile | 0-<40% | >40-<80% | >80-<90% | >90-<97% | >97% |
| **Suppression Resources: July 1-September 30** | | | | | |
| | 1 | 2 | 3 | 4 | 5 |
| Days per week | 5 day | 5 day | 7 day starting PP13 | 7 day | 7 day |
| Length of work day | 8 hours | 8 hours | Discuss Extended Hours | Extended Hours 10 hours a day | Extended Hours 12 hours a day |
| Forest Fire Duty Officer-DIVS & ICT3 or RXB2; or ASGS & ICT3 Qualified | 1 | 1 | 1 | 1 | 1 |
| Forest Aviation Officer | 0 | 0 | 0 | 1 | 1 |
| District Fire Duty Officer TFLD & ICT3 or RXB2; or HEBM & ICT3 Qualified | 3 | 3 | 3 | 3 | 3 |
| Forest Dispatcher | 1 | 1 | 1 | 1 | 1 |
| Initial Attack Dispatcher | 1 | 1 | 1 | 2 | 2 |
| Fire Investigator | 1 | 1 | 1 | 1 | 1 |
| Fire Lookouts | 0 | Key Lookouts Staffed | Key Lookouts Staffed | Key Lookouts Staffed | Key Lookouts Staffed |
| Engines/IA Modules | 2 (1 must be engine) | 3 (2 must be engine) | 4 (3 must be engine) | 6 (3 must be engine) | 4 |
| 10 person IA Crew | 0 | 0 | 0 | Consider Pre-positioning | 2 |
| Overhead | 0 | 0 | 0 | 1-ICT3 | 2-ICT3 |
| Helicopter Module | 0 | 0 | 1 | 1 | 1 |
| Prevention | 1 | 1 | 1 | 1 | 1 |
| Aerial Detection | Following lightning and/or DO request | Following lightning and/or DO request | Following lightning and/or DO request | Following lightning and/or DO request | Following lightning and/or DO request |
| **Suppression Resources: October 1-June 30** | | | | | |
| | 1 | 2 | 3 | 4 | 5 |
| Forest Fire Duty Officer | 1 | 1 | 1 | 1 | 1 |
| Forest Aviation Officer | 0 | 0 | 0 | 1 | 1 |
| District Fire Duty Officer | 1 | 1 | 3 | 3 | 3 |
| Forest Dispatcher | 1 | 1 | 1 | 1 | 1 |
| Initial Attack Dispatcher | 1 | 1 | 1 | 1 | 1 |
| Fire Investigator | 1 | 1 | 1 | 1 | 1 |

| | | | | | |
|---|---|---|---|---|---|
| **Fire Lookouts** | 0 | 0 | 0 | 0 | 0 |
| **Engines/IA Modules** | 1 | 2 (1 must be engine) | 3 (2 must be engine) | 4 (3 must be engine) | 6 (3 must be engine) |
| **10 person IA Crew** | 0 | 0 | 0 | 0 | 0 |
| **Overhead** | 0 | 0 | 0 | 1-ICT3 | 1-ICT3 |
| **Helicopter Module** | 0 | 0 | 0 | 0 | 1 |
| | | | | | |
| **Prevention** | 1 | 1 | 1 | 1 | 1 |
| **Aerial Detection** | Following lightning and/or DO request | Following lightning and/or DO request | Following lightning and/or DO request | Following lightning and/or DO request | Following lightning and/or DO request |

### D. Aerial Detection

The Lolo and Bitterroot National Forest will utilize MATOC Call-When -Needed Light Fixed Wing contracts, IAA fixed wing detection, or rotor wing aircraft for fire detection. 2024 Detection "Call When Needed" requests will be placed through the dispatch system and routed through NICC. There is no designated tail number for CWN detection flights for the Lolo National Forest in 2024.

These aircraft are used primarily for wildland fire detection and monitoring purposes. The need and ordering of aerial detection will be at the discretion of the District/Forest DO's, and DFMO's and should consider the following.

- Current and Expected Fire weather.
- Recent Lightning activity
- Recent Fire activity
- District DO's or DFMO's should coordinate all aerial detection needs through the Forest Aviation Officer and place orders through the Missoula Dispatch Aircraft Desk by 9am.
- Order a second aircraft for coverage as needed.

Missoula Dispatch Center is responsible for ordering and dispatching aircraft, assigning Aerial Observers, and determining flight routes. Every effort will be made to place an Aerial Observer trainee on each flight. Districts will assist with providing Aerial Observers.

The Bitterroot National Forest has detection aircraft available under on-demand and call-when-needed (CWN) and MATOC contracts. They are primarily used for wildland fire detection, wildland fire response, and monitoring purposes. The Forest uses aircraft on an as-needed basis determined by the following general guidelines:

- As determined by fire danger levels
- Following lightning storms
- As assistance in the location of wildland fires
- To assess ignitions in wilderness areas

Bitterroot Dispatch Center maintains a list of Aerial Observers on the Bitterroot National Forest and is responsible for staffing an Aerial Observer on detection flights. The District Fire Duty Officer is responsible for ordering aerial detection when needed for their unit through dispatch.

The Montana DNRC fixed wing aircraft is used for aerial detection, initial incident size-up, and guiding ground crews to the fire. This resource will be obtained by ordering through Missoula Dispatch Center. The SWLO Duty Officer will have the responsibility for determining priorities when multiple incidents occur on two or more units. MDC is responsible for reassignment of the aircraft when necessary. Before the aircraft is moved or reassigned, communication will be initiated by the dispatch center to the Area Duty Officer and the unit currently controlling the aircraft.

At Preparedness Level III or higher, a discussion between Unit Fire Managers (or designee) and the Aviation Operations Supervisor (or assistant if AOS is unavailable) will determine the flight schedule for each day. This discussion will take place the evening prior to or the day of scheduled flights.

## E. Severity Staffing

Forest Service, DNRC, and CSKT Fire Staff, FMO's/Duty Officers, and Missoula, Bitterroot, and Ronan Dispatch Centers will consult, order, and preposition severity resources to best meet their Agency needs.

**2024 Severity Plan/Step Up Plan**

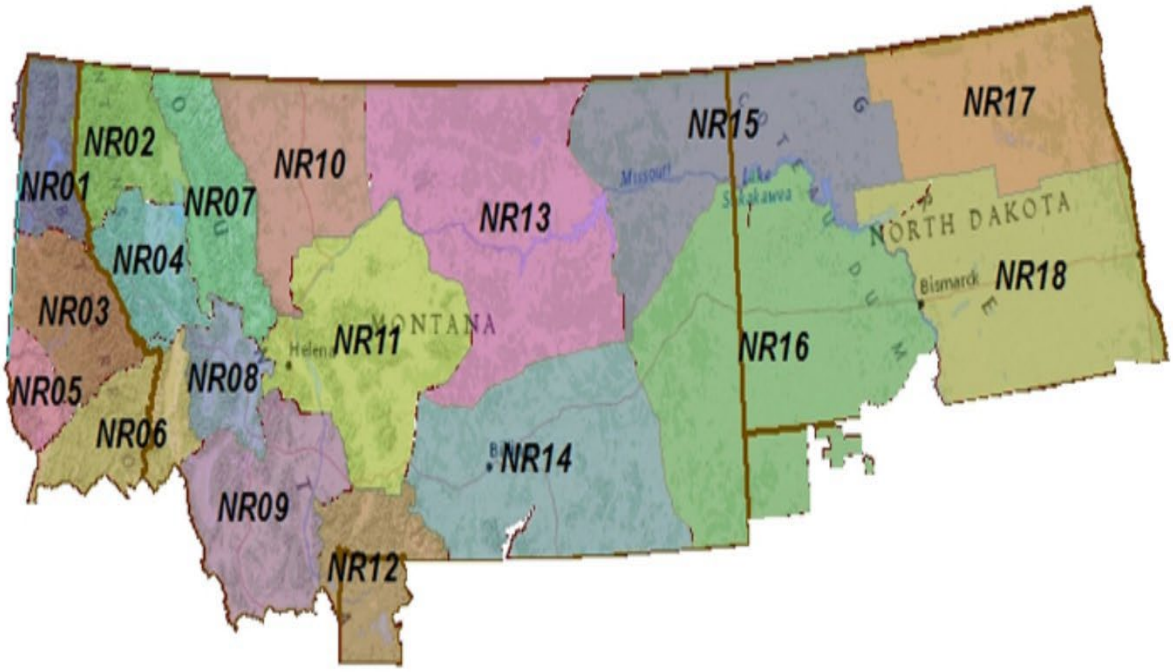
| | | | | | |
|---|---|---|---|---|---|
| **Preparedness Level<br>Fire Danger Rating** | **1<br>Low** | **2<br>Moderate** | **3<br>High** | **4<br>Very High** | **5<br>Extreme** |
| **Fire Danger ERC Percentile** | **0-<40%** | **>40-<80%** | **>80-<90%** | **>90-<97%** | **>97%** |
| **Severity Resources** | | | | | |
| | **1** | **2** | **3** | **4** | **5** |
| **Days per week** | Established Work Schedule | Established Work Schedule | Consider 7 Day | 7 day | 7 day |
| **Length of work day** | Established Work Schedule Hours | Established Work Schedule Hours | Extended Hours as Needed | Extended Hours (District DO Discretion) | Extended Hours (District DO Discretion) |
| **CWN Exclusive Use Helicopter** | 0 | 0 | Preposition as Needed | Preposition as Needed | Preposition as needed |
| **SEAT** | 0 | 0 | Preposition as Needed | Preposition as Needed | Preposition as needed |
| **ATGS/HLCO** | 0 | 0 | Preposition as Needed | Preposition as Needed | Preposition as Needed |
| **ICT3/District Duty Officer/Forest Duty Officer** | 0 | 0 | Consider Ordering to Boost Capacity | Consider Ordering to Boost Capacity | Consider Ordering to Boost Capacity |

| | | | | | |
|---|---|---|---|---|---|
| **Engine and/or IA Modules** | 0 | 0 | Consider Ordering to Boost Capacity | Consider Ordering to Boost Capacity | Consider Ordering to Boost Capacity |
| **T2IA Hand Crews** | 0 | 0 | 0 | Preposition as Needed | Preposition as Needed |
| **T1 Crews** | 0 | 0 | 0 | Preposition as Needed | Preposition as Needed |
| **Heavy Equipment (Dozer, Excavator, Skidgine, etc.)** | 0 | 0 | 0 | Preposition as Needed | Preposition as Needed |
| **IA/Aircraft Dispatch** | 0 | 0 | Consider Ordering to Boost Capacity | Consider Ordering to Boost Capacity | Consider Ordering to Boost Capacity |
| **Fire Investigator/LEO** | 0 | 0 | Consider Ordering to Boost Capacity | Consider Ordering to Boost Capacity | Consider Ordering to Boost Capacity |
| **Prevention** | 0 | Increase Messaging | Consider Prevention Team | Consider Prevention Team | Consider Prevention Team |

# *Appendix 1 - USFWS*

## MONTANA FIRE ZONE
## STEP-UP AND PREPAREDNESS PLAN

The U.S. Fish and Wildlife Service Montana Fire Zone (Zone) has adopted this one step-up plan concept to cover all current and new Fire Management Plans (FMP) within the Zone. This new plan will decrease confusion from inconsistencies between new and old FMP's and provide fire manager's clear guidance when determining current staffing levels and preparedness actions. This step-up plan utilizes climatological breakpoints for Energy Release Component (ERC) found within the Northern Rockies Predictive Service Area's (PSA's). Each PSA is outlined with current fuels conditions, utilizing NFDRSv4 fuel model Y, and climatological breakpoints that can easily be utilized when determining staffing levels. Current PSA information can be found on the Northern Rockies Coordination Center website under Fuels/Fire Danger tab. PSA's are outlined below:




## Northern Rockies Predictive Service Areas (PSAs)

(Click on PSA # for particular ERC, 1000-hr, and 100-hr Fuel Moisture, and BI graphs)

| PSA # | PSA NAME |
|---|---|
| NR01 | Northern Idaho Panhandle |
| NR02 | Northwestern Montana |
| NR03 | Southern Idaho Panhandle |
| NR04 | Western Montana |
| NR05 | Camas Prairie of Idaho |
| NR06 | North Central Idaho & Bitterroot/Sapphire Mountains |
| NR07 | Glacier National Park & Wilderness Areas |
| NR08 | Southwest Montana, West of Continental Divide |
| NR09 | Big Hole - Southwest Montana, East of Continental Divide |
| NR10 | Northern Front Range |
| NR11 | West Central Montana |
| NR12 | South Central Montana & Yellowstone National Park |
| NR13 | Northern Plains & Missouri River Breaks |
| NR14 | Southern Montana (Big Horn/Powder River) |
| NR15 | Northeastern Montana & Northwestern North Dakota |
| NR16 | Southeastern Montana & Southwestern North Dakota |
| NR17 | Northeastern North Dakota |
| NR18 | Southeastern North Dakota |

The following is a list of FWS lands associated with each specific PSA:

**NR02 - Northwestern Montana**

•Lost Trail NWR
•Creston NFH

**NR04 - Western Montana**

• National Bison Range
• Nine Pipe NWR
• Pablo NWR
• Swan Lake NWR

**NR08 - Southwest Montana, West of Continental Divide**

• Lee Metcalf NWR

**NR09 - Big Hole – Southwest Montana, East of Continental Divide**

• Red Rock Lakes NWR
• Ennis NFH
• Bozeman NFH

**NR11 - West Central Montana**

• Benton Lake NWR
• Benton Lake WMD

**NR13 - Northern Plains & Missouri River Breaks**

• Bowdoin NWR
• Bowdoin WMD
• Charles M. Russell NWR/UL Bend NWR
• War Horse NWR

**NR14 - Southern Montana (Big Horn/Powder River)**

• Lake Mason NWR
• Hailstone NWR
• Grass Lake NWR

**NR15 - Northeastern Montana & Northwestern North Dakota**

• Medicine Lake NWR
• Northeast Montana WMD

Common **Step-up Actions** per staffing levels throughout the Zone include:

• **Staffing Level 1**
  - Normal staffing hours and tours of duty
  - Fire Danger signs activated during fire season
  - Pre-season risk analysis completed
  - Fire Duty Officer identified and available

•**Staffing Level 2**
  - All Level 1 activities plus:
  - At least one fire ready apparatus housed at available cache's

-Does not apply to stations without fire staff or equipment
- Fire ready equipment checked weekly for readiness
- Fire staff carries fire gear while on duty

**•Staffing Level 3**

- All Level 1 and 2 activities plus:
- All fire stations with Engines and staff have at least one engine fire ready
- Fire ready equipment checked for readiness at least twice per week
- Each fire cache will have a minimum of one portable pump and two chainsaws fire ready and checked for readiness bi-weekly
- Stage 1 or 2 restrictions may be implemented

**•Staffing Level 4**

- All Level 1-3 activities plus:
- All fire equipment ready and checked daily
- Minimum one ICT5 plus one Type VI or larger Engine available for response from within Zone.
- Extended hours and 7-day staffing considered
- Short Term and Long-Term severity requests may be submitted for approval
- Non-fire red carded staff may be requested to be available for suppression support. AD's and/or detailers may also be utilized.
- Project Leaders/Refuge managers may consider closing areas/roads

**•Staffing Level 5**

- All level 1-4 activities plus:
- Minimum of one ICT4 plus one Type VI or larger Engine with staff available for fire response from within Zone
- Consider aerial detection flights
- All Zone activities (mowing, driving off-road, etc.) will be evaluated as potential ignition sources and possibly delayed until a time of lower fire danger.

***NOTE:*** FWS lands in portions of western Montana are protected through off-set language outlined within the Montana Statewide agreement by the Montana DNRC. Fire managers may choose to utilize this step-up plan to add additional FWS resources if DNRC resources are not adequate during staffing levels 4 and 5.

The table below utilizes climatological breakpoints of the 50th, 80th, 90th, and 97th percentile for ERCs of each PSA utilizing Fuel Model Y. Breakdowns of staffing level/ ERCs are as follows: staffing level 1 = 0-50th, 2 = 51st-80th, 3 = 80th-89th, 4 = 90th-96th, 5 = 97th +

| ERC values | Staffing Level | | | | | |
|---|---|---|---|---|---|---|
| | PSA | 1 | 2 | 3 | 4 | 5 |
| | NR02 | <13 | 13-31 | 32-39 | 40-47 | >47 |
| | NR04 | <15 | 15-34 | 35-43 | 44-51 | >51 |
| | NR08 | <15 | 15-32 | 33-39 | 40-46 | >46 |
| | NR09 | <22 | 22-35 | 36-42 | 42-47 | >47 |
| | NR11 | <17 | 17-34 | 35-41 | 41-49 | >49 |
| | NR13 | <32 | 32-39 | 40-46 | 47- | >55 |
| | NR14 | <21 | 21-36 | 37-43 | 44-52 | >52 |
| | NR15 | <16 | 16-25 | 26-29 | 30-35 | >36 |

Staffing level break point for USFWS

# Appendix C: Prevention Plans

## Lolo Fire Prevention Plan

## Bitterroot Fire Prevention Plan

The Lolo and Bitterroot are currently working on updating their prevention plans. Links to these documents will be updated soon.

# Appendix D: Fire Restrictions Plan

## Missoula Area Restrictions and Closure Plan

# Appendix E: Response Plan

## I. Introduction

### A. Purpose

Local-level Initial Pre-planned Response Plans, also referred to as "Run Cards", 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.

### B. Terminology

1. **Dispatch Response Level**
   Dispatch Response Levels (Low, Moderate, and High) 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. FireFamilyPlus software is used to establish the Response Level thresholds. A statistical analysis of fire occurrence and historical weather has been completed for each FDRA and the combination of ERC and BI values determines the daily Dispatch Response Level. The Lolo and Bitterroot National Forests, Montana DNRC, and CSKT agencies may utilize the Dispatch Response Levels calculated for each FDRA in response to wildland fires.

2. **Dispatch Response Zone**
   Dispatch Response Zones are currently or will be identified for use by the Missoula and Bitterroot Dispatch Centers. Response zones may be based on various criteria such as: common management objectives, land use, fire load, dispatch locations, estimated response times, WUI locations, topographical features, vegetation communities, etc. Response Zone maps for Ronan Dispatch Center have not yet been created at the time of this Response Plan.

3. **Dispatch Center**
   Each geographic area has established dispatch centers that mobilize and demobilize resources directly with the geographic area coordination center. The dispatch center is the focal point for mobilizing firefighting resources between units within the dispatch area responsibility, coordinating incoming resources into the dispatch area, dispatching resources mobilized out of the dispatch area, and collecting and disseminating fire intelligence information within the dispatch area and with the geographic area coordination center.

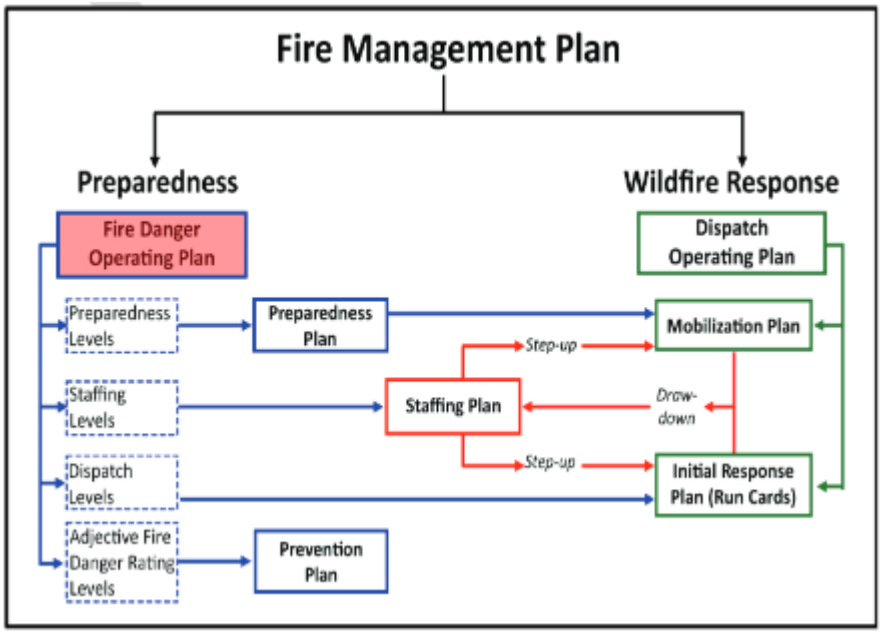
4. **Pre-Planned Response Plan**
   Each dispatch center with the responsibility for initial response to wildland fires shall have a pre-planned response plan that allocates resources to new wildland fires in accordance with fire management direction, initial attack agreements and established ordering procedures. The pre-planned response plan will be reviewed and updated

annually prior to fire season.

### C. Policy and Guidance

Policy and guidance regarding the development of Pre-Planned Response Plans can be found in Chapter 19 of the Interagency Standards for Fire & Aviation Operations (Red Book).

Fire Management Officers will ensure Pre-planned Response Plans are in place, utilized, and provide for initial response commensurate with guidance provided in the FMRS and/or LRMP. Initial Pre-planned Response Plans will reflect agreements and annual operating plans and will be reviewed annually prior to fire season. These plans may be modified as needed during fire season to reflect the availability of national, prepositioned, and/or severity resources. Specific agency directives and interagency guidance requires numerous unit plans and guides to meet fire preparedness and wildfire response objectives. Some of these plans and guides are inter-related; one or more plans/guides provide the basis for other plans/guides. The Response Plan is an operational plan tiered from the Fire Danger Operating Plan as shown below:




## II. Dispatch Response Level Matrix

### A. Dispatch Response Level

Agency personnel may use the Dispatch Response Level to assign an appropriate mix of suppression resources to a reported wildland fire incident. Dispatch Response Levels will be established for each day utilizing the Dispatch Response Level Matrix (Table 3) which is a combination of the Preparedness and Response Levels calculated from ERC and BI values. (See Section IV: Dispatch Response Level Decision Process for ERC and BI threshold ranges which provide the daily input into the Dispatch Response Level Matrix).

# III. Response Plan – Run Card

## A. Run Card Overview

At the time of this plan, the Lolo and Bitterroot National Forests as well as the DNRC have developed and are utilizing Run cards. The CSKT are in the process of developing their run card systems for their jurisdiction.

**Effective Dates: May 1st through September 30th.**

Beyond these dates, notification of smoke reports will be made directly to the appropriate jurisdictional Duty Officer.

The Interagency Run Cards are developed by a group of jurisdictional Duty Officers to provide a standard wildland fire suppression response to the dispatch center for dispatching initial attack fires within pre-identified geographic areas (response zones).

The run cards will be used when a wildfire is reported and does not meet the discretionary smoke report criteria listed below. When an NWCG qualified Incident Commander is on scene of the fire, they may adjust the pre-established initial attack response, as identified on the run card, by cancelling resources currently en-route (or about to be dispatched) or by ordering additional resources as needed. Until such time as an IC is on scene, the Duty Officer is responsible for the fire response and can modify the run card as necessary.

Once run card development is completed, periods of large/multiple fire activity, when there are not enough resources to fill the run cards, the Duty Officers from the Lolo and Bitterroot National Forests and the Montana DNRC will be available to their respective Dispatch center to determine incident prioritization and response. The same process can be implemented at Ronan Dispatch Centers, once run cards are developed.

## B. Run Card Procedures:

During working hours, Missoula, Bitterroot, and Ronan Dispatch Centers will dispatch the closest available resource according to the appropriate Fire Danger Rating Area (FDRA) Dispatch Response Level.

After resource duty hours, dispatchers will contact the jurisdictional Duty Officer, who will determine the response.

Volunteer fire departments (or any other resource not dispatched by Missoula, Bitterroot, or Ronan Dispatch Centers) will not be considered as meeting the run card requirements for numbers of resources during the initial attack dispatch. The dispatch center can list the closest agency for “Assist by Hire” in each run card.

1. **Discretionary Smoke Reports:**

   When any of the following smoke reports are received, the run card will not be sent, and the jurisdictional Duty Officer will be contacted to determine the response.

   - Federal Aviation Administration (FAA) Report.
   - Abandoned Campfires, when clearly stated that it is still within the ring.

- Incidents that local volunteer fire departments have responded to or are on scene and are requesting no additional resources.

**2. Limited Response Plan:**

Periodically Missoula, Bitterroot, and Ronan Dispatch Centers get widespread lightning activity resulting in numerous starts, many of these single tree lightning strikes. It is not possible to dispatch the number and type of resources called for in the run card plan to each of these fires. This plan is designed to provide guidance to Dispatch Centers to coordinate an initial response under these multiple start conditions (generally considered 3 or more starts).

Under circumstances where multiple starts are likely to occur (i.e. forecasted LAL 6) or are occurring and each FDRA is at a Dispatch Response Level of Moderate or High the Dispatch Center run card plan may be suspended and guidance provided by District Duty Officer for initial response to new starts. If possible, it is desired that the appropriate Agency Duty Officer meet at their Dispatch Center to provide coordinated guidance to the floor supervisor. A MAC call may be initiated if meeting in person is not possible.

Duty Officers should consider using the following priorities for dispatching resources*:

1. When there is a direct threat to human life
2. When there is a direct threat to homes or communities
3. When there is a direct threat to other high value infrastructure or improvements
4. All others

Until such time as the Duty Officers are able to provide coordinated direction, the Dispatch Center floor supervisor is authorized to determine the fire priorities based on given direction and make modifications to the established run card response during multiple start events.

During circumstances where there are no longer resources available to be dispatched to a new smoke report, dispatch staff will notify the District/Unit Duty Officer of each new report and they will, considering the priorities mentioned above, make a determination of needed staffing adjustments and provide guidance to dispatch staff as to what resources to dispatch to each new smoke report.

*Additionally, if on any given day when all FDRAs are at a Dispatch Response Level of Moderate or High and Missoula, Bitterroot, and Ronan Dispatch Centers recognize the inability of daily staffed resources to fulfill a dispatch of any run card, the Dispatch Response Plan/run cards may be suspended and any start would use the prioritization process as identified above.

## C. Run Cards

During working hours, Missoula, Bitterroot, and Ronan Dispatch Centers will dispatch the closest available resource according to the appropriate Fire Danger Rating Area (FDRA) Dispatch Response Level.

At the time of this plan, CSKT have not yet developed run card systems for their jurisdiction.

**Bitterroot NF Run Cards**

| RUN CARDS (DISPATCH RESPONSES) | | | | |
|---|---|---|---|---|
| RESPONSE LEVELS / FMUs | LOW | MODERATE | High | Notes |
| 1 WUI | Engine + IA Module | Engine Module + IA Module + Helicoptor + ICT4 | Engine Module + IA Module + Helicoptor + ICT4 + ICT3 + Engine Module + Air Attack Platform + Helicopter | |
| 2 Roaded | Engine + IA Module | Engine + IA Module + Helocptor | Engine + IA Module + Helocptor + ICT4 + Engine + Air Attack Platform | |
| 3 Roadless | Engine + IA Module | Engine + IA Module + Helicopter | Engine + IA Module + Helicopter + ICT4 | |
| 4 WIlderness | Call DO | Call DO | Call DO | |

**Lolo NF Run Cards (Link below)**

[Missoula Interagency Dispatch Center]

# IV. Dispatch Response Level Decision Process

Preparedness Level, based upon ERC, from Table 1 and Response Level, based upon BI, from Table 2 are the two inputs in determining the Dispatch Response Level calculated in Table 3.

## ERC

| | Lolo DNRC East | Lolo DNRC West | CSKT East | CSKT West | Bitterroot Low | Bitterroot High |
|---|---|---|---|---|---|---|
| Decision Threshold Ranges | | | | | | |
| Low - PL 1 0% - <40% | 0 - 20.9 | 0 - 23.9 | 0 - 20.9 | 0 - 22.9 | 0 - 19.9 | 0 - 15.9 |
| Moderate - PL 2 >40% - <80% | 21 - 39.9 | 24 - 40.9 | 21 - 32.9 | 23 - 37.9 | 20 - 43.9 | 16 - 40.9 |
| High - PL 3 >80% - <90% | 40 - 45.9 | 41 - 47.9 | 33 - 37.9 | 38 - 43.9 | 44 - 48.9 | 41 - 46.9 |
| Very High - PL 4 >90% - <97% | 46 - 50.9 | 48 - 53.9 | 38 - 42.9 | 44 - 49.9 | 49 - 54.9 | 47 - 52.9 |
| Extreme - PL 5 >97% | 51+ | 54+ | 43+ | 50+ | 55+ | 53+ |

**Table 1: Prepardeness Levels and ERC Decision Threshold Ranges in all FDRA's.**

## BI

| | Lolo DNRC East | Lolo DNRC West | CSKT East | CSKT West | Bitterroot Low | Bitterroot High |
|---|---|---|---|---|---|---|
| Decision Threshold Ranges | | | | | | |
| Low | 0 - 28.9 | 0 - 21.9 | 0 - 24.9 | 0 - 20.9 | 0 - 32.9 | 0 - 30.9 |
| Moderate | 29-35.9 | 22-43.9 | 25 - 32.9 | 21 - 40.9 | 33 - 46.9 | 31 - 41.9 |
| High >97% | 36+ | 44+ | 33+ | 41+ | 47+ | 42+ |

**Table 2: BI Decision Threshold Ranges in all FDRA's.**

The decision matrix below uses the combination of ERC (weekly trend) and BI (daily trend) levels to determine the overall Dispatch Response Level. This table provides a connection between the preparedness plan and response plan while incorporating staffing needs. This Dispatch Response Level will be calculated daily to assist fire managers with resource staffing and response decisions.

+ days represent the 1% days when the ERC and BI are above the 97$^{th}$ percentile. Historically, most firefighter entrapments, shelter deployments, and fatalities have occurred under these conditions.

| Response Level BI (Y) | Dispatch Response Level | | | | |
|---|---|---|---|---|---|
| H | Low | Low | Mod | High | High + |
| M | Low | Low | Mod | Mod | High |
| L | Low | Low | Low | Mod | Mod |
| | 1 | 2 | 3 | 4 | 5 |

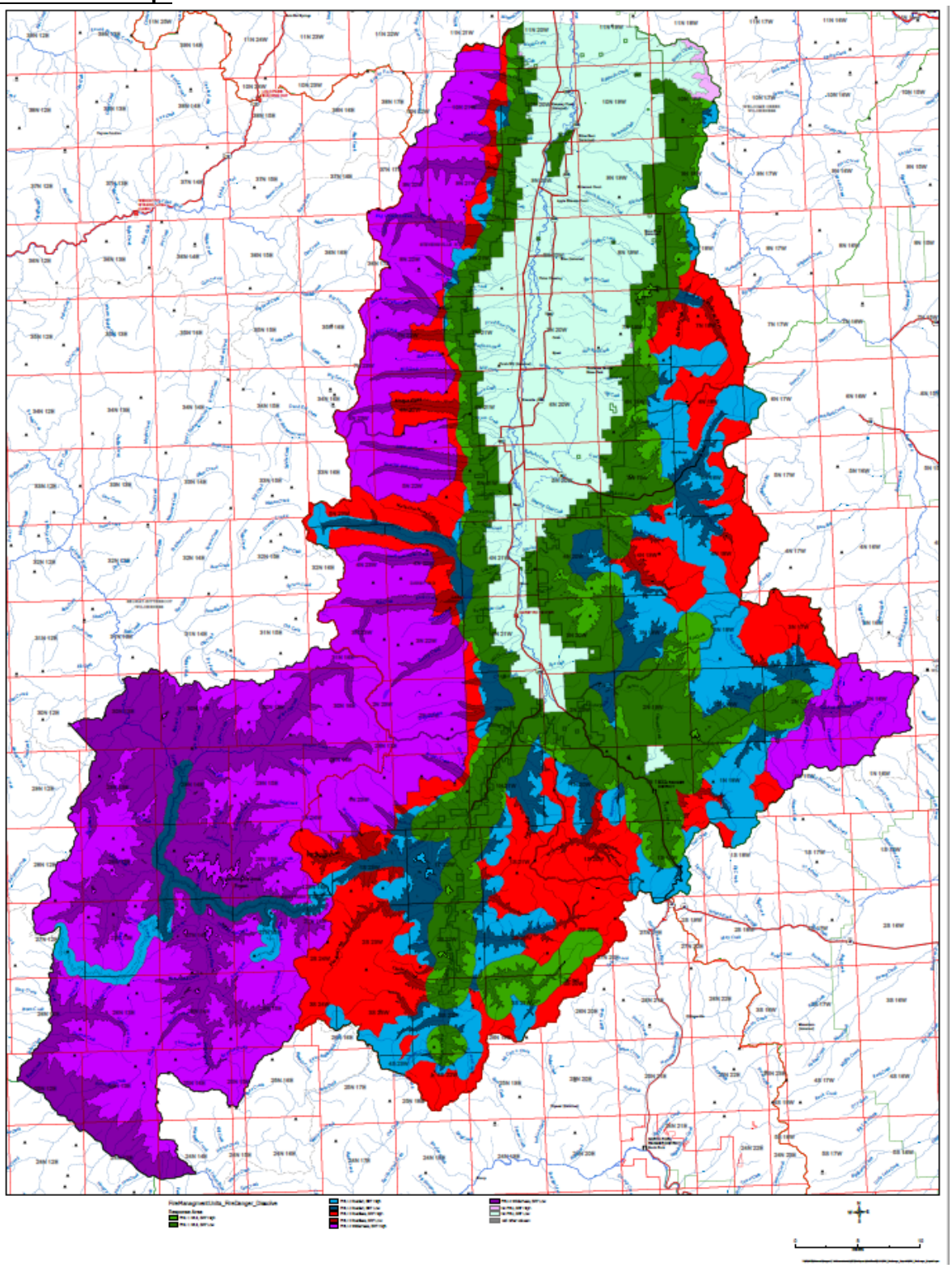
**Preparedness Levels**

**ERC (Y)**

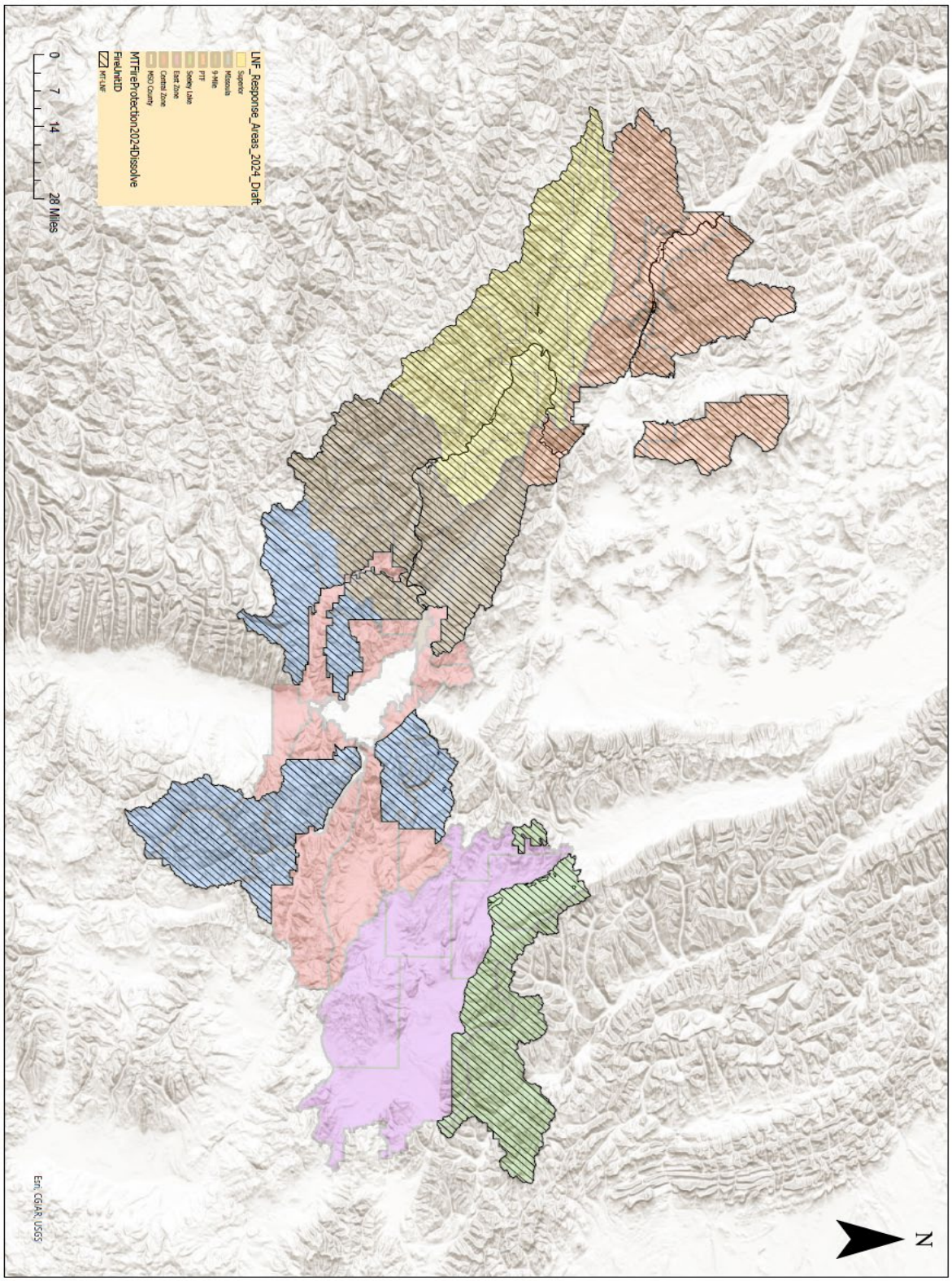
Table 3: Dispatch Response Level Matrix.

## Appendix B

**Response Zone Map:** **Bitterroot National Forest**



**Response Zone Map:** **Lolo National Forest**



**Response Zone Map: CSKT**

Contact Ronan Dispatch Center

## Appendix C

**Run Cards:**

**EXAMPLE RUN CARD:**

**[Name of Response Zone]**

**[Name of FDRA]**

**[Name of Radio Group]**

| DISPATCH RESPONSE LEVEL | LOW | MODERATE | HIGH |
|---|---|---|---|
| RESOURCES (MINIMUM) | Ex: 1 Engine or Module | Ex: 2 Engine or Modules; ICT4/5 | Ex: 2 Engine; IA Module; ICT3/4 |

**Dispatch Comments**

| |
|---|
| **SHARED BOUNDARY:**<br>• Notify adjacent Dispatch Office if fire is within 5 miles of neighbor's boundary. |
| **IF AIRCRAFT IS ORDERED:**<br>• Ex: Landing site approvals; dip-site locations; |
| **KNOWN HAZARDS:**<br>• Ex: Access, power lines, etc. |
| **NOTIFICATIONS:**<br>• Ex: District Duty Officer; Forest Duty Officer, MSO Unit Duty Officer, SWLO Duty Officer, |
| **DUTY OFFICER CONSIDERATIONS:**<br>• Ex: Contact appropriate Sheriff's office when fire is threatening or close to private property. |

# Appendix F: Northern Rockies Interagency Mobilization Plan

NRCC Mobilization Plan

## Appendix H: Topography

**Topography:**
The topography in the Lolo, DNRC, and CSKT FDRA's is generally a rugged mix of mountainous forests and valley bottoms with elevations ranging from approximately 2,400' to 4,000' in the lowest valley bottoms to 8,000' to 9,500' in the higher mountainous terrain. Slope over the area ranges widely from rolling foothills to sheer rocky cliffs.

The Flathead, Clark Fork, Blackfoot, and Bitterroot Rivers, and portions of Flathead Lake are the main water influences within the planning area. The Idaho/Montana, Reservation, Ninemile, Sapphire, Swan Range, and Mission Mountains are all major Divides located within the planning area.

The Mission Valley is a clear topological feature within the study area. The valley is wetter to the east along the toe of the slope of the Mission Mountains. The western portion of the Mission Valley is more arid and the entire valley is generally rolling and level with a constant elevation. The Missoula, Frenchtown, and Potomac Valleys to the south of the Mission Valley are generally rolling and level as well.

The topography in the Bitterroot Low and High FDRA's consists of a valley floor about 60 miles long, ranging in width from 4 to 10 miles. To the west, the Bitterroot Range rises abruptly from the valley floor with a vertical relief of about 5,000 feet and rising to over 10,000 feet in elevation. Breaking this front at intervals of 1 to 3 miles are 30 deep, rocky glaciated canyons. South facing slopes are steep and rocky and north facing slopes are heavily timbered and often decadent with considerable dead and down fuel.

To the east, vertical relief along the Sapphire Mountains is much less pronounced, at about 3,000 feet. Grassy foothills provide a relatively gradual transition from the valley floor to the crest of the Sapphires, at over 8,000 feet in elevation. Major streams are much less frequent and occur at intervals of 4 to 7 miles.

Slopes on the forest are characteristically steep. Gentle slopes, under 40% slope, lie adjacent to the larger streams, along the ridges, and are fairly extensive at higher elevations representing 30% of the forest. Mid-slopes between streams and ridges are moderately steep, 40%-60% slope, and represent 40% of the forest. Those rising above major streams are usually very steep, over 60% slope, representing 30 % of the forest.

## Appendix I: Vegetation

**Lolo DNRC East**

This FDRA includes lands associated with the Missoula, Seeley Lake, and portions of the Ninemile Ranger District on the Lolo National Forest, Montana DNRC Missoula and Clearwater Units, Montana Fish, Wildlife, and Parks, Bureau of Land Management, U. S. Fish and Wildlife Service, private industry, and private ownership. Interstate 90 and Highway 83 and 200 are the main travel corridors through this FDRA.

Most of the area is dominated by mixed conifer with areas of grassland to the east. The northern portion has higher elevation mountainous terrain which lends itself more readily to lodgepole pine transitioning to whitebark pine and wetter, vegetation growth.

Lower elevations of the eastern Clark Fork River Drainage consist of grasses, forbs, and shrubs transitioning to warm, dry ponderosa pine and Douglas fir stands. Ninebark, serviceberry, rough and Idaho fescues, and bluebunch wheatgrass habitat types are present along with occasional grassy parks on southerly aspects along the Frenchtown Face and throughout the Rock Creek Corridor. These lower elevations all contain this vegetative structure and are located within the Community Wildfire Protection Zone of Missoula Valley, Lolo Creek, Ninemile Creek, Petty Creek, Rock Creek, Clark Fork River Drainage, and the Highway 200 corridor.

Vegetation at mid-elevations transitions into cool, dry, and moist interior Douglas fir stands. Much of the vegetation structure consists of mixed conifer stands including western larch, ponderosa pine, and Douglas fir with inclusions of western red cedar, grand fir and lodgepole pine. These locations are typically within human developed areas.

Vegetation in the higher elevations and north aspects are characterized by lodgepole pine and lower subalpine pine/Engelmann spruce habitat types with grasses and shrubs. High elevations in the Great Burn Proposed Wilderness, Rattlesnake Wilderness, Scapegoat Wilderness, Ninemile Divide, Reservation Divide, and portions of the Rock Creek Drainage consist primarily of whitebark and lodgepole pine habitat types. Increased fuel loadings and tree mortality may be seen at these higher elevations due to mountain pine beetle attacks over the last several decades. Vegetation in these higher elevations is pre-disposed to stand replacement fire due to the high fuel load accumulations and understory vegetation.

**Lolo DNRC West**

This FDRA includes lands associated with Plains, Superior, and portions of the Ninemile Ranger District on the Lolo National Forest, Montana DNRC, Montana Fish, Wildlife, and Parks, private industry, and private ownership. Interstate 90, Highway 135, and Highway 200 are the main travel corridors through this FDRA.

The western portions of the Lolo NF and Montana DNRC lands have ponderosa pine, Douglas fir, and western larch at lower elevations near the river corridors and quickly transitions

through mixed conifer with shrub understory and western larch on wetter aspects into higher elevation lodgepole pine.

Lower elevations of the western Lolo NF and Montana DNRC lands consist of grasses, forbs, and shrubs transitioning to warm, dry ponderosa pine and Douglas fir stands. Ninebark, serviceberry, rough and Idaho fescues, and bluebunch wheatgrass habitat types are present with occasional grassy parks intermixed on southerly aspects all along the Lower Clark Fork River near Fish Creek, Superior, Plains, and Thompson Falls.

The higher elevations along the Flathead River Divide, Clark Fork River Divide, CCC Divide, and the Idaho/Montana border can vary depending on aspect, but are typically characterized as mixed conifer stands with lodgepole pine and subalpine fir/Engelmann spruce stands. Intermittently dispersed throughout these stands are grasses, shrubs, and litter. Fires in this fuel model would be more of a stand replacement event under very high to extreme conditions.

**CSKT East**
This FDRA includes lands owned by the Confederated Salish and Kootenai Tribe. Highway 93 is the main travel corridors through this FDRA. This FDRA extends into the Mission Mountain Wilderness.

The lower elevations on the east side of the Mission Valley are composed of wetlands and agricultural lands bordered by large areas of annual and perennial grasses, forbs, and shrubs mainly on the valley floor and south aspects. From valley floor to mid elevation, this grass vegetation type transitions to warm, dry ponderosa pine and Douglas fir.

Mid to high elevations of the Mission Mountains are depicted by mixed conifer stands consisting of lodgepole pine, Douglas fir, and subalpine fir/Engelmann spruce. Intermittently dispersed throughout these forested stands is a mix of grasses, shrubs, and litter with understory conifer development. Whitebark and lodgepole pine stands dominate higher elevations in the Mission Mountains Wilderness and the South Fork Jocko Tribal Primitive Area. Increased fuel loadings and tree mortality due to mountain pine beetle attacks over the last two decades are evident and pre-disposed the area to stand replacement fire.

**CSKT West**
This FDRA includes lands owned by the Confederated Salish and Kootenai Tribe, U.S Fish and Wildlife Service, and Montana Fish, Wildlife, and Parks. Highway 28, 93, and 200 are the main travel corridors through this FDRA.

The lower elevations on the west side of the Mission Valley are composed of wetlands and agricultural lands bordered by large areas of annual and perennial grasses, forbs, and shrubs mainly on the valley floor and south aspects. From valley floor to mid elevation, this grass vegetation type transitions to warm, dry ponderosa pine and Douglas fir.

The mid to high elevations within and bordering the Mission Valley are predominately mixed conifer stands including Douglas fir, lodgepole pine and subalpine fir/Engelmann spruce. Intermittently dispersed throughout these forested stands is a mix of grasses, shrubs, and litter with understory conifer development.

**Bitterroot Low (Below 6000')**

The Bitterroot Low FDRA includes lands associated with the Stevensville, Darby, Sula, and West Fork Ranger Districts on the Bitterroot National Forest, Montana DNRC, Montana State Trust, Montana, Fish, Wildlife, Parks, U. S. Fish and Wildlife Service, private industry, and private ownership. Highways 93 and 473 are the main travel corridors in this FDRA. The Bitterroot and West Fork of the Bitterroot River are the largest water features throughout this FDRA.

As the lower elevations of the Bitterroot Valley transition from grasslands into timber, the south and west aspects are dominated by warm and dry ponderosa pine habitat types with predominately a grass understory. Shrubs such as snowberry, bitterbrush, and chokecherry are also common. Extremely dry rocky slopes in the Darby and Trapper Creek Job Corps areas contain mountain mahogany. These habitat types were historically open stands managed by a frequent fire return interval. Without the presence of fire, Douglas-fir is commonly found in the understory.

North and east aspects in the lower elevations are still considered warm, relatively dry, and commonly support a Douglas-fir habitat type with a mix of ponderosa pine. In the absence of fire, Douglas-fir is the dominant species in the understory and is often found in dense clumps. Shrubs such as ninebark and snowberry along with pine grass and bunch grasses are frequently found here.

With an increase in elevation (4000-6000') and precipitation, Douglas-fir habitat types transition into relatively wetter stands with higher stand densities, greater forb and shrub component, and higher fuel loadings. A mix of lodgepole pine, grand-fir, ponderosa pine, and western larch (north aspects on Stevensville RD) are common. Huckleberry, ninebark, kinnikinnick, Oregon grape, pine grass, and elk sedge are present in the understory.

Canyons and steep drainage bottoms in the lower elevations often contain a wetter mix of species including Engelmann spruce, grand fir, Douglas-fir, red osier dogwood, fools huckleberry, Oregon grape, a variety of ferns, and moisture loving forbs. Heavy down woody accumulation is often present.

**Bitterroot High (Above 6000')**

The Bitterroot High FDRA includes lands associated with the Stevensville, Darby, Sula, and West Fork Ranger Districts on the Bitterroot National Forest, Montana State Trust, Montana, Fish, Wildlife, Parks, private industry, and private ownership.

As the elevation increases above 6000', Ponderosa pine drops out and Douglas-fir dominated habitat types transition to include a greater mix of lodgepole pine, subalpine fir and Engelmann

Spruce. Understories often consist of dense shrubs, forbs and grasses. Fools huckleberry (MEFE), alder, willow, huckleberry, bear grass and elk sedge are often common. Western larch is present on north aspects on the Stevensville Ranger District. Lodgepole pine dominated stands are also found at this elevation and may be dense stands with higher fuels loadings. Aside from western larch being fire tolerant, fire in many of these stands is often stand replacing.

At the highest elevations, subalpine cold habitat types exist including a mix of whitebark pine, lodgepole pine, subalpine fir, and subalpine larch. These stands tend to be more open grown with rocky soils and patchy shrubs, forbs and grasses. Mountain heather, grouse whortleberry, and smooth woodrush are common.

## Appendix J: Climate

**Climate (Common to Lolo DNRC East, Lolo DNRC West, CSKT East, & CSKT West FDRA's):**
In general, all FDRA's have a northern Pacific coastal climate with cool summers and mild winters. Winter snowfall averages 39.5 inches on average occurring between October 30 and April 20. As with the rest of the state, summers are very sunny, and the average diurnal temperature variation is more than 30 °F from late June through late September, due to the relative aridity. The monthly daily average temperature ranges from 23.9 °F in December to 68.6 °F in July. There is an average of 24 days with temperatures above 90 °F, 45 days where the temperature does not rise above freezing, and 7.8 days with temperatures below 0 °F.

Prevailing winds are generally from the southwest except where terrain influenced. Strong wind events are normally associated with thunderstorms and cold frontal passages. Cold front passages are of particular concern during late summer and early fall when fuels conditions are at their driest and a fire start can result in large fire growth. Large fire growth has been observed, during the peak of the fire season, when prevailing winds align with drainages that run southwest to northeast.

**Climate (Common to Bitterroot Low and Bitterroot High FDRA's):**

Climate zones on the Bitterroot Forest include: the semiarid and relatively warm valley bottoms; a broad range of cool, moist coniferous forests; and the cold, moist subalpine and alpine region characterized by bedrock escarpments, coarse rock debris, and cirque lakes and headwalls carved by alpine glaciation of the recent geologic past. This topographic variety provides a diverse mosaic of plant and animal communities, and distinctive panoramas of high mountains and broad valleys. This zone is heavily forested, but the growing season is very short

The Bitterroot Valley is semiarid with annual precipitation less than 14 inches. Precipitation increases with elevation. Approximately 10 percent of the Forest receives less than 20 inches of annual precipitation. About 30 percent of the Forest receives 20-30 inches of precipitation annually.

Precipitation on 60 percent of the Forest is above 30 inches. It ranges from an annual average of 50 inches on the Sapphire divide, to 100 inches in higher elevations of the Bitterroot Range. Approximately two-thirds of the precipitation falls as snow, the primary source for ground water recharge and streamflow.

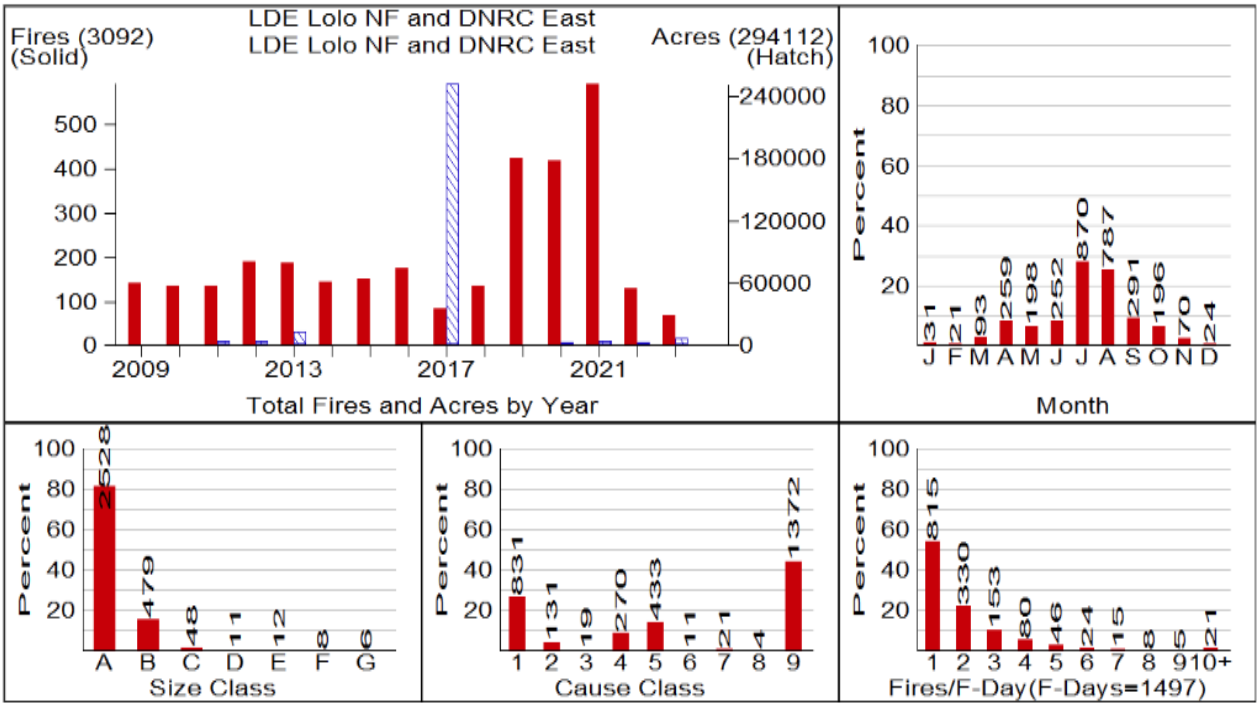
## Appendix K: Fire Occurrence

The Fire Cause Classes Table provides a crosswalk with the Cause Class Graph in the FireFamilyPlus FDRA modelling.

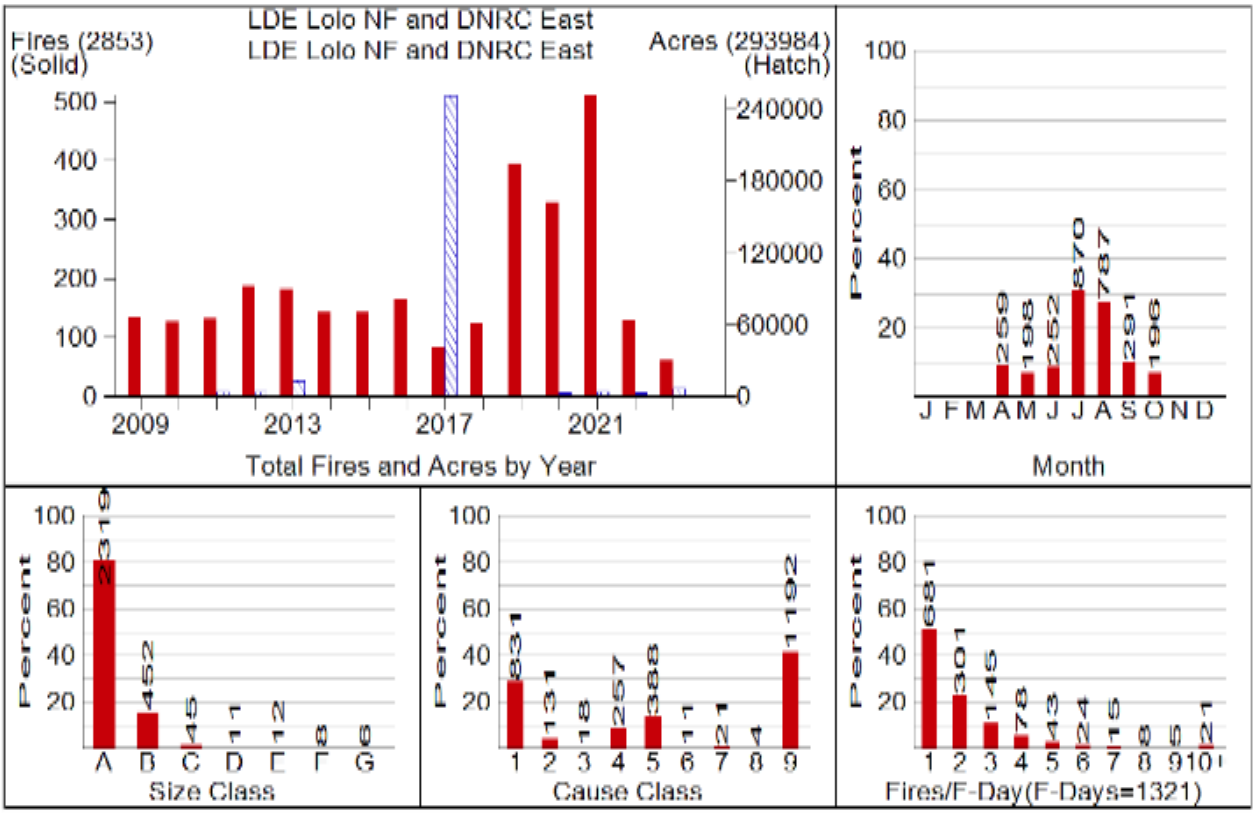
| Fire Cause Classes Table | |
|---|---|
| 1 | Lightning |
| 2 | Equipment |
| 3 | Smoking |
| 4 | Campfire |
| 5 | Debris Burning |
| 6 | Railroad |
| 7 | Arson |
| 8 | Children |
| 9 | Miscellaneous |

**LDE: Lolo NF & DNRC East**

Fire Analysis Yearly Timeframe: January 1-December 31: 2009-2023.

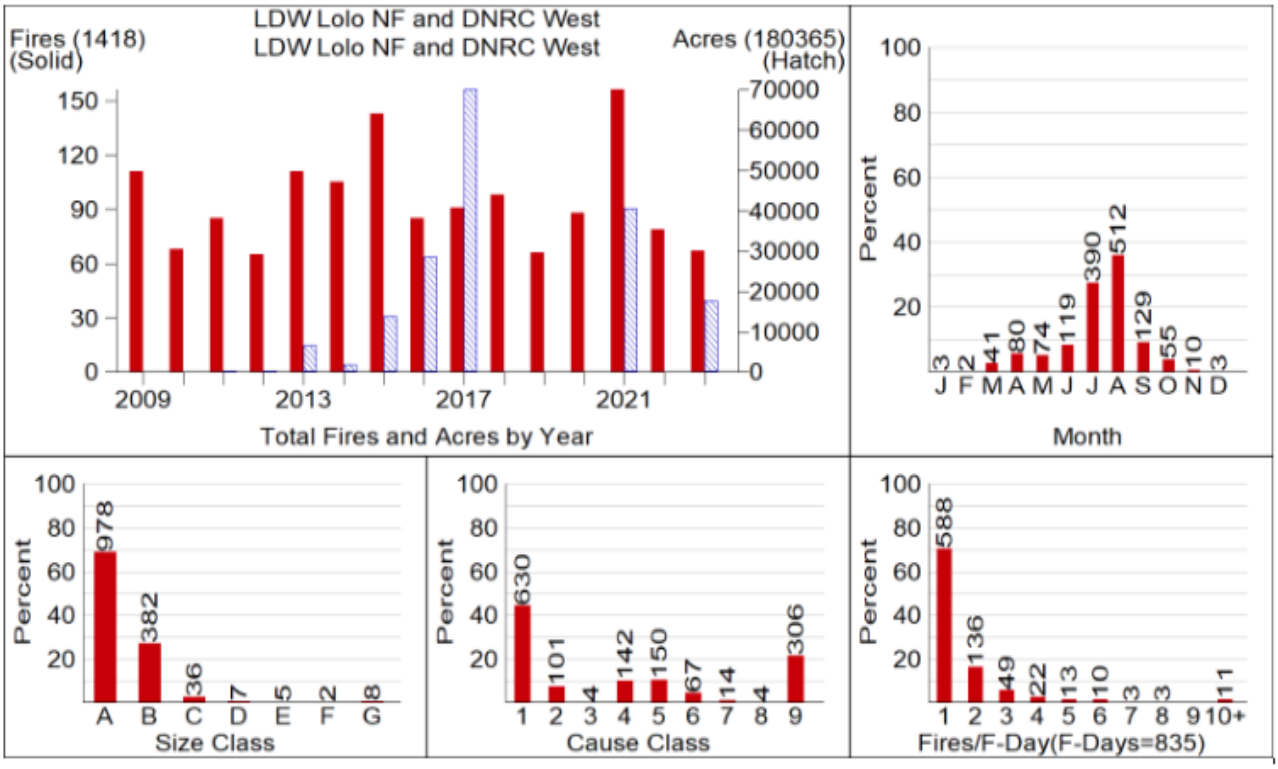



Fire Analysis Timeframe: April 1-October 31: 2009-2023.

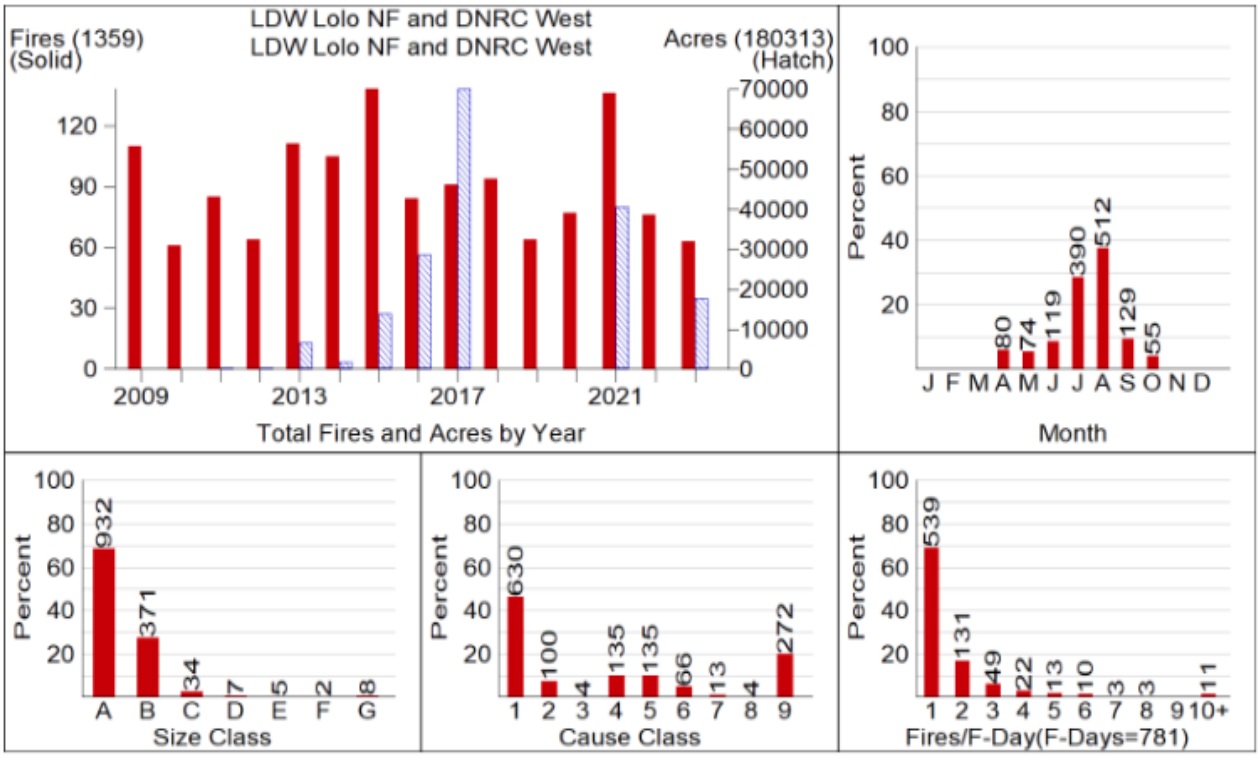


**LDW: Lolo NF & DNRC West**

Fire Analysis Yearly Timeframe: January 1-December 31: 2009-2023.

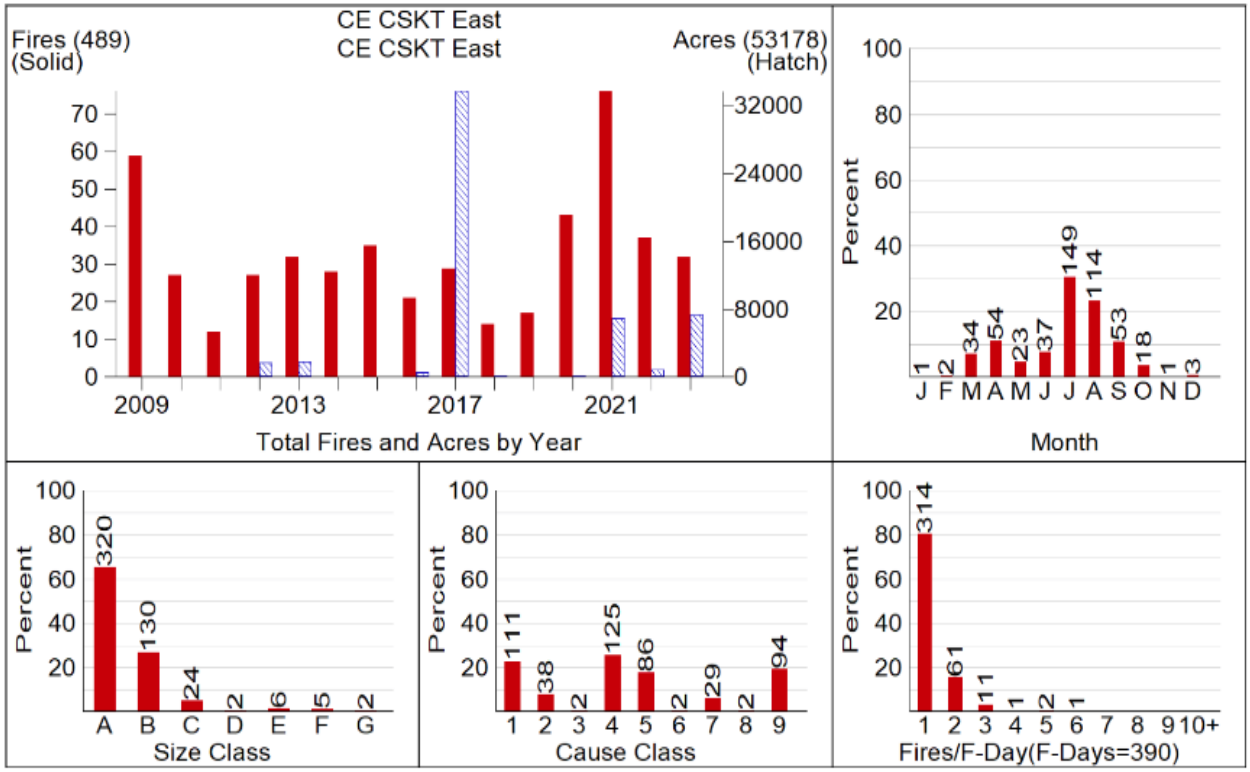



Fire Analysis Timeframe: April 1-October 31: 2009-2023.

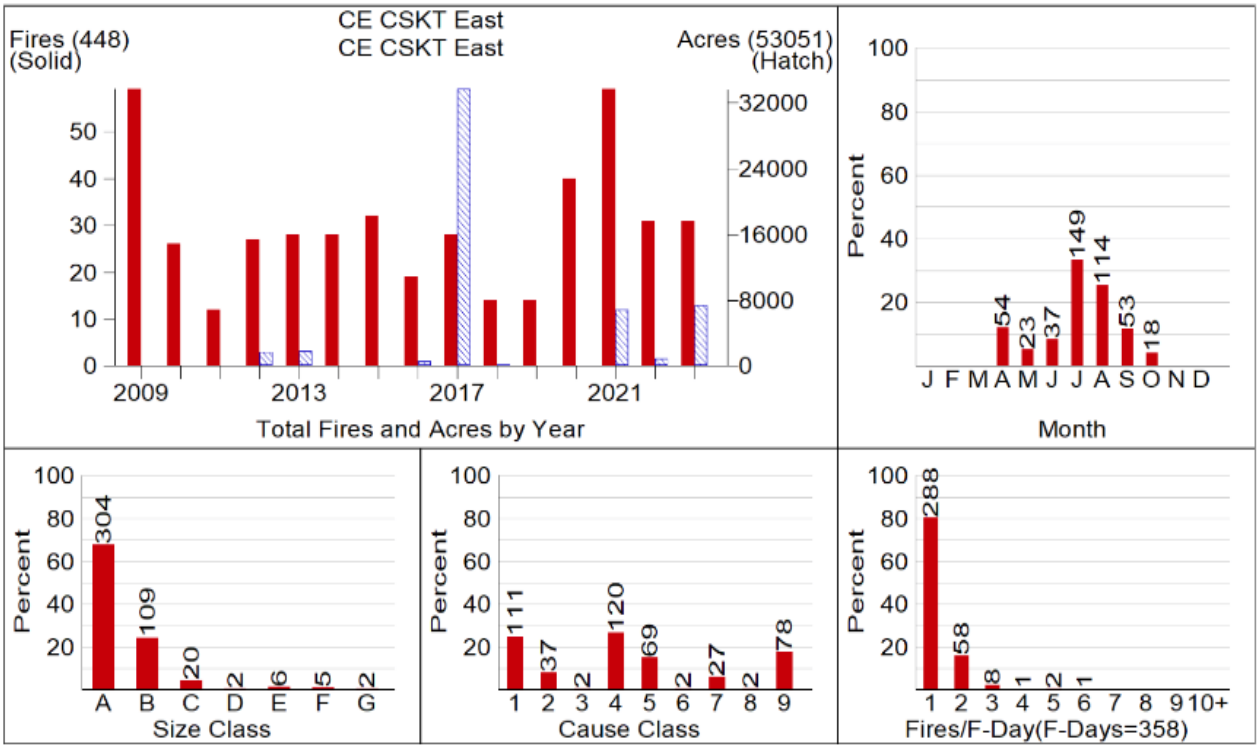


**CE: CSKT East**

Fire Analysis Yearly Timeframe: January 1-December 31: 2009-2023.

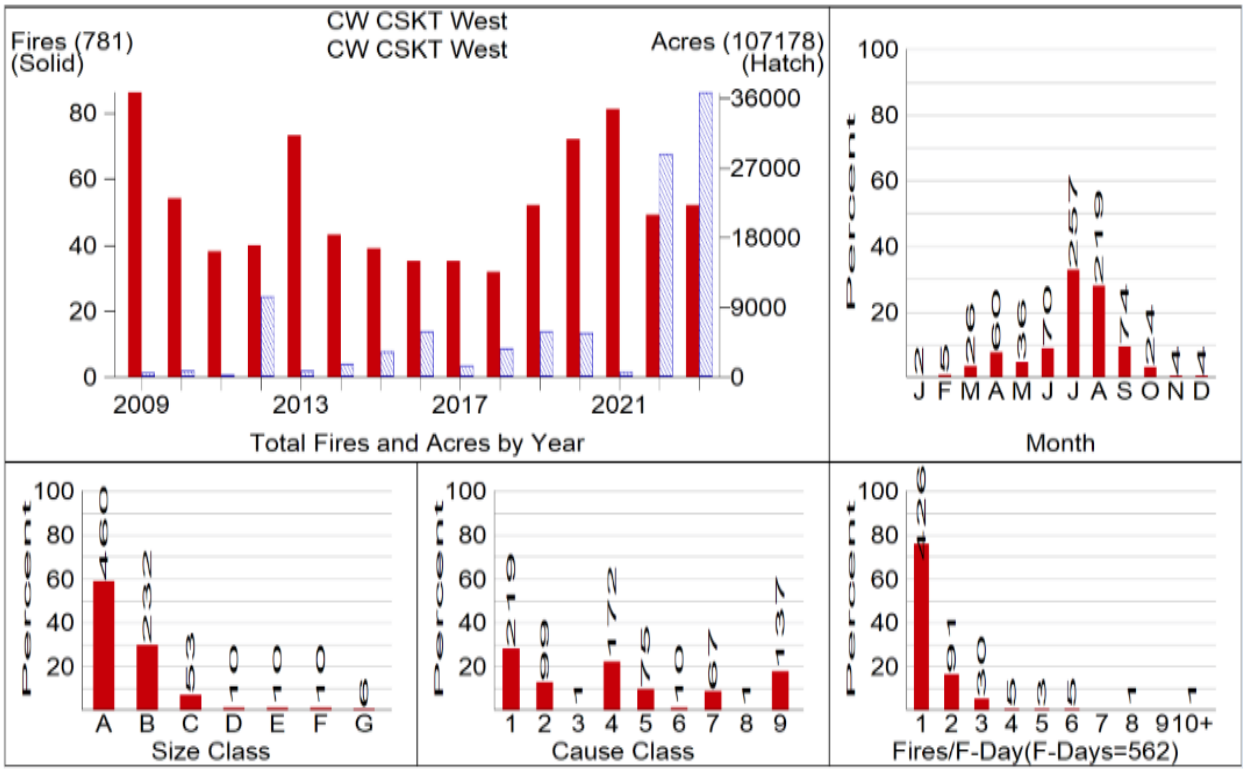



Fire Analysis Timeframe: April 1-October 31: 2009-2023.

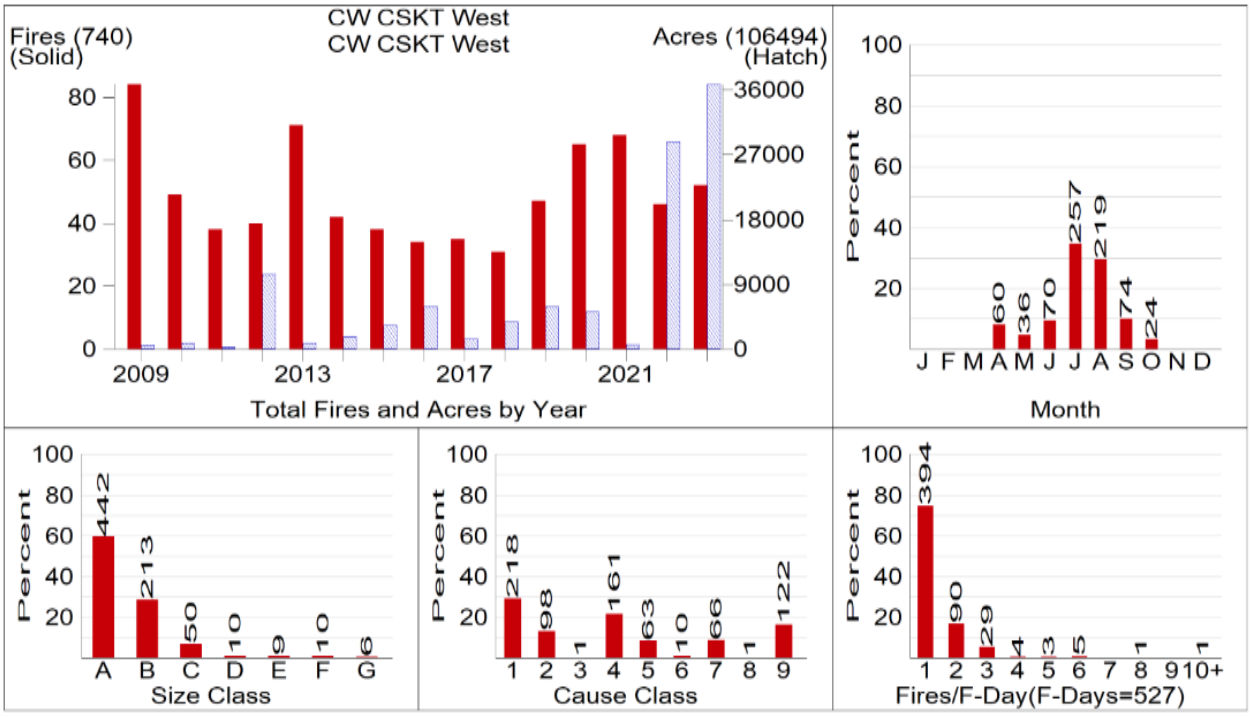


**CW: CSKT West**

Fire Analysis Yearly Timeframe: January 1-December 31: 2009-2023.

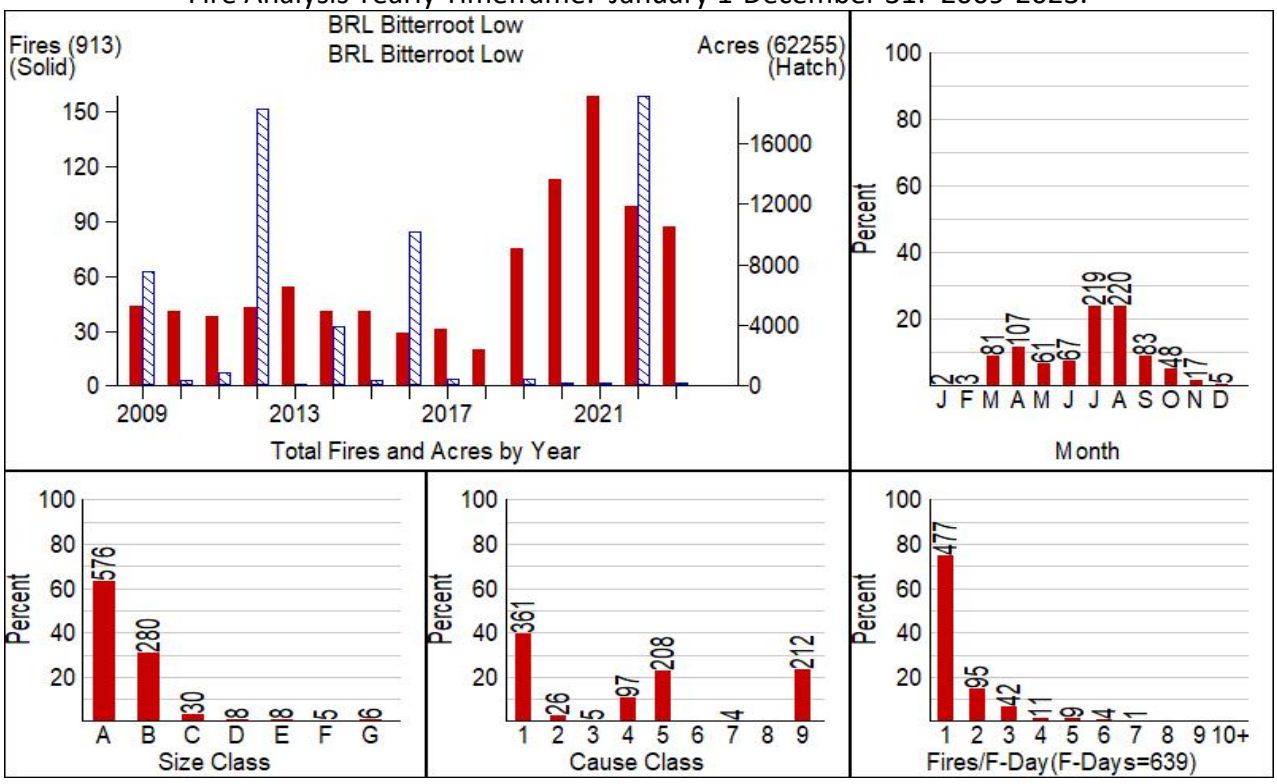



Fire Analysis Timeframe: April 1-October 31: 2009-2023.

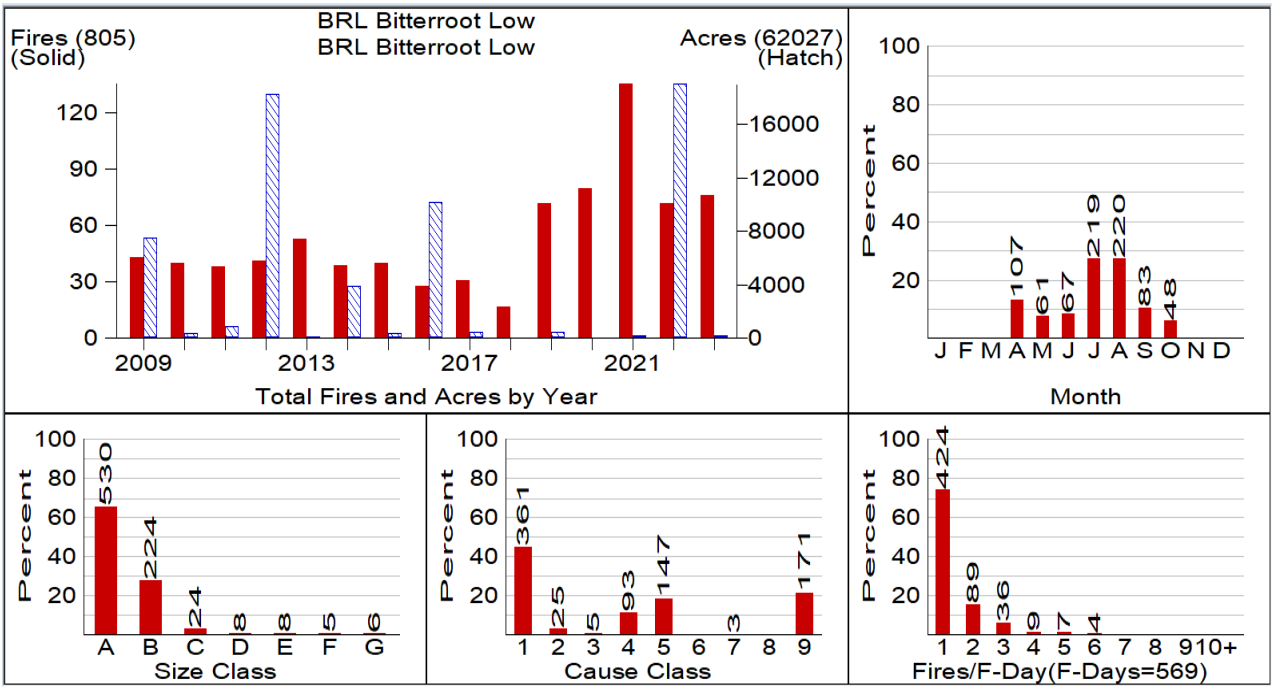


**BRL: Bitterroot NF Low**

Fire Analysis Yearly Timeframe: January 1-December 31: 2009-2023.

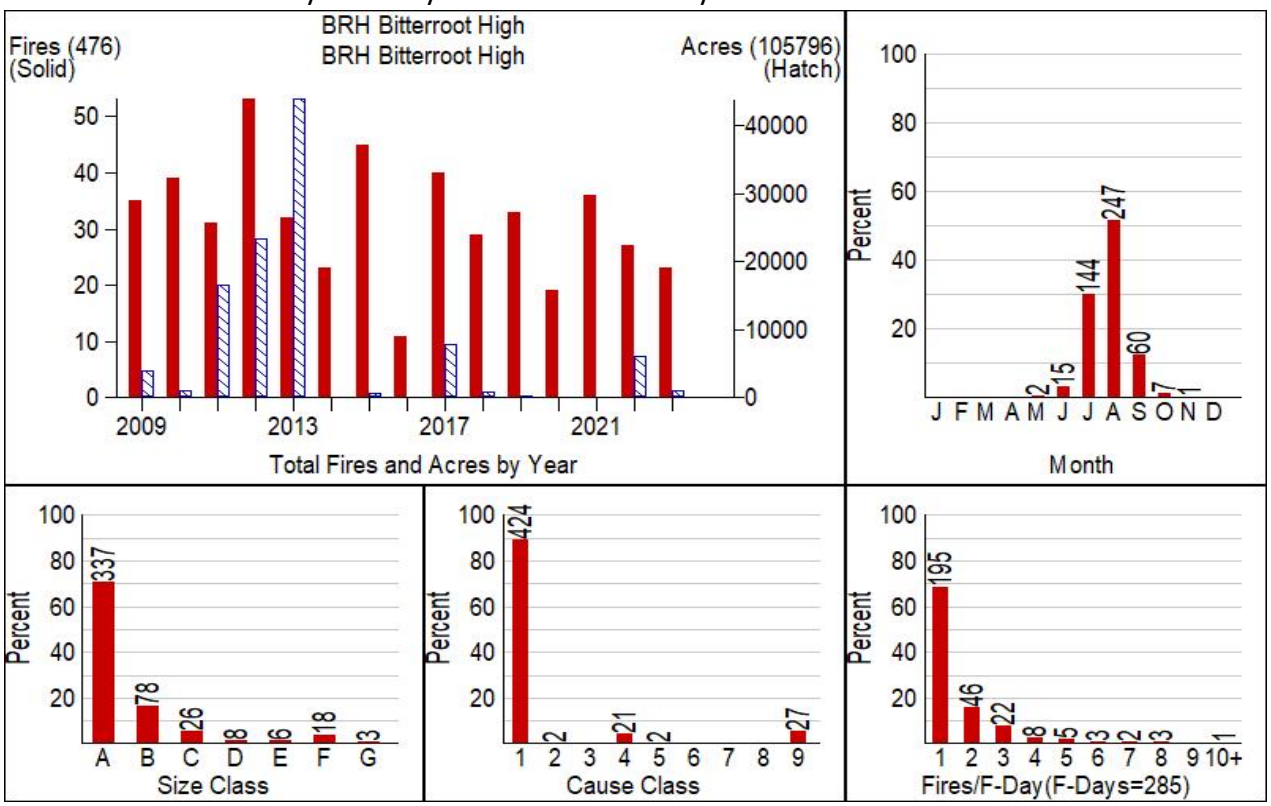



Fire Analysis Timeframe: April 1-October 31: 2009-2023.

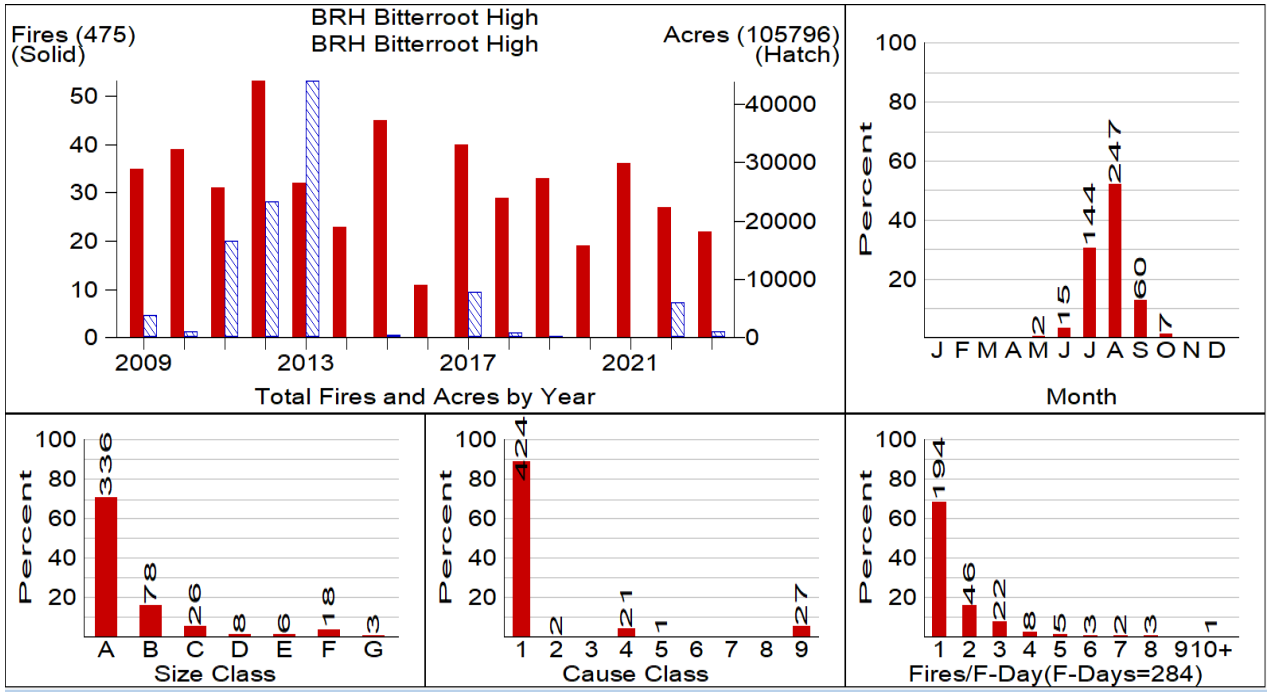


**BRH: Bitterroot NF High**

Fire Analysis Yearly Timeframe: January 1-December 31: 2009-2023.




Fire Analysis Timeframe: April 1-October 31: 2009-2023.



## Appendix L: Weather Station and Special Interest Groups Data

This table displays data associated with the RAWS used in this analysis.

| Station Name | WIMS ID | FDRA | Agency / Owner | Elevation | Latitude | Longitude |
|---|---|---|---|---|---|---|
| Ninemile | 241507 | Lolo DNRC East<br>Lolo DNRC West | FS | 3314 | 47.07133 | -114.40139 |
| Seeley Lake | 241208 | Lolo DNRC East | FS | 4130 | 47.17597 | -113.44439 |
| Blue Mtn | 241513 | Lolo DNRC East | FS | 3412 | 46.82073 | -114.10089 |
| Plains | 241206 | Lolo DNRC West<br>CSKT West | FS | 2481 | 47.46622 | -114.87961 |
| St. Regis | 241302 | Lolo DNRC West | FS | 2678 | 47.30711 | -115.10761 |
| Ronan | 241403 | CSKT East<br>CSKT West | CSKT | 3234 | 47.53677 | -114.09894 |
| Sawmill Creek | 242915 | Bitterroot Low | FS | 5540 | 46.45111 | -113.89028 |
| Smith Creek | 242912 | Bitterroot Low | FS | 5650 | 46.43958 | -114.22682 |
| West Fork | 242907 | Bitterroot Low | FS | 4420 | 45.81556 | -114.25833 |
| Little Rock Creek | 242914 | Bitterroot Low | FS | 5507 | 46.03783 | -114.26271 |
| Sula | 242905 | Bitterroot Low | FS | 4570 | 45.82073 | -113.95383 |
| Teepee Point | 242910 | Bitterroot High | FS | 6629 | 45.93343 | -113.74202 |
| Gird | 242911 | Bitterroot High | FS | 6950 | 46.19322 | -113.92258 |
| Deer Point | 242902 | Bitterroot High | FS | 7282 | 46.02549 | -114.05521 |
| Hells Half | 101019 | Bitterroot High | FS | 8100 | 45.64548 | -114.62798 |

**Special Interest Groups Data:**

**Lolo DNRC East SIG:**

| Special Interest Group (SIG): Lolo DNRC East (LDE) | |
|---|---|
| **Station/WIMS Number** | **Station Name** |
| 241507 | Ninemile |
| 241508 | Seeley Lake |
| 241513 | Blue Mtn |

**Lolo DNRC West SIG:**

| Special Interest Group (SIG): Lolo DNRC West (LDW) | |
|---|---|
| **Station/WIMS Number** | **Station Name** |
| 241507 | Ninemile |
| 241302 | St. Regis |
| 241206 | Plains |

**Bitterroot Low SIG:**

| Special Interest Group (SIG): Bitterroot Low (BRL) | |
|---|---|
| **Station/WIMS Number** | **Station Name** |
| 242915 | Sawmill Creek |
| 242912 | Smith Creek |
| 242907 | West Fork |
| 242905 | Sula |
| 242914 | Little Rock Creek |

**Bitterroot High SIG:**

| Special Interest Group (SIG): Bitterroot High (BRH) | |
|---|---|
| **Station/WIMS Number** | **Station Name** |
| 242911 | Gird Point |
| 242910 | Teepee Point |
| 242902 | Deer Mtn |
| 101019 | Hells Half |

**CSKT West SIG:**

| Special Interest Group (SIG): CSKT West (CW) | |
|---|---|
| **Station/WIMS Number** | **Station Name** |
| 241403 | Ronan |
| 241206 | Plains |

**CSKT East SIG:**

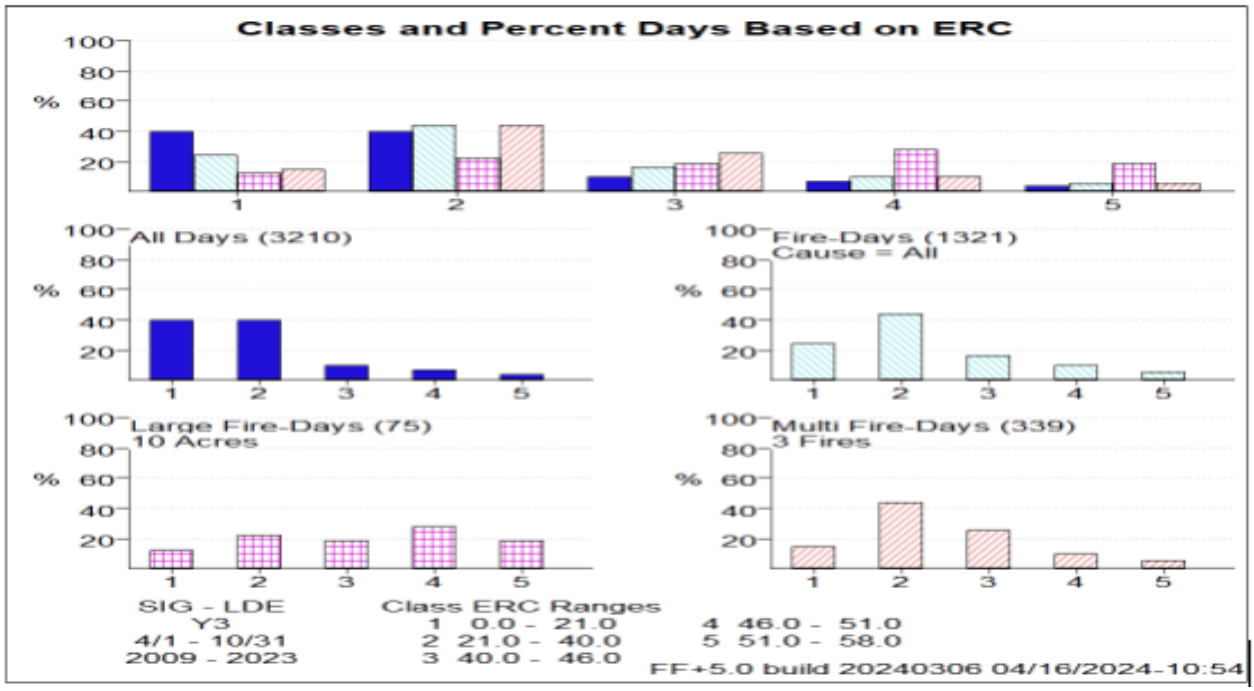
| Special Interest Group (SIG): CSKT East (CE) | |
|---|---|
| **Station/WIMS Number** | **Station Name** |
| 241403 | Ronan |

## Appendix M: FireFamilyPlus Analysis

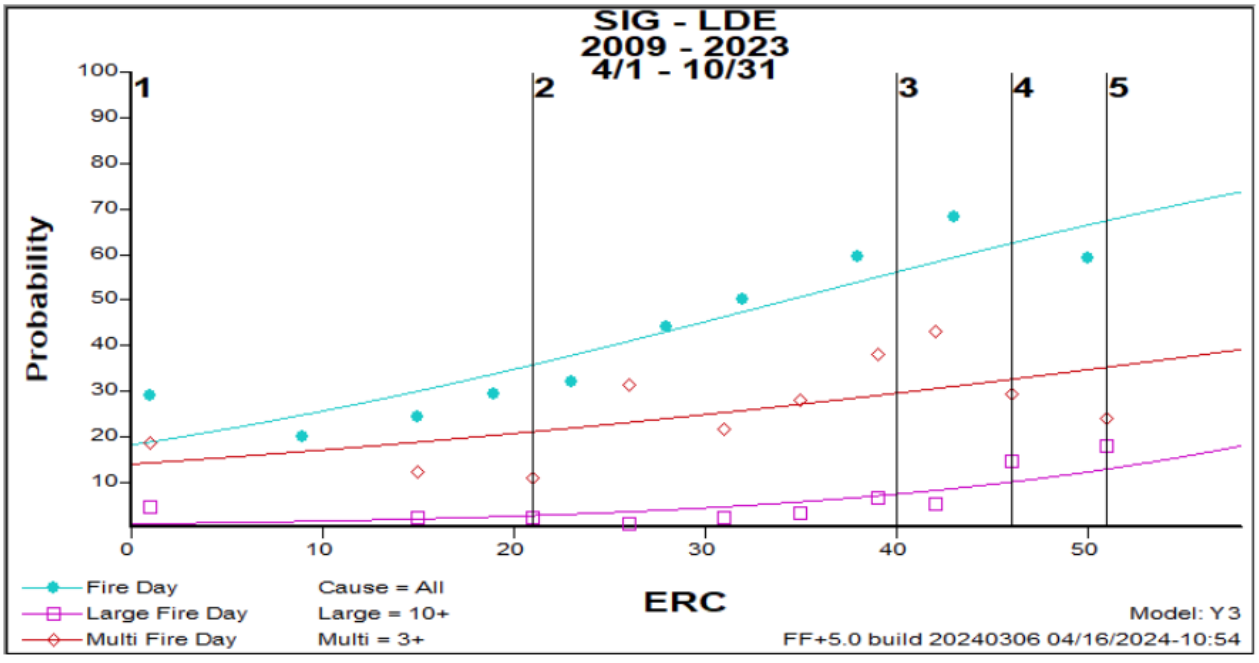
### FireFamilyPlus ERC Class Percentages, Graphs, & Decision Thresholds

**LDE: Lolo NF & DNRC East**

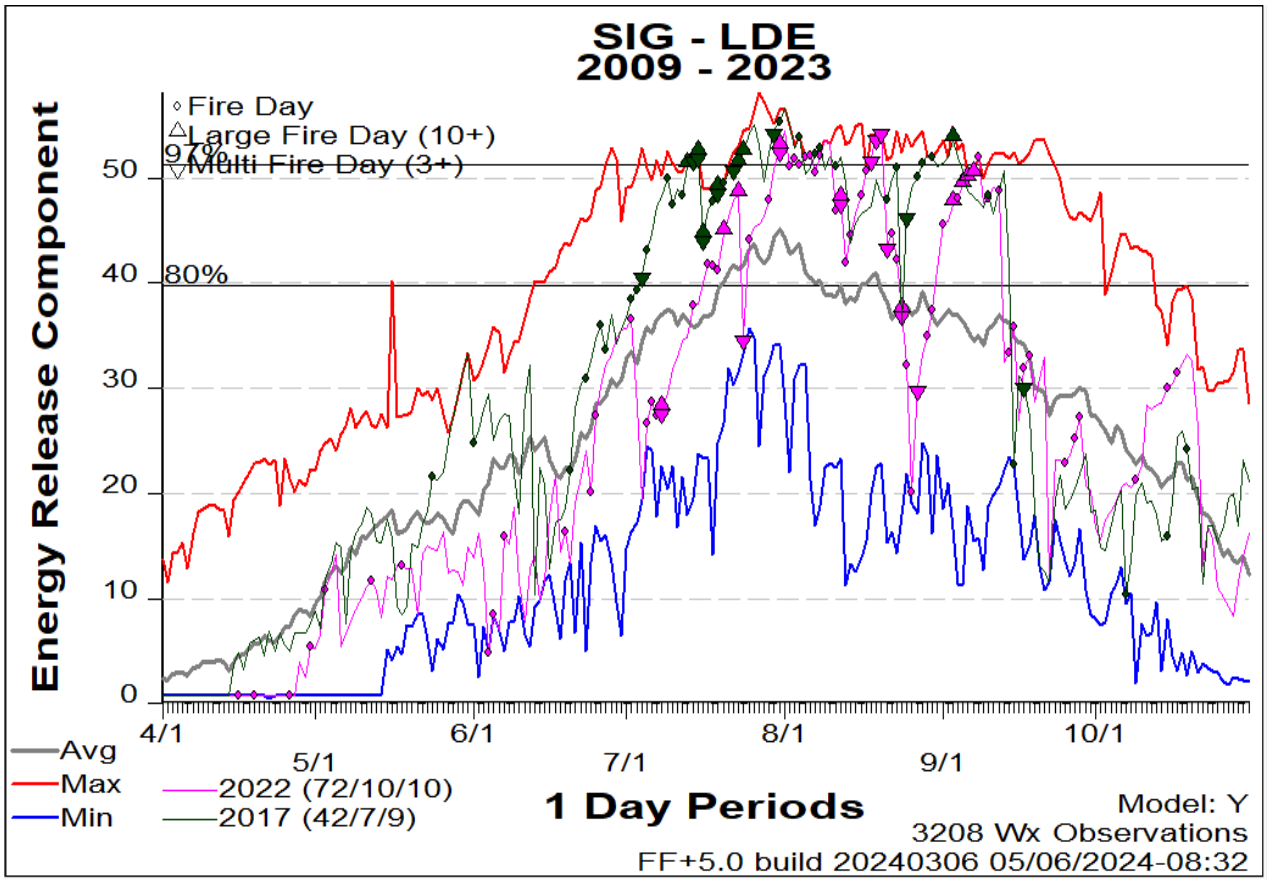
ERC Decision Thresholds & Class Percentages: April 1-October 31: 2009-2023.




ERC Fire Day, Large Fire Day, Multi Fire Day: April 1-October 31: 2009-2023.

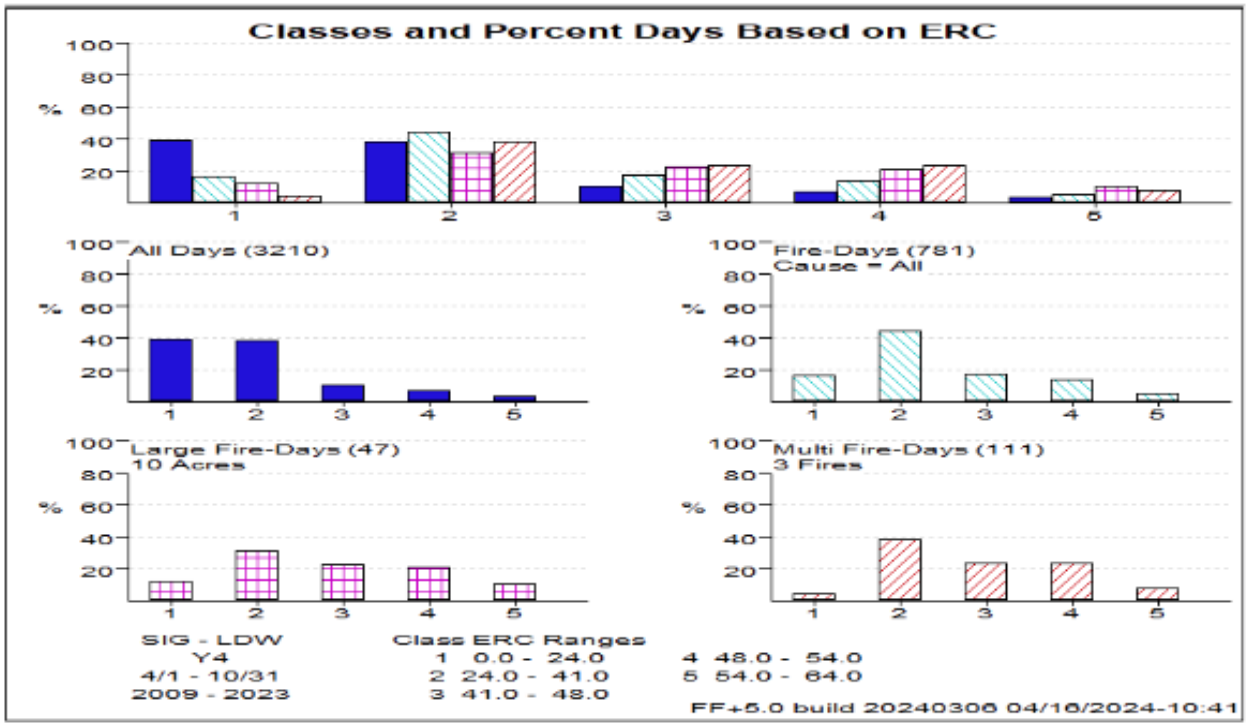


ERC Statistics Graph:  April 1-October 31: 2009-2023.

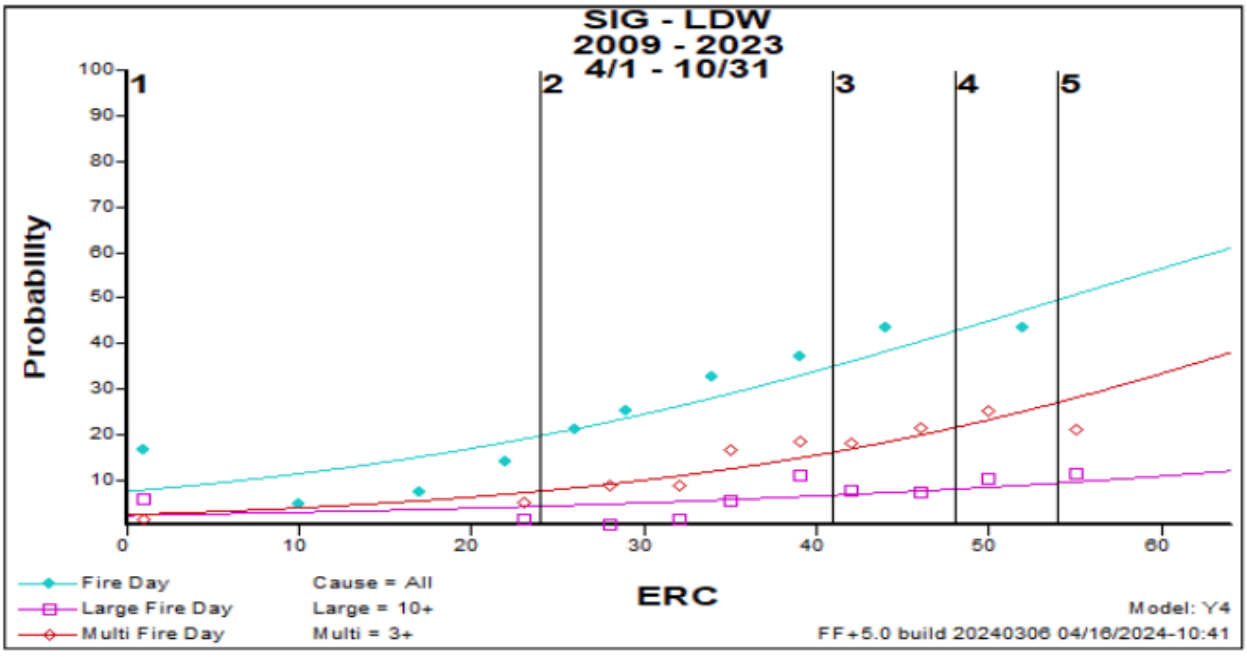


**LDW: Lolo NF & DNRC West**

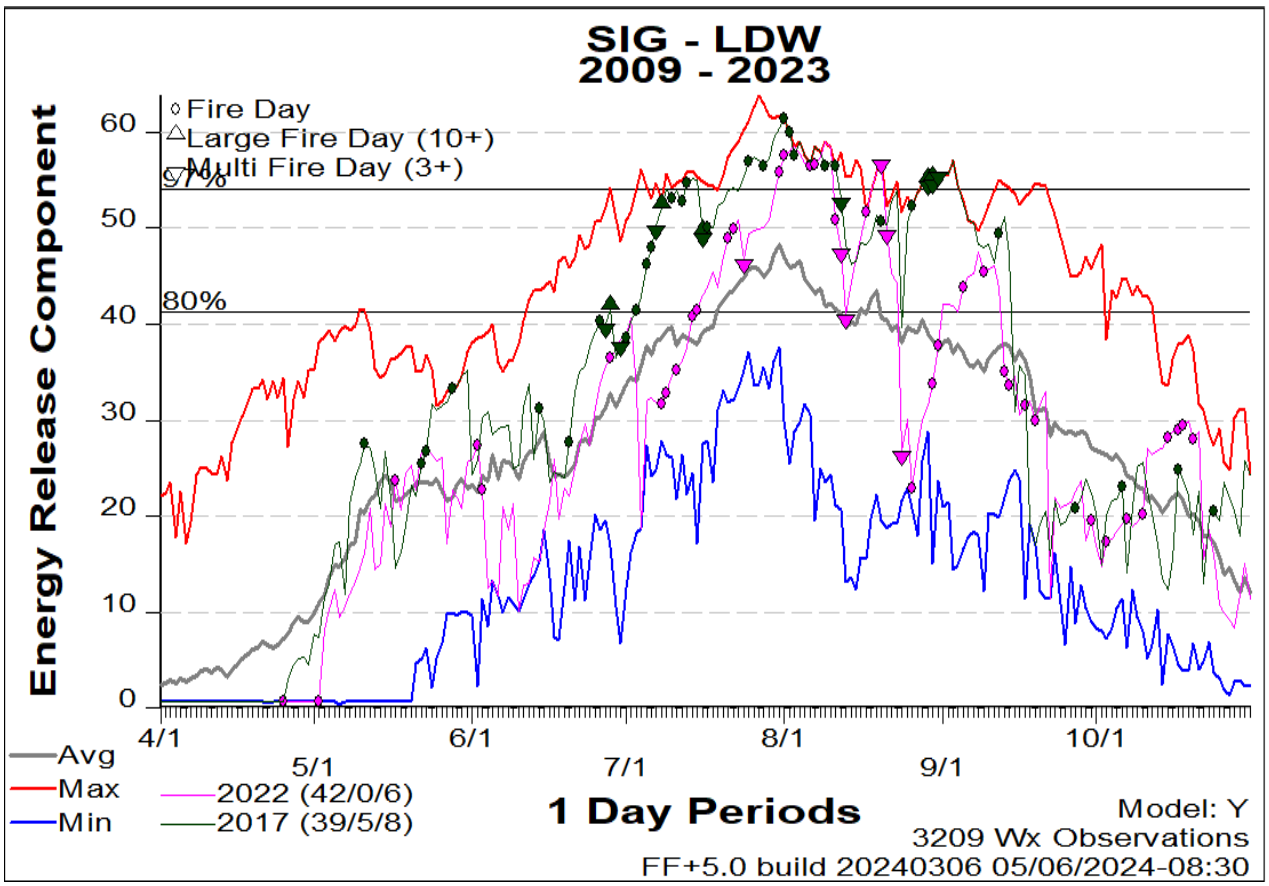
ERC Decision Thresholds & Class Percentages: April 1-October 31: 2009-2023.




ERC Fire Day, Large Fire Day, Multi Fire Day: April 1-October 31: 2009-2023.

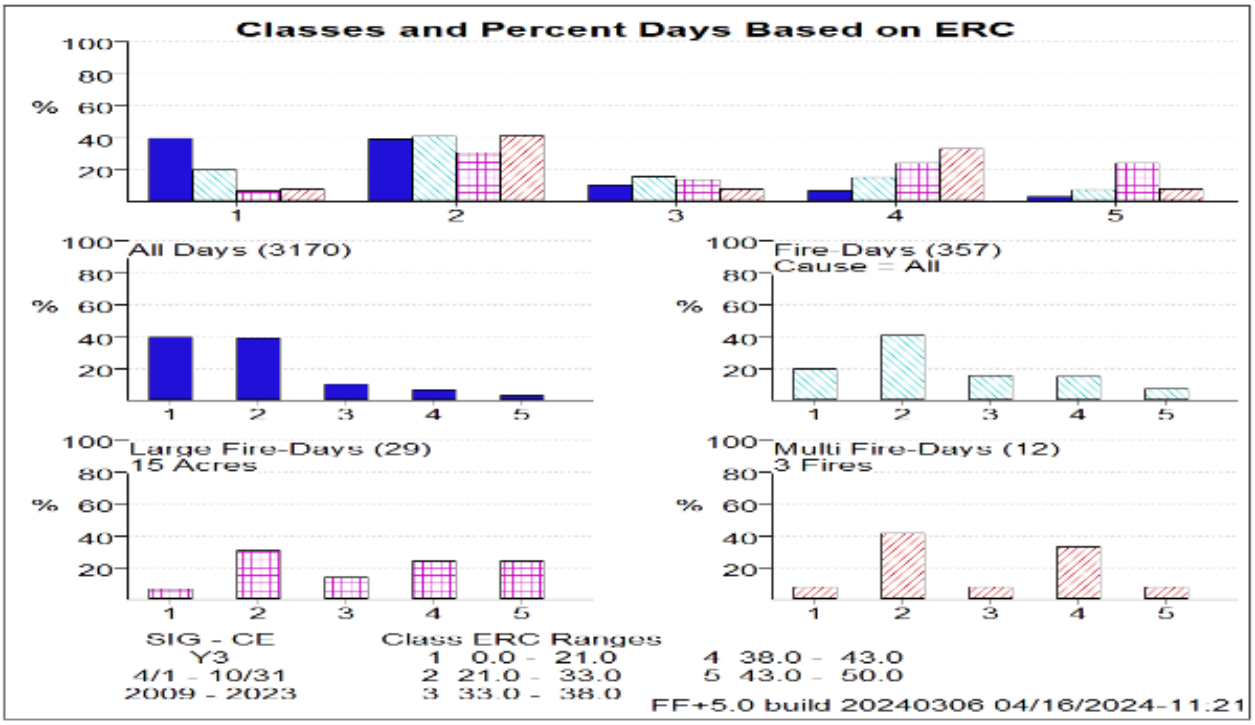


ERC Statistics Graph:  April 1-October 31: 2009-2023.

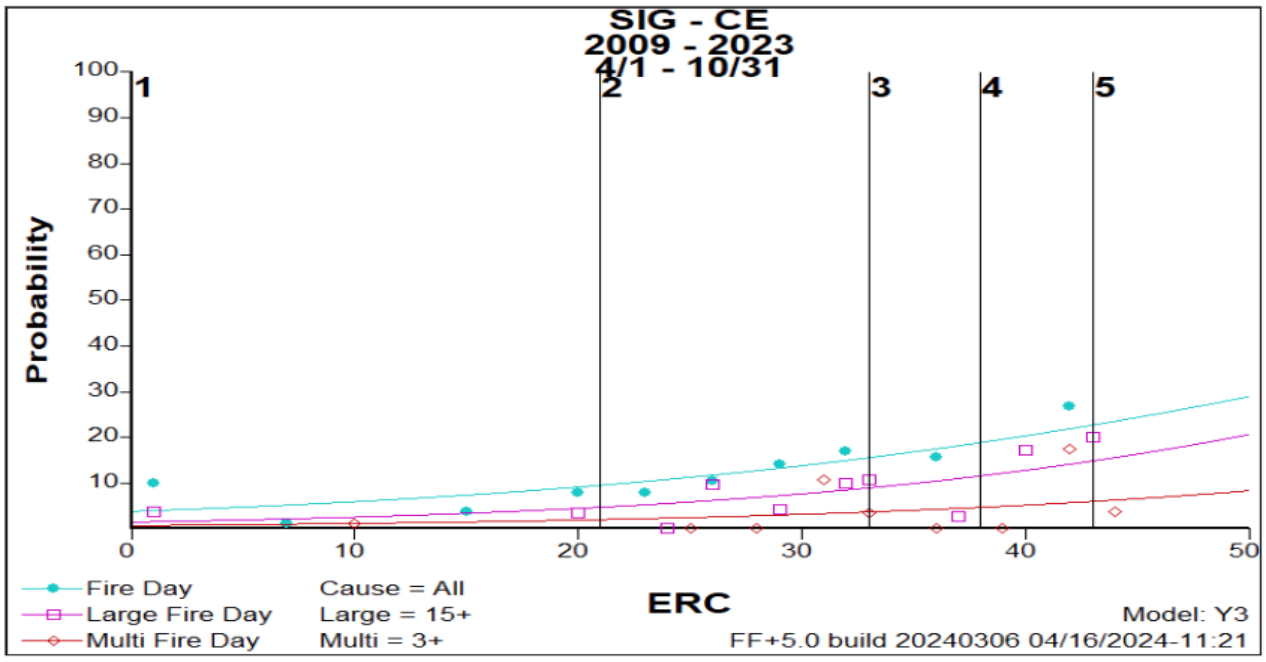


**CE: CSKT East**

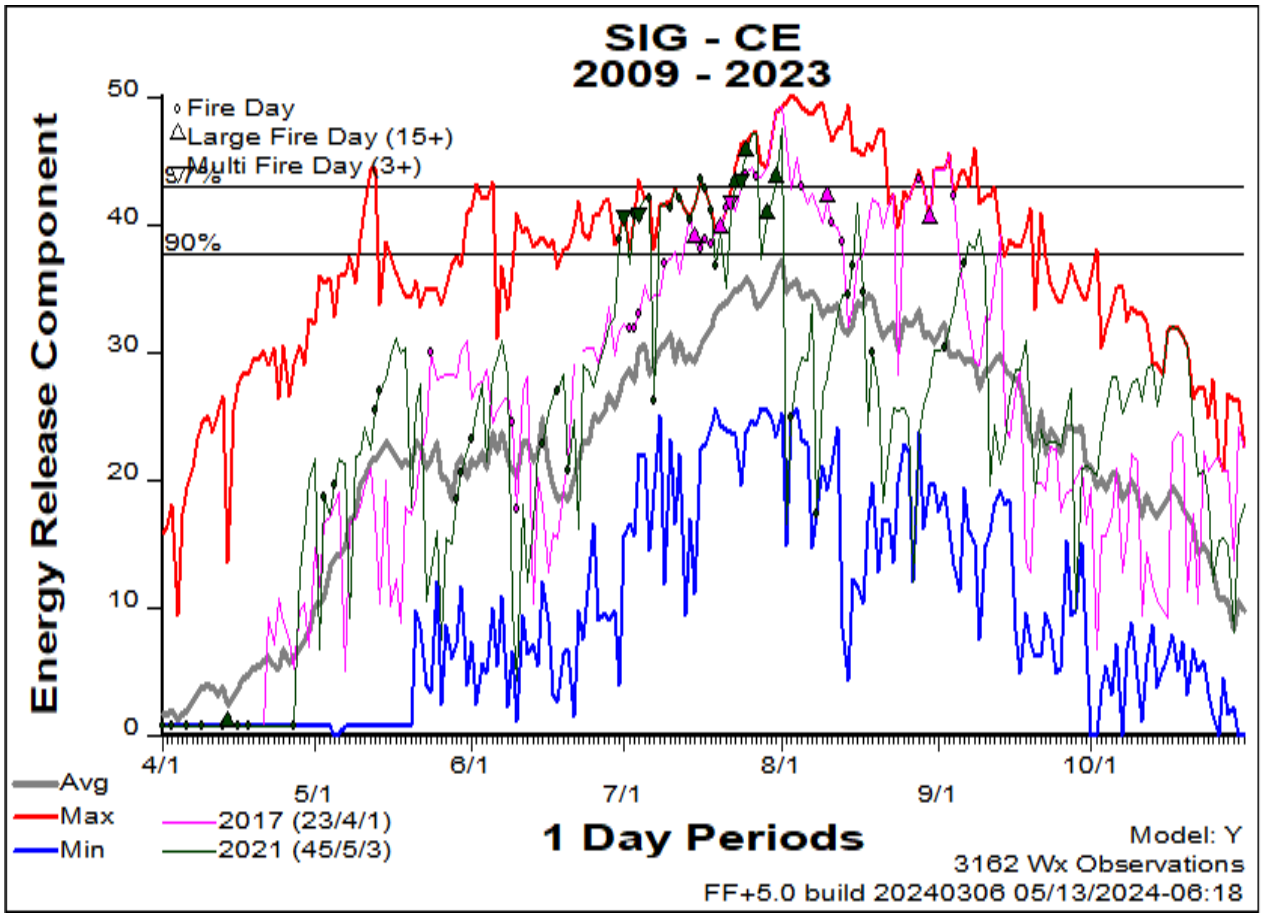
ERC Decision Thresholds & Class Percentages: April 1-October 31: 2009-2023.




ERC Fire Day, Large Fire Day, Multi Fire Day: April 1-October 31: 2009-2023.

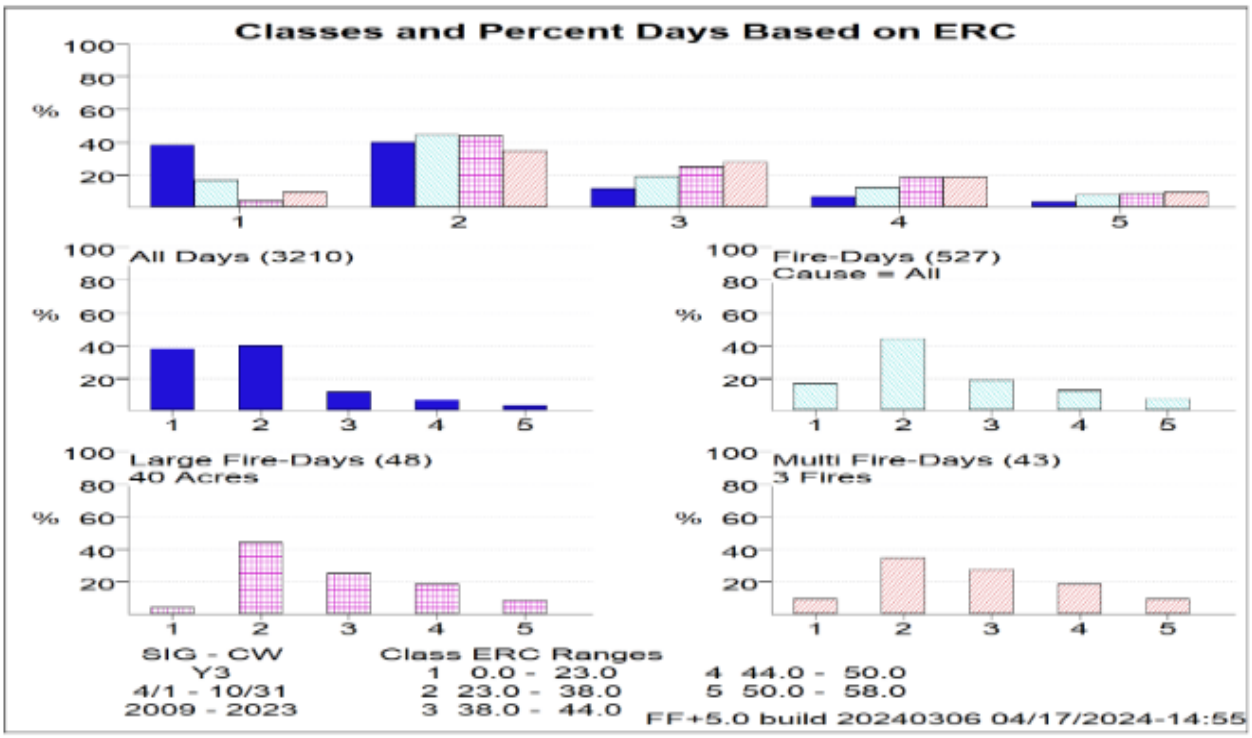


ERC Statistics Graph:  April 1-October 31: 2009-2023.

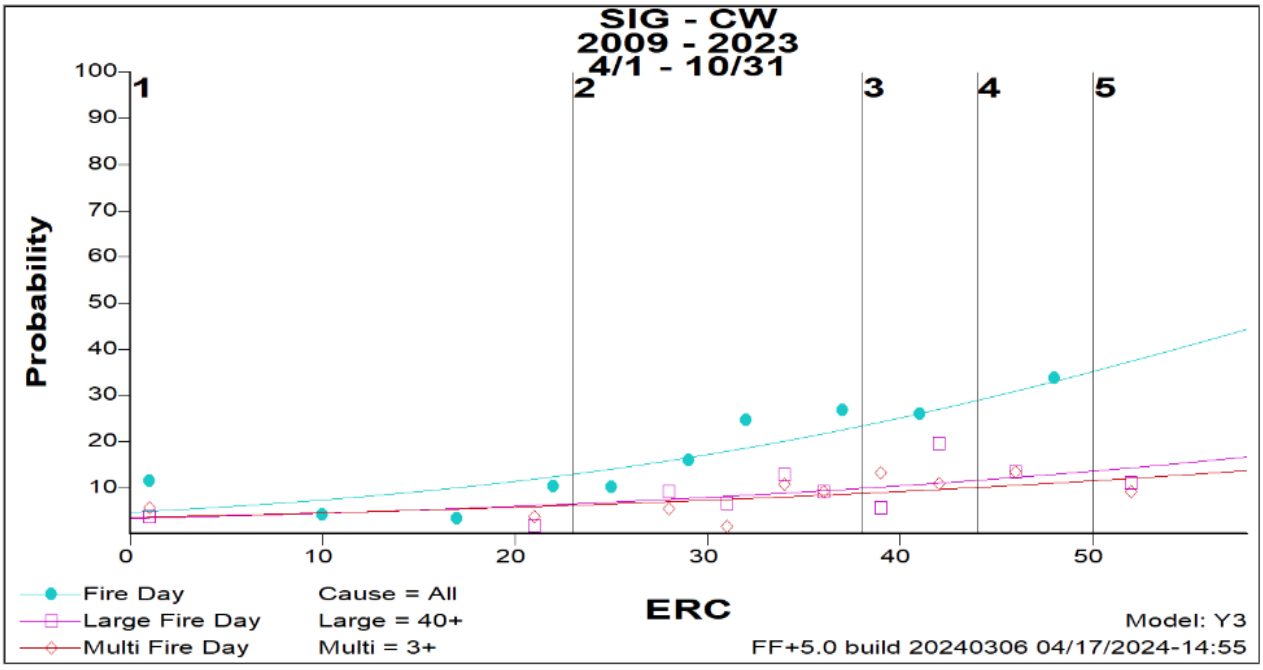


**CW: CSKT West**

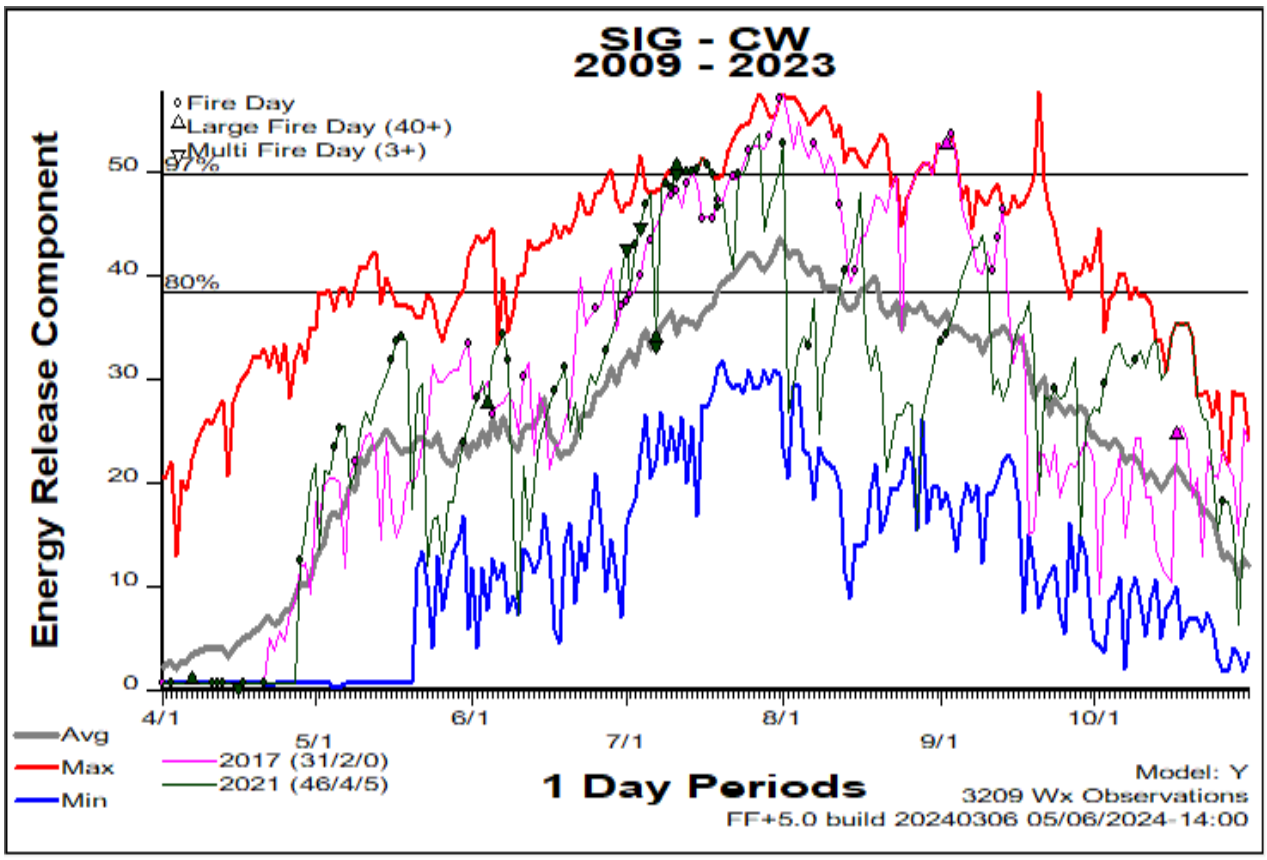
ERC Decision Thresholds & Class Percentages: April 1-October 31: 2009-2023.




ERC Fire Day, Large Fire Day, Multi Fire Day: April 1-October 31: 2009-2023.

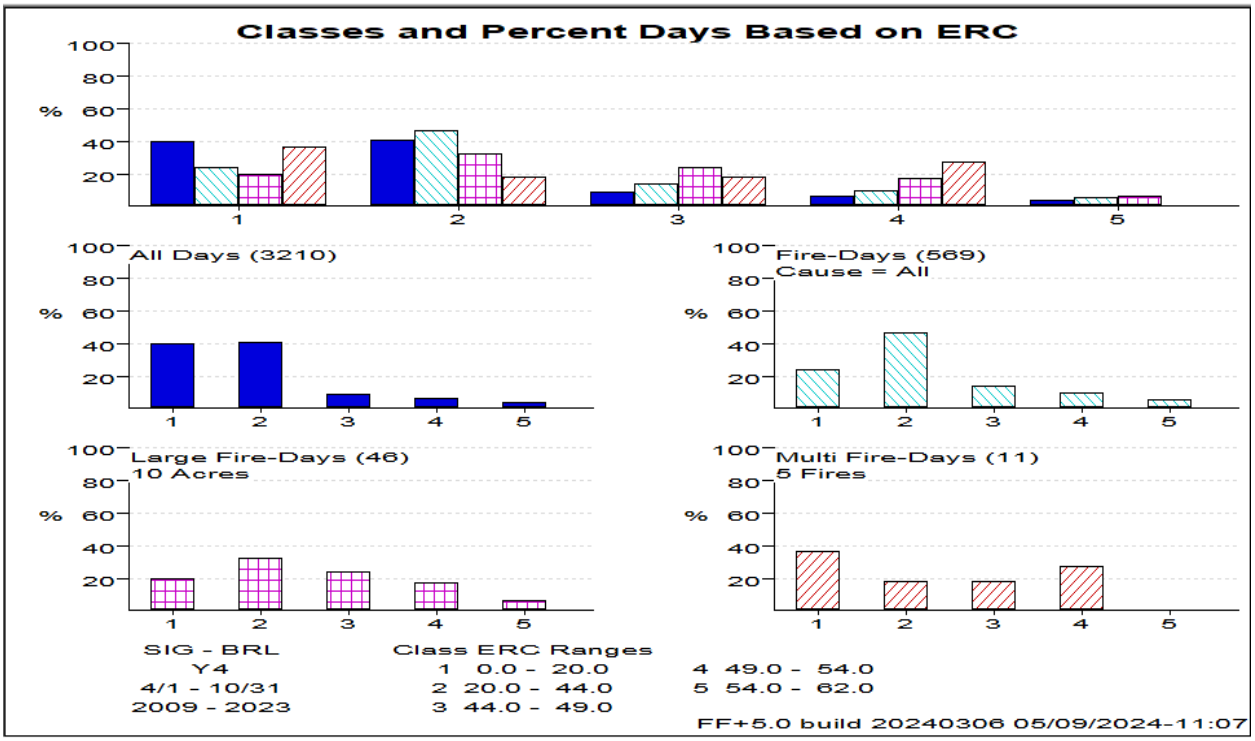


ERC Statistics Graph:  April 1-October 31: 2009-2023.

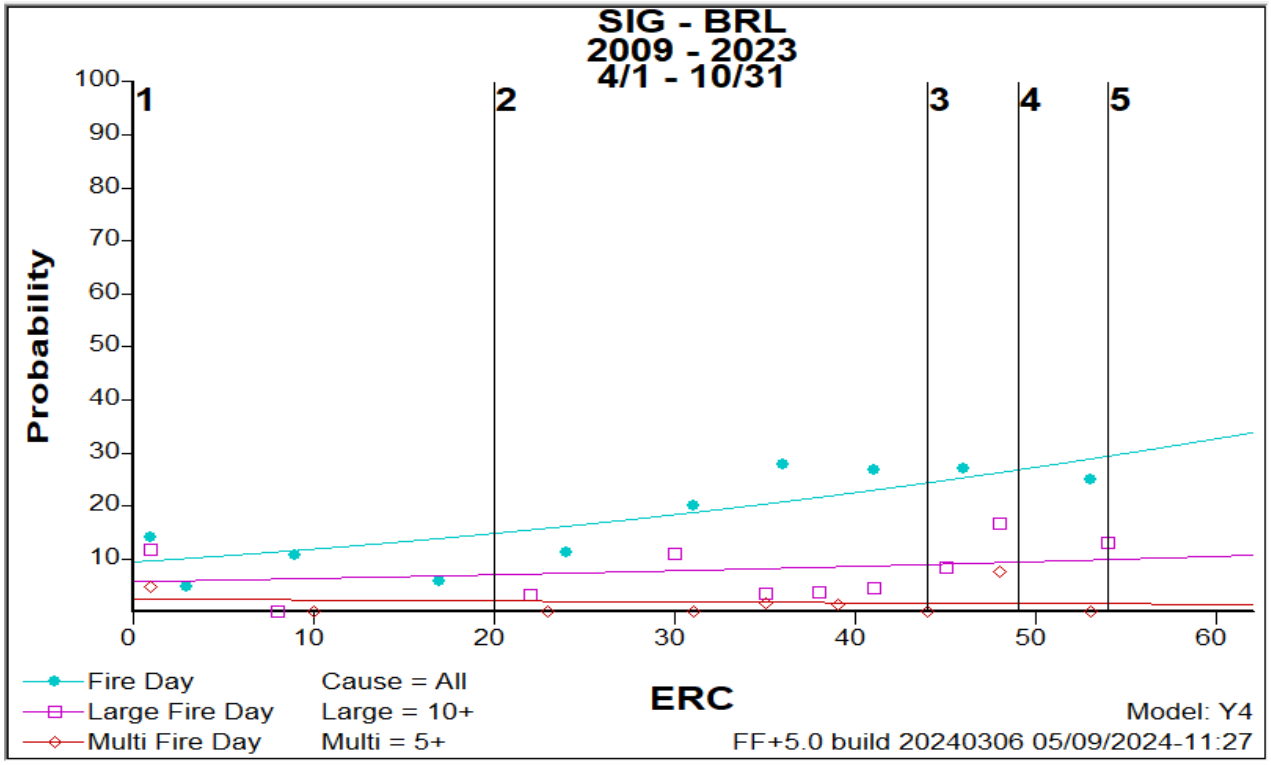


**BRL: Bitterroot Low**

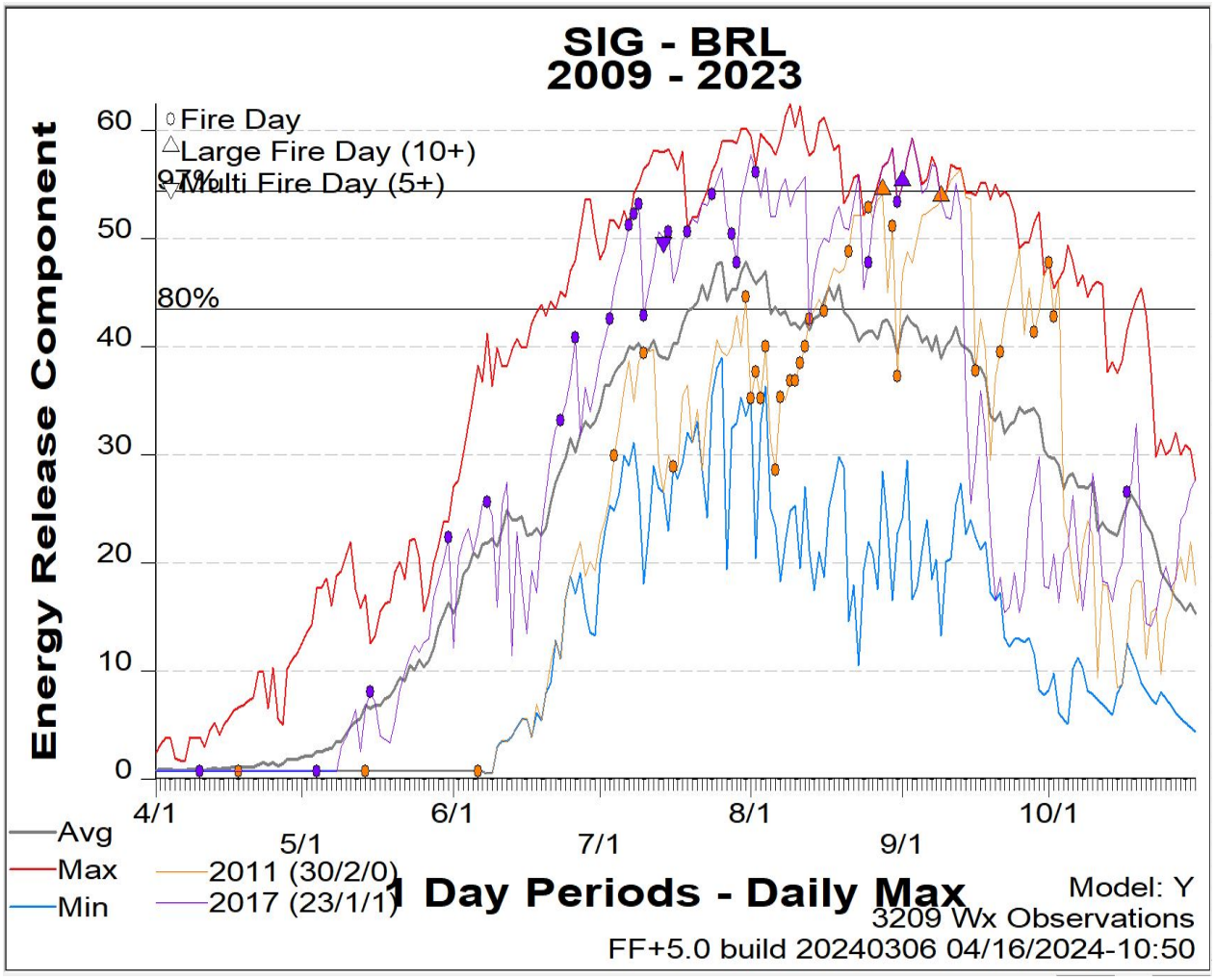
ERC Decision Thresholds & Class Percentages: April 1-October 31: 2009-2023.




ERC Fire Day, Large Fire Day, Multi Fire Day: April 1-October 31: 2009-2023.

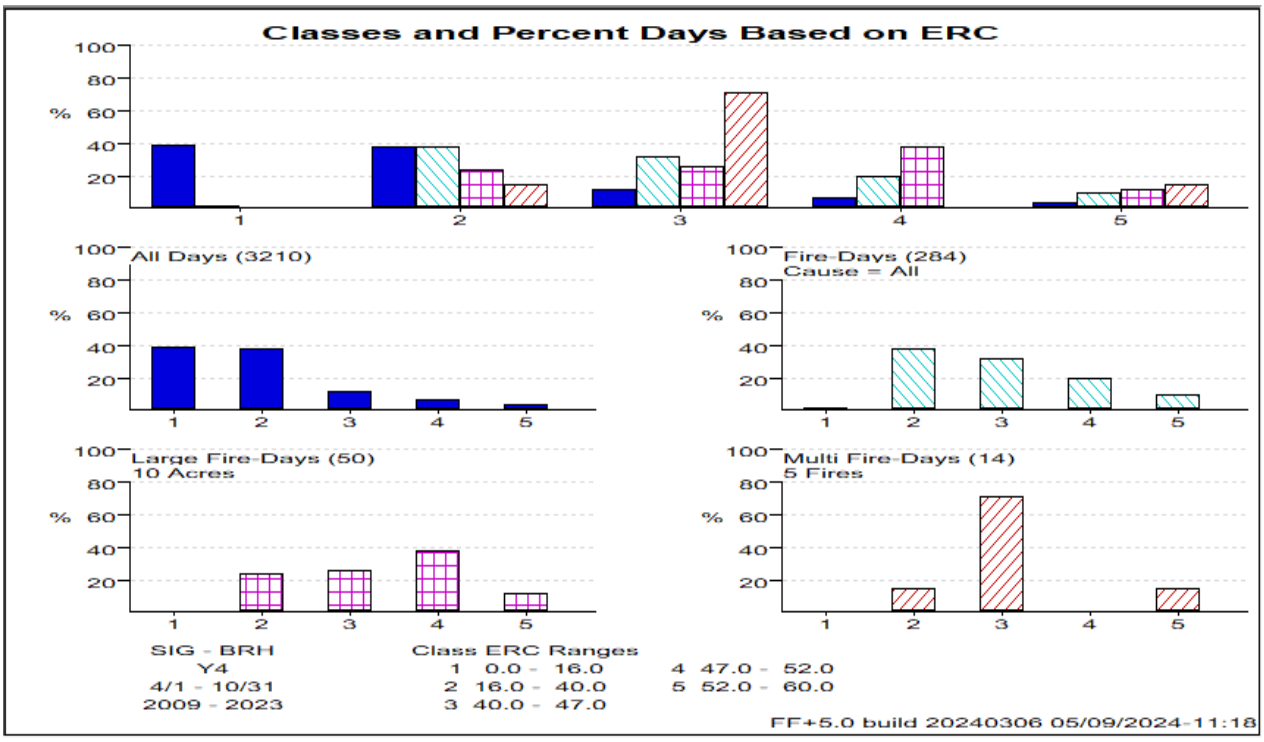


ERC Statistics Graph:  April 1-October 31: 2009-2023.

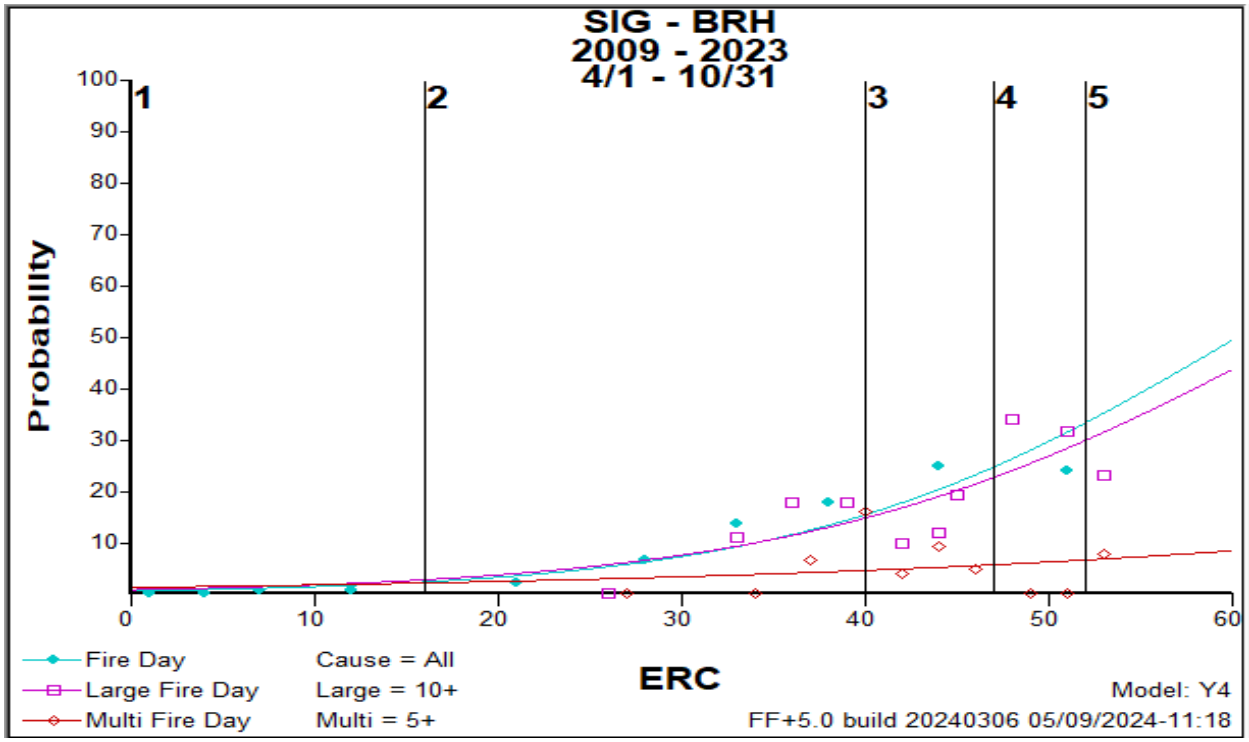


**BRH: Bitterroot High**

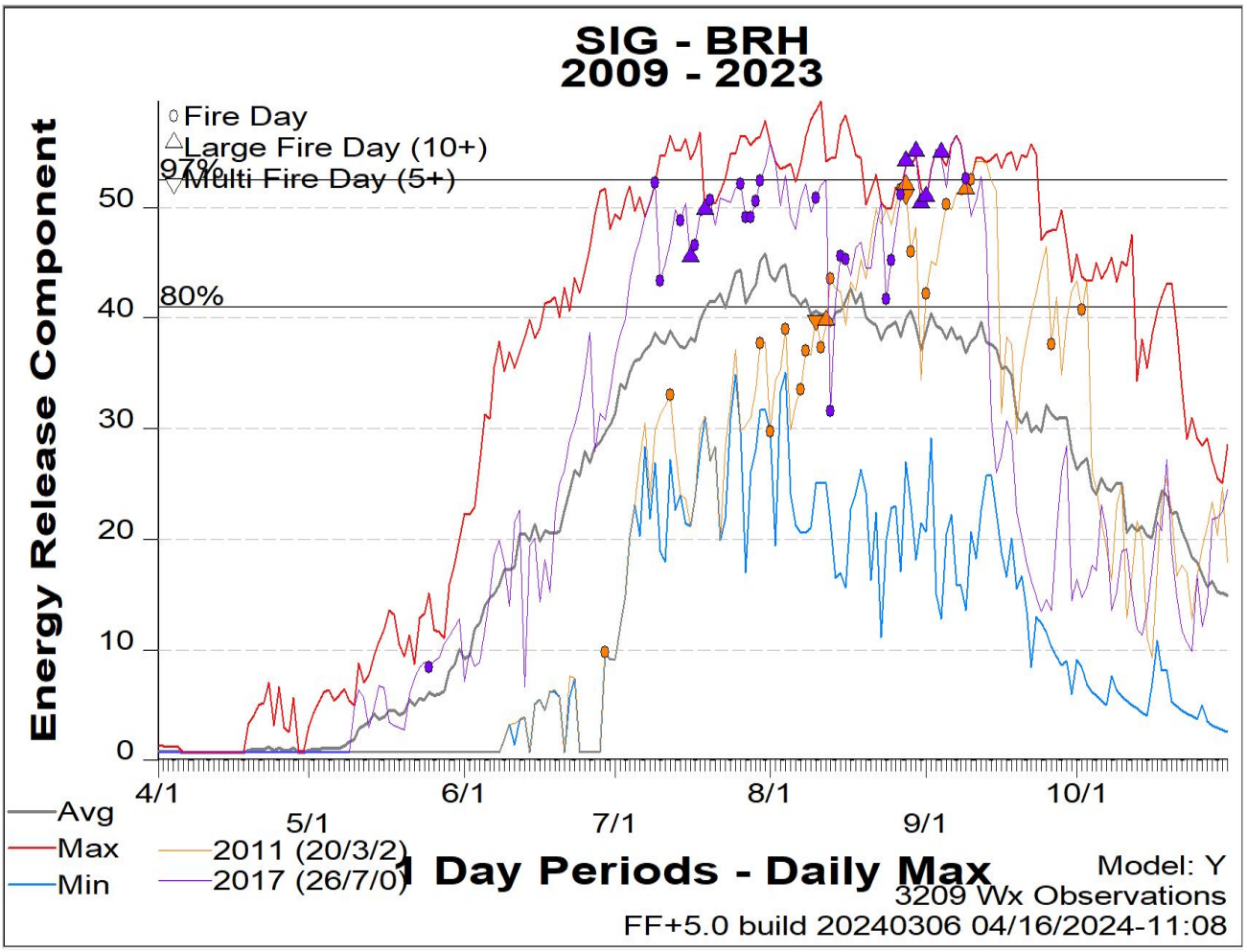
ERC Decision Thresholds & Class Percentages: April 1-October 31: 2009-2023.




ERC Fire Day, Large Fire Day, Multi Fire Day: April 1-October 31: 2009-2023.



ERC Statistics Graph:  April 1-October 31: 2009-2023.

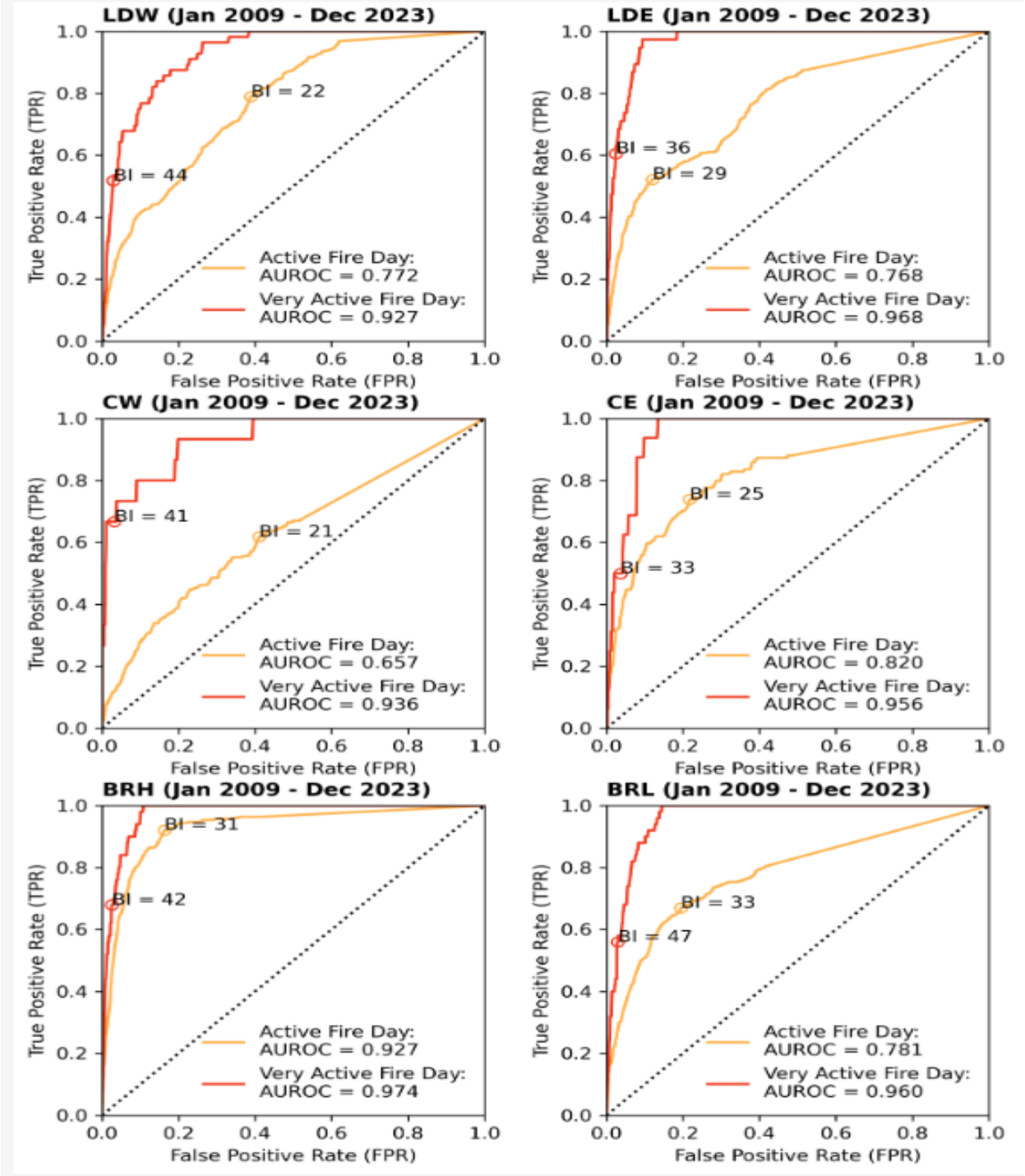


## MODIS BI Graphs

Two thresholds were used to split the full spectrum of BI values into three separate response levels. The first BI threshold (separating Low and Moderate) is based on the relationship between BI and the fire activity observed by the Moderate Resolution Imaging Spectroradiometer (MODIS) instrument. An "active fire day" is defined as a day when MODIS detected at least one hotspot in a FDRA, and a non-active fire day is a day when MODIS did not detect any hotspots in a FDRA. Ideally, the first BI threshold would be selected so that (a) all active fire days occur above this value, and (b) all non-active fire days occur below this value. In this perfect scenario the true positive rate would be 1.0 (i.e., 100%) and the false positive rate would be 0.0 (i.e., 0%). In reality, however, the overlap in the weather conditions during which fires are burning or not burning in a FDRA forces a trade-off in the threshold selection. Therefore, the first BI threshold is selected to maximize the number of active fire days whilst minimizing the number of non-active fire days. For example, the first threshold for the Lolo DNRC West (LDW) is set to BI=22. Between 2009 and 2023, nearly 76% of all active fire days occurred above this threshold (true positive rate TPR=0.76), while 38% of non-fire days occurred above this threshold (false positive rate FPR=0.38). The second BI threshold (separating Moderate and High) is selected solely based on the climatology of each FDRA and is set to the 97% percentile. The performance of the second BI threshold is again evaluated based on the TPR and FPR, but with regard to very active fire days, or days when MODIS observed an active fire pixel with a fire radiative power (FPR) value greater than the 95% percentile. Across all FDRAs in the SWZ, the second BI threshold captured approximately one-half of all very active fire days (TPR=0.50).

## SW Zone FDRA's BI Decision Thresholds using MODIS data:

**Lolo DNRC East: January 1 - December 31; 2009-2023.**
**Lolo DNRC West: January 1 - December 31; 2009-2023.**
**CSKT West: January 1 - December 31; 2009-2023.**
**CSKT East: January 1 - December 31; 2009-2023.**
**Bitterroot Low: January 1 - December 31; 2009-2023.**
**Bitterroot High: January 1 - December 31; 2009-2023.**



## Appendix N: Lolo and Bitterroot Fuel Monitoring Sites

### Lolo National Forest, Ninemile Ranger District Fuel Monitoring Sites:

| Fuel Monitoring Site | Latitude | Longitude | Elevation | Aspect | Fuel Model | Fuels Sampled |
|---|---|---|---|---|---|---|
| Ninemile C1 | 47-05-45 | 114-24-53 | 3,595 | South | TL8 | 1 hr., 10 hr., 100 hr., 1000 hr., DF, Snowberry |
| Ninemile C2 | 47-05-40 | 114-24-40 | 3,650 | West | TL8 | 1 hr.,10 hr., 100 hr., 1000 hr., DF, Snowberry |
| Ninemile C3 | 47-05-37 | 114-24-14 | 3,675 | South | TL8 | 1 hr., 10 hr., 100 hr., 1000 hr., DF, Snowberry |

### Bitterroot National Forest, Stevensville, Sula, & West Fork Ranger Districts Fuel Monitoring Sites:

| Fuel Monitoring Site | Latitude | Longitude | Elevation | Aspect | Fuel Model | Fuels Sampled |
|---|---|---|---|---|---|---|
| Smith Creek, Stevensville RD | 46-26-22 | 114-13-37 | 5,650 | Southeast | GR2 | 10 hr., 100 hr., 1000 hr., DF, PP, LPP, kinnikinnick |
| Tepee, Sula RD | 45-55-44 | 113-44-32 | 6,257 | South | GR2 | 1 hr., 10 hr., 1000 hr., DF, PP, Snowberry |
| Lost Trail, Sula RD | 45-41-34 | 113-58-11 | 7,729 | West | TU1 | 1 hr., 10 hr., 1000 hr., SAF, LPP, WBP |
| Blue Joint, West Fork RD | 45-42-14 | 114-20-13 | 4,950 | South | TL8 | 1 hr., 10 hr., 100 hr., 1000 hr., DF, LPP, PP, Snowberry |
| Nez Pass, West Fork RD | 45-43-01 | 114-30-13 | 6,517 | Northeast | GS2 | 1 hr., 10 hr., 100 hr., 1000 hr., DF, SAF, LPP, beargrass, huckleberry |