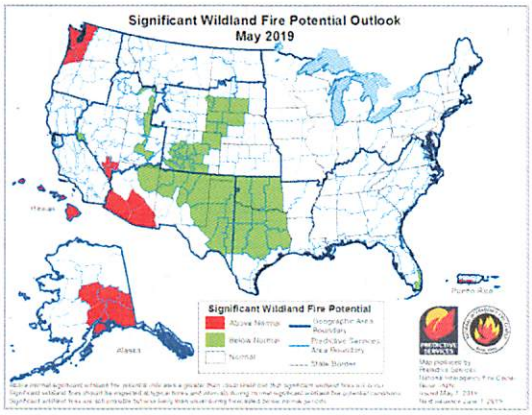
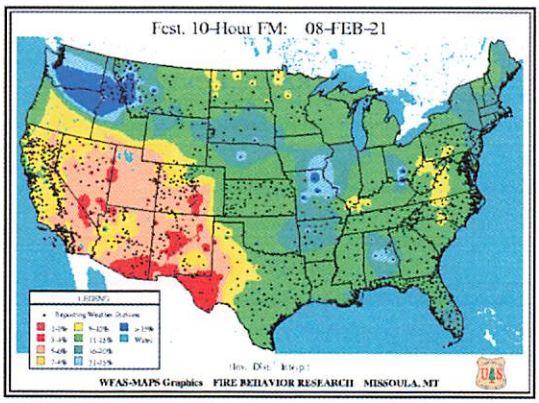
Ely Interagency Communications Center

Interagency Fire Danger Operating Plan





Condition Class and Fire Danger Rating

BI - Y

Ely North

Class Condition	BI - Y	Response Level
GREEN	0-30	LOW
YELLOW	31-42	MODERATE
RED	43-77+	HIGH

Ely South

Class Condition	BI - Y	Response Level
GREEN	0-35	LOW
YELLOW	36-50	MODERATE
RED	51-78+	HIGH

ERC - Y

Ely North

Planning Level	ERC - Y	Response Level
1	0-40	LOW
2	41-48	MODERATE
3	49-63	HIGH
4	64-70	VERY HIGH
5	71-90+	EXTREME

Ely South

Planning Level	ERC - Y	Response Level
1	0-52	LOW
2	53-62	MODERATE
3	63-74	HIGH
4	75-80	VERY HIGH
5	81-94+	EXTREME

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Ely Interagency Communications Center

Interagency Fire Danger Operating Plan

Approved By:

ROBBIE MCABOY

Digitally signed by ROBBIE MCABOY
Date: 2021.03.30 08:53:59 -07'00'

Robbie J. McAboy – District Manager
Bureau of Land Management, Ely District

Date

JOSE NORIEGA

Digitally signed by JOSE NORIEGA
Date: 2021.04.21 18:07:19 -07'00'

Jose Noriega - Ely District Ranger
USDA Forest Service, Humboldt Toyiabe National Forest

Date

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Ely Interagency Communications Center

Interagency Fire Danger Operating Plan

Recommended By:

TYE PETERSEN

Digitally signed by TYE PETERSEN
Date: 2021.03.30 08:35:44 -07'00'

Tye Petersen – Fire Management Officer
Bureau of Land Management, Ely District

Date

WILLIAM PANAGOPOULOS

Digitally signed by WILLIAM PANAGOPOULOS
Date: 2021.04.01 14:04:02 -07'00'

Bill Panagopoulos – Zone Fire Management Officer
Ely Ranger District, Humboldt Toyiabe National Forest

Date

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Ely Interagency Communications Center

Interagency Fire Danger Operating Plan

Recommended By:

NICHOLE ANDLER

Digitally signed by NICHOLE ANDLER
Date: 2022.04.19 16:39:53 -07'00'

James Woosley – Park Superintendent
National Park Service, Great Basin National Park

Date

TIEGE DOWNES

Digitally signed by TIEGE DOWNES
Date: 2022.04.12 14:59:43 -07'00'

Tiege Downes – (Acting) Fire Management Officer
National Park Service, Great Basin National Park

Date

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Ely Interagency Communications Center

Interagency Fire Danger Operating Plan

Prepared By:

JONATHAN HOLMES Digitally signed by JONATHAN HOLMES
Date: 2021.04.01 10:13:49 -07'00'

Jon Holmes – Fire Operations Planner
Bureau of Land Management, Ely District

Date

Table of Contents

1.0 INTRODUCTION

1.1 Purpose

The public, industry, and our own agency personnel expect the interagency wildland fire management agencies to implement appropriate and timely decisions which ultimately result in safe, efficient, and effective wildland fire management actions. This Fire Danger Operating Plan (FDOP) is intended to document a decision-making process for agency administrators, fire program managers, fire operations specialists, dispatchers, agency cooperators, and firefighters by establishing interagency planning and response levels using the best available scientific methods and historical weather/fire data.

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

1.1.1 Fire Danger Operating Plan

Interagency policy and guidance require numerous unit plans and guides in order to meet preparedness objectives. Some of these plans and guides are inter-related; some plans and guides provide the basis for other plans/guides as shown in this schematic. This FDOP guides the application of information from decision support tools (such as NFDRS) at the local level and is supplemental to agency Fire Management Plans (FMPs). This plan documents the establishment and management of a fire weather station network and describes how fire danger ratings will be applied to local unit fire management decisions. The actual implementation of the fire business thresholds is described in the following supplemental action plans.

1.1.1.1 Staffing Plan (Step up Plan)

The Staffing Plan describes escalating responses that are usually noted in the FMP. Mitigating actions are designed to enhance the unit's fire management capability during short periods (one burning period, Fourth of July or other pre-identified events) where normal staffing cannot meet initial attack, prevention, or detection needs. The decision points are identified and documented in this FDOP; the associated decisions and planned actions are located in Appendix B.

1.1.1.2 Preparedness Plan

Preparedness plans provide management direction given identified levels of burning conditions, fire activity, and resource commitment, and are required at national, state/regional, and local levels. Preparedness Levels (1 to 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 this FDOP; the associated decisions and planned actions are in Appendix B.

1.1.1.3 Prevention Plan

Prevention plans document the wildland fire problems identified by a prevention analysis. This analysis will not only examine human-caused fires, but also the risks, hazards, and values for the planning unit. Components of the plan include mitigation (actions initiated to reduce impacts of wildland fire to communities), prevention (of unwanted human-caused fires), education (facilitating and promoting awareness and understanding of wildland fire), enforcement (actions necessary to establish and carry out regulations, restrictions, and closures), and administration of the prevention program. The analysis of fire problems and associated target groups in the NUIFC are documented in this FDOP; the associated decisions and planned actions are in Appendix B.

1.1.1.4 Restriction Plan

Restrictions are done on a state management level.

1.1.2 Wildland Fire Response

1.1.2.1 Initial Response Plan (Pre-Attack Plan)

Initial response plans, also referred to as run cards or pre-attack 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. The Ely District Pre-Attack plan responses areas are designed on a transportation-based model. This is not necessarily closest resource but based on response time. This plan properly addresses the need and type of aircraft response. Also considered in response is fire weather, fuel conditions, fire management objectives, and resource availability. Response levels are identified and documented in this FDOP. The number and type of suppression resources dispatched to a reported fire is documented in the associated Pre -Attack Plan Appendix B.

1.1.2.2 Local Mobilization Plan

Mobilization Plans identify 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 EICC plan utilizes standards and procedures already outlined in the Great Basin Mobilization Guide

1.2 Policy and Guidance

Interagency policy and guidance regarding the development of FDOPs can be found in the Interagency Standards for Fire & Aviation Operations. Agency-specific direction can be found in:

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

1.3 Operating Plan Objectives

- Provide a tool for agency administrators, fire managers, dispatchers, agency cooperators, and firefighters to correlate fire danger ratings with appropriate fire business decisions in fire danger planning area.
- Delineate Fire Danger Rating Areas (FDRAs) in fire danger planning area with similar climate, vegetation, and topography.
- Establish an interagency fire weather-monitoring network consisting of Remote Automated Weather Stations (RAWS) which comply with NFDRS Weather Station Standards (PMS 426-3).
- Determine climatological breakpoints and fire business thresholds using the Weather Information Management System (WIMS), NFDRS, and Fire Family Plus software to analyze and summarize an integrated database of historical fire weather and fire occurrence data.
- Define roles and responsibilities to make fire preparedness decisions, manage weather information, and brief fire suppression personnel regarding current and potential fire danger.
- Determine the most effective communication methods for fire managers to communicate potential fire danger to cooperating agencies, industry, and the public.
- Provide guidance to interagency personnel outlining specific daily actions and considerations at each preparedness level.
- Identify seasonal risk analysis criteria and establish general fire severity thresholds.
- Identify the development and distribution of fire danger pocket cards to all personnel involved with fire suppression within the fire danger planning area.
- Identify program needs and suggest improvements for implementation of the FDOP.

2.0 FIRE DANGER PLANNING AREA INVENTORY

2.1 Administrative Units

This plan encompasses an area of approximately 12.8 million acres in Eastern Nevada, with wildland fire management and suppression responsibilities shared among the U.S. Department of Agriculture (USDA), Forest Service (USFS); U.S. Department of the Interior (USDI), Bureau of Land Management (BLM), Nevada Department of Forestry (NDF); and local cooperators. Eastern Nevada has a diverse landscape ranging from high desert to mountain peaks that are over 13,000 feet in elevation. Administrative units included in Eastern Nevada Interagency Communications Center (EICC) fire danger planning area are presented in Table 1.

Table 1: Administrative units within the Eastern Nevada fire danger planning area

Agency	Office	Estimated Acreage
BIA	Eastern Nevada Agency	109,429
BLM	Ely District Office	11,403,771
NPS	Great Basin National Park	77,135
STATE	Forestry, Fire, and State Lands	11,204
USFS	Humboldt Toyiabe National Forest	1,010,562
PRIVATE	White Pine, Lincoln and Nye County	414,541

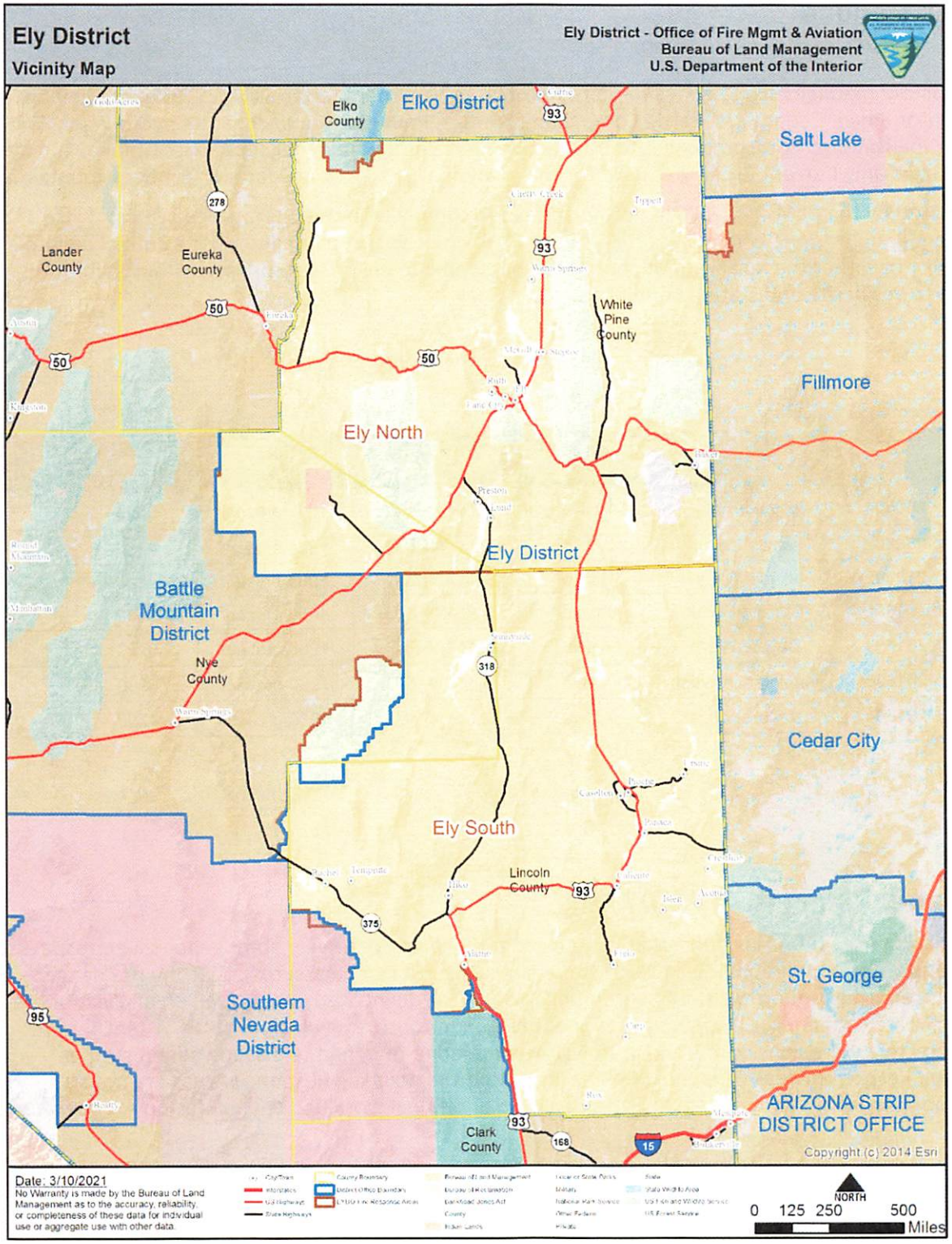


Figure 1: Map depicting land ownership and/or management agency

2.2 Weather Stations

The BLM Ely District manages six (6) active Remote Automated Weather Stations (RAWS) at the following locations: Alligator Ridge, Cedar Pass, Cattle Camp, Kane Springs, Immigration Wash, and Coyote Wash. The Humboldt-Toiyabe National Forest manages two (2) active RAWS at the following locations: Timber Mountain and Current Creek. Only Current Creek was used for the analysis, due to missing data for Timber Mountain.

All RAWS operated by the BLM and USFS in northern Nevada comply with the Interagency Wildland Fire Weather Station Standards and Guidelines (2014). Each RAWS receives, at a minimum, one annual on-site maintenance visit by either the local user or contracted personnel to ensure sensors are within calibration standards, and to verify site and station conditions.

Table 2: RAWS Information Summary Table

FDRA	Station ID	Station Name	Status	Agency/Owner	Data Years	Elevation	Reporting Time
North	260804	Alligator Ridge	Active	BLM-NV-ELD	1989-present	6560	
	260807	Cattle Camp	Active	BLM-NV-ELD	1994-present	7300	
	260805	Cedar Pass	*Active*	BLM-NV-ELD	*1989-present*	*7180*	
	261406	Current Creek	*Active*	USFS-NV-HTF	*1989-present*	*5580*	
South	261603	Coyote Wash	Active	BLM-NV-ELD	1986-present	5720	
	261608	Immigration Wash	Active	BLM-NV-ELD	1990-present	6230	
	261604	Kane Springs	Active	BLM-NV-ELD	1990-present	4590	

2.3 Fire Danger Rating Areas (FDRAs)

A Fire Danger Rating Area (FDRA) is defined as a large geographic area relatively homogenous with respect to climate, vegetation, and topography. Because of these similarities, it can be assumed that the fire danger within a FDRA is relatively uniform. Fire Danger Rating Areas were delineated based upon an analysis of these three factors: climate (Appendix C), vegetation (Appendix C), and topography (Appendix C). After these environmental factors were considered, the draft FDRAs were edge-matched to existing administrative boundaries using Response Areas (Appendix C). It is important that existing Response Areas are not split by FDRAs; a Response Area must not have two FDRAs to avoid additional workload and confusion for operational personnel.

2.3.1 FDRA Descriptions

2.3.1.1 North FDRA

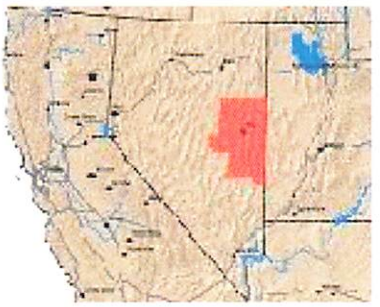


Table 3: NFDRS Parameter Summary for the Ely North

FDRA	Slope Class	Climate Class	Herbaceous Type
North	1 (0%-25%)	2 (Semi-Arid)	A (Annual)

Vegetation: Large areas of sagebrush. Grasses consist of Indian rice grass, galleta grass, needle-and-thread grass, squirrel tail, and cheatgrass. Forbs include globe mallow, princess plume, evening primrose, and a variety of annual forbs. The middle elevation sites within the unit are dominated by Wyoming big sagebrush, black sagebrush, rabbit brush, snakeweed, pinyon-juniper woodlands and a few agricultural areas. Common grasses include blue bunch wheatgrass, western wheatgrass, Sandberg's bluegrass and crested wheatgrass. Forbs are diverse and abundant throughout. Significant sagebrush habitat has been lost due to pinyon-juniper infilling and expansion and infilling and as well as cheatgrass invasion. Upper elevations have mountain big sagebrush, mountain mahogany, bitterbrush, quaking aspen, serviceberry, white fir, and Douglas fir. This FDRA has been impacted by large and numerous fires in the past and has many areas dominated by cheatgrass. Most wind driven wildfires typically grow large due to the continuity of cheatgrass in the area.

2.3.1.2 South FDRA

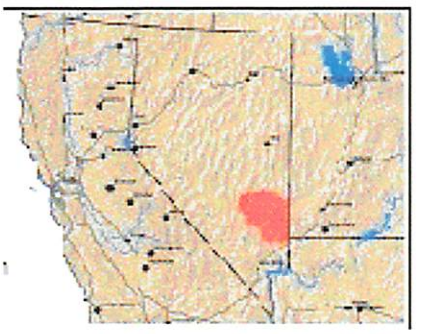


Table 4: NFDRS Parameter Summary for the Ely North

FDRA	Slope Class	Climate Class	Herbaceous Type
South	1 (0%-25%)	1 (Arid)	A (Annual)

Vegetation: Lower elevations of this FDRA are salt desert shrub lands characterized by greasewood, shad scale, four wing saltbush, Gardner saltbush, horse brush, ephedra, winter fat, kochia, rabbit brush, snakeweed, black sagebrush, and small areas of Wyoming big sagebrush. Grasses consist of Indian rice grass, galleta grass, needle-and-thread grass, squirrel tail, sand drop seed, and cheatgrass. Forbs include globe mallow, princess plume, evening primrose, and a variety of annual forbs. The middle elevation sites within the unit are dominated by Wyoming big sagebrush, black sagebrush, rabbit brush, snakeweed, pinyon-juniper woodlands and a few agricultural areas. Common grasses include blue bunch wheatgrass, western wheatgrass, Sandberg's bluegrass and crested wheatgrass. Forbs are diverse and abundant throughout. Significant sagebrush habitat has been lost due to pinyon-juniper infilling and expansion and infilling as well as cheatgrass invasion. Upper elevations have mountain big sagebrush, mountain mahogany, bitterbrush, quaking aspen, serviceberry, white fir, and Ponderosa Pine. This FDRA has been impacted by large and numerous fires in the past and has many areas dominated by cheatgrass. Most wind driven wildfires typically grow large due to the continuity of cheatgrass in the area.

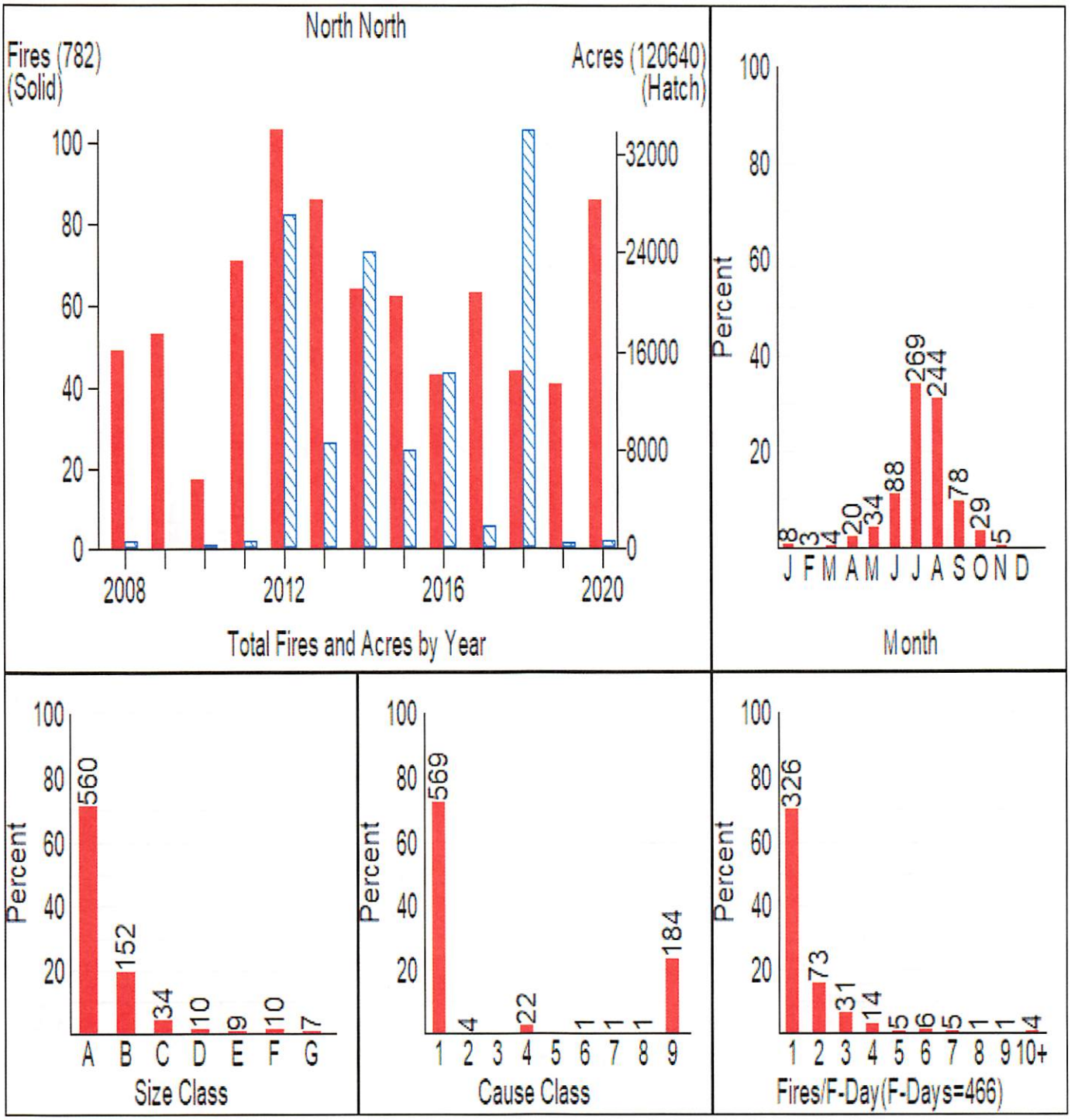
3.0 FIRE DANGER PROBLEM ANALYSIS

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

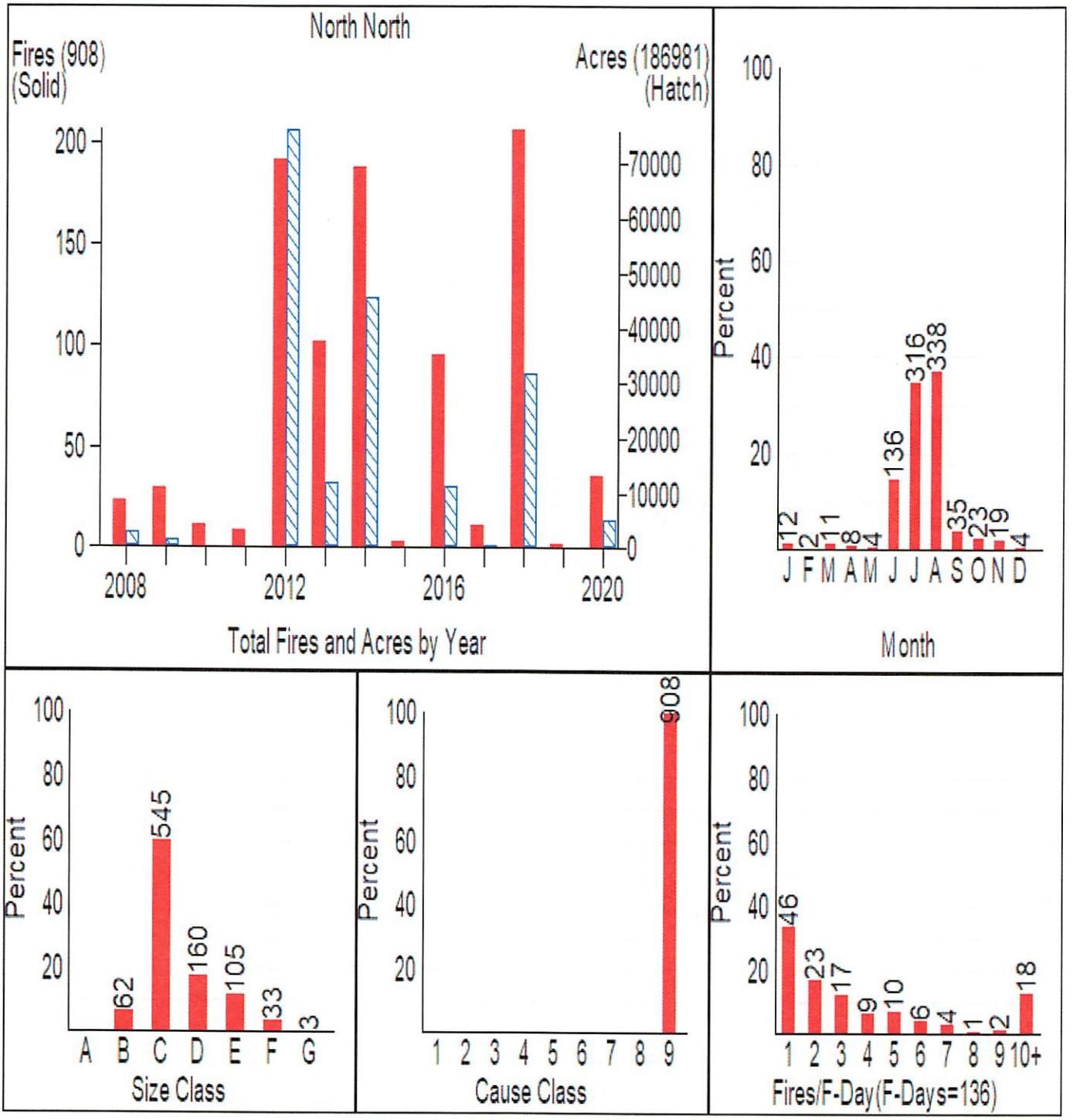
3.1 Fire Occurrence

Twelve years (2008-2020) of Modis data was used for the statistical analysis. The Modis data is useful for detecting large fires but may miss small single tree fires. Modis was used because it gave a better representation of large and multi-fire days. Large fire activity is a driver for increased preparedness where single tree fires are less of a factor. Fire Family Plus software was utilized to produce statistics and graphs. The following fire summary graphs do not differentiate between agencies; fires are depicted without regard to agency affiliation.

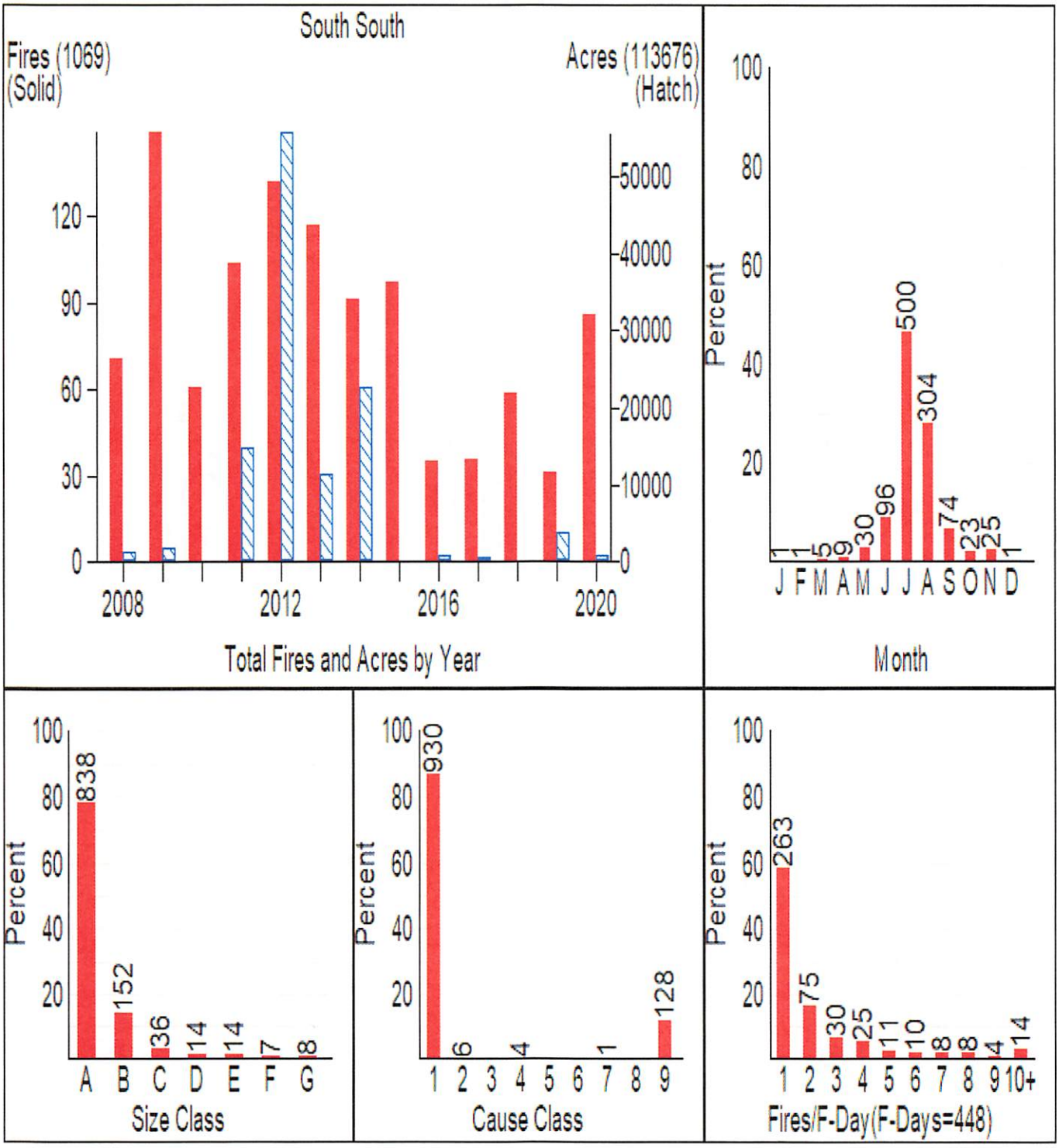
3.2.1 North FDRA



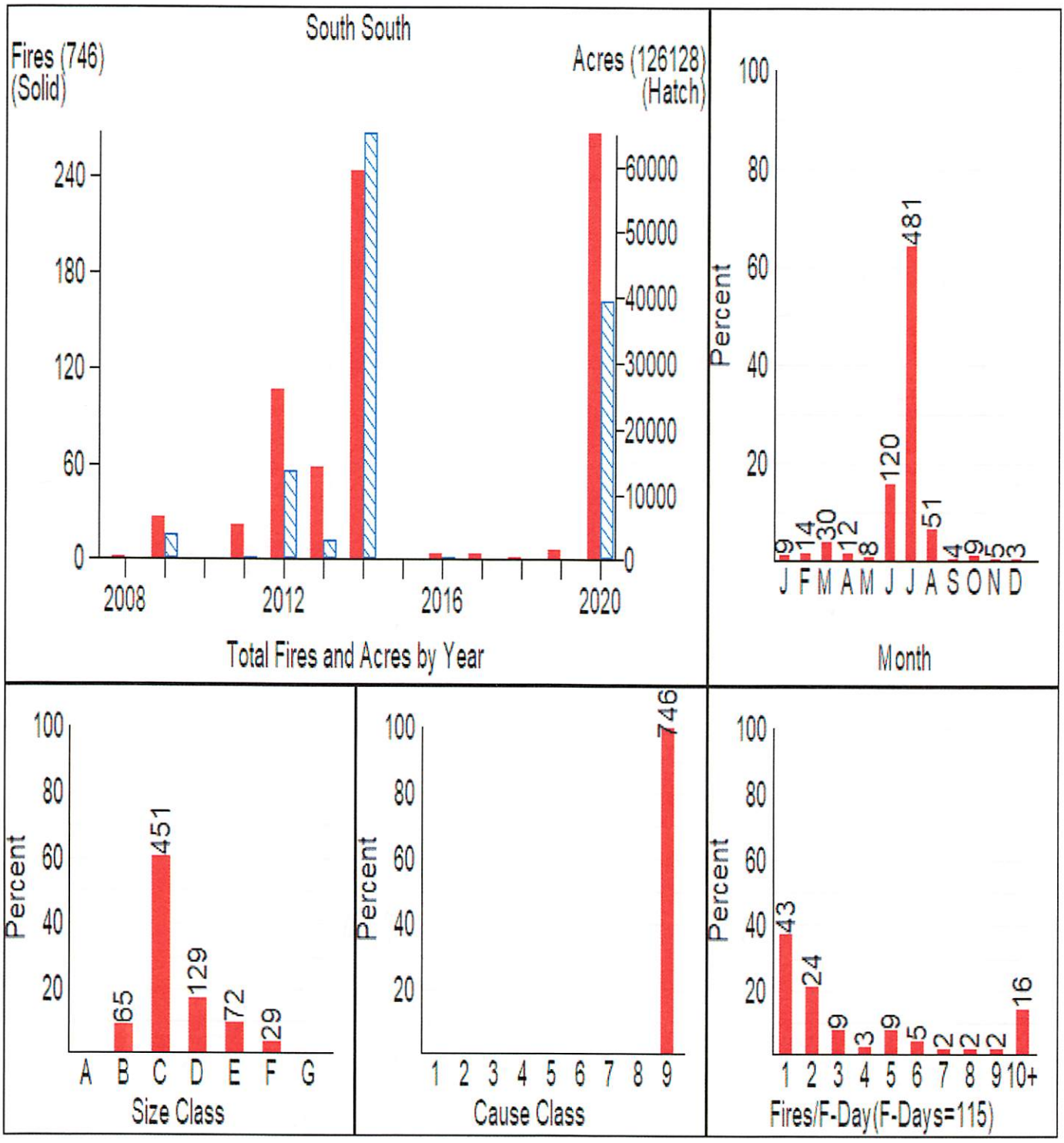
3.2.1 North FDRA



3.2.2 South FDRA



3.2.2 South FDRA



4.0 FIRE DANGER THRESHOLD/DECISION ANALYSIS

Decision points can be based upon either:

- Climatological Breakpoints, 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 points. A "decision point" is a point along the range of possible output values where a decision shifts from one choice to another. When the combination of events and conditions signal that it is time to do something different, a "decision point" has been identified for each Fire Danger Rating Level within each Fire Danger Rating Area.

4.1 Climatological Analysis

Climatological breakpoints are points on the cumulative distribution curve of one fire weather/danger index computed from climatology (weather) without regard for associated fire occurrence/business. For example, the value at the 90th percentile ERC is the climatological breakpoint at which only 10 percent of the ERC values are greater in value. Climatological percentiles were originally developed for budgetary decisions by federal agencies and area predetermined by agency directive, as shown below:

- **BLM:** 80th and 95th percentiles

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

The decision thresholds identified in this FDOP are based upon the statistical correlation of historical fire occurrence and weather data and, therefore, do not utilize climatological (percentiles) for decision points.

NOTE: These numbers will be used in WIMS for use in external applications such as WFAS.

4.3 Fire Business Analysis

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

4.4 Parameters Used to Calculate Fire Danger

Table 5: Parameters used to calculate fire danger

	North FDRA	South FDRA
RAWS	Alligator Ridge, Cedar Pass, Cattle Camp	Coyote Wash, Immigration Wash. Kane Springs
NFDRS Fuel Models	Y	Y
Slope Class	2 (26%-40%)	2 (26%-40%)
Climate Class	2 (Sub-humid)	1 (Arid)
Herbaceous Type	Annual	Annual
Annual Precipitation (inches)	5-12	5-8
Elevation Range (feet)	6,000-13,000	2,000-9,000
Acres	6,300,000	6,100,000
Green-up Standard (estimate)	June 1	May 1
Freeze Date (estimate)	Oct 31	Nov 30
1000 Hr Starting	20	15
Starting KBDI	100	100
Large Fires	10 FRP	10 FRP
Multiple Fire Day	5 FRP	5 FRP

- **NFDRS Fuel Model:**
- **Slope Class** was determined using GIS slope analysis.
- **Climate Class** were assigned based on temperature and precipitation patterns as defined in the NFDRS Users Guide.
- **Herbaceous Type:** Due to the abundance of cheat grass within the FDRA, "annual" was selected as the herbaceous type for this analysis.
- **Large Fire Size:** 10 FRP (fire radiative power) was determined to be the large fire size due to statistical correlation and the tipping point of resource commitment.
- **Multiple Fire Days** 5 FRP (fire radiative power) reflect number of fires that exceeds local staffing capability per fire danger zone.

4.5 Fire Business Decision Threshold Analysis

Using the Fire Family Plus software, NFDRS thresholds have been identified where changes in fire business should occur. There was great difficulty in trending fire danger and response to anything other than large fire occurrence. This was true for both FDRA but especially true for the South FDRA. Reasons are mainly attributed to the monsoonal influence and the variability of Burning Index and the timing of the start date and days of actual large fire growth. All work is shown in appendix D.

4.6 Fire Business Decision Summary Table

This table summarizes the analysis done in this FDOP. It shows the decision points to be used for all the management tools within each FDRA.

Target Group	Fire Danger Rating Area(s)	Number of Decision Points	Index / Comp.	Fuel Model	Preparedness Plan(s) Intended to Modify Target Group Behaviour
Agency	North and South	5	ERC	Y	Preparedness Plan, Staffing Plan, Fire Danger Rating
Agency	North and South	3	BI	Y	Response / Dispatch Plan

5.0 FIRE DANGER RATING LEVEL DECISIONS

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. The NFDRS outputs from the WIMS processor can be used to determine various levels of fire danger rating to address the fire problems identified previously in the Fire Problem Analysis Chart. The system is designed to model worst-case fire danger scenario. The NFDRS, along with other decision support tools, will be utilized to produce levels (thresholds) of fire business to address local fire problems by targeting public, industrial, or agency groups.

The NFDRS will be utilized to produce outputs to assist fire management with four sets of decisions.

- **Staffing Levels** and the **Step up Plan** will be used for appropriate day-to-day suppression resource staffing and severity.
- **Preparedness Levels** will assist fire managers with more long-term (or seasonal) decisions with respect to fire danger.
- **Fire Danger Adjective Rating** levels are intended to communicate fire danger to the public, such as fire danger signs.

5.1 Response (or Dispatch) Level

Response (or Dispatch) Levels are pre-planned actions which identify the number and type of resources (engines, crews, aircraft, etc.) initially dispatched to a reported wildland fire based upon fire danger criteria. Dispatch Levels are established to assist fire managers with decisions regarding the most appropriate response to an initial fire report until a qualified Incident Commander arrives at the incident. The Fire Family Plus software has been used to establish the Dispatch Level thresholds. A statistical analysis of fire occurrence and historical weather has been completed for each FDRA. The correlation of various combinations of NFDRS outputs with weather records is listed in the appendix.

Agency personnel use the dispatch level (response level) to assign initial attack resources based on pre-planned interagency "Run Cards." Combined with predefined Dispatch Zones, the Dispatch Level is used to assign an appropriate mix of suppression resources to a reported wildland fire based upon fire danger potential. The dispatch levels are derived from the most appropriate NFDRS index and/or component that correlate to fire occurrence. Burning Index (BI) with NFDRS Fuel Model T has been determined to be the most appropriate NFDRS index that statistically correlates to the potential for large fires to occur. Due to the ability of BI to reflect the most current fire danger potential, and the Dispatch Center's ability to track agency personnel throughout the course of any given day, BI will be computed and implemented for initial attack response levels until a qualified Incident Commander evaluates the need for the dispatched resources.

The response levels as it pertains to the Ely District Pre-Attack plan is valid only for the first or second initial responses within a response zone. When multiple starts or emerging large fires happen the ability to maintain the same response as listed in the Pre-Attack plan is no longer feasible. It then becomes the call of the Operational Duty Officer to augment priorities and fire response.

See Pre-Attack plan in Appendix B.

Table 6: Dispatch Level, Fire Family Plus Analysis Factors and Determinations

FDRA	RAWS		Data Years Used	Weight Factor	Fuel Model	NFDRS Index	Class	Range
	NWS #	Name						
North	260805	Cedar Pass	2008 – 2020	1.0	Y	BI	Low	0 - 30
	260804	Alligator Ridge	2008 – 2020	1.0			Mod	31 - 42
	260807	Cattle Camp	2008 – 2020	1.0			High	42 - 74+
	261406	Current Creek	2008 - 2020	1.0				
South	261603	Coyote wash	2008 – 2020	1.0	Y	BI	Low	0 - 35
	261608	Immigration Wash	2008 – 2020	1.0			Mod	36 - 50
	261604	Kane Springs	2008 – 2020	1.0			High	51 - 78+

Table 7: Ely Interagency Communications Center Dispatch Level Worksheet

Dispatch Level Worksheet *Ely Interagency Communications Center*			
Fire Danger Rating Area (FDRA)	**Burning Index (Model Y)**		
North FDRA	0 - 30	31 - 42	42 - 77 +
South FDRA	0 - 35	36 - 50	51 - 78 +
Dispatch Level	LOW	MODERATE	HIGH

5.3 Preparedness Level

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

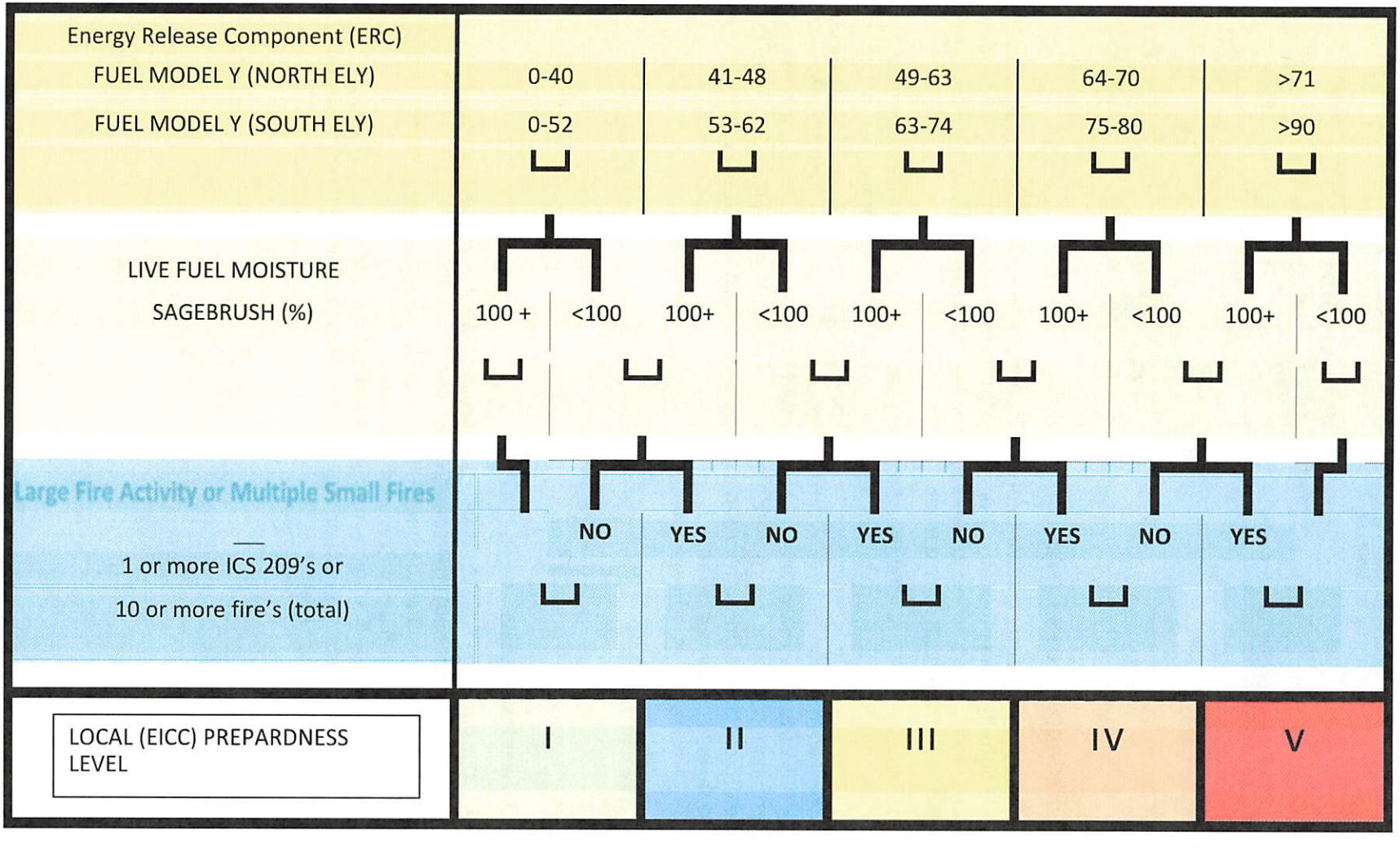
Preparedness Levels are established to assist fire managers with weekly or monthly planning decisions based upon seasonal fire danger elements. The Fire Family Plus software has been used to establish the fire business thresholds. A statistical analysis of fire occurrence and historical weather has been completed for each FDRA. The correlation of various combinations of NFDRS outputs with weather records is listed in the appendix. The final Preparedness Level determination will also incorporate a measure of current and projected levels of resource commitment due to fire activity and a measure of Ignition risk. The Ely Preparedness Level Worksheet is presented in Table 9.

Worksheet Instructions:

- **Consider Live Fuel Moisters - Sagebrush LFM** – If Sage live fuel moister is < 100% consider bumping up Preparedness Level.
- **Consider Fine Fuel Loadings** – If Fine Fuel loadings are above normal across the District consider bumping up Preparedness Level.
- **Fire Activity** – If fire activity is increasing due to weather conditions (ex: wind events, red flag conditions ect.) or expected incoming lightning, consider bumping up Preparedness Level.

Table 8: Ely Interagency Communications Center Local Preparedness Level Worksheet

ELY DISTRICT FIRE PREPARDNESS WORKSHEET



5.4.2 Adjective Fire Danger Rating Determination

Although NFDRS processors (e.g., WIMS) will automatically calculate the adjective class rating, Ely Interagency Communications Center will manually determine Adjective Fire Danger Rating based upon fire business thresholds. The actual determination of the daily adjective rating is based on the current or forecasted value of a selected index ERC and was created with business thresholds related to large fire occurrence on the Ely District.

Table 90: North and South FDRA Adjective Fire Danger Rating Worksheet

Fire Danger Index (ERC-G)	North FDRA
0 – 40	L
41 - 48	M
49 – 63	H
64 – 70	VH
70+	E

Fire Danger Index (ERC-G)	South FDRA
0 – 52	L
53 – 62	M
63 – 74	H
75 – 80	VH
81+	E

5.4.3 Staffing Level

Once Planning Level 2 is reached Duty Officer may consider adding resources based on the criteria in Appendix B. The step-up plan provides management direction given in identified level of burning conditions, fire activity and resource commitment. This decision may be based or in concurrence with incoming weather events, low live fuel moister in sagebrush or higher than normal fine fuel loadings.

6.0 FIRE DANGER OPERATING PROCEDURES

6.1 Roles and Responsibilities

6.1.1 Agency Administrators

During periods of high fire activity the FMO or duty officer will coordinate with the appropriate Agency Administrators and keep them up to date on daily fire growth and major events. The Agency Administrator will assist with the WFDSS and be the final approver of the document.

6.1.2 Fire Program Managers

During periods when local preparedness levels are High to Extreme, the Operational Duty Officers (DO) from each agency will strive to achieve the most efficient and effective organization to meet Fire Management Plan (FMP) objectives. This may require the pre-positioning of suppression resources. The Operational Duty Officer (DO) from each agency will also determine the need to request/release off unit resources or support personnel throughout the fire season. The program manager/agency administrator is ultimately responsible for ensuring this plan is maintained, utilized, and communicated. The FMO from each federal agency will ensure that seasonal risk assessments are conducted monthly during the fire season. The risk analysis will include information such as live fuel moisture, 1000-hour fuel moisture, fuel loading, NFDRS (BI/IC/ERC) trends, NDVI imagery, and other pertinent data. This information will be distributed to agency staff and the EICC Manager. The EICC Manager, AFMOs, and FMOs will ensure information is posted at fire suppression duty stations. The FMOs will ensure that the pocket cards are prepared at least every three years and are in compliance with NWCG standards. The cards will be distributed to all interagency, local and incoming firefighters and Incident Management Teams (IMTs). The pocket cards will be posted on the National Wildfire Coordinating Group (NWCG) pocket card web site. Fire suppression supervisors will utilize pockets cards to train and brief suppression personnel ensuring that they are posted at their respective fire stations.

6.1.3 Fire Weather Station Owners/Managers

The Ely District Fuels Program Lead is listed as the station owner for the BLM RAWS. The Ely Ranger District Fuels Program is listed as the station owner for the Humboldt-Toyiabe National Forest RAWS. The owner maintains the WIMS Access Control List (ACL). The station owner will ensure appropriate editing of the RAWS catalogs. The EICC Manager will ensure the timely editing of daily 1300 (LST) weather observations of all stations. The Remote Sensing Unit located at the National Interagency Fire Center (NIFC) maintains and calibrates the BLM RAWS stations on an annual basis. The BLM Fuels Staff is qualified as first responders to RAWS malfunctions.

6.1.4 Dispatch/Communications Center

The Ely Interagency Communications Center (EICC) Manager will ensure that the Fire Danger Operating and Preparedness Plan along with all necessary amendments /updates to this plan are completed. Updates to this plan will be made at least every three years and approved by the line officers (or delegates) from each agency. The dispatch center manager will ensure that the daily fire weather forecast (including NFDRS indices) is retrieved and that the preparedness, response level, and adjective rating are calculated and communicated to the appropriate target group.

6.1.5 Duty Officer

A Duty Officer will be identified to the EICC, daily from May through October. The Duty Officer is designated to provide input and guidance regarding staffing, preparedness and dispatch levels. It is the Duty Officer's role to interpret and modify the daily staffing, preparedness and dispatch levels (if warranted) by extenuating factors not addressed by this plan. Modifications of the staffing, preparedness and/or dispatch levels must be coordinated through the dispatch center. The Duty Officer will keep their respective agency's fire and management staff updated (as needed).

6.1.6 GIS Specialists

GIS specialists will be utilized when needed to assist in planning and preparedness.

6.1.7 National Weather Service

Weather forecasts and products for the Eastern Nevada area are provided by the National Weather Service, Elko and Las Vegas offices. The annual Fire Weather Operating Plan with contact information and product listing (including NFDRS point and trend forecast products) can be found at: https://gacc.nifc.gov/gbcc/aop.php

6.1.8 Geographic Area, Predictive Services – Meteorologist

https://gacc.nifc.gov/gbcc/outlooks.php

6.1.9 Education, Mitigation, and Education Specialists

Education and mitigation programs will be implemented by the agency Public Information Officers, Law Enforcement Officers, FMOs, AFMOs and Fire Education/Mitigation Specialists based on Preparedness Level Guidelines and direction provided by each agency's FMO and Duty Officer.

6.2 Daily Schedule

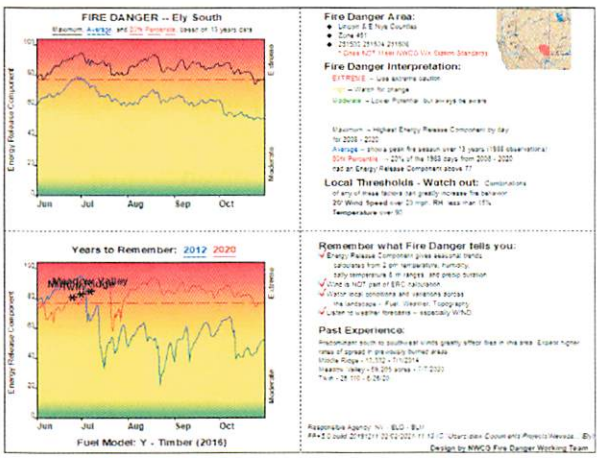
See Ely District Firefighter Handbook

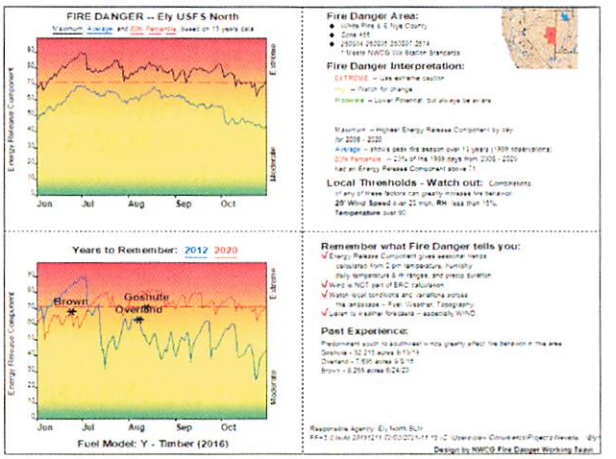
6.4 Season Ending Event

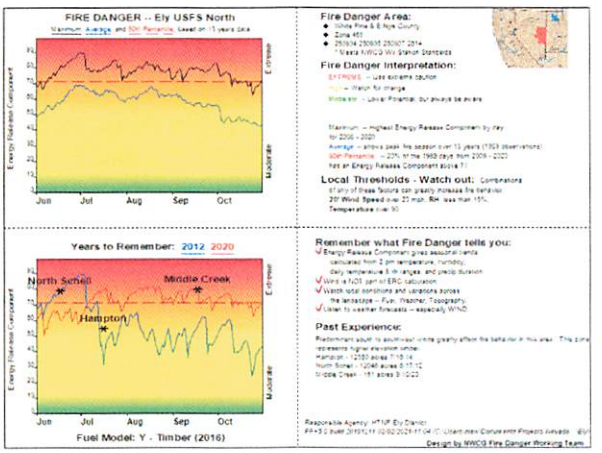
Utilizing the Term Module of the Rare Event Risk Assessment Process (RERAP) software, the Weibull waiting-time distribution was developed from historical season-ending dates. The probability graphs along with the event locator parameters from the Fire Family Plus software dialog box. An analysis will be performed as needed during late season and use of wildland fire for resource benefit.

6.6 Fire Danger Pocket Cards

The Fire Danger Pocket Card is a tool which can aid fire suppression personnel to interpret NFDRS outputs and understand local fire danger thresholds for a local area. Pocket cards can relate current NFDRS outputs with the historical average and worst-case values in a specific geographic location. Burning Index was the NFDRS output chosen as a measure of fire controllability (Deeming et al. 1978). ERC was chosen as a measure of seasonality and severity. NFDRS fuel model G was selected for ERC values in both fire danger rating areas as it provides a good statistical correlation to large fire occurrence. NFDRS fuel model T was selected for the Burning Index (BI) in both rating areas for its ability to respond quickly to changing weather and conditions. Refer to Appendix H for an example. Visiting resources can use the pocket card to familiarize themselves with local fire danger conditions. The Eastern Nevada Pocket Cards meet NWCG guidelines and are posted on the NWCG website.


FIRE DANGER -- Ely South
Years to Remember: 2012 2020
Fuel Model: Y - Timber (2016)
Fire Danger Area:
Fire Danger Interpretation:
Local Thresholds - Watch out:
Remember what Fire Danger tells you:
Past Experience:
Design by NWCG Fire Danger Working Team


FIRE DANGER -- Ely USFS North
Years to Remember: 2012 2020
Brown
Goshute Overlook
Fuel Model: Y - Timber (2016)
Fire Danger Area:
Fire Danger Interpretation:
Local Thresholds - Watch out:
Remember what Fire Danger tells you:
Past Experience:
Design by NWCG Fire Danger Working Team


FIRE DANGER -- Ely USFS North
Years to Remember: 2012 2020
North Schell
Middle Creek
Hampton
Fuel Model: Y - Timber (2016)
Fire Danger Area:
Fire Danger Interpretation:
Local Thresholds - Watch out:
Remember what Fire Danger tells you:
Past Experience:
Design by NWCG Fire Danger Working Team

6.5 Weather Station Monitoring and Maintenance

The Remote Sensing Laboratory located at the National Interagency Fire Center (NIFC) maintains and calibrates the BLM RAWS stations on an annual basis. The USFS RAWS Coordinator is responsible for maintaining and calibrating the USFS RAWS stations on an annual basis.

7.0 FIRE DANGER PROGRAM NEEDS

Weather Stations

- No issues.

Computer/Equipment

- Consider creating a web page where fire information can be shared.

Training

- Provide FDOP training to cooperators including city and county fire chiefs.
- Provide refresher training on fire danger applications and Pocket Cards, emphasizing the differences between BI, ERC, Staffing/Dispatch/Preparedness Levels, and Adjective Fire Danger Rating Levels.
- Emphasize NFDRS training (S-491) for mid-level fire management personnel and Advanced NFDRS for upper-level fire management personnel.

APPENDICES

Appendix A: Glossary of Terminology

Appendix B: Sub Plans

- **Response / Pre-Attack Plan**
- **Staffing Plan / Draw-Down Levels / Preparedness Plan**
- **Prevention Plan**

Appendix C: Maps

- **Occurrence**
- **Topography**
- **Vegetation**
- **Climate**

Appendix D: Fire Family Plus Analysis

Appendix A: Glossary of Terminology

1-hour Timelag Fuels: The 1-hour fuel moisture content represents the modeled fuel moisture of dead fuels from herbaceous plants or roundwood that is less than one quarter inch in diameter. Also estimated is the uppermost layer of litter on the forest floor.

10-hour Timelag Fuels: Dead fuels consisting of roundwood in the size range of one quarter to 1 inch in diameter and, very roughly, the layer of litter extending from just below the surface to three-quarters of an inch below the surface.

100-hour Timelag Fuels: Dead fuels consisting of roundwood in the size range of 1 to 3 inches in diameter and, very roughly, the forest floor from three quarters of an inch to 4 inches below the surface.

1000-hour Timelag Fuels: Dead fuels consisting of roundwood 3 to 8 inches in diameter or the layer of the forest floor more than about 4 inches below the surface or both.

Adjective Rating: A public information description of the relative severity of the current fire danger situation.

Annual Plant: A plant that lives for one growing season, starting from a seed each year.

Burning Index (BI): BI is a number related to the contribution of fire behavior to the effort of containing a fire. The BI (difficulty of control) is derived from a combination of Spread Component (how fast it will spread) and Energy Release Component (how much energy will be produced). In this way, it is related to flame length, which, in the Fire Behavior Prediction System, is based on rate of spread and heat per unit area. However, because of differences in the calculations for BI and flame length, they are not the same. The BI is an index that rates fire danger related to potential flame length over a fire danger rating area. The fire behavior prediction system produces flame length predictions for a specific location (Andrews, 1986). The BI is expressed as a numeric value related to potential flame length in feet multiplied by 10. The scale is open-ended which allows the range of numbers to adequately define fire problems, even during low to moderate fire danger.

Climatological Breakpoints: Points on the cumulative distribution of one fire weather/fire danger index without regard to associated fire occurrence/business. They are sometimes referred to as exceedance thresholds.

Duff: The partially decomposed organic material of the forest floor that lies beneath the freshly fallen twigs, needles and leaves. (The F and H layers of the forest soil profile.)

Energy Release Component (ERC): ERC is a number related to the available energy (BTU) per unit area (square foot) within the flaming front at the head of a fire. Since this number represents the potential "heat release" per unit area in the flaming zone, it can provide guidance to several important fire activities. It may also be considered a composite fuel moisture value as it reflects the contribution that all live and dead fuels have to potential fire intensity. The ERC is a cumulative or "build- up" type of index. As live fuels cure and dead fuels dry, the ERC values get higher thus providing a good reflection of drought conditions. The scale is open-ended or unlimited and, as with other NFDRS components, is relative. Conditions producing an ERC value of 24 represent a potential heat release twice that of conditions resulting in an ERC value of 12.

Equilibrium Moisture Content: The moisture content that a fuel particle will attain if exposed for an infinite period in an environment of constant temperature and humidity. When a fuel

particle has reached its equilibrium moisture content, the net exchange of moisture between it and its environment is zero.

Fire Business Thresholds: Values of one or more fire weather/fire danger indexes that have been statistically related to occurrence of fires (fire business). Generally, the threshold is a value or range of values where historical fire activity has significantly increased or decreased.

Fire Danger: The resultant descriptor of the combination of both constant and variable factors that affect the ignition, spread, and control difficulty of control of wildfires on an area.

Fire Danger Continuum: The range of possible values for a fire danger index or component, given a set of NFDRS parameters and inputs.

Fire Danger Rating: A system that integrates the effects of existing and expected states of selected fire danger factors into one or more qualitative or numeric indices that reflect an areas protection needs.

Fire Danger Rating Area: A geographic area relatively homogeneous in climate, fuels and topography, tens of thousands of acres in size, within which the fire danger can be assumed to be uniform. Its size and shape is primarily based on influences of fire danger, not political boundaries. It is the basic, on the ground unit for which unique fire danger decisions are made based on fire danger ratings. Weather is represented by one or more NFDRS weather (RAWS) stations.

Fire Weather Forecast Zone: A grouping of fire weather stations that experience the same weather change or trend. Zones are developed by the National Weather Service to assist NWS production of fire weather forecasts or trends for similar stations. Fire weather forecast zones are best thought of as a list of similar-weather stations, rather than an area on a map.

Forb: A non- grass-like herbaceous plant.

Fuel Class: A group of fuels possessing common characteristics. In the NFDRS, dead fuels are grouped according to their timelag (1, 10, 100, and 1000 hr) and live fuels are grouped by whether they are herbaceous (annual or perennial) or woody.

Fuel Model: A simulated fuel complex for which all the fuel descriptors required by the mathematical fire spread model have been supplied.

Fuel Moisture Content: The water content of a fuel particle expressed as a percent of the oven-dry weight of the particle. Can be expressed for either live or dead fuels.

Fuels: Non-decomposed material, living or dead, derived from herbaceous plants.

Green-up: Green-up within the NFDRS model is defined as the beginning of a new cycle of plant growth. Green- up occurs once a year, except in desert areas where rainy periods can produce a flush of new growth more than once a year. Green- up may be signaled at different dates for different fuel models. Green-up should not be started when the first flush of green occurs in the area. Instead, the vegetation that will be the fire problem (represented by the NFDRS fuel model associated with the weather station) when it matures and cures should be identified. Green-up should start when the majority of this vegetation starts to grow.

Herb: A plant that does not develop woody, persistent tissue but is relatively soft or succulent and sprouts from the base (perennials) or develops from seed (annuals) each year. Included are grasses, forbs, and ferns.

Herbaceous Vegetation Moisture Content: The water content of a live herbaceous plant expressed as a percent of the oven-dry weight of the plant.

Ignition Component (IC): IC is a rating of the probability that a firebrand will cause a fire requiring suppression action. Since it is expressed as a probability, it ranges on a scale of 0 to 100. An IC of 100 means that every firebrand will cause a fire requiring action if it contacts a receptive fuel.

Keetch-Byram Drought Index (KBDI): KBDI is a stand-alone index that can be used to measure the effects of seasonal drought on fire potential. The actual numeric value of the index is an estimate of the amount of precipitation (in 100ths of inches) needed to bring the soil back to saturation (a value of 0 is complete saturation of the soil). Since the index only deals with the top 8 inches of the soil profile, the maximum KBDI value is 800 or 8.00 inches of precipitation would be needed to bring the soil back to saturation. The Keetch-Byram Drought Index's relationship to fire danger is that as the index value increases, the vegetation is subjected to increased stress due to moisture deficiency. At higher values, desiccation occurs and live plant material is added to the dead fuel loading on the site. Also, an increasing portion of the duff/litter layer becomes available fuel at higher index values.

Litter: The top layer of the forest floor, typically composed of loose debris such as branches, twigs, and recently fallen leaves or needles; little altered in structure by decomposition. (The layer of the forest soil profile.)

Live Fuels: Naturally occurring fuels whose moisture content is controlled by the physiological processes within the plant. The National Fire Danger Rating System considers only herbaceous plants and woody material small enough (leaves, needles and twigs) to be consumed in the flaming front of a fire.

Moisture of Extinction: The theoretical dead fuel moisture content above which a fire will not spread.

Perennial Plant: A plant that lives for more than two growing seasons. For fire danger rating purposes, biennial plants are classed with perennials.

Roundwood: Boles, stems, or limbs of woody material; that portion of the dead wildland fuel which is roughly cylindrical in shape.

Shrub: A woody perennial plant differing from a perennial herb by its persistent and woody stem; and from a tree by its low stature and habit of branching from the base.

Slash: Branches, bark, tops, cull logs, uprooted stumps, and broken or uprooted trees left on the ground after logging; also debris resulting from thinning or wind storms.

Slope: The rise or fall in terrain measured in feet per 100 feet of horizontal distance measurement, expressed as a percentage.

Spread Component (SC): SC is a rating of the forward rate of spread of a headfire. Deeming, et al., (1977), states that "the spread component is numerically equal to the theoretical ideal rate of spread expressed in feet-per-minute". This carefully worded statement indicates both guidelines (theoretical) and cautions (ideal) that must be used when applying the SC. Wind speed, slope and fine fuel moisture are key inputs in the calculation of the spread

component, thus accounting for a high variability from day-to-day. The SC is expressed on an open-ended scale; thus it has no upper limit.

Staffing Index: Adjective rating calculations are keyed off the first priority fuel model listed in your station record in the processor. It uses the staffing index (such as ERC or BI) the user associates with the first fuel model/slope/grass type/climate class combination.

Staffing Level: The basis for decision support for daily staffing of initial attack resources and other activities; a level of readiness and an indicator of daily preparedness.

Surface-Area-to-Volume Ratio: The ratio of the surface area of a fuel particle (in square- feet) to its volume (in cubic-feet). The "finer" the fuel particle, the higher the ratio; for example, for grass this ratio ranges above 2,000; while for a ½ inch diameter stick it is 109.

Timelag: The time necessary for a fuel particle to lose approximately 63 percent of the difference between its initial moisture content and its equilibrium moisture content.

Timelag Fuel Moisture Content: The dead fuel moisture content corresponding to the various timelag fuel classes.

X-1000 Hr Fuel Moisture: X-1000 is the live fuel moisture recovery value derived from the 1000-hr fuel moisture value. It is an independent variable used in the calculation of the herbaceous fuel moisture. The X-1000 is a function of the daily change in the 1000-hour timelag fuel moisture, and the average temperature. Its purpose is to better relate the response of the live herbaceous fuel moisture model to the 1000-hour timelag fuel moisture value. The X-1000 value is designed to decrease at the same rate as the 1000-hour timelag fuel moisture, but to have a slower rate of increase than the 1000-hour timelag fuel moisture during periods of precipitation, hence limiting excessive herbaceous fuel moisture recovery.