

Color Country *Fire Management*

Bureau of Land Management AZ
Dixie National Forest
Utah, Forestry, Fire, and State Lands

Bureau of Land Management UT
Zion and Bryce National Parks
Bureau of Indian Affairs



Color Country Interagency Fire Danger Operating and Preparedness Plan

May 2015

Color Country Interagency Fire Danger Operating and Preparedness Plan

Recommended By:

<hr/> Mark Rosenthal, Fire Management Officer Bureau of Land Management, Arizona Strip District Office	<hr/> Date
<hr/> Walter A. Burdick Jr., Fire Management Officer Bureau of Land Management, Color Country District Office	<hr/> Date
<hr/> Kevin Greenhalgh, Fire Management Officer U.S. Forest Service, Dixie National Forest	<hr/> Date
<hr/> Taiga Rohrer, Fire Management Officer National Park Service, Zion and Bryce Canyon National Parks	<hr/> Date
<hr/> Jeramie Ybright, Fire Management Officer Bureau of Indian Affairs, Southern Paiute Agency	<hr/> Date
<hr/> Mike Melton, Fire Management Officer State of Utah, Division of Forestry, Fire and State Lands	<hr/> Date

Approved By:

<hr/> Tim Burke, District Manager Bureau of Land Management, Arizona Strip District Office	<hr/> Date
<hr/> Heather Whitman , District Manager Bureau of Land Management, Color Country District Office	<hr/> Date
<hr/> Angelita Bullets, Forest Supervisor U.S. Forest Service, Dixie National Forest	<hr/> Date
<hr/> Jeff Bradybaugh, Park Superintendent National Park Service, Zion National Park	<hr/> Date
<hr/> Ron Wilson, Area Manager State of Utah, Division of Forestry, Fire and State Lands	<hr/> Date
<hr/> Paul Schlafly, Field Office Manager Bureau of Indian Affairs, Southern Paiute Agency	<hr/> Date

Table of Contents

- I. INTRODUCTION..... [334](#)
- II. ROLES AND RESPONSIBILITIES..... [445](#)
 - A. Fire Danger Technical Group or Committee [445](#)
 - B. Fire Weather Station Owner/Managers..... 5
 - C. Agency/Unit Dispatch/Communications/Command Center 5
 - D. Fire weather program coordinator(s) [556](#)
 - E. Duty Officers and Fire Management Officers 6
- III. FIRE DANGER PLANNING AREA INVENTORY 6
 - A. The Administrative Unit(s) 6
 - B. Fire Problem Identification 7
 - C. Weather Stations 4
 - D. Vegetation 5
 - E. Climate 6
 - F. Topography 7
 - G. Fire Danger Rating Areas 7
 - 1. Basin FDRA 8
 - 2. Mountains FDRA 10
 - 3. Mojave FDRA 11
 - 4. Plateau FDRA 13
- IV. CLIMATOLOGICAL BREAKPOINT AND FIRE BUSINESS ANALYSIS 15
 - A. Fire Weather Data 15
 - B. Fire Occurrence Data 19
 - C. Parameters Used for each Fire Danger Rating Area [191920](#)
 - D. Correlation with Fire Occurrence 20
 - E. Climatological Breakpoints..... 21
 - F. Adjective Danger Ratings 22
- V. FIRE DANGER-BASED DECISIONS [242425](#)
 - A. Prevention Plan* [242425](#)
 - B. Daily Staffing Levels/Plan* 25
 - C. Dispatch Plan* 26
 - D. Preparedness Plan* 27
 - E. Restriction/Closure Plan 36
- VI. OPERATIONAL PROCEDURES 36
 - A. Seasonal Schedule/WIMS Station Catalog Maintenance 36
 - B. Daily Schedule/WIMS Observation monitoring & Output production and dissemination..... 37

C. Weather Station Monitoring and Maintenance	37
VII. PROGRAM NEEDS	37
A. Weather Station Needs.....	37
B. Computer/Equipment Needs.....	37
C. NFDRS, RAWS & WIMS Training	37
D. Seasonal Tracking of Index/Component.....	38
E. Update of PocketCard(s).....	38
VIII. Appendices.....	39
A. Maps.....	39
1. Agency Units participating in operating plan.....	39
2. Fire Danger Rating Areas.....	40
3. Weather Stations	41
4. IA Response Areas	42
B. Summary of Weather Data clean-up.....	42
C. Summary of Fire Data clean-up.....	42
D. FireFamily Plus Analysis – Fire Business Candidates table and Decision Point tables & graphs..	43
E. PocketCards by FDRA.....	47
F. Technical References	49
G. Definitions.....	49

I. INTRODUCTION

Each Agency (Color Country BLM District Utah / Arizona Strip BLM District Arizona, Dixie National Forest USFS, Utah Parks Group NPS, Southern Paiute BIA, and Utah State Forestry, Fire and State Lands) must maintain a level of preparedness to meet wildland fire management objectives. Preparedness is based upon the assessment of fuels and weather conditions utilizing the National Fire Danger Rating System (NFDRS). This Fire Danger Operating Plan (FDOP) documents the establishment and management of the Color Country interagency fire weather system and incorporates NFDRS fire danger modeling into fire management decisions. In addition, this plan combines an Operating Plan with a Preparedness Plan for the five primary wildland fire management agencies in Color Country (BLM, USFS, NPS, BIA, and State). Guidance and policy for development of a Fire Danger Operating and Preparedness Plan can be found in the DOI/USFS Standards for Fire and Aviation Operations and Forest Service Manual 5120.

Objectives

- Provide a tool for agency administrators, fire managers, dispatchers, agency cooperators, and firefighters to correlate fire danger ratings with approved fire business decisions in Color Country by establishing agency planning and response levels using the best available scientific methods and historical weather/fire data.
- Delineate fire danger rating areas (FDRAs) in Color Country with similar climate, fuels, topography, and corresponding response areas.
- Establish a fire weather-monitoring network consisting of Remote Automated Weather Stations (RAWS) which comply with NFDRS Weather Station Standards (PMS 426-3).
- Determine fire business and adjective fire danger rating break points using the Weather Information Management System (WIMS), National Fire Danger Rating System (NFDRS), Fire Family Plus software, and by analyzing historical 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.
- Provide a tool to communicate to agency administrators, fire managers, cooperating agencies, industry, and the public the potential fire danger.
- Provide guidance to interagency personnel outlining specific daily actions to take at each preparedness level.
- Identify seasonal risk analysis criteria and establish general fire severity thresholds.
- Develop for distribution fire danger pocket cards for personnel involved with fire suppression activities within the Color Country Fire Danger Rating Areas.
- Identify program needs and suggest improvements for the Fire Danger Operating and Preparedness Plan.

II. ROLES AND RESPONSIBILITIES

A. Fire Danger Technical Group or Committee

Each participating agency will be responsible for providing an NFDRS technical

specialist to participate in the maintenance, review, and update of this plan.

2014 Team Members:

- Dixie National Forest, Scott Tobler, Kevin Greenhalgh, Lyndsey Fonger
- State of Utah, Earl Levanger
- Arizona Strip BLM, Patrick Fleming and Shawn Jaca
- Color Country BLM, Clair Jolley and Randy Turrill
- Utah Parks Group NPS, Taiga Rohrer
- Southern Paiute Agency BIA, Jeramie Ybright

Members of the Fire Danger Technical Group will monitor NFDRS to ensure validity, coordinate/communicate any problems identified, review plan implementation, coordinate plan revisions, present the plan, and be available for NFDRS technical consultation. Some specific elements to monitor and coordinate are ensuring observations are selected correctly (time, SOW, wet flag, consistent), station management in WIMS (herb state, catalog), station maintenance (instrument errors, transmit times), station siting (eliminate redundant/inappropriate, propose new sites where appropriate).

B. Fire Weather Station Owner/Managers

Following is the list of weather station owners for the Color Country Fire Management Area:

- Dixie National Forest USFS, Kevin Greenhalgh
- Arizona Strip BLM, Mark Rosenthal
- Color Country BLM, Ryan Shakespear
- Utah Parks Group NPS, Taiga Rohrer

The station owner is the contact for all issues regarding station management in WIMS and station maintenance for stations under their control. The station owner will assure that identified problems with a weather station are either corrected or assure that someone else corrects the problem.

C. Agency/Unit Dispatch/Communications/Command Center

Personnel at the Color Country Interagency Fire Center (CCIFC) are responsible for entering observations daily and updating the Fire Danger workbook. The CCIFC will communicate the fire danger outputs daily by reading the indices for all the rating areas over the radio along with the morning and afternoon weather. CCIFC will be responsible for posting the Fire Danger Ratings to the CCIFC website daily.

D. Fire weather program coordinator(s)

The Fire Weather Program Coordinator is responsible to oversee the entire Color Country

fire weather program and identify deficiencies and ensures the technical group, station owners, and/or dispatch address issues in a timely manner. Scott Tobler, Fire Planner, Dixie National Forest is the Fire Weather Program Coordinator for Color Country.

E. Duty Officers and Fire Management Officers

Fire Management Officers and their assistants, will assure that their personnel understand NFDRS outputs and how they are to be used. Duty Officers have the primary responsibility for implementing this plan and ensuring decisions are made consistent with the intent of the plan on a daily basis.

III. FIRE DANGER PLANNING AREA INVENTORY

A. The Administrative Unit(s)

The Color Country interagency fire danger planning area is divided into four Fire Danger Rating Areas (FDRAs). They are identified as the Basin, Mountains, Mojave, and Plateau. These areas were defined due to their unique and homogeneous fuels, climate, and topographical characteristics.

This plan encompasses an area of approximately 14 million acres in southwestern Utah and northwestern Arizona. Wildland fire management responsibilities are shared among the US Forest Service (USFS), Bureau of Land Management (BLM), Utah Forestry Fire and State Lands (UFFSL), National Park Service (NPS), Bureau of Indian Affairs (BIA), as well as numerous other local cooperators.

Each Agency (Utah / Arizona BLM, Dixie National Forest USFS, Utah Parks Group NPS, Southern Paiute BIA, and Utah State Forestry, Fire and State Lands) must maintain an approved level of preparedness to meet wildland fire management objectives. Preparedness is based upon the assessment of fuels and weather conditions utilizing the National Fire Danger Rating System (NFDRS).

This plan simplifies the decision-making process for agency administrators, fire managers, dispatchers, agency cooperators, and firefighters by establishing agency planning and response levels using the best available scientific methods and historical weather/fire data. In addition, this plan outlines procedures for developing seasonal risk analysis and defines fire severity trigger points. Most importantly, this plan provides the direction necessary to convey fire danger awareness to fire management personnel and the public of escalating fire potential. This awareness is critical when wildfire danger levels are at severe thresholds which may significantly compromise safety and control.

B. Fire Problem Identification

Fire Problem Analysis Chart

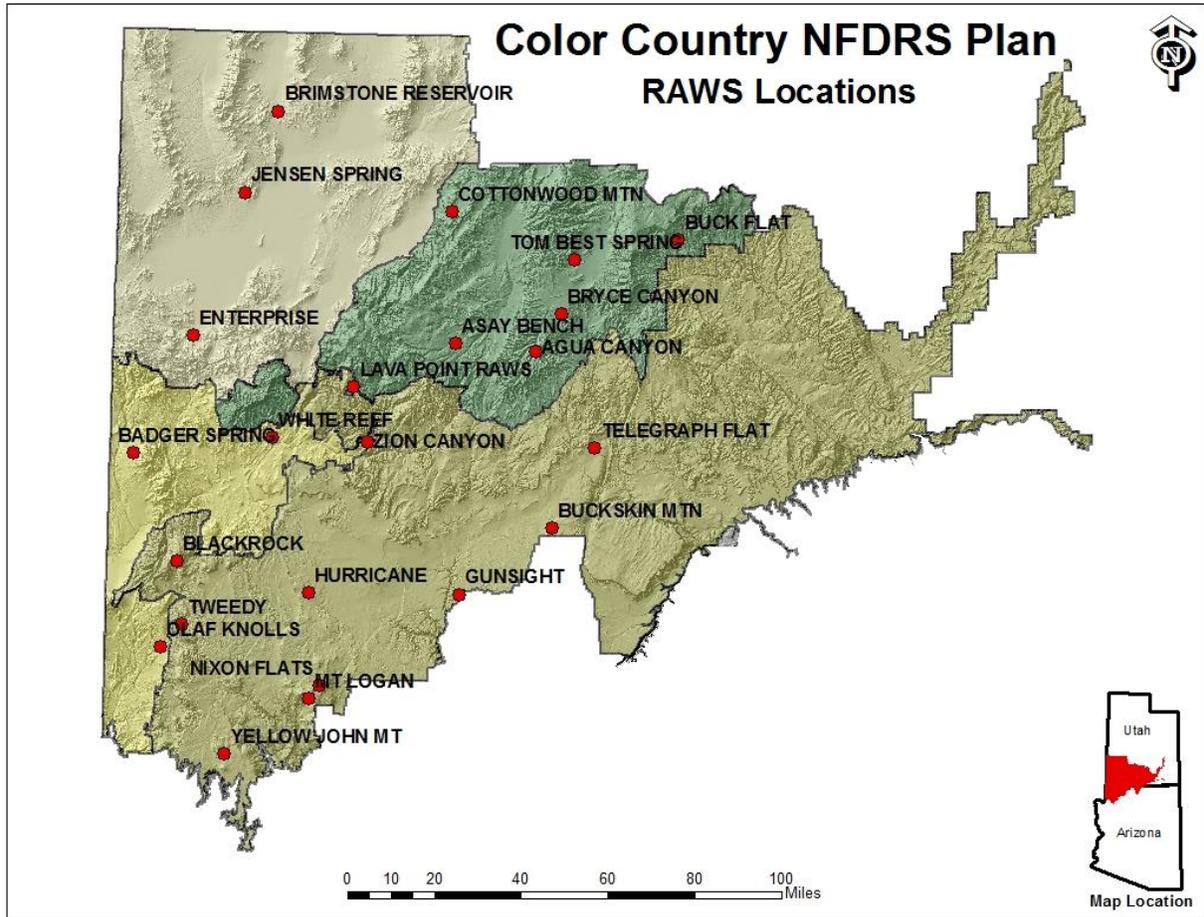
Exercise 1: Problem Analysis						Exercise 2: Management Action		
FRAMING THE PROBLEM	AFFECTED TARGET GROUP			RELATIVE CONTROL OF TARGET GROUP	ANTICIPATED COMMUNICATION WITH TARGET GROUP	PROBABLE IMPACTS	INDEX / COMPONENT	MANAGEMENT TOOL
	AGENCY	PUBLIC	INDUSTRIAL					
<p>Problem #1: Lightning: Significant lightning events resulting in multiple starts requiring multiple resources, combined with rapid fire growth in remote locations.</p> <p>These events not only depend on fire danger, but also lightning prediction and often come in “waves” of several days and may be boosted by wind events.</p> <p>Outside of severity, we lack a consistent process which incorporates relevant Fire Danger criteria in decisions to boost Initial Attack (IA) capability in preparation for additional IA workload.</p>	✓			High	<p>Dispatch Center retrieves actual NFDERS indices via WIMS daily; processes indices for Staffing, Dispatch, Preparedness, and Adjective Rating Levels; communicates resultant Fire Danger Levels via radio and web to Duty Officer, Prevention Officers, and fire personnel (Staffing Level & Preparedness Level);</p> <p>Change fire danger signs (based upon Adjective Level); dispatch information via radio to suppression resource(s) (based upon Dispatch Level).</p> <p>Duty Officer: Communicates daily staffing changes to crew leaders via phone, email, text message; relays this information to FMO via</p>	<p>Fires will go unstaffed for longer periods of time if IA resources are not available, potentially resulting in:</p> <ul style="list-style-type: none"> • more acreage burned • Non-attainment with FMP objectives if goal is to minimize acreage burned • Higher suppression costs • Rehabilitation costs increase • Increased risk to firefighters & public <p>If agency appropriately anticipates need for additional suppression resources, and responds with additional staffing, potentially:</p> <ul style="list-style-type: none"> • More fires get sized-up and staffed faster • Burned acreage is minimized • Achieve FMP Objectives 	Burning Index	Staffing Level

Exercise 1: Problem Analysis						Exercise 2: Management Action		
FRAMING THE PROBLEM	AFFECTED TARGET GROUP			RELATIVE CONTROL OF TARGET GROUP	ANTICIPATED COMMUNICATION WITH TARGET GROUP	PROBABLE IMPACTS	INDEX / COMPONENT	MANAGEMENT TOOL
	AGENCY	PUBLIC	INDUSTRIAL					
					telephone, email, or text. Detection (air and ground) sooner after events.	<ul style="list-style-type: none"> • Less overall suppression and rehabilitation costs • Less risk to firefighters & 		
<p>Problem #2: Human Cause Fires:</p> <p>Roadside fires: Fires frequently occur from vehicle maintenance or towing issues including blown tires, dragging chains, sparks, vehicle fires etc. in fine flashy fuels along roadsides after curing. Problem is greater during heat of summer and on major thoroughfares with steep grades, but is not confined to these or specific times of the year. Also included are fires caused by hot exhaust systems of vehicles driving or parked in fine flashy fuels.</p> <p>Unattended Campfires: Campfires in dispersed areas under “high” fire danger.</p> <p>Fireworks: Fires caused by fireworks centered around time of year when fire danger is typically</p>		✓		Low	<p>Fire danger signs placed along major thoroughfares. Billboards describing hazards, social media, targeting of user groups, press, radio, signs. DOT and agency road crews – present case to mow grass immediately after they have seeded out.</p> <p>Regular fire prevention planning and actions, fire prevention patrols. Media releases and information signs.</p> <p>Fire prevention campaign</p>	As above	ERC	<p>Adjective Fire Danger Rating</p> <p>Fire Prevention Plan/ Preparedness Level</p>

Exercise 1: Problem Analysis						Exercise 2: Management Action		
FRAMING THE PROBLEM	AFFECTED TARGET GROUP			RELATIVE CONTROL OF TARGET GROUP	ANTICIPATED COMMUNICATION WITH TARGET GROUP	PROBABLE IMPACTS	INDEX / COMPONENT	MANAGEMENT TOOL
	AGENCY	PUBLIC	INDUSTRIAL					
<p>high or above (July). Fire problem related to fine flashy fuels and exacerbated by wind. Multiple fire starts occur at same timeframe overwhelming response capabilities.</p> <p>High risk activities: High ignition risk activities including cutting and grinding, driving vehicles/atv's/utv's in flashy fuels and windy days.</p>					<p>centered around timeframe and distribution areas</p> <p>Public and land owners, looking at daylighting complacency on high risk/low frequency events. Target specific user groups.</p>			
<p>Problem #3: Debris burning: Debris burning centers around mostly agricultural and "hobby" farmers igniting fires to burn off debris, weeds, ditches, etc. without proper regard to wind events. Fire problem involved cured fine flashy fuels, but most often prior to higher fire danger –</p>		✓		Low	<p>Landowners and homeowners. County officials, industry associations.</p> <p>Additional information/warnings attached to local weather forecasts. PSA campaign. Permitting process to include predicted weather and danger.</p>		ERC	<p>Adjective Fire Danger Rating</p> <p>Fire Prevention Plan/Preparedness Level</p>

Exercise 1: Problem Analysis						Exercise 2: Management Action		
FRAMING THE PROBLEM	AFFECTED TARGET GROUP			RELATIVE CONTROL OF TARGET GROUP	ANTICIPATED COMMUNICATION WITH TARGET GROUP	PROBABLE IMPACTS	INDEX / COMPONENT	MANAGEMENT TOOL
	AGENCY	PUBLIC	INDUSTRIAL					
i.e. springtime pre greenup. Also occurs during spring and fall outside of fire season.					Restrictions/burn bans based on predicted weather daily rather than open burn season.			
Problem #4: Remote locations: Fires occurring in remote locations from population take longer to be detected, reported, and respond to thus resulting in larger fires and higher cost.	✓			High	Elaborate on fire danger planning related to the need for detection flights during increased fire danger and ignition events which may or may not be significant. Run cards to reflect remoteness and fire danger.		ERC BI	Preparedness Level Staffing Level
Problem #5: Industrial / Maintenance Fires: Fires occurring by cutting, welding and grinding operations.			✓	Moderate	Restrictions / Permits with multi-media advertising		BI	Adjective Fire Danger Rating

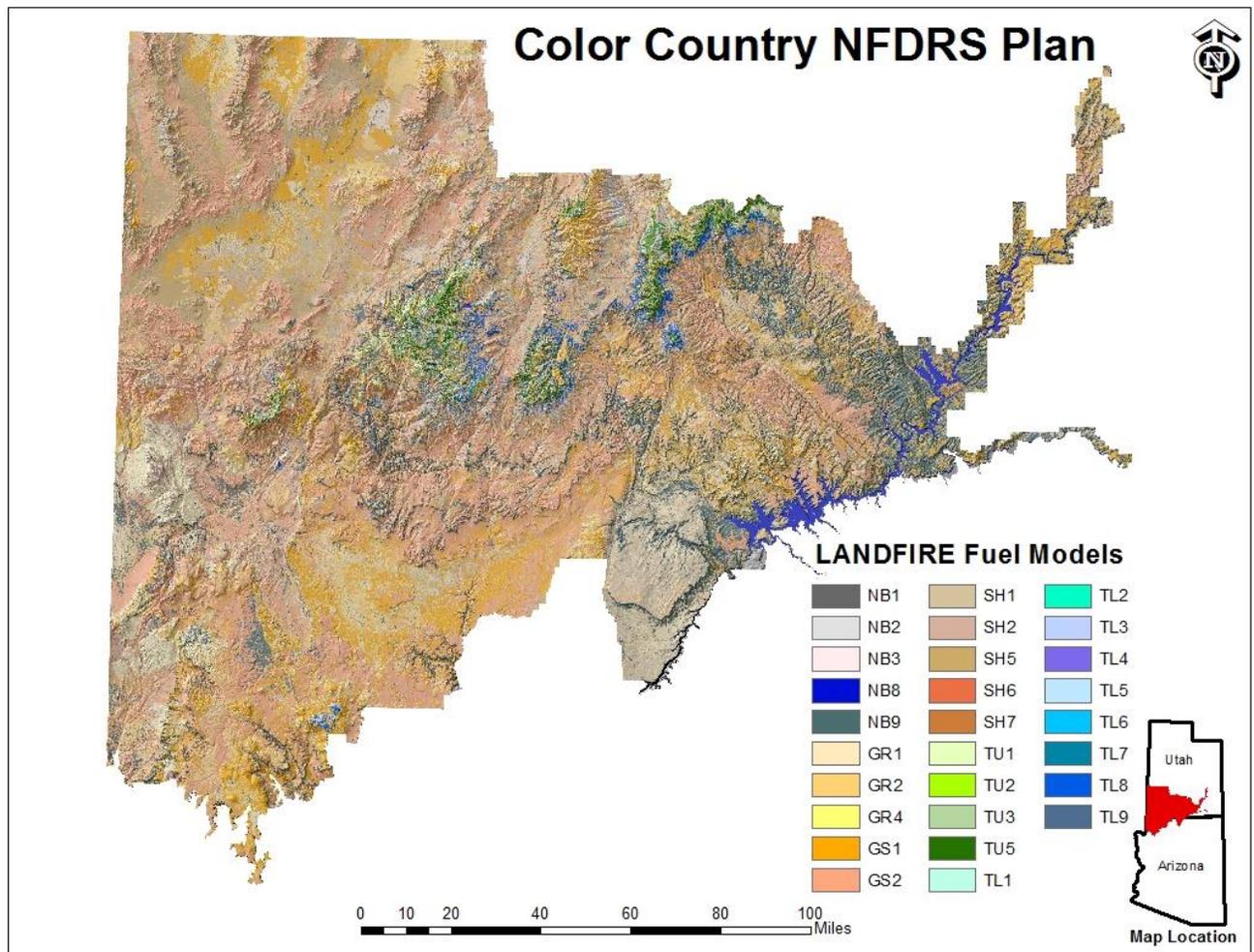
C. Weather Stations



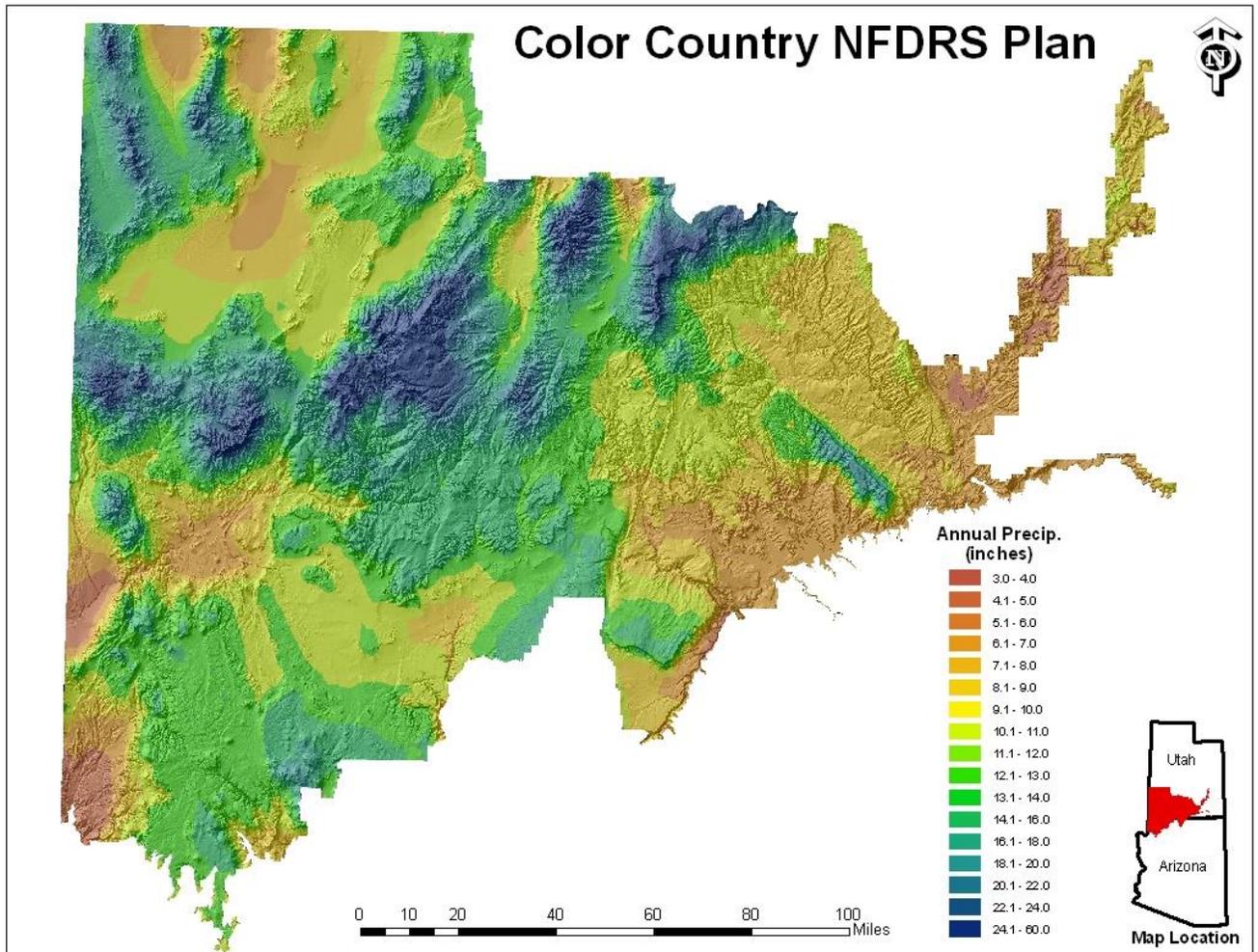
Station ID	Name	Elevation (ft)	Green-up	Freeze	Owner	Contact	Phone #
20107	Logan	7,200	1-May	3-Nov	BLM	Cris Madrigal	435 688-3292
20108	Olaf	2,900	1-Mar	15-Dec	BLM	Cris Madrigal	435 688-3292
20109	Tweedy	5,200	15-Apr	21-Nov	BLM	Cris Madrigal	435 688-3292
20113	Nixon	6,500	1-May	26-Oct	BLM	Cris Madrigal	435 688-3292
20114	Blackrock	7,080	1-May	6-Nov	BLM	Cris Madrigal	435 688-3292
20117	Hurricane	5,445	15-Apr	15-Oct	BLM	Cris Madrigal	435 688-3292
20217	Yellow John	6,160	1-May	7-Oct	BLM	Cris Madrigal	435 688-3292
422503	Cottonwood Mtn.	7500	15-May	15-Oct	FS	Scott Tobler	435-865-3775
422203	Brimstone Reservoir	5,719	15-May	15-Oct	BLM	Ryan Shakespear	435 865-3027
422502	Jensen Spring	5,740	15-May	15-Oct	BLM	Ryan Shakespear	435 865-3027
422604	Asay Bench	8,100	1-Jun	15-Oct	FS	Scott Tobler	435-865-3775
422606	Buck Flat	8,000	1-Jun	15-Oct	FS	Scott Tobler	435-865-3775
422608	Tom Best Spring	7,500	1-Jun	15-Oct	FS	Scott Tobler	435-865-3775
422609	Bryce Canyon	7,855	1-Jun	15-Oct	NPS	Taiga Rohrer	435 772-7842
422803	Enterprise	5,340	15-May	15-Oct	FS	Scott Tobler	435-865-3775

422805	White Reef	3,300	15-Apr	15-Oct	FS	Scott Tobler	435-865-3775
422806	Badger Springs	3,990	15-Apr	15-Oct	BLM	Ryan Shakespear	435 865-3027
422807	Lava Point RAWS	7,890	1-Jun	15-Oct	NPS	Taiga Rohrer	435 772-7842
422808	Zion Canyon RAWS	3,999	15-Apr	15-Oct	NPS	Taiga Rohrer	435 772-7842
422902	Telegraph Flat	5,450	15-May	15-Oct	BLM	Ryan Shakespear	435 865-3027
422903	Agua Canyon	8,890	1-Jun	15-Oct	NPS	Taiga Rohrer	435 772-7842
20223	Gunsight	5,280	15-Apr	1-Nov	BLM	Cris Madrigal	435 688-3292
20224	Buckskin Mtn	6,400	1-May	15-Oct	BLM	Cris Madrigal	435 688-3292

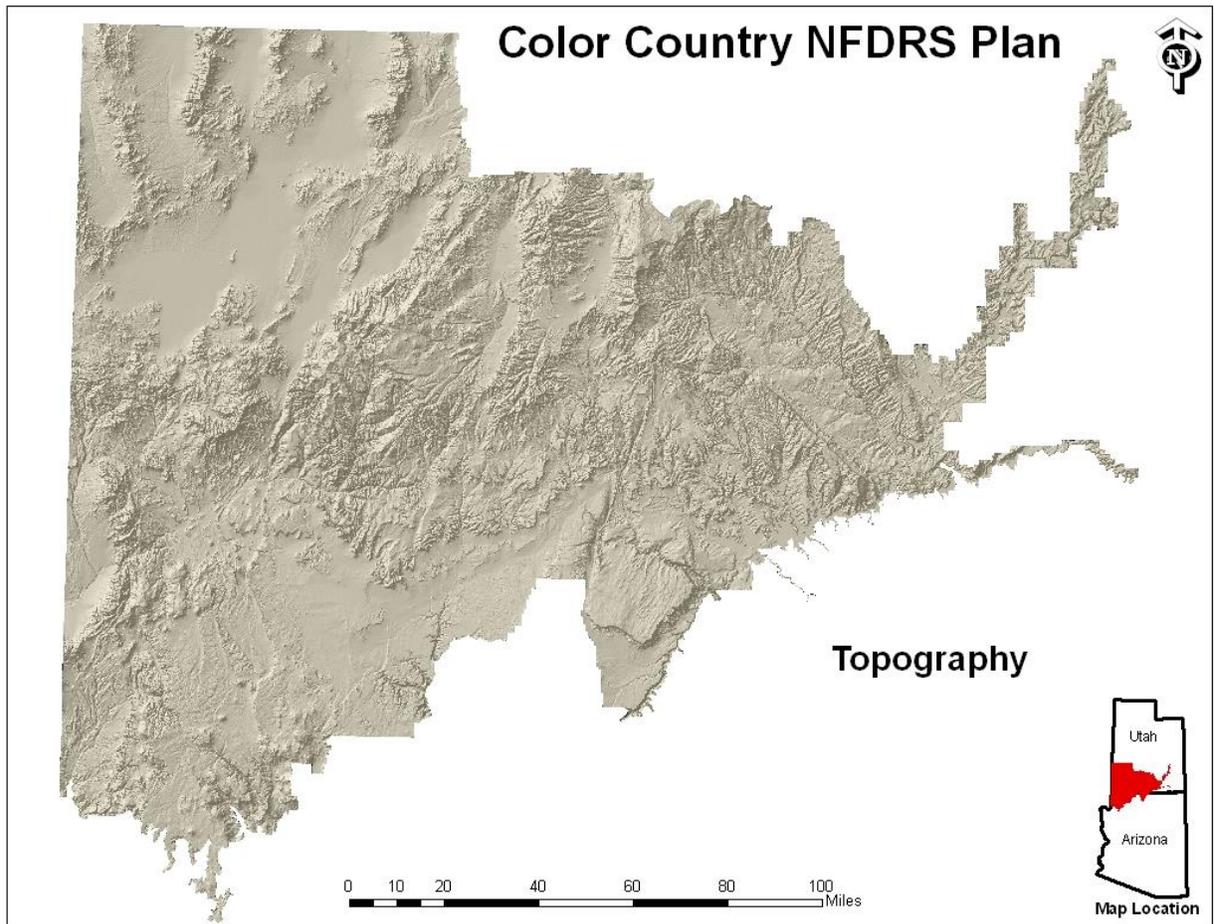
D. Vegetation



E. Climate



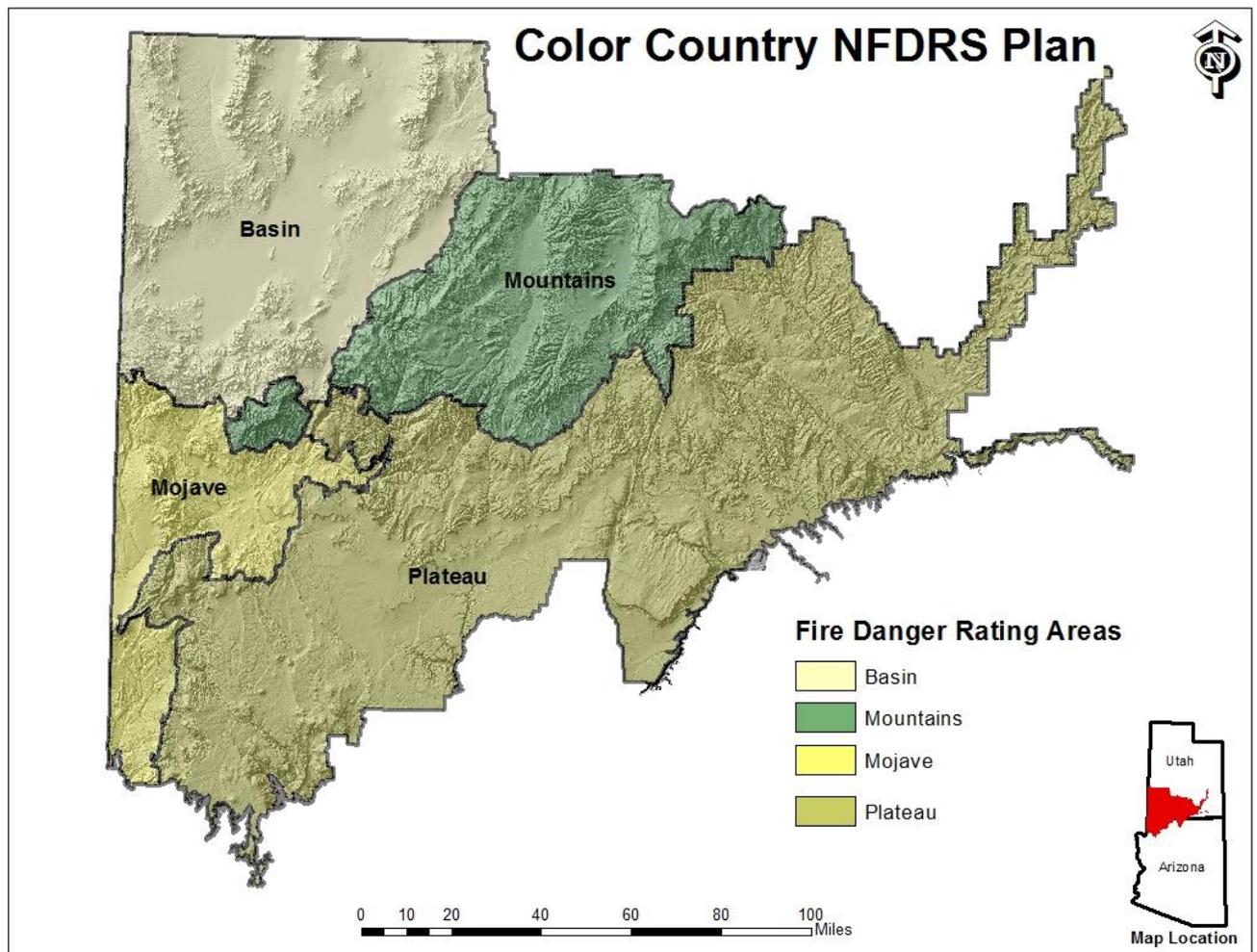
F. Topography



G. Fire Danger Rating Areas

A Fire Danger Rating Area (FDRA) is defined as: “A geographic area relatively homogenous in climate, fuels and topography, tens of thousands of acres in size, within which the fire danger can be assumed to be uniform. Its size and shape is primarily based on influences of fire danger, not political boundaries. It is the basic on-the-ground unit for which unique fire management decisions are made based on fire danger ratings. Weather is represented by one or more NFDRS weather stations. (NWCG Fire Danger Working Team. 2002). Four Fire Danger Rating Areas were delineated based on identifying areas of uniform fire danger. The contribution of fuels, or weather, or topography was weighed as to which would have the greatest effect on wildland fire in making the delineation. Following are the results and a table with descriptive parameters:

FDRA	Acres	Climate Class	Slope Class	95 th percentile Fire Size
Basin	3,505,818	1	1, 0-25%	60 acres
Mountain	2,391,894	2	2, 26-50%	16 acres
Mojave	1,282,673	1	1, 0-25%	670 acres
Plateau	6,756,952	1	1, 0-25%	50 acres



1. Basin FDRA

a) Location:

The Basin FDRA encompasses State, USFS, and BLM administered lands

in Beaver, Iron and Washington Counties. It lies generally West of I-15 and north of the southern forest boundary north of St. George.

b) Fuels:

The vegetation in this FDRA is best characterized by sagebrush and grass in the valley bottoms, stands of brush including Mountain Mahogany and Gambel Oak are found widely scattered at the middle and lower elevations, stands of pinion pine and juniper occur widely at the mid elevations. Scattered pockets of ponderosa pine dominate the higher elevations, with some stands of conifers such as spruce and fir that do not represent the fuels in this FDRA in a significant way.

Ponderosa pine occurs at various elevations across the area. The ponderosa pine stands are scattered and generally fairly open canopy communities with surface, ladder and brush fuels and high dead fuel loadings. These stands are modeled with FBPS FM 9 and NFDRS FM G or U. Brush is primarily Gambel Oak, mountain mahogany, bitter brush, live oak, and manzanita. Needle litter is the primary carrier of fire in the brush/ponderosa fuels. Some open ponderosa pine stands occur in the coverage area and are considered FBPS FM 9 or FM 2 and NFDRS FM C. The mixed conifer community begins at about 7000'

c) Climate:

Hot and dry weather dominates the lower elevations of Southern Utah during fire season. Temperatures at the lowest elevations can reach 95-100°F and high 90's are common in the highest elevations of this FDRA. Single digit daytime relative humidity and poor overnight recovery is common in June and early July. Summer weather patterns affecting the area are westerly and southwesterly flows. Low-pressure systems and upper level disturbances bring enough energy and mid-level moisture to initiate thunderstorm activity and erratic winds. The potential for large fire growth is high. ERC and temperature tends to be highest and humidity lowest in June into mid to late July. The summer monsoonal pattern, though not strong or predictable in the area, initially brings dry thunderstorms to the area in June and as moisture increases in late July, humidity tends to rise and although fires may still be frequent, controllability is often higher later in the summer. A second peak in ERC is typical in late September and October. Strong thermal lows (non-frontal low pressure areas) can develop in the low elevation areas giving rise to very strong diurnal wind patterns, particularly in the southern areas of the FDRA. Upper elevations of Washington County that fall within this FDRA and the lower elevation areas of Iron and Beaver counties lie in climate class 1 (arid/semi-arid).

d) Topography:

This FDRA is located in southwest Utah in the Great Basin region. It is characterized by vast acres of sagebrush and pinyon-juniper clad foothills. The region offers a variety of landscapes ranging from salt desert shrub flats at about 5,000 ft. to high mountains over 8,000 ft. with riparian, aspen, and bristlecone pine communities. Principle mountain ranges are the Minerals, the Wah Wahs, and the Indian Peak ranges.

e) Fire Occurrence:

From 1994 through 2013 (20 years), the Basin FDRA recorded 2,249 fires that burned 577,632 acres. Roughly 75% of these fires were lightning caused. In this FDRA 95% of all fires are less than 60 acres. Fire season in this FDRA is May through October. The majority of fires, 82%, occur in June, July and August with the peak ~ 38% in July. The largest fire in State of Utah history started in this FDRA on July 6, 2007 and burned 357,185 acres.

2. Mountains FDRA

a) Location:

The Mountains FDRA straddles the divide between the Great Basin and the Colorado River Plateau in Southern Utah and takes in most of the land managed by the Dixie National Forest.

b) Fuels:

The vegetation in this FDRA grades from stands of pinyon pine and juniper at the lower elevations to ponderosa pine dominating the mid-elevations. At the higher elevations, aspen and conifers such as, spruce, and fir dominate. Ponderosa pine occurs at elevation of 6500'-9000' across the area. Most of the ponderosa pine stands are closed canopy communities with surface, ladder and brush fuels and high dead fuel loadings. These stands are modeled with FBPS FM 9 and NFDRS FM G or U. Brush is primarily gambel oak, serviceberry, snowberry, and manzanita. Needle litter is the primary carrier of fire in the brush/Ponderosa fuels. Bark beetle infestations are a problem in some areas with single tree and large group mortality. Some open ponderosa pine stands occur in the coverage area and are considered FBPS FM 9 or FM 2 and NFDRS FM C.

The mixed conifer community begins at about 7000' and continues to tree line. Mixed conifer tend to be closed canopy with heavy dead fuel loading. Most communities are FBPS FM10, NFDRS FM G and H. Many areas of mixed conifer are beetle-killed. Aspen communities exist in moist pockets of the ponderosa and mixed conifer vegetation types across the area above 6500'. Most aspen clones are declining in vigor due to absence of disturbance. Significant bark beetle mortality of spruce has

occurred in the higher elevations of this FDRA, leaving thousands of acres of “grey” snags. Fir mortality in some of the same areas has recently become more pronounced.

c) Climate:

Higher elevation areas (>7,000’) are climate class II. There is some variation in climate across the FDRA. Precipitation ranges from 12 inches in the lower elevations to more than 40 inches per year near Brian Head Peak. Most of the annual precipitation falls as snow, but monsoon thunderstorms are common during July and August and can produce heavy rains. In some areas, August is the wettest month of the year. Temperature extremes can be impressive, with summer temperatures near 100 degrees Fahrenheit and winter lows exceeding -30 degrees Fahrenheit on the plateau tops.

d) Topography:

The FDRA is divided into five general geographic areas. High altitude forests in gently rolling hills characterize the Markagunt, Pansaugunt, Pine Valley Laccolith, Aquarius Plateaus, and Boulder Mountain, one of the largest high-elevation plateaus in the United States, is dotted with hundreds of small lakes 10,000 to 11,000 feet above sea level. Elevations vary, but this FDRA is characterized by the highest elevations in the Color Country including Blue Bell Knoll on Boulder Mountain at 11,322 feet.

e) Fire Occurrence:

From 1994 through 2013 (20 years), the Color Country Mountains FDRA recorded 2,119 fires that burned 133,146 acres. Roughly 82% of these fires were lightning caused. In this FDRA 95% of all fires are less than 16 acres. Fire season in this FDRA is May through October. The majority of fires, 78%, occur in June, July and August with the peak ~ 34% in July. The majority of the acres burned in this FDRA occurred in a single event, the Sanford fire in 2002.

3. Mojave FDRA

a) Location:

The Mojave FDRA encompasses areas below 5000’ feet in Mojave County Arizona and Washington County Utah. Agency lands in this FDRA are the Arizona Strip BLM District, Color Country BLM District, Zion National Park, Lake Mead NRA, and the Shivwits Indian

Reservation. This area generally lies below the Grand Wash Cliffs and in the Virgin River Basin and ends in Zion Canyon.

b) Fuels:

The lowest elevations are desert scrub communities and include annual, invasive and native perennial grasses, blackbrush, Joshua tree and other scrub brush species. Extensive grasslands occur primarily in the lower elevation areas of the area. Pure grasslands are modeled as FBPS FM 1 and NFDRS FM A. Brush occurs throughout the coverage area and consists primarily of sagebrush interior chaparral and mountain-brush communities. Low elevation brush communities are sagebrush, gambel and turbinella oak, cliffrose, serviceberry and mahogany. Where sagebrush grows it is the dominant brush type and commonly occurs with native and exotic grasses, and pinyon-juniper. Sagebrush communities are best modeled in this area with FBPS FM 2 or 5 and NFDRS FM T. The other major brush community is the mountain brush type occurring in the transitional zone from low to high elevation. These brush types are also known as interior chaparral. Mountain brush communities consist of a variety of brush species. The composition is dependent on local conditions such as aspect, slope and moisture and may include pure or mixed stands of the following brush types: gambel and turbinella oak, cliffrose, mountain mahogany, serviceberry and manzanita. These mountain brush communities extend across several ecosystem types and elevations. Typical stands consist of mature or decadent plants with declining or absent perennial grasses and forbs. Drier site species are modeled as FBPS FM 4 and NFDRS FM F or B. Moister site brush species are modeled as FM 6 and NFDRS FM F.

c) Climate:

Hot and dry weather dominates the lower elevations of the Arizona Strip District and Washington County during fire season. Temperatures at the lowest elevations can reach 110-115°F and high 90's are common in the highest elevations of this FDRA. Single digit daytime relative humidity and poor overnight recovery is common in June and early July. Summer weather patterns affecting the area are westerly and southwesterly flows. Winds are typically southwesterly 10-20mph with high Haines Index values during the summer. Low-pressure systems and upper level disturbances bring enough energy and mid-level moisture to initiate thunderstorm activity and erratic winds. The potential for large fire growth is high. ERC and temperature tend to be highest and humidity lowest in June into mid to late July. The summer monsoonal pattern, though not strong or predictable in the area, initially brings dry thunderstorms to the area towards the end of June and as moisture increases in late July. Humidity tends to rise and although fires may still

be frequent, controllability is often higher later in the summer. A second peak in ERC is typical in late September and October. Strong thermal lows can develop in the low elevation areas giving rise to very strong diurnal wind patterns, throughout this FDRA. Lower elevations of the district lie in climate class 1 (arid/semi-arid).

d) Topography:

Most of this of the FDRA consists of broken, basaltic terrains, basically desert basins with rocky ridges and rolling hills on the west to the base of steep sandstone canyon country to the east. Accessibility varies greatly dependent on area. Elevations in this FDRA range from approximately 2,200 to 5,000 feet.

e) Fire Occurrence:

From 1994 through 2013 (20 years), the Mojave FDRA recorded 1,361 fires that burned 484,004 acres. Roughly 55% of these fires were lightning caused, with Equipment, Debris Burning, Arson, and Miscellaneous accounting for about 34% of the fires. The remaining 11% are fairly well divided amongst Smoking, Campfires, and Children. In this FDRA only 79% of all fires are less than 10 acres, with 11% between 10 and 100 acres. The remaining 10% are larger than 100 acres. Fire season in this FDRA is May through October. The majority of fires, 74%, occur in June, July and August with the peak - 33% in July; however, fires have occurred in all months of the year. Although large fires occur elsewhere in the FDRA, the majority of large fires have occurred in the Pakoon Basin, which is the area between the Grand Wash Cliffs, and the Virgin Mountains and around Utah Hill. Large fires in this FDRA are defined as fires larger than 670 acres.

4. Plateau FDRA

a) Location:

The Plateau FDRA is made up of lands within Southern Utah and Northern Arizona, which are located on the Southwest portion of the Colorado River Plateau. These lands are administered by the National Park Service, Bureau of Land Management, Bureau of Reclamation, Bureau of Indian Affairs, the States of Utah and Arizona, and County and Private Property. Within the FDRA there are five national monuments: Grand Canyon-Parashant, Grand Staircase-Escalante, and Vermillion Cliffs. Additionally, Glen Canyon National Recreation Area, Rainbow Bridge National Monument, Pipe Spring National Monument, and the Kaibab Paiute Reservation are located within this FDRA.

b) Fuels:

The fuels complex of the Plateau FDRA consists of invasive and native grasses, sagebrush, rabbit brush, cliff rose, greasewood, gamble oak, serviceberry, manzanita, live oak and pinyon-juniper at lower elevations. Ponderosa pine, mixed conifer, mountain brush and aspen are found at higher elevations. NFDRS fuel model G correlates well with Burning Index for Dispatch Levels and Energy Release Component for preparedness levels in this FDRA.

c) Climate:

Hot and dry weather typically dominates the Plateau FDRA during fire season. Precipitation generally increases with elevation. Lower elevations typically receive 12-15 inches per year with higher peaks receiving up to 24 + inches per year. Summer temperatures range from 90 to over 100 degrees. The predominate wind pattern during the fire season is southwest except where modified by local topography. Strong up-canyon winds cause control problems. Fires in this FDRA are typically in climate class 1 (Arid, Semi-Arid).

d) Topography:

Elevations in the Plateau FDRA range from 3,500 to nearly 9,000 feet. This FDRA is primarily focused on the 3500' to 7500' foot range. The area consists of a series of plateaus and cliffs, with small mountain ranges. Faults divide the Colorado River Plateau into a system of plateaus, cliffs, and valleys. Terrain is generally flat to rolling on the top of the plateaus, broken by cliffs and steep-walled canyons. The Virgin River watershed is located in the Northwest portion of the FDRA, Kanab Creek watershed runs through the approximate center, and the Paria River watershed in the Northeast. All three watersheds lie in deep, steep-sided canyons. The Plateau FDRA is dominated by Slope Class 1. Slope Classes 2 and 3 are found in association with cliffs and the Mountains. The upper and mid-elevations of the mountains are steep slopes and canyons.

e) Fire Occurrence:

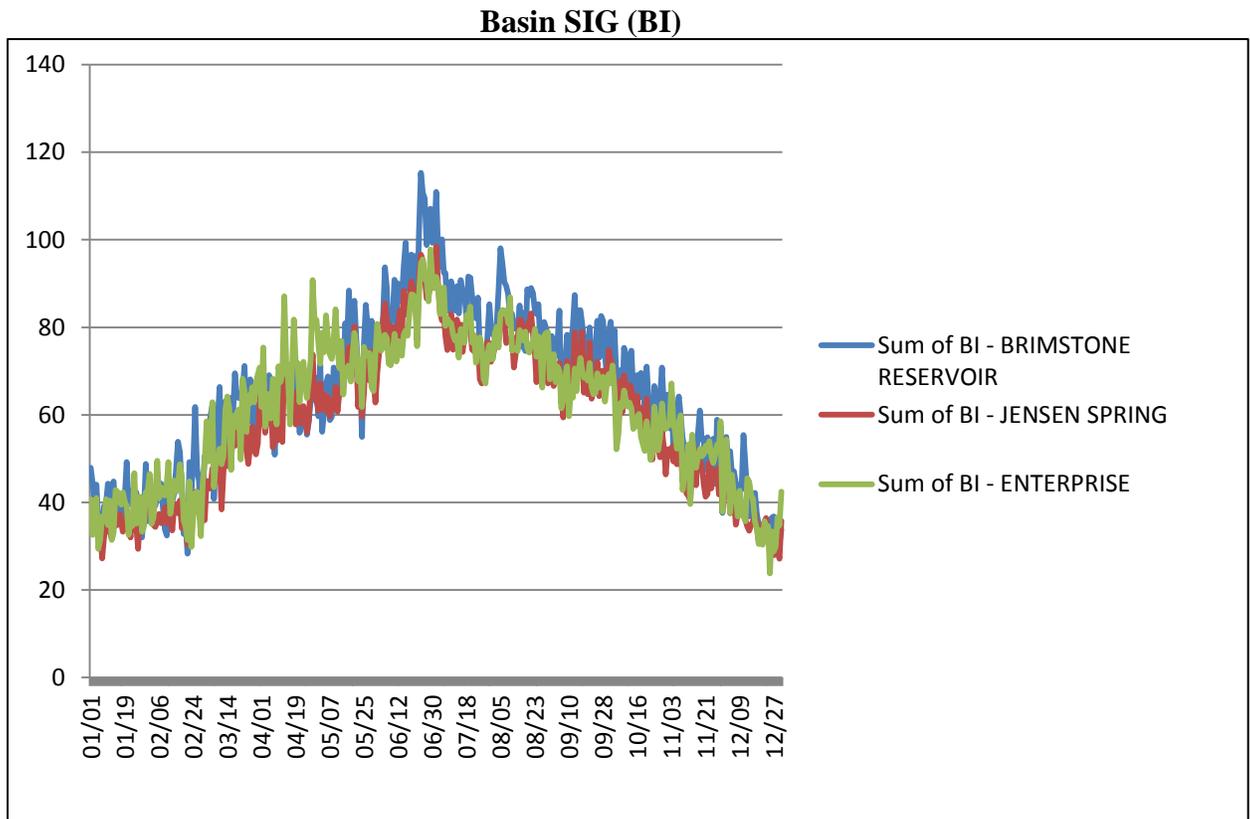
From 1994 to 2013 (20 years), the agencies recorded 3,438 fires, which burned approximately 264,567 acres within the Plateau FDRA. Approximately 87% of these were lightning caused; 13% were human caused. The months of July and August represent the largest percentage of fire activity with 67% of the fires occurring during this period.

IV. CLIMATOLOGICAL BREAKPOINT AND FIRE BUSINESS ANALYSIS

A. Fire Weather Data

Basin FDRA

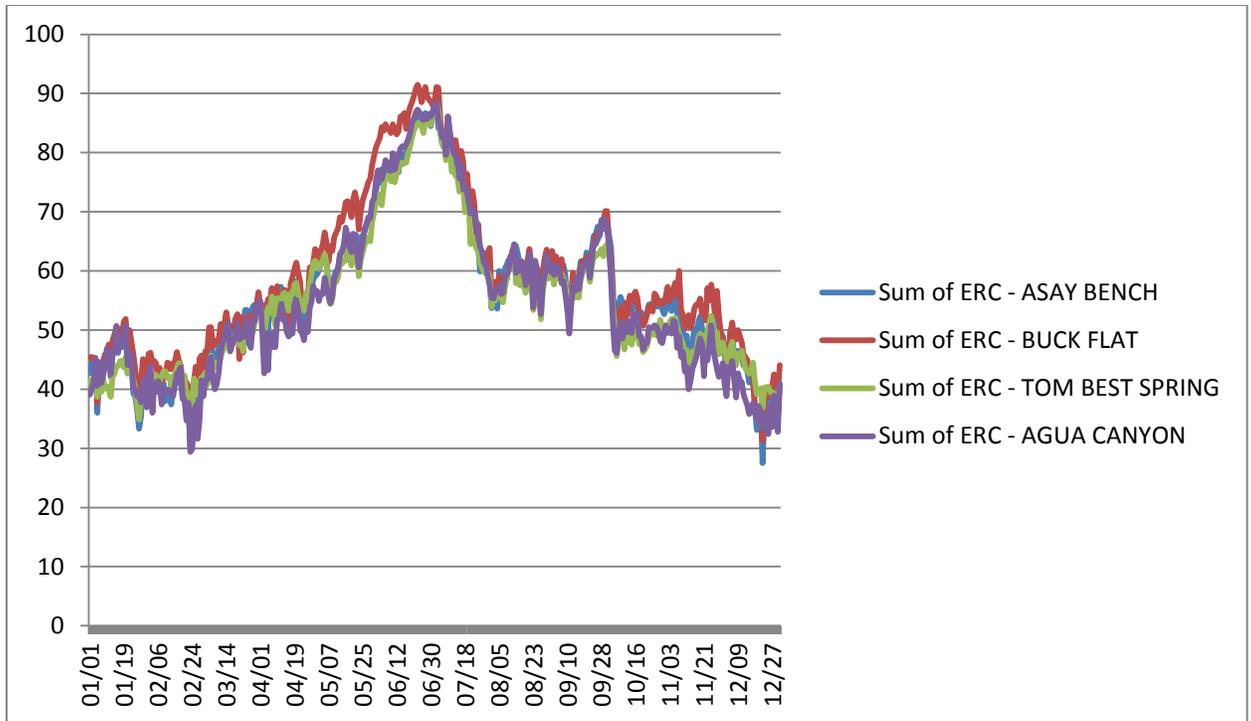
Brimstone Reservoir, Jensen Springs, and Enterprise RAWS were selected to create a Special Interest Group (SIG) in WIMS because their observations trend well with each other. The RAWS in this FDRA SIG group are equally weighted. Twenty years of data (1994-2013) and a defined fire season of May to October were used to establish a trends analysis.



Mountain FDRA

Asay Bench, Buck Flat, Tom Best Spring, and Agua Canyon RAWS were selected to create a Special Interest Group (SIG) in WIMS because their observations trend well with each other. The RAWS in this FDRA SIG group are equally weighted. Seventeen years of data (1997-2013) and a defined fire season of May to October were used to establish a trends analysis.

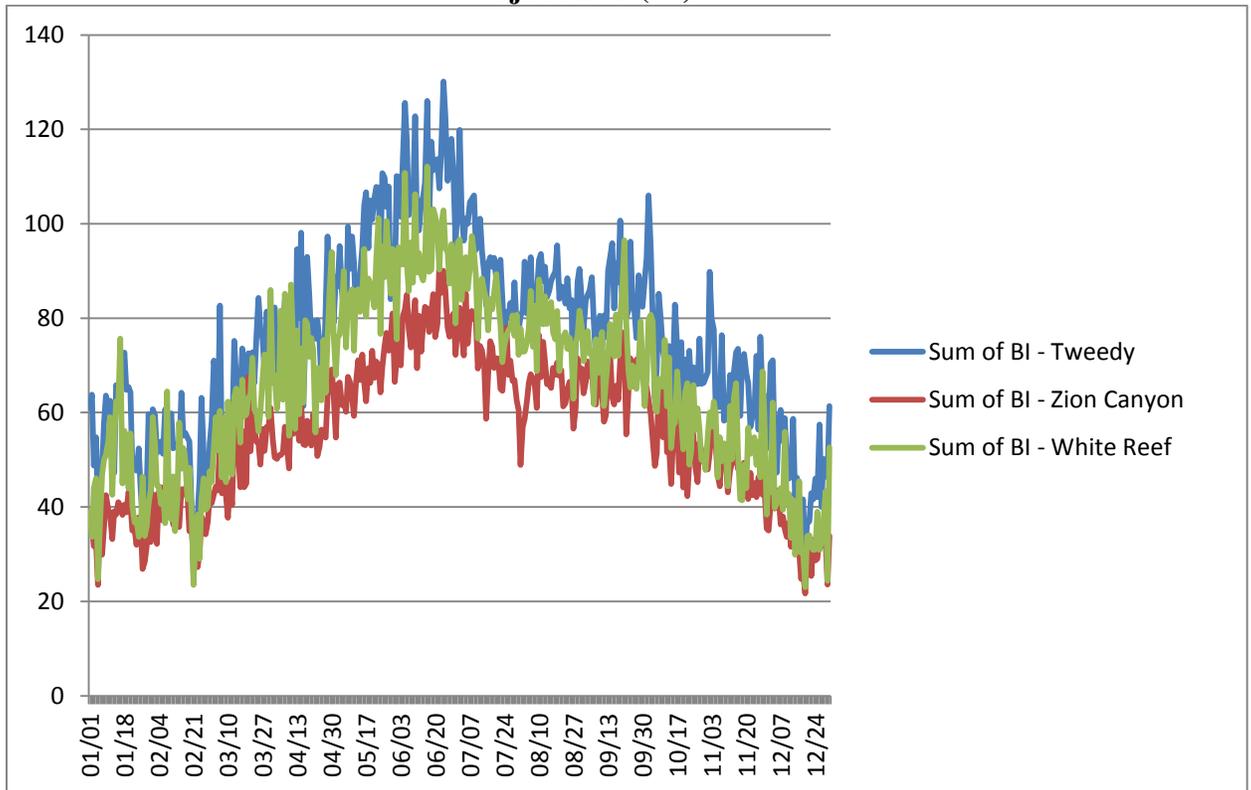
Mountain SIG (ERC)



Mojave FDRA

Tweedy, Zion Canyon, and White Reef RAWS were selected to create a Special Interest Group (SIG) in WIMS because their observations trend well with each other. The RAWS in this FDRA SIG group are equally weighted. Twenty years of data (1994-2013) and a defined fire season of May to October were used to establish a trends analysis.

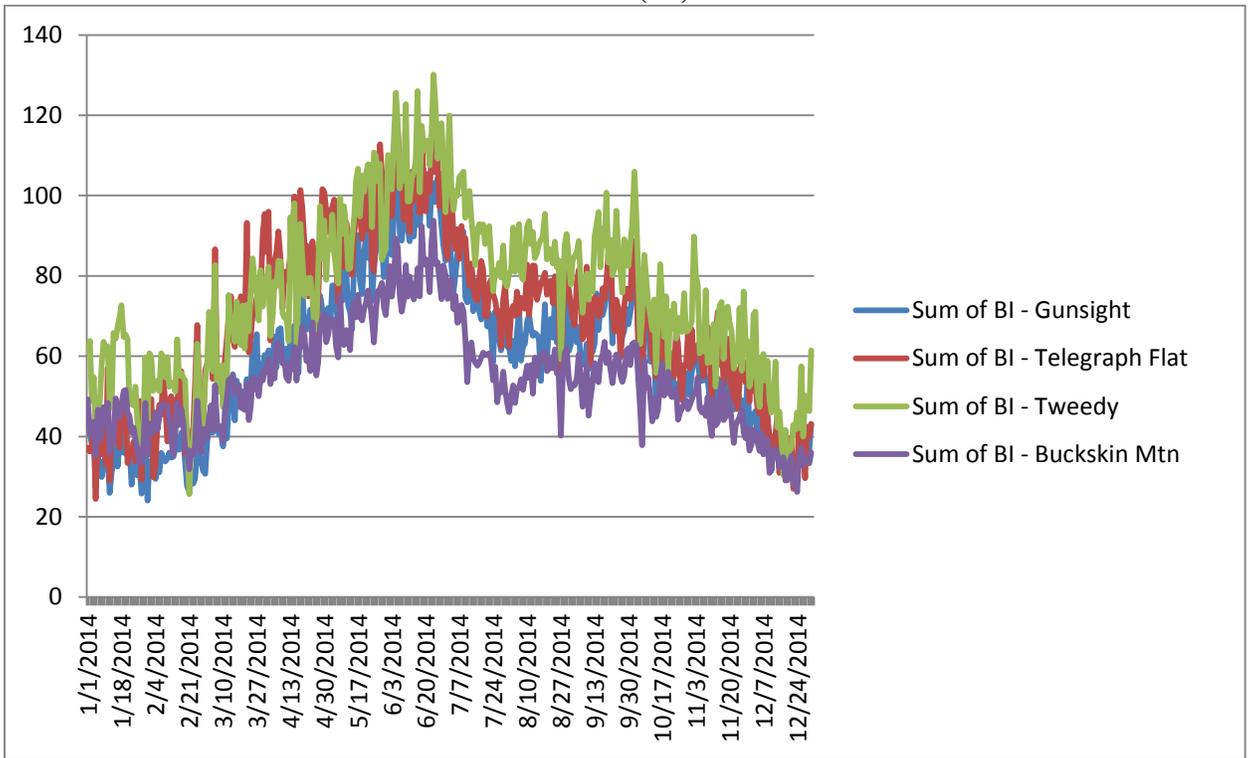
Mojave SIG (BI)



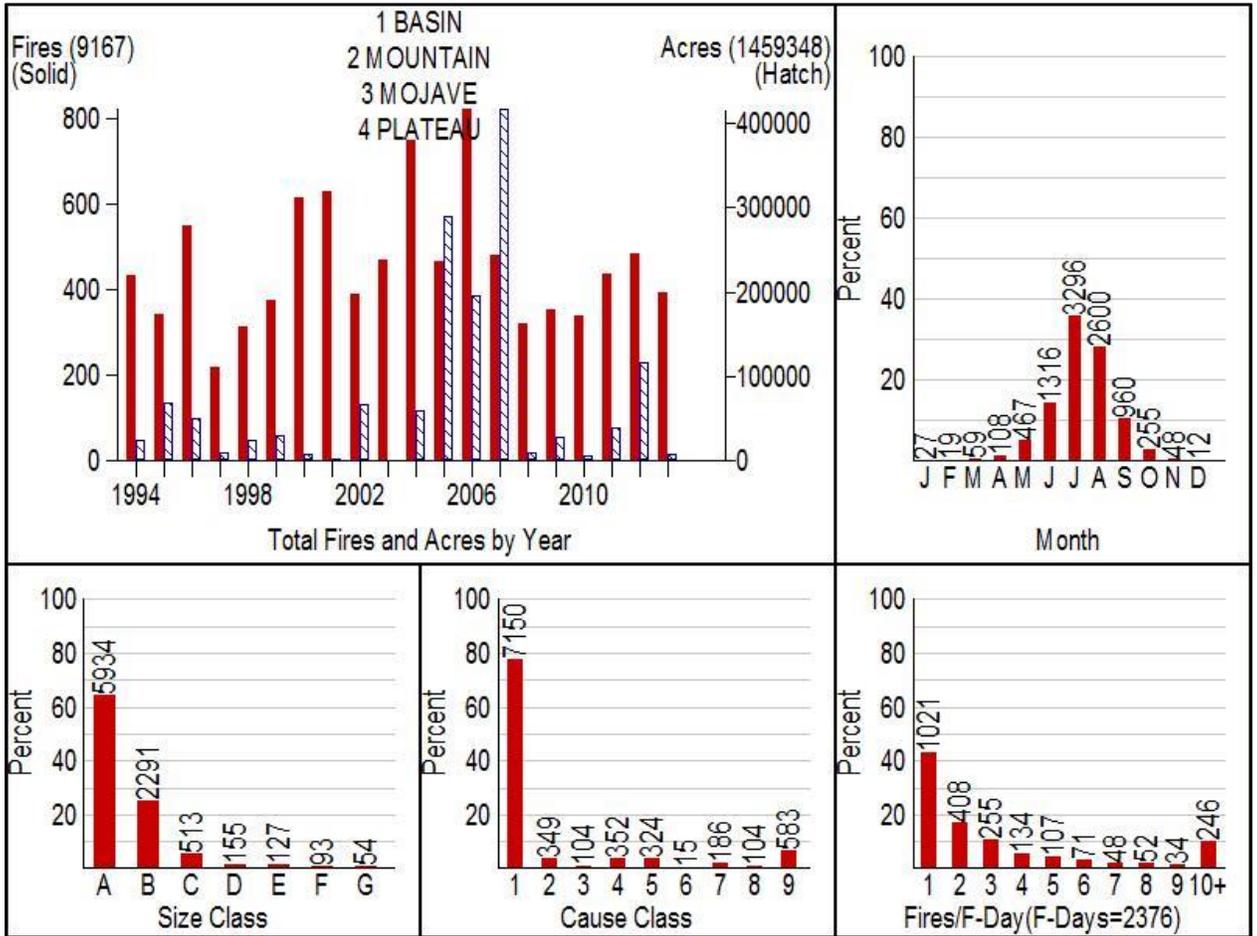
Plateau FDRA

Gunsight, Telegraph Flat, Tweedy, and Buckskin Mtn. RAWS were selected to create a Special Interest Group (SIG) in WIMS because their observations trend well with each other. The RAWS in this FDRA SIG group are equally weighted. Nineteen years of data (1995-2013) and a defined fire season of May to October were used to establish a trends analysis

Plateau SIG (BI)



B. Fire Occurrence Data



**FireFamily Plus Database (1994-2013)
Color Country Interagency Fire Center**

FDRA	# of Fires	% of Total Fires	Acres Burned	% of Total Acres
BASIN	2,249	25	577,632	40
MOUNTAINS	2,119	23	133,146	9
MOJAVE	1,361	15	484,004	33
PLATEAU	3,438	37	264,567	18
TOTALS	9,167	100%	1,459,348	100%

C. Parameters Used for each Fire Danger Rating Area

FDRA	Herbaceous	Climate Class	Slope Class	95 th percentile	Analysis
------	------------	---------------	-------------	-----------------------------	----------

	Type			Fire Size	Fire Size
Basin	Annual	1	1, 0-25%	60 acres	60 acres
Mountain	Perennial	2	2, 26-50%	16 acres	2 acres
Mojave	Annual	1	1, 0-25%	670 acres	1500 acres
Plateau	Annual	1	1, 0-25%	50 acres	50 acres

D. Correlation with Fire Occurrence

Statistical analysis was completed by the Color Country Interagency Technical Group for the Basin, Mountain, Mojave, and Plateau FDRAs. Twenty years of fire occurrence data from 1994-2013 was used for the Basin and Mojave FDRAs. Nineteen years, 1995-2013 was used for the Plateau FDRA and seventeen years was used for the Mountain FDRA. These differences in analysis years were necessary because of the length of record for some weather stations used. The statistical correlations and other qualitative factors used by the technical group determined that fuel model 7G provided the best correlations of Chi squared, R squared, and Probability range values for both fire indices of ERC and BI for each FDRA.

Station Name/Number	Component/Index	NFDRS Fuel Model	Prob. Range	R ²	Chi ²	F=Fire Day L=Large Fire Day M=Multi-Fire Day
SIG Color Country Basin FDRA): 422203, 422502, 422803	BI-Burning Index	G-Short Needle Pine (Heavy Dead)	.16 - .55	.56	34.21	F
SIG (Color Country Basin FDRA): 422203, 422502, 422803	BI-Burning Index	G-Short Needle Pine (Heavy Dead)	.00 - .21	.62	15.0	L
SIG (Color Country Basin FDRA): 422203, 422502, 422803	BI-Burning Index	G-Short Needle Pine (Heavy Dead)	.04 - .04	0	39.5	M
SIG (Color Country Mountains FDRA): 422604, 422606, 422608, 422903	BI-Burning Index	G-Short Needle Pine (Heavy Dead)	.26 - .30	0	52.38	F
SIG (Color Country Mountains FDRA): 422604, 422606, 422608, 422903	BI-Burning Index	G-Short Needle Pine (Heavy Dead)	.02 - .12	.32	17.89	L
SIG (Color Country Mountains FDRA): 422604, 422606, 422608, 422903	BI-Burning Index	G-Short Needle Pine (Heavy Dead)	.02 - .04	.01	30.92	M
SIG (Mojave Desert FDRA): 020109, 422805, 422808	BI-Burning Index	G-Short Needle Pine (Heavy Dead)	.13 - .34	.40	17.25	F
SIG (Mojave Desert FDRA): 020109, 422805, 422808	BI-Burning Index	G-Short Needle Pine (Heavy Dead)	.00 - .03	.28	2.92	L
SIG (Mojave Desert FDRA): 020109, 422805, 422808	BI-Burning Index	G-Short Needle Pine (Heavy Dead)	.01 - .02	0	21.14	M
SIG (Plateau FDRA): 020109, 020223, 020224, 422902	BI-Burning Index	G-Short Needle Pine (Heavy Dead)	.25 - .35	.09	36.25	F
SIG (Plateau FDRA): 020109, 020223, 020224, 422902	BI-Burning Index	G-Short Needle Pine (Heavy Dead)	.08 - .21	.19	18.06	L
SIG (Plateau FDRA): 020109, 020223, 020224, 422902	BI-Burning Index	G-Short Needle Pine (Heavy Dead)	.02 - .14	.17	35.81	M

Station Name/Number	Component/Index	NFDRS Fuel Model	Prob. Range	R ²	Chi ²	F=Fire Day L=Large Fire Day M=Multi-Fire Day
SIG Color Country Basin FDRA): 422203, 422502, 422803	ERC - Energy Release Component	G-Short Needle Pine (Heavy Dead)	.04 - .57	..86	32.31	F
SIG (Color Country Basin FDRA):	ERC - Energy Release Component	G-Short Needle Pine (Heavy Dead)	.00 - .12	.81	9.87	L

422203, 422502, 422803						
SIG (Color Country Basin FDRA): 422203, 422502, 422803	ERC - Energy Release Component	G-Short Needle Pine (Heavy Dead)	.00 - .12	.71	13.21	M
SIG (Color Country Mountains FDRA): 422604, 422606, 422608, 422903	ERC - Energy Release Component	G-Short Needle Pine (Heavy Dead)	.14 - .40	.40	42.36	F
SIG (Color Country Mountains FDRA): 422604, 422606, 422608, 422903	ERC - Energy Release Component	G-Short Needle Pine (Heavy Dead)	.01 - .11	.48	17.17	L
SIG (Color Country Mountains FDRA): 422604, 422606, 422608, 422903	ERC - Energy Release Component	G-Short Needle Pine (Heavy Dead)	.01 - .06	.45	12.86	M
SIG (Mojave Desert FDRA): 020109, 422805, 422808	ERC - Energy Release Component	G-Short Needle Pine (Heavy Dead)	.06 - .31	.65	21.79	F
SIG (Mojave Desert FDRA): 020109, 422805, 422808	ERC - Energy Release Component	G-Short Needle Pine (Heavy Dead)	.00 - .02	.34	6.26	L
SIG (Mojave Desert FDRA): 020109, 422805, 422808	ERC - Energy Release Component	G-Short Needle Pine (Heavy Dead)	.00 - .03	.29	14.99	M
SIG (Plateau FDRA): 020109, 020223, 020224, 422902	ERC - Energy Release Component	G-Short Needle Pine (Heavy Dead)	.18 - .40	.41	29.58	F
SIG (Plateau FDRA): 020109, 020223, 020224, 422902	ERC - Energy Release Component	G-Short Needle Pine (Heavy Dead)	.01 - .08	.77	4.59	L
SIG (Plateau FDRA): 020109, 020223, 020224, 422902	ERC - Energy Release Component	G-Short Needle Pine (Heavy Dead)	.02 - .14	.56	15.32	M

E. Climatological Breakpoints

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

The climatological breakpoints have been established by each federal agency at the national level as identified Chp 10 of the Interagency Standards for Fire & Aviation Operations (Red Book).

- BLM 80th and 95th percentile.
- USFS, FWS, and NPS 90th & 97th percentile

Basin FDRA

Input Information			Staffing Class and Percentile Break Points	
RAWS	Fuel Model	Staffing Index	80 th	95 th
Brimstone Res. (422203)	G	ERC	92	102
Jensen Spring (422502)	G	ERC	94	105
Enterprise (422803)	G	ERC	85	97

Mountains FDRA

Input Information			Staffing Class and Percentile Break Points	
RAWS	Fuel Model	Staffing Index	90 th	97 th

Asay Bench (422604)	G	ERC	90	100
Agua Canyon (422903)	G	ERC	91	100
Tom Best Spring (422608)	G	ERC	89	99
Buck Flat (422606)	G	ERC	92	101

Mojave FDRA

Input Information			Staffing Class and Percentile Break Points	
RAWS	Fuel Model	Staffing Index	80 th	95 th
Zion Canyon (422808)	G	ERC	97	106
White Reef (422805)	G	ERC	103	113
Tweedy (020109)	G	ERC	98	109

Plateau FDRA

Input Information			Staffing Class and Percentile Break Points	
RAWS	Fuel Model	Staffing Index	80 th	95 th
Telegraph Flat (422902)	G	ERC	93	104
Buckskin Mtn. (020224)	G	ERC	89	102
Tweedy (020109)	G	ERC	98	109
Gunsight (020223)	G	ERC	99	111

F. Adjective Danger Ratings

In 1974, the Forest Service, Bureau of Land Management, National Park Service, Bureau of Indian Affairs, and State Forestry organizations established a standard adjective description for five levels of fire danger for use in public information releases and fire prevention signing. For this purpose only, fire danger is expressed using the adjective levels and color codes described below.

Fire Danger Class and Color Code	Description
Low (L) (Green)	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 (M) (Blue)	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. Short-distance spotting may occur, but is not persistent. Fires are not likely to become serious and control is relatively easy.
High (H) (Yellow)	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 hit hard and fast while small.
Very High (VH) (Orange)	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 in heavier fuels.
Extreme (E) (Red)	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.

The resultant adjective fire danger information will be used by agency personnel to maintain the awareness of public and industrial entities. The amount of interaction will depend on the magnitude of the adjective fire danger.

Adjective Fire Danger Rating Determination

NFDRS processors automatically calculate the adjective class rating. The adjective rating calculations are keyed off the first priority fuel model listed in the station catalog 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.

The actual determination of the daily adjective rating is based on the current or predicted value for a user selected staffing index and ignition component using the table below.

Staffing Levels	Adjective Fire Danger Rating				
1-, 1, 1+	L	L	L	M	M
2-, 2, 2+	L	M	M	M	H
3-, 3, 3+	M	M	H	H	VH

4-, 4, 4+	M	H	VH	VH	E
5	H	VH	VH	E	E
Ignition Component	0-20	21-45	46-65	66-80	81-100

Given the same weather inputs, the NFDRS processor will calculate the adjective fire danger for selected fuel models. The adjective fire danger rating for the Basin FDRA is a weighted average of weather observations between the Jensen Spring (422502), Enterprise (422803) and Brimstone Reservoir (422230) RAWS. A Special Interest Group (SIG) has been created in WIMS that combines the data from these three stations using the appropriate priority NFDRS fuel model from each station catalog. The data is accessed using the WIMS “DAVG” command and entering the SIG name in the query box. If a forecasted adjective fire danger rating is required, enter “F” in the “type” query block. The adjective fire danger for the Mountains FDRA is determined by querying the SIG of Asay Bench (422604), Tom Best Spring (422608), Agua Canyon (422903), and Buck Flat (422606) RAWS. The adjective fire danger for the Mojave FDRA is determined by querying the SIG of Zion Canyon (422808), White Reef (422805), and Tweedy (020109) RAWS. The adjective fire danger for the Plateau FDRA is determined by querying the SIG of Telegraph Flat (422902), Buckskin (020224), Tweedy (020109), and Gunsight (020223) RAWS.

The example below displays the forecasted 1300 adjective fire danger (R)ating of (E)xtreme for July 4th.

Ver. 1.2.0 FastPath **Weather Information Management System** [Show Navigation Tree](#)

Display NFDRS Weighted Averages DAVG [Back to Menu](#)

SIG Type: Date: Time:

Date	WS	WDY	HRB	1H	10	HU	TH	IC	SC	ERC	BI	FL	SL	R	KBDI	Rgn	PAL	PV	IFPL
04-JUL-08	16	50	1	1	2	2	4	97	10	61	57	41	5	E	387	4			

V. FIRE DANGER-BASED DECISIONS

A. Prevention Plan

The Color Country Prevention and Education Committee developed basic prevention

actions that will be carried out by all agencies at various fire danger ratings. These actions are based on the daily Adjective Fire Danger Rating values generated by WIMS for each of the Fire Danger Rating Areas. These actions are not all encompassing, but rather represent the minimum actions that will be taken by the agencies at each fire danger level.

Low – Implement signing at pre-identified/strategic locations throughout Color Country to raise awareness, create/distribute general interagency awareness news release.

Moderate – Develop specific op-ed pieces for local media, implement established state-wide awareness campaign material/messages.

High – Implement general fire restrictions, enhance strategic fire prevention tools, utilize cooperators to develop strategic messages, increase signing in hazard areas, target/create prevention material for specific fire ignition causes.

Very High – Schedule specialized public awareness events, utilize state/national outlets for internal/external message distribution, coordinate cooperator sponsored prevention/education campaigns, consider and evaluate effectiveness of bringing in additional personnel to assist with objectives.

Extreme – Increase signing in target areas, implement a higher level of fire restrictions, conduct community planning meetings, implement mass media campaigns, consider and evaluate effectiveness of ordering a Fire Prevention Team. Work with local elected officials/stakeholders to develop a plan of action.

B. Daily Staffing Levels/Plan

Daily staffing necessary for the successful initial attack of new starts is determined by a number of factors, fire danger (potential workload), available resources, fire activity, and agency requirements. Each of the agencies in Color Country determines their individual staffing needs based on these and other factors. NFDRS indicies are utilized to inform the daily staffing decisions by each agency. In general, as fire danger increases daily staffing needs increase. The ideal situation is where there are an adequate number of initial attack resources available to meet the demands of fire starts on any given day. The Burning Index (BI) is utilized by most agencies as one part of their decision making for daily staffing due to its ability to react quickly to day to day changes and the direct link to the dispatch levels discussed below. This gives agencies a good foundation upon which to base their daily staffing decisions.

Step-Up plans are developed utilizing many of the criteria mentioned above by various agencies in order to document when specific resource staffing actions will take place. These plans form the basis for the determination of severity funding needs, move-up actions, extended staffing needs, and additional resource requests from outside the area. These plans are developed on an individual agency basis as requirements vary. Staffing/Step-Up plans are included in the appendices for those agencies that have them developed. Some agencies have not developed an individual plan due to the limited amount of resources and/or typical fire workload. These agencies do, however, still utilize fire danger to base daily needs decisions on.

C. Dispatch Plan

Wind plays an important role in fire spread and large fire growth in Color Country, so BI was considered the best index for establishing dispatch levels. It was determined that the 50th, and 90th percentile climatological breakpoints of Burning Index categorized the days and large fires appropriately based on analysis of historic fire activity.

Dispatch Level: Fire Family Plus Analysis Factors and Determinations							
Rating Area	RAWS	Data Years Used	Weight Factor	Fuel Model	NFDRS Index	Climatological Break Point Ranges	
Basin	Jensen Spring Brimstone Res. Enterprise	1994- 2013	1 1	G	BI	Low Moderate High	0 – 75 76 – 114 115+
Mountains	Asay Bench Buck Flat Agua Canyon Tom Best Spring	1997- 2013	1 1 1 1	G	BI	Low Moderate High	0 – 56 57 – 79 80+
Mojave	Zion Canyon White Reef Tweedy	1994- 2013	1 1 1	G	BI	Low Moderate High	0 – 73 74 – 103 104+
Plateau	Telegraph Flat Tweedy Gunsight Buckskin Mtn.	1995- 2013	1 1 1	G	BI	Low Moderate High	0 – 74 75 – 108 109+

Agency personnel use the dispatch level (response level) to assign initial attack resources based on pre-planned interagency “Run Cards”. Combined with predefined geographic areas referred to as Response Areas, the Dispatch Level is used as an input to the computer aided dispatch system to assign a mix of suppression resources to a reported wildfire based upon fire danger potential. The dispatch levels are derived from the most appropriate NFDRS index and/or component that correlate to fire occurrence. Due to the ability of BI to reflect the most current fire danger potential, and the Dispatch Center’s ability to contact agency personnel throughout the course of any given day, BI for each FDRA will be computed and implemented according to the chart above for initial response levels until a qualified Incident Commander arrives on scene to validate the need for the dispatched resources and modify the response if necessary.

Dispatch Level Worksheet

Color Country Interagency Fire Center

FDRA	Index Values		
BI - Model G (Basin FDRA)	0 - 75	76 - 114	115+
BI - Model G (Mountain FDRA)	0 - 56	57 - 79	80+
BI - Model G (Mojave FDRA)	0 - 73	74 - 103	104+
BI - Model G (Plateau FDRA)	0 - 74	75 - 108	109+
Dispatch Level	LOW	MODERATE	HIGH

D. Preparedness Plan

Preparedness Levels are established to assist fire managers with weekly or monthly planning decisions based upon seasonal fire danger elements. The FireFamilyPlus software has been used to establish the fire business thresholds. A statistical analysis of fire occurrence and historical weather has been completed for each Fire Danger Rating Area. Each agency will consider management actions identified in the appendix based upon five local Preparedness Levels.

Preparedness Level: Fire Family Plus Analysis Factors and Determinations							
Rating Area	RAWS	Data Years Used	Weight Factor	Fuel Model	NFDRS Index	Fire Business Break Point Ranges	
Basin	Jensen Spring Brimstone Res. Enterprise	1994- 2013	1 1 1	G	ERC	PL 1 PL 2 PL 3 PL 4 PL 5	0 – 45 46 – 66 67 – 79 80 – 91 92 +
Mountain	Asay Bench Buck Flat Agua Canyon Tom Best Spring	1997- 2013	1 1 1 1	G	ERC	PL 1 PL 2 PL 3 PL 4 PL 5	0 –37 38 –54 55 –67 68 –77 78 +
Mojave	Zion Canyon White Reef Tweedy	1994- 2013	1 1 1	G	ERC	PL 1 PL 2 PL 3 PL 4 PL 5	0 – 50 51 – 74 75 – 85 86 –96 97+
Plateau	Telegraph Flat Tweedy Buckskin Mtn. Gunsight	1995- 2013	1 1 1 1	G	ERC	PL 1 PL 2 PL 3 PL 4 PL 5	0 – 35 36 –57 58 –77 77 –89 90 +

The preparedness level is a five-tier (1-5) fire danger rating system that will be based on Energy Release Component and indicators of fire business. The fire business indicators

used to calculate the preparedness level include an indication of fire activity, 7-Day Significant Fire Potential Outlook, Haines Index, and a measure of Ignition Risk. A flow chart guides personnel through the process. Several procedures and guidelines are to be followed and/or considered once the preparedness level has been determined. The break points for the planning level are set using an historical analysis (Fire Family Plus) of fire business and its relationship to 1300 RAWS observations entered into the NIFMID database and processed by WIMS, which calculates the staffing index values (BI, IC, SC, ERC, etc).

Worksheet Instructions:

1. **Staffing Index Value:** Place a checkmark in row one indicating the appropriate staffing index/component (ERC Fuel Model G) range. These indices (forecasted by the Salt Lake Weather Office) are based on the 1300 RAWS observations which are input to the WIMS processor by CCIFC personnel.
2. **Haines Index:** Place a checkmark in row two indicating the forecast Haines Index for the Fire Weather Zone that covers the FDRA.
3. **Great Basin 7-Day Significant Fire Potential Outlook:** Place a checkmark in row three based on the presence of a High Risk Day.
<http://gacc.nifc.gov/gbcc/outlooks.php>
4. **Ignition Risk:** Place a checkmark in row four to indicate the relative risk of human and/or naturally caused ignitions. Human-caused risk is based upon activities such as holidays or special events occurring within the FDRA. During holidays (Memorial Day, July 4th, July 24th, and Labor Day), the ignition risk is “High,” otherwise, it is “Low.” The ignition risk will also be set at “High” on the day before and after each of the above holidays. Lightning Probability would be the basis for relative risk for natural ignitions; a forecasted Lightning Probability of 15-30% is “High” ignition risk; everything else is “Low”. If multiple Lightning Probabilities are forecasted within the FDRA, use the “High” risk category to complete the worksheet on row four if any part of the FDRA has a forecasted probability between 15-30%.
<http://www.wrh.noaa.gov/slc/fire/Dryness/Dryness.php>
5. **Fire Activity:** fire activity will be Yes if approximately 50% of the resources within the Color Country Interagency Dispatch Area (regardless of FDRA) are committed or responding to a fire. This may be revised if there is a significant change in fire activity between the time the initial calculation is made (approx. 1500) and when the Situation Report is due to the Great Basin Coordination Center (approx. 1900). Place a checkmark in the appropriate box in row five.

Preparedness Level Worksheet Color Country Interagency Fire Center

1	ERC - Model G (Basin FDRA)	0 - 45		46 - 66		67 - 79		80 - 91		92 Plus		
	ERC - Model G (Mountain FDRA)	0 - 37		38 - 54		55 - 67		68 - 77		78 Plus		
	ERC - Model G (Mojave FDRA)	0 - 50		51 - 74		75 - 85		86 - 96		97 Plus		
	ERC - Model G (Plateau FDRA)	0 - 35		36 - 57		58 - 77		78 - 89		90 Plus		
1	✓ ⇒											
2	Haines Index	2-4 ↓	5-6 ↓	2-4 ↓	5-6 ↓	2-4 ↓	5-6 ↓	2-4 ↓	5-6 ↓	2-6 ↓		
	✓ ⇒											
3	7-day Significant Fire Potential Outlook	No ↓	Yes ↓	No ↓	Yes ↓	No ↓	Yes ↓	No ↓	Yes ↓	No ↓	Yes ↓	
	✓ ⇒											
4	Ignition Risk	Low-High ↓	Low ↓	High ↓	Low ↓	High ↓	Low ↓	High ↓	Low ↓	High ↓	Low ↓	High ↓
	✓ ⇒											
5	Fire Activity	Yes or No ↓		No ↓	Yes ↓	No ↓	Yes ↓	No ↓	Yes ↓	No ↓	Yes ↓	Yes or No ↓
	✓ ⇒											
	Preparedness Level	I			II		III		IV		V	

Agency Administrator

Responsible Party	Suggested Action	PL 1	PL 2	PL 3	PL 4	PL 5
Agency Administrator or Acting	Ensure supervisors approve fire availability of staff and notify Duty Officer.			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Ensure resource advisors are designated and available for fire assignments.			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Evaluate work/rest needs of FMO.			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Consider need for fire restrictions or closures and consult with FMO.			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Provide appropriate political support to interagency fire personnel regarding the implementation of Preparedness level actions.			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Review and transmit severity requests to the appropriate State Office and/or Regional Office.				<input type="checkbox"/>	<input type="checkbox"/>
	Issue guidance to field office staff indicating severity of the season and increased need and availability for fire support personnel.				<input type="checkbox"/>	<input type="checkbox"/>

Unit Fire Management Officer

Responsible Party	Suggested Action	PL 1	PL 2	PL 3	PL 4	PL 5
FMO or Acting	If Preparedness level is decreasing, consult with Duty Officers/ Fire Center Manager and consider release of pre-positioned or detailed personnel.	<input type="checkbox"/>				
	Evaluate season severity data (BI and ERC trends for season, fuel loadings, live FM, drought indices, and long term forecasts).	<input type="checkbox"/>				
	Evaluate crew and staff work/rest requirements.	<input type="checkbox"/>				
	Brief agency administrators on burning conditions and fire activity.			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Review geographical and national Preparedness levels and evaluate need to suspend local prescribed fire or wildland fire use activities.			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Ensure Prevention Officer has initiated media contacts and public notification.			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Ensure field office and forest staff is briefed on increasing fire activity.			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Brief State/Regional FMO or Fire Director on fire activity.			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Consider activating the local MAC group			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Consider fire severity request and pre-positioning of resources including: suppression resources, aerial support, aerial supervision, command positions, dispatch, logistical support, and prevention.			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Evaluate need for possible fire restrictions or closures.				<input type="checkbox"/>	<input type="checkbox"/>
Request the Agency Administrator to issue guidance to office staff regarding the need for increased availability for fire assignments.				<input type="checkbox"/>	<input type="checkbox"/>
Consult with the State and/or Regional Offices regarding potential need to pre-position a Type 3 organization/Type 2 Team.				<input type="checkbox"/>	<input type="checkbox"/>

Duty Officer

Responsible Party	Suggested Action	PL 1	PL 2	PL 3	PL 4	PL 5
Duty Officer or Acting	If Preparedness level is decreasing, consider releasing pre-positioned and detailed resources.	<input type="checkbox"/>				
	Evaluate work/rest needs of crew. Ensure days off are taken and request relief personnel if needed.	<input type="checkbox"/>				
	Consider need for aerial detection flights and or ground detection patrols.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Evaluate need to change or shift duty hours of IA resources.			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Evaluate draw-down levels for suppression, command, and oversight positions.			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Consider extending staffing beyond normal shift length or bringing in local IA resources from scheduled days off..			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Provide FMO with feedback regarding unique/unexpected fire behavior and severity conditions and the need to increase IA capabilities.			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Consider pre-positioning and/or detailing of additional IA resources.	<input type="checkbox"/>				
Consider patrols and pre-positioning of local IA resources in high-risk areas.	<input type="checkbox"/>				
Consider pre-positioning and automatic dispatch of ATGS aircraft and air tankers for initial attack.	<input type="checkbox"/>				
Ensure IA crews are briefed on local Preparedness level, burning conditions, and availability of additional IA resources and air support.	<input type="checkbox"/>				
Ensure incoming pre-positioned or detailed personnel are briefed on local conditions and fire behavior.	<input type="checkbox"/>				
Consider suspension of project work.	<input type="checkbox"/>				

Fire Center Manager

Responsible Party	Suggested Action	PL 1	PL 2	PL 3	PL 4	PL 5
Fire Center Manager or Acting	Ensure that briefings are completed each morning and each shift change with all fire center personnel.	<input type="checkbox"/>				
	Evaluate work/rest needs of center staff.	<input type="checkbox"/>				
	Ensure that fire cache inventory is adequate for current activity level. Order additional supplies and equipment as needed to meet activity level.	<input type="checkbox"/>				
	If Preparedness level is decreasing, consider release of pre-positioned or detailed dispatchers and logistical support personnel.	<input type="checkbox"/>				
	Consult with FMOs concerning potential for extended staffing beyond normal shift length or days.	<input type="checkbox"/>				
	Consider pre-positioning or detailing of off-unit IA dispatchers and logistics support personnel.	<input type="checkbox"/>				
	Consider activation of local area MAC Group.	<input type="checkbox"/>				
	Order fire cache support personnel as necessary to meet work load.	<input type="checkbox"/>				
	Three expanded support dispatchers will be identified, available and briefed	<input type="checkbox"/>				

Consider activating dispatch and the cache for 24-hour coverage upon recommendation of logistics coordinator.			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
Consult with FMOs about activating the expanded dispatch plan				<input type="checkbox"/>	<input type="checkbox"/>
Ensure that briefings are completed each morning and each shift change with expanded dispatch coordinator / supervisor.				<input type="checkbox"/>	<input type="checkbox"/>
Consult with Great Basin Coordination Center (EGBCC) regarding availability of resources at the geographical and national levels.				<input type="checkbox"/>	<input type="checkbox"/>

Aviation Officer/Air Center Manager

Responsible Party	Suggested Action	PL 1	PL 2	PL 3	PL 4	PL 5
Air Center Manager or Acting	Evaluate work/rest needs of pilots, helitack crew, and aviation support personnel.	<input type="checkbox"/>				
	Ensure pilots are briefed on other aircraft working in area and coordination procedures.	<input type="checkbox"/>				
	Ensure helispot kits at all fire stations are complete and adequately stocked.	<input type="checkbox"/>				
	Consider need for extended hours of aviation crews with Center Manager.			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Consider need for relief or additional personnel for aviation crews.			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Coordinate with Duty Officers regarding potential for additional aircraft at aviation base.				<input type="checkbox"/>	<input type="checkbox"/>
	Evaluate need for additional aircraft for initial attack.				<input type="checkbox"/>	<input type="checkbox"/>

Fire Prevention

Responsible Party	Suggested Action	PL 1	PL 2	PL 3	PL 4	PL 5
Fire Prevention Officer	Contact local media to make the public aware of the start of fire season and the potential for local fire danger to increase.	<input type="checkbox"/>				
	Provide public and industrial entities with access to fire danger information, closures, restrictions, and warnings.	<input type="checkbox"/>				
	Consider need for increased prevention patrols.	<input type="checkbox"/>				
	Contact local industrial entities to make them aware of fire hazard and risk.	<input type="checkbox"/>				
	Contact local fire chiefs to make them aware of fire danger.	<input type="checkbox"/>				
	Consider door-to-door contacts in rural communities or ranch areas.	<input type="checkbox"/>				
	Post signs and warnings in camp and recreation areas.	<input type="checkbox"/>				
	Notify local media of high/extreme fire danger and need for increased public caution.	<input type="checkbox"/>				
	Consult with FMO regarding potential need for additional prevention personnel or fire prevention team.	<input type="checkbox"/>				
	Consult with FMO regarding need for fire restrictions, closures and the need to order a Fire Prevention Team.	<input type="checkbox"/>				

Initial Attack Modules

Responsible Party	Suggested Action	PL 1	PL 2	PL 3	PL 4	PL 5
Engine Module Leaders, Crew Leaders,	Ensure that an adequate daily briefing is completed with all crewmembers.	<input type="checkbox"/>				
	Ensure equipment and crew preparedness.	<input type="checkbox"/>				

Water Tender Operators	Evaluate crew and staff work/rest requirements.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Provide Duty Officer feedback regarding crew fatigue.		<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Ensure that re-supply orders are completed promptly to keep supplies at a level adequate for fire activity.			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Communicate any potential out of service of crew or equipment to Supervisor.			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>
	Participate in prevention activities as required.			<input type="checkbox"/>	<input type="checkbox"/>	<input type="checkbox"/>

Minimum Resource Levels

Minimum resource levels define the minimum number of state and federal initial attack firefighting resources available at various Preparedness Levels (PL) within Color Country.

The following table lists the minimum numbers for each resource type in the interagency organization. The numbers include resources from the Southern Paiute Agency, Color Country District BLM, Arizona Strip District BLM, the Dixie National Forest, SW Area Utah Division of Forestry, Fire and State Lands and Zion and Bryce Canyon National Parks. Extenuating circumstances (such as holidays) may necessitate keeping more resources than indicated below at Preparedness Levels 1 through 3. Ordering additional resources to meet minimum levels will occur on a case-by-case basis through consensus of the LMAC group.

Resource	PL 1	PL 2	PL 3	PL 4	PL 5
Type 4 Engine	3	4	5	6	7
Type 6 Engine	6	8	10	12	14
Water Tenders		1	1	2	2
Helicopter		1	1	2	2
SEAT		1	1	2	2
ATGS Platform			1	2	2
T-2 / T-2IA Crews	Rotation PL 1-3 MAC Approval PL 4-5				

At preparedness levels 4 and 5, off-unit resource requests will be considered on a case-by-case basis. For example, there may be a chance to get a trainee qualified or the LMAC group may have strong indications that the preparedness level will drop in the near future.

E. Restriction/Closure Plan

Restrictions and or closures will be coordinated through the LMAC group to help ensure there is a consistent message between the Agencies that minimizes public confusion.

VI. OPERATIONAL PROCEDURES

A. Seasonal Schedule/WIMS Station Catalog Maintenance

Each agency's FMO along with the CCIFC Manager will be responsible for establishing and reviewing the preparedness, dispatch, and adjective level guidelines on a bi-annual basis (as a minimum).

The FMO from each agency will ensure that seasonal risk assessments are conducted monthly during the fire season. The risk analysis might 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 CCIFC Manager. The CCIFC Manager and AFMO's will ensure information is posted at fire operation duty

stations. The Color Country FMO group will look at the need for more frequent analysis based on the current situation.

B. Daily Schedule/WIMS Observation monitoring & Output production and dissemination

The CCIFC Manager will ensure that the daily fire weather forecast (including NFDRS indices) is retrieved and that the daily preparedness, dispatch, and adjective levels are calculated and distributed.

The BLM FMOs are listed as the respective station owners for the BLM RAWS. The Forest FMO is listed as the station owner for the Dixie National Forest RAWS. The Park FMO is listed as the station owner for Zion and Bryce National Park RAWS. The owner maintains the WIMS Access Control List (ACL). The station owner will ensure appropriate editing of the RAWS catalogs. The CCIFC Manager will ensure the timely editing of daily 1300 weather observations of all stations.

C. 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 Arizona Strip BLM Fuels Technician (Cris Madrigal) and the Color Country BLM Prescribed Fire and Fuels Manager (Ryan Shakespear) are currently qualified as first responders to RAWS malfunctions. The Forest Service Fire Planner (Scott Tobler) is responsible for maintaining and calibrating the USFS RAWS stations on an annual basis and is qualified as a first responder for RAWS malfunctions. The Park Service Fire Management Officer is responsible for maintaining and calibrating the NPS RAWS stations on an annual basis.

VII. PROGRAM NEEDS

A. Weather Station Needs

None identified at this time.

B. Computer/Equipment Needs

Technology & Information Management

- Integrate preparedness level flow chart into a software package.
- Improve the CCIFC Internet Site where pertinent seasonal risk assessment information can be reviewed.

C. NFDRS, RAWS & WIMS Training

RAWS

- Find and input missing weather data.
- Perform a more in depth analysis of data from all weather stations. Compare weather

station data to other data sources to determine usefulness of data.

Training

- Provide FDOP training to personnel within the Color Country Interagency Fire Management Area and cooperating dispatch centers.
- Train more personnel as first responders to RAWS malfunctions.
- Establish local WIMS/NFDRS training courses for agency personnel.
- Emphasize NFDRS training (S-491) at the geographic area level for mid-level fire management personnel.
- Inform agency fire management supervisors of FDOP applications by integrating the training in unit orientation and “Red Card” meetings. At a minimum, this should include Fire Management Officers, Assistant Fire Management Officers, Fire Operations Supervisors, Area Managers, and Fire Wardens.

D. Seasonal Tracking of Index/Component

Current charts of ERC, BI, and calculated 1000 hr fuel moisture will be created and sent out to FMOs, AFMOs, and Duty Officers weekly (or as requested) through fire season (May 1 – October 31). These charts are also posted on the Color Country web site weekly.

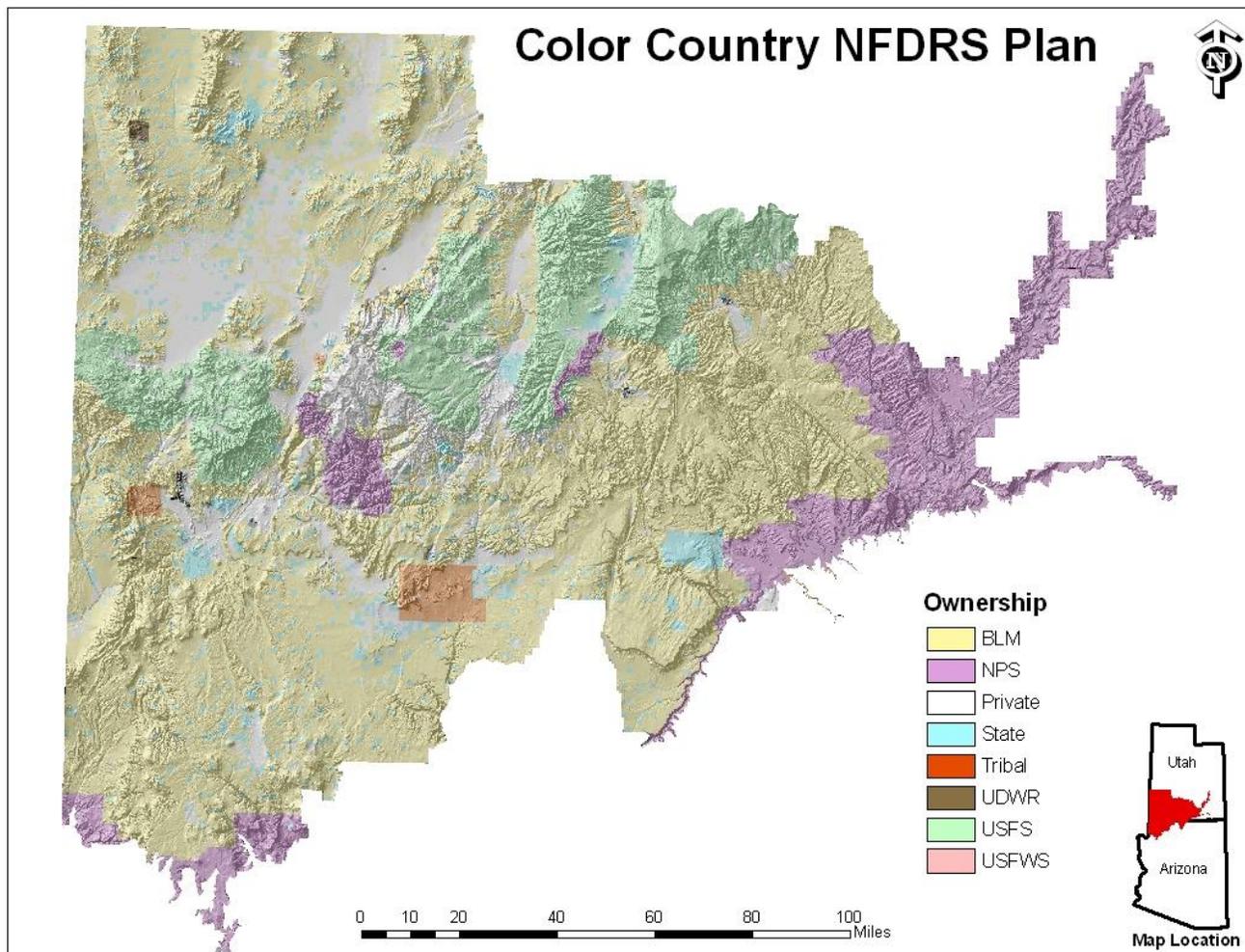
E. Update of PocketCard(s)

The FMO’s will ensure that pocket cards are prepared at least every two 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 CCIFC and National Wildfire Coordinating Group (NWCG) pocket card web site (<http://fam.nwcg.gov/fam-web/pocketcards/pocketcards.htm>). Fire management supervisors will utilize pockets cards to train and brief personnel ensuring that they are posted at their respective fire stations.

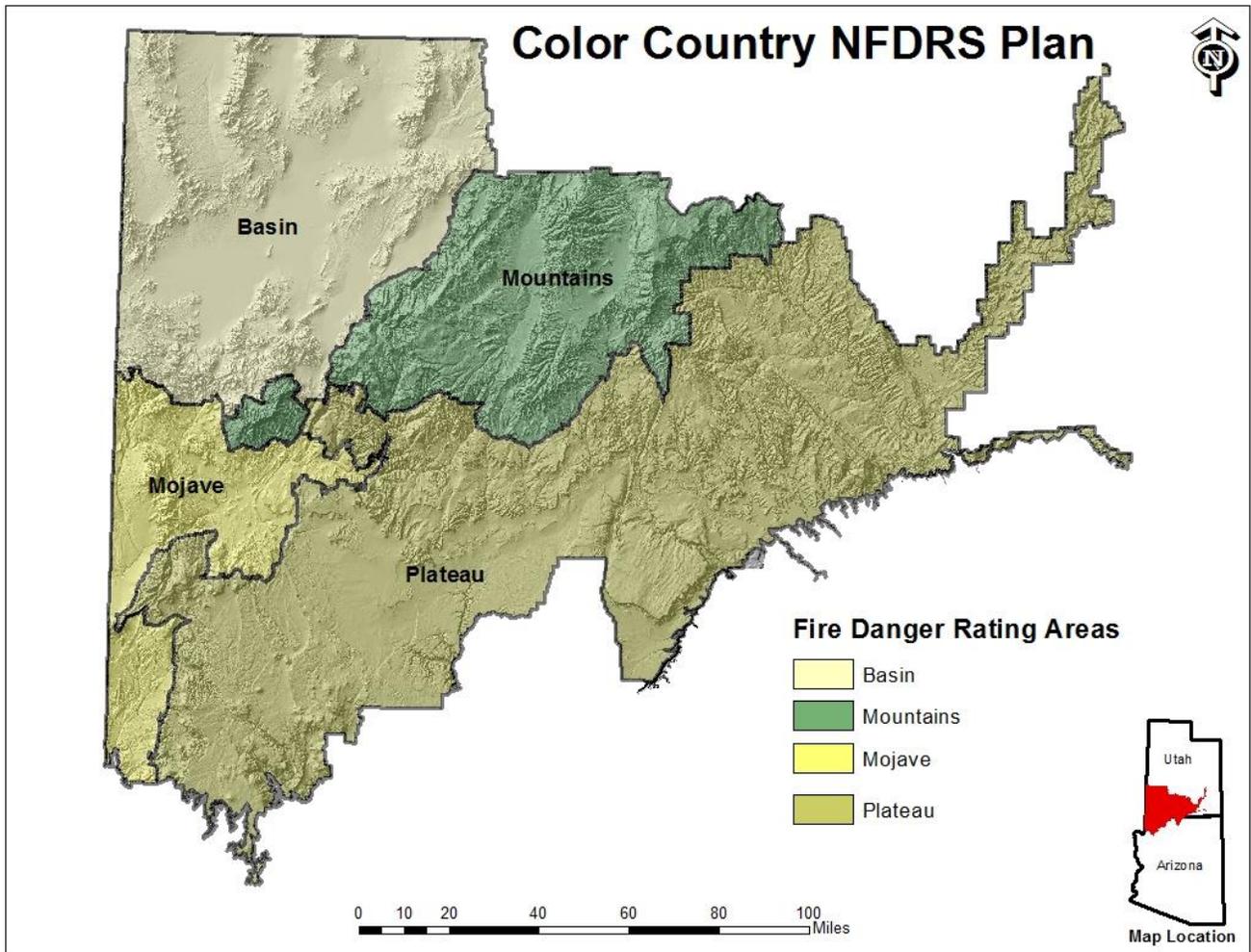
VIII. Appendices

A. Maps

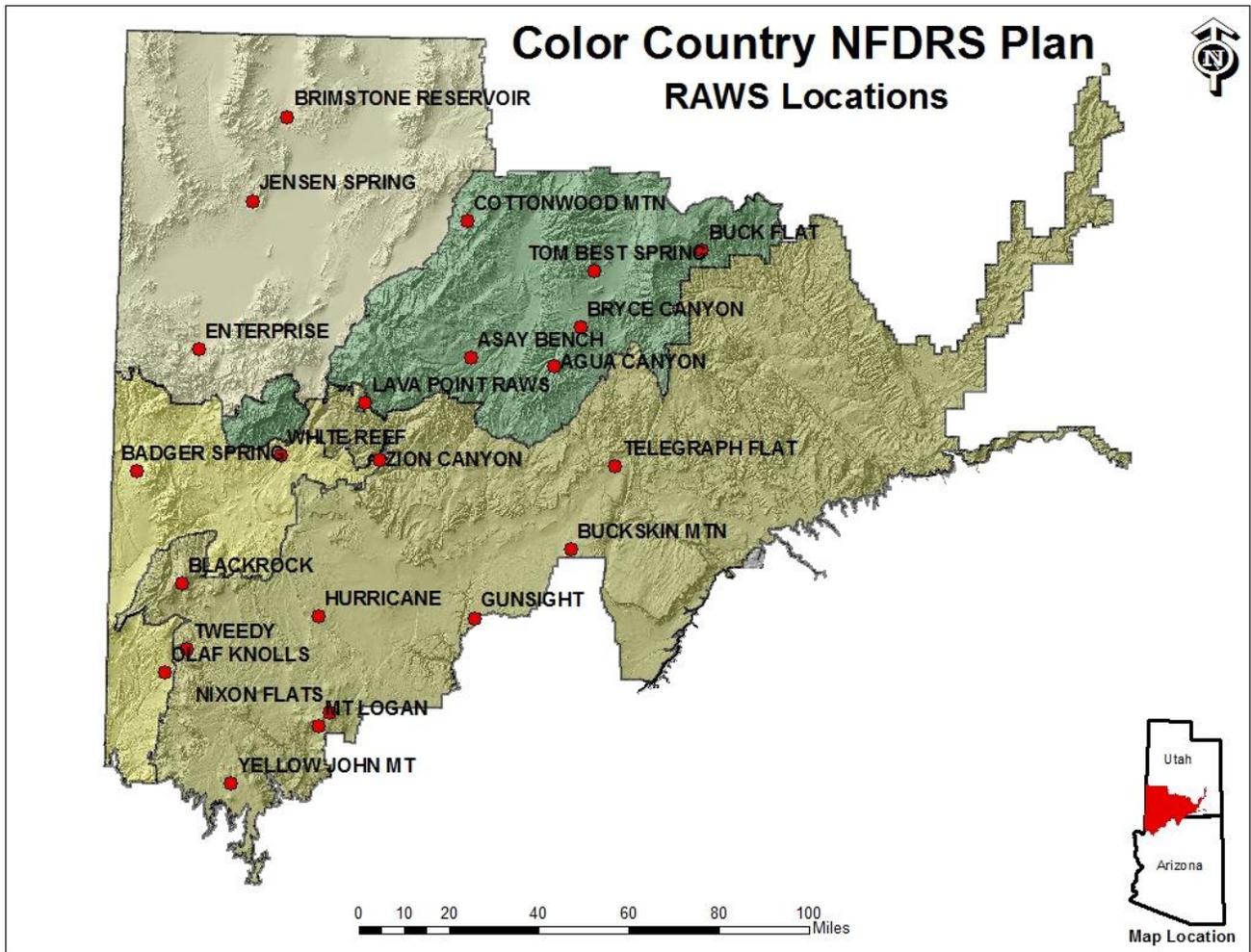
1. Agency Units participating in operating plan



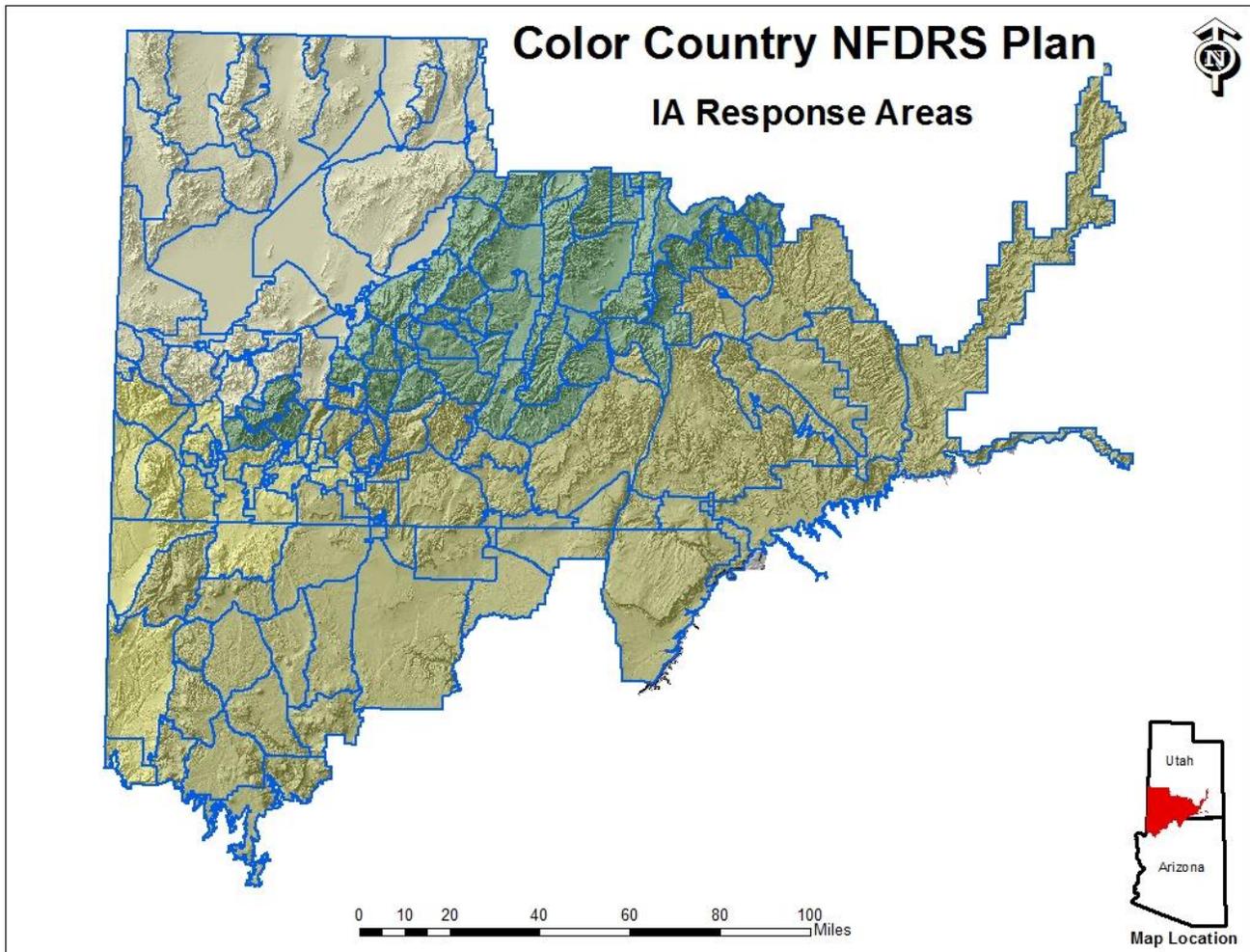
2. Fire Danger Rating Areas



3. Weather Stations



4. IA Response Areas



B. Summary of Weather Data clean-up

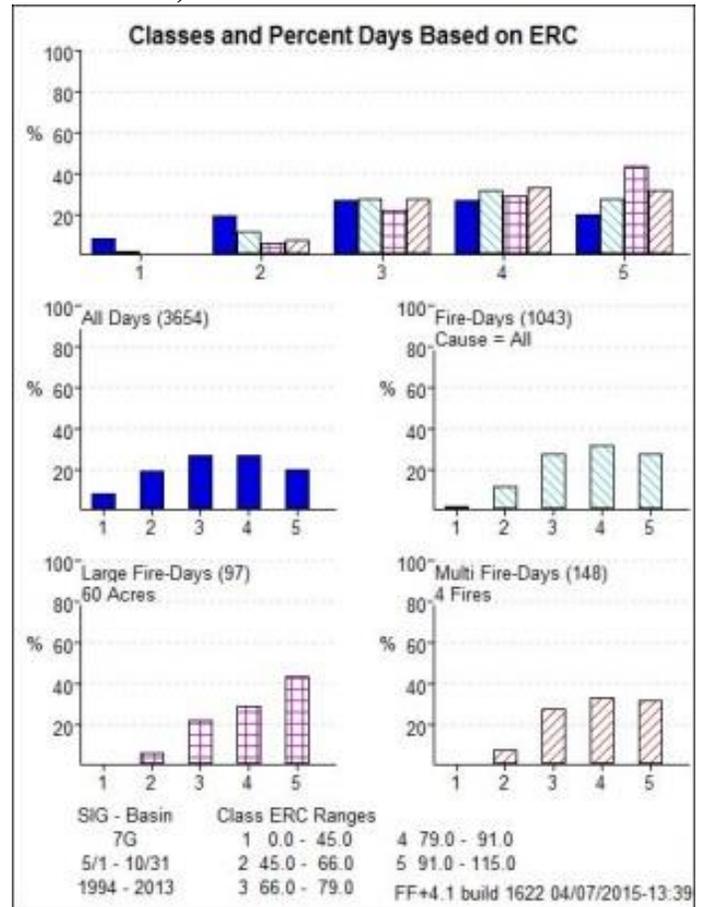
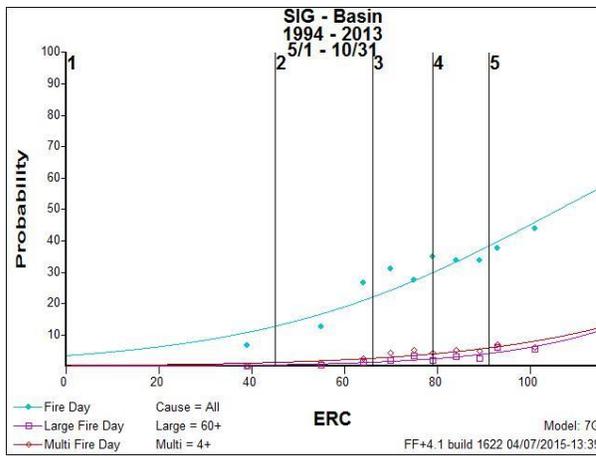
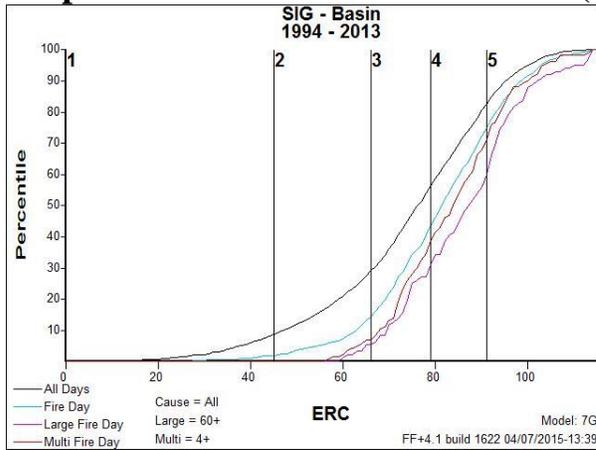
Weather data was downloaded from KCFast for each weather station. Clean-up consisted primarily of looking for missing data and checking for extremes in precipitation, windspeed, temperature, and RH. If extreme values were found, they were reduced to more reasonable levels based on observations from nearby RAWS.

C. Summary of Fire Data clean-up

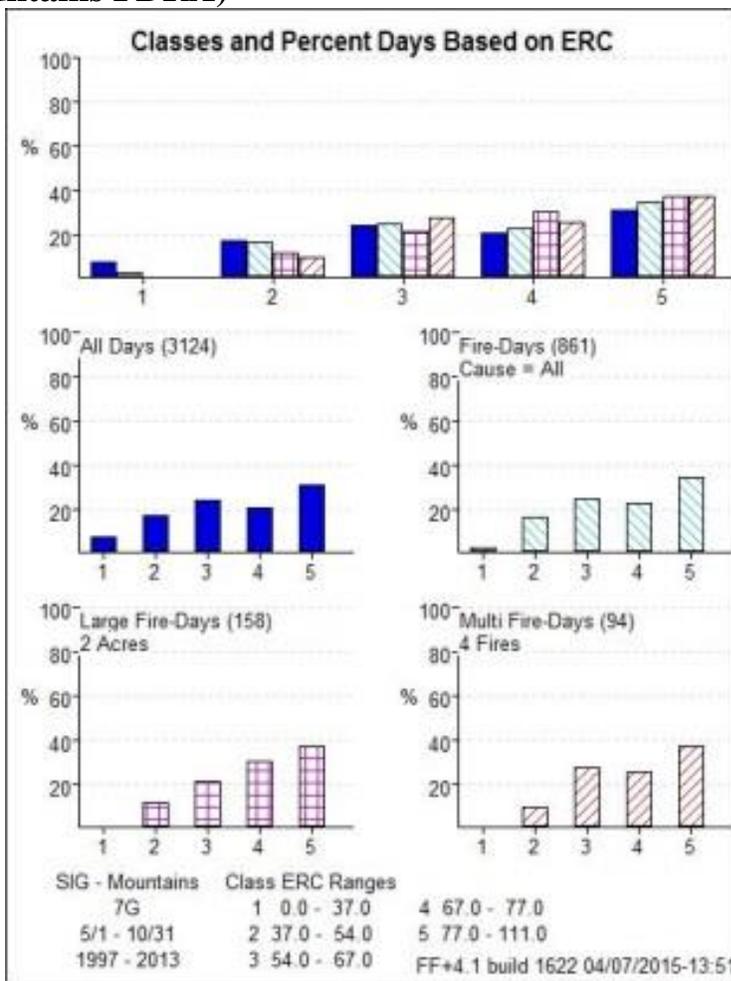
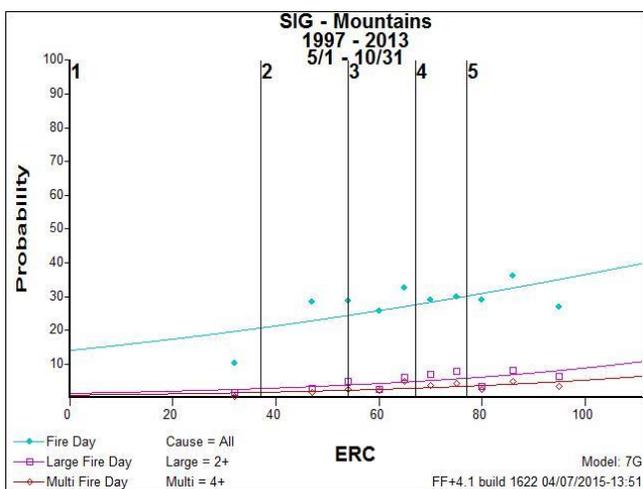
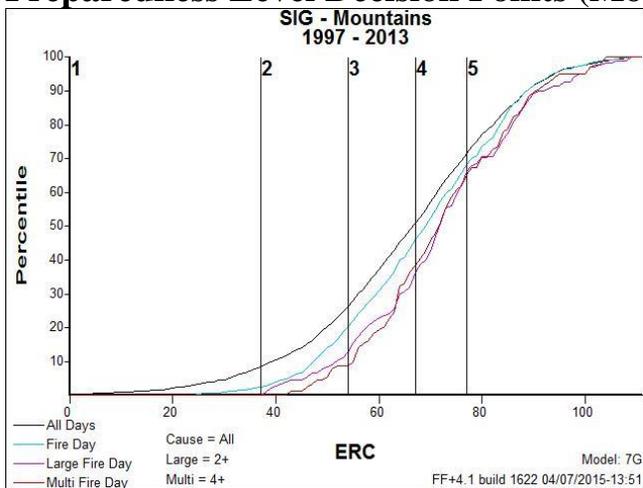
GIS fire history point shapefiles were collected from the Forest Service, Bureau of Land Management, National Park, and State of Utah. Fires for the Southern Paiute BIA were downloaded from famweb. These datasets were combined and clipped to the Color Country boundary. A subcommittee of the NFDERS Technical Group reviewed the fires and removed duplicates and identified fires that were not immediately suppressed. In most cases, for fires that were allowed to burn, the date was changed from the start date to the date the fire showed significant growth. This edited fire data set was then loaded into Fire Family Plus for use in the statistical analysis.

D. FireFamily Plus Analysis – Fire Business Candidates table and Decision Point tables & graphs

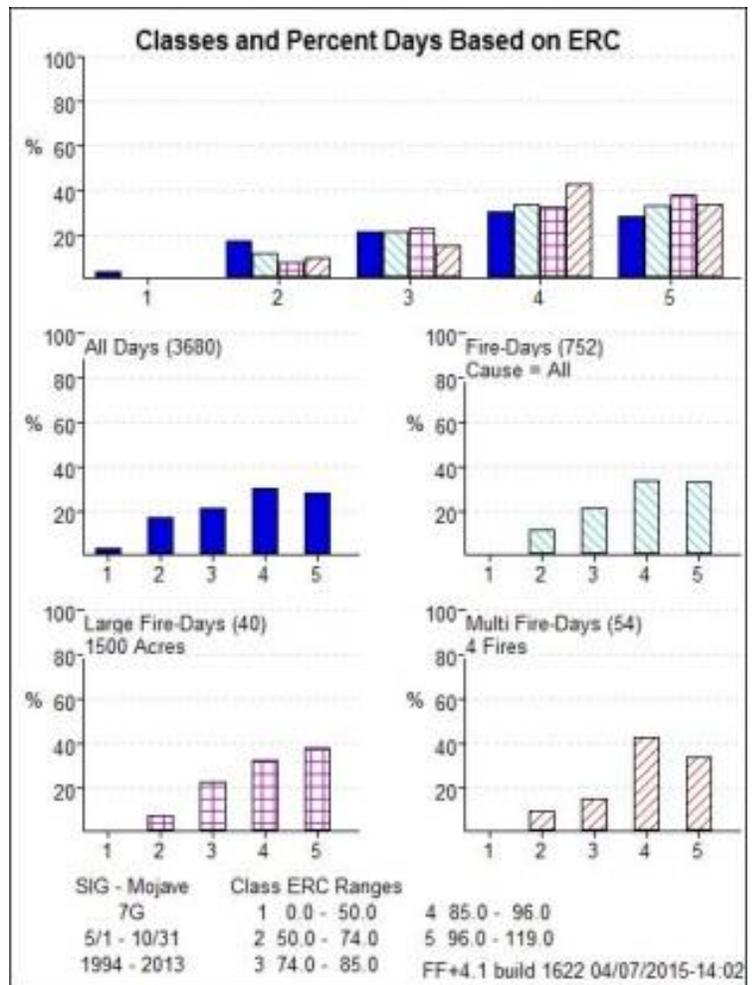
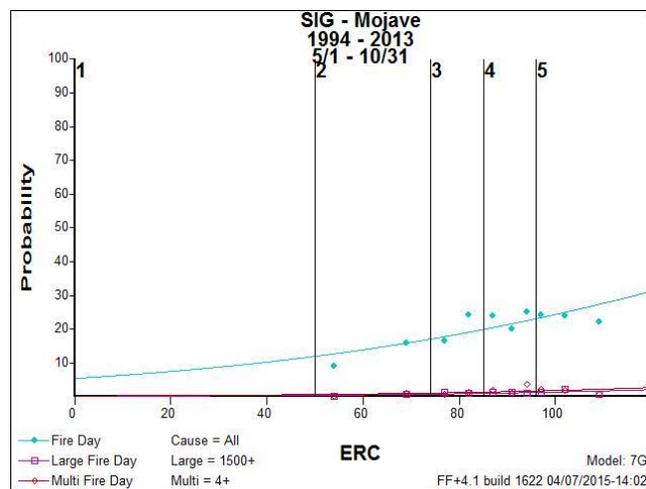
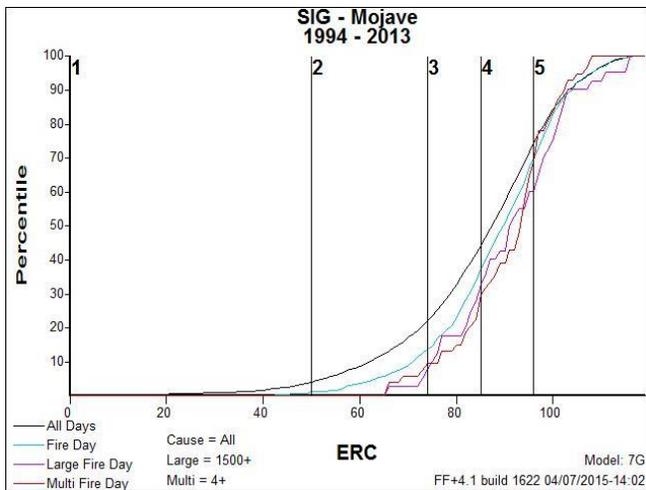
Preparedness Level Decision Points (Basin FDRA)



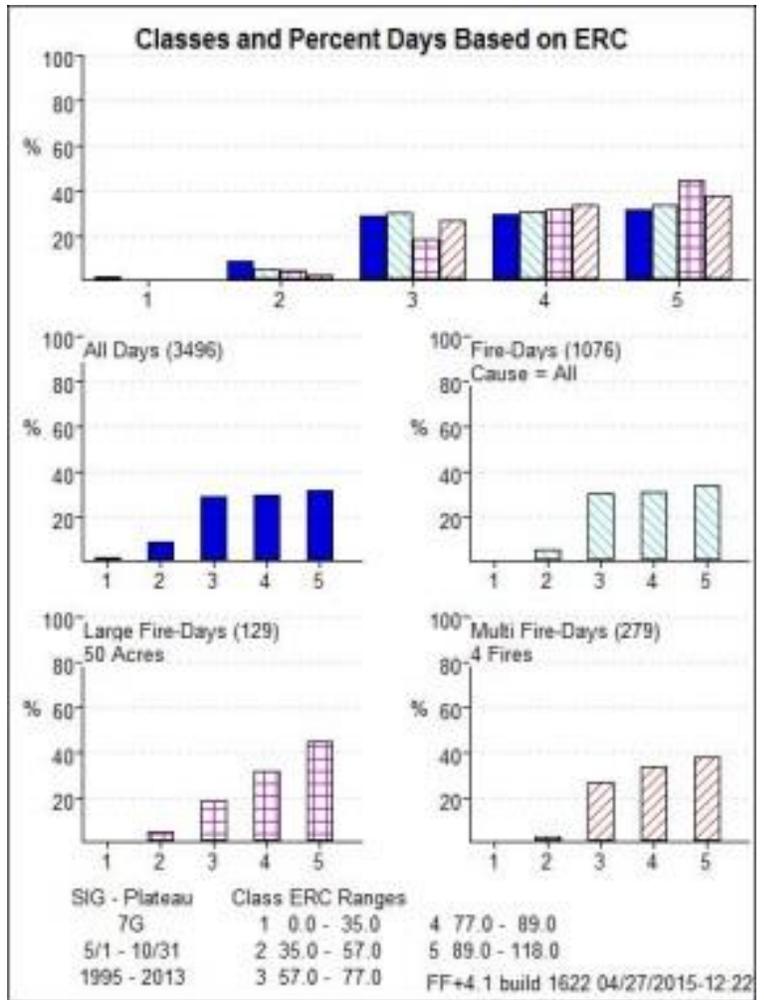
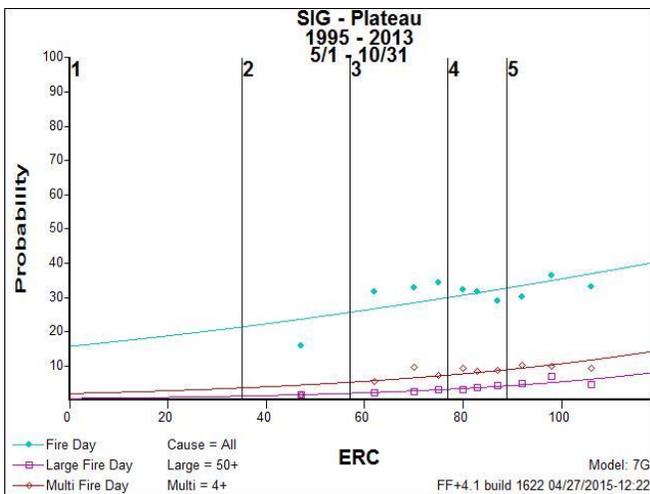
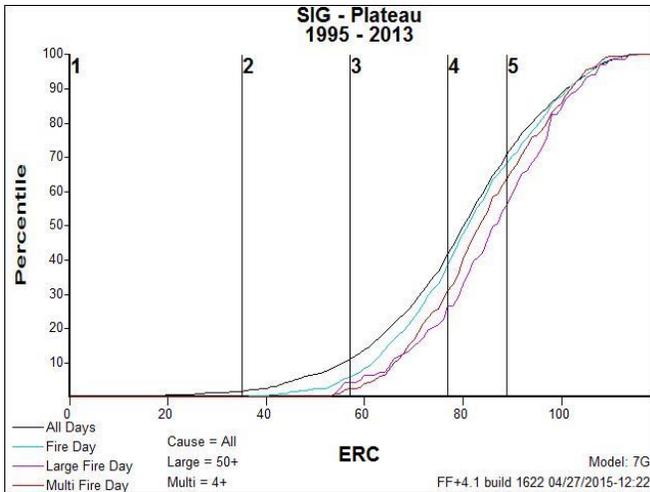
Preparedness Level Decision Points (Mountains FDRA)



Preparedness Level Decision Points (Mojave FDRA)



Preparedness Level Decision Points (Plateau FDRA)



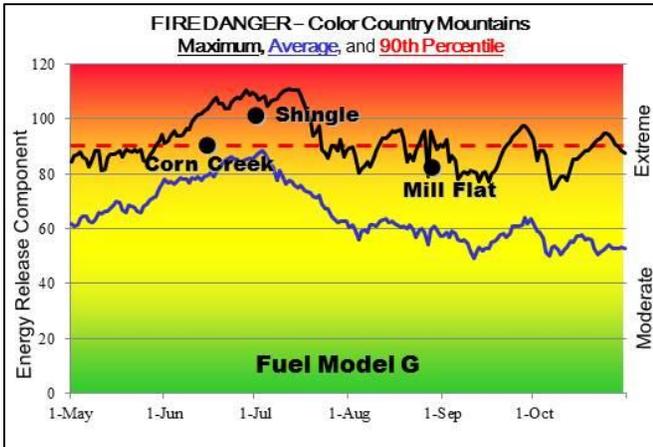
Preparedness Level: Fire Family Plus Analysis Factors and Determinations

Rating Area	RAWS	Data Years Used	Weighting Factor	Fuel Model	NFDRS Index	Fire Business Break Point Ranges	
Basin	Jensen Spring Brimstone Res. Enterprise	1994-2013	1	G	ERC	PL 1	0 - 45
			1			PL 2	46 - 66
			1			PL 3	67 - 79
						PL 4	80 - 91
						PL 5	92 +
Mountains	Asay Bench Buck Flat Agua Canyon Tom Best Spring	1997-2013	1	G	ERC	PL 1	0 - 37
			1			PL 2	38 - 54
			1			PL 3	55 - 67
			1			PL 4	68 - 77
						PL 5	78 +
Mojave	Zion Canyon White Reef Tweedy	1994-2013	1	G	ERC	PL 1	0 - 50
			1			PL 2	51 - 74
			1			PL 3	75 - 85
						PL 4	86 - 96
						PL 5	97+

Plateau	Telegraph Flat Tweedy Buckskin Mtn. Gunsight	1995- 2013	1 1 1 1	G	ERC	PL 1 PL 2 PL 3 PL 4 PL 5	0 – 35 36 – 57 58 – 77 77 – 89 90 +
----------------	---	-----------------------	----------------------------	----------	------------	---	--

E. PocketCards by FDRA

<p>FIRE DANGER – Color Country Basin Maximum, Average, and 90th Percentile</p> <p>Energy Release Component</p> <p>1-May 1-Jun 1-Jul 1-Aug 1-Sep 1-Oct</p> <p>Milford Flat Cove Mtn Frisco</p> <p>Fuel Model G</p> <p>Extreme Moderate</p>	<p>Fire Danger Area: Basin</p> <ul style="list-style-type: none"> Color Country Interagency Fire Management Area Color Country BLM and Dixie NF Fire Wx Forecast Zone UTZ 495 Jensen Spring* (422502), Enterprise* (422803), and Brimstone Res.* (422203) RAWS *Meets NWCG Weather Station Standards <p>Fire Danger Graph Interpretation:</p> <p> EXTREME – Use extreme caution CAUTION – Watch for change MODERATE – Lower potential, but always be aware</p> <p>MAXIMUM – Highest ERC / BI by day for 1994 - 2013 AVERAGE – Average daily ERC / BI value for 1994 – 2013 90th Percentile ERC – Only 5% of the days from 1994 – 2013 were over 96 80th Percentile BI – Only 20% of the days from 1994 – 2013 were over 100</p> <p>Local Thresholds – Watch Out: A combination of any of these 90th percentile factors can greatly increase fire behavior: 20' Wind Speed over 18 mph, Relative Humidity below 6%, Temperature over 95 degrees, Haines Index of 5 or 6</p>
<p>Maximum, Average, and 80th Percentile</p> <p>Burning Index</p> <p>1-May 1-Jun 1-Jul 1-Aug 1-Sep 1-Oct</p> <p>Milford Flat Cove Mtn Frisco</p> <p>Fuel Model G</p> <p>Extreme Moderate</p>	<p>Remember what Fire Danger tells you:</p> <ul style="list-style-type: none"> ✓ Energy Release Component gives seasonal trends calculated from 13:00 temperature and RH, daily temperature & RH ranges, and precipitation duration ✓ Burning Index gives day to day fluctuations calculated from 13:00 temperature, wind, and RH, daily temperature & RH ranges, and precipitation duration ✓ Burning Index divided by 10 gives an estimate of expected surface fire flame length. Double the estimate if it is crowning in brush or juniper. <p>Past Fire Experience:</p> <p>State/CCD BLM Milford Flat Fire July 6, 2007 (ERC 113, BI 154), 357,185 acres. Brimstone Reservoir RAWS Temp. 100, RH 4, Windspeed 26 mph.</p> <p>Pine Valley RD Cove Mountain Fire June 30, 2006 (ERC 94, BI 65), 18,825 acres. Enterprise RAWS Temp. 93, RH 14, Windspeed 6 mph.</p> <p>CCD BLM Frisco Fire July 16, 2005 (ERC 94, BI 82), 1,885 acres. Brimstone Reservoir RAWS Temp. 99, RH 8, Windspeed 5 mph.</p> <p>Check with local personnel about cheatgrass fuel loading. Large fires can occur at low ERC if annual grasses and fine fuels are continuous enough to carry a fire.</p> <p>Produced April 15, 2015 using FireFamily+ v4.1 (CC_NFDRS_2014.mdb)</p> <p style="writing-mode: vertical-rl; transform: rotate(180deg);">Responsible Agency : Color Country Interagency Fire</p>



Fire Danger Area: Mountain

- Color Country Interagency Fire Management Area
- Dixie NF, Color Country BLM, Zion, Bryce Canyon, and Cedar Breaks NPS
- Fire Wx Forecast Zone UTZ 496
- Agua Canyon* (422903), Asay Bench* (422604) Buck Flat* (422606) and Tom Best Spring* (422608) RAWS
- *Meets NWCG Weather Station Standards

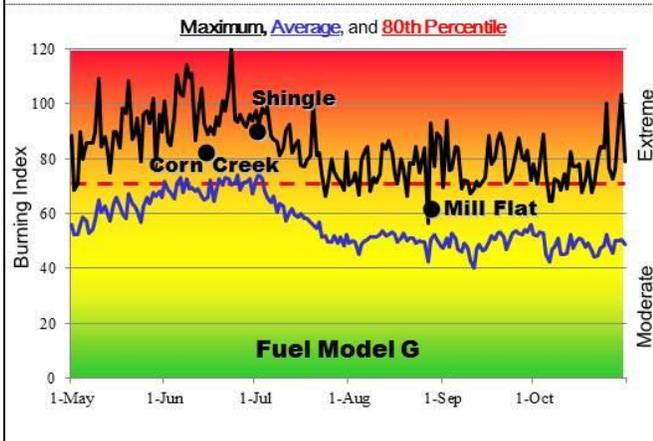


Fire Danger Graph Interpretation:

EXTREME – Use extreme caution
CAUTION – Watch for change
MODERATE – Lower potential, but always be aware

MAXIMUM – Highest ERC / BI by day for 1997 - 2013
AVERAGE – Average daily ERC / BI value for 1997 – 2013
90th Percentile ERC – Only 10% of the days from 1997 – 2013 were over **89**
80th Percentile BI – Only 20% of the days from 1997 – 2013 were over **71**

Local Thresholds – Watch Out:
 A combination of any of these 90th percentile factors can greatly increase fire behavior: 20' Wind Speed over 9 mph, Relative Humidity below 8%, Temperature over 83 degrees, Haines Index of 5 or 6



Remember what Fire Danger tells you:

- Energy Release Component gives seasonal trends calculated from 13:00 temperature and RH, daily temperature & RH ranges, and precipitation duration
- Burning Index gives day to day fluctuations calculated from 13:00 temperature, wind, and RH, daily temperature & RH ranges, and precipitation duration
- Burning Index divided by 10 gives an estimate of expected flame length

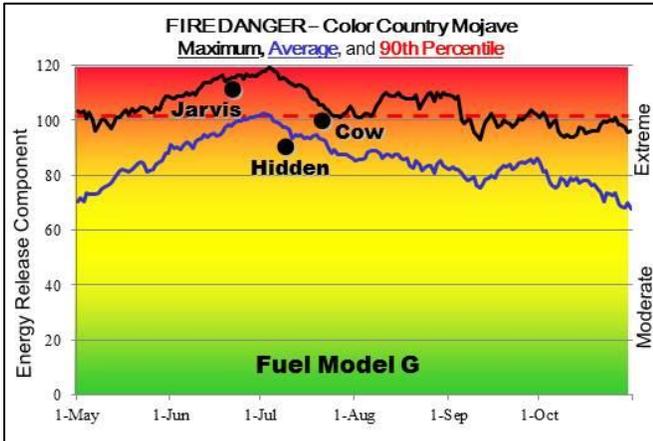
Past Fire Experience:

- Pine Valley RD** Mill Flat Fire (major spread event) Aug. 29, 2009 (ERC 83, BI 63), 12,607 acres. Lava Point RAWS Temp. 87, RH 12, Windspeed 8 mph.
- Cedar City RD** Shingle Fire July 1, 2012 (ERC 102, BI 91), 8,061 acres. Asay RAWS Temp. 87, RH 5, Windspeed 13 mph.
- Escalante RD** Corn Creek Fire June 15, 2008 (ERC 89, BI 84), 2,269 acres. Buck Flat RAWS Temp. 84, RH 5, Windspeed 6 mph.

Check with local personnel about cheatgrass fuel loading. Large fires can occur at low ERC if annual grasses and fine fuels are continuous enough to carry a fire.

Produced April 15, 2015 using FireFamily+ v4.1 (CC_NFDRS_2014.mdb)

Responsible Agency : Color Country Interagency Fire



Fire Danger Area: Mojave

- Color Country Interagency Fire Management Area
- Color Country and AZ Strip BLM, Southern Paiute BIA and Zion NP
- Fire Wx Forecast Zones UTZ 497 and AZZ 102
- Zion Canyon* (422808), Tweedy* (020109), and White Reef* (422805) RAWS
- *Meets NWCG Weather Station Standards

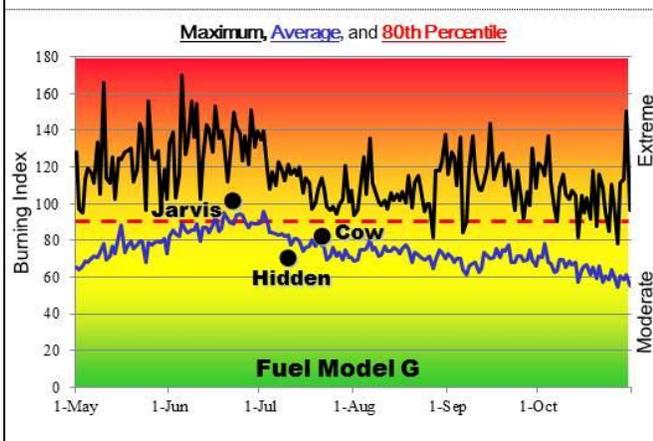


Fire Danger Graph Interpretation:

EXTREME – Use extreme caution
CAUTION – Watch for change
MODERATE – Lower potential, but always be aware

MAXIMUM – Highest ERC / BI by day for 1994 - 2013
AVERAGE – Average daily ERC / BI value for 1994 – 2013
90th Percentile ERC – Only 5% of the days from 1994 – 2013 were over **104**
80th Percentile BI – Only 20% of the days from 1994 – 2013 were over **92**

Local Thresholds – Watch Out:
 A combination of any of these 90th percentile factors can greatly increase fire behavior: 20' Wind Speed over 13 mph, Relative Humidity below 6%, Temperature over 100 degrees, Haines Index of 5 or 6



Remember what Fire Danger tells you:

- Energy Release Component gives seasonal trends calculated from 13:00 temperature and RH, daily temperature & RH ranges, and precipitation duration
- Burning Index gives day to day fluctuations calculated from 13:00 temperature, wind, and RH, daily temperature & RH ranges, and precipitation duration
- Burning Index divided by 10 gives an estimate of expected surface fire flame length. Double the estimate if it is crowning in brush or juniper.

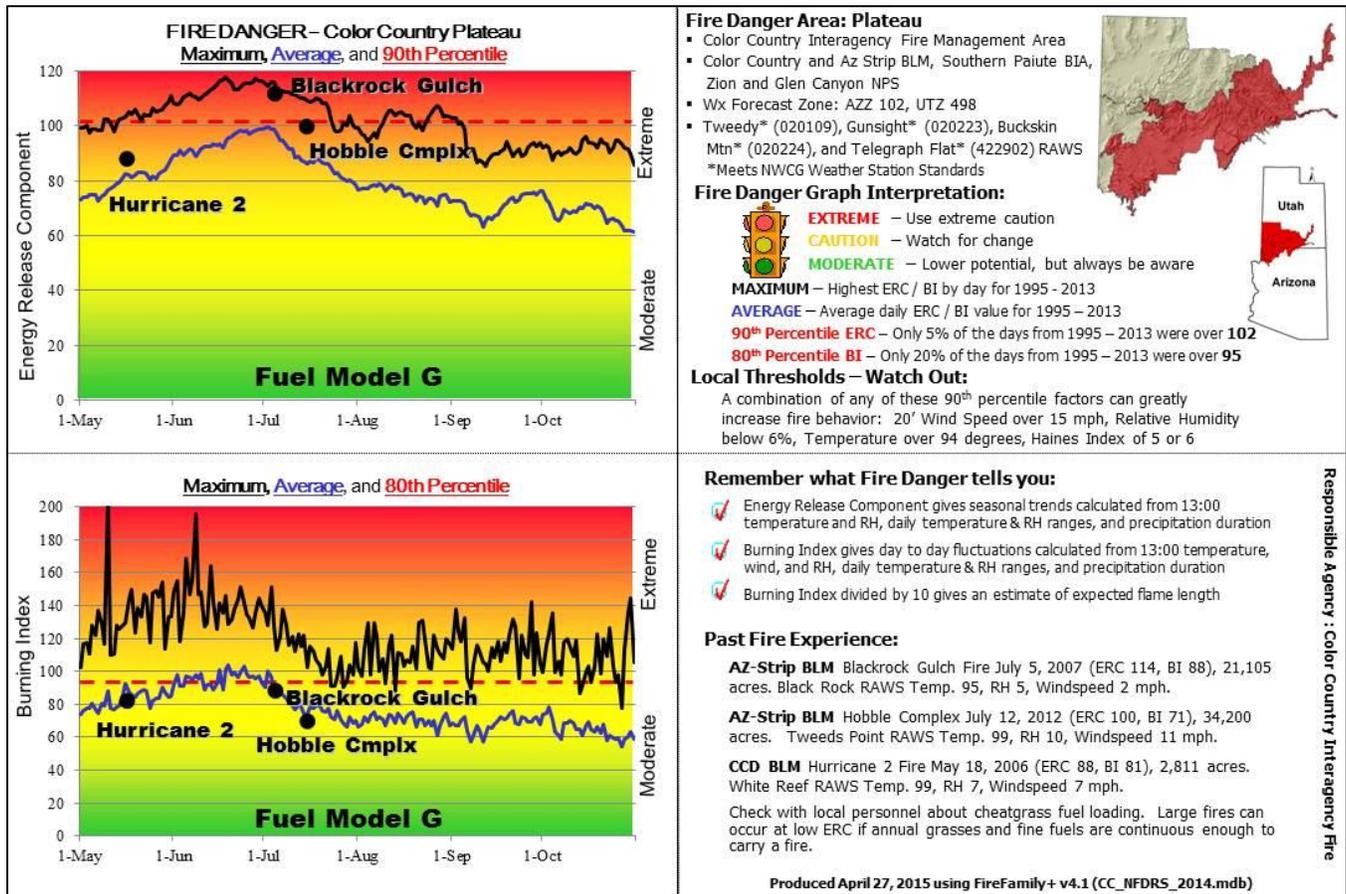
Past Fire Experience:

- AZ-Strip BLM** Cow Fire July 21, 2005 (ERC 100, BI 83), 44,707 acres. Tweeds Point RAWS Temp. 96, RH 13, Windspeed 11 mph.
- CCD BLM** Jarvis Fire June 25, 2006 (ERC 111, BI 104), 50,737 acres. Badger Spring RAWS Temp. 105, RH 4, Windspeed 9 mph.
- AZ-Strip BLM** Hidden Fire July 9, 2011 (ERC 86, BI 76), 17,188 acres. Olaf Knolls RAWS Temp. 101, RH 18, Windspeed 7 mph.

Check with local personnel about cheatgrass fuel loading. Large fires can occur at low ERC if annual grasses and fine fuels are continuous enough to carry a fire.

Produced April 15, 2015 using FireFamily+ v4.1 (CC_NFDRS_2014.mdb)

Responsible Agency : Color Country Interagency Fire



F. Technical References

G. Definitions

- Daily Staffing Levels/Plan –also called Step-Up Plan; direct incremental preparedness actions in response to increasing fire danger only, i.e. what resources are available & response timeframes; each unit defines the number of levels based on fire business but define 3-11 (5 or 6 typical).
- Dispatch Plan – also called Initial or Preplanned Response Plan or Run Cards; specifies the suppression response within a defined geographic area, i.e. what number & kind of resources are sent; each unit defines the number of levels based on fire business but typically define 2-4.
- Preparedness Plan – required at national, state/regional, & local levels; provide management directions based on burning conditions (fire danger), fire activity, & resource commitment/availability; each unit must define 5 levels.
- Prevention Plan – direct mitigation activities based on adjective rating to prevent human-caused fires, i.e. what education actions are indicated by Smokey’s arm; are 5 nationally-recognized color/adjective rating levels but units may chose not to define actions for all 5.
- Restriction/Closure Plan – actions taken to restrict public or industrial activities at the Extreme Adjective Rating, i.e. what activities are prohibited or restricted in specified areas.