Central Nevada Interagency Dispatch Center
Fire Danger Operating and Preparedness Plan
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Central Nevada Interagency Dispatch Center

Fire Danger Operating and Preparedness Plan

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I. INTRODUCTION

This plan is intended to document a 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.

An appropriate level of preparedness to meet wildland fire management objectives is based upon an assessment of vegetation, climate, and topography utilizing the National Fire Danger Rating System (NFDRS) modeling. This plan combines an Operating Plan with a Preparedness Plan for the three primary wildland fire management agencies responsible for wildland fire management in the Central Nevada Interagency Dispatch Center (Bureau of Land Management, United States Forest Service, and Bureau of Indian Affairs).

Guidance and policy for development of a Fire Danger Operating and Preparedness Plan can be found in the *Interagency Standards for Fire & Aviation Operations* (*Red Book*), *Wildland Fire and Aviation Program and Management and Operation Guide* (*Blue Book*), and *Forest Service Manual 5120*.

On July 6, 1994, the South Canyon Fire resulted in the deaths of 14 firefighters in Colorado. In 1995, an Interagency Management Review Team for the South Canyon Fire charged the National Advisory Group for Fire Danger Rating with developing "an implementation plan to improve technical transfer of fire danger technology." On July 10, 2001, four firefighters lost their lives on the Thirtymile Fire in Washington. The Thirtymile tragedy prompted an Accident Prevention Plan which contained specific actions to enhance firefighter safety, including the need to identify thresholds for critical fuels and weather conditions that lead to extreme burning conditions and publishing these on pocket cards for use by firefighters. On July 22, 2003, two firefighters lost their lives in the Cramer Fire in central Idaho. OSHA levied serious violations which included the failure to recognize fire danger thresholds for large fires and respond accordingly. In addition, a remote automated weather station (RAWS) near the fire had not received maintenance and calibration before the start of the fire season. This plan addresses action items identified in these tragic fires by providing the direction necessary to convey fire danger awareness to fire management personnel of escalating fire potential. This awareness is critical when wildland fire danger levels exceed thresholds which may significantly compromise safety and control.

This is the second revision (since 2005) of the Central Nevada Interagency Dispatch Center Fire Danger Operating and Preparedness Plan. In the previous version, three different Fire Danger Rating Areas (FDRAs) had been delineated: the North FDRA, the Central FDRA, and the South FDRA. Subsequently, fire managers have identified that the climate and vegetation characteristics in the North FDRA extend further south into the Battle Mountain District. Additionally, the Central and South FDRAs were adjusted to be more representative of the change in Fire Danger from the higher elevation mountains of Central Nevada, to the deserts in the south. This 2014 version identifies three Fire Danger Rating Areas: Humboldt Basin, Toiyabe Mountains, and Mohave Desert.

II. OBJECTIVES

A. Provide a tool for agency administrators, fire managers, dispatchers, agency cooperators, and firefighters to correlate fire danger ratings with appropriate fire business decisions in the Central Nevada Interagency Dispatch Center.

B. Delineate fire danger rating areas (FDRAs) in the Central Nevada Interagency Dispatch Center with similar climate, vegetation, and topography.

C. Establish an interagency fire weather-monitoring network consisting of Remote Automated Weather Stations (RAWS) which comply with *NFDRS Weather Station Standards* (PMS 426-3).

D. Determine fire business thresholds 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.

E. Define roles and responsibilities to make fire preparedness decisions, manage weather information, and brief fire suppression personnel regarding current and potential fire danger.

F. Determine the most effective communication methods for fire managers to communicate potential fire danger to cooperating agencies, industry, and the public.

G. Provide guidance to interagency personnel outlining specific daily actions and considerations at each preparedness level.

H. Identify seasonal risk analysis criteria and establish general fire severity thresholds.

I. Identify the development and distribution of fire danger pocket cards to all personnel involved with fire suppression activities within the Central Nevada Interagency Dispatch Center.

J. Identify program needs and suggest improvements for the Fire Danger Operating and Preparedness Plan.

III. INVENTORY AND ANALYSIS

In order to apply a system which will assist managers with fire management decisions, the problems must be inventoried and analyzed to determine the most appropriate management control mechanism which will adequately address the issues.

A. Involved Parties

This plan will affect a wide range of entities. However, these entities can be grouped into three primary categories:

1. **Agency:** Employees of the federal, state, and local governments involved in the cooperative effort to suppress wildland fires. This includes BLM, USFS, BIA, County and volunteer fire departments.

2. **Industry:** Organizations that either utilize the natural resources or have permits to conduct activities on federal, state, or private lands for commercial purposes. These entities include utility companies (power/phone), ranchers, mines, hazardous material disposal sites, railroads, building construction, etc.

3. **Public:** Individuals who use the land for recreational purposes such as off-highway vehicle (OHV) use, camping, hiking, fishing, firewood gathering, mountain biking, or general travel. This group also includes those living within the wildland/urban interface.

B. Fire Problem Analysis

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

1. **Involved Party:** The group of people commonly associated with the Action (Agency, Industry or Public).

2. **Action:** This is the problem specific to the area of concern and includes ignition causes. The problem is "framed" to focus on the wildland fire management issue, such as the point when fire activity becomes a burden to the local suppression forces.

3. **Controllability:** This is a general description of how much control the agencies have over these entities (High $\rightarrow$ Low) and how quickly a target group can respond to management actions.

4. **Management Action:** This is the decision(s) which will affect the public, industry, or agency personnel. This includes fire management applications which can be used to formulate decisions regarding the potential issues which have been identified for the specific area. Management actions represent a way to link fire danger information with fire management decisions which affect specific target groups. Consider the appropriate set of decision thresholds to address the issue (i.e., Dispatch Level, Staffing Level, Preparedness Level, Adjective Rating, etc.).

5. **Interface Method:** Forms of communication used with the user group (face-to-face, radio, telephone, email, newspaper, television, signing/posting, text-messaging, etc.).

6. **Potential Impacts (Positive and Negative):** The potential impacts on the target group and the likely consequences of a good (or bad) decision.

7. **Decision Tool:** Sensitivity of the NFDRS outputs should be consistent with the ability to react (or communicate) to the target group. Memory and variability of the selected component or index must be understood to appropriately match the task and user group. If a situation where control and ability to communicate with the target group is high, the component and/or index which would be most appropriate should also be highly reactive to changing conditions (i.e., Ignition Component, Spread Component). If the situation was reversed where the control and ability to communicate with the target group is low, the appropriate component and/or index should not vary significantly over time (i.e., Energy Release Component)

Fire Analysis Chart

Involved Party	Action	Controllability	Management Action	Interface Method	Potential Positive Impacts	Potential Negative Impacts	Decision Tool
Agency	Lightning—suppression resources are committed to multiple fires	High	Staffing Level Dispatch Level	Radio Telephone E-mail Pager	Successful IA	Resources not essential for successful IA	Burning Index
	Automatic Dispatch of Initial Attack Resources		Dispatch Level		Successful IA	Accidents/Incidents	Burning Index
	Pre-positioning of Resources		Staffing Level Preparedness Level		Resources effective	Resources not essential for successful IA	Burning Index Energy Release Component
	Extended Staffing		Staffing Level		Improved IA Capability	Financial Logistical	Burning Index
Industry	Mechanized equipment restrictions Railroad	Low/Moderate	Adjective Fire Rating	Newspaper Television Local Radio Internet Face-to-Face	Prevention of fires	Political Financial	Energy Release Component
	Debris Burning/ Fire Restrictions/Burn permits		Adjective Fire Rating		Prevention of fires	Political Financial	Energy Release Component
	Area closures		Adjective Fire Rating		Prevention of fires	Political Financial	Energy Release Component
Public	Debris Burning/Fire Restrictions/Burn Permits	Low	Adjective Fire Rating	Newspaper Television Local Radio Internet Face-to-Face	Prevention of fires	Political Public Perception	Energy Release Component
	Unattended camp fires		Adjective Fire Rating		Prevention of fires	Political Financial	Energy Release Component
	OHV Restrictions		Adjective Fire Rating		Prevention of fires	Political Financial	Energy Release Component

C. Fire Danger Rating Areas

A Fire Danger Rating Area (FDRA) is a geographic area relatively homogenous in *climate*, *vegetation* and *topography*. It can be assumed that the fire danger within a region is relatively uniform.

1. Humboldt Basin FDRA

a. Location: The Humboldt Basin FDRA covers lands located within the Winnemucca District BLM, USFS Santa Rosa District Humboldt-Toiyabe National Forest (HTF), McDermitt, BIA, and the northern portion of the Battle Mountain District BLM. This is primarily BLM and Forest Service administered with scattered tracts of BIA, private and state lands administered by the counties and state.

b. Vegetation: The fuels of the Humboldt Basin FDRA consist of: forbs, perennial native and non-native grasses, invasive annual grasses, salt desert shrub, mountain shrubs, sagebrush, scattered aspen groves, and intermixed pinyon-juniper. The vegetation best described as a cold desert or Northern Great Basin plant community. The fuel model that depicts the vegetative state is NFDRS fuel model T and fuel model G. BI will be used to calculate Dispatch Levels and Staffing Levels. ERC will be used to calculate Adjective Fire Danger Levels and Preparedness Levels.

c. Climate: Hot and Dry weather typically dominates the Humboldt Basin FDRA during the fire season; Nevada is the third driest state in the nation. The temperatures reach into the 100's, relative humidity drops to the single digits, and wetting rains are scarce. Summer weather patterns that affect the area, are westerly and southwesterly flows. Westerly flows generally bring hot and dry air into the region with little to no precipitation. The main concern is when low pressure systems or upper level disturbances pass through the area with enough energy and moisture to initiate thunderstorm activity and erratic winds. Fire activity may be infrequent, but the potential for large growth is usually quite high. Southwesterly flows typically bring monsoonal moisture into the region. Fire frequency may increase due to additional thunderstorm activity, but large fire growth potential may be lower due to increased moisture.

d. Topography: The Humboldt Basin FDRA is a series of north to south mountain ranges, divided by flats, deserts, mesas, and canyons. Fire occurrence in this area is generally considered in slope class 1.

e. Fire Occurrence: The Humboldt Basin FDRA has an average of 106 fires per year (23 year fire occurrence).

2. Toiyabe Mountains FDRA

a. Location: The Toiyabe Mountains FDRA covers lands in the Austin and Tonopah Ranger Districts HTF divided by the central part of the Battle Mountain District Office. It primarily includes lands in Nye, Lander, and southern Eureka counties administered by the BLM, Forest Service, BIA, state and county.

b. Vegetation: The fuel complex of the Toiyabe Mountains FDRA is similar to the Humboldt Basin FDRA except that the area has a greater concentration of 100- and 1000-hour time lag fuels. The vegetation is best described as a high elevation basin and range plant community with salt desert shrub in the valley bottoms transitioning to

sagebrush, and pinyon-juniper as you increase in elevation, with mixed conifer stands at the highest elevations. The fuel model that depicts the vegetative state is NFDRS fuel model T and fuel model G. BI will be used to calculate Dispatch Levels and Staffing Levels. ERC will be used to calculate Adjective Fire Danger Levels and Preparedness Levels.

c. Climate: Hot and dry weather typically dominates the Toiyabe Mountains FDRA during the fire season. The temperatures reach into the 100's, relative humidity drops to the single digits, and wetting rains are scarce. Summer weather patterns that effect the areas are westerly and southwesterly flows. Westerly flows generally bring hot and dry air into the region with little to no precipitation. The main concern is when low pressure systems or upper level disturbances pass through the area with enough energy and moisture to initiate thunderstorm activity and erratic winds. Fire activity may be infrequent, but the potential for large growth is usually quite high. Southwesterly flows typically bring monsoonal moisture into the region. Fire frequency may increase due to additional thunderstorm activity, but large fire growth potential may be lower due to increased moisture. The primary difference between the Toiyabe Mountains FDRA and the Mohave Desert FDRA being cooler temperatures by as much as 10-20 degrees in the higher elevations.

d. Topography: The Toiyabe Mountains FDRA includes a series of north to south trending mountain ranges throughout central Nevada, separated by wide, lower elevation valleys. The drainages are steep, rocky, and often inaccessible. The remoteness of many of these areas hinders radio and cellular communications.

e. Fire Occurrence: The Toiyabe Mountains FDRA has an average of 15 fires per year (23 year fire occurrence).

3. Mohave Desert FDRA

a. Location: The Mohave Desert FDRA covers lands in the southern portion of the Battle Mountain District, extending south from the southern edge of the Austin-Tonopah Ranger District of the HTF. These lands encompass southern Nye and Esmeralda Counties and are primarily administered by the BLM with some Forest Service, BIA and scattered tracts of private and state lands.

b. Vegetation: The fuels of the Mohave Desert FDRA consist of: forbs, perennial grasses, western annual grasses, salt desert shrub, sagebrush, intermixed pinyon-juniper, and some small mixed conifer stands at the highest elevations. The vegetation is best described as an arid desert or Mojave plant community. The fuel model that depicts the vegetative state is NFDRS fuel model T and fuel model G. BI will be used to calculate Dispatch Levels and Staffing Levels. ERC will be used to calculate Adjective Fire Danger Levels and Preparedness Levels.

c. Climate: Hot and dry weather typically dominates the Mohave Desert FDRA during the fire season. Wetting rains are scarce while temperatures reach into the 100's and relative humidity drops into the single digits. Summer weather patterns that affect the area are westerly and southwesterly flows. Westerly flows generally bring hot and dry air into the region with little to no precipitation. The main concern is when low pressure systems or upper level disturbances pass through the area with enough energy and moisture to initiate thunderstorm activity and erratic winds. Southwesterly flows

typically bring monsoonal moisture into the region. Fire frequency may increase due to additional thunderstorm activity, but large fire growth potential may be lower due to increased moisture.

d. Topography: The Mohave Desert FDRA transitions from the higher-elevation based Toiyabe Mountains FDRA with its north-south trending ranges to a mixture of flats, deserts, mesas, and canyons.

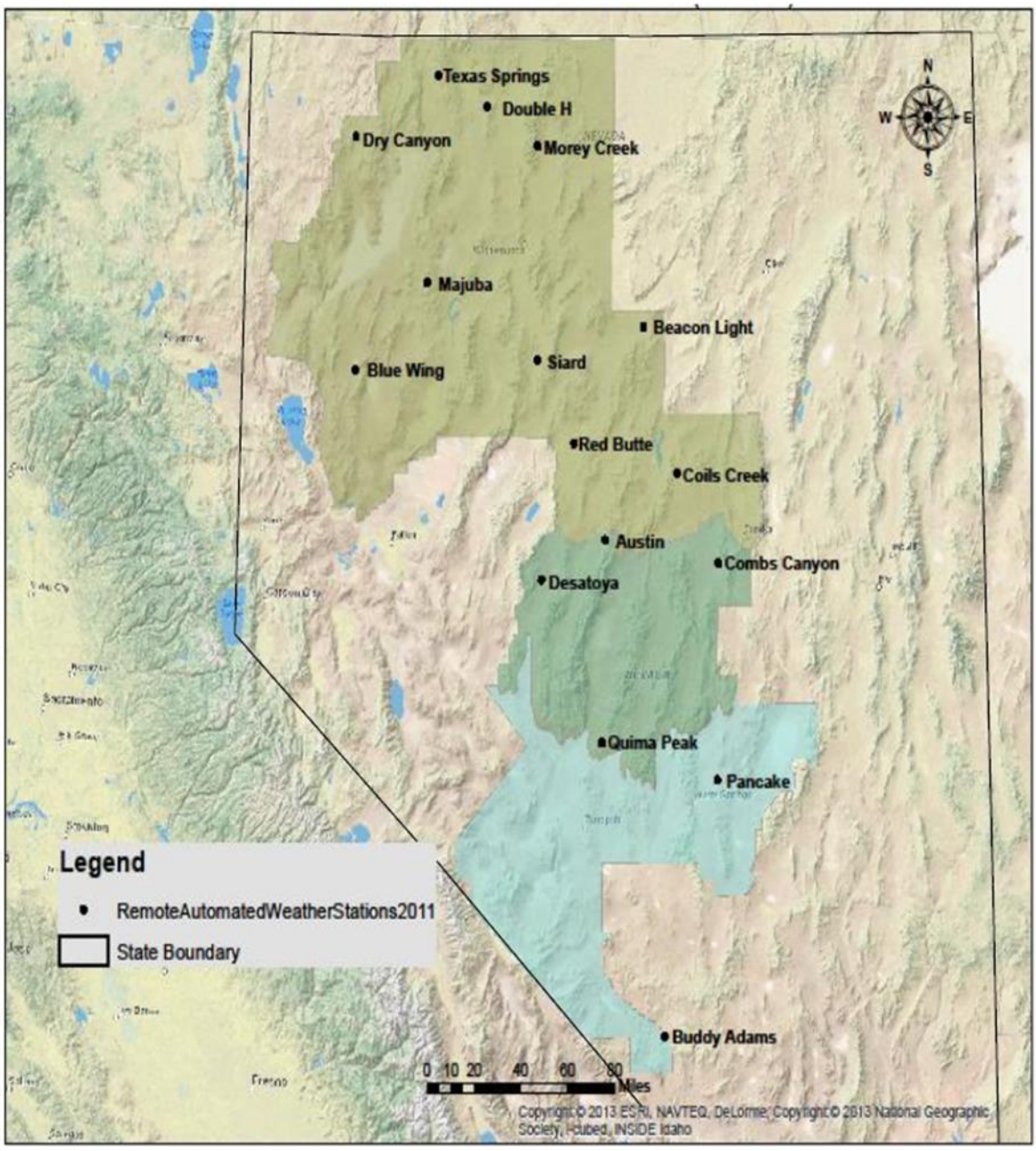
e. Fire Occurrence: The Mohave Desert FDRA has an average of 3 fires per year (23 year fire occurrence).

D. Weather Stations

1. Description

There are a total of 16 Remote Automatic Weather Stations (RAWS). The Winnemucca District (BLM) manages seven active RAWS: Dry Canyon, Texas Spring, Double H, Morey Creek, Blue Wing, Siard, and Majuba. The Battle Mountain District (BLM) manages seven active RAWS: Beacon Light, Red Butte, Coils Creek, Combs Canyon, Desatoya Mountain, Pancake, and Buddy Adams. The USFS Austin-Tonopah Ranger Districts of the HTF manage two active RAWS: Austin and Quima Peak. All of these stations comply with NWCG NFDRS Weather Station Standards (*http://www.nwcg.gov/pms/pubs/PMS426-3.pdf*).

2. RAWS Locations and Status (Map)

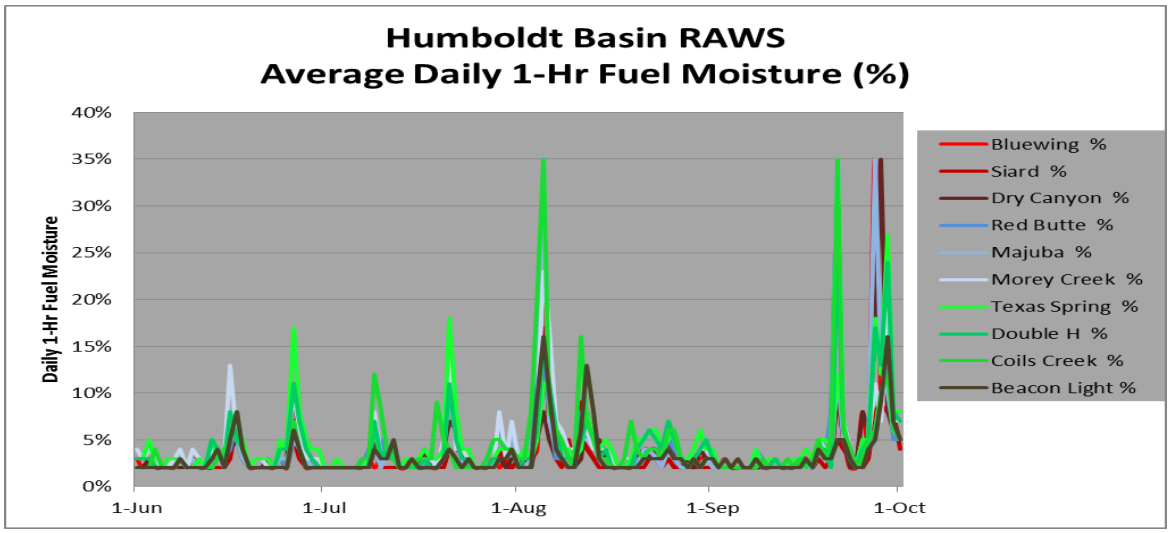


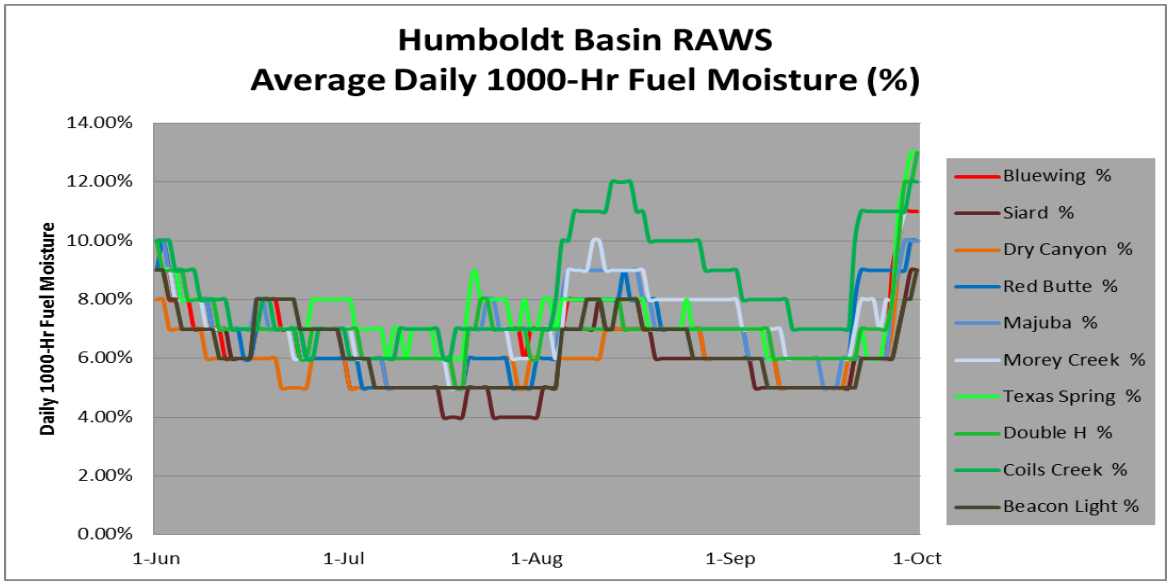
3. RAWS Summary (Table)

Station ID	Station Name	Status	Agency/Owner	Data Years	Elevation	Reporting Time	Fire Weather Zone
Humboldt Basin Fire Danger Rating Area							
260203	Dry Canyon	Active	BLM-NV-WID	1986-2014	4900'	XX:38:20	467
260206	Texas Spring	Active	BLM-NV-WID	1989-2014	5760'	XX:38:00	467
260207	Double H	Active	BLM-NV-WID	2009-2014	6380'	XX:47:10	468
260204	Morey Creek	Active	BLM-NV-WID	1986-2014	5500'	XX:37:50	468
260505	Beacon Light	Active	BLM-NV-BMD	1989-2014	4800'	XX:39:20	468
260202	Blue Wing	Active	BLM-NV-WID	1986-2001, 2003-2014	4570'	XX:37:30	453
260402	Siard	Active	BLM-NV-WID	1986-2014	4600'	XX:38:10	453
260208	Majuba	Active	BLM-NV-WID	2009-2014	5293'	XX:47:20	453
260603	Coils Creek	Active	BLM-NV-BMD	1986-2014	6800'	XX:38:40	454
260504	Red Butte	Active	BLM-NV-BMD	1989-2014	5050'	XX:39:10	454
260201	Winnemucca	Inactive	USFS-NV-HTF	1964-1973, 1975-2005	4303’		468
260205	Burma Springs	Inactive	BLM-NV-WID	1989-1996	4550’		468
260403	Coyote Canyon	Inactive	BLM-NV-WID	1989-1996	5050’		453
260502	BAM	Inactive	BLM-NV-BMD	1975-1998	4515’		454
260110	Fox Mountain	Inactive	BLM-NV-WID	1989-2011	6890'		458
Toiyabe Mountains Fire Danger Rating Area							
260601	Combs Canyon	Active	BLM-NV-BMD	1986-2001, 2003-2014	6590'	XX:39:00	457
260501	Austin	Active	USFS-NV-HTF	1964-1965, 1967-2014	6310'	XX:50:20	454, 457
260503	Desatoya Mountain	Active	BLM-NV-BMD	1986-2014	6200'	XX:38:50	457
260810	Quima Peak	Active	USFS-NV-HTF	2009-2014	7984'	XX:11:40	457
Mohave Desert Fire Danger Rating Area							
261404	Pancake	Active	BLM-NV-BMD	1986-2014	5200'	XX:47:20	457
261408	Buddy Adams	Active	BLM-NV-BMD	2009-2014	4593'	XX:51:50	460
261451	Tonopah	Inactive	USFS-NV-HTF	1976-2000	5426’		457
261501	Royston Hills	Inactive	BLM-NV-BMD	1986-1996, 2005, 2007	5100’		460

4. **Special Interest Groups (SIGs)**

RAWS located in different geographical locations with common sensitivity to NFDRS model inputs can be grouped together to form a SIG. A technique developed by Michael Fosberg and William Furman (Fosberg, Furman. 1973[1]) utilizes the 1-hour timelag fuel moisture as the integrator of weather elements to help define fire climate zones. In addition, 1000-hour timelag fuel moisture was evaluated for dead fuel moisture modeling of heavy fuels in the 3 to 8 inch diameter classification. RAWS with common modeling sensitivity have been grouped into SIGs for each FDRA.

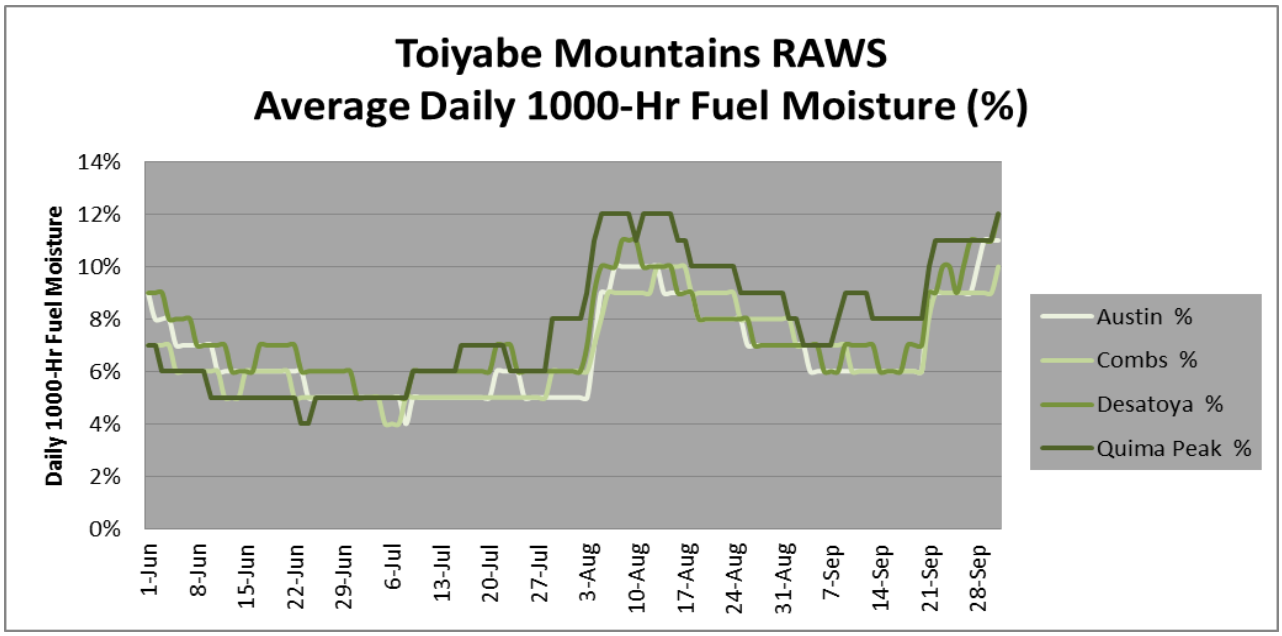


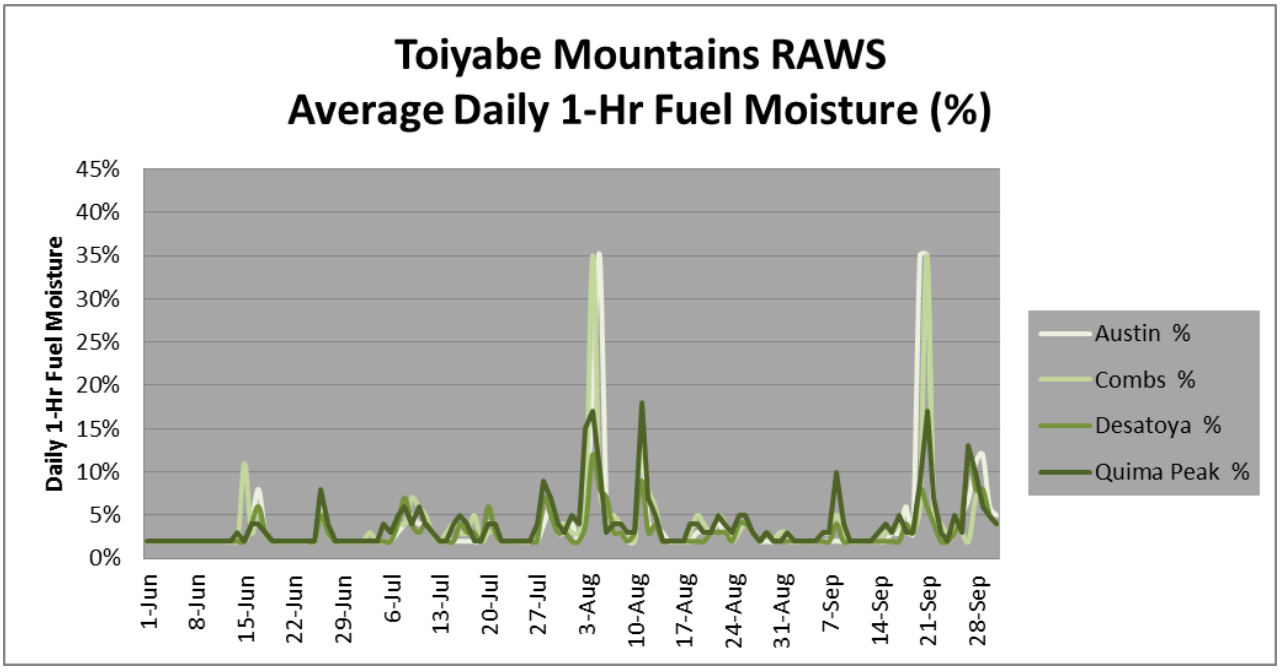


a. **Humboldt Basin SIG**

The Bluewing, Siard, Beacon Light, Dry Canyon, Red Butte, Majuba, Morey Creek, Texas Spring Double H, and Coils Creek RAWS have been combined as a SIG to compute an equally weighted set of fire danger indices for the Humboldt Basin FDRA.

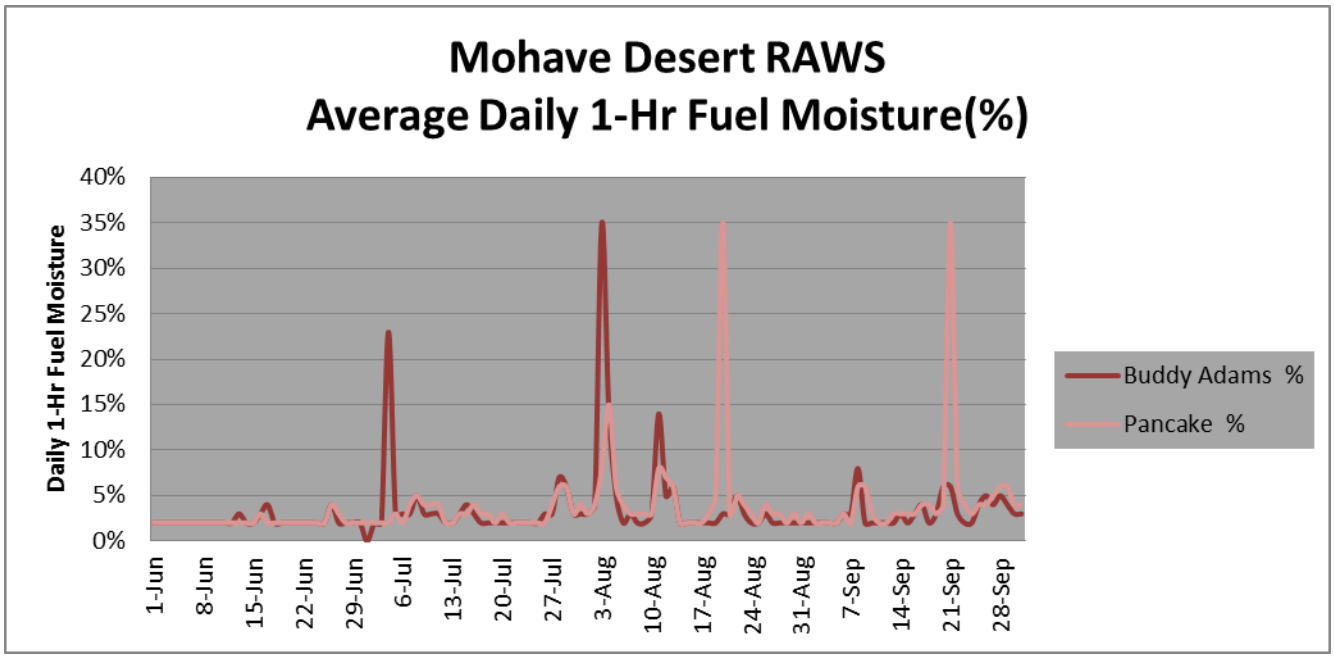
[1] Fosberg, M.A, and W.R Furman. 1973. Fire climates in the southwest. Agricultural Meteorology, v. 12, p. 27-3

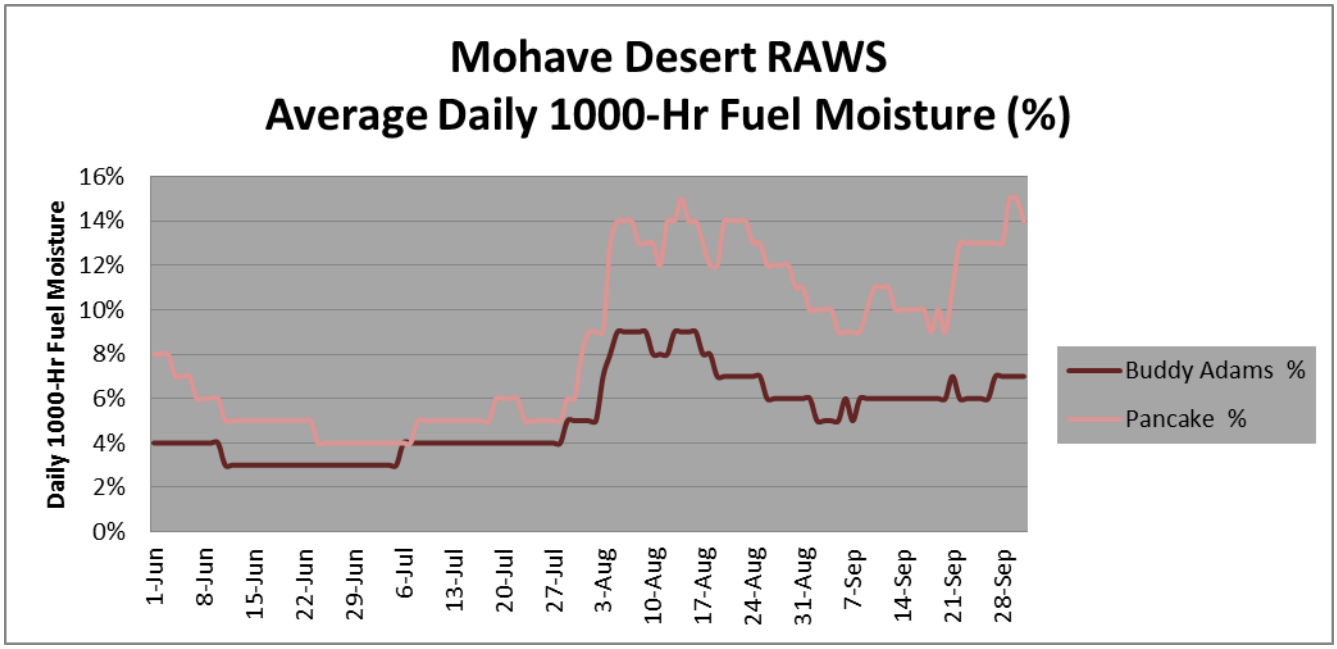




b. Toiyabe Mountains SIG

The Austin, Combs, Desatoya and Quima Peak RAWS have been combined as a SIG to compute an equally weighted set of fire danger indices for the Toiyabe Mountains FDRA.

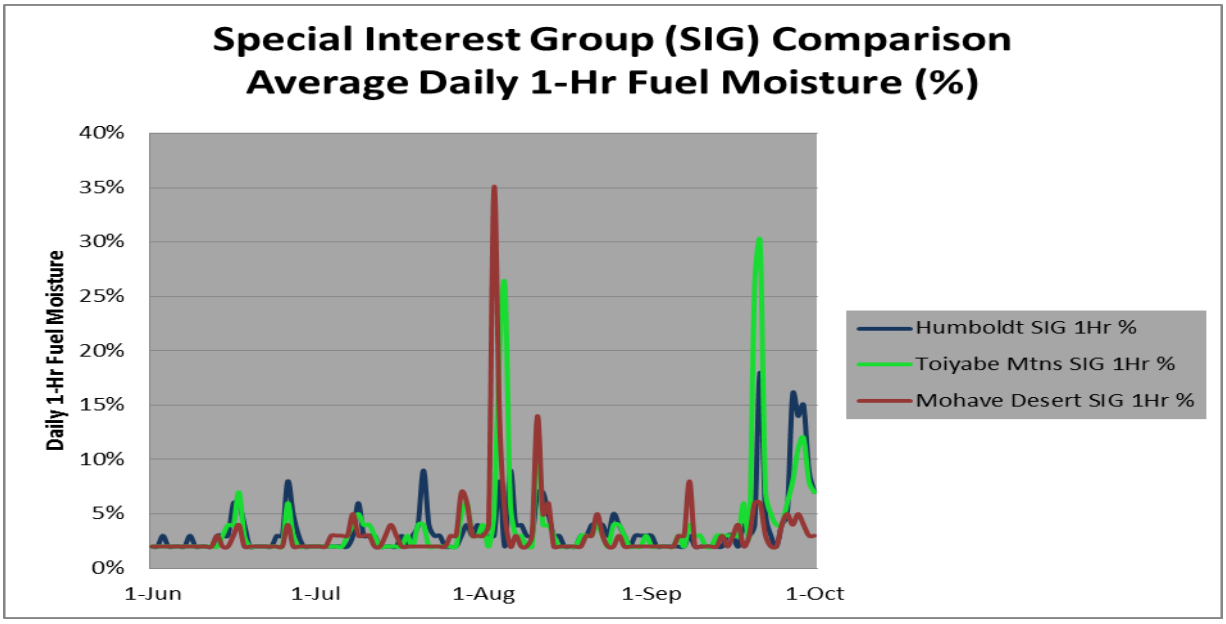




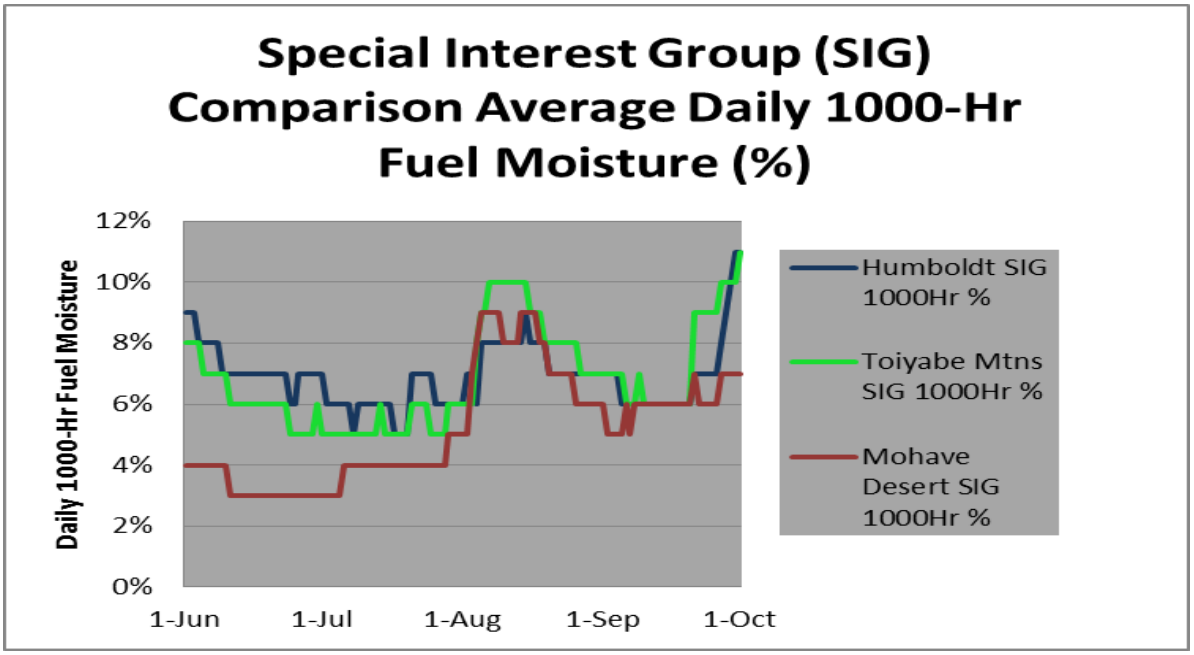
c. Mohave Desert SIG

The Buddy Adams and Pancake RAWS have been combined as a SIG to compute an equally weighted set of fire danger indices for the Mohave Desert FDRA.

d. 1-hour Fuel Moisture (SIG Comparison)



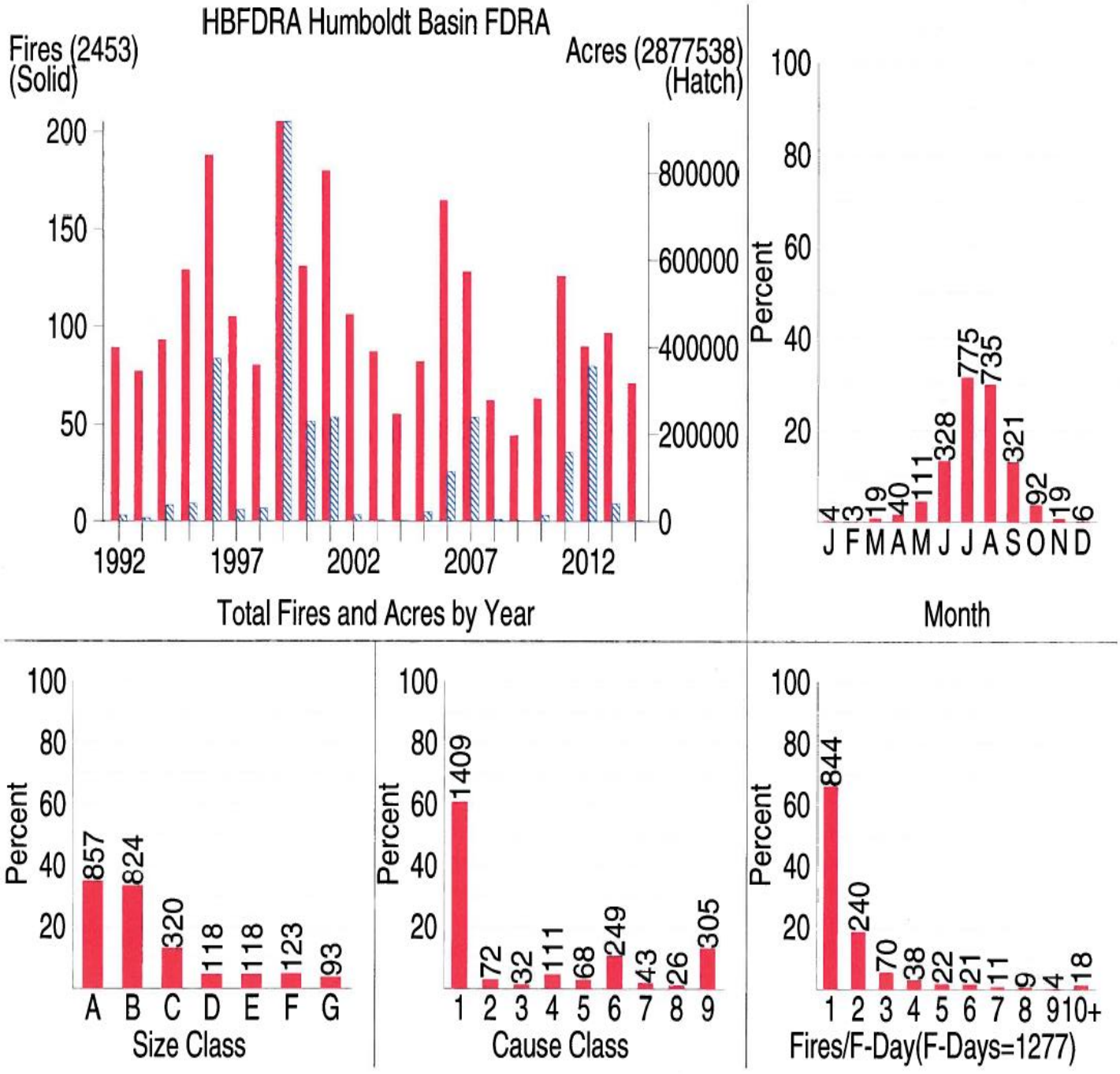
b. 1000-hour Fuel Moisture (SIG Comparison)



E. Fire Occurrence

Twenty-three years (1992-2014) of fire occurrence data was used for the statistical analysis. Department of Interior BLM, BIA, and Department of Agriculture USFS fire occurrence data was obtained from the *Wildland Fire Management Information* system. Since all three agencies may have reported the same fire in their respective databases, the fires were cross-referenced and duplicate fires were eliminated (to the extent possible) to avoid misrepresentation (skewing) of the statistical correlation with large and multiple fire days. FireFamilyPlus software was utilized to produce statistics and graphs. The following fire summary graphs do not differentiate between agencies; fires are depicted without regard to agency affiliation.

Humboldt Basin FDRA



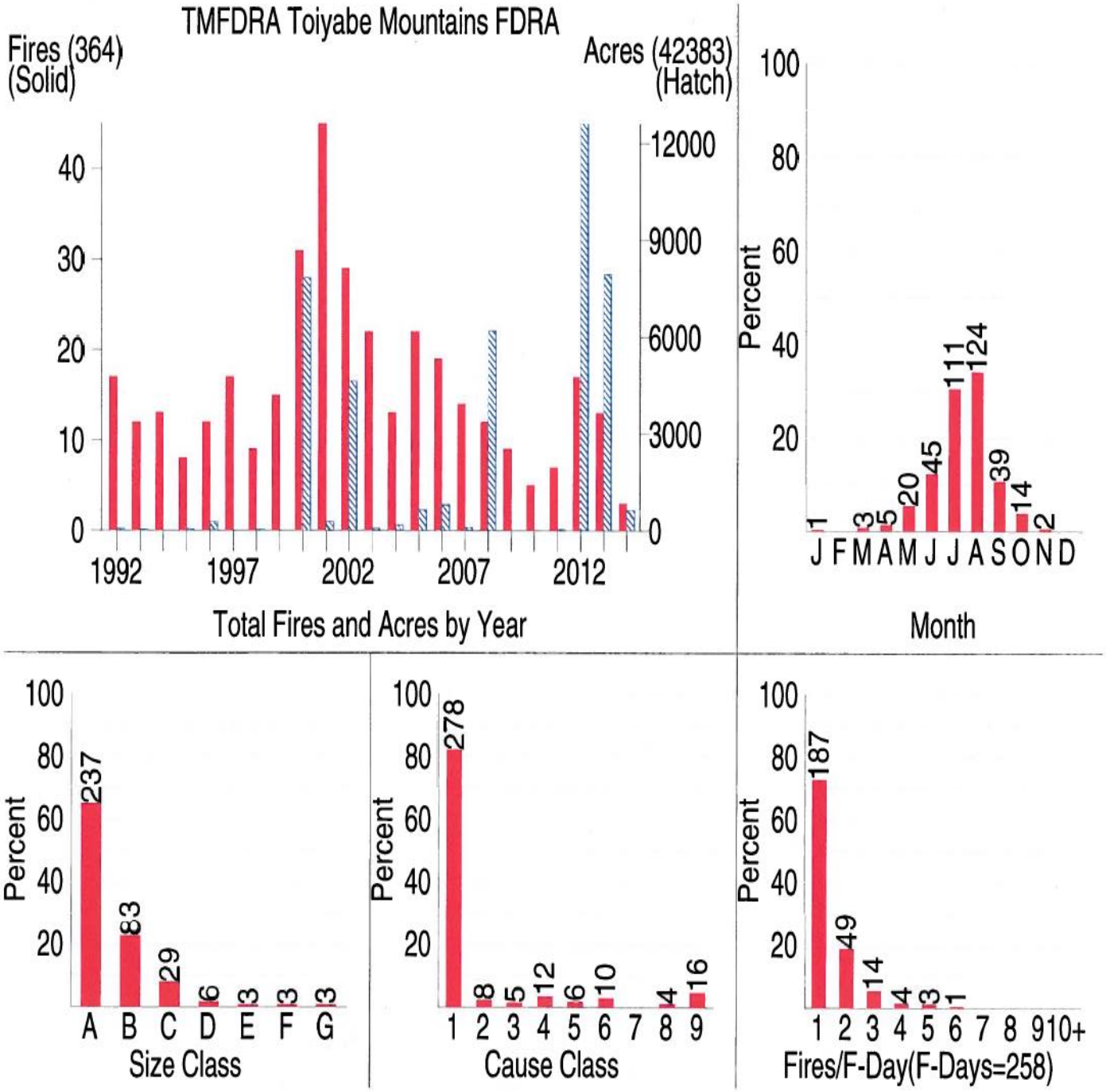
Size Class:

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

Cause Class:

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

Toiyabe Mountains FDRA



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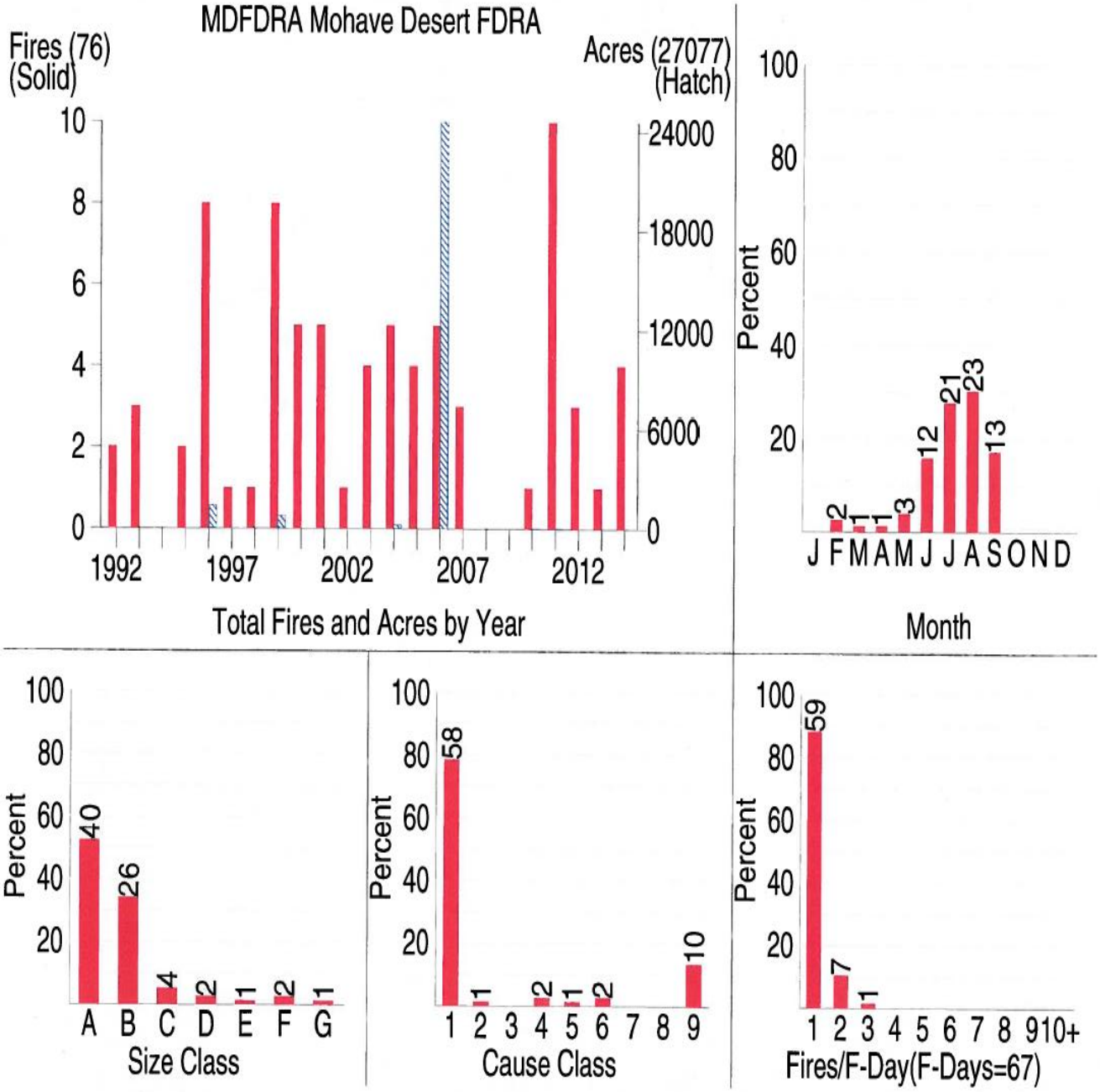
Mohave Desert FDRA



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Cause Class:

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

F. Fire Danger Decision Levels

The National Fire Danger Rating System (NFDRS) utilizes the Weather Information Management System (WIMS) processor to manipulate weather data and forecasted data stored in the National Interagency Fire Management Integrated Database (NIFMID) to produce fire danger ratings for corresponding weather stations (RAWS). NFDRS outputs from the WIMS processor can be used to determine various levels of fire danger rating to address the fire problems identified previously in the *Fire Problem Analysis Chart*. The system is designed to calculate worst-case scenario fire danger. NFDRS will be utilized in four ways for the purpose of this plan. The **Dispatch Level** is a decision tool for fire managers to assign initial attack resources to a fire reported in a dispatch zone. The **Staffing Level** will assist fire managers determine levels with increased fire danger. The **Preparedness Level** will assist fire managers with more long- term (or seasonal) decisions with respect to fire danger. **Adjective Fire Danger** levels are intended to communicate fire danger to the public, i.e. fire danger signs. Although not used for making fire business decisions, **Climatological Percentiles** are discussed in this section.

1. Dispatch Level Analysis

Dispatch Levels are established to assist fire managers with decisions regarding the most appropriate response to an initial fire report until a qualified Incident Commander arrives at the incident. BI will be utilized for the Humboldt Basin, Mohave Desert FDRAs and the Toiyabe Mountains FDRA. The Fire Family Plus software has been used to establish the Dispatch Level thresholds. A statistical analysis of fire occurrence and historical weather has been completed for each FDRA. The correlation of various combinations of NFDRS outputs is listed in Appendixes E and F.

Dispatch Level: Fire Family Plus Analysis Factors and Determinations

FDRA	RAWS		Data Years Used	Weight Factor	Fuel Model	NFDRS Index	Class	Range
	NWS#	Name						
Humboldt Basin	260203	Dry Canyon	1992-2014	1.0	7T	BI	Low	0-40
	260206	Texas Spring	1992-2014	1.0	7T	BI		
	260207	Double H	1992-2014	1.0	7T	BI	Mod	40-95
	260204	Morey Creek	1992-2014	1.0	7T	BI		
	260505	Beacon Light	1992-2014	1.0	7T	BI	High	95+
	260202	Blue Wing	1992-2014	1.0	7T	BI		
	260402	Siard	1992-2014	1.0	7T	BI		
	260208	Majuba	2009-2014	1.0	7T	BI		
	260603	Coils Creek	1992-2014	1.0	7T	BI		
	260504	Red Butte	1992-2014	1.0	7T	BI		
Toiyabe Mountains	260601	Combs Canyon	1992-2014	1.0	7T	BI	Low	0-35
	260501	Austin	1992-2014	1.0	7T	BI		
	260503	Desatoya Mtn.	1992-2014	1.0	7T	BI	Mod	35-90
	260810	Quima Peak	2009-2014	1.0	7T	BI		
							High	90+
Mohave Desert	261404	Pancake	1992-2014	1.0	7T	BI	Low	0-45
	261408	Buddy Adams	2009-2014	1.0	7T	BI		
							Mod	45-105
							High	105+

2. Staffing Level Analysis

Staffing levels will vary throughout the year by Fire Danger Rating Area. When fire danger rating is Low, typically during pre/post and early season no or limited initial attack capability is required. Resources needed by staffing level should increase with increasing fire danger.

Staffing Level: Fire Family Plus Analysis Factors and Determinations

FDRA	RAWS		Data Years Used	Weight Factor	Fuel Model	NFDRS Index	Class	Range
	NWS#	Name						
Humboldt Basin	260203	Dry Canyon	1992-2014	1.0	7T	BI	Low	0-40
	260206	Texas Spring	1992-2014	1.0	7T	BI		
	260207	Double H	1992-2014	1.0	7T	BI	Mod	40-95
	260204	Morey Creek	1992-2014	1.0	7T	BI		
	260505	Beacon Light	1992-2014	1.0	7T	BI	High	95+
	260202	Blue Wing	1992-2014	1.0	7T	BI		
	260402	Siard	1992-2014	1.0	7T	BI		
	260208	Majuba	2009-2014	1.0	7T	BI		
	260603	Coils Creek	1992-2014	1.0	7T	BI		
	260504	Red Butte	1992-2014	1.0	7T	BI		
Toiyabe Mountains	260601	Combs Canyon	1992-2014	1.0	7T	BI	Low	0-35
	260501	Austin	1992-2014	1.0	7T	BI		
	260503	Desatoya Mtn.	1992-2014	1.0	7T	BI	Mod	35-90
	260810	Quima Peak	2009-2014	1.0	7T	BI		
							High	90+
Mohave Desert	261404	Pancake	1992-2014	1.0	7T	BI	Low	0-45
	261408	Buddy Adams	2009-2014	1.0	7T	BI		
							Mod	45-105
							High	105+

3. Preparedness Level Analysis

Preparedness Levels are established to assist fire managers with weekly or monthly planning decisions based upon seasonal fire danger elements. Central Nevada will be utilizing ERC for Humboldt Basin FDRA, Mohave Desert FDRA and for the Toiyabe Mountains FDRA. The Fire Family Plus software has been used to establish the fire business thresholds*. A statistical analysis of fire occurrence and historical weather has been completed for each FDRA. The correlation of various combinations of NFDRS outputs with weather records is listed in Appendix I. The final Preparedness Level determination will also incorporate a measure of current and projected levels of resource commitment due to fire activity and a measure of Ignition Risk.

Preparedness Level: Fire Family Plus Analysis Factors and Determinations

FDRA	RAWS		Data Years Used	Weight Factor	Fuel Model	NFDRS Index	Class	Range
	NWS#	Name						
Humboldt Basin	260203	Dry Canyon	1992-2014	1.0	7G	ERC	1	0-25
	260206	Texas Spring	1992-2014	1.0	7G	ERC	2	25-40
	260207	Double H	1992-2014	1.0	7G	ERC	3	40-75
	260204	Morey Creek	1992-2014	1.0	7G	ERC	4	75-98
	260505	Beacon Light	1992-2014	1.0	7G	ERC	5	98+
	260202	Blue Wing	1992-2014	1.0	7G	ERC		
	260402	Siard	1992-2014	1.0	7G	ERC		
	260208	Majuba	2009-2014	1.0	7G	ERC		
	260603	Coils Creek	1992-2014	1.0	7G	ERC		
	260504	Red Butte	1992-2014	1.0	7G	ERC		
Toiyabe Mountains	260601	Combs Canyon	1992-2014	1.0	7G	ERC	1	0-24
	260501	Austin	1992-2014	1.0	7G	ERC	2	24-56
	260503	Desatoya Mtn	1992-2014	1.0	7G	ERC	3	56-86
	260810	Quima Peak	2009-2014	1.0	7G	ERC	4	86-106
							5	106+
Mohave Desert	261404	Pancake	1992-2014	1.0	7G	ERC	1	0-25
	261408	Buddy Adams	2009-2014	1.0	7G	ERC	2	25-50
							3	50-75
							4	75-100
							5	100+

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

4. Adjective Fire Danger Rating

The Adjective Fire Danger Rating will be used by agency personnel to inform the public of the current level of fire danger associated with a specific FDRA. Adjective ratings will be based upon ERC's. NFDRS processors (such as WIMS) will automatically calculate the adjective class rating. Weekly, fire management will look at the calculated adjective fire danger ratings and decide whether to raise or lower the "Smoky Signs" to one of the five levels: low, moderate, high, very high, and extreme.

Humboldt Basin FDRA--Adjective Fire Danger Rating Staffing Class and Break Points

Input Information for Humboldt Basin FDRA			**Staffing Class Percentile Break Points**	
RAWS	**Fuel Model**	**Staffing Index**	**80th**	**95th**
Dry Canyon	G	ERC	97	105
Texas Spring	G	ERC	98	105
Double H	G	ERC	95	103
Morey *Creek*	G	ERC	99	105
Beacon Light	G	ERC	104	113
Blue Wing	G	ERC	102	110
Siard	G	ERC	102	108
Majuba	G	ERC	95	103
Coils Creek	G	ERC	89	95
Red Butte	G	ERC	101	105

Toiyabe Mountains FDRA --Adjective Fire Danger Rating Staffing Class and Break Points

Input Information for Toiyabe Mountains FDRA			Staffing Class Percentile Break Points	
RAWS	**Fuel Model**	**Staffing Index**	**80th**	**95th**
Combs Canyon	G	ERC	88	100
Austin	G	ERC	87	102
Desatoya Mountain	G	ERC	88	100
Quima Peak	G	ERC	86	100

Mohave Desert FDRA --Adjective Fire Danger Rating Staffing Class and Break Points

Input Information for Mohave Desert FDRA			Staffing Class Percentile Break Points	
RAWS	**Fuel Model**	**Staffing Index**	**80th**	**95th**
Pancake	G	ERC	102	108
Buddy Adams	G	ERC	104	111

Climatological Percentiles

Climatological breakpoints are points on the cumulative distribution of one fire weather/danger index computed from climatology without regard for associated fire occurrence/business. For example, the value of the 90th percentile ERC is the climatological breakpoint at which only 10 percent of the ERC values are greater in value. The percentiles for climatological breakpoints predetermined by agency directive are shown below.

> ***BLM*** *- 80th and 95th percentiles* ***FWS*** *- 90th and 97th percentiles* ***NPS*** *- 90th and 97th percentiles* ***FS*** *- 90th and 97th percentiles*

It is equally important to identify the period or range of data analysis used to determine the agency percentiles. The percentile values for 12 months of data will be different from the percentile values for the fire season. Year round data should be evaluated for percentiles involving severity-type decisions. Other than agency-specific direction (such as severity requests), this **plan does not support the use of climatological percentiles as decision points**. Rather, decisions will be based upon fire business thresholds determined through a comprehensive statistical analysis of historical weather correlated with fire occurrence data.

IV. OPERATIONS AND APPLICATIONS

Worksheets will be used to determine the daily dispatch, staffing levels, preparedness, adjective fire rating Step Up Levels and Drawdown levels. The dispatch, staffing, preparedness levels and the adjective fire danger rating for each FDRA will be posted on the Morning Intelligence Report (MIR). The ERCs and BIs will be broadcast each morning and afternoon with the fire weather forecast.

Although fire danger ratings do not prevent human-caused fires, a strong effort should be made to communicate the fire danger as it changes throughout the fire season. The social, political, and financial impacts of wildfires on agency, public, and industrial entities can be far reaching. Loss of life, property, and financial resources can potentially be associated with any wildfire. As the fire danger fluctuates, agency personnel need to have pre-planned and appropriate responses. These actions should not only focus on appropriate fire suppression, but also mitigation/education.

A. Dispatch Level

Agency personnel use the dispatch level (response level) to assign initial attack resources based on pre-planned "Run Cards." Combined with predefined Dispatch Zones, the Dispatch Level is used to assign an appropriate mix of suppression resources to a reported wildland fire based upon fire danger potential. The dispatch levels are derived from the most appropriate NFDRS index and/or component that correlate to fire occurrence. Burning Index (BI) with NFDRS Fuel Model T (for the Humboldt Basin, Mohave Desert and the Toiyabe Mountains), has been determined to be the most appropriate NFDRS index that statistically correlates to the potential for large fires to occur.

Dispatch Level Worksheet
Central Nevada Interagency Dispatch Center

FIRE DANGER AREA (FDRA)	INDEX & MODEL		
	BURNING INDEX (MODEL T)		
Humboldt Basin	0-40	40-95	95+
Dispatch Level →	LOW	MODERATE	HIGH
	BURNING INDEX (MODEL T)		
Toiyabe Mountains	0-35	35-90	90+
Dispatch Level →	LOW	MODERATE	HIGH
	BURNING INDEX (MODEL T)		
Mohave Desert	0-45	45-105	105+
Dispatch Level →	LOW	MODERATE	HIGH

B. Staffing Level

Burning Index (BI) is a combination of Energy Release Component (ERC) and Spread Component (SC). ERC does not include wind in any part of the index calculation, and is highly weighted to large fuel moistures. SC is very sensitive to wind and is weighed to fine fuel moistures. The BI can fluctuate fairly dramatically from day to day, but does tend to have a seasonal trend. Fires can occur at a BI of 0, but would have little spread potential as long as conditions on the fire were similar to conditions at the weather station, where the index value was computed from. The BI was selected because it considers wind, because a forecasted index value for the next day is available so the dispatch level can be set in the afternoon before, and because firefighting resources are adaptable to changing dispatch levels.

Staffing Level Worksheet
Central Nevada Interagency Dispatch Center

FIRE DANGER AREA (FDRA)	INDEX & MODEL		
	BURNING INDEX (MODEL T)		
Humboldt Basin	0-40	40-95	95+
Staffing Level →	LOW	MODERATE	HIGH
	BURNING INDEX (MODEL T)		
Toiyabe Mountains	0-35	35-90	90+
Staffing Level →	LOW	MODERATE	HIGH
	BURNING INDEX (MODEL T)		
Mohave Desert	0-45	45-105	105+
Staffing Level →	LOW	MODERATE	HIGH

C. Preparedness Level

The Preparedness Level is a five-tier (1-5) fire danger rating system that will be based on ERC, BI and fire business indicators. The fire business indicators used to calculate the preparedness level will be each FDRA's area by utilizing Fuel Model G ERC. Several procedures and guidelines are to be followed and/or considered once the preparedness level has been determined (Appendix G). The thresholds for the preparedness level are set using an historical analysis (Fire Family Plus) of fire business and its relationship to 1200 and 1300 RAWS observations entered into the NIFMID database and processed by WIMS, which calculates BI, IC, SC, ERC, etc.

PREPAREDNESS LEVEL	*PREPAREDNESS LEVEL DESCRIPTION*	*HUMBOLDT BASIN ERC FM G*	*TOIYABE MOUNTAINS ERC FM G*	*MOHAVE DESERT ERC FM G*
I	Most NFDRS Weather station show LOW to MODERATE adjective fire danger rating levels. No activity occurring within the CNIDC dispatch area	0-25	0-24	0-25
II	Most NFDRS Weather Stations show LOW to MODERATE adjective fire danger rating levels. Little to no activity occurring within the CNIDC dispatch Area Some commitment of CNIDC resources locally or nationally.	25-40	24-56	25-50
III	Most NFDRS Weather Stations show HIGH TO VERY HIGH adjective fire danger levels CNIDC area incidents occurring regularly requiring moderate commitment of CNIDC resources The potential exists for ordering additional resources from neighboring dispatch centers/or GBCC Many CNIDC area resources are committed to local, regional, or national incidents. Potential of Type 3 incidents or larger exists. Lightning activity may produce multiple start fire days.	40-75	56-86	50-75
IV	Most NFDRS Weather Stations show VERY HIGH to EXTREME adjective fire danger rating levels CNIDC area incidents occurring regularly requiring significant commitment of CNIDC resources CNIDC supporting 1 or more extended attack fire, Type III, or above Additional resources are being ordered through neighboring dispatch centers/ or GBCC Heavy commitment of resources to regional and national incidents. 7 day weather predictions DO NOT call for any immediate relief.	75-98	86-106	75-100
V	All NFDRS Weather Stations show VERY HIGH to EXTREME adjective fire danger rating levels. CNIDC is supporting multiple extended attack fires, Type I, II or III Most CNIDC resources are commited to incidents or preparedness activities. Heavy competition for regional and national resources. Most resource orders will take more than 24 hours to fill 7-14 day weather predictions do not call for any immediate relief	98+	106+	100+

D. Adjective Fire Danger Rating

1. Adjective Fire Danger Rating Description

In 1974, the Forest Service, Bureau of Land Management 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 punkie 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 lessons.

2. Adjective Fire Danger Rating Determination

Although NFDRS processors (i.e., WIMS) will automatically calculate the adjective class rating, CNIDC will manually determine Adjective Fire Danger Rating. The five day average from ERC will be calculated in the NFDRS spreadsheet and that number will be applied to the chart below to get the adjective fire danger rating.

Humboldt Basin FDRA	Adjective Fire Danger Rating				
5 Day Average from ERC	0-25	25-40	40-75	75-98	98-111
	L	M	H	VH	E

Toiyabe Mountains FDRA	Adjective Fire Danger Rating				
5 Day Average from ERC	0-24	24-56	56-86	86-106	106-112
	L	M	H	VH	E

Mohave Desert FDRA	Adjective Fire Danger Rating				
5 Day Average from ERC	0-25	25-50	50-75	75-100	100-120
	L	M	H	VH	E

E. Display Average (DAVG) Spreadsheet

Central Nevada Dispatch Center utilizes the following spreadsheet to determine and track all WIMS weather data the spreadsheet calculates the dispatch staffing and preparedness levels as well as adjective fire danger rating based on 5 day average and ERC. The indices are taken from WIMS and utilized in the spreadsheet below.

More detailed instructions can be found in the Intelligence How to Guide under WIMS in the table of contents. This will provide the most accurate and up to date information on completing the spreadsheet.

PREPAREDNESS LEVEL	PREPAREDNESS LEVEL DESCRIPTION	HUMBOLDT BASIN ERC FM G	TOIYABE MOUNTAINS ERC FM G	MOHAVE DESERT ERC FM G
I	Most NFDRS Weather station show LOW to MODERATE adjective fire danger rating levels. No activity occurring within the CNIDC dispatch area	0-25	0-24	0-25
II	Most NFDRS Weather Stations show LOW to MODERATE adjective fire danger rating levels. Little to no activity occurring within the CNIDC dispatch Area Some commitment of CNIDC resources locally or nationally.	25-40	24-56	25-50
III	Most NFDRS Weather Stations show HIGH TO VERY HIGH adjective fire danger levels CNIDC area incidents occurring regularly requiring moderate commitment of CNIDC resources The potential exists for ordering additional resources from neighboring dispatch centers/or GBCC Many CNIDC area resources are committed to local, regional, or national incidents. Potential of Type III incidents or larger exists. Lightning activity may produce multiple start fire days.	40-75	56-86	50-75
IV	Most NFDRS Weather Stations show VERY HIGH to EXTREME adjective fire danger rating levels CNIDC area incidents occurring regularly requiring significant commitment of CNIDC resources CNIDC supporting 1 or more extended attack fire, Type III, or above Additional resources are being ordered through neighboring dispatch centers/ or GBCC Heavy commitment of resources to regional and national incidents. 7 day weather predictions DO NOT call for any immediate relief.	75-98	86-106	75-100
V	All NFDRS Weather Stations show VERY HIGH to EXTREME adjective fire danger rating levels. CNIDC is supporting multiple extended attack fires, Type I, II or III Most CNIDC resources are commited to incidents or preparedness activities. Heavy competition for regional and national resources. Most resource orders will take more than 24 hours to fill 7-14 day weather predictions do not call for any immediate relief	98+	106+	100+

F. Step-Up Plan

Step-up plans provide management direction given identified levels of burning conditions, fire activity, and resource commitment. These plans are required at national, state/regional, and locals levels.

Step-Up Plans are designed to direct incremental preparedness actions in response to increasing fire danger. Each Step-Up Plan should address the five preparedness levels (1, 2, 3, 4 and 5) and the corresponding planned actions that are intended to mitigate those fire danger decisions. The Step-Up Plan describes escalating responses that are pre-identified to enhance the unit's fire management capability during short periods where normal staffing cannot meet initial attack, prevention, or detection needs.
The emergency preparedness step-up plan for Central Nevada Interagency Dispatch Center is included below.

The following conditions apply when in Preparedness Levels 2 thru 5 and are listed below.

- Unit/Zone Duty Officer (DO) may activate extended staffing during busy holiday weekends or other pre-identified events within the identified fire season where normal staffing cannot meet. Ex. Extended staffing for affected Unit/Zone DO's, necessary dispatch staff, minimum of 2 IA resources per affected zone.

- LAL of 2 thru 6 forecasted, the DO should consider utilizing actions in the next Preparedness Level for the Unit/Zone affected.

- Red Flag Warnings or Fire Weather Watches, the DO should consider utilizing actions in the next Preparedness Level for the Unit/Zone affected.

- When local resource commitment is 50 percent or more, the DO should consider utilizing actions in the next Preparedness Level for the Unit/Zone affected.

Preparedness Level	HB FDRA ERC FM G	TM FDRA ERC FM G	MD FDRA ERC FM G	Preparedness Actions to Consider
1	0-25	0-24	0-25	• Normal staffing during identified fire season
2	25-40	24-56	25-50	• No emergency preparedness actions and funding are authorized • Normal staffing during identified fire season. • Necessary extended staffing will be funded from ongoing fire accounts/fires. • Minimal AD use
3	40-75	56-86	50-75	• Extended staffing approved for Unit and/or Zone DO of area affected; Dispatch Center Manager or acting; 2 IA dispatchers; 2 IA resources at each station within affected Zone. Resources from within the affected zone or other unaffected zones may be extended to "move up and cover" stations where pre-positioning is occurring away from primary stations. • Extended staffing of Aviation resources and personnel. • Minimal AD use • Consider ordering 1 to 2 ea : additional engines, water tenders, dozer and needed overhead
4	75-98	86-106	75-100	• Extended staffing approved for Unit FMO; Unit and/or Zone DO of area affected; Up to 3 IA resources at each station within affected zone. Resources from within the affected zone or other unaffected zones may be extended to "move up and cover" stations where pre-positioning is occurring away from primary stations. • Extended staffing of Aviation resources and personnel. • Moderate AD use • Consider ordering 2 to 4 ea: additional engines, water tenders, dozer and needed overhead • Consider ordering 1 to 2 ea: SEAT, helicopter, air attack, smokejumpers
5	98+	106+	100+	• Extended staffing approved for Unit FMO; Unit and/or Zone DO of area affected; up to 3-4 IA resources at each station within affected Zone Resources from within the affected zone or other unaffected zones may be extended to "move up or cover" stations where prepositioning is occurring away from primary stations. • Extended staffing of Aviation resources and personnel. • AD's use encouraged. • Consider ordering 5 to 8 ea: additional engines, water tenders, dozer and needed overhead • Consider ordering 3-4 ea: SEAT, helicopter, air attack, smokejumpers, • Consider ordering heavy Airtankers or VLAT

G. Drawdown Plan

Local Drawdown Levels-

1. Drawdown is the predetermined number and type of suppression resources that are required to maintain a viable initial attack capability at the local area. Drawdown resources are considered unavailable outside the local area for which they have been identified.
2. Drawdown is intended to:
    a. Ensure adequate fire suppression capability for local area managers; and
    b. Enable sound planning and preparedness at all management levels.

3. Although drawdown resources are considered unavailable outside the local or Geographic area for which they have been identified, they may still be reallocated by the Geographic Area or National MAC to meet high priority obligations.

4. Establishing Drawdown Levels:
Local drawdown is established by the local unit and/or the local MAC group and implemented by the local dispatch office. The local dispatch will notify the Geographic Area Coordination Center of local drawdown decisions and actions. Geographic area drawdown is established by the GMAC and implemented by the GBCC. The GBCC will notify the local dispatch offices and National Interagency Coordination Center of geographic area drawdown decisions and actions.

DRAWDOWN LEVELS					
Winnemucca					
Resource Available	**PL 1**	**PL 2**	**PL 3**	**PL 4**	**PL 5**
Engines	**2**	**5**	**8**	**10**	**12**
Water Tenders	**0**	**0**	**1**	**2**	**2**
Dozers	**0**	**1**	**1**	**2**	**3**

DRAWDOWN LEVELS					
Battle Mountain					
Resource Available	**PL 1**	**PL 2**	**PL 3**	**PL 4**	**PL 5**
Engines	**1**	**2**	**3**	**4**	**5**
Water Tenders	**0**	**0**	**0**	**1**	**1**
Dozers	**0**	**0**	**0**	**1**	**1**

Drawdown Levels do not include sending resources to neighboring units for assistance with IA.

H. Thresholds (Extreme Fire Danger)

Seasonal risk escalation in fuel complexes of Central Nevada Interagency Dispatch Center (CNIDC) relies upon a combination of factors, which will ultimately trigger an extreme state of fuel volatility and a high potential for large fire growth or multiple ignition scenarios.

1. **Fire Activity:** The occurrence of large/multiple fires is the reliable indicator of severity conditions and the potential for seasonal risk. Any one incident reaching type one or two complexity would be an indicator of severity. Two or more type three incidents within a two to four week period would also be a strong indicator. Three or more initial attack fires in the same day indicate a point where resources are limited. A progressive approach to assessing seasonal risk will prepare the local unit for these occurrences and the necessary resources will already be in place.
2. **Live Fuel Moisture:** Fire severity is determined by comparing current trends to historical averages. Comparison of fuel moisture to historical conditions at various locations within CNIDC and surrounding areas can be located on the National Fuel Moisture Database at: http://72.32.186.224/nfmd/public/index.php
    a. **Live Fuel Moisture (Juniper):** The average woody fuel moisture of juniper typically fluctuates between 100% (June) and 75% (August). Any readings below 80% indicate increased risk relating to large fire growth and severity conditions. Below average readings may indicate an early or extended fire season.
    b. **Live Fuel Moisture (Sagebrush):** The average herbaceous fuel moisture of sagebrush in the Humboldt Basin fluctuates between 200% (June) and 80% (August). Readings below 75% indicate increased risk relating to large fire growth and severity conditions. Below average readings may indicate an early or extended fire season. Preliminary data from mountain big sagebrush in the Toiyabe Mountains shows live fuel moisture values between 180% (June) and 60% (September).
    c. **Live Fuel Moisture (Deciduous):** The average deciduous fuel moisture of aspen on the Toiyabe FDRA fluctuates between approximately 220% (May/June) and 75-85% (September/October). Readings below 90% indicate increased risk relating to large fire growth and severity conditions. Below average readings may indicate an early or extended fire season.
    d. **Fine Fuel Loading:** Fuel loadings over .5 tons/acre indicate a fire controllability problem. If areas exhibit significant amounts of carry-over fuel and/or matted grass, it will contribute to continuity and fuel bed density, resulting in control problems and increased fireline intensity.
3. **NFDRS Thresholds:** ERC and 10-hr (1/4" – 1/2" diameter dead) fuel are used as the primary indicators to track seasonal trends of fire danger potential. The ERC threshold for high fire potential is 111 (or higher) for the Humboldt Basin FDRA; the ERC threshold for high fire potential is 112 (or higher) for the Toiyabe Mountains FDRA; the ERC threshold for high fire potential is 120 (or higher) for the Mohave Desert FDRA. It has been statistically proven that large fire events will occur proportionally more often when these thresholds are exceeded. Early and late-season readings that trend above average may indicate an extension of the normal fire season.

5. **Weather Thresholds:** Seasonal weather assessments rely upon long-range (30-90 day) forecasts. This information is available in two formats: seasonal long-lead outlooks and 30-90 day outlooks. This information is provided by NOAA Climate Prediction Center. The observable weather factors that contribute to large fires and the potential for extreme fire behavior can be determined from the same percentiles determined from NFDRS thresholds. Any of these factors significantly increase the potential for extreme fire behavior and large fire growth. Combination of these factors will increase the risk.

6. **Drought Indicators:** The Keetch-Byram Drought Index (KBDI) and Palmer Drought Index (PDI) track soil moisture and have been tailored to meet the needs of fire risk assessment personnel. Current KBDI information is located on the Wildfire Assessment System (WFAS) Internet site (*http://www.wfas.us/*). Tracking and comparing 1000-hour fuel moisture is another method to assess drought conditions. Palmer Drought Index graphics display current drought conditions while KBDI values of 500-800 indicate the potential for rapid curing and drying of the fine fuels and potential for live fuel moisture to drop. The 1000-hour fuel moisture is also a good drought indicator. Values between six and ten percent indicate the potential risk for extreme burning conditions.

7. **Normalized Difference Vegetation Index (NDVI):** NDVI data is satellite imagery, which displays vegetative growth and curing rates of live fuels. The WFAS Internet site (http://www.wfas.us/) provides several different ways to analyze current and historical greenness imagery, which can be a significant contributor to seasonal risk assessments. An analysis of this imagery will assist in the assessment of current fuel moisture conditions and provide historical as well as average greenness comparisons.

I. Fire Danger Pocket Cards

The Fire Danger Pocket Card is a tool which can aid fire suppression personnel to interpret NFDRS outputs and understand local fire danger thresholds for a local area. Pocket cards can relate current NFDRS outputs with the historical average and worst-case values in a specific geographic location. Burning Index was the NFDRS output chosen as a measure of fire controllability (Deeming et al. 1978)[2]. NFDRS fuel model G and FM T was selected for the Winnemucca, Battle Mountain BLM, USFS Austin/Tonopah and Santa Rosa Ranger Districts of HTF for ERC and BI. Visiting resources can use the pocket cards to familiarize themselves with local fire danger conditions. The CNIDC Pocket Cards meet NWCG guidelines and are posted on the interagency web site: *http://fam.nwcg.gov/fam-web/pocketcards/*

[2] Deeming, John E., and Jack D. Cohen. *The 1978 national fire-danger rating system*: *Technical documentation.* Intermountain Forest and Range Experiment Station, Forest Service, US Department of Agriculture, 1983.

J. Roles and Responsibilities

1. Fire Danger Operating and Preparedness Plan: The Central Nevada Interagency Dispatch Center (CNIDC) Manager will ensure that necessary amendments or updates to this plan are completed. Updates to this plan will be made at least every three years and approved by the line officers (or delegates) from each agency. Revised copies will be distributed to the individuals on the primary distribution list.

2. Suppression Resources: During periods when local preparedness levels are High to Extreme, the Fire Management Officers (FMO) from each agency will strive to achieve the most efficient and effective organization to meet Fire Management Plan objectives. This may require the pre-positioning of suppression resources. The FMO/Assistant Fire Management Officer (AFMO) from each agency will also determine the need to request/release off unit resources or support personnel throughout the fire season.

3. Duty Officer: For the purposes of this plan, a Duty Officer(s) from each agency will be identified to the CNIDC Manager. The Duty Officer provides input and guidance regarding dispatch levels. It is the Duty Officer's role to interpret and modify the daily dispatch levels as required by factors not addressed by this plan. Modifications of the dispatch level must be coordinated through the Dispatch Center Manager. The Duty Officer will keep their respective agency's fire and management staff updated (as needed).

4. Fire Weather Forecasting: Daily fire weather forecasts will be developed by the National Weather Service, Elko and Reno Fire Weather Forecast Office, which is posted on the Internet and broadcast twice daily.

5. NFDRS Outputs and Indices: The CNIDC 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.

6. Risk Analysis Information: The FMO/AFMO from each federal agency will ensure that seasonal risk assessments are conducted monthly during the fire season. The risk analysis will include information such as live fuel moisture, 1000-hour fuel moisture, fuel loading, NFDRS (BI/IC/ERC) trends, NDVI imagery, and other pertinent data. This information will be distributed to agency staff and the CNIDC Manager. The CNIDC Manager, FMOs, and AFMOs will ensure information is posted at fire suppression duty stations.

7. Weather Station Maintenance: The Remote Sensing Laboratory located at the National Interagency Fire Center (NIFC) maintains and calibrates the RAWS stations on an annual basis.

8. WIMS Access, Daily Observations, and Station Catalog Editing: Tina Flodeen is listed as the owner of the RAWS stations in the Central Nevada Interagency Dispatch Center. The owner maintains the WIMS Access Control List (ACL). The station owner will ensure appropriate editing of the RAWS catalogs. The CNIDC Manager will ensure the timely editing of daily 1200 and 1300 weather observations of all stations.

9. **Preparedness, Dispatch, and Adjective Level Guidelines:** Each agency's fire management staff along with the CNIDC Manager will be responsible for establishing and reviewing the staffing, preparedness, dispatch, and adjective level guidelines every three years (as a minimum).

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

11. NFDRS and Adjective Fire Danger Break Points: The FDOP team (see Appendix A) will review weather and fire data at least every three years (when the FDOP is re-analyzed). The team will ensure that the thresholds reflect the most accurate information with the concurrence of the FMOs.

12. Fire Danger Pocket Cards: The FMOs 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 CNIDC and National Wildfire Coordinating Group (NWCG) pocket card web site (*http://fam.nwcg.gov/fam-web/pocketcards/*). Fire suppression supervisors will utilize pockets cards to train and brief suppression personnel ensuring that they are posted at their respective fire stations.

Current Pocket Cards are located in Appendix M, Page 82.

V. PROGRAM IMPROVEMENTS

A. Training

1. Provide FDOP training to cooperators including county fire officers, cooperating dispatch centers, and military fire departments.
2. Provide refresher training on the FDOP each year emphasizing the differences between BI, ERC, Levels, Preparedness, and Adjective Rating Levels.
3. Train more personnel as first responders to RAWS malfunctions.
4. Establish local WIMS/NFDRS training courses for agency personnel.
5. Emphasize NFDRS training (S-491) at the geographic area level for mid-level fire management personnel.
6. Inform agency fire suppression supervisors of FDOP applications by integrating the training in unit orientation and *Incident Qualification Card* meetings. At a minimum, this should include Fire Management Officers, Fire Operations Supervisors, and Area Managers.

B. RAWS

1. Find and input missing weather data annually.
2. Perform an in depth analysis of data from the weather stations that were excluded from this analysis due to poor quality data. Compare weather station data to other data sources to determine usefulness of data.
3. Analyze the effect of weighting RAWS within each SIG to better represent the potential fire danger for each FDRA.

C. Technology & Information Management

1. Improve the CNIDC internet site where pertinent seasonal risk assessment information can be reviewed.

Appendix A – Team Members

Fire Danger Operating Preparedness Plan

Tina Flodeen
Assistant Center Manger-Intelligence
Central Nevada Interagency Dispatch Center—USFS-Santa Rosa RD/Humboldt-Toiyabe NF

Nancy Ellsworth
Center Manager-BLM-Winnemucca District
Central Nevada Interagency Dispatch Center

Mike Fettic
Fire Management Officer-Desert Basin Zone

Fire Danger Operating and Preparedness Plan

Assisted with this document

Robert Bunkel
GIS Specialist-BLM Winnemucca District

Appendix B – Primary Distribution List

Name	Title	Agency	Mailing Address	E-mail
Nancy Ellsworth	Center Manager CNIDC	BLM	5330 Jay's Road Winnemucca, NV 89445	nellswor@blm.gov
Mike Fettic	FMO	BLM/ USFS Santa Rosa	5100 E. Winnemucca Blvd. Winnemucca, NV 89445	mfettic@blm.gov
Doug Furtado	District Manager	BLM	50 Bastian Road Battle Mountain, NV 89820	dfurtado@blm.gov
Flavio Gallegos	AFMO-HTF Central Zone	USFS	P.O. Box 130 Austin, NV 89310	fgallegos@fs.fed.us
Joseph Garrotto	Santa Rosa RD	USFS	5100 E. Winnemucca Blvd. Winnemucca, NV 89445	jgarrotto@fs.fed.us
Gene Seildlitz	District Manager	BLM	5100 E. Winnemucca Blvd. Winnemucca, NV 89445	gseidlit@blm.gov
Bill Panagopolous	FMO-HTF	USFS	825 Avenue East Ely, NV 89301	bpanagopolous@fs.fed.us
Brock Uhlig	AFMO-BMD	BLM	50 Bastian Road Battle Mountain, NV 89820	buhlig@blm.gov
Donovan Walker	AFMO-WID	BLM	5100 E. Winnemucca Blvd. Winnemucca, NV 89445NV	d1walker@blm.gov

Appendix C – Terminology

1-hour Timelag Fuels	The 1-hour fuel moisture content represents the modeled fuel moisture of dead fuels from herbaceous plants or roundwood that is less than one quarter inch in diameter. Also estimated is the uppermost layer of litter on the forest floor.
10-hour Timelag Fuels	Dead fuels consisting of roundwood in the size range of one quarter to 1 inch in diameter and, very roughly, the layer of litter extending from just below the surface to three-quarters of an inch below the surface.
100-hour Timelag Fuels	Dead fuels consisting of roundwood in the size range of 1 to 3 inches in diameter and, very roughly, the forest floor from three quarters of an inch to 4 inches below the surface.
1000-hour Timelag Fuels	Dead fuels consisting of roundwood 3 to 8 inches in diameter or the layer of the forest floor more than about 4 inches below the surface or both.
Adjective Rating	A public information description of the relative severity of the current fire danger situation.
Annual Plant	A plant that lives for one growing season, starting from a seed each year.
Burning Index (BI)	BI is a number related to the contribution of fire behavior to the effort of containing a fire. The BI (difficulty of control) is derived from a combination of Spread Component (how fast it will spread) and Energy Release Component (how much energy will be produced). In this way, it is related to flame length, which, in the Fire Behavior Prediction System, is based on rate of spread and heat per unit area. However, because of differences in the calculations for BI and flame length, they are not the same. The BI is an index that rates fire danger related to potential flame length over a fire danger rating area. The fire behavior prediction system produces flame length predictions for a specific location (Andrews, 1986). The BI is expressed as a numeric value related to potential flame length in feet multiplied by 10. The scale is open-ended which allows the range of numbers to adequately define fire problems, even during low to moderate fire danger.
Climatological Breakpoints	Points on the cumulative distribution of one fire weather/fire danger index without regard to associated fire occurrence/business. They are sometimes referred to as exceedence thresholds.
Duff	The partially decomposed organic material of the forest floor that lies beneath the freshly fallen twigs, needles and leaves. (The F and H layers of the forest soil profile.)
Energy Release Component (ERC)	ERC is a number related to the available energy (BTU) per unit area (square foot) within the flaming front at the head of a fire. Since this number represents the potential "heat release" per unit area in the flaming zone, it can provide guidance to several important fire activities. It may also be considered a composite fuel moisture value as it reflects the contribution that all live and dead fuels have to potential fire intensity. The ERC is a cumulative or "build- up" type of index. As live fuels cure and dead fuels dry, the ERC values get higher thus providing a good reflection of drought conditions. The scale is open-ended or unlimited and, as with other NFDRS components, is relative. Conditions producing an ERC value of 24 represent a potential heat release twice that of conditions resulting in an ERC value of 12.
Equilibrium Moisture Content	The moisture content that a fuel particle will attain if exposed for an infinite period in an environment of constant temperature and humidity. When a fuel particle has reached its equilibrium moisture content, the net exchange of moisture between it and its environment is zero.
Fire Business Thresholds	Values of one or more fire weather/fire danger indexes that have been statistically related to occurrence of fires (fire business). Generally, the threshold is a value or range of values where historical fire activity has significantly increased or decreased.
Fire Danger	The resultant descriptor of the combination of both constant and variable factors that affect the ignition, spread, and control difficulty of control of wildfires on an area.
Fire Danger Continuum	The range of possible values for a fire danger index or component, given a set of NFDRS parameters and inputs.
Fire Danger Rating	A system that integrates the effects of existing and expected states of selected fire danger factors into one or more qualitative or numeric indices that reflect an areas protection needs.

Fire Danger Rating Area	A geographic area relatively homogeneous in climate, fuels and topography, tens of thousands of acres in size, within which the fire danger can be assumed to be uniform. Its size and shape is primarily based on influences of fire danger, not political boundaries. It is the basic, on the ground unit for which unique fire danger decisions are made based on fire danger ratings. Weather is represented by one or more NFDRS weather (RAWS) stations.
Fire Weather Forecast Zone	A grouping of fire weather stations that experience the same weather change or trend. Zones are developed by the National Weather Service to assist NWS production of fire weather forecasts or trends for similar stations. Fire weather forecast zones are best thought of as a list of similar-weather stations, rather than an area on a map.
Forb	A non- grass-like herbaceous plant.
Fuel Class	A group of fuels possessing common characteristics. In the NFDRS, dead fuels are grouped according to their timelag (1, 10, 100, and 1000 hr) and live fuels are grouped by whether they are herbaceous (annual or perennial) or woody.
Fuel Model	A simulated fuel complex for which all the fuel descriptors required by the mathematical fire spread model have been supplied.
Fuel Moisture Content	The water content of a fuel particle expressed as a percent of the oven-dry weight of the particle. Can be expressed for either live or dead fuels.
Fuels	Non-decomposed material, living or dead, derived from herbaceous plants.
Green-up	Green-up within the NFDRS model is defined as the beginning of a new cycle of plant growth. Green- up occurs once a year, except in desert areas where rainy periods can produce a flush of new growth more than once a year. Green- up may be signaled at different dates for different fuel models. Green-up should not be started when the first flush of green occurs in the area. Instead, the vegetation that will be the fire problem (represented by the NFDRS fuel model associated with the weather station) when it matures and cures should be identified. Green- up should start when the majority of this vegetation starts to grow.
Herb	A plant that does not develop woody, persistent tissue but is relatively soft or succulent and sprouts from the base (perennials) or develops from seed (annuals) each year. Included are grasses, forbs, and ferns.
Herbaceous Vegetation Moisture Content	The water content of a live herbaceous plant expressed as a percent of the oven-dry weight of the plant.
Ignition Component (IC)	IC is a rating of the probability that a firebrand will cause a fire requiring suppression action. Since it is expressed as a probability, it ranges on a scale of 0 to 100. An IC of 100 means that every firebrand will cause a fire requiring action if it contacts a receptive fuel.
Keetch-Byram Drought Index (KBDI)	KBDI is a stand-alone index that can be used to measure the effects of seasonal drought on fire potential. The actual numeric value of the index is an estimate of the amount of precipitation (in 100ths of inches) needed to bring the soil back to saturation (a value of 0 is complete saturation of the soil). Since the index only deals with the top 8 inches of the soil profile, the maximum KBDI value is 800 or 8.00 inches of precipitation would be needed to bring the soil back to saturation. The Keetch-Byram Drought Index's relationship to fire danger is that as the index value increases, the vegetation is subjected to increased stress due to moisture deficiency. At higher values, desiccation occurs and live plant material is added to the dead fuel loading on the site. Also, an increasing portion of the duff/litter layer becomes available fuel at higher index values.
Litter	The top layer of the forest floor, typically composed of loose debris such as branches, twigs, and recently fallen leaves or needles; little altered in structure by decomposition. (The layer of the forest soil profile.)
Live Fuels	Naturally occurring fuels whose moisture content is controlled by the physiological processes within the plant. The National Fire Danger Rating System considers only herbaceous plants and woody material small enough (leaves, needles and twigs) to be consumed in the flaming front of a fire.

Moisture of Extinction	The theoretical dead fuel moisture content above which a fire will not spread.
Perennial Plant	A plant that lives for more than two growing seasons. For fire danger rating purposes, biennial plants are classed with perennials.
Roundwood	Boles, stems, or limbs of woody material; that portion of the dead wildland fuel which is roughly cylindrical in shape.
Shrub	A woody perennial plant differing from a perennial herb by its persistent and woody stem; and from a tree by its low stature and habit of branching from the base.
Slash	Branches, bark, tops, cull logs, uprooted stumps, and broken or uprooted trees left on the ground after logging; also debris resulting from thinning or wind storms.
Slope	The rise or fall in terrain measured in feet per 100 feet of horizontal distance measurement, expressed as a percentage.
Spread Component (SC)	SC is a rating of the forward rate of spread of aheadfire. Deeming, et al., (1977), states that "the spread component is numerically equal to the theoretical ideal rate of spread expressed in feet-per-minute". This carefully worded statement indicates both guidelines (it's theoretical) and cautions (its ideal) that must be used when applying the Spread Component. Wind speed, slope and fine fuel moisture are key inputs in the calculation of the spread component, thus accounting for a high variability from day-to-day. The Spread Component is expressed on an open-ended scale; thus it has no upper limit.
Staffing Index	Adjective rating calculations are keyed off the first priority fuel model listed in your station record in the processor. It uses the staffing index (such as ERC or BI) the user associates with the first fuel model/slope/grass type/climate class combination.
Staffing Level	The basis for decision support for daily staffing of initial attack resources and other activities; a level of readiness and an indicator of daily preparedness.
Surface-Area-to-Volume Ratio	The ratio of the surface area of a fuel particle (in square- ft) to its volume (in cubic-ft). The "finer" the fuel particle, the higher the ratio; for example, for grass this ratio ranges above 2,000; while for a ½ inch diameter stick it is 109.
Timelag	The time necessary for a fuel particle to lose approximately 63 percent of the difference between its initial moisture content and its equilibrium moisture content.
Timelag Fuel Moisture Content	The dead fuel moisture content corresponding to the various timelag fuel classes.
X-1000 Hr Fuel Moisture	X-1000 is the live fuel moisture recovery value derived from the 1000-hr fuel moisture value. It is an independent variable used in the calculation of the herbaceous fuel moisture. The X-1000 is a function of the daily change in the 1000-hour timelag fuel moisture, and the average temperature. Its purpose is to better relate the response of the live herbaceous fuel moisture model to the 1000-hour timelag fuel moisture value. The X-1000 value is designed to decrease at the same rate as the 1000-hour timelag fuel moisture, but to have a slower rate of increase than the 1000-hour timelag fuel moisture during periods of precipitation, hence limiting excessive herbaceous fuel moisture recovery.

Appendix D – WIMS User ID List

Name
Fettic, Mike
Flodeen, Tina
Ellsworth, Nancy
Walker, Lisa
Sellner, Samantha
Mann, Alexis

For assistance with passwords you may contact the WIMS help desk at 1-800-253-5559 or 208-387-5290, fax 208-387-5292, email: fire_help@fs.fed.us.

Appendix E – Weather Station Catalogs

(*Active RAWS Only*)

Station	Priority	Model	Slope	Herb Grass Type	Climate Class	Staffing Index	Decision Classes	Staffing Index Breakpoints			
								Low		High	
								SI%	VAL	SI%	VAL
Blue Wing (260202)	1	7G	1	P	1	ERC	5	80	100	95	105
	2	7A	1	A	1	BI	3	80	50	95	67
	3	7T	1	A	1	BI	3	80	79	95	103
Siard (260402)	1	7T	1	P	1	BI	3	80	83	95	114
	2	7A	1	A	1	BI	3	80	56	95	70
	3	7L	1	P	1	BI	3	80	68	95	88
	4	7G	1	P	1	ERC	5	80	102	95	107
Beacon (260505)	1	7G	1	P	1	ERC	5	80	103	95	110
	2	7A	1	A	1	BI	3	80	54	95	72
	3	7L	1	P	1	BI	3	80	65	95	86
	4	7T	1	A	1	BI	3	80	82	95	103
Dry Canyon (260203)	1	7G	1	P	1	ERC	5	80	95	95	103
	2	7A	1	A	1	BI	3	80	52	95	68
	3	7T	1	A	1	BI	3	80	78	95	100
	4	7C	1	P	1	BI	3	80	51	95	65
Red Butte (260504)	1	7G	1	P	1	ERC	5	80	100	95	105
	2	7A	1	A	1	BI	3	80	56	95	68
	3	7L	1	P	1	BI	3	80	68	95	85
	4	7T	1	P	1	BI	3	80	83	95	105
Majuba (260208)	1	7G	1	P	1	ERC	5	80	95	95	105
	2	7A	1	A	1	BI	3	80	50	95	64
	3	7T	1	A	1	BI	3	80	78	95	100
Morey Creek (260204)	1	7G	1	P	1	ERC	5	80	98	95	105
	2	7A	1	A	1	BI	3	80	53	95	68
	3	7T	1	A	1	BI	3	80	83	95	108
	4	7C	1	P	1	BI	3	80	56	95	68
Texas Spring (260206)	1	7T	1	A	1	BI	3	80	77	95	102
	2	7A	1	A	1	BI	3	80	52	95	67
	3	7C	1	P	1	BI	3	80	54	95	67
	4	7G	1	P	1	ERC	5	80	90	95	102
Double H (260207)	1	7T	1	A	1	BI	3	80	83	95	104
	2	7A	1	A	1	BI	3	80	55	95	68
	3	7C	1	P	1	BI	3	80	57	95	69
	4	7G	1	P	1	ERC	5	80	95	95	103
Coils Creek (260603)	1	7G	1	P	1	ERC	5	80	85	95	96
	2	7A	1	A	1	BI	3	80	56	95	68
	3	7L	1	P	1	BI	3	80	65	95	84
	4	7T	1	P	1	BI	3	80	89	95	105
Austin (260501)	1	7T	1	P	2	BI	3	80	68	95	95
	2	7G	1	P	2	ERC	5	80	96	95	103
Combs Canyon (260601)	1	7G	1	P	1	ERC	5	80	96	95	103
	2	7A	1	A	1	BI	3	80	57	95	73
	3	7L	1	P	1	BI	3	80	70	95	96
	4	7T	1	P	1	BI	3	80	85	95	116

Appendix E – Weather Station Catalogs

(*Active RAWS Only*)

Station	Priority	Model	Slope	Herb Grass Type	Climate Class	Staffing Index	Decision Classes	Staffing Index Breakpoints			
								Low		High	
								SI%	VAL	SI%	VAL
Desatoya Mountain (260503)	1	7G	2	P	1	ERC	5	80	96	95	103
	2	7A	2	A	1	BI	3	80	62	95	78
	3	7L	2	P	1	BI	3	80	77	95	98
	4	7T	2	P	1	BI	3	80	96	95	117
Quima Peak (260810)	1	7T	1	A	2	BI	3	80	85	95	116
	2	7G	1	P	2	ERC	5	80	93	95	103
Buddy Adams (261408)	1	7A	2	A	1	BI	3	80	68	95	82
	2	7L	2	P	1	BI	3	80	85	95	106
	3	7T	2	P	1	BI	3	80	106	95	131
	4	7G	2	P	1	ERC	5	80	105	95	120
Pancake (261404)	1	7T	2	P	1	BI	3	80	95	95	123
	2	7A	2	A	1	BI	3	80	61	95	82
	3	7L	2	P	1	BI	3	80	77	95	100
	4	7G	2	P	1	ERC	5	80	98	95	105

APPENDIX F – Weather Station Analysis

		Fire Day					Large Fire Day					Multiple Fire Day				
SIG	Variable	Model	R^2	Chi^2	P-Val	P-Range	Acres	R^2	Chi^2	P-Val	P-Range	Fires	R^2	Chi^2	P-Val	P-Range
Humboldt Basin FDRA	**ERC**	**7G**	**0.93**	**89.2**	**0**	**0**	**100 (C)**	**0.9**	**21.6**	**0.0056**	**0**	**3 (C)**	**0.83**	**48.8**	**0**	**0**
Humboldt Basin FDRA	ERC	7A	0.89	71.8	0	0	100 (C)	0.75	31.5	0	0	3 (C)	0.57	51.5	0	0
Humboldt Basin FDRA	ERC	7T	0.97	27.2	0.0007	0	100 (C)	0.85	22.1	0.0047	0	3 (C)	0.73	41.7	0	0
Humboldt Basin FDRA	ERC	7L	0.89	76.2	0	0	100 (C)	0.72	34	0	0	3 (C)	0.53	63	0	0
Humboldt Basin FDRA	ERC	7C	0.95	40.8	0	0	100 (C)	0.82	31.4	0.0001	0	3 (C)	0.71	41.6	0	0
Humboldt Basin FDRA	BI	7C	0.83	117	0	0	100 (C)	0.68	44	0	0	3 (C)	0.62	50.5	0	0
Humboldt Basin FDRA	**BI**	**7T**	**0.84**	**120**	**0**	**0**	**100 (C)**	**0.67**	**48.4**	**0**	**0**	**3 (C)**	**0.62**	**56.9**	**0**	**0**
Humboldt Basin FDRA	BI	7L	0.87	100.2	0	0	100 (C)	0.7	38.8	0	0	3 (C)	0.63	47.6	0	0
Humboldt Basin FDRA	BI	7G	0.86	142.7	0	0	100 (C)	0.72	51.9	0	0	3 (C)	0.66	65.2	0	0
Humboldt Basin FDRA	BI	7S	0.88	85.3	0	0	100 (C)	0.77	32	0.0001	0	3 (C)	0.72	39.4	0	0
Humboldt Basin FDRA	BI	7A	0.85	116	0	0	100 (C)	0.67	47.7	0	0	3 (C)	0.61	54.1	0	0
Toiyabe Mnts. FDRA	ERC	7A	0.45	26	0	0	100 (C)	0.89	1.7	0.197	0.0003	3 (C)	0.34	NA	NA	0.5373
Toiyabe Mnts. FDRA	ERC	7L	0.36	35.8	0	0	100 (C)	0.54	6.8	0.1469	0.0035	3 (C)	0.62	**0.1**	0.7116	0.6401
Toiyabe Mnts. FDRA	**ERC**	**7G**	**0.85**	**30.7**	**0.0002**	**0**	**100 (C)**	**0.7**	**7.6**	**0.4726**	**0**	**3 (C)**	**1**	**0**	**0.9049**	**0.0166**
Toiyabe Mnts. FDRA	ERC	7N	0.71	27.2	0.0006	0	100 (C)	0.81	2.9	0.894	0	3 (C)	0.72	0.4	0.5274	0.3111
Toiyabe Mnts. FDRA	ERC	7T	0.66	24.7	0.0018	0	100 (C)	0.48	13.2	0.1041	0.0003	3 (C)	0.4	**2.1**	0.1519	0.1475
Toiyabe Mnts. FDRA	**BI**	**7T**	**0.53**	**39.6**	**0**	**0**	**100 (C)**	**0.43**	**14.1**	**0.0801**	**0.0007**	**3 (C)**	**0.33**	**1.9**	**0.1651**	**0.2409**
Toiyabe Mnts. FDRA	BI	7L	0.5	30.5	0.0002	0	100 (C)	0.49	16	0.0427	0.0001	3 (C)	0.2	**1.6**	0.2103	0.4334
Toiyabe Mnts. FDRA	BI	7A	0.51	30.9	0.0001	0	100 (C)	0.61	9.4	0.3059	0	3 (C)	0.23	**1.7**	0.1922	0.3778
Toiyabe Mnts. FDRA	BI	7K	0.6	41.6	0	0	100 (C)	0.54	12.9	0.1161	0.0001	3 (C)	0.13	5	0.247	0.3927
Toiyabe Mnts. FDRA	BI	7G	0.62	45.7	0	0	100 (C)	0.57	10.3	0.2414	0.0001	3 (C)	0.18	**5**	0.0251	0.2917
Mohave Desert FDRA	**ERC**	**7T**	**0.47**	**6.9**	**0.5429**	**0.0113**	**300 (C)**	**0.97**	**NA**	**NA**	**0.6847**	**3 (C)**	**NA**	**NA**	**NA**	**1**
Mohave Desert FDRA	ERC	7L	0.17	9.7	0.0848	0.1244	300 (C)	0.14	NA	NA	0.4282	3 (C)	NA	NA	NA	1
Mohave Desert FDRA	ERC	7A	0.2	7.4	0.0592	0.1423	300 (C)	0	NA	NA	1	3 (C)	NA	NA	NA	1
Mohave Desert FDRA	ERC	7Q	0.48	13.9	0.0848	0.0003	300 (C)	0.98	NA	NA	0.6527	3 (C)	NA	NA	NA	1
Mohave Desert FDRA	ERC	7G	0.62	17.3	0.027	0	300 (C)	0.99	NA	NA	0.5329	3 (C)	NA	NA	NA	1
Mohave Desert FDRA	**BI**	**7G**	**0.48**	**17.6**	**0.0243**	**0**	**300 (C)**	**1**	**NA**	**NA**	**0.3158**	**3 (C)**	**NA**	**NA**	**NA**	**1**
Mohave Desert FDRA	BI	7T	0.5	12.4	0.1349	0.0004	300 (C)	1	NA	NA	0.3822	3 (C)	NA	NA	NA	1
Mohave Desert FDRA	BI	7A	0.62	8.6	0.38	0.0001	300 (C)	1	NA	NA	0.566	3 (C)	NA	NA	NA	1
Mohave Desert FDRA	BI	7L	0.54	9.9	0.2706	0.0004	300 (C)	1	NA	NA	0.5141	3 (C)	NA	NA	NA	1

Appendix G – Preparedness Level Plan

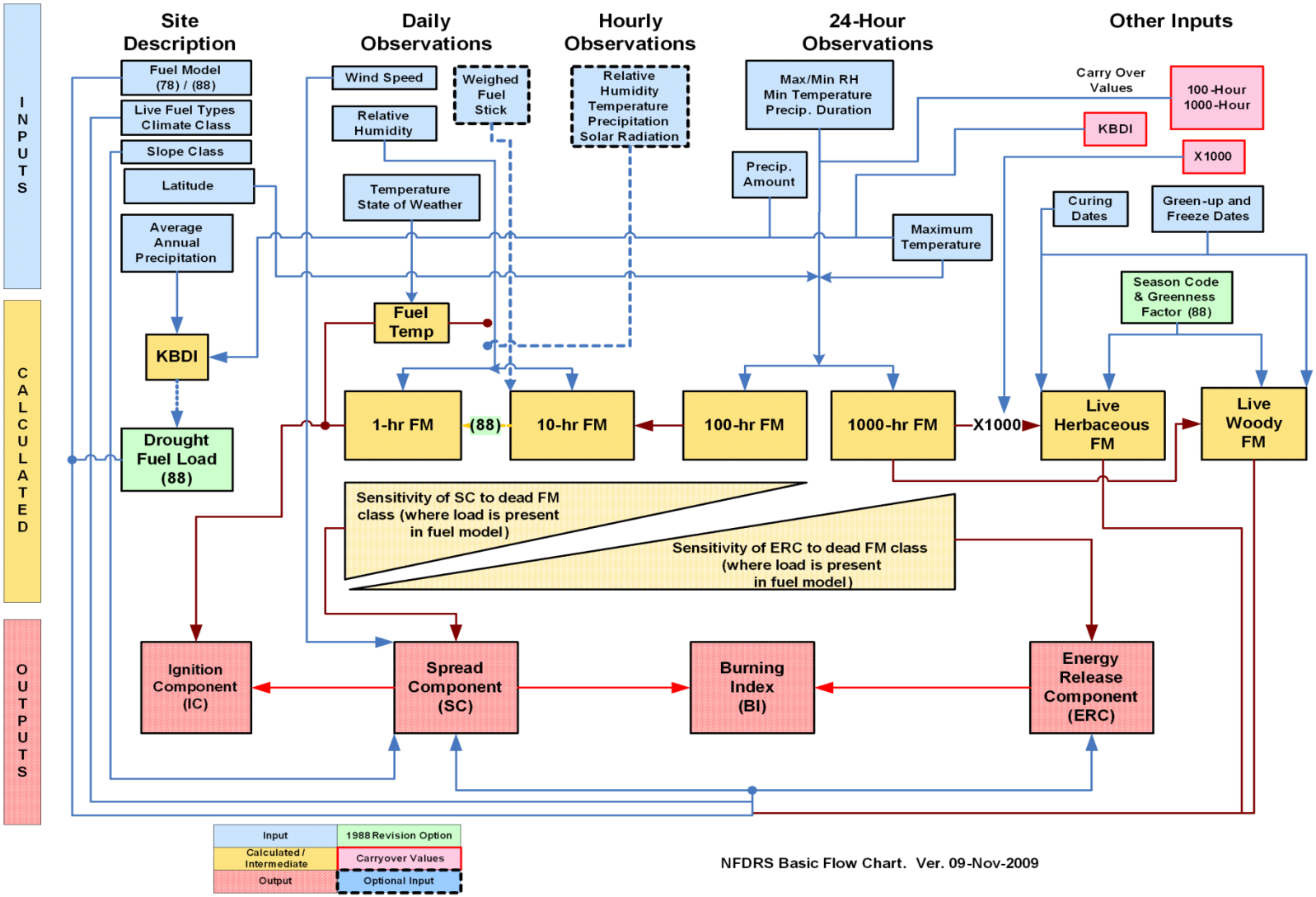
The following Preparedness Level actions are guidelines for agency personnel. They are discretionary in nature and usually will require a consensus between agency personnel prior to implementation.

Responsible Party	Suggested Action	PL 1	PL 2	PL 3	PL 4	PL 5	Affected Entity
Agency Administrator	Ensure supervisors approve fire availability of staff and notify Duty Officer.	●	●	●	●	●	Agency
	Ensure resource advisors are designated and available for fire assignments.	●	●	●	●	●	Agency
	Evaluate work/rest needs of fire staff.		●	●	●	●	Agency
	Consider need for fire restriction or closures.				●	●	Public Industry
	Provide appropriate political support to fire staff regarding the implementation of preparedness level actions.			●	●	●	Agency Public Industry
	Review and transmit severity requests to the appropriate level.			•	●	●	Agency
	Issue guidance to respective agency staff indicating severity of the season and increased need and availability for fire support personnel.				●	●	Agency
Fire Staff Officer or FMO	Evaluate season severity data (BI and ERC trends for season, fuel loadings, live FM, drought indices, and long term forecasts).	●	●	●	●	●	Agency
	Evaluate fire staff work/rest requirements.		●	●	●	●	Agency
	Brief agency administrator on burning conditions and fire activity.			●	●	●	Agency
	Review geographical and national preparedness levels and evaluate need to suspend local prescribe fire activities.			●	●	●	Agency
	Ensure Education/Mitigation personnel have initiated media contacts and public notification.				●	●	Public Industry
	Ensure agency staff is briefed on increasing fire activity.				●	●	Agency
	Brief next higher level of fire management on increasing/decreasing fire activity.				●	●	Agency
	Consider fire severity request and pre-positioning of resources including: suppression resources, aerial support, aerial supervision, command positions, dispatch, logistical support, and prevention.			•	●	●	Agency
	Coordinate with interagency partners the need for fire restrictions or closures.					●	Public Industry
	Request that the Agency Administrator issue guidance to respective agency staff regarding the need for increased fire availability in support positions.				●	●	Agency
	Pre-position a Type 3 organization/Type 2 Team.					●	Agency

Responsible Party	Suggested Action	PL 1	PL 2	PL 3	PL 4	PL 5	Affected Entity
Duty Officer	Confirm (or adjust) Dispatch Levels with the CNIDC Manager.	●	●	●	●	●	Agency
	If preparedness level is decreasing, consider releasing pre-positioned and detailed resources.	●	●	●			Agency
	Evaluate work/rest needs of IA crews, dispatchers, & aviation bases.			●	●	●	Agency
	Consider aerial detection flight.				●	●	Agency
	Evaluate need to change or shift duty hours of IA resources.				●	●	Agency
	Evaluate draw-down levels for suppression, command, and oversight positions.				●	●	Agency
	Consider extending staffing beyond normal shift length.				●	●	Agency
	Brief FMO on severity of conditions and consider severity request.				●	●	Agency
	Consider pre-positioning and/or detailing of additional IA resources.				●	●	Agency
	Consider pre-positioning and automatic dispatch of ATGS.				●	●	Agency
	Consider bringing in local IA resources from scheduled days off.				●	●	Agency
	Consider patrols and pre-positioning of local IA resources in high risk areas.				●	●	Agency
	Consider automatic dispatch of helicopter, SEAT and/or heavy air tankers for IA				●	●	Agency
CNIDC Manager	Confirm and broadcast the morning and afternoon preparedness, dispatch, and adjective fire danger levels to interagency fire personnel.	●	●	●	●	●	Agency
	Evaluate work/rest needs of center staff.			●	●	●	Agency
	If preparedness level is decreasing, consider release of pre-positioned or detailed dispatchers and logistical support personnel.	●	●	●			Agency
	Consult with Duty Officer concerning potential for extended staffing beyond normal shift length.				●	●	Agency
	Consider pre-positioning or detail of off-unit IA dispatchers and logistical support personnel.				●	●	Agency
	Consider discussing activation of local area MAC Group.					●	Agency
	Consider ordering a Fire Behavior Analyst.					●	Agency
	Consult with duty officer and FMO regarding potential need for severity request.			●	●	●	Agency
	Consider bringing additional dispatch personnel in from scheduled days off.					●	Agency
	Notify appropriate military personnel of high/extreme fire danger and request the drop heights of chaff/flares be increased.					●	Agency
	Consult with Western Great Basin Coordination Center (WGBCC) regarding availability of resources at the geographical and national levels.			●	●	●	Agency

Responsible Party	Suggested Action	PL 1	PL 2	PL 3	PL 4	PL 5	Affected Entity
Assistant Fire Staff or AFMO	Ensure that roadside fire danger signs reflect the current adjective fire danger rating.	●	●	●	●	●	Public
	Ensure IA crews are briefed on local burning conditions, and availability of IA resources and air support.	●	●	●	●	●	Agency
	Ensure incoming pre-position or detailed personnel are briefed on local conditions.	●	●	●	●	●	Agency
	Evaluate work/rest needs of crews.			●	●	●	Agency
	Increase patrols in camping and recreation areas.				●	●	Public
	Consider suspension of project work away from station.					●	Agency
	Provide duty officer with feedback regarding unique/unexpected fire behavior and severity conditions and the need to increase IA capabilities.				●	●	Agency
Fire Education & Mitigation	Ensure that roadside fire danger signs reflect the current adjective fire danger rating.	●	●	●	●	●	Public
	Initiate press release to inform public/industry of the potential fire danger.				●	●	Public Industry
	Ensure the public and industrial entities are aware of the policy regarding fire trespass investigations for human-caused fires and cost recovery for suppression action.				●	●	Public Industry
	Consider need for increased prevention patrols.				●	●	Public Industry
	Contact local fire chiefs to make them aware of fire danger.				●	●	Agency
	Consider door to door contacts in rural communities or ranch areas.					●	Public Industry
	Post signs and warnings in camp and recreation areas.				●	●	Public
	Consult with FMO regarding severity request and potential need for additional prevention personnel.				●	●	Public Industry
	Consult with AFMO and FMO regarding need for fire restrictions, closures and the need to order a Fire Prevention Team.				●	●	Agency Public Industry

Appendix H – NFDRS Structure Chart

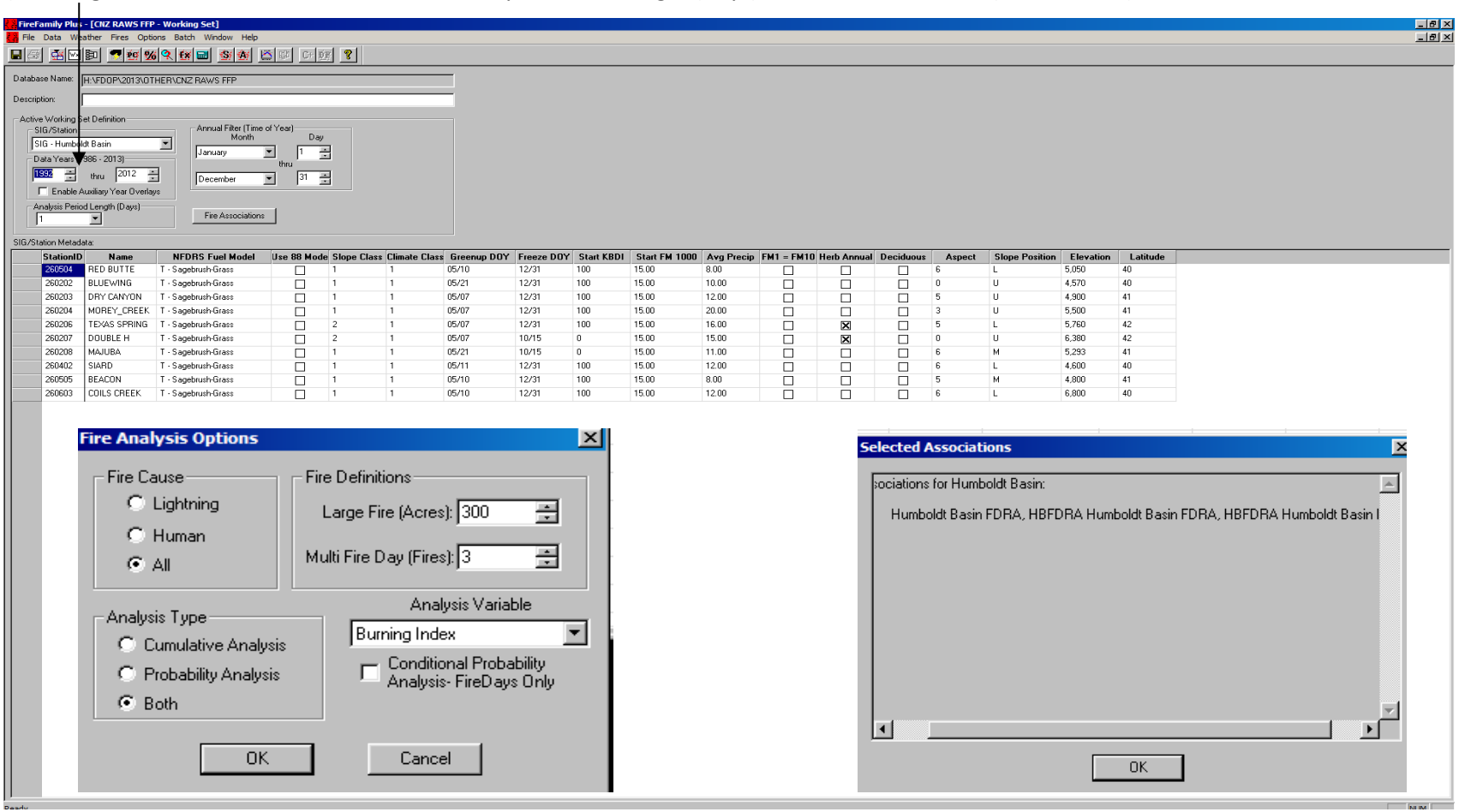


NFDRS Basic Flow Chart. Ver. 09-Nov-2009

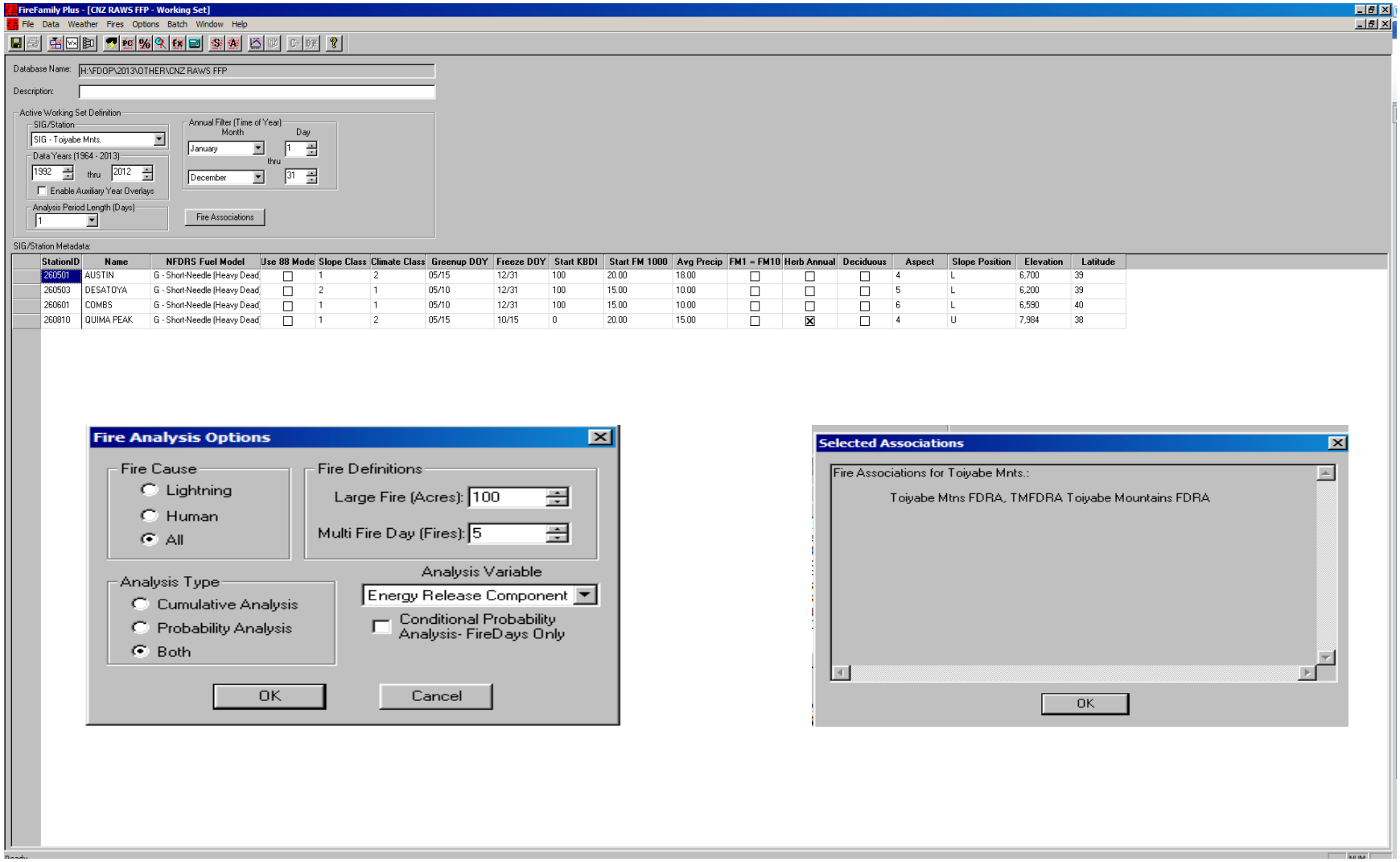
APPENDIX I – Fire Family Plus Analysis

Working Set (Humboldt Basin FDRA)

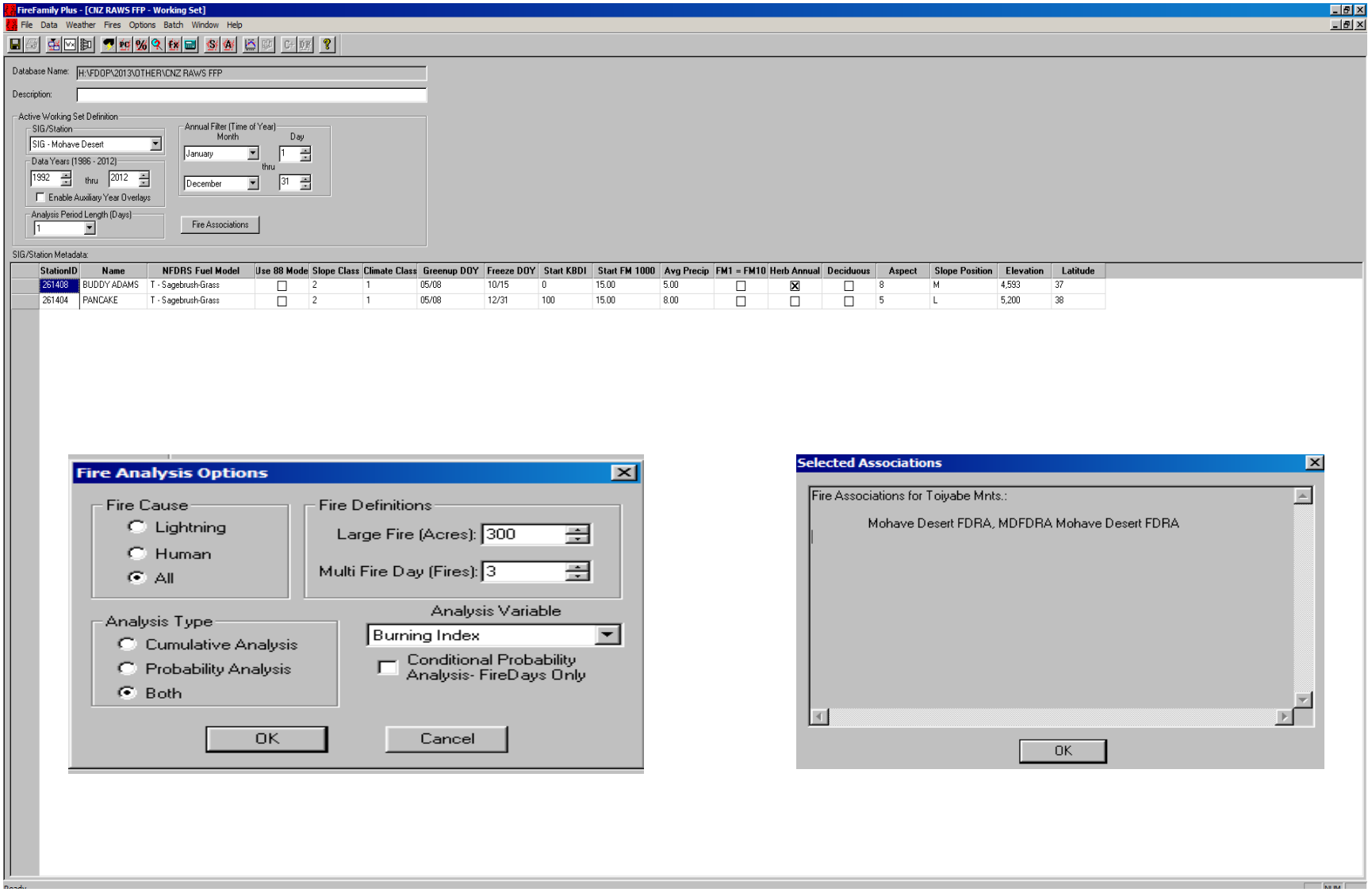
(**Working Set**-is the SIG/Station, Data Years, Analysis Period Length (Days), and the Annual Filter (Time of Year).



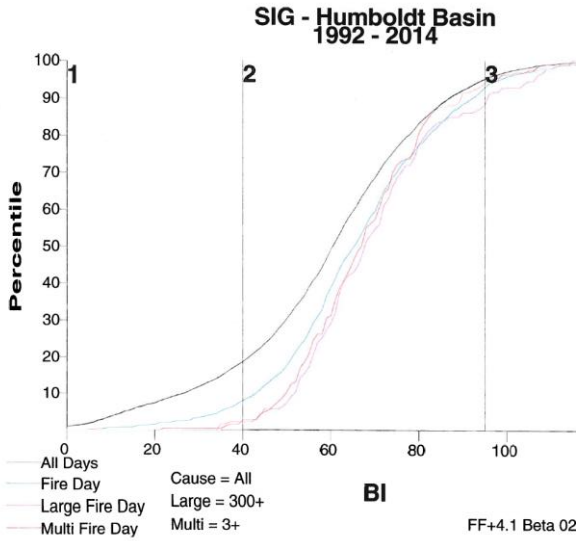
Working Set (Toiyabe Mountains FDRA)

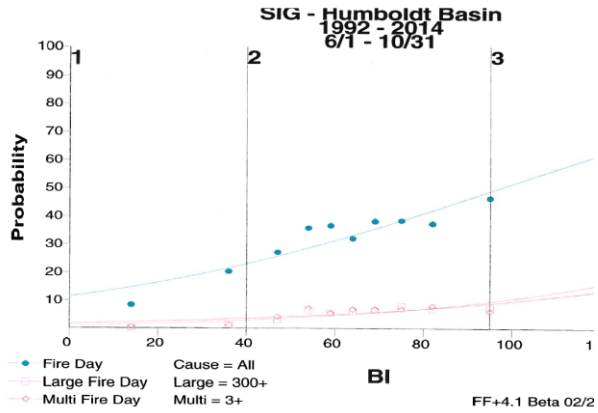


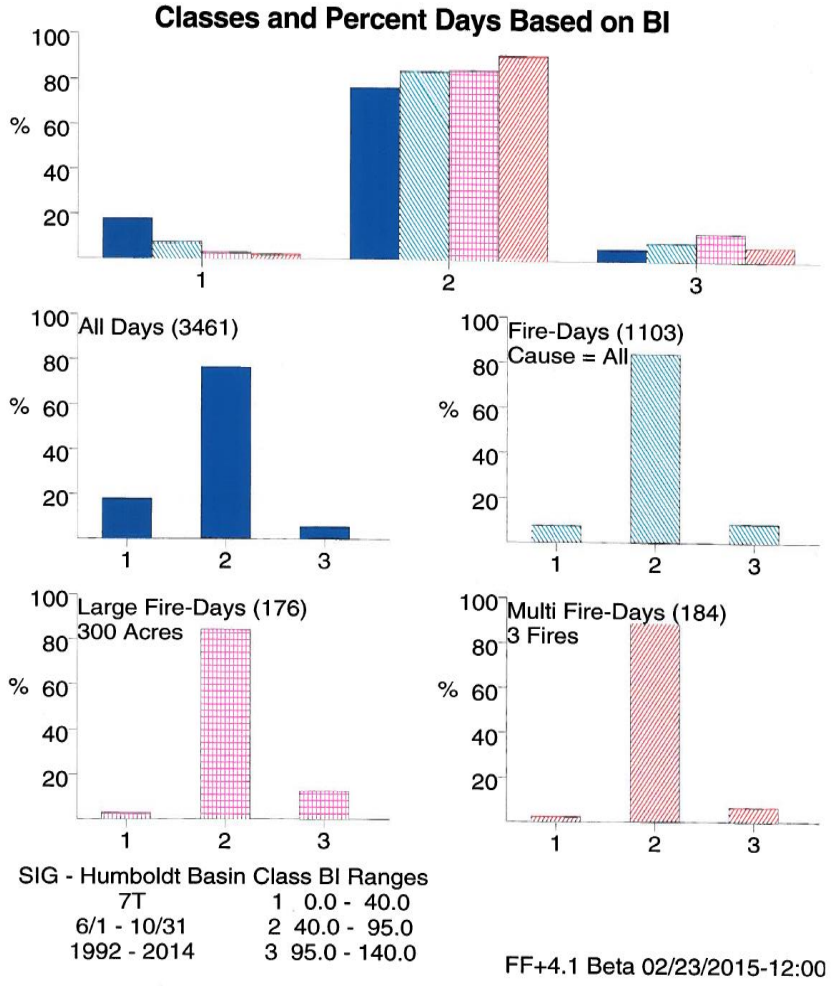
Working Set (Mohave Desert FDRA)



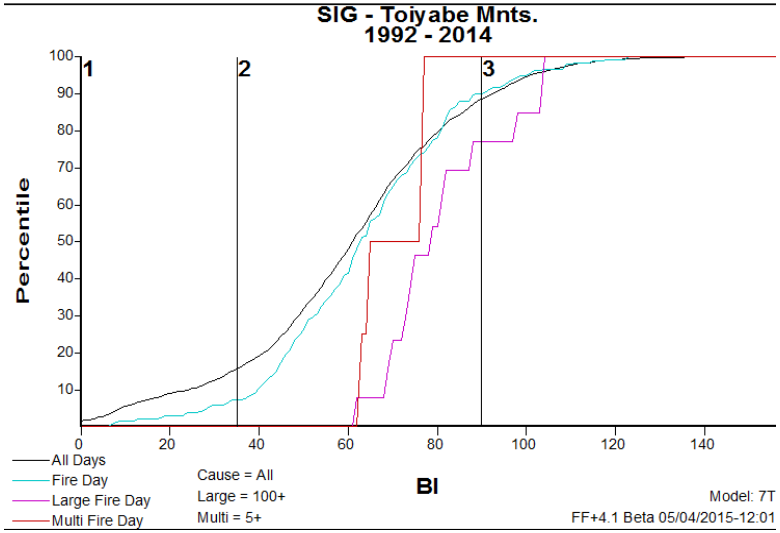
Dispatch Level Decision Points (Humboldt Basin FDRA)

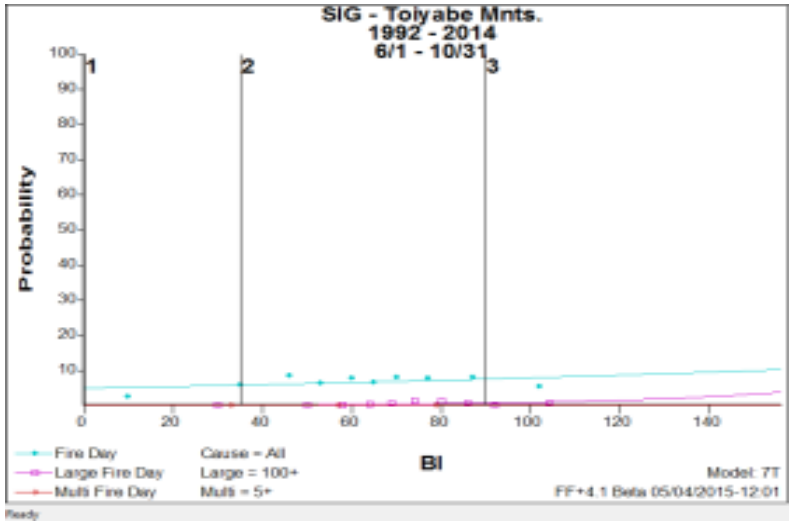


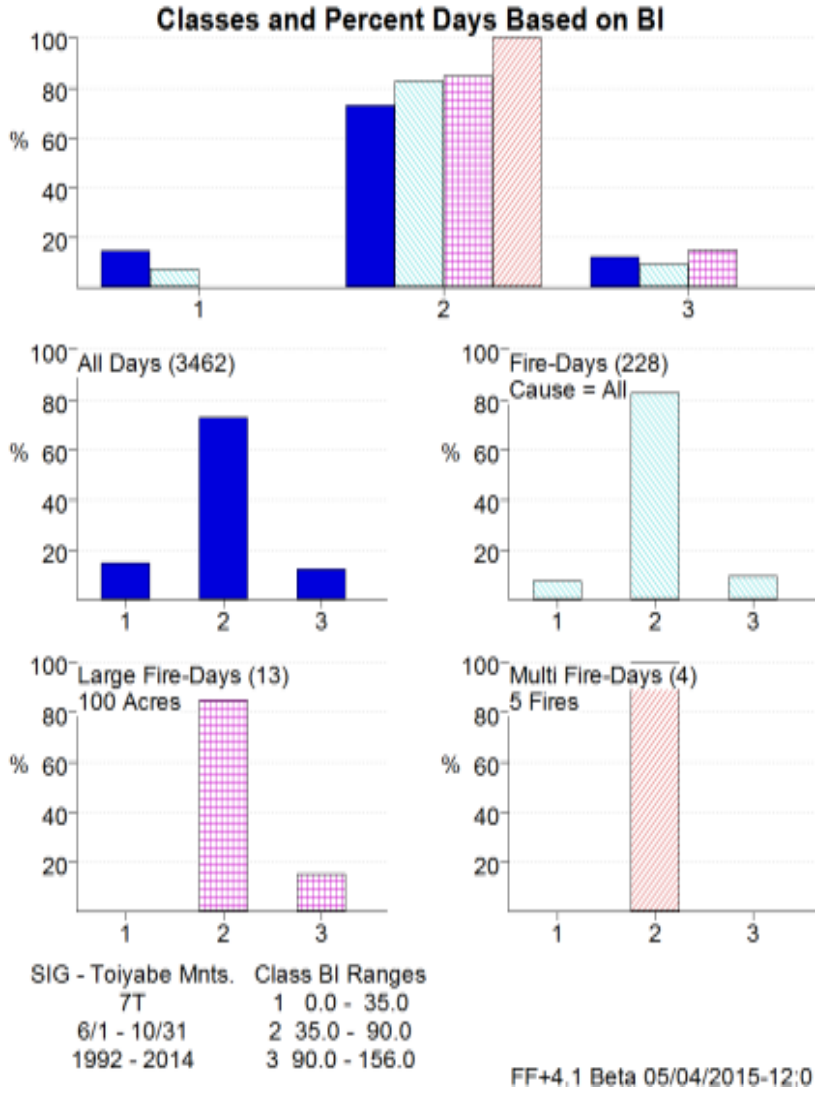




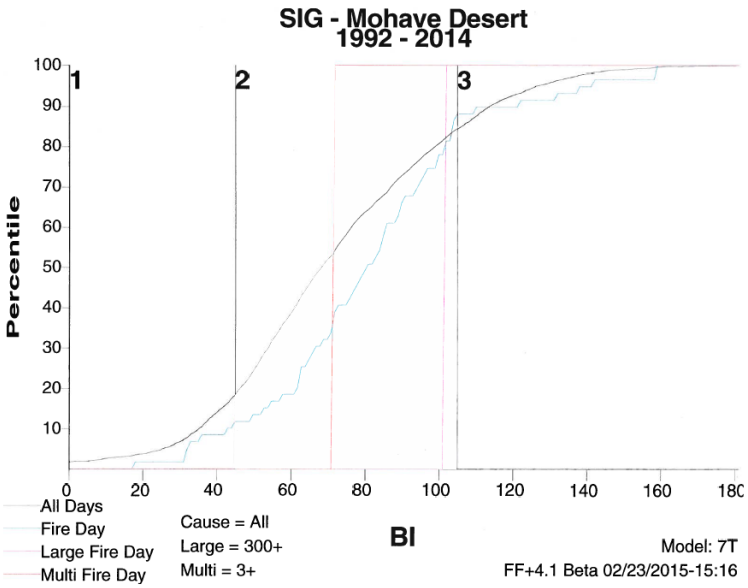
Dispatch Level Decision Points (Toiyabe Mountains FDRA)

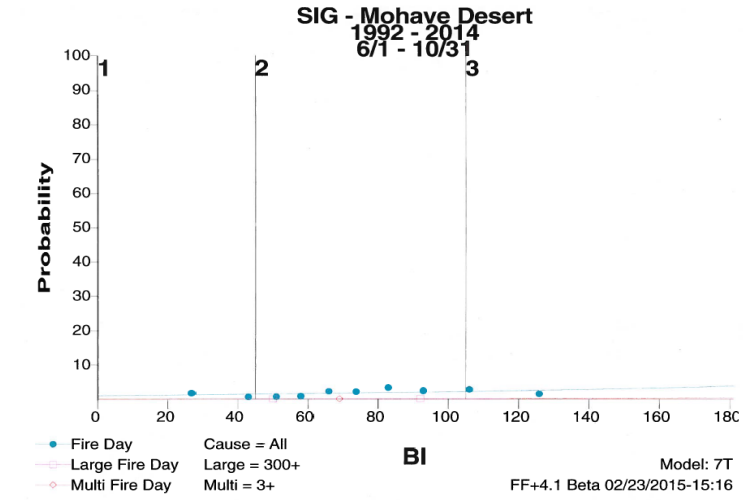


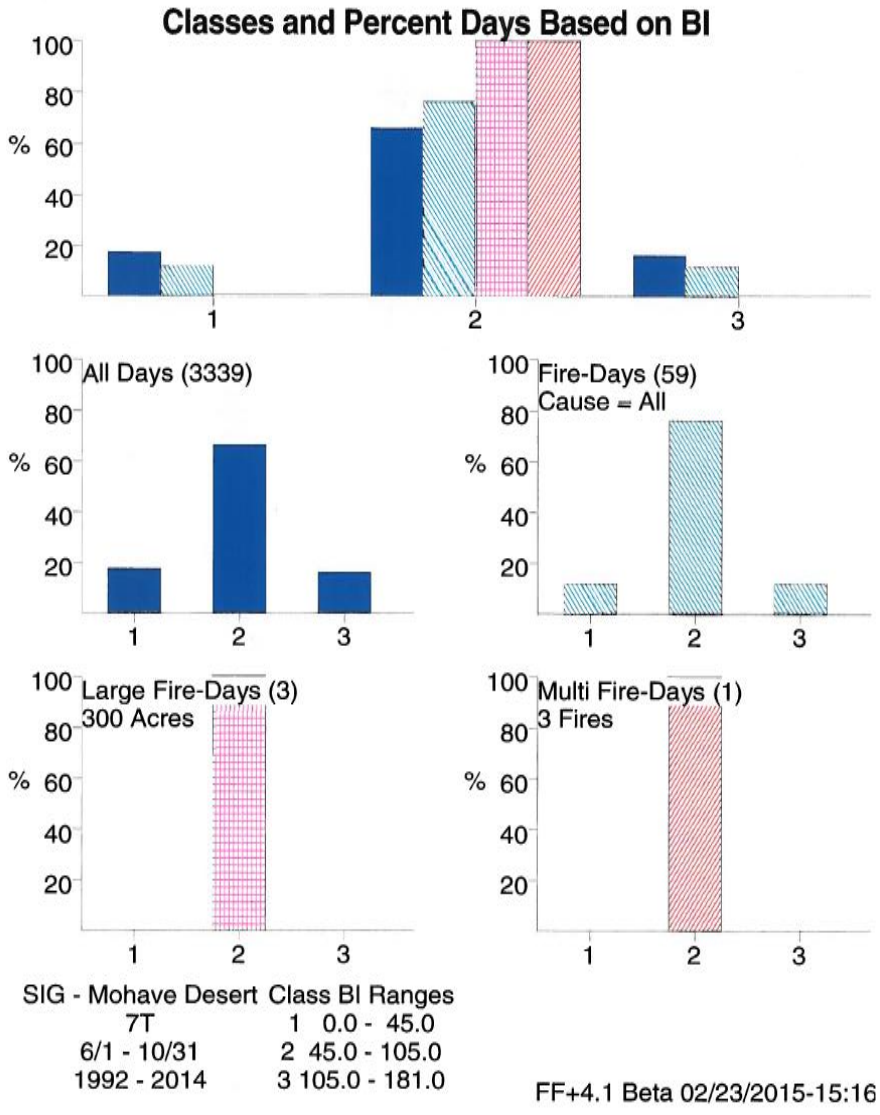




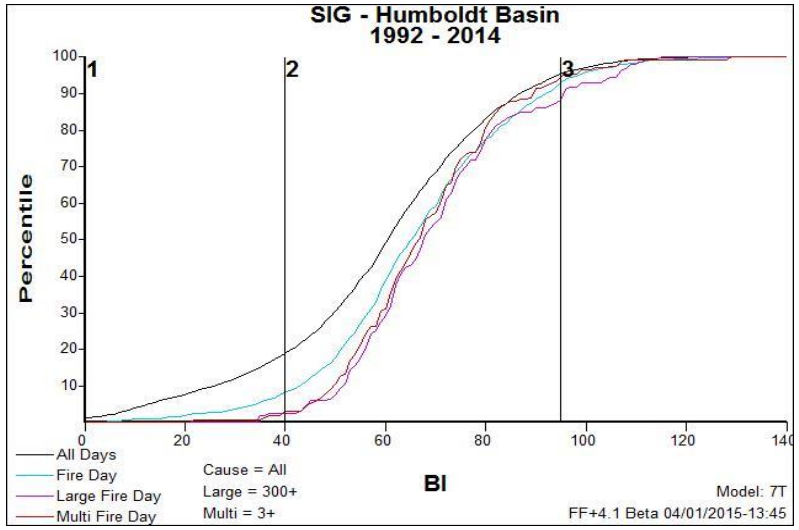
Dispatch Level Decision Points (Mohave Desert FDRA)

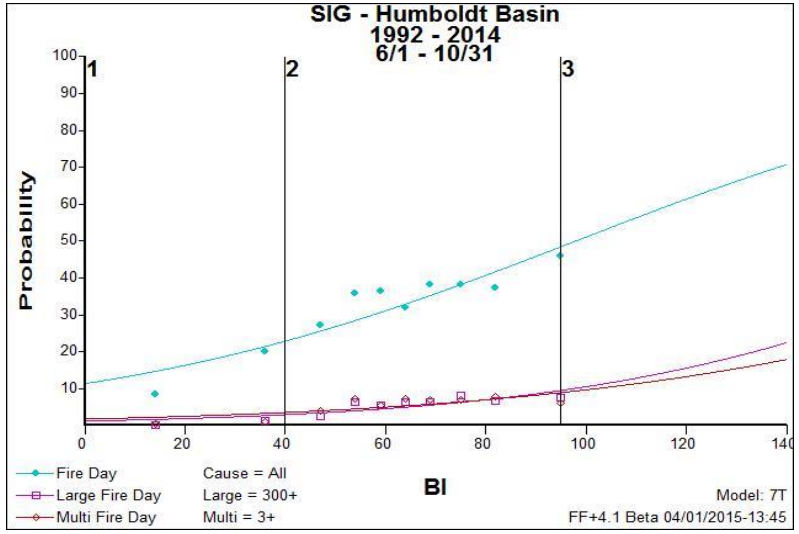


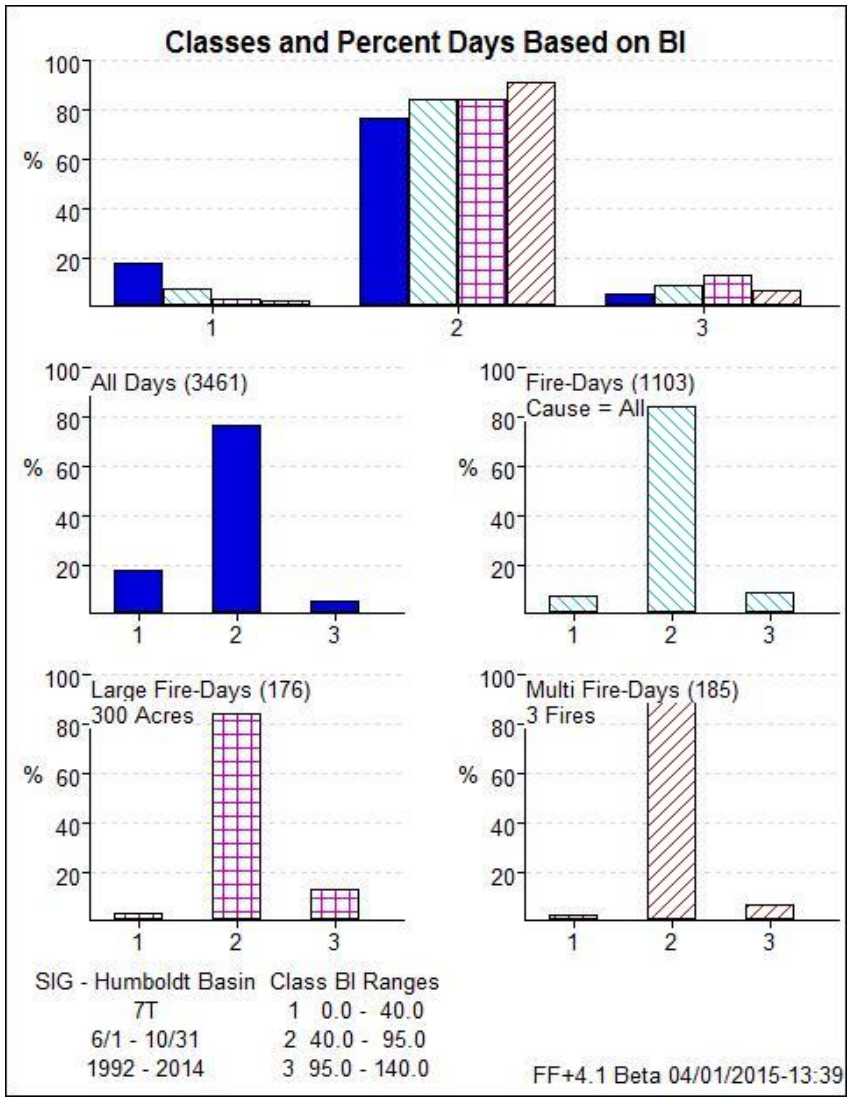




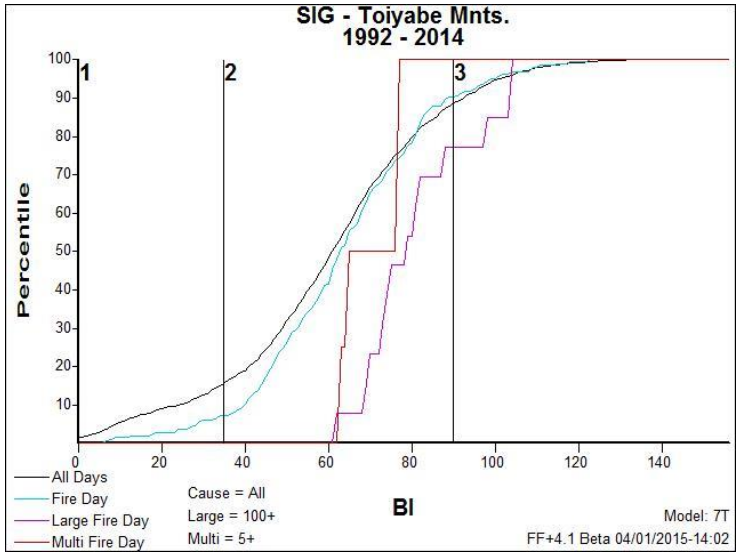
Staffing Level Decision Points (Humboldt Basin FDRA)

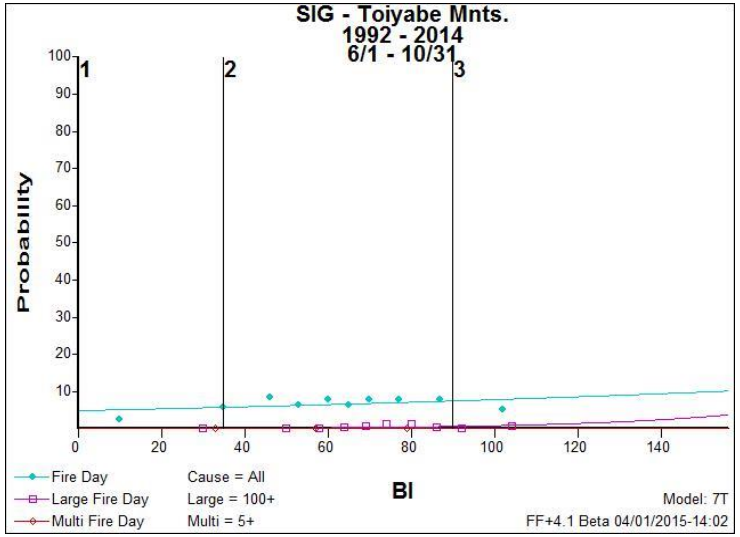


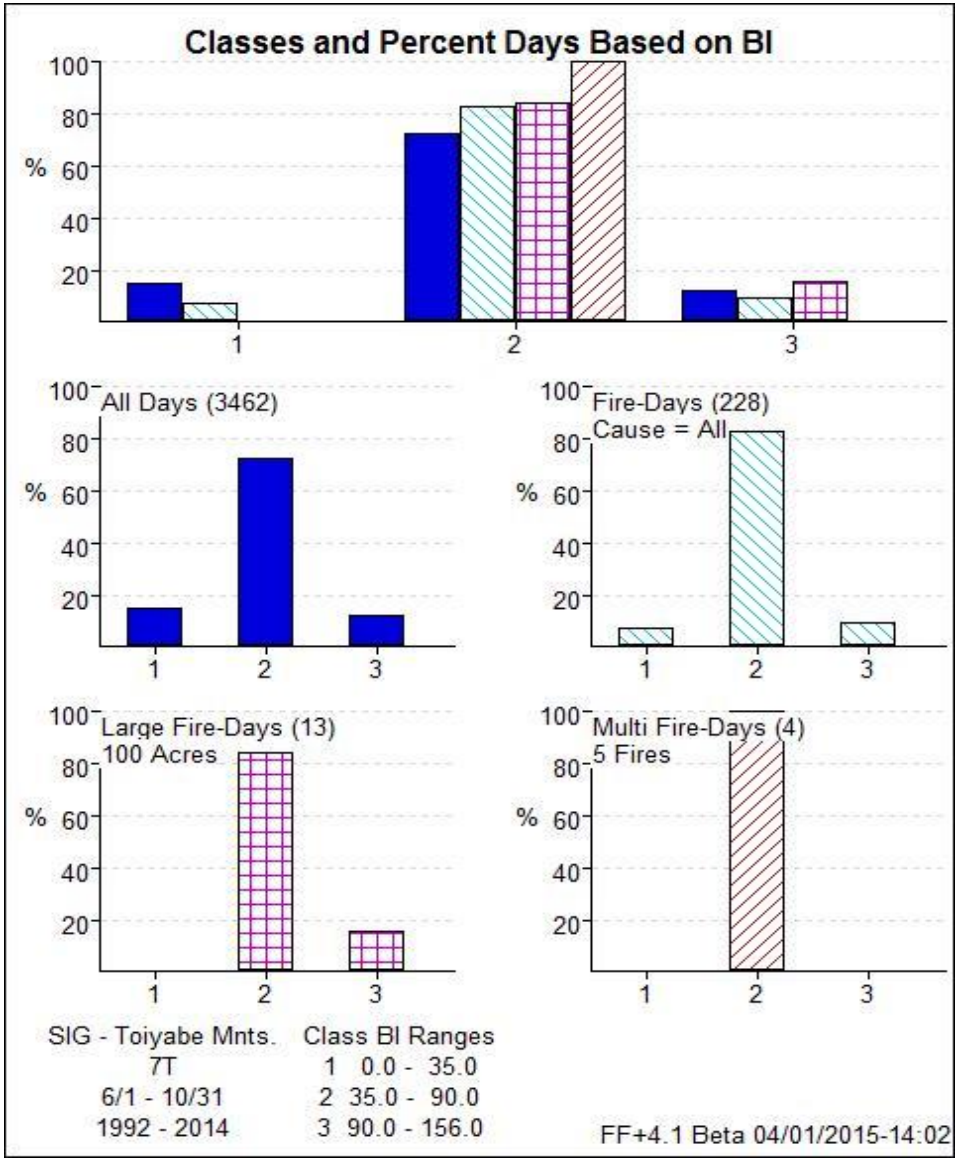




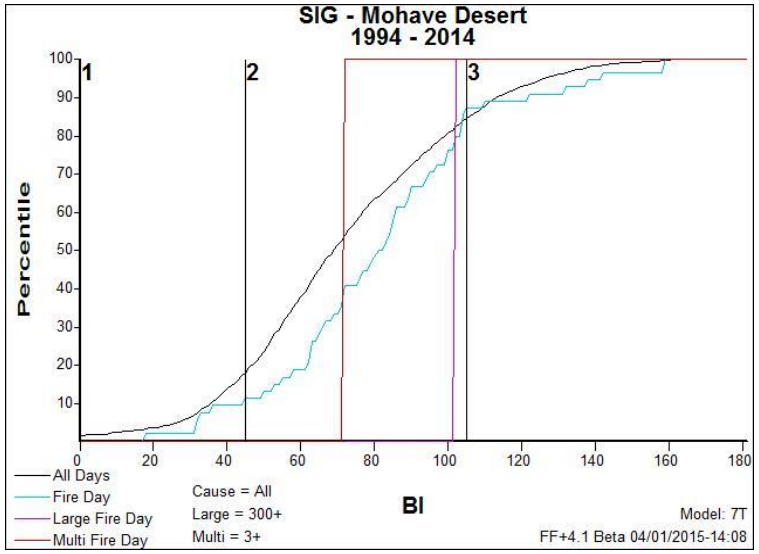
Staffing Level Decision Points (Toiyabe Mountain FDRA)

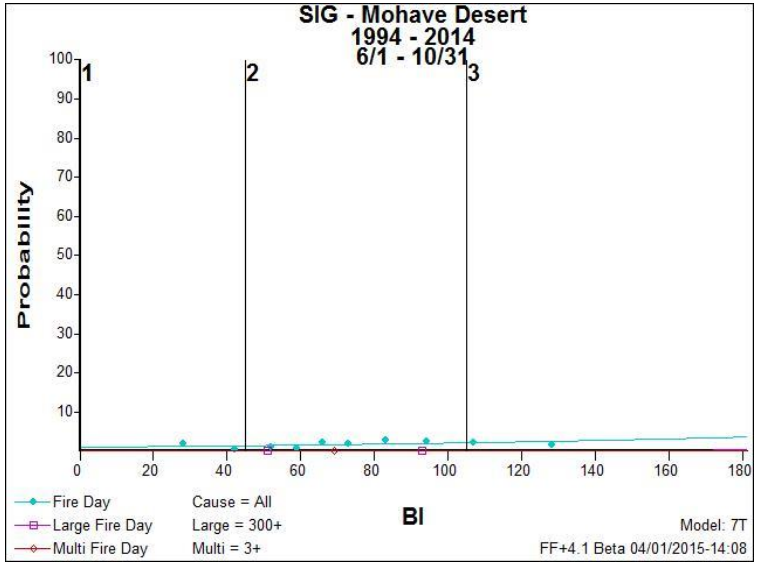


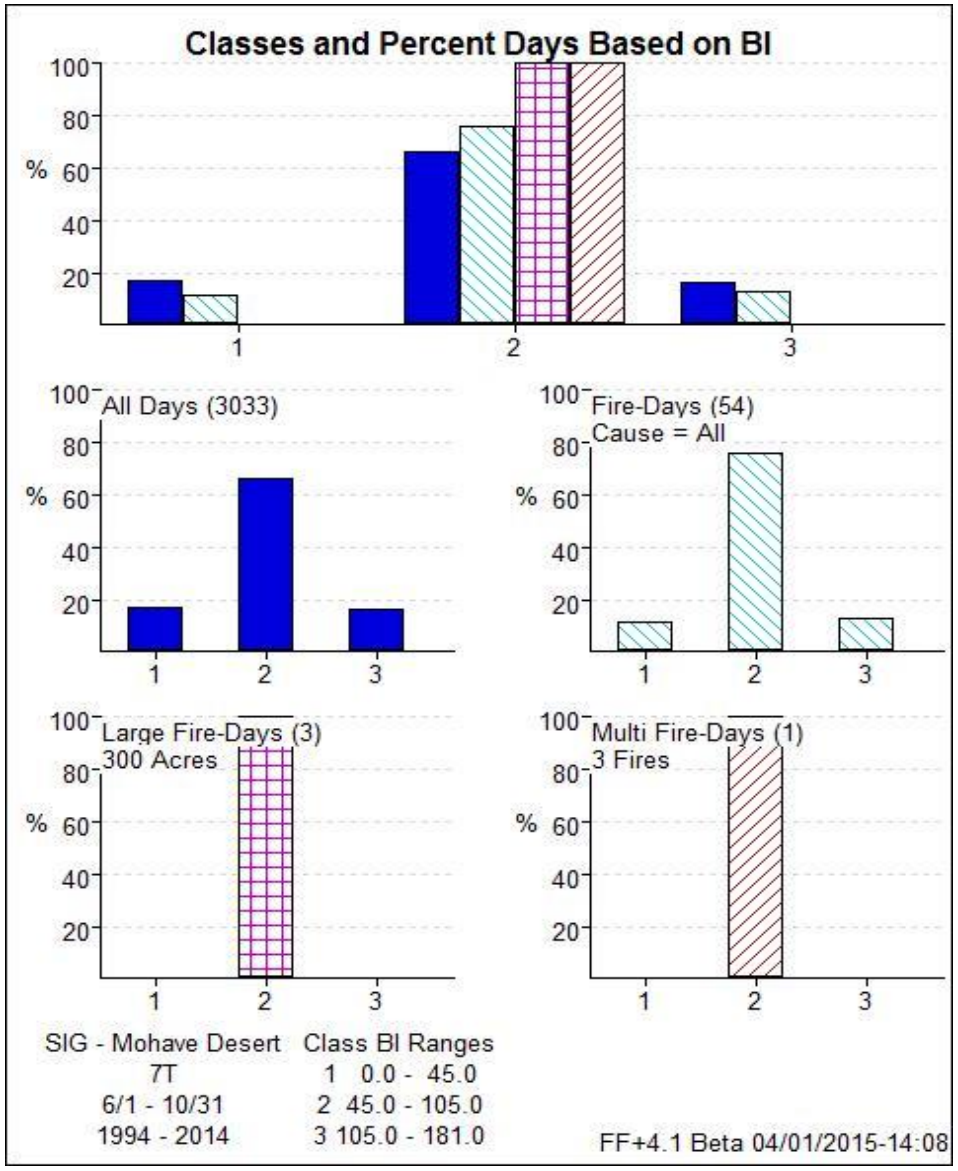




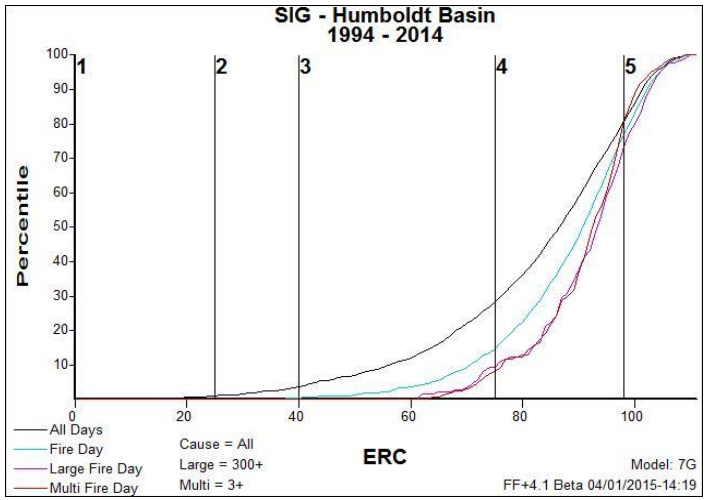
Staffing Level Decision Points (Mohave Desert FDRA)

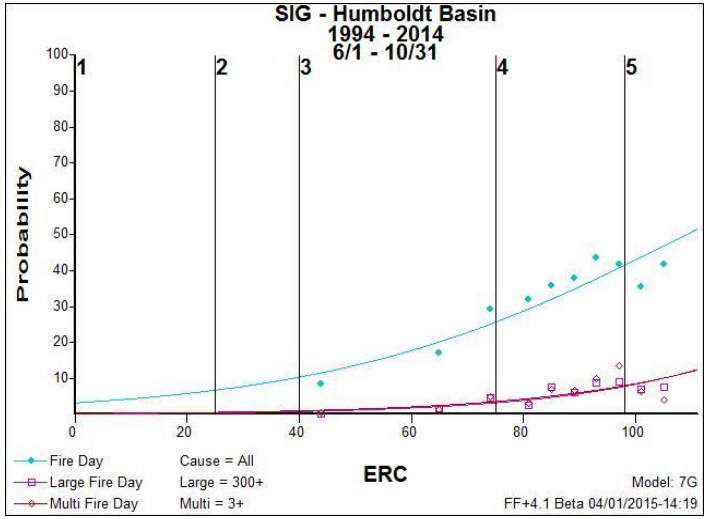


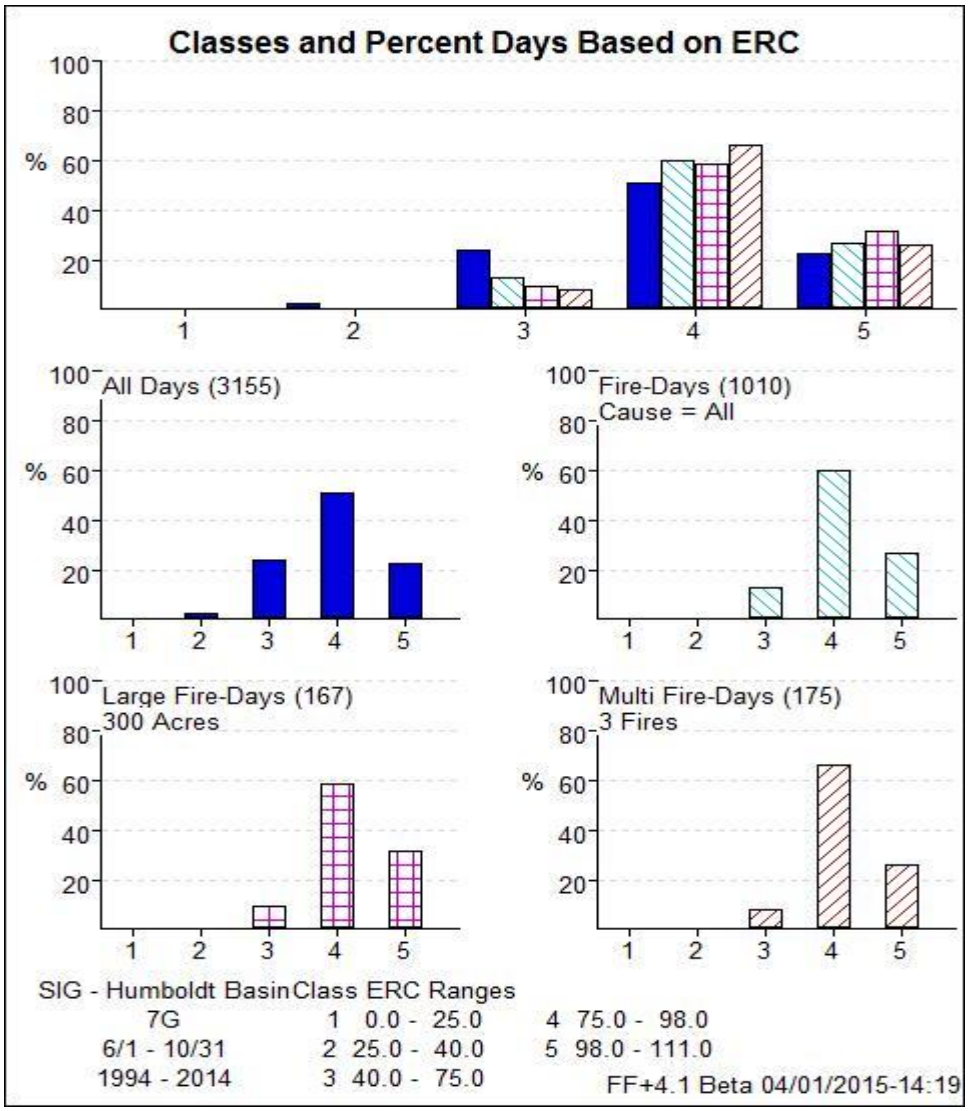




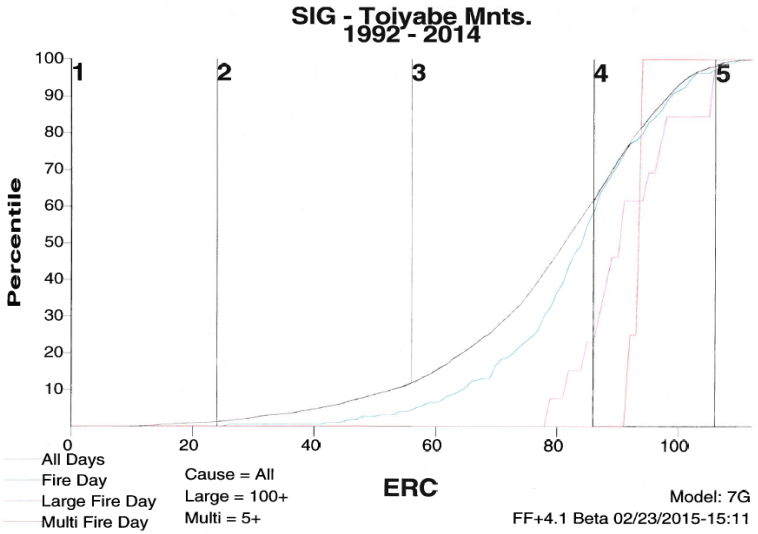
Preparedness Level Decision Points (Humboldt Basin FDRA)

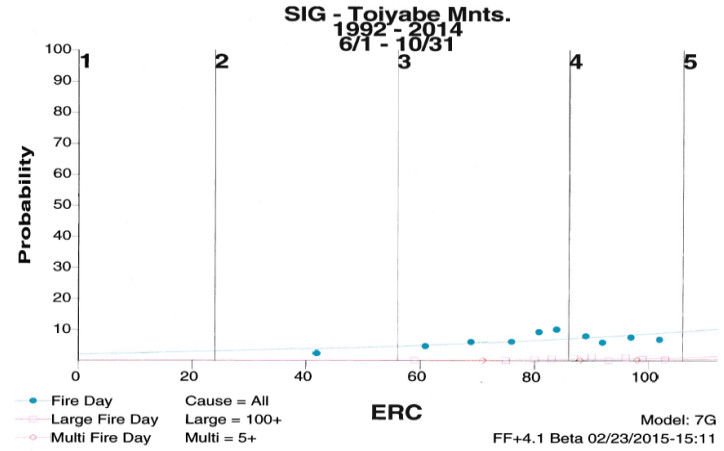


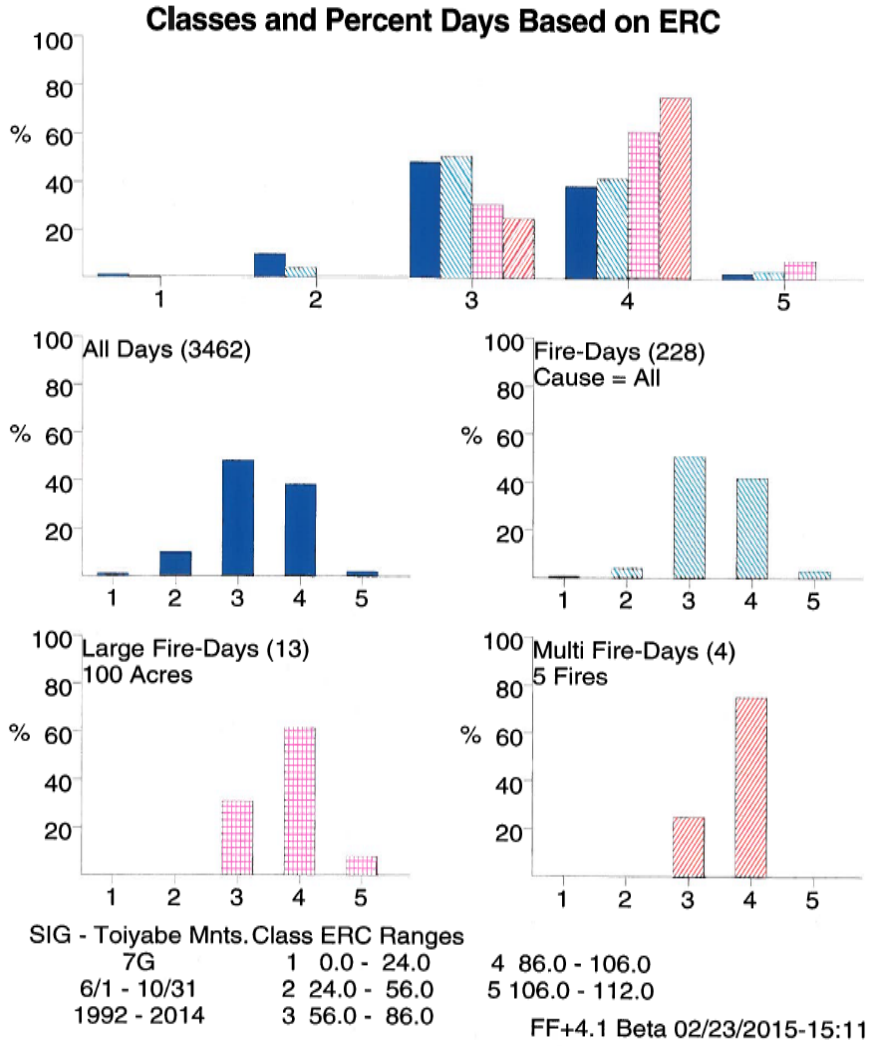




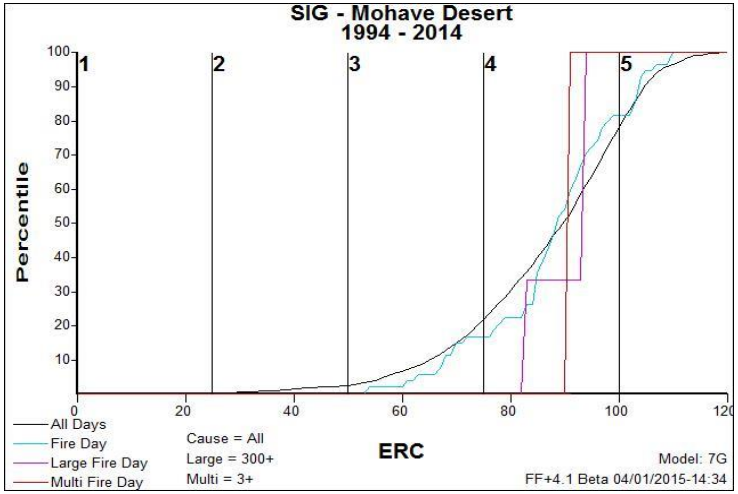
Preparedness Level Decision Points (Toiyabe Mountains FDRA)

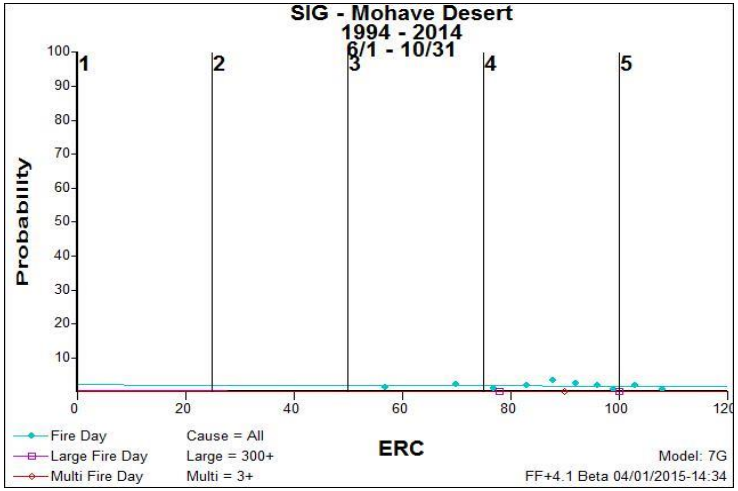


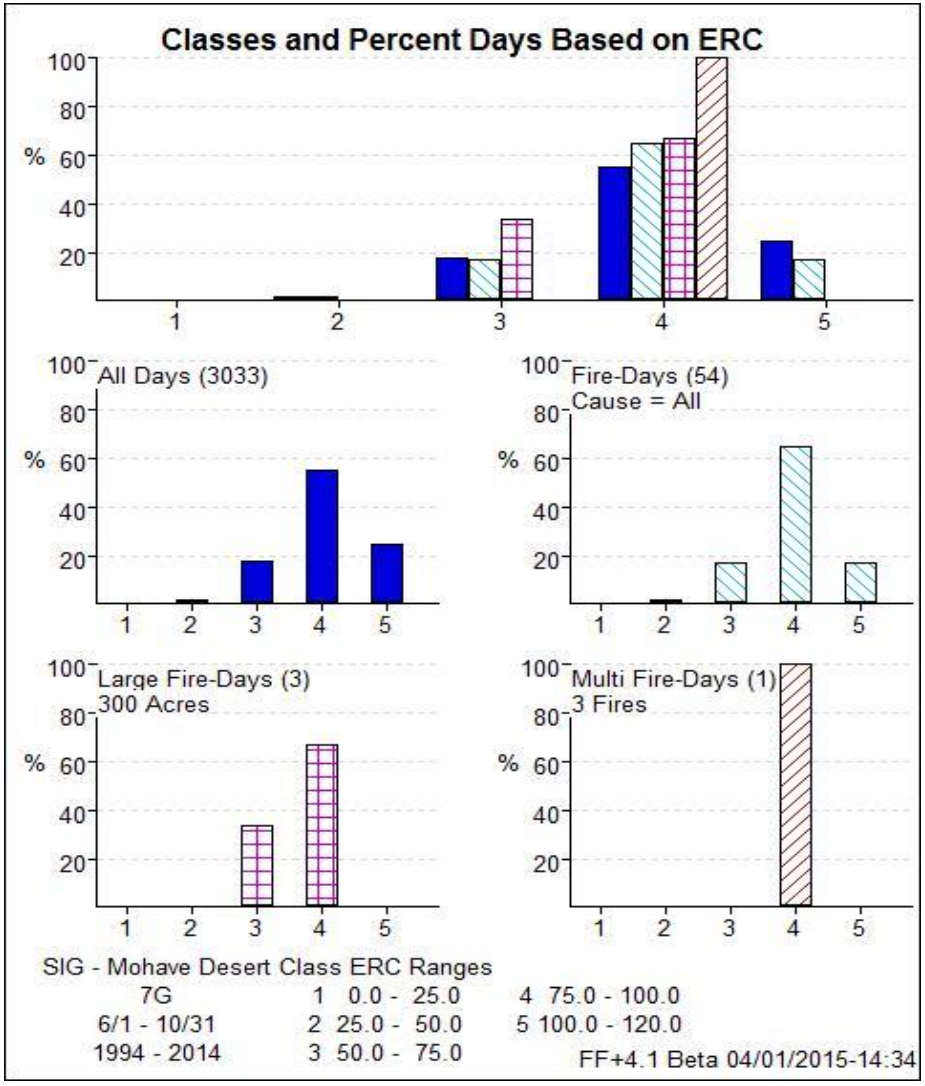




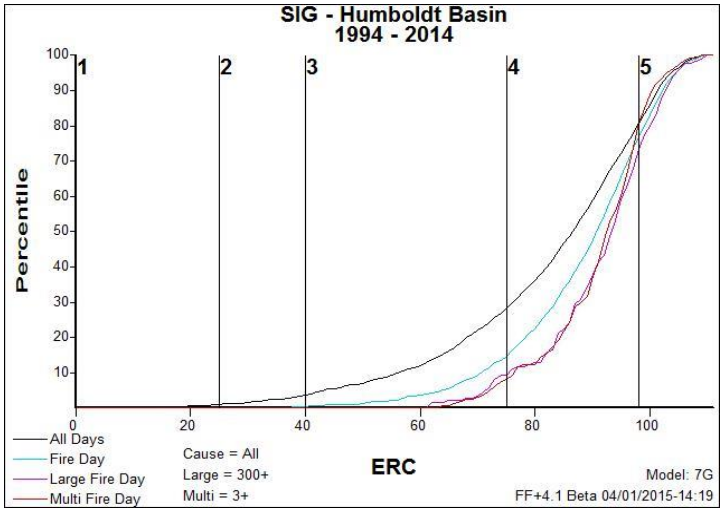
Preparedness Level Decision Points (Mohave Desert)

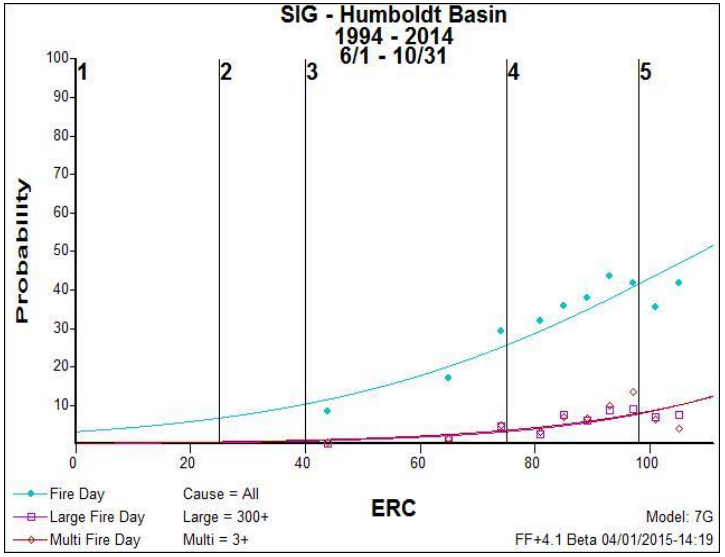


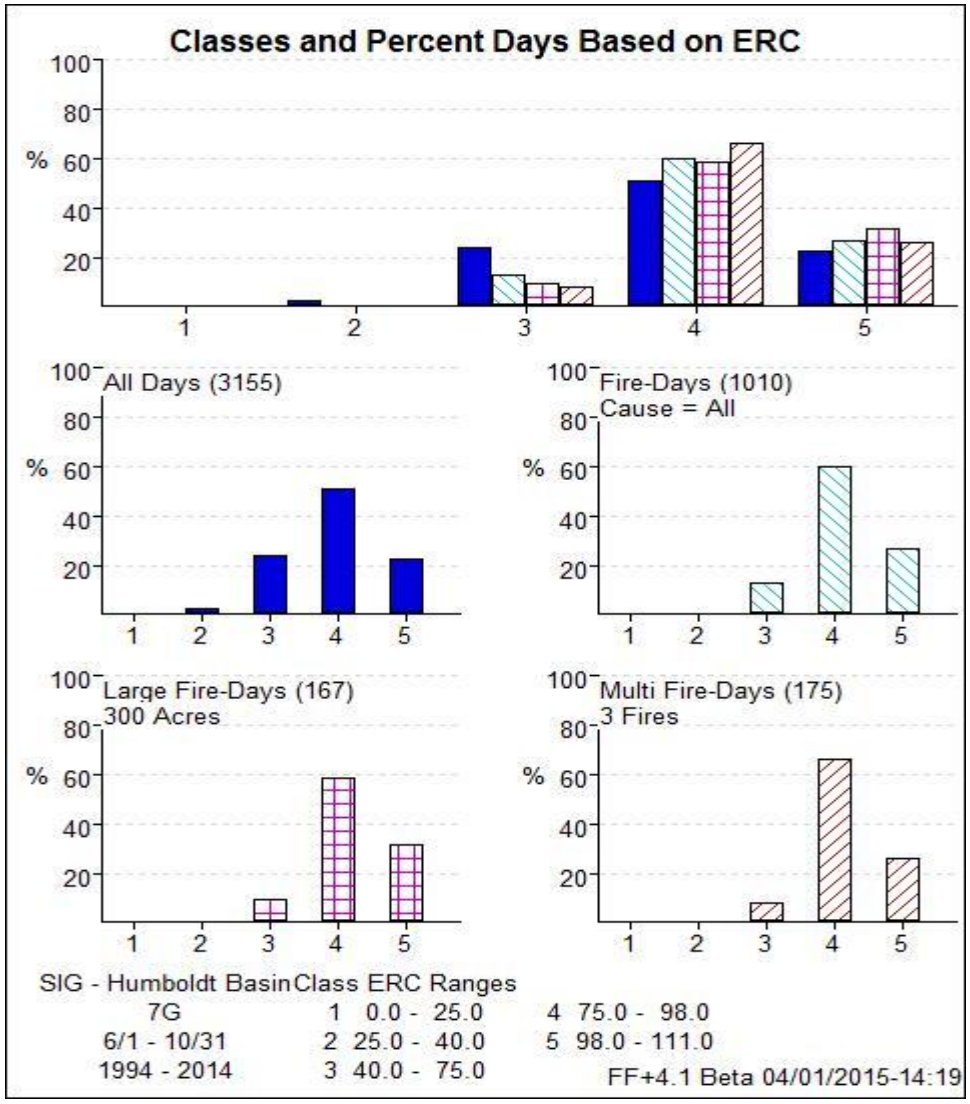




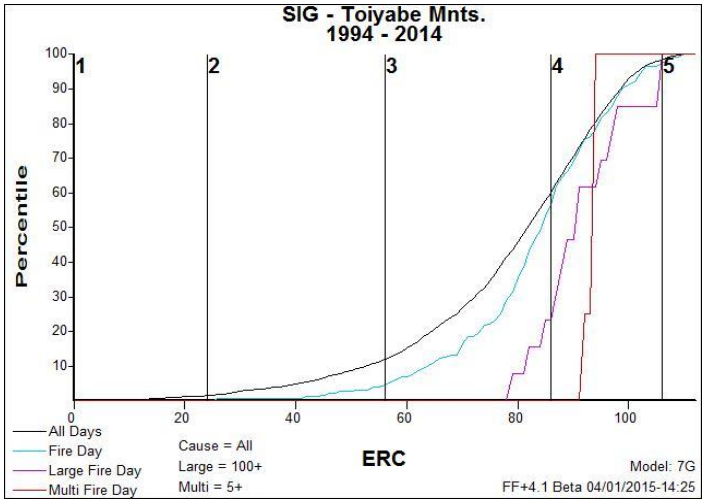
Adjective Fire Danger Rating Decision Points (Humboldt Basin FDRA)

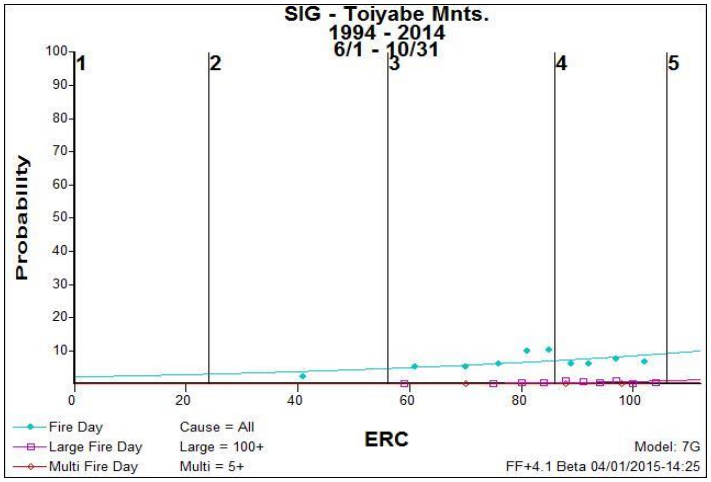


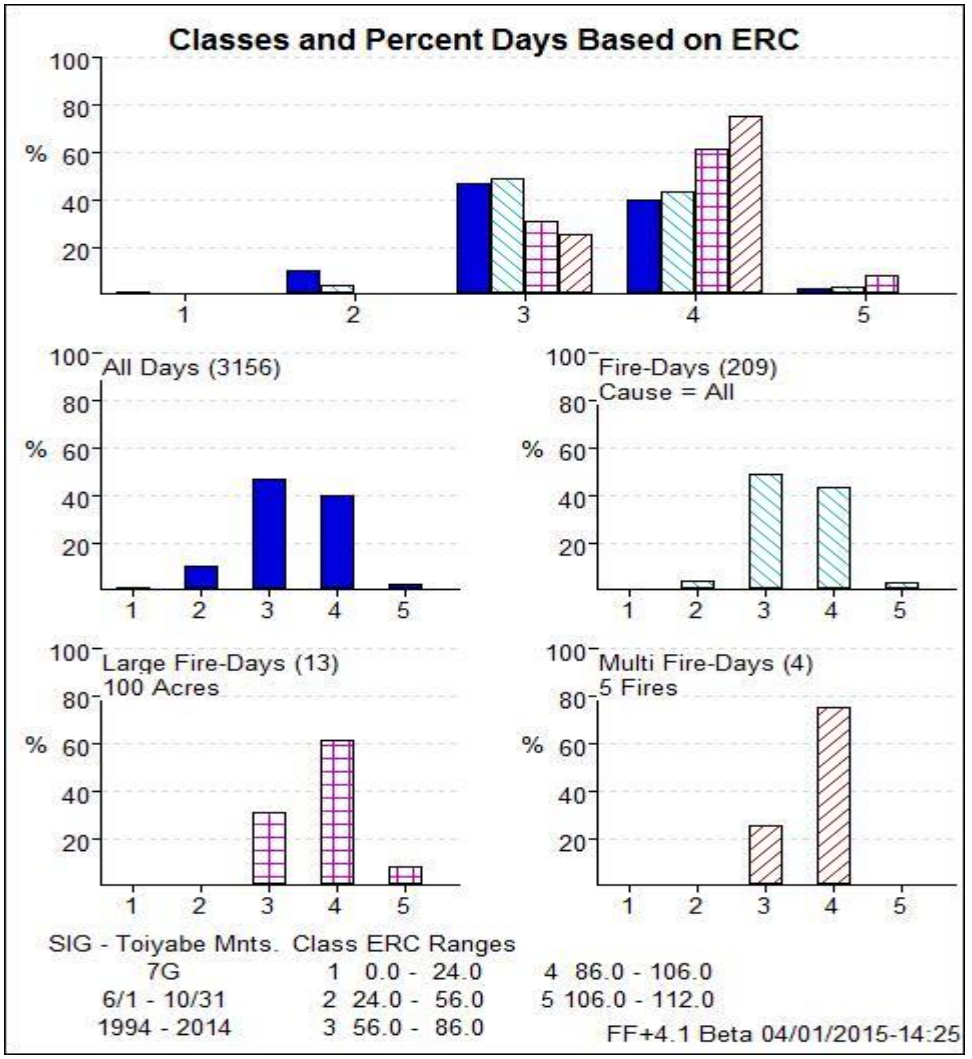




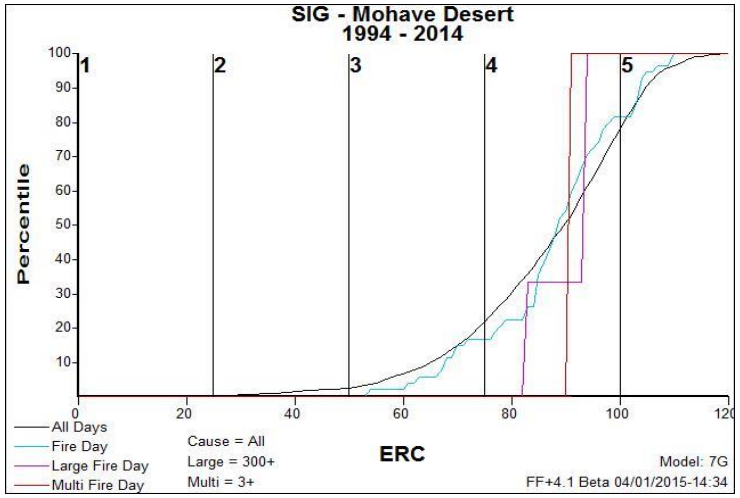
Adjective Fire Danger Rating Decision Points (Toiyabe Mountains FDRA)

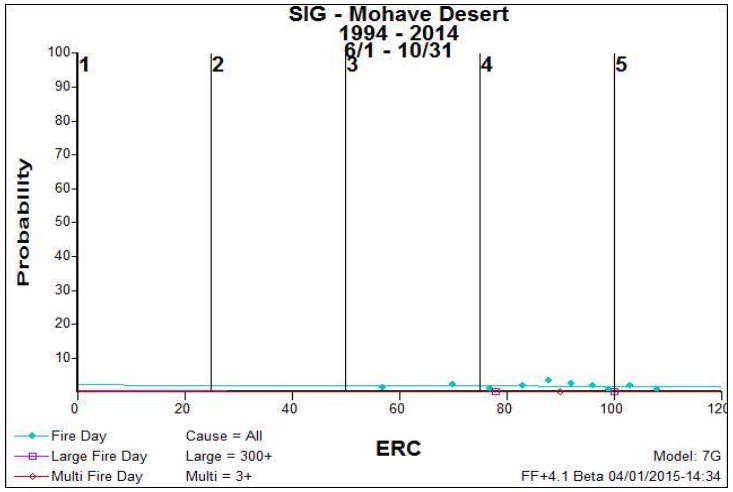


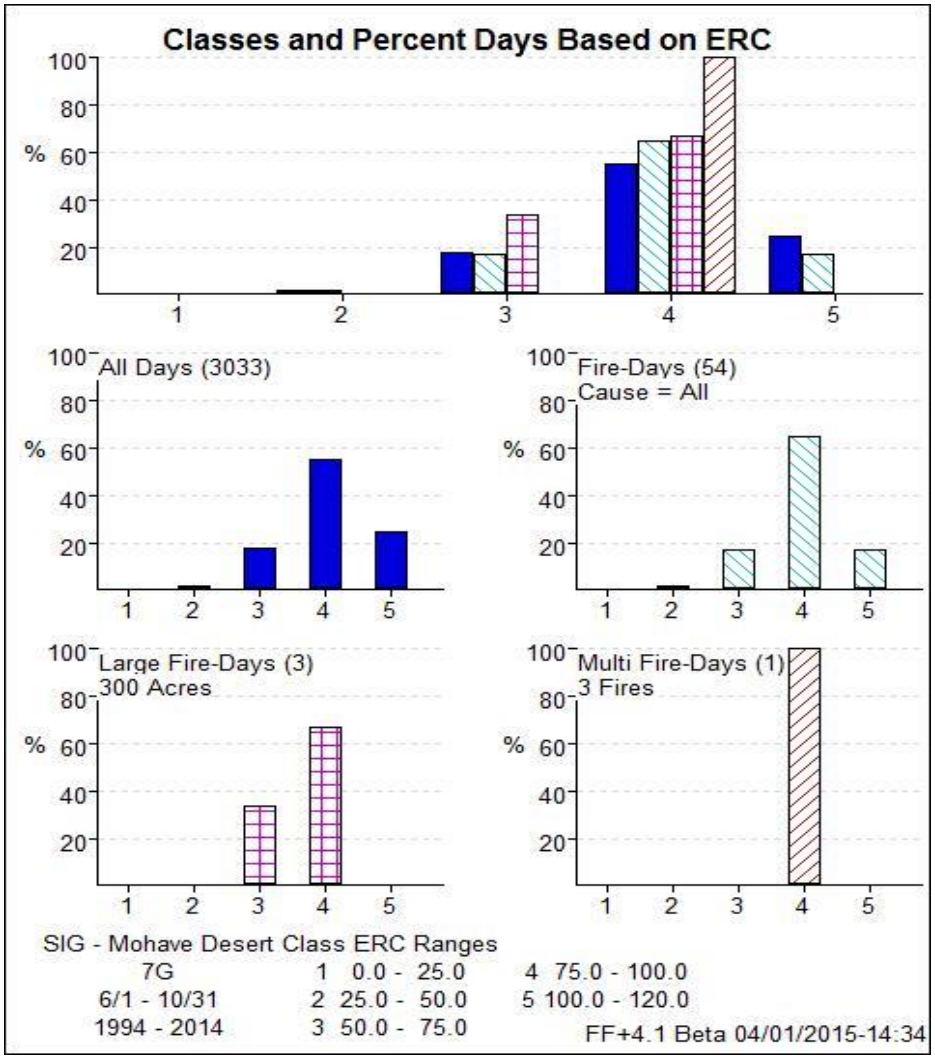




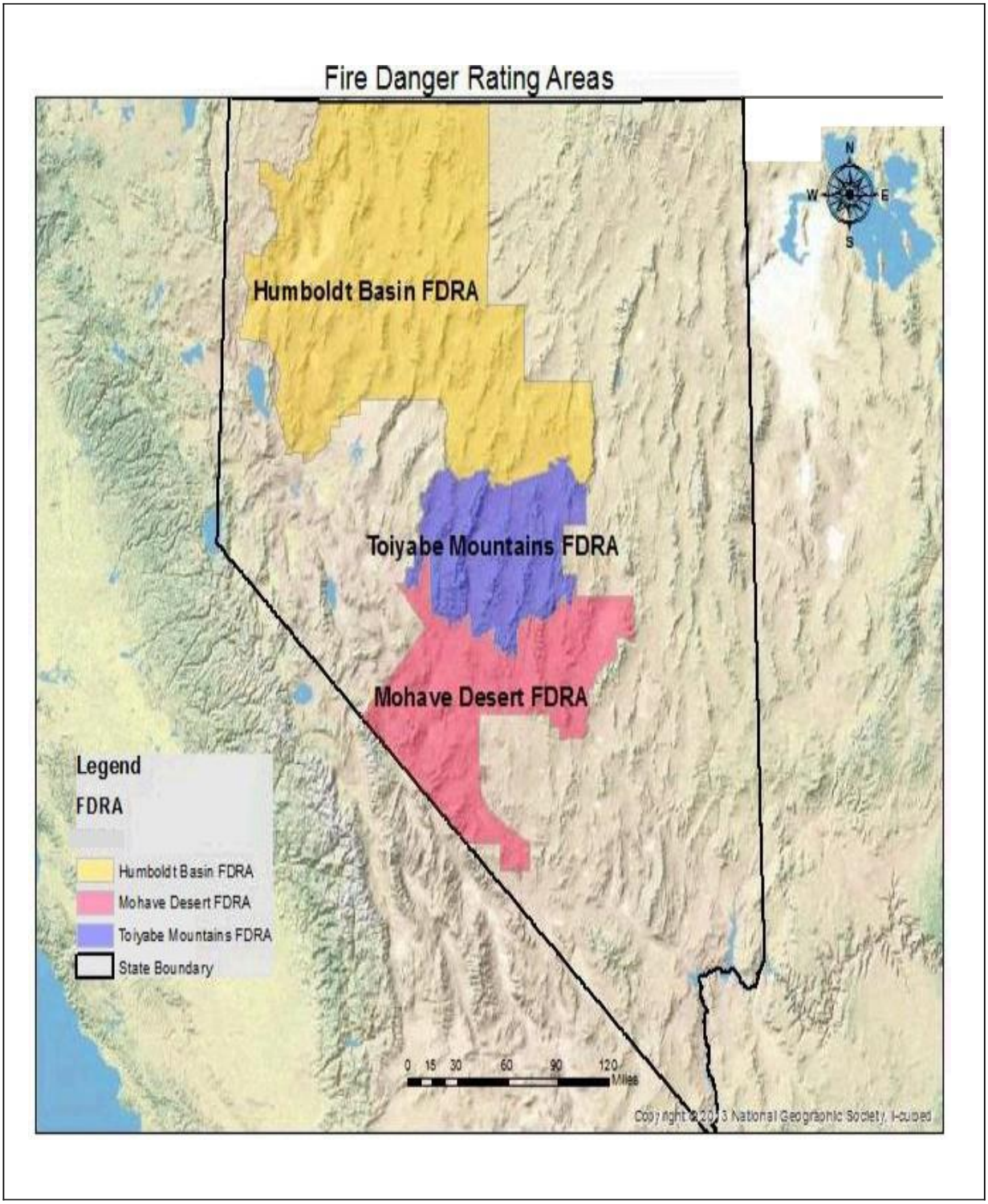
Adjective Fire Danger Rating Decision Points (Mohave Desert FDRA)



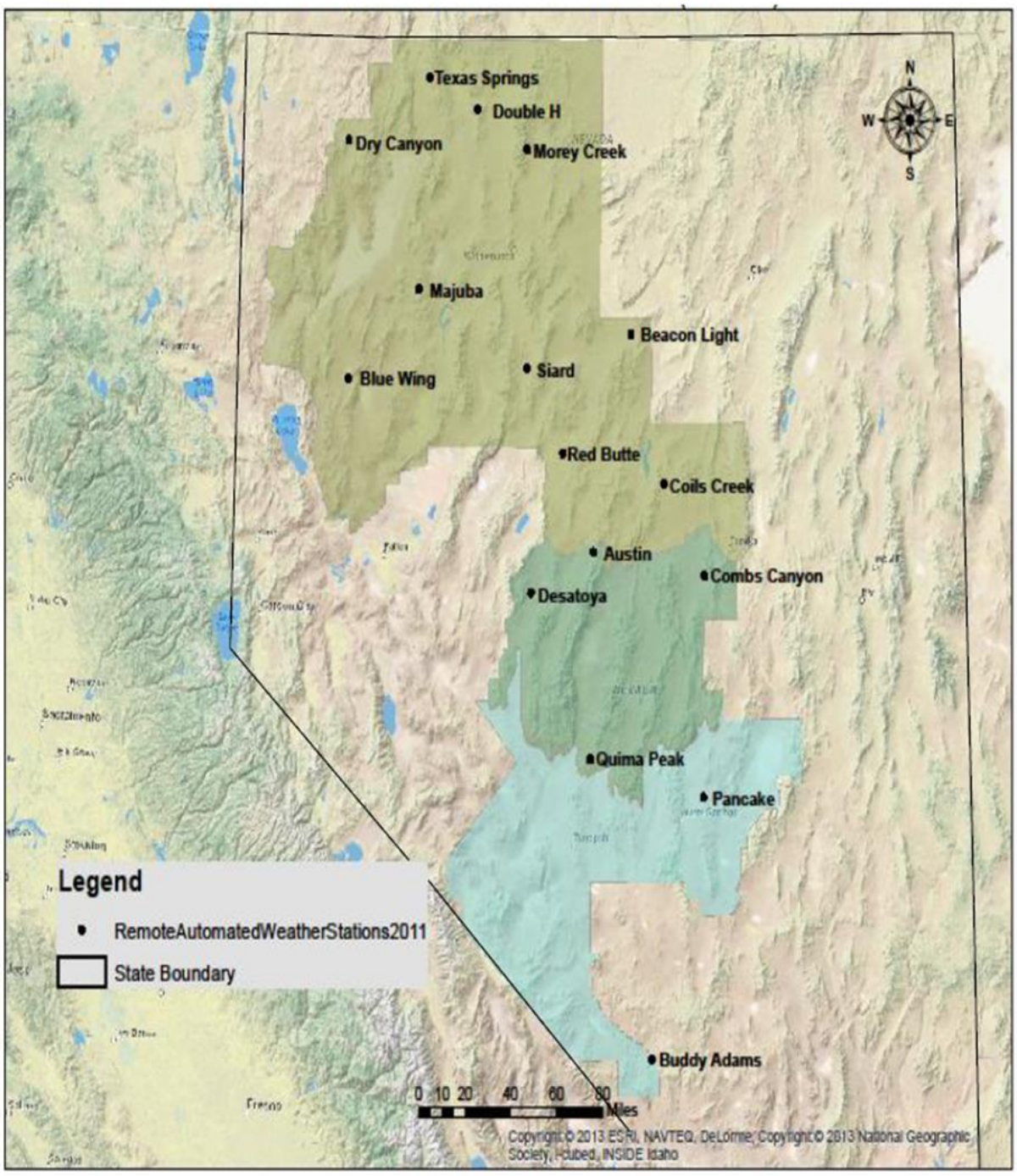




Appendix J – Maps



Remote Automated Weather Stations (RAWS)



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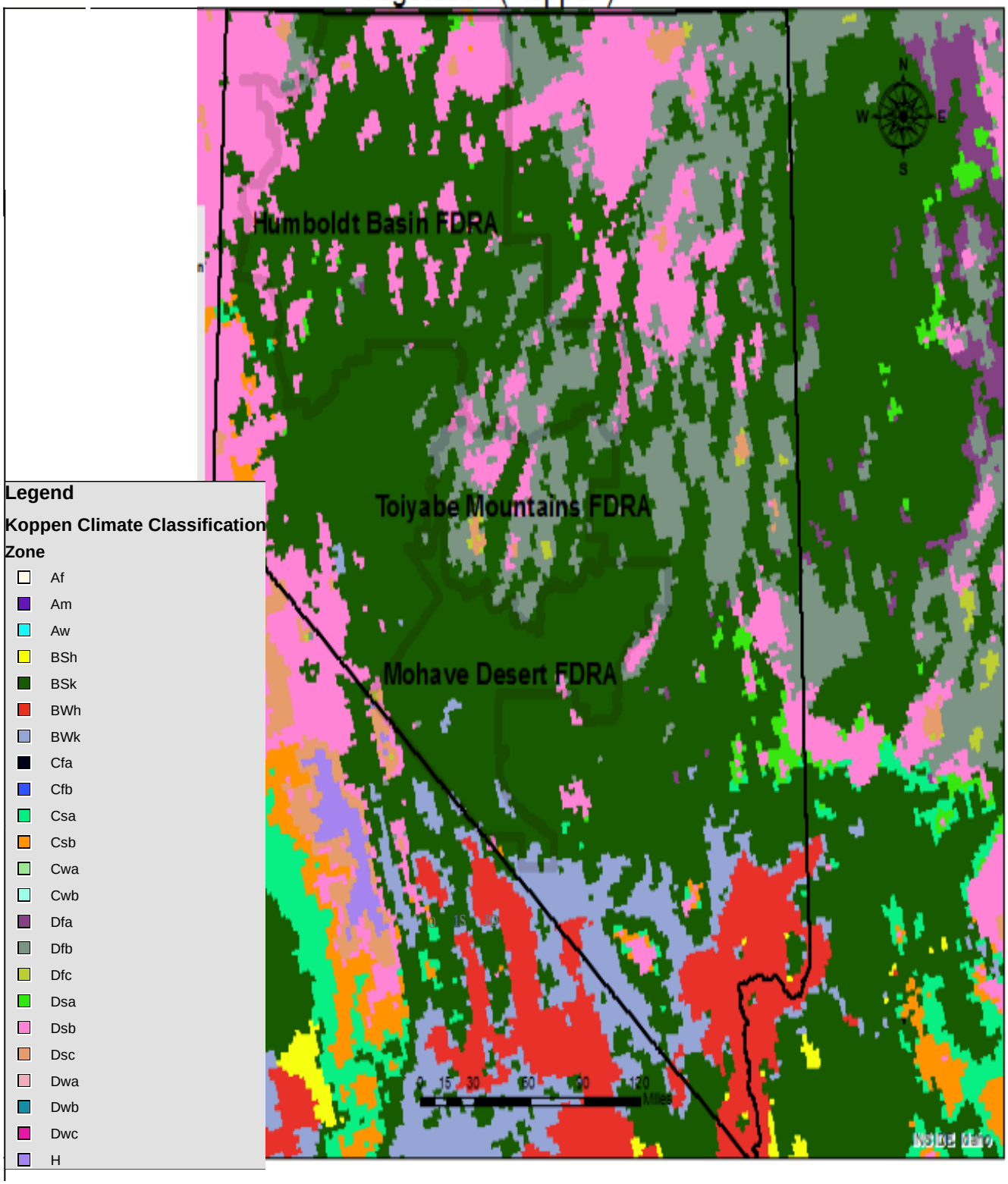
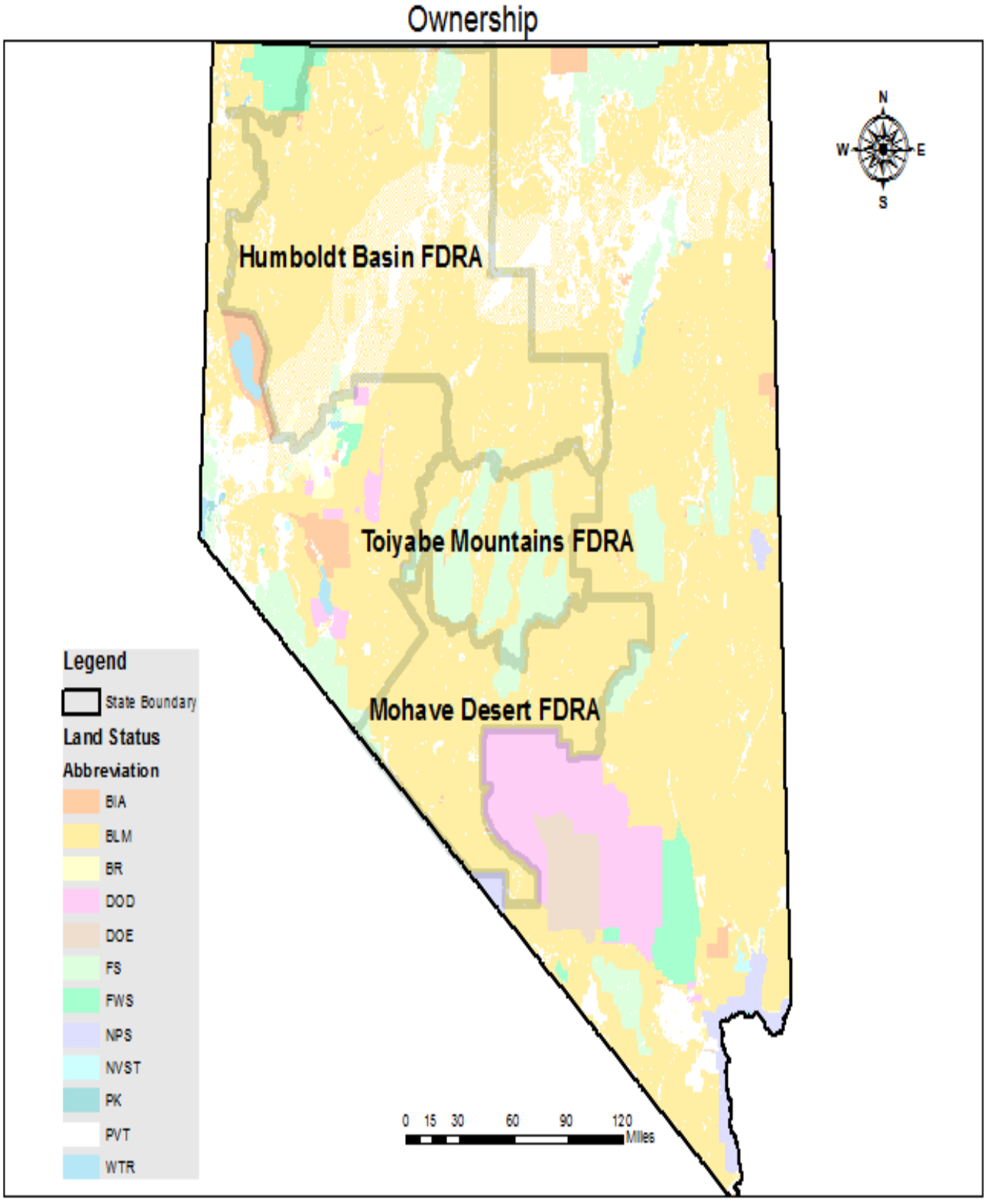
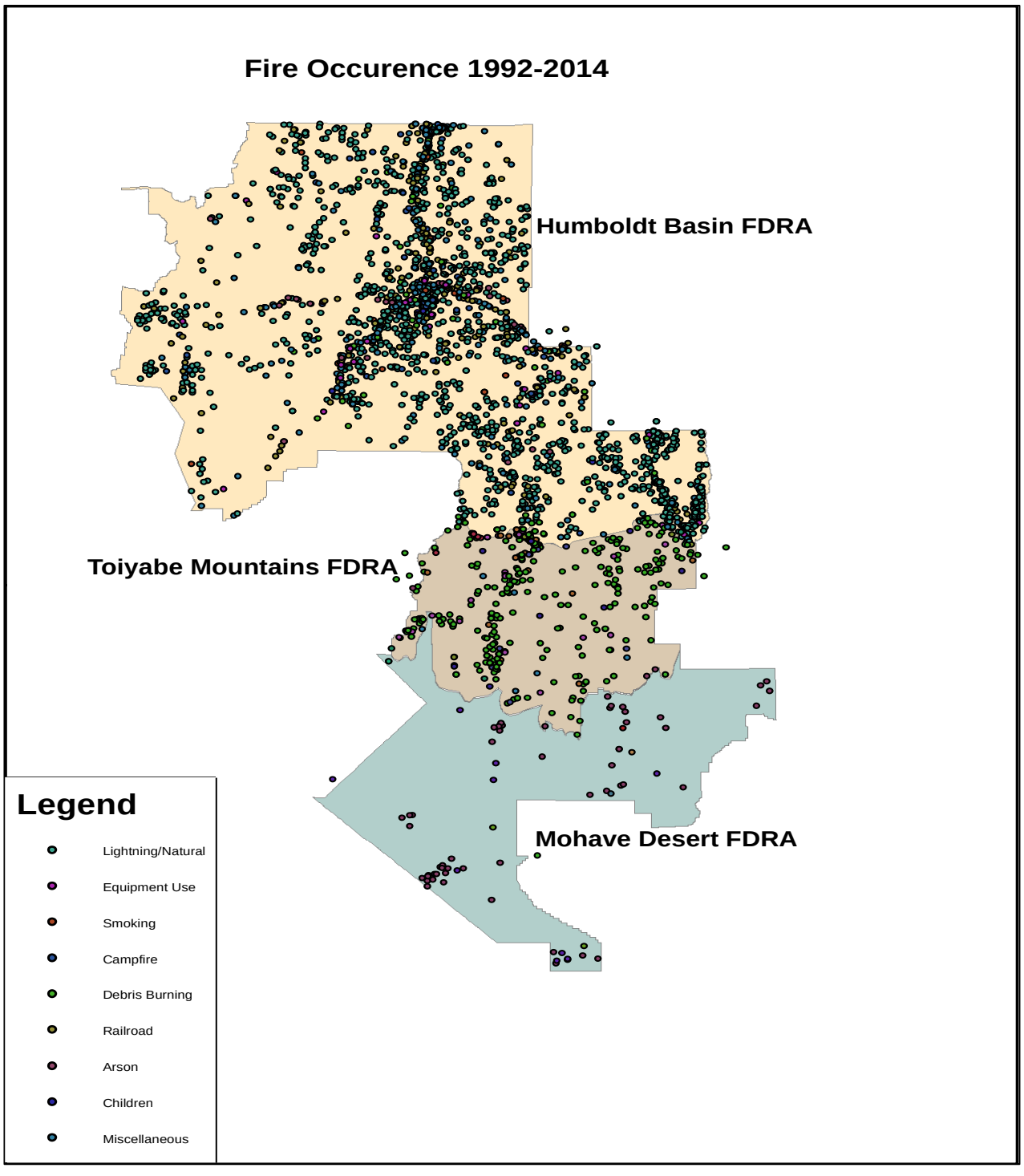
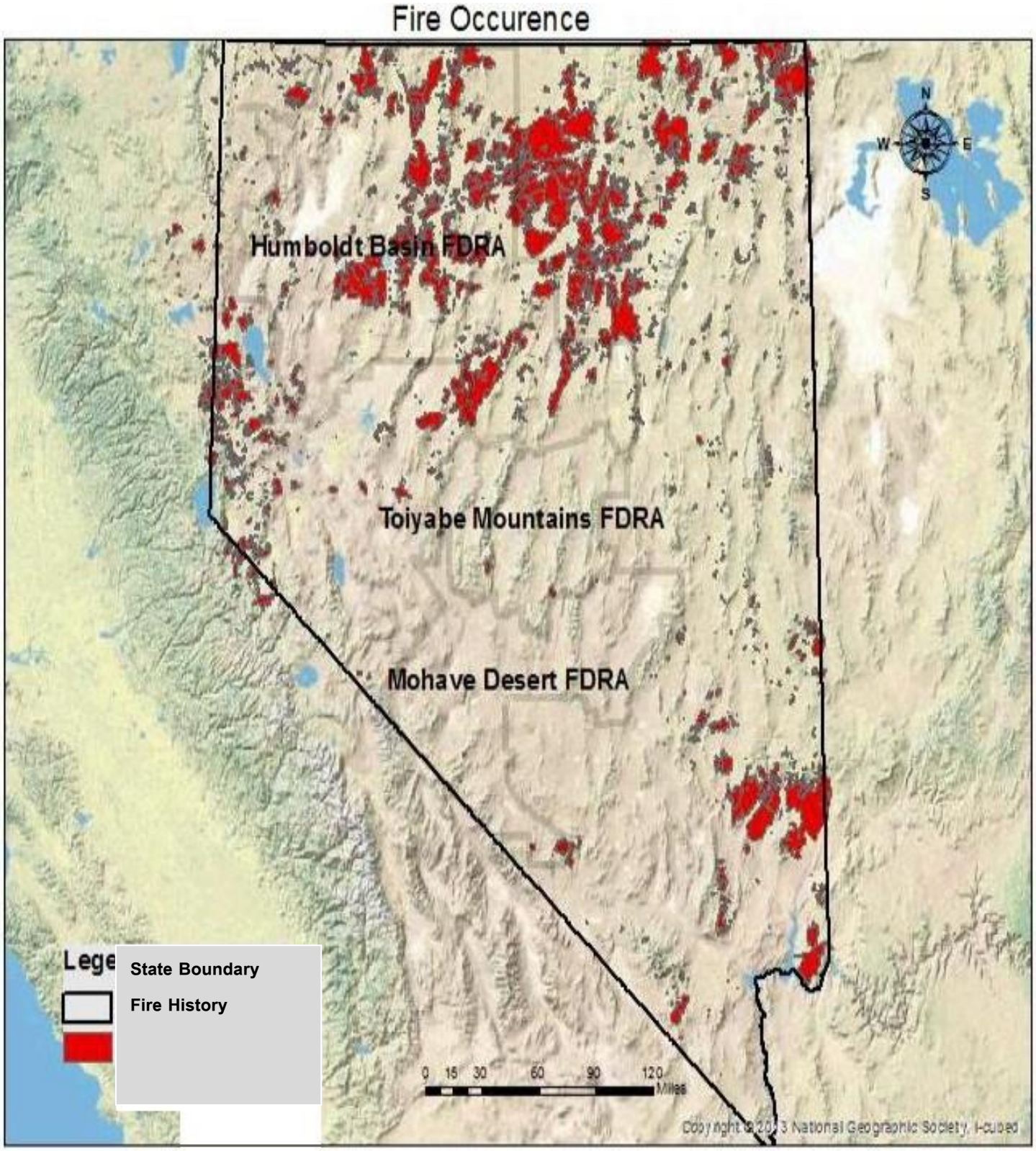



Ownership
N
W
E
S
Humboldt Basin FDRA
Toiyabe Mountains FDRA
Mohave Desert FDRA
Legend
State Boundary
Land Status
Abbreviation
BIA
BLM
BR
DOD
DOE
FS
FWS
NPS
NVST
PK
PVT
WTR
0 15 30 60 90 120
Miles

Fire Occurrence (Point Location)




Fire Occurence
Humboldt Basin FDRA
Toiyabe Mountains FDRA
Mohave Desert FDRA
N
W
E
S
Lege
State Boundary
Fire History
0 15 30 60 90 120
Miles
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Appendix K – WIMS Setup and Application

The Weather Information Management System (WIMS) is a comprehensive system that enables users to manage weather information.

WIMS can be accessed at *http://fam.nwcg.gov/fam-web/*.

The WIMS User Guide can be downloaded from the following web site:
http://www.fs.fed.us/fire/planning/nist/wims_web_ug/wims__ug_complete061803.pdf

1. **NSIG: Create a Special Interest Groups (SIG)**

   Enter SIG name (i.e., "HB") and select Setup

   Enter the associated station numbers for the SIG. . . . then select Save

   Repeat these steps until all three SIGs have been created.

2. **EAVG: Assign NFDRS Weighted Avg.**

   Enter the SIG name and select Display

   By default, each station is weighted equally for the first priority fuel model. Keep the default value by selecting Save

   If successful, the following message will be displayed: *Weighted average for SIG 'XXXXX' has been successfully updated.*

   Repeat these steps for each SIG.

Humboldt Basin FDRA

Station ID	Station Name
260202	BLUEWING
260203	DRY CANYON
260204	MOREY_CREEK
260206	TEXAS SPRING
260207	DOUBLE H
260208	MAJUBA
260402	SIARD
260504	RED BUTTE
260505	BEACON LIGHT
260603	COILS CREEK

Toiyabe Mountains FDRA

Station ID	Station Name
260501	AUSTIN
260503	DESATOYA
260601	COMBS
260810	QUIMA PEAK

Mohave Desert FDRA

Station ID	Station Name
261404	PANCAKE
261408	BUDDY ADAMS

Humboldt Basin FDRA

Station ID	Station Name	Priority	Weight Factor %
260202	BLUEWING	1	10
260203	DRY CANYON	1	10
260204	MOREY CREEK	1	10
260206	TEXAS SPRING	1	10
260207	DOUBLE H	1	10
260208	MAJUBA	1	10
260402	SIARD	1	10
260504	RED BUTTE	1	10
260505	BEACON	1	10
260603	COILS CREEK	1	10

Toiyabe Mountains FDRA

Station ID	Station Name	Priority	Weight Factor %
260501	AUSTIN	1	25
260503	DESATOYA	1	25
260601	COMBS	1	25
260810	QUIMA PEAK	1	25

Mohave Desert FDRA

Station ID	Station Name	Priority	Weight Factor %
261404	PANCAKE	1	50
261408	BUDDY ADAMS	1	50

DAVG: Display NFDRS Weighted Averages

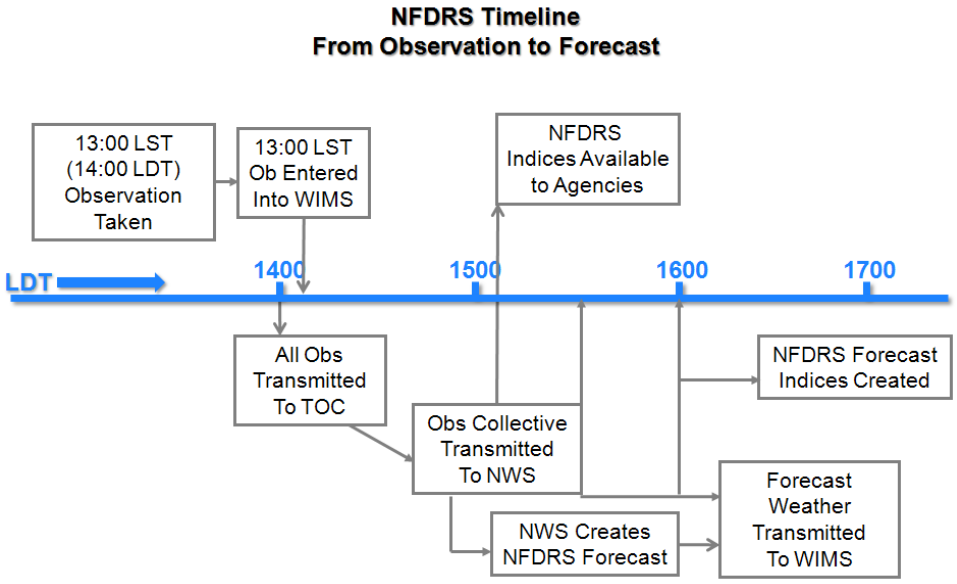
Enter the SIG name, Type "O", and current date for daily indices, then select FIND

Display NFDRS Weighted Averages DAVG

HB **Type:** O/R **Date:** 07-APR-13 **Time:** 12 Find Reset

Date	Type	WS	WDY	HRB	1H	10	HU	TH	IC	SC	ERC	BI	FL	SL	R	KBDI	Rgn
07-APR-13	O	21	50	5	5	6	10	14	51	36	52	95	68	3-	H	573	4

Appendix L – NFDRS Timeline



1. **Dispatch Level**
   a. **Morning Level** — effective from midnight to 16:00

      Inputs will be taken from the following:

      - *Forecasted* ***Burning Index/Energy Release Component*** (Fuel Model T and G) issued for that day and available in WIMS by 16:00 the previous day.

   b. **Afternoon Level** — effective from 16:00 to midnight

      Inputs will be taken from the following:

      - *Actual* ***Burning Index/Energy Release Component*** (Fuel Model T and G) available in WIMS after the observations are edited by 15:15

2. **Preparedness Level**
   a. **Daily Preparedness Level** — effective from 08:00 (today) to 07:59 (tomorrow)

      Inputs will be taken from the following:

      - *Forecasted* ***Burning Index/Energy Release Component*** (Fuel Model-G) issued for that day and available in WIMS by 16:00 the previous day.
      - ***Live Fuel Moisture*** for the FDRA.
      - ***Multiple Large Fire*** activity (2 or more on-going incidents which require an ICS-209).

3. **Adjective Rating Level**

   a. **Daily Adjective Rating Level** — effective from 08:00 (today) to 07:59 (tomorrow)

      Inputs will be taken from the following:

      - *Forecasted* ***Energy Release Component*** issued for that day and available in WIMS by 16:00 the previous day for the Humboldt Basin, Toiyabe Mountains and Mohave Desert FDRA

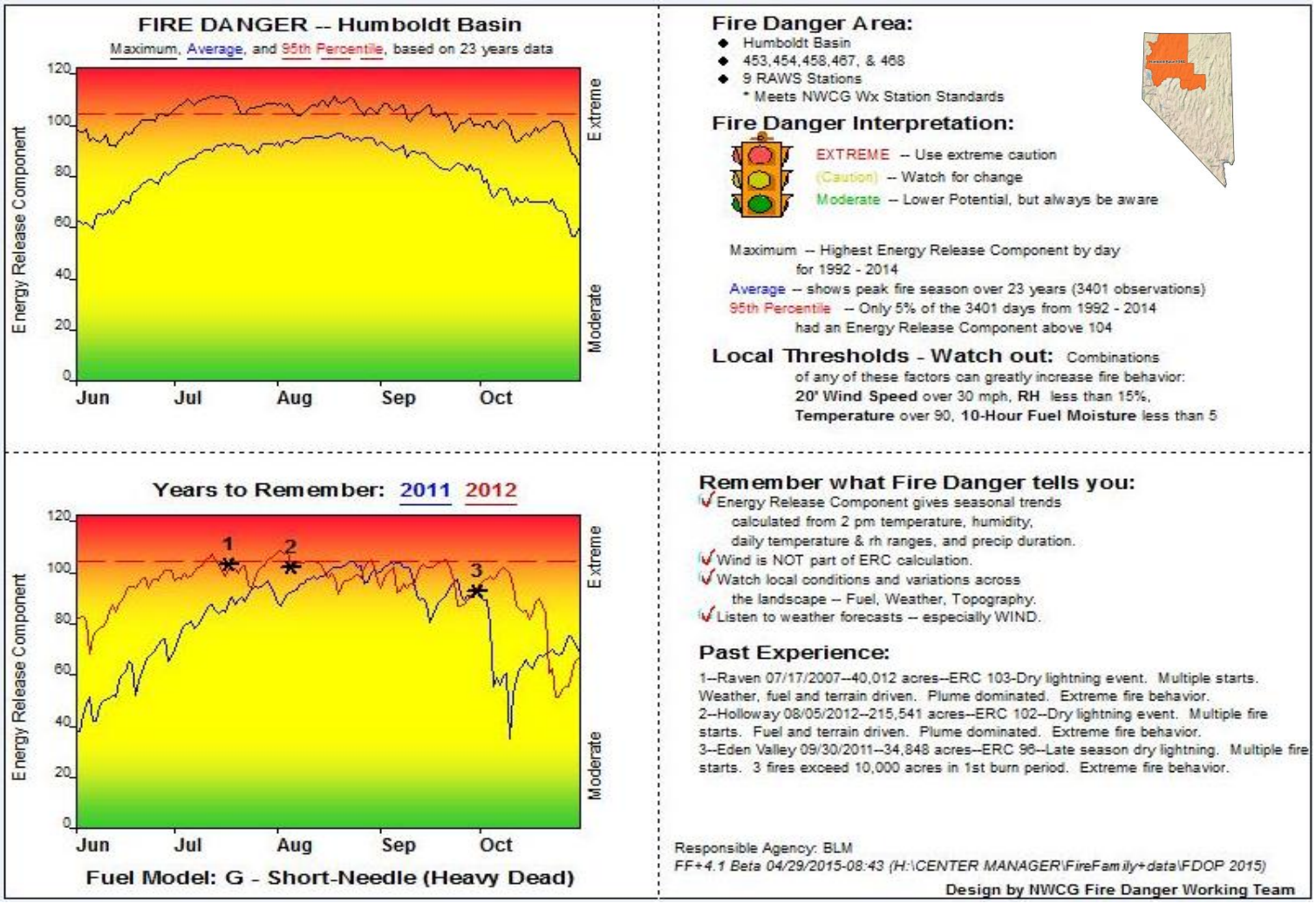
4. **Duty Officer Briefing**

   a. **Morning Level** — briefing between 08:30 and 09:00

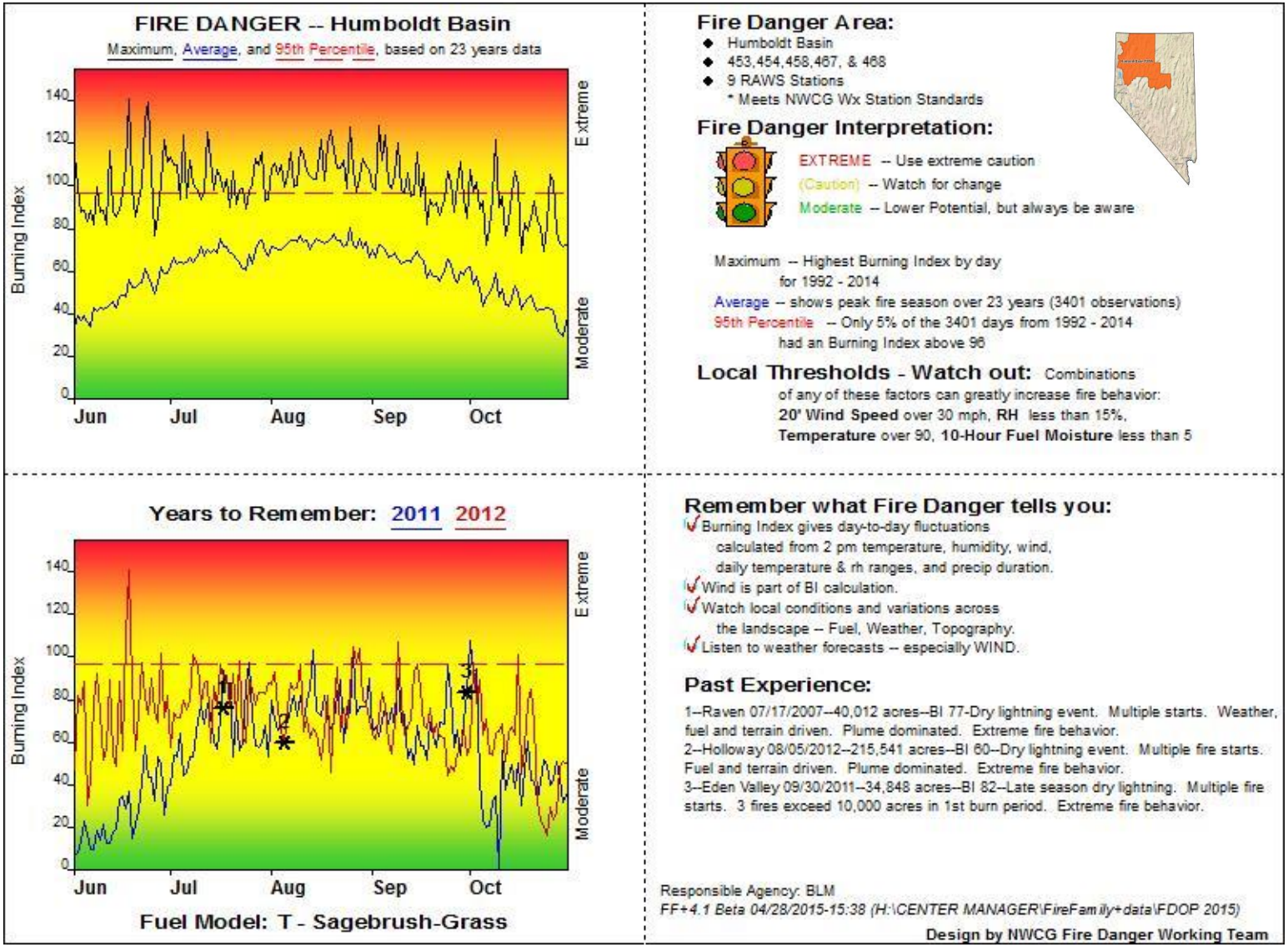
   b. **Afternoon Level** — briefing between 16:00 and 16:30

Appendix M – Pocket Cards

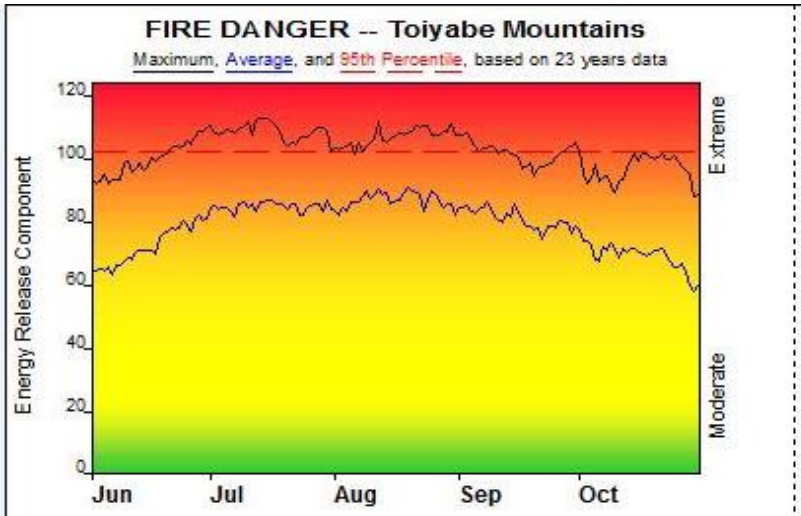
Humboldt Basin FDRA FM G ERC



Humboldt Basin FDRA FM T BI



Toiyabe Mountains FDRA FM G ERC



Fire Danger Area:

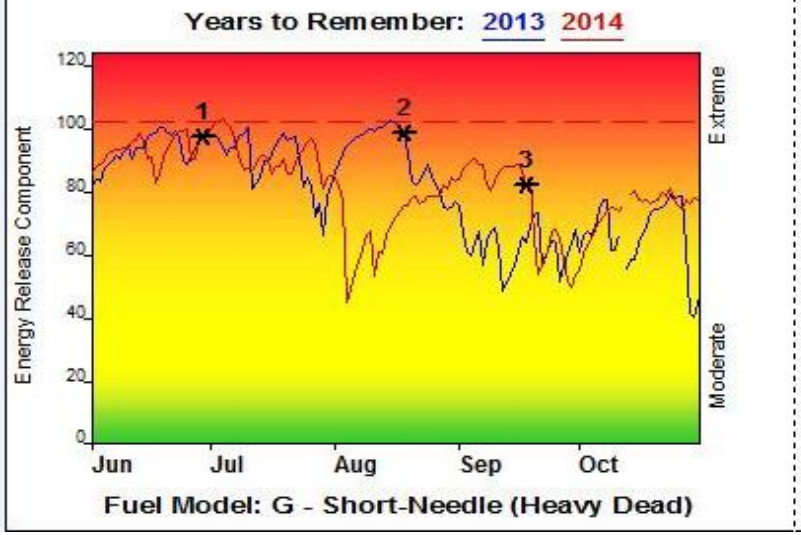
- Toiyabe Mtns FDRA
- 454 & 457
- 4 RAWS Stations
  * Meets NWCG Wx Station Standards

Fire Danger Interpretation:

EXTREME -- Use extreme caution
(Caution) -- Watch for change
Moderate -- Lower Potential, but always be aware

Maximum -- Highest Energy Release Component by day for 1992 - 2014
Average -- shows peak fire season over 23 years (3381 observations)
95th Percentile -- Only 5% of the 3381 days from 1992 - 2014 had an Energy Release Component above 102

Local Thresholds - Watch out: Combinations of any of these factors can greatly increase fire behavior: **20' Wind Speed** over 30 mph, **RH** less than 15%, **Temperature** over 90, **10-Hour Fuel Moisture** less than 10



Remember what Fire Danger tells you:

- ✓ Energy Release Component gives seasonal trends calculated from 2 pm temperature, humidity, daily temperature & rh ranges, and precip duration.
- ✓ Wind is NOT part of ERC calculation.
- ✓ Watch local conditions and variations across the landscape -- Fuel, Weather, Topography.
- ✓ Listen to weather forecasts -- especially WIND.

Past Experience:

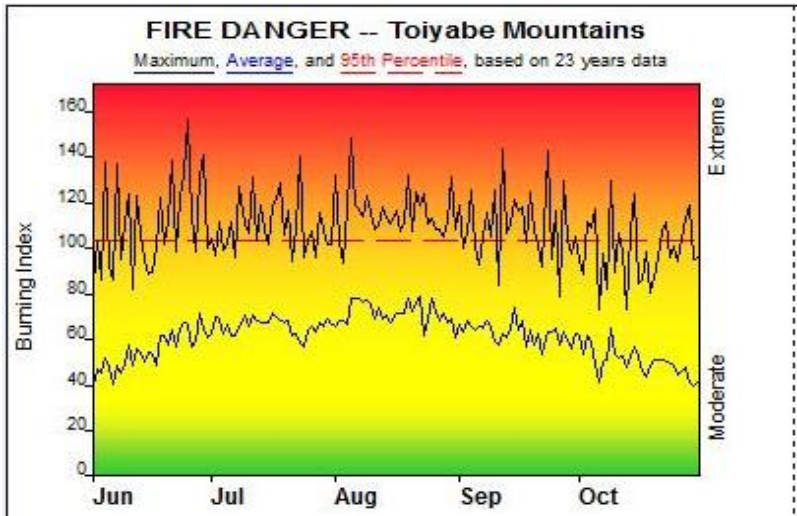
1--Willow Creek--6/29/13--4,028 acres--ERC 98--Lightning caused--Terrain and fuel driven fire behavior in drought stressed old grow Pinyon-Juniper.

2--Chestnut--8/18/2013--3,909 acres--ERC 99--Lightning caused--High rates of spread with medium ranged spotting were observed. Drought stressed fuels and steep terrain hampered suppression activities.

3--Murphy--9/18/2014--634 acres--ERC 81--Human Caused--Moderate rates of spread with short range spotting observed.

Responsible Agency: BLM/USFS
FF+4.1 Beta 04/29/2015-08:49 (H:\CENTER MANAGER\FireFamily+data\FDOP 2015)
Design by NWCG Fire Danger Working Team

Toiyabe Mountains FDRA FM T BI



Fire Danger Area:

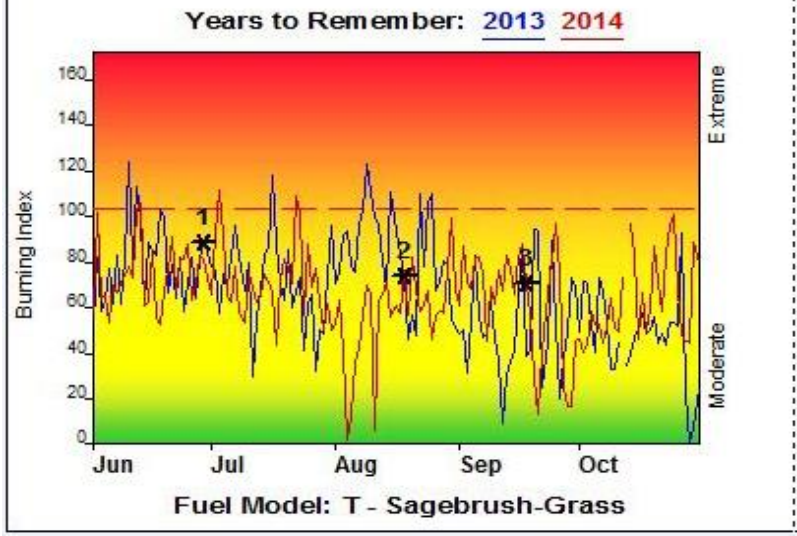
- Toiyabe Mtns FDRA
- 454 & 457
- 4 RAWS Stations
  * Meets NWCG Wx Station Standards

Fire Danger Interpretation:

EXTREME -- Use extreme caution
(Caution) -- Watch for change
Moderate -- Lower Potential, but always be aware

Maximum -- Highest Burning Index by day for 1992 - 2014
Average -- shows peak fire season over 23 years (3381 observations)
95th Percentile -- Only 5% of the 3381 days from 1992 - 2014 had an Burning Index above 102

Local Thresholds - Watch out: Combinations of any of these factors can greatly increase fire behavior: **20' Wind Speed** over 30 mph, **RH** less than 15%, **Temperature** over 90, **10-Hour Fuel Moisture** less than 10



Remember what Fire Danger tells you:

- ✓ Burning Index gives day-to-day fluctuations calculated from 2 pm temperature, humidity, wind, daily temperature & rh ranges, and precip duration.
- ✓ Wind is part of BI calculation.
- ✓ Watch local conditions and variations across the landscape -- Fuel, Weather, Topography.
- ✓ Listen to weather forecasts -- especially WIND.

Past Experience:

1--Willow Creek--6/29/13--4,028 acres--BI 85--Lightning caused--Terrain and fuel driven fire behavior in drought stressed old grow Pinyon-Juniper.

2--Chestnut--8/18/2013--3,909 acres--BI 78--Lightning caused--High rates of spread with medium ranged spotting were observed. Drought stressed fuels and steep terrain hampered suppression activities.

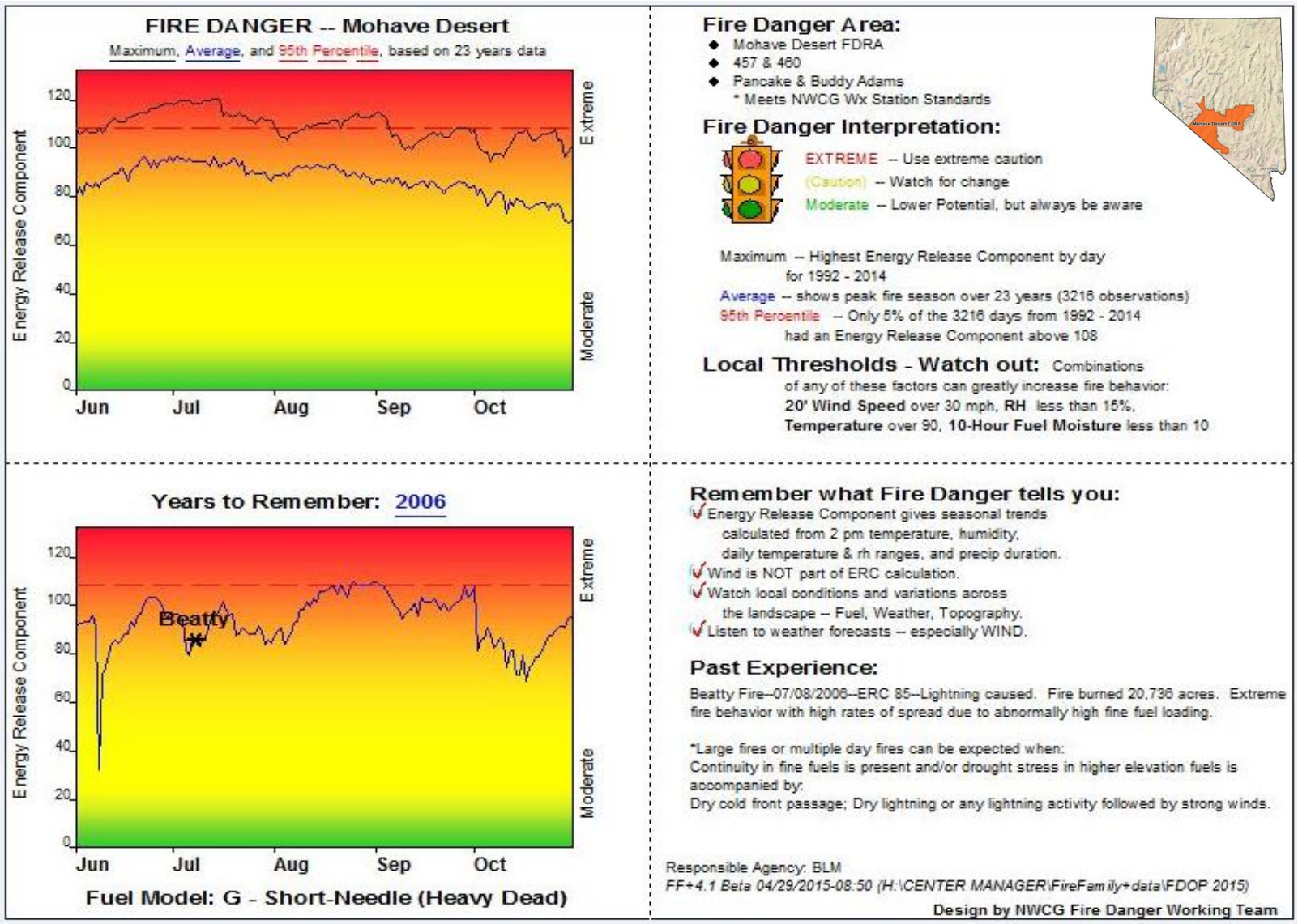
3--Murphy--9/18/2014--634 acres--BI 75--Human Caused--Moderate rates of spread with short range spotting observed.

Responsible Agency: BLM/USFS

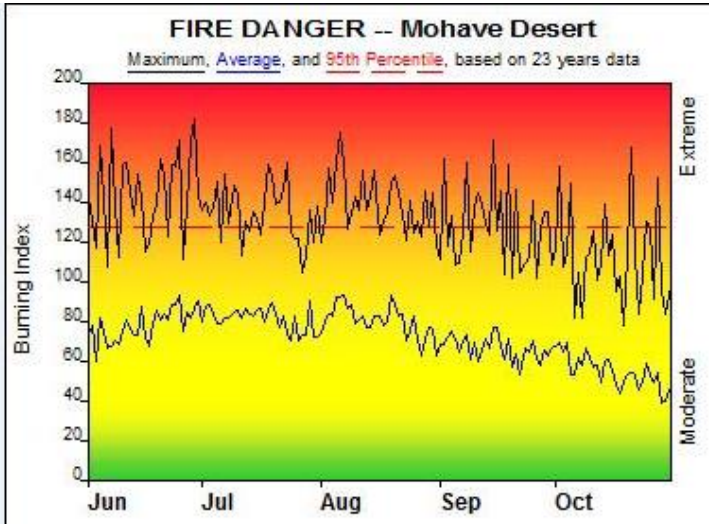
FF+4.1 Beta 04/29/2015-08:48 (H:\CENTER MANAGER\FireFamily+data\FDOP 2015)

Design by NWCG Fire Danger Working Team

Mohave Desert FDRA FM G ERC



Mohave Desert FDRA FM T BI



Fire Danger Area:

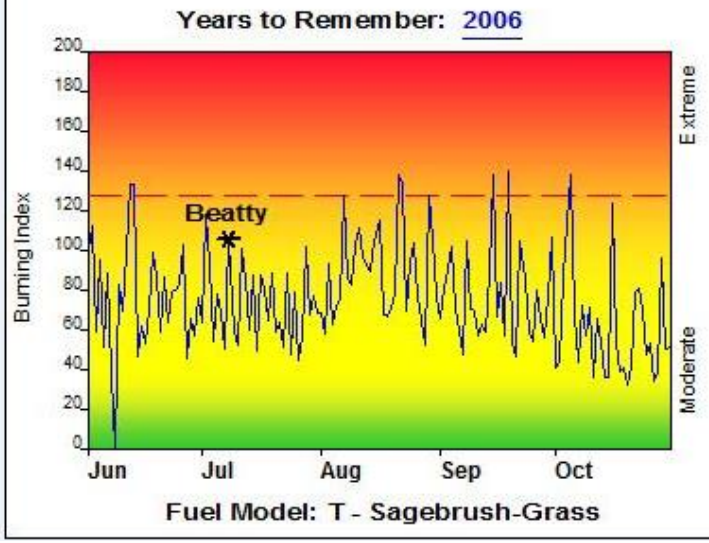
- Mohave Desert FDRA
- 457 & 460
- Pancake & Buddy Adams
  * Meets NWCG Wx Station Standards

Fire Danger Interpretation:

EXTREME -- Use extreme caution
(Caution) -- Watch for change
Moderate -- Lower Potential, but always be aware

Maximum -- Highest Burning Index by day for 1992 - 2014
Average -- shows peak fire season over 23 years (3216 observations)
95th Percentile -- Only 5% of the 3216 days from 1992 - 2014 had an Burning Index above 127

Local Thresholds - Watch out: Combinations of any of these factors can greatly increase fire behavior: **20' Wind Speed** over 30 mph, **RH** less than 15%, **Temperature** over 90, **10-Hour Fuel Moisture** less than 10



Remember what Fire Danger tells you:

- ☑ Burning Index gives day-to-day fluctuations calculated from 2 pm temperature, humidity, wind, daily temperature & rh ranges, and precip duration.
- ☑ Wind is part of BI calculation.
- ☑ Watch local conditions and variations across the landscape -- Fuel, Weather, Topography.
- ☑ Listen to weather forecasts -- especially WIND.

Past Experience:

Beatty Fire--07/08/2006--BI 103--Lightning caused. Fire burned 20,736 acres. Extreme fire behavior with high rates of spread due to abnormally high fine fuel loading.

*Large fires or multiple day fires can be expected when:
Continuity in fine fuels is present and/or drought stress in higher elevation fuels is accompanied by:
Dry cold front passage; Dry lightning or any lightning activity followed by strong winds.

Responsible Agency: BLM
FF+4.1 Beta 04/29/2015-08:52 (H:\CENTER MANAGER\FireFamily+data\FDOP 2015)
Design by NWCG Fire Danger Working Team

Appendix N – Procedures Completed for Data Analysis

FireFamily Plus Documentation—Fire History

April 2015

Obtained Fire History from 1992 to 2014 for BLM and the USFS from:

- BLM: WFMI reports
    - Included all action fires (1), natural outs (2), and support actions (37).
        - Support action (37) fires were first imported into FireFamilyPlus. Fires that included a Forest Service identifier in the name were deleted in order to avoid duplications in the Toiyabe Mountains and Mohave Desert FDRAs. Once these records were cleaned up, then the action fires (1) and natural out fires (2) were imported.

- All fire data converted into FireFamilyPlus format (.csv file) and then imported.

    - US Forest Service: KCFast
        - Included all Santa Rosa and Austin/Tonopah Ranger Districts forest fires.
        - All fire data was converted into FireFamilyPlus format (.csv file) and then imported.

- All data was imported into FireFamilyPlus, then exported as a shape file.
        - Shape file was imported into Arcmap in order to associate fires with a Fire Danger Rating Area created a unique fire data set. FDRA shape file (.shp) saved in the working data folder. Joined fire point data to associate the FDRAs.
        - Point data file defined geographic coordinate system (NAD 83) to guarantee all fire shape files match the FDRA shape fie.

- Fires were associated, the new .csv file was analyzed for duplicates and imported into FireFamilyPlus.

FireFamilyPlus Documentation – Fire Business Candidates

April 2015

- Working Set – confirmed the following to ensure the data being used is correct
    - SIG or weather station
    - Fuel Model – Set the same for all stations within the SIG
    - Data Years (1992-2014) for all stations but, Majuba, Buddy Adams, Double H and Quima Peak select (2009-2014)
    - Annual Filter set to correct time from (Jan 1- Dec 31)
    - Fire Associations are defined by the SIG or station

- Fire History Data – Key Points
    - Checked Data – Removed duplicate fires from agency to agency
    - Special Interest Groups set up by FDRA (Data – SIG – New)
    - Edited the SIG, ensured appropriate RAWS weather stations were selected
    - Data – import – (selected by agency and type of file) – Selected data from saved file – Reordered by column and moved to the Selected Fields
    - Selected data and opened
    - Select – Fires – Summary, selected each specific area to view fires and reviewed data
    - Working Copy, selected Fire Associations, specific fires to each FDRA

- To Analyze Fire Business Candidates
    - Selected Batch menu and click Interactive
    - Selected appropriate SIG from list and Run
    - Selected the tab Fire Analysis Report or Fire Analysis Graph (Required)
    - Clicked on each tab: Working Set, Fire Associations and Fire options and selected the correct settings
    - Selected the index
    - Clicked the Add Candidates button.
    - For the 2014 plan, ran all fuel models combined with ERC and BI for analysis.
    - Once all candidates had been added, returned to the main screen, Fires menu, selected Fire Business Candidates.
    - Export to spreadsheet for analysis

- Analysis for setting Decision Points (Threshold)
    - Chose fires menu and selected on Fires Analysis
    - Set Large Fire Acres (300 acres for Humboldt Basin and Mohave Basin FDRA's and 100 acres for the Toiyabe Mountains FDRA), Multiple Fire Days (3 for Humboldt Basin and Mohave Basin FDRA's and 5 for Toiyabe Mountains FDRA), and Analysis Variable, selected OK
    - Selected Fires Probability Analysis window and then selected the Decision Points button