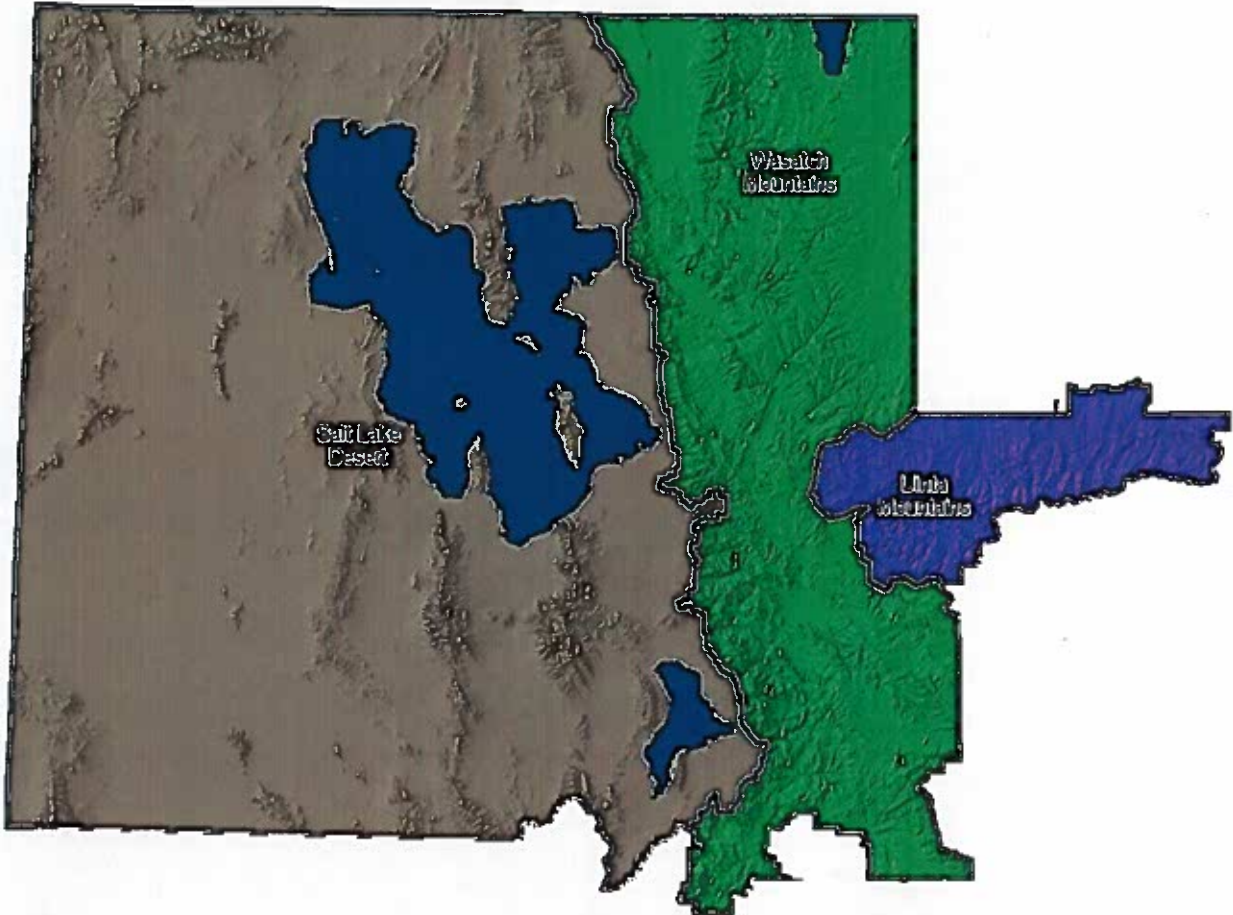


NORTHERN UTAH INTERAGENCY FIRE CENTER

FIRE DANGER OPERATING PLAN



2018

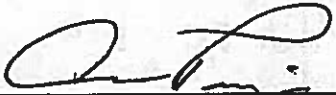
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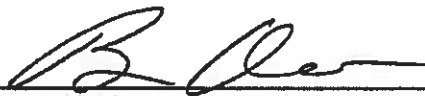
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NORTHERN UTAH INTERAGENCY FIRE DANGER OPERATING PLAN




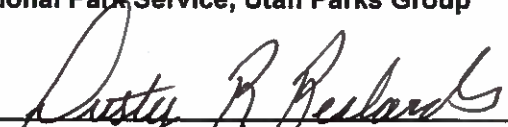


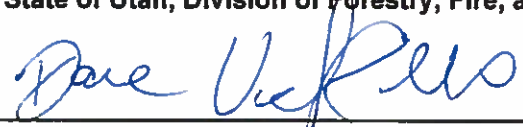

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1.0 INTRODUCTION

1.1 Purpose

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

An appropriate level of preparedness to meet wildland fire management objectives is based upon an assessment of vegetation, climate, and topography utilizing the National Fire Danger Rating System (NFDRS). This plan provides a science-based “tool” for interagency fire managers to incorporate a measure of risk associated with decisions, which have the potential to significantly compromise safety and control of wildland fires. This plan combines an FDOP with a Preparedness and Staffing Plan for the five primary wildland fire management agencies responsible for wildland fire management in Northern Utah: Bureau of Land Management (BLM); USDA Forest Service (USFS); U.S. Fish & Wildlife Service (USFWS), National Park Service (NPS), and the State of Utah, Division of Forestry, Fire, and State Lands (Utah FFSL).

This is the fifth revision (since 2000) of the Northern Utah Interagency Fire Center (NUIFC) FDOP. Since 2004, the NUIFC fire danger area has been incorporated into the Advanced NFDRS course taught at the National Advanced Fire and Resource Institute in Tucson, Arizona. In addition, this plan has been utilized as an example for many FDOPs throughout the United States. This widespread exposure can be attributed to the many fire management professionals who have provided valuable input to this plan. Furthermore, this document serves as an interagency example where consistent and effective applications of fire danger decisions have been successfully applied across jurisdictional boundaries.

1.2 Fire Danger Operating Plan

Interagency policy and guidance requires numerous unit plans and guides in order to meet preparedness objectives. Some of these plans and guides are inter-related; some plans and guides provide the basis for other plans/guides as shown in this schematic. This FDOP guides the application of information from decision support tools (e.g., NFDRS) at the local level and is supplemental to agency fire management plans (FMPs). See Figure 1. This plan documents the establishment and management of a fire weather station network and describes how fire danger ratings will be applied to local unit fire management decisions. The actual implementation of the fire business thresholds is described in the following supplemental action plans.

1.2.1 Staffing Plan

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

1.2.2 Preparedness Plan

Preparedness plans provide management direction given identified levels of burning conditions, fire activity, and resource commitment, and are required at national, state/regional, and local levels. Preparedness Levels (1 to 5) are determined by incremental measures of burning conditions, fire activity, and resource commitment. Fire danger rating is a critical measure of burning conditions. The

Preparedness Levels are identified and documented in this FDOP; the associated decisions and planned actions are located in Appendix F.

1.2.3 Prevention Plan

Prevention plans document the wildland fire problems identified by a prevention analysis. This analysis will not only examine human-caused fires, but also the risks, hazards, and values for the planning unit. Components of the plan include mitigation (actions initiated to reduce impacts of wildland fire to communities), prevention (of unwanted human-caused fires), education (facilitating and promoting awareness and understanding of wildland fire), enforcement (actions necessary to establish and carry out regulations, restrictions, and closures), and administration of the prevention program. The analysis of fire problems and associated target groups in the NUIFC are documented in this FDOP. Each wildland fire agency in Northern Utah is responsible for maintaining its own prevention plan. These prevention plans can be obtained by contacting agency fire prevention, education, and mitigation staff.

1.2.4 Restriction Plan

A restriction plan is an interagency document that outlines interagency coordination efforts regarding fire restrictions and closures. An interagency approach for initiating restrictions or closures helps provide consistency among the land management partners, while defining the restriction boundaries so they are easily distinguishable to the public. Based on the fire danger, managers may impose fire restrictions or emergency closures to public lands. Decision points, when restrictions and/or closures should be considered, are identified and documented in this FDOP. Actions and decisions regarding the implementation and coordination of fire restrictions and closures are contained within the Northern Utah Interagency Annual Operating Plan, which can be found on the [NUIFC¹ website](http://www.nuifc.org), and is updated annually.



Figure 1: Relationship of Fire Danger Operating Plan to the Fire Management Plan and Wildfire Response

¹ <https://gacc.nifc.gov/gbcc/dispatch/ut-nuc/index.html>

1.3 Wildland Fire Response

1.3.1 Initial Dispatch/Response Plan

Initial response plans, also referred to as run cards or pre-planned response plans, specify the fire management response (e.g., number and type of suppression assets to dispatch) within a defined geographic area to an unplanned ignition, based on fire weather, fuel conditions, fire management objectives, and resource availability. Response levels are identified and documented in this FDOP. The number and type of suppression resources dispatched to a reported fire is documented in the associated Initial Dispatch/Response Plan (also call Initial Attack Run Cards). Run Cards for the Northern Utah area are update each year by the member agencies. The current Run Cards (Initial Dispatch/Response Plan) can be found on the [NUIFC website](#) under the “Predictive Services – Intelligence” heading.

1.3.2 Local Mobilization Plan

The NUIFC Mobilization Plan identifies standard procedures, which guide the operations of multi-agency logistical support activity throughout the coordination system. The Mobilization Plan is intended to facilitate interagency dispatch coordination, ensuring the timeliest and most cost effective incident support services available are provided. Communication between Local Units, GACCs, State, Regional Offices and other cooperative agencies are addressed. The Mobilization Plan can be located on the [NUIFC website](#).

1.4 Policy and Guidance

Interagency policy and guidance regarding the development of FDOPs can be found in the [Interagency Standards for Fire & Aviation Operations](#). Agency-specific direction can be found in each agencies applicable fire management handbook/manual (e.g., BLM Manual 9211-1).

1.5 Operating Plan Objectives

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

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2.0 FIRE DANGER PLANNING AREA INVENTORY

2.1 Administrative Units

This plan encompasses an area of approximately 15.5 million acres in northern Utah, with wildland fire management and suppression responsibilities shared among the BLM, USFS, Utah FFSL, USFWS, NPS, Bureau of Indian Affairs (BIA), the Department of Defense (DOD), and local county and municipal cooperators. Northern Utah has a diverse landscape ranging from high desert to mountain peaks that are over 13,000 feet in elevation, with the Great Salt Lake in the middle of the dispatch zone. Administrative units included in the Northern Utah Interagency Fire Center (NUIFC) fire danger planning area are presented in Table 1 and Appendix A: Map 1.

Table 1: Administrative units within the Northern Utah fire danger planning area

Agency	Office	Approximate Acres Managed
BIA	Confederated Tribes of the Goshute Reservation	122,000
BIA	Skull Valley Goshute Reservation	15,500
BIA	Uinta Ouray Reservation	2,700
BLM	Salt Lake Field Office	3,200,000
DOD	Utah Test and Training Range	357,000
DOD	Dugway Proving Ground	800,000
DOD	Tooele Army Depot	23,600
DOD/NG	Camp Williams	28,000
NPS	Golden Spike National Historic Site	2,700
NPS	Timpanogos Cave National Monument	250
State	Forestry, Fire, and State Lands	1,000,000
USFWS	Bear River Migratory Bird Refuge	74,000
USFS	Wasatch-Cache National Forest	1,200,000
USFS	Uinta National Forest	900,000
USFS	Sawtooth National Forest	72,000
USFS	Caribou National Forest	7,000

2.2 Weather Stations

The BLM West Desert District manages six (6) active Remote Automated Weather Stations (RAWS) at the following locations: Vernon, Cedar Mountain, Aragonite, Otter Creek, Rosebud, and Clifton Flat. The Uinta-Wasatch-Cache National Forest manages seven (7) active RAWS at the following locations: Bear River, Bues Canyon, Hewinta, Norway Flat, Pleasant Grove, Ray’s Valley, and Red Spur. Table 2 provides information for each RAWS station and Appendix A: Map 2 depicts the locations of each RAWS. Data can be accessed at the following sites: [MesoWest](http://mesowest.utah.edu)² and [NWS Salt Lake City Fire Weather](http://www.wrh.noaa.gov/slc/fire/obs.php)³.

All RAWS operated by the BLM and USFS in northern Utah comply with the [National Wildfire Coordinating Group \(NWCG\) Interagency Wildland Fire Weather Station Standards and Guidelines \(PMS-426-3\)](#). Each RAWS receives, at a minimum, one annual on-site maintenance visit by either the local user or contracted personnel to ensure sensors are within calibration standards, and to verify site and station conditions.

² <http://mesowest.utah.edu/cgi-bin/droman/mesomap.cgi?state=UT&rawsflag=3>

³ <http://www.wrh.noaa.gov/slc/fire/obs.php>

Table 2: Remote Automated Weather Stations Information Summary Table

FDRA	Station ID	Station Name	Status	Agency/Owner	Data Years	Elevation	Reporting Time
Salt Lake Desert	420901	Cedar Mountain	Active	BLM-UT-SLD	1965-present	4,820	XX:55
	420908	Vernon	Active	BLM-UT-SLD	1990-present	5,500	XX:42
	420909	Muskrat	Inactive	BLM-UT-SLD	1993-1996	4,400	n/a
	420910	Simpson Springs	Inactive	BLM-UT-SLD	1993-1996	4,900	n/a
	420911	Aragonite	Active	BLM-UT-SLD	1997-present	5,030	XX:58
	420914	Rosebud	Active	BLM-UT-SLD	2002-present	5,040	XX:42
	420915	Clifton Flat	Active	BLM-UT-SLD	2003-present	6,384	XX:44
Uinta Mountains	420703	Bear River	Active	USFS-UT-WCF	1983-present	8,475	XX:03
	420705	Hewinta	Active	USFS-UT-WCF	1984-present	9,186	XX:10
	420706	Norway Flat	Active	USFS-UT-WCF	1983-present	8,200	XX:04
Wasatch Mountains	420206	Red Spur	Active	USFS-UT-WCF	2007-present	8,872	XX:07
	420403	Bues Canyon	Active	USFS-UT-WCF	1993-present	5,100	XX:01
	420912	Otter Creek	Active	BLM-UT-SLD	2002-present	7,160	XX:45
	421101	Pleasant Grove	Active	USFS-UT-UIF	1970-present	5,200	XX:55
	421103	Rays Valley	Active	USFS-UT-UIF	1983-present	7,300	XX:13

2.3 Fire Danger Rating Areas (FDRAs)

A Fire Danger Rating Area (FDRA) is defined as a large geographic area relatively homogenous with respect to climate, vegetation, and topography. Because of these similarities, it can be assumed that the fire danger within a FDRA is relatively uniform. Fire Danger Rating Areas were delineated based upon an analysis of these three factors: climate (see Appendix A: Map 4 and Map 5), vegetation (see Appendix A: Map 6 and Map 7), and topography/slope (see Appendix A: Map 8). After these environmental factors were considered, the draft FDRAs were edge-matched to existing administrative boundaries using Response Areas. It is important that existing Response Areas are not split by FDRAs; a Response Area must not have two FDRAs to avoid additional workload and confusion for operational personnel. The final FDRA delineation is depicted in Appendix A: Map 3 and described below.

2.3.1 Salt Lake Desert FDRA

General Location: The Salt Lake Desert FDRA is geographically defined as paralleling the east side of Interstate 15 along the lower bench of the Wasatch Mountains. The southern end borders the Tooele/Juab and Utah/Juab County lines. The western edge of the FDRA is defined by the Utah/Nevada State Line. The northern border follows the Utah/Idaho border. The Salt Lake Desert FDRA encompasses over 10,500,000 acres. However, much of this area is comprised of water (Great Salt Lake and Utah Lake) and military reservation land (i.e., Tooele Army Depot, Dugway Proving Grounds, Utah Test and Training Range).

Vegetation: Lower elevations of this FDRA are salt desert shrublands characterized by greasewood, shadscale, fourwing saltbush, Gardner saltbush, horsebrush, ephedra, gray molly, winterfat, kochia, rabbitbrush, snakeweed, black sagebrush, and small areas of Wyoming big sagebrush. Grasses consist of Indian ricegrass, galleta grass, needle-and-thread grass, squirreltail, sand dropseed, and cheatgrass. Forbs include globemallow, princess plume, evening primrose, and a variety of annual forbs. The middle elevation sites within the unit are dominated by Wyoming big sagebrush, black sagebrush, rabbitbrush, snakeweed, pinyon-juniper woodlands and agricultural areas. Common grasses include bluebunch wheatgrass, western wheatgrass, Sandberg's bluegrass and crested wheatgrass. Forbs are diverse and abundant throughout. Significant sagebrush habitat has been lost due to pinyon-juniper infilling and expansion and infilling asnd well as cheatgrass invasion. Upper elevations have mountain big sagebrush, mountain mahogany, bitterbrush, quaking aspen, serviceberry, white fir, and Douglas fir. This FDRA has been impacted by large and numerous fires in the past and has many areas dominated by cheatgrass. Most wind driven wildfires typically grow large due to the continuity of cheatgrass in the area.

Climate: Hot and dry weather typically dominates the Salt Lake Desert FDRA during fire season. Utah is the second driest state in the nation. Annual precipitation averages 4 to 12 inches. Westerly flows generally bring hot and dry air into the region with little or no precipitation. The main concern is that the low-pressure systems or upper level disturbances pass through the area with enough energy and moisture to initiate thunderstorm activity and produce erratic winds. Fire activity may be frequent, and the potential for large fire growth is high. Southwesterly flows typically bring monsoonal moisture into the region. Strong up-canyon winds cause control problems during the afternoon. The Great Salt Lake, like other large bodies of water, has a significant influence on local winds. Lake breezes (or sea breezes) are wind currents that blow from the bodies of water toward the land. Land breezes are wind currents that blow from land towards the bodies of water. In the summertime during the day, lake breezes occur when the cool air over the lake moves inland. During a summer night, the air over the lake may be warmer than the air over the land and the cooler air over the land may move towards the lake resulting in a land breeze. When a lake breeze penetrates inland, the forward edge of the cool lake air is called the Lake Breeze Front. This front is similar to a typical "Cold Front", but is smaller in scale, but can have a significant influence on the behavior of fires adjacent to the Great Salt Lake or Utah Lake after sunset.

Topography: The Salt Lake Desert FDRA is made up of basins that are broken up by several mountain ranges that are generally oriented from north to south. The basin terrain is flat and generally accessible by vehicle, while the mountain ranges are steep, rocky, and inaccessible.

NFDRS Parameter Summary:

- FDRA: Salt Lake Desert
- Slope Class: 1 (0 percent to 25 percent)
- Climate Class: 1 (Arid)
- Herbaceous Type: A (Annual)

2.3.2 Wasatch Mountains FDRA

General Location: The Wasatch Mountains FDRA western boundary is geographically defined as paralleling the east side of Interstate 15 along the lower bench of the Wasatch Mountains. The southern edge borders the Utah/Juab and Utah/Sanpete County lines east of Nephi, UT. The eastern edge follows the Utah/Wyoming State line on the north half, the Summit/Daggett County line in the middle and The Wasatch/Duchesne county line on the southern portion. The northern border follows the Utah/Idaho border and includes a small area of the Wasatch-Cache National Forest that extends into southwestern Wyoming. The Wasatch Mountains FDRA encompasses over 4,100,000 acres.

Vegetation: The fuel complex of the Wasatch Mountains FDRA consists of sagebrush, grasses, oak brush, maple and pinyon-juniper at lower elevations. Lodgepole pine, mixed conifer and aspen are found

at higher elevations. Conversion of perennial grasses to annual grasses has increased fire risk along the foothills. Fires along the Wasatch front have potential to grow large due to preheating of live woody fuels on steep slopes.

Climate: The climate ranges from high desert to Alpine Forest. Precipitation generally increases with elevation. Lower elevations typically receive 12 to 15 inches per year with higher mountain peaks receiving up to 60 inches per year. February and April tend to be the wettest months while summer and early fall are typically the driest. Summer temperatures can rise to over 100 °F at lower elevations and mid-eighties at higher elevations. The prevailing wind pattern during the fire season is southwest except where modified by local topography. Strong up-canyon winds cause control problems during the afternoon. After sunset, fires adjacent to the Great Salt Lake and Utah Lake will often be influenced by a pressure gradient force resulting in surface winds blowing from the land to the water body. Relative humidity can drop to the lower teens and occasionally into the single digits.

Topography: Elevations in the FDRA range from 3,000 to 12,000 feet. The Wasatch Range is generally oriented north to south. The Wasatch Front (from Idaho border to Nephi) is characterized by steep canyons. Upper and mid-elevations of the mountains are steep slopes and canyons where fires can make significant runs. Fire occurrence in this area is generally considered in slope class 2 to 3.

NFDRS Parameter Summary:

- FDRA: Wasatch Mountains
- Slope Class: 3 (41 percent to 55 percent)
- Climate Class: 2 (Sub-Humid)
- Herbaceous Type: A (Annual)

2.3.3 Uinta Mountains FDRA

General Location: The western boundary of the Uinta Mountains FDRA is geographically defined from the Wyoming State line to the Chalk Creek road, south from Coalville along the eastern side of I-80 to Wanship, south along State Route 32 to Kamas, and south to the Wasatch/Summit county line. Then east along the county line to the forest boundary between the Uinta/ Wasatch Forests. Following the Wasatch National Forest boundary to the Wyoming State line at highway 150 then follows the Wyoming/Utah state line to back around to Chalk Creek road. The Uinta Mountains FDRA encompasses nearly 900,000 acres.

Vegetation: The vast majority of the mountain slopes are forested. Coniferous trees (lodgepole pine, Engelmann spruce, Douglas-fir, sub-alpine fir) grow in large continuous stands. Quaking aspen occur in scattered patches throughout most of the lower elevations. Isolated meadows, resembling large parks, and willow fields add variety to the timbered areas. Many peaks extend above tree line. Recently, several hundred thousand acres of forested landscape in this FDRA have been impacted by bark beetles, in particular the mountain pine beetle and the spruce beetle, resulting in up to 80 to 90 percent mortality in some stands. The vast majority of the beetle killed trees are now in the “gray stage”, when all of the red needles have fallen. Surface fuel loads will continue to increase in this area as the beetle killed trees fall.

Climate: The Uinta Mountains receive about 40 inches of precipitation annually, mostly as snow. The growing season is short; consequently, fire season is usually only two months (July-August). Temperatures in areas above 10,000 feet are seldom above 80 degrees during summer days. Nighttime temperatures during the summer are 30 to 40 degrees, with the possibility of freezing. Summer afternoon thunderstorms often occur in late July and August with the probability of precipitation increasing with elevation.

Topography: The Uinta Range is the highest in Utah, and is the only major range in the contiguous United States with an east-west orientation. Elevations range from 8,000 feet in the lower canyons to

13,528 feet atop Kings Peak, the highest point in Utah. Ridges divide the area into large basins; many ridges rise abruptly several thousand feet above the basins.

NFDRS Parameter Summary:

- FDRA: Uinta Mountains
- Slope Class: 3 (41 percent to 55 percent)
- Climate Class: 3 (Humid)
- Herbaceous Type: P (Perennial)

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3.0 FIRE DANGER PROBLEM ANALYSIS

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

3.1 Fire Occurrence

Fifteen years (2000-2015) of fire occurrence data was used for the statistical analysis. U.S. Department of the Interior, BLM, NPS, BIA, and USFWS fire occurrence data was obtained from the Wildland Fire Management Information system. U.S. Department of Agriculture, USFS fire occurrence data was obtained from the National Interagency Fire Management Integrated Database (NIFMID) via Kansas City Fire Access Software. State of Utah data was obtained from their agency database. 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 (Figure 2, Figure 3, and Figure 4) do not differentiate between agencies; fires are depicted without regard to agency affiliation for each FDRA. See Appendix A: Map 9 and Map 10 for maps depicting large fire perimeters and point/cause type, respectively.

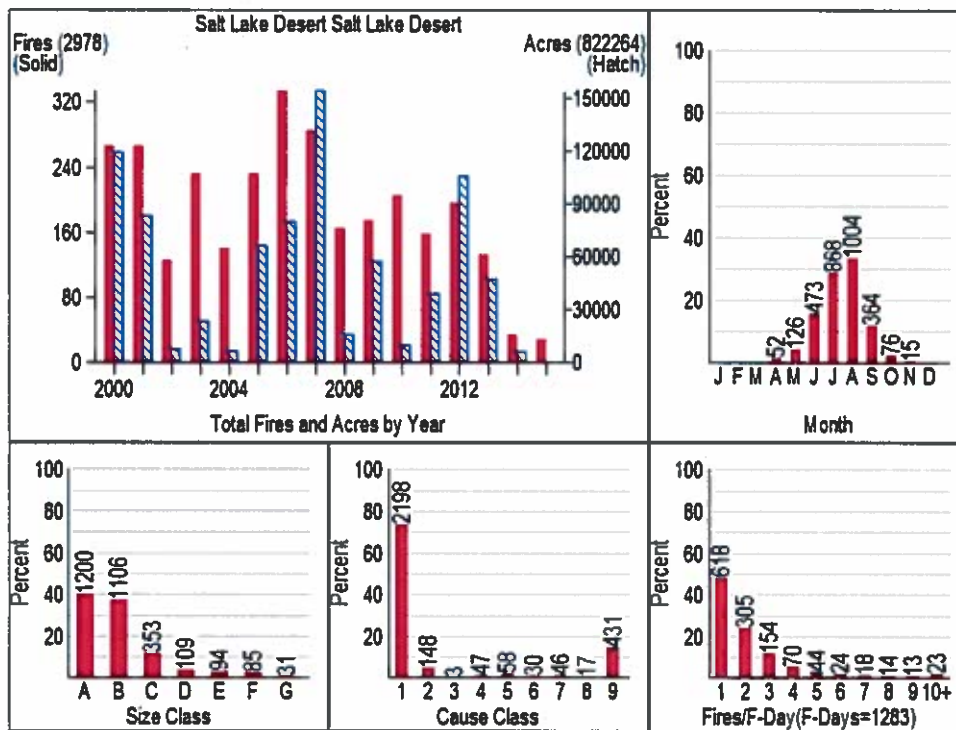


Figure 2: Fire occurrence data from FireFamilyPlus for the Salt Lake Desert FDRA (2000 to 2015)⁴

⁴ Figure Notes for Figures 2, 3, and 4:

Size Class: A (0 to 0.25 acres); B (0.30 to 9.0 acres); C (10 to 99 acres); D (100 to 299 acres); E (300 to 99 acres); F (1,000 to 4,900 acres); and G (5,000 or greater acres).

Cause Class: 1 (Lightning); 2 (Equipment); 3 (Smoking); 4 (Campfire); 5 (Debris Burning); 6 (Railroad); 7 (Arson); 8 (Children); and 9 (Miscellaneous).

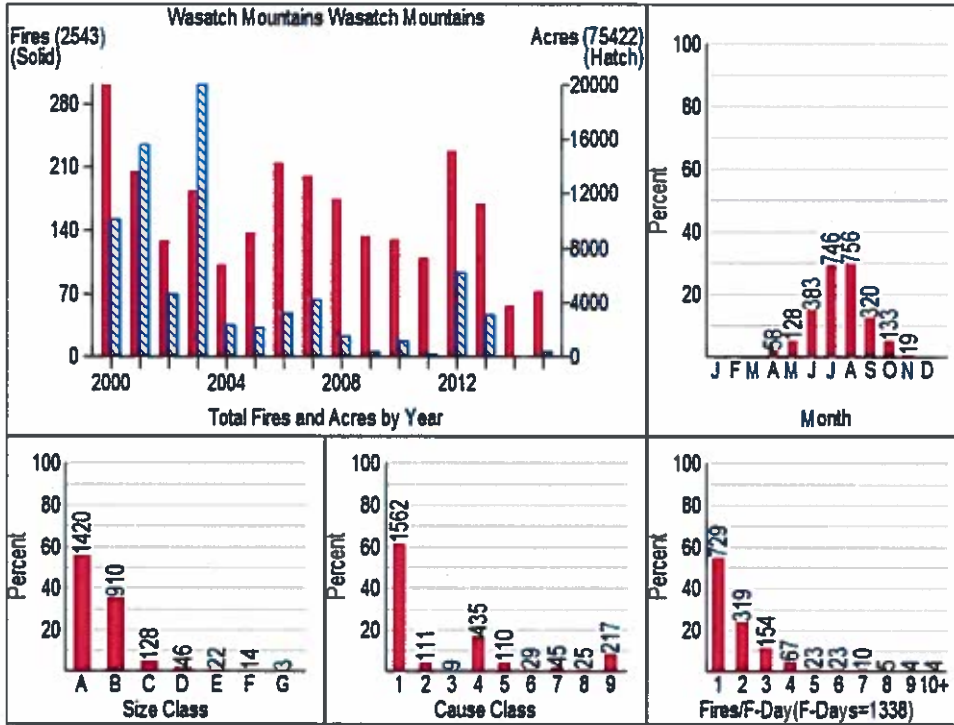


Figure 3: Fire occurrence data from FireFamilyPlus for the Wasatch Mountains FDRA (2000 to 2015)

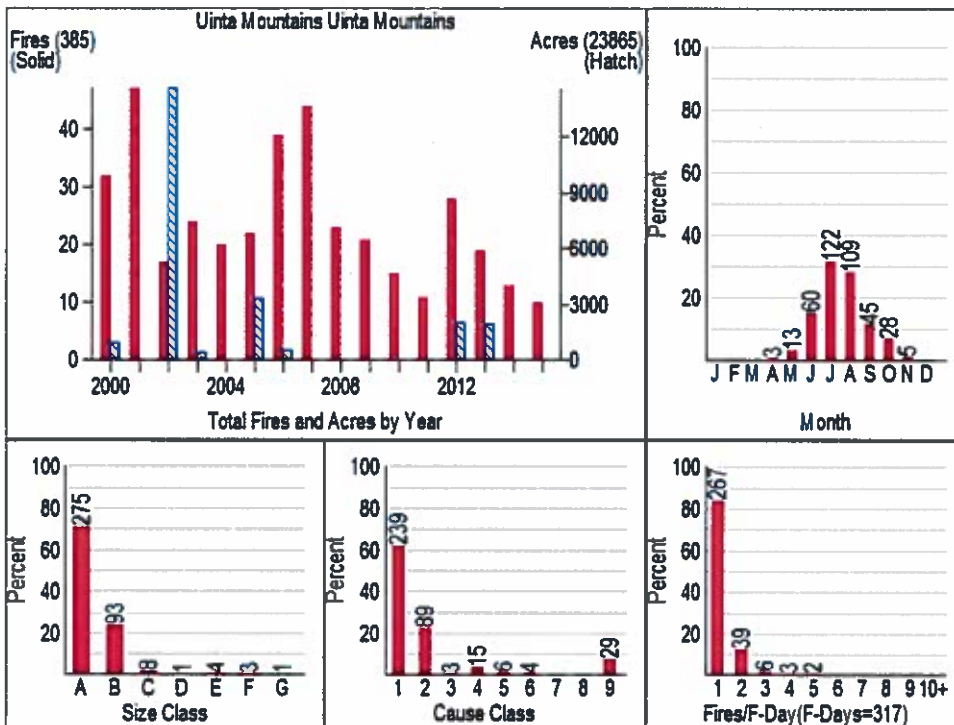


Figure 4: Fire occurrence data from FireFamilyPlus for the Uinta Mountains FDRA (2000 to 2015)

3.2 Identification / Definition of the Fire Problem(s)

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

- **Affected Target Group:** The group of people commonly associated with the problem (e.g., agency, industry, or public).
 - **Agency:** Employees of the federal, state, and local governments involved in the cooperative effort to suppress wildland fires. This includes federal, state, and county land management employees, along with volunteer fire departments who share a similar protection mission to manage wildland fires.
 - **Industry:** Employees affiliated with organizations that utilize natural resources and/or obtain permits or leases to conduct commercial activities on federal, state, or private lands. These entities or activities include ranchers, wilderness camps, railroads, mines, timber harvesting, filming, construction, oil and gas, electric generation, guiding services, etc.
 - **Public:** Individuals who use public lands for non-commercial purposes such as off-highway vehicle (OHV) use, camping, hiking, hunting, fishing, skiing, firewood gathering, agriculture, mountain biking, general travel and recreation. This group also includes those living within the wildland/urban interface (WUI).
- **Problem Definition:** This is the problem specific to the area of concern and includes ignition causes. The problem is “framed” to focus on the wildland fire management issue associated with a specific target group.
- **Degree of Control:** This is a general description of how much control the fire management agencies have over the target group (high or low). This is a measure of how quickly the affected target group can respond to changing fire danger levels.
- **Communication:** Various methods of communication are utilized to influence an affected target group to change their behavior. Depending upon the specific target group, communication with the target group may include face-to-face verbal conversations, radio, telephone, email, newspaper, television, signing/posting, text-messaging, etc.
- **Potential Impacts:** The potential impacts on the target group and the likely consequences of a bad or unfortunate decision.
- **Component/Index:** Sensitivity of the NFDRS outputs should be commensurate 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 that 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).
- **Management Action (Application):** The action or application is a set of pre-defined decision points based upon an analysis of fire danger indices and fire occurrence. Collectively, the decision points represent levels of fire danger applied as a communication mechanism to specific target groups. The intent is to minimize the risk of a fire ignition problem by controlling or influencing a specific target group (Agency, Public, and Industry). Nationally, the following fire danger management applications and their associated levels are recognized: staffing level, dispatch level, preparedness level, and adjective fire danger rating level.

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 that 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 (see Table 3).

Table 3: Fire Problem Analysis Chart for the Northern Utah Interagency fire area

Problem / Issue	Affected Target Group			Degree Of Control	Communication	Potential Impacts	Index / Component	Management Action
	Agency	Public	Industrial					
Unattended and/or escaped campfires at developed recreation sites	n/a	Campers; Picnickers	n/a	Moderate	Communicated by dispatch center daily to agency personnel for implementation. The intent is to raise awareness of potential fire danger in simple, easy to communicate terms via local radio, TV, newspaper, "Smokey's Arm" sign at the entrance to developed recreation areas.	Public anger and resistance; LEO, recreation, and fire patrol workload; prevention workload; reduction in suppression costs	Energy Release Component / 7-day significant fire potential	Fire restrictions (web, radio, TV, newspaper). Roadside prevention signs based on Adjective Rating Level. Fire prevention education. Signs posted at campgrounds and picnic areas (deterrence – fines). Face-to-face public contacts by recreation staff.
Unattended and/or escaped campfires in wilderness, roadless, or other undeveloped (dispersed) areas	n/a	Backcountry Hikers / Campers	n/a	Low	Communicated by dispatch center daily to agency personnel for implementation. Patrols will be necessary to conduct face-to-face awareness of fire danger.	Prevention workload; LEO, recreation, and fire patrol workload; reduction in suppression costs	Energy Release Component / 7-day significant fire potential	Wilderness Patrols (face-to-face contacts). Roadside prevention signs based on Adjective Rating Level.
Fires caused by power infrastructure	n/a	n/a	Power Companies; Railroads	Moderate	Power line easements will be updated to address requirements for certain fire danger levels. Dispatch center	Loss of productivity; socio-economic; reduced	Energy Release Component / 7-day	Adjective Rating

NORTHERN UTAH INTERAGENCY FIRE DANGER OPERATING PLAN

Problem / Issue	Affected Target Group			Degree Of Control	Communication	Potential Impacts	Index / Component	Management Action
	Agency	Public	Industrial					
Motorized equipment and vehicles	n/a	Equipment & vehicle	n/a	Low	to communicate Adjective Rating daily during fire season. Prevention personnel should communicate annually with power companies. One Less Spark campaign; Media messaging; Increase level of public awareness of fire danger via local radio, TV, newspaper, adjective rating signs at typical problem areas.	ignitions; reduced suppression workload. Public anger and resistance; LEO, recreation, and fire patrol workload; prevention workload; reduction in suppression costs	significant fire potential Energy Release Component / 7-day significant fire potential	Fire restrictions (web, radio, TV, newspaper). Roadside prevention signs. Face-to-face public contacts. Public education. Media emphasis on motorized equipment and vehicles. Patrols by law enforcement (deterrence/fines).
Railroad (maintenance issues and grinding)	n/a	n/a	Railroad Companies	Low	Obtain maintenance schedules from railroad. Inform of fire danger in relation to maintenance (phone, e-mail).	Infrastructure impacts (power, roads, etc.); Commerce impacts (e.g., railroad shutdown).	Adjective Level	Grinder schedule cooperation. Cost recovery.
Suppression resources committed to multiple fires	All Agencies	n/a	n/a	High	Dispatch Center orders/releases resources based upon each agencies staffing plan. Preposition resources and extend or supplement staffing.	Agency mob/demob costs vs. suppression costs; reduced	Burning Index	Dispatch Level / Staffing Level

NORTHERN UTAH INTERAGENCY FIRE DANGER OPERATING PLAN

Problem / Issue	Affected Target Group			Degree Of Control	Communication	Potential Impacts	Index / Component	Management Action
	Agency	Public	Industrial					
Suppression resources unavailable after work hours and/or on scheduled days off	All Agencies	n/a	n/a	High	Dispatch Center notifies Duty Officer(s) of indices. Duty Officer extends staffing as needed.	Agency Costs vs. suppression costs; improved readiness.	Burning Index	Staffing Level
Fires caused by target shooting	n/a	Recreationists; Target Shooters	n/a	Low	Communicated by Dispatch Center daily to agency personnel for implementation. Increase level of public awareness of fire danger via local radio, TV, newspaper, adjective rating signs at typical problem areas (i.e., Lake Mountain). Fire prevention order prohibiting steel ammo during fire season. "Know Your Ammo" signs and educational materials.	Public anger and resistance; loss of agency credibility; LEO/fire patrol workload	Energy Release Component / 7-day significant fire potential	Adjective Rating Restrictions and/or closures. Focus on retailers and exploding targets. Public education via recreation, law enforcement, and fire prevention staffs.
Fires resulting from debris burning	n/a	Property Owners	n/a	Low	Communication through permit stipulations. Post adjective fire danger via web, newspaper, radio. Fire prevention patrolling for face- to-face communication and enforcement.	Public Anger; loss of credibility; agency costs (false alarms)	Energy Release Component / 7-day significant fire potential	Modify daily operational activities based on Adjective Rating
Fire resulting from agricultural burns	n/a	n/a	Agriculture	Low	Post adjective fire danger via web, newspaper, radio. Fire prevention patrolling for face- to-face communication and enforcement.	Public Anger; loss of credibility; agency costs (false alarms)	Energy Release Component / 7-day significant fire potential	Work through legislature to gain more control through permitting.

NORTHERN UTAH INTERAGENCY FIRE DANGER OPERATING PLAN

Problem / Issue	Affected Target Group			Degree Of Control	Communication	Potential Impacts	Index / Component	Management Action
	Agency	Public	Industrial					
Fires resulting from equipment (e.g., chainsaws, vehicles, heavy equipment, welders)	n/a	n/a	Contractors; Permittees	Low/ Moderate	Communication through permit stipulations. Post adjective fire danger via web, newspaper, radio. Fire prevention patrolling for face-to-face communication and enforcement.	Public anger; loss of credibility; LEO recreation, and fire patrol workload	Energy Release Component / Ignition Component	Modify daily operational activities based on Adjective Rating. Permit stipulations for fire prevention.
Military-caused fires on or burning off of military lands.	All agencies	n/a	n/a	Moderate	Interagency agreements with DOD and National Guard.	Public anger; fiscal impacts for suppression costs; public perception of military and/or land management agencies.	Adjective Rating	Fuel breaks around military boundaries; preposition of resources during military activities during higher fire danger periods.

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4.0 FIRE DANGER THRESHOLD / DECISION ANALYSIS

This Fire Danger Operating Plan will be used to support preparedness, staffing and response decisions that are made at specific decision points. A “decision point” is a point along the range of possible output values where a decision shifts from one choice to another. When the combination of events and conditions signal that it is time to do something different, a “decision point” has been identified for each Fire Danger Rating Level within each Fire Danger Rating Area. Decision points can be based upon climatological breakpoints or weather station analysis.

4.1 Climatological Analysis

Climatological breakpoints are points on the cumulative distribution curve of one fire weather/danger index computed from climatology (weather) without regard for associated fire occurrence/business. For example, the value at the 90th percentile energy release component (ERC) is the climatological breakpoint at which only 10 percent of the ERC values are greater in value. Climatological percentiles were originally developed for budgetary decisions by federal agencies and area predetermined by agency directive: BLM (80th and 95th percentiles); FWS (90th and 97th percentiles); NPS (90th and 97th percentiles); and USFS (90th and 97th percentiles). See Appendix D for more information.

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

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

4.2 Weather Station Analysis

Remote automated weather stations (RAWS) located in different geographical locations with common sensitivity to NFDRS model inputs can be grouped together to form a special interest group (SIG). Of the 13 active RAWS in the Northern Utah area, five were grouped into the Salt Lake Desert SIG, five into the Wasatch Mountains SIG, and three into the Uinta Mountains SIG.

Salt Lake Desert SIG: The Vernon, Cedar Mountain, Aragonite, Rosebud, and Clifton Flat RAWS have been combined as a SIG to compute an equally weighted set of fire danger indices for the Salt Lake Desert FDRA. See Figure 5, Figure 6, Figure 7, Figure 8, Figure 9, and Figure 10 for average daily observed parameters for the Salt Lake Desert SIG RAWS sites between May 1 and September 30, 2014.

Wasatch Mountains SIG: The Otter Creek, Pleasant Grove, Rays Valley, Red Spur, and Bues Canyon RAWS have been combined as a SIG to compute an equally weighted set of fire danger indices for the Wasatch Mountain FDRA. See Figure 11, Figure 12, Figure 13, Figure 14, Figure 15, Figure 16 for average daily observed parameters for the Wasatch Mountains SIG RAWS sites between May 1 and September 30, 2014.

Uinta Mountains SIG: The Bear River, Hewinta and Norway Flats RAWS have been combined as a SIG to compute an equally weighted set of fire danger indices for the Uinta Mountain FDRA. See Figure 17, Figure 18, Figure 19, Figure 20, Figure 21, and Figure 22 for average daily observed parameters for the Uinta Mountains SIG RAWS sites between May 1 and September 30, 2014.

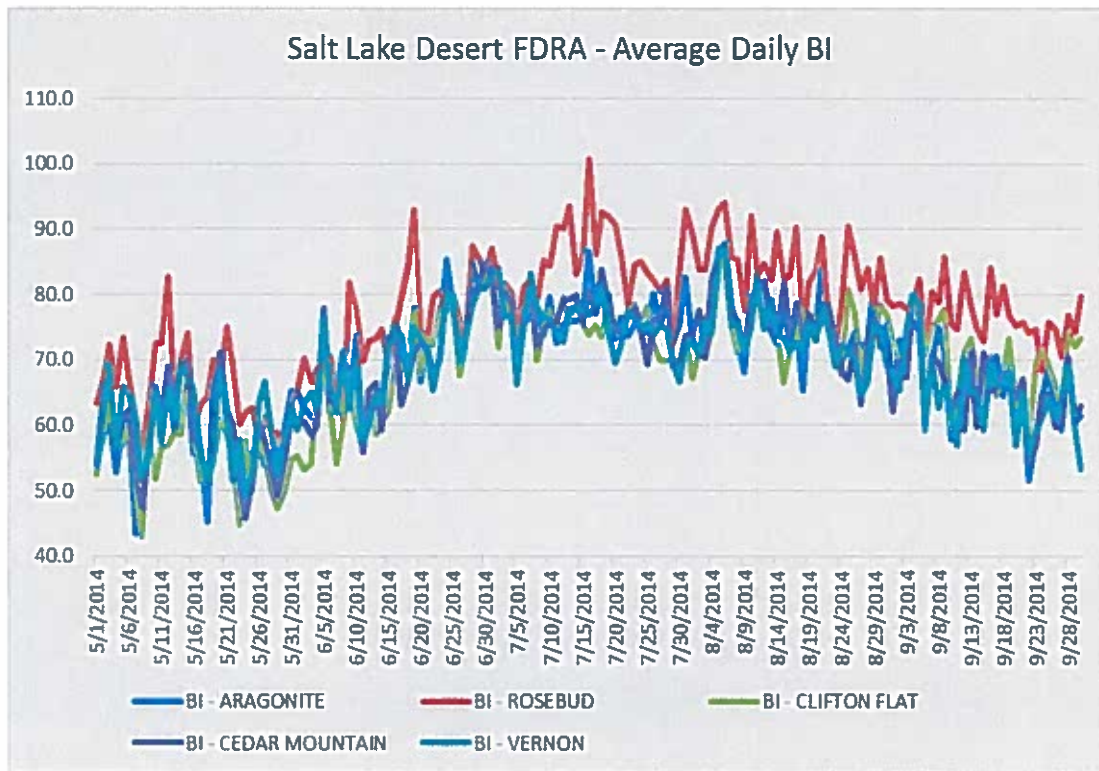


Figure 5: Average daily burning index (BI), Salt Lake Desert FDRA (May-September)

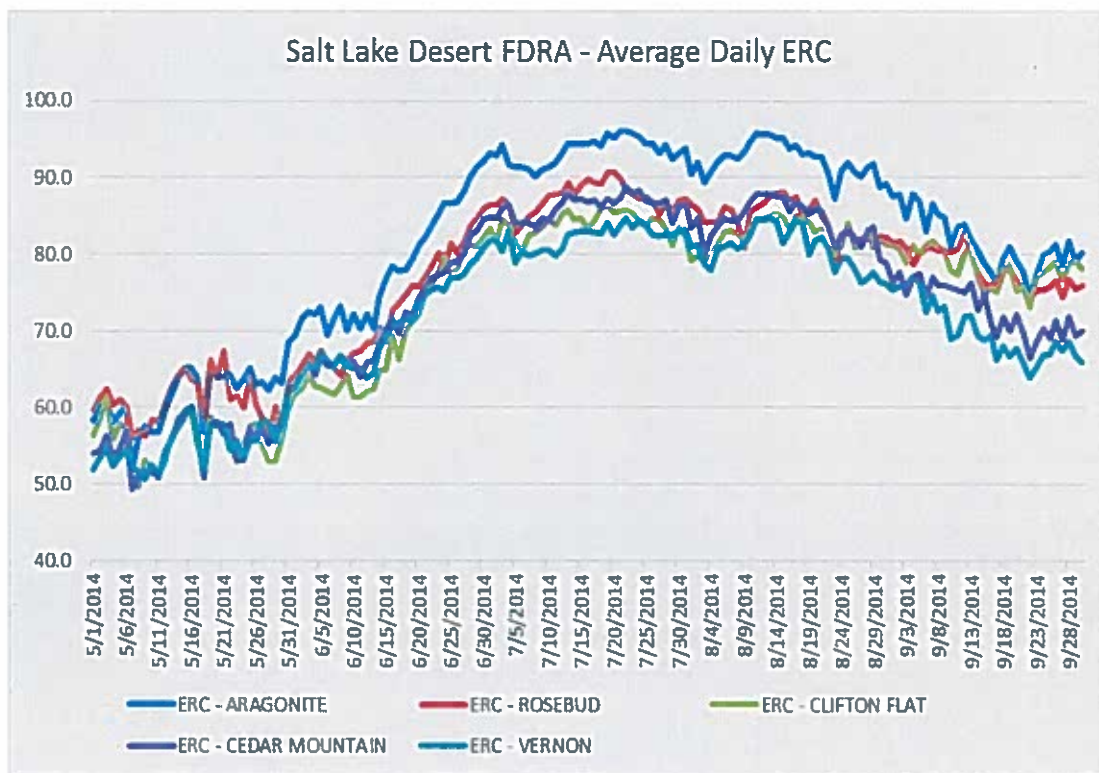


Figure 6: Average daily energy release component (ERC), Salt Lake Desert FDRA (May-September)

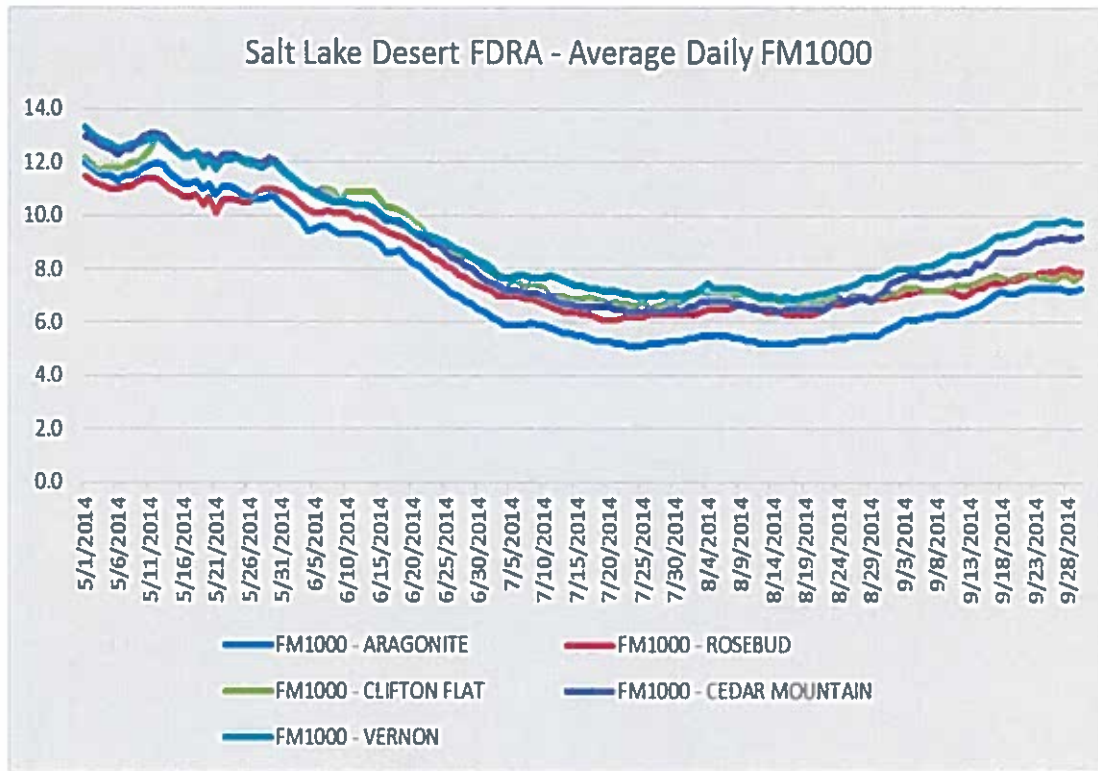


Figure 7: Average daily 1,000-hr fuel moisture, Salt Lake Desert FDRA (May-September)

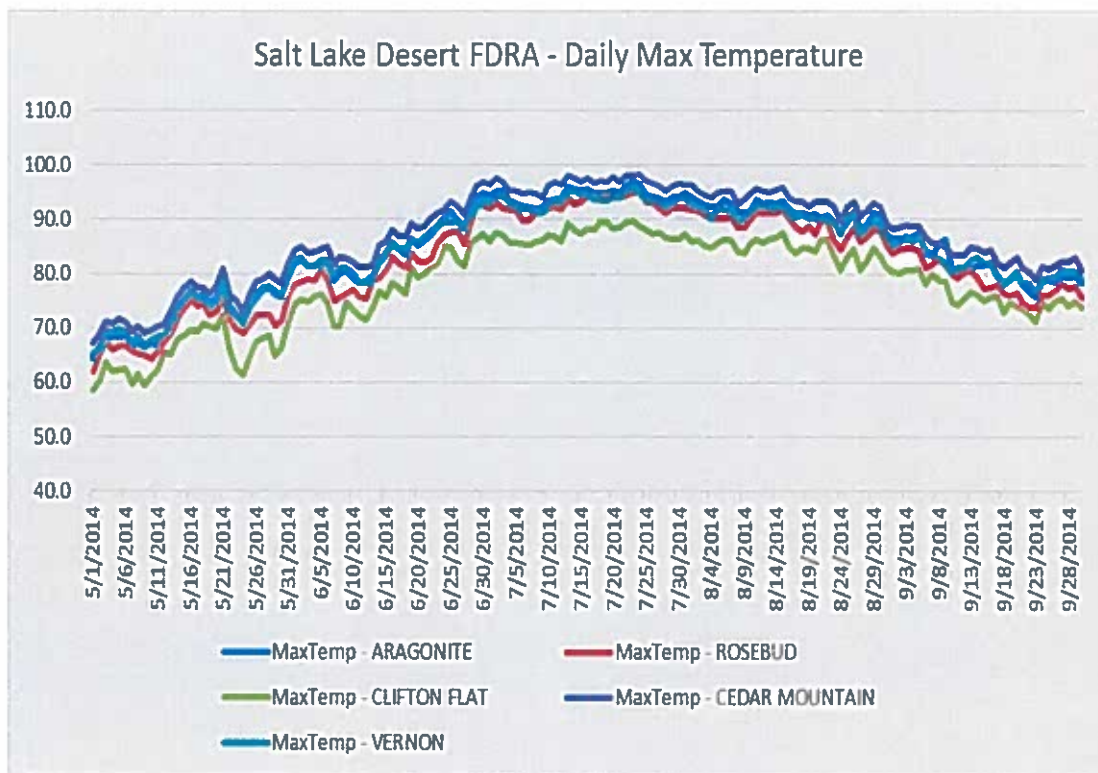


Figure 8: Daily observed max temperature, Salt Lake Desert FDRA (May-September)

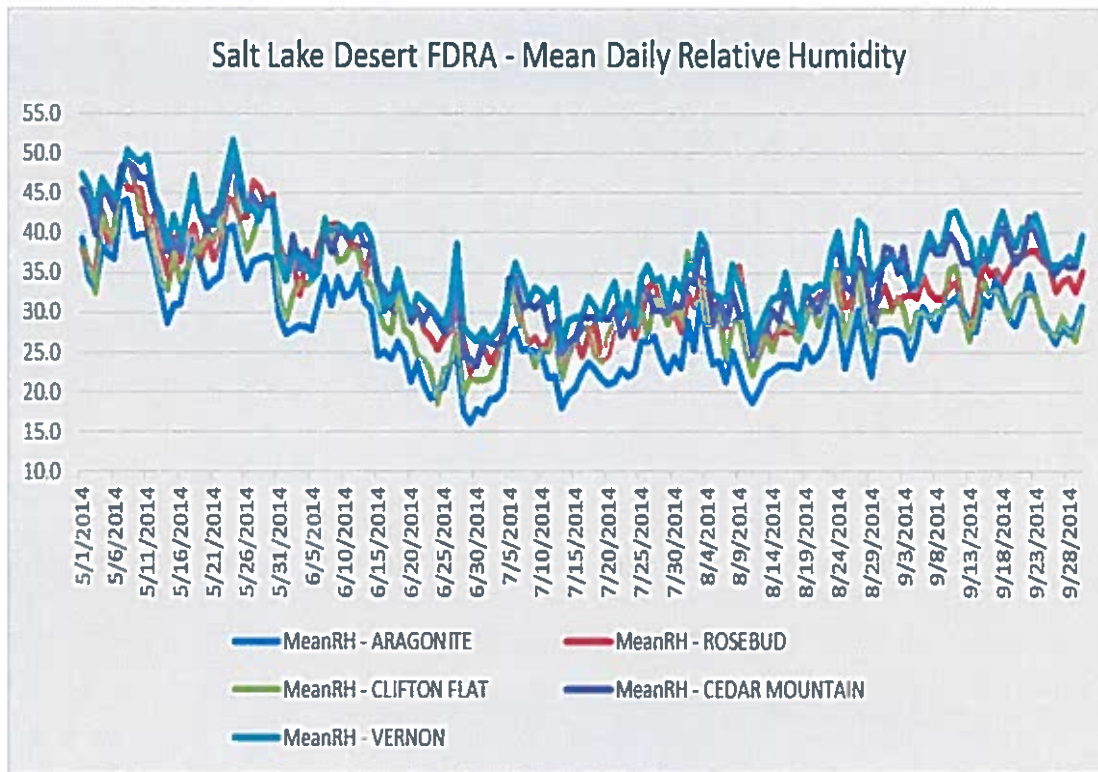


Figure 9: Mean daily observed relative humidity, Salt Lake Desert FDRA (May-September)

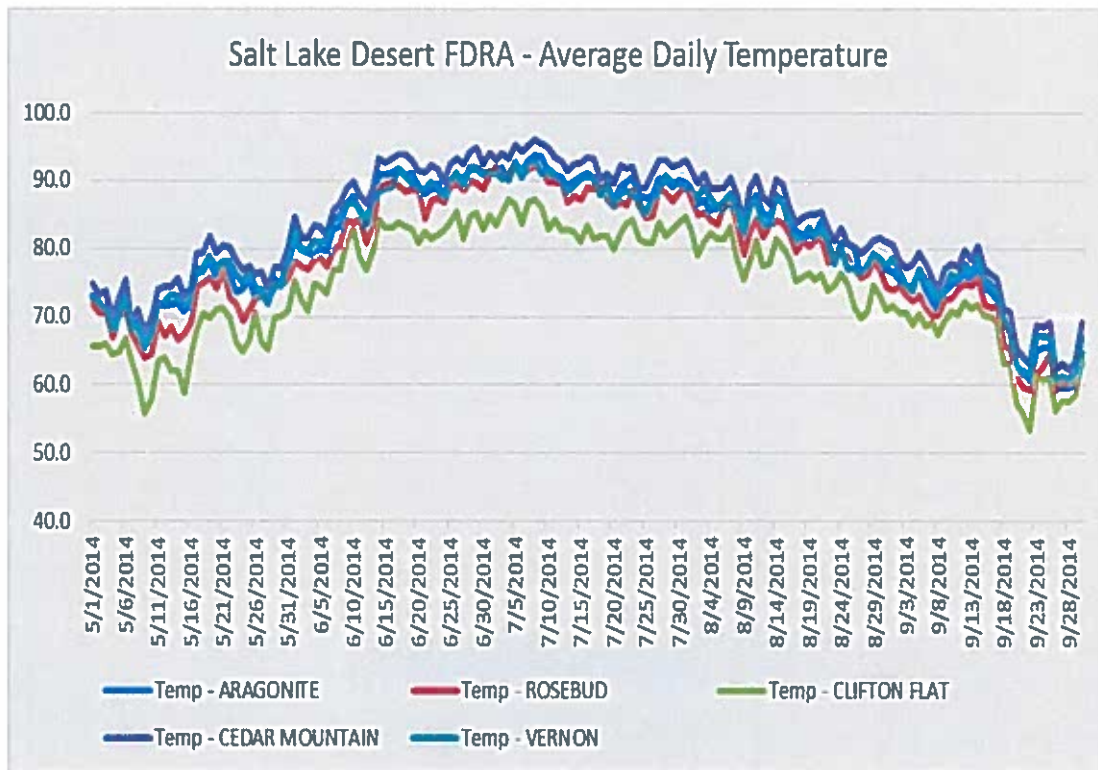


Figure 10: Average daily observed temperature, Salt Lake Desert FDRA (May-September)

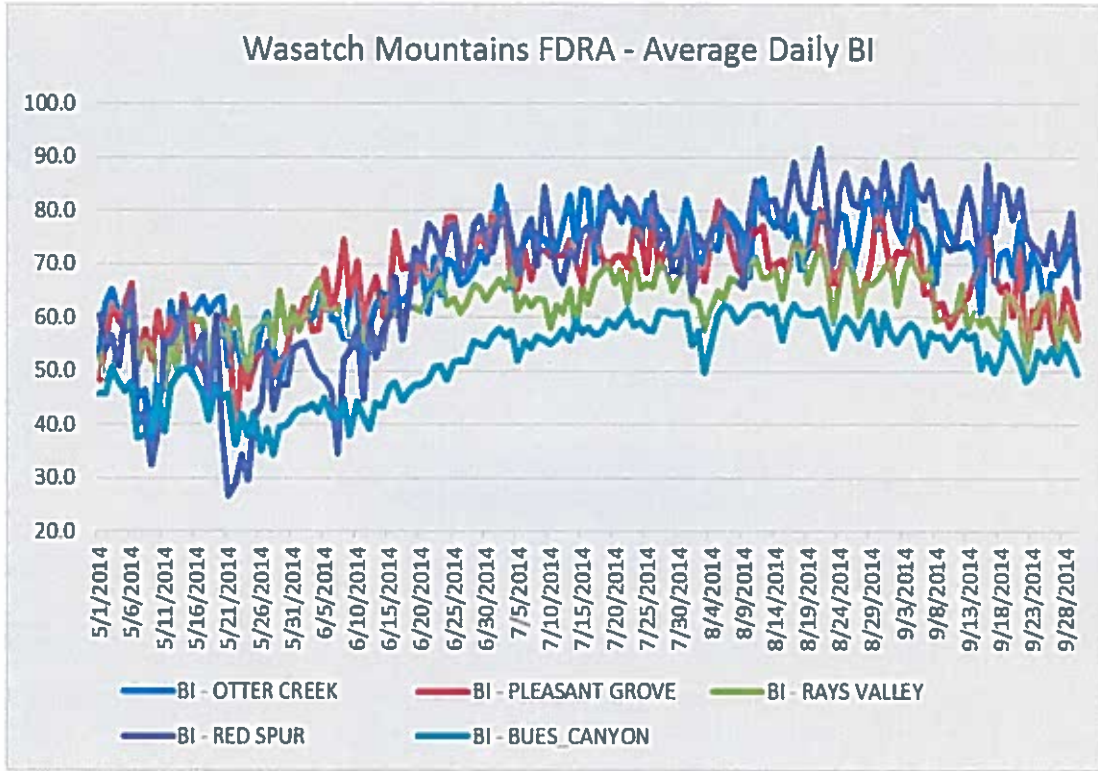


Figure 11: Average daily burning index (BI), Wasatch Mountains Desert FDRA (May-September)

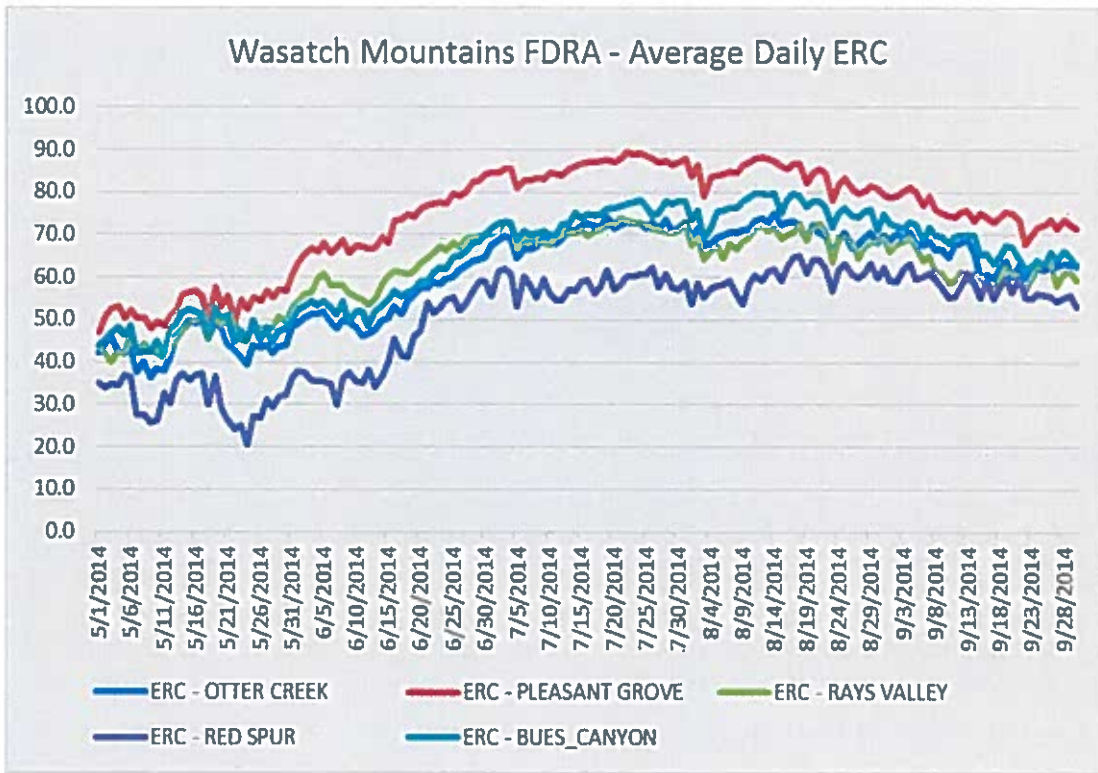


Figure 12: Average daily energy release component (ERC), Wasatch Mountains FDRA (May-September)

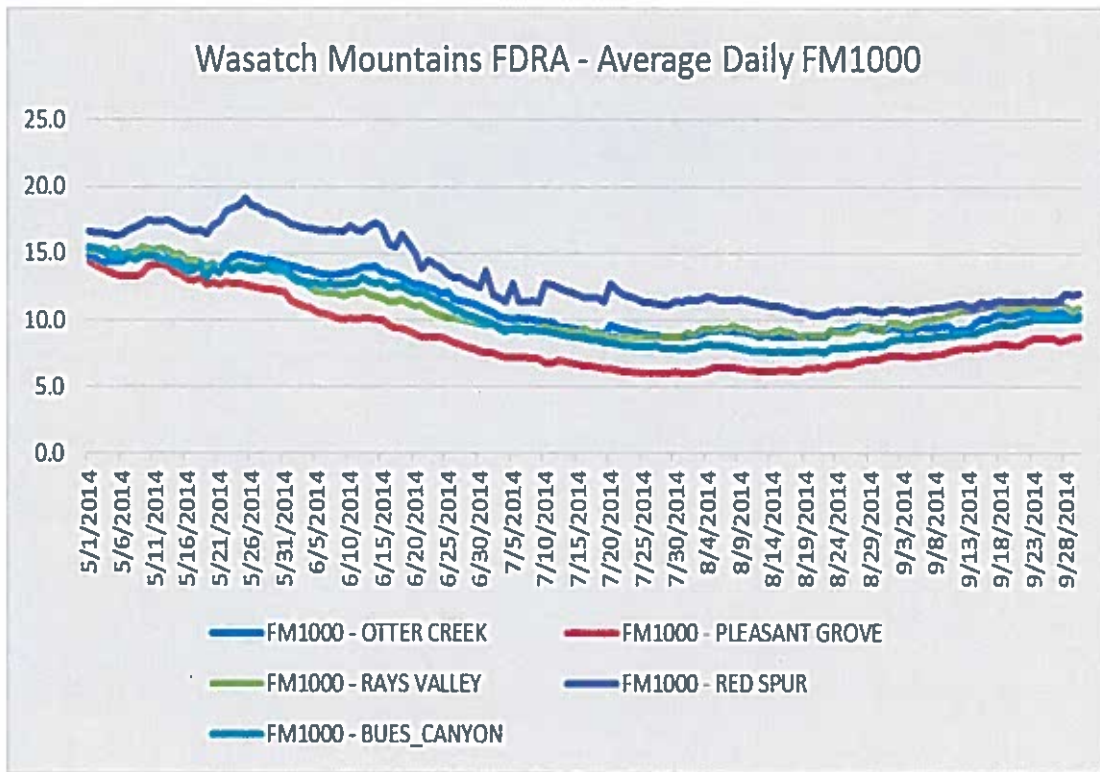


Figure 13: Average daily 1,000-hr fuel moisture, Wasatch Mountains FDRA (May-September)

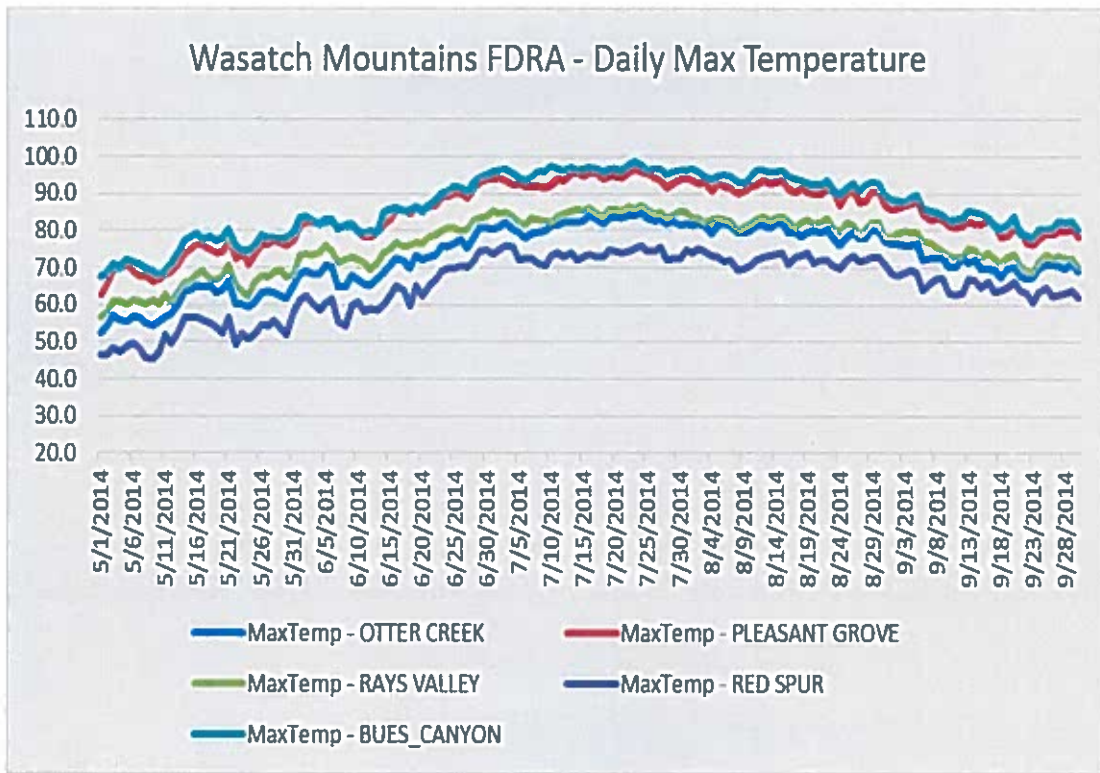


Figure 14: Daily observed max temperature, Wasatch Mountains FDRA (May-September)

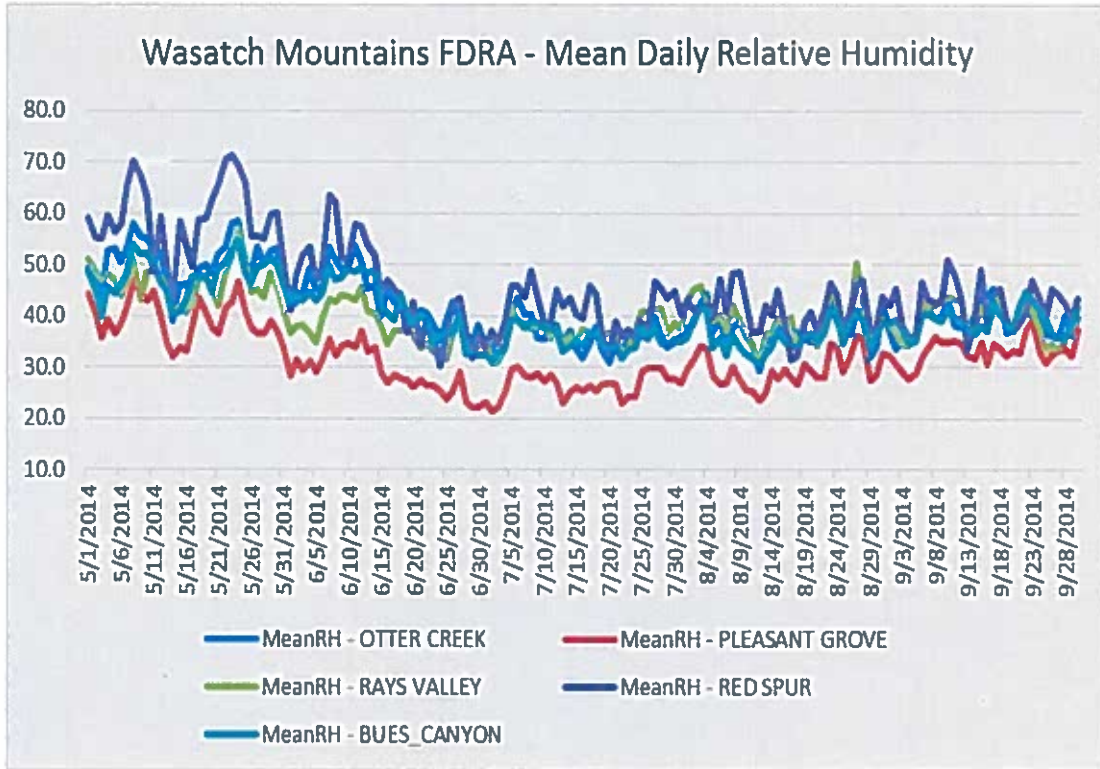


Figure 15: Mean daily observed relative humidity, Wasatch Mountains FDRA (May-September)

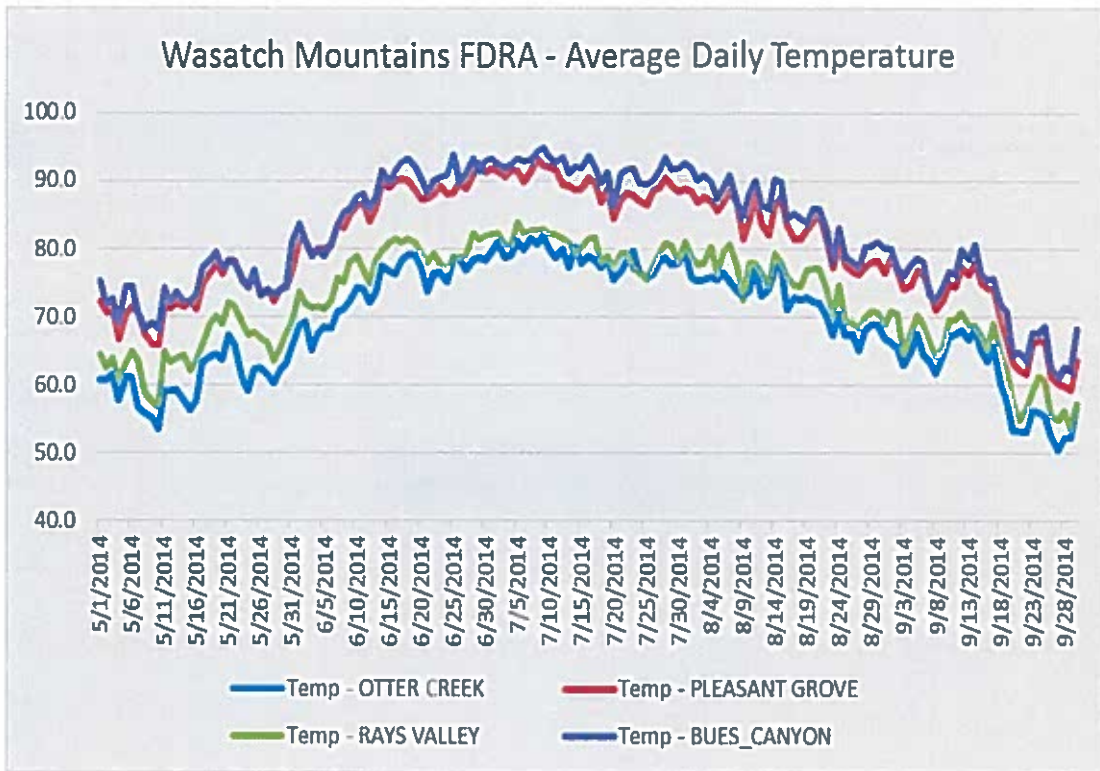


Figure 16: Average daily observed temperature, Wasatch Mountains FDRA (May-September)

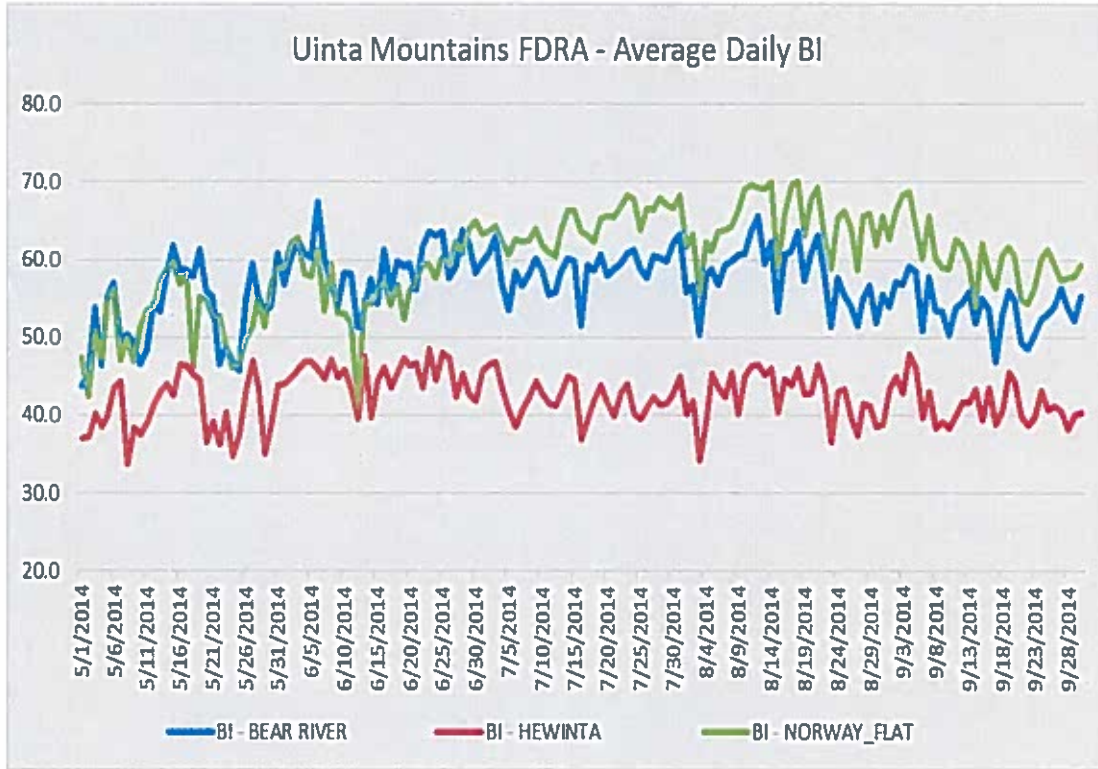


Figure 17: Average daily burning index (BI), Uinta Mountains Desert FDRA (May-September)

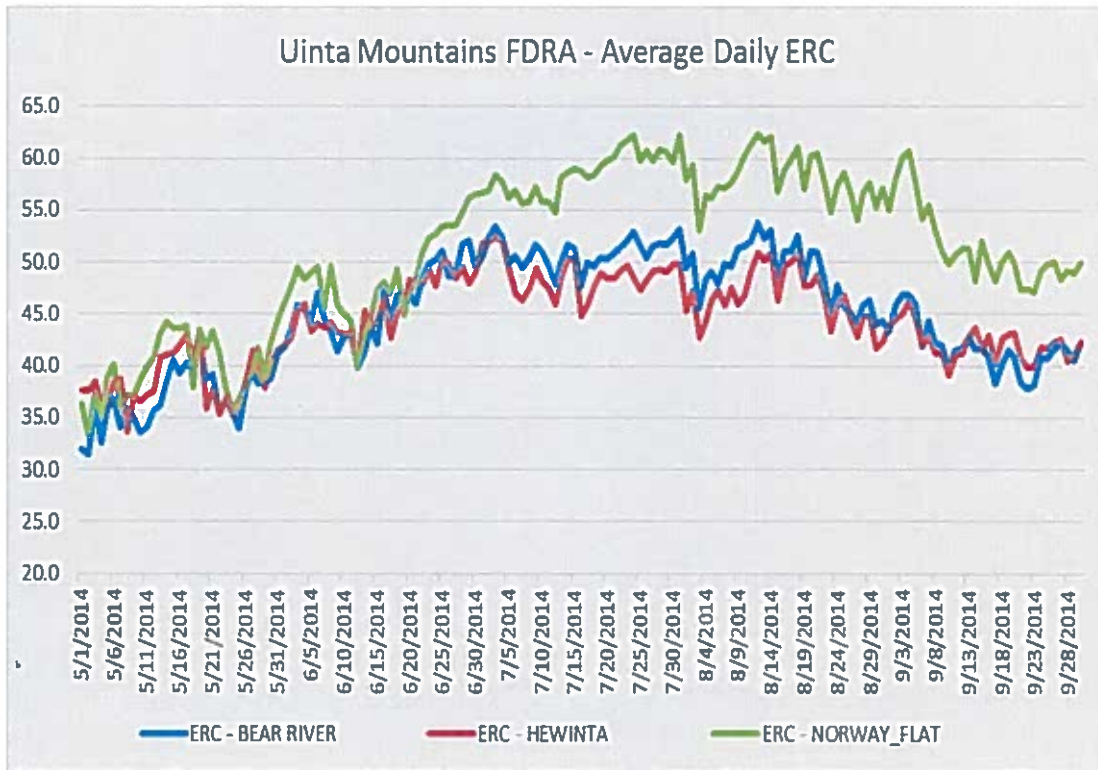


Figure 18: Average daily energy release component (ERC), Uinta Mountains FDRA (May-September)

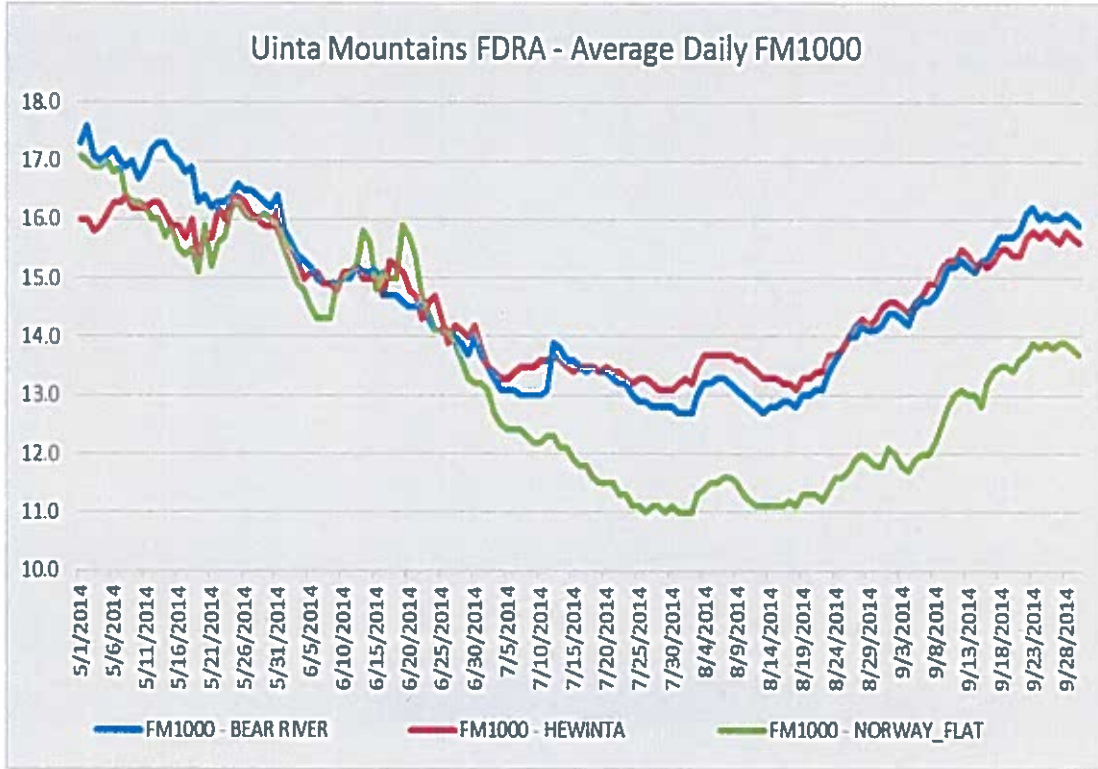


Figure 19: Average daily 1,000-hr fuel moisture, Uinta Mountains FDRA (May-September)

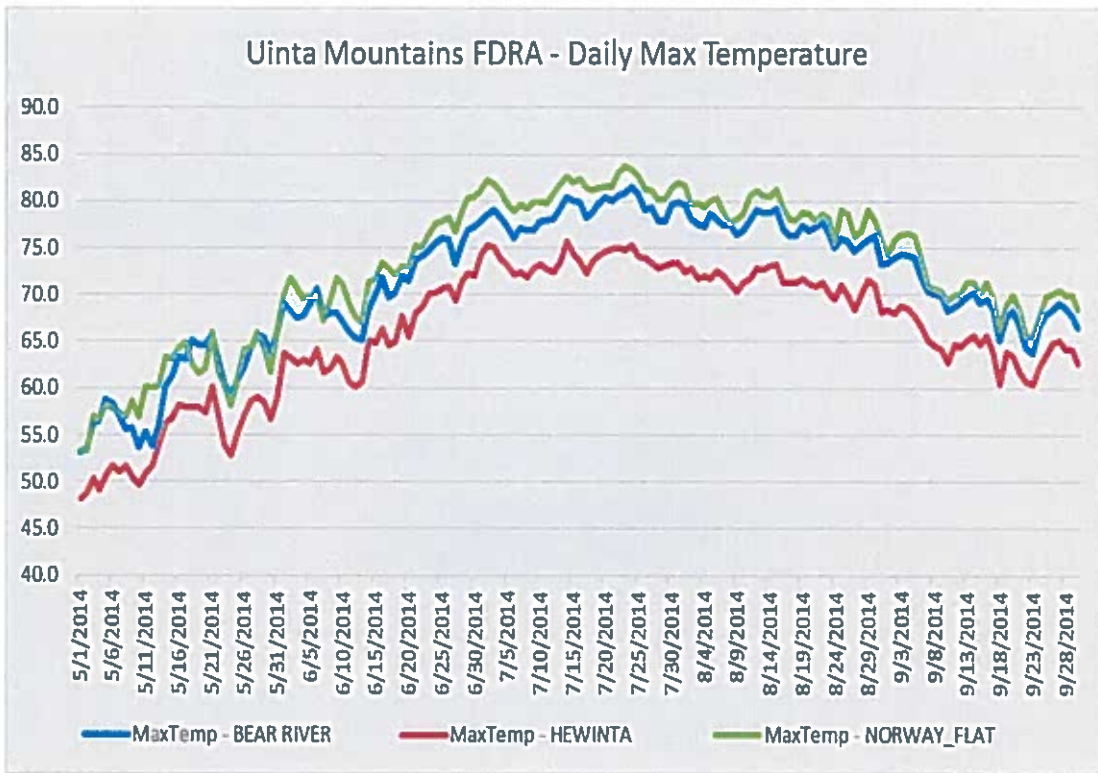


Figure 20: Daily observed max temperature, Uinta Mountains FDRA (May-September)

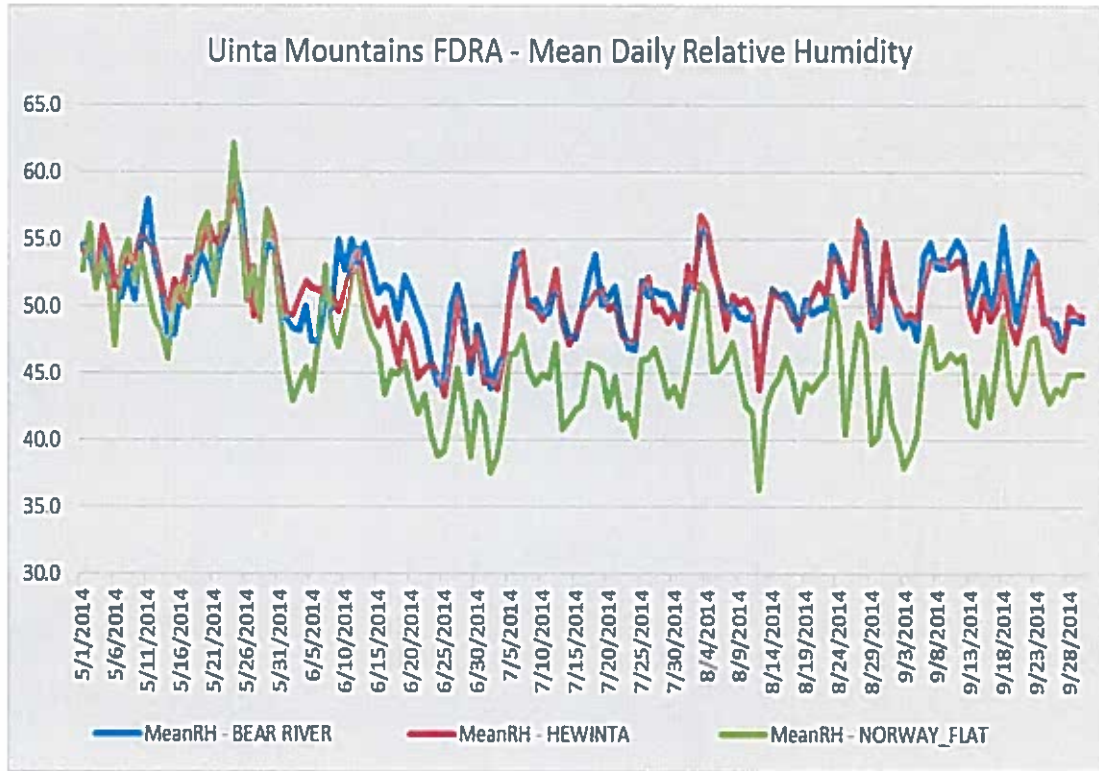


Figure 21: Mean daily observed relative humidity, Uinta Mountains FDRA (May-September)

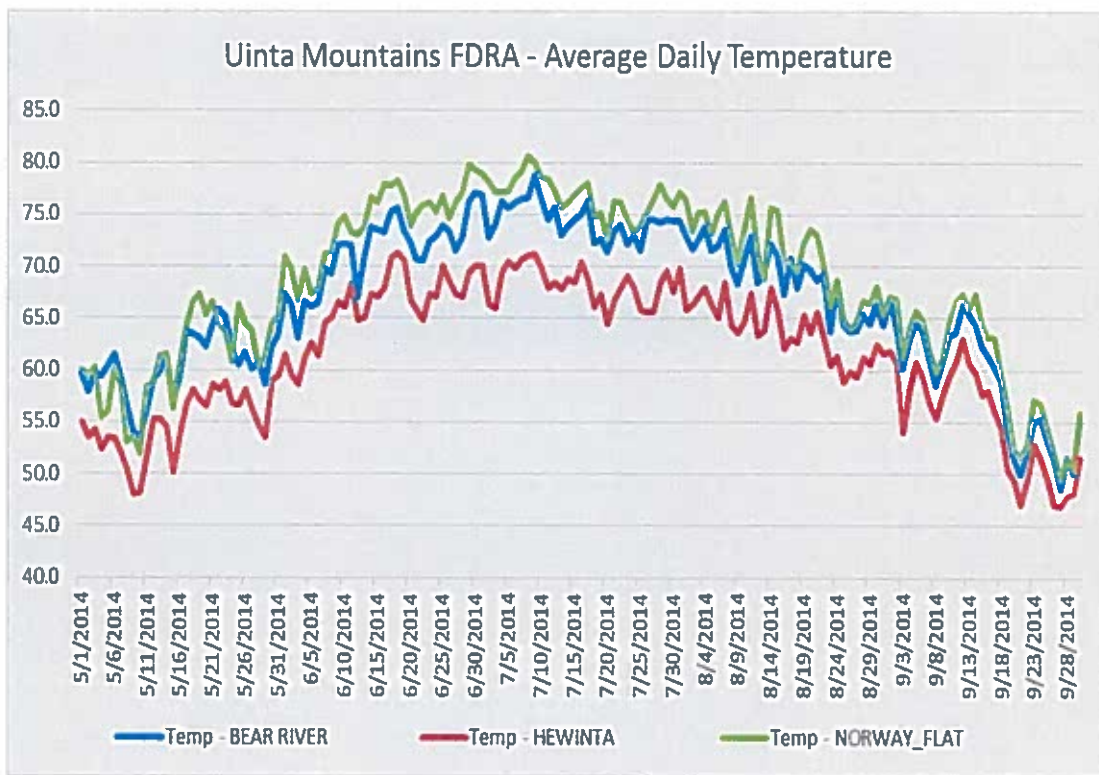


Figure 22: Average daily observed temperature, Uinta Mountains FDRA (May-September)

4.3 Parameters Used to Calculate Fire Danger

Table 4 presents information on the parameters used by the Northern Utah Interagency Fire Danger Operating Plan Committee to calculate fire danger for each FDRA.

Table 4: Parameters used to calculate fire danger by FDRA

Parameter	Salt Lake Desert FDRA	Wasatch Mountains FDRA	Uinta Mountains FDRA
RAWS	Cedar Mtn, Vernon, Aragonite, Rosebud, Clifton Flat	Otter Creek, Bues Canyon, Pleasant Grove, Ray's Valley, Red Spur	Bear River, Hewinta, Norway Flat
Data Years	2000 to 2015	2000 to 2015	2000 to 2015
Annual Filter (Time of Year)	June 1 to September 30	June 1 to September 30	June 1 to September 30
Analysis Period Length (Days)	1	1	1
NFDRS Fuel Models	7G	7G	7G
Slope Class	1 (0%-25%)	3 (41%-55%)	3 (41%-55%)
Climate Class	1 (Arid/Semi-Arid)	2 (Sub-humid)	3 (Humid)
Herbaceous Type	Annual	Annual	Perennial
Annual Precipitation (inches)	5-12	12-15	40
Elevation Range (feet)	4,000-12,000	3,000-12,000	8,000-13,523
Acres	10,500,000	4,100,000	900,000
Green-up Standard (estimate)	May 1	May 15	June 1
Freeze Date (estimate)	Nov 1	Oct 31	Oct 31
1000 Hr Starting	11*	19*	37*
Starting KBDI	381*	45*	14*
Large Fires (acres)	300	20	1
Multiple Fire Day	3	2	2

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5.0 FIRE DANGER RATING LEVEL DECISIONS

The NFDRS utilizes the WIMS processor to manipulate weather data and forecasted data stored in the National Interagency Fire Management Integrated Database (NIFMID) to produce fire danger ratings for corresponding weather stations. The NFDRS outputs from the WIMS processor can be used to determine various levels of fire danger rating to address the fire problems identified previously in the Fire Problem Analysis Chart (Table 3). The system is designed to model worst-case fire danger scenario. The NFDRS, along with other decision support tools, will be utilized to produce levels (thresholds) of fire business to address local fire problems by targeting public, industrial, or agency groups. The NFDRS will be utilized to produce outputs to assist fire management with four sets of decisions.

- **Dispatch Levels** will be used as a decision tool for dispatchers to assign initial attack resources to a fire reported in a specific dispatch zone.
- **Staffing Levels** will be used to determine appropriate day-to-day suppression resource staffing.
- **Preparedness Levels** will assist fire managers with long-term (or seasonal) decisions with respect to fire danger.
- **Fire Danger Adjective Rating** levels are intended to communicate fire danger to the public (e.g., fire danger signs).
 - **Extreme Fire Danger Thresholds:** Seasonal risk escalation in fuel complexes of northern Utah relies upon a combination of factors, which may ultimately trigger an extreme state of fuel volatility and a high potential for large fire growth or multiple ignition scenarios.

5.1 Dispatch Level Analysis

Dispatch levels are pre-planned actions which identify the number and type of resources (e.g., engines, crews, aircraft) initially dispatched to a reported wildland fire based upon fire danger criteria. Dispatch levels are established to assist fire managers with decisions regarding the most appropriate response to an initial fire report until a qualified incident commander arrives at the incident. The FireFamilyPlus software has been used to establish the dispatch level thresholds. A statistical analysis of fire occurrence and historical weather has been completed for each FDRA. The correlation of various combinations of NFDRS outputs with weather records is listed in the appendix. Each agency will utilize the same dispatch levels calculated for each FDRA in response to wildland fires in Northern Utah. See Table 5 for descriptions of the analysis factors used for evaluating each FDRA in FireFamilyPlus.

Agency personnel use the dispatch level to assign initial attack resources based on pre-planned interagency “Run Cards.” Combined with predefined dispatch zones, the dispatch level is used to assign an appropriate mix of suppression resources to a reported wildland fire based upon fire danger potential. The dispatch levels are derived from the most appropriate NFDRS index and/or component that correlate to fire occurrence. Burning Index (BI) with NFDRS Fuel Model G has been determined to be the most appropriate NFDRS index that statistically correlates to the potential for large fires to occur (see Table 6). Due to the ability of BI to reflect the most current fire danger potential and the NUIFC’s ability to track agency personnel throughout the course of any given day, BI will be computed and implemented for initial attack response levels until a qualified incident commander evaluates the need for the dispatched resources.

Table 5: Dispatch Level, FireFamilyPlus Analysis Factors

FDRA	RAWS NWS #	RAWS Name	Data Years Used	Weight Factor	Fuel Model	NFDRS Index	Class	Range
Salt Lake Desert	420901	Cedar Mtn	2000 – 2015	1.0	7G	BI	Low Mod High	0 - 60 61 - 81 82 +
	420908	Vernon	2000 – 2015	1.0				
	420911	Aragonite	2000 – 2015	1.0				
	420914	Rosebud	2000 – 2015	1.0				
	420915	Clifton Flat	2000 – 2015	1.0				
Wasatch	420912	Otter Creek	2000 – 2015	1.0	7G	BI	Low Mod High	0 - 54 55 - 73 74 +
	420403	Bues Canyon	2000 – 2015	1.0				
	421101	Pleasant Grove	2000 – 2015	1.0				
	421103	Ray's Valley	2000 – 2015	1.0				
Uinta	420703	Bear River	2000 – 2015	1.0	7G	BI	Low Mod High	0 - 49 50 - 64 65 +
	420705	Hewinta	2000 – 2015	1.0				
	420706	Norway Flat	2000 – 2015	1.0				

Table 6: Northern Utah Interagency Fire Center Dispatch Level Worksheet

Dispatch Level Worksheet Northern Utah Interagency Fire Center			
Fire Danger Rating Area (FDRA)	Burning Index (Model G)		
Salt Lake Desert FDRA	0 - 60	61 - 81	82 +
Wasatch Mountains FDRA	0 - 53	54 - 73	74 +
Uinta Mountains FDRA	0 - 49	50 - 64	65 +
Dispatch Level	Low (1)	Moderate (2)	High (3)

5.2 Staffing Level

Staffing levels will be used to make daily internal fire preparedness and operational decision. At the protection unit level, the staffing level can form a basis for decisions regarding the “degree of readiness” for initial attack resources and support resources. Specific preparedness actions are defined at each staffing level. Although staffing level can be a direct output in WIMS, the WIMS output is only based upon weather observations and climatological percentiles. The use of climatological percentiles for daily staffing decisions is optional. The preferred methods to delineate staffing level thresholds are based on statistical correlation of weather and fire occurrence.

Staffing levels are established to assist fire managers with internal/agency staffing decisions. Staffing Levels will be a function of dispatch level, current fire activity, and the potential for ignitions in the next 24-hour period. The NUIFC’s process for determining local staffing levels is not the same as staffing level calculated directly from WIMS. WIMS calculates staffing level on climatological breakpoints; NUIFC will calculate Staffing Level on fire business thresholds (Table 7). Each agency will develop their respective management actions based upon five staffing levels.

Table 7: Northern Utah Interagency Fire Center Staffing Level Worksheet

Staffing Level Worksheet Northern Utah Interagency Fire Center							
Dispatch Level →		Low (1)		Moderate (2)		High (3)	
Fire Activity? (Y/N)	N	1	2	2	3	3	4
	Y	2	3	3	4	4	5
Significant Fire Potential? Forecasted High Risk Day/Event (Y/N)		N	Y	N	Y	N	Y

The staffing level forms the basis for decisions regarding the “degree of readiness” of initial attack (IA) resources and support resources. The staffing level is based on an analysis of cumulative frequency of occurrence of burning index (BI) as they relate to a dispatch level. Staffing levels are expressed as numeric values where 1 represents the low end of the fire danger continuum and 5 the high end (Table 7). Staffing level is intended to provide fire managers with day-to-day decision support regarding staffing of suppression resources. Staffing level will be used to determine staffing which requires employee overtime associated with working people beyond their normal schedules (i.e., days off, after hours). In addition, the extended staffing of shared resources such as air tankers, helicopters, hotshot crews and other large fire support resources will be a function of the staffing level.

- **Dispatch Level:** the actual or forecasted dispatch level will be the first factor input to the Staffing Level Worksheet.
- **Fire Activity** can be defined as any wildland fire (including prescribed fire) within the Northern Utah Interagency Dispatch Area (regardless of FDRA) that requires a commitment of NUIFC suppression (ground or aviation) resources. For example, if NUIFC suppression resource is committed to a local incident, Fire Activity is “YES”.
- **Significant Fire Potential:** The Predictive Service Area (PSA) 7-Day Fire Potential Outlooks combine forecasted fuel dryness with significant weather triggers to identify high risk areas. The [7-day Fire Potential Outlook](#) is posted daily during fire season and forecasts significant fire potential for the next 7 days. Tomorrow’s Significant Fire Potential can be found on the [Predictive Services \(Outlooks\)](#) page of the GBCC website.

Table 8: Northern Utah Predictive Service Areas and Fire Weather Zone by FDRA

FDRA	Predictive Service Area (PSA) Zone	Fire Weather (FWX) Zone
Salt Lake Desert	GB20	478
Wasatch Mountains	GB21	479
Uinta Mountains	GB22	480

If a high risk event in PSAs EB07, EB08, or EB09 for wind⁵ or lightning⁶ is forecasted for today or tomorrow, Significant Fire Potential is a “Y” input; otherwise, it is an “N” input. If a Red Flag Watch or

⁵ Wind gusts 25 miles per hour or higher in the mountains and gust 30 miles per hour or higher elsewhere AND relative humidity 15 percent or lower.

⁶ Scattered or greater coverage of lightning (thunderstorms)

Warning has been issued by the National Weather Service for FWX Zone 478, 479, or 480 (see Appendix A: Map 11), the Significant Fire Potential is a “Y” input for that respective FDRA.

5.3 Preparedness Level

The preparedness level is a five-tier (1 to 5) fire danger rating decision tool that is based on NFDRS output(s) and other indicators of fire business (such as projected levels of resource commitment). Preparedness levels assist fire managers with weekly or monthly planning decisions based upon seasonal fire danger elements. The FireFamilyPlus software has been used to establish the fire business thresholds. A statistical analysis of fire occurrence and historical weather has been completed for each FDRA. The correlation of various combinations of NFDRS outputs with weather records is listed in the appendix. The final preparedness level determination will also incorporate a measure of current and projected levels of resource commitment due to fire activity and a measure of ignition risk. The Northern Utah Preparedness Level Worksheet is presented in Table 9.

Worksheet Instructions:

- **ERC:** Energy Release Component, Fuel Model G. These indices, forecasted by the Salt Lake Weather Office, are based on the 1300 RAWs observations that are inputted to the WIMS processor by NUIFC personnel.
- **Staffing Index Value:** Place a checkmark in Row One indicating the appropriate staffing index (ERC, Fuel Model G). These indices (forecasted by the Salt Lake Weather Office) are based on the 1300 RAWs observations that are input to the WIMS processor by NUIFC personnel.
- **Live Fuel Moisture:** Place a checkmark in Row Two indicating the appropriate live fuel moisture for the associated FDRA. Data can be obtained from the [National Fuel Moisture Database \(NFMD\)](#)⁷ Sample Site or the NUIFC webpage under Predictive Services ([Fuels / NFDRS](#)).
 - **Salt Lake Desert FDRA – Sagebrush LFM:** Average of the most recent samples from the [Muskrat](#) and [Vernon](#) sagebrush sites.
 - **Salt Lake Desert FDRA – Juniper LFM:** Average of the most recent samples from the [Muskrat](#) and [Vernon](#) juniper sites.
 - **Wasatch Mountains FDRA – Gambel Oak LFM:** Average of the most recent samples from the [Squaw Peak](#), [Maple Canyon](#), [Hobble Creek](#), and [Bues Canyon](#) Gambel oak sites.
 - **Uinta Mountains FDRA – Lodgepole Pine LFM:** The most recent samples from the [Norway Flat](#) and [Bear River](#) lodgepole pine sites.
- **Large Fire Activity or Multiple Small Fires:** Multiple large fire activity will be defined when one or more Incident Status Summaries (ICS-209s) have been (or will be) submitted within the next 12 hour period for incidents managed within the NUIFC (regardless of FDRA). Incident Status Summaries submitted for fires in “monitor” status will not be included; only ICS-209s submitted for incidents which are utilizing local resources will be included in the count.

⁷ <http://www.wfas.net/index.php/national-fuel-moisture-database-moisture-drought-103>

NORTHERN UTAH INTERAGENCY FIRE DANGER OPERATING PLAN

Preparedness Level Worksheet

Local Preparedness Level Worksheet Northern Utah Interagency Fire Center									
Component (ERC)									
Lake Desert FDRA)	0 - 55	56 - 72	73 - 87	88 - 94	95 +				
High Mountains FDRA)	0 - 49	50 - 64	65 - 76	77 - 83	84 +				
Mountain FDRA)	0 - 29	30 - 41	42 - 56	57 - 66	67 +				
Moisture (%)									
Lake Desert FDRA)	100 +	< 100	< 100	< 100	< 100	100 +	< 100	< 100	< 100
High Mountains FDRA)	100 +	< 100	< 100	< 100	< 100	100 +	< 100	< 100	< 100
Mountain FDRA)	100 +	< 100	< 100	< 100	< 100	100 +	< 100	< 100	< 100
Number of Multiple Small Fires									
ICS-209s	No	Yes	No	Yes	No	Yes	No	Yes	No
Preparedness Level	1	2	3	4	5				

5.4 Adjective Fire Danger Rating Level

5.4.1 Adjective Fire Danger Rating Description

In 1974, the USFS, BLM, and state forestry organizations established five standard adjective fire danger rating levels descriptions for public information and signing. For this purpose only, fire danger is expressed using the national adjective descriptions and color codes (Table 10).

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

Table 10: Adjective fire danger rating class and color code descriptions

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

5.4.2 Adjective Fire Danger Rating Determination

Although NFDERS processors (e.g., WIMS) will automatically calculate the adjective class rating, the Northern Utah Interagency Fire Center will manually determine adjective fire danger rating based upon fire business thresholds. The actual determination of the daily adjective rating is based on the current or

forecasted value of a selected staffing index (ERC) and 7-Day Significant Fire Potential as depicted in Table 11.

Worksheet Instructions:

- **ERC:** Energy Release Component, Fuel Model G. These indices, forecasted by the Salt Lake Weather Office, are based on the 1300 RAWs observations that are inputted to the WIMS processor by NUIFC personnel.
- **7-Day Significant Fire Potential:** The GBCC postes that forecasted [National 7-Day Significant Fire Potential](#) daily
-
- look atPlace a checkmark indicating the appropriate 7-Day Significant Fire Potential: Low (7-12), Moderate (13-17), or High (18-21). The Predictive Service Area (PSA) 7-Day Fire Potential Outlooks combine forecasted fuel dryness with significant weather triggers to identify high-risk areas. The 7-day Fire Potential Outlook is posted daily during fire season and forecasts significant fire potential for the next 7 days.

Table 11: Northern Utah Interagency Fire Center adjective fire danger rating worksheet

Salt Lake Desert (PSA GB20) Adjective Fire Danger Rating Worksheet																
ERC	Model 7G	0 – 55	56 – 72	73 – 87	88 – 94	95 +										
7-Day Significant Fire Potential Sum	7-12															
	13-17															
	18-21															
ADJECTIVE FIRE DANGER RATING		L	L	M	L	M	H	M	H	VH	H	VH	E	VH	E	E
Wasatch Mountains (PSA GB21) Adjective Fire Danger Rating Worksheet																
ERC	Model 7G	0 – 49	50 – 64	65 – 76	77 – 83	84 +										
7-Day Significant Fire Potential Sum	7-12															
	13-17															
	18-21															
ADJECTIVE FIRE DANGER RATING		L	L	M	L	M	H	M	H	VH	H	VH	E	VH	E	E
Uinta Mountains (PSA GB22) Adjective Fire Danger Rating Worksheet																
ERC	Model 7G	0 – 29	30 – 41	42 – 56	57 – 66	67 +										
7-Day Significant Fire Potential Sum	7-12															
	13-17															
	18-21															
ADJECTIVE FIRE DANGER RATING		L	L	M	L	M	H	M	H	VH	H	VH	E	VH	E	E
Reference		L (Low)	M (Moderate)	H (High)	VH (Very High)	E (Extreme)										

5.4.3 Extreme Fire Danger Thresholds

Seasonal risk escalation in fuel complexes of Northern Utah 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.

- **Fire Activity:** The occurrence of large/multiple fires is the reliable indicator of severity conditions. 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.
- **Live Fuel Moisture:** Live woody (Utah juniper) and herbaceous (Wyoming big sagebrush) fuel moisture plots were established in the vicinity of the Vernon (1996) and Muskrat (1995) Fire Stations. Since that time, valuable data has been collected and a direct correlation has been drawn between fire intensity (controllability) and live fuel moisture levels. Consequently, fire severity is determined by comparing current trends to historical averages. Live gambel oak samples have been collected at six sites on the Wasatch Front (Wasatch Mountains FDRA) since 2002. Beginning in 2007, a site at Snowbasin in the Wasatch Mountains has been sampled for live (twigs and needles) Douglas-fir and subalpine fir, and a site at Norway Flats in the Uinta Mountains for mountain big sagebrush, Rocky Mountain juniper, and Lodgepole pine. Comparison of fuel moisture to historical conditions at various locations within the Utah and surrounding areas can be located on the [National Fuel Moisture Database](#):
- **Fine Fuel Loading:** There are six fine dead fuel load plots located in the Salt Lake Desert FDRA. Fuel load determinations are made on an annual basis and compared to historical averages in order to determine the potential intensity of wildfires. Fuel loading over 0.5 tons/acre indicates a fire controllability problem. If significant amounts of carry-over fuel and/or matted grass are observed, control problems and increased fireline intensity could be expected.
- **NFDRS Thresholds:** ERC and 1000-hr (3 to 8 inch diameter dead) fuel moisture are used as the primary indicators to track seasonal trends of fire danger potential. NFDRS fuel model G has been chosen due to its good “fit” with the BI and ERC models. Other fuel models which might seem to be more appropriate due to their classification (grass/brush) do not correlate very well statistically with the NFDRS models. Consequently, fuel model G was chosen due to its ability to predict fire occurrence; specifically, a day when a large fire is likely to occur. It has been statistically proven that large fire events will occur statistically more often when these thresholds are exceeded. Early and late-season ERC values that trend above average may indicate an extension of the normal fire season.
- **Weather Thresholds:** Seasonal weather assessments rely upon long-range (30 to 90 day) forecasts. This information is available in two formats: seasonal long-lead outlooks and 30 to 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. When combined these factors will increase the risk.
- **Drought Indicators:** The Keetch-Byrum Drought Index (KBDI) and Palmer Drought Index 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. 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 to 800 indicate the potential for rapid curing and drying of the fine fuels and potential for live fuel

moisture to drop. Values below 10 percent indicate the potential risk for extreme burning conditions.

- **Normalized Difference Vegetation Index (NDVI):** NDVI data is satellite imagery, which displays vegetative growth and curing rates of live fuels. The [WFAS](#) Internet site 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.

5.5 Season-Slowing and Season-Ending Events

Utilizing the Term Module of the Rare Event Risk Assessment Process (RERAP) software, the Weibull waiting-time distribution was developed from historical season-slowing and season-ending dates. The probability graphs along with the event locator parameters from the FireFamilyPlus software dialog box are contained in Appendix E. From this analysis, it can be estimated that there is an equal probability of a season slowing and season-ending event occurring before or after the 50th percentile date. Historical fire records were examined for all FDRAs to determine the combination of weather parameters which would best indicate the slowing and end of the fire season. The following season-slowing and season-ending events have been identified:

- **Salt Lake Desert FDRA**
 - **Season Slowing Event:** three (3) consecutive days with an ERC of 65 or less for the Salt Lake Desert SIG, after September 1. The 50th percentile date for season slowing is around **September 25**.
 - **Season Ending Event** three (3) consecutive days with an ERC of 50 or less for the Salt Lake Desert SIG, after September 1. The 50th percentile date for season slowing is around **October 17**.
- **Wasatch Mountains FDRA**
 - **Season Slowing Event:** three (3) consecutive days with an ERC of 60 or less for the Wasatch Mountains SIG, after September 1. The 50th percentile date for season slowing is around **September 21**.
 - **Season Ending Event:** three (3) consecutive days with an ERC of 50 or less for the Wasatch Mountains SIG, after September 1. The 50th percentile date for season ending is around **October 1**.
- **Uinta Mountain FDRA**
 - **Season Slowing Event:** three (3) consecutive days with an ERC of 40 or less for the Uinta Mountains SIG, after September 1. The 50th percentile date for season slowing is around **September 14**
 - **Season Ending Event:** three (3) consecutive days with an ERC of 30 or less for the Uinta Mountains SIG, after September 1. The 50th percentile date for season ending is around **October 5**.

5.6 Fire Danger Pocket Cards

The Fire Danger Pocket Card is a tool which can aid fire suppression personnel to interpret NFDRS outputs and understand local fire danger thresholds for a local area. Pocketcards 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). NFDRS fuel model G was selected for all fire danger rating areas as it provides a good statistical correlation to large fire occurrence and responds quickly to changing weather and fuel conditions. Visiting resources can use the pocketcard to familiarize themselves with local fire danger conditions. The Northern Utah Pocket Cards meet NWCG guidelines and are posted on the [NWCG](#) website.

6.0 FIRE DANGER OPERATING PROCEDURES

6.1 Roles and Responsibilities

6.1.1 Fire Program Managers

During periods when local preparedness levels are high to extreme, Fire Management Officers (FMOs) 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 and/or Assistant FMO (AFMO) from each agency will also determine the need to request/release off unit resources or support personnel throughout the fire season.

The USFS Forest Fire Staff Officer, BLM West Desert District FMO, and Utah DNR FMO will use this FDOP and NFDRS outputs as a tool to coordinate and to make informed fire related decisions. The program manager/agency administrator is ultimately responsible for ensuring this plan is maintained, utilized, and communicated.

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

The FMOs will ensure that the pocket cards are prepared at least every 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. The pocket cards will be posted on the NUIFC and National Wildfire Coordinating Group (NWCG) pocket card web site. Fire suppression supervisors will utilize pocket cards to train and brief suppression personnel ensuring that they are posted at their respective fire stations.

6.1.2 Northern Utah Fire Danger Technical Group

Each participating agency will be responsible for providing an NFDRS technical specialist to participate in the maintenance, review, and update of this plan. Table 12 lists these specific individuals by agency or Dispatch Center.

Table 12: Northern Utah Fire Danger Technical Group

Name	Title	Agency/Office
Dan Ames	Rich County Fire Warden	Utah Forestry, Fire, and State Lands
Bob Farrel	Assistant Fire Management Officer	BLM West Desert District
Phillip Kacirek	Fire Planner	USFS Uinta-Wasatch-Cache National Forest
Randy Kyes	Fuels Planner	BLM West Desert District
Robert Lamping	East Zone Fire Management Officer	USFS Uinta-Wasatch-Cache National Forest
Shelby Law	Meteorologist	BLM GBCC Predictive Services
Ryan LaFontaine	Fire Management Officer	Utah FFSL, Northeastern Area
Sean Lodge	Dispatch Center Manager	BLM NUIFC
Julie Osterkamp	Geospatial Ecologist	BLM West Desert District
Dusty Richards	Fire Management Officer	Utah FFSL, Bear River Area
Taiga Rohrer	Fire Management Officer	NPS Utah Parks Group
Tracy Swenson	Fire Management Officer	USFWS Rocky Basin Fire Zone
Erik Valdez	Fuels Program Manager	BLM West Desert District

Name	Title	Agency/Office
Dave Vickers	Fire Management Officer	Utah FFSL, Wasatch Front Area

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

The technical group will coordinate with fire managers from their unit for updates and additions to the plan. The technical group will meet annually to review plan implementation, decide if revisions are necessary, and accomplish revisions.

6.1.3 Fire Weather Station Owners/Managers

The BLM AFMO is listed as the station owner for the BLM RAWS. The NUIFC Manager (or Assistant) is listed as the station owner for the Uinta-Wasatch-Cache National Forest RAWS. The owner maintains the WIMS Access Control List (ACL). The station owner will ensure appropriate editing of the RAWS catalogs. The NUIFC Manager will ensure the timely editing of daily 1300 (LST) weather observations of all stations.

The Remote Sensing Laboratory located at the National Interagency Fire Center (NIFC) maintains and calibrates the BLM RAWS stations on an annual basis. The BLM Fuels Staff and Fire Operations Specialists are qualified as first responders to RAWS malfunctions. The Salt Lake Interagency Fire Cache Manager is responsible for maintaining and calibrating the USFS RAWS stations on an annual basis.

6.1.4 Northern Utah Interagency Fire Center

The NUIFC Manager will ensure that this plan along with all necessary amendments /updates to this plan are completed. Updates to this plan will be made at least every three years and approved by the line officers (or delegates) from each agency. Revised copies will be distributed to the individuals on the primary distribution list as identified in Appendix B.

The dispatch center manager will ensure that the daily fire weather forecast (including NFDRS indices) is retrieved and that the daily staffing, preparedness, dispatch, and adjective levels are calculated and communicated to the appropriate target group and posted on the internet

6.1.5 Duty Officers

Duty Officer(s) from each agency will be identified to the NUIFC, daily from June through October. The Duty Officer is designated to provide input and guidance regarding staffing, preparedness and dispatch levels. It is the Duty Officer's role to interpret and modify the daily staffing, preparedness and dispatch levels (if warranted) by extenuating factors not addressed by this plan. Modifications of the staffing, preparedness and/or dispatch levels must be coordinated through the dispatch center. The Duty Officer will keep their respective agency's fire and management staff updated (as needed). The BLM, USFS, and State of Utah will ensure the dispatch center is aware of their respective Duty Officer(s) at all times.

6.1.6 National Weather Service – Fire Weather Program

Weather forecasts and products for the Northern Utah area are provided by the National Weather Service, Salt Lake City, UT office. Fire weather information and forecasts can be found on the [Salt Lake City NWS fire weather website](#)⁸.

6.1.7 Great Basin Coordination Center, Predictive Services

Great Basin Predictive Services will provide input to this plan through the 7 day outlook and as requested to provide other technical expertise.

6.1.8 Education, Mitigation, and Education Specialists

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

6.2 Daily Schedule

6.2.1 Daily Timeline

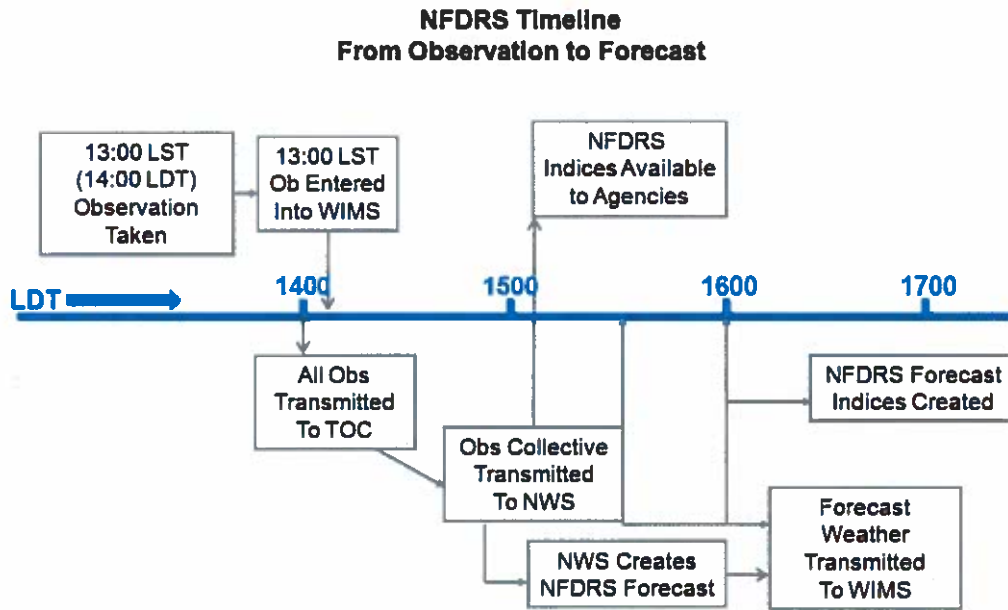


Figure 23: Daily NFDRS timeline for northern Utah

6.2.2 Dispatch Level

- **Morning Level (0000 hours to 1600 hours)**
 - Inputs will be taken from the Forecasted Burning Index (Fuel Model G) issued for that day and available in WIMS by 1600 hours the previous day.
- **Afternoon Level (1600 hours to 0000 hours)**
 - Inputs will be taken from the Actual Burning Index (Fuel Model G) available in WIMS after the observations are edited by 1515 hours.

⁸ <http://www.wrh.noaa.gov/firewx/?wfo=slc>

6.2.3 Staffing Level

- **Morning Level (0000 hours to 1600 hours)**
 - Inputs will be taken from the forecasted dispatch level issued for that day:
 - If a ground or aviation resource has been committed to any wildfire (or prescribed fire) within the NUIFC (regardless of FDRA), Fire Activity is a “Y” input; otherwise, it is an “N” input.
 - If a High Risk Event for wind or lightning is forecasted for that day, Significant Fire Potential is a “Y” input; otherwise, it is an “N” input.
- **Afternoon Level (1600 hours to 0000 hours)**
 - Inputs will be taken from the actual dispatch level issued for that day:
 - If a ground or aviation resource has been committed to any wildfire (or prescribed fire) within the NUIFC (regardless of FDRA), Fire Activity is a “Y” input; otherwise, it is an “N” input.
 - If a High Risk Event for wind or lightning is forecasted for that day, Significant Fire Potential is a “Y” input; otherwise, it is an “N” input.

6.2.4 Preparedness Level

- **Daily Preparedness Level (0800 hours [today] to 0759 hours [tomorrow])**
 - Inputs will be taken from the following:
 - Forecasted Energy Release Component (ERC-G) issued for that day and available in WIMS by 1600 hours the previous day.
 - Live Fuel Moisture for the FDRA.
 - Large Fire activity or multiple small fires (1 or more on-going incidents which require an ICS-209 or 4 or more small fires within the dispatch zone).

6.2.5 Adjective Rating Level

- **Daily Adjective Rating Level (0800 hours [today] to 0759 hours [tomorrow])**
 - Inputs will be taken from the following:
 - Forecasted Energy Release Component issued for that day and available in WIMS by 1600 hours the previous day.
 - Forecasted Ignition Component issued for that day and available in WIMS by 1600 hours the previous day.

6.2.6 Duty Officer Briefing

- **Morning Level:** Briefing between 0830 hours and 0900 hours.
- **Afternoon Level:** Briefing between 1600 hours and 1630 hours.

6.3 Seasonal Risk Analysis

Seasonal risk analysis is a comparison of the historic weather/fuels records with current and forecasted weather/fuels information. Seasonal risk analysis is an on-going responsibility for fire program managers. The most reliable indicators of seasonal fire severity have been measurements of fine fuel loading, live fuel moisture, 1000-hour (dead) fuel moisture, and ERC. These levels will be compared graphically to historical maximum values and the average; these graphs will be routinely updated and distributed to fire suppression personnel and dispatch. Seasonal risk analysis information will be used as a basis for pre-positioning critical resources, dispatching resources, and requesting fire severity funding.

7.0 FIRE DANGER PROGRAM NEEDS

Weather Stations

- Find and input missing weather data.
- Explore the possibility of contracting with the NIFC RAWS personnel to provide annual maintenance of USFS weather stations.
- Analyze the effect of weighting RAWs within each SIG to better represent the potential fire danger for each FDRA.

Technology and Information Management

- Integrate preparedness level flow chart into a software package.
- Develop a “burn line” for the public to notify local dispatchers by phone when they are burning to reduce dispatches to false alarms
- Create a crew briefing page on NUIFC’s website including the following information or links:
 - ERC and 1000-hr fuel trends bi-monthly (when fuel moistures are updated)
 - Seasonal Risk Assessments (GACC and local FDRA)
 - 1-hour fuel comparisons for each FDRA
 - Live fuel moistures

Training

- Provide FDOP training to cooperators including county fire wardens, cooperating dispatch centers, and military fire departments.
- Train more personnel as RAWs first responders.
- Establish local WIMS/NFDRS training courses for agency personnel.
- Emphasize NFDRS training (S-491) for mid-level fire management personnel and Advanced NFDRS for upper-level fire management personnel.

Preparedness

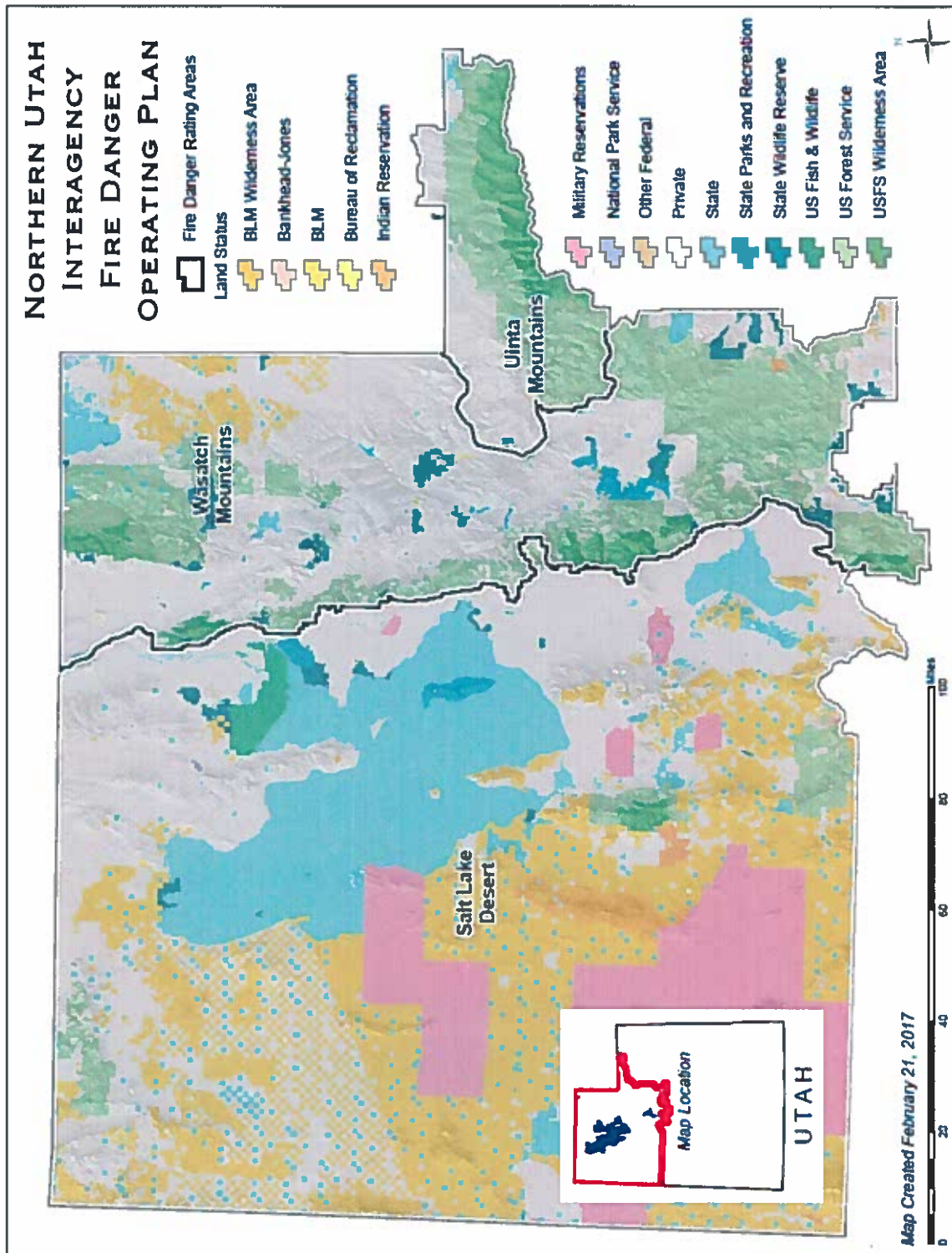
- Anticipate that during times of draw-down of Run Card resources, the State of Utah Area FMOs will consider creating a strike team or taskforce of cooperator engines for local response.

Other

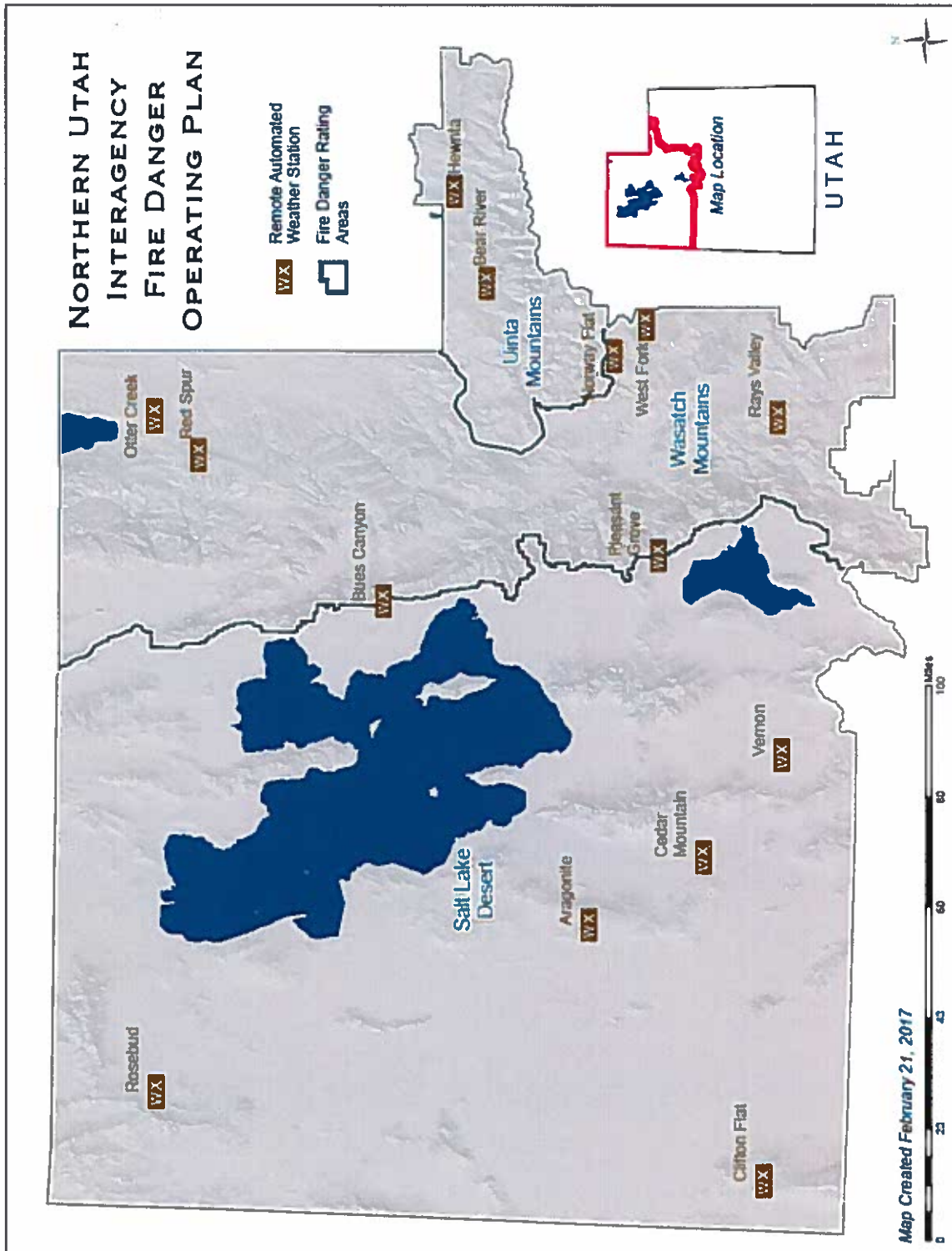
- Need to tie the restriction plan back to the fire danger plan. The restriction plan should be based on the FDOP; the long-term fire danger related to preparedness level actions. Integrate into the AOP for Northern Utah.
- Develop an industrial fire protection (go/no-go) system for high fire danger time.

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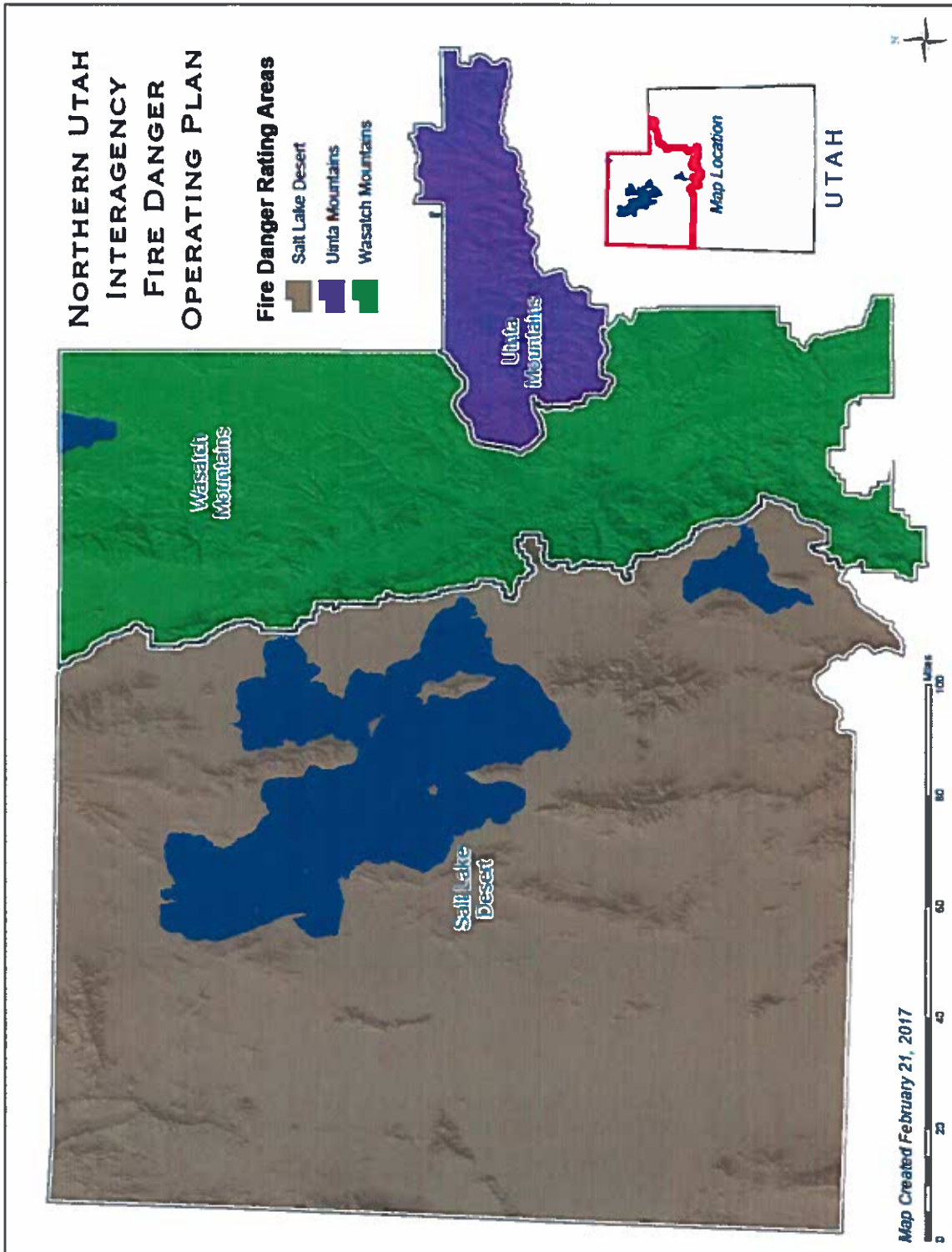
APPENDIX A: MAPS



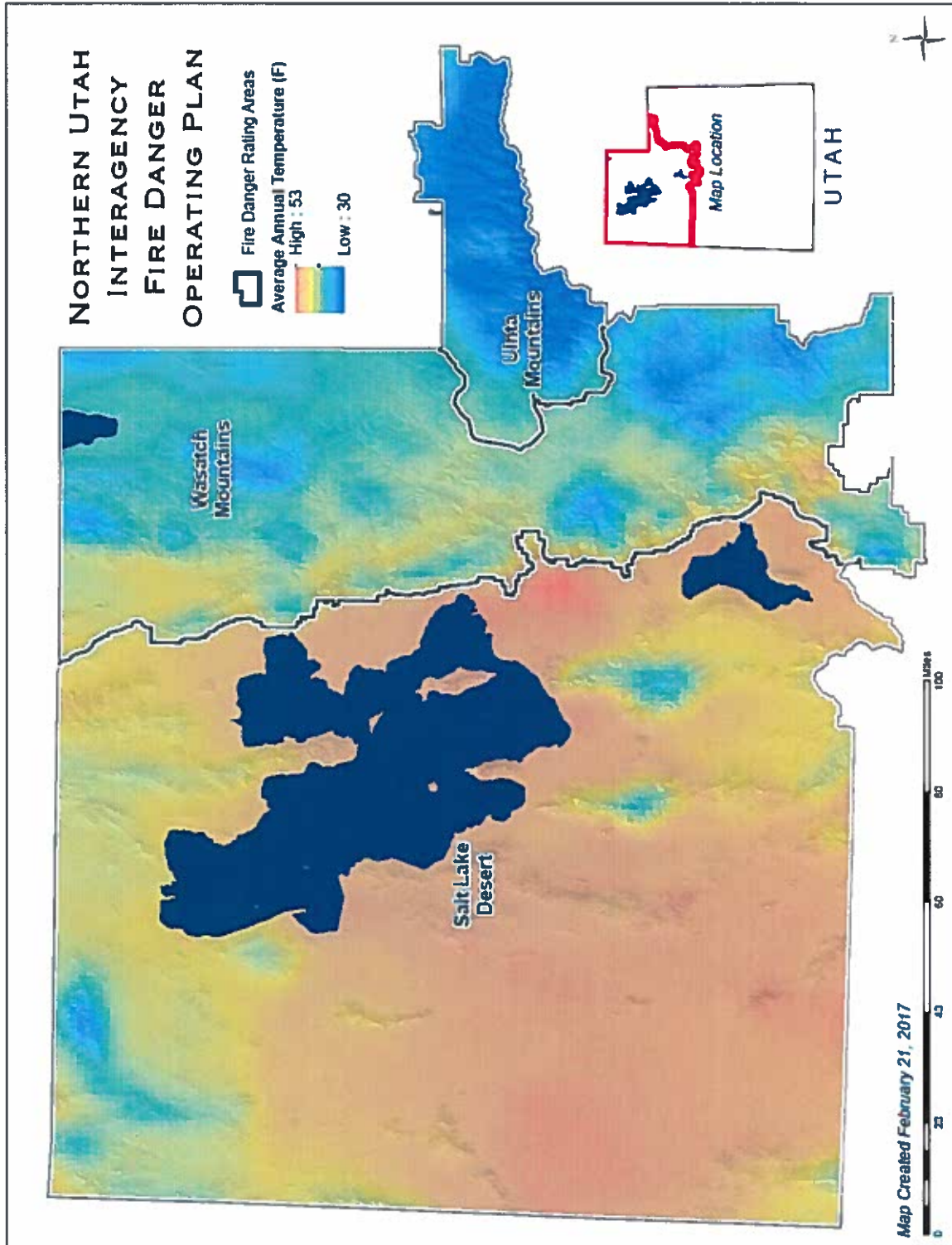
Map 1: Land ownership and/or management agency within the Northern Utah fire danger planning area



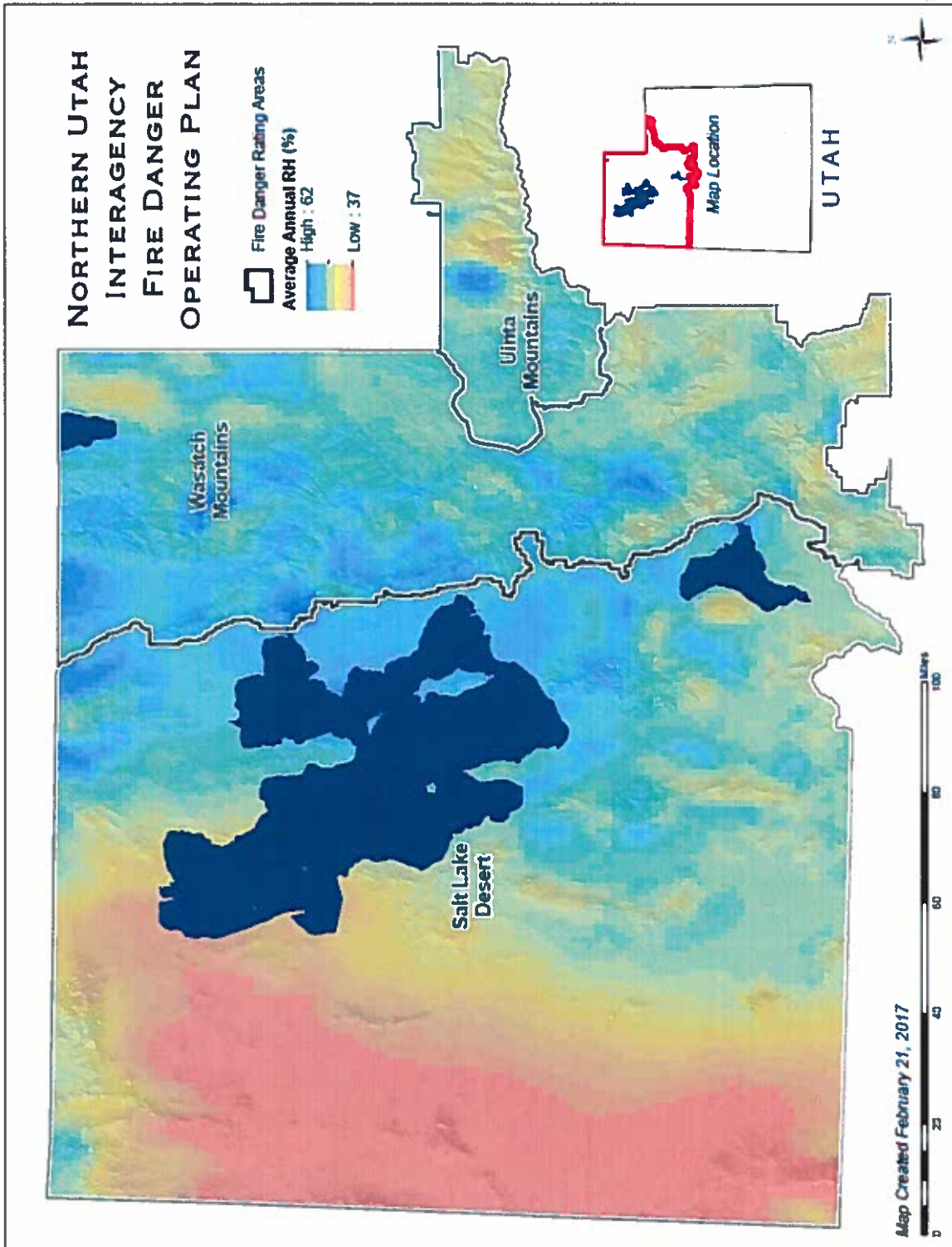
Map 2: Location of Northern Utah Remote Automated Weather Stations



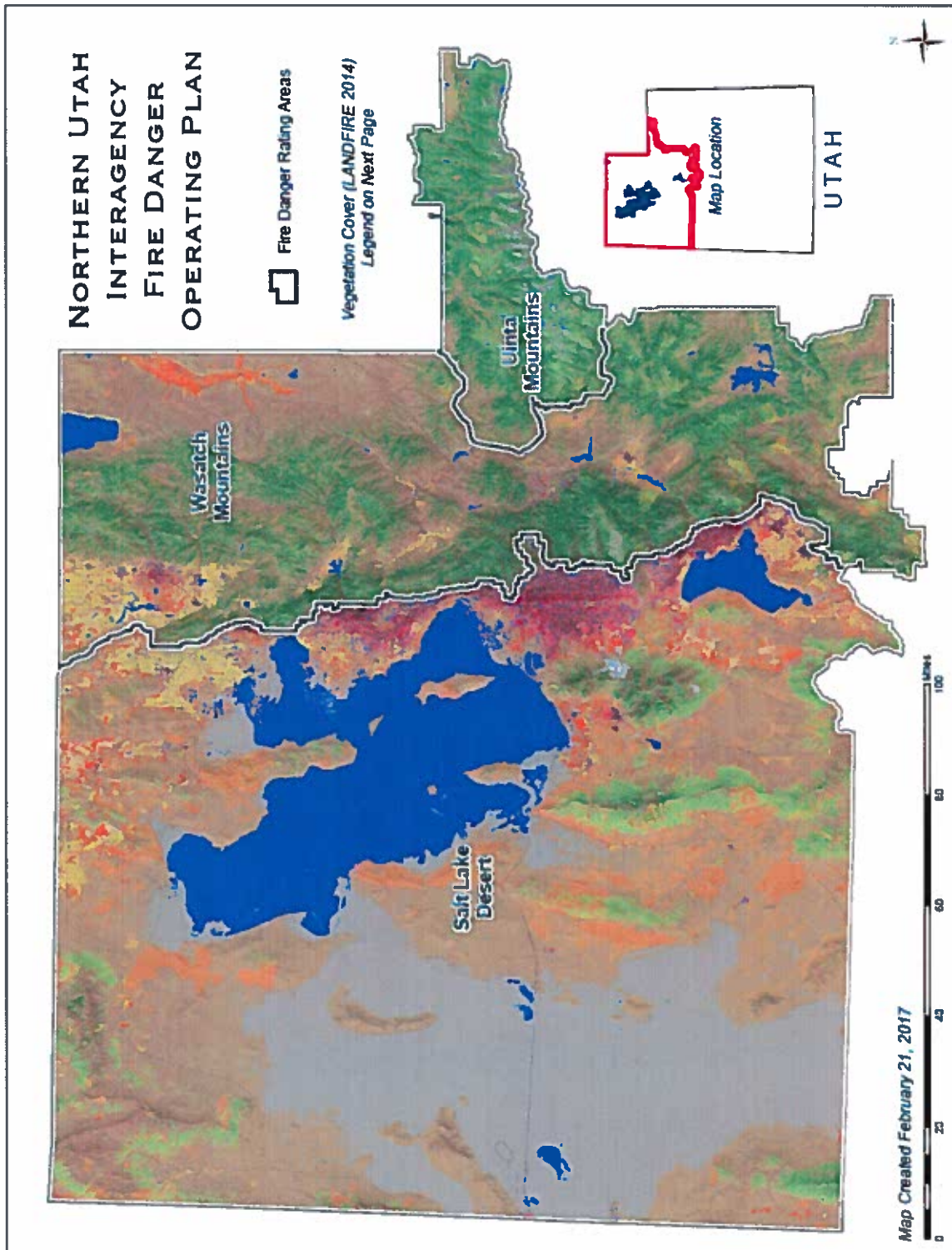
Map 3 Northern Utah Fire Danger Rating Areas



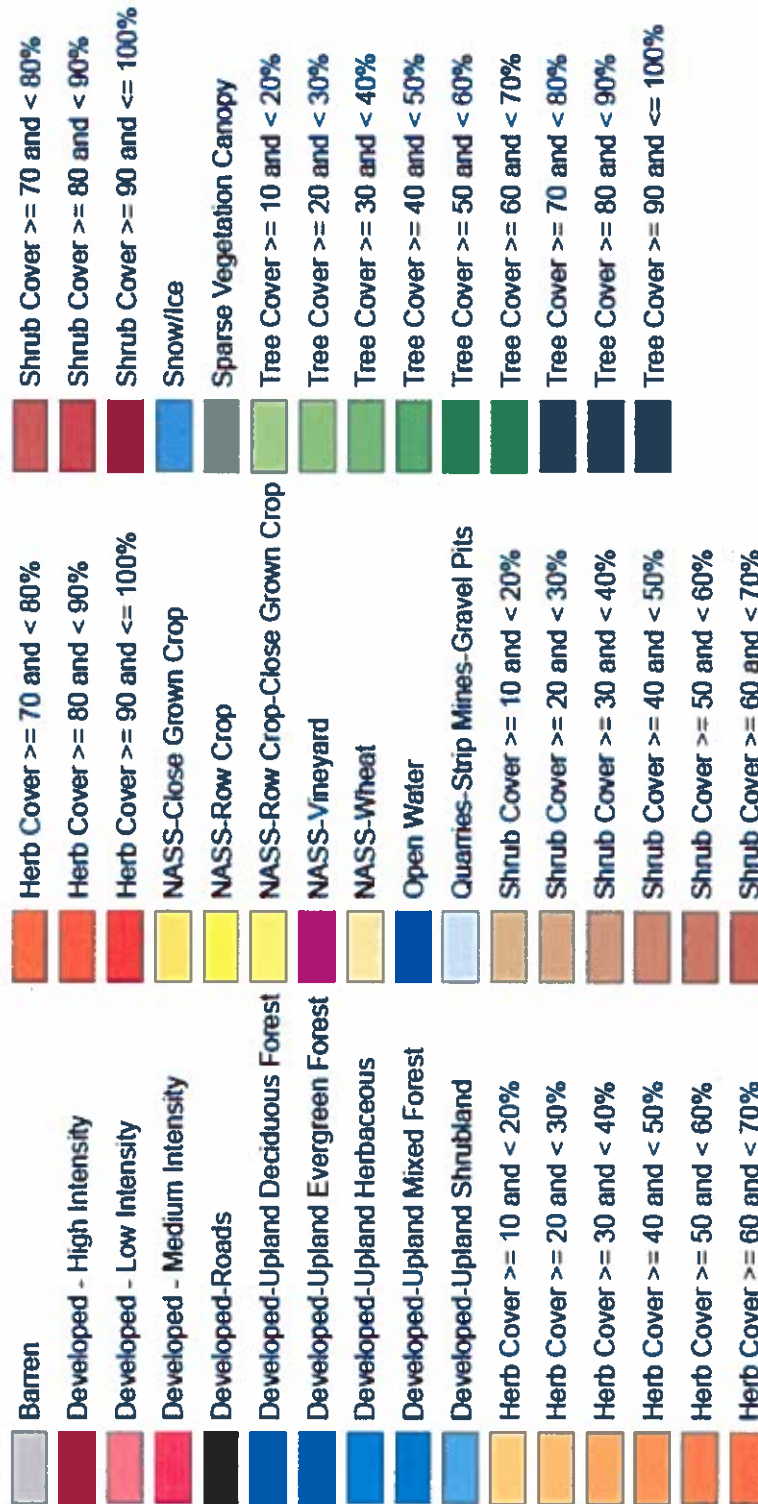
Map 4: Average annual temperature for the Northern Utah fire danger planning area



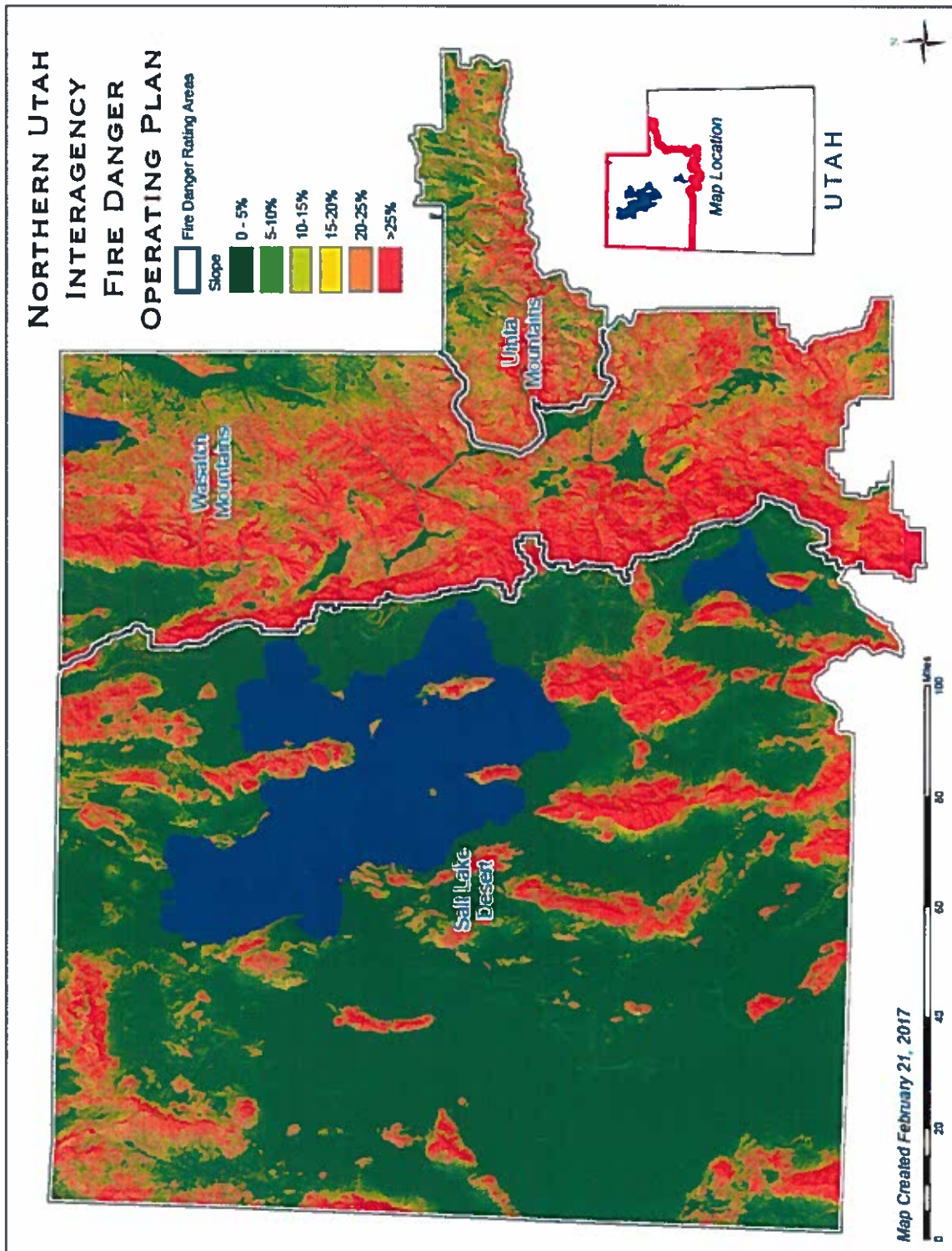
Map 5: Average annual relative humidity for the Northern Utah fire danger planning area



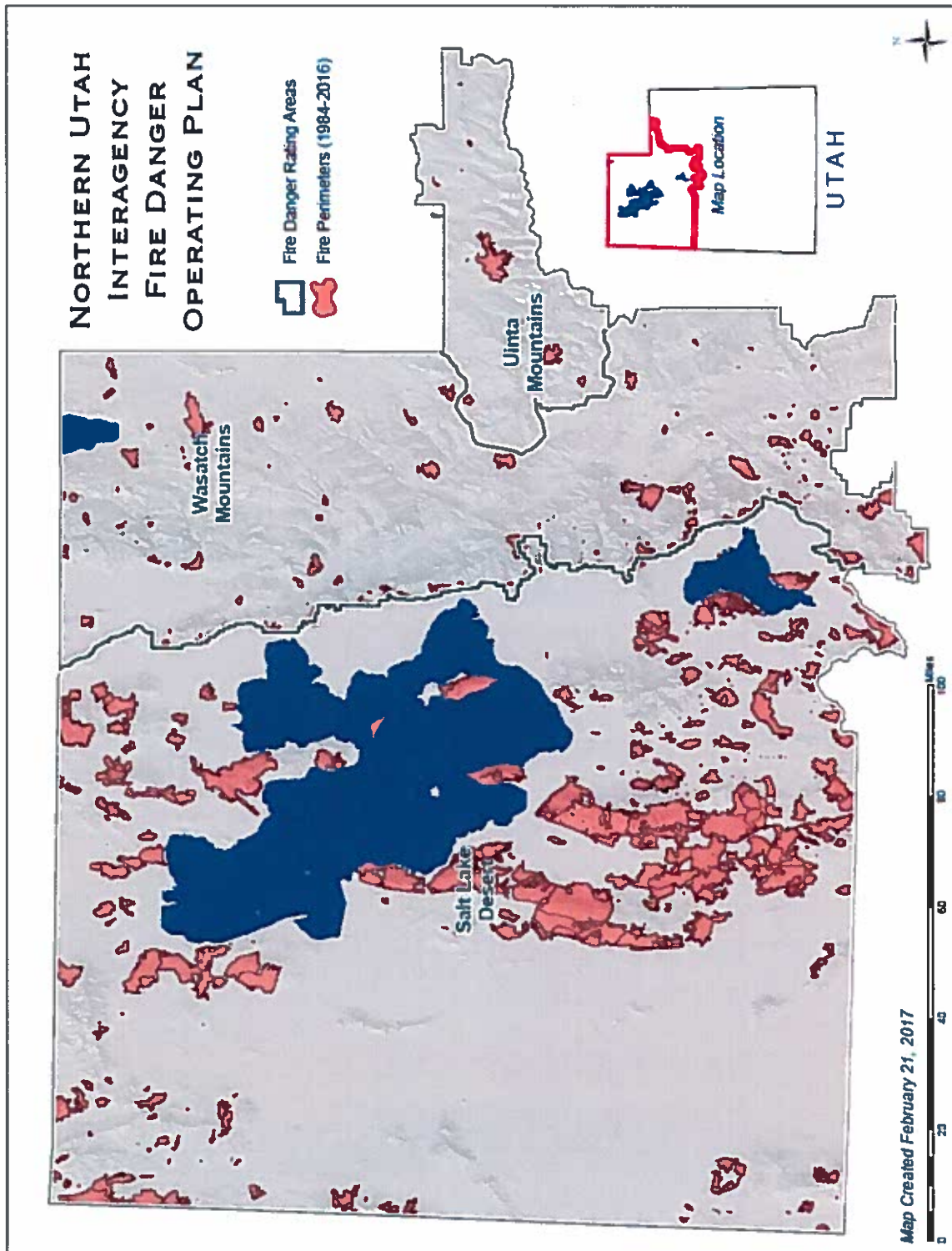
Map 6: Vegetation cover for the Northern Utah fire danger planning area



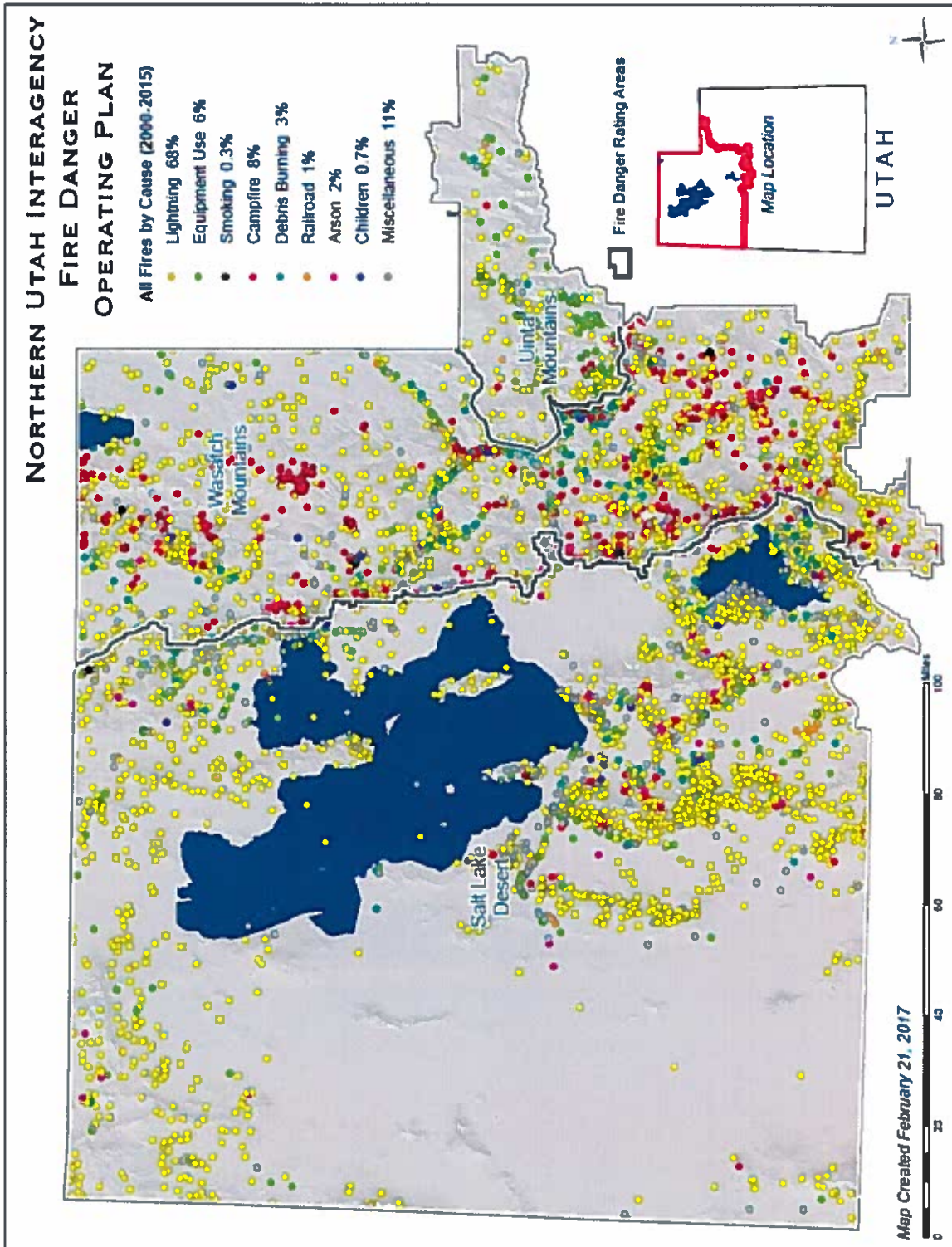
Map 7: Legend for the vegetative cover map depicted in Map 6



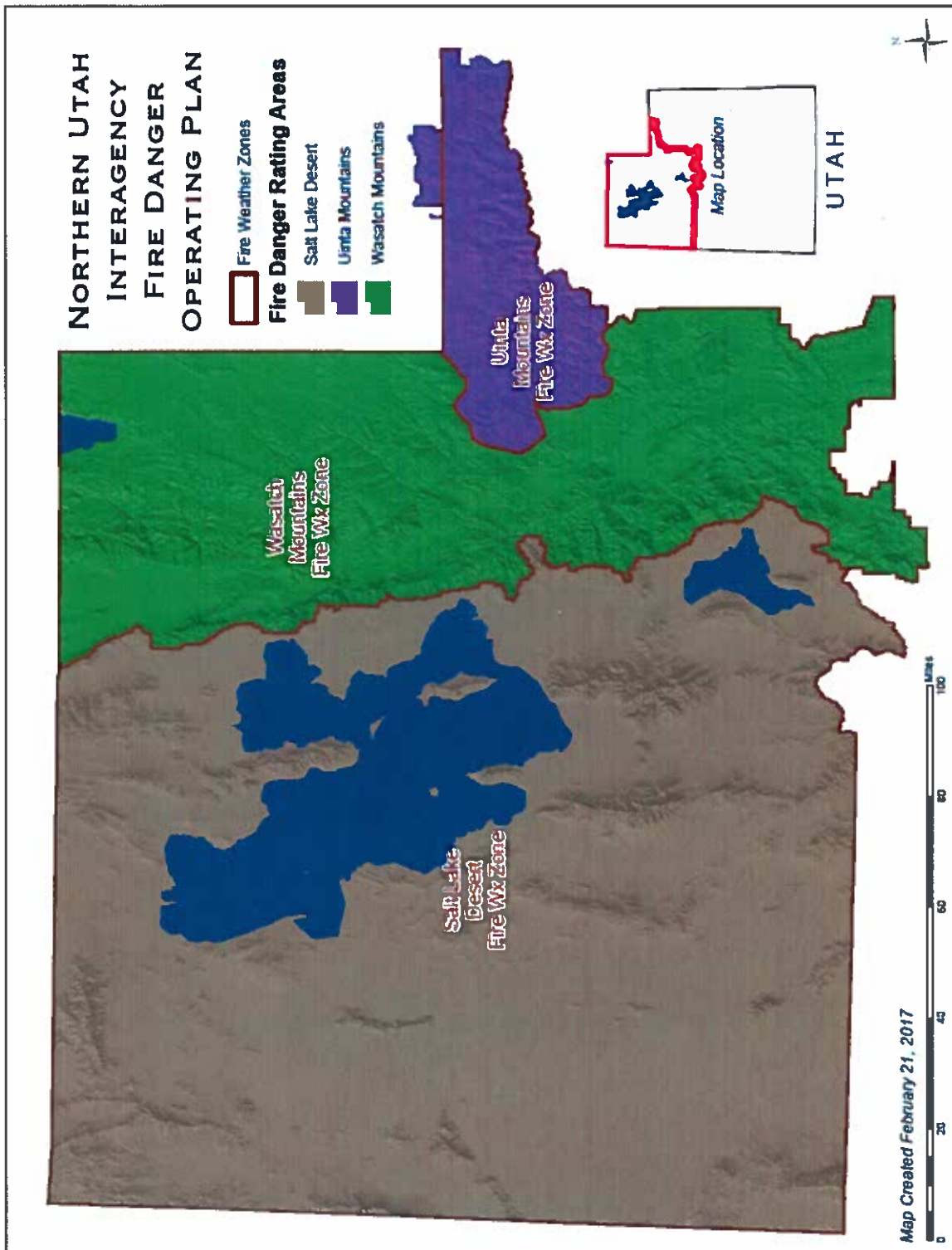
Map 8: Slope (topography) within the Northern Utah fire danger planning area



Map 9: Historic fire perimeters (1984 to 2016) within the Northern Utah fire danger planning area



Map 10: Location of wildland fires by cause within the Northern Utah fire danger planning area (2000 to 2015)



Map 11: Fire weather zones for the Northern Utah fire danger planning area

APPENDIX B: PRIMARY DISTRIBUTION LIST

Name	Title	Agency/Office	Mailing Address	E-mail
Kevin Oliver	District Manager	BLM, West Desert District	2370 S. Decker Lake Blvd., West Valley City, UT 84119	koliver@blm.gov
Jim Ireland	Park Superintendent	NPS, Timpanogos Cave National Monument	RR 3 Box 200, American Fork, UT 84003	jim_ireland@nps.gov
Brian Cottam	State Forester	State of Utah, Department of Natural Resources, Division of Forestry, Fire, and State Lands	1594 W. North Temple, Suite 3520 P.O. Box 145703 Salt Lake City, UT 84114-5703	briancottam@utah.gov
David Whittekiend	Forest Supervisor	USFS, Uinta-Wasatch-Cache National Forest	857 West South Jordan Parkway, South Jordan, UT 84095	dwhittekiend@fs.fed.gov
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Taiga Rohrer	Fire Management Officer (Utah Parks Group)	NPS, Zion National Park	1 Zion Park Blvd., State Route 9 Springdale, UT 84767	taiga_s_rohrer@nps.gov
Brett Ostler	Acting State Fire Management Officer	State of Utah, Department of Natural Resources, Division of Forestry, Fire, and State Lands	1594 W. North Temple, Suite 3520 Salt Lake City, UT 84114	brettostler@utah.gov
Shane Freeman	Assistant Fire Management Officer	State of Utah, Department of Natural Resources, Division of Forestry, Fire, and State Lands	1594 W. North Temple, Suite 3520 Salt Lake City, UT 84114	shanefreeman@utah.gov

NORTHERN UTAH INTERAGENCY FIRE DANGER OPERATING PLAN

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Brook Chadwick	Assistant Fire Staff Officer	USFS, Uinta- Wasatch-Cache National Forest	857 W. South Jordan Parkway, South Jordan, UT 84095	jhchadwick@fs.fed.us

NORTHERN UTAH INTERAGENCY FIRE DANGER OPERATING PLAN

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Wade Stoddard	Assistant Fire Management Officer (North Zone)	USFS, Uinta-Wasatch-Cache National Forest, Mountain View Ranger District	321 Highway 414, P.O. Box 129 Mountain View, WY 82939	wstoddard@fs.fed.us
Robert Lamping	Fire Management Officer (East Zone)	USFS, Uinta-Wasatch-Cache National Forest	2460 South Highway 40, P.O. Box 190 Heber City, UT 84032	rlamping@fs.fed.us
	Assistant Fire Management Officer (East Zone)	USFS, Uinta-Wasatch-Cache National Forest, Heber-Kamas Ranger District	2460 South Highway 40, P.O. Box 190 Heber City, UT 84032	
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Allen Briggs	Fire Management Officer (South Zone)	USFS, Uinta-Wasatch-Cache National Forest, Pleasant Grove Ranger District	390 N. 100 East Pleasant Grove, UT 84062	acbriggs@fs.fed.us
Chris Kirby	Assistant Fire Management Officer (South Zone)	USFS, Uinta-Wasatch-Cache National Forest, Salt Lake Ranger District	6944 S. 3000 East Cottonwood Heights, UT 84121	cakirby@fs.fed.us
Mathew Armantrout	Assistant Fire Management Officer (South Zone)	USFS, Uinta-Wasatch-Cache National Forest, Spanish Fork Ranger District	44 W. 400 North Spanish Fork, UT 84660	marmanttrout@fs.fed.us

The above list indicates key personnel associated with this plan. Copies of the FDOP will also be distributed to Utah Division of Forestry, Fire, and State Lands managers, BLM West Desert District personnel, Uinta-Wasatch-Cache National Forest personnel, military airspace coordinators, military fire departments, and surrounding county cooperators.

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APPENDIX C: GLOSSARY OF TERMINOLOGY

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

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

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

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

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

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

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

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

Season-Slowing Event: When the fire season begins to slow within a fire danger rating area. Examples are when initial attack slows, usually only triggered by the occasional passing front, and multiple starts are rare.

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

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

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

Spread Component (SC): SC is a rating of the forward rate of spread of a headfire. Deeming, et al., (1977), states that "the spread component is numerically equal to the theoretical ideal rate of spread expressed in feet-per-minute". This carefully worded statement indicates both guidelines (theoretical) and cautions (ideal) that must be used when applying the SC. Wind speed, slope and fine fuel moisture are key inputs in the calculation of the spread component, thus accounting for a high variability from day-to-day. The SC is expressed on an open-ended scale; thus it has no upper limit.

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

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

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

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

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

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

APPENDIX D: WEATHER STATION CATALOGS

Station	Priority	Model	Slope	Herb Grass Type	Climate Class	Staffing Index	Decision Classes	Staffing Index Breakpoints			
								Low		High	
								SI%	VAL	SI%	VAL
Cedar Mountain (420901)	1	7G	1	A	1	ERC	5	80	89	95	99
	2	7G	1	P	1	ERC	5	80	89	95	99
	3	7H	1	A	1	ERC	5	80	51	95	57
	4	7Q	1	A	1	ERC	5	80	75	95	81
Vernon (420908)	1	7G	1	P	1	ERC	5	80	85	95	95
	2	7G	1	A	1	ERC	5	80	85	95	95
	3	7H	1	A	1	ERC	5	80	49	95	55
	4	7Q	1	A	1	ERC	5	80	73	95	79
Aragonite (420911)	1	7G	1	A	1	ERC	5	80	96	95	105
	2	7G	1	P	1	ERC	5	80	96	95	104
	3	7H	1	A	1	ERC	5	80	55	95	60
	4	7Q	1	A	1	ERC	5	80	78	95	83
Rosebud (420914)	1	7G	1	A	1	ERC	5	80	90	95	99
	2	7G	1	P	1	ERC	5	80	90	95	99
	3	7H	1	A	1	ERC	5	80	52	95	58
	4	7Q	1	A	1	ERC	5	80	76	95	81
Clifton Flat (420915)	1	7G	2	A	1	ERC	5	80	94	95	100
	2	7G	2	P	1	ERC	5	80	94	95	100
	3	7H	2	A	1	ERC	5	80	55	95	58
	4	7Q	2	A	1	ERC	5	80	78	95	81
Bues Canyon (420403)	1	7G	3	P	3	ERC	5	90	86	97	91
	2	7G	3	A	2	ERC	5	90	86	97	91
	3	7H	3	P	2	ERC	5	90	49	97	52
	4	7Q	3	P	2	ERC	5	90	73	97	76
Norway Flat (420706)	1	7G	4	P	3	ERC	5	90	73	97	81
	2	7G	4	A	3	ERC	5	90	73	97	81
	3	7H	4	P	3	ERC	5	90	43	97	48
	4	7Q	4	P	3	ERC	5	90	68	97	73
Otter Creek (420912)	1	7G	1	A	2	ERC	5	80	80	95	88
	2	7G	1	P	2	ERC	5	80	79	95	87
	3	7H	1	A	2	ERC	5	80	45	95	51
	4	7Q	1	A	2	ERC	5	80	70	95	76
Pleasant Grove (421101)	1	7G	3	P	2	ERC	5	90	94	97	100
	2	7G	3	A	2	ERC	5	90	94	97	100
	3	7H	3	P	2	ERC	5	90	53	97	57
	4	7Q	3	P	2	ERC	5	90	77	97	80
Ray's Valley (421103)	1	7G	4	P	3	ERC	5	90	84	97	93
	2	7G	4	A	3	ERC	5	90	84	97	93
	3	7H	4	P	3	ERC	5	90	48	97	54
	4	7Q	4	P	3	ERC	5	90	72	58	78
	1	7G	3	P	2	ERC	5	90	62	97	71

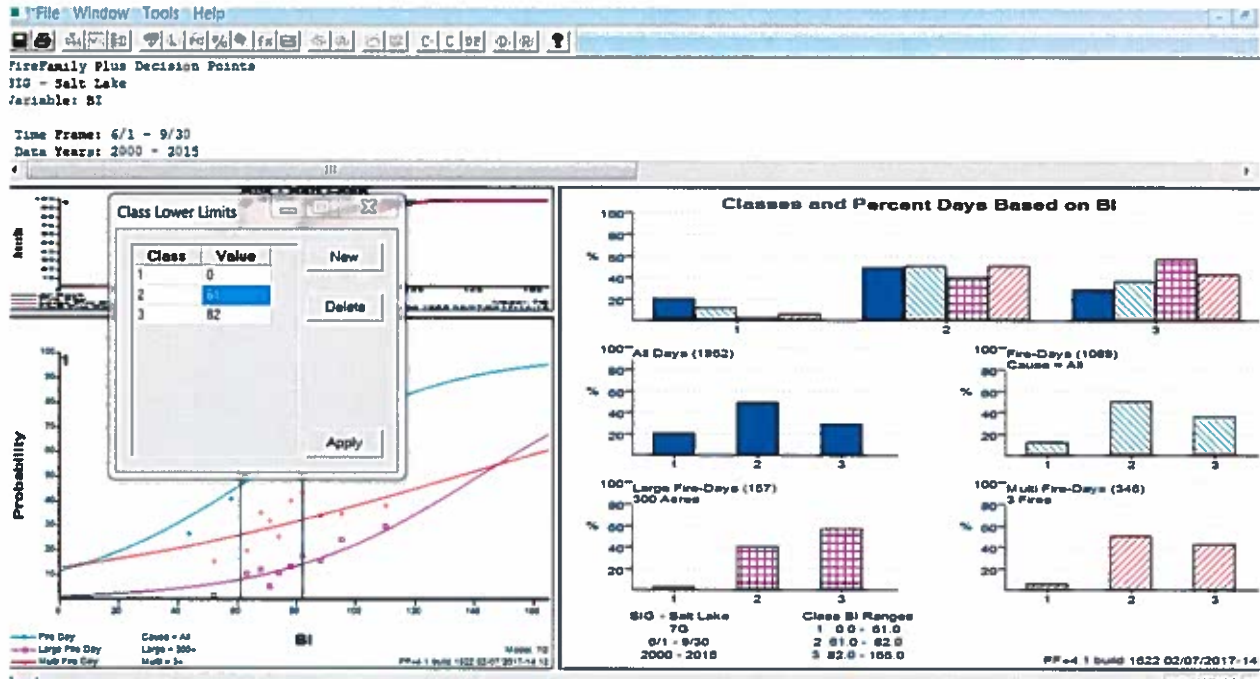
NORTHERN UTAH INTERAGENCY FIRE DANGER OPERATING PLAN

Station	Priority	Model	Slope	Herb Grass Type	Climate Class	Staffing Index	Decision Classes	Staffing Index Breakpoints			
								Low		High	
								SI%	VAL	SI%	VAL
Bear River (420703)	2	7G	3	A	2	ERC	5	90	62	97	71
	3	7H	3	P	2	ERC	5	90	35	97	41
	4	7Q	3	P	2	ERC	5	90	60	97	67
Hewinta (420705)	1	7G	4	P	3	ERC	5	90	61	97	69
	2	7G	4	A	3	ERC	5	90	61	97	69
	3	7H	4	P	3	ERC	5	90	35	97	40
	4	7Q	4	P	3	ERC	5	90	59	97	66
Red Spur (420206)	1	7G	4	P	3	ERC	5	90	78	97	84
	2	7G	4	A	3	ERC	5	90	78	97	84
	3	7H	4	P	3	ERC	5	90	44	97	48
	4	7Q	4	P	3	ERC	5	90	68	97	72

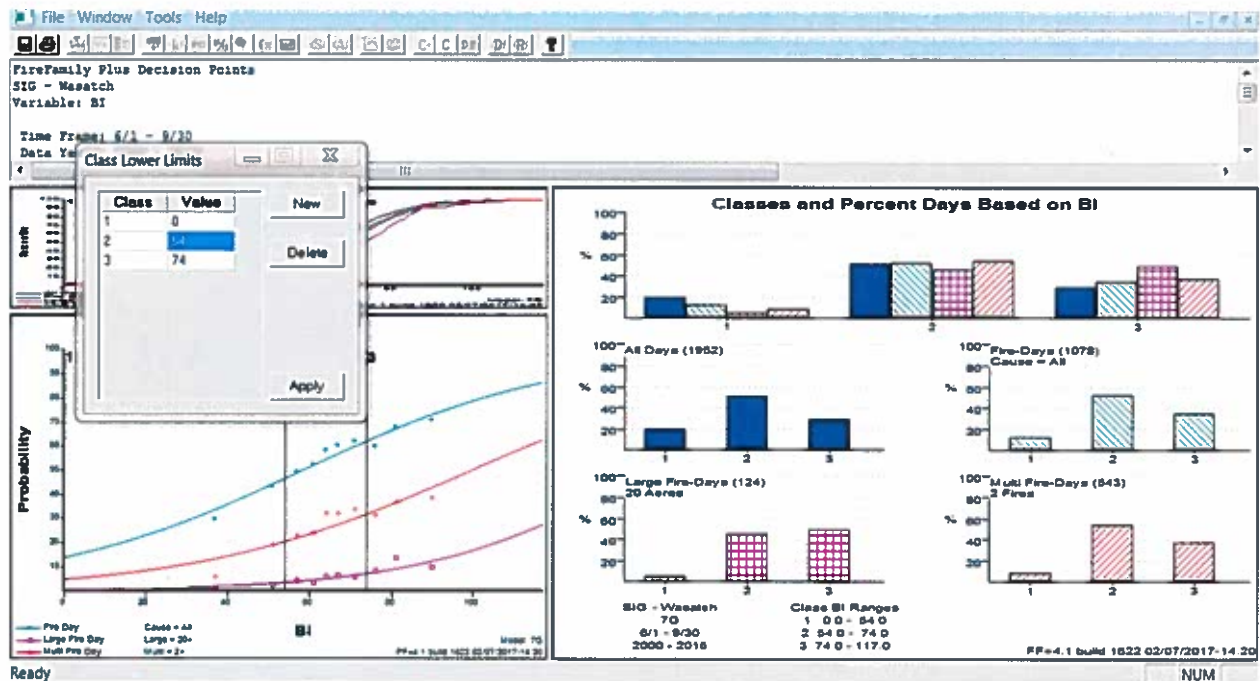
APPENDIX E: FIREFAMILYPLUS AND RERAP ANALYSIS

Dispatch Level Decision Points

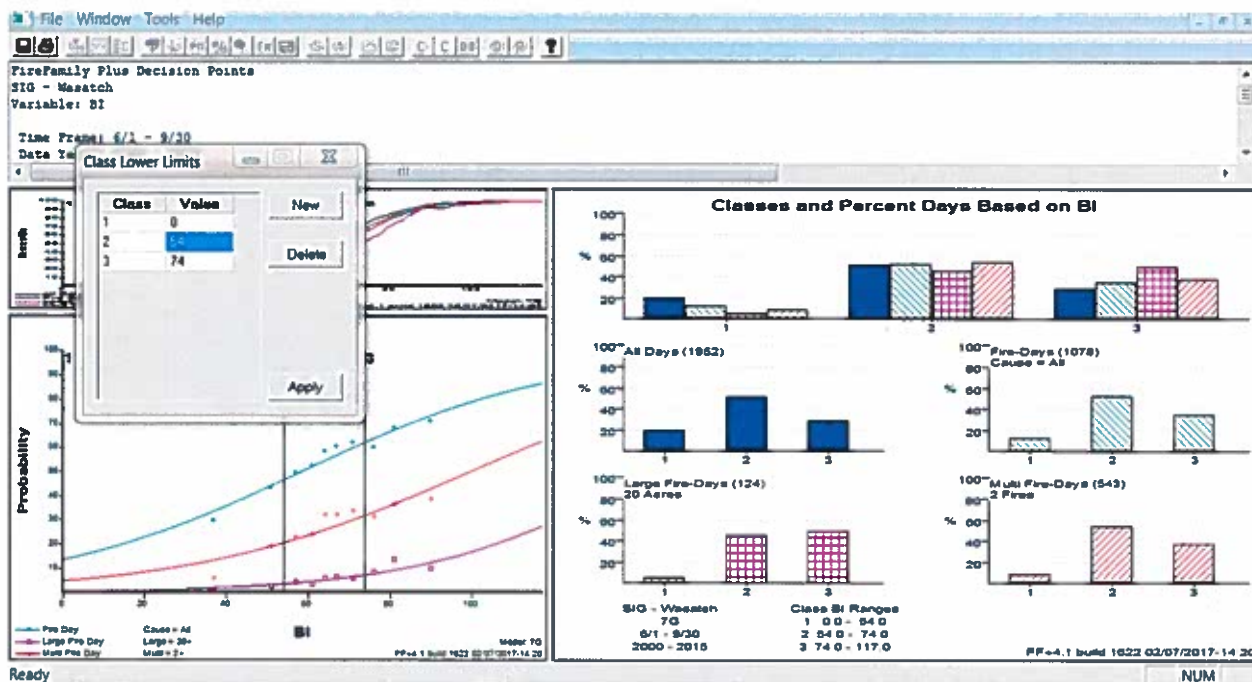
Salt Lake Desert FDRA



Wasatch Mountains FDRA

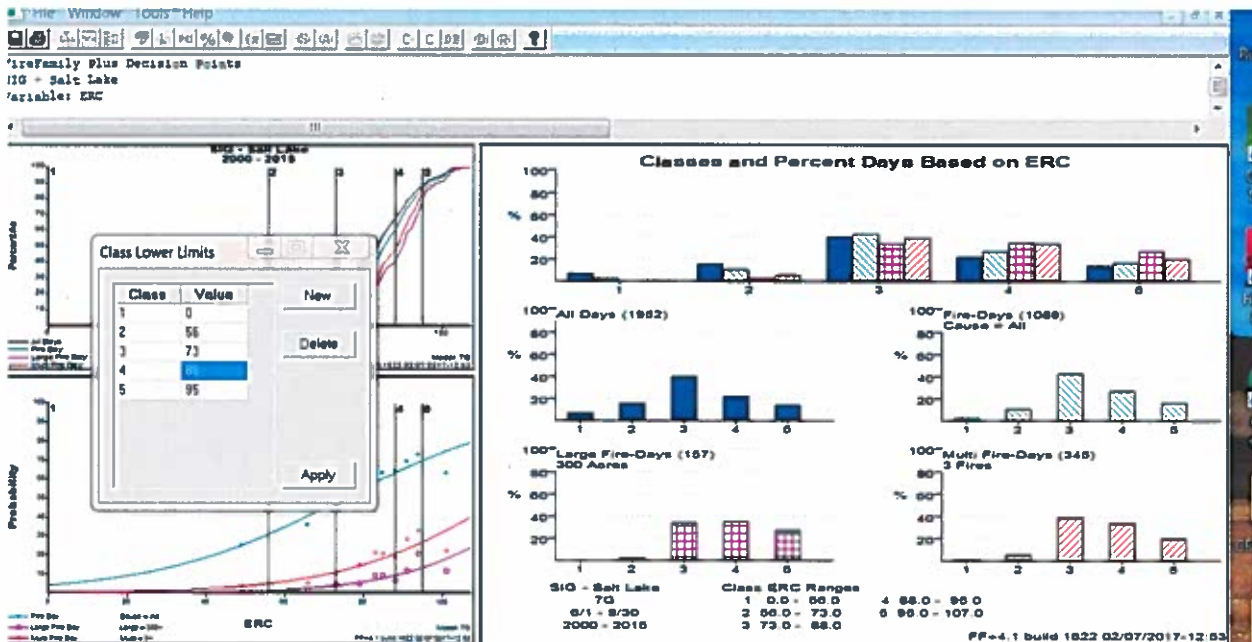


Uinta Mountains FDRA

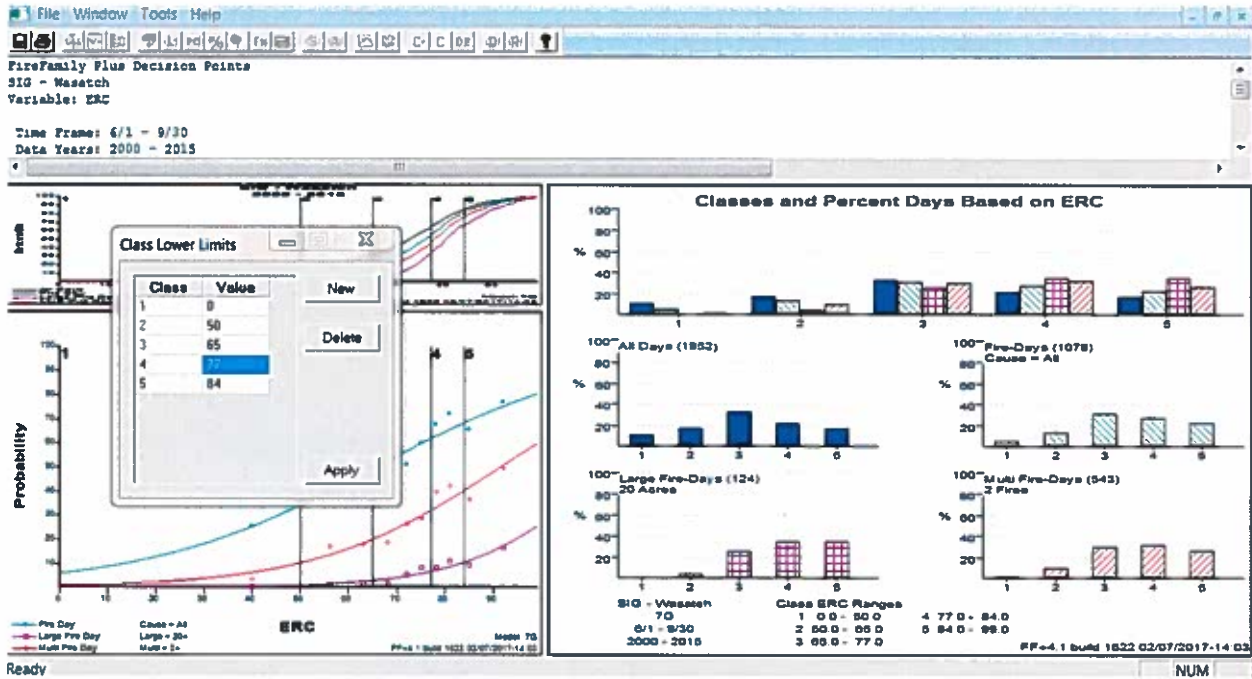


Preparedness Level Decision Points

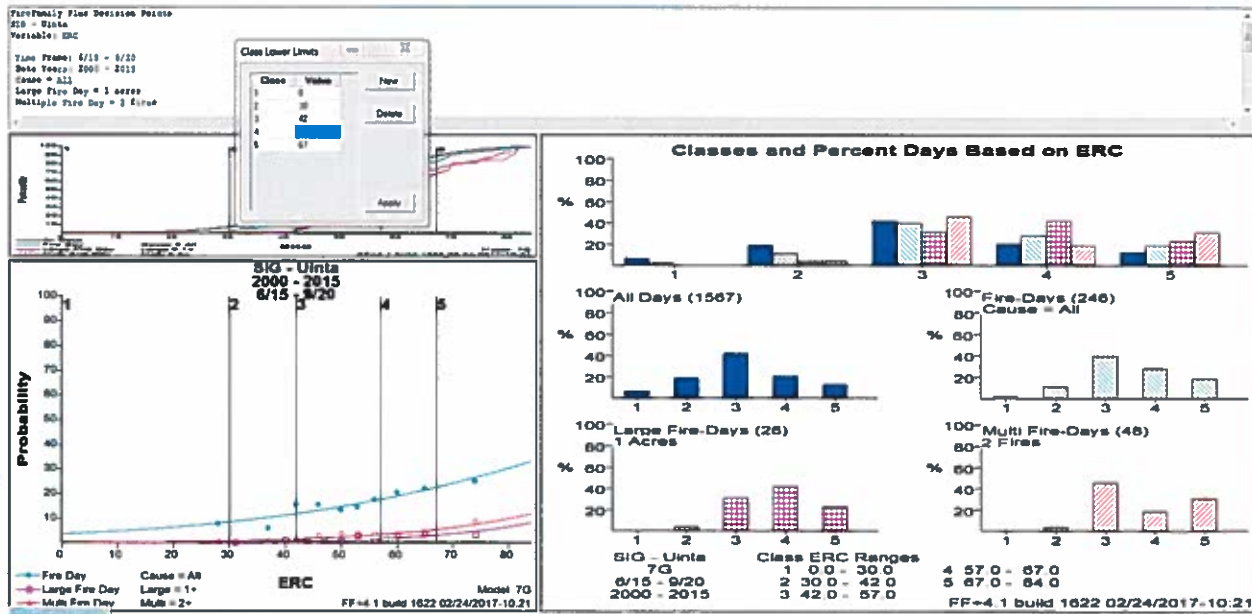
Salt Lake Desert FDRA



Wasatch Mountains FDRA

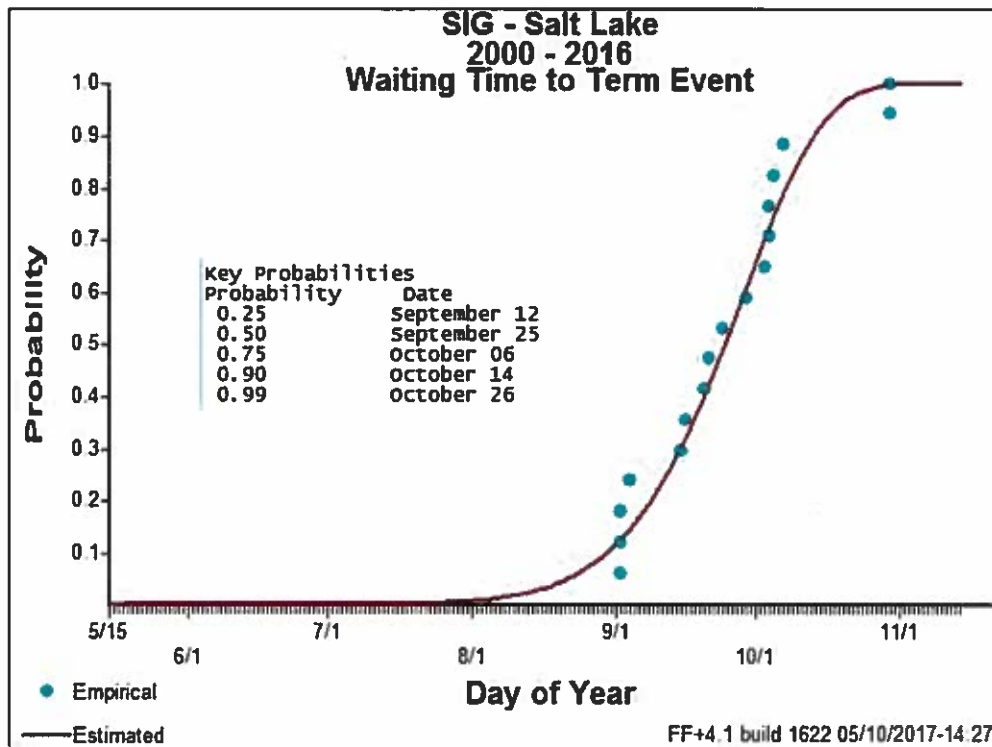


Uinta Mountains FDRA



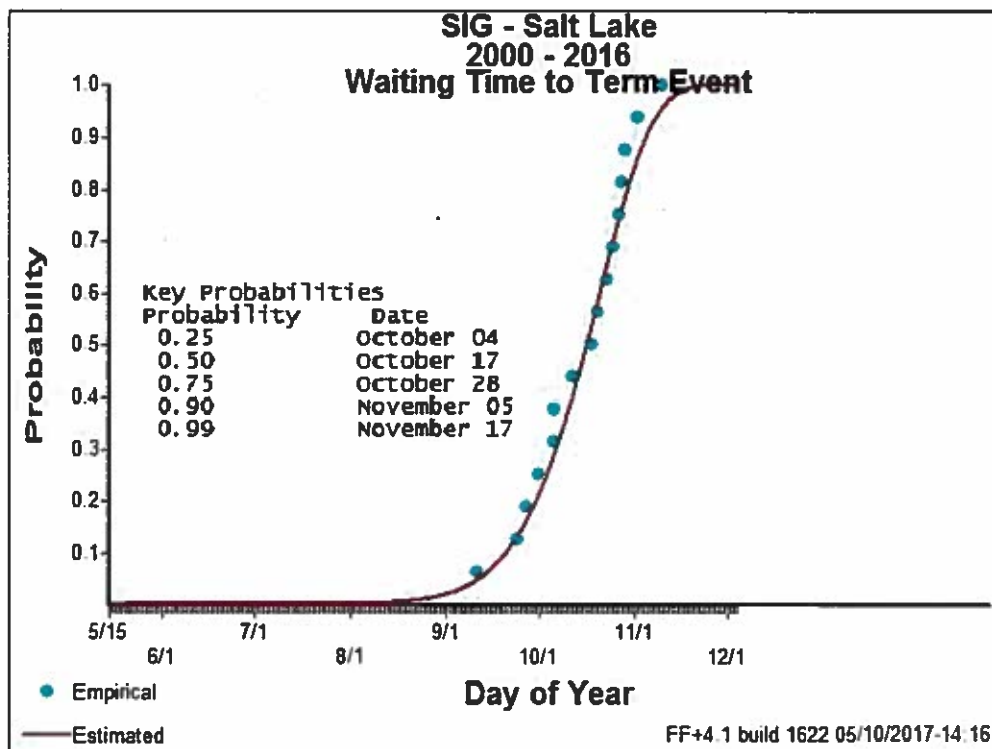
Season-Slowing and Season Ending Probabilities (RERAP)

Salt Lake Desert SIG

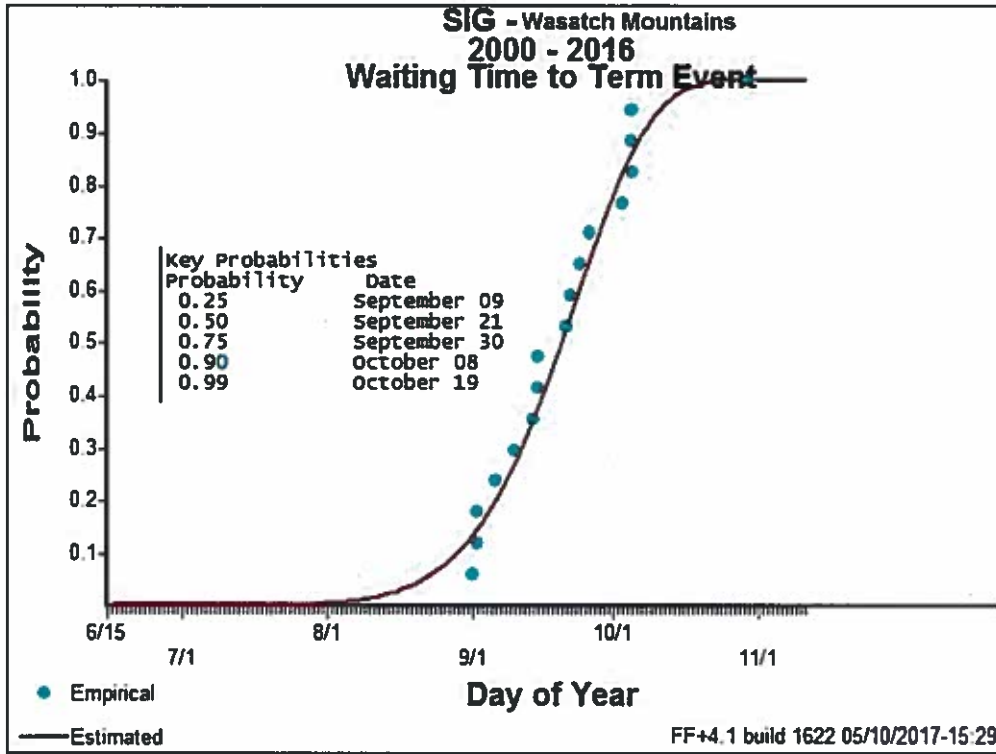


Above: Salt Lake Desert SIG, Season-Slowing Event Probability

Below: Salt Lake Desert SIG, Season-Ending Event Probability

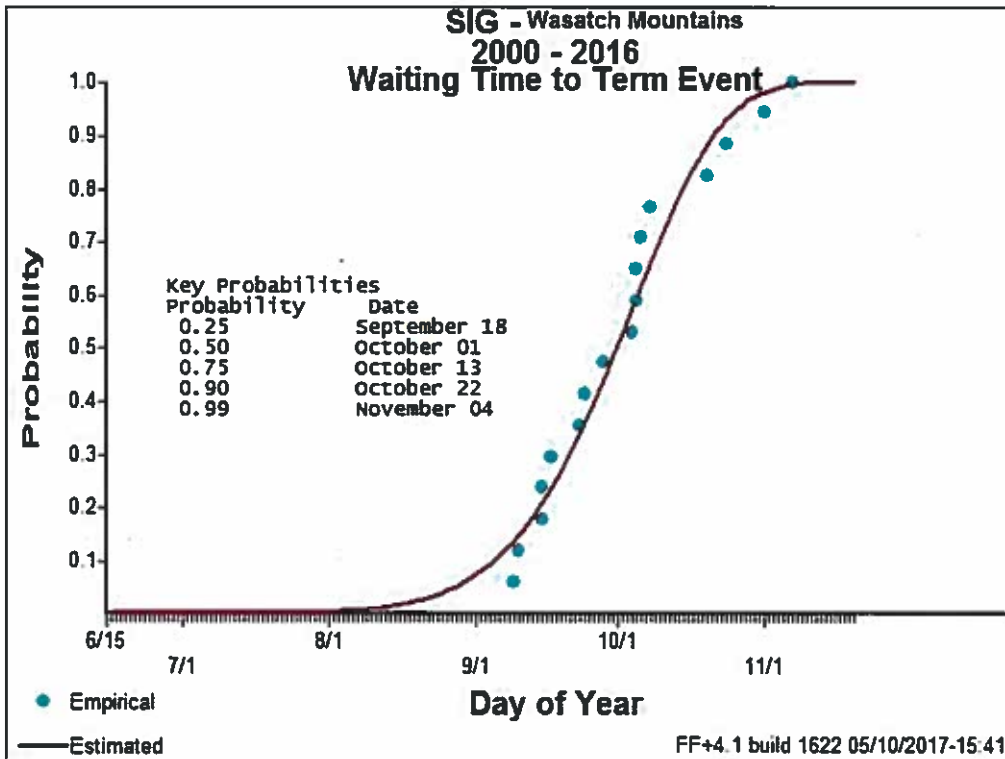


Wasatch Mountains SIG

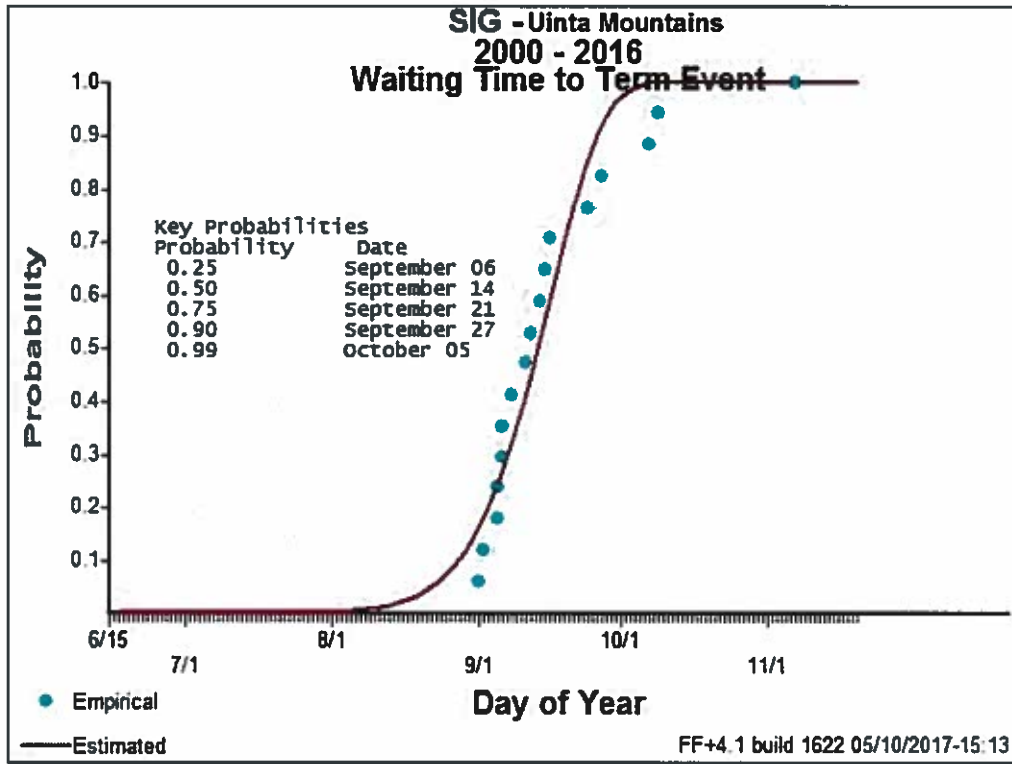


Above: Wasatch Mountains SIG, Season-Slowing Event Probability

Below: Wasatch Mountains SIG, Season-Ending Event Probability

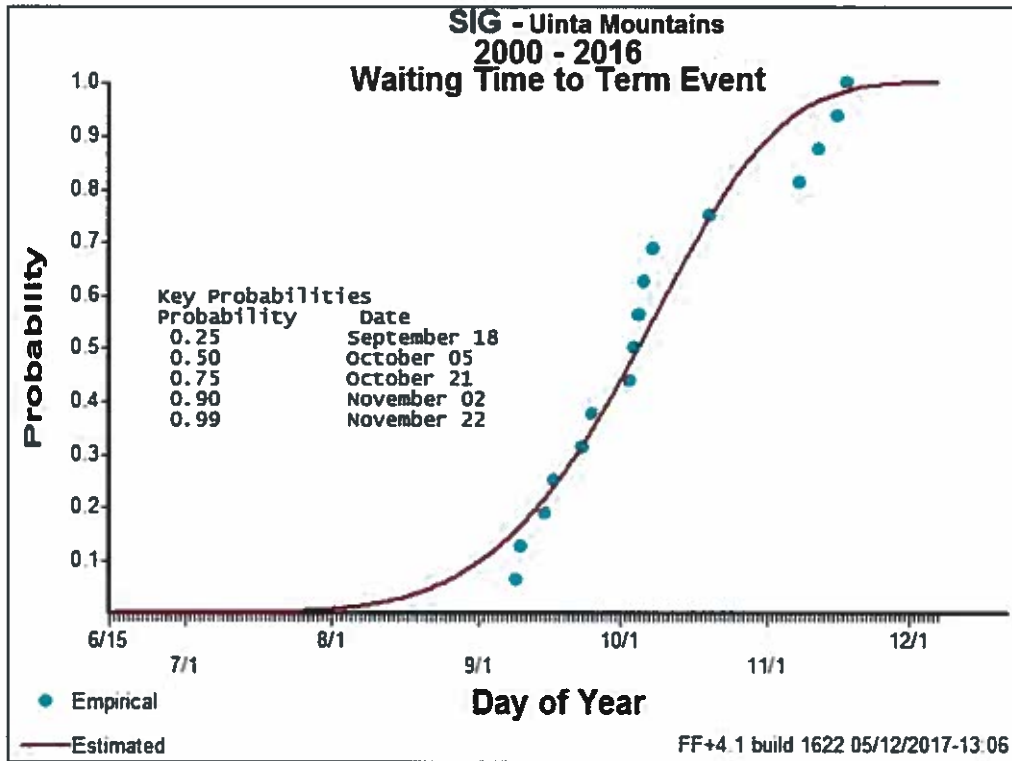


Uinta Mountains SIG



Above: Uinta Mountains SIG, Season-Slowing Event Probability

Below: Uinta Mountains SIG, Season-Ending Event Probability



APPENDIX F: PREPAREDNESS LEVEL ACTIONS

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	
Duty Officer	Confirm (or adjust) the Preparedness and Dispatch Levels with the NUJFC Manager.	•	•	•	•	•	Agency
	If preparedness level is decreasing, consider releasing pre-positioned and detailed resources.	•	•	•	•	•	Agency

NORTHERN UTAH INTERAGENCY FIRE DANGER OPERATING PLAN

Responsible Party	Suggested Action	PL 1	PL 2	PL 3	PL 4	PL 5	Affected Entity
	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
NUIFC Manager	Determine 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 Eastern Great Basin Coordination Center (EGBCC) regarding availability of resources at the geographical and national levels.			•	•	•	Agency
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 preparedness level, burning conditions, and availability of IA resources and air support.	•	•	•	•	•	Agency

NORTHERN UTAH INTERAGENCY FIRE DANGER OPERATING PLAN

Responsible Party	Suggested Action	PL 1	PL 2	PL 3	PL 4	PL 5	Affected Entity
	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

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APPENDIX G: NORTHERN UTAH POCKET CARDS

Fire Danger PocketCard

Northern Utah Interagency Fire Center

<http://fam.nwccg.gov/fam-web/pocketcards/>

Fire Danger Interpretation

Dispatch Levels	Burning Index - Model G	
	SL Desert	Wasatch
High: Potential for high to extreme intensity. Expect high rates of spread, flame length, and control difficulty.	82 + (78 th percentile)	74 + (72 nd percentile)
Moderate: Anticipate moderate fire intensity. The BI can change rapidly with variable weather conditions.	61 - 81	54 - 73
Low: Expect low fire intensity. Containment should be attainable. However, always be cautious.	0 - 60	0 - 53

Local (Critical) Thresholds: any of these factors will significantly increase the risk for extreme fire behavior. The more factors present, the greater the

Weather Observations (at the Critical Percentile)	SL Desert FDRA 78 th percentile	Wasatch Mtn FDRA 74 th percentile
20-ft Wind (mph)	> 11	> 9
Min. Relative Humidity (%)	< 9	< 13
Max. Temperature (°F)	> 92	> 89

- ◆ **Wind Gusts** exceeding 20 mph will increase the probability of erratic fire behavior and large fire growth.
- ◆ **Microburst Winds** are powerful downdrafts from thunderstorms which can affect the spread rate, intensity, and direction from several miles away.
- ◆ **Lake Effect Winds** will enhance up-slope winds (in the afternoon) & down-slope winds (after sunset) resulting in unexpected fire intensity adjacent to the Great Salt Lake and Utah Lake

Updated: June 2017



Recent Fire Experience Salt Lake Desert FDRA

Date	Fire Name	Size (ac)	BI	RH (%)	Temp (°F)	Wind (mph)
06/22/12	Dump	5,507	125	6	94	17
07/28/12	Dallan Canyon	43,660	98	8	96	13
08/08/16	Broad Mouth	20,619	78	12	96	8
08/10/13	Patch Springs	31,010	112	10	90	14

Wasatch Mountains FDRA

Date	Fire Name	Size (ac)	BI	RH (%)	Temp (°F)	Wind (mph)
07/03/12	Quall	2,222	108	9	91	12
07/22/16	West Antelope	14,240	78	13	93	8
08/10/13	Millville	2,200	74	17	84	8
08/21/16	Peterson Hollow	1,242	75	14	85	6

RED values indicate exceedance of local (critical) threshold

Burning Index (BI) Facts:

- BI is an index representing the potential difficulty containing a fire due to flame length (intensity) at the head of the fire.
- BI is very sensitive to small fluctuations in wind speed.
- BI with Fuel Model G has a very good statistical correlation to large fire occurrence in Northern Utah.

Salt Lake Desert FRDA

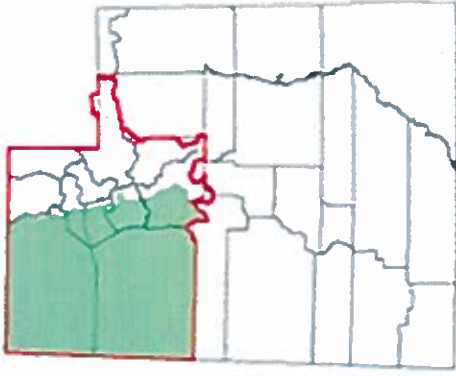
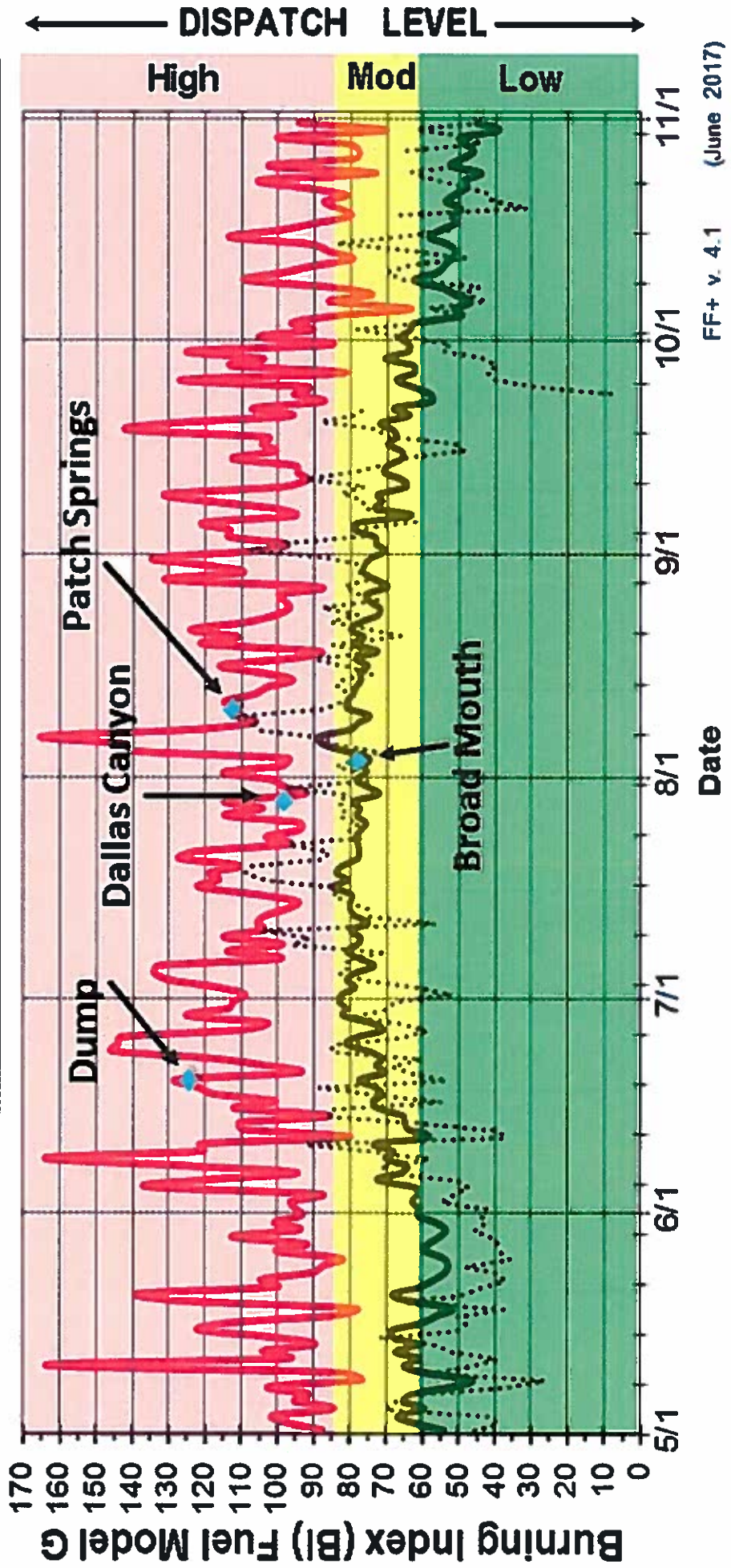
NWS Forecast Zone 478

RAWS (in SIG)	Number	Elevation	Data Years	Model
Cedar Mountain *	420901	4650'	2000 - 2016	7G
Vernon *	420908	5510'	2000 - 2016	7G
Aragonite *	420911	5030'	2000 - 2016	7G
Clifton Flat *	420915	6384'	2000 - 2016	7G
Rosebud *	420914	4987'	2000 - 2016	7G

* These stations comply with NWCG Weather Station Standards (PMS 426-3)

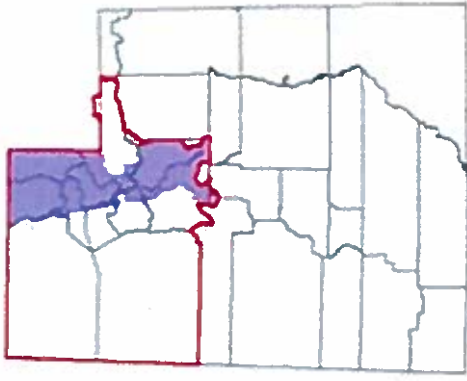
..... 2016

— Average — Maximum ◆ Memorable Fires



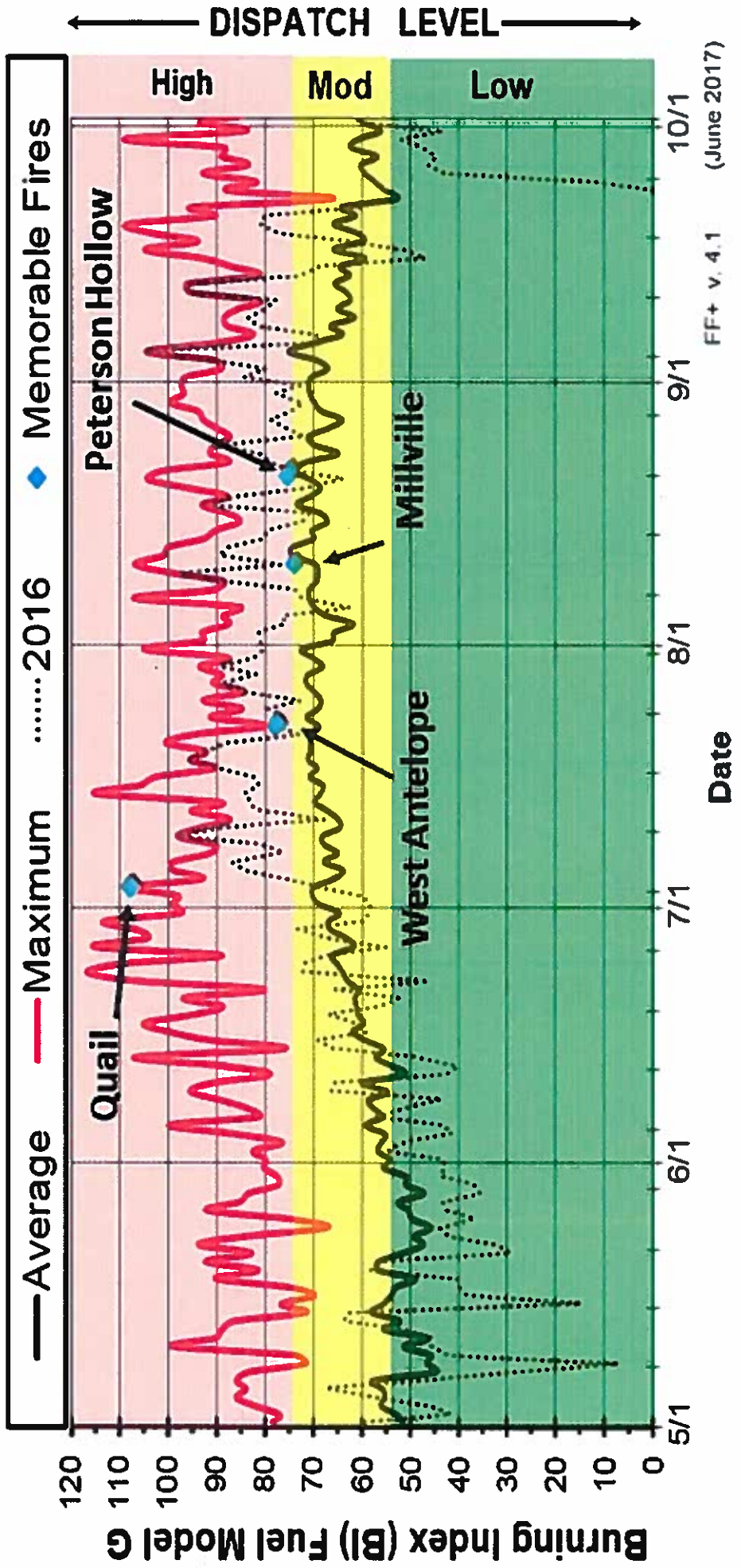
Wasatch Mountains FRDA

NWS Forecast Zone 479



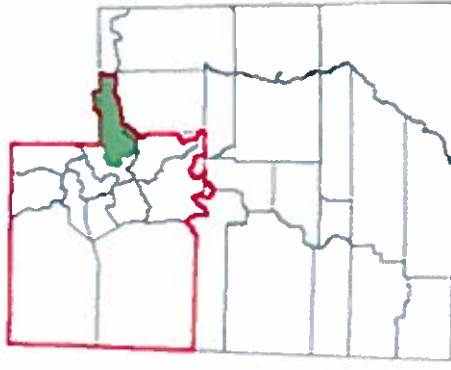
RAWS (in SIG)	Number	Elevation	Data Years	Model
Beus Canyon *	420403	5100'	2000 - 2016	7G
Otter Creek *	420912	7160'	2000 - 2016	7G
Pleasant Grove *	421101	5200'	2000 - 2016	7G
Rays Valley *	421103	7300'	2000 - 2016	7G

* These stations comply with NWCG Weather Station Standards (PMS 426-3)



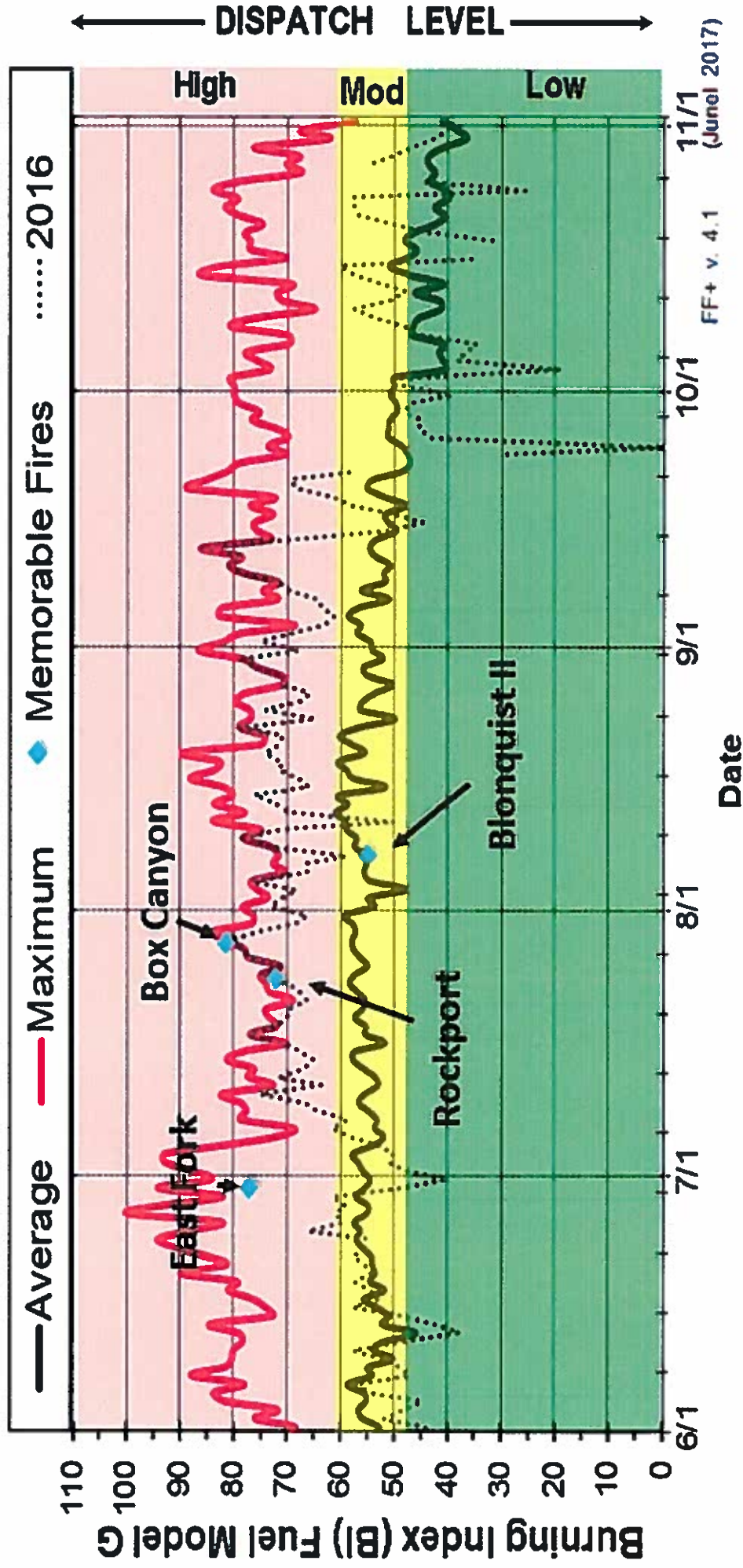
Uinta Mountains FRDA

NWS Forecast Zone 480



RAWS (in SIG)	Number	Elevation	Data Years	Model
Bear River *	420703	8536'	2000 - 2016	7G
Hewinta *	420705	9186'	2000 - 2016	7G
Norway Flat *	420706	8280'	2000 - 2016	7G

* These stations comply with NWCG Weather Station Standards (PMS 426-3)



Fire Danger PocketCard

Northern Utah Interagency Fire Center

<http://fam.nwcg.gov/fam-web/pocketcards/>

Fire Danger Interpretation

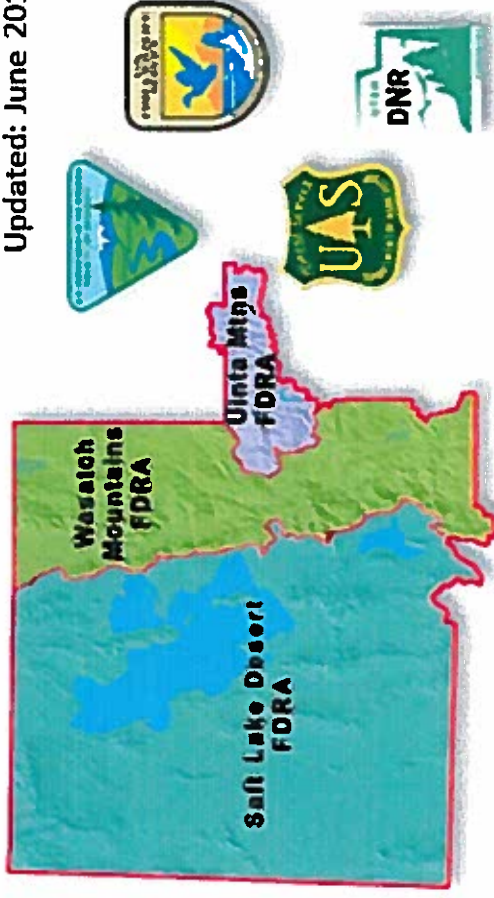
Dispatch Levels	Burning Index - Model	
	Wasatch	Uinta Mtns
High: Potential for high to extreme intensity. Expect high rates of spread, flame length, and control difficulty.	74 + (72 nd percentile)	65 + (75 th percentile)
Moderate: Anticipate moderate fire intensity. The BI can change rapidly with variable weather conditions.	54 - 73	50 - 64
LOW: Expect low fire intensity. Containment should be attainable. However, always be cautious.	0 - 53	0 - 49

Local (Critical) Thresholds: any of these factors will significantly increase the risk for extreme fire behavior. The more factors present, the greater the risk.

Weather Observations (at the Critical Percentile)	Wasatch Mtn	Uinta Mtn
	FDR (74th percentile)	FDR (75 th percentile)
20 - ft Wind (mph)	> 9	> 5
Min. Relative Humidity (%)	< 13	< 13
Max. Temperature (°F)	> 89	> 78

- ◆ Wind Gusts exceeding 20 mph will increase the probability of erratic fire behavior and large fire growth.
- ◆ Microbursts are powerful downdrafts from thunderstorms which can seriously affect the spread rate, intensity, and direction from several miles away.
- ◆ Lake Effect Winds will enhance up-slope winds (in the afternoon) & down-slope winds (after sunset) resulting in unexpected fire intensity adjacent to the Great Salt Lake and Utah Lake.

Updated: June 2017



Recent Fire Experience

Wasatch Mountains FDR

Date	Fire Name	Size (ac)	BI	RH (%)	Temp (°F)	Wind (mph)
07/03/12	Quail	2,222	108	9	91	12
07/22/16	West Antelope	14,240	78	13	93	8
08/10/13	Millerville	2,200	74	17	84	8
08/21/16	Peterson Hollow	1,242	75	14	85	6

Uinta Mountains FDR

Date	Fire Name	Size (ac)	BI	RH (%)	Temp (°F)	Wind (mph)
06/29/02	East Fork	14,355	77	9	82	6
07/25/14	Rockport	120	71	17	81	6
07/28/16	Box Canyon	4715	81	10	83	6
08/10/13	Blonquist II	30	55	23	72	4

RED values indicate exceedance of local (critical) threshold

Burning Index (BI) Facts:

- BI is an index representing the potential difficulty containing a fire due to flame length (intensity) at the head of the fire
- BI is very sensitive to small fluctuations in wind speed
- BI with Fuel Model G has a very good statistical correlation to large fire occurrence in Northern Utah.