

**Alley Springs Glade Prescribed Fire
Regional After Action Review**



**Ozark National Scenic Riverways
Eminence, Missouri**

May 5, 2005

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I. EXECUTIVE SUMMARY

On April 4, 2005, the Alley Springs Glade prescribed fire was ignited in Ozark National Scenic Riverways. The prescribed fire escaped the burn unit the same day and was declared a wildfire. After the prescribed fire was declared a wildfire, the park Fire Management Officer (FMO) assumed the role of the Incident Commander. The Ozark National Scenic Riverways Superintendent, as required by National Park Service policy, requested a review be conducted of this prescribed fire and assembled a review team for that purpose. The review was conducted from May 3-5, 2005 at Ozark National Scenic Riverways.

The team developed a report that details findings.

II. INTRODUCTION and BACKGROUND

Incident summary and chronology

Summary

On 04/04/05, Ozark NSR Fire Management Staff conducted a 265-acre prescribed fire at Alley Spring, 6 miles west of the town of Eminence. During this project, the fire escaped fire lines and burned approximately 130 acres of mostly Missouri Department of Conservation (MDC) lands. An ATV was also destroyed by fire. Three firefighters were treated for heat exhaustion and dehydration.

Project Objectives:

1. Reduce dead & down fuels (1, 10 and 100 hr time lag) by 20-80%
2. Retain >90% duff cover
3. Burn 75-95% of the unit with moderate intensity
4. Kill 50-90% of the hardwood seedling (oak, fragrant sumac and red cedar <2.5cm)

Personnel assigned to the project

(1) Prescribed Fire Burn Boss	<i>Qualified as a RXB2</i>
(1) Ignition Specialist	<i>Qualified as a RXI2</i>
(1) Holding Supervisor	<i>Qualified as a DIVS</i>
(1) Fire Effects Monitor	
(1) Information Officer Type 3	
(3) Type 6 Engines w/2 person crews	
(6) Ignition Personnel (Fire Use Module)	
(4) ATVs and operators	
(8) Holding personnel on foot	
29 total (<i>Plan called for 21</i>)	

Chronology:

- 0945- Pre-burn briefing held with all personnel assigned to the project. MDC resource advisor asked not to be put into the organization of the burn to allow him to move freely around the unit. (Weather observations were: temp 69, RH 34%, winds 4G6 from the south, FDFM 6%, POI 50%)
- 1050- Start test fire
- 1110- Start ignition of the unit after RXB2, RXI2, Holding and MDC Resource Advisor concur that personnel should be able to safely burn the unit.
- 1120- Small spot fire on the west flank. Holding personnel able to handle.
- 1130- Weather Observations: temp 77, RH 27%, winds 1-3 SSW, FDFM 5%, POI 60%
- 1200- More spot fires on the west flank.
- 1210- Holding personnel report more spot fires than they can handle and requested personnel from the east flank to help them. Ignition stopped.
- 1215- Personnel from east flank shifted to the other side of the unit to assist in holding operations. Supervisory Forestry Technician put DIVS in charge of the operations and moved to the staging area to manage the incident and call FMO at office to inform him of our situation. He said he is heading to our location.
- 1230- Slop-over reported to be 7 acres. Forest Supervisory Technician heard radio traffic about an ATV accident. No one injured. (Weather Observations: temp 77, RH 27%, Winds 3-6 South, FDFM 4%, POI 70%)
 - 1240- [Dispatchers log] made notification for Park Superintendent- sent Park Superintendent & District Ranger e-mail in regard to shutting down of burn. Not declaring an escape at this time.
- 1245- DIVS reported that hand line is holding on the west side slop-over. Should be good to continue after 20 minutes or so.
- 1255- Report of spot on east flank (north line).
- 1302- FEMO reports that spot is 1 acre and growing. Cannot handle with personnel on hand. MDC resource advisor arrives at staging with dozer, operator, and 3 personnel.
- 1320- Spot on east flank has made the top of the ridge; 25 acres and growing. Supervisory Forestry Technician asked Information Officer to take a blower up the east line from the river and assist personnel on that spot. FMO arrives.
- 1325- Dozer line up hollow from Point A to top of ridge. This was contingency line in case the hand line did not hold on the west flank.
- 1342- Authorized to put dozer on park lands by Assistant Park Superintendent. 1345- Hand line on west flank still holding.
- 1420- Fire on east line has made the ridge. Personnel securing anchor point and holding that.
- 1440- Dozer making way up the hollow on the west side with contingency line. Getting close to top of ridge.
- 1500- Dozer on ridge. Park FMO scouting fire edge. DIVS reported that fire has crossed ridge and backing into the head of the hollow on the west side of the road. He has blowers putting in line from the original RX unit across the head of the hollow to the road on the ridge.

- 1510- Dozer putting in line to the east off the ridge road. Supervisory Forestry Technician asked DIVS about the radio traffic I heard about an ATV accident. DIVS said that an ATV was burned. He said, "To the ground." He then stated it was one of Ozark's ATVs.
- 1525- Dozer made bottom of hollow. Personnel could not hold the line. Dozer pulled out to road and constructed check lines to slow the spread. East flank personnel doing as well as possible with what they have but still losing ground.
- 1600- Dozer back out to road. Dozer boss scouting different route/tactic.
Declared the escape a wildfire. Supervisory Forestry Technician contacted HQ. Then called Assistant Park Superintendent and informed him of our situation. Then called the regional office and informed Regional Fuels Management Specialist, of the status.
- 1610- Started to order additional resources. Decided to transition from a Type 4 to a Type 3 incident because of the amount of and variety of resources assigned. A qualified ICT3 was ordered. Park FMO was going to take over command as an ICT3 (T).
- 1630- Transition complete. Park FMO took over command. Supervisory Forestry Technician was assigned as TFLD (T) on the head of the fire.

III. AFTER ACTION REVIEW (AAR) and PROCESS

Specific objectives for the review given to the team included:

- Review the accident report and factor in the loss of an ATV.
- Review summarized time records for assigned personnel for the duration of this project up to the and through the time of the escaped fire. Include time summaries of personnel that had been assigned to other fires.
- Compare weather forecasts and actual weather observations for the project.
- Conduct a field reconnaissance of the project to evaluate overall accomplishment of stated objectives against the evaluated values at risk and mitigation measures planned.
- Document costs of the prescribed fire and the ensuing wildfire.

Additional factors to consider and evaluate are the interagency obligations recently assigned and delegated to the park FMO, with added complexities of cooperative planning and execution of projects such as the Alley Springs Prescribed Fire.

IV. FINDINGS and RECOMMENDATIONS

Direct causes of the prescribed fire escape:

- A spot fire established on the NE flank of the prescribed burn and grew rapidly on to Missouri Department of Conservation lands.
- The spot fire was beyond the ability of a small squad to control; other holding resources were fully engaged.
- Weather conditions were warm and dry.
- Winds were terrain channeled and slope amplified in complex terrain.
- Heavy forest fuels were very dry for the season from recent prolonged drought.
- Increasing southerly winds ahead of a cold front that was approaching the area, and;
- Fire lines were repeatedly breached by frequent spotting.

Indirect causes contributing to the prescribed fire escape:

- Last precipitation received at the Eminence RAWS station was seven days prior to the burn, with no recorded rain data at the Alley Springs Ranger Station.
- Low RH in the teens was reported from Big Springs RAWS several days prior to the burn.
- Control force requirements were based upon calculations for a lower intensity prescribed fire; therefore adequate holding resources were not on scene.
- Overtaxed resources quickly became fatigued, with three minor incidents - two of heat exhaustion and one of smoke inhalation.
- The limited access for engines constrained water delivery to key points of the fire perimeter, thus relying solely on the use of ATVs for water delivery, and;
- Availability of water was reduced due to the loss of an ATV with water handling capability. A second ATV had mechanical problems prior to ignition of unit, further reducing ability to transport water to the remote sites of fire area.

Other Findings which, if left uncorrected, could lead to future incidents:

- Strengthen contingency and transition planning, including the possible use of interagency resources.
- Review and revise prescription criteria for site specific objectives.
- Burn complexity was understated due to interpretation of ratings of both primary and secondary factors.

- Risk assessment values needed to be adjusted upward as appropriate with mitigation measures implemented.
- Better coordinated planning effort with the state to meet expectations of both agencies for meeting respective land management objectives.
- Coordinate with local weather forecasters to provide consistency in terms and units of measure when giving fire forecasts.
- Park staff should provide feedback to the local NWS concerning forecast.
- Discuss with local NWS office the possibility of segmenting the fire weather planning forecast for a more localized forecast product, and;
- Bolster the daily incident action plans (IAP) as per RM 18 Ch.10 pg. 15.

Opinions and recommendations that are not findings:

- Improve fire tactical training and certification for ATV operators.
- Cumulative fatigue, distractions, span of control issues, administrative and personal demands; all may have been contributing factors that degraded the effectiveness of the fire program staff. Some realignment of responsibilities should be considered.
- A multi-agency fire suppression effort, conducted with consideration and attention to safety, was managed with good organizational structure and leadership and facilitated a good transition from initial attack to an extended attack incident.
- Early recognition of the need for a dozer was essential to containing the fire before it reached the critical fuels accumulations located on state land. Had the dozer been staged at the burn unit - to be used if necessary - containment lines could have been put in sooner.
- Include temperature as a component in prescribed burn planning, and;
- Consider upper level planning criteria in coordination with Missouri Department of Conservation such as a burning index (BI) cut off value of 45 NFFL 9, in combination with other relevant factors.

Additional comments and suggestions from the review team presentation and feedback from park staff:

- Cumulative fatigue was evident in the OZAR fire overhead.
- Administrative pressures in the form of target accomplishments were a factor felt by OZAR fire overhead.
- The fire staff at OZAR had completed in spring 2005, twenty-three projects with a total of 6,546 acres. In addition, the fire staff responded to forty-four wildfires, with total acres of 2,025.
- Fireline locations on this terrain may need to be adjusted for future projects.

V. LESSONS LEARNED

- Timeframes for critical operations and events must be realistic and attainable. If activities rely on mechanical equipment (ATVs, engines, heavy equipment, etc) for completion, reasonable consideration must be paid to the logistics of travel times, refueling requirements, operator expertise, and the chance of breakdowns to plan effectively for the operational period. For example, something as seemingly insignificant as one malfunctioning pump on one of the ATVs that could result in unacceptable delays and possible failure of the activity or project, if another piece of equipment goes down, such as in this case, the loss of an ATV with a water tank.
- Preplanned management commitment and decisions which rely upon vulnerable support mechanisms (i.e. water and logistical re-supply where timing is critical), necessitate in-depth and realistic contingency planning. The tighter the window of opportunity, the more attention is required to address logistical details.
- Critical timelines that are established to ensure success of operations need be tracked and reassessed frequently so that adjustments or mitigations (i.e. ignition pattern or method) can be made early enough in the operation period to secure successful completion. This is particularly important when burning on the hot end of the prescription.
- Updated or critical weather information must flow easily from the National Weather Service to fireline personnel and vice-versa.
- A significant emphasis was placed on pre-burn public education and notifications. It was critical, after the burn escaped, to maintain a high level of honest communication with the public.

VI. RECOGNITION

- The Ozarks National Scenic Riverways staff and its cooperators are to be commended for its willingness to accept the level of risk involved with prescribed fire in these fuel types and conditions.

VIII. COSTS

The costs associated with the prescribed fire and subsequent wildfire are still being determined as of the writing of this report. The cost is currently estimated at \$22,000

REFERENCES

Ozark National Scenic Riverways Fire Management Plan, 2004

Ozark National Scenic Riverways General Management Plan, 1981

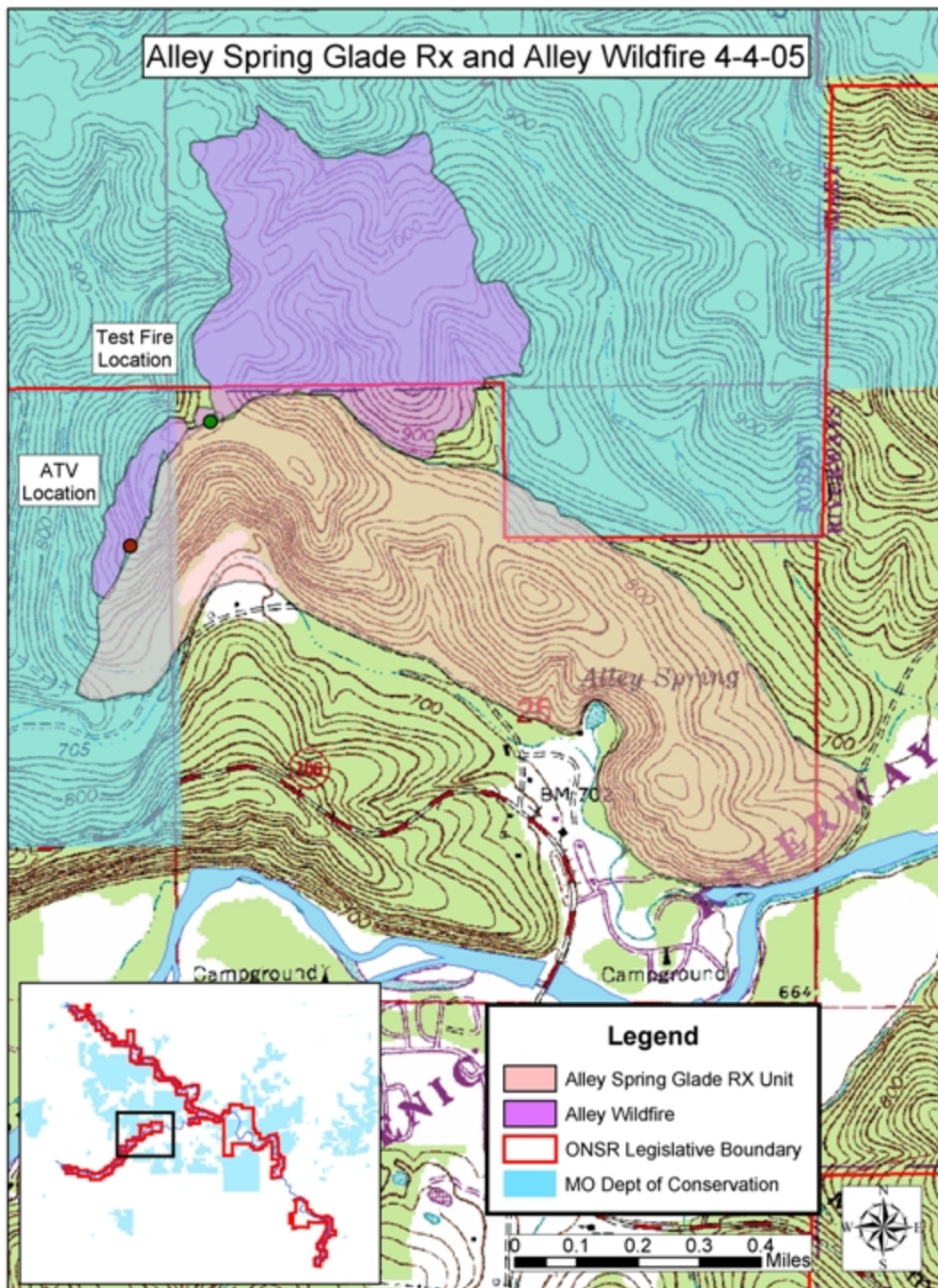
Ozark National Scenic Riverways Resource Management Plan, 1995

Interagency Standards for Fire and Fire Aviation Operations, 2005

NPS Wildland Fire Management Reference Manual -18, 2001

Appendices

Alley Spring Glade Rx and Alley Wildfire 4-4-05



Supplement

Review of the Alley Springs Prescribed Fire.

Review team final report shall contain...

3. Compare weather forecast and actual weather observations for the project.

Listed below: The forecasts for the 7 days leading up to 4/4/05. These forecasts are from the Paducah Forecast Office and located on the twice daily "Fire Weather Planning Forecasts". The Spot Forecast for the Alley Spring Glade Prescribed Fire. The Red Flag Warning. Three observations from the fire site before and during the burn and a partial observation at the end of the day. Hourly observations from 2 surrounding RAWS sites, Carr Creek, and Big Springs, Missouri from 8 AM LST to 8 PM LST. The closest RAWS site, Eminence Missouri, provided unrealistic temperatures through the day and for the 4 days prior to 4/4/05.

The Fire Weather Planning Forecasts listed below are only a partial forecast copied from the complete Fire Weather Planning Forecast. The forecast copied pertains to Monday April 4th only. Complete forecasts are available on request from the Paducah Forecast office.

Fire Weather Planning Forecast for the Heartland
National Weather Service Paducah Ky.
230 PM CST Mon Mar 28 2005

.Discussion....

MOZ074>076-085>087-098-100-106>112-114-290812-
Shannon-Carter-Mississippi-Stoddard-Scott-Ste. Genevieve-
St. Francois-New Madrid-Perry-Bollinger-Butler-Ripley-Madison-
Wayne-Oregon-Cape Girardeau-
Including the Mark Twain National Forest-
230 PM CST Mon Mar 28 2005

Tonight	Tue	Tue Night	Wed
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.....

.Forecast for Days 3 through 7...

.....

.Monday (4/4/05).....Partly cloudy. Lows around 50. Highs in the lower 70s.
Southwest winds around 5 mph.

Forecast from 358 AM CST Tue Mar 29 2005

.Monday (4/4/05)... Partly cloudy. Lows around 50. Highs in the lower 70s.
Southwest winds around 5 mph.

Forecast from 300 PM CST Tue Mar 29 2005

.Monday (4/4/05)...Partly cloudy. Lows in the upper 40s. Highs in the lower 70s.
Southwest winds 10 - to 15 mph.

Forecast from 800 AM CST Wed Mar 30 2005

.Monday (4/4/05)...Partly cloudy. Lows in the upper 40s. Highs in the lower 70s.
Southwest winds 10 - to 15 mph.

Forecast from 300 PM CST Wed Mar 30 2005

.Monday (4/4/05)...Partly cloudy. Lows in the upper 40s. Highs in the lower 70s.
Southwest winds around 10 mph.

Forecast from 800 AM CST Thu Mar 31 2005

.Monday (4/4/05)...Partly cloudy. Lows in the upper 40s. Highs in the lower 70s.
Southwest winds around 10 mph.

Forecast from 300 PM CST Thu Mar 31 2005

.Monday (4/4/05)...Partly cloudy. Lows in the upper 40s. Highs in the lower 70s.
Southwest winds around 5 mph.

Forecast from 600AM CST Fri Apr 1 2005

.Monday (4/4/05)...Partly cloudy. Lows in the upper 40s. Highs in the lower 70s.
Southwest winds around 5 mph.

Forecast from 320PM CST Fri Apr 1 2005

.Monday (4/4/05)...Partly cloudy. Lows in the upper 40s. Highs in the lower 70s.
Southwest winds around 5 mph.

Forecast from 830AM CST Sat Apr 2 2005

.Monday (4/4/05)...Partly cloudy. Lows in the mid 40s. Highs in the mid 70s.
South winds 10 to 15 mph.

Fire Weather Planning Forecast for the Heartland
National Weather Service Paducah Ky.
245 PM CST Sat Apr 2 2005

.Discussion....A ridge of high pressure will keep dry conditions in place until Tuesday night. Winds are expected to eventually come around to the south ahead of a low pressure system moving through the heartland from the west. This system is expected to bring a chance of wetting rain during mid week.

MOZ074>076-085>087-098-100-106>112-114-290812-
Shannon-Carter-Mississippi-Stoddard-Scott-Ste. Genevieve-
St. Francois-New Madrid-Perry-Bollinger-Butler-Ripley-Madison-
Wayne-Oregon-Cape Girardeau-
Including the Mark Twain National Forest-
245 PM CST Sat Apr 2 2005

	Tonight	Sun	Sun Night	Mon
Cloud Cover				PTCLDY
Precip Type				NONE
Chance Precip (%)				0
Temp (24H Trend)				74
1700' Mix Hgt Temp				61
RH % (24H Trend)				28
20ftwnd-VAL/AM(MPH)				SW 8-12G24
20ftwnd-RDG/PM(MPH)				S 12-16G25
Precip Amount				0.00
Precip Duration				0
Precip Began				
Precip End				
Mixing HGT (FT-AGL/MSl)				4206
Transport WND (KTS)				S22
Transport WND (M/S)				S13
Dispersion Index				Good
LAL				1
Haines Index				4
Stability (DSI)				SLGT UNSTBL

Fire Weather Planning Forecast for the Heartland
National Weather Service Paducah Ky.
830 AM CDT Sun Apr 3 2005

.Discussion....Dry conditions will continue through Monday. Surface high pressure will slip to our south today...allowing a return of southerly winds in most areas tonight and eventually an increase in low level moisture. Depending on how aggressively the moisture increases....red flag criteria may be approached across the Mark Twain forest Monday afternoon. Moisture return should be sufficient Tuesday to keep relative humidity well above criteria. An upper level storm system and weak cold front are expected to bring chance of showers or thunderstorms to the heartland from Tuesday night through Thursday. Temperatures for Wednesday and Thursday are expected to be near normal.

MOZ074>076-085>087-098-100-106>112-114-290812-
Shannon-Carter-Mississippi-Stoddard-Scott-Ste. Genevieve-
St. Francois-New Madrid-Perry-Bollinger-Butler-Ripley-Madison-
Wayne-Oregon-Cape Girardeau-
Including the Mark Twain National Forest-
830 AM CDT Sun Apr 3 2005

	Today	Tonight	Monday
Cloud Cover			PTCLDY
Precip Type			NONE
Chance Precip (%)			0
Temp (24H Trend)			76
1700' Mix Hgt Temp			66
RH % (24H Trend)			28
20ftwnd-VAL/AM(MPH)			S 5-9
20ftwnd-RDG/PM(MPH)			S 9-13
Precip Amount			0.00
Precip Duration			0
Precip Began			
Precip End			
Mixing HGT (FT-AGL/MSl)			4080
Transport WND (KTS)			S 22
Transport WND (M/S)			S 13
Dispersion Index			Good
LAL			1
Haines Index			5

Stability (DSI)

SLGT UNSTBL

Fire Weather Planning Forecast for the Heartland
National Weather Service Paducah Ky.
320 PM CDT Sun Apr 3 2005

.Discussion....Persistent southerly daytime winds will continue into Tuesday...with slowly increasing temperatures and humidity. For the Mark Twain National Forest... humidity are expected to flirt with red flag criteria... but winds will probably will not reach it. On Tuesday night...precipitation associated with a large low pressure system will begin... lasting off and on until Friday morning.

MOZ074>076-085>087-098-100-106>112-114-290812-
Shannon-Carter-Mississippi-Stoddard-Scott-Ste. Genevieve-
St. Francois-New Madrid-Perry-Bollinger-Butler-Ripley-Madison-
Wayne-Oregon-Cape Girardeau-
Including the Mark Twain National Forest-
320 PM CDT Sun Apr 3 2005

	Tonight	Monday
Cloud Cover		CLEAR
Precip Type		NONE
Chance Precip (%)		0
Temp (24H Trend)		75 (+6)
1700' Mix Hgt Temp		64
RH % (24H Trend)		25 (+4)
20ftwnd-VAL/AM(MPH)		SW 5-9
20ftwnd-RDG/PM(MPH)		S 8-12
Precip Amount		0.00
Precip Duration		0
Precip Began		
Precip End		
Mixing HGT (FT-AGL/MSl)		4150
Transport WND (KTS)		S 24
Transport WND (M/S)		S 12
Dispersion Index		Good
LAL		1
Haines Index		4
Stability (DSI)		SLGT UNSTBL

Fire Weather Planning Forecast for the Heartland
National Weather Service Paducah Ky.
500 AM CDT Mon Apr 4 2005

...Conditions approaching red flag criteria on the Mark Train National Forest this afternoon...

.Discussion....A combination of increasing southwest winds and low humidity will produce elevated fire danger again today. Over the Mark Train National Forest... where very little rain fell with the last couple of systems... conditions will approach red flag criteria this afternoon. The limiting factor for a red flag warning on the Mark Twain will be relative humidity... which will fall into the 20s at some sites. This parameter will be monitored today in case it falls below red flag criteria of 25 percent. Elsewhere...higher fuel moisture and humidity will produce somewhat lower fire danger. On Tuesday...significantly high humidity is expected. However...winds will be stronger and no rain is forecast until Tuesday night

MOZ074>076-085>087-098-100-106>112-114-290812-
Shannon-Carter-Mississippi-Stoddard-Scott-Ste. Genevieve-
St. Francois-New Madrid-Perry-Bollinger-Butler-Ripley-Madison-
Wayne-Oregon-Cape Girardeau-
Including the Mark Twain National Forest-
500 AM CDT Mon Apr 4 2005

Today (Monday 4/4/05)

Cloud Cover	PTCLDY
Precip Type	NONE
Chance Precip (%)	0
Temp (24H Trend)	77 (+3)
1700' Mix Hgt Temp	71
RH % (24H Trend)	29 (+7)
20ftwnd-VAL/AM(MPH)	SW 5-9
20ftwnd-RDG/PM(MPH)	S 10-14 G22
Precip Amount	0.00
Precip Duration	0
Precip Began	
Precip End	
Mixing HGT (FT-AGL/MSI)	3939
Transport WND (KTS)	S 25
Transport WND (M/S)	S 13
Dispersion Index	Good
LAL	1
Haines Index	4
Stability (DSI)	SLGT UNSTBL

Fire Weather Planning Forecast for the Heartland
National Weather Service Paducah Ky.
221 PM CDT Mon Apr 4 2005

...Red Flag Warning in effect until 7 PM CDT parts of Southeast Missouri...

.Discussion....The combination if increasing southwest winds and low humidity has produced elevated fire danger today. Over the Mark Train National Forest...where very little rain fell with last couple of system... conditions have met red flag criteria. Elsewhere...higher fuel moisture and humidity will produce a somewhat lower fire danger. On Tuesday...significantly high humidity is expected. However...winds will be stronger and no rain is forecast until Tuesday night.

MOZ074>076-085>087-098-100-106>112-114-290812-
Shannon-Carter-Mississippi-Stoddard-Scott-Ste. Genevieve-
St. Francois-New Madrid-Perry-Bollinger-Butler-Ripley-Madison-
Wayne-Oregon-Cape Girardeau-
Including the Mark Twain National Forest-
221 PM CDT Mon Apr 4 3 2005

	Tonight	Tue	Tue night	Wed
.....				

Spot Forecast for Alley Spring Glade
Weather Service Paducah Ky.
622 AM CDT Mon Apr 4 2005

If conditions become unrepresentative, contact the National Weather Service.

...Near Red Flag Warning Conditions This Afternoon...

Discussion...a combination of increasing southwest winds and low humidity will produce conditions approaching red flag criteria this afternoon. The limiting factor for a red flag warning will be relative humidity...which will fall into the upper 20s. This parameter will be monitored today in case it falls below red flag criteria of 25 percent. The Alley Spring Glade burn will experience fairly strong south winds due to being on a south-facing slope.

For Planned Ignition Time if 900 CDT 4/4/05
Sky / weather.....partly sunny

Temperature.....60....Max 77
0900...60 1100...69 1300...74 1500...76 1700...76
RH.....68%...Min 28%
0900...68 1100...35 1300...29 1500...30 1700...32
20 foot wind..... SW 12 MPH
0900...SW 5 1100...SW 10 1300...S 14 Gust 22
1500...S 16 Gust 25 1700...S 16 Gust 24
CWR.....0%
Haines index.....4
Mixing Height.....4000 Ft
Mixing Wind.....S 25

For Tonight

Sky / weather.....P Cloudy
Temperature.....MIN 52
RH.....MAX 84%
20 foot wind..... SW 12 MPH
CWR.....0%
Haines index.....3
Mixing Height.....1000 Ft
Mixing Wind.....S 25

Outlook For Tomorrow

Sky / weather.....P Cloudy
Temperature.....MIN 52
RH.....MAX 84%
20 foot wind..... SW 12 MPH
CWR.....0%
Haines index.....3
Mixing Height.....1000 Ft
Mixing Wind.....S 25

Forecaster....MY

\$\$

Requested by...Scott Bressler

Reason for Request...Under the interagency agreement for meteorological services
(USFS, BLM, NPS, USFWS, BIA).

Red Flag Warning
National Weather Service Paducah Ky
151 PM CDT Mon Apr 4 2005

...Red Flag Warning through 7 PM for Shannon... Carter... Piple... and Oregon
Counties of southeast Missouri...including the Mark Twain National Forest...

The combination of very low humidity...brisk southerly winds...and dry forest fuels has resulted in favorable conditions for wildfires in southeast Missouri. Early this afternoon... relative humidity was in the 20 to 25 percent range...forest fuels were around 7... and southerly winds were approaching 15 mph and expected to exceed that threshold in the warning area. Forest officials reported an active fire situation already in progress. Conditions will remain hazardous through about sunset...when temperatures will cool down and relative humidity will increase.

Please alert the appropriate officials and fire crews in the field of this red flag warning.

\$\$
JAP

Weather Observations from the Fire...

Time	Temp	RH	Wind Dir	Wind Speed (MPH) Eye level
10:30	69	34	South	4 gust to 6
11:30	77	27	South/SW	1-3 gusts to 5
13:30	77	27	South	3-6
2015	67	38		

Carr Creek Missouri RAWSDew Point temperatures or RH not available

Hour L.S.T.	Wind Ave Dir Max			Air Temperature	Total Precipitation
0800	3.0	134	4.0	61.0	0.00
0900	4.0	171	7.0	66.0	0.00
1000	5.0	181	11.0	73.0	0.00
1100	5.0	180	14.0	76.0	0.00
1200	7.0	160	16.0	77.0	0.00
1300	6.0	161	19.0	78.0	0.00
1400	7.0	171	18.0	79.0	0.00
1500	9.0	148	17.0	77.0	0.00
1600	8.0	152	17.0	76.0	0.00
1700	8.0	154	19.0	73.0	0.00
1800	7.0	145	18.0	68.0	0.00
1900	6.0	163	20.0	65.0	0.00
2000	5.0	159	14.0	63.0	0.00

Big Springs Missouri RAWS

Hour L.S.T.	Wind Ave Dir		Air Temperature	RH Percent	Dew Point	Total Pcpn
0800	8.0	180	64.0	49	41	0.00
0900	6.0	180	66.0	39	40	0.00
1000	11.0	180	73.0	30	40	0.00
1100	18.0	180	77.0	25	39	0.00
1200	16.0	180	77.0	27	40	0.00
1300	18.0	180	78.0	24	38	0.00
1400	18.0	180	77.0	27	40	0.00
1500	16.0	180	77.0	29	42	0.00
1600	19.0	180	74.0	32	42	0.00
1700	18.0	180	70.0	33	40	0.00
1800	14.0	180	67.0	37	40	0.00
1900	13.0	180	63.0	49	44	0.00
2000	14.0	180	61.0	55	45	0.00

Conclusion.

The forecast leading up to 04/04/05 was consistent through the prior week with high temperatures forecast in the 70s and southerly winds from 5 to 15 mph. The forecast issued Sunday did back off on the predicted higher winds for Monday mentioned Saturday afternoon. The Sunday morning Fire Weather Planning forecast alluded to the potential for Red Flag conditions Monday afternoon across the Mark Twain National Forest mainly from low relative humidity. The Fire Weather Planning Forecast Monday morning as well as the Spot Forecast for the Alley Springs Glade burn were headlined with "Near or Approaching Red Flag Conditions". A Red Flag Warning was issued for the Mark Twain National Forest at 151 PM CDT on April 4th.

Comparison of the observed weather conditions with the Spot Forecast issued for the Alley Springs Glade indicated a forecast temperature 2 degree lower than the actual high temperature of 79 degrees recorded at the Carr Creek RAWS. The forecast low relative humidity of 28% was 4 degrees higher than the lowest RH of 24% recorded at Big Springs RAWS. Forecast winds of 16 MPH with gusts to 25 MPH were 3 mph lower than the actual average high wind at Big Springs. The prevailing wind was from the south at all sites. The Spot forecasted wind direction did not take into account the complex terrain associated with the burn area. This may only have been accomplished with a forecaster present on the burn site. No observations from the prescribed burn area were provided prior to the beginning of the burn and no phone calls were made to the forecast office pertaining to this prescribed burn.