

Fuel Models 3 & 9

WELCOME TO THE BEHAVE SYSTEM

BURN SUBSYSTEM

FIRE1 PROGRAM: VERSION 4.4 -- FEBRUARY 1997

DEVELOPED BY: THE FIRE BEHAVIOR RESEARCH WORK UNIT
INTERMOUNTAIN FIRE SCIENCES LABORATORY
MISSOULA, MONTANA

YOU ARE RESPONSIBLE FOR SUPPLYING VALID INPUT AND FOR
CORRECTLY INTERPRETING THE FIRE BEHAVIOR PREDICTIONS.

ASSUMPTIONS, LIMITATIONS, AND APPLICATION OF MATHEMATICAL
MODELS USED IN THIS PROGRAM ARE IN:

Andrews, Patricia L. "BEHAVE: Fire behavior prediction and
fuel modeling system--BURN subsystem, Part 1", INT-GTR-194, 1986

Andrews, Patricia L., and Chase, Carolyn H. "BEHAVE: Fire
behavior prediction and fuel modeling system--BURN
subsystem, Part 2", INT-GTR-260, 1989

DIRECT

1--TWO FUEL MODEL CONCEPT - 80%	3	--	TALL GRASS, 2.5 FT (75 CM)					
	20%	9	--	HARDWOOD LITTER				
2--1-HR FUEL MOISTURE, % --	5.0		7.0	9.0	11.0	13.0		
3--10-HR FUEL MOISTURE, % -	8.0							
4--100-HR FUEL MOISTURE, %	12.0							
7--MIDFLAME WINDSPEED, MI/H	1.0		3.0	5.0	7.0	9.0		
8--TERRAIN SLOPE, % -----	5.0							
9--DIRECTION OF WIND VECTOR	.0							
DEGREES CLOCKWISE								
FROM UPHILL								
10--DIRECTION OF SPREAD ----	.0							(DIRECTION OF MAX SPREAD)
CALCULATIONS								
DEGREES CLOCKWISE								
FROM UPHILL								

FUEL MODEL 3 (80%)

=====
RATE OF SPREAD, CH/H (V4.4)
=====

1-HR	I	MIDFLAME WIND, MI/H				
MOIS	I					
	I	1.0	3.0	5.0	7.0	9.0
(%)	I-----					
	I					
5.0	I	20.	69.	129.	198.	273.
	I					
7.0	I	17.	58.	109.	168.	231.
	I					

9.0	I	15.	52.	97.	148.	205.
	I					
11.0	I	14.	47.	89.	136.	187.
	I					
13.0	I	13.	44.	82.	126.	173.

FUEL MODEL 9 (20%)

=====

RATE OF SPREAD, CH/H (V4.4)

=====

1-HR MOIS (%)	I	MIDFLAME WIND, MI/H				
		1.0	3.0	5.0	7.0	9.0
	I	-----				
	I					
5.0	I	1.	5.	10.	16.	25.
	I					
7.0	I	1.	4.	8.	14.	21.
	I					
9.0	I	1.	3.	7.	12.	19.
	I					
11.0	I	1.	3.	7.	11.	17.
	I					
13.0	I	1.	3.	6.	10.	16.

FUEL MODEL 3 (80%)

FUEL MODEL 9 (20%)

=====

WEIGHTED RATE OF SPREAD, CH/H (V4.4)

=====

1-HR MOIS (%)	I	MIDFLAME WIND, MI/H				
		1.0	3.0	5.0	7.0	9.0
	I	-----				
	I					
5.0	I	17.	56.	105.	162.	223.
	I					
7.0	I	14.	47.	89.	137.	189.
	I					
9.0	I	12.	42.	79.	121.	167.
	I					
11.0	I	11.	38.	72.	111.	153.
	I					
13.0	I	11.	36.	67.	103.	142.

FUEL MODEL 3 (80%)

=====

HEAT PER UNIT AREA, BTU/SQFT (V4.4)

=====

1-HR MOIS	I	MIDFLAME WIND, MI/H				
(%)	I	1.0	3.0	5.0	7.0	9.0
5.0	I	783.	783.	783.	783.	783.
7.0	I	712.	712.	712.	712.	712.
9.0	I	673.	673.	673.	673.	673.
11.0	I	654.	654.	654.	654.	654.
13.0	I	642.	642.	642.	642.	642.

FUEL MODEL 9 (20%)

=====

HEAT PER UNIT AREA, BTU/SQFT (V4.4)

=====

1-HR MOIS	I	MIDFLAME WIND, MI/H				
(%)	I	1.0	3.0	5.0	7.0	9.0
5.0	I	390.	390.	390.	390.	390.
7.0	I	355.	355.	355.	355.	355.
9.0	I	335.	335.	335.	335.	335.
11.0	I	326.	326.	326.	326.	326.
13.0	I	320.	320.	320.	320.	320.

FUEL MODEL 3 (80%)

=====

FIRELINE INTENSITY, BTU/FT/S (V4.4)

=====

1-HR MOIS	I	MIDFLAME WIND, MI/H				
(%)	I	1.0	3.0	5.0	7.0	9.0
5.0	I	293.	987.	1855.	2840.	3919.

7.0	I	225.	760.	1428.	2186.	3016.
	I					
9.0	I	189.	636.	1195.	1830.	2525.
	I					
11.0	I	168.	565.	1062.	1626.	2243.
	I					
13.0	I	152.	514.	966.	1480.	2041.

FUEL MODEL 9 (20%)

=====

FIRELINE INTENSITY, BTU/FT/S (V4.4)

=====

1-HR MOIS (%)	I	MIDFLAME WIND, MI/H				
		1.0	3.0	5.0	7.0	9.0
	I					
	I					
5.0	I	11.	32.	69.	117.	177.
	I					
7.0	I	8.	25.	53.	90.	136.
	I					
9.0	I	7.	21.	44.	76.	114.
	I					
11.0	I	6.	19.	39.	67.	101.
	I					
13.0	I	6.	17.	36.	61.	92.

FUEL MODEL 3 (80%)

=====

FLAME LENGTH, FT (V4.4)

=====

1-HR MOIS (%)	I	MIDFLAME WIND, MI/H				
		1.0	3.0	5.0	7.0	9.0
	I					
	I					
5.0	I	6.1	10.7	14.3	17.4	20.2
	I					
7.0	I	5.4	9.5	12.7	15.5	17.9
	I					
9.0	I	5.0	8.8	11.7	14.3	16.5
	I					
11.0	I	4.7	8.3	11.1	13.5	15.7
	I					
13.0	I	4.5	7.9	10.6	12.9	15.0

FUEL MODEL 9 (20%)

=====

FLAME LENGTH, FT (V4.4)

=====

1-HR	I	MIDFLAME WIND, MI/H				
MOIS	I					
(%)	I	1.0	3.0	5.0	7.0	9.0
	I					
5.0	I	1.3	2.2	3.1	4.0	4.9
	I					
7.0	I	1.2	2.0	2.8	3.6	4.3
	I					
9.0	I	1.1	1.8	2.6	3.3	4.0
	I					
11.0	I	1.0	1.7	2.4	3.1	3.8
	I					
13.0	I	1.0	1.7	2.3	3.0	3.6

SIZE-LINKED-TO-DIRECT

- 1--RATE OF SPREAD, CH/H --- OUTPUT FROM DIRECT. RANGE= 11. TO 223.
- 2--EFFECTIVE WIND, CH/H --- OUTPUT FROM DIRECT. RANGE= 1.0 TO 9.0
- 3--ELAPSED TIME, HR ----- .2

=====

AREA, ACRES (V4.4)

=====

1-HR	I	MIDFLAME WIND, MI/H				
MOIS	I					
(%)	I	1.0	3.0	5.0	7.0	9.0
	I					
5.0	I	1.1	6.8	17.2	31.9	50.6
	I					
7.0	I	.8	4.8	12.3	22.9	36.3
	I					
9.0	I	.6	3.8	9.7	18.0	28.4
	I					
11.0	I	.5	3.2	8.1	15.0	23.8
	I					
13.0	I	.4	2.7	6.9	12.9	20.4

=====

PERIMETER, CHAINS (V4.4)

=====

1-HR	I	MIDFLAME WIND, MI/H				
MOIS	I					
(%)	I	1.0	3.0	5.0	7.0	9.0
	I					

5.0	I	12.	31.	52.	76.	101.
	I					
7.0	I	10.	26.	44.	64.	85.
	I					
9.0	I	9.	23.	39.	57.	76.
	I					
11.0	I	8.	21.	36.	52.	69.
	I					
13.0	I	7.	20.	33.	48.	64.

CONTAIN-LINKED-TO-DIRECT-AND-SIZE

1--RUN OPTION -----	1.=COMPUTE LINE BUILDING RATE		
2--MODE OF ATTACK -----	2.=REAR		
3--RATE OF SPREAD, CH/H ---	OUTPUT FROM DIRECT.	RANGE=	11. TO 223.
4--INITIAL FIRE SIZE, AC --	OUTPUT FROM SIZE.	RANGE=	0. TO 51.
5--LENGTH-TO-WIDTH RATIO --	OUTPUT FROM SIZE.	RANGE=	1.3 TO 3.3
6--BURNED AREA TARGET, AC -	10.0		

=====

TOTAL LENGTH OF LINE, CHAINS (V4.4)

=====

1-HR	I	MIDFLAME WIND, MI/H				
MOIS	I					
(%)	I	1.0	3.0	5.0	7.0	9.0
5.0	I	40.*	38.#	-1.#	-1.#	-1.#
	I					
7.0	I	41.*	39.#	-1.#	-1.#	-1.#
	I					
9.0	I	41.*	40.#	-1.#	-1.#	-1.#
	I					
11.0	I	42.*	41.#	41.#	-1.#	-1.#
	I					
13.0	I	43.*	41.#	41.#	-1.#	-1.#
	I					

-1 = INITIAL AREA IS EITHER LARGER THAN OR NEARLY
EQUAL TO THE BURNED AREA TARGET.

* = FIRE IS TOO INTENSE FOR DIRECT ATTACK BY
HAND CREWS.
EQUIPMENT SUCH AS DOZERS, PUMPERS, PLOWS,
AND RETARDANT AIRCRAFT CAN BE EFFECTIVE.

= CONTROL EFFORTS AT THE HEAD OF THE FIRE
WILL PROBABLY BE INEFFECTIVE.

=====

TOTAL CONTAINMENT TIME, HOURS (V4.4)

=====

1-HR MOIS	I	MIDFLAME WIND, MI/H				
(%)	I	1.0	3.0	5.0	7.0	9.0
5.0	I	.8*	.1#	-1.0#	-1.0#	-1.0#
7.0	I	1.0*	.1#	-1.0#	-1.0#	-1.0#
9.0	I	1.2*	.2#	-1.0#	-1.0#	-1.0#
11.0	I	1.4*	.2#	.0#	-1.0#	-1.0#
13.0	I	1.6*	.3#	.1#	-1.0#	-1.0#

-1 = INITIAL AREA IS EITHER LARGER THAN OR NEARLY
EQUAL TO THE BURNED AREA TARGET.

* = FIRE IS TOO INTENSE FOR DIRECT ATTACK BY
HAND CREWS.
EQUIPMENT SUCH AS DOZERS, PUMPERS, PLOWS,
AND RETARDANT AIRCRAFT CAN BE EFFECTIVE.

= CONTROL EFFORTS AT THE HEAD OF THE FIRE
WILL PROBABLY BE INEFFECTIVE.

=====

TOTAL LINE BUILDING RATE, CH/H (V4.4)

=====

1-HR MOIS	I	MIDFLAME WIND, MI/H				
(%)	I	1.0	3.0	5.0	7.0	9.0
5.0	I	51.*	590.#	-1.#	-1.#	-1.#
7.0	I	40.*	292.#	-1.#	-1.#	-1.#
9.0	I	34.*	205.#	-1.#	-1.#	-1.#
11.0	I	30.*	164.#	1251.#	-1.#	-1.#
13.0	I	27.*	139.#	704.#	-1.#	-1.#

-1 = INITIAL AREA IS EITHER LARGER THAN OR NEARLY
EQUAL TO THE BURNED AREA TARGET.

* = FIRE IS TOO INTENSE FOR DIRECT ATTACK BY
HAND CREWS.
EQUIPMENT SUCH AS DOZERS, PUMPERS, PLOWS,
AND RETARDANT AIRCRAFT CAN BE EFFECTIVE.

= CONTROL EFFORTS AT THE HEAD OF THE FIRE
WILL PROBABLY BE INEFFECTIVE.

CONTAIN-LINKED-TO-DIRECT-AND-SIZE

1--RUN OPTION -----	2.=COMPUTE BURNED AREA		
2--MODE OF ATTACK -----	2.=REAR		
3--RATE OF SPREAD, CH/H ---	OUTPUT FROM DIRECT. RANGE=	11. TO	223.
4--INITIAL FIRE SIZE, AC --	OUTPUT FROM SIZE. RANGE=	0. TO	51.
5--LENGTH-TO-WIDTH RATIO --	OUTPUT FROM SIZE. RANGE=	1.3 TO	3.3
7--TOTAL LINE BLDG RATE----	64.0		

CH/H

=====

TOTAL LENGTH OF LINE, CHAINS (V4.4)

=====

1-HR	I	MIDFLAME WIND, MI/H				
MOIS	I					
	I	1.0	3.0	5.0	7.0	9.0
(%)	I-----					
	I					
5.0	I	27.*	-2.#	-2.#	-2.#	-2.#
	I					
7.0	I	19.*	-2.#	-2.#	-2.#	-2.#
	I					
9.0	I	16.*	-2.#	-2.#	-2.#	-2.#
	I					
11.0	I	13.*	-2.#	-2.#	-2.#	-2.#
	I					
13.0	I	12.*	-2.#	-2.#	-2.#	-2.#
	I					

-2 = FORWARD RATE OF SPREAD IS EITHER GREATER THAN
OR NEARLY EQUAL TO LINE BUILDING RATE PER FLANK.

* = FIRE IS TOO INTENSE FOR DIRECT ATTACK BY
HAND CREWS.
EQUIPMENT SUCH AS DOZERS, PUMPERS, PLOWS,
AND RETARDANT AIRCRAFT CAN BE EFFECTIVE.

= CONTROL EFFORTS AT THE HEAD OF THE FIRE
WILL PROBABLY BE INEFFECTIVE.

=====

TOTAL CONTAINMENT TIME, HOURS (V4.4)

=====

1-HR	I	MIDFLAME WIND, MI/H				
MOIS	I					
	I	1.0	3.0	5.0	7.0	9.0
(%)	I-----					
	I					

5.0	I	.4*	-2.0#	-2.0#	-2.0#	-2.0#
	I					
7.0	I	.3*	-2.0#	-2.0#	-2.0#	-2.0#
	I					
9.0	I	.2*	-2.0#	-2.0#	-2.0#	-2.0#
	I					
11.0	I	.2*	-2.0#	-2.0#	-2.0#	-2.0#
	I					
13.0	I	.2*	-2.0#	-2.0#	-2.0#	-2.0#
	I					

-2 = FORWARD RATE OF SPREAD IS EITHER GREATER THAN
OR NEARLY EQUAL TO LINE BUILDING RATE PER FLANK.

* = FIRE IS TOO INTENSE FOR DIRECT ATTACK BY
HAND CREWS.
EQUIPMENT SUCH AS DOZERS, PUMPERS, PLOWS,
AND RETARDANT AIRCRAFT CAN BE EFFECTIVE.

= CONTROL EFFORTS AT THE HEAD OF THE FIRE
WILL PROBABLY BE INEFFECTIVE.

=====

FINAL FIRE SIZE, ACRES (V4.4)

=====

1-HR MOIS	I	MIDFLAME WIND, MI/H				
		1.0	3.0	5.0	7.0	9.0
(%)	I	-----				
	I					
5.0	I	5.*	-2.#	-2.#	-2.#	-2.#
	I					
7.0	I	3.*	-2.#	-2.#	-2.#	-2.#
	I					
9.0	I	2.*	-2.#	-2.#	-2.#	-2.#
	I					
11.0	I	1.*	-2.#	-2.#	-2.#	-2.#
	I					
13.0	I	1.*	-2.#	-2.#	-2.#	-2.#
	I					

-2 = FORWARD RATE OF SPREAD IS EITHER GREATER THAN
OR NEARLY EQUAL TO LINE BUILDING RATE PER FLANK.

* = FIRE IS TOO INTENSE FOR DIRECT ATTACK BY
HAND CREWS.
EQUIPMENT SUCH AS DOZERS, PUMPERS, PLOWS,
AND RETARDANT AIRCRAFT CAN BE EFFECTIVE.

= CONTROL EFFORTS AT THE HEAD OF THE FIRE
WILL PROBABLY BE INEFFECTIVE.

**APPENDIX #5
AGENCY ADMINISTRATOR
GO/NO-GO PRE-IGNITION APPROVAL**

Prescribed Fire Name: _____

Date: _____

A) Instructions

The Agency Administrator's Go/No-Go Pre-Ignition Approval is the first of two GO/NO-GO decisions that must be completed before a prescribed fire can be implemented. The Agency Administrator's Go/No-Go Pre-Ignition Approval is the final management approval prior to execution of the prescribed fire and evaluates whether compliance requirements, prescribed fire plan elements, and internal and external notifications have been completed. The Agency Administrator's Go/No-Go Pre-Ignition Approval is valid for 30 days. If ignition of the prescribed fire is not initiated prior to expiration date determined by the Agency Administrator, a new approval will be required.

B) Key Elements

1. Is the prescribed fire plan up to date?

Hints: changes, amendments, seasonality.

2. Have all compliance requirements been completed?

Hints: cultural, threatened and endangered species, smoke management.

3. Is risk management in place and the residual risk acceptable?

Hints: Prescribed Fire Mitigation Table and Prescribed Fire Complexity Rating Guide completed with rationale and mitigations identified.

4. Will all elements of the prescribed fire plan be met?

Hint: preparation work, mitigation, weather, organization, prescription.

5. Have all internal and external notifications and media releases been completed?

6. Are key park staff fully briefed, and understand the implementation of the prescribed fire?

7. Other?

Recommended by: _____ Date _____
FMO/Burn Boss

Approved by: _____ Date _____
Park Superintendent

Approval expires: _____ (May not be more than 30 days after approved date.)
Date

APPENDIX #6
Prescribed Fire Operations
GO/NO-GO Checklist

Prescribed Fire Name:

Date:

	YES	NO
- Has Agency Administrator GO/NO-GO Pre-Ignition Approval been approved?		
Narrative/Comments:		
- Are current and forecasted weather conditions favorable for execution of the prescribed fire? (hints: spot weather, dialogue with fire weather forecaster, climatological analysis complete)		
Narrative/Comments:		
- Have all key personnel listed on the Incident Action Plan (IAP) been briefed with an opportunity to give feedback? (hints: safety, objectives, assignments)		
Narrative/Comments:		
- Has all pre-burn preparedness work been completed? (hints: fuels and weather observations, signs, closures, smoke management, unit preparation)		
Narrative/Comments:		
- Are all equipment and supplies required in the prescribed fire plan in place and functional? (hints: pumps, radios, ignition devices, hose lays, vehicles, aviation, etc.)		
Narrative/Comments:		
- Are all holding resources described in the IAP committed and can be on-scene within specified time frames?		
Narrative/Comments:		
- Are all personnel certified for their assigned positions? (hints: Check Red Cards)		
Narrative/Comments:		
- There are no extenuating circumstances that preclude successful completion of this project? (hints: regional & national preparedness, unusual circumstances, unusual drought, outstanding issues, other fires, recent fire escapes, etc.)		
Narrative/Comments:		
IF ALL BOXES HAVE BEEN CHECKED "YES" YOU MAY PROCEED WITH THE TEST FIRE.		
TEST FIRE DOCUMENTATION AND RESULTS:		

	YES	NO
- Observed Fire Behavior within Prescription?		
Narrative/Comments:		
- Test fire was successful?		
Narrative/Comments:		
- Are all prescription parameters in the prescribed fire plan favorable for implementing the project? (hints: each plan element, pre-burn, smoke management, cooperater coordination)		
Narrative/Comments:		
IF LAST 3 BOXES ARE ALL "YES", YOU MAY PROCEED WITH PRESCRIBED FIRE.		

Signatures

<u>RX BURN BOSS:</u>	<u>IGNITION SPECIALIST:</u>
<u>HOLDING OPERATIONS:</u>	<u>DATE:</u>

	<p>C. Hauling flammable substances.</p> <p>D. Transporting sharp tools.</p>	<p>backing.</p> <p>B. Check loads for security before departing – use tie downs.</p> <p>C. Use appropriate containers for hauling drip torch fuels and gasoline. Secure containers on vehicle.</p> <p>D. Use guards and secure tools in engine compartments or on vehicles.</p>
--	---	---

JOB HAZARD ANALYSIS

United States Department of Interior NATIONAL PARK SERVICE	1. WORK PROJECT/ACTIVITY Prescribed Fire	2. LOCATION Wilson’s Creek National Battlefield	3. UNIT Core Area
JOB HAZARD ANALYSIS (JHA)	4. NAME OF ANALYST B. Bloodworth	5. JOB TITLE Fuels Specialist	6. DATE PREPARED 12-28-01
7. TASKS/PROCEDURES	8. HAZARDS	9. ABATEMENT ACTIONS ENGINEERING CONTROLS – SUBSTITUTION - ADMINISTRATIVE CONTROLS - PPE	
2. Motor Vehicle Operation (Cont.)	E. Loading vehicles.	E. Use of proper lifting techniques.	
	F. Trailer use.	F. Use safe loading and operation procedures. Refer to Job Hazard Analysis on trailer use. Use spotter when backing.	
	G. Smoke on Roadways	G. Use smoke ahead signs and smoke monitors.	
3. ATV Operation	A. Operation accidents	A. Proper ATV procedures. Refer to Job Hazard Analysis on ATV operations for more detail. Use qualified atv operators and wear DOT approved helmets. Only one rider per atv.	
4. Holding Operations	A. Proximity to intense heat and erratic fire behavior.	A. Use Personal Protective Equipment (PPE), maintain close supervision. Thorough briefing on expected fire behavior. Use appropriate tactics to insure personnel are not subjected to unnecessary heat.	
	B. Fatigue	B. Rotate personnel on different tasks. Limit smoke exposure. Take adequate	

5. Mop-up Operations	<p>C. Excessive Smoke Exposure</p> <p>D. ATV Operations</p> <p>E. Poor visibility due to smoke.</p> <p>A. Poor footing</p> <p>B. Falling snags</p>	<p>breaks. Drink plenty of water.</p> <p>C. Rotate personnel so that one group is not always in the smoke.</p> <p>D. Stay alert and watch for ATV traffic on fireline</p> <p>E. Stay alert. Watch for tripping and overhead hazards, sudden drop-offs, ATV traffic.</p> <p>A. Be constantly aware; identify hazard areas; slow down.</p> <p>B. Be alert, post lookouts when necessary. Flag off dangerous areas. Watch for strong winds. Use qualified fallers only.</p>
----------------------	--	--

JOB HAZARD ANALYSIS

United States Department of Interior NATIONAL PARK SERVICE	1. WORK PROJECT/ACTIVITY Prescribed Fire	2. LOCATION Wilson's Creek National Battlefield	3. UNIT Core Area
JOB HAZARD ANALYSIS (JHA)	4. NAME OF ANALYST B. Bloodworth	5. JOB TITLE Fuels Specialist	6. DATE PREPARED 12-28-01
7. TASKS/PROCEDURES	8. HAZARDS	9. ABATEMENT ACTIONS ENGINEERING - CONTROLS - SUBSTITUTION - ADMINISTRATIVE CONTROLS - PPE	

<p>6. Monitoring Operations</p>	<p>C. Fatigue</p> <p>A. Possibility of entrapment</p> <p>B. Proximity to intense heat and erratic fire behavior.</p>	<p>C. Rotate personnel on different tasks. Take adequate breaks. Drink plenty of water.</p> <p>A. Stay in communication and relay location to Burn Boss and Ignition Specialists. Identified escape routes and safe zones in briefing.</p> <p>B. Use Personal Protective Equipment (PPE), maintain close supervision. Thorough briefing on expected fire behavior. Use appropriate tactics to insure personnel are not subjected to unnecessary heat.</p>
<p>10. SUPERVISOR'S SIGNATURE</p>	<p>11. TITLE</p>	<p>12. DATE</p>

APPENDIX # 8
IAP/BRIEFING GUIDE

- I. Present Handouts**
 - A. Map of Burn**
 - B. Organization Chart**

- II. Describe Area Of Burn**
 - A. Vegetation Type**
 - B. Acreage**
 - C. Slope**
 - D. Roads/Access**
 - E. High Values at risk**
 - F. Water Sources-natural, tanker and hydrants**
 - G. Natural/Manmade barriers**

- III. Weather Forecast- Use National Weather Service "Forestry" and "Smoke Management" Forecasts for applicable Zones. Use "Fire Weather Special Request" Form if updates are deemed necessary.**
 - A. Wind direction and Speed**
 - B. Relative Humidity**
 - C. Temperatures**
 - D. Predicted Changes**

- IV. Organization**
 - A. Organization Chart - Location on Map**
 - B. Equipment - tankers, refueling, etc.**
 - C. Fire Monitoring**
 - D. Any other resources**
 - E. Transition Fire Plan**

- V. Firing Sequence**
 - A. Test fire**
 - B. Type and Sequence of Firing**

- VI. Radio Assignments**
 - A. Given Day of Burn**
 - B. Communication Plan**

- VII. Safety**
 - A. Winds**
 - B. Escape Routes and Safe Zones**
 - C. Hazards - crew and equipment (wildlife, research plots, trash, etc.)**
 - D. Personal Protective equipment (PPE)**
 - E. Refueling - fuel handling, gloves, spilling, etc.**
 - F. Activation of emergency and headlights on major roads**
 - G. Other public safety considerations**

- VIII. Comments and Questions Period**

APPENDIX # 9

ADEQUATE HOLDING RESOURCES WORKSHEET

Project Name: Core Area (All Blocks)
 Prepared By/Date: Bloodworth 12-28-01

Fuel Models Inside Project Area: 3 & 9
 Fuel Models Outside Project Area: 9 (E)

Characteristics	Output type	Modeling Predictions Inside Project Area	Modeling Predictions Outside Project Area	Unit of Measure
CRITICAL FIRE INPUTS	1 Hr Fuel Moisture	5	5	%
	Wind Speed	9	9	MPH
	Slope	30	30	%
KEY FIRE BEHAVIOR OUTPUTS	Rate of Spread	26	26.0	ch/hr
	Fire line Intensity	186	186	BTU/ft/sec
	Flame Length	5	5.0	Feet
	POI	70	70	%
	Spotting Distance		0.3	Miles
	Scorch Height			Feet
FIRE SIZE	Projection Time			Hours
	Forward Spread			Chains
	Backward Spread			Chains
FIRE CONTAINMENT	Method Of Attack	Rear	Rear	Head/Rear
	Max Escape Target	10	10	Acres
	Max Containment Time	1	1	Hours
	Total Line Building Rate	63	63	Ch/hr

1. Choose worst case total line building rate above that is needed for containment of slop over or spot fire : 63h/hr
2. Estimate potential number spot fires or slop overs at on time: 1
3. TOTAL LINE BUILDING RATE NEEDED (multiply line 1 times line 2) 63ch/hr
4. Production Rates: Ease of Access: POOR-FAIR-GOOD-EXCELLEN(circle)
 Fuel Resistance to Control LOW- MODERATE-HIGH-EXTREME(circle)
 (refer to fire line handbook) Hand Crew Production 8 ch/hr
 Engine Production (Crew of 2) 8 ch/hr
 Dozer Production (Type) ch/hr

On Site Organization	Total # Planned On Burn	Total # Available for Spot Fire or Slop Over Control		Line Building Production Rates		Spot Fire or Slop Over Line Building Capacity
Overhead	4	0	X	8	ch/hr	0
Firing Crew	3	2	X	8	ch/hr	16
Holding (ATV w/ water)	4	4	X	8	ch/hr	32
Other Personnel			X	8	ch/hr	0
Engine (Crew of 2)	2	1	X	25	ch/hr	25
Dozer (Size)			X		ch/hr	
Other Equipment			X		ch/hr	

5. TOTAL SLOP OVER OR SPOT FIRE LINE BUILDING RATE CAPACITY = 75 ch/hr

6. DETERMINATION OF ADEQUATE HOLDING RESOURCES (Line 5 minus Line 3) +12 ch/hr
 If number on line 6 is positive then adequate holding forces will be available. If number is negative, more holding resources are needed to control potential spot fires or slopovers.

**APPENDIX #10
POST-PROJECT EVALUATION**

Instructions for Completion of Post-Project Evaluation Form

This form is to be completed and submitted for review within 30 days of declaring the project complete.

Block 1 Self-explanatory

Block 2 Copy of the Project Objectives as listed in the Project Plan.

Block 3 Give quantitative results of how well objectives were met, i.e. % of 1 hour and 10 hour fuels removed, % of burn area with fuels reduced, % of area with acceptable/unacceptable scorch, etc.

Block 4 Give a short narrative of problems encountered and suggestions for improving or refining operations and prescriptions i.e. firing pattern, equipment limitations, drought index, effectiveness of barriers.

Block 5 Self-explanatory - for providing feedback to the Program

Block 1)

Individual Leading Evaluation: _____

Management: _____ **Project**

Name: _____

Acres Treated: _____ **Fire**

Number: _____

Total Cost:

Cost/Acre: _____

(Block 2)

Objectives:

(Block 3)

Results:

(Block 4)

Problems Encountered, Methods to Improve Next Operation:

Review & Signature:

Burn Boss: _____

Comments:

FMO: _____

Comments:

Appendix # 12
Pre-burn Notifications List

Mandatory Contact List: All persons or entities on this list will be contacted prior to ignition.

Name	Agency	Phone Number	Date Notified
Dispatcher	Green County Sheriff	(417)868-4040	Burn day
Dispatcher	Christian County Sheriff	(417)581-2332	Burn day
Dispatcher	Missouri State Patrol	(417)895-6868	Burn day
Dispatcher	Battlefield VFD	(417)868-4040	Burn day
Dispatcher	Clever VFD	(417)868-4040	Burn day
KAMO Electric Coop	Vinita, OK	(918)256-5551 x217	2 days prior
U.S. Forest Service	Mark Twain N.F., Ava District	(417)683-4428	Burn day
Barnes, Richard	Air Pollution Control Dept., Missouri Dept. of Natural Resources, Springfield, MO	(471)891-4328	1 week prior
Parker, Duane	State Forester, Missouri Dept. of Conservation, Springfield, MO	(417)895-6880	

Optional Cooperator Contact List: Every effort will be made to contact these cooperators before ignition, however , notification is optional and is not required.

Name	Agency	Phone Number	Date Notified
Davis, William	Director, National Weather Service	869-4491 or 863-7889	1 week prior
Shumway, Steve	National Weather Service	869-4491 or 863-7889	1 week prior

Optional Media Contact List: Every effort will be made to contact these members of the media by phone before ignition, however, notification is optional and is not required.

Name	Agency	Phone Number	Date Notified
Newsroom	KWFC Radio	869-0891	1 week prior
Newsroom	KY3 TV	268-3299 or 268-3200	1 week prior
Newsroom	KSMU	836-5878	1 week prior
Newsroom	KTTS	869-2153	1 week prior
Newsroom	KOLR TV	862-1010	1 week prior
Newsroom	KSPR TV	831-1234	1 week prior

Optional Park Neighbor Contact List: Every effort will be made to contact these park neighbors by phone or mail before ignition, however, notification is optional and is not required.

Name	Agency	Phone Number	Date Notified
Blackwell, D.	Park Neighbor	(417)883-9962	1 week prior
Bybee, L.J.	Park Neighbor	Unlisted	1 week prior
Carroll, Leo	Park Neighbor	(417)869-9787	1 week prior
Dulan, Frances	Park Neighbor	(417)865-6915	1 week prior
Hash, Robert	Park Neighbor	(Warsaw, MO)	1 week prior
Heston, Wayne	Park Neighbor	(417)732-8226	1 week prior
Keet, James	Park Neighbor	(417)887-8711	1 week prior
Kary, Bill	Park Neighbor	(417)889-6440	