NATIONAL PARK SERVICE
NEW RIVER GORGE NATIONAL RIVER
PRESCRIBED FIRE PLAN

XERIC OAK HABITAT
Restoration Prescribed Burn
BACKUS UNIT

Complexity Rating: LOW
(Minimum RXB2 Required)

PREPARED BY: _____ **DATE: _____**
Peg Ainslie, Assistant Fire Management Officer (RXB2)

REVIEW BY: _____ **DATE: _____**
Jeff B.West, Chief, Visitor and Resource Protection

REVIEW BY: _____ **DATE: _____**
Mark Graham, Chief, Resource Management and Planning

REVIEW BY: _____ **DATE: _____**
Deborah Darden, Deputy Superintendent

TECHNICAL REVIEW BY: _____ **DATE: _____**

APPROVED BY: _____ **DATE: _____**
Patricia Kicklighter, Superintendent

DOI: The approved Prescribed Fire Plan constitutes the authority to burn. No one has the authority to burn without an approved plan or in a manner not in compliance with the approved plan. Actions taken in compliance with the approved Prescribed Fire Plan will be fully supported. Personnel will be held accountable for actions taken that are not in compliance with elements of the approved plan regarding execution in a safe and cost-effective manner.

NFPORS # 6282165

Contents

Executive Summary:

The New River Gorge National River seeks to reintroduce fire into the xeric oak/mountain laurel/huckleberry forest to prevent losing their dominance on dry ridges and rimrock outcrops of the gorge. This forest type is fire adaptive, meaning occasional fires actually help oaks compete favorably with shade-loving species such as, maples, basswood, beach, white pine, and yellow buckeye. Through the use of prescribed burning, the National Park Service is creating conditions that allow young chestnut oak, black oak, scarlet oak, Virginia pine, pitch pine, hickory, mountain laurel, and huckleberries, to thrive. The park's long-term monitoring program has documented the underrepresentation of "dry" oaks in the sapling layer and the significant increase in mesic species, predominately red maple, which are expected to replace the oaks and rimrock pines in the future.

The park is recommending the reintroduction of prescribed fire into the xeric oak/mountain laurel/huckleberry forest, which occurs on less than 2,777 acres (<4% of NERI forests), in an effort to abate their replacement by more shade tolerant trees lacking the hard mast (acorns, pine nuts, and hickories) necessary to sustain many species of wildlife, including the rare Allegheny woodrat.

Backus Mountain Burn Unit…looking west to east, just downhill from the top. Sept, 2012.

ELEMENT 2: PRESCRIBED FIRE GO/NO-GO CHECKLISTS

Agency Administrator GO/NO GO Checklist

Instructions: The Agency Administrator's Pre-Ignition Approval is the intermediate planning review process (i.e. between the Prescribed Fire Complexity Rating System Guide and Go/No-Go Checklist) that should be completed before a prescribed fire can be implemented. The Agency Administrator's Pre-Ignition Approval evaluates whether compliance requirements, Prescribed Fire Plan elements, and internal and external notifications have been or will be completed and expresses the Agency Administrator's intent to implement the Prescribed Fire Plan. If ignition of the prescribed fire is not initiated prior to expiration date determined by the Agency Administrator, a new approval will be required.

YES	NO	KEY ELEMENT QUESTIONS
		Is the Prescribed Fire Plan up to date? *Hints: amendments, seasonality.*
		Will all compliance requirements be completed? *Hints: cultural, threatened and endangered species, smoke management, NEPA.*
		Is risk management in place and the residual risk acceptable? *Hints: Prescribed Fire Complexity Rating Guide completed with rationale and mitigation measures identified and documented?*
		Will all elements of the Prescribed Fire Plan be met? *Hints: Preparation work, mitigation, weather, organization, prescription, contingency resources*
		Will all internal and external notifications and media releases be completed? *Hints: Preparedness level restrictions*
		Will key agency staff be fully briefed and understand prescribed fire implementation?
		Are there any other extenuating circumstances that would preclude the successful implementation of the plan?
		Have you determined if and when you are to be notified that contingency actions are being taken? Will this be communicated to the Burn Boss?
		Other:

Recommended by: _____ Date: _____
FMO/ Burn Boss

Approved by: _____ Date: _____
Agency Administrator

Approval expires (date): _____

PRESCRIBED FIRE GO/NO-GO CHECKLIST

A. Has the burn unit experienced unusual drought conditions or does it contain above normal fuel loadings which were not considered in the prescription development? If NO proceed with checklist., if YES go to item B.	**YES**	**NO**
B. Has the prescribed burn plan been reviewed and an amendment and technical review been completed; or has it been determined that no amendment is necessary? If Yes to any, proceed with check list below, if NO, STOP.		

YES	NO	QUESTIONS
		Are ALL fire prescription elements met?
		Are ALL smoke management specifications met?
		Have ALL required current and projected fire weather forecasts been obtained and are they favorable?
		Are ALL planned operations personnel and equipment on-site, available, and operational?
		Has the availability of ALL contingency resources been checked, and are they available?
		Have ALL personnel been briefed on the project objectives, their assignment, safety hazards, escape routes, and safety zones?
		Have all the pre-burn considerations identified in the Prescribed Fire Plan been completed or addressed?
		Have ALL the required notifications been made?
		Are ALL permits and clearances obtained?
		In your opinion, can the burn be carried out according to the Prescribed Fire Plan and will it meet the planned objective?

If all the questions were answered "YES" proceed with a test fire. Document the current conditions, location, and results

_____ _____

Burn Boss Date

ELEMENT 3 COMPLEXITY ANALYSIS SUMMARY

Xeric Oak/Mountain Laurel/Huckleberry Backus Mountain Prescribed Burn			
Element	**Risk**	**Potential Consequence**	**Technical Difficulty**
1. Potential for escape	LOW	MODERATE	LOW
2. The number and dependence of activities	LOW	LOW	LOW
3. Off-site Values	LOW	LOW	LOW
4 On-Site Values	LOW	LOW	LOW
5. Fire Behavior	LOW	LOW	LOW
6. Management organization	LOW	LOW	LOW
7. Public and political interest	LOW	MODERATE	LOW
8. Fire Treatment objectives	LOW	MODERATE	LOW
9 Constraints	LOW	LOW	LOW
10 Safety	LOW	LOW	LOW
11. Ignition procedures/ methods	LOW	LOW	MOD
12. Interagency coordination	LOW	LOW	LOW
13. Project logistics	LOW	LOW	LOW
14 Smoke management	LOW	LOW	LOW
COMPLEXITY RATING SUMMARY			
		OVERALL RATING	
RISK		**LOW**	
CONSEQUENCES		**LOW**	
TECHNICAL DIFFICULTY		**LOW**	
SUMMARY COMPLEXITY DETERMINATION		**LOW**	

RATIONALE: This prescribed fire project is rated as LOW complexity due to the fact that the project is approximately 17 acres in size with one continuous fuel type and there are good natural and man-made barriers surrounding the unit. The plan calls for low to moderate fire intensities easily achieved in this fuel model. The fuels surrounding the target area are classified the same as the target area, leaf litter with light fuel loading. As this is the first time this area has been burned an RXB2 is required for implementation, as per FMO.

ELEMENT 4: DESCRIPTION OF PRESCRIBED FIRE AREA

A. Physical Description

1. **Location:** In southeastern Fayette County, Backus Mountain forms part of the northern wall of the New River Gorge. It rises steeply more than 1,500 feet from the banks of the New River and Laurel Creek to 2,825 feet above sea level. Much of the mountain remains wooded and is a popular destination for hunters in fall and spring.

Administrative Unit:	New River Gorge National River
County:	Southeastern Fayette County
State:	West Virginia
Prescribed Fire Name:	Backus Mountain
Topo Map:	Prince Quadrangle - USGS
Staging Area Coordinates:	N 37° 46' 59" W 80° 53' 50"
Elevation:	2280' to 2560'
Directions:	From Prince, take route 41 East for 5.5 miles, then turn right onto Backus Mountain Road and stay right onto NPS property for four miles.

2. **Size:** The overall project size is 17 acres

3. **Topography:** The terrain varies from 0% to 50% slope, with an average aspect of Southwest, and Elevation from 2280' – 2560'.

4. **Project Boundaries:** The burn location has an old logging road on the northern perimeter and has 3 drainages on the east, west and south Flanks. The drainage on the Southern perimeter is an intermittent stream that in the spring has good water flow through it. Two leaf blown hand lines are located on the uphill side of the east and west flanks and are tied directly to the wet creek on the south and the logging road to the north. In the late summer this creek is intermittent, but will still provide a natural barrier of exposed rock on the southern perimeter.

B. Vegetation/Fuels Description:

Vegetation and fuel descriptions are based on field inspection and classified using the 2005 Scott and Burgan standard fire behavior fuel models.

1. **Inside Burn Area:**

Name	Description	Fuel Model CODE	Acres	% of Unit	1hr & 10 hr fuel load in tons/acre
Leaf Litter	0 to 3" depth	TL2	17	99%	1.4 ta

The burn unit includes a large rock band outcropping in the south east section. The unit is best described as hardwood leaf litter, Fuel Model TL2. Fire behavior is expected to be low to moderate due to fuel loading conditions. There are several large diameter trees that will be addressed further in Element 9, On-Site Considerations page 11.

2. **Adjacent Fuels Data:** Adjacent fuels are similar to the fuels within the unit and consist of fuel model TL2.

C. Description of Unique Features:
Several unique features are located within the burn unit area including a rock cliff band, abandoned logging roads in several directions, and a borrow pit pond depression.

D. Maps (See Appendix A Maps)

E. NPS Assessment of Effect to federally listed Threatened or Endangered Species
The 17-acre project area is within the range of and may provide suitable habitat for two federally listed bat species: the Indiana bat (Myotis sodalis) and the Virginia big-eared bat (Corynorhinus townsendii virginianus). The nearest mine portal known to be used by either of these bat species is located approximately 7.3 miles from the project area, and there are no mine portals located within the project area. There are no known Indiana bat maternity roosts within the project area or within 2.5 miles of the project area. Summer capture bat surveys are not conducted within the park, but fall swarm surveys at mine portal entrances are conducted. Prior to the burn, fuels will be raked away from the bases of standing snags that are greater than or equal to 5 inches DBH to limit ignition of trees which could serve as maternity roost habitat for Indiana bats or other bat species. If any trees within the burn unit need to be felled before the burn because they are designated as hazard trees, approval must first be obtained from the park wildlife biologist who will ensure that the trees are not currently being used as maternity roosts by Indiana bats.

To limit effects on eastern red bats (Lasiurus borealis) which might be roosting in the ground leaf litter, the burn will be conducted when the ambient temperature is 50°F or warmer.

The project area is also within the range of two federally listed plant species: Virginia spiraea (Spiraea virginiana) and running buffalo clover (Trifolium stoloniferum). There are no known occurrences of either of these plants species within the project area. The habitat within the project area is not conducive to the presence of Virginia spiraea. Running buffalo clover is not known to occur in the park and its park status is now only historic.

In conclusion, the NPS has determined that the proposed prescribed burns may affect, but are unlikely to adversely affect any federally-listed endangered or threatened species.

ELEMENT 5: GOALS AND OBJECTIVES

- Fire Fighter Safety- Maintain an organized controlled environment where the project can be accomplished with minimal risk to firefighters.

- **GOALS:**
  - **1.** Restore and maintain the fire adapted oak/ericad vegetation on site.
  - **2.** Reduce hazardous fuel accumulations thus decreasing the threat of catastrophic wildfire impacts to the surrounding communities and park neighbors.

- **OBJECTIVES:**
  - **1. RESOURCE OBJECTIVES:**
    - A. Total percent herbaceous cover will be at least 90% (ninety)
    - B. Reduce duff (decaying ground) layer by 15 to 35% over the next 10 years.

- C. Limit loss of snags (potential bat habitat) > 13cm or 5" dbh to < 5%
- D. Limit mortality of mature pitch/Virginia pines and large oaks to 15-30% as measured 2 years post burn.
- E. No net increase in invasive exotic species cover as measured 1 year post burn.

- **2. PRESCRIBED FIRE OBJECTIVES:**
  - A. Provide for visitor and fire fighter safety.
  - B. Burn >60% of the surface litter over 75% of the target area
  - C. Reduce mesic pole size (2.5-15cm dbh) trees by 70%
  - D. Limit loss of snags (potential bat habitat) > 13cm or 5" dbh to < 5%
  - E. Prevent the creation of large canopy gaps >.5acres in areas of mature forest
  - F. Limit mortality of mature pitch/Virginia pines and large oaks to 15-30% as measured 2 years post burn.
  - G. Limit smoke impacts to area residents, visitors, and infrastructure.

ELEMENT 6: FUNDING:

A. Cost:

Projected Personnel Hours:	**Estimated Cost:**
Unit Preparation	**$400**
Burning/Holding Personnel	**$3,000**
Total Personnel	**$3,400**
Equipment:	
Tools, Replacement & Repair	**$200**
Ignition Devices, Drip Torch Mix	**$200**
Vehicle Fuel	**$200**
Other	**0**
Total Equipment	**$600**
Projected Total Cost	**$4,000**

B. Funding Source:

The NERI FMO will work with the Northeast Regional Fire Management Office to secure funding levels from a hazardous fuels account.

ELEMENT 7: PRESCRIPTION

A. Environmental Prescription:

The prescription parameters are broad, illustrating the ease of ignition with these light fuels. All firing patterns will reflect current weather conditions.

ENVIRONMENTAL PARAMETERS	Fuels Within the Project or Burn Unit Boundary	
	Acceptable Range	Optimum Range
Temperature	50°F - 85°F	50°F - 70°F
Relative Humidity	25% - 70%	30% - 40%
Wind Direction	Any	South
Mid-flame Wind Speeds	0 mph – 10 mph	4 mph
Wind Mixing Height	500 feet or greater	750 feet or greater
Transport Wind Speed	3.5 mph or greater	3.5 mph or greater
1-Hour Fuel Moisture (calculated from relative humidity)	4-15%	8-12%
Days Since Measurable Rain	1-30	2-6
K.B. Drought Index	<400	200 to 300

B. Fire Behavior Prescription:

FIRE BEHAVIOR ENVIRONMENTAL PARAMETERS	Fuels Within the Project or Burn Unit Boundary	
	Acceptable Range	Optimum Range
Rate of Spread	.5 – 10 chains per hour	2 - 4 chains per hour
Flame Length	0.5ft – 8ft	1ft – 3ft

Fire Behavior Narrative:

The fuels within the unit are best described as a Fuel Model TL2, hardwood leaf litter, low fuel load, compact broadleaf litter. Fire behavior is expected to be low with flame lengths less than 2 foot in the compacted leaf litter. Terrain within the unit varies from 5% - 50% slope. Fire burning on slopes in TL2 may exhibit flame lengths from 6" to 2' with a rate of spread of 1 to 3 chains per hour. Reversely, the fire behavior on the flatter terrain will exhibit much lower flame lengths and much slower rates of spread. Regardless of slope, the Firing Boss will modify ignition patterns and techniques to achieve desired fire behavior. Similar fuel conditions exist outside of the unit.

ELEMENT 8: SCHEDULING

A. Ignition Time Frames/Season(s):

- April – May or August - September (depending on ambient temperatures)
- This burn is scheduled for mid spring, prior to full green-up. Objectives can also be met when burning in late summer, prior to dormancy.
- There will need to be a sufficient quantity of dry, horizontally continuous fuels (e.g. litter or herbaceous material) over the unit to carry fire and achieve objectives.

B. Projected Duration:

The burn will be implemented so that all ignition operations are completed during the burn period and heavy fuels have had a chance to substantially burn out prior to the end of the day to minimize overnight smoldering and smoke production. Smoldering of interior fuels overnight in burn units is allowed.

C. Constraints:

This prescribed burn will not be conducted when the following conditions occur as per Red Book chapter 17 Fuels Management:

- Local county government enacts a burn ban.
- National, Regional, or Local Preparedness Levels preclude prescribed fires.

ELEMENT 9: PRE-BURN CONSIDERATIONS

A. On-Site Considerations:

- Reduce fuel around standing snags > 5" (dbh) to limit the ignition of trees containing potential habitat for the endangered Indiana bat.
- The control lines will be leaf blown prior to burn day.
- Identify hazardous snags that may cause safety or control issues prior to burn day and flag the area to be avoid by fire personnel. If a hazard tree must be removed, seek prior approval from park's wildlife biologist before felling any snag that may contain bat habitat.
- Ensure that all holding lines are easily identifiable for incident personnel
- Monitor weather and fuel conditions in the burn area
- Burn Boss should monitor the site and implement operational changes as necessary

<u>Burn Boss or designee will ensure the following are completed on the day of the burn:</u>

- Post Prescribed Fire sign at War Ridge Bulletin board.
- Final check of control lines (make sure the burn unit is clear of unauthorized personnel)
- Ensure that all notifications were completed prior to ignition
- Obtain Spot Forecast from National Weather Service, Charleston, WV (304)-746-0188 (http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=rlx)

B. Off-Site Considerations:

To be completed by Burn Boss or designated park staff prior to burn:

- Keep Superintendent and Division Chiefs informed of approaching burn window
- Obtain Cultural Resources clearance
- Obtain USFWS Section 7 Consultation clearance
- A burn permit shall be procured from West Virginia Division of Forestry
- Ensure that notifications are initiated correctly as stated in the Notifications chart
- Update and print Incident Action Plan
- Acquire sufficient number of maps to be distributed at briefing
- Post informational burn notice flyers at the War Ridge bulletin board approximately 1 weeks prior
- Post informational burn notice flyers at the Prince Railroad Depot, approximately 1 weeks prior

C. Method and Frequency for Obtaining Weather and Smoke Management Forecast(s):

General weather forecasts and site conditions will be monitored to determine when the burn unit will be in prescription. This may be done monthly, weekly, or daily as the conditions become closer to prescription. Specific local weather forecasts will be reviewed prior to ignition to verify that conditions and smoke dispersal are predicted to be within prescription. Spot or local forecasts should also be reviewed by assigned holding forces until the fire has been declared out. On-site fire weather will be taken prior to test fire. On-site fire weather will be recorded and communicated at regular intervals to fire resources until ignition is complete and mop up is started. The Burn Boss or designee will request a Spot Weather Forecast through the National Weather Service for the morning of the proposed burn day and each subsequent day of burning. A spot weather forecast can be obtained through the NWS web site: http://spot.nws.noaa.gov/cgi-bin/spot/spotmon?site=rlx .

D. Notifications: Notifications will be completed the day of burn by the Burn Boss or designee.

Who:	Phone Number:	When[1]:	Responsibility:	Date:	Response: Contact Type[2]
Beckley Appalachian Regional	(304)255-3825	I			
Cabell Huntington Hospital	(304)526-2000	I			
Raleigh General Hospital	(304)256-4100	I			
Healthnet	(304)256-1700	I			
The River Radio	(304) 461-9286	B	PIO		
Beckley Register Herald	(304)255-4400	B	PIO		
WOAY TV	(304)469-3361	B	PIO		
WVNS 59 Ghent	(304)787-5959	B	PIO		
WVVA 06 TV	(304)253-0006	B	PIO		
EICC	(540) 999-3412	I			
Park Division Chief	(304) 465-6518	B	PIO		
Park Superintendent	(304) 465-6511	A,B,D	PIO		
Raleigh Control E.O.C. (911)	(304) 255-9121	D	PIO		
Fayette Control E.O.C. (911)	(304) 574-3594				
Fayette County Sheriff's Office	(304) 574-4216	D	PIO		
CSX Railroad, select option #1	800-232-0144	B,D	PIO		
Meadow Bridge VFD Station #4	(304) 484-7117	B,D	PIO		
Danese VFD Station #2	(304) 438-5312	B,D	PIO		
WV State Police	(304) 466-2800	D	PIO		
WV Department of Highways	(304) 466-2810 or (800) 642-9292	D	PIO		
WV Division of Air Quality	(304) 926-0499	B	PIO		
WV Division of Forestry	(304) 256-6775	B,D	FMO		
WV Department of Natural Resources	(304) 256-6947	B	FMO		

[1]When To Notify	Before (B): Prior to burn day Day of (D): Prior to ignition on burn day After (A): After burn is completed Informational (I): For your information	Contact Type[2]	Phone Contact (PC) Phone Message (PM) Direct Contact (DC) E-mail (EM)

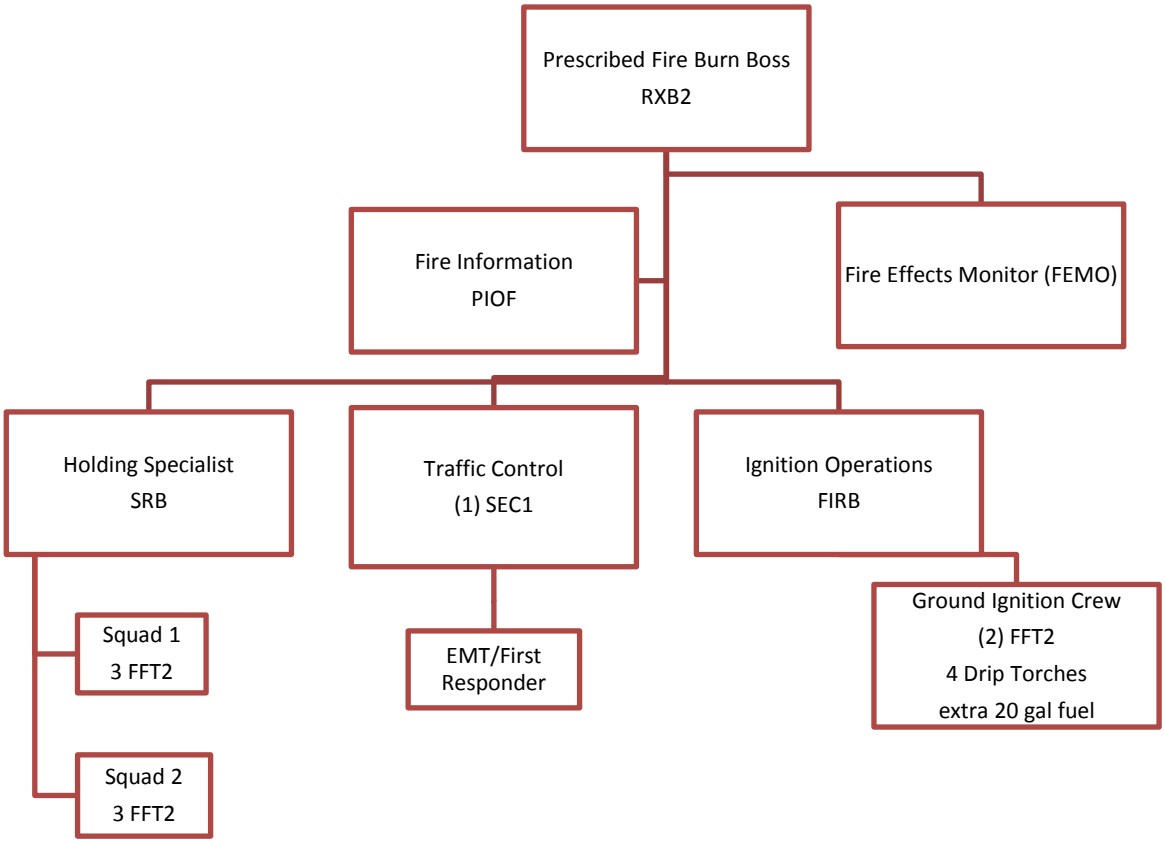
ELEMENT 10: BRIEFING

This is a briefing checklist to be covered at the pre-burn meeting with all fire fighters. Most of the information will be in the Incident Action Plan which will be provided to all fire fighters at that briefing. Space is provided for Burn Boss and others involved in the briefing to make special emphasis notes for that meeting.

Briefing Checklist:	**Notes**
Burn Organization:	
Burn Objectives:	
Description of Burn Area: **MAPS: poster, and individual map in IAP**	
Expected Weather & Fire Behavior:	
Communications:	
Ignition plan:	
Holding Plan:	
Contingency Plan:	
Wildfire Conversion:	
Safety:	
Medical Plan:	

ELEMENT 11: ORGANIZATION AND EQUIPMENT

A. Positions and Equipment:



Minimum Personnel Required: 15

CHANGES TO ORGANIZATION DURING IMPLEMENTATION:
Any changes to the organization during implementation must be documented. These are changes that may reflect assignments to other personnel not changes to the capabilities, equipment or supplies, which would require an amendment.

Equipment and Supplies: The burn boss may adjust the amount and type of equipment needed based on site conditions, resources, expected fire behavior, crew size, and crew experience. The adjustment must be of a type that will not affect the complexity of the burn.

- 4 drip torches
- 4 backpack pumps
- 14 hand tools
- 2 prescribed burn signs
- 1 weather kit
- 1 Type 6 engine
- 2 leaf blowers
- 20 gal drip torch fuel

ELEMENT 12: COMMUNICATION

A. Radio Frequencies:

Frequency Name:	RX:	Tone:	TX:	Tone:
Command	171.7750	000.0	166.3500	000.0
Tactical	168.3500	000.0	168.3500	000.0
Air Medical	155.4000	N/A	155.4000	110.9

B. Telephone Numbers:

A complete list of telephone number contacts is listed in the Notifications section under Element 9, Preburn Considerations.

ELEMENT 13: PUBLIC AND PERSONNEL SAFETY, MEDICAL

A. Safety Message:

The Burn Boss is responsible for safety on the burn, and will ensure all standard wildland fire safety rules are adhered to. Project personnel will wear appropriate personal protective equipment (PPE) during all phases of the project. No person will be allowed within the burn unit without the proper PPE.

An Incident Action Plan (IAP) will be completed by the Burn Boss prior to each operational period. The IAP will address objectives, fire weather/behavior, assignments, communications, safety, and the medical plan. A daily briefing will be conducted prior to beginning every phase of the project. The Burn Boss will ensure that all personnel have received a briefing.

B. Safety Hazards: [See Job Hazard Analysis (JHA), Appendix D]

- Fire line hazards, i.e., stump holes, footing issues, open flames, snags, etc.
- Animal/Insect hazards, i.e., wasps, bees, snake, spiders, etc.
- Fuel storage, i.e., drip torches, drip torch fuel, saw gas, pump gas, etc.
- Firing techniques, devices, i.e., drip torches, qualifications
- Vehicles, i.e., Travel to/from project, lights on, traffic conditions, visitors, local residents, smoke, UTV's, etc.
- Health Hazards, i.e., heat, smoke inhalation, lightning, dehydration, injuries, hazardous materials, poison ivy, etc.
- Training, i.e., inexperienced personnel, span of control, qualified trainers, etc.

C. Measures Taken to Reduce the Hazards:

- The burn area will be closed to the public. Law Enforcement may be posted on War Ridge road at the Burn Boss's decision (for public safety). A sweep may be necessary prior to ignition to insure no visitors are exposed to fire and or smoke.
- A safety briefing will be conducted prior to each operation period. Personnel will be advised of staffing position, ignition pattern, holding actions, lookouts, communications, escape routes & safety zones. The Job Hazard Analysis will be covered in the briefing.
- Favorable winds will be used to divert smoke away from sensitive areas.
- Law Enforcement personnel will monitor smoke and provide traffic control if needed.
- All line personnel will wear standard Personnel Protective Equipment including a fire shelter.

- Adhere to all standard fire fighting safety rules (ref. IRPG, Fireline handbook).

The Burn Boss will work with and through appropriate supervisors to institute any corrective safety measures associated with this project. If a serious safety issue cannot be resolved prior to ignition of any portion of this project, ignitions may be postponed. If the issue occurs during the course of operations, it will be mitigated with the most reasonable means possible providing for safety of personnel and public. If necessary, the project will be shut down until the mitigation efforts are successful.

D. Emergency Medical Procedures: (included in the IAP)

In the event of an injury, contact will be established with the injured resource's immediate incident supervisor and the Burn Boss. If the injury requires medical assistance, qualified on-site personnel will provide first aid to the injured party until relieved by a more qualified medical provider. Qualified on-scene medical personnel will be identified in the IAP and briefing.

E. Emergency Procedures/Evacuation Methods:

The Burn Boss, working with identified on-scene medical personnel, will implement the Medical Plan (outlined in the IAP) as required to initiate medical response and transportation to the nearest treatment facility. This will be coordinated with Raleigh Control and on-scene personnel will aid in any in facilitating method of transport (i.e. landing zone construction). The Burn Boss will take measures to secure the prescribed burn and will notify the Superintendent and Chief Ranger of the injury.

F. Emergency Facilities:

EMERGENCY TRANSPORTATION								
NAME	TELEPHONE		LOCATION			PARAMEDICS	
						YES	NO
Healthnet	800-346-4206		Charleston, WV			X	
Raleigh County EOC	304-256-1700		Beckley, WV				
HELISPOT CLOSEST TO PROJECT		LAT.	N37º46.926'	LONG.			

HOSPITALS								
NAME	ADDRESS AND LATITUDE AND LONGITUDE	TRAVEL TIME (MIN)		PHONE	HELIPAD		BURN CENTER	
		AIR	GROUND		YES	NO	YES	NO
Raleigh General	1710 Harper Rd., Beckley, WV N37º47.268' W81º12.138'	10 min.	60 min.	304-256-4100	X			X
Beckley Appalachian Regional	306 Stanaford Rd., Beckley, WV N37º47.91' W81º10.086'	10 min.	60 min.	304-255-3825	X			X
Cabell Huntington Hospital	1340 Hal Greer Boulevard, Huntington, WV N38° 24.59' W82° 25.64'	10 min.	2 hr.	304-526-2000	X		X	

ELEMENT 14: TEST FIRE

A. Description: A test fire will be identified and conducted in an area with representative fuels of the burn unit on ignition day as part of the go/no-go decision process. Ignition of the test fire will occur under the direct supervision of the Burn Boss. The test fire will be used by the Burn Boss, Firing Boss, and Holding Specialist to determine if the fire behavior is within prescription. If weather conditions, fire behavior, and the ability to meet management objectives fall within prescription parameters, ignition of the burn unit will begin. The results of the test fire will be documented by the Burn Boss and included in the project folder for each consecutive year. If weather conditions, fire behavior, and the ability to meet management objectives do not fall within this plans parameters, the test fire will be extinguished and mopped-up. A second test fire may be conducted using the same criteria listed above when environmental conditions are more favorable.

B. Planned location: The test fire location will be determined on the day of ignition by the Burn Boss and Firing Boss. The test fire should be in a location that contains fuels representative of the burn unit. It should be located in an area along the perimeter of the burn unit that may be easily accessible by burn personnel and equipment.

Test Fire Documentation: The Burn Boss will ensure that the project file at the Fire Management Office is up-to-date for each year that this plan is a valid document, including updated Test Fire documentation for each burn.

Weather conditions On-Site:		
Date / Time:		
Temperature:		
Relative Humidity:		
Wind:		
Does the observed conditions fall within prescription?	Yes	No
Does weather forecast fall within prescription?	Yes	No
Test Fire Results:		
Does fire behavior fall within prescription?	Yes	No
Does observed fire behavior meet management objectives?	Yes	No
The test fire meets all weather conditions, fire behavior, and management objectives as described in the burn plan. Ignition of the burn unit may begin.		
Burn Boss	**Signature**	**Date / Time**

ELEMENT 15: IGNITION PLAN

The Firing Boss will recommend ignition strategies and tactics to the Burn Boss who will be the final decision on which resources and techniques will be used based upon the operational objectives and environmental conditions. The Burn Boss is responsible to ensure that all personnel receive a pre-burn briefing and understand the ignition plan, holding plan, who is in charge, incident objectives, priorities, and critical areas. IAP's and project maps will be available at the pre-burn briefing.

A. Firing Methods Techniques, Sequences, and Pattern:

1. **Methods:** The Firing Boss under direction of the Burn Boss at their discretion may utilize hand ignition techniques which may involve a combination of strip head fire, backing fire, flanking fire, and/or spot ignition. Fire behavior and effects will be observed by the Burn Boss or designee to ensure that objectives are being met. If objectives are not being met, the Burn Boss may terminate ignition operations until conditions become more favorable. If the project comes back into prescription ignition operations may continue; if not, the unit shall be placed in a mop-up and patrol status. The Holding Specialist, under the discretion of the Burn Boss, shall maintain control of the fire until a decision is made to continue, postpone, or suppress the fire. The Burn Boss will document this decision process.

2. **Techniques, Sequences, and Patterns:** Firing techniques may include a combination of strip head firing, spot ignition, and/or perimeter ignition based on conditions the day of the burn. In general, a dotting spot firing technique is preferred; this keeps fire behavior from developing too rapidly, and allows for a longer flame residence time which will consume more of the duff layer. Modifications of ignition patterns or methods may be made in order to achieve objectives as long as changes do not jeopardize firefighter and public safety.

B. Devices: This plan is only written for hand firing techniques. Devices may range from drip torches, fusees, and/or flares. Safe practices for the use of these ignition devices will be observed at all times, refer to attached JHA.

C. Ignition Staffing: The staffing chart lists one Firing Boss and two igniters. Additional personnel may be utilized as needed as long as communications and span of control can maintain a safe operation. The Firing Boss is responsible to brief their personnel on objectives and ignition operations according to the ignition plan, conduct operations in a safe manner, identify the impacts of ignition on the control and desired fire effect, coordinate ignition operations with the holding specialist, and to maintain control of his/her forces.

ELEMENT 16: HOLDING PLAN

A. General Procedures for Holding:

1) Holding operations will be directed by a qualified single resource boss or higher qualified leader. Specific holding resource assignments will be made on the IAP the day of the burn, and be under the direction of the Holding Specialist.

2) The Holding Specialist will coordinate with the Firing Boss to ensure that the prescribed burn is contained within the project area to protect private property, infrastructure, and other values at risk.

3) Holding actions should be based on the use of Minimum Impact Suppression Tactics (MIST).

4) Holding Specialist will work in close coordination with the Firing Boss to ensure that personnel will be able to safely hold the ignited unit.

B. Critical Holding Points and Actions:

Actions will be taken to prevent ignition of dead trees greater than 5" dbh. These trees are potential habitat for wildlife. A reconnaissance will be done prior to ignition by burn personnel to verify that adequate unit prep has taken place and familiarize personnel with location and access to these areas.

C. Minimum Organization or Capabilities Needed: Element 11 describes the minimum number and type of resources necessary to conduct this prescribed burn. Additional personnel may be utilized as needed as long as communications and span of control can maintain a safe operation.

D. Mop-Up Operations: The Burn Boss is responsible to determine the extent of mop-up operations. Mop-up may be necessary along the units boundaries, however, fuels should be allowed to burn out naturally, if possible. Where smoldering fuels pose a control (i.e. stump holes near the line) or safety hazard (i.e. smoke on roadways) mop-up should take place with MIST in mind.

E. Patrol and Monitoring: The Burn Boss is responsible for the scheduling of patrols of the fire perimeter and is ultimately responsible for the project until the fire is officially declared out.

ADEQUATE HOLDING RESOURCES WORKSHEET

(For High End of Prescription)

Project Name: BACKUS UNIT Prescribed Burn Fuel Model(s)/Type(s) Inside Project Area: TL2
Prepared By: Peggy Ainslie Fuel Model(s)/Type(s) Outside Project Area: TL2

	Output Type	Modeling Predictions Inside Project Area	Modeling Predictions Outside Project Area	Unit of Measure
CRITICAL FIRE INPUTS	1 hr Fuel Moisture	4	4	%
	Wind Speed	10	10	mph
	Slope	50	50	%
KEY FIRE BEHAVIOR OUTPUTS	Rate of spread	3	3	ch/hr
	Fire behavior	Head	Head	---
	Flame Length	1.5	1.5	ft
FIRE SIZE	Projection time		.5	hours
	Forward spread		1.5	chains
	Backing spread		.1	chains
FIRE CONTAIN-MENT	Method of attack		rear	---
	Max escape target		.1	ac
	Max containment time		.1	hours
	Total line building rate		8	ch/hr
1. Choose greater of (inside/outside) total line building rate:			8	ch/hr
2. Estimate potential # of spot fires/slopovers at one time:			3	---
3. TOTAL LINE BUILDING RATE NEEDED			24	ch/hr

Ease of Access (Poor/Fair/Good/Excellent): **GOOD**

On Site Organization	Total # Planned on Burn	Total # Dedicated to Rx Fire	Total # Available for Spot/Slopover Control		Line Building Rates		Spot/Slopover Line Building Capacity
Overhead	3	2	1		8	ch/hr	8
Firing Crew (#)	3	3	1		8	ch/hr	8
Holding - hand tools (#)	7	4	3		8	ch/hr	24
Holding – leaf blowers (#)	2	2	2		18**	ch/hr ch/hr	36**
Other					0	ch/hr	
3. TOTAL LINE BUILDING CAPACITY						c/hr	76
4. TOTAL LINE BUILDING RATE NEEDED (from table above)						ch/hr	24
5. ADEQUATE HOLDING RESOURCES (Line 3 – Line 4)?						ch/hr	52

If number on line 5 is positive then adequate holding resources will be available. If number is negative, more holding resources are needed.

Note: Production rates and adequate holding forces calculated on worst case scenarios extreme high end of prescription). Line production rates required under more moderate conditions will be lower. Production rates are derived from Fireline Handbook, March, 2004 for Fuel Model 9.

**** Leaf blower production rate was calculated during tests at Kings Mountain National Military Park in open hardwood understory over varied terrain.**

ELEMENT 17: CONTINGENCY PLAN

A. Trigger Points and Actions Needed:

The following conditions or triggers warrant the activation of the contingency plan.

- **Objectives not met:** The Burn Boss or designee is responsible for observing, documenting, and communicating fire behavior and fire effects. Firing methods may be modified in order to achieve desired fire effect. When modifications to firing techniques are still not achieving objectives then the Burn Boss will relay to the Firing Boss to cease ignitions. It is the Burn Boss's discretion where the best place to hang the fire up in order for holding resources to contain the fire. In areas where there are no natural boundaries the Burn Boss may complete a unit in order to assist the Holding Specialists with mop-up/extinguishment of the unit. If environmental conditions allow, ignition operations may continue as long as the goals and objectives of this plan are being met.
- **Prescription Elements Exceeded:** Should prescription elements be exceeded during the course of ignition operations, the Burn Boss shall notify the Firing Specialist / ignition personnel to terminate ignition at the first available opportunity as described above. Operations will concentrate on holding and / or mop-up until such time as conditions return to acceptable levels. If it is anticipated that conditions will improve, operations may hold in place until weather / fire behavior observations indicate it is acceptable to continue. If conditions are unfavorable to continue ignition operations, efforts shall be directed towards improving holding lines and mopping up fire as needed to prevent escape.
- **Spotting and/or Escaped Fire:** In the event of spot fires or slop-overs, holding forces shall immediately notify the Firing Specialist and Burn Boss with a size-up and assessment as to additional resource needs at the scene. The nearest resource(s) to the spot shall be responsible for suppression efforts until relieved by either the Holding Boss or more qualified personnel. The Burn Boss and / or Firing Specialist shall evaluate spotting activity to determine whether ignition techniques can be adjusted or if environmental conditions are becoming unfavorable to proceed. If mitigation efforts are less than effective and spotting and or slop-overs begin to become problematic, ignition operations shall be modified or terminated and operations will concentrate on holding and improving lines and mopping up perimeters as needed.

  If the spot fire rate of spread exceeds the capabilities of the available resources, or if the spot fire is not expected to be confined before reaching any critical holding areas, the Burn Boss shall consider converting the prescribed fire to wildfire status per Element 18 below. The NPS Regional Office will be notified within 24 hours of a prescribed fire escape.

- **Report of Smoke Effects in Critical Smoke Sensitive Area:** The Firing Specialist and/or Burn Boss will modify ignition techniques in an attempt to mitigate smoke impacts. If smoke hazards cannot be mitigated the Burn Boss will cease ignitions and proceed to mop-up. Law enforcement personnel and signs on nearby roadways should aid in smoke mitigation.

B. Additional Resources and Maximum Response Time(s):

All staff required to conduct the burn as well as those needed for contingency in the event of an escape will be present on the burn. A Type 6 Engine with crew will be at the staging area

available for IA, including working any possible escaped fire from the unit. Other possible reinforcements, if needed, include: additional park service fire fighters and West Virginia Division of Forestry assistance through local Volunteer Fire Departments, both resources would have a 30 to 60 minute response times. Their status will be checked prior to ignition.

ELEMENT 18: WILDFIRE CONVERSION

A. Wildfire Declared By:
If spot fires and/or slop-over cannot be controlled within one burn period the Burn Boss in consultation with the Holding Boss will declare the escape as a wildfire. The Burn Boss will also communicate through the Agency Administrator or delegate during this process.

B. IC Assignment:
A pre-identified qualified ICT4 will assume control of an initial attack situation (identified in Incident Action Plan). If an additional IC or Burn Boss is needed, an order will be made through EICC/Shenandoah Dispatch.

C. Notifications:
All decisions and notifications will be made and documented by the Burn Boss. The Fire Management Officer, Chief Ranger, Park Superintendent, Raleigh Control, WV Division of Forestry, and Shenandoah Dispatch will be notified of the declaration. The NPS Regional Fire Office will be notified within 24 hours of a prescribed fire escape.

D. Extended Attack Actions and Opportunities to Aid in Fire Suppression:
Fuels inside the units are timber litter/leaves and vary from 1 to 3 inches deep on a 0-50% slope. If there is an escape outside of the unit the fuels can be best described as the same, TL2 on moderate to steep slopes. There are numerous man-made features (old logging roads) surrounding this area that will aid in suppression including the units location at the top of the ridge. Behave runs predicted that in the event of a slop over outside of the unit would be contained with resources on scene.

- Type VI Wildland Engine, will be at the staging area throughout the burn.
- Direct attack methods may be utilized, if possible.
- Multiple logging roads exist around the unit to assist with catching slopovers and are identified on maps in Incident Action Plan.
- The Burn Boss retains responsibility for the prescribed burn and ICT4 will remain in charge of the escape, until relieved by an Incident Commander Type 3 (ICT3).
- All suppression actions will be taken in accordance with DOI 18 and park policy to protect identified values at risk.
- If additional resources are needed they can be ordered through the EICC.
- A WFDSS will be completed by the NERI Fire Management Officer.
- The WFDSS will define all future appropriate management response.
- Once declared a wildfire, the fire may not be returned to prescribed fire status.
- All escaped fires will be reviewed per NPS policy.

ELEMENT 19: SMOKE MANAGEMENT AND AIR QUALITY

A. Compliance:
The burn will comply with all State and Federal regulations, as of spring 2012 there were no specific state smoke guidelines. For informational purposes, West Virginia Department of Air Quality will be notified prior to ignition of approaching window and on burn day.

B. Permits to be obtained:
NERI FMO will obtain an open Burning Permit from the West Virginia Division of Forestry.

C. Smoke Sensitive Areas/Receptors:
- County Road 41 (CR41) – Smoke may be visible from the road.
- Community of Backus, 2.5 miles, point to point, east along Backus Mtn. Road.

D. Potential Impacted Areas:
None

E. Mitigation Strategies and Techniques to Reduce Smoke Impacts:
Smoke columns produced from the fire will be highly visible as it is near the top of the ridge, but short in duration. Smoke should be monitored for impacts along CR41. The Burn Boss is responsible for monitoring potential smoke impacts and implements the necessary mitigation method to reduce the risk.
- Prescription parameters outlined in this plan should minimize smoke impacts.
- Burning during daytime hours will allow for the most complete combustion
- The smoke column should disperse with the transport winds.
- Heavy smoke producing fuels will be mopped-up should they create an unacceptable smoke hazard along nearby roads, otherwise, they will be allowed to burn.
- If smoke induced fog is anticipated, the Burn Boss may assign personnel to a late shift or early morning shift in order to monitor and mitigate potential smoke impacts on CR41.
- CSX will also be called to inform of potential smoke induced fog impacting the rails.

ELEMENT 20: MONITORING

A. Weather Monitoring (forecasted and observed) Required and Procedures:
Weather will be monitored with both ocular estimates and utilizing the Grandview and/or Pipestem RAWS to establish a trend. Monitoring will include wind direction and speed, temperature, relative humidity, fuel moistures, and precipitation. The Burn Boss will monitor the general fire weather forecast issued from the NWS. A spot forecast will be obtained from the same office. The Burn Boss or designee will record and broadcast over the tactical channel, at minimum, the following on-site weather conditions each hour: temperature (wet and dry bulb), relative humidity, wind speed at eye level and direction, percentage of cloud cover, and fuel type observations were taken in. The recorded observations will be reported in the post-burn monitoring report and included in the project file for each consecutive year.

B. Fire Behavior Monitoring Required and Procedures:
Fire behavior data (e.g. rate of spread and flame length) will be collected for backing, flanking, and heading fires, and will be recorded by the Fire Effects Monitor (FEMO).

C. Monitoring Required Ensuring That Prescribed Fire Plan Objectives Are Met:
Fire Effects Monitoring plots were established in 2012 and all vegetation data recorded. These same plots will be read immediately post-burn, and then 1 year, 2 years, and 5 years post burn. The Resource Management staff in conjunction with the NER Fire Ecology staff will make the determination if objectives are being met.

D. Smoke Dispersal Monitoring Required and Procedures:
The FEMO will observe smoke and record degree of visibility, column height, and direction of travel. These observations will be documented in a weather and fire behavior log (Appendix F).

ELEMENT 21: POST-BURN ACTIVITIES

Post-burn Activities and Reporting:
An After Action Review (AAR) with prescribed burn personnel will occur at the end of the operational period. The Burn Boss, or designee, will initiate a fire file for records of the prescribed fire. The fire file shall be maintained in the NERI Fire Management Office.

Items to be included in the fire file:

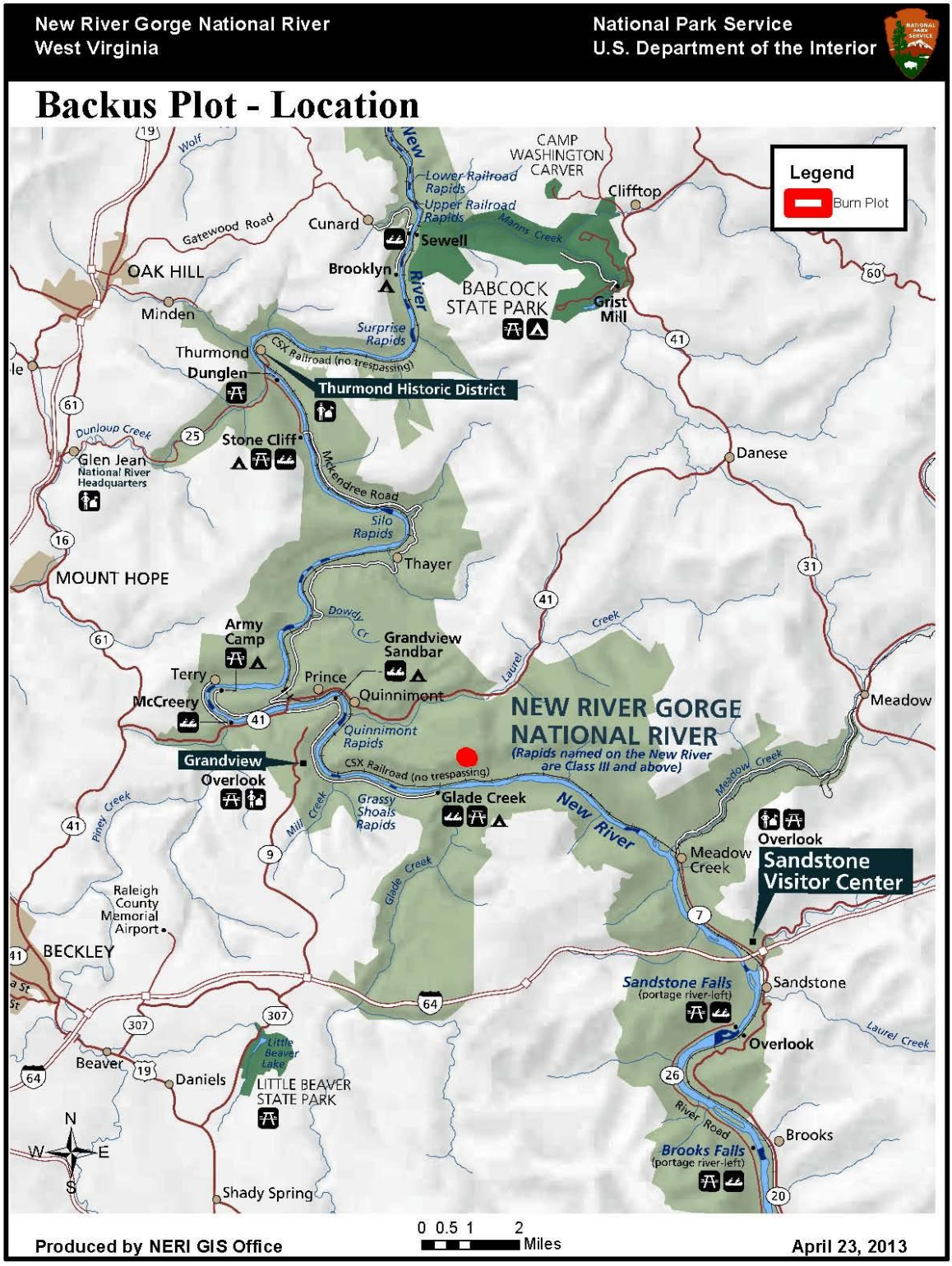
- An copy of the NPS Wildland Fire Report Form (The Wildland Fire Report will be completed and entered into the WFMI within 10 days of the fire being declared out WFMI accessed at: https://www.nifc.blm.gov/cgi/nsdu/FireReporting.cgi).
- A copy of the NFPORS project accomplishment, if applicable. (Project accomplishments will be entered into the NFPORS web site within 10 days of the fire being declared out. This web site can be accessed at: http://www.nfpors.gov/).
- Copies of Go / No-Go Checklist and Administrator Approval Documents
- The Burn Boss, FMO, and selected Rx burn staff will complete a post-project analysis and brief report for input into EACC records.
- The Burn Boss will prepare a post fire evaluation report as defined in Chapter 11, RM-18.
- The fire file may include:
  - ICS-214 Unit Log
  - Fire Name
  - Resources Assigned (Number and Type)
  - Acres Burned
  - Burn Objectives
  - Ignition Type and Pattern
  - Holding Strategy
  - Fuel Moisture Information
  - Drought Index Information
  - Fire Behavior Indices
  - Prescription Information
  - Test Burn Description
  - Chronology of Events
  - Temperature (range, min/max)
  - Relative Humidity (range, min/max)
  - RAWS data
  - Accuracy of Spot Forecast
  - Initial Qualitative Assessment of results
  - Future monitoring plan for area (plots, photo points)
  - Additional Comments

APPENDICES

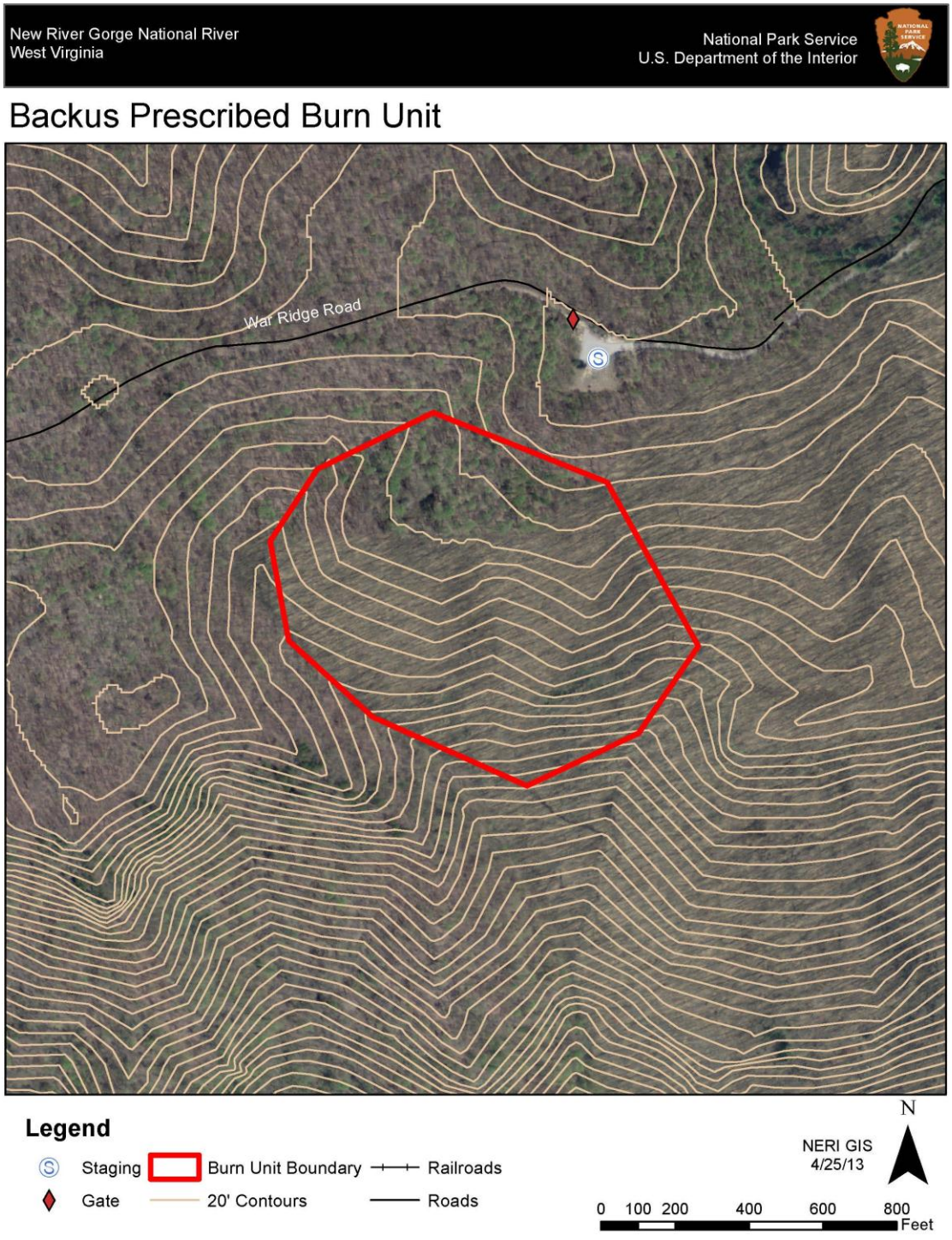
A. Maps: Vicinity, Project, Smoke Vector
B. Technical Reviewer Checklist
C. Complexity Analysis
D. Job Hazard Analysis
E. Fire Behavior Modeling

Appendix A: MAPS

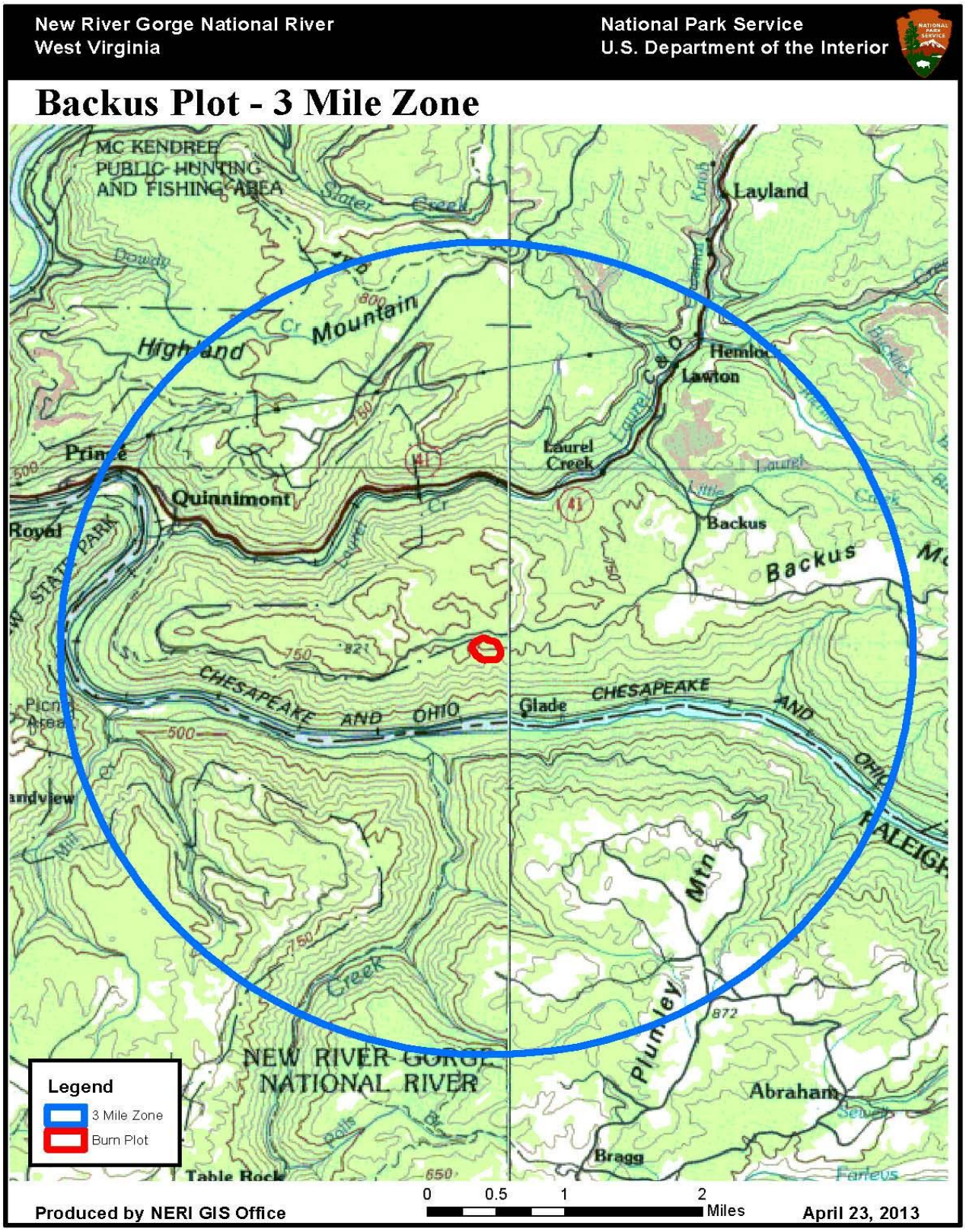
Vicinity Map



Project Area Map



Smoke Vector Map



Appendix B: TECHNICAL REVIEWER CHECKLIST

TECHNICAL REVIEWER CHECKLIST	**Grandview Prescribed Burn Unit**	
PRESCRIBED FIRE PLAN ELEMENTS:	**S / U**	**COMMENTS**
1. Signature page		
2. GO/NO-GO Checklists		
3. Complexity Analysis Summary		
4. Description of the Prescribed Fire Area		
5. Goals and Objectives		
6. Funding		
7. Prescription		
8. Scheduling		
9. Pre-burn Considerations		
10. Briefing		
11. Organization and Equipment		
12. Communication		
13. Public, Personnel Safety and Medical Procedures		
14. Test Fire		
15. Ignition Plan		
16. Holding Plan		
17. Contingency Plan		
18. Wildfire Conversion		
19. Smoke Management and Air Quality		
20. Monitoring		
21. Post-burn Activities		
22. Maps		
23. Complexity Analysis		
24. JHA		
25. Fire Prediction Modeling Runs		
26. Other		

S = Satisfactory U = Unsatisfactory

Recommended for Approval: ☐ **Not Recommended for Approval:** ☐

TECHNICAL REVIEW BY: _____ **DATE:** _____

Printed Name: _____

Agency: _____

Qualification: _____

Approval is recommended subject to the completion of all requirements listed in the comments or on the Prescribed Fire Plan.

Appendix C: Prescribed Fire Complexity Analysis

1. Potential for Escape

Risk	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	LOW - There is a low potential for spot fires, however, they will be easily detected and suppressed. There are no concentrations or dangerous ladder fuels near critical holding points. Ignition procedures do not create intense fire. There is limited residual fire expected beyond the day of ignition.
Final Rating: ***Low*** ***Moderate*** ***High***	LOW - No change.
Potential Consequences	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	MOD – An escape could result in little damage to natural resource values or to improvements. No structures are expected to be involved. There will be minimal impact to the public or users. The fire could burn onto private or other agency lands.
Final Rating: ***Low*** ***Moderate*** ***High***	MOD – A leaf blown and scratch line will be in place prior to ignition of the unit. Sufficient holding crew will monitor the backing fire. Resources will be assigned to patrol for spots.
Technical Difficulty	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	LOW – A single resource boss is all that is required for the on-site holding resources.
Final Rating: ***Low*** ***Moderate*** ***High***	LOW – No change.

2. The Number and Dependency of Activities

Risk	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	LOW - Minimal coordination is necessary, simple burn with minimal activities dependent on each other.
Final Rating: ***Low*** ***Moderate*** ***High***	LOW - No change.
Potential Consequences	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	LOW - Coordination issues do not result in an increased risk of escape, threaten the completion of the project, failure to meet project objectives, or create a safety issue.
Final Rating: ***Low*** ***Moderate*** ***High***	LOW - Due to the close proximity of firing and holding resources potential consequences has been mitigated through; verbal close proximity communication and a thorough pre-burn briefing.
Technical Difficulty	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	LOW – Coordination will be minimally difficult due to the control lines through leaf litter. With low complexity for holding and ignition resources. Coordination activities require a basic skill level.
Final Rating: ***Low*** ***Moderate*** ***High***	LOW - Continuous communication is necessary for successful project completion.

3. Off-Site Values

Risk	Rationale
Preliminary Rating: *Low* ***Moderate*** ***High***	LOW – There are no areas of private property near the project area. There is slight risk of visitor use during the project. Hunting season for spring turkey is open but area of burn will be posted prior to burn.
Final Rating: *Low* ***Moderate*** ***High***	LOW – A leaf blown line and/or scratch line will be in place prior to ignition. Informational posters will be placed in public areas prior to day of ignition.
Potential Consequences	**Rationale**
Preliminary Rating: *Low* ***Moderate*** ***High***	LOW – Potentially affected vegetation generally has rapid recovery rates and expected fire behavior would cause minimal damage to off-site values, improvements, private or other agency lands. In the event of an escape we have enough resources on-scene to catch slop/spots.
Final Rating: *Low* ***Moderate*** ***High***	LOW - Having all values and infrastructure pre-identified will aid personnel to recognize the hazards and lower the chance of our impact or further damage upon the value or infrastructure.
Technical Difficulty	**Rationale**
Preliminary Rating: *Low* ***Moderate*** ***High***	LOW – Correct firing techniques being utilized on the upper side of the unit will protect perimeter and minimize holding efforts.
Final Rating: *Low* ***Moderate*** ***High***	LOW – The area of concern is the rocky bottom/steep terrain of the unit which is small in size. Adequate holding forces will be in place prior to ignition of this area.

4. On-Site Values

Risk	Rationale
Preliminary Rating: *Low* ***Moderate*** ***High***	LOW - There are a few on-site values at risk or the values identified are generally considered low or minimal.
Final Rating: *Low* ***Moderate*** ***High***	LOW – No change.
Potential Consequences	**Rationale**
Preliminary Rating: *Low* ***Moderate*** ***High***	LOW – Implementation problems will not damage special features or adversely affect on-site resource values.
Final Rating: *Low* ***Moderate*** ***High***	LOW - No change.
Technical Difficulty	**Rationale**
Preliminary Rating: *Low* ***Moderate*** ***High***	LOW – No Special skills or operating procedures are required. Resource values within the unit are easy to protect.
Final Rating: *Low* ***Moderate*** ***High***	LOW – No change.

5. Fire Behavior

Risk	Rationale
Preliminary Rating: *Low* ***Moderate*** ***High***	LOW – Fuels are uniform and can be characterized using a single fuel model. Terrain is mostly sloped and aspect is uniform, leading to a relatively unvarying fire. Winds, microclimate, and other fire conditions are relatively uniform. Fire behavior is highly predictable.
Final Rating: *Low* ***Moderate*** ***High***	LOW – No change.
Potential Consequences	**Rationale**
Preliminary Rating: *Low* ***Moderate*** ***High***	LOW – Fire behavior outside of the primary unit boundary would be the same as the fire behavior within the unit.
Final Rating: *Low* ***Moderate*** ***High***	LOW – No change.
Technical Difficulty	**Rationale**
Preliminary Rating: *Low* ***Moderate*** ***High***	LOW - Standard safety precautions are adequate to ensure personnel safety. The number or size of spot fires and slopovers would not require additional suppression resources. Fire behavior is such that holding forces can control all spot fires and slopovers using direct attack tactics. No on-site operational fire behavior assessments or calculations are needed.
Final Rating: *Low* ***Moderate*** ***High***	LOW – No change.

6. Management Organization

Risk	Rationale
Preliminary Rating: *Low* ***Moderate*** ***High***	LOW – A small number of qualified people are required to implement the prescribed fire. A single person may fill different positions. A double level of supervision is utilized to ensure firefighter safety.
Final Rating: *Low* ***Moderate*** ***High***	LOW – No change.
Potential Consequences	**Rationale**
Preliminary Rating: *Low* ***Moderate*** ***High***	LOW - Problems related to supervision or communications are expected to be minimal.
Final Rating: *Low* ***Moderate*** ***High***	LOW – No change.
Technical Difficulty	**Rationale**
Preliminary Rating: *Low* ***Moderate*** ***High***	LOW – All team members are available within the local unit are familiar with local factors affecting project implementation. Several qualified personnel are available.
Final Rating: *Low* ***Moderate*** ***High***	LOW – No change.

7. Public and Political Interest

Risk	Rationale
Preliminary Rating: ***Low*** ***Moderate*** ***High***	LOW – The prescribed fire is small in size, but in an area with moderate hunting use. There has been little or no public or political interest related to the project and little or no news media interest.
Final Rating: ***Low*** ***Moderate*** ***High***	LOW – No change.
Potential Consequences	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	MOD – Unexpected or adverse events would attract some public, political, or media attention and may delay implementation of other projects. News releases and local news briefings would be required.
Final Rating: ***Low*** ***Moderate*** ***High***	MOD – No change.
Technical Difficulty	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	LOW – A public information officer is written into this plan. Routine media releases are needed, and no special notifications of the public are needed.
Final Rating: ***Low*** ***Moderate*** ***High***	LOW – Having an information officer on-scene will relieve the Burn Boss from these duties. This plan requires an informational bulletin to be posted not only at the Visitor Centers but also at the community of Backus Mountain, if possible at least one week prior to implementation.

8. Fire Treatment Objectives

Risk	Rationale
Preliminary Rating: ***Low*** ***Moderate*** ***High***	LOW - Objectives are limited to easily achieved fuel reduction and ecosystem maintenance. The necessary fire behavior is easily created, managed, and be monitored.
Final Rating: ***Low*** ***Moderate*** ***High***	LOW – No change.
Potential Consequences	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	MOD – No opportunities to meet objectives will be available. Other management activities are not dependent on the completion of the project. Failure to meet objectives would have few or no adverse impacts on natural resources.
Final Rating: ***Low*** ***Moderate*** ***High***	MOD – No change.
Technical Difficulty	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	LOW - Measures to achieve objectives are easy to complete. There are few restrictions on techniques. Limited pre-burn monitoring is needed to determine when the unit is in prescription.
Final Rating: ***Low*** ***Moderate*** ***High***	LOW - No change.

9. Constraints

Risk	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	LOW – There may be a slight chance of scheduling restrictions, and public access. Spring turkey season begins April 22.
Final Rating: ***Low*** ***Moderate*** ***High***	LOW - Minimal visual inspection may be necessary to determination when the units are in prescription.
Potential Consequences	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	LOW - Project can be completed any time prescription parameters are met, tactics and burn activities are not limited.
Final Rating: ***Low*** ***Moderate*** ***High***	LOW – No change.
Technical Difficulty	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	LOW – Constraints do not increase the difficulty of completing the project.
Final Rating: ***Low*** ***Moderate*** ***High***	LOW – No change.

10. Safety

Risk	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	LOW – Safety issues are easily identifiable and mitigated. Potential hazards are typical and easily addressed in briefings. Public exposure is limited to smoke drift but will be mitigated by warnings, signs, and possible closures.
Final Rating: ***Low*** ***Moderate*** ***High***	LOW – No change.
Potential Consequences	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	LOW – Minimal potential for serious accidents/injuries to firefighters or the public.
Final Rating: ***Low*** ***Moderate*** ***High***	LOW – No change.
Technical Difficulty	**Rationale**
Preliminary Rating: ***Low*** ***Moderate*** ***High***	LOW – Safety concerns can be easily mitigated through LCES. A standard mandatory safety briefing as part of the project briefing should be sufficient to cover any safety concerns. Special mitigation to protect public health and safety are not needed.
Final Rating: ***Low*** ***Moderate*** ***High***	LOW - The mandatory pre-burn briefing prior to ignition will be sufficient enough to mitigate any potential safety hazards.

11. Ignition Procedures/Methods

Risk	Rationale
Preliminary Rating: ***Low Moderate High***	MOD – Firing sequences and timing are somewhat critical to holding resources to allow easy control of fire. The entire project area is readily accessible to the Firing Boss/Burn Boss.
Final Rating: ***Low Moderate High***	LOW – Ignition patterns preplanned and will change as weather dictates, all burners will be on the "same page" prior to dropping a match. Firing Boss and Holding specialists will be filled levels of management.
Potential Consequences	**Rationale**
Preliminary Rating: ***Low Moderate High***	MOD - Firing pattern must be carefully planned, but all ignitions are by hand.
Final Rating: ***Low Moderate High***	LOW – Firing methods and procedures must be coordinated to provide for adequate safety, to meet project objectives, and reduce the risk of an unexpected or adverse event.
Technical Difficulty	**Rationale**
Preliminary Rating: ***Low Moderate High***	LOW – There is no need for special firing equipment, techniques, or patterns, all firing will be done by hand methods. Ignition patterns require minimal supervision of the lighters.
Final Rating: ***Low Moderate High***	LOW – No change.

12. Interagency Coordination

Risk	Rationale
Preliminary Rating: ***Low Moderate High***	MOD – The project does not involve another land management agency but does require verbal notification on burn day to several NPS partners.
Final Rating: ***Low Moderate High***	LOW – A Public information officer is written into this plan that will handle most all notifications.
Potential Consequences	**Rationale**
Preliminary Rating: ***Low Moderate High***	LOW - Project can be completed as planned.
Final Rating: ***Low Moderate High***	LOW – No change.
Technical Difficulty	**Rationale**
Preliminary Rating: ***Low Moderate High***	LOW - Interagency resources are readily available with few or no restrictions on their use.
Final Rating: ***Low Moderate High***	LOW – No change.

13. Project Logistics

Risk	Rationale
Preliminary Rating: *Low* *Moderate* *High*	MOD – There are some small logistical operations necessary prior to ignition. Obtaining some personnel may require additional contacts and advanced scheduling.
Final Rating: *Low* *Moderate* *High*	LOW – The Burn Boss will address the advanced scheduling of a LEO as stated in this plan and minimal staffing chat. The logistics are minimal and should be a no factor for a qualified RXB2. Project duration is 1 day or less.
Potential Consequences	**Rationale**
Preliminary Rating: *Low* *Moderate* *High*	LOW - Logistics need would not increase with risk of escape.
Final Rating: *Low* *Moderate* *High*	LOW – No change.
Technical Difficulty	**Rationale**
Preliminary Rating: *Low* *Moderate* *High*	LOW - No special logistical support issues.
Final Rating: *Low* *Moderate* *High*	LOW – No change.

14. Smoke Management

Risk	Rationale
Preliminary Rating: *Low* *Moderate* *High*	LOW- Smoke concerns are generally few or easily mitigated. The project will produce smoke for only a short period of time or is barely visible to the public.
Final Rating: *Low* *Moderate* *High*	LOW – One NPS LE Rangers will be assigned to assist in traffic control if necessary. Smoke exposure or amounts are not expected to cause health or safety concerns to project personnel or the public.
Potential Consequences	**Rationale**
Preliminary Rating: *Low* *Moderate* *High*	LOW – No impacts or minor impacts to isolated residences, remote roads or other facilities are expected. Firefighter exposure to smoke is expected to be minimal and not cause health and safety concerns.
Final Rating: *Low* *Moderate* *High*	LOW – No change.
Technical Difficulty	**Rationale**
Preliminary Rating: *Low* *Moderate* *High*	LOW – No special operational procedures are required. Limitations on wind direction, season, etc. are in the plan. Smoke production is expected to be limited due to the small unit size.
Final Rating: *Low* *Moderate* *High*	LOW – No change.

COMPLEXITY RATING SUMMARY

RISK OVERALL RATING LOW

POTENTIAL CONSEQUENCES OVERALL RATING LOW

TECHNICAL DIFFICULTY OVERALL RATING LOW

SUMMARY COMPLEXITY RATING LOW

RATIONALE:

This prescribed fire project is approximately 17 acres in size with one continuous fuel type. There are good natural and man- made barriers surrounding the unit and the plan calls for adequate resources to handle the unit under prescribed conditions. The fuel surrounding the target area is classified the same as the target area. An RXB2 is required for implementation.

Prepared by: Mike Peck (RXB2) Date: 4/01/2013

Approved by: _____ Date: _____
(Agency Administrator)

Appendix D: JOB HAZARD ANALYSIS

United States Department of Interior National Park Service	1. WORK PROJECT/ACTIVITY **Prescribed Fire**	2. LOCATION **Backus Mountain**	3. UNIT **NERI**
JOB HAZARD ANALYSIS (JHA)	4. NAME OF ANALYST **P. Ainslie**	5. JOB TITLE **Fire Operations Specialist**	6. DATE PREPARED **04/20/2013**

7. TASKS/PROCEDURES	8. HAZARDS	9. ABATEMENT ACTIONS Engineering Controls * Substitution * Administrative Controls * PPE
***Travel to, from and on Project.**	**Motor vehicle accidents Slippery road surfaces,soft shoulders,unimproved and narrow roadways. Weather darkness,smoke.**	**Driving Defensively. Use seat belts. Identify road conditions during briefings. Post Road Guards. Mark hazards. Use Headlights. Perform pre-use inspections on equipment. Scout roads and identify turnouts before ignition of project. Maintain communications. Use Backers and chock vehicle tires. Have vehicles facing out. Do not leave vehicles parked unattneded on consumeable fuel.**
***Qualifications For assigned Position**	**Lack of Experience Injuries**	**Workers recruited for burn assignments shall be qualified for regular firefighting duties and meet Prescribed Burn qualifications.**
***Briefing**	**Lack of communications**	**Provide project briefing before burning clarify firing order, organization responsibilities, communications, hazards, weather, and expected fire behavior.**
***Protective Clothing and equipment**	**Injuries,burns and death**	**Wear hard hat with chin strap, safety glasses, gloves, Nomex Fire resistant pants and shirts NFPA 1977 compliant. Keep sleeves rolled down. Wear leather, lace type, boots with skid resistant soles, and tops at least 8 inches high. Carry drinking water and fire shelter. Wear hearing protection when working around equipment where noise level exceeds 90 dba. Wear additional protective equipment as dictated by local conditions and exposure to special equipment.**
***Lighters**	**Injuries and death falls, smoke, burns, rolling material.**	**Always have an escape route. Maintain LCES. Follow the Standard Fire Orders and Watch Out Situations. Maintain communications with other Lighters and RX Firing Boss. Do not fill drip torches near ignition sources. Do not spill burn mix on clothing. Shall be trained in 1) the proper techniques for ignition and, and 2) firing equipment included to, but not limied to fusees, drip torches.**
***Fuel Mixing**	**Burns, spills, fuel saturated clothing and boots.**	**No smoking within 25 feet of mixing and filling area. Do not fill or mix in pick up beds with bed liners. Avoid the use of cellular telephones in and around fill or mixing area. Avoid fuel contact with bare hands, clothing and boots. Provide pour spouts. Use only approved fuel containers. Use 3:2 or 4:1 mix ratio**
***Holding/Mop Up/Patrol Crews**	**Smoke,burns,Falls,**	**Wear PPE listed above. Maintain LCES, Follow Standard Fire**

	back injuries, , rolling material,eye injuries. Heat Stress. Dehydration CO Poisoning	**Orders and Watch out Situations. Receive briefing from Holding and Mop Up Boss. Identify hazards in work area. Flag hazards for others. Use warning lights and provide traffic control on roadways during smoky and nights operations. Maintaining a high level of aerobic fitness is one of the best ways to protect yourself against heat stress. Drink lots of fluids before, during and after work. Periodically rotate crews from work sites with high smoke levels to areas of less smoke or smoke free areas. Protective clothing and equipment shall be the same as required for firefighting. Crews shall follow all guidelines in the NWCG Fireline Handbook Chapter 5 Firefighting Safety (Rev. 9/98).**	
***Chain Saw Operation**	**Inexperienced operators, snags/widow makers, saw cut injuries, falling hazards**	**Sawyers and swampers shall have completed S212 and be red carded or under the supervision of a qualified sawyer. Call out appropriate warnings during falling operations. Be aware of adjacent ongoing operations and crews, warn all on site personnel of pending falling operations and locations. Be aware of and maintain situational awareness of snags, broken limbs, and hang-ups. Use spotters. Sawyers and swampers shall wear all required PPE including chaps. Avoid contacting bar tip with objects to reduce potential for kick-back. Use proper felling techniques and procedures.**	
***Portable Pump Operation**	**Burns from pump motor, refueling hazards, draft site, injuries, back injuries**	**Operator must have completed S211. Ensure pump is set up correctly and in a secure position. Use proper lifting and carrying techniques, ask for assistance. Watch footing around water sources, be alert for slip hazards. Allow for required warm-up and cool down times during use. Encure pump has cooled prior to refueling. Wear hearing protection when operating pump. Advise other personnel prior to shutting down or starting up pump.**	
***Emergency Evacuation Procedures (EEP)**	**Serious illness Injuries**	**Notify burn boss of injury. Provide type of injury,location,access, number of patients. Provide first aid O2 and medical kit will be on site. Identify EMT's and available medical equipment on project during briefing. Familiarity with medical plan.**	
10. SUPERVISOR SIGNATURE		11. TITLE **Fire Management Officer**	12. DATE

A Instructions

The JHA shall identify the location of the work project or activity, the name of employee(s) writing the JHA, the date(s) of development, and the name of the appropriate line officer approving it. The supervisor acknowledges that employees have read and understand the contents, have received the required training, and are qualified to perform the work project or activity.

Blocks 1, 2, 3, 4, 5, and 6: Self-explanatory.

Block 7: Identify all tasks and procedures associated with the work project or activity that have potential to cause injury or illness to personnel and damage to property or material. Include emergency evacuation procedures (EEP).

Block 8: Identify all known or suspect hazards associated with each respective task/procedure listed in block 7. For example:

a. Research past accidents/incidents
b. Research the Health and Safety Code, FSH 6709.11 or other appropriate literature.
c. Discuss the work project/activity with participants
d. Observe the work project/activity
e. A combination of the above

Block 9: Identify appropriate actions to reduce or eliminate the hazards identified in block 8. Abatement measures listed below are in the order of the preferred abatement method:

a. Engineering Controls (the most desirable method of abatement). For example, ergonomically designed tools, equipment, and furniture.

b. Substitution. For example, switching to high flash point, non-toxic solvents.

c. Administrative Controls. For example, limiting exposure by reducing the work schedule; establishing appropriate procedures and practices.

d. PPE (least desirable method of abatement). For example, using hearing protection when working with or close to portable machines (chain saws, rock drills portable water pumps)

e. A combination of the above.

Block 10: The JHA must be reviewed and approved by a line officer. Attach a copy of the JHA as justification for purchase orders when procuring PPE.

Blocks 11 and 12: Self-explanatory.

Emergency Evacuation Instructions

Work supervisors and crew members are responsible for developing and discussing field emergency evacuation procedures (EEP) and alternatives in the event a person(s) becomes seriously ill or injured at the worksite.

Be prepared to provide the following information:

a. Nature of the accident or injury (avoid using victim's name).
b. Type of assistance needed, if any (ground, air, or water evacuation)
c. Location of accident or injury, best access route into the worksite (road name/number), identifiable ground/air landmarks.
d. Radio frequency(s).
e. Contact person.
f. Local hazards to ground vehicles or aviation.
g. Weather conditions (wind speed & direction, visibility, temp).
h. Topography.
i. Number of person(s) to be transported
j. Estimated weight of passengers for air/water evacuation.

The items listed above serve only as guidelines for the development of emergency evacuation procedures.

JHA and Emergency Evacuation Procedures Acknowledgment

We, the undersigned work leader and crew members, acknowledge participation in the development of this JHA (as applicable) and accompanying emergency evacuation procedures. We have thoroughly discussed and understand the provisions of each of these documents:

SIGNATURE	DATE	SIGNATURE	DATE

Appendix E. FIRE BEHAVIOR MODELING

XERIC OAK (TL2) HEAD FIRE, BehavePlus 5.0.5 (Build 307)
Input Worksheet **Inputs: SURFACE, SIZE, CONTAIN, IGNITE**

Input Variables	Units	Input Value(s)
Fuel/Vegetation, Surface/Understory		
Fuel Model		tl2
Fuel Moisture		
Moisture Scenario		D1l2
Weather		
Midflame Wind Speed (upslope)	mi/h	0, 2, 4, 6, 8, 10
Air Temperature	oF	85
Fuel Shading from the Sun	%	50
Terrain D2L2 –		
Slope Steepness	%	50
Fire		
Elapsed Time	h	0.1
Suppression		
Suppression Tactic		Rear
Line Construction Offset	ch	0
Resource Line Production Rate	ch/h	16
Resource Arrival Time	h	.1
Resource Duration	h	8

Notes; BEHAVE runs for Head Fire, Hot End of Prescription at 85' temps and Dead Fuel Moistures at 6%, max slope at 50%... Description of Fuel Model: The primary carrier of fire in TL2 is broadleaf (hardwood) litter. Low load, compact broadleaf litter. Spread rate is very low; flame length very low. Live fuel, if present, has little effect on fire behavior.

RESULTS

Midflame Wind Speed	ROS (max)	Flame Length	Spread Distance	Residence Time	Fire Area	Fire Perimeter	Contain Status	Time from Report	Contain Area	Fireline Constructed	Firebrand Ignition
mi/h	ch/h	ft	ch	min	ac	ch		h	ac	ch	%
0	1.0	0.8	0.1	0.21	0.0	0	Contained	0.3	0.0	1.0	85
2	1.5	0.9	0.1	0.21	0.0	0	Contained	0.3	0.0	1.4	85
4	2.2	1.1	0.2	0.21	0.0	1	Contained	0.3	0.0	2.3	85
6	3.2	1.3	0.3	0.21	0.0	1	Contained	0.4	0.1	3.7	85
8	3.7	1.4	0.4	0.21	0.0	1	Contained	0.5	0.1	4.8	85
10	3.7	1.4	0.4	0.21	0.0	1	Contained	0.5	0.1	4.8	85

Inputs: SURFACE, IGNITE

Input Variables	Units	Input Value(s)
Fuel/Vegetation, Surface/Understory		
Fuel Model		tl2
Fuel Moisture		
1-h Moisture	%	4, 6, 8, 10, 12
10-h Moisture	%	5
100-h Moisture	%	7
Live Herbaceous Moisture	%	60
Live Woody Moisture	%	90
Weather		
Midflame Wind Speed (upslope)	mi/h	0, 2, 4, 6, 8, 10, 15
Air Temperature	oF	85
Fuel Shading from the Sun	%	40
Terrain		
Slope Steepness	%	50
Fire		
Elapsed Time	h	0.1

Notes

BEHAVE runs for Head Fire, Range of Fuel Moistures and wind Speeds. Still at the hot end of prescription at 85' temps and max slope at 50%...
Description of Fuel Model: The primary carrier of fire in TL2 is broadleaf (hardwood) litter. Low load, compact broadleaf litter. Spread rate is very low; flame length very low. Live fuel, if present, has little effect on fire behavior.

Results for: Surface Rate of Spread (maximum) (ch/h)

1-h Moisture	Midflame Wind Speed (upslope) mi/h						
%	0	2	4	6	8	10	15
4	0.9	1.3	2.0	2.8	3.0	3.0	3.0
6	0.8	1.1	1.7	2.2	2.2	2.2	2.2
8	0.7	1.0	1.5	1.7	1.7	1.7	1.7
10	0.6	0.9	1.3	1.5	1.5	1.5	1.5
12	0.6	0.8	1.2	1.3	1.3	1.3	1.3

Results for: Flame Length (ft)

1-h Moisture	Midflame Wind Speed (upslope) mi/h						
%	0	2	4	6	8	10	15
4	0.7	0.8	1.0	1.2	1.2	1.2	1.2
6	0.6	0.7	0.9	1.0	1.0	1.0	1.0
8	0.6	0.7	0.8	0.9	0.9	0.9	0.9
10	0.5	0.6	0.8	0.8	0.8	0.8	0.8
12	0.5	0.6	0.7	0.8	0.8	0.8	0.8