

Badlands National Park

Picnic Prescribed Fire

September 17, 2009

Prepared by andy thorstenson

Burn Unit Summary

The Picnic Prescribed Fire was completed in one operational period on September 17, 2009. This cooperative fire between the National Park Service and The Nature Conservancy consisted of 960 acres of mixed grass in primarily flat terrain.



Favorable winds on the south perimeter

Objectives

- Increase native grass and forb cover.
- Reduce 1-hr fuel loading.
- Enhance active prairie dog colony size by 20% 1-year postburn.
- Burn 65-80% of the burnable project area.



Ignition and holding on the south line

Personnel

Burn Boss: Eric Allen, Clint Phillips (trainee)

Ignition Specialist: Mike Carlborn

Holding Specialist: Al Stover, Toby Nettifee (trainee)

Fire Monitor: andy thorstenson

5 Type 6 Engines

4 ATV's

1 Structural engine

Weather conditions

The National Weather Service in Rapid City predicted fair and mild weather for the area with sunny skies, high temperatures near 85°, and light southeast wind. On-site weather observations showed clear skies, a high temperature of 88°, a minimum relative humidity of 22%, and light winds shifting from south-southwest to southeast.

Weather Observations

Time	Temp.	RH	Wind Speed	Wind Direction	Comments
0900	69°	49%	2-5	S	Clear skies
1000	72°	47%	2-4	Var S	
1100	77°	44%	1-4	SSW	Winds switching SW to SSE
1200	82°	33%	2-4, G-6	SE-SW	
1300	84°	27%	4-6, G-8	S	
1400	86°	28%	4-6	SE	Some SW winds
1500	88°	27%	1-5, G-7	S,SE	Variable wind speeds
1600	88°	22%	4-6, G-8	SSE	
1700	88°	22%	2-3	SE	No cloud cover for the entire day

Fire Behavior

Fire behavior was active for most of the day driven by continuous, cured grass fuel, low fine dead fuel moisture and south winds.

A few areas of sparse fuels existed within the unit limiting fire spread. Fine dead fuel moisture began at 8% at ignition and was 5% for most of the duration of the fire



Backing fire moving at 4 to 5 chains/hour



Head fire moving northwest at 30+ chains/hour

Fire Behavior Observations

Time	Location	Fire Type	ROS	FL	Comments
1101	Test fire	B	2-3 c/h		Northwest corner
1105	West line	H	4 c/h	3'-4'	Short duration head fire
1120	"	H/F	40	2'-3'	66 feet in 1:30
1140	"	F/B	3 c/h	8"-18"	SSW wind, occasional direction shift
1200	West line, North of TNC	F	12 c/	Up to 6'	Wind shifting b/n SW and SE
1210	West line	B	3 ½ c/h	6"-10"	Sweetclover/western wheatgrass
1220	"	H	120 c/h	5'-8'	Flame Zone Depth 10' or greater, Western wheat grass and sweetclover
1520	Southeast corner	H/F	~150 c/h	4'-8'	20 minutes about 50 chains
1626	"	H/F	30 c/h	4'	Final perimeter ignition
1630	Plot GFV-07	H	30+ c/h	~3'-6'	Unable to see plot due to smoke and fire activity

B=backing fire; F=flanking fire; H=head fire; ROS = rate of spread in chains per hour (1 chain = 66 feet or ≈ 20 meters)

Fire Progression

With a forecast of southeast winds, a test fire was ignited in the northwest corner of the unit at 1101 hours. Ignition progressed south toward the TNC ranch, then jogged east and south around the ranch headquarters. Ignition around the buildings was completed around 1300 hours and ignition continued along the south perimeter of the unit.

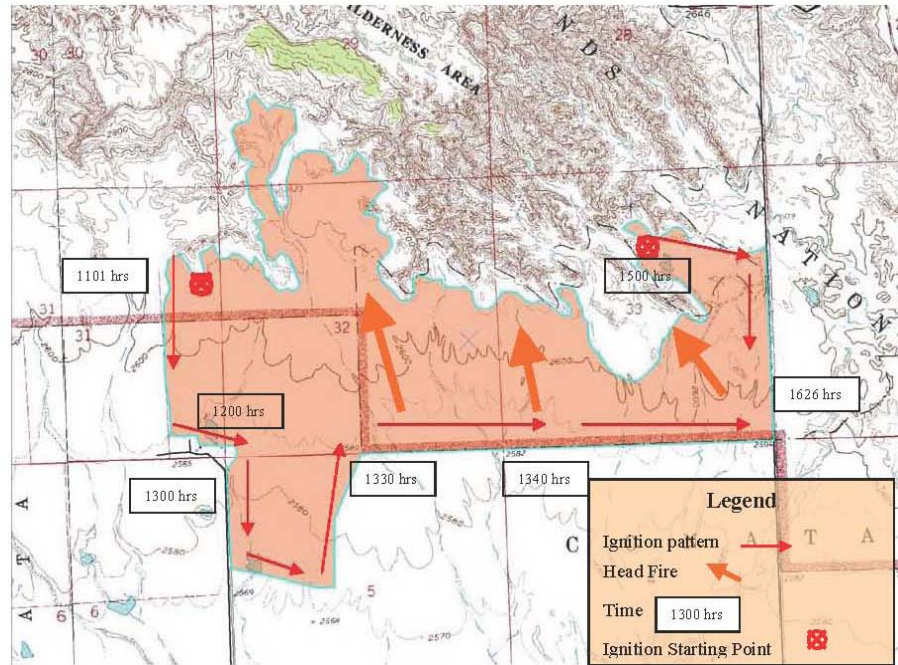
Construction along the Conata Road temporarily precluded firing operations. Ignitions slowed along the south line until

construction activity cleared. Igniters on the south line humored the fire edge when occasional southwest winds pushed the fire.

At about 1430 hours a second ignition team set up near the northeast corner. At 1500 this team began igniting toward the east along the badlands edge and then south along the Conata Road. The 2 ignition teams tied in the burn near the southeast corner along Conata Road at 1626 hours.

Much of the unit was ignited from the perimeter with favorable winds and very little interior ignition was necessary.

Fire Progression Map



Smoke Monitoring

The National Weather Service forecast predicted "Fair" smoke dispersal with mixing heights 3900 to 4900 feet above ground level. With transport winds primarily south-southeast during ignition, smoke moved northwest. Initially, smoke rose well and eventually rose to a height of greater than 2000' above ground level dispersing to the northwest. Smoke volume ranged from light to moderate. Moderate volumes occurred when the fire moved as a head fire through the center of the burn.

Biomass and Soil Moisture

Total aboveground biomass was sampled at each of the 3 monitoring plots located in the Picnic unit. Two monitoring plots had evidence of grazing and averaged 2.4 tons/acre while the ungrazed plot showed 4.1 tons/acre.

Soil moisture sampling in the top 1 inch of soil showed drier conditions in the grazed plots. Those 2 plots had an average of 19.4% soil moisture while the ungrazed plot had a soil moisture of 33.1%.



Smoke column at 1320 hrs

Fire Effects Monitoring

Three fire monitoring plots were installed within the boundaries of the Picnic Prescribed Fire. However only 1 plot burned as the prescribed fire boundary changed and 2 plots were excluded. Monitoring will continue at 1 Year, 2 Years and 5 Years to track changes in vegetation composition and ground cover.

Immediate postburn severity at the one monitoring plot showed lightly to moderately burned. This indicates that most of the standing grass was completely consumed and a portion of the litter and thatch was also consumed. Initial visual observation estimated that greater than 90% of the area burned in the fire.

Conclusions

A consistent south wind definitely contributed to the operational ease and success of the Picnic Prescribed Fire. The fire also represents a success for National Park Service and The Nature Conservancy cooperation on resource management issues. The fire succeeded in reducing the fine dead fuel load on the park boundary.

Fire personnel from the US Forest Service and staff of The Nature Conservancy assisted in the preparation and implementation of this prescribed fire. The Interagency relationships were improved as a result of this event.

Monitoring of native grass and forb cover and prairie dog colony size will occur in the following growing season to assess if those objectives have been met by the fire.



Head fire crossing the interior of the unit at 1515 hours