

Badlands National Park Roadside Prescribed Fire Monitoring Report

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Black Hills Fire Use Module*



Burn Unit Summary

The Roadside RX unit is a 422 acre unit that was burned on four operational periods: April 13, 14, 26 and 27, 2004. This unit consists of a narrow band of predominantly smooth brome on the north side of the Badlands Loop Road.

4/13/04

Size: 200 acres burned

Vegetation Type: Mixed-grass Prairie, dominated by smooth brome.

Personnel: Burn Boss: Eric Allen
Ignition Specialist: Chris Moore, Sabrina Henry (T)
Holding Specialist: Pam Griswall
Engine Bosses: Feaster, Childers, Littlewhiteman, Merrill
Fire Monitors: Andy Thorstenson (lead), Katie Johnson
4 Type-6 Engines
2 ATV's
1 Water Tender

4/14/04

Size: 15 acres burned

Vegetation Type: Mixed-grass Prairie, dominated by smooth brome.

Personnel: Burn Boss: Chad Suppa
Ignition Specialist: Mike Carlbom
Holding Specialist: Nate Gross
Engine Bosses: Sonya Feaster and others
6 Type-6 Engines
1 Water Tender

4/26 and 4/27/04

Size: 207 acres burned

Vegetation Type: Mixed-grass Prairie, dominated by smooth brome.

Personnel:

Burn Boss: Dan Morford

Ignition Specialist: Mike Carlbom

Holding Specialist: Steve Ipswitch

Engine Bosses: Kevin Merrill, Andy Bundshuh, Childers, and others

4 Type-6 Engines

1 Water Tender

Objectives

Objectives of the Roadside RX are as follows:

- Increase relative cover of native grasses by 10 to 25% 1-year post burn.
- Restore natural processes by reintroducing fire back into the ecosystem.

Weather Observations

4/13/04 Time	Temperature		Dew Point	RH	Wind		Comments
	Dry	Wet			Speed	Direction	
1055	58	44	27	31	3-6 (7)	SSW	
1205	65	47	27	23	9 (12)	SW	RH down 8%; slight cirrus increase
1300	70	51	33	23	7 (11)	S	winds erratic; temperature up 5
1400	74	53	34	23	7 (13)	S / SE	temp up 4
1500	72	51	30	21	8-10 (13)	SW	temp down 2; RH down 2

4/14/04 Time	Temperature		Dew Point	RH	Wind		Comments
	Dry	Wet			Speed	Direction	
1015	68	55	45	44	3-6 (9)	S	clear skies
1105	71	58	49	46	5-7 (10)	S	clear skies
1200	81	61	48	32	6-9 (10)	SE	cirrus clouds forming
1300	83	60	44	26	8-10 (18)	S	clouds increasing; cumulous building; stronger south winds
1400	83	59	41	23	8-10 (12)	S	large cumulous with virga in the west

4/26/04 Time	Temperature		Dew Point	RH	Wind		Comments
	Dry	Wet			Speed	Direction	
0930	59	42	22	24	10 (14)	W	
1100	64	46	24	22	8 (14)	WNW	
1200	67	48	27	22	15 (23)	SSW	Winds picking up

4/27/04	Temperature		Dew Point	Wind			Comments
	Dry	Wet		RH	Speed	Direction	
0800	57	45	32	39	12-13	W	hazy
0900	63	48	38	32	8 (12)	SSW	wind shifts
1000	70	52	36	28	7 (11)	SSW	
1100	77	55	39	26	7 (11)	SE to SW	
1200	86	59		19	5-8	SE	basin derived wind
1300	82	56	33	17	6 (9)	S to SW	temp reading off?
1400	86	58	35	16	8 (13)	W	start East Roadside
1500	89	59	35	15	3 (6)	W	
1600	87	58	34	15	6 (10)	WSW	
1700	86	58	35	16	4 (7)	SW	
1800	85	57	35	16	negligible		

Fire Behavior Observations

Date	Time	Location	Fire Type	ROS	FL	Comments
4/13	1125	north line	backing	2 ch./hr.	6"	
4/13	1140	north line	backing	0.6		
4/13	1155	north line	backing	1.33	4-6"	
4/13	1230	near Quinn Road	backing	2	6"	slight whirl in ash
4/13	1315	near Quinn Road				lots of whirls in ash
4/13	1345	near Quinn Road	flanking	2	10-12"	
4/13	1430		flanking	1.5	10-12"	more whirls, some with fire

Date	Time	Location	Fire Type	ROS	FL	Comments
4/14	1130	QuinnRd.& LoopRd	backing		4 – 8"	
4/14	1200	Quinn Road	backing		4 – 8"	
4/14	1300	Badlands Loop Rd.	backing/ flanking		2 – 4"	ROS slower due to strong S wind

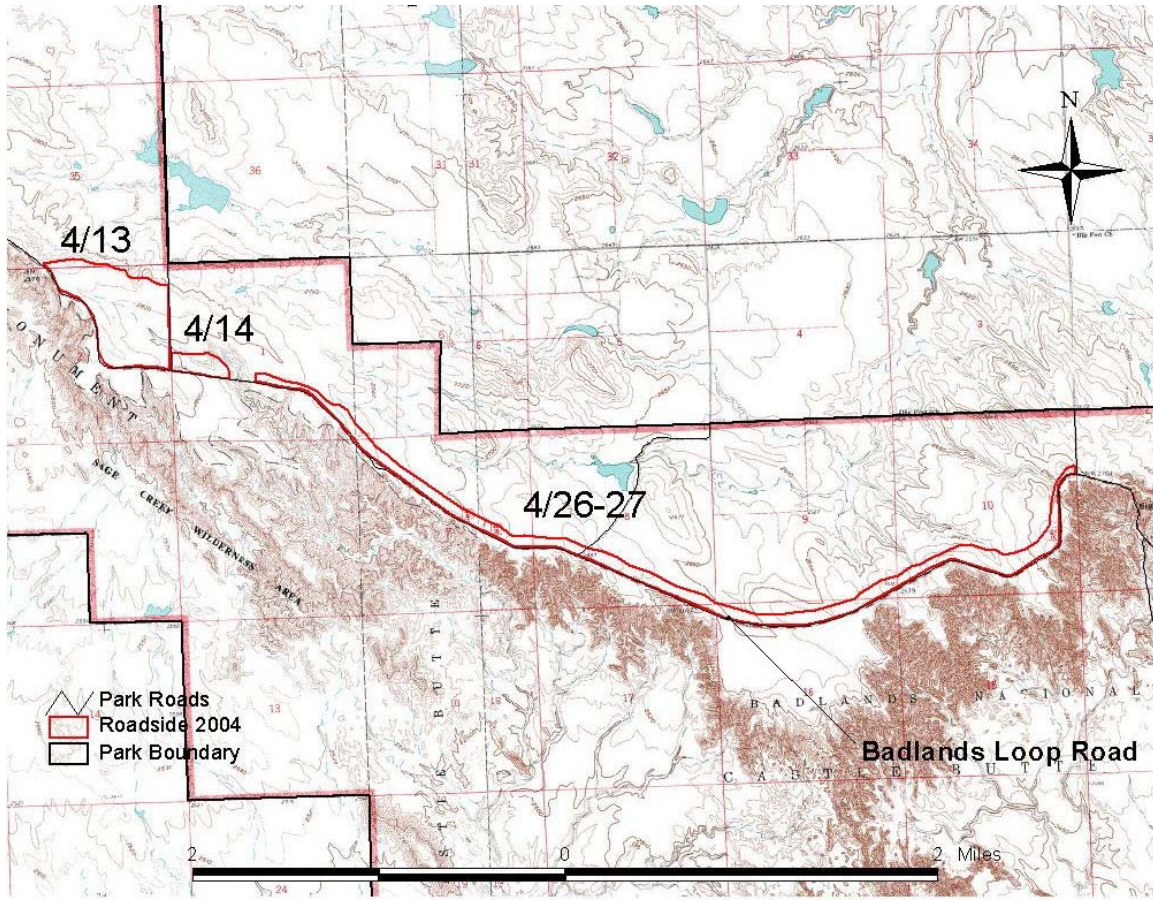
Date	Time	Location	Fire Type	ROS	FL	Comments
4/27	1220	Roadside	backing	1.7	6 – 8"	
4/27	1630	East Roadside	Flanking/ backing	1.5	3 – 6"	

ROS = rate of spread measured in chains per hour (1 chain = 66 feet or 20 meters)

Biomass and Soil Moisture

Type	Sample size	Fuel Loading	Average Fuel Loading	Soil Moisture	Average Soil Moisture
Smooth brome	3	1.30 tons per acre	1.17 tons per acre	7.5%	7.16%
Smooth brome	3	1.02 tons per acre		6.6%	
Smooth brome	3	1.18 tons per acre		7.4%	

Fire Progression



4/13: The test fire was lit at the northeastern corner of the unit. Ignition then proceeded west along the north mow line, allowing fire to back south through the unit. The eastern perimeter was then lit, proceeding from the northeastern corner south along Quinn Road to Badlands Loop Road. Flanking strips were lit from north to south, in the eastern side of the unit. More flanking strips were then lit (from north to south) in the western side of the unit, as well as along the Loop Road starting from the northwestern unit corner.

4/14: The test fire was lit at 1130 at the northwestern corner of the unit, where the mow line met Quinn Road. From there the ignition team proceeded east along the mow line, allowing fire to back through the unit to the south. At approximately 1215 three igniters were spaced out evenly in the unit and they brought fire from the backing fire south to the Loop Road. Ignition had ceased by 1230, and the fire was

allowed to back and flank up to the Loop Road. The decision was made not to continue ignition due to strong wind gusts and other prescribed fire priorities in the region.

4/26: The test fire was lit at 0930 at the Prairie Winds pullout and ignition started westward along the park road and also along the north mow line. Ignition continued along the road for approximately a mile and then ceased at 1200 due to gusty winds.

4/27: The test fire was lit at 0830 at the edge of the black from the previous day's burn. Ignition continued west along the road and mow line with strips taken throughout the unit. Ignition paused once badlands were reached just east of the black from 4/14. Then ignition began again at the far east side of the unit igniting westward with a predominately west wind allowing for backing fire to come through the unit. A flanking fire was started along the mow line and continued until the Prairie Winds pullout was reached from the east.

Smoke Monitoring

Smoke production during the four operational periods was moderate, increasing slightly as flanking strips were lit. During most of the operations smoke was dispersing vertically, from ground level to less than 1000 feet. Fireline visibility during the four operational periods ranged from a quarter-mile to a mile. For the first two of the operational periods southerly winds resulted in only the holding resources along the northern perimeter of the burn unit to be impacted by smoke. The other two operational periods had westerly winds affecting resources along the northeast perimeter of the unit. Once the fire backed away from the fireline, visibility increased dramatically and smoke impact along the fireline decreased. Smoke blew away from the Badlands Loop Road and only impacted visibility on the road for about an hour total on the afternoon of 4/13 and for part of the afternoon on 4/27. The National Weather Service predicted good smoke dispersal for 4/13 with a mixing height at 6500 feet above ground level. For 4/14, 26, and 27 they predicted excellent smoke dispersal with a mixing heights over 9000 feet above ground level.

Conclusions

The long-term health of ecosystems is the focus of the prescribed burning program in the Northern Great Plains and Badlands National Park therefore certain criteria need to be assessed. Some objectives are immediately measurable such as fuel load reduction immediate post-burn. Other quantifiable specific objectives need to be viewed over the course of several years before results can be determined. With a long term ecological monitoring program in place, a quantifiable assessment of prescribed fires specific objectives can be made.

