

Theodore Roosevelt National Park Northwest Corner Prescribed Fire

October 09, 2008

Prepared by Matt Koller and Jon Freeman

Burn Unit Summary

The Northwest Corner Prescribed Fire was completed during one operational period on October 09, 2008. It consisted of 700 acres of mixed grass prairie in primarily flat terrain. The vegetation type is a mix of native perennial and non-native annual grass.



Igniters on west end of Unit 3

Personnel

Burn Boss: Rod Skalsky

Ignition Specialist: Sonya Feaster, Krystal Jahner (trainee), Jason Melin, Kenn Perreault

Holding Specialists: Jesse Olson, Chad Wimer, Andy Thorstensen (trainee)

Fire Monitors: Jon Freeman, Marcus Lund

7 Type 6 Engines

3 ATV's

1 Five person holding squad

Objectives

- Provide for public and firefighter safety.
- Provide educational opportunities for the public concerning the role of fire in mixed grass ecosystems.
- Restore fire to mixed grass prairie ecosystem.
- Reduce 1 hour fuels by 70% immediate post burn.
- Retard encroachment of woody plant species such as snowberry and juniper.
- Maintain mixture of native cool and warm season grasses and stress cool season exotic grass species.
- Reduce likelihood of high severity catastrophic wildfires through fuel reduction.



FEMO observing fire behavior on STVI-05

Weather conditions

The National Weather Service in Bismarck, ND predicted a cold front passage with a wind shift from the northwest to the northeast in the afternoon for October 9th. The wind shift never occurred and a steady northwest wind with clear skies prevailed throughout the ignition period. Interestingly, all RAWS stations north and east of the burn unit agreed with our winds, while RAWS stations immediately south and west were influenced by the predicted wind shift.

Weather Observations

Date	Time	Temp.	RH	Wind Speed	Wind Direction	Comments
8 Oct	1000	42	64%	6 G8	W/NW	
8 Oct	1100	49	45%	3-5 G8	W/NW	Light Cirrus to the SE
8 Oct	1130	49	45%	8 G11	NW	
8 Oct	1200	52	33%	5 G10	NW	Cirrus overhead
8 Oct	1230	52	33%	9 G12	NW	Cirrus overhead moving NW
8 Oct	1300	54	26%	8 G10	NW	Cirrus moving N
8 Oct	1330	54	26%	10 G15	N/NW	Front to the SW Moving N
8 Oct	1400	54	26%	10 G15	N/NW	Front to the SW
8 Oct	1500	53	24%	9 G11	W/NW	Cirrus to the N, Front to the SW
8 Oct	1530	54	26%	6-7	NW	Cirrus to the N, Front to the SW
8 Oct	1600	54	26%	8 G11	NW	
8 Oct	1700	51	32%	3-5	NW	Cirrus to the N, Front to the SW

Wind speed in miles per hour, Temperature in degrees Fahrenheit

Fire Behavior

Fire behavior was driven primarily by northwest winds while patchy fuel loading contributed to reduced activity near areas of heavy grazing. Areas of continuous cured native perennial grass, mixed annual brome grass, and shrubs allowed extensive flanking and head fires to cross the prescribed fire area.

Fire Behavior Observations

Time	Location	Fire Type	ROS	FL	Comments
1130	Test fire	B	1/2 c/h	1'	Browsed areas not carrying fire
1130	Test fire	F	6 c/h	2'	Shrub/dead grass primary fuel, Mosaic burning occurring
1230	Map pt. L/M	B	2 c/h	1'	Backing quickly through heavy fuels
1230	Map pt. L/M	H	30 c/h	4'	6' FL with 6' to 8' FZD in shrubs
1230	Map pt. L/M	F	3 c/h	1'	
1300	STVI 6	F	1 c/h	1'	Flanking at 0P, sparse veg. from 0P-30P, spotty burning.
1400	Map pt. K	B	1 c/h	6"	Low behavior due to very sparse fuels
1530	STVI 4	B	2 c/h	1'	
1530	STVI 4	H/F	30 c/h	1'-3'	
1600	STVI 5	H	20 c/h	3'	Grazed areas resisting burning
1615	STVI 5	F	1.5 c/h	1'	

B=backing fire; F=flanking fire; H=head fire

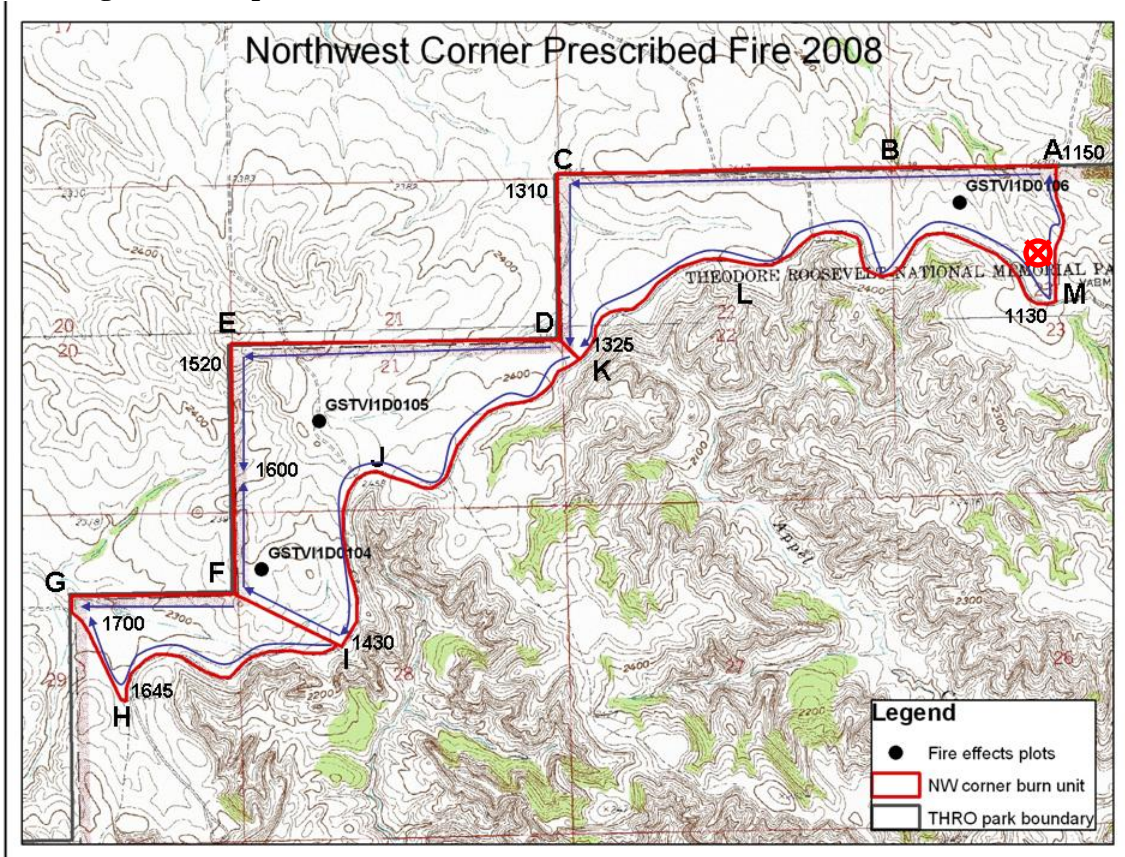
ROS = rate of spread measured in chains per hour (1 chain = 66 feet or ≈ 20 meters)

Fire Progression

With northwest winds, a test fire was ignited in the east corner of unit 3 at map point 'M' at 1130 hours. During the ignition sequence, 2 ignition teams were used to ignite the unit. Initially, one ignition team moved west along the south perimeter toward point 'L' while a second ignition team moved north to point 'A'. Fire backed away from the south and east perimeters where sufficient grass fuel was present. Fire carried well through both grass and shrub plant communities, and it was only in heavily grazed areas (primarily buffalo) where fire would not

carry. Spot ignitions were carried out in interior sections to increase the percent of the unit burned. The two ignition and holding teams continues working west and south along the park and unit boundaries, tying in the last unit at 1700 hours.

Fire Progression Map



Smoke Monitoring

The National Weather Service forecast predicted "Good" smoke dispersal. With wind direction primarily north-northwest during ignition, smoke moved exclusively to the southeast. Smoke did not rise significantly throughout the ignition period. Due to limited atmospheric lift, smoke drifted into the Little Missouri River valley. Smoke dispersal heights were around 250' to 500' above ground level. Smoke volume ranged from light to moderate. Moderate volumes occurred only when ignition teams moved through favorable continuous fuel.



Biomass and Soil Moisture

Total aboveground biomass was sampled at each of the 3 monitoring plots located in the Northwest Corner. Fuel load measured approximately 1.32 tons per acre and ranged from 0.65 to 2.19 tons per acre.

Soil moisture sampling in the top 1 inch of soil at the 3 plots averaged 26% with a range from 22% to 29%.

Fire Effects Monitoring

Three fire monitoring plots lay within the boundaries of the Northwest Corner prescribed fire. We recorded fire behavior at each plot and also measured immediate post-burn severity at the plots. Vegetation monitoring will continue at 1, 2, 5, and 10 years post-fire to track changes in vegetation non-native species composition.

Initial results indicate that the majority of the unit burned lightly, though completely. Subjective estimates immediately post-fire showed that roughly 75% of the unit did

burn in some fashion. Immediate post-burn severity indicated low severity in both the vegetation and substrate. This indicates that most of the standing grass was completely consumed, though there was little heat penetration into the duff or soil.

