

Devils Tower National Monument Meadow Prescribed Fire Monitoring Report

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Introduction

The Meadow burn unit is a 20 acre unit of mixed grass prairie in the northwest corner of Devils Tower National Monument. The unit is bounded by mowed lines on the north and south perimeters and by gravel road on the east side. A gravel road bisects the unit dividing it into Block 1 on the north side and Block 2 on the south side. Ignition of Block 1 occurred on April 30 and Block 2 on May 10, 2002. Block 1 had previously burned as part of the Meadow prescribed fire in May of 1999 and Block 2 had burned as part of the Westside prescribed fire in October of 1999.

Overhead personnel for the Graham burn consisted of Burn Boss Dan Morford, holding specialist Doug Alexander, and ignition specialist Eric Allen. Holding forces included three Type 6 Engines, one ATV, and one Type III water tender. Additional resources included various personnel from the National Park Service, the US Forest Service, and local volunteer fire departments.

Resource Goals

Primary resource goals for the burn:

- Increase native grass and forb cover
- Reduce occurrence of non-native perennial grasses
- Reduce pine encroachment in open meadow areas.

Summary of Events

Ignition of Block one began at 0910 hours on April 30 and concluded just before 1000 hours when light precipitation began. Weather conditions were decidedly cold and damp and fire activity was minimal. Ignition of Block 2 occurred on May 10 beginning at 1158 and ending one hour later. Weather conditions for Block 2 were more favorable but significant green-up had occurred, limiting fire activity and spread. The weather forecast for May 10 was received as a verbal forecast from the National Weather Service in Rapid City.

Weather Observations

Table 1, Weather Conditions Observed on 30 April 2002

Condition	Temperature	Relative Humidity	Wind Speed (mph)	Wind Direction	1-Hr Fuel Moisture
Predicted	51° F	52%	2-5 mph increasing to 7-11	NE	11%
Observed	47° F	62%	0-3	NE and NW	13%

Table 2, Weather Conditions Observed on 10 May 2002

Condition	Temperature	Relative Humidity	Wind Speed (mph)	Wind Direction	1-Hr Fuel Moisture
Predicted	Not available	Not available	Not available	Not available	Not available
Observed	Max 56° F	42%	0-5	East/variable	7%

Ignition Pattern

Ignition of Block 1 began at the north boundary (DP1) and progressed southwest along the mowed line and south along the gravel road. Ignition continued along the mowed line reaching the west boundary (DP2) in just under 1 hour. Additional interior ignition occurred in the southeast corner. Block 2 ignition began at the west boundary (DP2) and moved southeast along the mow line and east along the gravel road. Ignition teams met in the southeast corner (DP3) after about 1 hour of ignition. Additional interior ignition was used in some areas to improve consumption of grass fuels. See attached fire progression map.

Fire Behavior Observations

On April 30, backing fire flame lengths ranged between 2 and 4 inches with a rate of spread of less than 1 chain/hour. Cool, moist air often extinguished head and flanking fires.

On May 10, rates of spread for backing fire ranged from 2 to 3 chains per hour with flame lengths of 3-10 inches. Head fire rates of spread ranged from 5 to 30 chains per hour. Flame lengths for head fire ranged from 3 to 12 inches feet, with flame zone depths of up to 2 feet.

Biomass, Fuel and Soil Moisture Measurements

Biomass samples were collected from near the fire effects plot in Block 2 and showed fuel loading of 0.69 tons per acre. Soil moisture samples measured 27% soil moisture on April 29. Ponderosa pine live fuel moisture was measured at 92%.

Smoke Monitoring

Small amounts of smoke were produced on this fire. Visibility on roads and fireline was only minimally hazy during ignition operation.

Fire Monitoring

One long-term fire-monitoring plot is located within this portion of the Meadow burn unit. This plot was read immediately postburn and showed severity of scorched to lightly burned. The plot will be read 1, 2, 5, and 10 years after treatment of fire to determine the immediate, short, and long term ecological and vegetative effect fire had on this burn unit. Results will be compared with 2 other plots in the Meadow area that have burned in the past.