

# 2009 Nenana Ridge Prescribed Fire Monitoring Report

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29-30 April 2009

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Three FEMOs were assigned to the burn. Two followed the firing crew up the west flank (Allen and Northway) and one up the east flank (Miller). Additional imagery and was taken from the viewpoint on the Upper Hunter Road (R. Jandt).

## Weather

Two RAWS were located at the south (AP5) and north (AP3) end of the burn area. AP5 is not used in this report because it is located on the fireline and data were influenced by fire activity and operations. The station was wet-lined about 1400. Wind data were influenced by ignition but less so later in the afternoon when the fire front moved to the north.

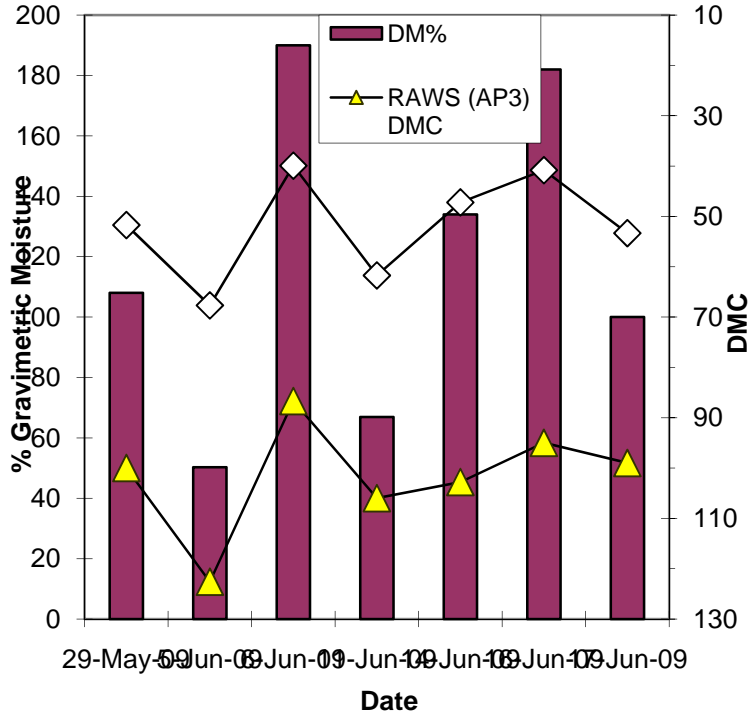
Cumulus clouds to the south developed just about ignition time and shaded the unit for most of the afternoon which may have brought the fine dead fuel moisture up.

## Fuel Moistures and Indices

Duff plugs, live herbaceous, live woody, and conifer foliage were taken in control and treatment areas to monitor moisture prior to the ignition date by AFS staff and the PNW Research Station crew (Vihnanek). Duff plug layers were converted to indices using the Lawson and Dalrymple (1996) equation and given as Field DMC and Field DC in Table 1. Four live moss moisture samples in the B unit at 10:00 averaged 44%. Another 5 samples at the test fire area at 13:30 averaged 47%.

DATE	LM%	RAWS (AP3) FPMC	DM%	RAWS (AP3) DMC	FIELD DMC	UD%	RAWS (AP3) DC	FIELD DC	LD%
29-May-09	21	88	108	100	52	157	175	304	
5-Jun-09	20	92	50	123	68	108	220	405	314
6-Jun-09	405	65	190	87	40	125	222	364	
11-Jun-09	19	92	67	106	62	84	268	471	126
14-Jun-09		85	134	103	47	82	279	478	163
16-Jun-09	94	92	182	95	41	144	296	327	176
17-Jun-09	44	92	100	99	53	121	303	374	207

### Nenana Ridge : DMC and Dead Moss Moisture Content



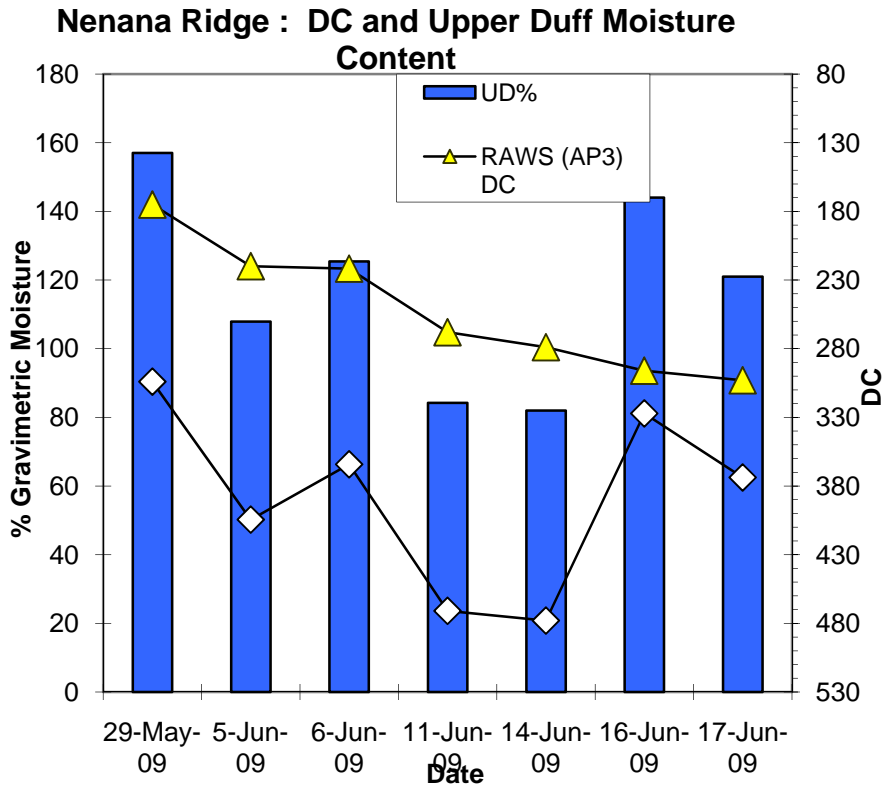


Table \_\_. Live fuel moisture contents.

Fuel	Moisture %
Live Shrub	189
Black Spruce	81

## Fire Behavior

Ignition started at the south end of Unit A at 13:45. Once the east and west firelines were fired, the interior was fired by aerial PSD to generate a self-sustaining fire front. Fire behavior was initially intermittent torching with ~50% crown consumption. However surface spread into the interior was poor. At 1445 fire behavior picked up with better heat build-up and group torching. Smoke dispersal was to the Northeast. At 15:11 the column indicated a strong interior crown fire. At 15:30 there may have been a downdraft from the southeast that caused spotting into Unit B on the west flank that resulted in a 10-15 acre slop-over. On the east flank the fire transitioned from group torching to dependent crown fire pushing toward the north. The fire was stopped at the transition from black spruce-feathermoss to mixed conifer-hardwood leaf litter at the north end of the unit. Firing operations ceased about 16:30.

## Fire Effects

Fire effects were assessed in the days following the burn. The southernmost unit, A2 (thinning treatment), had only a few spotfires, possibly from ping-pong balls. The fire failed to spread into the unit. In fact there was enough post-fire green that a second attempt to burn this unit is still possible. Unit A3 (shear-blade and leave treatment), burned extremely hot. This unit was not hit hard by crown fire but appears to have been inherently flammable (Figure 1). Unit A4 (shear-blade and wind-row) also burned hot under the wind-rows but left much green and unburned material in the wet swales. Spotting over the green swales appears to have been more important than surface spread. At Unit A1 (thinning treatment) crown fire entered the south end of the treatment area, dropped to a surface fire, spotted ahead leaving burn patches, and eventually failed to spread into the north side of the treatment area. A distinct line along the west edge of the unit suggests that the fire behavior was due to surface fuels. Within the treatment the surface fuels had changed from feathermosses (pre-treatment) to grasses and other mosses (post-treatment).

Table 1. Weather data collected on the east flank by Miller.

Location	Time	T	RH	DP	WS	WD	FDFM	SOW	Comment
EAST FLANK	12:15	68	46	47	1	135	10	10-50% Cloud Cover	CUMULUS
EAST FLANK	13:00	77	36	48	1	158	8	10-50% Cloud Cover	CUMULUS
EAST FLANK	14:00	69	47	48	3.8	270	10	10-50% Cloud Cover	CUMULUS
EAST FLANK	15:00	70	48	49	2.8	203	10	50-90% Cloud Cover	CUMULUS
EAST FLANK	16:00	70	48	49	2.2	180	11	50-90% Cloud Cover	CUMULUS + SMOKE
EAST FLANK	17:00	69	51	50	0.8	225	11	50-90% Cloud Cover	CUMULUS + SMOKE

Table 2. Weather data collected on the west flank by Allen.

Location	Time	T	RH	DP	WS	WD	FDFM	SOW	Weather Comment
WEST FLANK	15:45	75	31	42	1	180	9	50-90% Cloud Cover	CUMULUS, SMOKE COLUMN
WEST FLANK	14:30	70	37	42	0		9	10-50% Cloud Cover	CUMULUS, 40% CLOUD COVER
WEST FLANK	14:00	74	36	45	2	270	9	10-50% Cloud Cover	CUMULUS, 35% CLOUD COVER

Table 3. Weather data from the AP3 RAWS at the top of the burn area.

Location	Time	T	RH	DP	WS	WD
RAWS AP3	12:00	71	40	46	3	282
RAWS AP3	13:00	76	34	46	3	196
RAWS AP3	14:00	72	38	45	4	169
RAWS AP3	15:00	68	41	43	9	191
RAWS AP3	16:00	68	37	41	10	207
RAWS AP3	17:00	68	54	51	9	209
RAWS AP3	18:00	68	48	49	8	227





Figure 3. Fire behavior at 15:36 from the viewpoint.





Figure 4. Fire Behavior at 14:05 at the ignition point. Single trees and groups torched but fire failed to carry into the unit.





Figure 5. Peak fire behavior at 15:31. The flame front is approximately 170 m south of the A1 unit.





Figure 6. Fire Behavior at 15:43. This image is on the east fireline looking into unit A1 approximately halfway across the unit.