

## Alphabet Hills Prescribed Fire (AA30) 2 Year Post Burn Field Monitoring Report

November 6, 2006

The Alphabet Hills prescribed fire (AA30) was ignited on August 10, 2004 by the BLM Alaska Fire Service and burned approximately 37,500 acres. Two vegetation and consumption plots were established in 2001 on the west side of Porkchop Lake (see attached map). Both transects were burned in 2004, with burn severity ratings of light to moderate for transect PC-1 and severe for transect PC-2. For further details and data on burn severity and duff consumption, see *Jandt, Randi, 2004, Alphabet Hill Prescribed Fire Monitoring Notes and Field Report (unpublished)*. Both transects were re-measured on August 17, 2006.



Figure 1. Burned area in transect PC-1 one month post-burn (September 2004) and 2 years post-burn (August, 2006).

Transect PC-1 is located in an open black spruce feather moss fuel type with a dwarf birch and willow shrub component. Pre-burn vegetation data collected in 2001 documented understory cover of primarily blueberry, sedges (*Carex* species), willow, and crowberry with a feather moss and litter forest floor (Table1). Approximately 60% of the transect was burned in 2004. Regeneration in 2006 (2 years post burn) is dominated by grass species (20% cover) typically seen after disturbance (Figure 1). Other species include (in descending order) crowberry, willow (primarily *Salix pulchra*), labrador tea, and fireweed. The largest changes in species composition occurred with grasses replacing sedges after the burn and the presence of fireweed, a colonizing species. Horsetail was also seen in abundance in the surrounding area, though not reflected on the transect.

Where burned, fire moss (*Ceratodon purpureus*) and liverwort (*Marchantia polymorpha*) have taken hold in areas where a thin layer of lower duff remained. We also observed an increase in standing water from 2% to 8% cover. This could be a result of the removal of insulating duff layers, allowing heat to penetrate the permafrost layer and lead to melting. Along with standing water, we also saw water slowly running down the slight slope through small channels where the duff layers were consumed. No erosion was seen.

Table 1. Transect PC-1 absolute percent cover (total cover, including overlaps of multiple species at a single spot) pre-burn (2001) and 2 years post-burn (2006).

Species Name	Common Name	2001 % Cover	2006 % Cover	Difference
<i>Vaccinium uliginosum</i>	Blueberry	20	11	-9
<i>Carex</i> species	Sedge	18	0	-18
<i>Salix</i> species	Willow	11	7	-4
<i>Empetrum nigrum</i>	Crowberry	10	8	-2
<i>Vaccinium vitis-idaea</i>	Low-bush cranberry	8	1	-7
<i>Ledum palustre</i>	Labrador tea	6	6	0
<i>Equisetum</i> species	Horsetail	3	1	-2
<i>Rubus chamaemorus</i>	Cloudberry	3	3	0
<i>Betula nana</i>	Dwarf birch	2	1	-1
Grass species	Grass	1	20	+19
<i>Petasites frigidus</i>	Coltsfoot	1	0	-1
<i>Epilobium angustifolium</i>	Fireweed	0	5	+5
<i>Pluerozium schreberi</i> / <i>Hylocomium splendens</i>	Feather moss	29	4	-25
-	Litter	12	11	-1
-	Duff	3	14	+11
-	Stalk lichens	2	1	-1
-	Standing water	2	8	+6
<i>Peltigera</i> species	Leaf lichen	1	1	0
<i>Sphagnum</i> moss species	Sphagnum moss	1	0	-1
-	Dead moss	0	1	+1
<i>Ceratodon purpureus</i>	Fire moss	0	11	+11
<i>Marchantia polymorpha</i>	Liverwort	0	2	+2
Other moss species	Other moss	0	1	+1



Figure 2. Transect PC-2 one month post-burn (September 2004) and 2 years post-burn (August, 2006).

Transect PC-2 is located on a dry southeast facing slope above Porkchop Lake. Dense resin birch (*Betula glandulosa*) with underlying low shrubs (blueberry, crowberry, and labrador tea) along with a shallow forest floor layer of feather moss and litter

characterized vegetation cover pre-burn (Table 2). The entire hillside was severely burned in 2004. Almost all of the organic material was consumed, exposing shrub root masses, rocks, and mineral soil (Figure 2). Most of the exposed soil has been colonized by fire moss (*Ceratodon purpureus*), though some areas remain as unconsumed lower duff and char. Vegetation regeneration along the transect consisted of only fireweed, grass (*Calamagrostis* species), bunchberry, and fire moss, though some blueberry and liverwort (*Marchantia polymorpha*) were identified in the adjacent area.

Table 2. Transect PC-2 absolute percent cover (total cover, including overlaps of multiple species at a single spot) pre-burn (2001) and 2 years post-burn (2006).

Species Name	Common Name	2001 % Cover	2006 % Cover	Difference
<i>Vaccinium uliginosum</i>	Blueberry	31	0	-31
<i>Betula glandulosa</i>	Resin birch	29	0	-29
<i>Empetrum nigrum</i>	Crowberry	16	0	-16
<i>Ledum palustre</i>	Labrador tea	12	0	-12
<i>Cornus Canadensis</i>	Bunchberry	7	1	-6
<i>Vaccinium vitis-idaea</i>	Low-bush cranberry	6	0	-6
<i>Salix pulchra</i>	Flat-leaved willow	1	0	-1
<i>Spiraea beauverdiana</i>	Meadowsweet	1	0	-1
<i>Epilobium angustifolium</i>	Fireweed	0	14	+14
<i>Calamagrostis</i> species	Grass	0	4	+4
<i>Pluerozium schreberi</i> / <i>Hylocomium splendens</i>	Feather moss	26	0	-26
-	Litter	19	5	-14
-	Duff	2	7	+5
<i>Cladina</i> species	Reindeer lichen	2	0	-2
<i>Peltigera</i> specis	Leaf lichen	1	0	-1
-	Char	0	6	+6
<i>Ceratodon purpureus</i>	Fire moss	0	31	+31
-	Mineral Soil	0	2	+2
<i>Polytrichum</i> species	Hair-cap moss	0	1	+1
-	Rock	0	3	+3

Willow density was also measured in the two transects. Post-burn counts in PC-1 showed just under 50% of the willows (primarily *Salix pulchra*) were resprouting in 2006 (Table 3). No willow seedlings were found within PC-1. Willows were not present pre- or post-burn in transect PC-2. Resin birch density was not measured pre-burn but no regeneration was seen within the transect in 2006. However, a small amount of resprouting was seen on the hillside. As this area is also being monitored by the Alaska Department of Fish and Game for moose browse, it may also be important to note that moose droppings were very evident in the flatter areas adjacent to the lake (near PC-1), along with an occasional spot of bear sign. We also observed a bull moose browsing between the two transects.

Table 3. Shrub density (shrubs/acre), including willow species and resin birch in 2001 and 2006.

Transect	(PRE) 2001		(YR2) 2006		% Change
	Stem Count	Shrubs/acre	Stem Count	Shrubs/acre	
PC-1	31	8184	15	3960	-51.6
PC-2	<i>no data</i>	-	0	0	-

Active layer depth measurements taken in 2006 revealed that the average depth to permafrost in PC-1 has increased approximately 39 cm from 2001 (Figure 3). The increase in active layer depth could explain the increase in standing water. The average depth to permafrost, or in this case rock, in PC-2 decreased from 11.8 cm in 2001 to 2.9 cm in 2006. The thin mat of feather moss present in 2001 was almost completely consumed in 2004, leaving a very rocky subsurface. The depths recorded for PC-2 more accurately reflect depth of remaining duff/soil to rock.

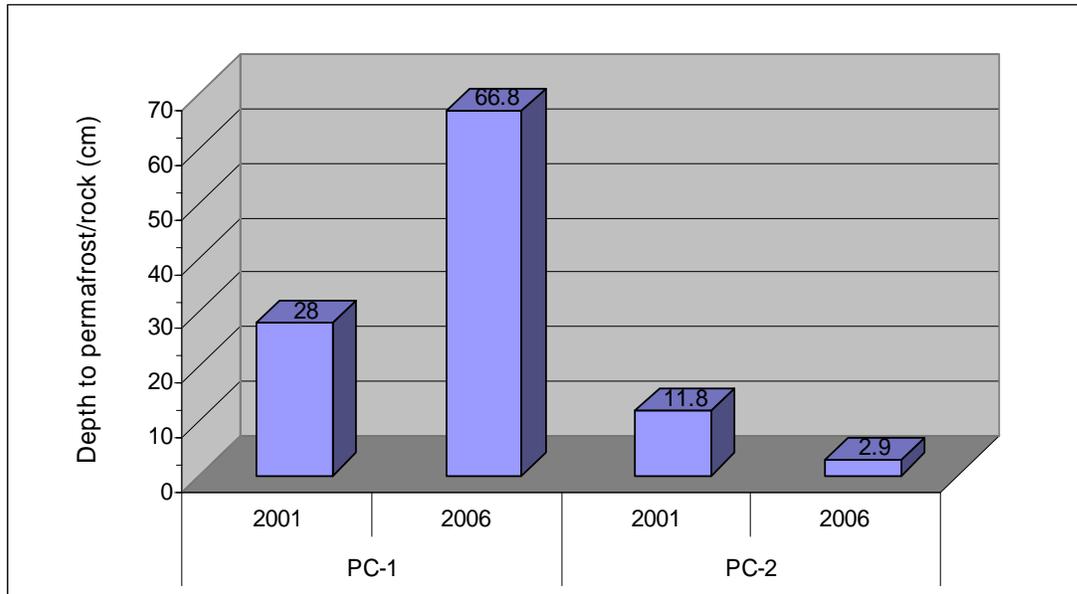


Figure 3. Average active layer depths (cm) for PC-1 and depth to rock (cm) for PC-2.

Additional long-term monitoring of the Alphet Hills transects will continue on 3-5 year interval to further assess vegetation recovery and correlate these changes to burn severity.

Jennifer Hrobak  
 ECO Fire/Fuels Technician  
 BLM-Alaska Fire Service



PC-1, 50 – 0 ft, 8-17-06



PC-2, 50 – 0 ft, 8-17-06



Willow resprouting in PC-1.



Resin birch resprouting near PC-2.