

PHOTO GUIDE FOR APPRAISING DOWNED WOODY MASTICATED FUELS IN INTERIOR PONDEROSA PINE FORESTS ON THE COLORADO FRONT RANGE

**PART ONE OF A FOUR-PART SERIES ON INTERIOR PONDEROSA PINE,
GAMBEL OAK, MIXED CONIFER AND LODGEPOLE PINE COVER TYPES**



THIS PHOTO GUIDE IS BEING DEVELOPED BY FOREST STEWARDSHIP CONCEPTS, LTD., OF MONTE VISTA, COLORADO, AND IS FUNDED BY THE COLORADO STATE FOREST SERVICE IN COOPERATION WITH THE COLORADO FOREST RESTORATION INSTITUTE AT COLORADO STATE UNIVERSITY

This photo series on downed woody masticated fuels in interior ponderosa pine is the first in a four-part series. The following photo series is being developed and will be available as treatment occurs:

SERIES 1 – Masticated Interior Ponderosa Pine Stands, SAF Cover Type 237

SERIES 2 – Masticated Gambel Oak Stands, Society of Range Management Code SRM 109

SERIES 3 – Masticated Mixed Conifer Stands (Douglas-fir/ponderosa pine), SAF Cover Types 237 and 210

SERIES 4 – Masticated Lodgepole Pine Stands, SAF Cover Type 218

PUBLICATIONS CITED—MASTICATED INTERIOR PONDEROSA PINE

Andrews, Patricia L., Collin D. Bevins, Robert C. Seli. 2005. BehavePlus fire modeling system Version 3.0.1 Users Guide. USDA Forest Service. General Technical Report RMRS-GTR-106WWW. Rocky Mountain Research Station.

Brown, James K. 1974. Handbook for inventorying downed woody material. USDA Forest Service. General Technical Report INT-79. Intermountain Forest and Range Experimental Station, Ogden, Utah.

Hornby, L.G. 1936. Fire control planning in the northern Rocky Mountain region. USDA Forest Service. Program Report 1, Northern Rocky Mountain Forest and Range Experimental Station. Missoula, Montana.

Society of American Foresters (SAF). 1954. Forest cover types of North America. Society of American Foresters, Washington D.C.

Carlton, Donald. Fuels Management Analyst Suite FMAPlus users' guide. 2005. Fire Program Solutions & Acacia Services. Sandy, Oregon.

ADDITIONAL ARTICLES OF INTEREST

Webb, J.B. 2006. Kennedy Gulch Prescribed Burn Fuel Modeling and Smoke Management. Colorado Forest Restoration Institute & Colorado State Forest Service. Fort Collins, Colorado.

INTRODUCTION

This photo guide contains information that can be used to appraise the dead woody debris found on the forest floor after mastication treatment. The photos, which were taken from early to mid-summer 2006, concentrate on forested stands along the Front Range of Colorado, but are applicable across a much wider zone in the Central Rockies. Interior ponderosa pine is the only cover type completed to date. Plots in this series that have not yet been treated are scheduled for treatment in 2007-2008, and post-treatment conditions will be inventoried. Gambel oak, mixed conifer and lodgepole pine cover types also will be included in the guide as the sites are treated. Treatment in these forest types will occur sometime during the spring or winter of 2007.

The guide will facilitate estimation of dead woody fuel-loading following mastication treatments under a wide variety of vegetative conditions. Knowledge of fuel-bed loading by size class and fuel-bed depth allows one to determine expected fire behavior and smoke production. Stand conditions such as pre- and post-treatment basal area and stems per acre provide insight into woody fuel production and eventual aesthetic outcomes.

The photos provide a relatively quick and inexpensive means to determine fuel-loading across a forested landscape. This photo guide will provide better accuracy than the stylized fuel models used in the National Fire Danger Rating System or BehavePlus system, but less accuracy than an intensive standard fuel inventory.

Perhaps the most useful feature of this series is the fire potential rating of each photo.

METHODOLOGY

Photo points were chosen to represent a wide variety of forest stand conditions and fuel-loading. Four dead/down woody fuel inventory transects were run at each photo point to capture the variety of fuel-loading shown in the photo. James Brown's 1974 Handbook for Inventorying Downed Woody Material describes the inventory technique used.

The fuel treatment triangle sign was always located 30 feet from the camera. Digital photos were taken with two different cameras and the best photo was selected for each plot. Other site-specific information was collected to complete the "Data Sheet" for each photo.

Two approaches were taken to determine pre- and post-treatment stand data. All but a few of the ponderosa stands already had been treated when this project started. In treated stands, all the stumps in a 1/100-acre plot were measured so that pretreatment stand basal area and stems per acre could be reconstructed. In stands that had not been treated, basal area was measured with a ten-factor prism and stand stocking was derived using basal area factors by size class.

Raw fuel inventory metrics were processed using the DDWoodyPC® program from Fuels Management Analyst Plus® (FMAPlus). Consolidated fuel loading by size class information for each plot was then entered into the BehavePlus3.0.1 fire modeling system to determine fire behavior potential for the site. The D2L1 fuel moisture scenario in BehavePlus was used to describe relatively hot fire conditions. It has low dead fuel moistures of 6, 7 and 8 percent for 1-, 10- and 100-hour fuels. A seven mile per hour mid-flame wind speed is a constant in all runs.

Fire behavior potential is described in both empirical and adjective ratings. Rate of spread in chains/hour and flame length in feet were derived directly from BehavePlus runs. Torching, crowning, resistance to control and overall fire potential are expressions of expected fire behavior.

This approach of estimating fire potential is not without precedent. In many ways, it is a refinement of the time-tested concept of fuel rating introduced more than 40 years ago by L.G. Hornby (1936).

The adjective ratings nil, low, moderate, high and extreme are defined as follows for each of the different expressions of fire behavior.

TORCHING:

Nil – no chance of torching

Low – occasional tree may torch

Moderate – pole-sized understory trees likely to torch-out

High – most understory and occasional overstory trees likely to torch-out

Extreme – entire stand likely to torch out

CROWNING:

Nil – sustained spread in crowns will not occur

Low – sustained spread in crowns unlikely

Moderate - some crowning likely, but will not be continuous

High – sustained crowning likely

Extreme – sustained crowning will occur

RESISTANCE TO CONTROL:

Nil – no physical impediments to line building and holding

Low – occasional tough spots but not enough to cause serious line building and holding problems

Moderate – hand-line construction will be difficult and slow, but dozers can operate without serious problems

High – slow work for dozers, very difficult for hand crews; hand-line holding will be difficult

Extreme – neither dozers nor hand crews can effectively build and hold line

OVERALL:

Nil – fire will not sustain itself

Low – fire can be easily controlled by several smokechasers with hand tools

Moderate – aggressive crew-sized (6-10 persons) initial attack required for successful control

High – aggressive crew-sized (25 persons) initial attack with substantial reinforcement required for successful control; 10-percent chance that initial control action will fail

Extreme – 90 percent chance that initial control action will fail

PONDEROSA 1 DATA SHEET

Stand Number: Lower North Fork 11
 Forest Cover Type: SAF No. 237
 Interior Ponderosa Pine

DOWN & DEAD WOODY FUEL LOADINGS

SIZE CLASS (INCHES)	WEIGHT T/AC
0-0.25	0.04
0.25-1	0.74
1-3	1.71
Subtotal 0-3	2.50
3+	3.62
Needles	0.68
Total	6.80

OTHER FUEL DATA:

Average Duff Depth: 1.31 inches
 Fuel Bed Depth: 0.21 feet

FIRE BEHAVIOR POTENTIAL	RATING
Rate of Spread: chains/hour	3.6
Flame Length: feet	2.1
Torching	Low
Crowning	Low
Resistance to Control	Low
Overall Fire Potential	Low

SITE DATA:

Average Slope: 30 percent
 Aspect: East
 Elevation: 6,870 feet
 Latitude & Longitude: N39.43301/W105.21227
 Remarks: Denver Water Lower North Fork Area
 Mastication Method: Timbco with Fecon head
 Treatment Year/Contractor: 2006, West Range Reclamation, Crawford, CO



STAND DATA

STEM SIZE	PRE-TREAT BASAL AREA	PRE TREAT # STEMS	POST TREAT BASAL AREA	POST TREAT # STEMS
0-2"				
3-4"				
5-6"				
7-8"				
9-10"				
11-12"				
> 13"			40	21
Total	Not measured		40	21

Note: No tally trees in the 1/100th acre post-treatment plot

PONDEROSA 2 DATA SHEET

Stand Number: Lower North Fork 5
 Forest Cover Type: SAF No. 237
 Interior Ponderosa Pine

DOWN & DEAD WOODY FUEL LOADINGS

SIZE CLASS (INCHES)	WEIGHT T/AC
0-0.25	1.30
0.25-1	3.03
1-3	0.38
Subtotal 0-3	4.72
3+	2.42
Needles	1.27
Total	8.41

OTHER FUEL DATA:

Average Duff Depth: 0.34 inches
 Fuel Bed Depth: 0.18 feet

FIRE BEHAVIOR POTENTIAL	RATING
Rate of Spread: chains/hour	1.8
Flame Length: feet	1.2
Torching	Low
Crowning	Low
Resistance to Control	Low
Overall Fire Potential	Low

SITE DATA:

Average Slope: 10 percent
 Aspect: East
 Elevation: 7,000 feet
 Latitude & Longitude: N39.43655/W105.21503
 Remarks: Denver Water Lower North Fork Area
 Light loading plot
 Mastication Method: Timbco with Fecon head
 Treatment Year/Contractor: 2006, West Range Reclamation, Crawford, CO



STAND DATA

STEM SIZE	PRE-TREAT BASAL AREA	PRE TREAT # STEMS	POST TREAT BASAL AREA	POST TREAT # STEMS
0-2"	1	100	0	0
3-4"	7	100	0	0
5-6"	31	100	0	0
7-8"	26	100	0	0
9-10"				
11-12"	20	25	20	25
> 13"	20	16	20	16
Total	105	441	40	41

PONDEROSA 3 DATA SHEET

Stand Number: Lower North Fork 13
 Forest Cover Type: SAF No. 237
 Interior Ponderosa Pine

DOWN & DEAD WOODY FUEL LOADINGS

SIZE CLASS (INCHES)	WEIGHT T/AC
0-0.25	0.27
0.25-1	1.86
1-3	1.58
Subtotal 0-3	3.71
3+	4.94
Needles	0.83
Total	9.48

OTHER FUEL DATA:

Average Duff Depth: 0.95 inches
 Fuel Bed Depth: 0.35 feet

FIRE BEHAVIOR POTENTIAL	RATING
Rate of Spread: chains/hour	3.9
Flame Length: feet	2.0
Torching	Low
Crowning	Low
Resistance to Control	Low
Overall Fire Potential	Moderate

SITE DATA:

Average Slope: 20 percent
 Aspect: North
 Elevation: 7,110 feet
 Latitude & Longitude: N39.43582/W105.21770
 Remarks: Denver Water Lower North Fork Area
 Mastication Method: Hydro-Ax with rotary ax mower
 Treatment Year/Contractor: 2005, Rue Logging, South Fork, CO



STAND DATA

STEM SIZE	PRE-TREAT BASAL AREA	PRE TREAT # STEMS	POST TREAT BASAL AREA	POST TREAT # STEMS
0-2"	2	100	0	0
3-4"	5	100	0	0
5-6"	20	100	0	0
7-8"	35	100	0	0
9-10"	20	45	20	45
11-12"				
> 13"	40	54	40	54
Total	122	499	60	99

PONDEROSA 4 DATA SHEET

Stand Number: Lower North Fork 6
 Forest Cover Type: SAF No. 237
 Interior Ponderosa Pine

DOWN & DEAD WOODY FUEL LOADINGS

SIZE CLASS (INCHES)	WEIGHT T/AC
0-0.25	0.08
0.25-1	0.15
1-3	0.00
Subtotal 0-3	0.24
3+	9.51
Needles	0.19
Total	9.94

OTHER FUEL DATA:

Average Duff Depth: 1.14 inches
 Fuel Bed Depth: 0.87 feet

FIRE BEHAVIOR POTENTIAL	RATING
Rate of Spread: chains/hour	0.9
Flame Length: feet	0.2
Torching	High
Crowning	High
Resistance to Control	Moderate
Overall Fire Potential	High

SITE DATA:

Average Slope: 20 percent
 Aspect: South
 Elevation: 7,050 feet
 Latitude & Longitude: N39.43920/W105.2176
 Remarks: Denver Water Lower North Fork Area
 Pretreatment Plot in Mastication Unit 4

STAND DATA

STEM SIZE	PRE- TREAT BASAL AREA	PRE- TREAT # STEMS	POST TREAT BASAL AREA	POST TREAT # STEMS
0-2"				
3-4"				
5-6"	20	102		
7-8"				
9-10"	40	90		
11-12"	20	30		
> 13"	40	41		
Total	120	263		



LOOKING DOWNHILL BEFORE TREATMENT



LOOKING UPHILL BEFORE TREATMENT

PONDEROSA 5 DATA SHEET

Stand Number: Lower North Fork 8
 Forest Cover Type: SAF No. 237
 Interior Ponderosa Pine

DOWN & DEAD WOODY FUEL LOADINGS

SIZE CLASS (INCHES)	WEIGHT T/AC
0-0.25	0.05
0.25-1	0.07
1-3	3.37
Subtotal 0-3	3.49
3+	4.39
Needles	3.57
Total	11.45

OTHER FUEL DATA:

Average Duff Depth: 0.75 inches
 Fuel Bed Depth: 1.60 feet

FIRE BEHAVIOR POTENTIAL	RATING
Rate of Spread: chains/hour	43.7
Flame Length: feet	7.0
Torching	High
Crowning	High
Resistance to Control	High
Overall Fire Potential	High

SITE DATA:

Average Slope: 10 percent
 Aspect: Southwest
 Elevation: 7,300 feet
 Latitude & Longitude: N39.45488/W105.20889
 Remarks: Denver Water Lower North Fork Area
 Pretreatment Plot in Mastication Unit 14 Ponderosa and Gambel oak understory



PRETREATMENT

STAND DATA

STEM SIZE	PRE-TREAT BASAL AREA	PRE TREAT # STEMS	POST TREAT BASAL AREA	POST TREAT # STEMS
0-2"				
3-4"				
5-6"				
7-8"				
9-10"				
11-12"				
> 13"	60	27		
Total	60	27		

Note: Many small trees did not tally with a 10-factor basal area prism

PONDEROSA 6 DATA SHEET

Stand Number: Lower North Fork 3
 Forest Cover Type: SAF No. 237
 Interior Ponderosa Pine

DOWN & DEAD WOODY FUEL LOADINGS

SIZE CLASS (INCHES)	WEIGHT T/AC
0-0.25	0.72
0.25-1	5.76
1-3	3.54
Subtotal 0-3	10.02
3+	1.92
Needles	2.53
Total	14.46

OTHER FUEL DATA:

Average Duff Depth: 1.29 inches
 Fuel Bed Depth: 0.22 feet

FIRE BEHAVIOR POTENTIAL	RATING
Rate of Spread: chains/hour	0.8
Flame Length: feet	0.8
Torching	Low
Crowning	Low
Resistance to Control	Low
Overall Fire Potential	Low

SITE DATA:

Average Slope: 25 percent
 Aspect: Northeast
 Elevation: 7,080 feet
 Latitude & Longitude: N39.43596/W105.21655
 Remarks: Denver Water Lower North Fork Area
 Mastication Method: Hydro-Ax with rotary ax mower (cover photo area)
 Treatment Year/Contractor: 2005, Rue Logging, South Fork, CO



STAND DATA

STEM SIZE	PRE-TREAT BASAL AREA	PRE TREAT # STEMS	POST TREAT BASAL AREA	POST TREAT # STEMS
0-2"	3	200	0	0
3-4"	20	300	0	0
5-6"	33	200	0	0
7-8"				
9-10"	56	100	0	0
11-12"				
> 13"	20	20	20	20
Total	132	820	20	20

PONDEROSA 7 DATA SHEET

Stand Number: Trumbull 1
 Forest Cover Type: SAF No. 237
 Interior Ponderosa Pine

DOWN & DEAD WOODY FUEL LOADINGS

SIZE CLASS (INCHES)	WEIGHT T/AC
0-0.25	0.18
0.25-1	0.92
1-3	1.24
Subtotal 0-3	2.34
3+	11.77
Needles	0.72
Total	14.82

OTHER FUEL DATA:

Average Duff Depth: 0.44 inches
 Fuel Bed Depth: 0.39 feet

FIRE BEHAVIOR POTENTIAL	RATING
Rate of Spread: chains/hour	3.0
Flame Length: feet	1.3
Torching	Low
Crowning	Low
Resistance to Control	Moderate
Overall Fire Potential	Low

SITE DATA:

Average Slope: 10 percent
 Aspect: North
 Elevation: 6,680 feet
 Latitude & Longitude: N39.25341/W105.21240
 Remarks: USDA Forest Service, Pike National Forest east of Trumbull
 Mastication Method: Rough grind & firewood sale
 Treatment Year/Contractor: 2002, Forest Rehab Vegetation Management, Libby, MT



STAND DATA

STEM SIZE	PRE-TREAT BASAL AREA	PRE TREAT # STEMS	POST TREAT BASAL AREA	POST TREAT # STEMS
0-2"	5	400	0	0
3-4"	54	800	0	0
5-6"	116	700	0	0
7-8"	31	100	0	0
9-10"				
11-12"				
> 13"	60	56	60	56
Total	266	2,056	60	56

PONDEROSA 8 DATA SHEET

Stand Number: Trumbull 2
 Forest Cover Type: SAF No. 237
 Interior Ponderosa Pine

DOWN & DEAD WOODY FUEL LOADINGS

SIZE CLASS (INCHES)	WEIGHT T/AC
0-0.25	0.40
0.25-1	3.99
1-3	4.78
Subtotal 0-3	9.17
3+	3.77
Needles	2.82
Total	15.76

OTHER FUEL DATA:

Average Duff Depth: 0.50 inches
 Fuel Bed Depth: 0.26 feet

FIRE BEHAVIOR POTENTIAL	RATING
Rate of Spread: chains/hour	1.6
Flame Length: feet	1.5
Torching	Low
Crowning	Low
Resistance to Control	Low
Overall Fire Potential	Low

SITE DATA:

Average Slope: 35 percent
 Aspect: West
 Elevation: 6,490 feet
 Latitude & Longitude: N39.25840/W105.21568
 Remarks: Denver Water east of Trumbull
 Mastication Method: Hydro-Ax with rotary ax mower
 Treatment Year/Contractor: 2003, Enviro Land Management, Grand Junction, CO



STAND DATA

STEM SIZE	PRE-TREAT BASAL AREA	PRE TREAT # STEMS	POST TREAT BASAL AREA	POST TREAT # STEMS
0-2"	3	200	0	0
3-4"	14	200	0	0
5-6"	17	100	0	0
7-8"				
9-10"				
11-12"				
> 13"	40	60	40	60
Total	74	560	40	60

PONDEROSA 9 DATA SHEET

Stand Number: Lower North Fork 7
 Forest Cover Type: SAF No. 237
 Interior Ponderosa Pine

DOWN & DEAD WOODY FUEL LOADINGS

SIZE CLASS (INCHES)	WEIGHT T/AC
0-0.25	0.12
0.25-1	1.89
1-3	1.26
Subtotal 0-3	3.27
3+	10.20
Needles	2.55
Total	16.01

OTHER FUEL DATA:

Average Duff Depth: 1.28 inches
 Fuel Bed Depth: 1.15 feet

FIRE BEHAVIOR POTENTIAL	RATING
Rate of Spread: chains/hour	16.2
Flame Length: feet	3.9
Torching	High
Crowning	High
Resistance to Control	High
Overall Fire Potential	High

SITE DATA:

Average Slope: 15 percent
 Aspect: North
 Elevation: 7,410 feet
 Latitude & Longitude: N39.444967/W105.20060
 Remarks: Denver Water Lower North Fork Area
 Pretreatment Plot in Mastication Unit 13 with abundant common Juniper



PRETREATMENT

STAND DATA

STEM SIZE	PRE-TREAT BASAL AREA	PRE TREAT # STEMS	POST TREAT BASAL AREA	POST TREAT # STEMS
0-2"				
3-4"				
5-6"	20	102		
7-8"				
9-10"	40	90		
11-12"	20	30		
> 13"	40	41		
Total	120	263		

PONDEROSA 10 DATA SHEET

Stand Number: Lower North Fork 14
 Forest Cover Type: SAF No. 237
 Interior Ponderosa Pine

DOWN & DEAD WOODY FUEL LOADINGS

SIZE CLASS (INCHES)	WEIGHT T/AC
0-0.25	1.27
0.25-1	7.01
1-3	0.79
Subtotal 0-3	9.07
3+	3.78
Needles	2.04
Total	17.36

OTHER FUEL DATA:

Average Duff Depth: 1.25 inches
 Fuel Bed Depth: 0.33 feet

FIRE BEHAVIOR POTENTIAL	RATING
Rate of Spread: chains/hour	3.4
Flame Length: feet	2.5
Torching	Low
Crowning	Low
Resistance to Control	Moderate
Overall Fire Potential	Moderate

SITE DATA:

Average Slope: 20 percent
 Aspect: East
 Elevation: 7,030 feet
 Latitude & Longitude: N39.43657/W105.21867
 Remarks: Denver Water Lower North Fork Area
 Mastication Method: Hydro-Ax with rotary ax mower
 Treatment Year/Contractor: 2005, Rue Logging, South Fork, CO



STAND DATA

STEM SIZE	PRE-TREAT BASAL AREA	PRE TREAT # STEMS	POST TREAT BASAL AREA	POST TREAT # STEMS
0-2"	1	200	0	0
3-4"	34	500	0	0
5-6"	83	500	0	0
7-8"				
9-10"	20	37	20	37
11-12"				
> 13"	20	11	20	11
Total	158	1,248	40	48

PONDEROSA 11 DATA SHEET

Stand Number: Lower North Fork 15
 Forest Cover Type: SAF No. 237
 Interior Ponderosa Pine

DOWN & DEAD WOODY FUEL LOADINGS

SIZE CLASS (INCHES)	WEIGHT T/AC
0-0.25	0.76
0.25-1	1.97
1-3	7.18
Subtotal 0-3	9.91
3+	9.17
Needles	0.74
Total	19.82

OTHER FUEL DATA:

Average Duff Depth: 1.25 inches
 Fuel Bed Depth: 0.33 feet

FIRE BEHAVIOR POTENTIAL	RATING
Rate of Spread: chains/hour	3.4
Flame Length: feet	2.5
Torching	Low
Crowning	Low
Resistance to Control	Moderate
Overall Fire Potential	Moderate

SITE DATA:

Average Slope: 25 percent
 Aspect: North
 Elevation: 6,770 feet
 Latitude & Longitude: N39.43678/W105.22256
 Remarks: Denver Water Lower North Fork Area
 Mastication Method: Hydro-Ax with rotary ax mower
 Treatment Year/Contractor: 2005, Rue Logging, South Fork, CO



STAND DATA

STEM SIZE	PRE-TREAT BASAL AREA	PRE TREAT # STEMS	POST TREAT BASAL AREA	POST TREAT # STEMS
0-2"				
3-4"	9	100	0	0
5-6"	20	100	0	0
7-8"				
9-10"	55	100	0	0
11-12"				
> 13"	92	100	0	0
Total	176	400	0	0**

***Note: Many large Douglas-fir taken*

PONDEROSA 12 DATA SHEET

Stand Number: Lower North Fork 4
 Forest Cover Type: SAF No. 237
 Interior Ponderosa Pine

DOWN & DEAD WOODY FUEL LOADINGS

SIZE CLASS (INCHES)	WEIGHT T/AC
0-0.25	2.39
0.25-1	8.78
1-3	5.50
Subtotal 0-3	16.67
3+	1.15
Needles	5.36
Total	23.18

OTHER FUEL DATA:

Average duff Depth: 0.94 inches
 Fuel Bed Depth: 0.26 feet

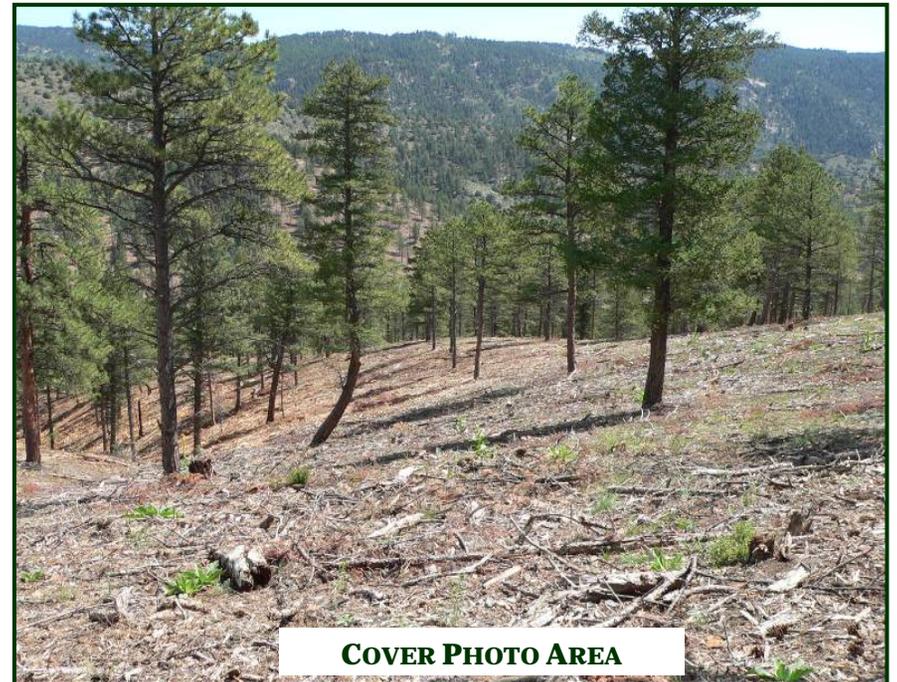
FIRE BEHAVIOR POTENTIAL	RATING
Rate of Spread: chains/hour	0.2
Flame Length: feet	0.3
Torching	Low
Crowning	Low
Resistance to Control	Low
Overall Fire Potential	Low

SITE DATA:

Average Slope: 25 percent
 Aspect: East
 Elevation: 7,020
 Latitude & Longitude: N3943622/W10521532
 Remarks: Denver Water Lower North Fork Area
 Douglas-fir & ponderosa pine
 Mastication Method: Timbco with Fecon head
 Treatment Year/Contractor: 2006, West Range Reclamation, Crawford, CO

STAND DATA

STEM SIZE	PRE-TREAT BASAL AREA	PRE TREAT # STEMS	POST TREAT BASAL AREA	POST TREAT # STEMS
0-2"	1	100	0	0
3-4"	7	100	0	0
5-6"	17	100	0	0
7-8"	92	300	0	0
9-10"	49	200	0	0
11-12"				
> 13"	20	20	20	20
Total	252	920	20	20



COVER PHOTO AREA

PONDEROSA 13 DATA SHEET

Stand Number: Lower North Fork 9
 Forest Cover Type: SAF No. 237
 Interior Ponderosa Pine

DOWN & DEAD WOODY FUEL LOADINGS

SIZE CLASS (INCHES)	WEIGHT T/AC
0-0.25	3.15
0.25-1	6.36
1-3	8.21
Subtotal 0-3	17.72
3+	4.68
Needles	4.27
Total	26.66

OTHER FUEL DATA:

Average Duff Depth: 1.13 inches
 Fuel Bed Depth: 0.31 feet

FIRE BEHAVIOR POTENTIAL	RATING
Rate of Spread: chains/hour	0.4
Flame Length: feet	0.4
Torching	Low
Crowning	Low
Resistance to Control	Low
Overall Fire Potential	Low

SITE DATA:

Average Slope: 30 percent
 Aspect: Northwest
 Elevation: 6,600 feet
 Latitude & Longitude: N39.43000/W105.19762
 Remarks: Denver Water Lower North Fork Area
 Mastication Method: Timbco with Fecon head
 Treatment Year/Contractor: 2006, West Range Reclamation, Crawford, CO



STAND DATA

STEM SIZE	PRE-TREAT BASAL AREA	PRE TREAT # STEMS	POST TREAT BASAL AREA	POST TREAT # STEMS
0-2"				
3-4"				
5-6"	27	200	0	0
7-8"	35	100	0	0
9-10"	20	40	20	40
11-12"	20	30	20	30
> 13"	40	51	0	0
Total	142	421	40	70

PONDEROSA 14 DATA SHEET

Stand Number: Lower North Fork 12
 Forest Cover Type: SAF No. 237
 Interior Ponderosa Pine

DOWN & DEAD WOODY FUEL LOADINGS

SIZE CLASS (INCHES)	WEIGHT T/AC
0-0.25	2.33
0.25-1	18.27
1-3	17.11
Subtotal 0-3	37.71
3+	2.37
Needles	9.51
Total	49.58

OTHER FUEL DATA:

Average Duff Depth: 1.31 inches
 Fuel Bed Depth: 0.21 feet

FIRE BEHAVIOR POTENTIAL	RATING
Rate of Spread: chains/hour	0.4
Flame Length: feet	1.8
Torching	Low
Crowning	Low
Resistance to Control	Moderate
Overall Fire Potential	Moderate

SITE DATA:

Average Slope: 20 percent
 Aspect: Northeast
 Elevation: 6,870 feet
 Latitude & Longitude: N39.43450/W105.21764
 Remarks: Denver Water Lower North Fork Area
 Mastication Method: Hydro-Ax with rotary ax mower
 Treatment Year/Contractor: 2005, Rue Logging, South Fork, CO



STAND DATA

STEM SIZE	PRE-TREAT BASAL AREA	PRE TREAT # STEMS	POST TREAT BASAL AREA	POST TREAT # STEMS
0-2"	2	100	0	0
3-4"	5	100	0	0
5-6"				
7-8"				
9-10"	44	100	0	0
11-12"	66	100	0	0
> 13"	20	11	20	11
Total	137	411	20	11

PONDEROSA 15 DATA SHEET

Stand Number: Lower North Fork 10
 Forest Cover Type: SAF No. 237
 Interior Ponderosa Pine

DOWN & DEAD WOODY FUEL LOADINGS

SIZE CLASS (INCHES)	WEIGHT T/AC
0-0.25	3.33
0.25-1	12.25
1-3	4.98
Subtotal 0-3	20.56
3+	33.40
Needles	5.60
Total	59.65

OTHER FUEL DATA:

Average Duff Depth: 1.41 inches
 Fuel Bed Depth: 0.34 feet

FIRE BEHAVIOR POTENTIAL	RATING
Rate of Spread: chains/hour	0.3
Flame Length: feet	0.3
Torching	Low
Crowning	Low
Resistance to Control	Moderate
Overall Fire Potential	Moderate

SITE DATA:

Average Slope: 15 percent
 Aspect: East
 Elevation: 6,800 feet
 Latitude & Longitude: N39.43081/W105.21275
 Remarks: Denver Water Lower North Fork Area
 Mastication Method: Hydro-Ax with rotary ax mower
 Treatment Year/Contractor: 2005, Rue Logging, South Fork, CO



STAND DATA

STEM SIZE	PRE-TREAT BASAL AREA	PRE TREAT # STEMS	POST TREAT BASAL AREA	POST TREAT # STEMS
0-2"	3	200		
3-4"	20	300		
5-6"	33	200		
7-8"	31	100		
9-10"				
11-12"	14	100		
> 13"	160	116	20	16
Total	260	1,116	20	16

