~~[redacted]~~ Pass
~~[redacted]~~ Creek

Tues July 5 - Started on July 2 } moved Equip in.

Tues July 12 - 7 pieces of Equip Video on Phone

Tues July 26 - Jerry & Butch had to get pin for log loader

CSFS ACCOUNTING REQUEST

CSFS **#813** Rev
08/14/18

DATE: 08/14/18

TO: State Office Accounting

FROM: _____
Signature of CSFS employee initiating request.

THIS IS A REQUEST FOR (Check One):
Please attach copies of all appropriate supporting documentation.

[X] JOURNAL ENTRY/ACCOUNTING TRANSFER:

Transfer $1,000.00 Reason for transfer: Transfer from 1940100 to 9998700 for default on completion of LaGarde/Pass Creek Timber Sale

Document #: _____ Invoice # 87395 Fiscal Year 17'/18'

Vendor Name: Heggie Logging

From Fund:	1940100	2060	To Fund:	9998700	4380
	Account #	Subcode		Account #	Subcode

Signature _____ 08/14/18 Signature _____
Account Manager Date Account Manager Date

[ ] HOURLY PAYROLL/OVERTIME EXPENSE TRANSFER:

Transfer $0.00 Reason for transfer: _____

Employee Name: _____ PPE DATE: _____

From Fund:			To Fund:		
	Account #	Subcode		Account #	Subcode

Signature _____ Signature _____
Account Manager Date Account Manager Date

[ ] CUSTOMER PAYMENT REFUND:

Send refund in the amount of: $0.00 to customer listed below.

Received on CSFS Invoice # _____ Fiscal Year _____

Name: _____

Address: _____

_____

Reason for Refund: _____

_____

CHEYENNE WY 820
15 AUG 2016 PM 1 T

HEGGIE LOGGING COMPANY
P.O. BOX 267
LARAMIE, WYOMING 82073

Return to:

Colorado State Forest Service
5060 Campus Delivery, CSU
Ft. Collins, CO 80523-5060

Attn: Michael Hughes

		State Sale	LaGarde/Pass Creek		
	7/1-15/2016				
	DATE	HL TKT	Logs	PP	
1	7/5/2016	1851	1		
2	7/5/2016	1825	1		
3	7/6/2016	1852	1		
4	7/6/2016	1826	1		
5	7/7/2016	1827		1	
6	7/7/2016	1853	1		
7	7/8/2016	1828	1		
8	7/8/2016	1829	1		
9	7/11/2016	1830		1	
10	7/11/2016	1854	1		
11	7/12/2016	1831	1		
12	7/12/2016	1832		1	
13	7/13/2016	1833	1		
14	7/13/2016	1834		1	
15	7/14/2016	1835	1		
16	7/14/2016	1836		1	
17	7/15/2016	1837		1	
18	7/15/2016	1838		1	
19	7/15/2016	1855	1		
20	7/15/2016	1856		1	
21	7/18/2016	1839		1	
22	7/18/2016	1840		1	
23	7/18/2016	1841	1		
24	7/18/2016	1842		1	
25	7/19/2016	1843	1		
26	7/19/2016	1844		1	
27	7/19/2016	1845		1	
28	7/19/2016	1846	1		
29	7/20/2016	1847	1		
30	7/20/2016	1848		1	
31	7/20/2016	1849		1	
32	7/20/2016	1850	1		
33	7/21/2016	1857	1		
34	7/21/2016	1858		1	
35	7/21/2016	1859		1	
36	7/21/2016	1860	1		
37	7/21/2016	1861		1	
38	7/21/2016	1862		1	
39	7/22/2016	1863		1	
40	7/22/2016	1864		1	
41	7/25/2016	1865	1		
42	7/25/2016	1866		1	
43	7/26/2016	1867		1	

44		1868		1	
45		1869	1		
46	7/27/2016	1870		1	
47		1871		1	
48		1872		1	
49		1873		1	
50		1874		1	
51		1875		1	
52	7/28/2016	1876		1	
53		1877		1	
54		1878		1	
55		1879		1	
56		1880		1	
57		1881	1		
58		1882		1	
59	8/1/2016	1883		1	
60		1884		1	
61		1885	1		
62		1886		1	
63	8/2/2016	1887		1	
64		1888		1	
65		1889	1		
66		1890		1	
67	8/3/2016	1891		1	
68		1892		1	
69		1893	1		
70		1894		1	
71	8/4/2016	1895		1	
72		1896	1		
73		1897		1	
74		1898	1		
75	8/5/2016	1899	1		
76		1900		1	
77		1901	1		
78		1902		1	
79	8/8/2016	1903		1	
80		1904	1		
81	8/9/2016	1905		1	
82		1906		1	
83		1907	1		
84	8/10/2016	1908		1	
85		1909		1	
		Totals	31	54	
			$110/ld	$83/ld	
	Grand Totals		**$3,410.00**	**$4,482.00**	

7892.00

Pass Creek State Section

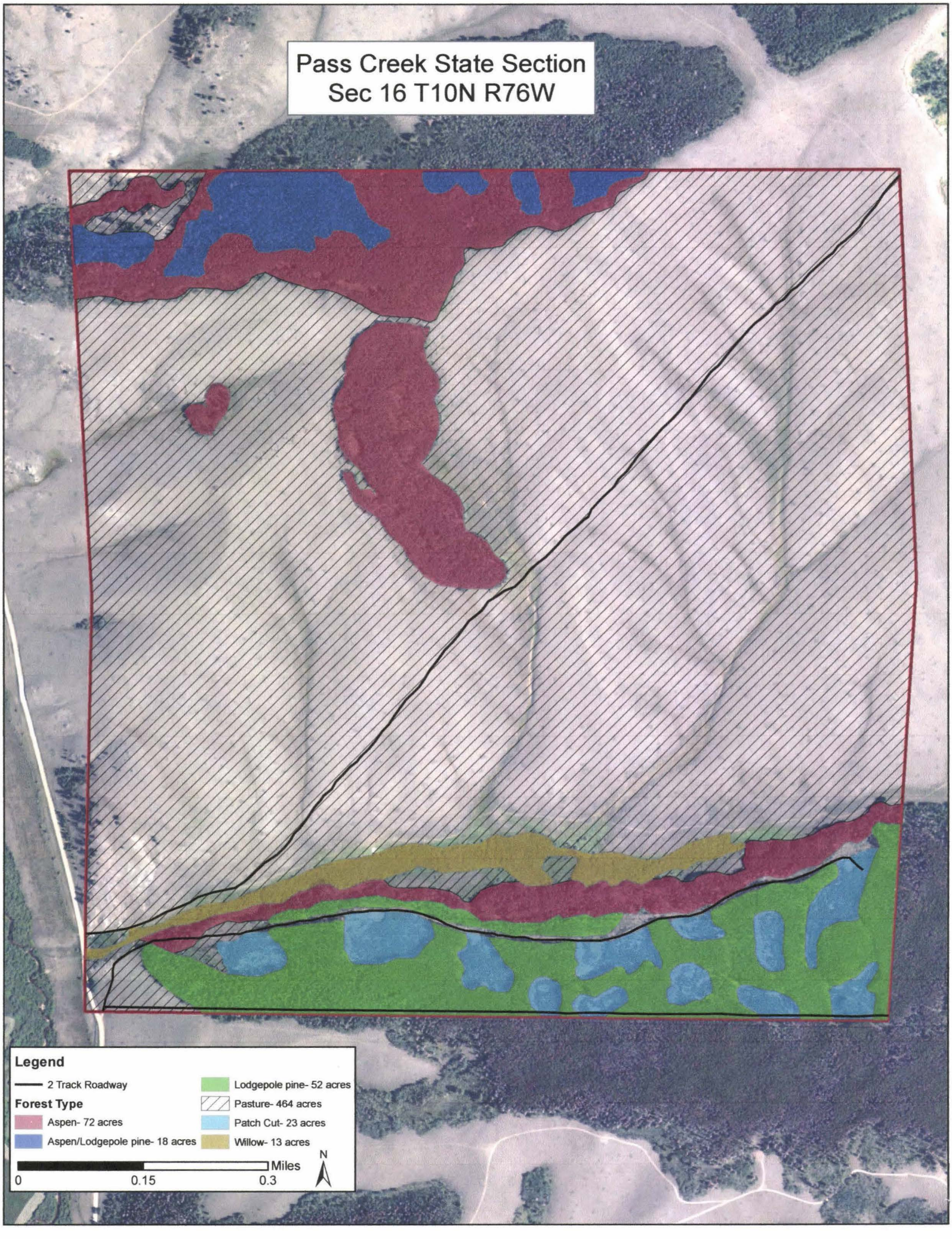
Unit 1

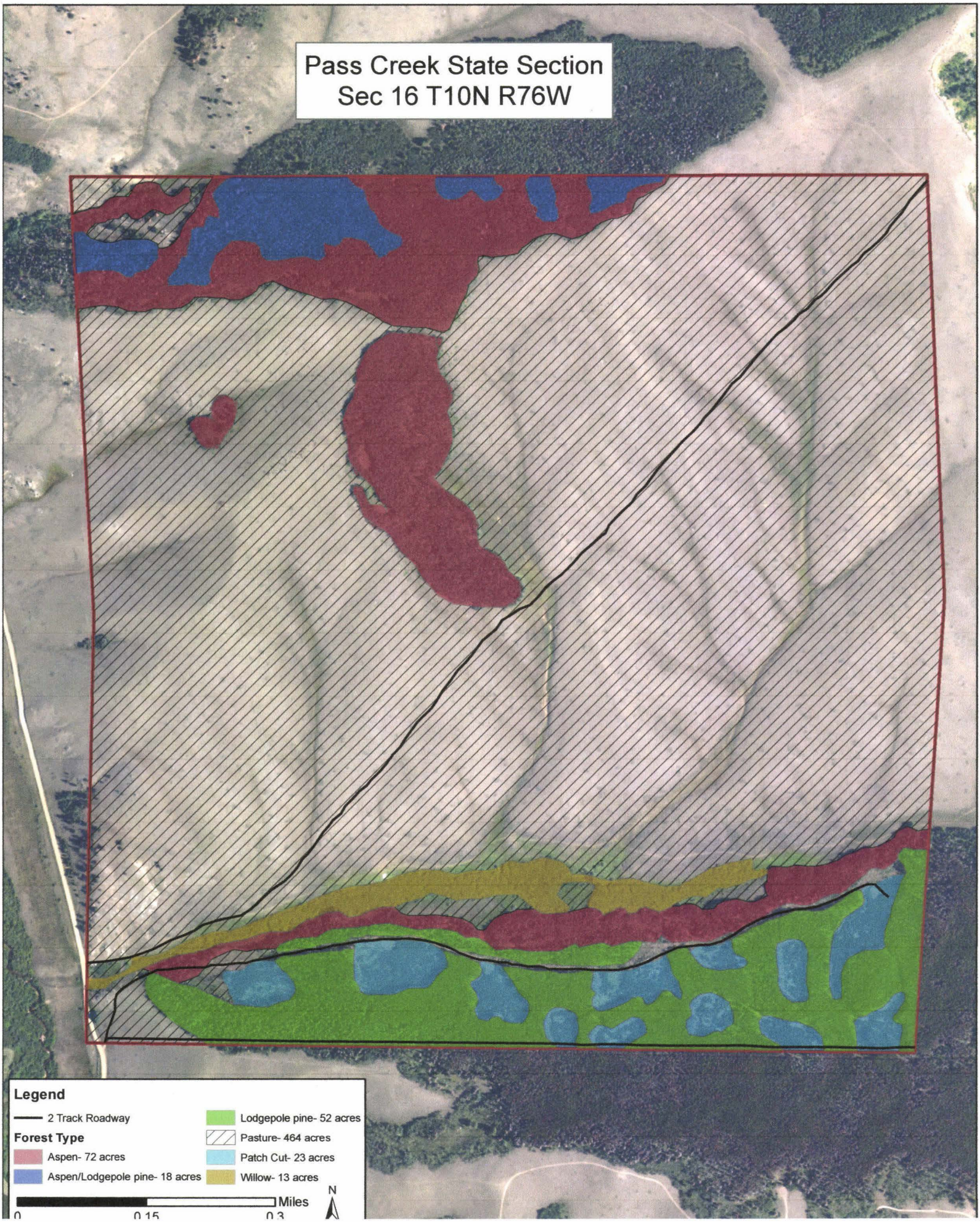
Forest cover type	Lodgepole pine
Unit size	57 acres
Slope	5-25%
Aspect	North, Northeast
Basal area (average)	143 square feet/acre
Trees/acre (≥3" DBH)	668 lodgepole pine
Average tree diameter	5.9" DBH
Average tree height	42 feet
Stocking	Healthy
Estimated stand volumes	2190 cubic feet/acre 5727 board feet/acre
Sapling trees/acre (<3" DBH and >4.5' high)	66 lodgepole pine
Seedling trees/acre (<4.5' high)	116 quaking aspen
Tree Status	Alive- 56% Dead- 44%

Big Horn Grant: 3rd week of February


Pass Creek
McIntyre Rd
N


Pass Creek
N
McIntyre Rd


Pass Creek State Section
Sec 16 T10N R76W
Legend
2 Track Roadway
Forest Type
Aspen- 72 acres
Aspen/Lodgepole pine- 18 acres
Lodgepole pine- 52 acres
Pasture- 464 acres
Patch Cut- 23 acres
Willow- 13 acres
Miles
0
0.15
0.3
N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Miles
0
0.15
0.3
N

---Fvsstand Alone Analysis

DATE RUN - 08/30/2013
PLOT ACRES - 1.00
MEASUREMENT LENGTH - 10.00 YEARS

TABLE 1-1 S T A N D T A B L E

--- (108) Lodgepole pine

DIA. CLASS:	2003 TREES /AC	2003 AVG DBH	2003 AVG HGT	2003 BA /AC	2003 CUBIC CU/AC	2003 BOARD CU/AC	2003 BOARD BD/AC	2013 TREES /AC	2013 AVG DBH	2013 AVG HGT	2013 BA /AC	2013 CUBIC CU/AC	2013 BOARD CU/AC	2013 BOARD BD/AC	% CU DEF	% BD DEF	% CN COV
<1.	0.000	0.00	0.0	0.000	0.00	0.00	0.0	0.000	0.00	0.0	0.000	0.00	0.00	0.0	0.00	0.00	0.00
2.	0.000	0.00	0.0	0.000	0.00	0.00	0.0	0.000	0.00	0.0	0.000	0.00	0.00	0.0	0.00	0.00	0.00
4.	0.000	0.00	0.0	0.000	0.00	0.00	0.0	278.033	4.16	37.4	26.667	0.00	0.00	0.0	0.00	0.00	5.83
SUB.	0.000	0.00	0.0	0.000	0.00	0.00	0.0	278.033	4.16	37.4	26.667	0.00	0.00	0.0	0.00	0.00	5.83
6.	0.000	0.00	0.0	0.000	0.00	0.00	0.0	219.589	5.75	42.5	40.000	640.70	0.00	0.0	0.00	0.00	8.18
8.	0.000	0.00	0.0	0.000	0.00	0.00	0.0	85.939	7.52	46.3	26.667	504.77	0.00	1773.7	0.00	0.00	5.17
SUB.	0.000	0.00	0.0	0.000	0.00	0.00	0.0	305.528	6.25	43.6	66.667	1145.47	0.00	1773.7	0.00	0.00	13.35
10.	0.000	0.00	0.0	0.000	0.00	0.00	0.0	72.129	10.07	49.0	40.000	830.60	0.00	2997.0	0.00	0.00	7.28
12.	0.000	0.00	0.0	0.000	0.00	0.00	0.0	13.172	11.79	52.1	9.999	214.04	0.00	956.4	0.00	0.00	1.74
14.	0.000	0.00	0.0	0.000	0.00	0.00	0.0	0.000	0.00	0.0	0.000	0.00	0.00	0.0	0.00	0.00	0.00
16.	0.000	0.00	0.0	0.000	0.00	0.00	0.0	0.000	0.00	0.0	0.000	0.00	0.00	0.0	0.00	0.00	0.00
SUB.	0.000	0.00	0.0	0.000	0.00	0.00	0.0	85.301	10.33	49.5	49.999	1044.64	0.00	3953.4	0.00	0.00	9.02
18.	0.000	0.00	0.0	0.000	0.00	0.00	0.0	0.000	0.00	0.0	0.000	0.00	0.00	0.0	0.00	0.00	0.00
20.	0.000	0.00	0.0	0.000	0.00	0.00	0.0	0.000	0.00	0.0	0.000	0.00	0.00	0.0	0.00	0.00	0.00
22.	0.000	0.00	0.0	0.000	0.00	0.00	0.0	0.000	0.00	0.0	0.000	0.00	0.00	0.0	0.00	0.00	0.00
24.	0.000	0.00	0.0	0.000	0.00	0.00	0.0	0.000	0.00	0.0	0.000	0.00	0.00	0.0	0.00	0.00	0.00
26.	0.000	0.00	0.0	0.000	0.00	0.00	0.0	0.000	0.00	0.0	0.000	0.00	0.00	0.0	0.00	0.00	0.00
28.	0.000	0.00	0.0	0.000	0.00	0.00	0.0	0.000	0.00	0.0	0.000	0.00	0.00	0.0	0.00	0.00	0.00
30.	0.000	0.00	0.0	0.000	0.00	0.00	0.0	0.000	0.00	0.0	0.000	0.00	0.00	0.0	0.00	0.00	0.00
32.	0.000	0.00	0.0	0.000	0.00	0.00	0.0	0.000	0.00	0.0	0.000	0.00	0.00	0.0	0.00	0.00	0.00
34.	0.000	0.00	0.0	0.000	0.00	0.00	0.0	0.000	0.00	0.0	0.000	0.00	0.00	0.0	0.00	0.00	0.00
36.	0.000	0.00	0.0	0.000	0.00	0.00	0.0	0.000	0.00	0.0	0.000	0.00	0.00	0.0	0.00	0.00	0.00
38.	0.000	0.00	0.0	0.000	0.00	0.00	0.0	0.000	0.00	0.0	0.000	0.00	0.00	0.0	0.00	0.00	0.00
40.	0.000	0.00	0.0	0.000	0.00	0.00	0.0	0.000	0.00	0.0	0.000	0.00	0.00	0.0	0.00	0.00	0.00
SUB.	0.000	0.00	0.0	0.000	0.00	0.00	0.0	0.000	0.00	0.0	0.000	0.00	0.00	0.0	0.00	0.00	0.00
TOTAL:	0.000	0.00	0.0	0.000	0.00	0.00	0.0	668.862	5.90	41.8	143.333	2190.12	0.00	5727.1	0.00	0.00	28.20
>=5"+:	0.000	0.00	0.0	0.000	0.00	0.00	0.0	390.829	7.14	44.9	116.666	2190.12	0.00	5727.1	0.00	0.00	22.37

USDA United States Department of Agriculture | Forest Service | Arapaho and Roosevelt National Forests and Pawnee National Grassland

2150 Centre Avenue, Building E
Fort Collins, CO 80526-8119
Voice: (970) 295-6600 TDD: (970) 295-6794
Web: www.fs.usda.gov/arp
Fax: (970) 295-6696

File Code: 2430
Date: November 20, 2013

Dear Prospective Bidder:

The Arapaho and Roosevelt National Forests tentatively plan to advertise the following sales for the period October 1, 2013 – September 30, 2014.

Questions regarding the following sales should be directed to Vegetation Management Forester, Steve Singleton at (970) 295-6645.

Thank you for your continued interest in our timber management program.

BOULDER RANGER DISTRICT

Mike —
Corey X
Diana X
Boyd X

Tungsten Timber Sale
General Location: Tungsten Geographical Area

Estimated Volume: 60 CCF Sawtimber; 20 CCF Non-Sawtimber

Estimated Acres: 8

Contract Type: 2400-4

Road Package: No road construction or reconstruction

Estimated Bid Date: 03/01/2014

CANYON LAKES RANGER DISTRICT

Deadhorse 2 Timber Sale
General Location: Sheep Creek

Estimated Volume: 3,800 CCF Sawtimber; 880 CCF Non-Sawtimber

Estimated Acres: 255

18.35 CCF/acre

Contract Type: 2400-6

Road Package: Some temporary road work

Estimated Bid Date: 07/01/2014

Tower Timber Sale
General Location: Deadman Geographical Area

Estimated Volume: 7,500 CCF Sawtimber; 2,500 CCF Non-Sawtimber

Estimated Acres: 450

Contract Type: 2400-6

Road Package: Yes, approximately 1 mile road reconstruction

Estimated Bid Date: 8/31/2014

Swampy
General Location: Elkhorn Geographical Area

Estimated Volume: 375 CCF Sawtimber; 125 CCF Non-Sawtimber

Estimated Acres: 50

Contract Type: 2400-3

Road Package: No road construction or reconstruction

Estimated Bid Date: 8/31/2014

CLEAR CREEK RANGER DISTRICT

No sales will be advertised during this period.

SULFUR RANGER DISTRICT

Blue Ridge Timber Sale
General Location: Blue Ridge

Estimated Volume: 6,134 CCF Sawtimber; 4,798 CCF Non-Sawtimber

Estimated Acres: 579

Contract Type: 2400-6

Road Package: No road construction or reconstruction

Estimated Bid Date: 4/1/2014

Sincerely,

GLENN P. CASAMASSA
Forest Supervisor

cc: Glenn Casamassa, Ron Archuleta, Hal D Gibbs, Mark L Martin, Michael Spisak, Linda Deuell, David Stamler, Ken Anderson, Robert DeBall, Andy Cadenhead, Stephen E Singleton

Pass Creek State Section
Sec 16 T10N R76W

Legend

2 Track Roadway

Forest Type

- Aspen- 72 acres
- Aspen/Lodgepole pine- 18 acres
- Lodgepole pine- 52 acres
- Pasture- 464 acres
- Patch Cut- 23 acres
- Willow- 13 acres

0 0.15 0.3 Miles

N

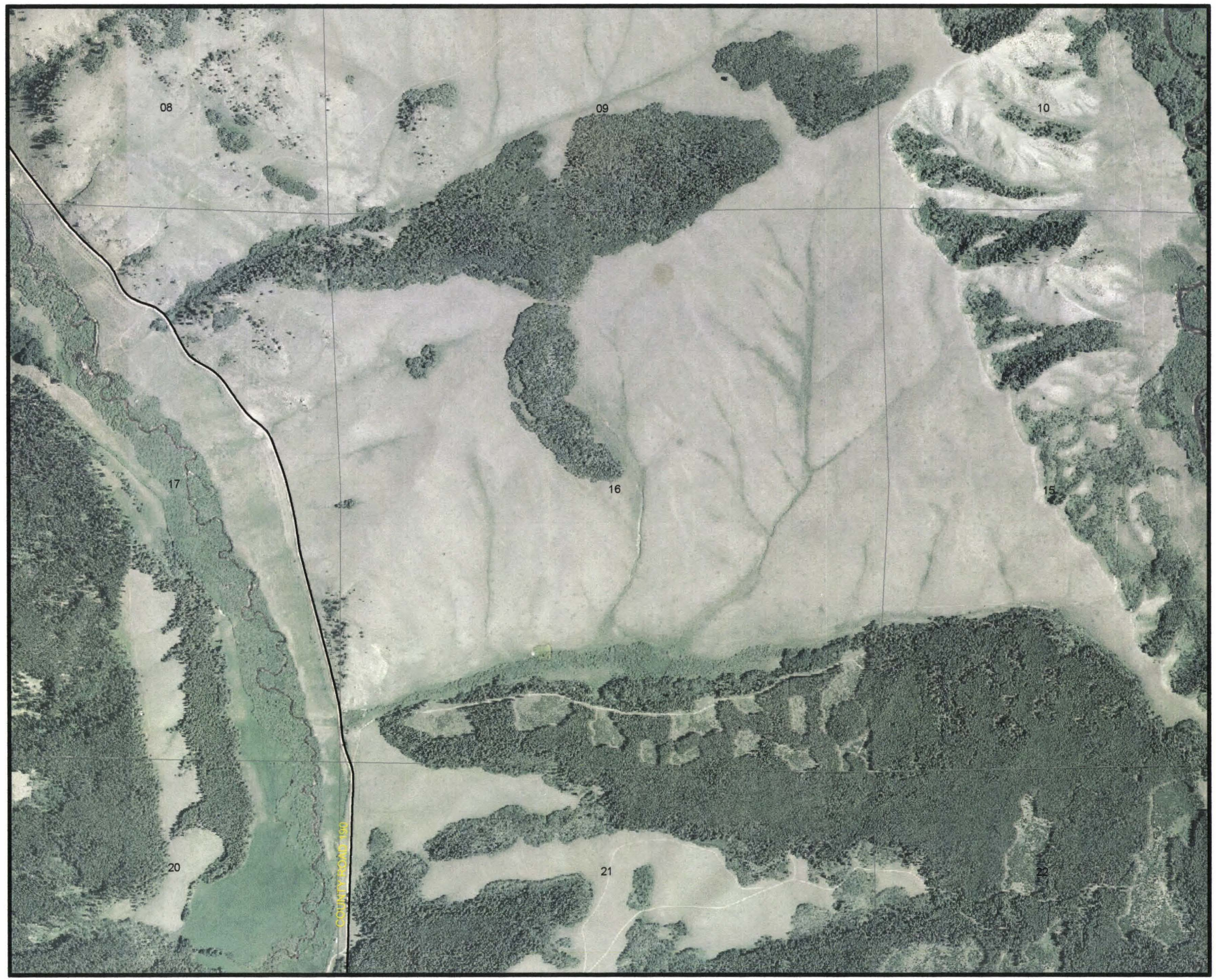
Mike, 01/23/08

Colorado State FOREST SERVICE

This is a salvage project of 250 acres.

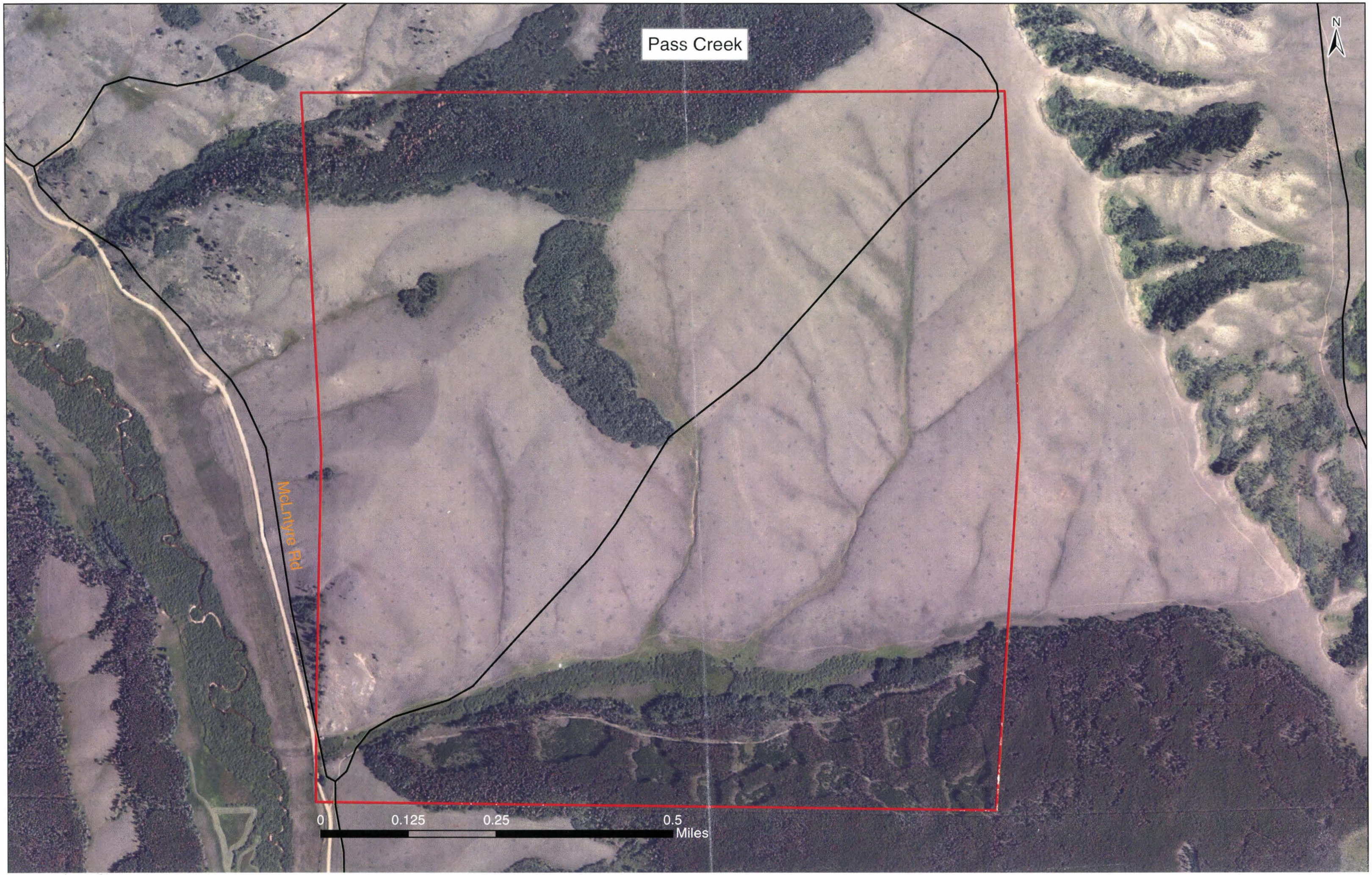
NEPA scoping letter will go out around mid-Feb. We'll get a letter too. The USFS is planning on offering the wood this September.

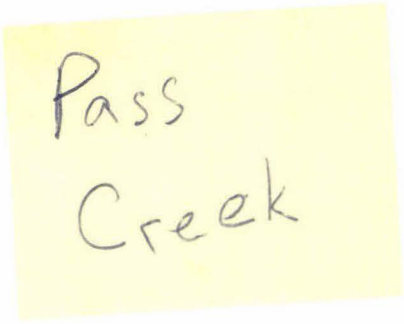
They did some spraying around Browns Park campground but most LP in that area is dead. . Diane



Sholine Ranch Properties

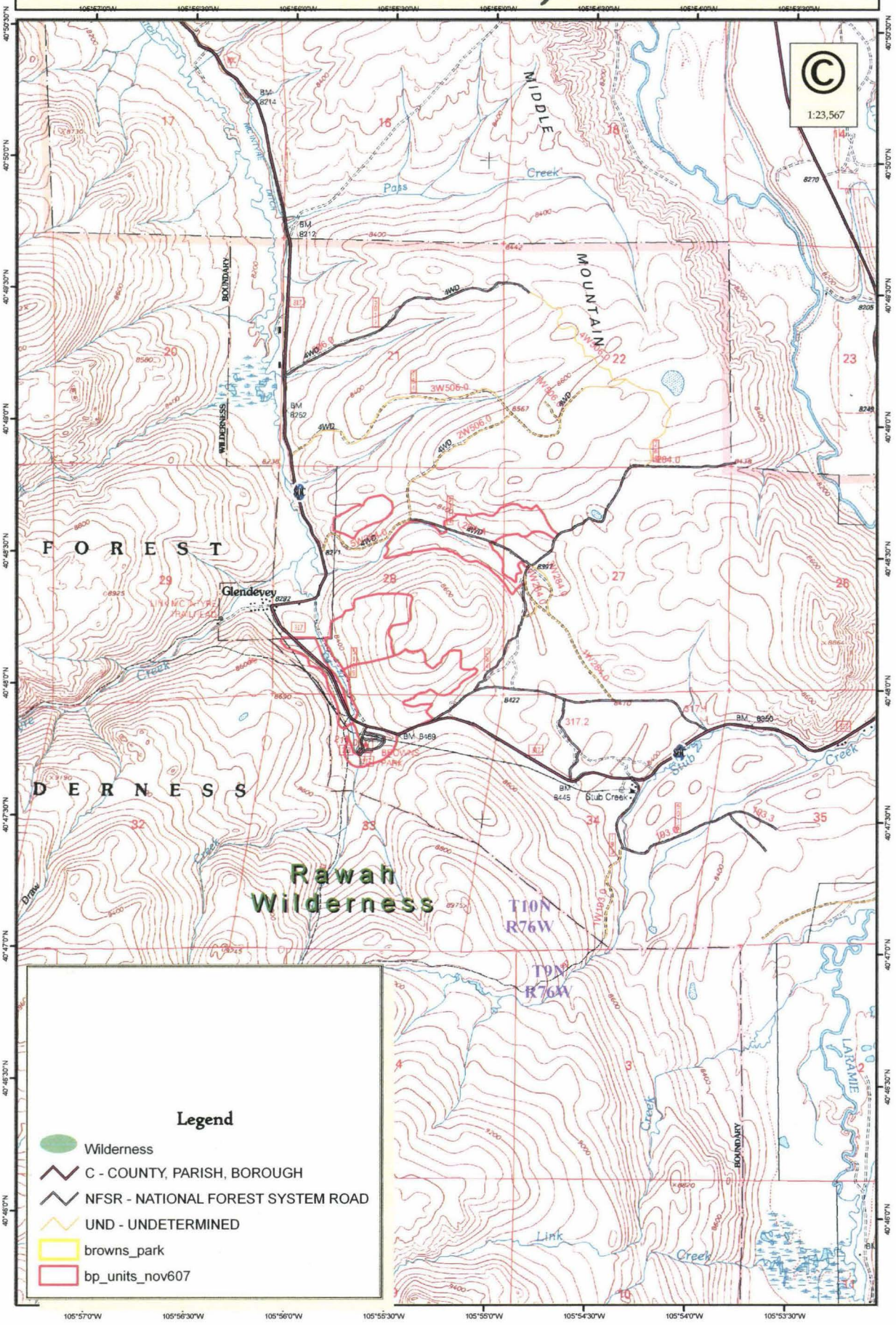
Rose Valley Ranch


Pass Creek
McLntyre Rd
N
0
0.125
0.25
0.5
Miles


Pass
Creek

from Dyce

Browns Park Project Area



United States Department of Agriculture
Forest Service Arapaho/Roosevelt
Canyon Lakes Ranger District
2150 Centre Avenue
Building E
Fort Collins, Colorado 80526-8119

Reply to: 2430

Date: 08/04/2008

Dear Prospective Bidder:

On 09/15/2008, at 03:30 PM, sealed bids will be opened in the S.O. MEDBOW ROUTT NF, 2468 JACKSON ST., LARAMIE, WY 82070 for the Browns Park sale. This sale is located in T10N R76W Sections or portions of 27, 28, and 33. Timber sale Contract 2400-6 will be used. The termination date for this sale is 03/30/2012.

Measurement of the estimated quantities will be made after felling. The total estimated quantity on this sale is 1,159 CCF. The Forest Service encourages potential bidders to make their own inspection and estimate prior to bid submission. The Forest Service makes no representation, warranty, or guarantee of the accuracy of the following quantity estimates:

Estimated Quantities and Minimum Acceptable Rates per Unit of Measure

							Required Deposits	
Species	Product	Unit of Measure	Estimated Quantities	Average DBH	Minimum Acceptable Bid Rates	Base Rates	Slash Disposal	Road Maintenance
Lodgepole Pine Live and Dead	Sawtimber	CCF	1,159.00	N/A	$9.02	$9.02	$8.51	$0.00
	Total	CCF	1,159.00				$9,863.09	$0.00

The minimum acceptable bid for advertised timber is $10,454.18 for the biddable species.

There is a $1,100.00 bid guarantee required on this sale.

If you wish further information on this sale, the prospectus and bid form, please write or call the S.O. Medbow Routt NF, 2468 Jackson ST., LARAMIE, WY 82070.

Sincerely,

Ellen L. Hodges

Enclosure

Imagine: Selling Timber

BL ✓ Go ARF!

MH NA - I will check on 9/15 to see if SOLD

DS DS

DW DW

TH

MB

DB

TR

Colorado State Forest Service
Fort Collins District
Memorandum

TO: Mike Babler & Mike Hughes

FROM: Mike Harvey

DATE: November 13, 1995

SUBJECT: State Land

Here are six traverses that I did on Pass Creek, and a sketch map indicating their relative position. I used a hand compas and pacing so a couple of the closures aren't that great, but they are plenty good for records. The numbers I assigned to the cutting units probably contridict the numbers on the map that Bill gave Ray, so keep that in mind. I suggest that you try to borrow a 1994 aerial photo to get the acreages of the remaining five or six units.

While I was at Pass Creek I noticed that two sections of the road are beginning to wash out. One area is a spur off the main road that goes through unit #5 and unit #3. The other area is on the main road above the switch back in unit #2.

A few other state land issues that I noticed on the district are:

-could not find plan for Crystal Mountain
-erosion of a haul road in an old cutover area on Crystal Mountain
-time to do some precommercial thinning on Crystal Mountain
-no reference in the Trail Creek plan to harvesting Christmas trees
-no designation of take or leave trees in Christmas tree sales
-pile burning on Trail Creek

I left one loose end on state land that I can think of. Don Hass with the M.S. Society asked if we would sell them 100 Christmas trees on Crystal Mountain. He told me that Ray has done this in the past. He also said Ray was charging $4 or $5 per tree, which I think is too low. I told him I thought we probably could (I did not commit to any price), but that I wanted to look at the section first. I think we could go ahead with this in 1995, but I would suggest a more controlled tree selection procedure in the future, but of course that will be your decision. Don's home number is 669-3032, office is 667-3083.

2310

FORREST MANAGEMENT PLAN

Section 16 Township 10 North Range 76 West

Prepared by: Woodland Management Consultants

Date: May 23, 1992

72 Acres LP

↓

Total Volume

638 Cords

141 mBF

I. Summary

Section 16, Township 10 North, Range 76 West is composed of 486 acres of non-forest and 154 acres of forested land. The forested land is made up of 82 acres of aspen and 72 acres of lodgepole pine.

The lodgepole pine is mature (110 years) in all size classes with heavy dwarf misteltoe in 95% of all stems. The pine is the only stand to be featured for forest management.

The primary object is to promote forest health and utilize the site productivity. This will be accomplished by regeneration harvest in patches up to 10 acres in size. This will eliminate the dwarf misteltoe in the patches. Subsequent harvest entries will be in 10 -12 years once the initial patch cuts are fully stocked with 6-8 foot trees. This will prevent the new trees becoming infected with misteltoe from the adjacent overstory.

II. Management Objectives

a. Maintain and improve forest health and productivity of school lands.

b. Improve wildlife habitat, particulary for big game while balancing current domestic grazing use.

III. Physical Description

A. Location. Section 16 lies one-half mile east of the Laramie River and just west of McIntyre Creek. The main access to this section is US Forest Service Road # 194. The adjoining land to the north, east and west is owned by Diamond Tail Ranch. The southerly section is owned by the US Forest Service.

B. Physiogrpahy.

1. Climate. This area is characterized by cool summers and cold winters. Precipation occurs year round with deep snowpacks in the winter. Average precipation is 14 - 16 inches per year with 75% falling within the growing season (April - September). Thunderstorms occur frequently during the late summer months.

2. Topography. Three-quarters of the section faces south on slopes of 15-20%. The remaining quarter is a north facing 20% slope. Pass Creek is an intermittent creek with dry draws in the middle of the section. All draws flow into the west running Pass Creek during snowmelt, refer to Exhibit A.

3. Soils. Soil type and descriptions are contained in Exhibit B, along with woodland suitability ratings for each soil type.

4. Water. There is no permanent running water or springs on this section.

C. Access. The main access is US Forest Service Road # 194. One unimproved road crosses the section form the southwest to the northeast corner.
Fencces occur along all section boundaries except for a portion of the eastern line, refer to Exhibit A.

D. Local Economy. The primary source of income in the surrounding area is cattle ranching. All forest products markets exist along the Front Range which is 90 miles from the section.

IV. Forest Description

Section 16 is composed of 486 acres of non-forest and 154 acres of forested land, refer to Exhibit A.

The non-forest land is made up of sagebrush and intermittent grass.

The forested land is composed of 82 acres of aspen and 72 acres of lodgepole pine.

The aspen occurs in a relatively pure stand in the north half of the section. with a stringer adjacent to Pass Creek. The aspen is 4-6 inch diameter, 45 feet in height with heavy form damage and cystospera canker. The low volume, small size and physical location within the section warrant this stand non-commerical.

The lodgepole pine is the result of fire 100+ years ago. Scattered older trees appear thru the stand with light fire scar. Dwarf misteltoe is the predominant disease with 95% of all stems infected. The most eastern 15 acres is composed of scattered poletimber with a heavy stocking of suppressed saplings, all with heavy misteltoe.

Specific parameters are listed in Exhibit C for the lodgepole pine.

V. Management Recommendations

A. Objectives. The principal forest management objective is to promote forest growth by removing mature and diseased trees.

B. Silviculture. Current lodgepole stand age is 100-120 years, with 95% of all stems infected with dwarf mistletoe. 80-90% of current trees contain serotinous cones. The lodgepole will be harvested with a regeneration cut in patches up to 10 acres in size. This will remove all the disease stems within the patches.

C. Means to obtain objective. Patch cuts will be laid out to correspond to natural openings in the surrounding forested land. All stems will be cut within the patches with the resulting slash to be piled and burned by the purchaser. The high incidence of serotinous cones along with the skidding during harvest will ensure adequate natural regeneration.

Once the patches are fully stocked with 6-8 foot trees (10-12 years), the remaining uncut areas will be harvested in alike manner. This will guarantee that the regenerated patches do not become misteltoe infected.

One new road will be needed to access the patch cuts, located on the south side of Pass Creek. The road will start at the southwest corner of the section and continue west to the eastern property line.

D. Timetable.

Year 1- 30 acres of regeneration harvest.

Year 11- 42 acres of regeneration harvest.

VI. Other Resources

A. Grazing. Diamond Tail Ranch is the current lessee. A letter and several personal conversations with the ranch manager (George Banderyer) revealed the primary concern was increased hunter access from the south if the patch cuts were visible from this area. Thus, a buffer strip (approx. 100 feet) will be left along the southern boundary. Access is thru a locked gate at the southwest corner, with the new road taking off from this point within the section. The new road will be maintained in a drivable condition for the lessee.

B. Wildlife. Wildlife is a product of the soil on which it lives. The soil must provide food, cover and water. The quality and quantity of available habitat determines the kinds of wildlife which are present. Soils directly influence the kinds and amount of vegetation and the amount of water available for wildlife use. Exhibit D lists seven elements of wildlife habitat and four groups of wildlife by soil type.

A rating of good means that habitat is easily improved, maintained or created. There are few or no soil limitations in habitat management.

A rating of fair means that habitat can be improved but that moderate soil limitations affect habitat management. A moderate rating requires some intensity of management and frequent alterations to ensure satisfactory results.

A rating of poor means that habitat can be improved but soil limitations are severe. Habitat management is difficult and expensive and requires intensive effort.

A rating of very poor means that under current soil conditions it is impractical to attempt to improve or create habitat. Unsatisfactory results are probable.

C. Water. Section 16 contains no permanent water sources.

D. Recreation. Exhibit E rates soils according to there limitations for playgrounds, camp areas, picnic areas and trails.

A slight limitation means that the soil properties are generally favorable.

A moderate limitation is one that can be overcome by planning by design of maintainance.

A severe limitation means that costly soil reclamation and intensive maintainance is required.

E. Aesthetics. Patch cuts will be layed out to duplicate natural openings commensurate with those in the surrounding forest.

F. Endangered Plants & Animals. There are no known endangered plants or animals on this section.

VII. Forest Protection

A. Fire. Summer thunderstorms provide a potential fire hazard. Stand conversion to young, healthy trees, and burning of slash piles from the harvesting operation will mitigiate catastrophic wildfire loss.

B. Insect & Disease. Dwarf misteltoe is the predominant disease with 95% of all stems infected. Scattered, isolated lodgepole have been killed by ips beetle, particulary along Pass Creek.

Regeneration harvest will greatly reduce the spread of misteltoe to young trees.

Piling and burning of slash will deter any major buildup of Ips beetle.

C. Trespass. All current trespass occurs along the southern boundary (USFS section) from hunters. This will probably continue even though the southern boundary is fenced and posted.

VIII. Appendix

Exhibit A - Forest Type Map

Exhibit B - Soil Map & Description with Woodland Suitability Ratings

Exhibit C- Lodgepole Pine Timber Parameters

Exhibit D- Ratings for Wildlife Habitat Potential

Exhibit E- Recreational Development by Soil Type.

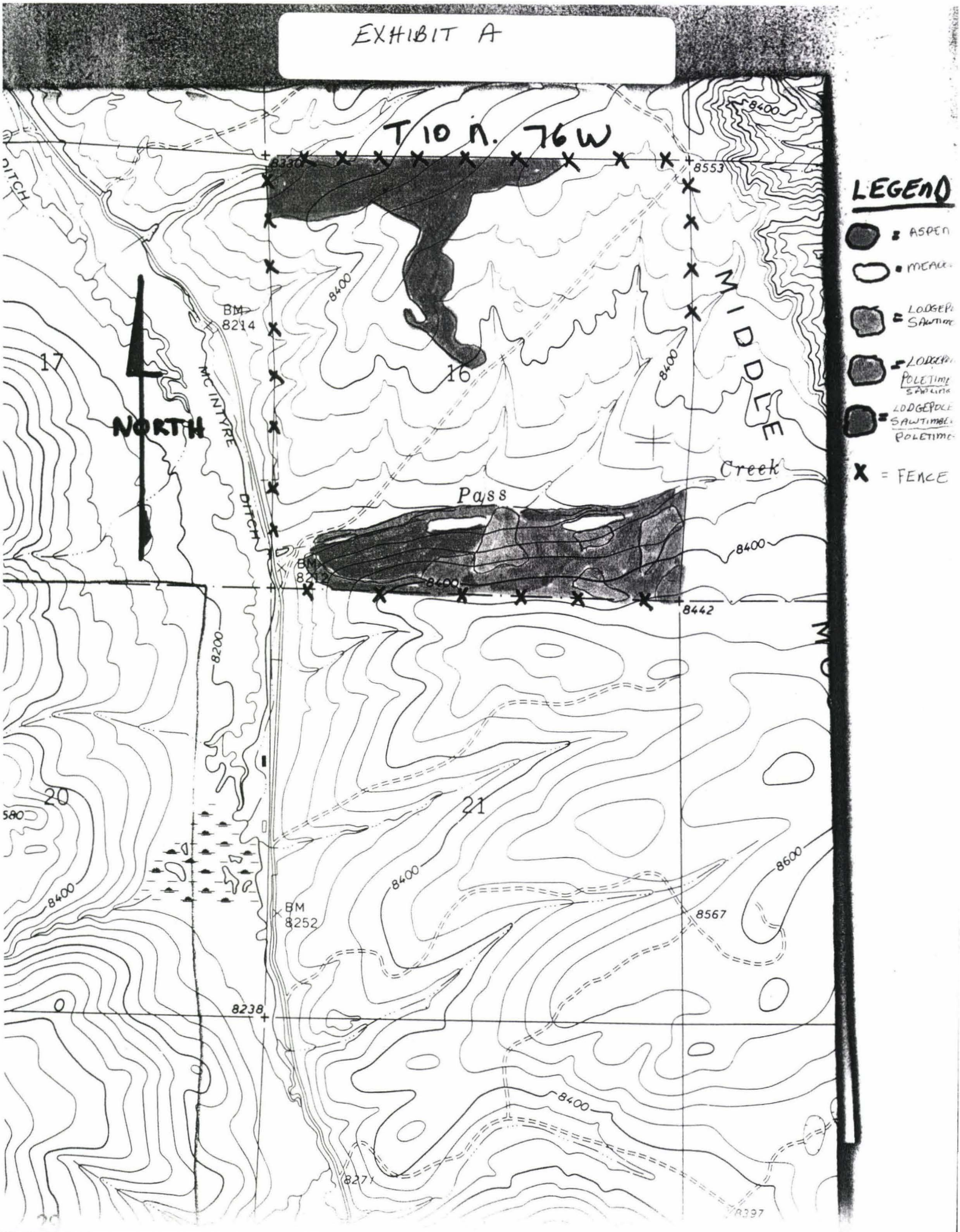


EXHIBIT A
T 10 N. 76 W
LEGEND
ASPEN
MEAD
LODGEPOLE SAWTIMBER
LODGEPOLE POLETIMBER SAPLING
LODGEPOLE SAWTIMBER POLETIMBER
X = FENCE
NORTH
MIDDLE
Creek
Pass
MC INTYRE DITCH
BM 8214
BM 8212
BM 8252
17
16
20
21
8400
8200
8600
8567
8553
8442
8238
8271


EXHIBIT B - SOIL TYPES
Lonetree
Creek
Pass
Creek
Pete
Creek
9
16
15
14
11
23
4
LIMIT OF SOIL SURVEY
1890 000 FEET
1
2 Miles

C—10 to 60 inches; reddish brown (5YR 5/4) loam stratified with thin strata of sandy loam or clay loam, dark reddish brown (5YR 3/4) moist; weak medium and coarse subangular blocky structure; slightly hard, very friable; calcareous; moderately alkaline.

The A horizon is loam, heavy sandy loam, or sandy clay loam and it is stratified in places. The C horizon is mainly loam, but it is stratified with sandy loam, fine sandy loam, and light clay loam. The A and C horizons range from mildly alkaline to moderately alkaline and are generally calcareous, but some strata are noncalcareous.

Barnum soils are mapped only with Connerton soils in Larimer County Area.

Blackwell Series

The Blackwell series consists of deep, poorly drained soils that formed in material weathered from alluvium. These soils are on low terraces and flood plains. Elevation ranges from 7,000 to 8,500 feet. Slopes are 0 to 5 percent. The native vegetation is mainly bluegrass, little bluestem, cordgrass, and sedges and rushes. Mean annual precipitation ranges from 15 to 18 inches, mean annual air temperature ranges from 42° to 44° F, and the frost-free season ranges from 60 to 85 days.

In a representative profile a 1-inch-thick layer of organic material is on the surface. The upper part of the surface layer is dark grayish brown clay loam about 9 inches thick, and the lower part is grayish brown clay loam about 8 inches thick. The subsoil is mottled, grayish brown clay loam about 18 inches thick. The underlying material is brown gravelly sandy loam about 8 inches thick that is underlain by sand and gravel.

Permeability is moderately slow, and the available water capacity is high. Reaction is slightly acid above a depth of 17 inches and neutral below that depth.

These soils are used for irrigated hay and pasture.

Representative profile of Blackwell clay loam, 0 to 5 percent slopes, in grass, about 1,800 feet south of ranch headquarters in the NE¼ sec. 10, T. 10 N., R. 76 W.:

O1—1 inch to 0; partly decayed grass roots and leaves.

A11—0 to 9 inches; dark grayish brown (10YR 4/2) clay loam, very dark grayish brown (10YR 3/2) moist; weak to moderate medium subangular blocky structure parting to weak fine granular; hard, friable; few medium distinct yellowish red (5YR 5/6) mottles; slightly acid; clear smooth boundary.

A12—9 to 17 inches; grayish brown (10YR 5/2) clay loam, very dark brown (10YR 2/2) moist; moderate medium and fine subangular blocky structure; very hard, firm; few medium distinct yellowish red (5YR 5/6) mottles; slightly acid; gradual smooth boundary.

B2g—17 to 35 inches; grayish brown (10YR 5/2) clay loam, dark grayish brown (10YR 4/2) moist; moderate medium subangular blocky structure; hard, friable; co mon medium and coarse distir yellowish red (5YR 5/6) mottles; ne tral; clear smooth boundary.

IIC1g—35 to 43 inches; brown (10YR 5/3) gra elly sandy loam, dark brown (10YR 4/ moist; massive; hard, very friable; co mon medium distinct yellowish r (5YR 5/6) mottles; neutral; clear wa boundary.

IIIC2—43 to 60 inches; clean sand and gravel.

The A horizon is loam or clay loam 10 to 20 inch thick. A loam or clay loam B2g horizon is present some places. Reaction is medium acid to neutral. Co trasting substrata occur in many profiles below a dep of 40 inches.

13—Blackwell clay loam, 0 to 5 percent slopes. Th nearly level to gently sloping soil is on low terrac and bottom lands.

Included with this soil in mapping are small are of soils that have dark colors deeper in the profile. A included are small areas of Foxcreek and Newfork s and a few gravel bars.

Runoff is slow, and the hazard of erosion is slight.

This soil is suited to hay and pasture. Capability u VIw–1, irrigated; Mountain Meadow range site; n assigned to a windbreak suitability group.

Boyle Series

The Boyle series consists of shallow, well drained excessively drained soils that formed in mater weathered from granite. These soils are on upla and mountainsides and are underlain by weathe granite at a depth of 10 to 20 inches. Elevation ran from 7,000 to 8,200 feet. Slopes are 1 to 30 perce The native vegetation is mainly blue grama, bluebu wheatgrass, fescues, fringed sage, and other forbs a shrubs. Mean annual precipitation ranges from 14 18 inches, mean annual air temperature ranges fr 44° to 46° F, and the frost-free season ranges fr 75 to 100 days.

In a representative profile the surface layer is bro gravelly sandy loam about 5 inches thick. The subs is brown and reddish brown gravelly or very grave sandy clay loam about 8 inches thick. Below this weathered granite.

Permeability is moderate, and the available wa capacity is low. Reaction is slightly acid to neutral.

These soils are used for native grasses.

Representative profile of Boyle gravelly loam in area of Boyle-Ratake gravelly sandy loams, 1 to 9 p cent slopes, in native grass, 1,100 feet south of st line and just west of Tie Siding Road in sec. 22, T. N., R. 73 W.:

A1—0 to 5 inches; brown (7.5YR 5/2) grave sandy loam, dark brown (7.5YR 3 moist; weak fine subangular blo structure parting to moderate fine gr ular; soft, very friable; 15 perc gravel; neutral; clear smooth bounda

B21t—5 to 10 inches; brown (7.5YR 5/3) gr elly sandy clay loam, dark brown (7.5 3/3) moist; weak to moderate medi subangular blocky structure; very ha

of 4 and 15 inches, and moderately alkaline below a depth of 15 inches.

These soils are mainly used for native grasses. Some areas are used for irrigated hay.

Representative profile of Driggs loam, 0 to 3 percent slopes, in irrigated hayland, about 2,350 feet west and 1,350 feet north of the southeast corner of sec. 11, T. 11 N., R. 77 W.:

Ap—0 to 4 inches; brown (10YR 5/3) loam, very dark grayish brown (10YR 3/2) moist; weak to moderate very fine granular structure; soft, very friable; 10 percent gravel; slightly acid; clear smooth boundary.

B1—4 to 9 inches; brown (10YR 5/3) clay loam, dark brown (10YR 3/3) moist; weak medium prismatic structure parting to moderate medium subangular blocky; very hard, friable; very thin and patchy clay films on ped faces; 10 percent gravel; neutral; clear smooth boundary.

B2t—9 to 15 inches; brown (10YR 5/3) clay loam, dark brown (10YR 3/3) moist; weak medium prismatic structure parting to moderate fine and medium angular and subangular blocky; very hard, friable; thin patchy clay films on ped faces; 25 percent gravel; neutral; clear smooth boundary.

C1ca—15 to 22 inches; very pale brown (10YR 7/3) loam, brown (10YR 5/3) moist; massive; slightly hard, very friable; strongly effervescent; secondary calcium carbonate occurring as thin seams and streaks; 25 percent gravel; moderately alkaline; clear smooth boundary.

C2—22 to 30 inches; pale brown (10YR 6/3) clay loam, brown (10YR 4/3) moist; massive; hard, friable; slightly effervescent; some visible calcium carbonate coating the undersides of gravel; 40 percent gravel; moderately alkaline; clear smooth boundary.

IIC3—30 to 60 inches; sand and gravel weakly cemented in the upper part with calcium carbonate.

The A horizon is loam or sandy loam 3 to 6 inches thick. The B horizon is clay loam or gravelly clay loam 8 to 16 inches thick. The C horizon ranges from loam to gravelly or very gravelly clay loam. The A and B horizons range from slightly acid to neutral.

28—Driggs loam, 0 to 3 percent slopes. This nearly level soil is on terraces and benches. It has the profile described as representative of the series.

Included with this soil in mapping are some small areas of soils that have a surface layer of clay loam or gravelly loam. Also included are some small areas of soils in which sand and gravel is at a depth of 40 to 60 inches.

Runoff is slow, and the hazard of water erosion is slight.

If irrigated, this soil is suited to hay. Under dryland management it is suited to pasture and native grasses. Capability units VIc–1, irrigated, and VIe–5, dryland; Dry Mountain Loam range site; not assigned to a windbreak suitability group.

29—Driggs loam, 3 to 25 percent slopes. This gently sloping to moderately steep soil is on high terraces and benches. This soil has a profile similar to the one described as representative of the series, but the surface layer is thinner.

Included with this soil in mapping are some small areas of soils that have a surface layer of sandy loam or clay loam. Also included are some small areas of soils in which sand and gravel is at a depth of 10 to 20 inches and also at a depth of 40 to 60 inches.

Runoff is medium to rapid, and the hazard of water erosion is moderate to severe.

This soil is suited to pasture and native grasses. Capability unit VIe–5, dryland; Dry Mountain Loam range site; not assigned to a windbreak suitability group.

Elbeth Series

The Elbeth series consists of deep, well drained soils that formed in material weathered from granite, schist, and phyllite. These soils are on mountainsides. Elevation ranges from 6,200 to 7,800 feet. Slopes are 5 to 35 percent. The native vegetation is mainly ponderosa pine and a thin understory of grass and some shrubs. Mean annual precipitation ranges from 18 to 20 inches, mean annual air temperature ranges from 44° to 47° F, and the frost-free season ranges from 75 to 100 days.

In a representative profile an organic layer about 1 inch thick is on the surface. The surface layer is dark grayish brown loam about 4 inches thick. The subsurface layer is pale brown loam about 4 inches thick. The subsoil is brown and strong brown clay loam and sandy clay loam about 48 inches thick. Below this is partly weathered granite.

Permeability is moderate, and the available water capacity is high. Reaction is neutral.

These soils are used for woodland, recreation, and wildlife and for limited grazing.

Representative profile of Elbeth loam in an area of Elbeth-Moen loams, 5 to 30 percent slopes, in woodland, about 3,750 feet west of the southeast corner of sec. 31, T. 8 N., R. 70 W.:

O1—1 inch to 0; partly decomposed needles, leaves, and twigs.

A1—0 to 4 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; weak and moderate fine granular structure; soft, very friable; neutral; clear wavy boundary.

A2—4 to 8 inches; pale brown (10YR 6/3) loam, dark grayish brown (10YR 4/2) moist; weak to moderate fine granular structure; slightly hard, very friable; neutral; clear wavy boundary.

B21t—8 to 13 inches; brown (10YR 5/3) clay loam, dark brown (7.5YR 4/4) moist; moderate fine angular and subangular blocky structure; very hard, firm; thin patchy clay films on peds; neutral; clear smooth boundary.

B22t—13 to 41 inches; brown (7.5YR 5/4) clay

3/4) moist; massive; hard, very friable; violently effervescent; streaks and small specks of calcium carbonate; moderately alkaline.

Thickness of the mollic epipedon is 20 to 40 inches. The A horizon is loam, fine sandy loam, or sandy loam 5 to 12 inches thick. The B horizon is loam, light clay loam, or sandy clay loam. The A and B horizons range from neutral to mildly alkaline. They are leached of lime but are slightly effervescent in many places because of additions of lime by irrigation water. A sand and gravel substratum is below a depth of 40 inches in some places.

40—Garrett loam, 0 to 1 percent slopes. This level soil is on terraces and fans (fig. 6).

Included with this soil in mapping are a few small areas of soils that have gravel on the surface and a few areas of soils in which gravel is at a depth of 40 to 60 inches. Also included are small areas of Harlan, Otero, Connerton, and Barnum soils.

Runoff is slow. The hazard of erosion is slight, but some areas near stream channels have been cut in places. Lower areas near the channels are flooded at times in spring or early summer.

If irrigated, this soil is suited to corn, sugar beets, beans, barley, alfalfa, and wheat. It is also well suited to pasture. Under dryland management it is suited to wheat and barley and it is well suited to pasture and native grasses. Capability units IIw–1, irrigated, and IIIe–6, dryland; Overflow range site; windbreak suitability group 5.

41—Garrett loam, 1 to 3 percent slopes. This nearly level soil is on terraces and fans. This soil has the profile described as representative of the series.

Included with this soil in mapping are a few small areas of Harlan, Otero, Connerton, and Barnum soils. Also included are a few areas of soils in which gravel is on the surface and at a depth of 40 to 60 inches.

Runoff is medium, and the hazard of erosion is slight or moderate. Areas near the stream channel receive overflow at times and cutting occurs in places.

If irrigated, this soil is suited to corn, sugar beets, beans, barley, alfalfa, and wheat. Under dryland management it is suited to wheat and barley. It is also suited to pasture and native grasses (fig. 7). Capability units IIe–1, irrigated, and IIIe–6, dryland; Overflow range site; windbreak suitability group 1.

Gravel Pits

42—Gravel pits. This unit consists of areas where the soil and underlying gravel deposits have been removed. These areas have no value for farming and little value for grazing. Some areas are filled with water and provide habitat for fish and wildlife. Some areas are used for sanitary landfills. Also included are borrow pits and areas where material was removed in road construction, mainly along Interstate Highway 25. Capability unit VIIIs–1, dryland; not assigned to a range site or windbreak suitability group.

Haploborolls-Rock Outcrop Complex, Steep

43—Haploborolls-Rock outcrop complex, steep. This complex consists of steep and very steep, cool soils and Rock outcrop on mountainsides and fans (fig. 8). The soils are extremely variable; about 50 to 70 percent of the unit, however, is stony and cobbly, dark colored soils that range from shallow to deep. These soils mainly have a surface layer and subsurface layer of sandy loam or loam that contain 10 to 25 percent cobbles and 20 to 35 percent stones. Stones that are on the surface are mainly boulders of granite, gneiss, and schist. About 30 to 50 percent of the mapped area is Rock outcrop. It is mainly on the steeper parts of the area, but it is scattered throughout.

Runoff is rapid, and the hazard of water erosion is severe.

These soils are used for a limited amount of grazing and are also used for wildlife habitat and watershed. Capability unit VIIe–1, dryland; Haploborolls in Stony Loam range site and Rock outcrop not assigned to a range site; not assigned to a windbreak suitability group.

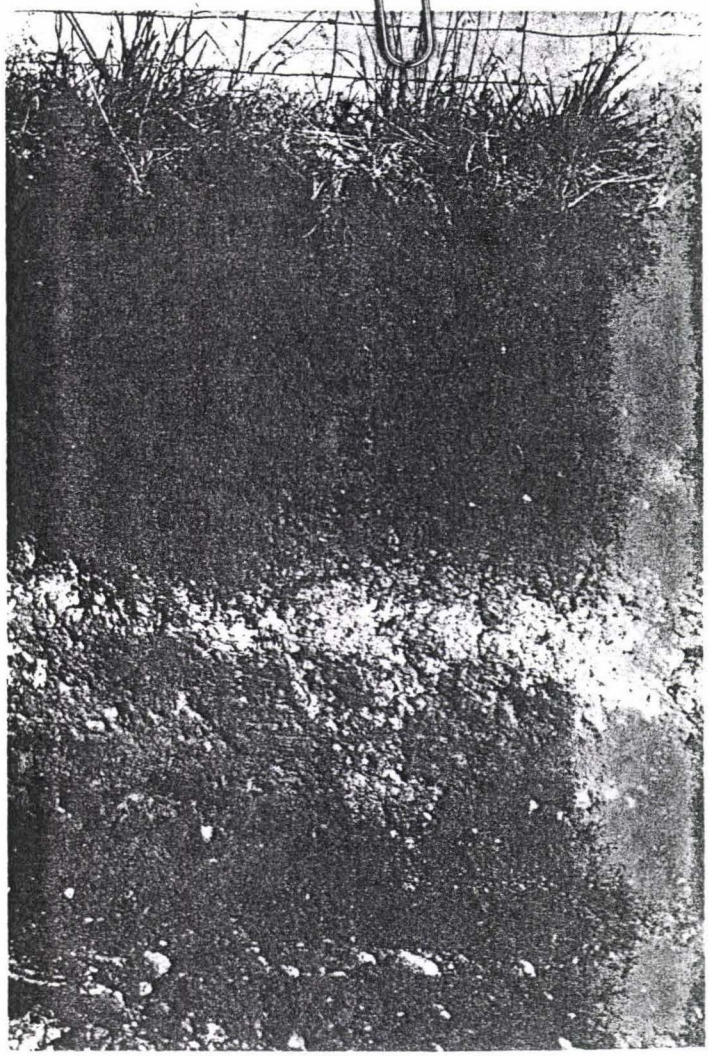


Figure 6.—Profile of Garrett loam, 0 to 1 percent slopes.

Haplustolls, Hilly

44—Haplustolls, hilly. These strongly sloping to

Naz Series

The Naz series consists of deep, well drained soils that formed in material weathered mainly from granite. These soils are on terraces and valleysides. Elevation ranges from 7,500 to 9,000 feet. Slopes are 1 to 25 percent. The native vegetation is mainly scattered pine and an understory of junegrass, Idaho fescue, sagebrush, and other shrubs and forbs. Mean annual precipitation ranges from 15 to 20 inches, mean annual air temperature ranges from 42° to 44° F, and the frost-free season ranges from 60 to 85 days.

In a representative profile the surface layer is very dark grayish brown and dark grayish brown sandy loam about 22 inches thick. The underlying material is brown sandy loam about 38 inches thick.

Permeability is moderately rapid, and the available water capacity is medium. Reaction is slightly acid above a depth of 22 inches and neutral below that depth.

These soils are used mainly for native grasses.

Representative profile of Naz sandy loam, 3 to 25 percent slopes, in native grass, about one mile west of the upper Cherokee Park Road in the southwest quarter of sec. 9, T. 11 N., R. 73 W.:

A11—0 to 5 inches; very dark grayish brown (10YR 3/2) sandy loam, very dark grayish brown (10YR 2/2) moist; weak fine granular structure; soft, very friable; slightly acid; gradual smooth boundary.

A12—5 to 22 inches; dark grayish brown (10YR 4/2) sandy loam, very dark brown (10YR 2/2) moist; weak coarse subangular blocky structure; soft, very friable; slightly acid; gradual smooth boundary.

C—22 to 60 inches; brown (10YR 5/3) sandy loam, dark brown (10YR 4/3) moist; very weak and weak coarse subangular blocky structure; soft, very friable; 15 percent gravel; neutral.

The A horizon is sandy loam or light loam 9 to 30 inches thick. The C horizon is sandy loam or coarse sandy loam. Bedrock is at a depth of 40 to 60 inches in some places. Content of rock fragments, mainly granitic gravel, ranges to as much as 15 percent.

69—Naz sandy loam, 1 to 3 percent slopes. This nearly level soil is on terraces. This soil has a profile similar to the one described as representative of the series, but the surface layer is about 25 inches thick.

Included with this soil in mapping are some small areas of soils that are more sloping and some small areas of soils that have a gravelly layer at a depth of 40 to 60 inches. Also included are a few small areas of soils in which bedrock is at a depth of 40 to 60 inches.

Runoff is slow, and the hazard of erosion is slight.

This soil is suited to pasture and native grasses. Some small areas are used for irrigated hay. Capability units VIc–1, irrigated, and VIe–6, dryland; Mountain Loam range site; not assigned to a windbreak suitability group.

70—Naz sandy loam, 3 to 25 percent slopes. This gently sloping to strongly sloping soil is on terraces and valleysides. This soil has the profile described as representative of the series.

Included with this soil in mapping are a few small areas of soils in which granite bedrock is at a depth of 30 to 60 inches. Also included are a few small areas of soils in which gravel is at a depth of 40 to 60 inches and a few small areas of granite outcrop.

Runoff is medium to rapid, and the hazard of erosion is severe.

This soil is suited to pasture and native grasses. Capability unit VIe–6, dryland; Mountain Loam range site; not assigned to a windbreak suitability group.

Nelson Series

The Nelson series consists of moderately deep, well drained soils that formed in material weathered from sandstone. These soils are on uplands and are underlain by soft sandstone at a depth of 20 to 40 inches. Elevation ranges from 4,800 to 5,500 feet. Slopes are 0 to 15 percent. The native vegetation is mainly blue grama, side-oats grama, yucca, and cactus. Mean annual precipitation ranges from 13 to 15 inches, mean annual air temperature ranges from 48° to 50° F, and the frost-free season ranges from 135 to 150 days.

In a representative profile the surface layer is light brownish gray fine sandy loam about 5 inches thick. The underlying material is light yellowish brown fine sandy loam about 20 inches thick. Below this is soft sandstone.

Permeability is moderately rapid, and the available water capacity is low. Reaction is moderately alkaline.

These soils are used mainly for native grasses, but some areas are used for irrigated and dryfarmed crops and for pasture.

Representative profile of Nelson fine sandy loam, 3 to 9 percent slopes, in native grass, about 450 feet east and 175 feet south of the northwest corner of sec. 23, T. 8 N., R. 68 W.:

A1—0 to 5 inches; light brownish gray (10YR 6/2) fine sandy loam, dark grayish brown (10YR 4/2) moist; weak fine subangular blocky structure parting to moderate very fine granular; soft, very friable; calcareous; moderately alkaline; clear smooth boundary.

C1ca—5 to 16 inches; light yellowish brown (2.5Y 6/4) fine sandy loam, light olive brown (2.5Y 5/4) moist; massive; slightly hard, very friable; calcareous; visible secondary calcium carbonate as thin seams, streaks, and spots; moderately alkaline; clear wavy boundary.

C2ca—16 to 25 inches; light yellowish brown (2.5Y 6/4) fine sandy loam, olive brown (2.5Y 4/4) moist; massive; slightly hard, very friable; 10 percent partly disintegrated sandstone fragments; calcareous; visible secondary calcium carbonate as streaks and seams and on undersides of rock fragments; moderately alkaline; gradual smooth boundary.

C3r—25 to 60 inches; calcareous soft sandstone.

The A horizon is light loam or sandy loam 4 to 12 inches thick. The C horizon is sandy loam or fine

Capability unit VIe–3, dryland; Shallow Foothill range site; not assigned to a windbreak suitability group.

86—Purner-Rock outcrop complex, 10 to 50 percent slopes. This complex consists of moderately steep or steep soils on uplands and ridges. It is about 55 percent Purner fine sandy loam and about 30 percent Rock outcrop. Purner fine sandy loam is smoother and less sloping, and Rock outcrop is steeper commonly on the western side of ridges.

Included with this soil in mapping is about 15 percent areas of Kirtley soils.

Runoff is rapid, and the hazard of erosion is severe.

This soil is suited to native grasses. Capability unit VIIe–1, dryland; Purner soil in Shallow Foothill range site and Rock outcrop not assigned to a range site; not assigned to a windbreak suitability group.

Ratake Series

The Ratake series consists of shallow, well drained or somewhat excessively drained soils that formed in material weathered from granite, schist, or phyllite. These soils are on upland ridges and mountainsides and are underlain by weathered phyllite, schist, or weathered granite at a depth of 10 to 20 inches. Elevation ranges from 6,800 to 8,500 feet. Slopes are 1 to 60 percent. The native vegetation is mainly blue grama, side-oats grama, slender wheatgrass, bluebunch wheatgrass, mountainmahogany, and sage. Mean annual precipitation ranges from 14 to 18 inches, mean annual air temperature ranges from 44° to 46° F, and the frost-free season ranges from 75 to 100 days.

In a representative profile the surface layer is reddish gray channery loam about 10 inches thick. The subsoil is reddish brown very channery loam about 5 inches thick. The underlying material is weathered phyllite or phyllite schist.

Permeability is moderate, and the available water capacity is low. Reaction is neutral.

These soils are mainly used for native grasses.

Representative profile of Ratake channery loam in an area of Ratake-Rock outcrop complex, 25 to 55 percent slopes, in native grass, about 2,350 feet east of the southwest corner of sec. 5, T. 8 N., R. 70 W.:

A1—0 to 10 inches; reddish gray (5YR 5/2) channery loam, dark reddish brown (5Y 3/2) moist; strong fine granular and crumb structure; soft, very friable; 20 percent soft phyllite channers; very high mica content; neutral; clear smooth boundary.

B2—10 to 15 inches; reddish brown (5YR 5/3) very channery loam, reddish brown (5YR 4/3) moist; moderate fine subangular blocky structure parting to strong fine granular; soft, very friable; 60 percent phyllite channers; very high mica content; neutral; diffuse boundary.

Cr—15 to 25 inches; weathered phyllite or phyllitic schist; coarse fragments are weathered and can be crushed in the hand with some difficulty but without significant contributions to the fine parts of the soil on first and second breakages; horizon can be penetrated with a spade with difficulty; very high mica content.

The A horizon is loam or sandy loam 7 to 20 inches thick. The B2 horizon is absent in some profiles. Content of rock fragments, mainly phyllite, schist, or granite ¼ inch to 2 inches in size, ranges from 35 to 80 percent.

87—Ratake-Rock outcrop complex, 25 to 55 percent slopes. This complex consists of steep or very steep soils on mountainsides and ridges. It is about 60 percent Ratake channery loam and about 30 percent Rock outcrop. Ratake channery loam is less steep, and Rock outcrop is throughout the complex but commonly is near ridgetops and is steeper.

Included with this soil in mapping is about 10 percent areas of Breece soils along drainageways.

Runoff is rapid, and the hazard of water erosion is severe.

This soil is suited to native grasses. Capability unit VIIe–1, dryland; Rocky Loam range site; not assigned to a windbreak suitability group.

Redfeather Series

The Redfeather series consists of shallow, well drained soils that formed in material weathered from granite. These soils are on ridges and mountainsides and are underlain by granite bedrock at a depth of 10 to 20 inches. Elevation ranges from 8,500 to 9,500 feet. Slopes are 5 to 50 percent. The native vegetation is mainly forest of lodgepole pine, spruce, and some aspen and a thin understory of grass. Mean annual precipitation ranges from 15 to 20 inches, mean annual air temperature ranges from 40° to 44° F, and the frost-free season ranges from 60 to 85 days.

In a representative profile a 2-inch-thick layer of organic material is on the surface. The surface layer is dark grayish brown and light brownish gray sandy loam about 8 inches thick. The subsoil is brown gravelly sandy loam about 4 inches thick and reddish brown gravelly sandy clay loam about 5 inches thick. Below this is hard granite bedrock.

Permeability is moderately rapid, and the available water capacity is low. Reaction is medium acid above a depth of about 1 inch, strongly acid to a depth of about 12 inches, and medium acid below a depth of 12 inches.

These soils are used mainly for forest and recreation.

Representative profile of Redfeather sandy loam, 5 to 50 percent slopes, in forest, approximately 1,300 feet south and 1,000 feet west of the northeast corner of sec. 21, T. 11 N., R. 74 W.:

O1—2 inches to 1 inch; undecomposed organic material, mainly needles, bark, and twigs and remains of understory plants.

O2—1 inch to 0; partly decomposed organic material like that in the O1 horizon.

A1—0 to 1 inch; dark grayish brown (10YR 4/2) sandy loam, very dark brown (10YR 2/2) moist; weak fine granular structure; soft, very friable; noncalcareous; more than 10 percent gravel and stones; medium acid; clear smooth boundary.

A2—1 inch to 8 inches; light brownish gray (10YR 6/2) sandy loam, dark grayish

brown (10YR 4/2) moist; weak fine granular structure; soft, very friable; about 15 percent gravel and stones; strongly acid; abrupt smooth boundary.

A&B—8 to 12 inches; brown (10YR 5/3) gravelly sandy loam, dark brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable; few patchy clay films on peds; about 30 percent gravel and stones; strongly acid; clear wavy boundary.

B2t—12 to 17 inches; reddish brown (5YR 5/4) gravelly sandy clay loam, dark reddish brown (5YR 3/4) moist; moderate fine and medium subangular blocky structure; slightly hard, firm; thin patchy clay films on peds; about 35 percent gravel and 10 percent cobbles; medium acid; gradual wavy boundary.

R—17 to 24 inches; hard granite bedrock.

The A1 horizon is sandy loam or gravelly sandy loam 1 inch to 3 inches thick. The A2 horizon is sandy loam or gravelly sandy loam 5 to 10 inches thick. The B2t horizon is gravelly or very gravelly sandy clay loam. Content of rock fragments, mainly fine granitic gravel and cobbles, in the solum ranges from 35 to 80 percent. Reaction ranges from strongly acid to slightly acid.

88—Redfeather sandy loam, 5 to 50 percent slopes. This strongly sloping to steep soil is on mountainsides and ridges.

Included with this soil in mapping are some small areas of shallow soils that have a darker colored surface layer. Also included are a few small areas of Schofield and Naz soils and areas of Rock outcrop.

Runoff is medium to rapid, and the hazard of erosion is moderate to severe.

This soil is suited to woodland and forestry purposes and to recreation. Some areas are used as sites for summer homes. Capability unit VIIs–1, dryland; woodland suitability group 6d2; not assigned to a range site or windbreak suitability group.

Renohill Series

The Renohill series consists of moderately deep, well drained soils that formed in material weathered from sandstone and shale. These soils are on uplands and are underlain by soft shale at a depth of 20 to 40 inches. Elevation ranges from 4,800 to 5,600 feet. Slopes are 0 to 15 percent. The native vegetation is mainly blue grama, buffalograss, western wheatgrass, and cactus. Mean annual precipitation ranges from 13 to 15 inches, mean annual air temperature ranges from 48° to 50° F, and the frost-free season ranges from 135 to 150 days.

In a representative profile the surface layer is pale brown clay loam about 3 inches thick. The subsoil is pale brown heavy clay loam about 4 inches thick and light yellowish brown clay about 12 inches thick. The underlying material is light yellowish brown clay loam about 10 inches thick. Below this is soft shale.

Permeability is slow, and the available water capacity is medium. Reaction is mildly alkaline above a depth of 12 inches and moderately alkaline below this depth.

These soils are used mainly for irrigated and dry farmed crops and for pasture and native grasses.

Representative profile of Renohill clay loam, 3 to 6 percent slopes, in grass, 200 feet north and 700 feet west of the southeast corner of sec. 12, T. 6 N., R. 6 W.:

A1—0 to 3 inches; pale brown (10YR 6/3) clay loam, dark brown (10YR 4/3) moist; weak fine granular structure; soft, very friable; mildly alkaline; clear smooth boundary.

B1—3 to 7 inches; pale brown (10YR 6/3) heavy clay loam, dark brown (10YR 4/3) moist; weak medium subangular blocky structure; very hard, friable; mildly alkaline; clear smooth boundary.

B2t—7 to 12 inches; light yellowish brown (2.5Y 6/3) clay, olive brown (2.5Y 4/3) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; extremely hard, very firm; thin nearly continuous clay films on ped faces; mildly alkaline; clear smooth boundary.

B3ca—12 to 19 inches; light yellowish brown (2.5Y 6/3) light clay, light olive brown (2.5Y 5/3) moist; weak medium angular and subangular blocky structure; extremely hard, very firm; thin patchy clay films on ped faces; calcareous; visible secondary calcium carbonate as soft spots; moderately alkaline; gradual smooth boundary.

C1ca—19 to 29 inches; light yellowish brown (2.5Y 6/3) heavy clay loam, light olive brown (2.5Y 5/3) moist; weak medium subangular blocky structure; very hard, friable; calcareous; visible secondary calcium carbonate as soft spots; moderately alkaline; gradual smooth boundary.

C2r—29 to 60 inches; calcareous clay shale.

The A horizon is clay loam or silty clay loam 6 to 9 inches thick in cultivated areas. A B1 horizon is present in some places. The B2t horizon is heavy clay loam, heavy silty clay loam, clay, or silty clay. The combined thickness of the A and B horizons ranges from 15 to 30 inches. Depth to calcareous material generally ranges from 6 to 20 inches, but some pedons are weakly calcareous throughout.

89—Renohill clay loam, 0 to 3 percent slopes. This nearly level soil is on uplands. This soil has a profile similar to the one described as representative of the series, but the combined thickness of the surface layer and subsoil is about 22 inches.

Included with this soil in mapping are a few small areas of soils that are more sloping and a few small areas of soils that have gravel on the surface. Also included are a few small areas of Ulm, Heldt, and Midway soils.

Runoff is medium, and the hazard of erosion is slight to moderate.

If irrigated, this soil is well suited to pasture and

clay loam, grayish brown (10YR 5/2) moist; weak medium platy and moderate fine subangular blocky structure; hard, friable; calcareous; moderately alkaline; calcium sulfate as many crystals and nodules; clear smooth boundary.

C1cacs—26 to 35 inches; white (10YR 8/2) loam, light gray (10YR 7/2) moist; massive; slightly hard, friable; many calcium sulfate crystals and nodules; visible secondary calcium carbonate as spots and seams; calcareous; moderately alkaline; clear smooth boundary.

C2cacs—35 to 60 inches; light gray (2.5Y 7/2) sandy loam, light yellowish brown (2.5Y 6/4) moist; few faint light brownish red mottles; massive; slightly hard, very friable; common calcium sulfate crystals and nodules; visible secondary calcium carbonate as spots and seams; calcareous; moderately alkaline.

The A horizon is light clay loam 6 to 12 inches thick. The B2t horizon is light clay loam 6 to 15 inches thick. The lower part of the B horizon and the C horizon have accumulations of secondary sulfate.

98—Satanta Variant clay loam, 0 to 3 percent slopes. This nearly level soil is on terraces.

Included with this soil in mapping are a few small areas of soils that have a surface layer and subsurface layer of loam. Also included are a few small areas of Nunn clay loam, wet, and areas of Caruso and Loveland soils.

Runoff is slow. The hazard of erosion is slight to moderate, except in areas near stream channels where cutting occurs.

If irrigated, this soil is suited to corn, barley, alfalfa, wheat, and pasture. Under dryland management it is suited to pasture and native grasses and, to a lesser extent, wheat and barley. Capability units IIe–1, irrigated, and IVe–3, dryland; Overflow range site; windbreak suitability group 3.

Schofield Series

The Schofield series consists of moderately deep, well drained soils that formed in material weathered from granite, gneiss, and schist. These soils are on ridges and mountainsides and are underlain by bedrock at a depth of 20 to 40 inches. Elevation ranges from 7,500 to 9,000 feet. Slopes are 5 to 25 percent. The native vegetation is mainly lodgepole pine, Engelmann spruce, and Douglas fir and a few grasses and shrubs. Mean annual precipitation ranges from 15 to 20 inches, mean annual air temperature ranges from 40° to 44° F, and the frost-free season ranges from 60 to 85 days.

In a representative profile a 1½-inch-thick layer of organic material is on the surface. The surface layer is dark gray coarse sandy loam about 2 inches thick. The subsurface layer is light brownish gray coarse sandy loam about 10 inches thick. The subsoil is brown gravelly sandy clay loam 8 inches thick. The underlying material is brown gravelly loamy sand about 7 inches thick. Below this is granite bedrock.

Permeability is moderate, and the available water capacity is low. Reaction is medium acid above a depth of 12 inches and slightly acid below that depth.

These soils are used mainly for forest and recreation.

Representative profile of Schofield coarse sandy loam in an area of Schofield-Redfeather-Rock outcrop complex, 5 to 25 percent slopes, in forest, about 3,500 feet north and 1,500 feet east of the southwest corner of sec. 20, T. 9 N., R. 73 W.:

O1—1½ inches to ½ inch; undecomposed organic matter consisting of needles, twigs, and leaves.

O2—½ inch to 0; partly decomposed organic material similar to that in the O1 horizon.

A1—0 to 2 inches; dark gray (10YR 4/1) coarse sandy loam, black (10YR 2/1) moist; moderate medium and fine granular structure; slightly hard, very friable; 10 percent gravel; medium acid; clear smooth boundary.

A2—2 to 12 inches; light brownish gray (10YR 6/2) coarse sandy loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky structure; slightly hard, very friable; 10 percent gravel; medium acid; gradual smooth boundary.

B2t—12 to 20 inches; brown (10YR 5/3) gravelly sandy clay loam, dark brown (10YR 4/3) moist; moderate coarse subangular blocky structure; very hard, firm; thick patchy clay films on peds; 15 percent gravel; slightly acid; clear smooth boundary.

C—20 to 27 inches; brown (10YR 5/3) gravelly loamy sand, dark brown (10YR 4/3) moist; massive; slightly hard, very friable; 25 percent gravel; slightly acid; clear smooth boundary.

R—27 to 31 inches; granite bedrock.

The A1 horizon is sandy loam 0 to 3 inches thick. The A2 horizon is sandy loam or loamy sand 4 to 12 inches thick. The B2t horizon is sandy clay loam 7 to 15 inches thick. A C horizon is present in some places, and some profiles have mixed A and B horizons. Reaction ranges from medium acid to neutral.

99—Schofield-Redfeather-Rock outcrop complex, 5 to 25 percent slopes. This complex consists of strongly sloping to moderately steep soils on mountainsides and ridges. It is about 40 percent Schofield coarse sandy loam, about 30 percent Redfeather sandy loam, and about 20 percent Rock outcrop. Schofield coarse sandy loam is near the base of the slope. Redfeather sandy loam is on the upper parts of the slopes, and Rock outcrop occurs throughout but is commonly near ridgetops and is steeper.

Included with this complex in mapping are about 10 percent areas of Naz soils.

Runoff is medium to rapid, and the hazard of erosion is severe.

These soils are used for woodland and recreation and for a limited amount of cattle grazing. Capability unit VIe–6, dryland; woodland suitability group 6x2;

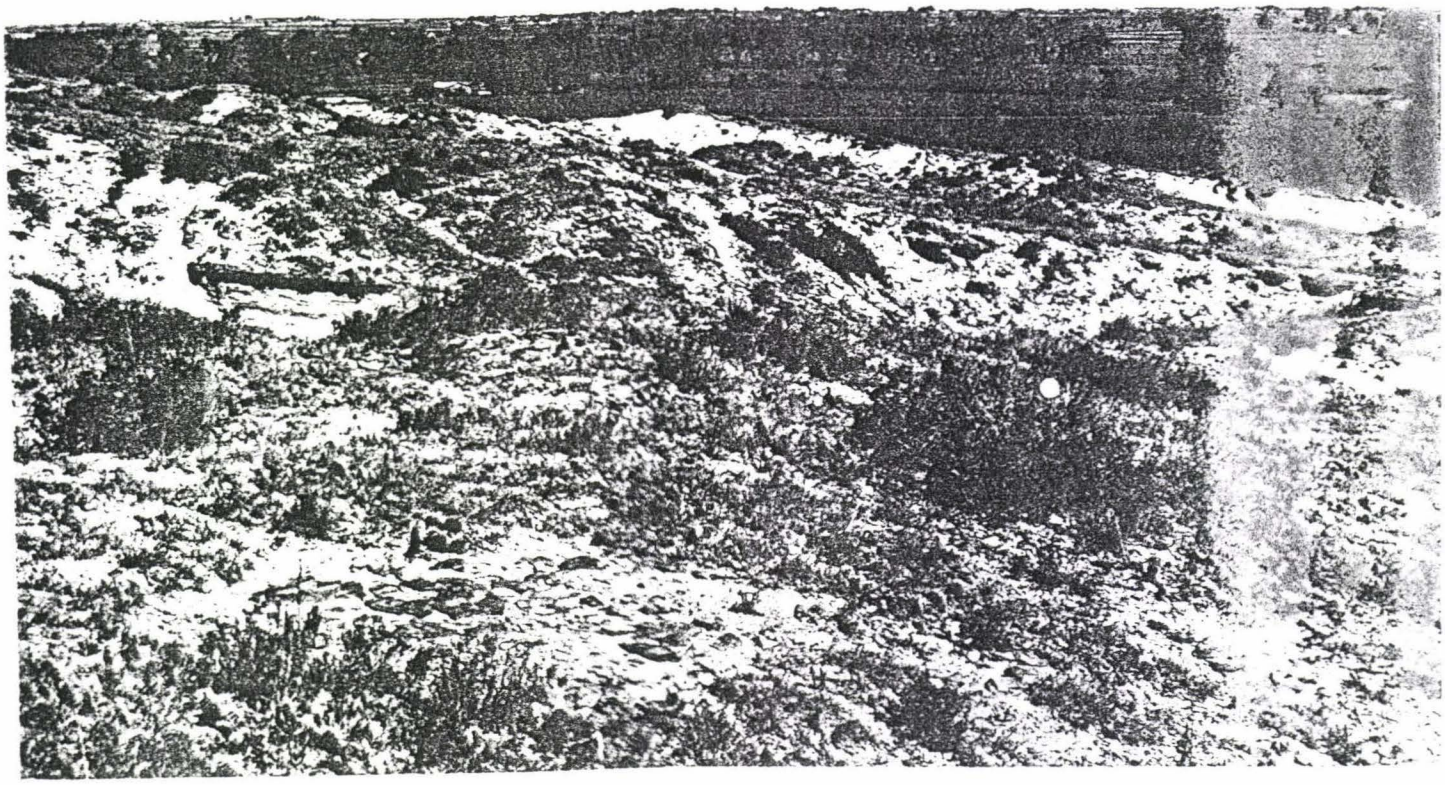


Figure 11.—Area of Tassel sandy loam, 3 to 25 percent slopes, in foreground; Cache La Poudre river valley in background.

6/4) loam, light olive brown (2.5Y 5/4) moist; massive; hard, very friable; calcareous; moderately alkaline; clear smooth boundary.

C2r—37 to 60 inches; light gray (2.5Y 7/2) dry and moist interbedded shale and sandstone.

The A1 horizon is loam or light clay loam 4 to 11 inches thick. The C horizon is loam or light clay loam. Depth to calcareous material ranges from 0 to 6 inches. Reaction ranges from neutral to moderately alkaline. Content of rock fragments ranges from 0 to 15 percent throughout, but particularly in the surface layer.

107—Thedalund loam, 0 to 3 percent slopes. This nearly level soil is on uplands. This soil has a profile similar to the one described as representative of the series, but the surface layer is about 8 inches thick.

Included with this soil in mapping are some small areas of soils that are more sloping and a few small areas of Kim soils.

Runoff is slight, and the hazard of erosion is slight to moderate.

If irrigated, this soil is suited to barley, wheat, and corn and, to a lesser extent, alfalfa and sugar beets. Under dryland management it is suited to wheat and barley. It is also well suited to pasture and native grasses. Capability units IIIe–3, irrigated, and IVe–3, dryland; Loamy Plains range site; windbreak suitability group 1.

108—Thedalund loam, 3 to 9 percent slopes. This gently sloping to moderately sloping soil is on uplands. This soil has the profile described as representative of the series.

Included with this soil in mapping are a few small areas of soils that are more sloping or less sloping. Also included are a few small areas of soils that have a surface layer of clay loam and small areas of Kim, Cushman, and Midway soils.

Runoff is medium, and the hazard of erosion is moderate.

If irrigated, this soil is suited to barley, wheat, alfalfa, and pasture. Under dryland management it is suited to pasture or native grasses. Capability units IVe–1, irrigated, and VIe–1, dryland; Loamy Plains range site; windbreak suitability group 1.

Thiel Series

The Thiel series consists of deep, well drained soils that formed in alluvium or glacial outwash. These soils are on terraces and high benches and are underlain by sand and gravel at a depth of 20 to 40 inches. Elevation

ranges from 7,500 to 8,500 feet. Slopes are 5 to 25 percent. The native vegetation is mainly Idaho fescue, needleandthread, and sage. Mean annual precipitation ranges from 15 to 18 inches, mean annual air temperature ranges from 42° to 44° F, and the frost-free season ranges from 60 to 85 days.

In a representative profile the surface layer is brown gravelly sandy loam about 4 inches thick. The subsoil is brown very gravelly sandy loam about 8 inches thick and light yellowish brown very gravelly light sandy clay loam about 2 inches thick. The underlying material is very gravelly sandy loam about 16 inches thick over very pale brown extremely gravelly sand.

Permeability is moderately rapid above a depth of about 30 inches and very rapid below that depth. The available water capacity is low to medium. Reaction is neutral above a depth of 8 inches, slightly acid between depths of 8 and 12 inches, and moderately alkaline below a depth of 12 inches.

These soils are used mainly for native grasses.

Representative profile of Thiel gravelly sandy loam, 5 to 25 percent slopes, in native grass, about 2,350 feet east and 100 feet north of the southwest corner of sec. 4, T. 12 N., R. 77 W.:

A1—0 to 4 inches; brown (10YR 4/3) gravelly sandy loam, dark brown (10YR 3/3) moist; strong fine granular structure; soft, very friable; 40 percent fine and very fine angular granite gravel; neutral; clear smooth boundary.

B21t—4 to 8 inches; brown (7.5YR 5/3) very gravelly sandy loam, dark brown (7.5YR 3/3) moist; moderate medium subangular blocky structure parting to strong medium granular; slightly hard, very friable; thin clay films on ped faces and on gravel fragments and as bridges between sand grains; 50 percent fine angular granite gravel; neutral; clear smooth boundary.

B22t—8 to 12 inches; brown (7.5YR 5/4) very gravelly sandy loam, dark brown (7.5YR 4/4) moist; moderate medium subangular blocky structure parting to strong medium granular; extremely hard, very friable; common thin clay films on ped faces and on gravel fragments and as bridges between sand grains; 50 percent fine granite gravel; slightly acid; clear wavy boundary.

B3ca—12 to 14 inches; light yellowish brown (10YR 6/4) very gravelly light sandy clay loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; extremely hard, very friable; few clay films on gravel fragments; few clay bridges between sand grains; 50 percent fine granite gravel; moderate continuous accumulation of secondary calcium carbonate as soft concretions; calcareous; moderately alkaline; diffuse wavy boundary.

C1ca—14 to 30 inches; very pale brown (10YR 8/3) very gravelly sandy loam, pale brown (10YR 6/3) moist; single grained; extremely hard, very friable; 60 percent fine and very fine granitic gravel; strong continuous horizon of secondary carbonate accumulation and carbonate in finely divided marl-like forms; calcareous; moderately alkaline; diffuse wavy boundary.

IIC2ca—30 to 60 inches; very pale brown (10YR 7/3) extremely gravelly sand, brown (10YR 5/3) moist; single grained; very hard, loose; 70 percent fine angular granite gravel; moderate continuous horizon of secondary carbonate accumulation and calcium carbonate mostly in seams and streaks or as coatings on coarse fragments; content of carbonate decreases with depth; calcareous; moderately alkaline.

The A horizon is sandy loam to very gravelly sandy loam 3 to 8 inches thick. The combined thickness of the A and B horizons ranges from 8 to 15 inches. The B horizon is very gravelly sandy loam or very gravelly sandy clay loam. Depth to calcareous material ranges from 6 to 15 inches. Content of rock fragments, mainly fine granitic gravel, ranges from 35 to 80 percent.

109—Thiel gravelly sandy loam, 5 to 25 percent slopes. This strongly sloping or moderately steep soil is on high benches, terraces, and alluvial fans.

Included with this soil in mapping are small areas of soils that lack lime accumulations and a few small areas of soils that are underlain by sand and gravel at a shallow depth.

Runoff is medium to rapid, and the hazard of water erosion is moderate to severe.

This soil is suited to pasture and native grasses. Capability unit VIe–7, dryland; Dry Mountain Loam range site; not assigned to a windbreak suitability group.

Tine Series

The Tine series consists of deep, well drained or somewhat excessively drained soils that formed in material weathered from alluvium or glacial outwash. These soils are on terraces and benches and are underlain by sand and gravel at a depth of 10 to 20 inches. Elevation ranges from 7,500 to 9,000 feet. Slopes are 0 to 40 percent. The native vegetation is mainly wheatgrass, junegrass, sedges, and sagebrush. Mean annual precipitation ranges from 13 to 17 inches, mean annual air temperature ranges from 42° to 44° F, and the frost-free season ranges from 60 to 85 days.

In a representative profile the surface layer is brown gravelly sandy loam about 15 inches thick. The underlying material is yellowish brown very gravelly loamy sand about 3 inches thick over sand, gravel, and cobbles.

Permeability is moderately rapid above a depth of about 15 inches and rapid below that depth. The available water capacity is low. Reaction is slightly acid.

These soils are used mainly for native grasses.

Representative profile of Tine gravelly sandy loam, 0 to 3 percent slopes, in native grass, about 2,000 feet south and 1,700 feet west of the northeast corner of sec. 35, T. 12 N., R. 77 W.:

STONY LOAM RANGE SITE

This site consists of moderately steep and steep, stony soils on mountainsides. Slopes are 10 to 50 percent. Elevation ranges from 7,000 to 9,000 feet. The soils are generally moderately deep or deep and well drained. The surface layer is mostly moderately fine textured or moderately coarse textured. Permeability is generally moderate or moderately slow, and the available water capacity is medium or high.

Serviceberry, bitterbrush, big sagebrush, snowberry, and Douglas rabbitbrush give the appearance of a shrub plant community. Grasses and forbs, however, are dominant. The approximate composition of the potential plant community, by percentage of total weight, is 20 percent bluebunch wheatgrass, 10 percent Indian ricegrass, 10 percent Idaho fescue, 10 percent needlegrasses, 10 percent muttongrass, and 10 percent serviceberry. The remaining 30 percent is junegrass, western wheatgrass, sedge, bitterbrush, big sagebrush, and snowberry.

The total annual production of air-dry vegetation ranges from 2,000 pounds per acre in favorable years to 1,000 pounds per acre in unfavorable years. As much as 80 percent of this production provides forage for cattle and sheep.

As the range starts to deplete, western wheatgrass, junegrass, big sagebrush, and fringed sage increase. As the condition declines further, annuals invade and fringed sage continues to increase.

MOUNTAIN MEADOW RANGE SITE

This site consists of level to gently sloping soils in valleys and swales. Slopes are 0 to 5 percent. Elevation ranges from 7,000 to 11,500 feet. The soils are deep and poorly drained or somewhat poorly drained. The surface layer is moderately fine textured to moderately coarse textured and is gravelly in places. Permeability is slow to rapid, and the available water capacity is low to high. A water table is within the root zone during most of the growing season.

The potential plant community is mostly tufted hairgrass, Nebraska sedge, ovalhead sedge, slender wheatgrass, Baltic rush, and Canada bluegrass. Some forbs occur in small amounts, and willows and shrubby cinquefoil are also present. The approximate composition of the potential plant community, by percentage of total weight, is 30 percent tufted hairgrass, 20 percent Nebraska sedge, 15 percent slender wheatgrass, 10 percent ovalhead sedge, 5 percent Baltic rush, and 5 percent willows. The remaining 15 percent is Canada bluegrass and shrubby cinquefoil.

The total annual production of air-dry vegetation ranges from 4,000 pounds per acre in favorable years to 2,000 pounds in unfavorable years. As much as 90 percent of this production provides forage for cattle.

As the range starts to deplete, Baltic rush, ovalhead sedge, and several forbs increase. As the condition declines further timothy, smooth brome, redtop, Kentucky bluegrass, and Canada thistle invade.

MOUNTAIN SHALE RANGE SITE

This site consists of level to steep soils on shale hills. Slopes are 0 to 30 percent. Elevation ranges from 7,000 to 9,000 feet. The soils are moderately deep and well drained. The surface layer is moderately fine textured. Permeability is slow, and the available water capacity is low or medium.

The potential plant community is mostly bluebunch wheatgrass, western wheatgrass, Indian ricegrass, squirreltail, and muttongrass. The approximate composition of the potential plant community, by percentage of total weight, is 25 percent bluebunch wheatgrass, 10 percent western wheatgrass, 10 percent Indian ricegrass, 10 percent squirreltail, 10 percent muttongrass, 10 percent Sandberg bluegrass, 10 percent needlegrasses, and 10 percent serviceberry. The remaining 5 percent is lupine, milkvetch, eriogonum, big sagebrush, Douglas rabbitbrush, and winterfat.

The total annual production of air-dry vegetation ranges from 700 pounds per acre in favorable years to 200 pounds per acre in unfavorable years. As much as 80 percent of this production provides forage for cattle and sheep.

As the range starts to deplete, big sagebrush increases. As the condition declines further annuals invade.

SUBALPINE LOAM RANGE SITE

This site consists of nearly level to moderately steep soils in open parks and on mountainsides. Slopes are 2 to 15 percent. Elevation ranges from 8,000 to 9,000 feet. The soils are deep or moderately deep and well drained. The surface layer is moderately coarse textured. Permeability is moderately rapid to moderately slow, and the available water capacity is low to high.

The potential plant community is mostly Thurber fescue, Parry oatgrass, Idaho fescue, and big bluegrass. Shrubs are of minor importance, although a few are generally scattered throughout. The approximate composition of the potential plant community, by percentage of total weight, is 35 percent Thurber fescue, 20 percent Parry oatgrass, 10 percent Idaho fescue, 10 percent big bluegrass, and 10 percent Columbia needlegrass and Letterman needlegrass. The remaining 15 percent is slender wheatgrass, western wheatgrass, nodding brome, and snowberry.

The total annual production of air-dry vegetation ranges from 3,500 pounds per acre in favorable years to 2,000 pounds per acre in unfavorable years. As much as 85 percent of this production provides forage for cattle and sheep.

As the range starts to deplete, mountain big sage is dominant. Lupine, fringed sage, cinquefoil, and yarrow also increase. As the condition declines further, Kentucky bluegrass, Douglas rabbitbrush, rubber rabbitbrush, and annuals invade.

Woodland [5]

Most of the woodland in Larimer County Area is in the western and northwestern parts of the survey area. The main native trees at the lower elevations are ponderosa pine, Douglas-fir, and Rocky Mountain juniper. Douglas-fir is mainly on the northern slopes. Engelmann spruce, subalpine fir, and lodgepole pine are the main trees at higher elevations. Aspen also

[5] SHERMAN J. FINCH, woodland conservationist, Soil Conservation Service, helped to prepare this section.

grows, mainly in small groves or as scattered trees. One small isolated grove of pinyon, northwest of the city of Fort Collins, is unique in that it is the most northwestern location in the United States for this tree.

The woodland areas are about equally divided between private and government ownership. Most of the government-administered land is national forest, but some is State and county owned.

Much of this woodland was logged by early settlers. Little of the privately owned woodland is managed for timber production, although it is used for poles, fenceposts, and firewood. Almost all of the area is used for grazing, recreation, and wildlife habitat. In recent years much of the privately owned woodland has been used as sites for summer and year-round homes.

Woodland suitability groups

The soils in the mountainous part of Larimer County Area have been placed in woodland suitability groups to assist owners in planning the use of their soils for wood crops. Each group is made up of soils that are suited to the same kinds of trees, that need about the same management, and that have the same potential production.

Each woodland group is identified by a three-part symbol, for example, 6o1. The potential productivity of the soils in the group is indicated by the first numeral in the symbol: 1 is very high; 2, high; 3, moderately high; 4, moderate; 5, moderately low; and 6, low. These ratings are based on field determination of average site index. Site index of a given soil is the height, in feet, that the taller trees of a given species reach in a natural, essentially unmanaged stand in a stated number of years.

The second part of the symbol is a small letter. In this survey, *x*, *d*, and *o* are used. The small letter indicates an important soil property that imposes a hazard or limitation in managing the soils for trees. The letter *x* indicates that the soil has major limitations because of rockiness or stoniness. The letter *d* indicates that the soil has a restricted rooting depth. The letter *o* shows that the soils have few limitations that restrict their use for trees.

The third part of the symbol, another numeral, differentiates groups that have the same first and second parts in their identifying symbols.

Soils that have not been placed in a woodland suitability group are not suited to or are not used for woodland. The woodland suitability group is shown at the end of the mapping unit description for applicable soils.

The woodland suitability groups in the survey area are briefly described in the following paragraphs.

Woodland suitability group 6o1.—The soils in this group are suited to the production of ponderosa pine. They are capable of producing about 2,020 cubic feet per acre, or 7,800 board feet, in a managed, even-aged stand of 100-year-old trees. There are no major limitations to the use of the soils for woodland.

Woodland suitability group 6x1.—The soils in this group are suited to the production of ponderosa pine. They are capable of producing about 1,610 cubic feet per acre, or 5,300 board feet, in a managed, even-aged stand of 100-year-old trees. The hazard of erosion is high, and equipment limitations and seedling mortality are moderate.

Woodland suitability group 6x2.—The soils in this group are suited to the production of Engelmann spruce. They are capable of producing about 3,300 cubic feet per acre, or 9,000 board feet, in managed, even-aged stands of 90-year-old trees. Seedling mortality is severe, and the equipment limitations and windthrow hazard are moderate.

Woodland suitability group 6d1.—The soils in this group are suited to the production of ponderosa pine. They are capable of producing about 1,610 cubic feet per acre, or 5,300 board feet, in a managed, even-aged stand of 100-year-old trees. Seedling mortality is severe, and the hazard of erosion, equipment limitations, and windthrow hazard are moderate.

Woodland suitability group 6d2.—The soils in this group are suited to the production of lodgepole pine. They are capable of producing about 2,490 cubic feet per acre, or 4,900 board feet, in a managed, even-aged stand of 90-year-old trees. Seedling mortality is severe, and the hazard of erosion, equipment limitations, and windthrow hazard are moderate.

Windbreaks[6]

The native vegetation on the plains in Larimer County Area is grass. Early settlers planted trees for beautification and protection, mainly around farmsteads. Many of these trees still survive, although most of them, mainly cottonwood and willows, in the plains are along the streams and drainageways.

Windbreaks and tree plantings can be very beneficial to landowners. They help to reduce home heating costs by reducing winds. They help to protect livestock from winter storms and drifting snow. They provide habitat for wildlife and birds and enhance the beauty and value of homesteads.

If windbreaks are planted, care is needed establishing them. Evergreens are among the most desirable trees because they are long lived and resist damage by wind, snow, and disease. They provide protection from winds, which occur before deciduous trees leaf. Evergreens grow much more slowly than deciduous trees for the first few years and should, therefore, be planted in rows separate from the faster growing but short-lived broadleaf trees.

Climatic conditions limit the kinds of trees and shrubs that can be grown, and careful selection, therefore, is necessary. Cultivation reduces competition from weeds and grass and also the hazard of destructive fires.

Replacing trees lost in the first years to develop a continuous, uniform wind barrier. Pruning should be limited to the removal of dead branches.

Protection of newly planted trees from livestock and other animals is important. Rabbits, mice, deer, and antelope can damage trees. Repellants can be applied in fall to help protect the young trees. Providing supplemental water to newly planted trees is beneficial and increases survival. Adequate water should be sup-

[6] SHERMAN J. FINCH, woodland conservationist, Soil Conservation Service, helped to prepare this section.

TIMBER PARAMETERS

Lodgepole Pine

14 sample points, using a 20 BAF prism. Sampling error of 8%.

Average Site Index is 55 with dominants being 110 years, 55 feet in height.

	Total Stand	5-7" DBH	8"DBH & Greater
Trees per acre	529	418	101
Average DBH	6.7	6.1	9.1
Average Height	45	41	57
Basal Area per acre	121	75	46
Cubic feet per acre	1295	1295	
Board feet per acre	4719		4719
Acres	72	42	30
Total Volume		638 cords *	141 mbf

* 1 cord equals 85 cubic feet.

12.9 CCF/ac 70.5 cords

542 CCF 60CCF

— EXHIBIT C —

2 CCF/acre

.5 mbf/cord

Prepared By	Initials	Date
Approved By		

POTENTIAL FOR HABITAT ELEMENTS *

SOIL TYPE	#	GRAIN CROPS	GRASSES & LEGUMES	WILD HERBACEOUS PLANTS	CONIFER PLANTS	SHRUBS	WETLAND PLANTS	SHALLOW WATER PLANTS	OPEN LAND	WOODLAND	WETLAND	RANGE
BLACKWELL	13	POOR	POOR	FAIR	—	FAIR	GOOD	GOOD	POOR	—	GOOD	FAIR
DRIGGS	29	POOR	POOR	GOOD	—	GOOD	POOR	VERY POOR	FAIR	—	VERY POOR	GOOD
NAZ	70	POOR	POOR	GOOD	—	GOOD	VERY POOR	VERY POOR	FAIR	—	VERY POOR	GOOD
PEDERSON	88	VERY POOR	VERY POOR	POOR	VERY POOR	POOR	VERY POOR	VERY POOR	VERY POOR	VERY POOR	VERY POOR	—
SHOFIELD	99	VERY POOR	VERY POOR	POOR	VERY POOR	POOR	VERY POOR	VERY POOR	VERY POOR	VERY POOR	VERY POOR	—
TRIEL	109	POOR	FAIR	GOOD	—	GOOD	VERY POOR	VERY POOR	FAIR	—	VERY POOR	GOOD

* SOURCE : SOIL SURVEY LARIMER COUNTY

EXHIBIT C

RECREATIONAL DEVELOPMENTS

SOIL NAME	*	CAMP AREAS	PICNIC AREAS	PLAY-GROUNDS	PATHS & TRAILS
BLACKWELL	13	SEVERE	SEVERE	SEVERE	SEVERE
DRIGGS	29	SEVERE	SEVERE	SEVERE	MODERATE
NAZ	70	SEVERE	SEVERE	SEVERE	MODERATE
REDFEATHER	88	SEVERE	SEVERE	SEVERE	SEVERE
SCHOFIELD	99	SEVERE	SEVERE	SEVERE	MODERATE
THIEL	109	SEVERE	SEVERE	SEVERE	MODERATE

* SOURCE: SOIL SURVEY OF LARIMER COUNTY

Colorado State Forest Service

Fort Collins District

Memorandum

TO: Mike Babler & Mike Hughes

FROM: Mike Harvey MH

DATE: October 11, 1995

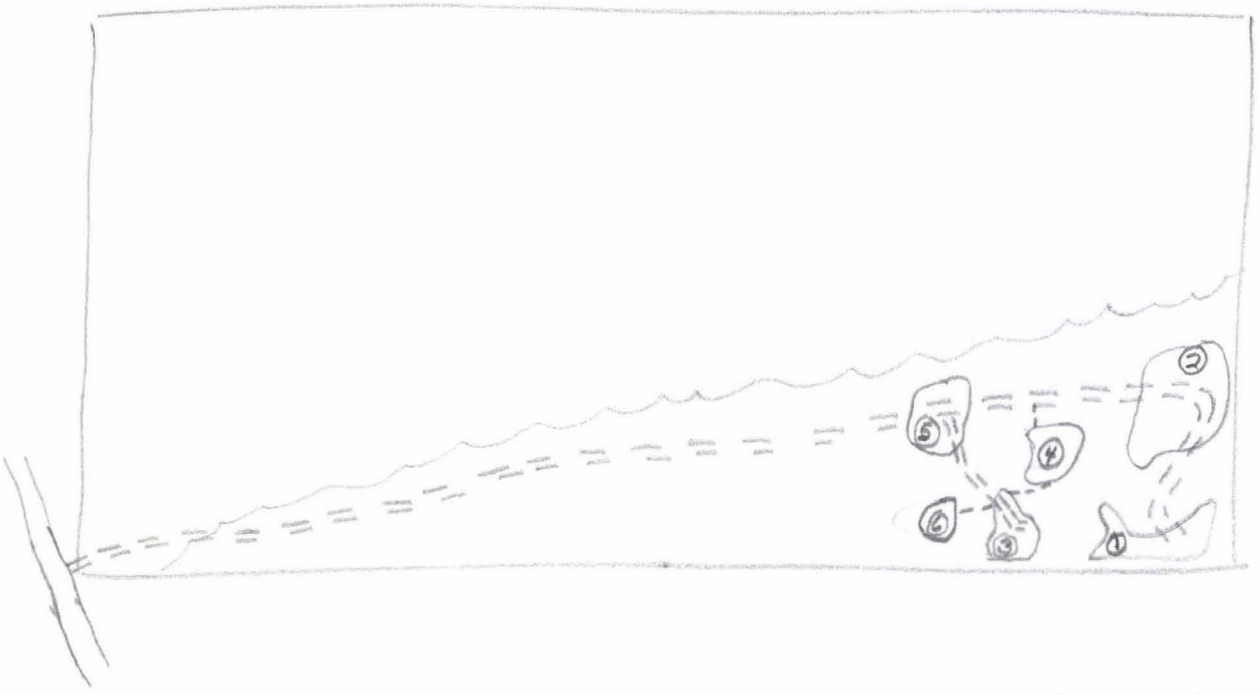
SUBJECT: State Land

Here are six traverses that I did on Pass Creek, and a sketch map indicating their relative position. I used a hand compas and pacing so a couple of the closures aren't that great, but they are plenty good for records. The numbers I assigned to the cutting units probably contridict the numbers on the map that Bill gave Ray, so keep that in mind. I suggest that you try to borrow a 1994 aerial photo to get the acreages of the remaining five or six units.

While I was at Pass Creek I noticed that two sections of the road are beginning to wash out. One area is a spur off the main road that goes through unit #5 and unit #3. The other area is on the main road above the switch back in unit #2.

PASS Creek

N



Not to scale. MH.

County Road ═══
Logging Road ═ ═ ═
Skid Trail - - -
Cutting unit

Colorado State
FOREST
SERVICE

Colorado State University
Fort Collins, Colorado 80523-5060
(970) 491-6303
FAX: (970) 491-7736

October 10, 1995

Kathy Porter
Colorado State Forest Service
Fort Collins District
Building 1052 Foothills Campus
Colorado State University
Fort Collins CO 80523-5075

Dear Kathy:

Many thanks for generosity of time in volunteering in the CSFS display during the 1995 State Fair. Thanks to you and other employees who gave so unselfishly, our presence at the Fair was, once more, a great success.

By the way, following the tradition of the 1993 CSFS display at the State Fair, the combined Natural Resources display took Best Commercial Exhibit of 1995. I'm in the position of knowing that this is due to the pivotal role we played.

Thank you so much, and congratulations!

Judy

Judy Serby
Conservation Education Division

TRAVERSE COMPUTATION AND ADJUSTMENT (COMPASS RULE)

FOR: PASS CREEK #1

COURSE	DEGREE (AZIMUTH)	LENGTH (FEET)	BALANCED LAT	BALANCED DEP	COORDINATE NORTH	COORDINATE EAST
1- 2	180.00	214.00	-212.698	-0.043	0.000	0.000
2- 3	325.00	125.00	103.154	-71.722	-212.698	-0.043
3- 4	305.00	120.00	69.559	-98.322	-109.544	-71.766
4- 5	286.00	59.00	16.622	-56.726	-39.985	-170.088
5- 6	171.00	181.00	-177.671	28.278	-23.363	-226.814
6- 7	270.00	122.00	0.742	-122.025	-201.034	-198.536
7- 8	22.00	92.00	85.861	34.445	-200.292	-320.561
8- 9	351.00	184.00	182.854	-28.821	-114.431	-286.116
9- 10	124.00	77.00	-42.589	63.820	68.423	-314.937
10- 11	72.00	135.00	42.538	128.365	25.833	-251.116
11- 12	50.00	172.00	111.606	131.725	68.372	-122.751
12- 13	181.00	110.00	-109.314	-1.942	179.977	8.974
13- 14	224.00	81.00	-57.774	-56.284	70.663	7.032
14- 1	105.00	51.00	-12.890	49.252	12.890	-49.252
		1723.00	-10.481	0.348		

CLOSURE = 10.486 FEET

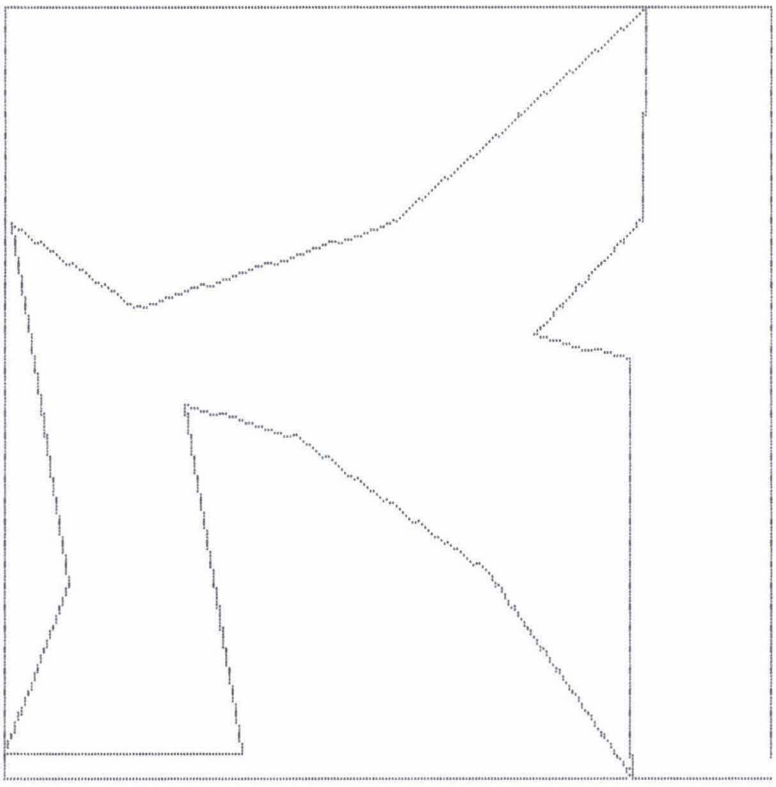
PRECISION = 1 IN 164 (0.6%)

CORRECTED AREA = 1.387 ACRES
60397.693 SQUARE FEET

UNCORRECTED AREA = 1.353 ACRES
58943.148 SQUARE FEET

CORRECTED MAP OUTPUT FOR: PASS CREEK #1

North



MAP SCALE: 1 : 1185
1 INCH = 98.77 FEET
1.50 CHAINS

TRAVERSE COMPUTATION AND ADJUSTMENT (COMPASS RULE)

FOR: PASS CREEK #2

COURSE	DEGREE (AZIMUTH)	LENGTH (FEET)	BALANCED LAT	BALANCED DEP	COORDINATE NORTH	COORDINATE EAST
1- 2	189.00	78.00	-77.076	-12.294	0.000	0.000
2- 3	265.00	98.00	-8.587	-97.743	-77.076	-12.294
3- 4	247.00	98.00	-38.337	-90.326	-85.663	-110.037
4- 5	202.00	160.00	-148.424	-60.127	-124.001	-200.363
5- 6	192.00	147.00	-143.856	-30.737	-272.425	-260.489
6- 7	320.00	113.00	86.510	-72.769	-416.282	-291.227
7- 8	20.00	115.00	108.011	39.196	-329.771	-363.995
8- 9	3.00	240.00	239.559	12.276	-221.761	-324.799
9- 10	48.00	273.00	182.545	202.555	17.798	-312.523
10- 11	357.00	131.00	130.759	-7.011	200.343	-109.967
11- 12	45.00	95.00	67.131	67.063	331.102	-116.978
12- 13	79.00	196.00	37.307	192.167	398.233	-49.916
13- 14	170.00	108.00	-106.410	18.626	435.540	142.251
14- 1	206.00	366.00	-329.130	-160.877	329.130	160.877
		2218.00	1.038	2.626		

CLOSURE = 2.824 FEET

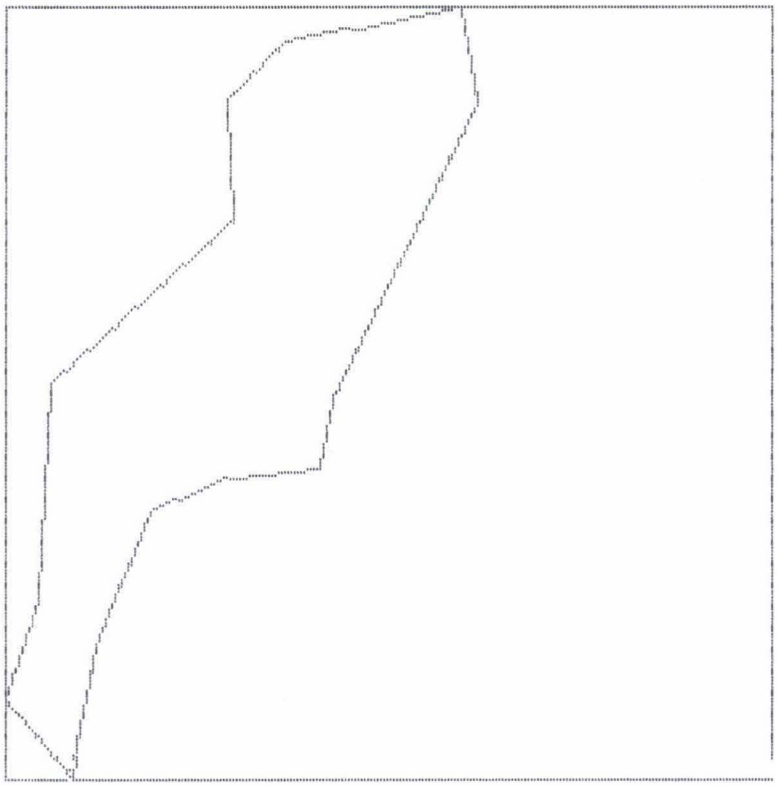
PRECISION = 1 IN 785 (0.1%)

CORRECTED AREA = 3.694 ACRES
160925.952 SQUARE FEET

UNCORRECTED AREA = 3.702 ACRES
161246.159 SQUARE FEET

CORRECTED MAP OUTPUT FOR: PASS CREEK #2

North



MAP SCALE: 1 : 2554
1 INCH = 212.82 FEET
3.22 CHAINS

TRAVERSE COMPUTATION AND ADJUSTMENT (COMPASS RULE)

FOR: PASS CREEK #3

COURSE	DEGREE (AZIMUTH)	LENGTH (FEET)	BALANCED LAT	BALANCED DEP	COORDINATE NORTH	COORDINATE EAST
1- 2	293.00	125.00	49.560	-115.549	0.000	0.000
2- 3	297.00	68.00	31.262	-60.853	49.560	-115.549
3- 4	182.00	142.00	-141.097	-5.507	80.822	-176.401
4- 5	123.00	108.00	-58.200	90.157	-60.275	-181.908
5- 6	141.00	54.00	-41.656	33.774	-118.476	-91.751
6- 7	181.00	50.00	-49.705	-1.067	-160.131	-57.978
7- 8	81.00	255.00	41.356	250.870	-209.836	-59.045
8- 9	335.00	208.00	189.707	-88.712	-168.480	191.826
9- 1	258.00	105.00	-21.227	-103.113	21.227	103.113
		1115.00	-6.408	4.330		

CLOSURE = 7.734 FEET

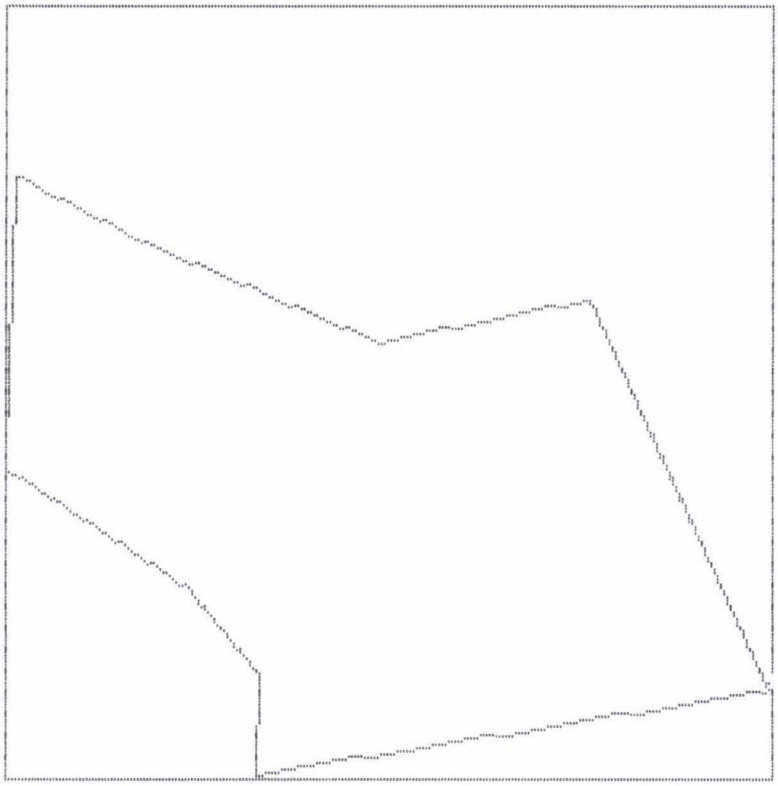
PRECISION = 1 IN 144 (0.7%)

CORRECTED AREA = 1.411 ACRES
61469.170 SQUARE FEET

UNCORRECTED AREA = 1.414 ACRES
61581.499 SQUARE FEET

CORRECTED MAP OUTPUT FOR: PASS CREEK #3

North



MAP SCALE: 1 : 1115
1 INCH = 92.89 FEET
1.41 CHAINS

TRAVERSE COMPUTATION AND ADJUSTMENT (COMPASS RULE)

FOR: PASS CREEK #4

COURSE	DEGREE (AZIMUTH)	LENGTH (FEET)	BALANCED LAT	BALANCED DEP	COORDINATE NORTH	COORDINATE EAST
1- 2	41.00	64.00	48.415	41.185	0.000	0.000
2- 3	350.00	115.00	113.457	-21.412	48.415	41.185
3- 4	360.00	154.00	154.274	-1.932	161.873	19.773
4- 5	333.00	64.00	57.138	-29.858	316.146	17.842
5- 6	255.00	127.00	-32.644	-124.265	373.284	-12.016
6- 7	172.00	154.00	-152.228	19.501	340.640	-136.282
7- 8	176.00	110.00	-109.537	6.294	188.413	-116.781
8- 9	140.00	110.00	-84.069	69.327	78.876	-110.487
9- 1	83.00	42.00	5.193	41.160	-5.193	-41.160
		940.00	-1.671	11.790		

CLOSURE = 11.908 FEET

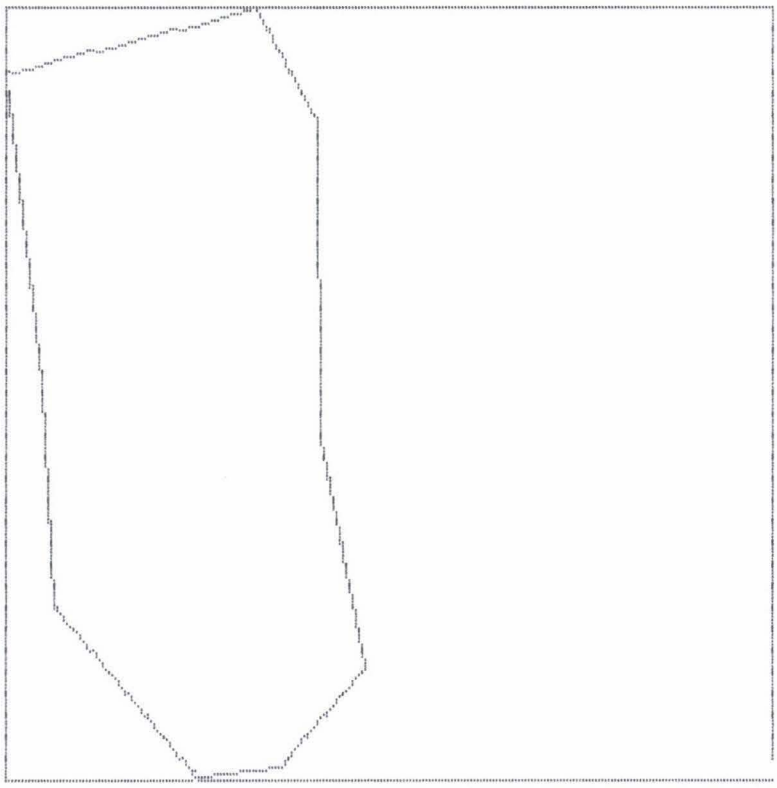
PRECISION = 1 IN 79 (1.3%)

CORRECTED AREA = 1.100 ACRES
47919.711 SQUARE FEET

UNCORRECTED AREA = 1.058 ACRES
46092.620 SQUARE FEET

CORRECTED MAP OUTPUT FOR: PASS CREEK #4

North



MAP SCALE: 1 : 1143
1 INCH = 95.27 FEET
1.44 CHAINS

TRAVERSE COMPUTATION AND ADJUSTMENT (COMPASS RULE)

FOR: PASS CREEK UNIT #5

COURSE	DEGREE (AZIMUTH)	LENGTH (FEET)	BALANCED LAT	BALANCED DEP	COORDINATE NORTH	COORDINATE EAST
1- 2	258.00	110.00	-22.590	-107.409	0.000	0.000
2- 3	265.00	103.00	-8.715	-102.432	-22.590	-107.409
3- 4	164.00	118.00	-113.129	32.726	-31.305	-209.841
4- 5	125.00	103.00	-58.816	84.548	-144.434	-177.115
5- 6	78.00	150.00	31.568	146.978	-203.251	-92.567
6- 7	57.00	47.00	25.718	39.498	-171.682	54.411
7- 8	303.00	74.00	40.492	-61.935	-145.965	93.909
8- 1	343.00	110.00	105.473	-31.973	-105.473	31.973
		815.00	-2.073	-1.389		

CLOSURE = 2.495 FEET

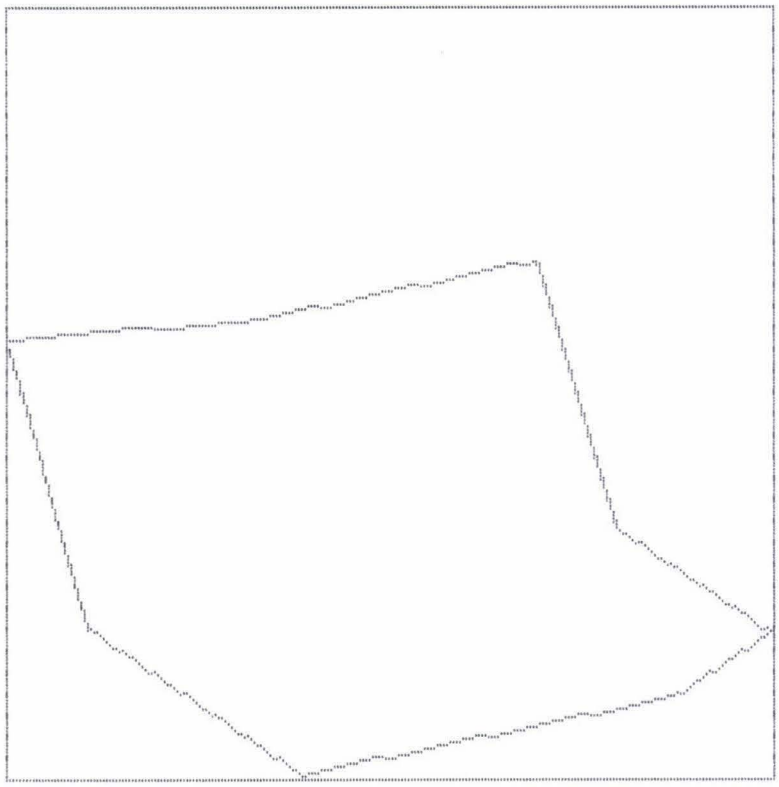
PRECISION = 1 IN 327 (0.3%)

CORRECTED AREA = 0.871 ACRES
37954.123 SQUARE FEET

UNCORRECTED AREA = 0.869 ACRES
37849.109 SQUARE FEET

CORRECTED MAP OUTPUT FOR: PASS CREEK UNIT #5

North



MAP SCALE: 1 : 913
1 INCH = 76.10 FEET
1.15 CHAINS

TRAVERSE COMPUTATION AND ADJUSTMENT (COMPASS RULE)

FOR: PASS CREEK UNIT 6

COURSE	DEGREE (AZIMUTH)	LENGTH (FEET)	BALANCED LAT	BALANCED DEP	COORDINATE NORTH	COORDINATE EAST
1- 2	299.00	88.00	43.399	-75.365	0.000	0.000
2- 3	315.00	64.00	45.790	-44.090	43.399	-75.365
3- 4	250.00	56.00	-18.685	-51.604	89.190	-119.456
4- 5	274.00	59.00	4.609	-57.783	70.505	-171.060
5- 6	204.00	54.00	-48.880	-20.981	75.114	-228.843
6- 7	228.00	54.00	-35.681	-39.147	26.234	-249.824
7- 8	164.00	69.00	-65.750	20.274	-9.447	-288.971
8- 9	184.00	98.00	-96.942	-5.053	-75.197	-268.697
9- 10	75.00	115.00	30.726	113.174	-172.138	-273.750
10- 11	67.00	91.00	36.318	85.422	-141.412	-160.576
11- 1	35.00	127.00	105.095	75.155	-105.095	-75.155
		875.00	-7.319	-15.920		

CLOSURE = 17.522 FEET

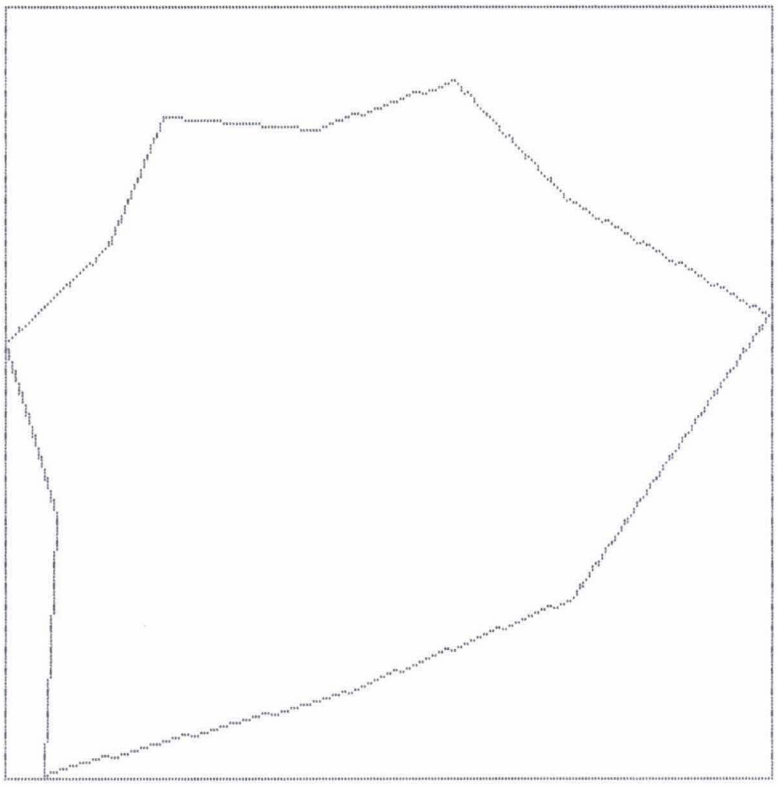
PRECISION = 1 IN 50 (2.0%)

CORRECTED AREA = 1.073 ACRES
46731.419 SQUARE FEET

UNCORRECTED AREA = 1.072 ACRES
46710.713 SQUARE FEET

CORRECTED MAP OUTPUT FOR: PASS CREEK UNIT 6

North



MAP SCALE: 1 : 877
1 INCH = 73.10 FEET
1.11 CHAINS

Colorado State Forest Service

Fort Collins District

Memorandum

TO: Mike Babler & Mike Hughes

FROM: Mike Harvey

DATE: November 13, 1995

SUBJECT: State Land

Here are six traverses that I did on Pass Creek, and a sketch map indicating their relative position. I used a hand compas and pacing so a couple of the closures aren't that great, but they are plenty good for records. The numbers I assigned to the cutting units probably contridict the numbers on the map that Bill gave Ray, so keep that in mind. I suggest that you try to borrow a 1994 aerial photo to get the acreages of the remaining five or six units.

While I was at Pass Creek I noticed that two sections of the road are beginning to wash out. One area is a spur off the main road that goes through unit #5 and unit #3. The other area is on the main road above the switch back in unit #2.

A few other state land issues that I noticed on the district are:

-could not find plan for Crystal Mountain
-erosion of a haul road in an old cutover area on Crystal Mountain
-time to do some precommercial thinning on Crystal Mountain
-no reference in the Trail Creek plan to harvesting Christmas trees
-no designation of take or leave trees in Christmas tree sales
-pile burning on Trail Creek

I left one loose end on state land that I can think of. Don Hass with the M.S. Society asked if we would sell them 100 Christmas trees on Crystal Mountain. He told me that Ray has done this in the past. He also said Ray was charging $4 or $5 per tree, which I think is too low. I told him I thought we probably could (I did not commit to any price), but that I wanted to look at the section first. I think we could go ahead with this in 1995, but I would suggest a more controlled tree selection procedure in the future, but of course that will be your decision. Don's home number is 669-3032, office is 667-3083.