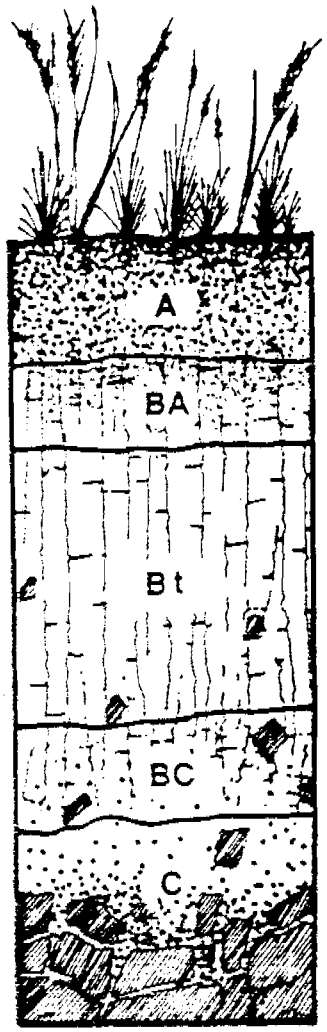
MS82-16



Soil Characterization Laboratory Data

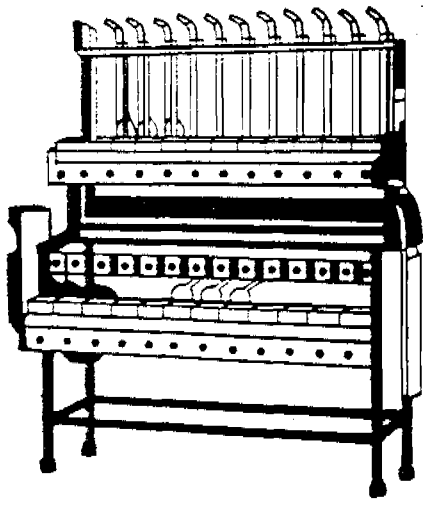
KOOTENAI NATIONAL FOREST

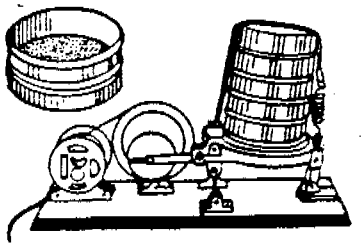
Lou Kuennen

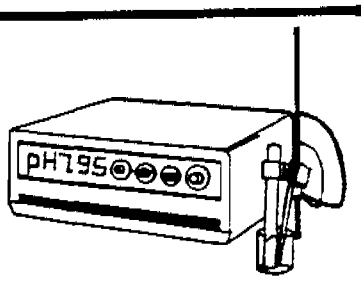
November 1986

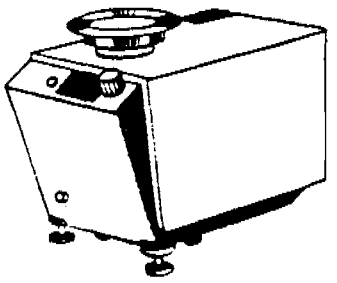
Plant, Soil & Entomological Sciences

University of Idaho
College of Agriculture









When you know	Multiply by	To find
in	2.5	cm
mi	1.6	km
oz	28.0	g
lb	0.45	kg
qt	0.95	l
gal	3.8	l
^{o}F	5/9 (after subtracting 32)	C^{o}

SOIL CHARACTERIZATION LABORATORY DATA

for

Kootenai National Forest

MS82-16

Prepared by

A. L. Falen and M. A. Fosberg

University of Idaho

College of Agriculture

Plant, Soil, & Entomological Sciences

November 1986

Preface

This publication contains characterization data including soil descriptions, chemical and physical laboratory data. These data will be useful in support of the USDA-Forest Service, mapping, classification, and for many other types of interpretations in research and land-use planning.

The field samples were collected by Lou Kuennen, Marci Gerhardt and other forest service personnel of the Kootenai National Forest. The field nomenclature and laboratory methods represent those in effect at the time work was done. The classification done at the time of sampling was placed on the written descriptions. The laboratory procedures are contained in "Soil Characterization Laboratory Procedures" (Miscellaneous Publication 81, College of Agriculture, University of Idaho).

This publication represents a cooperative arrangement with the USDA-Forest Service and the University of Idaho. A tremendous amount of work by soil scientists of the forest service and technicians of the University of Idaho made it possible to obtain these data.

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85-MT-27118

USDA - FOREST SERVICE Marci' Masters **SOIL DESCRIPTION** frigid

1. SOIL SER. TYPE, PHASE	MAP SYMBOL	CLASSIFICATION	MODA. OR INTEGRADE TO	DATE	BY	PHO. NO.	STOP NO.
			Andic Dystrochrept loamy skeletal mixed	5/30/85	MNG		

2. AREA	FOREST	RANGER DISTRICT	STATE	COUNTY	LOCATION SEC. T. R.
Basin Cr Unit 7	Kootenai	Yaak	MT	Lincoln	

3. PARENT ROCK	FORMATION NAME	MINERALS	TEXTURE	FAULTING	WEATHERING	SURFACE STONE AND ROCK %
dirty limestone	Piegan Siyeh					

4. LANDFORM	SLOPE	SINGLE	COMPLEX	ASPECT	ELEVATION	EROSION	GULLIES	ALKALI	SALINES
mid sideslope		✓		WNW	4250				

5. CLIMATIC ZONE (veg.)	PRECIP. Inches	AV. TEMP. °F	LITTER TYPE	INFILTRATION	PERCOLATION	STORAGE	DRAINAGE CLASS	WATER TABLE (Ft.)
Thpl / Clun								

6. HORIZON	DEPTH Cm / In	COLOR Dry, Moist, Crushed	Mottling	TEXTURE	STRUCTURE	CONSISTENCE Dry, Moist Wet, Cem.	SPECIAL FEATURES: Clay Films	Stone Rock % Vol.	Roots	Pores	X	REACTION (pH)	BOUNDARY	PERCOLATION CLASS
O1 & O2	2.5-0 1-0													
*A2 (A1)	0-3 0-1½	7.5YR 6/2M 10YR 2/1 char coal		g sil	1fgr	ss op vfr so	—	20 gr+co subr	3vf+f 2m 1co			5.0	cw	rapid
B21	3-13 1.5-5	7.5YR 4/4 M		g sil	1fdmgr	ss op vfr so	—	25 gr+co subr.	2vf+f 3m 2co			6.0	gr	rapid
B22	13-28 5-11	10YR 4/6 M		g sil 1fdmsbk	1fdmsbk	ss op fr so	—	30 co+gr subr.	2f 2m 1co			5.5	as	mod. rapid
IIA21	28-49 11-19.5	2.5Y 7/4 M		vg sil-vfsl	m	ss sp fi h	—	45 subr. gr+co	1f	Vesic		5.5	gw	mid. slow
IIA22	49-72 19.5-28	2.5Y 6/4M		vg sil-vfsl	m	ss sp fi vh	—	60 subr. gr, co, st	1f	4 qr		5.5	cw	mod. slow - slow
IIB2	72-106 28-42	2.5Y 7/4M 30% 2.5Y 5/4M 70%		vg sil-sicl	m	s p fi h		60-70 rounded co+st				6.0		mod. slow

2500-1 (REV. 4/61)

7. SOIL SERIES, TYPE PHASE	MAP SYMBOL	SLOPE %	ASPECT	ELEVATION Ft.	DATE	BY	PHOTO NO.	STOP NO.

8. AREA	FOREST	RANGER DISTRICT	STATE	COUNTY	LOCATION SEC. T. R.

9. (Species) TREES	(Amount)	(Species) SHRUBS	(Amount)	(Species) FORBS	(Amount)	(Species) GRASSES	(Amount)
Labc		Mefe Bere		Vior		Caru	
Abla		Pamy		Asco			
Pien		Chum		Clun			
Pico		Coca		Arco			
Thpl		Rias					
Tshe		Vasc					
		Lout					
		Alsi					
		Spbe					
		Shca					
10.	100%	Libo	100%		100%		100%

11. SUITABILITY ESTIMATE FOR ↓	TENTATIVE CLASSES I	II	III	IV	V	12. MEASURED INTERPRETATIVE DATA
a. Erosion Hazard						
b. Range						
c. Timber						
d. Water Storage						
e.						
f.						
g.						
h.						
i.						

GPO 909746

Unnamed Gravelly Silt Loam 85-MT-27118

Classification: loamy-skeletal, mixed, frigid Andic Dystrochrept

General Site Characteristics

Location: Lincoln County, Montana; southeast 1/4, northwest 1/4 of section 10, T. 37N., R. 30W.
Forest: Kootenai National Forest
Area: Basin Creek, Yaak Ranger District
Described by/Date: Lou Kuennen and Marci Gerhardt on May 30, 1985
Parent material: ash over glacial till
Habitat type: Thpl/Clun; Laoc, Abla, Pien, Pico, Thpl, Tshe, Mefe, Pamy, Chum, Coca, Pyas, Vasc, Lout, Alsi, Spbe, Shca, Libo, Bere, Vior, Asco, Clun, Arco, Caru
Topography: mid sideslope
Landform: Piegan, Siyeh
Climate:
Erosion:
Aspect: W Northwest
Elevation: 4250 feet
Drainage:
Stoniness:
Slope: 25 percent
Infiltration:
Permeability:
Soil temp. at 50 cm:
Salt or alkali:

Remarks:

Pedon Description

01/02 2.5-0 centimeters. Duff.

A1/A2 0-3 centimeters. Gravelly silt loam, pinkish gray (7.5YR 6/2) moist; black (10YR 2/1) moist, charcoal; weak fine granular structure; soft, very friable, slightly sticky and nonplastic; 20 percent gravels by volume; many very fine and fine, common medium, few coarse roots; very strongly acid pH 5.0; rapid percolation; clear wavy boundary.

B21 3-13 centimeters. Gravelly silt loam, brown to dark brown (7.5YR 4/4) moist; weak fine and medium

granular structure; soft, very friable, slightly sticky and nonplastic; 25 percent gravels by volume; common very fine and fine, many medium, few coarse roots; moderately acid pH 6.0; rapid percolation; gradual irregular boundary.

B22 13-28 centimeters. Gravelly silt loam, dark yellowish brown (10YR 4/6) moist; weak fine and medium subangular blocky structure; soft, friable, slightly sticky and nonplastic; 30 percent gravels by volume; common fine and medium, few coarse roots; strongly acid pH 5.5; moderately rapid percolation; abrupt smooth boundary.

IIA21 28-49 cemtimeters. Very gravelly silt loam to very fine sandy loam, pale yellow (2.5Y 7/4) moist; massive structure; firm, hard, slightly sticky and slightly plastic; 45 percent gravels by volume; few fine roots; strongly acid pH 5.5; moderately slow percolation; gradual wavy boundary.

IIA22 49-72 centimeters. Very gravelly silt loam to very fine sandy loam, light yellowish brown (2.5Y 6/4) moist; massive structure; firm, hard, slightly sticky and slightly plastic; 60 percent gravels by volume; few fine roots; strongly acid pH 5.5; moderately slow to slow percolation; clear wavy boundary.

IIB2 72-108 centimeters. Very gravely silt loam to silty clay loam, pale yellow (2.5Y 7/4) and light olive brown (2.5Y 5/4) moist; massive structure; firm, hard, sticky and plastic; 60-70 percent gravels by volume; moderately acid pH 6.0; moderately slow percolation.

Pedon: Unnamed Silt Loam B5-MT-27118 (Basin Creek) Date: August 1985

Sample No.	Horizon	Depth	pH paste	EC*10^3	% Water at Saturation	Available P	Sesquioxides				Spodic
							Di-Citrate Extract		Pyrophosphate Extract		
							Fe	Al	Fe	Al	
		cm		mmhos/cm		ppm	%				
	O1/O2	2.5- 0	NS	NS	NS	NS					
1	A2/A1	0- 3	4.29	0.56	147.2	7.0					
2	B21	3- 13	5.78	0.16	75.1	1.9					
3	B22	13- 28	5.85	0.20	58.7	1.7					
4	IIA21	28- 49	5.53	0.22	28.0	1.1					
5	IIA22	49- 72	5.69	0.20	27.4	1.0					
6	IIB2	72-106	5.77	0.14	32.2	1.3					

Sample No.	Exchangeable Ions				Ext. Acidity	CEC	Base	OM	OC	N	C:N	Soil	
	Ca	Mg	Na	K	H		Saturation					Fraction	NaF pH
	meq/100 gms						%	%			ratio		
	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
1	7.72	2.48	0.22	1.19	27.87	41.2	29.41	28.69	16.68	0.445	37.5	0.83	7.30
2	1.93	0.59	0.10	0.39	19.26	20.2	13.52	3.94	2.29	0.115	19.9	0.76	10.42
3	1.71	0.44	0.10	0.27	14.22	13.9	14.88	2.64	1.54	0.088	17.5	0.53	10.11
4	2.57	0.55	0.06	0.04	0.69	4.1	82.35	0.31	0.18	0.010	18.0	0.61	7.82
5	2.41	0.54	0.07	0.03	0.35	3.7	89.71	0.19	0.11	0.009	12.2	0.61	7.72
6	3.56	1.04	0.04	0.14	1.06	5.8	81.85	0.22	0.13	0.010	13.0	0.47	7.90

Remarks: Cations were leached with pH 7.0 ammonium acetate (1N)
CEC's were leached with 10% acidified NaCl.
CEC's were run on a Technicon Autoanalyzer.
B.S.P. = sum of the cations/sum of the cations plus H+.

Analysis by: Mike Fritts

Pedon: Unnamed Silt Loam 85-MT-27118 (Basin Creek) Date: July 1985

	Particle Size Distribution (mm)								Gravel & Stone		
Depth	VCS	CS	MS	FS	VFS	TS	TSi	TC	>2 mm		Textural
	2-1.0	1-0.5	0.5-0.25	0.25-0.1	0.1-0.05	2-0.05	0.05-0.002	<0.002	wt.	vol.	Classes
cm	----------	----------	----------	----------	----------	----------	----------	----------	-------	-------	-------
						%				%	
2.5- 0	NS	NS	NS	NS	NS	NS	NS	NS	NS		NS
0- 3	3.14	3.04	1.78	4.46	8.47	20.88	72.29	6.83	17		Silt loam
3- 13	3.13	3.52	1.94	3.59	11.14	23.32	71.87	4.81	24		Silt loam
13- 28	3.45	5.11	2.55	4.30	9.67	25.09	69.94	4.97	47		Gr. Silt loam
28- 49	2.92	3.34	1.72	3.72	8.15	19.85	76.47	3.68	39		Gr. silt loam
49- 72	2.89	3.83	1.97	3.48	7.21	19.36	77.05	3.58	39		Gr. silt loam
72-106	3.92	4.08	2.15	3.95	7.02	21.12	70.38	8.50	53		V. gr. silt loam

	Silt Size Distribution (mm)					Water Content		Liquid	Plastic	Plastic
Depth	CoSi	MSi	FSi	Bulk Density		1/3	15	Limit	Limit	Index
	0.05-0.02	0.02-0.005	0.005-0.002	Clod	Core	Bar	Bar			
cm	----------	% ----------		------	g/cc ------	------	% ------	----------	% ----------	
2.5- 0										
0- 3										
3- 13										
13- 28										
28- 49										
49- 72										
72-106										

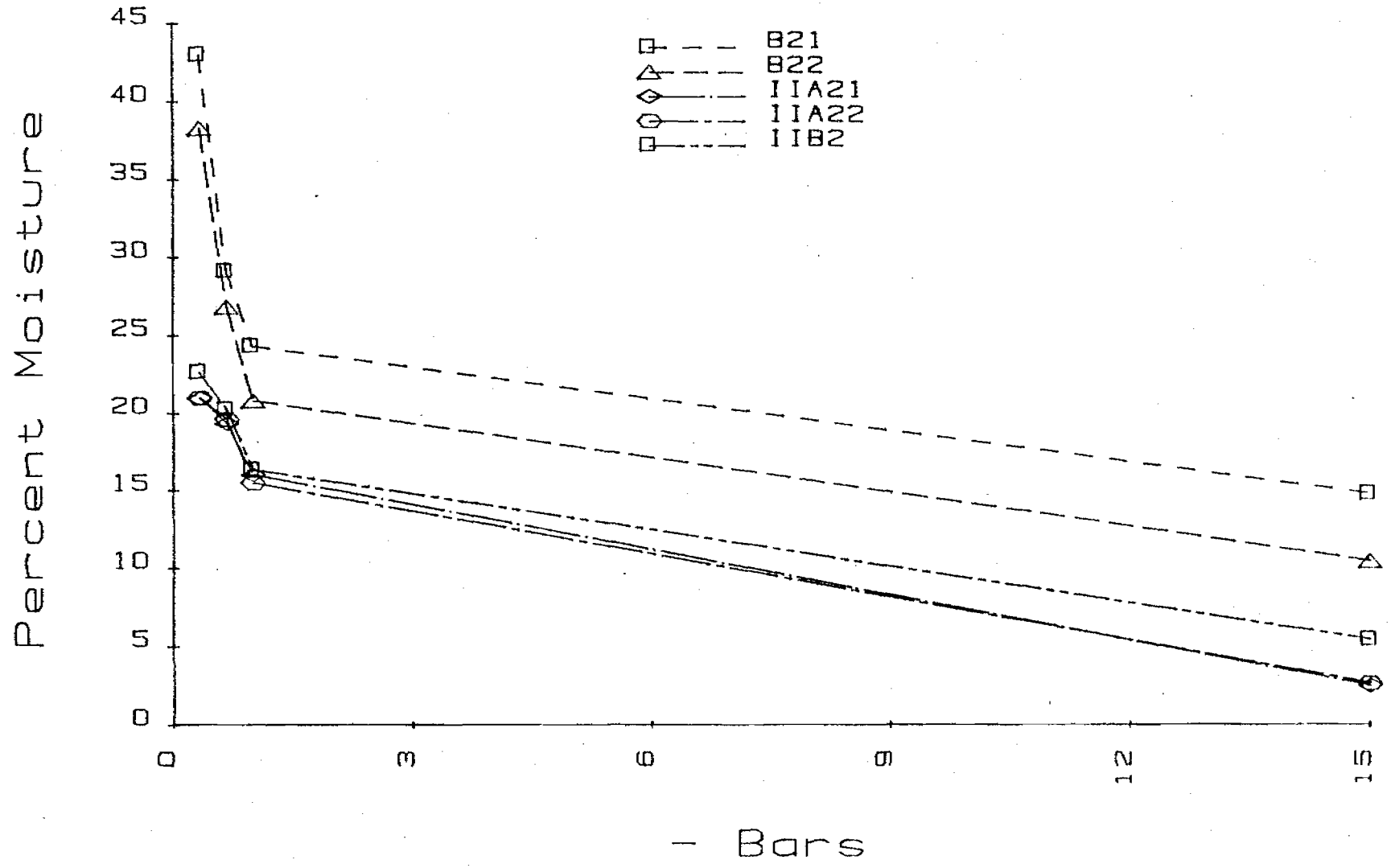
Remarks: Samples were run by the centrifuge method.
NS - no sample

Analysis by: Anita L. Falen

WATER RETENTION SUMMARY

Identification Marci Gerhardt
Analysis By Anita L. Falen
Date July 1985

Code Number	[1/3] Bar	[2/3] Bar	[1] Bar	[15] Bar	[ ] Bar
85-MT-27118 (Basin Creek)					
A2/A1	65.83	IS	IS	24.78	
B21	42.95	29.05	24.28	14.79	
B22	38.25	26.77	20.78	10.45	
II A21	20.95	19.31	15.99	2.48	
II A22	20.97	19.58	15.46	2.64	
II B2	22.62	20.20	16.31	5.43	


Percent Moisture
45
40
35
30
25
20
15
10
5
0
0
3
6
9
12
15
- Bars
B21
B22
IIA21
IIA22
IIB2

85-MT-27119

USDA - FOREST SERVICE

SOIL DESCRIPTION

1. SOIL SERIES, TYPE, PHASE	MAP SYMBOL	CLASSIFICATION	MODAL OR INTEGRADE TO	DATE	BY	PHO. NO.	STOP NO.
	352		Andic Dystrochrept loamy skeletal mixed, frigid	5/23/85	MG JWS		

2. AREA	FOREST	RANGER DISTRICT	STATE	COUNTY	LOCATION
Cool Creek	Kootenai	Sylvanite	Mt.	Lincoln	SEC. SE NW 8 T. 35N R. 33W

3. PARENT ROCK	FORMATION NAME	MINERALS	TEXTURE	FAULTING	WEATHERING	SURFACE STONE AND ROCK
	Ravalli Prichard					%

4. LANDFORM	SLOPE	SINGLE	COMPLEX	ASPECT	ELEVATION	EROSION	GULLIES	ALKALI	SALINES
sideslope	8%			NE 28°	3760'				

5. CLIMATIC ZONE (veg.)	PRECIP.	AV. TEMP.	LITTER TYPE	INFILTRATION	PERCOLATION	STORAGE	DRAINAGE CLASS	WATER TABLE (Ft.)
Thpl / Clun	Inches	20" 46.5 °F						

6. HORIZON	DEPTH cm / in	COLOR (Dry, Moist, Crushed)	Mottling	TEXTURE	STRUCTURE	CONSISTENCE Dry, Moist, Wet, Cem.	Clay Films	Stone Rock % Vol.	Roots	Pores		REACTION (pH)	BOUNDARY	PERCOLATION CLASS
A1 A2	0-2.5 / 0-1	10YR 5/2	charcoal mixed in with mineral soil	sil	1 fgr	NS op SO fr		< 5% gravels	3vf+f 2M			5.5	AW	v rap
E21 ash	2.5-12 / 1-5	5YR 4/6		sil	1 fgr	NS op SO fr		< 5% gravels	1vf+f 2M			6.0	CW	v rap
E22 ash	12-20 / 5-8	10YR 4/6		sil	1 f+m sbk	NS op SO fr		< 5% gravels	1vf+f 2M			6.0	CW	v rap
E23 ash	20-28 / 8-10	10YR 3/6		gr sil	1 f+m sbk	SS op SO fr		15-25% gravels	2f 1M			6.0	AS	v rap
IIA2	28-51 / 10-19	2.5yr 6/2		vgr csil → vfsl	OM	SS op eh fi		50% gravels + cobbles	1ff+fc			5.7	C IRR	slow
IIC	51-93 / 18-37	2.5yr 5/2 matrix; 2.5yr 6/3 broken bands		vfsl egr	OM	SS op eh fi		gravels + cobbles 60-70%				6.0		slow

A1+A2 is ½" charcoal layer under duff → ½" Mt St Helens T

IIC has orange → yellow broken bands running horizontally through till

Soil unusually dry + extremely compacted till (naturally)

-6-

7. SOIL SERIES, TYPE PHASE	MAP SYMBOL	SLOPE %	ASPECT	ELEVATION Ft.	DATE	BY	PHOTO NO.	STOP NO.

8. AREA	FOREST	RANGER DISTRICT	STATE	COUNTY	LOCATION SEC. T. R.

9. (Species) TREES	(Amount)	(Species) SHRUBS	(Amount)	(Species) FORBS	(Amount)	(Species) GRASSES	(Amount)
Abgr				Chun		Caru	
Lael		Vasc		Hiracium			
Thpl		Vagl					
Abla		Chum					
WWP		Bere					
LPP		Pamy					
Psme		Spbe					
		Lont					
		Libo					
		Alsi					
10.	100%		100%		100%		100%

11. SUITABILITY ESTIMATE FOR ↓	TENTATIVE CLASSES I	II	III	IV	V	12. MEASURED INTERPRETATIVE DATA
a. Erosion Hazard						
b. Range						
c. Timber						
d. Water Storage						
e.						
f.						
g.						
h.						
i.						

GPO 909746

Unnamed Silt Loam 85-MT-27119

Classification: loamy-skeletal, mixed frigid Andic Dystrochrept

General Site Characteristics

Location: Lincoln County, Montana; southeast 1/4, northwest 1/4 of section 8, T. 35N., R. 32W.
Forest: Kootenai National Forest
Area: Cool Creek, Sylvanite Ranger District
Described by/Date: Marci Gerhardt on May 29, 1985
Parent material: ash over glacial till
Habitat type: Thpl/Clun; Abgr, Lao, Thpl, Abla, Wwp, Lpp, Psme, Vaso, Vagl, Chum, Bere, Pamy, Spbe, Lout, Libo, Alsi, Clun, Hiracium, Caru
Topography: sideslope
Landform: Ravalli, Prichard
Climate:
Erosion: Slope: 8 percent
Aspect: N. Northeast 28 deg. Infiltration:
Elevation: 3760 feet Permeability:
Drainage: Soil temp. at 50 cm: 46.5 deg. F
Stoniness: Salt or alkali:

Remarks: Soil is usually dry and extremely compacted till (naturally). A1/A2 has 1/2" charcoal layer under duff. A 1/2" layer of Mt. St. Helen's T. The IIC has orange to yellow broken bands running horizonatally through the till.

Pedon Description

O1/O2 5-0 centimeters. Duff.

A1/A2 0-2.5 centimeters. Grayish brown (10YR 5/2) silt loam; charcoal mixed with shallow A2; weak fine granular structure; soft, friable, nonsticky and nonplastic; less than 5 percent gravels by volume; many very fine and fine, common medium roots; strongly acid pH 5.5; very rapid percolation; abrupt wavy boundary.

B21 2.5-12 centimeters. Yellowish red (5YR 4/6) silt loam; weak fine granular structure; soft, friable, nonsticky and nonplastic; less than 5 percent gravels by volume; few very fine and fine, common medium roots; moderately acid pH 6.0; very rapid percolation; clear wavy boundary.

B22 12-20 centimeters. Dark yellowish brown (10YR 4/6) silt loam; weak fine and medium subangular blocky structure; soft, friable, nonsticky and nonplastic; less than 5 percent gravels by volume; few very fine and fine, common medium roots; moderately acid pH 6.0; very rapid percolation; clear wavy boundary.

B23 20-28 centimeters. Dark yellowish brown (10YR 3/6) gravelly silt loam; weak fine and medium subangular blocky structure; soft, friable, slightly sticky and nonplastic; 15-25 percent gravels by volume; common fine and few medium roots; moderately acid pH 6.0; very rapid percolation; abrupt smooth boundary.

IIA2 28-51 centimeters. Pale red (2.5YR 6/2) very gravelly coarse silt loam to very fine sandy loam; massive structure; extremely hard, firm, slightly sticky and nonplastic; 50 percent gravels and cobbles by volume; few very fine, fine and coarse roots; moderately acid pH 5.7; slow percolation; clear irregular boundary.

IIC 51-93 centimeters. Weak red (2.5YR 6/2) matrix and pale red to light reddish brown (2.5YR 6/3) broken bands, extremely gravelly very fine sandy loam; massive structure; extremely hard, firm, slightly sticky and nonplastic; 60-70 percent gravels and cobbles by volume; moderately acid pH 6.0; slow percolation.

Pedon: Unnamed Silt Loam 85-MT-27119 (Cool Creek) Date: August 1985

Sample No.	Horizon	Depth	pH paste	EC*10^3	% Water at Saturation	Available P	Sesquioxides: Di-Citrate Extract Fe	Sesquioxides: Di-Citrate Extract Al	Sesquioxides: Pyrophosphate Extract Fe	Sesquioxides: Pyrophosphate Extract Al	Spodic
		cm		mmhos/cm		ppm	%				
	O1/O2	5- 0	NS	NS	NS	NS					
1	A1&A2	0-2.5	4.74	0.28	143.9	3.0					
2	B21	2.5- 12	5.83	0.16	71.7	2.6					
3	B22	12- 20	5.74	0.22	68.5	4.0					
4	B23	20- 28	5.62	0.26	39.7	2.1					
5	IIA2	28- 51	5.38	0.16	27.1	0.7					
6	IIC	51- 93	5.23	0.15	29.6	0.7					

Sample No.	Exchangeable Ions: Ca	Mg	Na	K	Ext. Acidity: H	CEC	Base Saturation	OM	OC	N	C:N	Soil Fraction	NaF pH
	meq/100 gms						%	%			ratio		
	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS	NS
1	10.49	13.45	0.25	0.62	34.11	54.0	30.27	27.15	15.79	0.390	40.5	1.00	7.05
2	2.58	0.90	0.18	0.48	19.20	20.8	17.74	3.35	1.95	0.119	16.4	0.79	10.37
3	3.81	1.51	0.21	0.71	16.48	23.3	27.46	3.44	2.00	0.119	16.8	0.74	9.62
4	2.34	1.02	0.14	0.40	6.80	9.6	36.45	1.38	0.80	0.056	14.3	0.63	9.05
5	1.14	0.47	0.02	0.11	1.53	3.6	53.21	0.31	0.18	0.024	7.5	0.63	8.02
6	1.35	0.58	0.08	0.13	1.98	4.7	51.94	0.32	0.18	0.030	6.0	0.64	7.76

Remarks: Cations were leached with pH 7.0 ammonium acetate (1N).
CEC's were leached with 10% acidified NaCl.
CEC's were run on a Technicon Autoanalyzer.
B.S.P. = sum of the cations/sum of the cations plus H+.

Analysis by: Mike Fritts

Pedon: Unnamed Silt Loam 85-MT-27119 (Cool Creek) Date: July 1985

	Particle Size Distribution (mm)								Gravel & Stone		
Depth	VCS	CS	MS	FS	VFS	TS	TSi	TC	>2 mm		Textural
	2-1.0	1-0.5	0.5-0.25	0.25-0.1	0.1-0.05	2-0.05	0.05-0.002	<0.002	wt.	vol.	Classes
cm	%								%		
5- 0	NS	NS	NS	NS	NS	NS	NS	NS	NS		NS
0-2.5	2.25	2.78	1.77	5.18	10.80	22.78	67.52	9.70	tr.		Silt loam
2.5- 12	0.60	0.83	0.54	2.95	10.67	15.59	71.58	12.82	21		Silt loam
12- 20	0.72	1.35	0.90	2.82	7.49	13.29	61.09	25.62	26		Gr. silt loam
20- 28	3.05	4.16	2.05	6.91	9.30	25.47	63.31	11.22	37		Gr. silt loam
28-51	0.73	2.04	1.75	4.84	14.27	23.62	73.49	2.90	37		Gr. silt loam
51- 93	0.26	0.53	0.70	3.66	13.97	19.13	78.38	2.50	36		Gr. silt loam

	Silt Size Distribution (mm)			Bulk Density		Water Content		Liquid	Plastic	Plastic
Depth	CoSi	Msi	Fsi	Clod	Core	1/3	15	Limit	Limit	Index
	0.05-0.02	0.02-0.005	0.005-0.002			Bar	Bar			
cm	%			g/cc		%		%		
5- 0										
0-2.5										
2.5- 12										
12- 20										
20- 28										
28- 51										
51- 93										

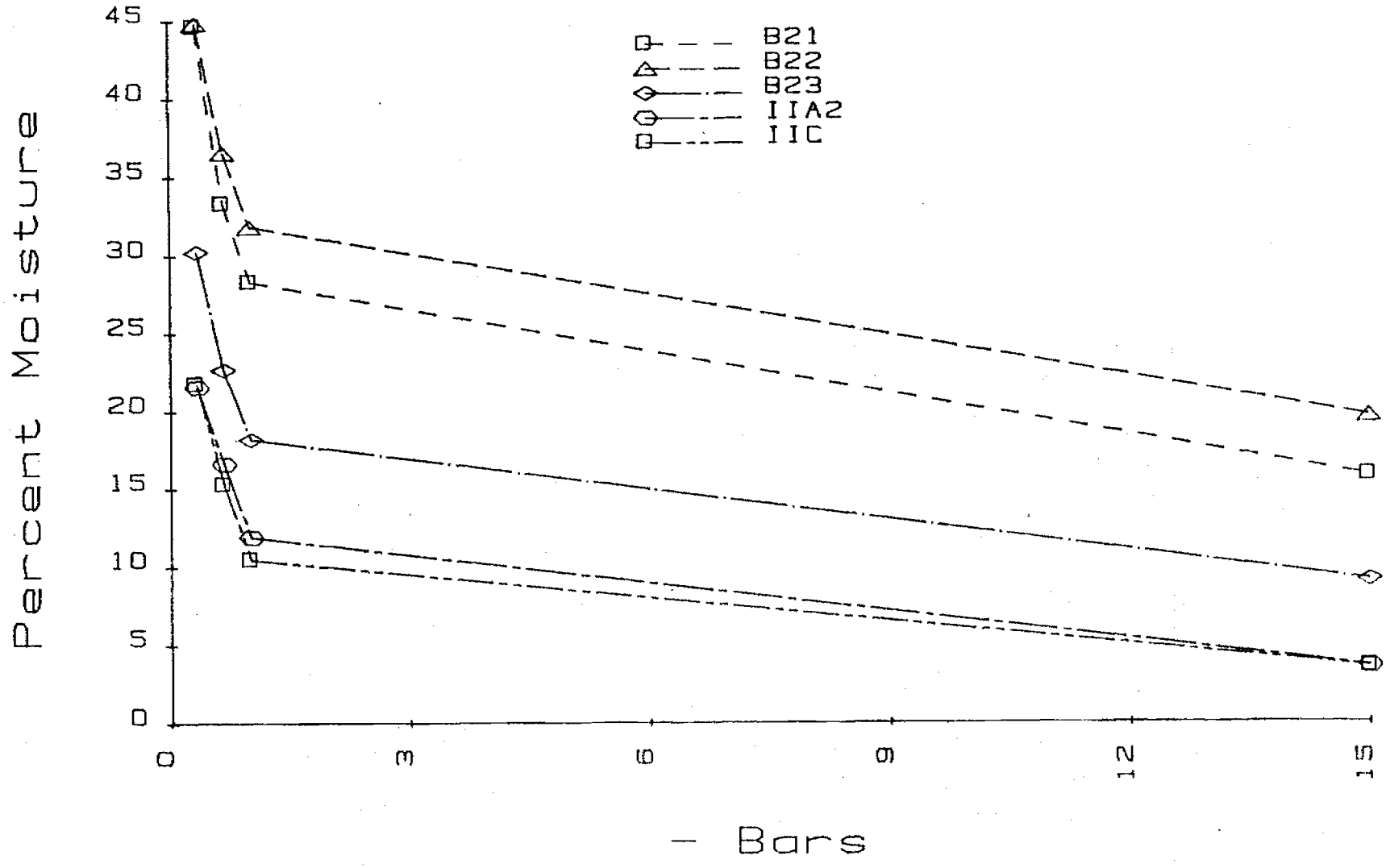
Remarks: Samples were run by the centrifuge method.
NS - no sample

Analysis by: Anita L. Falen

WATER RETENTION SUMMARY

Identification Marci Gerhardt
Analysis By Anita L. Falen
Date July 1985

Code Number	[1/3] Bar	[3/3] Bar	[1] Bar	[15] Bar	[ ] Bar
85-MT-27119 (Cool Creek)					
A1/A2	63.74	IS	IS	17.15	
B21	44.59	33.28	28.25	15.81	
B22	44.80	36.52	31.81	19.64	
B23	30.22	22.64	18.16	9.08	
IIA2	21.54	16.58	11.86	3.54	
IIC	21.72	15.23	10.41	3.51	


Percent Moisture
45
40
35
30
25
20
15
10
5
0
0
3
6
9
12
15
- Bars
B21
B22
B23
IIA2
IIC

Bulk Density

Identification Marci Gerhardt

Analysis By Anita & Eileen

Date 7/85

Volume 2.
98.23

Cores - sack = O.D. core wt.

Sample Number	Clod plus water wt. — water wt. equals volume	Oven dried wt. of coated clod	Divide wt. of clod by volume	Average Bulk Density
7-7-85 cool creek slight Undisturbed upper unit	1	76.82 - 10.89 = 65.93		
	2	58.00 - 10.63 = 47.37		
	3	81.30 - 10.75 = 70.55		
7-9-85 cool creek slight (undisturbed upper unit	4	72.26 - 10.70 = 61.56		
	5	83.44 - 11.18 = 72.26		
	6	63.32 - 11.00 = 52.32		
7-9-85 cool creek slight undisturbed upper unit	7	87.16 - 11.15 = 76.01		
	8	73.44 - 11.10 = 62.34		
	9	49.16 - 11.04 = 38.12		
7-9-85 cool Creek slight undisturbed upper unit	10	76.79 - 11.09 = 65.7		
	11	56.09 - 11.08 = 45.01		
	12	91.82 - 11.00 = 80.82		
7-10-85 cool creek slight undisturbed Lower unit	13	92.23 - 10.87 = 81.36		
	14	102.83 - 10.98 = 91.85		
	15	55.75 - 10.68 = 45.07		
7-10-85 cool creek slight undisturbed Lower unit	16	70.20 - 10.67 = 59.53		
	17	121.36 - 10.76 = 110.6		
	18	72.15 - 10.94 = 61.21		
7-10-85 cool creek, slight undisturbed Lower unit	19	79.43 - 10.77 = 68.66		
	20	86.53 - 10.65 = 75.88		
	21	88.65 - 10.65 = 78.00		
7-10-85 cool creek slight undisturbed Lower unit	22	52.10 - 10.78 = 41.32		
	23	70.13 - 10.74 = 59.39		
	24	61.67 - 10.88 = 50.79		
7-7-85 cool creek control Plot upper unit	25	67.70 - 11.04 = 56.66		
	26	63.37 - 11.16 = 52.21		
	27	76.84 - 11.04 = 65.80		

Bulk Density

Identification Marci Gerhardt

Analysis By Anita + Eileen

Date 7/85

Cores - sack = O.D. core wt.

Sample Number	Clod plus water wt. — water wt. equals volume	Oven dried wt. of coated clod	Divide wt. of clod by volume	Average Bulk Density
7-7-85 cool creek Control Plot upper unit	27	67.92 - 11.10 = 56.82		
	29	89.94 - 10.75 = 79.19		
	30	72.86 - 10.75 = 62.11		
7-7-85 cool creek Control plot upper unit	31	58.55 - 10.94 = 47.61		
	32	84.91 - 10.75 = 74.16		
	33	70.43 - 10.82 = 59.61		
7-7-85 cool creek Control plot upper unit	34	82.11 - 11.02 = 71.09		
	35	74.08 - 10.53 = 63.55		
	36	70.78 - 10.78 = 60.00		
7-9-85 cool creek Control plot Lower unit	37	86.27 - 10.85 = 75.42		
	38	65.60 - 10.85 = 54.75		
	39	77.61 - 10.82 = 66.79		
7-9-85 cool creek Control plot Lower unit	40	81.89 - 10.87 = 71.02		
	41	95.15 - 10.95 = 84.20		
	42	73.42 - 10.86 = 62.56		
7-9-85 cool creek Control plot Lower unit	43	82.91 - 11.14 = 71.77		
	44	73.92 - 10.81 = 63.11		
	45	69.21 - 11.10 = 58.11		
7-9-85 cool creek Control plot Lower unit	46	85.30 - 11.13 = 74.17		
	47	86.99 - 11.15 = 75.84		
	48	65.78 - 10.83 = 54.95		
7-9-85 cool creek severe upper unit	49	143.12 - 10.82 = 132.30		
	50	87.95 - 11.13 = 76.82		
	51	92.13 - 10.56 = 81.57		
7-9-85 cool creek severe upper unit	52	82.87 - 10.99 = 71.88		
	53	119.70 - 11.04 = 108.66		
	54	112.18 - 10.90 = 101.28		

Bulk Density

Identification Marci Gerhardt

Analysis By Anita + Eileen

Date 7/85

Cores - sack = O.D. core wt.

Sample Number	Clod plus water wt. — water wt. equale volume	Oven dried wt. of coated clod	Divide wt. of clod by volume	Average Bulk Density
7-9-85 coolcreek severe upper unit	55	117.28 - 11.30 = 105.98		
	56	104.58 - 10.67 = 93.91		
	57	114.83 - 10.62 = 104.21		
7-9-85 coolcreek severe upper unit	58	77.23 - 10.66 = 66.57		
	59	123.66 - 11.05 = 112.61		
	60	139.02 - 10.79 = 128.23		
7-10-85 coolcreek severe lower unit	61	71.18 - 10.82 = 60.36		
	62	86.86 - 10.77 = 76.09		
	63	85.49 - 10.87 = 74.62		
7-10-85 coolcreek severe lower unit	64	94.39 - 10.59 = 83.80		
	65	88.24 - 10.68 = 77.56		
	66	112.03 - 10.83 = 101.20		
7-10-85 coolcreek severe lower unit	67	113.73 - 10.57 = 103.16		
	68	92.10 - 10.77 = 81.33		
	69	77.53 - 10.85 = 66.68		
7-10-85 coolcreek severe lower unit	70	119.79 - 10.76 = 109.03		
	71	77.41 - 10.78 = 66.63		
	72	74.27 - 10.86 = 63.41		
7-9-85 coolcreek moderate upper unit	73	81.77 - 10.82 = 70.95		
	74	92.00 - 10.63 = 81.37		
	75	84.30 - 10.57 = 73.73		
7-9-85 coolcreek moderate upper unit	76	74.75 - 11.10 = 63.65		
	77	89.35 - 10.88 = 78.47		
	78	85.72 - 10.57 = 75.15		
7-9-85 coolcreek moderate upper unit	79	71.26 - 10.61 = 60.65		
	80	58.10 - 11.00 = 47.10		
	81	59.68 - 10.63 = 49.05		

Bulk Density

Identification Marci Gerhardt

Analysis By Anita & Eileen

Date 7/85

Cores - sack = O.D. core wt.

Sample Number	Clod plus water wt. — water wt. equals volume	Oven dried wt. of coated clod	Divide wt. of clod by volume	Average Bulk Density
7-7-85 coolcreek moderate upper unit	82	100.53 - 10.74 = 89.79		
	83	99.66 - 10.78 = 88.88		
	84	123.03 - 10.77 = 112.26		
7-10-85 coolcreek moderate lower unit	85	94.77 - 10.63 = 84.14		
	86	103.92 - 11.29 = 92.63		
	87	71.72 - 10.72 = 61.00		
7-10-85 coolcreek moderate lower unit	88	141.52 - 10.84 = 130.68		
	89	91.89 - 10.70 = 81.19		
	90	69.70 - 10.68 = 59.02		
7-10-85 coolcreek moderate lower unit	91	68.84 - 10.76 = 58.08		
	92	70.26 - 10.71 = 59.55		
	93	94.14 - 10.71 = 83.43		
7-10-85 coolcreek moderate lower unit	94	74.12 - 10.74 = 63.38		
	95	94.45 - 11.09 = 83.36		
	96	71.01 - 10.65 = 60.36		

Marci Eberhardt

Cool Creek Upper

IDENT	LAB NO. R507		pH	OC %	OM %	Residual NH_3-N µg/g	Min. N µg/g				
CONTROL											
DUFF	46		–	–	–	9.91	96.4				
"	47		–	–	–	9.46	142.3				
"	48		–	–	–	7.69	78.9				
"	49		–	–	–	11.35	93.3				
0-10	50		5.76	2.63	4.52	2.47	15.4 / 16.3				
"	51		5.43	2.89	4.93	3.41	14.5				
"	52		5.74	2.48	4.27	2.48	12.9				
"	53		5.54	2.19	3.76	1.64	7.7				
10-20	54		5.63	1.96	3.37	2.15	8.5				
"	55		6.15	1.89	3.23	1.45 / 1.46	7.9				
"	56		5.46	2.37	4.08	3.16	12.0				
"	57		5.74	1.79	3.07	2.07	7.5 / 7.4				
SLIGHT DUFF	58		–	–	–	44.56	146.5				
"	59		–	–	–	15.40	108.8				
"	60		–	–	–	25.84	187.5				
"	61		–	–	–	43.14	243.9				
0-10	62		5.70	2.79	4.81	2.45	13.0				
"	63		5.60	4.02 / 4.11	6.92 / 7.07	10.90	31.0				
"	64		5.71	3.99	6.85	6.03	16.1				
"	65		5.58	1.98	3.41	4.99	12.0				
10-20	66		5.71	2.25	3.87	4.02	9.0				
"	67		5.50	1.71	2.95	4.51	10.7				
"	68		5.80	2.74	4.72	4.31	14.1				
"	69		5.86	2.58	4.44	2.13	8.6				
MODERATE 0-10	70		6.06	2.88	4.95	4.98	16.8 / 18.5				
"	71		5.80	2.91	5.01	3.20	11.7				
"	72		5.58	3.21	5.52	4.91	17.6				
"	73		5.74	2.40 / 2.45	4.13 / 4.21	3.89	11.7				
10-20	74		5.68	2.31	3.98	4.28 / 4.29	10.8				
"	75		5.99	2.01	3.45	3.97 / 3.97	9.7				
"	76		5.67	2.95	5.08	3.71	11.7				
"	77		6.12	2.04	3.51	2.97	9.0				
SEVERE 0-10	78		5.84	3.41	5.87	4.38	12.4				
"	79		5.44	3.67	6.32	4.66	15.0				
"	80		5.54	2.26	3.89	2.61	9.0 / 9.3				
"	81		5.77	1.91	3.29	2.61	6.2				

MARCI GERHARDT

9-26-95

IDENT	LAB NO. RSD7		pH	OC %	OM %	RESIDUAL NH_3-N µg/g	MIN. N µg/g				
SEVERE											
10-20	82		5.81	2.39	4.11	4.08	10.1				
"	83		5.96	2.29/3.14	3.93/3.67	4.29	10.1				
"	84		5.82	1.62	2.79	3.56	5.6				
"	85		5.55	0.76	1.31	2.50	3.6/3.6				
COOL CREEK LOWER											
SLIGHT											
DUFF	92		—	—	—	6.89	45				
"	93		—	—	—	0.24	56				
"	94		—	—	—	16.88	66				
"	95		—	—	—	24.40	131				
0-10	96		5.53	3.16	5.44	1.48	15				
"	97		5.50	1.76	3.04	1.42	11				
"	98		5.59	3.18	5.46	4.35	25				
"	99		5.64	3.19	5.49	2.87	20				
10-20	100		6.00	2.27	3.90	3.25/3.15	17/17				
"	1		5.90	1.26	2.16	1.29/1.31	10				
"	2		6.00	2.01	3.45	2.09	12				
"	3		6.13	1.80	3.10	1.58	10				
MODERATE 0-10	4		5.84	2.78	4.79	2.89	20				
"	5		5.80	2.70/2.85	4.65/2.89	3.28	20				
"	6		5.38	3.20	5.51	4.77	19				
"	7		5.83	2.23	3.83	1.94	10				
10-20	8		6.16	2.02	3.47	2.27	13				
"	9		6.09	2.57	4.43	2.28	14				
"	10		5.57	1.60	2.76	4.02/3.99	13/11				
"	11		5.56	3.09	5.31	1.78/1.79	10				
SEVERE 0-10	12		5.92	1.92	3.31	1.13	10				
"	13		5.82	3.08	5.30	1.34	6				
"	14		5.36	1.82	3.13	1.58	9				
"	15		5.73	3.08/2.86	5.30/4.91	2.90	12				
10-20	16		5.72	3.77	6.48	1.49	6				
"	17		6.12	1.39	2.39	1.72	10/9				

MARC GERHARDT

9-26-

IDENT	LAB NO. 2507		pH	CC o/o	OH o/o	RESIDUAL NH_3-N µg/g	MIN. N. µg/g			
SEVERE 10-20	18		5.40	1.22	2.09	3.20	10			
"	19		5.85	2.42	4.15	2.60	15			
CONTROL DUKE	20		–	–	–	8.10 / 8.70	54 / 50			
"	21		–	–	–	13.74	94			
"	22		–	–	–	10.04 / 10.26	95			
"	23		–	–	–	11.80	110			
0-10	24		5.72	2.61	4.50	1.78	17			
"	25		5.51	2.56	4.40	1.19	9			
"	26		6.13	1.93	3.33	4.19	15			
"	27		5.81	2.12	3.64	1.67	11			
10-20	28		6.20	1.87	3.21	3.48	15			
"	29		6.04	2.72 / 2.37	4.68 / 4.11	1.90	13			
"	30		5.80	2.10	3.62	0.94 / 0.79	7 / 7			
"	31		6.16	1.67	2.88	1.56	9			

MAZZI GERHARDT

SAMPLE IDENT	LAB NO R567		pH	OC %	OM %	RESIDUAL NH_3-N ug/g	MIN N ug/g				
BASIN CR-5											
CONTROL DUFF	133		—	—	—	13.91	109				
"	34		—	—	—	12.66	59				
"	35		—	—	—	5.61	71 / 77				
"	36		—	—	—	9.66 / 9.52	57				
BASIN CONTROL CR-5 0-10	37		5.20	3.04	5.24	1.94	20				
0-10	38		5.50	2.55	4.39	1.65	16				
"	39		5.55	3.16	5.43	2.29	16				
"	40		5.45	3.79	6.52	2.21	24 / 26				
10-20	41		5.63	2.02	3.47	1.47	15				
"	42		6.30	1.64	2.82	1.43	10 / 11				
"	43		6.07	2.25	3.87	1.46	12				
"	44		5.99	2.35	4.04	1.64	15				
DUFF	45		—	—	—	13.60	154				
"	46		—	—	—	8.57	113 / 109				
"	47		—	—	—	14.14	119 / 121				
"	48		—	—	—	26.50	104				
SLIGHT 0-10	49		6.64	3.66 / 3.71	6.47 / 6.37	0.78 / 0.97	25				
"	50		6.11	3.53	6.07	1.42	34 / 32				
"	51		5.41	3.39	5.83	0.46	20				
"	52		5.26	3.06	5.26	0.57	18				
10-20	53		6.54	2.57	4.43	1.05	21				
"	54		6.13	2.51	4.31	0.75	16				
"	55		6.05	2.59	4.46	0.41	11				
"	56		6.84	1.90	3.26	0.76	12				
MODERATE 0-10	57		6.07	2.64	4.54	0.87	21				
"	58		5.72	3.42	5.85	1.42	20				
"	59		6.02	2.93	5.04	1.09	16				
"	60		6.02	2.97 / 2.55	5.11 / 4.90	1.23 / 1.24	18 / 17				
10-20	61		6.51	2.30	3.95	0.69 / 0.69	12				
"	62		6.21	2.77	4.76	0.94	16				
"	63		5.66	2.13	3.66	1.16	12				
"	64		6.46	2.06	3.55	1.14	15				
SEVERE 0-10	65		5.84	2.79	4.80	0.99	19				
"	66		5.91	4.16	7.15	0.99	26				
"	67		5.86	3.41	5.87	1.20	26				
"	68		5.53	3.25	5.64	1.54	21				

MARCI GERHARDT

SAMPLE IDENT	LAB NO 2507		PH	OC %	OM %	RESIDUAL NH_3-N mg/L	MIN N mg/kg				
BASINS 4 OR 5											
SEWAGE 10-20	169		6.06	1.83	3.15	0.95	11				
"	70		6.07	1.79	3.09	1.20	11 / 10				
"	71		6.11	2.07 / 2.03	3.56 / 3.49	3.83	15				
"	72		6.09	2.71	4.67	6.26	20				

SAMPLE IDENT	LAB No R504		PH	OC %	OM %	RESIDUAL NH_3-N mg/g	MIN N mg/g				
BASIN CR-7											
CONTROL-DUFF	188		—	—	—	15.35	63.4				
"	89		—	—	—	22.15	125.4				
"	90		—	—	—	41.04	99.7 / 124				
"	91		—	—	—	19.75	69.0				
0-10cm	92		4.87	4.92	8.47	3.51	15.5				
"	93		5.53	2.45	4.21	1.67	12.0				
"	94		5.41	2.44	4.20	1.74	13.1				
"	95		5.36	2.92	5.01	2.12	14.2				
10-20cm	96		5.54	2.42	4.16	1.44	11.0				
"	97		5.62	2.65	4.55	2.14	12.4				
"	98		5.67	1.89	3.26	1.56	5.5 / 8.1				
"	99		6.02	1.63 / 1.50	2.80 / 3.05	1.17	8.0				
BASIN CR-7											
SLIGHT (UNDIST.)											
DUFF	200		—	—	—	18.65	50.4 / 63.2				
"	1		—	—	—	37.10	143.2				
"	2		—	—	—	5.02	35.4				
"	3		—	—	—	14.05	85.4				
0-10cm	4		5.50	2.27	3.91	1.92	11.0				
"	5		5.71	2.96	5.12	4.84	29.5				
"	6		5.66	2.31	3.97	5.05 / 5.08	19.0				
"	7		5.92	1.94	3.33	2.05	11.9				
10-20cm	8		5.97	1.81	3.12	1.51	7.9				
"	9		5.86	2.35 / 2.29	4.04 / 3.93	3.50	18.8				
"	10		6.04	1.51	2.60	1.68	9.3 / 9.2				
"	11		5.63	1.59	2.73	3.34	11.5				
MODERATE											
0-10cm	212		5.67	2.57	4.93	2.43	14.1				
"	13		5.56	2.16	3.71	2.59	16.2				
"	14		5.71	2.16	3.72	2.97	16.6				
"	15		5.69	2.43	4.17	4.99 / 5.04	20.6				
10-20cm	16		5.92	1.58	2.71	2.25	9.5				
"	17		5.66	2.05	3.53	5.27	17.6				
"	18		6.01	1.59	2.73	2.01	7.9				
"	19		5.52	1.73 / 1.72	2.97 / 2.95	2.74 / 2.66	9.3				

MARCI GERHARDT

SAMPLE IDENT	LAB NO. R508		PH	OC %	OM %	RESIDUAL NH_3-N ug/g	MIN N ug/g				
BASIN CR-7											
SEVERE											
0-10cm	220		5.56	2.92	5.01	4.10	15.3 / 15.4				
"	21		5.75	1.63	2.80	2.49	7.8				
"	22		5.95	3.24	5.58	2.04	16.6				
"	23		5.92	1.42	2.44	2.48	11.1				
10-20cm	24		5.92	0.51	1.39	2.50	7.2				
	25		6.02	2.52	4.33	2.15	14.2				
	26		5.63	1.90	3.27	4.52	10.7				
	27		5.62	0.95	1.64	2.61	7.2				

MARCI GERHARDT

SAMPLE IDENT	LAB No R507		pH	OC %	OM %	RESIDUAL NH_3-N ug/g	MIN N ug/g				
BASIN CR-4											
CONTROL DUFF	133		—	—	—	13.51	109				
"	34		—	—	—	12.66	59				
"	35		—	—	—	5.61	71/77				
"	36		—	—	—	9.66/9.52	87				
BASIN CONTROL CR-4 0-10	37		5.20	3.04	5.24	1.94	20				
0-10	38		5.50	2.55	4.39	1.65	16				
"	39		5.55	3.16	5.43	2.29	16				
"	40		5.45	3.74	6.52	2.21	24/26				
10-20	41		5.53	2.02	3.47	1.47	15				
"	42		6.34	1.64	2.82	1.43	10/11				
"	43		6.07	2.25	3.87	1.46	12				
"	44		5.49	2.35	4.04	1.64	15				
DUFF	45		—	—	—	13.60	154				
"	46		—	—	—	8.87	113/109				
"	47		—	—	—	14.14	119/121				
"	48		—	—	—	26.86	104				
SLIGHT 0-10	49		6.64	3.66/3.71	6.37/6.37	0.95/6.97	25				
"	50		6.11	3.53	6.07	1.42	34/32				
"	51		5.41	3.39	5.83	0.46	20				
"	52		5.26	3.06	5.26	0.57	18				
10-20	53		6.54	2.57	4.43	1.05	21				
"	54		6.13	2.51	4.31	0.75	16				
"	55		6.04	2.59	4.46	0.41	11				
"	56		6.84	1.90	3.26	0.76	12				
MODERATE 0-10	57		6.07	2.64	4.54	0.87	21				
"	58		5.72	3.42	5.86	1.42	20				
"	59		6.07	2.93	5.04	1.09	16				
"	60		6.07	2.97/2.55	5.11/4.40	1.23/1.24	18/17				
10-20	61		6.51	2.30	3.95	0.67/0.69	12				
"	62		6.21	2.77	4.76	0.94	16				
"	63		5.66	2.13	3.66	1.16	12				
"	64		6.46	2.06	3.55	1.14	15				
SEVERE 0-10	65		5.84	2.79	4.80	0.99	19				
"	66		5.91	4.16	7.15	0.99	26				
"	67		5.06	3.41	5.87	1.20	26				
"	68		5.83	3.28	5.64	1.54	21				

MARC GERHARDT

SAMPLE IDENT	LAB NO R507		PH	OC %	OM %	RESIDUAL NH_3-N ug/g	MIN N ug/g				
BASINCK 5											
SOUARE 10-20	169		6.06	1.83	3.15	0.95	11				
"	70		6.07	1.79	3.09	1.20	11/10				
"	71		6.11	2.07/2.03	3.56/3.49	3.83	15				
"	72		6.09	2.71	4.67	6.26	≥20				

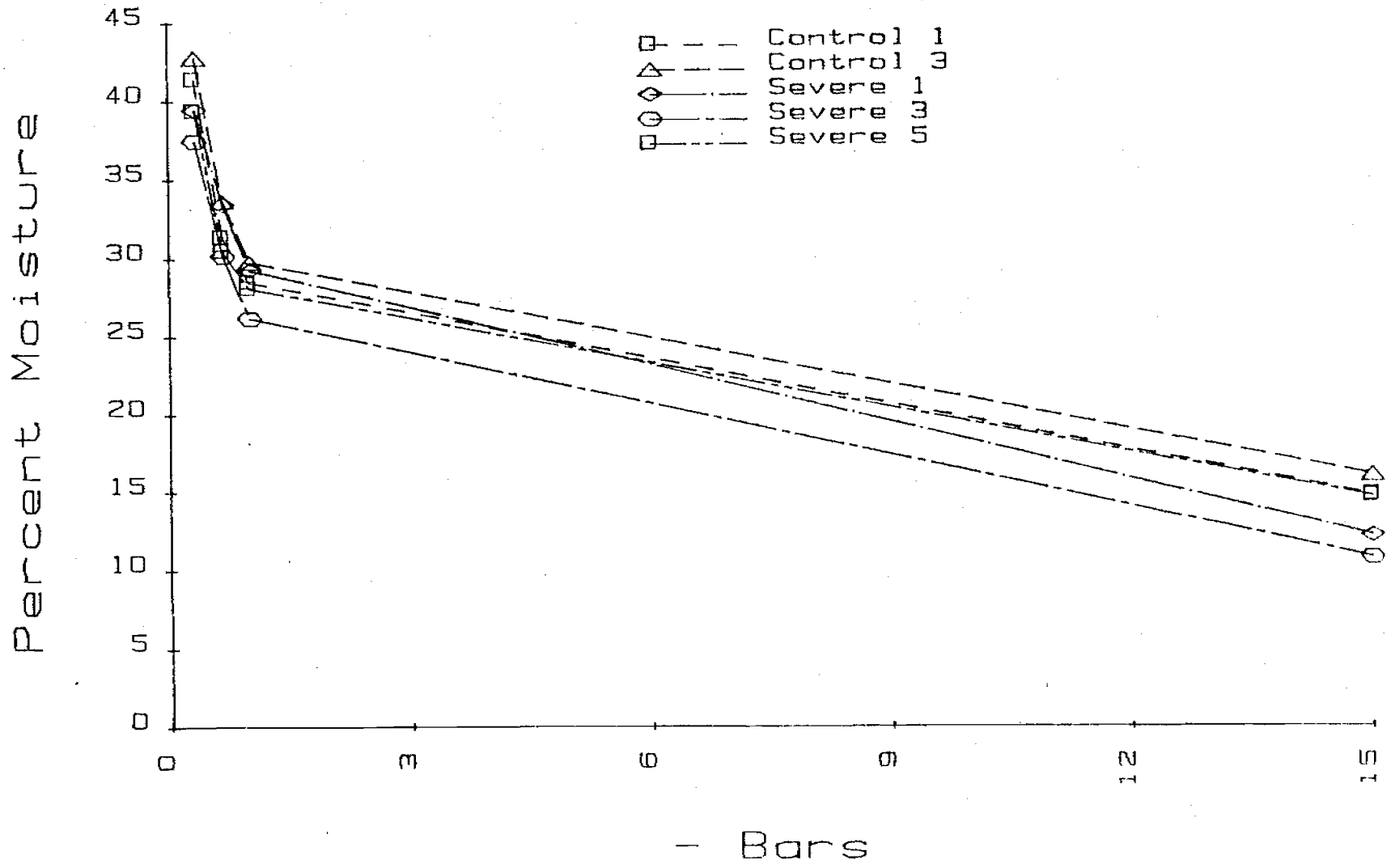
WATER RETENTION SUMMARY

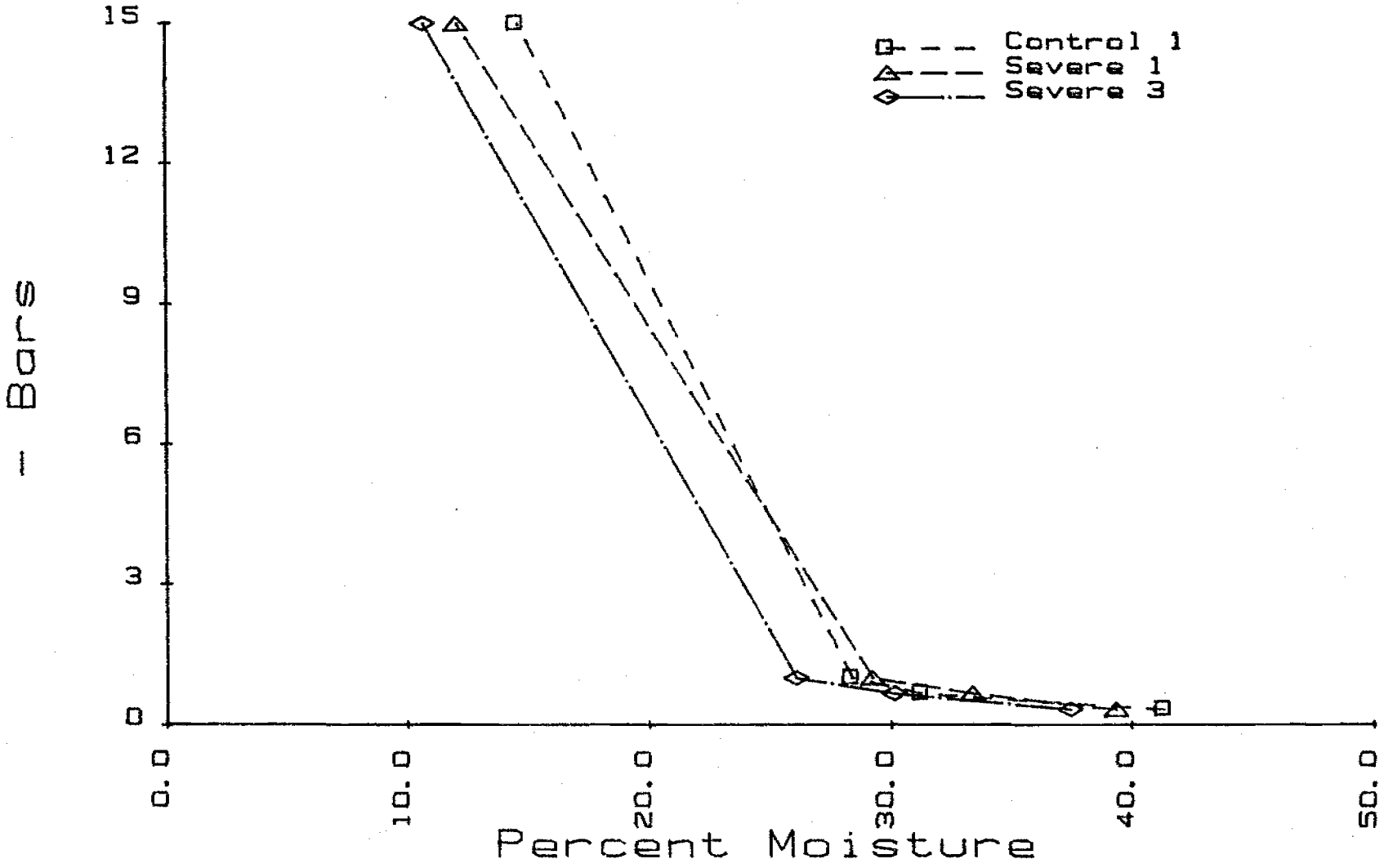
Identification Marci Gerhardt - Kootenai Nat'l Forest

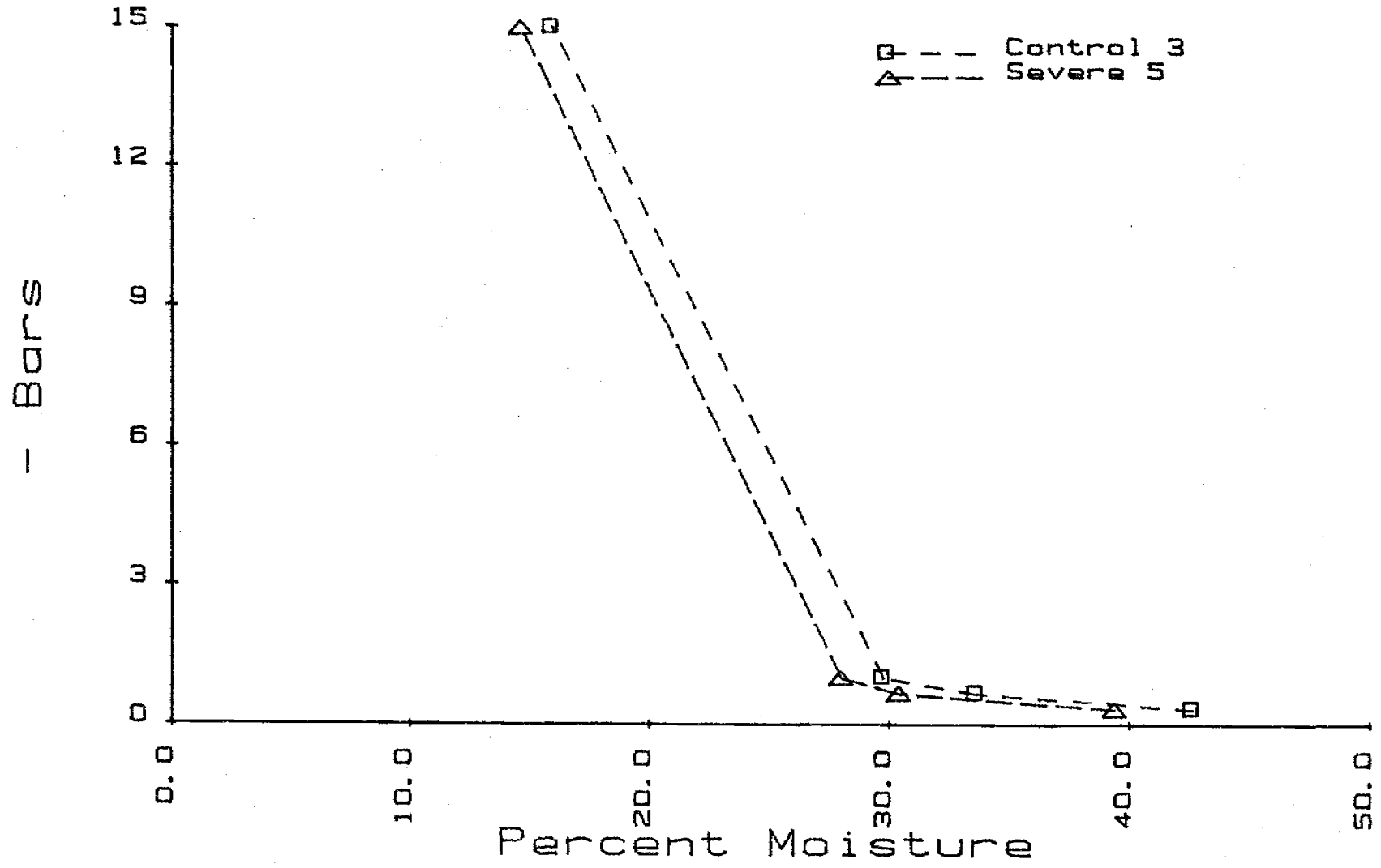
Analysis By Anita L. Falen

Date 9/85

Code Number	[1/3] Bar	[3/3] Bar	[1] Bar	[15] Bar	[ ] Bar
Control 1	41.3	31.3	28.4	14.7	
control 3	42.7	33.6	29.7	16.0	
Severe 1	39.4	33.4	29.2	12.1	
severe 3	37.4	30.1	26.1	10.7	
severe 5	39.3	30.4	28.0	14.6	


Control 1
Control 3
Severe 1
Severe 3
Severe 5
Percent Moisture
45
40
35
30
25
20
15
10
5
0
0
3
6
9
12
15
- Bars


Control 1
Severe 1
Severe 3
15
12
9
6
3
0
- Bars
0.0
10.0
20.0
30.0
40.0
50.0
Percent Moisture


Control 3
Severe 5
15
12
9
6
3
0
- Bars
0.0
10.0
20.0
30.0
40.0
50.0
Percent Moisture

Pedon: Roderick Butte - Kootenai National Forest

Date: October 1985

Sample No.	Horizon	Depth	pH paste	EC*10^3	% Water at Saturation	Available P	Sesquioxides				Spodic
							Di-Citrate Extract		Pyrophosphate Extract		
							Fe	Al	Fe	Al	
		cm		mmhos/cm		ppm	%				
BP-1			7.15								
BP-2			7.38								
BP-3			6.84								
C-1			5.06								
C-2			4.82								
C-3			4.79								

Sample No.	Exchangeable Ions				Ext. Acidity	CEC	Base	OM	OC	N	C:N	Soil	
	Ca	Mg	Na	K	H		Saturation					Fraction	NaF pH
	meq/100 gms						%	%			ratio		
BP-1	20.1*	3.6	0.7	1.3		8.9*		5.35	3.11				
Bp-2	18.6*	2.7	0.7	1.1		5.0*		1.23	0.71				
BP-3	9.0*	1.3	1.0	1.1		7.2*		2.30	1.34				
C-1	3.3	0.4	0.1	0.4		16.8		4.76	2.77				
C-2	2.3	0.5	0.1	0.5		15.5		4.11	2.39				
C-3	4.2	0.7	0.1	0.5		18.2		5.35	3.11				

Remarks: CEC's were leached with 10% acidified NaCl.
*rerun
BP-1 Ca - 18.1; CEC - 8.5
BP-2 Ca - 16.2; CEC - 5.6
BP-3 Ca - 8.9; CEC - 7.7

Analysis by: Anita L. Falen

Pedon: Roderick Butte - Kootenai National Forest

Date: October 1985

Sample No.	Horizon	Depth	pH paste	EC*10^3	% Water at Saturation	Available P	Sesquioxides: Di-Citrate Fe	Sesquioxides: Di-Citrate Extract Al	Sesquioxides: Pyrophosphate Fe	Sesquioxides: Pyrophosphate Extract Al	Spodic
		cm		mmhos/cm		ppm	%				
M-1			4.93								
M-2			5.35								
M-3			5.10								
M-4			5.20								
S-1			5.06								
S-2			5.09								
S-3			5.09								
S-4			4.93								
S-5			5.24								

Sample No.	Exchangeable Ions: Ca	Mg	Na	K	Ext. Acidity: H	CEC	Base Saturation	ON	OC	N	C:N	Soil Fraction	NaF pH
	meq/100 gms						%	%			ratio		
M-1	4.6	1.2	0.2	0.7		18.4		7.76	4.51				
M-2	12.9	2.0	0.2	0.7		17.8		4.87	2.83				
M-3	3.3	0.7	0.1	0.6		14.3		6.05	3.51				
M-4	11.6	1.2	0.1	0.7		17.4		8.24	4.79				
S-1	3.1*	0.4	0.1	0.4		9.2*		3.42	1.99				
S-2	3.7*	0.8	0.1	0.4		9.2*		2.08	1.21				
S-3	3.5*	0.9	0.2	0.3		10.1*		2.73	1.59				
S-4	6.5	1.9	0.1	0.6		14.0		6.01	3.49				
S-5	2.6	1.2	0.1	0.4		11.3		3.47	2.02				

Remarks: CEC's were leached with acidified NaCl.
CEC's were steam distilled.
*rerun
S-1 Ca - 3.2; CEC - 10.0
S-2 Ca - 3.4; CEC - 9.4
S-3 Ca - 2.7; CEC - 9.6

Analysis by: Anita L. Falen

Pedon: Roderick Butte - Kootenai National Forest Date: August 1985

Depth	Particle Size Distribution (mm)								Gravel & Stone		Textural
	VCS	CS	MS	FS	VFS	TS	TSi	TC	>2 mm		
	2-1.0	1-0.5	0.5-0.25	0.25-0.1	0.1-0.05	2-0.05	0.05-0.002	<0.002	wt.	vol.	Classes
	%								%		
Control 1	3.74	2.55	1.31	3.03	7.49	18.11	70.01	11.88			Silt loam
Control 3	3.15	2.51	1.52	3.74	8.16	19.07	62.94	17.99			Silt loam
Severe 1	4.56	3.06	1.69	3.64	7.52	20.47	67.59	11.94			Silt loam
Severe 3	3.20	2.59	1.47	4.21	8.22	19.70	68.28	12.02			Silt loam
Severe 5	6.87	5.11	2.50	4.79	8.05	27.33	59.95	12.73			Silt loam

Depth	Silt Size Distribution (mm)			Bulk Density		Water Content		Liquid Limit	Plastic Limit	Plastic Index
	CoSi	Msi	Fsi	Clod	Core	1/3 Bar	15 Bar			
	0.05-0.02	0.02-0.005	0.005-0.002							
cm	%			g/cc		%		%		

Remarks: Samples were run by the centrifuge method, 5% sodium hexametaphosphate added, and sonnified.

Analysis by: Anita L. Falen

Pedon: Set #1 (Upper Cool Creek 0-10 cm) - Kootenai Nat'l Forest Date: October 1985

Sample No.	Horizon	Depth	pH paste	EC*10^3	% Water at Saturation	Available P	Sesquioxides: Di-Citrate Extract Fe	Sesquioxides: Di-Citrate Extract Al	Sesquioxides: Pyrophosphate Extract Fe	Sesquioxides: Pyrophosphate Extract Al	Spodic
		cm		mmhos/cm		ppm	%				
control	R507-52	0-10	5.74								
slight	R507-65	0-10	5.58								
moderate	R507-73	0-10	5.74								
severe	R507-79	0-10	5.44								

Sample No.	Exchangeable Ions: Ca	Mg	Na	K	Ext. Acidity: H	CEC	Base Saturation	OM	OC	N	C:N	Soil Fraction	NaF pH
	meq/100 gms						%	%			ratio		
control	3.8	1.3	0.1	0.6		17.0		4.27	2.48				
slight	3.5	1.5	0.1	0.7		13.8		3.41	1.98				
moderate	2.8	0.8	0.2	0.5		16.9		4.18	2.42				
severe	3.0	1.0	0.1	0.5		17.8		6.32	3.67				

Remarks: CEC's were leached with 10% acidified NaCl.
CEC's were steam distilled.

Analysis by: Anita L. Falen

Pedon: Set #2 (Lower Cool Creek 0-10 cm) - Kootenai Nat'l Forest Date: October 1985

Sample No.	Horizon	Depth	pH paste	EC*10^3	% Water at Saturation	Available P	Sesquioxides: Di-Citrate Extract Fe	Sesquioxides: Di-Citrate Extract Al	Sesquioxides: Pyrophosphate Extract Fe	Sesquioxides: Pyrophosphate Extract Al	Spodic
		cm		mmhos/cm		ppm	%				
control	R507-127		5.81								
slight	R507-99		5.64								
moderate	R507-107		5.83								
severe	R507-113		5.82								

Sample No.	Exchangeable Ions: Ca	Mg	Na	K	Ext. Acidity: H	CEC	Base Saturation	OM	OC	N	C:N	Soil Fraction	NaF pH
	meq/100 gms						%	%			ratio		
control	2.8	1.1	0.1	0.3		12.8		3.64	2.12				
slight	3.7	0.7	0.2	0.5		16.8		5.49	3.19				
moderate	3.1	1.3	0.2	0.8		18.3		3.83	2.23				
severe	2.8	0.7	0.1	0.6		14.7		5.30	3.08				

Remarks: CEC's were leached with 10% acidified NaCl.
CEC's were steam distilled.

Analysis by: Anita L. Falen

Pedon: Set #3 (Basin Creek 7 0-10 cm) - Kootenai National Forest Date: October 1985

Sample No.	Horizon	Depth	pH paste	EC*10^3	% Water at Saturation	Available P	Sesquioxides: Di-Citrate Extract Fe	Sesquioxides: Di-Citrate Extract Al	Sesquioxides: Pyrophosphate Extract Fe	Sesquioxides: Pyrophosphate Extract Al	Spodic
		cm		mmhos/cm		ppm	%				
control	R508-194		5.41								
slight	R508-207		5.92								
moderate	R508-214		5.71								
severe	R508-223		5.92								

Sample No.	Exchangeable Ions: Ca	Mg	Na	K	Ext. Acidity: H	CEC	Base Saturation	OM	OC	N	C:N	Soil Fraction	NaF pH
	meq/100 gms						%	%			ratio		
control	1.9	0.4	0.2	0.5		12.0		4.20	2.44				
slight	3.8	0.8	0.1	0.5		11.3		3.33	1.94				
moderate	2.2	0.4	0.1	0.6		12.8		3.72	2.16				
severe	4.0	1.3	0.1	0.6		12.2		2.44	1.42				

Remarks: CEC's were leached with 10% acidified NaCl.
CEC's were steam distilled.

Analysis by: Anita L. Falen

Pedon: Set #4 (Basin Creek 8 0-10 cm) - Kootenai National Forest Date: October 1985

Sample No.	Horizon	Depth	pH paste	EC*10^3	% Water at Saturation	Available P	Sesquioxides: Di-Citrate Extract Fe	Sesquioxides: Di-Citrate Extract Al	Sesquioxides: Pyrophosphate Extract Fe	Sesquioxides: Pyrophosphate Extract Al	Spodic
		cm		mmhos/cm		ppm	%				
control	R507-139		5.55								
slight	R507-149		6.64								
moderate	R507-160		6.02								
severe	R507-168		5.83								

Sample No.	Exchangeable Ions: Ca	Mg	Na	K	Ext. Acidity: H	CEC	Base Saturation	OM	OC	N	C:N	Soil Fraction	NaF pH
	meq/100 gms						%	%			ratio		
control	2.0	3.7	0.1	0.3		13.5		5.43	3.16				
slight	18.6	5.8	0.2	0.6		28.5		6.33	3.69				
moderate	5.5	2.0	0.1	0.6		16.5		5.01	2.91				
severe	3.0	0.8	0.2	0.5		12.8		5.64	3.28				

Remarks: CEC's were leached with 10% acidified NaCl.
CEC's were steam distilled.

Analysis by: Anita L. Falen

Marci Gerhardt

Sample I.D.	Lab No.		Residual NH_3-N mg/g		mineralized NH_3-N mg/g					
Roderick Butte Burn Pile-1	R 509-307		2.80		18					
" " -2	8		0.00		6					
" " 3	9		1.90		5					
Control -1	10		0.77 / 0.87		9.0 / 10.0					
" 2	11		0.66		6					
" 3	12		1.08		14					
Duff - 1	13		18.6 / 18.9		196					
" 2	14		6.69		96					
" 3	15		10.9		148					
Moderate 1	16		5.21		28					
" 2	17		3.33		20 / 20					
" 3	18		3.54		28					
" 4	19		5.89		33					
Severe 1	20		2.10 / 2.04		8 / 8					
" 2	21		1.37		5					
" 3	22		1.14		5 / 5					
" 4	23		1.44		9					
" 5	324		0.94		6					

4/28/86

Kootenai National Forest

Sample ID.	Lab No.	Residual NH_4-N ug/g	mineralizable NH_4-N ug/g
Smoot Cr.	R602		
Kootenai Chem. Control Duff-1	1190	5.20	588
" " -2	91	5.08	564
" " -3	92	29.8	3620
Severe	93	0.41	79.8
Severe -plot 1	94	0.83	69.6
" -plot 2	95	1.05	530
" -plot 3	96	0.41	420
" -plot 4	97	0.82	37.3
Control 0-10cm	98	0.41	41.8
" 2	99	0.48	60.8
" 3	1300	0.94	128.

USDA - FOREST SERVICE — Roderick Butte — SOIL DESCRIPTION 86-MT-37120

SOIL SER.	TYPE, PHASE	MAP SYMBOL	CLASSIFICATION	MODAL OR INTEGRADE TO	DATE	BY	PHOTO NO.	STOP NO.
					9/21/85	MG JW		

1. AREA	FOREST	RANGER DISTRICT	STATE	COUNTY	LOCATION	
Roderick Butte	Kootenai	D-2	MT	Lincoln	SEC. 26 T. 35N R. 32W	NE SW ¼

3. PARENT ROCK	FORMATION NAME	MINERALS	TEXTURE	FAULTING	WEATHERING	SURFACE STONE AND ROCK %
Argillite Limestone	Wallace					

4. LANDFORM	SLOPE	SINGLE	COMPLEX	ASPECT	ELEVATION	EROSION	GULLIES	ALKALI	SALINES
sideslope	10%			W-SW	4240'				

5. CLIMATIC ZONE (veg.)	PRECIP. Inches	AV. TEMP. °F	LITTER TYPE	INFILTRATION	PERCOLATION	STORAGE	DRAINAGE CLASS	WATER TABLE (Ft.)
Tshl Clw								

6. HORIZON	DEPTH	COLOR Dry, Moist, Crushed	Mottling	TEXTURE	STRUCTURE	CONSISTENCE Dry, Moist Wet, Cem.	SPECIAL FEATURES: Clay Films	Stone Rock % Vol.	Roots	Pores		REACTION (pH)	BOUNDARY	PERCOLATION CLASS
01-02	4-0" 10-0cm 0-2" 0-5cm													
A_2		10yr 6/1		sil	1fgr	vfr so os op						6.5	CW	
B_{21}	2-9" 5-23cm	10yr 4/4		sil	1fgr vfr so os op	vfr so os op		co 10	3vf+f 3M 3C			6.5	AW	
B_{22}	9-13" 23-38cm	10yr 4/6		sil	1vf+fsbk vfr so os op	vfr so os op		co 10	2vf+f 3M 2C			6.7	AW	
II A_2	13-21" 38-53cm	10yr 5/4		vgr sl	OM	sh sl os+op		gr+co 50	1f+f 1M			6.5	AW	
III C	21-40" 53-102cm	10yr 6/6 mixed with 2.5Y 7/4		gr scl	OM	vh vfi s+p	INPtrpo	gr+co 25	1vf			6.0	—	slow

Notes: II A_2 + III C are from different Times — III C has clay pick up and appears to be some type of well weathered material (hard w/very little rock content) / Very few roots penetrate clay layer

2500-1 . 4/61)

-43-

7. SOIL TYPE PHASE	MAP SYMBOL	SLOPE %	ASPECT	ELEVATION Ft.	DATE	BY	PHOTO	STOP NO.
8. AREA	FOREST	RANGER DISTRICT	STATE	COUNTY	LOCATION SEC.	T.	R.	

9. (Species) TREES (Amount)	(Species) SHRUBS (Amount)	(Species) FORBS (Amount)	(Species) GRASSES (Amount)
Western Cedar	Libo	Clintonia	
Larch	Pachistama		
Western White Pine	Vasc		
Lodgepole	Bedstraw		
Douglas Fir	Ceanothus		
Hemlock			
Grand Fir			
10. 100%	100%	100%	100%

11. SUITABILITY ESTIMATE FOR	TENTATIVE CLASSES I	II	III	IV	V	12. MEASURED INTERPRETATIVE DATA
a. Erosion Hazard						
b. Range						
c. Timber						
d. Water Storage						
e.						
f.						
g.						
h.						
i.						

GPO 909746

Unnamed Gravely Fine Sandy Loam 86-MT-27120 (Roderick Butte)

Classification:

General Site Characteristics

Location: Lincoln County, Montana; northeast, southwest 1/4 of section 26, T. 35N., R. 32W.
Forest: Kootenai National Forest
Area: Roderick Butte, D-2 Ranger District
Described by/Date: Marci Gerhardt and forest service personnel on September 29, 1985
Parent material: argillitic limestone
Habitat type: Tshe/Clun habitat; wester cedar, larch, western white pine, lodgepole, Douglas fir, hemlock, grand fir, pachistma, bedstraw, clintonia, Libo, Vasc
Topography: sideslope
Landform: Wallace
Climate:
Erosion:
Aspect: west - southwest
Elevation: 4240 feet
Drainage:
Stoniness:
Remarks:

Slope: 10 percent
Infiltration:
Permeability:
Soil temp. at 50 cm:
Salt or alkali:

Pedon Description

O1/O2 10-0 centimeters. Litter, needles.

A2 0-5 centimeters. Gray to light gray (10YR 6/1) gravelly fine sandy loam; weak fine granular structure; loose, very friable, nonsticky and nonplastic; moderately acid pH 5.6; 41 percent gravels by weight; clear wavy boundary.

B21 5-23 centimeters. Dark yellowish brown (10YR 4/4) gravelly silt loam; weak fine granular structure; loose, very friable, nonsticky and nonplastic; 35 percent gravels by weight, 10 percent cobbles; strongly acid pH 5.2; many very fine, fine, medium, and coarse roots; abrupt wavy boundary.

B22 23-38 centimeters. Dark yellowish brown (10YR 4/6)

gravelly silt loam; weak very fine and fine subangular blocky structure; loose, very friable, nonsticky and nonplastic; 38 percent gravels by weight, 10 percent cobbles; common very fine, fine, coarse and many medium roots; strongly acid pH 5.3; abrupt wavy boundary.

IIA2 38-53 centimeters. Yellowish brown (10YR 5/4) very gravelly coarse sandy loam; massive structure; firm, slightly hard, nonsticky and nonplastic; 65 percent gravels by weight; few fine and medium roots; strongly acid pH 5.1; abrupt wavy boundary.

IIIC 53-102 centimeters. Brownish yellow (10YR 6/6) mixed with pale yellow (2.5Y 7/4) silt loam; massive structure; massive structure; very firm, very hard, sticky and plastic; 20 percent gravels by weight; few very fine roots; very strongly acid pH 4.8; few thin clay films on ped faces and in pores; slow percolation.

Note: IIA2 and IIIC are from different times. IIIC has clay pick up and appears to be some type of well weathered material (hard with very little rock content). Very few roots penetrate clay layer.

Pedon: Unnamed Gravelly Fine Sandy Loam B6-MT-27120 (Roderick Butte) Date: August 1986

Sample No.	Horizon	Depth	pH paste	EC*10^3	% Water at Saturation	Available P	Sesquioxides: Di-Citrate Fe	Sesquioxides: Extract Al	Sesquioxides: Pyrophosphate Fe	Sesquioxides: Extract Al	Spodic
		cm		mmhos/cm		ppm	%				
	O1/O2	10- 0	NS	NS	NS	NS					
1	A2	0- 5	5.6	0.22	30	1.0					
2	B21	5- 23	5.2	0.15	75	2.7					
3	B22	23- 38	5.3	0.18	63	2.8					
4	IIA2	38- 53	5.1	0.27	23	1.6					
5	IIIC	53-102	4.8	0.12	31	1.2					

Sample No.	Exchangeable Ions: Ca	Mg	Na	K	Ext. Acidity: H	CEC	Base Saturation	OM	OC	N	C:N	Soil Fraction	NaF pH
	meq/100 gms						%	%			ratio		
	NS	NS	NS	NS	NS	NS		NS	NS	NS		NS	NS
1	4.2	0.4	0.1	0.1	1.9	5.1	72	0.34	0.20	0.015	13	0.59	7.9
2	5.5	0.6	0.2	0.6	23.4	23.0	23	4.00	2.32	0.073	32	0.65	10.9
3	7.4	0.7	0.2	0.6	21.1	26.1	30	3.68	2.14	0.068	32	0.62	10.7
4	4.2	0.9	0.0	0.1	3.1	7.3	63	0.56	0.33	0.021	16	0.35	8.4
5	3.9	1.3	0.0	0.2	2.5	6.8	68	0.19	0.11	0.016	7	0.80	8.0

Remarks: CEC's and nitrogens were run on the Technicon autoanalyzer.
CEC's were leached with 10% acidified NaCl.
Extractable cations were run on the Jarrel ash atomic absorption.
NS - no sample

Analysis by: Anita L. Falen

Pedon: Unnamed Gravelly Fine Sandy Loam 86-MT-27120 (Roderick Butte) Date: August 1986

	Particle Size Distribution (mm)								Gravel & Stone		
Depth	VCS	CS	MS	FS	VFS	TS	TSi	TC	>2 mm		Textural
	2-1.0	1-0.5	0.5-0.25	0.25-0.1	0.1-0.05	2-0.05	0.05-0.002	<0.002	wt.	vol.	Classes
cm	----------	----------	----------	----------	----------	----------	----------	----------	-------	-------	
						%				%	
10- 0	NS	NS	NS	NS	NS	NS	NS	NS	NS		NS
0- 5	5.37	7.78	5.88	11.98	19.16	50.15	44.19	5.66	41		Gr. fine sandy loam
5- 23	6.13	7.22	3.00	5.20	10.85	32.40	59.49	8.11	35		Gr. silt loam
23- 38	5.20	6.93	2.72	5.10	9.92	29.86	59.63	10.52	38		Gr. silt loam
38- 53	17.44	19.84	8.11	8.61	6.41	60.42	30.80	8.79	65		V. gr. coarse sandy loam
53-102	3.36	4.32	3.00	5.58	9.25	25.52	53.49	21.00	20		Silt loam

	Silt Size Distribution (mm)					Water Content		Liquid	Plastic	Plastic
Depth	CoSi	Msi	Fsi	Bulk Density		1/3	15	Limit	Limit	Index
	0.05-0.02	0.02-0.005	0.005-0.002	Clod	Core	Bar	Bar			
cm	----------	% ----------		------ g/cc ------		------ % ------		----------	% ----------	
10- 0						NS	NS			
0- 5						15.99	3.12			
5- 23						43.74	13.93			
23- 38						39.32	12.31			
38- 53						14.80	5.46			
53-102						20.85	8.36			

Remarks: Samples were run by the pipette method, 5% Na hexametaphosphate added, samples were shaken two days.
NS - no sample

Analysis by: Anita L. Falen

SMOOT CR.

FOREST SERVICE — SOIL DESCRIPTION 86-MT-27121

1. SOIL SERIES, TYPE, PHASE	MAP SYMBOL	CLASSIFICATION	MODAL OR INTEGRADE TO	DATE	BY	PHO. NO.	STOP NO.
				9/30/85	MC		

2. AREA	FOREST	RANGER DISTRICT	STATE	COUNTY	LOCATION
Smoot Creek	Kootenai	D-2	MT	Lincoln	Sec. 8 T. 35N R. 31W

3. PARENT ROCK	FORMATION NAME	MINERALS	TEXTURE	FAULTING	WEATHERING	SURFACE STONE AND ROCK %
Argellitic Limestone	Wallace					

4. LANDFORM	SLOPE	SINGLE	COMPLEX	ASPECT	ELEVATION	EROSION	GULLIES	ALKALI	SALINES
Sideslope	20%			W	3800'				

5. CLIMATIC ZONE (veg.)	PRECIP. Inches	AV. TEMP. °F	LITTER TYPE	INFILTRATION	PERCOLATION	STORAGE	DRAINAGE CLASS	WATER TABLE (Ft.)
Tshe/Clun								

6. HORIZON	DEPTH	COLOR Dry, Moist, Crushed	Mottling	TEXTURE	STRUCTURE	CONSISTENCE Dry, Moist Wet, Cem.	Clay Films	Stone Rock % Vol.	Roots	Pores		REACTION (pH)	BOUNDARY	PERCOLATION CLASS
O1-O2	40%/0-0cm													
A2	0-1½"/0-3cm	10yr 6/2		sil		vfr so os op								
B21	1½-8" 3-20cm	10yr 4/4		sil	1f gr	vfr so os op		<5	2vf 3f 2m 3c			6.5-6.7	cw	
B22	8-16" 20-40cm	10yr 4/6		sil	1 f+m sbk	fr so ss sp		5	1vf 3f 2c 3m			↕	cw	
B23	16-24" 40-56cm	7.5yr 5/6		sil	1 f+m sbk	fr so ss sp		10	2vf+f 1m			↕	cw	
IIA21	24-28" 56-71cm	2.5Y 6/4		vgr vfs	om	fr sh os op		vgr-vfs 40	1m			↕	AW	
IIA22	28-32" 71-81cm	2.5Y 6/4		vgr vfs	om	fr sh os op		vgr-vfs 45	1vf+f			↕	cw	
IIIC	81-137+	2.5Y 5/4		exgr fs	om	fi sh os op		gr+co 50-70	1rf			6.5-6.7	—	

Notes: Large pocket of sand in B22; IIA's + IIIC is coarser than normal till — more sand; entire landform has sand layer below volcanic ash with coarse gravels mixed deeper; has rolling topography with some evidence of old water movement at depth; Smoot Cr. ...e conversion ≈ 60 yr old close spaced LPP — ... windrowing Organ... ash in piles

2500-... (4/61)

-49-

7. SO[illegible]S, TYPE PHASE	MAP SYMBOL	SLOPE %	ASPECT	ELEVATION Ft.	DATE	BY	PHO[illegible]	STOP NO.
8. AREA	FOREST	RANGER DISTRICT	STATE	COUNTY	LOCATION SEC. T. R.			

9. (Species) TREES	(Amount)	(Species) SHRUBS	(Amount)	(Species) FORBS	(Amount)	(Species) GRASSES	(Amount)
LPP		pachistama		clintonia			
DF		Alder		[illegible]			
Larch		Oregon grape		[illegible]			
		Libo		[illegible]			
		Thimble berry					
		Pyun					
		Chum					
		Caca					
		Vasc					
		Rose					
10.	100%		100%		100%		100%

11. SUITABILITY ESTIMATE FOR	TENTATIVE CLASSES I	II	III	IV	V
a. Erosion Hazard					
b. Range					
c. Timber					
d. Water Storage					
e.					
f.					
g.					
h.					
i.					

12. MEASURED INTERPRETATIVE DATA

GPO 909746

Unnamed Gravely Silt Loam 86-MT-27121 (Smoot Creek)

Classification:

General Site Characteristics

Location: Lincoln County, Montana; section 8, T. 35N., R. 31W.
Forest: Kootenai National Forest
Area: Smoot Creek, D-2 Ranger District
Described by/Date: Marci Gerhardt on September 29, 1985
Parent material: argillitic limestone
Habitat type: Tshe/Clun habitat; larch, lodgepole, Douglas fir, alder, Oregon grape, thimble berry, Pyun, Chum, pachistma, clintonia, Libo, Caca, Vasc, rose
Topography: sideslope
Landform: Wallace
Climate:
Erosion:
Aspect: west
Elevation: 3800 feet
Drainage:
Stoniness:
Remarks:

Slope: 20 percent
Infiltration:
Permeability:
Soil temp. at 50 cm:
Salt or alkali:

Pedon Description

O1/O2 10-0 centimeters. Litter, needles.

A2 0-3 centimeters. Light brownish gray (10YR 6/2) gravelly silt loam; loose, very friable, nonsticky and nonplastic.

B21 3-20 centimeters. Dark yellowish brown (10YR 4/4) gravelly silt loam; weak fine granular structure; loose, very friable, nonsticky and nonplastic; 38 percent gravels by weight; common very fine and medium, many fine and coarse roots; very strongly acid pH 4.9; clear wavy boundary.

B22 20-40 centimeters. Dark yellowish brown (10YR 4/6) gravelly silt loam; weak fine and medium subangular blocky structure; loose, friable, slightly sticky and slightly plastic; 33 percent gravels by weight; few very fine, common coarse, many fine and medium roots; strongly acid pH

5.4; clear wavy boundary.

B23 40-56 centimeters. Strong brown (7.5YR 5/6) gravelly silt loam; weak fine and medium subangular blocky structure; loose, friable, slightly sticky and slightly plastic; 38 percent gravels by weight; common very fine and fine, few medium roots; strongly acid pH 5.2; clear wavy boundary.

IIA21 56-71 centimeters. Light yellowish brown (2.5Y 6/4) no lab sample (very gravelly very fine sand); massive structure; loose, friable, nonsticky and nonplastic; approximately 40 percent gravels and cobbles; few medium roots; noneffervescent; abrupt wavy boundary.

IIA22 71-81 centimeters. Light yellowish brown (2.5Y 6/4) gravelly fine sandy loam; massive structure; slightly hard, friable, nonsticky and nonplastic; 39 percent gravels by weight; few very fine and fine roots; strongly acid pH 5.5; clear wavy boundary.

IIIC 81-137+ centimeters. Light olive brown (2.5Y 5/4) very gravelly fine sandy loam; massive structure; slightly hard, firm, nonsticky and nonplastic; 55 percent gravels by weight; few very fine roots; strongly acid pH 5.4.

Note: Large pocket of sand in B22. IIA's and IIIC is coarser than normal till - more sand. Entire landform has layer below volcanic ash with coarse gravels mixed deeper. Has rolling topography with some evidence of old water movement at depth. Smoot Creek has conversion approximately 60 years old close spaced lodgepole pine over windrowing organic and ash in piles.

Pedon: Unnamed Gravelly Silt Loam 86-MT-27121 (Smoot Creek) Date: August 1986

Sample No.	Horizon	Depth	pH paste	EC*10^3	% Water at Saturation	Available P	Sesquioxides: Di-Citrate Extract Fe	Sesquioxides: Di-Citrate Extract Al	Sesquioxides: Pyrophosphate Extract Fe	Sesquioxides: Pyrophosphate Extract Al	Spodic
		cm		mmhos/cm		ppm	%				
	O1/O2	10- 0	NS	NS	NS	NS					
	A2	0- 3	NS	NS	NS	NS					
1	B21	3- 20	4.9	0.18	62	4.1					
2	B22	20- 40	5.4	0.12	63	2.1					
3	B23	40- 56	5.2	0.14	54	1.7					
	IIA21	56- 71	NS	NS	NS	NS					
4	IIA22	71- 81	5.5	0.18	33	1.1					
5	IIIC	81-137	5.4	0.16	27	1.4					

Sample No.	Exchangeable Ions: Ca	Mg	Na	K	Ext. Acidity: H	CEC	Base Saturation	OM	OC	N	C:N	Soil Fraction	NaF pH
	meq/100 gms						%	%			ratio		
	NS	NS	NS	NS	NS	NS		NS	NS	NS		NS	NS
	NS	NS	NS	NS	NS	NS		NS	NS	NS		NS	NS
1	3.3	0.5	0.1	0.3	20.1	16.3	17	4.26	2.48	0.095	26	0.62	10.6
2	4.8	0.4	0.2	0.3	19.6	15.1	21	1.92	1.12	0.058	19	0.67	10.4
3	4.2	0.3	0.1	0.3	15.7	14.9	24	1.97	1.15	0.055	21	0.62	10.3
	NS	NS	NS	NS	NS	NS		NS	NS	NS		NS	NS
4	4.2	0.3	0.0	0.1	1.1	4.6	81	0.16	0.09	0.010	9	0.61	7.7
5	5.3	0.6	0.0	0.1	1.5	6.0	80	0.24	0.14	0.014	10	0.45	7.7

Remarks: CEC's and nitrogens were run on the Technicon autoanalyzer.
CEC's were leached with 10% acidified NaCl.
Extractable cations were run on the Jarrel Ash atomic absorption.
NS - no sample

Analysis by: Anita L. Falen

Pedon: Unnamed Gravelly Silt Loam 86-MT-27121 (Smoot Creek) Date: August 1986

	Particle Size Distribution (mm)								Gravel & Stone		
Depth	VCS	CS	MS	FS	VFS	TS	TSi	TC	>2 mm		Textural
	2-1.0	1-0.5	0.5-0.25	0.25-0.1	0.1-0.05	2-0.05	0.05-0.002	<0.002	wt.	vol.	Classes
cm	%								%		
10- 0	NS	NS	NS	NS	NS	NS	NS	NS	NS		NS
0- 3	NS	NS	NS	NS	NS	NS	NS	NS	NS		NS
3- 20	3.77	5.52	3.41	7.92	1.42	34.81	55.67	9.52	38		Gr. silt loam
20- 40	3.79	4.94	3.00	6.70	14.13	32.55	58.71	8.75	33		Gr. silt loam
40- 56	3.12	4.74	2.74	8.85	15.90	35.34	56.01	8.65	38		Gr. silt loam
56- 71	NS	NS	NS	NS	NS	NS	NS	NS	NS		NS
71- 81	5.57	7.93	4.85	9.36	17.94	45.65	48.76	5.60	39		Gr. fine sandy loam
81-137	7.37	11.86	8.92	14.38	17.04	59.56	33.84	6.60	55		V. gr. fine sandy loam

	Silt Size Distribution (mm)					Water Content		Liquid	Plastic	Plastic
Depth	CoSi	Msi	Fsi	Bulk Density		1/3	15	Limit	Limit	Index
	0.05-0.02	0.02-0.005	0.005-0.002	Clod	Core	Bar	Bar			
cm	%			g/cc		%		%		
10- 0						NS	NS			
0- 3						NS	NS			
3- 20						28.37	10.09			
20- 40						31.63	11.28			
40- 56						27.19	11.54			
56- 71						NS	NS			
71- 81						14.76	2.90			
81-137						13.07	3.73			

Remarks: Samples were run by the pipette method, 5% Na hexametaphosphate added samples were shaken two days.
NS - no sample

Analysis by: Anita L. Falen

Pedon: Kootenai National Forest - Lou Kuennen

Date: June 1986

Sample No.	Horizon	Depth	pH paste	EC*10^3	% Water at Saturation	Available P	Sesquioxides				Spodic
							Di-Citrate Fe	Extract Al	Pyrophosphate Fe	Extract Al	
		cm		mmhos/cm		ppm	%				
C	meadow	4	6.0	0.9	88	3.1					
D	hill	6	5.1	0.3	46	12.3					
E	N.meadow	6	5.7	0.6	88	1.1					
F	meadow	14	6.7	0.9	68	1.0					
G	meadow	20	6.3	0.4	64	1.8					

Sample No.	Exchangeable Ions				Ext. Acidity	CEC	Base	OM	OC	N	C:N	Soil	
	Ca	Mg	Na	K	H		Saturation					Fraction	NaF pH
	meq/100 gms						%	%			ratio		
C	32.0	11.5	1.3	0.7	19.7	55.0	70	14.97	8.70	0.700	12	0.77	7.9
D	5.6	1.8	0.2	0.8	8.5	10.8	50	1.54	0.89	0.078	11	1.00	8.6
E	32.0	12.3	0.5	0.5	26.9	64.5	63	13.41	7.80	0.548	14	0.71	8.9
F	37.6	14.7	0.9	0.5	14.1	54.0	79	4.97	2.89	0.331	9	1.00	9.2
G	29.2	12.7	0.6	0.6	12.9	50.0	77	2.76	1.60	0.142	11	0.83	9.1

Remarks: Samples were leached with acidified NaCl for CEC.
CEC's and nitrogens were run on the Technicon autoanalyzer.
Extractable cations were run on the Jarrel Ash atomic absorption.

Analysis by: Anita L. Falen

Pedon: Lou Kuennen - Kootenai National Forest Date: May 1986

		Particle Size Distribution (mm)								Gravel & Stone		
Depth		VCS	CS	MS	FS	VFS	TS	TSi	TC	>2 mm		Textural
		2-1.0	1-0.5	0.5-0.25	0.25-0.1	0.1-0.05	2-0.05	0.05-0.002	<0.002	wt.	vol.	Classes
cm		%								%		
(C)	1	0.41	0.42	0.47	1.45	2.65	5.41	40.45	54.14			Silty clay
(E)	2	0.52	1.07	0.91	1.57	1.76	5.82	35.99	58.19			Clay
(F)	3	0.24	0.30	0.40	1.50	3.70	6.14	39.07	54.79			Clay
(G)	4	0.10	0.16	0.16	0.74	4.25	5.41	37.07	57.52			Clay

	Silt Size Distribution (mm)					Water Content		Liquid	Plastic	Plastic
Depth	CoSi	MSi	FSi	Bulk Density		1/3	15	Limit	Limit	Index
	0.05-0.02	0.02-0.005	0.005-0.002	Clod	Core	Bar	Bar			
cm	%			g/cc		%		%		

Remarks: Samples were run by the centrifuge method.
Five percent sodium hexametaphosphate was added and samples were sonified.

Analysis by: Anita L. Falen

Pedon: Lou Kuennen (Smoot Creek Study) Date: June 1986

Sample No.	Horizon	Depth	pH paste	EC*10^3	% Water at Saturation	Available P	Sesquioxides: Di-Citrate Fe	Sesquioxides: Extract Al	Sesquioxides: Pyrophosphate Fe	Sesquioxides: Extract Al	Spodic
		cm		mmhos/cm		ppm	%				
	severe		4.85								
	severe1		4.81								
	severe2		4.81								
	severe3		4.84								
	severe4		4.89								
	control1	0-10	4.45								
	control2	0-10	4.93								
	control3	0-10	4.58								

Sample No.	Exchangeable Ions: Ca	Mg	Na	K	Ext. Acidity: H	CEC	Base Saturation	OM	OC	N	C:N	Soil Fraction	NaF pH
	meq/100 gms						%	%			ratio		
severe	2.9	0.7	0.2	0.4		21.1	20	4.99	2.90			0.88	
severe1	3.0	1.1	0.3	0.5		17.5	28	3.31	1.92			0.79	
severe2	2.7	0.6	0.2	0.3		11.0	35	3.10	1.80			0.72	
severe3	5.6	1.0	0.2	0.7		20.0	38	4.57	2.65			0.75	
severe4	6.3	1.1	0.3	0.5		20.0	41	4.25	2.47			0.72	
control1	3.0	0.3	0.2	0.4		16.4	24	3.36	1.96			0.83	
control2	3.3	0.4	0.2	0.4		18.3	24	4.36	2.53			0.77	
control3	10.5	2.7	0.2	0.4		15.7	88	2.58	1.50			0.81	

Remarks: Samples were leached with acidified NaCl for CEC.
CEC's were run on the Technicon autoanlyzer.
Extractable cations were run on the Jarrel Ash atomic absorption.

Analysis by: Anita L. Falen