307 Stonewell family, 0 to 20 percent slopes

Map Unit Components	**Stonewell family (80%)**
Geomorphic Position	Gently sloping mountain sideslopes, outwash terraces, cinder cones, in proximity to pumice cones.
Typical Vegetation Series	Lodgepole Pine Forest Red Fir Forest

Soil Profile Description

Surface Soil	0-14" light brownish gray and light gray very cindery loamy coarse sand, single grain, 40-50% gravel size pumice cinders, strongly to medium acid.
Subsoil	
Substratum	14-36" light gray extremely cindery loamy coarse sand, single grain, 80% gravel size pumice cinders, slightly acid.

Soil Properties & Management Interpretations

Forest Survey Site Class	7
Adapted Species Group	LPP, BL
Soil Erodibility	Low
AWC for Profile Depth	7.0-8.0
AWC for Surface 24"	4.0-5.0
Seedling Survival Potential	Low
Plantability Potential	High
Hydrologic Soil Group	A
Potential for Roadbed Damage	Moderate
Inclusions (20%)	Rock outcrop, volcanic, obsidian flows
Remarks:	

308 Stoneyford-Goulding families complex, 40 to 80 percent slopes

Map Unit Components	Stoneyford family (60%)	Goulding family (30%)
Geomorphic Position	Steep to very steep, dissected mountain sideslopes.	Steep to very steep, dissected mountain sideslopes.
Typical Vegetation Series	Low Montane & Foothill Mixed Chaparral Chamise Chaparral Whiteleaf Manzanita Chaparral	Low Montane & Foothill Mixed Chaparral Chamise Chaparral Whiteleaf Manzanita Chaparral

Soil Profile Description

Surface Soil	0-3" brown loam, moderate very fine subangular blocky structure, 13% gravel and cobbles, neutral.	0-7" yellowish brown very gravelly loam, moderate medium subangular blocky structure, 40% gravel and cobbles, neutral.
Subsoil	3-17" brown gravelly clay loam and strong brown gravelly sandy clay loam, weak very fine and moderate fine subangular blocky structure, 25-35% gravel and cobbles, neutral.	7-15" yellowish brown very gravelly loam, moderate medium subangular blocky structure, 55% gravel and cobbles, neutral.
Substratum	17-24" well fractured partially weathered metavolcanic rock.	15-20" fractured metavolcanic rock.

Soil Properties & Management Interpretations

Forest Survey Site Class	7	7
Adapted Species Group	BL	BL
Soil Erodibility	Moderate	Moderate
AWC for Profile Depth	1.8-3.3	0.7-1.9
AWC for Surface 24"	1.8-3.3	0.7-1.9
Seedling Survival Potential	V. Low	V. Low-Low
Plantability Potential	Low	V. Low-Low
Hydrologic Soil Group	D	D
Potential for Roadbed Damage	Moderate	Low
Inclusions (10%)	Rock outcrop, metamorphic Henneke family Parrish family	
Remarks:		

309 Tallac family-Lithic Xerumbrepts association, 40 to 70 percent slopes

Map Unit Components	Tallac family (45%)	Lithic Xerumbrepts (30%)
Geomorphic Position	Dissected steep to very steep, linear, upper mountain slopes.	Ridge tops and very steep, linear, mountain sideslopes.
Typical Vegetation Series	White Fir Forest	Upper Montane Mixed Chaparral

Soil Profile Description

Surface Soil	0-2" very dark grayish brown very gravelly loam, weak fine granular structure, 40% gravel, slightly acid.	0-12" very dark grayish brown very cobbly fine sandy loam and dark yellowish brown cobbly loamy sand, moderate very fine granular and weak medium subangular blocky structure, 30-40% cobbles and gravel, medium to very strongly acid.
Subsoil	2-11" dark brown very gravelly loam, moderate medium subangular blocky structure, 40% gravel, very strongly acid.	
Substratum	11-24" brown extremely cobbly loam, moderate medium subangular blocky structure, 80% cobbles and gravel, strongly acid. 24-30" highly fractured, slightly weathered schist.	12-19" yellowish brown very cobbly loamy sand, single grain, 55% gravel and cobbles, medium acid. 19-21" moderately weathered and fractured quartz monzonite.

Soil Properties & Management Interpretations

Forest Survey Site Class	5-6	6-7
Adapted Species Group	WF, JP, SP	BL, WF, JP, SP
Soil Erodibility	Low	Low
AWC for Profile Depth	1.9-4.8	0.5-1.5
AWC for Surface 24"	1.7-2.6	0.6-1.4
Seedling Survival Potential	Low-Moderate	V. Low-Low
Plantability Potential	High-Low	Low
Hydrologic Soil Group	B	B-C
Potential for Roadbed Damage	Moderate	Moderate
Inclusions (25%)	Nanny family Skymor family Rock outcrop, metamorphic	
Remarks:		

310 Tallac-Yollabolly families association, 20 to 40 percent slopes

Map Unit Components	Tallac family (55%)	Yollabolly family (30%)
Geomorphic Position	Moderately steep dissected linear mountain sideslopes.	Moderately steep dissected mountain sideslopes.
Typical Vegetation Series	Red Fir - White Fir Forest Red Fir Forest	Barren/Pussy Paws

Soil Profile Description

Surface Soil	0-2" very dark grayish brown very gravelly loam, weak fine granular structure, 40% gravel, slightly acid.	0-4" dark brown very gravelly loam, weak fine granular structure, 35% gravel, strongly acid.
Subsoil	2-11" dark brown very gravelly loam, moderate medium subangular blocky structure, 40% gravel, very strongly acid.	
Substratum	11-24" brown extremely cobbly loam, moderate medium subangular blocky structure, 80% cobbles and gravel, strongly acid. 24-30" highly fractured, slightly weathered schist.	4-6" yellowish brown very gravelly loam, massive 30% gravel, 10% stones, very strongly acid. 6-20" highly fractured, slightly weathered schist.

Soil Properties & Management Interpretations

Forest Survey Site Class	5-6	7
Adapted Species Group	WF, JP, SP	GL, BL
Soil Erodibility	Low	Moderate
AWC for Profile Depth	1.9-4.8	0.5-1.2
AWC for Surface 24"	1.7-2.6	0.5-1.2
Seedling Survival Potential	Low-Moderate	V. Low-Low
Plantability Potential	High-Low	V. Low
Hydrologic Soil Group	B	D
Potential for Roadbed Damage	Moderate	Low
Inclusions (15%)	Rock outcrop, metamorphic Typic Cryaquolls	
Remarks:		

311 Tallac-Yollabolly families association, 40 to 60 percent slopes

Map Unit Components	Tallac family (60%)	Yollabolly family (30%)
Geomorphic Position	Steep, dissected mountain sideslopes.	Steep, dissected mountain sideslopes.
Typical Vegetation Series	Red Fir - White Fir Forest Red Fir Forest, Mt. Alder Riparian Thicket	Barren/Pussy Paws Barren Stipa Chaparral

Soil Profile Description

Surface Soil	0-2" very dark grayish brown very gravelly loam, weak fine granular structure, 40% gravel, slightly acid.	0-4" dark brown very gravelly loam, weak fine granular structure, 35% gravel, strongly acid.
Subsoil	2-11" dark brown very gravelly loam, moderate medium subangular blocky structure, 40% gravel, very strongly acid.	
Substratum	11-24" brown extremely cobbly loam, moderate medium subangular blocky structure, 80% cobbles and gravel, strongly acid. 24-30" highly fractured, slightly weathered schist.	4-6" yellowish brown very gravelly loam, massive 30% gravel, 10% stones, very strongly acid. 6-20" highly fractured, slightly weathered schist.

Soil Properties & Management Interpretations

Forest Survey Site Class	5-6	7
Adapted Species Group	WF, JP, SP	GL, BL
Soil Erodibility	Low	Moderate
AWC for Profile Depth	1.9-4.8	0.5-1.2
AWC for Surface 24"	1.7-2.6	0.5-1.2
Seedling Survival Potential	Low-Moderate	V. Low-Low
Plantability Potential	Moderate	V. Low
Hydrologic Soil Group	B	D
Potential for Roadbed Damage	Moderate	Low
Inclusions (10%)	Rock outcrop, metamorphic Rubble land	
Remarks:		

312 Tamflat family-Rock outcrop complex, 50 to 70 percent slopes

Map Unit Components	**Tamflat family (45%)**	**Rock outcrop (35%)**
Geomorphic Position	Very steep ridge tops.	Similar position as Tamflat family.
Typical Vegetation Series	Mountain Mahogany Scrub, Upper Montane Serpentine Semi-Barrens	

Soil Profile Description

Surface Soil	0-1" brown very cobbly loam, moderate thin and medium platy structure, 58% gravel and cobbles, neutral.
Subsoil	1-19" yellowish red extremely gravelly clay loam and strong brown extremely gravelly clay, moderate medium to strong fine subangular blocky structure, 62-75% gravel and cobbles, mildly alkaline to neutral.
Substratum	19-24" high fractured peridotite rock.

Soil Properties & Management Interpretations

Forest Survey Site Class	6-7	
Adapted Species Group	BL, JP, IC, DF	
Soil Erodibility	Moderate	
AWC for Profile Depth	1.7-3.9	
AWC for Surface 24"	1.7-2.8	
Seedling Survival Potential	Low-Moderate	
Plantability Potential	Low	
Hydrologic Soil Group	C-D	D
Potential for Roadbed Damage	Low	Low
Inclusions (20%)	Parks family Toadlake family	

Remarks:

Tamflat limitations: Ca/Mg imbalance, possible toxicity and poor aeration.

313 Tamflat-Toadlake families association, 40 to 70 percent slopes

Map Unit Components	Tamflat family (55%)	Toadlake family (30%)
Geomorphic Position	Steep to very steep, linear, upper slopes and ridge tops.	Steep to very steep, dissected, linear, mountain slopes.
Typical Vegetation Series	Very open Jeffrey Pine - Incense Cedar Woodland Upper Montane Serpentine Semi-Barrens	Moderately dense Jeffrey Pine - Mixed Conifer Forest

Soil Profile Description

Surface Soil	0-1" brown very cobbly loam, moderate thin and medium platy structure, 58% gravel and cobbles, neutral.	0-10" grayish brown and light gray very gravelly loam, moderate very fine granular and very fine subangular blocky structure, 35-45% gravel and cobbles, slightly acid to neutral.
Subsoil	1-19" yellowish red extremely gravelly clay loam and strong brown extremely gravelly clay, moderate medium to strong fine subangular blocky structure, 62-75% gravel and cobbles, mildly alkaline to neutral.	10-56" light brownish gray very gravelly sandy clay loam to light yellowish brown very gravelly clay loam, moderate fine to weak coarse subangular blocky structure, 45-50% gravel and cobbles, mildly alkaline.
Substratum	19-24" high fractured peridotite rock.	56-59" hard, moderately fractured ultramafic rock.

Soil Properties & Management Interpretations

Forest Survey Site Class	6-7	5
Adapted Species Group	BL, JP, IC. DF	WF, JP, SP, WWP
Soil Erodibility	Moderate	Moderate
AWC for Profile Depth	1.7-3.9	3.5-5.8
AWC for Surface 24"	1.7-3.9	2.9-3.5
Seedling Survival Potential	Low-Moderate	Moderate-High
Plantability Potential	V. Low	Low
Hydrologic Soil Group	C-D	B
Potential for Roadbed Damage	Low	High
Inclusions (15%)	Gozem family Rock outcrop, ultramafic	
Remarks:	Tamflat limitations: Ca/Mg imbalance, possible toxicity and poor aeration. Toadlake limitation: Ca/Mg imbalance limits species.	

314 Toadlake family, 25 to 65 percent slopes

Map Unit Components	**Toadlake family (85%)**
Geomorphic Position	Moderately steep to very steep, linear, to broken mountain sideslopes.
Typical Vegetation Series	Klamath Enriched Mixed Conifer Forest, Mixed Upper Montane Coniferous Forest

Soil Profile Description

Surface Soil	0-10" grayish brown and light gray very gravelly loam, moderate very fine granular and very fine subangular blocky structure, 35-45% gravel and cobbles, slightly acid to neutral.
Subsoil	10-56" light brownish gray very gravelly sandy clay loam to light yellowish brown very gravelly clay loam, moderate fine to weak coarse subangular blocky structure, 45-50% gravel and cobbles, mildly alkaline.
Substratum	56-59" hard, moderately fractured ultramafic rock.

Soil Properties & Management Interpretations

Forest Survey Site Class	5-6
Adapted Species Group	JP, WWP, WF
Soil Erodibility	Moderate
AWC for Profile Depth	2.5-5.0
AWC for Surface 24"	2.3-3.0
Seedling Survival Potential	Moderate
Plantability Potential	High-Moderate
Hydrologic Soil Group	B
Potential for Roadbed Damage	Moderate
Inclusions (15%)	Beaughton family
Remarks:	Toadlake limitations: Ca/Mg limits species and productivity. Beaughton limitations: Ca/Mg imbalance limits species and productivity.

315 Toadlake-Gozem families association, 50 to 80 percent slopes

Map Unit Components	Toadlake family (50%)	Gozem family (30%)
Geomorphic Position	Steep to very steep, dissected, linear, mountain sideslopes, ridge tops, and scree slopes.	Ridge tops, ravines of very steep slopes.
Typical Vegetation Series	Mixed Upper Montane Coniferous Forest	Very Open Jeffrey Pine - Incense Cedar Woodland Upper Montane Serpentine Semi-Barrens

Soil Profile Description

Surface Soil	0-10" grayish brown and light gray very gravelly loam, moderate very fine granular and very fine subangular blocky structure, 35-45% gravel and cobbles, slightly acid to neutral.	0-4" yellowish brown very cobbly loam moderate fine and medium subangular blocky structure, 35% gravel and cobbles, slightly acid.
Subsoil	10-56" light brownish gray very gravelly sandy clay loam to light yellowish brown very gravelly clay loam, moderate fine to weak coarse subangular blocky structure, 45-50% gravel and cobbles, mildly alkaline.	4-18" yellowish brown very cobbly and very gravelly loam, moderate to strong medium subangular blocky structure, 45 to 55% gravel and cobbles, neutral to slightly acid.
Substratum	56-59" hard, moderately fractured ultramafic rock.	18-22"+ highly fractured serpentinized peridotite bedrock.

Soil Properties & Management Interpretations

Forest Survey Site Class	5	7
Adapted Species Group	JP, WWP, WF	BL, GL
Soil Erodibility	Moderate	Moderate
AWC for Profile Depth	3.5-5.6	1.5-2.4
AWC for Surface 24"	2.3-3.0	1.5-2.4
Seedling Survival Potential	Low	Low-Moderate
Plantability Potential	Low-V. Low	V. Low
Hydrologic Soil Group	B-C	C
Potential for Roadbed Damage	Moderate	Low

Inclusions (20%)

Rock outcrop, ultramafic
Rock rubble, ultramafic
Merkel family
Grell family

Remarks:

Toadlake limitations: Ca/Mg imbalances limits species. Gozem limitations: Ca/Mg imbalance, possible toxicity and poor aeration, shallow depth.

316 Toadlake family-Lithic Haploxeralfs association, 40 to 60 percent slopes

Map Unit Components	Toadlake family (60%)	Lithic Haploxeralfs (30%)
Geomorphic Position	Steep mountain sideslopes, ground moraine.	Ridge tops and steep mountain sideslopes.
Typical Vegetation Series	Mixed Upper Montane Coniferous Forest Jeffrey Pine Mixed Conifer Forest	Chaparral, Jeffrey Pine - Incense Cedar Woodland

Soil Profile Description

Surface Soil	0-10" grayish brown and light gray very gravelly loam, moderate very fine granular and very fine subangular blocky structure, 35-45% gravel and cobbles, slightly acid to neutral.	0-4" pale brown gravelly loam and yellowish brown very gravelly loam, moderate coarse platy and moderate medium subangular blocky structure, 20 to 35 percent gravel, slightly acid to neutral.
Subsoil	10-56" light brownish gray very gravelly sandy clay loam to light yellowish brown very gravelly clay loam, moderate fine to weak coarse subangular blocky structure, 45-50% gravel and cobbles, mildly alkaline.	4-17" light yellowish brown very gravelly loam to yellowish brown very gravelly sandy clay loam, moderate fine, medium and coarse subangular blocky structure, 40 to 50 percent gravel, mildly to moderately alkaline.
Substratum	56-59" hard, moderately fractured ultramafic rock.	17-24" moderately fractured serpentine rock.

Soil Properties & Management Interpretations

Forest Survey Site Class	5	7
Adapted Species Group	JP, WWP, WF	GL, BL
Soil Erodibility	Moderate	Moderate
AWC for Profile Depth	3.5-5.6	1.3-1.8
AWC for Surface 24"	2.0-3.0	1.3-1.7
Seedling Survival Potential	Low-Moderate	V. Low-Low
Plantability Potential	V. Low-Low	V. Low
Hydrologic Soil Group	B-C	C-D
Potential for Roadbed Damage	Moderate	Low
Inclusions (10%)	Rock outcrop, ultramafic Gozem family	
Remarks:	Toadlake and Lithic Haploxeralfs limitations: Ca/Mg imbalance and possible toxicity.	

317 Toadlake-Olete families association, 40 to 60 percent slopes

Map Unit Components	Toadlake family (65%)	Olete family (20%)
Geomorphic Position	Steep, linear, mountain sideslopes.	Steep, mountain sideslopes.
Typical Vegetation Series	Jeffrey Pine Mixed Conifer Forest	Klamath Enriched Mixed Conifer Forest, Jeffrey Pine Mixed Conifer Forest

Soil Profile Description

Surface Soil	0-10" grayish brown and light gray very gravelly loam, moderate very fine granular and very fine subangular blocky structure, 35-45% gravel and cobbles, slightly acid to neutral.	0-6" pale brown gravelly loam, weak very fine granular structure, 30% gravel, slightly acid.
Subsoil	10-56" light brownish gray very gravelly sandy clay loam to light yellowish brown very gravelly clay loam, moderate fine to weak coarse subangular blocky structure, 45-50% gravel and cobbles, mildly alkaline.	6-35" light yellowish brown very gravelly loam to brownish yellow very cobbly heavy loam, weak very fine to coarse subangular blocky structure, 35-55% gravel and cobbles, slightly acid to neutral.
Substratum	56-59" hard, moderately fractured ultramafic rock.	35-38" fractured ultramafic rock.

Soil Properties & Management Interpretations

Forest Survey Site Class	5	5
Adapted Species Group	JP, WWP, WF	DF, PP, SP
Soil Erodibility	Moderate	Low
AWC for Profile Depth	3.0-5.0	2.5-4.0
AWC for Surface 24"	2.3-2.1	1.6-3.1
Seedling Survival Potential	Moderate	Moderate-Low
Plantability Potential	High-Low	Moderate
Hydrologic Soil Group	B	B
Potential for Roadbed Damage	Moderate	Moderate
Inclusions (15%)	Rubble land, ultramafic Gozem family	
Remarks:	Ca/Mg imbalance, may limit species and growth on soils from ultramafics.	

318 Toadlake family-Rock outcrop complex, 55 to 70 percent slopes

Map Unit Components	Toadlake family (55%)	Rock outcrop (20%)
Geomorphic Position	Very steep, dissected, linear, mountain sideslopes and ridge tops.	Similar position as Toadlake family.
Typical Vegetation Series	Mixed Upper Montane Coniferous Forest	

Soil Profile Description

Surface Soil	0-10" grayish brown and light gray very gravelly loam, moderate very fine granular and very fine subangular blocky structure, 35-45% gravel and cobbles, slightly acid to neutral.
Subsoil	10-56" light brownish gray very gravelly sandy clay loam to light yellowish brown very gravelly clay loam, moderate fine to weak coarse subangular blocky structure, 45-50% gravel and cobbles, mildly alkaline.
Substratum	56-59" hard, moderately fractured ultramafic rock.

Soil Properties & Management Interpretations

Forest Survey Site Class	5	
Adapted Species Group	JP, WWP, WF	
Soil Erodibility	Moderate	
AWC for Profile Depth	3.5-5.6	
AWC for Surface 24"	2.3-3.0	
Seedling Survival Potential	Low	
Plantability Potential	Low-V. Low	
Hydrologic Soil Group	B-C	D
Potential for Roadbed Damage	Moderate	Low
Inclusions (25%)	Gozem family Rock rubble, ultramafic	

Remarks:

Serpentine mineralogy limits adapted species, rock outcrop may be in form of talus slopes, often has rubble overburden.

319 Toadlake family-Rubble land complex, 20 to 40 percent slopes

Map Unit Components	Toadlake family (65%)	Rubble land (20%)
Geomorphic Position	Moderately steep, moraines and sideslopes of glacial valleys.	Similar position as Toadlake family.
Typical Vegetation Series	Open stands of Mixed Upper Montane Coniferous Forest	

Soil Profile Description

Surface Soil	0-10" grayish brown and light gray very gravelly loam, moderate very fine granular and very fine subangular blocky structure, 35-45% gravel and cobbles, slightly acid to neutral.
Subsoil	10-56" light brownish gray very gravelly sandy clay loam to light yellowish brown very gravelly clay loam, moderate fine to weak coarse subangular blocky structure, 45-50% gravel and cobbles, mildly alkaline.
Substratum	56-59" hard, moderately fractured ultramafic rock.

Soil Properties & Management Interpretations

Forest Survey Site Class	5	
Adapted Species Group	JP, WWP, WF	
Soil Erodibility	Moderate	
AWC for Profile Depth	3.5-5.6	
AWC for Surface 24"	2.0-3.0	
Seedling Survival Potential	Moderate	
Plantability Potential	Low	
Hydrologic Soil Group	B-C	D
Potential for Roadbed Damage	Moderate	Low
Inclusions (15%)	Gozem family Rock outcrop, ultramafic	
Remarks:	Toadlake limitation: Ca/Mg imbalance limits species.	

320 Toadlake family-Rubble land association, 30 to 60 percent slopes

Map Unit Components	Toadlake family (50%)	Rubble land (25%)
Geomorphic Position	Moderately steep to steep, dissected, mountain slopes and moraines.	On ridges of slopes as described for Toadlake family.
Typical Vegetation Series	Mixed Upper Montane Coniferous Forest, Jeffrey Pine Mixed Conifer Forest	

Soil Profile Description

Surface Soil	0-10" grayish brown and light gray very gravelly loam, moderate very fine granular and very fine subangular blocky structure, 35-45% gravel and cobbles, slightly acid to neutral.
Subsoil	10-56" light brownish gray very gravelly sandy clay loam to light yellowish brown very gravelly clay loam, moderate fine to weak coarse subangular blocky structure, 45-50% gravel and cobbles, mildly alkaline.
Substratum	56-59" hard, moderately fractured ultramafic rock.

Soil Properties & Management Interpretations

Forest Survey Site Class	5	
Adapted Species Group	JP, WWP, WF	
Soil Erodibility	Moderate	
AWC for Profile Depth	3.0-5.0	
AWC for Surface 24"	2.3-2.1	
Seedling Survival Potential	Moderate	
Plantability Potential	Low-V. Low	
Hydrologic Soil Group	B	D
Potential for Roadbed Damage	Moderate	Low
Inclusions (25%)	Parks family Tamflat family Rock outcrop, ultramafic	
Remarks:	Toadlake limitation: Ca/Mg imbalance limits species.	

321 Toadlake-Tamflat families complex, 40 to 70 percent slopes

Map Unit Components	Toadlake family (65%)	Tamflat family (20%)
Geomorphic Position	Steep to very steep, undissected, linear, mountain sideslopes.	Position similar to Toadlake family.
Typical Vegetation Series	Jeffrey Pine Mixed Conifer Forest	Jeffrey Pine - Incense Cedar Woodland

Soil Profile Description

Surface Soil	0-10" grayish brown and light gray very gravelly loam, moderate very fine granular and very fine subangular blocky structure, 35-45% gravel and cobbles, slightly acid to neutral.	0-1" brown very cobbly loam, moderate thin and medium platy structure, 58% gravel and cobbles, neutral.
Subsoil	10-56" light brownish gray very gravelly sandy clay loam to light yellowish brown very gravelly clay loam, moderate fine to weak coarse subangular blocky structure, 45-50% gravel and cobbles, mildly alkaline.	1-19" yellowish red extremely gravelly clay loam and strong brown extremely gravelly clay, moderate medium to strong fine subangular blocky structure, 62-75% gravel and cobbles, mildly alkaline to neutral.
Substratum	56-59" hard, moderately fractured ultramafic rock.	19-24" high fractured peridotite rock.

Soil Properties & Management Interpretations

Forest Survey Site Class	5	6-7
Adapted Species Group	JP, WWP, WF	BL, JP, IC, DF
Soil Erodibility	Moderate	Moderate
AWC for Profile Depth	3.0-5.0	1.7-3.9
AWC for Surface 24"	2.3-2.1	1.7-2.8
Seedling Survival Potential	Moderate	Low-Moderate
Plantability Potential	Low-V. Low	Low
Hydrologic Soil Group	B	C-D
Potential for Roadbed Damage	Moderate	Low
Inclusions (15%)	Rock outcrop, ultramafic Gozem family	

Remarks: Toadlake limitation: Ca/Mg imbalance limits species. Tamflat limitations: Ca/Mg imbalance, possible toxicity, and poor aeration.

322 Toadlake family, till substratum, 10 to 40 percent slopes

Map Unit Components	**Toadlake family, till substratum (75%)**
Geomorphic Position	Gentle to moderately steep, ground moraine.
Typical Vegetation Series	Mixed Upper Montane Coniferous Forest, Jeffrey Pine Mixed Conifer Forest

Soil Profile Description

Surface Soil	0-12" yellowish brown very and pale brown extremely cobbly loam, strong fine granular and moderate fine subangular blocky structure, 45-65% gravel and cobbles, strongly to medium acid.
Subsoil	12-31" pale brown very gravelly loam and clay loam, moderate fine and medium subangular blocky structure, 35-50% gravel and cobbles, slightly acid to neutral.
Substratum	31-34" hard compacted glacial till.

Soil Properties & Management Interpretations

Forest Survey Site Class	5
Adapted Species Group	JP, WWP, WF
Soil Erodibility	Moderate
AWC for Profile Depth	3.0-5.0
AWC for Surface 24"	2.3-2.1
Seedling Survival Potential	Moderate
Plantability Potential	High-Moderate
Hydrologic Soil Group	B
Potential for Roadbed Damage	Moderate
Inclusions (25%)	Merkel family, till substratum Glacial till, ultramafic
Remarks:	Toadlake limitation: Ca/Mg imbalance limits species and productivity.

323 Typic Cryaquolls-Behanin family-Entic Cryumbrepts complex, 20 to 50 percent slopes

Map Unit Components	Typic Cryaquolls (30%)	Behanin family (30%)	Entic Cryumbrepts (20%)
Geomorphic Position	Moderate steep to steep, broken moraines and cirque basins.	Linear upper mountain slopes and cirques.	Moderately steep mountain sideslopes adjacent to wet meadows.
Typical Vegetation Series	Subalpine Wet Meadows and Seeps	Upper Montane Mixed Conifer	Upper Montane and Subalpine Moist Meadows

Soil Profile Description

Surface Soil	0-7" black sandy loam grayish brown loam, strong coarse granular structure to massive, 0-10% gravel, neutral to strongly acid.	0-21" very dark grayish brown cobbly sandy loam and dark grayish brown very cobbly fine sandy loam, weak fine granular and medium subangular blocky structure, 20-45% cobbles and gravel, slightly to medium acid.	0-17" dark yellowish brown gravelly very fine sandy loam, weak very fine granular and subangular blocky structure, 15-20% gravel, slightly acid.
Subsoil	7-9" grayish brown gravelly light clay loam, massive 15% gravel and cobbles, strongly acid.		17-25" yellowish brown gravelly very fine sandy loam, weak coarse subangular blocky structure, 25% gravel, strongly acid.
Substratum	9-17" yellowish brown very cobbly sandy clay loam to brown extremely cobbly loamy sand, moderate coarse subangular blocky structure to single grain, 50-75% gravel and cobbles, slightly to strongly acid, water table.	21-40" dark grayish brown very cobbly and extremely cobbly fine sandy loam, single grain to weak fine and medium subangular blocky structure, 45-70% gravel and cobbles, slightly acid.	25-28" fractured basic metasedimentary rock.

Soil Properties & Management Interpretations

Forest Survey Site Class	7	5-6	5-7
Adapted Species Group	GL	WF, RF, JP	WF, RF, JP, BL
Soil Erodibility	Low	Low	Low
AWC for Profile Depth	Saturated	2.7-4.7	3.7-6.0
AWC for Surface 24"	Saturated	2.3-2.8	3.2-3.6
Seedling Survival Potential	Saturated	Moderate	Low
Plantability Potential	High-Moderate	High-Moderate	High-Moderate
Hydrologic Soil Group	D	A-B	B
Potential for Roadbed Damage	High	Moderate	Moderate
Inclusions (20%)	Lithic Cryumbrepts Glacial till		
Remarks:			

324 Typic Cryaquolls-Deadfall family-Entic Cryumbrepts complex, 10 to 50 percent slopes

Map Unit Components	Typic Cryaquolls (40%)	Deadfall family (25%)	Entic Cryumbrepts (20%)
Geomorphic Position	Dissected, gentle to moderately steep benches and upper slopes.	Moderately steep to steep mountain sideslopes.	Moderately steep to steep mountain sideslopes adjacent to wet meadows.
Typical Vegetation Series	Subalpine Wet Meadows and Seeps	Upper Montane Serpentine Barrens Western White Pine Subalpine Woodland	Upper Montane and Subalpine Moist Meadows

Soil Profile Description

Surface Soil	0-7" black sandy loam grayish brown loam, strong coarse granular structure to massive, 0-10% gravel, neutral to strongly acid.	0-14" pale brown and yellowish brown very gravelly sandy loam, moderate to weak fine and very fine granular structure, 35-45% gravel and cobbles, slightly acid to neutral.	0-17" dark yellowish brown gravelly very fine sandy loam, weak very fine granular and subangular blocky structure, 15-20% gravel, slightly acid.
Subsoil	7-9" grayish brown gravelly light clay loam, massive 15% gravel and cobbles, strongly acid.	14-24" yellowish brown extremely gravelly sandy loam, weak very fine granular structure, 75% gravel and cobbles, mildly alkaline.	17-25" yellowish brown gravelly very fine sandy loam, weak coarse subangular blocky structure, 25% gravel, strongly acid.
Substratum	9-17" yellowish brown very cobbly sandy clay loam to brown extremely cobbly loamy sand, moderate coarse subangular blocky structure to single grain, 50-75% gravel and cobbles, slightly to strongly acid, water table.	24-34" highly fractured ultramafic rock with coatings of soil. 34-40" ultramafic rock.	25-28" fractured basic metasedimentary rock.

Soil Properties & Management Interpretations

Forest Survey Site Class	7	7	5-7
Adapted Species Group	GL	GL	WF, RF, JP, BL
Soil Erodibility	Low	Low	Low
AWC for Profile Depth	Saturated	0.9-1.5	3.7-6.0
AWC for Surface 24"	Saturated	0.9-1.5	3.2-3.6
Seedling Survival Potential	Low	V. Low	High
Plantability Potential	High-Moderate	V. Low	High-Moderate
Hydrologic Soil Group	D	A-B	B
Potential for Roadbed Damage	High	Moderate	Moderate
Inclusions (15%)	Rock outcrop and rubble, ultramafic Lithic Cryochrepts		
Remarks:			

325 Typic Cryaquolls-Entic Cryumbrepts-Jayar family, deep association, 5 to 40 percent slopes

Map Unit Components	Typic Cryaquolls (30%)	Entic Cryumbrepts (30%)	Jayar family, deep (30%)
Geomorphic Position	Gentle, ground moraines.	Moderately steep mountain sideslopes adjacent to wet meadows.	Gentle, to moderately steep mountain sideslopes.
Typical Vegetation Series	Subalpine Wet Meadows and Seeps	Upper Montane Moist Meadows	White Fir Forest

Soil Profile Description

Surface Soil	0-7" black sandy loam grayish brown loam, strong coarse granular structure to massive, 0-10% gravel, neutral to strongly acid.	0-17" dark yellowish brown gravelly very fine sandy loam, weak very fine granular and subangular blocky structure, 15-20% gravel, slightly acid.	0-11" pale brown sandy loam, moderate to weak very fine granular structure, 20% gravel and cobbles slightly to strongly acid.
Subsoil	7-9" grayish brown gravelly light clay loam, massive 15% gravel and cobbles, strongly acid.	17-25" yellowish brown gravelly very fine sandy loam, weak coarse subangular blocky structure, 25% gravel, strongly acid.	11-52" light gray and pale yellow sandy loam, weak fine subangular blocky structure to massive, 25-40% gravel and cobbles, very strongly acid.
Substratum	9-17" yellowish brown very cobbly sandy clay loam to brown extremely cobbly loamy sand, moderate coarse subangular blocky structure to single grain, 50-75% gravel and cobbles, slightly to strongly acid, water table.	25-28" fractured basic metasedimentary rock.	52-56" consolidated quartz diorite glacial till.

Soil Properties & Management Interpretations

Forest Survey Site Class	7	5-7	4-5
Adapted Species Group	GL	WF, RF, JP, BL	WF, JP, SP, DF
Soil Erodibility	Low	Low	Low
AWC for Profile Depth	Saturated	3.7-6.0	2.6-4.0
AWC for Surface 24"	Saturated	3.2-3.6	1.2-2.0
Seedling Survival Potential	Low	High	Low-Moderate
Plantability Potential	High-Moderate	High-Moderate	High-Low
Hydrologic Soil Group	D	B	A-B
Potential for Roadbed Damage	High	Moderate	Moderate

Inclusions (10%) Nanny family

Remarks: Typic Cryaquolls limitations: Too wet. Entic Cryumbrepts limitations: High water and extreme cold.

326 Typic Cryaquolls-Merkel family, till substratum association, 0 to 20 percent slopes

Map Unit Components	Typic Cryaquolls (40%)	Merkel family (20%)
Geomorphic Position	Ground moraines and cirque basins.	Topography as described for Typic Cryaquolls.
Typical Vegetation Series	Upper Montane and Subalpine Wet Meadows and Seeps	Lodgepole Pine Forest Mixed Upper Coniferous Forest

Soil Profile Description

Surface Soil	0-7" black sandy loam grayish brown loam, strong coarse granular structure to massive, 0-10% gravel, neutral to strongly acid.	0-9" reddish brown very strong sandy loam, moderate very fine granular structure, 50% stones and gravel, slightly acid.
Subsoil	7-9" grayish brown gravelly light clay loam, massive 15% gravel and cobbles, strongly acid.	9-29" strong brown stony loam and brownish yellow very stony sandy loam, weak to moderate medium subangular blocky structure, 30-40% stones and gravel, neutral.
Substratum	9-17" yellowish brown very cobbly sandy clay loam to brown extremely cobbly loamy sand, moderate coarse subangular blocky structure to single grain, 50-75% gravel and cobbles, slightly to strongly acid, water table.	29-49" compacted cobbly and stony glacial till.

Soil Properties & Management Interpretations

Forest Survey Site Class	7	5-7
Adapted Species Group	GL	JP, WWP, WF, LPP
Soil Erodibility	Low	Low
AWC for Profile Depth	Saturated	2.8-4.0
AWC for Surface 24"	Saturated	1.9-3.0
Seedling Survival Potential	Low	Moderate
Plantability Potential	High-Moderate	Low-V. Low
Hydrologic Soil Group	D	B-C
Potential for Roadbed Damage	High	Low

Inclusions (20%)

Toadlake family, till substratum
Skymor family
Glacial till, mixed

Remarks:

Typic Cryaquolls limitations: Too wet. Merkel limitations: Ca/Mg imbalance limits species and productivity.

327 Typic Cryaquolls-Wapal family association, 0 to 30 percent slopes

Map Unit Components	Typic Cryaquolls (60%)	Wapal family (25%)
Geomorphic Position	Gentle to moderately steep, ground moraines.	Similar topography as described for Typic Cryaquolls.
Typical Vegetation Series	Subalpine Wet Meadows and Seeps	Lodgepole Pine Forest Mixed Upper Montane Coniferous Forest

Soil Profile Description

Surface Soil	0-7" black sandy loam grayish brown loam, strong coarse granular structure to massive, 0-10% gravel, neutral to strongly acid.	0-4" brownish yellow very stony loam, weak fine granular structure, 47% gravel and stones, slightly acid.
Subsoil	7-9" grayish brown gravelly light clay loam, massive 15% gravel and cobbles, strongly acid.	
Substratum	9-17" yellowish brown very cobbly sandy clay loam to brown extremely cobbly loamy sand, moderate coarse subangular blocky structure to single grain, 50-75% gravel and cobbles, slightly to strongly acid, water table.	4-65" very pale brown very stony sandy loam to light brownish gray extremely stony loamy sand, single grain and massive, 55-80% gravel and cobbles, neutral.

Soil Properties & Management Interpretations

Forest Survey Site Class	7	5-6
Adapted Species Group	GL	WF, JP, SP
Soil Erodibility	Low	Low
AWC for Profile Depth	Saturated	1.5-3.8
AWC for Surface 24"	Saturated	0.9-2.0
Seedling Survival Potential	Low	V.Low-Low
Plantability Potential	High-Moderate	Low
Hydrologic Soil Group	D	A-B
Potential for Roadbed Damage	High	Moderate
Inclusions (15%)	Glacial till, basic intrusive Lithic Xerumbrepts	
Remarks:	Typic Cryaquolls limitations: Too wet.	

328 Typic Xerorthents, 60 to 80 percent slopes

Map Unit Components	**Typic Xerorthents (75%)**
Geomorphic Position	Very steep dissected, linear, mountain sideslopes.
Typical Vegetation Series	Canyon Oak Woodland

Soil Profile Description

Surface Soil	0-15" light brownish gray to light yellowish brown extremely gravelly loam, single grain, 75 to 85% gravel and cobbles, neutral.
Subsoil	
Substratum	15-48" fragmental gravel and cobbles.

Soil Properties & Management Interpretations

Forest Survey Site Class	6-7
Adapted Species Group	BL, DF, PP, SP
Soil Erodibility	Low
AWC for Profile Depth	0.6-2.1
AWC for Surface 24"	0.2-1.7
Seedling Survival Potential	V.Low-Low
Plantability Potential	V. Low-Low
Hydrologic Soil Group	B
Potential for Roadbed Damage	Low
Inclusions (25%)	Rubble land Neuns family Goulding family Deadwood family
Remarks:	

329 Typic Xerorthents-Neuns family association, 60 to 80 percent slopes

Map Unit Components	Typic Xerorthents (60%)	Neuns family (30%)
Geomorphic Position	Very steep, highly dissected, linear mountain sideslopes.	Northerly aspects of topography as described for Typic Xerorthents, extremely gravelly
Typical Vegetation Series	Canyon Oak Woodland	Douglas-Fir-Pine Mixed Conifer Forest

Soil Profile Description

Surface Soil	0-15" light brownish gray to light yellowish brown extremely gravelly loam, single grain, 75 to 85% gravel and cobbles, neutral.	0-11" brown to light brown very gravelly sandy loam, weak to moderate medium granular structure, 35-45% gravel, slightly acid.
Subsoil		11-23" light brown very gravelly sandy loam, moderate fine subangular blocky structure, 55% gravel and cobbles, slightly acid.
Substratum	15-48" fragmental gravel and cobbles.	23-34" highly fractured, slightly weathered metamorphic rock.

Soil Properties & Management Interpretations

Forest Survey Site Class	6-7	5
Adapted Species Group	BL, DF, PP, SP	DF, PP, SP
Soil Erodibility	Low	Low
AWC for Profile Depth	0.6-2.1	2.3-4.8
AWC for Surface 24"	0.2-1.7	1.6-3.2
Seedling Survival Potential	V.Low-Low	Low-Moderate
Plantability Potential	V. Low-Low	Low
Hydrologic Soil Group	B	B
Potential for Roadbed Damage	Low	Moderate
Inclusions (10%)	Deadwood family Goulding family Rock outcrop, metamorphic Rubble land	
Remarks:		

330 Washougal family, 0 to 20 percent slopes

Map Unit Components	**Washougal family (75%)**
Geomorphic Position	Gently tilted basalt flows.
Typical Vegetation Series	Upper Montane Mixed Chaparral Ponderosa Pine Forest

Soil Profile Description

Surface Soil	0-10" dark brown gravelly loam and very cobbly fine sandy loam, weak fine subangular blocky structure, 15 to 65% cobbles and gravel, neutral to slightly acid.
Subsoil	10-30" brown extremely cobbly fine sandy loam, weak very fine subangular blocky structure, 70% cobbles and gravel, neutral.
Substratum	30-32" fractured basalt.

Soil Properties & Management Interpretations

Forest Survey Site Class	5
Adapted Species Group	PP
Soil Erodibility	Moderate
AWC for Profile Depth	1.6-3.4
AWC for Surface 24"	1.4-2.3
Seedling Survival Potential	Low-Moderate
Plantability Potential	Low
Hydrologic Soil Group	B
Potential for Roadbed Damage	Low
Inclusions (25%)	Washougal family, deep Rock outcrop, volcanic Germany family Ledmount family
Remarks:	Plantability is dependent on depth of ashy overburden, subsoil has poor plantability, mapped as McCarthy series on adjacent Soil-Veg. survey.

331 Washougal family, 20 to 40 percent slopes

Map Unit Components	**Washougal family (80%)**
Geomorphic Position	Gently sloping volcanic sideslopes, buttes, lava flows.
Typical Vegetation Series	Greenleaf Manzanita Chaparral Sierran-Cascade Mixed Conifer Forest

Soil Profile Description

Surface Soil	0-10" dark brown gravelly loam and very cobbly fine sandy loam, weak fine subangular blocky structure, 15 to 65% cobbles and gravel, neutral to slightly acid.
Subsoil	10-30" brown extremely cobbly fine sandy loam, weak very fine subangular blocky structure, 70% cobbles and gravel, neutral.
Substratum	30-32" fractured basalt.

Soil Properties & Management Interpretations

Forest Survey Site Class	5
Adapted Species Group	PP
Soil Erodibility	Moderate
AWC for Profile Depth	1.6-3.4
AWC for Surface 24"	1.4-2.3
Seedling Survival Potential	Low-Moderate
Plantability Potential	Low
Hydrologic Soil Group	B
Potential for Roadbed Damage	Low
Inclusions (20%)	Germany family, deep Rock outcrop, volcanic Washougal family, deep
Remarks:	Plantability is dependent on depth of ashy overburden, subsoil has poor plantability, mapped as McCarthy series on adjacent Soil-Veg. survey.

332 Washougal family, 40 to 80 percent slopes

Map Unit Components	**Washougal family (75%)**
Geomorphic Position	Steep to very steep mountain sideslopes, slopes of volcanic buttes, cinder cones, and lava flows.
Typical Vegetation Series	White Fir Forest Bitterbrush Goldenbrush Scrub

Soil Profile Description

Surface Soil	0-10" dark brown gravelly loam and very cobbly fine sandy loam, weak fine subangular blocky structure, 15 to 65% cobbles and gravel, neutral to slightly acid.
Subsoil	10-30" brown extremely cobbly fine sandy loam, weak very fine subangular blocky structure, 70% cobbles and gravel, neutral.
Substratum	30-32" fractured basalt.

Soil Properties & Management Interpretations

Forest Survey Site Class	5
Adapted Species Group	PP
Soil Erodibility	Moderate
AWC for Profile Depth	1.6-3.4
AWC for Surface 24"	1.4-2.3
Seedling Survival Potential	Low-Moderate
Plantability Potential	Low
Hydrologic Soil Group	B
Potential for Roadbed Damage	Low
Inclusions (25%)	Germany family Rock outcrop, volcanic Ledmount family
Remarks:	Plantability is dependent on depth of ashy overburden, subsoil has poor plantability, mapped as McCarthy series on adjacent Soil-Veg. survey.

333 Washougal-Germany, deep families complex, 20 to 40 percent slopes

Map Unit Components	Washougal family (60%)	Germany family, deep (30%)
Geomorphic Position	Moderately steep slightly dissected mountain sideslopes.	Moderately steep dissected mountain sideslopes.
Typical Vegetation Series	White Fir Forest Ponderosa Pine Forest	White Fir Forest Ponderosa Pine Forest

Soil Profile Description

Surface Soil	0-10" dark brown gravelly loam and very cobbly fine sandy loam, weak fine subangular blocky structure, 15 to 65% cobbles and gravel, neutral to slightly acid.	0-6" very dark brown sandy loam weak medium subangular blocky structure 5% gravel, slightly acid.
Subsoil	10-30" brown extremely cobbly fine sandy loam, weak very fine subangular blocky structure, 70% cobbles and gravel, neutral.	6-31" dark brown fine sandy loam, and yellowish brown gravelly fine sandy loam, weak medium and fine subangular blocky structure, 10-15% gravel, slightly acid.
Substratum	30" fractured basalt.	31-60" light yellowish brown gravelly sandy loam and brown very gravelly very fine sandy loam, massive, 30-40% gravel, neutral.

Soil Properties & Management Interpretations

Forest Survey Site Class	5	3
Adapted Species Group	PP	PP, WF, JP, SP
Soil Erodibility	Moderate	Moderate
AWC for Profile Depth	1.6-3.4	5.0-6.3
AWC for Surface 24"	1.4-2.3	2.7-3.6
Seedling Survival Potential	Low-Moderate	Moderate-High
Plantability Potential	Low	High
Hydrologic Soil Group	B	B
Potential for Roadbed Damage	Low	High
Inclusions (10%)	Rock outcrop, volcanic	
Remarks:	Washougal family - Plantability is dependent on depth of ashy overburden, subsoil has poor plantability mapper as McCarthy series on adjacent Soil-Veg. survey.	

334 Washougal-Holland, ashy families association, 30 to 60 percent slopes

Map Unit Components	Washougal family (50%)	Holland family, ashy (35%)
Geomorphic Position	Steep slopes on dissected mountain sideslopes.	Steep slopes of volcanic buttes, dissected lava flows.
Typical Vegetation Series	White Fir Forest Sierran-Cascade Mixed Conifer Forest	White Fir Forest Sierran-Cascade Mixed Conifer Forest

Soil Profile Description

Surface Soil	0-10" dark brown gravelly loam and very cobbly fine sandy loam, weak fine subangular blocky structure, 15 to 65% cobbles and gravel, neutral to slightly acid.	0-13" reddish brown and yellowish red sandy loam, weak medium subangular blocky structure, 5% gravel, slightly acid.
Subsoil	10-30" brown extremely cobbly fine sandy loam, weak very fine subangular blocky structure, 70% cobbles and gravel, neutral.	13-40" yellowish red sandy clay loam, moderate medium subangular blocky structure, 15 to 25% gravel, slightly acid.
Substratum	30-32" fractured basalt.	40-41" paralithic contact with metasediments or volcanic rock.

Soil Properties & Management Interpretations

Forest Survey Site Class	5	3-4
Adapted Species Group	PP	PP, DF, SP, WF
Soil Erodibility	Moderate	High
AWC for Profile Depth	1.6-3.4	4.1-9.8
AWC for Surface 24"	1.4-2.3	2.5-3.6
Seedling Survival Potential	Low-Moderate	Moderate-High
Plantability Potential	Low	High
Hydrologic Soil Group	B	B
Potential for Roadbed Damage	Low	High
Inclusions (15%)	Germany family Rock outcrop, volcanic	

Remarks:

Regeneration on Washougal is dependent on depth of ashy overburden, subsoil has poor plantability and adequate AWC, Washougal family, moderately deep is mapped as McCarthy series on adjacent Soil-Veg. Survey.

335 Washougal family-Rock outcrop association, 40 to 60 percent slopes

Map Unit Components	**Washougal family (50%)**	**Rock outcrop (30%)**
Geomorphic Position	Steep to very steep lava flows, and mountain sideslopes.	Steep to very steep lava rims.
Typical Vegetation Series	White Fir Forest Upper Montane Mixed Chaparral	Rock Outcrop Chaparral

Soil Profile Description

Surface Soil	0-10" dark brown gravelly loam and very cobbly fine sandy loam, weak fine subangular blocky structure, 15 to 65% cobbles and gravel, neutral to slightly acid.
Subsoil	10-30" brown extremely cobbly fine sandy loam, weak very fine subangular blocky structure, 70% cobbles and gravel, neutral.
Substratum	30" fractured basalt.

Soil Properties & Management Interpretations

Forest Survey Site Class	5	
Adapted Species Group	PP	
Soil Erodibility	Moderate	
AWC for Profile Depth	1.6-3.4	
AWC for Surface 24"	1.4-2.3	
Seedling Survival Potential	Low-Moderate	
Plantability Potential	Low	
Hydrologic Soil Group	B	D
Potential for Roadbed Damage	Low	Low
Inclusions (20%)	Germany family Ledmount family	

Remarks:

Regeneration on Washougal moderately deep is dependent on depth of ashy overburden, subsoil has poor plantability and inadequate AWC. Washougal family, moderately deep is mapped as McCarthy series on adjacent Soil-Veg. survey.

336 Washougal family-Rock outcrop association, 60 to 80 percent slopes

Map Unit Components	Washougal family (50%)	Rock outcrop (30%)
Geomorphic Position	Very steep lava flows, and mountain sideslopes.	Very steep lava rims.
Typical Vegetation Series	White Fir Forest Upper Montane Mixed Chaparral	Rock Outcrop Chaparral

Soil Profile Description

Surface Soil	0-10" dark brown gravelly loam and very cobbly fine sandy loam, weak fine subangular blocky structure, 15 to 65% cobbles and gravel, neutral to slightly acid.
Subsoil	10-30" brown extremely cobbly fine sandy loam, weak very fine subangular blocky structure, 70% cobbles and gravel, neutral.
Substratum	30" fractured basalt.

Soil Properties & Management Interpretations

Forest Survey Site Class	5	
Adapted Species Group	PP	
Soil Erodibility	Moderate	
AWC for Profile Depth	1.6-3.4	
AWC for Surface 24"	1.4-2.3	
Seedling Survival Potential	Low-Moderate	
Plantability Potential	Low	
Hydrologic Soil Group	B	D
Potential for Roadbed Damage	Low	Low
Inclusions (20%)	Germany family Ledmount family	

Remarks:

Volcanic canyon lands, Washougal family, moderately deep is mapped as McCarthy series on adjacent Soil-Veg. survey.

337 Washougal family, deep, 0 to 30 percent slopes

Map Unit Components	**Washougal family, deep (75%)**
Geomorphic Position	Outwash channels, low outwash terraces, moraine deposits.
Typical Vegetation Series	Sierran-Cascade Mixed Conifer Forest, Ponderosa Pine Forest

Soil Profile Description

Surface Soil	0-26" dark brown sandy loam to brown extremely cobbly sandy loam, single grain, 10-65% gravel and cobbles, slightly acid to neutral.
Subsoil	26-36" yellowish brown extremely cobbly cobbly coarse sandy loam, single grain, 75% gravel and cobbles, neutral.
Substratum	36-60" gray and light gray extremely cobbly, loamy coarse sand, single grain, slightly acid to neutral.

Soil Properties & Management Interpretations

Forest Survey Site Class	4
Adapted Species Group	PP, WF, JP, SP
Soil Erodibility	Moderate
AWC for Profile Depth	4.4-6.3
AWC for Surface 24"	1.4-2.3
Seedling Survival Potential	Low-Moderate
Plantability Potential	Low-V. Low
Hydrologic Soil Group	C
Potential for Roadbed Damage	Low
Inclusions (25%)	Rock outcrop, volcanic Washougal family Shasta family
Remarks:	Includes deposits of unweathered cobbly glacial debris, also occurs in braided, intermittent stream channels, severe limitations for site preparation equipment.

338 Washougal family, deep, 30 to 60 percent slopes

Map Unit Components	**Washougal family, deep (75%)**
Geomorphic Position	Steep sideslopes and drainages of mud flows and debris flows, moraine deposits.
Typical Vegetation Series	Sierran-Cascade Mixed Conifer Forest, Ponderosa Pine Forest

Soil Profile Description

Surface Soil	0-26" dark brown sandy loam to brown extremely cobbly sandy loam, single grain, 10-65% gravel and cobbles, slightly acid to neutral.
Subsoil	26-36" yellowish brown extremely cobbly cobbly coarse sandy loam, single grain, 75% gravel and cobbles, neutral.
Substratum	36-60" gray and light gray extremely cobbly, loamy coarse sand, single grain, slightly acid to neutral.

Soil Properties & Management Interpretations

Forest Survey Site Class	4
Adapted Species Group	PP, WF, JP, SP
Soil Erodibility	Moderate
AWC for Profile Depth	4.4-6.3
AWC for Surface 24"	1.4-2.3
Seedling Survival Potential	Low-Moderate
Plantability Potential	Moderate-V. Low
Hydrologic Soil Group	C
Potential for Roadbed Damage	Low
Inclusions (25%)	Shasta family Washougal family
Remarks:	Includes very bouldery, rubble deposits on glacial moraines, severe limitations for site preparation equipment.

339 Washougal family, deep-Washougal family complex, 20 to 40 percent slopes

Map Unit Components	Washougal family, deep (60%)	Washougal family (25%
Geomorphic Position	Glacial outwash terraces and channels.	Gently sloping lava flows.
Typical Vegetation Series	Sierran-Cascade Mixed Conifer Forest, Ponderosa Pine Forest	Sierran-Cascade Mixed Conifer Forest, Ponderosa Pine Forest, Upper Montane Mixed Chaparral

Soil Profile Description

Surface Soil	0-26" dark brown sandy loam to brown extremely cobbly sandy loam, single grain, 10-65% gravel and cobbles, slightly acid to neutral.	0-10" dark brown gravelly loam and very cobbly fine sandy loam, weak fine subangular blocky structure, 15 to 65% cobbles and gravel, neutral to slightly acid.
Subsoil	26-36" yellowish brown extremely cobbly cobbly coarse sandy loam, single grain, 75% gravel and cobbles, neutral.	10-30" brown extremely cobbly fine sandy loam, weak very fine subangular blocky structure, 70% cobbles and gravel, neutral.
Substratum	36-60" gray and light gray extremely cobbly, loamy coarse sand, single grain, slightly acid to neutral.	30-32" fractured basalt.

Soil Properties & Management Interpretations

Forest Survey Site Class	4	5
Adapted Species Group	PP, WF, JP, SP	PP
Soil Erodibility	Moderate	Moderate
AWC for Profile Depth	4.4-6.3	1.6-3.4
AWC for Surface 24"	1.4-2.3	1.4-2.3
Seedling Survival Potential	Low-Moderate	Low-Moderate
Plantability Potential	Low-V.Low	Low
Hydrologic Soil Group	C	B
Potential for Roadbed Damage	Low	Low
Inclusions (15%)	Shasta family	
Remarks:	Lava flows with moderately deep relict soil tend to channel deep cobbly outwash deposits.	

340 Weitchpec family, 20 to 40 percent slopes

Map Unit Components	**Weitchpec family (75%)**
Geomorphic Position	Moderately steep mountain sideslopes and ridges.
Typical Vegetation Series	Jeffrey Pine - Incense Cedar Woodland Serpentine Chaparral

Soil Profile Description

Surface Soil	0-5" light gray gravelly loam, moderate fine and medium granular structure, 30% gravel, slightly acid.
Subsoil	5-25" white to pale yellow very gravelly loam, moderate fine subangular blocky structure, 35-45% gravel, slightly acid to neutral.
Substratum	25-38" highly fractured ultramafic rock.

Soil Properties & Management Interpretations

Forest Survey Site Class	5-6
Adapted Species Group	JP, IC, DF
Soil Erodibility	Moderate
AWC for Profile Depth	2.4-4.0
AWC for Surface 24"	2.0-2.7
Seedling Survival Potential	Moderate
Plantability Potential	Moderate
Hydrologic Soil Group	B
Potential for Roadbed Damage	Moderate
Inclusions (25%)	Dubakella family Ishi Pishi family, moderately deep
Remarks:	Weitchpec, Dubakella, and Ishi Pishi limitations: Ca/Mg imbalance

341 Weitchpec family, 40 to 60 percent slopes

Map Unit Components	**Weitchpec family (75%)**
Geomorphic Position	Steep mountain sideslopes and ridges.
Typical Vegetation Series	Jeffrey Pine - Incense Cedar Woodland Serpentine Chaparral

Soil Profile Description

Surface Soil	0-5" light gray gravelly loam, moderate fine and medium granular structure, 30% gravel, slightly acid.
Subsoil	5-25" white to pale yellow very gravelly loam, moderate fine subangular blocky structure, 35-45% gravel, slightly acid to neutral.
Substratum	25-38" highly fractured ultramafic rock.

Soil Properties & Management Interpretations

Forest Survey Site Class	5-6
Adapted Species Group	JP, IC, DF
Soil Erodibility	Moderate
AWC for Profile Depth	2.4-4.0
AWC for Surface 24"	2.0-2.7
Seedling Survival Potential	Moderate
Plantability Potential	Moderate
Hydrologic Soil Group	B
Potential for Roadbed Damage	Moderate
Inclusions (25%)	Dubakella family Lithic Haploxeralfs Rock outcrop, ultramafic Ishi Pishi family
Remarks:	Weitchpec limitations: Ca/Mg imbalance.

342 Weitchpec family, 60 to 80 percent slopes

Map Unit Components	**Weitchpec family (75%)**
Geomorphic Position	Dissected very steep, linear, lower mountain sideslopes.
Typical Vegetation Series	Jeffrey Pine - Incense Cedar Woodland Serpentine Chaparral

Soil Profile Description

Surface Soil	0-5" light gray gravelly loam, moderate fine and medium granular structure, 30% gravel, slightly acid.
Subsoil	5-25" white to pale yellow very gravelly loam, moderate fine subangular blocky structure, 35-45% gravel, slightly acid to neutral.
Substratum	25-38" highly fractured ultramafic rock.

Soil Properties & Management Interpretations

Forest Survey Site Class	5-6
Adapted Species Group	JP, IC, DF
Soil Erodibility	Moderate
AWC for Profile Depth	2.4-4.0
AWC for Surface 24"	2.0-2.7
Seedling Survival Potential	Low-High
Plantability Potential	Low
Hydrologic Soil Group	B
Potential for Roadbed Damage	Moderate
Inclusions (25%)	Lithic Haploxeralfs Rock outcrop and rubble, ultramafic
Remarks:	Weitchpec limitations: Ca/Mg imbalance limits species. Lithic Haploxeralfs: Ca/Mg imbalance limits species.

343 Weitchpec-Beaughton families complex, 40 to 60 percent slopes

Map Unit Components	**Weitchpec family (45%)**	**Beaughton family (30%)**
Geomorphic Position	Steep, linear, mountain sideslopes.	Ridge tops and steep, linear, sideslopes.
Typical Vegetation Series	Jeffrey Pine Mixed Conifer Jeffrey Pine - Incense Cedar - Woodland	Serpentine Chaparral Low Montane Serpentine Semi-Barrens

Soil Profile Description

Surface Soil	0-5" light gray gravelly loam, moderate fine and medium granular structure, 30% gravel, slightly acid.	0-3" brown gravelly loam, weak very fine granular and subangular blocky structure, 25% gravel, and cobbles, mildly alkaline.
Subsoil	5-25" white to pale yellow very gravelly loam, moderate fine subangular blocky structure, 35-45% gravel, slightly acid to neutral.	3-16" reddish brown very cobbly clay loam and strong brown extremely cobbly clay, weak to moderate fine subangular blocky structure 50-60% gravel, cobbles and stones, mildly to moderately alkaline.
Substratum	25-38" highly fractured ultramafic rock.	16-21" highly fractured ultramafic rock.

Soil Properties & Management Interpretations

Forest Survey Site Class	5-6	7
Adapted Species Group	JP, IC, DF	GL, BL
Soil Erodibility	Moderate	Moderate
AWC for Profile Depth	2.4-4.0	1.6-2.1
AWC for Surface 24"	2.0-2.7	1.6-2.1
Seedling Survival Potential	Moderate	Low
Plantability Potential	Moderate	Low
Hydrologic Soil Group	B	D-C
Potential for Roadbed Damage	Moderate	Low

Inclusions (25%)

Grell family
Dubakella family
Rock outcrop and rubble, ultramafic

Remarks:

Weitchpec limitations: Ca/Mg imbalance. Beaughton Limitations: Ca/Mg imbalance, possible toxicity and poor aeration.

344 Weitchpec-Dubakella families complex, 20 to 40 percent slopes

Map Unit Components	Weitchpec family (60%)	Dubakella family (30%)
Geomorphic Position	Moderately steep mountain sideslopes and ridge tops.	Moderately steep mountain sideslopes.
Typical Vegetation Series	Jeffrey Pine - Incense Cedar Woodland, Serpentine Chaparral	Jeffrey Pine - Incense Cedar Woodland, Serpentine Chaparral

Soil Profile Description

Surface Soil	0-5" light gray gravelly loam, moderate fine and medium granular structure, 30% gravel, slightly acid.	0-11" reddish brown cobbly loam and very stony clay loam, weak and moderate very fine subangular blocky structure, 30 to 50% gravel, cobbles and stones, neutral.
Subsoil	5-25" white to pale yellow very gravelly loam, moderate fine subangular blocky structure, 35-45% gravel, slightly acid to neutral.	11-18" strong brown extremely stony clay, strong fine subangular blocky structure, 65% gravels and stones, mildly alkaline.
Substratum	25-38" highly fractured ultramafic rock.	18-26" strong brown extremely stony clay, massive, 85% gravel and stones, mildly alkaline, 26-30" ultramafic rock.

Soil Properties & Management Interpretations

Forest Survey Site Class	5-6	5-6
Adapted Species Group	JP, IC, DF	JP, IC, DF
Soil Erodibility	Moderate	High
AWC for Profile Depth	2.4-4.0	1.8-4.2
AWC for Surface 24"	2.0-2.7	1.8-3.0
Seedling Survival Potential	Moderate	Low-Moderate
Plantability Potential	Moderate	Moderate
Hydrologic Soil Group	B	C
Potential for Roadbed Damage	Moderate	Moderate

Inclusions (10%)

Beaughton family
Grell family
Rock outcrop, ultramafic

Remarks:

Ca/Mg imbalance with above soils, possible toxicity and poor aeration.

345 Weitchpec-Dunsmuir families association, 20 to 40 percent slopes

Map Unit Components	Weitchpec family (60%)	Dunsmuir family (30%)
Geomorphic Position	Moderately steep mountain sideslopes and ridge tops.	Moderately steep mountain sideslopes, benches.
Typical Vegetation Series	Jeffrey Pine - Incense Cedar Woodland, Serpentine Chaparral	Klamath Enriched Mixed Conifer Forest

Soil Profile Description

Surface Soil	0-5" light gray gravelly loam, moderate fine and medium granular structure, 30% gravel, slightly acid.	0-7" reddish brown gravelly light sandy clay loam, moderate fine granular and weak medium subangular blocky structure, 20-35% gravel, medium acid.
Subsoil	5-25" white to pale yellow very gravelly loam, moderate fine subangular blocky structure, 35-45% gravel, slightly acid to neutral.	7-53" reddish brown gravelly clay loam and gravelly clay to yellowish red very cobbly clay loam, moderately medium subangular blocky structure, 20-55% gravel and cobbles, medium acid.
Substratum	25-38" highly fractured ultramafic rock.	53-60" weathered ultramafic rock, paralithic contact.

Soil Properties & Management Interpretations

Forest Survey Site Class	5-6	3-5
Adapted Species Group	JP, IC, DF	DF, PP, SP, JP
Soil Erodibility	Moderate	Moderate
AWC for Profile Depth	2.4-4.0	6.5-10.0
AWC for Surface 24"	2.0-2.7	3.3-3.8
Seedling Survival Potential	Moderate	High
Plantability Potential	Moderate	High
Hydrologic Soil Group	B	B-C
Potential for Roadbed Damage	Moderate	High
Inclusions (10%)	Dubakella family Ishi Pishi family	
Remarks:	Ca/Mg imbalance limits tree species and productivity.	

346 Weitchpec-Dunsmuir families association, 40 to 60 percent slopes

Map Unit Components	Weitchpec family (60%)	Dunsmuir family (30%)
Geomorphic Position	Steep mountain sideslopes and ridge tops.	Steep broken mountain sideslopes.
Typical Vegetation Series	Jeffrey Pine - Incense Cedar Woodland, Serpentine Chaparral	Klamath Enriched Mixed Conifer Forest

Soil Profile Description

Surface Soil	0-5" light gray gravelly loam, moderate fine and medium granular structure, 30% gravel, slightly acid.	0-7" reddish brown gravelly light sandy clay loam, moderate fine granular and weak medium subangular blocky structure, 20-35% gravel, medium acid.
Subsoil	5-25" white to pale yellow very gravelly loam, moderate fine subangular blocky structure, 35-45% gravel, slightly acid to neutral.	7-53" reddish brown gravelly clay loam and gravelly clay to yellowish red very cobbly clay loam, moderately medium subangular blocky structure, 20-55% gravel and cobbles, medium acid.
Substratum	25-38" highly fractured ultramafic rock.	53-60" weathered ultramafic rock, paralithic contact.

Soil Properties & Management Interpretations

Forest Survey Site Class	5-6	3-5
Adapted Species Group	JP, IC, DF	DF, PP, SP, JP
Soil Erodibility	Moderate	Moderate
AWC for Profile Depth	2.4-4.0	6.5-10.0
AWC for Surface 24"	2.0-2.7	3.3-3.8
Seedling Survival Potential	Moderate	High
Plantability Potential	Moderate	Moderate
Hydrologic Soil Group	B	B-C
Potential for Roadbed Damage	Moderate	High
Inclusions (10%)	Ishi Pishi family Dubakella family Lithic Haploxeralfs	
Remarks:	Weitchpec limitations: Ca/Mg imbalance may limit species and growth on ultramafic soils.	

347 Weitchpec family-Lithic Haploxeralfs complex, 30 to 50 percent slopes

Map Unit Components	Weitchpec family (60%)	Lithic Haploxeralfs (20%)
Geomorphic Position	Moderately steep broken mountain sideslopes and ridge tops.	Position similar to Weitchpec family.
Typical Vegetation Series	Jeffrey Pine Mixed Conifer Forest Serpentine Chaparral	Serpentine Chaparral

Soil Profile Description

Surface Soil	0-5" light gray gravelly loam, moderate fine and medium granular structure, 30% gravel, slightly acid.	0-4" pale brown gravelly loam and yellowish brown very gravelly loam, moderate coarse platy and moderate medium subangular blocky structure, 20 to 35 percent gravel, slightly acid to neutral.
Subsoil	5-25" white to pale yellow very gravelly loam, moderate fine subangular blocky structure, 35-45% gravel, slightly acid to neutral.	4-17" light yellowish brown very gravelly loam to yellowish brown very gravelly sandy clay loam, moderate fine, medium and coarse subangular blocky structure, 40 to 50 percent gravel, mildly to moderately alkaline.
Substratum	25-38" highly fractured ultramafic rock.	17-24" moderately fractured serpentine rock.

Soil Properties & Management Interpretations

Forest Survey Site Class	5-6	7
Adapted Species Group	JP, IC, DF	GL, BL
Soil Erodibility	Moderate	Moderate
AWC for Profile Depth	2.4-4.0	1.3-1.8
AWC for Surface 24"	2.0-2.7	1.3-1.7
Seedling Survival Potential	Moderate	Low
Plantability Potential	High-Moderate	Low
Hydrologic Soil Group	B	C-D
Potential for Roadbed Damage	Moderate	Low

Inclusions (20%)

Rock outcrop, ultramafic
Beaughton family
Dubakella family
Olete family

Remarks:

Weitchpec and Lithic Haploxeralfs limitations: Ca/Mg imbalance and possible toxicity.

348 Weitchpec family-Lithic Haploxeralfs-Rock outcrop complex, 60 to 80 percent slopes

Map Unit Components	Weitchpec family (50%)	Lithic Haploxeralfs (20%)	Rock outcrop (20%)
Geomorphic Position	Very steep mountain sideslopes.	Position similar to Weitchpec family.	Position similar to Weitchpec family.
Typical Vegetation Series	Jeffrey Pine Mixed Conifer Forest	Serpentine Chaparral Low Montane Serpentine Semi-Barrens	

Soil Profile Description

Surface Soil	0-5" light gray gravelly loam, moderate fine and medium granular structure, 30% gravel, slightly acid.	0-4" pale brown gravelly loam and yellowish brown very gravelly loam, moderate coarse platy and moderate medium subangular blocky structure, 20 to 35 percent gravel, slightly acid to neutral.	
Subsoil	5-25" white to pale yellow very gravelly loam, moderate fine subangular blocky structure, 35-45% gravel, slightly acid to neutral.	4-17" light yellowish brown very gravelly loam to yellowish brown very gravelly sandy clay loam, moderate fine, medium and coarse subangular blocky structure, 40 to 50 percent gravel, mildly to moderately alkaline.	
Substratum	25-38" highly fractured ultramafic rock.	17-24" moderately fractured serpentine rock.	

Soil Properties & Management Interpretations

Forest Survey Site Class	5-6	7	
Adapted Species Group	JP, IC, DF	GL, BL	
Soil Erodibility	Moderate	Moderate	
AWC for Profile Depth	2.4-4.0	1.3-1.8	
AWC for Surface 24"	2.0-2.7	1.3-1.7	
Seedling Survival Potential	Moderate	Low	
Plantability Potential	Low-V.Low	V.Low-Low	
Hydrologic Soil Group	B	C-D	D
Potential for Roadbed Damage	Moderate	Low	Low
Inclusions (10%)	Beaughton family Dubakella family Olete family		

Remarks: Weitchpec and Kelsey limitations: Ca/Mg imbalance and possible toxicity.

349 Weitchpec family-Rock outcrop association, 40 to 60 percent slopes

Map Unit Components	**Weitchpec family (45%)**	**Rock outcrop (30%)**
Geomorphic Position	Steep mountain sideslopes and ridge tops.	Steep to very steep mountain sideslopes and ridges.
Typical Vegetation Series	Jeffrey Pine - Incense Cedar Woodland Serpentine Chaparral	

Soil Profile Description

Surface Soil	0-5" light gray gravelly loam, moderate fine and medium granular structure, 30% gravel, slightly acid.
Subsoil	5-25" white to pale yellow very gravelly loam, moderate fine subangular blocky structure, 35-45% gravel, slightly acid to neutral.
Substratum	25-38" highly fractured ultramafic rock.

Soil Properties & Management Interpretations

Forest Survey Site Class	5-6	
Adapted Species Group	JP, IC, DF	
Soil Erodibility	Moderate	
AWC for Profile Depth	2.4-4.0	
AWC for Surface 24"	2.0-2.7	
Seedling Survival Potential	Moderate	
Plantability Potential	Moderate	
Hydrologic Soil Group	B	D
Potential for Roadbed Damage	Moderate	Low
Inclusions (25%)	Beaughton family Dubakella family Grell family	
Remarks:	Ca/Mg imbalance with above soils, possible toxicity and poor aeration.	

350 Wintoner-Jayar families complex, 20 to 60 percent slopes

Map Unit Components	Wintoner family (55%)	Jayar family (25%)
Geomorphic Position	Moderately steep, dissected, linear, broken mountain sideslopes.	Similar position as Wintoner family.
Typical Vegetation Series	White Fir Forest, Mixed Conifer-Fir Forest, Red Fir-White Fir Forest	Similar vegetation as Wintoner family.

Soil Profile Description

Surface Soil	0-11" dark brown gravelly sandy loam and brown gravelly loam, moderate fine granular and weak fine subangular blocky structure, 15-25% gravel and cobbles, medium to slightly acid.	0-5" light gray very gravelly sandy loam, moderate medium granular structure, 40% gravel and cobbles, medium acid.
Subsoil	11-30" brownish yellow gravelly loam, weak medium and coarse subangular blocky structure, 10-25% gravel and cobbles, strongly acid.	5-26" light brownish gray very cobbly very fine sandy loam and light gray very cobbly loam, weak medium subangular blocky structure, 42-55% cobbles and gravel, strongly to slightly acid.
Substratum	26-36" moderately fractured unweathered basic intrusive rock.	26-36" moderately fractured unweathered basic intrusive rock.

Soil Properties & Management Interpretations

Forest Survey Site Class	4-5	5-6
Adapted Species Group	WF, JP, SP, DF	WF, JP, SP, DF
Soil Erodibility	Low	Low
AWC for Profile Depth	2.9-3.6	2.0-4.0
AWC for Surface 24"	2.9-3.6	2.0-3.2
Seedling Survival Potential	Moderate-High	Moderate
Plantability Potential	High-Moderate	High-Moderate
Hydrologic Soil Group	B	B
Potential for Roadbed Damage	Moderate	Moderate
Inclusions (20%)	Inville family Skymor family	
Remarks:		

351 Xerofluvents-Riverwash association, 0 to percent slopes

Map Unit Components	**Riverwash (30%)**	**Xerofluvents (70%)**
Geomorphic Position	River floodplain.	Alluvial terraces and fans.
Typical Vegetation Series	Riverwash.	White Alder Riparian Woodland, Douglas-fir-Pine Mixed Conifer Forest

Soil Profile Description

Surface Soil	Riverwash is nearly level or gently sloping along stream channels. It is subject to continuous or frequent flooding, which prohibits the establishment of plant life. This land type is mapped along major creeks and rivers throughout the survey area. Elevation ranges from 1,000 to about 7,000 feet. This land type is excessively drained and has a rapid permeability.	0-11" medium to pale brown gravelly sandy loam, single grain, 20-30% gravel, slightly acid.
Subsoil		
Substratum		11-45" brown to yellowish brown, very gravelly sandy loam, single grain, 35-45% gravel, slightly acid.

Soil Properties & Management Interpretations

Forest Survey Site Class		6-3
Adapted Species Group		DF, PP, BL
Soil Erodibility		Low-High
AWC for Profile Depth		Variable
AWC for Surface 24"		Variable
Seedling Survival Potential		V.Low
Plantability Potential		V.Low-High
Hydrologic Soil Group	D	A-B
Potential for Roadbed Damage	Low	Low
Remarks:		

352 Yallani family, 5 to 40 percent slopes

Map Unit Components	**Yallani family (75%)**
Geomorphic Position	Gentle to moderately steep mountain sideslopes.
Typical Vegetation Series	Red Fir -White Fir Forest Upper Montane Mixed Chaparral

Soil Profile Description

Surface Soil	0-10" brown coarse sandy loam and gravelly coarse sandy loam, single grain and weak medium subangular blocky structure, 10-15% gravel and cobbles, slightly acid.
Subsoil	10-49" brown to reddish brown very gravelly loam, weak to moderate medium subangular blocky structure, 35-40% gravel and pebbles, slightly to medium acid.
Substratum	49-56" fractured andesite, paralithic contact.

Soil Properties & Management Interpretations

Forest Survey Site Class	4
Adapted Species Group	WF, RF, JP
Soil Erodibility	Moderate
AWC for Profile Depth	2.8-4.1
AWC for Surface 24"	1.3-2.6
Seedling Survival Potential	Low-Moderate
Plantability Potential	Low-High
Hydrologic Soil Group	B
Potential for Roadbed Damage	Moderate
Inclusions (25%)	Yallani family, pumice overburden Rock outcrop, volcanic
Remarks:	Similar to unit 294 but with thinner ashy overburden.

353 Yallani-Revit families complex, 20 to 50 percent slopes

Map Unit Components	Yallani family (60%)	Revit family (30%)
Geomorphic Position	Moderately steep, dissected mountain sideslopes.	Moderately steep, dissected mountain sideslopes.
Typical Vegetation Series	White Fir Red Fir forest White Fir Forest Snowbrush Chaparral	White Fir Forest Red Fir White Fir Forest Snowbrush Chaparral

Soil Profile Description

Surface Soil	0-10" brown coarse sandy loam and gravelly coarse sandy loam, single grain and weak medium subangular blocky structure, 10-15% gravel and cobbles, slightly acid.	0-20" very dark grayish brown to dark grayish brown fine sandy loam weak fine granular to weak medium angular blocky structure, 0-14% gravel, strongly to medium acid.
Subsoil	10-49" brown to reddish brown very gravelly loam, weak to moderate medium subangular blocky structure, 35-40% gravel and pebbles, slightly to medium acid.	20-36" brown cobbly loamy fine sand, weak medium subangular blocky structure, 30-35% gravel, medium to strongly acid.
Substratum	49-56" fractured andesite, paralithic contact.	36-40" fractured vesicular basalt.

Soil Properties & Management Interpretations

Forest Survey Site Class	4	4
Adapted Species Group	WF, RF, JP	WF, RF, JP
Soil Erodibility	Moderate	Low
AWC for Profile Depth	2.8-4.1	3.2-5.2
AWC for Surface 24"	1.3-2.6	2.4-2.8
Seedling Survival Potential	Low-Moderate	Moderate
Plantability Potential	Low-High	High
Hydrologic Soil Group	B	B
Potential for Roadbed Damage	Moderate	High
Inclusions (10%)	Sheld family Rock outcrop, volcanic	
Remarks:	Similar to unit 296.	

354 Yallani family-Rock outcrop association, 40 to 60 percent slopes

Map Unit Components	Yallani family (60%)	Rock outcrop (30%)
Geomorphic Position	Upper slopes ridge tops.	Upper slopes of volcanic ridges and peaks.
Typical Vegetation Series	Exposure Chaparral White Fir Forest	

Soil Profile Description

Surface Soil	0-10" brown coarse sandy loam and gravelly coarse sandy loam, single grain and weak medium subangular blocky structure, 10-15% gravel and cobbles, slightly acid.
Subsoil	10-49" brown to reddish brown very gravelly loam, weak to moderate medium subangular blocky structure, 35-40% gravel and pebbles, slightly to medium acid.
Substratum	49-56" fractured andesite, paralithic contact.

Soil Properties & Management Interpretations

Forest Survey Site Class	4	
Adapted Species Group	WF, RF, JP	
Soil Erodibility	Moderate	
AWC for Profile Depth	2.8-4.1	
AWC for Surface 24"	1.3-2.6	
Seedling Survival Potential	Low-Moderate	
Plantability Potential	Low-High	
Hydrologic Soil Group	B	D
Potential for Roadbed Damage	Moderate	Low
Inclusions (10%)	Sheld family	
Remarks:	Often has thin pumice overburden (2-6").	

355 Yallani-Sheld families complex, 20 to 50 percent slopes

Map Unit Components	Yallani family (60%)	Sheld family (30%)
Geomorphic Position	Moderately steep, dissected mountain sideslopes.	Moderately steep, dissected mountain sideslopes.
Typical Vegetation Series	Red Fir - White Fir Forest White Fir Forest, Ponderosa Pine Forest	Red Fir - White Fir Forest Snowbrush Chaparral

Soil Profile Description

Surface Soil	0-10" brown coarse sandy loam and gravelly coarse sandy loam, single grain and weak medium subangular blocky structure, 10-15% gravel and cobbles, slightly acid.	0-11" dark brown gravelly coarse sandy loam to brown gravelly sandy loam, single grain, 25% gravel and cobbles, slightly acid.
Subsoil	10-49" brown to reddish brown very gravelly loam, weak to moderate medium subangular blocky structure, 35-40% gravel and pebbles, slightly to medium acid.	11-42" dark yellowish brown and brown extremely cobbly fine sandy loam, weak to strong medium subangular blocky structure, 75% cobbles, stones and gravel, slightly acid.
Substratum	49-56" fractured andesite, paralithic contact.	42-44" consolidated glacial till.

Soil Properties & Management Interpretations

Forest Survey Site Class	4	5
Adapted Species Group	WF, RF, JP	WF, RF, JP, WWP
Soil Erodibility	Moderate	Low
AWC for Profile Depth	2.8-4.1	1.5-3.2
AWC for Surface 24"	1.3-2.6	1.0-2.2
Seedling Survival Potential	Low-Moderate	V. Low-Moderate
Plantability Potential	Low-High	V. Low-Low
Hydrologic Soil Group	B	B
Potential for Roadbed Damage	Moderate	Low
Inclusions (10%)	Revit family Rock outcrop, volcanic	
Remarks:	Sheld family is commonly very bouldery, severe limitation for brush clearing implements.	

356 Yallani family-Yallani family, pumice overburden complex, 20 to 50 percent slopes

Map Unit Components	Yallani family (60%)	Yallani family, pumice overburden (30%)
Geomorphic Position	Gentle to moderately steep sideslopes.	Upper mountain sideslopes.
Typical Vegetation Series	Upper Montane Mixed Chaparral	Upper Montane Mixed Chaparral

Soil Profile Description

Surface Soil	0-10" brown coarse sandy loam and gravelly coarse sandy loam, single grain and weak medium subangular blocky structure, 10-15% gravel and cobbles, slightly acid.	0-17" brown and very pale brown very cindery and extremely cindery coarse sandy loam, single grain, 40-70% gravel size pumice cinders, slightly acid. 17-28" brown cobbly fine sandy loam, weak medium subangular blocky structure, 35% gravel, cobbles and stones, neutral.
Subsoil	10-49" brown to reddish brown very gravelly loam, weak to moderate medium subangular blocky structure, 35-40% gravel and pebbles, slightly to medium acid.	28-46" brown very cobbly fine sandy loam, moderate medium subangular blocky structure, 35% gravel, cobbles and stones.
Substratum	49-56" fractured andesite, paralithic contact.	46-50" broken basalt bedrock.

Soil Properties & Management Interpretations

Forest Survey Site Class	4	5
Adapted Species Group	WF, RF, JP	WF, RF, JP, LLP
Soil Erodibility	Moderate	Low
AWC for Profile Depth	2.8-4.1	4.0-5.0
AWC for Surface 24"	1.3-2.6	3.0-3.8
Seedling Survival Potential	Low-Moderate	Low
Plantability Potential	Low-High	Low
Hydrologic Soil Group	B	B
Potential for Roadbed Damage	Moderate	High

Inclusions (10%) Rock outcrop, volcanic

Remarks:

Represents a gradient of pumice overburden (0-20"). Despite the high AWC values for pumice soils, the potential for regeneration is limited. The most limiting factor is the depth of pumice. Repeated attempts at establishing seedlings in pumice have been unsuccessful; it appears necessary for the roots to reach finer textured material beneath. High albedo, adverse thermal properties and very low inherent fertility are additional limiting factors for regeneration on pumice soils.

357 Yallani family, pumice overburden, 0 to 20 percent slopes

Map Unit Components	**Yallani family, pumice overburden (80%)**
Geomorphic Position	Gentle mountain sideslopes and ridgelets in proximity to pumice cones.
Typical Vegetation Series	White Fir Forest - Lodgepole Pine Forest Red Fir Forest Snowbrush Chaparral

Soil Profile Description

Surface Soil	0-17" brown and very pale brown very cindery and extremely cindery coarse sandy loam, single grain, 40-70% gravel size pumice cinders, slightly acid. 17-28" brown cobbly fine sandy loam, weak medium subangular blocky structure, 35% gravel, cobbles and stones, neutral.
Subsoil	28-46" brown very cobbly fine sandy loam, moderate medium subangular blocky structure, 35% gravel, cobbles and stones.
Substratum	46-50" broken basalt bedrock.

Soil Properties & Management Interpretations

Forest Survey Site Class	5
Adapted Species Group	WF, RF, JP, LLP
Soil Erodibility	Low
AWC for Profile Depth	4.0-5.0
AWC for Surface 24"	3.0-3.8
Seedling Survival Potential	Low
Plantability Potential	High
Hydrologic Soil Group	B
Potential for Roadbed Damage	High
Inclusions (20%)	Stonewell family Rubble land
Remarks:	Depth of pumice overburden determines suitability for artificial regeneration. Despite the high AWC values for pumice soils, the potential for regeneration is limited. The most limiting factor is the depth of pumice. Repeated attempts at establishing seedlings in pumice have been unsuccessful; it appears necessary for the roots to reach finer textured material beneath. High albedo, adverse thermal properties and very low inherent fertility are additional limiting factors for regeneration on pumice soils.

358 Yallani family, pumice overburden, 20 to 45 percent slopes

Map Unit Components	**Yallani family, pumice overburden (80%)**
Geomorphic Position	Moderately steep mountain sideslopes and ridge tops.
Typical Vegetation Series	Red Fir Forest Red Fir - White Fir Forest, Snowbrush Chaparral

Soil Profile Description

Surface Soil	0-17" brown and very pale brown very cindery and extremely cindery coarse sandy loam, single grain, 40-70% gravel size pumice cinders, slightly acid. 17-28" brown cobbly fine sandy loam, weak medium subangular blocky structure, 35% gravel, cobbles and stones, neutral.
Subsoil	28-46" brown very cobbly fine sandy loam, moderate medium subangular blocky structure, 35% gravel, cobbles and stones.
Substratum	46-50" broken basalt bedrock.

Soil Properties & Management Interpretations

Forest Survey Site Class	5
Adapted Species Group	WF, RF, JP, LLP
Soil Erodibility	Low
AWC for Profile Depth	4.0-5.0
AWC for Surface 24"	3.0-3.8
Seedling Survival Potential	Low
Plantability Potential	High
Hydrologic Soil Group	B
Potential for Roadbed Damage	High
Inclusions (20%)	Rock outcrop, volcanic Stonewell family Slightly weathered cinders
Remarks:	Depth of pumice overburden determines suitability for artificial regeneration. Despite the high AWC values for pumice soils, the potential for regeneration is limited. The most limiting factor is the depth of pumice. Repeated attempts at establishing seedlings in pumice have been unsuccessful; it appears necessary for the roots to reach finer textured material beneath. High albedo, adverse thermal properties and very low inherent fertility are additional limiting factors for regeneration on pumice soils.

359 Yallani, pumice overburden-Lostspring families association, 0 to 25 percent slopes

Map Unit Components	Yallani family, pumice overburden (60%)	Lostspring family (30%)
Geomorphic Position	Gently sloping mountain sideslopes and ridge tops.	Gently sloping outwash terraces.
Typical Vegetation Series	Red Fir - White Fir Forest Snowbrush Chaparral	Lodgepole Pine Forest Barren/Stipa White Fir Forest

Soil Profile Description

Surface Soil	0-17" brown and very pale brown very cindery and extremely cindery coarse sandy loam, single grain, 40-70% gravel size pumice cinders, slightly acid. 17-28" brown cobbly fine sandy loam, weak medium subangular blocky structure, 35% gravel, cobbles and stones, neutral.	0-24" brown very cindery coarse sand and very pale brown extremely cindery coarse sand, single grain, 40-90% gravel, slightly acid.
Subsoil	28-46" brown very cobbly fine sandy loam, moderate medium subangular blocky structure, 35% gravel, cobbles and stones.	
Substratum	46-50" broken basalt bedrock.	24-60" yellowish brown gravelly sandy loam, weak medium and coarse subangular blocky structure, 15-20% gravel, slightly acid.

Soil Properties & Management Interpretations

Forest Survey Site Class	5	5
Adapted Species Group	WF, RF, JP, LLP	WF, RF, JP, LLP
Soil Erodibility	Low	Low
AWC for Profile Depth	4.0-5.0	6.6-7.4
AWC for Surface 24"	3.0-3.8	4.2-4.6
Seedling Survival Potential	Low	Low
Plantability Potential	High	High
Hydrologic Soil Group	B	A
Potential for Roadbed Damage	High	High

Inclusions (10%)

Rock outcrop, volcanic
Rubble land

Remarks:

Depth of pumice overburden determines suitability for artificial regeneration. Despite the high AWC values for pumice soils, the potential for regeneration is limited. The most limiting factor is the depth of pumice. Repeated attempts at establishing seedlings in pumice have been unsuccessful; it appears necessary for the roots to reach finer textured material beneath. High albedo, adverse thermal properties and very low inherent fertility are additional limiting factors for regeneration on pumice soils.

360 Yallani, pumice overburden-Redcap families association, 20 to 50 percent slopes

Map Unit Components	Yallani family, pumice overburden (60%)	Redcap family (30%)
Geomorphic Position	Steep mountain sideslopes in proximity to pumice cones.	Steep mountain sideslopes to proximity to pumice cones.
Typical Vegetation Series	Red Fir - White Fir Forest Snowbrush Chaparral	red Fir Forest

Soil Profile Description

Surface Soil	0-17" brown and very pale brown very cindery and extremely cindery coarse sandy loam, single grain, 40-70% gravel size pumice cinders, slightly acid. 17-28" brown cobbly fine sandy loam, weak medium subangular blocky structure, 35% gravel, cobbles and stones, neutral.	0-24" light brownish gray cindery loam coarse sand, single grain, 30-40% gravel size pumice cinders slightly acid.
Subsoil	28-46" brown very cobbly fine sandy loam, moderate medium subangular blocky structure, 35% gravel, cobbles and stones.	
Substratum	46-50" broken basalt bedrock.	24-60" light gray very gravelly sandy loam, weak medium subangular blocky structure, 40-60% gravel and cobbles, slightly acid. 60-62" semi-consolidated glacial till.

Soil Properties & Management Interpretations

Forest Survey Site Class	5	5
Adapted Species Group	WF, RF, JP, LLP	RF, JP, WWP
Soil Erodibility	Low	Low
AWC for Profile Depth	4.0-5.0	5.7-7.2
AWC for Surface 24"	3.0-3.8	3.6-4.6
Seedling Survival Potential	Low	Low
Plantability Potential	High	High
Hydrologic Soil Group	B	B
Potential for Roadbed Damage	High	High
Inclusions (10%)	Rock outcrop, volcanic	

Remarks:

Depth of pumice overburden determines suitability for artificial regeneration. Despite the high AWC values for pumice soils, the potential for regeneration is limited. The most limiting factor is the depth of pumice. Repeated attempts at establishing seedlings in pumice have been unsuccessful; it appears necessary for the roots to reach finer textured material beneath. High albedo, adverse thermal properties and very low inherent fertility are additional limiting factors for regeneration on pumice soils.

361 Yallani, pumice overburden-Revit families complex, 40 to 60 percent slopes

Map Unit Components	Yallani family, pumice overburden (60%)	Revit family (30%)
Geomorphic Position	Upper mountain sideslopes.	Upper mountain sideslopes.
Typical Vegetation Series	Chaparral	Chaparral

Soil Profile Description

Surface Soil	0-17" brown and very pale brown very cindery and extremely cindery coarse sandy loam, single grain, 40-70% gravel size pumice cinders, slightly acid. 17-28" brown cobbly fine sandy loam, weak medium subangular blocky structure, 35% gravel, cobbles and stones, neutral.	0-20" very dark grayish brown to dark grayish brown fine sandy loam weak fine granular to weak medium angular blocky structure, 0-14% gravel, strongly to medium acid.
Subsoil	28-46" brown very cobbly fine sandy loam, moderate medium subangular blocky structure, 35% gravel, cobbles and stones.	20-36" brown cobbly loamy fine sand, weak medium subangular blocky structure, 30-35% gravel, medium to strongly acid.
Substratum	46-50" broken basalt bedrock.	36-40" fractured vesicular basalt.

Soil Properties & Management Interpretations

Forest Survey Site Class	5	4
Adapted Species Group	WF, RF, JP, LLP	WF, RF, JP
Soil Erodibility	Low	Low
AWC for Profile Depth	4.0-5.0	3.2-5.2
AWC for Surface 24"	3.0-3.8	2.4-2.8
Seedling Survival Potential	Low	High
Plantability Potential	High	High
Hydrologic Soil Group	B	B
Potential for Roadbed Damage	High	High

Inclusions (10%)

Rock outcrop, volcanic
Sheld family

Remarks:

Depth of pumice overburden determines suitability for artificial regeneration. Despite the high AWC values for pumice soils, the potential for regeneration is limited. The most limiting factor is the depth of pumice. Repeated attempts at establishing seedlings in pumice have been unsuccessful; it appears necessary for the roots to reach finer textured material beneath. High albedo, adverse thermal properties and very low inherent fertility are additional limiting factors for regeneration on pumice soils.

362 Yallani, pumice overburden-Rock outcrop association, 0 to 25 percent slopes

Map Unit Components	**Yallani family, pumice overburden (60%)**	**Rock outcrop (30%)**
Geomorphic Position	Gently sloping sideslopes and lava ridges.	Gently sloping lava flows.
Typical Vegetation Series	Red Fir-White Fir Forest White Fir Forest Ponderosa Pine Forest	

Soil Profile Description

Surface Soil	0-17" brown and very pale brown very cindery and extremely cindery coarse sandy loam, single grain, 40-70% gravel size pumice cinders, slightly acid. 17-28" brown cobbly fine sandy loam, weak medium subangular blocky structure, 35% gravel, cobbles and stones, neutral.
Subsoil	28-46" brown very cobbly fine sandy loam, moderate medium subangular blocky structure, 35% gravel, cobbles and stones.
Substratum	46-50" broken basalt bedrock.

Soil Properties & Management Interpretations

Forest Survey Site Class	5	
Adapted Species Group	WF, RF, JP, LLP	
Soil Erodibility	Low	
AWC for Profile Depth	4.0-5.0	
AWC for Surface 24"	3.0-3.8	
Seedling Survival Potential	Low	
Plantability Potential	High	
Hydrologic Soil Group	B	D
Potential for Roadbed Damage	High	Low
Inclusions (10%)	Sheld family Yallani family	

Remarks:

Depth of pumice overburden determines suitability for artificial regeneration. Despite the high AWC values for pumice soils, the potential for regeneration is limited. The most limiting factor is the depth of pumice. Repeated attempts at establishing seedlings in pumice have been unsuccessful; it appears necessary for the roots to reach finer textured material beneath. High albedo, adverse thermal properties and very low inherent fertility are additional limiting factors for regeneration on pumice soils.

363 Yollabolly family-Rock outcrop complex, 40 to 80 percent slopes

	Yollabolly family (50%)	Rock outcrop (30%)
Map Unit Components		
Geomorphic Position	Steep to very steep mountain sideslopes and ridge tops.	Same as above.
Typical Vegetation Series	Barren/Pussy Paws, Upper Montane Mixed Chaparral	

Soil Profile Description

Surface Soil	0-4" dark brown very gravelly loam, weak fine granular structure, 35% gravel, strongly acid.
Subsoil	
Substratum	4-6" yellowish brown very gravelly loam, massive 30% gravel, 10% stones, very strongly acid. 6-20" highly fractured slightly weathered schist.

Soil Properties & Management Interpretations

Forest Survey Site Class	7	
Adapted Species Group	GL, BL	
Soil Erodibility	Moderate	
AWC for Profile Depth	0.5-1.2	
AWC for Surface 24"	0.5-1.2	
Seedling Survival Potential	V. Low-Low	
Plantability Potential	V. Low	
Hydrologic Soil Group	D	D
Potential for Roadbed Damage	Low	Low
Inclusions (20%)	Jayar family Neuns family, schist substratum	
Remarks:		

FV2 Dystric Cryochrepts Association
Steep to Moderately Steep

Geomorphic Position	Steep to moderately steep mountain sideslopes.
Typical Vegetation Series	White Fir, Douglas-Fir Chaparral
Bedrock	Pre-Cretaceous Metavolcanics

Map Unit Components

Dystric Cryochrepts

General Soil Description	Loamy skeletal, more than 40" deep

Soil Properties & Management Interpretations

Forest Survey Site Class	3-4
Adapted Species Group	RF
Soil Erodibility	Low
AWC for Profile Depth	1.7-3.3
AWC for Surface 24"	1.5-2.0
Seedling Survival Potential	Low-Mod
Plantability Potential	Moderate
Hydrologic Soil Group	B-2
Potential for Roadbed Damage	Low

FP2 Dystric Xerochrepts-Dystric Cryochrepts Association
Gently Sloping to Moderately Steep

Geomorphic Position	Gentle to moderately steep mountain sideslopes.
Typical Vegetation Series	Red Fir, White Fir and Douglas-Fir
Bedrock	Pre-Silurian metavolcanics

Map Unit Components

	Dystric Xerochrepts (70%)	Dystric Cryochrepts (30%)
General Soil Description	Loamy skeletal soils less than 40" deep	Loamy skeletal soils less than 40" deep

Soil Properties & Management Interpretations

Forest Survey Site Class	3-5	4-5
Adapted Species Group	DF, PP, WF	RF, BL, WF
Soil Erodibility	Low-High	Low-Moderate
AWC for Profile Depth	2.0-5.7	1.7-3.3
AWC for Surface 24"	2.0-3.5	1.5-2.0
Seedling Survival Potential	Low-High	Moderate
Plantability Potential	Moderate	Moderate
Hydrologic Soil Group	B-2 - C-2	B-2 - A-2
Potential for Roadbed Damage	Mod-High	Low-Mod

FM3 Dystric Xerochrepts-Ultic Haploxeralfs Association
Moderately Steep

Geomorphic Position	Moderately steep mountain sideslopes.
Typical Vegetation Series	Douglas Fir, Ponderosa Pine, Sugar Pine, Tan Oak
Bedrock	Pre-Cretaceous metamorphics

Map Unit Components

	Dystric Xerochrepts (60%)	Ultic Haploxeralfs (40%)
General Soil Description	Sandy skeletal soils more than 40" deep	Fine loam, skeletal soils less than 40" deep

Soil Properties & Management Interpretations

Forest Survey Site Class	4-5	3-2
Adapted Species Group	DF, PP, SP	DF, PP, SP
Soil Erodibility	Low	Moderate
AWC for Profile Depth	2.1-5.0	1.9-8.0
AWC for Surface 24"	1.9-2.6	1.6-4.1
Seedling Survival Potential	Low-Mod	Mod-High
Plantability Potential	Low-Mod	Mod-High
Hydrologic Soil Group	B-2	B-2 - C-2
Potential for Roadbed Damage	Moderate	High

FG2 Pachic Xerumbrepts-Lithic Cryorthents, Rock Outcrop Association Moderately Steep

Geomorphic Position	Moderately steep mountain sideslopes
Typical Vegetation Series	High Montane Deciduous Oak and Chaparral, White Fir, Wester White Pine and Jeffrey Pine
Bedrock	Granitics

Map Unit Components

	Pachic Xerumbrepts (40%)	Lithic Cryorthents (30%)	Rock Outcrop (30%)
General Soil Description	Sandy skeletal soils less than 40" deep	Sandy skeletal soils less than 20" deep	

Soil Properties & Management Interpretations

Forest Survey Site Class	4-5	6	
Adapted Species Group	BL, WF, WWP	BL, RF, WF	
Soil Erodibility	Low	Moderate	Low
AWC for Profile Depth	1.9-4.8	0.7-1.8	
AWC for Surface 24"	1.9-2.6	0.7-1.8	
Seedling Survival Potential	Low-Mod	V. Low-Low	
Plantability Potential	Low	Low	
Hydrologic Soil Group	B-2	D-1	D-3
Potential for Roadbed Damage	Moderate	Low	Low

FV1 Rock Outcrop-Lithic Cryochrepts Association
Moderately Steep to Steep

Geomorphic Position	Moderately steep to steep mountain sideslopes.
Typical Vegetation Series	Upper Montane Mixed Chaparral
Bedrock	Pre-Cretaceous Metavolcanics

Map Unit Components

	Rockland (50%)	Lithic Cryochrepts (50%)
General Soil Description		Sandy skeletal less than 20" deep

Soil Properties & Management Interpretations

Forest Survey Site Class		6
Adapted Species Group		BL
Soil Erodibility	Low	Low
AWC for Profile Depth		0.7-2.0
AWC for Surface 24"		0.7-2.0
Seedling Survival Potential		V. Low-Low
Plantability Potential		V. Low-Low
Hydrologic Soil Group	D-3	D-1
Potential for Roadbed Damage	Low	Low

FU2 Rock Outcrop-Lithic Xerochrepts, Typic Xerochrepts Association
Gently Sloping to Steep

Geomorphic Position	Gentle to steep mountain sideslopes.
Typical Vegetation Series	White Fir, Jeffrey Pine, Incense Cedar, Wester, White Pine
Bedrock	Ultramafics

Map Unit Components

	Rock outcrop (35%)	Lithic Xerochrepts (35%)	Typic Xerochrepts (30%)
General Soil Description		Loamy skeletal less than 20" deep	Loamy skeletal less than 40" deep

Soil Properties & Management Interpretations

Forest Survey Site Class		6	4-5
Adapted Species Group		JP, IC, WF, BL	JP, IC, BL
Soil Erodibility	Low	Low-Moderate	Low-Moderate
AWC for Profile Depth		1.3-2.4	2.4-5.5
AWC for Surface 24"		1.3-2.4	1.8-4.0
Seedling Survival Potential		V. Low-Low	Low-Mod
Plantability Potential		Low-Mod	Low-Mod
Hydrologic Soil Group	D-3	C-1 - D-1	B-2
Potential for Roadbed Damage	Low	Low	Moderate

FU1 Rock Outcrop-Lithic Xerumbrepts

Geomorphic Position	Moderately steep to steep mountain sideslopes.
Typical Vegetation Series	Jeffrey Pine, Incense Cedar, and Douglas-Fir
Bedrock	Ultramafics

Map Unit Components

	Rock Outcrop (50%)	Lithic Xerumbrepts (50%)
General Soil Description		Loamy skeletal less than 20" deep

Soil Properties & Management Interpretations

Forest Survey Site Class		6-5
Adapted Species Group		JP, IC, BL
Soil Erodibility	Low	Moderate
AWC for Profile Depth		0.7-2.8
AWC for Surface 24"		0.9-2.8
Seedling Survival Potential		V. Low-Low
Plantability Potential		V. Low-Mod
Hydrologic Soil Group	D-3	D-1
Potential for Roadbed Damage	Low	Low

FP1 Rock Outcrop-Lithic Cryumbrepts, Lithic Xerochrepts Association
Steep

Geomorphic Position	Steep mountain sideslopes.
Typical Vegetation Series	Red Fir, Ponderosa Pine and Canyon Live Oak
Bedrock	Pre-Silurian Metavolcanics

Map Unit Components

	Rock outcrop (40%)	Lithic Cryumbrepts (30%)	Lithic Xerochrepts (30%)
General Soil Description		Sandy skeletal soils less than 20"	Loamy skeletal soils less than 20"

Soil Properties & Management Interpretations

Forest Survey Site Class		6	6
Adapted Species Group		GL, BL	BL
Soil Erodibility	Low	Low	Low
AWC for Profile Depth		1.1-2.2	0.9-2.0
AWC for Surface 24"		1.1-2.2	0.9-1.7
Seedling Survival Potential		V. Low-Low	V. Low-Low
Plantability Potential		Low	Low
Hydrologic Soil Group	D-3	D-1	D-1
Potential for Roadbed Damage	Low	Low	Low

FM1 Rock Outcrop-Lithic Xerorthents, Lithic Xerochrepts Association
Moderately Steep to Steep

Geomorphic Position	Moderately steep to steep side slopes.
Typical Vegetation Series	Canyon Oak, Chaparral, Tan Oak, and Douglas Fir
Bedrock	Pre-Cretaceous metamorphics

Map Unit Components

	Rock Outcrop (40%)	Lithic Xerorthents (30%)	Lithic Xerochrepts (30%)
General Soil Description		Loamy skeletal soils less than 20" deep	Loamy skeletal soils less than 20" deep

Soil Properties & Management Interpretations

Forest Survey Site Class		6	6
Adapted Species Group		BL	BL, DF
Soil Erodibility	Low	Moderate	Moderate
AWC for Profile Depth		0.7-1.2	0.7-1.9
AWC for Surface 24"		0.7-1.2	0.7-1.9
Seedling Survival Potential		V. Low	V. Low-Low
Plantability Potential		V. Low	Mod-High
Hydrologic Soil Group	D-3	D-1	D-1
Potential for Roadbed Damage	Low	Low	Low

FG1 Rock Outcrop-Lithic Xerumbrepts, Lithic Cryumbrepts Association
Steep

Geomorphic Position	Steep mountain sideslope at high elevation.
Typical Vegetation Series	Upper Montane Mixed Chaparral
Bedrock	Granitics

Map Unit Components

	Rock Outcrop (70%)	Lithic Xerumbrepts (15%)	Lithic Cryumbrepts (15%)
General Soil Description		Sandy skeletal soils less than 20" deep	Sandy skeletal soils less than 20" deep

Soil Properties & Management Interpretations

Forest Survey Site Class		6	6
Adapted Species Group		BL, RF, WF	BL, RF, WF
Soil Erodibility	Low	Low	Low
AWC for Profile Depth		0.7-1.8	0.7-2.0
AWC for Surface 24"		0.7-1.8	0.7-2.0
Seedling Survival Potential		V. Low-Low	V. Low-Low
Plantability Potential	V. Low-Low	Low	Low
Hydrologic Soil Group	D-3	D-1	D-1
Potential for Roadbed Damage	Low	Low	Low

FM2 Rock Outcrop-Pachic Xerumbrepts, Dystric Xerochrepts Association

Geomorphic Position	Steep mountain sideslopes
Typical Vegetation Series	White Fir, Canyon Oak, Douglas Fir and Tan Oak
Bedrock	Pre-Cretaceous metamorphics

Map Unit Components

	Rock Outcrop (40%)	Pachic Xerumbrepts (30%)	Dystric Xerochrepts (30%)
General Soil Description		Sandy skeletal soils less than 40" deep	Sandy skeletal soils more than 40" deep

Soil Properties & Management Interpretations

Forest Survey Site Class		4-6	3-4
Adapted Species Group		BL, WF, DF	DF, PP, SP
Soil Erodibility		Low	Low
AWC for Profile Depth		1.9-4.8	2.0-3.2
AWC for Surface 24"		1.9-2.6	2.0-4.0
Seedling Survival Potential		Low	Low-Mod
Plantability Potential		Low	Low-Mod
Hydrologic Soil Group	D-3	B-2	B-2
Potential for Roadbed Damage	Low	Moderate	Moderate

FU3 Ultic Haploxeralfs-Typic Xerochrepts Association
Gently Sloping to Moderately Steep

Geomorphic Position	Gentle to moderately steep mountain sideslopes.
Typical Vegetation Series	Douglas-Fir, Ponderosa Pine, Sugar Pine, and Tan Oak
Bedrock	Ultramafics

Map Unit Components

	Ultic Haploxeralfs (50%)	Typic Xerochrepts (50%)
General Soil Description	Fine loamy, deep to moderately deep	Fine loamy to loamy, skeletal deep to moderately deep

Soil Properties & Management Interpretations

Forest Survey Site Class	3-1	4-3
Adapted Species Group	DF, PP, JP	DF, JP, WF
Soil Erodibility	Low-High	Low-Moderate
AWC for Profile Depth	1.8-3.8	2.4-5.5
AWC for Surface 24"	2.9-6.7	1.8-4.0
Seedling Survival Potential	Mod-High	Low-Moderate
Plantability Potential	Mod-High	Moderate
Hydrologic Soil Group	B-2 - C-2	B-2
Potential for Roadbed Damage	Moderate	Moderate

Classification, Genesis, and Morphology

The soil classification system of the National Cooperative Soil Survey is presented in Soil Taxonomy (Soil Survey Staff, 1975). This system is comprehensive, in that it covers the soils of the world in a way pertinent to understanding their most fundamental differences and similarities and their genetic relationship (including soil-landscape, soil-vegetation, and soil-climate relationships) as well as their geographic distribution. The soil taxonomy provides defined classes at six categorical levels (order, suborder, great group, subgroup, family, and series). Classification at lower levels is coordinated with classification at all higher levels. That is, there is a consistent class-subclass relationship between categories.

ORDER. Ten soil orders are recognized. The differences among orders reflect the dominant soil-forming processes and the degree of soil formation. Each order is identified by a word ending on sol. An example is Alfisol.

SUBORDER. Each order is divided into suborders primarily on the basis of properties that influence soil genesis and are important to plant growth or properties that reflect the most important variables within the orders. The last syllable in the name of a suborder indicates the order. An example is Xeralf (Xer, meaning dry, plus alf, from Alfisol).

GREAT GROUP. Each suborder is divided into great groups on the basis of close similarities in kind, arrangement, and degree of development of pedogenic horizons; soil moisture and temperature regimes; and base status. Each great group is identified by the name of a suborder and by a prefix that indicates a property of the soil. An example is Haploxeralfs (hapl, meaning minimal horizonation, plus xeralf, the suborder of the Alfisols that have an xeric moisture regime).

SUBGROUP. Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but to not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective Typic identifies the subgroup that typifies the great group. An example is Typic Haploxeralfs.

FAMILY. Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Mostly the properties are those of horizons below plow depth where there is much biological activity. Among the properties and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is fine-loamy, mixed, thermic Typic Haploxeralfs.

Five soil orders are represented in the Shasta-Trinity Forests survey area: Alfisols, Entisols, Inceptisols, Mollisols and Ultisols.

The soils in the survey area have a xeric moisture regime and a cryic, frigid, mesic or thermic temperature regime. The xeric moisture regime is typical in Mediterranean climates, where winters are moist and cool and summers are warm and dry. Therefore, unless the soil is irrigated, its moisture control section is dry in all parts for 45 consecutive days or more from July until October in 6 out of 10 years. The moisture control section is moist in all parts for 45 consecutive days or more from December until May.

The temperature regime is thermic at the lower elevations, particularly on south-facing aspects. In a thermic temperature regime, the soil temperature at a depth of 20 inches ranges from 59 to 72°F. At higher elevations, the temperature regime is mesic. In a mesic temperature regime, the soil temperature at a depth of 20 inches ranges from 47 to 59°F. In a frigid temperature regime, which occurs at the high elevations, particularly on north-facing aspects, the soil temperature at a depth of 20 inches ranges from 32 to 47°F.

Alfisols are soils that have a massive and hard A horizon and an argillic B horizon. They have high base saturation, and water is held at less than 15 bar tension during at least 3 months of each year when the soil is warm enough for plants to grow. Alfisols in this area have been placed in the Xeralf suborder. They have a xeric moisture regime; winters are moist and cool, and summers are warm and dry.

Entisols are soils that have little or no evidence of development of pedogenic horizons.

The Entisols in this area are in the Orthent and Psamment suborders. The soils do not have a B horizon and generally are less than 1 percent organic matter.

Orthents have a particle-size class that is loamy or finer in texture in some horizons below the Ap horizon and have slope of more than 25 percent or have an organic carbon content that decreases regularly with increasing depth. The organic carbon reaches a level of 0.2 percent or less within a depth of 1.25 meters. Psamments are loamy fine sand or coarser in the textural control section. These soils are on alluvial fans and are deep to very deep. The Orthents and Psamments have been placed in the Xerorthent and Xeropsamment great groups since they have a xeric moisture regime.

Inceptisols are soils in which altered horizons have lost bases of iron and aluminum but have retained some weatherable minerals. These soils do not have an illuvial horizon enriched either with silicate clay that contains aluminum or with an amorphous mixture of aluminum and organic carbon.

The Inceptisols in the survey area are in the Ochrept suborder. They have an ochric epipedon and a cambic horizon. They do not have a mollic epipedon because either the dark color, organic matter, or structure is lacking. The cambic horizon increases in clay content by 1 or 2 percent and has structure. The texture is coarse sandy loam or finer. These soils have a xeric moisture regime and thus have been placed in the Xerochrept great group.

Mollisols typically have a dark colored surface layer which is more than 25 cm thick, is more than 1 percent organic matter, and is not both hard and massive. Base saturation of this layer is more than 50 percent.

In this survey area the Mollisols are in the Xeroll suborder. These soils formed in a warm, subhumid climate or in a semiarid climate where a natural, supplemental source of water extends the growing season. Winters are cool and moist, and summers are hot and dry. Unless irrigated, these soils are dry throughout the root zone for more than 60 consecutive days during the 3-month period following the summer solstice.

Xerolls are divided into to great groups: Argixerolls and Haploxerolls. Soils that do not have a clay-enriched B horizon or layers strong in calcium carbonates are classified in the Haploxeroll great group. Soils that have a clay-enriched B horizon and a clear to gradual boundary between the A and B horizons and do not have strongly calcareous layers have been placed in the Argixeroll great group.

TABLE 3. - Classification of the Soils

Soil Name	Family or Higher Taxa Classification
Asta	Fine-loamy, mixed, mesic Andeptic Haplohumults
Atter	Sandy-skeletal, mixed, mesic Typic Xerorthents
Avis	Ashy-skeletal, frigid Dystric Xerorthents
Beaughton	Clayey-skeletal, serpentinitic, mesic Lithic Argixerolls
Behanin	Loamy-skeletal, mixed, Pachic Cryoborolls
Brader	Loamy, mixed, mesic, shallow Typic Xerochrepts
Chaix	Coarse-loamy, mixed, mesic Dystric Xerochrepts
Chawanakee	Loamy, mixed, mesic, shallow Dystric Xerochrepts
Cheadel	Loamy-skeletal, mixed, Lithic Cryoborolls
Copsey	Fine, serpentinitic, mesic Vertic Haplaquolls
Coyata	Loamy-skeletal, mixed, mesic Typic Xerumbrepts
Deadfall	Loamy-skeletal, serpentinitic Typic Cryorthents
Deadwood	Loamy-skeletal, mixed, mesic Dystric Lithic Xerochrepts
Delaney	Ashy, mesic Typic Xeropsamments
Dewmine	Clayey-skeletal, serpentinitic, frigid Lithic Argixerolls
Dubakella	Clayey-skeletal, serpentinitic, mesic Mollic Haploxeralfs
Dunsmuir	Fine-loamy, oxidic, mesic Ultic Haploxeralfs
Endlich	Loamy-skeletal, mixed Dystric Cryochrepts
Etsel	Loamy-skeletal, mixed, nonacid, mesic Lithic Xerorthents
Fons	Medial over cindery, frigid Umbric Vitrandepts
Forbes	Fine, oxidic, mesic Ultic Palexeralfs
Germany	Medial, mesic Andic Xerumbrepts
Goulding	Loamy-skeletal, mixed, mesic Lithic Xerochrepts
Gozem	Loamy-skeletal, serpentinitic, frigid Lithic Xerochrepts
Grell	Loamy-skeletal, serpentinitic, mesic Lithic Haploxerolls
Henneke	Clayey-skeletal, serpentinitic, thermic Lithic Argixerolls
Hohmann	Fine-loamy, mixed, mesic Typic Xerochrepts
Holland	Fine-loamy, mixed, mesic Ultic Haploxeralfs
Hugo	Fine-loamy, mixed, mesic Dystric Xerochrepts
Huntmount	Fine-loamy, mixed, mesic Typic Haploxeralfs
Inville	Loamy-skeletal, mixed, frigid Ultic Haploxeralfs
Ishi Pishi	Clayey-skeletal, serpentinitic, mesic Ultic Haploxeralfs
Jayar	Loamy-skeletal, mixed, frigid Dystric Xerochrepts
Kang	Clayey-skeletal, serpentinitic, mesic Pachic Argixerolls
Konocti	Loamy-skeletal, mixed, mesic Typic Haploxeralfs

Soil Name	Family or Higher Taxa Classification
Ledmount	Medial, mesic Lithic Xerumbrepts
Lostspring	Cindery over medial, frigid Dystric Xerorthents
Marpa	Loamy-skeletal, mixed, mesic Ultic Haploxeralfs
McCumber	Ashy-skeletal, frigid, Umbric Vitrandepts
Merkel	Loamy-skeletal, mixed, frigid Typic Xerochrepts
Millsholm	Loamy, mixed, thermic Lithic Xerochrepts
Morical	Fine-loamy, mixed, mesic Mollic Haploxeralfs
Nanny	Loamy-skeletal, mixed, frigid Typic Xerumbrepts
Neer	Medial-skeletal, mesic Andic Xerochrepts
Neuns[1]	Loamy-skeletal, mixed, mesic Dystric Xerochrepts
Olete	Loamy-skeletal, mixed, mesic Typic Xerochrepts
Ovall	Coarse-loamy, mixed, mesic Typic Xerumbrepts
Parks	Loamy-skeletal, serpentinitic, frigid Typic Xerochrepts
Parrish	Fine, vermiculitic, mesic Ultic Haploxeralfs
Redcap	Cindery over medial-skeletal, frigid Dystric Xerorthents
Revit	Medial, frigid Andic Xerumbrepts
Rogue	Coarse-loamy, mixed, frigid Dystric Xerochrepts
Sadie	Medial, mesic Andic Xerochrepts
Secca	Fine, mixed, mesic Mollic Haploxeralfs
Shadeleaf	Fine, serpentinitic, mesic Typic Argixerolls
Shasta	Ashy, mesic Umbric Vitrandepts
Sheld	Medial-skeletal, frigid Andic Xerumbrepts
Skymor	Loamy-skeletal, mixed, frigid Dystric Lithic Xerochrepts
Soulajule	Clayey-skeletal, mixed, mesic Ultic Haploxeralfs
Stecum	Sandy-skeletal, mixed Typic Cryorthents
Stonewell	Cindery, frigid Dystric Xerorthents
Stonyford	Loamy, mixed, thermic Lithic Mollic Haploxeralfs
Tallac	Loamy-skeletal, mixed, frigid Pachic Xerumbrepts
Tamflat	Clayey-skeletal, serpentinitic, frigid Lithic Haploxeralfs
Toadlake	Loamy-skeletal, serpentinitic, frigid Typic Haploxeralfs
Wapal	Sandy-skeletal, mixed, frigid Typic Xerorthents
Washougal	Medial-skeletal, mesic Andic Xerumbrepts
Weitchpec	Loamy-skeletal, serpentinitic, mesic Typic Xerochrepts
Wintoner	Fine-loamy, mixed, frigid Ultic Haploxeralfs
Yallani	Medial-skeletal, frigid Andic Xerochrepts
Yollabolly	Loamy-skeletal, mixed, acid, frigid Lithic Xerorthents

Subgroups and Higher Taxa:

Andeptic Cryorthents
Andic Cryumbrepts
Aquic Xerorthents
Aquolls
Dystric Cryochrepts
Dystric Cryopsamments
Dystric Xerochrepts
Dystric Xerorthents
Entic Cryumbrepts
Lithic Cryochrepts
Lithic Cryorthents
Lithic Cryumbrepts
Lithic Haploxeralfs
Lithic Xerochrepts
Lithic Xerumbrepts
Lithic Xerorthents
Pachic Xerumbrepts
Typic Cryaquolls
Typic Xerochrepts
Typic Xerorthents
Ultic Haploxeralfs
Xerofluvents
Xerolls

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[1]Neuns is called Clallam on the Six Rivers and Klamath National Forests.

TABLE 4. - Classification by Taxonomic Category and Represented Taxonomic Families

Alfisols	
Xeralfs	
Haploxeralfs	
Typic Haploxeralfs	
loamy-skeletal, mixed, mesic	Konocti
loamy-skeletal, serpentinitic, frigid	Toadlake
fine-loamy, mixed, mesic	Huntmount
Lithic Haploxeralfs	(subgroup)
clayey-skeletal, serpentinitic, frigid	Tamflat
Lithic Mollic Haploxeralfs	
loamy, mixed, thermic	Stonyford
Mollic Haploxeralfs	
clayey-skeletal, serpentinitic, mesic	Dubakella
fine-loamy, mixed, mesic	Morical
fine, mixed, mesic	Secca
Ultic Haploxeralfs	
loamy-skeletal, mixed, frigid	Inville
loamy-skeletal, mixed, mesic	Marpa
loamy-skeletal, mixed, mesic	Marpa, deep
clayey-skeletal, mixed, mesic	Soulajule
clayey-skeletal, serpentinitic, mesic	Ishi Pishi
clayey-skeletal, serpentinitic, mesic	Ishi Pishi, deep
fine-loamy, mixed, frigid	Wintoner
fine-loamy, mixed, mesic	Yallani, deep
fine-loamy, mixed, mesic	Holland, ashy
fine-loamy, mixed, mesic	Holland, granitic
fine-loamy, mixed, mesic	Holland
fine, oxidic, mesic	Dunsmuir
fine, vermiculitic, mesic	Parrish
Ultic Palexeralfs	
fine, oxidic, mesic	Forbes
Entisols	
Orthents	
Cryorthents	
Typic Cryorthents	
sandy-skeletal, mixed	Stecum
Andeptic Cryorthents	(subgroup)
Xerorthents	
Typic Xerorthents	
Typic Xerorthents, extremely acid	(subgroup)

Typic Xerorthents, extremely gravelly	(subgroup)
sandy-skeletal, mixed, mesic	Atter
sandy-skeletal, mixed, frigid	Wapal
Aquic Xerorthents, seasonally flooded	(subgroup)
Dystric Xerorthents	
cindery, frigid	Stonewell
ashy-skeletal, frigid	Avis
Lithic Xerorthents	
loamy-skeletal, mixed, acid, frigid	Yollabolly
loamy-skeletal, mixed, nonacid, mesic	Etsel
Dystric Xerorthents	
cindery over medial, frigid	Lostspring
Dystric Xerorthents	
cindery over medial-skeletal, frigid	Redcap
Psamments	
Cryopsamments	
Dystric Cryopsamments	(subgroup)
Xeropsamments	
Typic Xeropsamments	
ashy, mesic	Delaney, deep
ashy, mesic	Delaney
Mollisols	
Aquolls	(subgroup)
Cryaquolls	
Typic Cryaquolls	(subgroup)
Haplaquolls	
Vertic Haplaquolls	
fine, serpentinitic, mesic	Copsey
Borolls	
Cryoborolls	
Lithic Cryoborolls	
loamy-skeletal, mixed	Cheadle
Pachic Cryoborolls	
loamy-skeletal, mixed	Behanin
Xerolls	(subgroup)
Argixerolls	
Typic Argixerolls	
fine, serpentinitic, mesic	Shadeleaf

Lithic Argixerolls	
clayey-skeletal, serpentinitic, frigid	Dewmine
clayey-skeletal, serpentinitic, mesic	Beaughton
clayey-skeletal, serpentinitic, thermic	Henneke
Pachic Argixerolls	
clayey-skeletal, serpentinitic, mesic	Kang
Haploxerolls	
Lithic Haploxerolls	
loamy-skeletal, serpentinitic, mesic	Grell
Inceptisols	
Andepts	
Cryandepts	
Vitrandepts	
Umbric Vitrandepts	
ashy, mesic	Shasta
ashy-skeletal, frigid	McCumber
medial over cindery, frigid	Fons
Ochrepts	
Cryochrepts	
Typic Cryochrepts	
loamy-skeletal, serpentinitic	Deadfall
Dystric Cryochrepts	
loamy-skeletal, mixed	Endlich
Lithic Cryochrepts	
Lithic Cryochrepts, ultramafic	(subgroup)
Xerochrepts	
Typic Xerochrepts	
loamy-skeletal, mixed, mesic	Olete
loamy-skeletal, mixed, frigid	Merkel
loamy-skeletal, serpentinitic, frigid	Parks
loamy-skeletal, serpentinitic, mesic	Weitchpec
loamy, mixed, mesic, shallow	Brader
fine-loamy, mixed, mesic	Hohmann
Andic Xerochrepts	
medial, mesic	Sadie, deep Sadie
medial-skeletal, frigid	Yallani
medial-skeletal, frigid	Yallani, pumice overburden
medial-skeletal, mesic	Neer
Dystric Xerochrepts	
loamy-skeletal, micaceous, mesic	Neuns, schist substratum

loamy-skeletal, mixed, frigid	Jayar, deep
loamy-skeletal, mixed, frigid	Jayar
loamy-skeletal, mixed, mesic	Neuns
loamy-skeletal, mixed, mesic	Neuns, deep
loamy, mixed, mesic, shallow	Chawanakee
coarse-loamy, mixed, frigid	Rogue
coarse-loamy, mixed, mesic	Chaix
fine-loamy, mixed, mesic	Hugo family
fine-loamy, mixed, mesic	Hugo, mod. deep
Dystric Lithic Xerochrepts	
loamy-skeletal, mixed, frigid	Skymor
loamy-skeletal, mixed, mesic	Deadwood
Lithic Xerochrepts	
loamy-skeletal, mixed, mesic	Goulding
loamy-skeletal, serpentinitic, frigid	Gozem
loamy, mixed, thermic	Millsholm
Umbrepts	
Cryumbrepts	
Andic Cryumbrepts	(subgroup)
Entic Cryumbrepts	(subgroup)
Lithic Cryumbrepts	(subgroup)
Xerumbrepts	
Typic Xerumbrepts	
loamy-skeletal, mixed, frigid	Nanny
loamy-skeletal, mixed, mesic	Coyata
coarse-loamy, mixed, mesic	Ovall
coarse-loamy, mixed mesic	Ovall, ponded
Andic Xerumbrepts	
medial, frigid	Revit
medial, mesic	Germany
	Germany, deep
medial-skeletal, frigid	Sheld
medial-skeletal, mesic	Washougal
	Washougal, deep
Lithic Xerumbrepts	
Lithic Xerumbrepts, cold	(subgroup)
medial, mesic	Ledmount
Pachic Xerumbrepts	
loamy-skeletal, mixed, frigid	Tallac
Ultisols	
Humults	
Haplohumults	
Andeptic Haplohumults	
fine-loamy, mixed, mesic	Asta

Table 5. - Acreage and Proportionate Extent of Map Units

Map Symbol	Mapping Unit Name	Survey Area%	Approx. Acreage
	Order 3		
1	**Andeptic Cryorthents** 10 to 40 percent slopes	.04	1,000
2	**Andeptic Cryorthents** 40 to 100 percent	.10	2,600
3	**Andic Cryumbrepts** 15 to 40 percent	.33	7,700
4	**Andic Cryumbrepts-Dystrict Cryopsamments complex** 0 to 70 percent slopes	.11	3,000
5	**Andic Cryumbrepts-Rock outcrop complex** 25 to 50 percent slopes	.02	500
6	**Aquolls-Xerolls complex** 0 to 20 percent slopes	.02	7,000
7	**Asta family** 5 to 40 percent slopes	.10	2,500
8	**Atter family** 0 to 20 percent slopes	.16	4,100
9	**Avis family** 0 to 20 percent slopes	.22	5,700
10	**Avis family-Andic Cryumbrepts** 0 to 20 percent slopes	.12	3,200
11	**Avis-Fons families association** 25 to 40 percent slopes	.27	7,000
12	**Beaughton family** 20 to 50 percent slopes	.11	2,900
13	**Beaughton-Dubakella families complex** 20 to 40 percent slopes	.08	2,100
14	**Beaughton family-Rock outcrop complex** 50 to 80 percent slopes	.05	1,300
15	**Beaughton-Weitchpec families complex** 20 to 40 percent slopes	.06	1,500
16	**Brader family** 40 to 60 percent slopes	.14	3,600
17	**Brader-Holland families association** 40 to 60 percent slopes	.04	1,000
18	**Chaix family** 40 to 60 percent slopes	.27	7,100
19	**Chaix family** 60 to 80 percent slopes	.10	2,700
20	**Chaix-Chawanakee families complex** 60 to 80 percent slopes	.53	10,600
21	**Chaix-Holland, granitic families association** 50 to 80 percent slopes	.22	5,800
22	**Chaix-Hugo families complex** 20 to 40 percent slopes	.01	1,600

Map Symbol	Mapping Unit Name	Survey Area%	Approx. Acreage
23	**Chawanakee family** 60 to 80 percent slopes	.02	3,800
24	**Chawanakee-Chaix families complex** 40 to 60 percent slopes	.01	2,500
25	**Chawanakee-Chaix families complex** 60 to 80 percent slopes	.18	4,800
26	**Chawanakee-Hugo families association** 60 to 80 percent slopes	.10	2,600
27	**Chawanakee family-Rock outcrop complex** 60 to 80 percent slopes	.40	10,600
28	**Copsey-Atter families association** 2 to 10 percent slopes	.04	1,000
29	**Coyata family** 0 to 20 percent slopes	.04	1,100
30	**Deadfall family-Lithic Cryochrepts complex** 40 to 60 percent slopes	.06	1,500
31	**Deadfall family-Rock outcrop complex** 50 to 80 percent slopes	.08	2,100
32	**Deadwood family** 40 to 60 percent slopes	.73	21,200
33	**Deadwood family** 60 to 80 percent slopes	.20	5,300
34	**Deadwood-Neuns families complex** 20 to 40 percent slopes	.29	7,500
35	**Deadwood-Neuns families complex** 40 to 60 percent slopes	.63	23,300
36	**Deadwood-Neuns families complex** 50 to 80 percent slopes	.59	15,800
37	**Deadwood family-Rock outcrop complex** 60 to 80 percent slopes	.63	20,500
38	**Deadwood family-Typic Xerorthents-Rock outcrop complex** 60 to 80 percent slopes	.10	2,500
39	**Delaney family** 0 to 35 percent slopes	.44	10,100
40	**Delaney family, deep-Delaney family complex** 0 to 20 percent slopes	.22	5,800
41	**Dewmine-Kang families association** 50 to 70 percent slopes	.12	3,000
42	**Dewmine family-Rock outcrop-Kang family association** 35 to 80 percent slopes	.06	1,600
43	**Dubakella family** 20 to 40 percent slopes	.12	3,100
44	**Dubakella family** 40 to 60 percent slopes	.12	3,100
45	**Dubakella-Beaughton families complex** 30 to 70 percent slopes	.06	1,500
46	**Dubakella family-Rock outcrop complex** 20 to 40 percent slopes	.09	2,400
47	**Dubakella-Weitchpec families complex** 20 to 40 percent slopes	.31	7,500

Map Symbol	Mapping Unit Name	Survey Area%	Approx. Acreage
48	**Dubakella-Weitchpec families complex** 40 to 60 percent slopes	.09	2,300
49	**Dubakella-Weitchpec families complex** 60 to 80 percent slopes	.05	1,200
50	**Dunsmuir family** 15 to 40 percent slopes	.38	9,600
51	**Dunsmuir family** 40 to 55 percent slopes	.25	6,500
52	**Dunsmuir-Dubakella-Weitchpec families complex** 40 to 60 percent slopes	.11	2,700
53	**Dunsmuir-Ishi Pishi, deep families complex** 20 to 40 percent slopes	.30	8,000
54	**Dunsmuir-Olete families complex** 20 to 40 percent slopes	.13	3,400
55	**Dystric Xerorthents** 5 to 40 percent slopes	.04	950
56	**Endlich family** 20 to 60 percent slopes	.13	3,400
57	**Endlich family-Rubble land complex** 15 to 40 percent slopes	.05	1,400
58	**Endlich family-Rubble land association** 50 to 70 percent slopes	.13	3,300
59	**Endlich family-Typic Cryaquolls association** 10 to 40 percent slopes	.28	7,300
60	**Entic Cryumbrepts** 40 to 60 percent slopes	.05	1,300
61	**Etsel family** 40 to 80 percent slopes	.68	15,200
62	**Etsel-Neuns families association** 60 to 80 percent slopes	.24	6,300
63	**Etsel family-Rock outcrop complex** 50 to 80 percent slopes	.22	5,700
64	**Fons family** 25 to 50 percent slopes	.13	3,300
65	**Forbes family** 0 to 20 percent slopes	.17	4,600
66	**Frobes family** 20 to 40 percent slopes	.25	6,500
67	**Forbes family** 40 to 60 percent slopes	.25	6,400
68	**Forbes-Soulajule families complex** 30 to 60 percent slopes	.09	2,400
69	**Germany family** 0 to 25 percent slopes	.20	5,200
70	**Germany family-Germany family, deep complex** 0 to 20 percent slopes	.26	6,900
71	**Germany-Ledmount families complex** 0 to 10 percent slopes	.31	8,000
72	**Germany-Shasta families association** 0 to 20 percent slopes	.15	3,700

Map Symbol	Mapping Unit Name	Survey Area%	Approx. Acreage
73	**Germany-Washougal families association** 0 to 20 percent slopes	.27	7,100
74	**Germany family, deep** 0 to 20 percent slopes	.15	4,000
75	**Germany, deep-Neer families association** 0 to 20 percent slopes	.33	8,700
76	**Germany family, deep-Rock outcrop association** 0 to 20 percent slopes	.15	3,800
77	**Germany, deep-Washougal families complex** 0 to 20 percent slopes	.15	3,900
78	**Glaciers**	.05	1,300
79	**Goulding family** 20 to 40 percent slopes	.09	2,400
80	**Goulding family** 40 to 60 percent slopes	.93	25,000
81	**Goulding family** 60 to 80 percent slopes	.55	10,200
82	**Goulding-Holland families association** 40 to percent slopes	.16	4,200
83	**Goulding-Marpa families association** 40 to 60 percent slopes	.26	6,700
84	**Goulding-Neuns families association** 50 to 80 percent slopes	.97	25,000
85	**Goulding family-Rock outcrop complex** 50 to 80 percent slopes	1.64	45,500
86	**Gozem family-Rock outcrop-Toadlake family complex** 30 to 70 percent slopes	.28	6,300
87	**Gozem-Toadlake families association** 20 to 40 percent slopes	.08	2,100
88	**Gozem-Toadlake families association** 40 to 60 percent slopes	.12	3,200
89	**Grell family-Rock outcrop complex** 20 to 40 percent slopes	.09	2,200
90	**Henneke family** 20 to 40 percent slopes	.08	2,100
91	**Henneke-Dubakella families complex** 40 to 60 percent slopes	.10	2,500
92	**Henneke family-Rock outcrop complex** 60 to 80 percent slopes eroded	.06	1,500
93	**Hohmann family** 40 to 60 percent slopes	.12	3,100
94	**Hohmann-Brader families association** 40 to 60 percent slopes	.15	3,900
95	**Hohmann-Hugo families complex** 40 to 60 percent slopes	.21	5,600
96	**Hohmann-Neuns families complex** 40 to 60 percent slopes	.11	2,700
97	**Holland family** 20 to 40 percent slopes	.23	6,100

Map Symbol	Mapping Unit Name	Survey Area%	Approx. Acreage
98	**Holland family** 40 to 60 percent slopes	.18	4,200
99	**Holland family** 60 to 80 percent slopes	.26	6,300
100	**Holland-Chawanakee families complex** 60 to 80 percent slopes	.11	2,800
101	**Holland-Goulding families association** 20 to 40 percent slopes	.22	4,800
102	**Holland-Goulding families association** 40 to 60 percent slopes	.34	8,800
103	**Holland-Goulding families association** 60 to 80 percent slopes	.16	4,200
104	**Holland family-Holland family, deep complex** 20 to 40 percent slopes	.28	7,000
105	**Holland family-Holland family, deep complex** 40 to 60 percent slopes	.32	8,000
106	**Holland-Neuns families complex** 20 to 40 percent slopes	.17	4,400
107	**Holland-Neuns families complex** 40 to 60 percent slopes	.24	5,300
108	**Holland-Neuns families complex** 60 to 80 percent slopes	.14	3,600
109	**Holland family, ashy** 0 to 20 percent slopes	.79	10,700
110	**Holland family, ashy** 20 to 40 percent slopes	.20	5,300
111	**Holland, ashy-Ledmount families association** 0 to 20 percent slopes	.07	1,900
112	**Holland, ashy-Neer families association** 0 to 25 percent slopes	.46	10,700
113	**Holland, ashy-Neer families complex** 25 to 50 percent slopes	.36	10,600
114	**Holland, ashy-Washougal families complex** 25 to 65 percent slopes	.24	6,400
115	**Holland family, deep** 0 to 20 percent slopes	.14	3,600
116	**Holland family, deep** 20 to 40 percent slopes	.46	10,800
117	**Holland family, deep** 40 to 60 percent slopes	.45	9,900
118	**Holland family, deep** 60 to 80 percent slopes	.13	3,400
119	**Holland family, deep-Holland family complex** 20 to 40 percent slopes	.24	6,400
120	**Holland family, deep-Holland family complex** 40 to 60 percent slopes	.19	5,100
121	**Holland, deep-Hugo families complex** 20 to 40 percent slopes	.41	6,800
122	**Holland, deep-Hugo families complex** 40 to 60 percent slopes	.12	3,100

Map Symbol	Mapping Unit Name	Survey Area%	Approx. Acreage
123	**Holland, deep-Marpa families complex** 20 to 40 percent slopes	.16	4,300
124	**Holland, deep-Marpa families complex** 40 to 60 percent slopes	.16	4,100
125	**Holland-Marpa families, deep complex** 40 to 60 percent slopes	.07	1,800
126	**Holland, deep-Neuns families complex** 20 to 40 percent slopes	.15	9,000
127	**Holland, deep-Neuns families complex** 40 to 60 percent slopes	.41	10,700
128	**Holland-Neuns families, deep complex** 20 to 40 percent slopes	.12	3,000
129	**Holland family, granitic** 20 to 50 percent slopes	.17	4,500
130	**Holland, granitic-Neuns families complex** 20 to 40 percent slopes	.09	2,400
131	**Hugo family** 15 to 40 percent slopes	.45	10,400
132	**Hugo family** 40 to 60 percent slopes	.23	4,900
133	**Hugo family** 60 to 80 percent slopes	.10	2,400
134	**Hugo-Chaix families complex** 40 to 60 percent slopes	.11	2,900
135	**Hugo-Chaix families complex** 50 to 80 percent slopes	.14	3,700
136	**Hugo-Holland, deep families complex** 20 to 40 percent slopes	.60	8,700
137	**Hugo-Neuns families complex** 20 to 40 percent slopes	.26	5,900
138	**Hugo-Neuns families complex** 40 to 50 percent slopes	.61	10,000
139	**Hugo-Neuns families complex** 60 to 80 percent slopes	.09	2,200
140	**Hugo family, moderately deep** 40 to 60 percent slopes	.33	6,600
141	**Hugo, moderately deep-Holland families complex** 40 to 60 percent slopes	.17	4,400
142	**Hugo, moderately deep-Holland, deep families complex** 20 to 40 percent slopes	.11	2,800
143	**Hugo moderately deep-Neuns families complex** 60 to 80 percent slopes	.27	6,100
144	**Huntmount family** 40 to 60 percent slopes	.07	1,700
145	**Huntmount-Hugo-Marpa, deep families complex** 15 to 45 percent slopes	.19	4,000
146	**Inville-Jayar, families association** 20 to 50 percent slopes	.05	1,200
147	**Inville-Jayar, deep families complex** 15 to 40 percent slopes	.09	2,400

Map Symbol	Mapping Unit Name	Survey Area%	Approx. Acreage
148	**Ishi Pishi family-Ishi Pishi family, deep complex** 35 to 70 percent slopes	.36	7,600
149	**Ishi Pishi-Olete families association** 20 to 40 percent slopes	.09	2,200
150	**Ishi Pishi-Olete families complex** 40 to 70 percent slopes	.10	2,500
151	**Ishi Pishi-Tamflat families association** 35 to 60 percent slopes	.10	2,500
152	**Ishi Pishi, deep-Dubakella families complex** 20 to 40 percent slopes	.12	3,200
153	**Ishi Pishi family, deep-Ishi Pishi family complex** 20 to 40 percent slopes	.18	4,700
154	**Ishi Pishi family, deep-Ishi Pishi family complex** 40 to 70 percent slopes	.21	4,500
155	**Jayar family** 40 to 60 percent slopes	.28	5,400
156	**Jayar family** 60 to 80 percent slopes	.29	5,700
157	**Jayar-Skymor families complex** 20 to 40 percent slopes	.09	2,300
158	**Jayar-Skymor families complex** 40 to 60 percent slopes	.23	5,100
159	**Jayar-Skymor families complex** 60 to 80 percent slopes	.10	2,700
160	**Jayar family, deep** 30 to 50 percent slopes	.10	2,500
161	**Jayar, deep-Skymor families association** 15 to 35 percent slopes	.10	2,600
162	**Jayar family, deep-Typic Cryaquolls association** 5 to 30 percent slopes	.21	4,500
163	**Jayar, deep-Wapal families complex** 10 to 50 percent slopes	.25	5,500
164	**Kang-Dewmine families complex** 35 to 70 percent slopes	.04	1,100
165	**Konocti-Olete families complex** 40 to 70 percent slopes	.24	5,200
166	**Ledmount-Germany families complex** 0 to 10 percent slopes	.26	5,800
167	**Ledmount family-Rock outcrop complex** 0 to 10 percent slopes	.27	6,000
168	**Lithic Cryumbrepts-Stecum family association** 30 to 50 percent slopes	.07	1,800
169	**Lithic Haploxeralfs-Rock outcrop-Weitchpec family association** 70 to 90 percent slopes	.09	2,300
170	**Lithic Haploxeralfs-Toadlake family-Rock outcrop association** 60 to 80 percent slopes	.12	3,200
171	**Lithic Xerumbrepts-Rock outcrop association** 60 to 80 percent slopes	.18	4,700
172	**Lithic Xerumbrepts-Rubble land-Nanny family complex** 5 to 40 percent slopes	.11	3,000

Map Symbol	Mapping Unit Name	Survey Area%	Approx. Acreage
173	**Lostspring family** 0 to 10 percent slopes	.07	1,900
174	**Marpa family** 20 to 40 percent slopes	.27	7,200
175	**Marpa family** 40 to 60 percent slopes	.87	19,200
176	**Marpa family** 60 to 80 percent slopes	.23	6,100
177	**Marpa-Chawanakee families complex** 40 to 60 percent slopes	.30	6,900
178	**Marpa-Goulding families association** 20 to 40 percent slopes	.19	5,000
179	**Marpa-Goulding families association** 40 to 60 percent slopes	1.47	35,700
180	**Marpa-Goulding families association** 60 to 80 percent slopes	.19	4,400
181	**Marpa-Holland, deep families complex** 0 to 20 percent slopes	.12	3,000
182	**Marpa-Holland, deep families complex** 20 to 40 percent slopes	.50	13,000
183	**Marpa-Holland, deep families complex** 40 to 60 percent slopes	1.22	32,000
184	**Marpa-Holland, deep families association** 60 to 80 percent slopes	.22	5,500
185	**Marpa family-Marpa family, deep complex** 40 to 60 percent slopes	.25	6,500
186	**Marpa-Neuns families complex** 20 to 40 percent slopes	.09	2,200
187	**Marpa-Neuns families complex** 40 to 60 percent slopes	1.02	20,700
188	**Marpa-Neuns families complex** 60 to 80 percent slopes	.30	6,900
189	**Marpa family, deep** 40 to 60 percent slopes	.09	2,100
190	**Marpa-Deadwood families association** 40 to 60 percent slopes	.05	1,100
191	**McCumber family** 0 to 35 percent slopes	.41	7,300
192	**McCumber-Revit families complex** 40 to 60 percent slopes	.32	7,000
193	**Merkel-Toadlake-Parks families complex** 5 to 40 percent slopes	.21	5,500
194	**Merkel-Wintoner families complex** 50 to 80 percent slopes	.13	3,500
195	**Millsholm family** 20 to 60 percent slopes	.28	6,000
196	**Morical family** 0 to 10 percent slopes	.16	4,300

Map Symbol	Mapping Unit Name	Survey Area%	Approx. Acreage
197	**Nanny family-Lithic Xerumbrepts association** 30 to 70 percent slopes	.20	5,300
198	**Nanny family-Rock outcrop-Rubble land complex** to 70 percent slopes	.08	2,000
199	**Neer family** 20 to 40 percent slopes	.32	8,400
200	**Neer family** 40 to 60 percent slopes	.20	4,100
201	**Neer-Sadie families association** 20 to 40 percent slopes	.36	9,500
202	**Neuns family** 20 to 40 percent slopes	.33	8,700
203	**Neuns family** 40 to 60 percent slopes	2.38	62,700
204	**Neuns family** 60 to 80 percent slopes	2.01	48,400
205	**Neuns-Deadwood families complex** 20 to 40 percent slopes	.46	10,000
206	**Neuns-Deadwood families complex** 40 to 60 percent slopes	2.56	60,000
207	**Neuns-Deadwood families complex** 60 to 80 percent slopes	1.51	30,700
208	**Neuns-Goulding families association** 40 to 60 percent slopes	.42	10,800
209	**Neuns-Goulding families association** 60 to 80 percent slopes	1.50	40,400
210	**Neuns-Holland families complex** 20 to 40 percent slopes	.18	4,800
211	**Neuns-Holland families complex** 40 to 60 percent slopes	.31	7,000
212	**Neuns-Holland families complex** 60 to 80 percent slopes	.32	7,400
213	**Neuns-Holland, deep families complex** 20 to 40 percent slopes	.15	3,900
214	**Neuns-Holland, deep families complex** 40 to 80 percent slopes	.38	7,000
215	**Neuns-Hugo families complex** 20 to 40 percent slopes	.15	3,800
216	**Neuns-Hugo families complex** 40 to 60 percent slopes	1.00	21,100
217	**Neuns-Hugo families complex** 60 to 80 percent slopes	.25	6,600
218	**Neuns-Marpa families complex** 40 to 60 percent slopes	.61	10,900
219	**Neuns-Marpa families complex** 60 to 80 percent slopes	.73	19,200
220	**Neuns-Marpa-Deadwood families complex** 40 to 60 percent slopes	.07	1,900
221	**Neuns-Marpa, deep families complex** 40 to 60 percent slopes	.16	3,100

Map Symbol	Mapping Unit Name	Survey Area%	Approx. Acreage
222	**Neuns family-Neuns family, deep complex** 60 to 80 percent slopes	.34	5,900
223	**Neuns family-Rock outcrop association** 40 to 60 percent slopes	.40	10,800
224	**Neuns family-Typic Xerorthents association** 50 to 80 percent slopes	1.90	3,800
225	**Neuns family, deep** 40 to 60 percent slopes	.18	4,800
226	**Neuns family, deep** 60 to 80 percent slopes	.44	8,700
227	**Neuns, deep-Hugo families complex** 20 to 40 percent slopes	.10	2,500
228	**Neuns family, deep-Neuns family complex** 40 to 70 percent slopes	.54	14,100
229	**Neuns family, schist substratum** 60 to 80 percent slopes	.14	3,700
230	**Neuns family, schist substratum-Neuns family, deep complex** 20 to 40 percent slopes	.08	2,100
231	**Olete family** 20 to 40 percent slopes	.10	2,600
232	**Olete family** 40 to 60 percent slopes	.13	3,300
233	**Olete-Ishi Pishi families complex** 20 to 40 percent slopes	.06	1,500
234	**Olete-Ishi Pishi families complex** 40 to 60 percent slopes	.07	1,900
235	**Olete-Konocti families association** 50 to 80 percent slopes	.04	1,000
236	**Olete family-Rock outcrop complex** 40 to 60 percent slopes	.12	3,200
237	**Olete family-Rock outcrop complex** 60 to 90 percent slopes	.07	1,800
238	**Ovall family** 40 to 60 percent slopes	.08	2,000
239	**Ovall family, ponded-Aquic Xerorthents complex** 0 to 5 percent slopes	.05	1,200
240	**Ovall, ponded-Morical families-Aquic Xerorthents complex** 0 to 5 percent slopes	.50	13,000
241	**Parks family-Rubble land complex** 50 to 80 percent slopes	.19	5,100
242	**Parks-Toadlake families complex** 40 to 60 percent slopes	.08	2,200
243	**Parrish family** 20 to 50 percent slopes	.06	1,800
244	**Parrish-Goulding families complex** 20 to 60 percent slopes	.04	1,000
245	**Redcap family** 25 to 50 percent slopes	.11	2,000
246	**Revit family** 10 to 40 percent slopes	.41	5,900

Map Symbol	Mapping Unit Name	Survey Area%	Approx. Acreage
247	**Revit-Sheld families complex** 15 to 45 percent slopes	.30	4,800
248	**Rock outcrop, basic intrusive**	.32	7,400
249	**Rock outcrop, granitic**	.28	7,100
250	**Rock outcrop, limestone**	.24	6,300
251	**Rock outcrop, metamorphic**	.06	1,600
252	**Rock outcrop, sedimentary**	.07	1,800
253	**Rock outcrop, volcanic**	2.11	40,600
254	**Rock outcrop-Cheadle-Behanin families complex** 30 to 80 percent slopes	.06	1,500
255	**Rock outcrop-Delaney family association** 0 to 10 percent slopes	.13	3,500
256	**Rock outcrop-Dubakella-Weitchpec families complex** 40 to 60 percent slopes	.26	6,800
257	**Rock outcrop-Endlich family association** 5 to 90 percent slopes	.36	9,600
258	**Rock outcrop-Fons-Sheld families association** 20 to 45 percent slopes	2.64	49,700
259	**Rock outcrop-Goulding family complex** 40 to 80 percent slopes	1.06	17,800
260	**Rock outcrop-Gozem family complex** 60 to 80 percent slopes	1.75	40,000
261	**Rock outcrop-Jayar family association** 40 to 80 percent slopes	.19	5,000
262	**Rock outcrop-Ledmount family complex** 0 to 20 percent slopes	.28	7,200
263	**Rock outcrop-Lithic Cryochrepts-Deadfall family complex** 20 to 70 percent slopes	.30	8,000
264	**Rock outcrop-Lithic Cryumbrepts complex** 50 to 80 percent slopes	.17	4,500
265	**Rock outcrop-Lithic Haloxeralfs-Beaughton family complex** 60 to 80 percent slopes	.40	10,400
266	**Rock outcrop-McCumber family association** 35 to 75 percent slopes	.43	6,300
267	**Rock outcrop-Nanny family association** 60 to 100 percent slopes	.12	3,200
268	**Rock outcrop-Neuns family association** 60 to 80 percent slopes	1.56	31,000
269	**Rock outcrop-Sheld family association** 60 to 80 percent slopes	.09	2,400
270	**Rock outcrop-Skymor family complex** 30 to 90 percent slopes	.26	6,800
271	**Rock outcrop-Skymor-Tallac families association** 60 to 80 percent slopes	.01	235
272	**Rock outcrop-Stecum family complex** 60 to 90 percent slopes	.13	3,300
273	**Rock outcrop-Washougal family, deep association** 0 to 40 percent slopes	.05	1,400
274	**Rock outcrop-Washougal family association** 0 to 35 percent slopes	2.61	50,900

Map Symbol	Mapping Unit Name	Survey Area%	Approx. Acreage
275	**Rock outcrop-Yallani family, pumice overburden association** 45 to 75 percent slopes	.55	14,500
276	**Rock outcrop, ultramafic-Rubble land association** 60 to 80 percent slopes	.06	1,500
277	**Rogue family complex** 40 to 70 percent slopes	.17	4,500
278	**Sadie-Neer families association** 0 to 20 percent slopes	.58	5,200
279	**Sadie family, deep** 0 to 35 percent slopes	.41	5,900
280	**Sadie, deep-Germany families association** 0 to 20 percent slopes	.23	3,100
281	**Sadie, deep-Holland, ashy families complex** 0 to 30 percent slopes	.57	5,100
282	**Sadie, deep-Neer families association** 0 to 25 percent slopes	.23	3,000
283	**Sadie, deep-Neer families complex** 50 to 80 percent slopes	.07	1,800
284	**Secca family** 20 to 50 percent slopes	.04	1,100
285	**Secca-Forbes families association** 20 to 40 percent slopes	.10	2,500
286	**Secca-Hugo moderately deep families complex** 20 to 40 percent slopes	.09	2,300
287	**Secca-Parrish families complex** 40 to 60 percent slopes	.07	1,900
288	**Shadeleaf-Kang families complex** 20 to 40 percent slopes	.08	2,000
289	**Shadeleaf-Kang families complex** 40 to 70 percent slopes	.21	5,500
290	**Shasta family** 0 to 15 percent slopes	.37	7,000
291	**Shasta-Germany, deep families complex** 0 to 20 percent slopes	.52	7,600
292	**Shasta-Washougal families-Washougal family, deep association** 0 to 30 percent slopes	.36	5,000
293	**Sheld family** 0 to 20 percent slopes	.94	10,000
294	**Sheld family** 20 to 40 percent slopes	.90	10,000
295	**Sheld family** 40 to 60 percent slopes	.97	10,500
296	**Sheld-Revit families complex** 20 to 50 percent percent slopes	.39	3,300
297	**Sheld-Revit families-Glacial outwash association** 10 to 35 percent slopes	.16	1,300
298	**Sheld family-Rock outcrop association** 15 to 50 percent slopes	.42	6,000
299	**Skymor family** 40 to 80 percent slopes	.09	2,400

Map Symbol	Mapping Unit Name	Survey Area%	Approx. Acreage
300	**Skymor-Jayar families complex** 20 to 60 percent slopes	.08	2,100
301	**Skymore-Jayar, deep families complex** 20 to 40 percent slopes	.08	2,100
302	**Skymor family-Rock outcrop complex** 20 to 40 percent slopes	.14	3,500
303	**Skymor family-Rock outcrop association** 40 to 80 percent slopes	.11	2,900
304	**Soulajule family** 20 to 40 percent slopes	.08	2,100
305	**Soulajule family** 40 to 60 percent slopes	.12	3,200
306	**Stecum family-Rock outcrop-Entic Cryumbrepts complex** 50 to 80 percent slopes	.05	1,300
307	**Stonewell family** 0 to 20 percent slopes	.07	1,900
308	**Stonyford-Goulding families complex** 40 to 80 percent slopes	.07	1,800
309	**Tallac family-Lithic Xerumbrepts association** 40 to 70 percent slopes	.07	1,800
310	**Tallac-Yollabolly families association** 20 to 40 percent slopes	.06	1,500
311	**Tallac-Yollabolly families association** 40 to 60 percent slopes	.08	2,100
312	**Tamflat family-Rock outcrop complex** 50 to 70 percent slopes	.10	2,800
313	**Tamflat-Toadlake families association** 40 to 70 percent slopes	.04	1,100
314	**Toadlake family** 25 to 65 percent slopes	.46	10,100
315	**Toadlake-Gozem families association** 50 to 80 percent slopes	.18	4,700
316	**Toadlake family-Lithic Haploxeralfs complex** 40 to 60 percent slopes	.06	1,500
317	**Toadlake-Olete families association** 40 to 60 percent slopes	.08	2,200
318	**Toadlake family-Rock outcrop complex** 55 to 70 percent slopes	.12	3,000
319	**Toadlake family-Rubble land complex** 20 to 40 percent slopes	.20	5,400
320	**Toadlake family-Rubble land association** 40 to 60 percent slopes	.06	1,500
321	**Toadlake-Tamflat families complex** 40 to 70 percent slopes	.10	2,700
322	**Toadlake family, till substratum** 10 to 40 percent slopes	.05	1,400
323	**Typic Cryaquolls-Behanin family-Entic Cryumbrepts complex** 20 to 50 percent slopes	.11	2,900

Map Symbol	Mapping Unit Name	Survey Area%	Approx. Acreage
324	**Typic Cryaquolls-Deadfall family-Entic Cryumbrepts complex** 10 to 80 percent slopes	.03	800
325	**Typic Cryaquolls-Entic Cryumbrepts-Jayar family, deep association** 5 to 40 percent slopes	.06	1,600
326	**Typic Cryaquolls-Merkel family, till substratum association** 0 to 20 percent slopes	.04	1,100
327	**Typic Cryaquolls-Wapal family association** 0 to 30 percent slopes	.04	1,100
328	**Typic Xerorthents** 60 to 80 percent slopes	.06	1,500
329	**Typic Xerorthents-Neuns family association** 60 to 80 percent slopes	.19	4,900
330	**Washougal family** 0 to 20 percent slopes	.13	3,300
331	**Washougal family** 20 to 40 percent slopes	.22	5,800
332	**Washougal family** 40 to 80 percent slopes	.21	5,800
333	**Washougal-Germany, deep families complex** 20 to 40 percent slopes	.29	7,500
334	**Washougal-Holland, ashy families association** 30 to 60 percent slopes	.14	3,600
335	**Washougal family-Rock outcrop association** 40 to 60 percent slopes	.15	3,800
336	**Washougal family-Rock outcrop complex**	.22	5,700
337	**Washougal family, deep** 0 to 30 percent slopes	.40	7,700
338	**Washougal family, deep** 30 to 60 percent slopes	.18	4,700
339	**Washougal family, deep-Washougal family complex** 20 to 40 percent slopes	.18	4,800
340	**Weitchpec family** 20 to 40 percent slopes	.07	1,900
341	Weitchpec **family** 40 to 60 percent slopes	.19	5,100
342	**Weitchpec family** 60 to 80 percent slopes	.09	2,200
343	**Weitchpec-Beaughton families complex** 40 to 60 percent slopes	.10	2,500
344	**Weitchpec-Dubakella families complex** 20 to 40 percent slopes	.07	1,800
345	**Weitchpec-Dunsmuir families association** 20 to 40 percent slopes	.13	3,300
346	**Weitchpec-Dunsmuir families association** 40 to 60 percent slopes	.18	4,600
347	**Weitchpec family-Lithic Haploxeralfs complex** 30 to 50 percent slopes	.14	3,700
348	**Weitchpec family-Lithic Haploxeralfs-Rock outcrop complex** 60 to 80 percent slopes	.11	3,000

Map Symbol	Mapping Unit Name	Survey Area%	Approx. Acreage
349	**Weitchpec family-Rock outcrop association** 40 to 80 percent slopes	.13	3,400
350	**Wintoner-Jayar families complex** 20 to 50 percent slopes	.08	1,900
351	**Xerofluvents-Riverwash association** 0 to 20 percent slopes	.75	4,200
352	**Yallani family** 5 to 40 percent slopes	.11	2,800
353	**Yallani-Revit families complex** 20 to 50 percent slopes	.16	4,000
354	**Yallani family-Rock outcrop association** 40 to 60 percent slopes	.12	3,000
355	**Yallani-Sheld families complex** 20 to 50 percent slopes	.19	5,100
356	**Yallani family-Yallani family, pumice overburden complex** 20 to 50 percent slopes	.08	2,000
357	**Yallani family, pumice overburden** 0 to 20 percent slopes	.32	8,500
358	**Yallani family, pumice overburden** 20 to 45 percent slopes	.06	1,500
359	**Yallani family, pumice overburden-Lostspring families association** 0 to 25 percent slopes	.24	6,400
360	**Yallani, pumice overburden-Redcap families association** 20 to 50 percent slopes	.09	2,300
361	**Yallani, pumice overburden-Revit families complex** 40 to 60 percent slopes	.05	1,300
362	**Yallani family, pumice overburden-Rock outcrop association** 0 to 25 percent slopes	.07	1,800
363	**Yollabolly family-Rock outcrop complex** 40 to 80 percent slopes	.13	3,300

Order 5

Approximately 327,900 acres of the Shasta-Trinity National Forest, were mapped at the Fifth Order. The area is located in the Salmon-Trinity Alps Wilderness Area in the northern part of the Big Bar District. The soil polygon in an Order V survey are generally considerably larger than in an Order III survey. The boundary between the two levels of surveys is labled on the soils maps.

Soil Symbols - The 5th Order soil symbols is comprised of three component parts. The letter F identifies the mapping unit as 5th Order. The second letter identifies the geology or rock type which this unit falls upon. The third component is an Arabic number which catagorizes the soils.

Map Symbol	Mapping Unit Name	Survey Area%	Approx. Acreage
FV2	**Dystric Cryochrepts** moderately steep to steep	0.5	1,600
FP2	**Dystric Xerochrepts-Dystric Cryochrepts association** gently sloping to moderately steep	4.9	16,100
FM3	**Dystric Xerochrepts-Ultic Haploxeralfs association** moderately steep	2.6	8,600
FG2	**Pachic Xerumbrepts-Lithic Cryorthents-Rock outcrop association** moderately steep	2.1	6,900
FV1	**Rock outcrop-Lithic Cryochrepts association** moderately steep to steep	1.4	4,500
FU2	**Rock outcrop-Lithic Xerochrepts-Typic Xerochrepts association** gently sloping to steep	6.2	20,300
FU1	**Rock outcrop-Lithic Haploxerolls-Typic Xerochrepts association** moderately steep to steep	9.4	30,700
FP1	**Rock outcrop-Lithic Cryumbrepts-Lithic Xerochrepts association** steep	23.0	75,500
FM1	**Rock outcrop-Lithic Xerorthents-Lithic Xerochrepts association** moderately steep to steep	25.1	82,200
FG1	**Rock outcrop-Lithic Xerumbrepts-Lithic Cryumbrepts association** steep	12.5	41,000
FM2	**Rock outcrop-Pachic Xerumbrepts-Dystric Xerochrepts association** steep	1.4	37,300
FU3	**Ultic Haploxeralfs-Typic Xerochrepts association** gently sloping to moderately steep	0.9	3,200
	TOTAL	100%	327,900

Taxonomic Unit Descriptions
(Order 3)

In this section, each soil family or higher category recognized in the survey area is described. The descriptions are arranged in alphabetic order. Characteristics of the soil and the material in which it formed are identified for each family. The pedon, a small three-dimensional area of the soil that is typical of the soil profile in the survey area, is described. The detailed description of each soil horizon follows standards in the Soil Survey Manual. Many of the technical terms used in the descriptions are defined in Soil Taxonomy. The soil moisture conditions at the time soil colors were described are given. Following the pedon description is the range of important characteristics of the soils in each family. The map units of each soil family are described in the section "Detailed Soil Map Units."

ANDEPTIC CRYORTHENTS

Andeptic Cryorthents are moderately deep and deep, well drained. Soils formed from volcanic ash laid over gentle to steep moraines, outwashes slopes, mudflows, and incised channels. Slopes are 10 to 100 percent. The mean annual precipitation is 40 to 50 inches and the mean annual temperature is 35 to 40'F. The elevation ranges from 5500 to 8500 feet.

Reference Pedon: Reference soil of Andeptic Cryorthents in an area of Andeptic Cryorthents on North Gate road; SE<, SE<, Section 25; T. 42 N., R. 3 W., on a 20 percent slope about 12 miles northeast of Weed in Siskiyou County, California:

01–2 inches to 0; duff consisting of fir needles covering about 60 percent of the surface.

A11–0 to 2 inches; grayish brown (10YR 5/2) loamy sand; very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; soft, friable, nonsticky and nonplastic; 5 percent pebbles; slightly acid (pH 6.5).

A12–2 to 9 inches; loamy sand; very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; soft, friable, nonsticky and nonplastic; 5 percent pebbles; slightly acid (pH 6.5).

A13–9 to 21 inches; grayish brown (10YR 5/2) very cobbly sand, very dark grayish brown (10YR 3/2) moist; massive; slightly hard, firm, nonsticky and nonplastic; 15 percent pebbles, 25 percent cobbles; neutral (pH 7.0).

A14–21 to 34 inches; extremely cobbly sand, very dark grayish brown (10YR 3/2) moist; massive, slightly hard, firm, nonplastic and nonsticky; 15 percent pebbles, 50 percent cobbles; neutral (pH 7.0).

C1–34 to 44 inches; light brownish gray (10YR 6/2) extremely cobbly sand, dark grayish brown (10YR 4/2) moist; massive; slightly hard, firm, nonsticky and nonplastic; 15 percent pebbles, 50 percent cobbles; neutral (pH 7.0).

C2–44 to 60 inches; extremely cobbly glacial till.

Range in Characteristics: Thickness of the profile and depth to glacial till or tillite ranges from 30 to 60 inches. Rock fragments make up to 5 to 75 percent of the profile. Reaction ranges from slightly acid to neutral.

The A horizon colors are grayish brown and gray. The texture is loamy sand or coarse loamy sand.

The C horizon is grayish brown or pale brown; the texture is loamy sand or sand.

ANDIC CRYUMBREPTS

Andic Cryumbrepts are moderately deep and deep, well drained soils formed from volcanic ash laid over flanks of glaciated lava flows and volcanic mountain and outwash slopes. Slopes are 0 to 70 percent. The mean annual precipitation ranges from 40 to 60 inches and the mean annual temperature is 37'F to 40'F. The elevation ranges from 5500 to 8800 feet.

Reference Pedon: Reference soil of Andic Cryumbrepts in an area of Andic Cryumbrepts near Panther Meadow on Mt. Shasta; SW< of Section 33, T.41 N., R. 3 W.:

01–3 inches to 0; duff consisting of fir needles covering 100% of surface.

A11–0 to 3 inches; brown (10YR 5/3) gravelly fine sandy loam, very dark grayish brown (10YR 3/2) moist; single grain; soft, friable, nonsticky and nonplastic; 25 percent pebbles and cinders; moderately acid (pH 6.0).

A12–3 to 10 inches; yellowish brown (10YR 5/3) very gravelly loamy sand, dark brown (10YR 3/3) moist; massive; slightly hard, firm, nonsticky and nonplastic; 55 percent pebbles and cinders; neutral (pH 6.7).

C1–10 to 17 inches; yellowish brown (10YR 5/4) very gravelly loamy sand, dark brown (10YR 3/3) moist; massive; slightly hard, firm, nonsticky and nonplastic; 55 percent pebbles and cinders; neutral (pH 7.0).

C2–17 to 31 inches; yellowish brown (10YR 5/4) extremely gravelly and cindery loamy sand, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, firm, nonsticky and nonplastic; 65 percent pebbles and cobbles; slightly acid (pH 6.5).

C3–31 to 36 inches; yellowish brown (10YR 5/4) extremely gravelly and cobbly loamy sand, dark yellowish brown (10YR 4/4) moist; massive; 65 percent pebbles and cobbles; slightly acid (pH 6.7).

C4–36 to 60 inches; extremely cobbly glacial till over lava flow.

Range in Characteristics: Thickness of the profile ranges 36 to 60 inches to glaciated lava flow. Rock fragments make up 25 to 75 percent of the profile. Reaction ranges from slightly acid to neutral.

The A horizon is brown and yellowish brown. It is fine sandy loam to very gravelly loamy sand.

The C horizon is yellowish brown and pale brown. It has a cindery loamy sand texture.

AQUIC XERORTHENTS

Aquic Xerorthents are seasonally flooded and consist of deep, poorly drained soils formed on dry lake beds, outwash flats, and terraces. Slopes are 0 to 5 percent. Mean annual precipitation ranges from 30 to 40 inches and mean annual temperature is 49'F to 52'F. The elevation ranges from 4200 to 4600 feet.

Reference Pedon: Reference pedon of Aquic Xerorthents in an area of Ovall family, ponded-Aquic Xerorthents complex, 0 to 5 percent slopes, near White Deer Lake, in the NW<, NW<, Section 4, T. 40 N., R. 2 E., about 20 miles ENE of McCloud, in Siskiyou County, CA.

A1–0 to 6 inches; brown (10RYR 5/3) silt loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; soft, very friable, sticky and nonplastic; neutral (pH 7.0).

AC1–6 to 30 inches; light yellowish brown (10YR 6/4) loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; neutral (pH 7.0).

AC2–30 to 46 inches; light yellowish brown (10YR 6/4) light clay loam, dark yellowish brown (10YR 4/4) moist; light clay loam; strong medium subangular blocky structure; soft, friable, sticky and plastic; many moderately thick clay films and lamellae, neutral (pH 7.0).

C–46 to 60 inches; light yellowish brown (10YR 6/4) loamy sand, dark yellowish brown (10YR 4/4) moist; single grain; loose, nonsticky and nonplastic; neutral (pH 7.0).

Range in Characteristics: Thickness of the profile is greater than 60 inches. Coarse fragments make up 0 to 5 percent of the profile. Reaction is neutral.

The A horizon is gray and dark brown. The texture is silt loam to fine sandy loam.

The AC horizon is stratified layers of varying textures and colors, faint mottles are commonly present.

The C horizon is yellowish brown and brown. The texture is loam to loamy sand.

AQUOLLS

Aquolls consist of shallow to deep poorly drained soils formed in residual and colluvial material weathered from mixed rock sources. They are wet mountain meadows on level to gently sloping benches, flats, and basins. The slopes are from 0 to 20 percent. Annual precipitation ranges from 40 to 55 inches and the mean annual soil temperature is 44'F to 51'F. Elevations range from 3,500 to 6,000 feet. The soils are continually moist or saturated and have a standing water table usually at less than 20 inches. The base saturation is over 50 percent.

The surface horizon is 5 to 11 inches thick. It has color value of 3 through 5 (2 or 3 moist) and chroma of 1 through 3. The hue is 10YR or 7.5YR. It is loam, silt loam or silty clay loam modified by 10 to 50 percent rock fragments; strong, medium granular structure; slightly acid.

The subsoil is 4 to 35 inches thick. It has color value of 5 or 6 (2 through 4 moist) and chroma of 2 through 5. The hue is 10YR, 7.5YR, or 2.5Y. The color is often mottled due to lack of oxygen. It is loam, clay loam or silty clay loam modified by 20 to 70 percent rock fragments. The structure is massive and the pH is strongly acid.

ASTA FAMILY

The Asta family consists of very deep, well drained soils on glacial outwash terraces. They formed in volcanic dust deposited over consolidated glacial outwash. Slopes are 5 to 40 percent. Mean annual precipitation is 35 to 45 inches and the mean annual temperature is 48'F to 50'F. The elevation ranges from 3,000 to 5,000 feet.

Taxonomic Class: Fine-loamy, mixed, mesic Andeptic Haplohumults.

Typical Pedon: Reference pedon of Asta family in an area of Asta family, 5 to 40 percent slopes, in Siskiyou County, CA about 5 miles northwest of Dunsmuir, 800 feet west and 1,680 feet south of the northeast corner of Section 32, T.40N., R.4W.:

02–2 to 1 inches; new needles, leaves, bark, twigs and other organic debris.

01–1 to 0 inches; partially decomposed needles, leaves, twigs, bark and other organic debris.

All–0 to 3 inches; dark brown (7.5YR 4/4) gravelly sandy loam, black (5YR 2/1) moist; weak fine granular structure; soft, very friable, slightly sticky and nonplastic; many very fine, fine and medium roots; many fine interstitial pores; 25 percent fine (2 to 5mm) iron concretions and rounded pebbles; weakly smeary; strongly acid (pH 4.8); abrupt smooth boundary.

A12–3 to 6 inches; dark brown (7.5YR 4/4) gravelly sandy loan, dark reddish brown (5YR 3/2) moist; weak fine granular structure; soft, very friable, slightly sticky and nonplastic; many very fine, fine and medium roots; many fine interstitial pores; 30 percent fine (2 to 5mm) iron concretions and rounded pebbles; weakly smeary; strongly acid (pH 5.0); abrupt smooth boundary.

A3–6 to 13 inches; brown (7/5YR 5/4) gravelly sandy loam, dark reddish brown (5YR 3/4) moist; very weak medium subangular blocky structure parting to moderate fine granular; slightly hard, very friable, slightly sticky and slightly plastic; many very fine, fine and medium roots; many fine interstitial pores; 30 percent fine (2 to 5mm) iron concretions and rounded pebbles; weakly smeary; strongly acid (pH 5.0); clear smooth boundary.

B1–13 to 20 inches; brown (7.5YR 5/4) loam, reddish brown (5YR 4/4) moist; moderate fine granular structure; slightly hard, friable, sticky and plastic; many medium and common very fine and fine roots; few very fine tubular pores; strongly acid (pH 5.5); abrupt wavy boundary.

B21t–20 to 27 inches; brown (7.5YR 5/4) loam, reddish brown (5YR 4/4) moist; weak medium subangular blocky structure parting to moderate fine granular; hard, friable, sticky and plastic; many medium and common very fine and fine roots; common very fine vesicular and few very fine tubular pores; common thin clay films in pores and on peds; strongly acid (pH 5.5); abrupt wavy boundary.

B22t–27 to 34 inches; strong brown (7.5YR 5/6) loam (near silt loam), reddish brown (5YR 4/4) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic; many medium and few very fine and fine roots; common very fine and fine tubular and few very fine vesicular pores; continuous thin clay films in pores and on peds; strongly acid (pH 5.5); clear wavy boundary.

B23t–34 to 50 inches; strong brown (7.5YR 5/6) silt loam, reddish brown (5YR 4/4) moist; structure determined by the weathered tuff-like glacial outwash; hard, friable, sticky and plastic; many medium and few very fine and fine roots; common very fine and fine tubular and very fine vesicular pores; continuous thin clay films in pores and on peds; 5 percent fine (2 to 5mm) rounded pebbles; strongly acid (pH 5.5); clear wavy boundary.

B24t–50 to 60 inches; strong brown (7.5YR 5/6) silt loam, reddish brown (5YR 4/4) moist; structure determined by weathered tuff-liked glacial outwash; hard, friable, sticky plastic; many medium and few very fine and fine roots; common very fine and fine tubular and few very fine vesicular pores; few thick clay films on pebbles and many thin clay films in pores and on peds; 5 percent fine (2 to 5mm) rounded pebbles; slightly smeary; strongly acid (pH 5.5); abrupt wavy boundary.

C–60 to 71 inches; strong brown (7.5YR 5/6) dry and moist, silt loam, massive; hard, friable, sticky and plastic; many medium and few very fine and fine roots; few very fine and fine tubular pores; slightly smeary; strongly acid (pH 5.5).

Range Characteristics: Depth to semiconsolidated glacial outwash ranges from 60 to 80 inches. The bulk density ranges from 0.6 to 1 g/cc to a depth of 10 to 20 inches but is 0.85 g/cc or more at a depth of 10 to 14 inches. There are few gravel and cobbles on soil surface.

The A1 horizon has values of 3 to 6 dry and 2 to 5 moist with chromas of 3, 4 or 6 dry and 1 to 4 moist in hues of 10YR, 7.5YR and 5YR. Reaction is very strongly to slightly acid. It is sandy loam with 10 to 15 percent clay and 15 to 35 percent rock fragments. Thickness ranges from 3 to 13 inches. The base saturation ranges from 25 to 35 percent. The NaF pH ranges from 9.0 to 10.0.

The B2t and IIB2t horizons have values of 3 to 7 dry and 4 to 6 moist with chromas of 2, 3, 4 or 6 dry and 2, 3, 4, 6 or 8 moist in hues of 10YR, 7.5YR and 5YR. Reaction is very strongly acid or strongly acid. It is loam or silt loam with 13 to 27 percent clay and 0 to 35 percent rock fragments. The weighted average of the upper 20 to 30 inches of the argillic horizon ranges from 18 to 25 percent clay and 0.9 to 2 percent organic carbon. Base saturation ranges from 25 to 35 percent. In the upper 20 inches of the argillic horizon the B.D. ranges from 1 to 1.2 g/cc.

The C horizon may not be present.

ATTER FAMILY

The Atter family consists of moderately deep and deep somewhat excessively drained soils formed in mixed cobbly alluvium. They are on alluvial fans, low stream terraces and in glacial outwash in mountain valleys. Slopes are 0 to 20 percent. The mean annual precipitation is 25 to 60 inches and the mean annual temperature is 48'F to 52'F. The elevation ranges from 2000 to 4500 feet.

Taxonomic Class: Sandy-skeletal, mixed, mesic Typic Xerorthents.

Typical Pedon: Reference pedon of Atter family from an area of Atter family, 0 to 20 percent slopes, in Shasta County, California, about 6 miles southwest of Dunsmuir, about 1700 feet south and 1500 feet west of the northeast corner of Section 18, T. 38 N., R. 4 W.:

01–1 inch to 0; duff consisting of grass, roots, and pine needles.

A11–0 to 3 inches; brown (10YR 5/3) cobbly sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine and very fine granular structure; very friable, nonsticky and nonplastic; many very fine roots; many very fine interstitial pores; 3 percent pebbles, 10 percent cobbles and stones; slightly acid (pH 6.3); abrupt wavy boundary.

A12–3 to 15 inches; yellowish brown (10YR 5/4) cobbly sandy loam, dark yellowish brown (10YR 3/4) moist; weak medium subangular blocky structure; very friable, nonsticky and nonplastic; common medium, fine and very fine roots; many very fine interstitial pores; 4 percent pebbles, 20 percent cobbles; slightly acid (pH 6.3); clear wavy boundary.

C1-15 to 26 inches; light yellowish brown (10YR 6/4) extremely cobbly loamy sand, dark yellowish brown (10YR 4/4) with yellowish brown (10YR and 10YR 5/8) variegations, moist; single grain; loose, nonsticky and nonplastic; few coarse, common medium, fine and very fine roots; common fine interstitial pores; 25 percent pebbles, 60 percent cobbles; slightly acid (pH 6.3); clear wavy boundary.

C2–26 to 66 inches; very pale brown (10YR 7/4) extremely stony sand, yellowish brown (10YR 5/4) with dark yellowish brown (10YR 3/4, 10YR 4/4) and 10YR 5/6) variegations, moist; single grain; loose, nonsticky and nonplastic; few fine and very fine roots; many fine and very fine interstitial pores; 40 percent pebbles, 40 percent stones; slightly acid (pH 6.3).

Range in Characteristics: The depth to unconsolidated boulders is 40 to 80 inches. Rock fragments average 35 to 80 percent of the volume of the 10 to 40 inch control section. The reaction ranges from medium acid to neutral.

The A1 horizon has color value of 4 through 6 (3 or 4 moist and chroma of 2 through 4. The hue is 10YR. The thickness of the upper part of the A horizon is not great enough to produce a mollic epipedon though in many cases they meet color requirements. The texture is sandy loam modified by 25 to 50 percent rock fragments.

The C horizon has color value of 5 through 7 (3 through 5 moist) and chroma of 2 through 4 (2 through 8 moist). It is loamy sand or sand modified by 35 to 80 percent rock fragments.

AVIS FAMILY

The Avis family consists of moderately deep and deep, well drained soils formed in glacially influenced material weathered from volcanic rocks. They are located along shallowly entrenched drainages and gentle sideslopes of lava flows. Slopes are 0 to 40 percent. Mean annual precipitation is 30 to 50 inches and the mean annual temperature is 42'F. The elevation ranges from 3,800 to 6,000 feet.

Taxonomic Class: Ashy-skeletal, frigid Dystric Xerorthents.

Typical Pedon: Reference pedon of Avis family from an area of Avis family, 0 to 20 percent slopes, about 13 miles NE of McCloud, California, in the SW<, NE< of section 22, T. 41 N., R. 1 W., 300 feet south and 2,750 feet west of the NW corner of Section 22:

01 & 02–2 to 0 inches; pine needles and duff.

A1–0 to 5 inches; dark brown (10YR 4/3) loamy coarse sand, dark brown (7.5YR 3/2) moist; weak medium subangular blocky structure; soft, very friable, nonsticky, nonplastic; common fine and medium, few coarse roots; few fine tubular, common very fine interstitial pores; 10 percent pebbles; neutral (pH 7.0); clear wavy boundary.

C1–5 to 13 inches; brown (7.5YR 5/4) loamy sand, dark brown (7.5YR 3/4) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common fine, medium, and coarse roots; common very fine interstitial, few medium tubular pores; 10 percent pebbles; neutral (pH 7.0); clear wavy boundary.

IIC1–13 to 23 inches; reddish brown (5YR 5/4) extremely cobbly loamy fine sand, dark reddish brown (5YR 3/4) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common coarse, many very fine, fine, and medium roots; common very fine interstitial and tubular pores; 10 percent pebbles, 50 percent cobbles; neutral (pH 7.0); gradual wavy boundary.

IIC2–23 to 38 inches; reddish brown (5YR 5/4) extremely cobbly sandy loam, reddish brown (5YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, slightly sticky, and nonplastic; common medium roots; common fine interstitial pores; 20 percent pebbles, 60 percent cobbles; slightly acid (pH 6.5); abrupt smooth boundary.

R–38 to 40 inches; extremely stony glaciated volcanic rock.

Range in Characteristics: The depth to bedrock ranges from 35 to 45 inches. Reaction ranges from neutral to slightly acid.

The A horizon has color values of 4 through 6 (3 through 5 moist) and chroma of 2 through 4. The texture is dominantly loamy sand or loamy coarse sand modified by 10 to 40 percent rock fragments. The hue is 10YR or 7.5YR.

The C horizon has color value of 3 through 5 (3 or 4 moist) and chroma of 3 or 4. The hue is 5YR or 7.5YR. The texture is loamy sand or sandy loam modified by 10 to 80 percent rock fragments, but is always over 35% rock in the control section.

BEAUGHTON FAMILY

The Beaughton family consists of shallow, well drained soils formed in material weathered from ultramafic rock. They are on dissected mountain side slopes and ridge tops. Slopes are 20 to 80 percent. Mean annual precipitation is 40 to 65 inches and the mean annual temperature is 55'F. The elevation ranges from 2500 to 5500 feet.

Taxonomic Class: Clayey-skeletal, serpentinitic, mesic Lithic Argixerolls.

Typical Pedon: Reference pedon of Beaughton family from an area of Beaughton family - Rock outcrop complex, 50 to 80 percent slopes about 8 miles west of Weed in Siskiyou County, CA., about 1,900 feet west and 1,600 feet north of the SE corner of section 3, T. 41N., R.6W., about 500 feet E NE of road crossing (ford) of the West Fork of Parks Creek.

01–> inch to 0; thin scattering of dead bunchgrass and Jeffrey pine needles.

A1–0 to 3 inches; brown (7.5YR 4/4) gravelly loam, dark brown (7.5YR 3/2) moist; weak very fine subangular blocky structure breaking to weak very fine granular; soft, very friable, nonsticky and slightly plastic; common very fine roots; many very fine interstitial pores; 20 percent pebbles, 5 percent cobbles and stones; mildly alkaline (pH 7.5); clear smooth boundary.

B21t–3 to 11 inches; reddish brown (5YR 4/4) very cobbly clay loam, dark reddish brown (5YR 3/3) moist; weak to moderate fine subangular blocky structure; slightly hard, very friable, slightly sticky and plastic; common very fine, fine and medium roots; common very fine tubular and common fine interstitial pores; many thin clay films on peds; 20 percent pebbles, 30 percent cobbles and stones; mildly alkaline (pH 7.5); gradual irregular boundary.

B22t–11 to 16 inches; strong brown (7.5YR 4/6) extremely cobbly clay, dark reddish brown (5YR 3/4) moist; moderate fine subangular blocky structure; hard, friable, sticky and plastic; common very fine, few fine and medium roots; many very fine tubular and common fine interstitial pores; many moderately thick clay films on peds and in pores; 30 percent pebbles, 30 percent cobbles and stones; moderately alkaline; (pH 8.0) abrupt irregular boundary.

R–16 to 21 inches; ultramafics, highly fractured, slightly weathered.

Range in Characteristics: The depth to a lithic contact is 7 to 20 inches. Rock fragments make up 35 to 70 percent of the profile. Reaction ranges from neutral to moderately alkaline.

The A horizon has color value of 3 through 5 (2 or 3 moist) and chroma of 2 through 4. The hue is 10YR, 7.5YR and 5YR. The texture is loam or light clay loam modified by 25 to 40 percent rock fragments.

The B horizon has color value 4 through 6 (3 or 4 moist) and chroma of 4 through 6. The hue is 7.5YR and 5YR. The texture is clay loam or clay modified by 40 to 60 percent rock fragments.

The C horizon may not be present.

BEHANIN FAMILY

The Behanin family consists of moderately deep and deep, well drained soils formed in material weathered from metamorphic rocks. They are on linear upper mountain slopes and cirques. Slopes are 20 to 80 percent. The mean annual precipitation is 60 to 80 inches and the mean annual temperature is 35 to 40°F. Elevation ranges from 6700 to 7500 feet.

Taxonomic Class: Loamy-skeletal, mixed, Pachic Cryoborolls.

Typical Pedon: Reference pedon of Behanin family in an area of Typic Cryaquolls-Behanin family-Entic Cryumbrepts complex, 20 to 50 percent slopes, in Trinity County, California, about 17 miles NNW of Weaverville, one mile north of Papoose Lake, about 500 feet south and 800 feet west of the NE corner Section 14, T. 36 N., R. 11 W.:

01–1 inch to 0; duff of loose needles, dead twigs and branches.

A1–0 to 11 inches; very dark grayish brown (10YR 3/2) cobbly sandy loam, very dark brown (10YR 2/2) moist; weak very fine and fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine, few fine and medium roots; many fine interstitial pores; 5 percent pebbles, 15 percent cobbles; medium acid (pH 6.0); abrupt wavy boundary.

A12–11 to 21 inches; dark grayish brown (10YR 4/2) very cobbly fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine, fine, medium and coarse roots; common fine interstitial pores; 5 percent pebbles, 40 percent cobbles; slightly acid (pH 6.2); clear wavy boundary.

C1–21 to 40 inches; dark grayish brown (2.5Y 4/2) very cobbly fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine, fine, medium and coarse roots; common fine interstitial pores; 25 percent pebbles, 20 percent cobbles; slightly acid (pH 6.2); clear wavy boundary.

C2–40 to 48 inches; dark grayish brown (2.5Y 4/2) extremely cobbly fine sandy loam, very dark grayish brown (2.5Y 3/2) moist; single grain; nonsticky and nonplastic; common fine, few very fine and medium roots; many very fine interstitial pores; 40 percent pebbles, 30 percent cobbles; slightly acid (pH 6.2); gradual irregular boundary.

Range in Characteristics: The depth to bedrock ranges from 20 to over 40 inches. The reaction is slightly to medium acid. Base saturation is over 50 percent.

The A horizon has color value of 3 or 4 (2 moist) and chroma of 1 through 3. The hue is 10YR or 2.5Y. It is sandy loam or very fine sandy loam modified by 15 to 45 percent rock fragments.

The C horizon has color value of 3 through 5 (2 through 3 moist) and chroma of 2 through 6 (2 through 3 moist). The hue is 10YR or 2.5Y. It is sandy loam or very fine sandy loam modified by 35 to 80 percent rock fragments.

BRADER FAMILY

The Brader family consists of shallow, well drained soils that formed on material weathered from soft metamorphic rock. They are on dissected mountain sideslopes. Slopes are 40 to 60 percent. Mean annual precipitation ranges from 40 to 60 inches and the mean annual temperature is 55'F. Elevation ranges from 2,000 to 4,000 feet.

Taxonomic Class: Loamy, mixed, mesic, shallow Typic Xerochrepts.

Typical Pedon: Reference pedon of Brader family from an area of Hohman-Brader families association, 40 to 60 percent slopes in Trinity County, California, 0.1 mile west of the SE corner of section 31, T. 31 N., R. 11 W., about 4 miles SE of Hayfork:

01–1 inch to 0; loose litter of oak and manzanita leaves.

A1–0 to 4 inches; yellowish brown (10YR 5/4) gravelly loam, dark yellowish brown (10YR 3/4) moist; moderate fine and medium subangular blocky structure parting to strong very fine subangular; soft, very friable, slightly sticky and slightly plastic; common very fine roots; few very fine discontinuous pores; 17 percent pebbles; slightly acid (pH 6.5); gradual smooth boundary.

B1t–4 to 11 inches; yellowish brown (10YR 5/4) gravelly heavy loam, dark yellowish brown (10YR 3/4) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and plastic; common very fine, fine, medium and coarse roots; common very fine and fine continuous pores; few thin clay films on ped faces and in pores; 20 percent pebbles; slightly acid (pH 6.5); gradual wavy boundary.

2t–11 to 19 inches; yellowish brown (10YR 5/4) gravelly light clay loam, dark yellowish brown (10YR 4/6) moist; moderate fine and medium subangular blocky structure, slightly hard, friable, slightly sticky and plastic; few very fine, fine, medium and coarse roots; common very fine and very fine discontinuous pores; common thin clay films on ped faces and in pores; 23 percent pebbles; medium acid (pH 6.0); clear irregular boundary.

Cr–19 to 27 inches; highly weathered augite metaandesite rock with inclusions of hard fractured rock.

Range in Characteristic: The thickness of the profile to a paralithic contact ranges from 10 to 20 inches. Reaction ranges from medium to slightly acid.

The A horizon has color value of 5 through 7 (3 through 5 moist) and chroma of 4 or 6. The hue is 7.5YR, 10YR, and 2.5Y. The texture is loam or sandy loam modified by 15 to 35 percent rock fragments.

The B horizon has color value of 5 through 7 (4 through 6 moist) and chroma of 4 through 6. The hue is 7.5YR, 10YR, and 2.5Y. The texture is loam, sandy clay loam, and clay loam with less than 30 percent clay modified by up to 35 percent rock fragments. The Brader family in this survey is a taxajunct, having slightly more clay in the B2 horizon.

The Cr horizon may not be present.

CHAIX FAMILY

The Chaix family consists of moderately deep, well drained soils that formed in material weathered from granitic rocks. Chaix soils are on dissected mountain side slopes. Slopes are 20 to 80 percent. Mean annual precipitation is 35 to 60 inches and the mean annual temperature is about 55'F. Elevation ranges from 2,000 to 5,000 feet.

Taxonomic Class: Coarse-loamy, mixed, mesic Dystric Xerochrepts.

Typical Pedon: Reference pedon of Chaix family from an area of Chaix-Chawanakee families complex, 60 to 80 percent slopes in Shasta County, California, 3 miles NW of Castella, near Sulfur Creek, about 1,500 feet NNE of the SW corner Section 8, T. 38 N., R. 4 W.:

01–1 inch to 0; litter of black oak, manzanita leaves and pine needles.

A11–0 to 3 inches; dark grayish brown (10YR 4/2) coarse sandy loam, very dark brown (10YR 2/2) moist; strong medium granular structure; very friable, nonsticky and nonplastic; many very fine and few fine roots; many very fine interstitial pores; 5 percent pebbles; medium acid (pH 5.7); clear smooth boundary.

A12–3 to 10 inches; light brownish gray (10YR 6/2) coarse sandy loam, dark grayish brown (10YR 4/2) moist; weak coarse granular structure; very friable, nonsticky and nonplastic; common fine, few very fine and medium roots; many very fine interstitial pores; 8 percent pebbles, 5 percent cobbles; medium acid (pH 6.0); gradual wavy boundary.

B2–10 to 18 inches; very pale brown (10YR 7/3) cobbly coarse sandy loam, brown (10YR 5/3) moist; massive; very friable, nonsticky and nonplastic; common fine roots; many very fine interstitial and few fine tubular pores; 10 percent pebbles, 10 percent cobbles, medium acid (pH 6.0); gradual irregular boundary.

C1–18 to 29 inches; light gray (10YR 7/2) gravelly loamy coarse sand, grayish brown (10YR 5/2) moist; massive; very friable, nonsticky, and nonplastic, common very fine and few fine roots; many very fine interstitial pores; 15 percent pebbles, 8 percent cobbles; medium acid (pH 6.0); clear wavy boundary.

Cr–29 to 32 inches; weathered granitic bedrock (granodiorite).

Range in Characteristics: The thickness of the profile to weathered granitic bedrock ranges from 20 to 40 inches. It is slightly to strongly acid.

The A horizon has color value of 4 through 7 (2 through 5 moist) and chroma of 2 through 4. The hue is 10YR and 7.5YR. The thickness of the darker upper A horizon is less than 7 inches. The texture is sandy loam or loamy sand with up to 20 percent rock fragments.

The B horizon has color value of 6 and 7 (4 or 5 moist); and chroma of 3 and 4. The hue is 10YR and 7.5YR. The texture is coarse sandy loam or loamy coarse sand modified by up to 25 percent rock fragments.

The C horizon (when present) has weaker chroma than the B horizon.

The Cr horizon may not be present.

CHAWANAKEE FAMILY

The Chawanakee family consists of shallow, well drained soils that formed in material weathered from granitic and rhyolitic rocks. They are on dissected mountain side slopes. Slopes are 40 to 80 percent. The mean annual precipitation is 50 to 70 inches and the mean annual temperature is 55'F. Elevation ranges from 1000 to 5000 feet.

Taxonomic Class: Loamy, mixed, mesic, shallow Distric Xerochrepts.

Typical Pedon: Reference pedon of Chawanakee family from an area of Marpa-Chawanakee families complex, 40 to 60 percent slopes, about 1> mile west-northwest of Shasta Dam in Shasta County, CA., 400 feet east and 150 feet north of the S.W. corner sec. 9, T.33N., R.5W. between present and old road on ridge.

01–> inch to 0; whiteleaf manzanita leaves and bark.

A11–0 to 2 inches; light brownish gray (10YR 6/2) gravelly sandy loam, dark grayish brown (10YR 4/2) moist; weak medium subangular blocky breaking to weak very fine granular structure; loose, nonsticky and nonplastic; common very fine, few fine, medium and coarse roots; common very fine and fine interstitial pores; 25 percent pebbles, 5 percent cobbles; very strongly acid (pH 5.0); clear smooth boundary.

A12–2 to 6 inches; light gray (10YR 7/2) gravelly loam, brown (10YR 5/3) moist; weak fine and medium subangular blocky structure; soft, very friable, nonsticky and slightly plastic; common very fine, fine, medium and coarse roots; common very fine interstitial pores; 20 percent pebbles, 5 percent cobbles; very strongly acid (pH 5.0); gradual wavy boundary.

B2–6 to 11 inches; very pale brown (10YR 7/4) cobbly loam, brownish yellow (10YR 6/6) moist; weak medium and coarse subangular blocky structure; soft, very friable, nonsticky and slightly plastic; common fine and medium, few very fine and coarse roots; few very fine interstitial, many very fine and common fine tubular pores; common thin clay films bridge grains; 10 percent pebbles, 20 percent cobbles; very strongly acid(pH 5.0); gradual wavy boundary.

Cr–11 to 20 inches; highly weathered meta rhyolite; (paralithic content).

R–20 to 25 inches; rhyolite bedrock, highly fractured.

Range in Characteristics: The thickness of the profile to a paralithic contact ranges from 10 to 20 inches. Reaction ranges from medium acid to very strongly acid.

The A horizon has color value of 5 through 7 (4 through 5 moist) and chroma of 2 through 4. The hue is 10YR and 2.5Y. The texture is loam or sandy loam modified by up to 35 percent rock fragments.

The B horizon has color value of 5 through 7 (4 through 6 moist) and chroma of 2 through 6. The hue is 10YR and 2.5Y. The texture is sandy loam or loam modified by up to 35 percent rock fragments.

The Cr horizon may not be present.

CHEADLE FAMILY

The Cheadle family consists of shallow, well drained soils that formed in material weathered from basic metavolcanic rocks. They are on steep broken upper slopes, ridges and cirques. Slopes are 30 to 80 percent. The mean annual precipitation is 70 inches and the mean annual temperature is 40'F. Elevation ranges from 6,500 to 7,500 feet.

Taxonomic Class: Loamy-skeletal, mixed Lithic Cryoborolls.

Typical Pedon: Reference pedon of Cheadle family in an area of Rock Outcrop-Cheadle-Behanin families complex, 30 to 80 percent slopes, in Trinity County, California, about 17 miles north northwest of Weaverville, about 1 mile north of Papoose Lake, 1,000 feet north and 1,100 feet west of the southeast corner section 11, T. 36 N., R. 11 W.:

01–1 inch to 0; duff consisting of shrub leaves.

A1–0 to 3 inches; very dark grayish brown (10YR 3/2) gravelly fine sandy loam, black (10YR 2/1) moist; weak fine and very fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine roots; many very fine interstitial pores; 25 percent pebbles, 5 percent cobbles; slightly acid (pH 6.3); abrupt wavy boundary.

C–3 to 11 inches; dark grayish brown (10YR 4/2) extremely gravelly sandy loam, very dark gray (10YR 3/1) moist; weak fine and very fine granular structure breaking to single grain; soft, very friable, nonsticky and nonplastic; common very fine, few fine and medium roots; many very fine interstitial pores; 50 percent pebbles, 10 percent cobbles: medium acid (pH 5.8); abrupt irregular boundary.

R–11 to 15 inches; hard, moderately fractured very dark metavolcanics.

Range in Characteristics: The depth to bedrock ranges from 11 to 20 inches. The reaction ranges from strongly acid to medium acid.

The A horizon has dry color of 10YR 3/2 or 5/3 and moist color of 10YR 3/2 or 2/1. The texture is sandy loam modified by 30 to 40 percent rock fragments.

The C horizon has dry color of 10YR 5/3 or 4/2 and moist color of 10YR 3/4 or 3/1. It is sandy loam modified by 50 to 75 percent rock fragments.

COPSEY FAMILY

The Copsey family consists of very deep, poorly drained soils on alluvial fans. They have formed in alluvium from serpentine rock. Slope are 2 to 10 percent. The mean annual precipitation is 20 to 30 inches and the mean annual temperature is 51'F. The elevation ranges from 2,500 to 3,500 feet.

Taxonomic Class: Fine, serpentinitic, mesic Vertic Haplaquolls.

Typical Pedon: Reference pedon of Copsey family in an area of Copsey-Atter families association, 2 to 10 percent slopes, in Siskiyou County California 1,080 feet north and 10 feet west of the southeast corner of sec. 31, T. 42 N., R. 5 W., about 4 miles west of Weed:

A11–0 to 3 inches; very dark brown (10YR 2/2) clay, black (10YR 2/1) moist; weak fine subangular blocky structure; slightly hard, slightly firm, sticky and plastic; many very fine and fine roots; 5 percent fine gravel; slightly acid; abrupt smooth boundary.

A12–3 to 18 inches; black (10YR 2/1) clay, black (N 2/0) moist, strong medium prismatic structure parting to strong medium subangular blocky structure; extremely hard, firm, very sticky and very plastic; common very fine and fine roots; few very fine tubular pores; 5 percent gravel; neutral; clear smooth boundary.

AC–18 to 23 inches; very dark gray (10YR 3/1) gravelly clay, black (N 2/0) moist; strong medium prismatic structure; extremely hard, very firm, very sticky and very plastic; many medium, few very fine and fine roots; few very fine tubular pores; gravelly; 20 percent fine gravel; mildly alkaline; gradual smooth boundary.

C1–23 to 31 inches; dark gray (10YR 4/1) gravelly clay, very dark gray (10YR 3/1) moist; strong medium prismatic structure; extremely hard, very firm, very sticky and very plastic; common medium and few very fine and fine roots; 20 percent fine and medium gravel; mildly alkaline; clear wavy boundary.

C2–31 to 37 inches; dark grayish brown (10YR 4/2) gravelly light clay, very dark brown (10YR 2/2) moist ped faces, and dark gray (10YR 4/1) moist and rubbed; strong medium subangular blocky structure; extremely hard, firm, very sticky and very plastic; few very fine and fine roots; few fine tubular pores; 25 percent very fine, fine and medium gravel, 2 percent cobbles; mildly alkaline; clear wavy boundary.

C3–37 to 60 inches; dark grayish brown (10YR 4/2) gravelly clay, black (2.5YR 2/2) moist ped faces, dark gray (10YR 4/1) moist and rubbed; strong medium prismatic structure; extremely hard, very firm, very sticky and very plastic; few very fine and fine roots; few very fine tubular pores; 20 percent fine gravel and 3 percent cobbles; mildly alkaline.

Range in Characteristics: Profile thickness ranges from 17 to 30 inches. Cracks have been observed to be 1 to 3 cm wide at a depth to 20 to 30 inches when the soil is dry. These soils have a water table at 6 to 18 inches from February through June and it fluctuates from 18 to 40 inches from July through January.

The A1 horizon has values of 2 to 4 dry and 2 or 3 moist with chromas of 0 to 2 hues of 2.5Y and 10YR. Reaction is slightly acid or neutral. It has a clay texture with 40 to 60 percent clay and 5 to 35 percent rock fragments. Content of organic matter ranges from 1 to 4 percent in the surface 18 inches. Thickness ranges from 14 to 23 inches.

The C horizon has values of 2 to 5 dry with chromas of 0 to 4 dry and 0 to 3 moist in hues of 5Y, 2.5Y and 10YR. Reaction is slightly acid to mildly alkaline. It has a clay texture with 30 to 50 percent clay and 15 to 35 percent rock fragments.

COYATA FAMILY

The Coyata family consists of deep, well drained soils. They are formed on stream terraces and swales derived from weathered volcanic rocks. Slopes are 0 to 20 percent. The mean annual precipitation ranges from 35 to 50 inches and the mean annual temperature is 48'F. The elevation ranges from 3,500 to 5,000 feet.

Taxonomic Class: Loamy-skeletal, mixed, mesic Typic Xerumbrepts.

Representative Soil: Reference soil of Coyata family in an area of Coyata family, 0 to 20 percent slopes, in Siskiyou County, California, about 14 miles east of McCloud, 1,300 feet north and 100 feet east of the center of Section 33, T. 40 N., R. 1 E., approximately 1/10 mile east of a 90 degree south curve in the railroad track:

01–1 to 0 inches; decomposing needles, twigs and other organic debris.

11–0 to 2 inches; brown (10YR 4/3) fine sandy loam, dark brown (10YR 3/3) moist; weak very fine and fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; many very fine and fine interstitial pores; 10 percent 2 to 20mm pebbles; slightly acid (pH 6.4); abrupt smooth boundary.

A12–2 to 10 inches; brown (10YR 4/3) fine sandy loam, dark brown (7.5YR 3/2) moist; moderate medium subangular blocky structure breaking to weak fine subangular blocky structure; soft, friable, nonsticky and nonplastic; many fine, common medium and few coarse roots; many very fine interstitial and few fine and medium tubular pores; 10 percent 2 to 20mm pebbles; slightly acid (pH 6.4); gradual smooth boundary.

B21–10 to 18 inches; yellowish brown (10YR 5/4) gravelly fine sandy loam, dark yellowish brown (10YR 3/4) moist; weak fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many fine and common medium roots; many very fine interstitial and few fine and medium tubular pores; 15 percent 2 to 50mm pebbles; slightly acid (pH 6.4); gradual smooth boundary.

B22–18 to 27 inches; dark yellowish brown (10YR 4/4) with stains of very dark brown (10YR 2/2) gravelly fine sandy loam, dark yellowish brown (10YR 4/3) with stains of very dark brown (10YR 2/2) moist; weak very fine and fine and moderate medium subangular blocky structure; soft, friable, nonsticky and nonplastic; few very fine and fine and common medium roots; few very fine and fine interstitial and common medium tubular pores; 30 percent rock fragments, mostly pebbles and cobbles; slightly acid (pH 6.4); gradual wavy boundary.

C1–27 to 36 inches; dark yellowish brown (10YR 4/4) with stains of very dark brown (10YR 2/2) very gravelly coarse loamy sand, dark yellowish brown (10YR 4/3) with stains of very dark brown (10YR 2/2) moist; weak very fine subangular blocky structure breaking to single grain; soft, loose, nonsticky and nonplastic; few fine roots; many very fine interstitial pores; 60 percent rock fragments, mostly pebbles; slightly acid (pH 6.4); gradual wavy boundary.

C2–36 to 49 inches; yellowish brown (10YR 5/4) very gravelly coarse loamy sand, dark yellowish brown (10YR 4/4) moist; weak very fine subangular blocky structure breaking to single grain; soft, loose, nonsticky and nonplastic; few very fine roots; many very fine interstitial pores; 60 percent rock fragments, mostly pebbles; slightly acid (pH 6.4); clear smooth boundary.

C3–49 to 60 inches; yellowish brown (10YR 5/4) very gravelly coarse loamy sand, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, nonsticky and nonplastic, weakly cemented; few very fine roots; many very fine and fine interstitial and common medium and coarse tubular pores; 60 percent rock fragments, mostly pebbles; slightly acid (pH 6.4).

Range in Characteristics: Depth to very gravelly or extremely gravelly alluvium ranges from 25 to 56 inches. This soil is similar to the Nanny family but differs by having a temperature at 20 inch depth of about 48'F. The reaction is medium or slightly acid.

The A1 horizon ranges from 10 to 16 inches in thickness. It is 10YR 4/3 or 4/2 in color. Rock fragments, mostly pebbles, range from 10 to 15 percent.

The B2 horizon is 10YR 5/4, 5/3, 4/4, or 7.5YR 4/4. The texture a fine sandy loam. Rock fragments, mostly pebbles and cobbles range from 10 to 30 percent.

The C horizon is 10YR 7/6 or 5/4. The texture is a coarse loamy sand. Rock fragments range from 50 to 85 percent. This horizon is commonly stratified. In some pedons the C horizon is weakly cemented.

DEADFALL FAMILY

The Deadfall family consists of moderately deep, well drained soils that formed in material weathered from ultramafic rocks with large amounts of serpentinitic minerals. They are on moderately steep to very steep ridgetops. Slopes are 10 to 80 percent. The mean annual precipitation is 50 inches and the mean annual temperature is 40'F. The elevation ranges from 6500 to 8900 feet.

Taxonomic Class: Loamy-skeletal, serpentinitic Typic Cryorthents.

Typical Pedon: Reference pedon of Deadfall family from an area of Deadfall family - Lithic Cryochrepts complex, 40 to 60 percent slopes in Siskiyou County, California, about 7 miles west of the city of Mt. Shasta, 1> miles east of the Mt. Eddy summit, in the NW<, NW< section 17, T.40N., R.5W., hand dug pit along a jeep trail:

01–> inch to 0; very sparse, scattered, undecomposed litter.

A1–0 to 6 inches; pale brown (10YR 6/3) very gravelly sandy loam, dark brown (10YR 3/3) moist; moderate very fine and fine granular structure; soft, very friable, slightly sticky and nonplastic; many very fine and few fine roots; many very fine interstitial pores; 35 percent pebbles, 10 percent cobbles; slightly acid (pH 6.5); clear smooth boundary.

A3–6 to 14 inches; yellowish brown (10YR 5/4) very gravelly sandy loam, brown (10YR 4/3) moist; weak very fine granular structure; soft, very friable, slightly sticky and nonplastic; common very fine interstitial pores; 45 percent pebbles, 3 percent cobbles; neutral (pH 7.0); gradual wavy boundary.

B2–14 to 24 inches; yellowish brown (10YR 5/4) extremely gravelly sandy loam, brown (10YR 4/3) moist; weak very fine granular structure breaking to single grain; soft, very friable, slightly sticky and nonplastic; few very fine roots; many very fine interstitial pores; 50 percent pebbles, 25 percent cobbles and stones; mildly alkaline (pH 7.5); abrupt wavy boundary.

C–24 to 34 inches; highly fractured, unweathered flinty ultramafic rock; 75 percent pebbles, 25 percent cobbles and stones; thin coating of soil on 99 percent of pebble surfaces; single grain; few fine roots; mildly alkaline (pH 7.5); many voids; fines too few to fill some of the interstices larger than 1 mm; clear irregular boundary.

R–34 to 40 inches; serpentinized ultramafics.

Range in Characteristics: The depth to bedrock ranges from 20 to 40 inches. The reaction ranges from neutral to mildly alkaline.

The A horizon has dry color of 10YR 6/3, 6/4, 5/2, 5/3, 5/4, 2.5YR 4/4, 6/4 or 7/4 and moist color of 10YR 3/2, 3/3, 4/3, 4/4 or 2.5YR 3/4. It is sandy loam or loamy sand modified by 35 to 45 percent rock fragments.

The B horizon has dry color of 10YR 5/4, 2.5YR 6/3, 6/2 or 7/4 and moist color of 10YR 3/4, 4/3, 4/4, 2.5YR 4/2 or 4/5. It is sandy loam or loam modified by 60 to 85 percent rock fragments.

The C horizon may not be present.

DEADWOOD FAMILY

The Deadwood family consists of shallow, well drained soils that formed in material weathered from metamorphosed sedimentary and volcanic rock. Soils of the Deadwood family are on dissected mountain sideslopes and ridgetops. Slopes are 20 to 80 percent. Mean annual precipitation ranges from 35 to 70 inches and the mean annual temperature is 52'F. Elevations range from 1,500 to 5,500 feet.

Taxonomic Class: Loamy-skeletal, mixed, mesic Dystric Lithic Xerochrepts.

Typical Pedon: Reference pedon of Deadwood family from an area of Deadwood-Neuns families complex, 40 to 60 percent slopes, 3/8 mile SW of old Pollard Flat Guard Station, 1 mile north of Lamoine, 1,320 feet north, 1,850 feet west of the SE corner section 10, T. 36 N., R. 5 W.:

01–1 inch to 0; duff - fir and pine needles and oak leaves.

A1–0 to 3 inches; brown (10YR 4/3) very gravelly sandy loam, dark brown (10YR 3/3) moist; weak fine granular structure; loose, nonsticky and nonplastic; common fine and very fine roots; many fine and very fine interstitial pores; 55 percent pebbles; neutral (pH 6.70; clear smooth boundary.

B1–3 to 7 inches; yellowish brown (10YR 5/4) very gravelly loam, dark yellowish brown (10YR 4/4) moist; weak fine subangular block structure; soft, very friable, slightly sticky and slightly plastic; many fine and medium roots; many very fine interstitial and tubular pores; 45 percent pebbles, 10 percent cobbles; slightly acid (pH 6.5); clear smooth boundary.

B2–7 to 15 inches; light brown (7.5YR 6/4) extremely cobbly heavy loam, brown (7.5YR 5/4) moist; weak medium subangular blocky; soft, very friable, slightly sticky and slightly plastic; common medium and coarse roots; many very fine tubular and interstitial pores; 25 percent pebbles, 40 percent cobbles; medium acid (pH 6.0); clear wavy boundary.

R–15 to 17+ inches; metamorphosed shale, moderately fractured, slightly weathered - fractolithic.

Range in Characteristics: The depth to a lithic contact is 10 to 20 inches. hhck fragments make up 35 to 70 percent of the profile. Reaction ranges from medium acid to neutral.

The A horizon has color value of 4 through 6 (3 through 5 moist) and chroma of 1 through 3. It is dominantly sandy loam or loam. The hue is 10YR or 7.5YR.

The B horizon has color value of 4 through 6 (3 to 6 moist) and chroma of 2 to 6. The hue is 10YR or 7.5YR. It is sandy loam, or loam modified by 35 to 70 percent rock fragments.

DELANEY FAMILY

The Delaney family consists of moderately deep and deep, excessively drained soils that formed in sandy glacial outwash fan, mudflow, and gently mountain sideslopes from extrusive igneous rocks and volcanic ash. They are formed on outwash plains and fans over fractured basalt lava flows. Slopes are 0 to 55 percent. The mean annual precipitation is 10 to 16 inches and the mean annual temperature is 48'F. The elevation ranges from 2800 to 4500 feet.

Taxonomic Class: Ashy, mesic Typic Xeropsamments.

Typical Pedon: Reference pedon of Delaney family in an area of Delaney family, deep-Delaney family complex, 0 to 20 percent slopes in Siskiyou County, California about 11 miles northeast of Weed, about 1 mile north of Haystack Butte in the south end of Shasta Valley. About 2,400 feet east and 200 feet south of the northwest corner of section 26, T. 43 N., R. 4 W.:

A11–0 to 3 inches; grayish brown (10YR 5/1) loamy sand, very dark grayish brown (10YR 3/2) moist; single grain; loose; few very fine and fine roots, many fine interstitial pores, 5 percent fine and medium (2 to 30mm) pumice pebbles; medium acid (pH 5.8); abrupt smooth boundary.

A12–3 to 7 inches; grayish brown (10YR 5/2) loamy sand, very dark grayish brown (10YR 3/2) moist; very weak fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine, fine and medium roots; few fine tubular and many fine interstitial pores; 10 percent fine and medium (2 to 30mm) pumice pebbles; medium acid (pH 5.8); abrupt smooth boundary.

AC–7 to 14 inches; light brownish gray (2.5Y 6/2) sand, very dark grayish brown (10YR 3/2) moist; massive; soft, very friable, nonsticky and nonplastic; common very fine and fine, many medium and coarse roots; many fine interstitial pores; 10 percent fine and medium (2 to 30mm) pumice pebbles; medium acid (pH 5.8); abrupt smooth boundary.

C–14 to 23 inches; pale brown (10YR 6/3) sand, dark brown (10YR 3/3) moist; massive; soft and slightly hard, very friable, nonsticky and nonplastic; few very fine and fine, common medium and coarse roots; few fine tubular, and many fine interstitial pores; 15 percent pebbles; neutral (pH 6.8); abrupt smooth boundary.

IIR–23 to 24 inches; hard basalt that is vesicular, has a high olivine content and is well fractured.

Range in Characteristics: There are two phases of Delaney Family recognized in this survey: Delaney and Delaney, deep.

Delaney

The depth to volcanic bedrock is 20 to 40 inches. The base saturation is assumed to be 60 to 75 percent in some part of the upper 10 to 30 inches. The soil is neutral to medium acid.

The A horizon has color value of 5 or 6 (2 or 3 moist) and chroma of 2 or 3. The hue is 10YR or 2.5Y. It is sand or loamy sand modified by 2 to 15 percent rock fragments.

The C horizon has color value of 5 or 6 (2 or 3 moist) and chroma of 2 or 3. The hue is 10YR or 2.5Y. It is sand or loamy sand modified by 2 to 15 percent rock fragments.

Delaney, deep

The depth to volcanic bedrock is over 40 inches. Base saturation is over 60 percent in the upper 10 to 30 inches and the soil is medium acid to neutral.

The A horizon has color value of 5 through 7 (3 or 4 moist) and chroma of 2 through 4. The hue is 10YR and 2.5Y. It is sand, loamy sand or sandy loam. Rock fragments make up 0 to 35 percent and consists of pebbles, cobbles and stones. Fragments are of rounded pumice and volcanic rock.

The C horizon has color value of 6 through 8 (3 though 5 moist) and chroma of 2 through 4. The hue is 10YR and 2.5Y. It is sand or loamy sand modified by 0 to 35 percent rock fragments.

DEWMINE FAMILY

The Dewmine family consists of shallow, well drained soils that formed in material weathered from serpentinized ultramafic rocks. They are on dissected mountain side slopes. Slopes are 35 to 80 percent. The mean annual precipitation is 40 inches and the mean annual temperature is 43'F. The elevation ranges from 4000 to 6500 feet.

Taxonomic Class: Clayey-skeletal, serpentinitic, frigid Lithic Argixerolls.

Typical Pedon: Reference pedon of Dewmine family from an area of Dewmine family - Rock outcrop - Kang family association, 35 to 80 percent slopes about 9 miles west of Weed in Siskiyou County, California in the NE<, SW<, NW< section 33, T.42N., R.6W. at a road cut:

01–1 inch to 0; duff of matted needles and leaves.

A11–0 to 2 inches; very dark gray (10YR 3/1) gravelly loam, black (10YR 2/1) moist; moderate very fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine roots; many very fine interstitial pores; 20 percent pebbles, 5 percent stones and cobbles; slightly acid (pH 6.5); abrupt smooth boundary.

A12–2 to 5 inches; dark gray (10YR 4/1) very gravelly clay loam, very dark gray (10YR 3/1) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and few fine roots; common fine interstitial and very fine tubular pores; 35 percent pebbles; neutral (pH 7.0); clear wavy boundary.

B1t–5 to 10 inches; dark grayish brown (10YR 4/2) very gravelly clay loam, very dark gray (10YR 3/1) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; common very fine, few fine, medium and coarse roots; common fine interstitial, common fine and very fine tubular pores; few thin and moderately thick clay films on ped faces and in pores; 35 percent pebbles; mildly alkaline (pH 7.8); clear wavy boundary.

B2t–10 to 19 inches; yellowish brown (10YR 5/4) very gravelly clay, very dark grayish brown (10YR 3/2) moist; weak coarse subangular blocky structure; very hard, very firm, sticky and very plastic; few very fine, fine, medium and coarse roots; few very fine and fine tubular pores; many moderately thick clay films on ped faces and in pores; 45 percent pebbles, 5 percent cobbles and stones; mildly alkaline (pH 7.8); clear irregular boundary.

R–19 to 24 inches; highly fractured serpentinitic rock.

Range in Characteristics: The depth to bedrock ranges from 10 to 20 inches. Rock fragments make up 35 to 60 percent of the profile. Reaction ranges from slightly acid to mildly alkaline.

The A horizon has color of 10YR 3/1, 4/1, 5/2, 5.3, or 2.5Y 5/2 and moist color of 10YR 2/1, 3/1, 3/2 or 2.5Y 2/2. It is loam or clay loam modified by 15 to 50 percent pebbles, stones, or cobbles. It is slightly acid to mildly alkaline.

The B horizon has dry color of 10YR 4/2, 5/4, 3/3, 3/2 or 2.5Y 5/2 and moist color of 10YR 3/1, 3/2, 3/3, 4/4 or 2.5Y 2/2. It is heavy clay loam or clay modified by 35 to 50 percent pebbles, stones, or cobbles. It is neutral or mildly alkaline.

DUBAKELLA FAMILY

The Dubakella family consists of moderately deep, well drained that formed in material weathered from ultramafic rocks. They are on dissected mountain side slopes and benches. Slopes are 20 to 80 percent. Mean annual precipitation ranges from 35 to 70 inches and the mean annual temperature is 55'F. Elevations ranges from 1,500 to 5,500 feet.

Taxonomic Class: Clayey-skeletal, serpentinitic, mesic Mollic Haploxeralfs.

Typical Pedon: Reference pedon of Dubakella family from an area of Dubakella family, 40 to 60 percent slopes in Tehama County, CA, 7.5 miles south of Platina, 1,820 feet south of the NE corner sec. 29, T. 28 N., R. 9 W.:

01–1 inch to 0; pine needles, fresh, partly decomposed, and decomposed.

A1–0 to 3 inches; reddish brown (5YR 4/3) cobbly loam, dark reddish brown (5YR 3/3) moist; weak very fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; common very fine and fine interstitial pores; 15 percent pebbles, 15 percent cobbles; neutral (pH 7.0); abrupt smooth boundary.

A12–3 to 11 inches; brown (5YR 5/4) very stony clay loam, dark brown (5YR 3/4) moist; moderate very fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common fine, medium and coarse roots; many fine and very fine interstitial pores; few thin clay films on ped faces; 20 percent pebbles, 30 percent stones; neutral (pH 7.2); clear smooth boundary.

B21t–11 to 18 inches; strong brown (7.5 YR 5/8) extremely stony clay, strong brown (7.5YR 4/6) moist; strong fine subangular blocky structure; slightly hard, friable, slightly sticky and plastic; few medium roots; common very fine and fine interstitial pores; many moderately thick clay films on ped faces and in pores; 35 percent pebbles, 30 percent stones; mildly alkaline (pH 7.5); clear wavy boundary.

B22t–18 to 26 inches; strong brown (7.5YR 5/8) extremely stony clay, (15 percent of volume is soil) strong brown (7.5YR 4/6) moist. Soil fills voids between gravel and rock fragments; slightly sticky and plastic; common very fine and fine interstitial pores; 45 percent pebbles, 40 percent stones; mildly alkaline (pH 7.5); clear irregular boundary.

R–26 to 30 inches; ultramafics. Blue, black and green with faces weathered white.

Range in Characteristics: The depth to bedrock ranges from 20 inches to over 40 inches. Reaction ranges from slightly to mildly alkaline.

The A horizon has hue of 10YR, 7.5YR and 5YR and value of 4 or 5 dry and 3 moist in the upper 4 inches. The chroma is 2, 3 or 4. The texture is loam, or clay loam modified by 30 to 60 percent rock fragments.

The B horizon has hue of 10YR, 7.5YR and 5YR, color value of 3 through 5 dry (3 or 4 moist) and chroma of 3 through 8. The texture is heavy clay loam or clay modified by 35 to 80 percent coarse fragments.

The C horizon may not be present.

DUNSMUIR FAMILY

The Dunsmuir family consists of deep, well drained soils that formed in material weathered from ultramafic rocks. They occur on linear and broken mountain side slopes and on benches. Slopes are 15 to 60 percent. Mean annual precipitation is 55 inches and the mean annual temperature is 51'F. Elevations range from 1,400 to 5,500 feet.

Taxonomic Class: Fine-loamy, oxidic, mesic Ultic Haploxeralfs.

Typical Pedon: Reference pedon of Dunsmuir family from an area of Dunsmuir-Ishi Pishi deep families, complex, 20 to 40 percent slopes in Siskiyou County about 1.5 miles southwest of central Dunsmuir, on a logging road that turns off at the switchback on the Mt. Bradley lookout road, about 1400 feet north and 700 feet west of the SE cor. of section 35, T. 39 N., R. 4 W.:

01–2 inches to 0; litter from fir and pine trees.

A11-0 to 3 inches; reddish brown (5YR 4/3) gravelly light sandy clay loam, dark reddish brown (5YR 3/3) moist; moderate fine granular structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine, fine and medium roots; many very fine interstitial pores; 32 percent pebbles; medium acid (pH 6.0); abrupt smooth boundary.

A12–3 to 7 inches; reddish brown (5YR 4/4) gravelly light sandy clay loam, dark reddish brown (5YR 3/3) moist; weak medium subangular blocky structure breaking to moderate fine granular; hard, friable, slightly sticky and slightly plastic; many very fine, fine and medium roots; many very fine interstitial pores; 20 percent pebbles; medium acid (pH 5.8); abrupt smooth boundary.

Blt–7 to 16 inches; reddish brown (5YR 5/4) gravelly clay loam, dark reddish brown (5YR 3/4) moist; hard, friable, slightly sticky and slightly plastic; common very fine and fine, many medium and coarse roots, few fine and very fine tubular pores; many thin clay films on ped faces and in pores; 20 percent pebbles; moderate medium subangular blocky structure; medium acid (pH 5.8); gradual wavy boundary.

B21t–16 to 28 inches; reddish brown (5YR 5/4) gravelly heavy clay loam, reddish brown (5YR 4/4) moist; moderate medium subangular blocky structure; very hard, friable, sticky and plastic; few very fine and fine, many medium and coarse roots; few fine and very fine tubular pores; few moderately thick clay films or ped faces, many thin clay films on ped faces and in pores; 22 percent pebbles; medium acid (pH 5.6); gradual wavy boundary.

B22t–28 to 35 inches; reddish brown (5YR 5/4) gravelly clay, reddish brown (5YR 4/4) moist; moderate medium subangular blocky structure; very hard, friable, sticky and plastic; few very fine and fine, many medium and coarse roots; few fine and very fine tubular pores; common moderately thick clay films on ped faces; 12 percent pebbles, 5 percent cobbles; medium acid (pH 5.6); gradual wavy boundary.

B23t–35 to 44 inches; reddish brown (5YR 4/4) gravelly clay, reddish brown (5YR 4/4) moist; moderate medium subangular blocky structure; very hard, friable, sticky and plastic; many medium, few fine and very fine roots; few very fine tubular pores; few thick clay films in pores and on ped faces, common moderately thick clay films in pores; 13 percent pebbles and 5 percent cobbles; medium acid (pH 5.6); gradual irregular boundary.

B3t–44 to 53 inches; yellowish red (5YR 5/6) very cobbly clay loam, reddish brown (5YR 4/4) moist; moderate medium subangular blocky structure; very hard, firm, sticky and plastic; many medium, few fine and very fine roots; few very fine tubular pores; 35 percent pebbles, 20 percent large weathered cobbles; medium acid (pH 5.6); gradual irregular boundary.

Cr–53 to 60 inches; paralithic contact with highly weathered ultramafics.

Range in Characteristics: The depth to bedrock is over 40 inches. Pebbles, cobbles and stones make up 0 to 35 percent of the profile. Reaction ranges from medium acid through neutral.

The A horizon has dry color of 5YR 5/4, 5/6, 4/3, 4/4, 4/6 or 7.5YR 6/4 and moist color of 5YR 4/4, 4/6, 3/3, 3/4, 2.5YR 3/4 or 3/6. It is loam, clay loam or sandy clay loam with 20 to 35 percent clay modified by 15 to 35 percent rock fragments.

The B2t horizon has dry color of 7.5YR 5/6, 5/8, 5/4, 5YR 4/4, 5/4, or 4/8 and moist color of 5YR 4/4, 7.5YR 4/6, 4/8, 5/6 or 2.5YR 3/6. It is heavy clay loam or clay

with 35 to 45 percent clay modified by 10 to 55 percent ock fragments. Iron oxide plus gibbsite to clay ratio is greater than 0.2. Rock fragments may range higher than 35%, but are below the 40" depth.

The CR horizon may not be present.

DYSTRIC CRYOPSAMMENTS

Dystric Cryopsamments consists of moderately deep and deep, well drained soils that formed in material weathered from granitic rocks. They occur on linear upper slopes and glacial outwash flats. Slopes are 0 to 70 percent. The mean annual precipitation is 40 to 70 inches and the mean annual temperature is 35'F. Elevation ranges from 6,400 to 7,500 feet.

Reference Pedon: Reference pedon of Dystric Cryopsamments from an area of Andic Cryumbrepts-Dystric Cryopsamments complex, 0 to 70 percent slopes in Trinity County California about 31 miles north of Weaverville, > mile south of Trail Gulch Lake on the south side of Deadman Peak in the SE<, SW< sec. 6, T. 38 N., R. 9 W.:

01–2 inches to 0; loose duff of red fir needles.

A1–0 to 3 inches; very dark grayish brown (10YR 3/2) loamy sand, very dark brown (10YR 2/2) moist; weak very fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine roots; many fine interstitial pores; 4 percent pebbles; strongly acid (pH 5.5); abrupt smooth boundary.

A2–3 to 7 inches; gray (10YR 6/1) loamy sand, dark gray (10YR 4/1) moist; single grain; loose, nonsticky and nonplastic; common very fine and fine roots; many very fine interstitial pores; 5 percent pebbles; strongly acid (pH 5.5); clear smooth boundary.

B2–7 to 17 inches; light brownish gray (10YR 6/2) loamy sand, dark grayish brown (10YR 4/2) moist; weak very fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine, fine, medium and coarse roots; many very fine interstitial pores; 5 percent pebbles; strongly acid (pH 5.5); clear wavy boundary.

C1–17 to 32 inches; light gray (10YR 7/1) gravelly sand, dark gray (10YR 4/1) moist; relict rock structure; loose, nonsticky and nonplastic; few very fine, fine, medium and coarse roots; many fine interstitial pores; 20 percent pebbles; strongly acid (pH 5.5); abrupt wavy boundary.

Cr–32 to 35 inches; paralithic contact with weathered granitic rock (gruss).

Range in Characteristics: The depth to bedrock ranges from 30 inches to over 60 inches. The base saturation is less than 60 percent. Reaction ranges from slightly to medium acid.

The A horizon has color value of 3 through 6 (2 through 4 moist) and chroma of 1 through 3 dry (1 through 4 moist). The hue is 10YR. It is sandy loam or loamy sand modified by up to 5 percent rock fragments.

The B horizon has color value of 6 dry (4 moist) and chroma of 2 or 3 dry or moist. The hue is 10YR. It is loamy sand with 5 to 10 percent rock fragments.

The C horizon has color value of 6 or 7 (4 through 6 moist) and chroma of 1 through 4 (1 through 6 moist). The hue is 10YR. It is sand or loamy sand modified by 20 to 30 percent rock fragments.

The Cr horizon may not be present.

DYSTRIC XERORTHENTS

Dystric Xerorthents consist of moderately deep and deep well drained soils that formed in material weathered from sericite schist. Dystric Xerorthents occur on barren ridges. Slopes are 5 to 40 percent. The mean annual precipitation is 60 to 75 inches and the mean annual temperature is 46'F. Elevation ranges from 5500 to 7500 feet.

Reference Pedon: Reference pedon of Dystric Xerorthents is from an area of Dystric Xerorthents, 5 to 40 percent slopes, in Trinity County, California, about 20 miles south of Hayfork on South Fork Mountain, > mile east of Horse Ridge LO, about 100 feet north and ? mile east of the southeast corner of Section 19, T. 28 N., R. 12 W.:

01–> inch to 0; scattered litter and gravel pavement.

A1–0 to 4 inches; light gray (10YR 7/2) very gravelly loam, grayish brown (10YR 5/2) moist; massive, breaking to single grain; loose, soft, nonsticky and nonplastic; many very fine, fine, common medium and coarse roots; many fine discontinuous pores; 40 percent pebbles; extremely acid (pH 4.3); clear smooth boundary.

C1–4 to 24 inches; pale brown (10YR 6/3) gravelly loam, brown (10YR 4/3) moist; massive, breaking to single grain; loose, soft, nonsticky and nonplastic; common medium, many fine and very fine roots; many very fine discontinuous pores; 25 percent pebbles; extremely acid (pH 4.3); gradual wavy boundary.

C2–34 to 52 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 4/3) moist; massive; loose, soft, nonsticky and nonplastic; few coarse, common fine and very fine roots; many very fine discontinuous pores; 15 percent pebbles, extremely acid (pH 4.3); abrupt wavy boundary.

R–52 to 56 inches; highly fractured and moderately weathered sericite schist.

Range in Characteristics: The depth to bedrock ranges from 20 to over 40 inches. Rock fragments comprise 15 to 60 percent of the profile volume. The reaction ranges from very strongly to extremely acid.

The A horizon has color volume of 6 through 8 (4 through 6 moist) and chroma of 2 through 4. The hue is 10YR or 2.5Y. It is loam or sandy loam modified by 25 to 60 percent rock fragments.

The C horizon has color value of 6 or 7 (3 through 5 moist and chroma of 2 through 4. The hue is 10YR or 2.5Y. It is loam or sandy loam modified by 15 to 45 percent rock fragments.

ENDLICH FAMILY

The Endlich family consists of moderately deep and deep, well drained soils that formed in material weathered from metamorphosed basic intrusive rock. They occur on dissected ridgetops, cirques, and ground moraines. Slopes are 5 to 90 percent slopes. The mean annual precipitation is 50 to 60 inches and the mean annual temperature is 35 to 40'F. Elevation ranges from 6,200 to 8,000 feet.

Taxonomic Class: Loamy-skeletal, mixed Dystric Cryochrepts.

Typical Pedon: Reference pedon of Endlich family from an area of Rock outcrop - Endlich family association, 5 to 90 percent slopes in Siskiyou County, California about 11 miles southwest of Weed, about < mile south of Upper Caldwell Lakes, about 1,500 feet west and 1,200 feet north of the SE corner of sec. 29, T. 41 N., R. 6 W.:

01–1 inch to 0; duff of hemlock needles.

A11–0 to 2 inches; dark yellowish brown (10YR 4/4) very fine sandy loam, dark brown (10YR 3/3) moist; moderate very fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine roots, many very fine interstitial pores; 10 percent pebbles; strongly acid (pH 5.5); abrupt smooth boundary.

A12–2 to 5 inches; yellowish brown (10YR 5/4) very gravelly sandy loam, dark yellowish brown (10YR 3/4) moist; weak very fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine, common fine and medium roots; many fine interstitial pores; 40 percent pebbles, 5 percent cobbles; medium acid (pH 6.0); clear wavy boundary.

B2–5 to 16 inches; yellowish brown (10YR 5/6) very gravelly very fine sandy loam, dark yellowish brown (10YR 4/4) moist; weak very fine granular structure; soft, very friable, nonsticky and nonplastic, common very fine, fine and medium roots; many very fine interstitial pores; 45 percent pebbles, 10 percent cobbles; medium acid (pH 6.0); gradual wavy boundary;

C1–16 to 25 inches; yellowish brown (10YR 5/6) very gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; weak medium to coarse subangular blocky structure; soft, very friable, nonsticky and nonplastic; common medium, few coarse, fine and very fine roots; many very fine interstitial pores; 30 percent pebbles, 10 percent cobbles; strongly acid (pH 5.5); clear wavy boundary.

C2–25 to 38 inches; yellowish brown (10YR 5/8) very cobbly coarse sandy loam, dark yellowish brown (10YR 4/6) moist; single grain; loose, nonsticky and nonplastic; common medium, many fine and very fine roots; many very fine interstitial pores; 30 percent pebbles, 20 percent cobbles; strongly acid (pH 5.5); clear irregular boundary.

R–38 to 47 inches; moderately fractured gabbro with roots veining deeper in cracks.

Range in Characteristics: The depth to bedrock ranges from 20 to 60 inches. The reaction ranges from strongly acid to neutral. Base saturation is less than 60 percent.

The A horizon has color value of 3 through 7 (2 through 4 moist) and chroma of 2 through 6. The hue is 10YR or 2.5Y. It is loam, sandy loam modified by 10 to 55 percent rock fragments.

The B horizon has color value of 4 through 7 (3 through 5 moist) and chroma of 3 through 6. The hue is 10YR or 2.5Y. It is loam or sandy loam modified by 35 to 60 percent rock fragments.

The C horizon has color value of 5 through 7 (3 through 5 moist) and chroma of 4 through 8 (2 through 6 moist). The hue is 10YR or 2.5Y. It is loamy sand or sandy loam modified by 40 to 80 percent rock fragments.

ENTIC CRYUMBREPTS

Entic Cryumbrepts consists of moderately deep and deep, well drained soils that formed in material weathered from metamorphic sedimentary and basic intrusive rocks. They occur on dissected, linear, ridgetops and glacial cirques. Slopes are 20 to 80 percent. The mean annual precipitation is 60 to 70 inches and the mean annual temperature is 35 to 40'F. The elevation ranges from 6000 to 8000 feet.

Reference Pedon: Reference pedon of Entic Cryumbrepts from an area of Stecum family - Rock outcrop-Entic Cryumbrepts complex, 50 to 80 percent slopes in Trinity County, California about 12 miles NNE of Weaverville, about 3/8 mile west of Granite Peak in the NW< NW< section 10, T. 35 N., R. 9 W.:

01–1 inch to 0; duff of conifer needles.

A1–0 to 5 inches; dark yellowish brown (10YR 3/4) gravelly very fine sandy loam, very dark brown (10YR 2/2) moist; weak very fine granular structure; soft, very friable, nonsticky and nonplastic; few coarse and many very fine roots; many fine interstitial pores; 15 percent pebbles; slightly acid (pH 6.2); clear wavy boundary.

A3–5 to 17 inches; dark yellowish brown (10YR 4/6) gravelly very fine sandy loam, dark brown (7.5YR 3/2) moist; weak very fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; few coarse and common very fine roots; common fine interstitial pores; 20 percent pebbles; slightly acid (pH 6.0); gradual wavy boundary.

B2–17 to 25 inches; yellowish brown (10YR 5/6) gravelly very fine sandy loam, dark brown (10YR 3/3) moist; weak coarse subangular blocky structure; soft, very friable, nonsticky and nonplastic; few very fine and coarse roots; few fine and medium tubular pores; 25 percent pebbles; strongly acid (pH 5.5); abrupt wavy boundary.

R–25 to 28 inches; fractured metasedimentary rock, roots and soil veining in cracks.

Range in Characteristics: The depth to bedrock is 24 to 60 inches. The base saturation is less than 50 percent. The reaction ranges from slightly to strongly acid.

The A horizon has color value of 3 or 4 (2 or 3 moist) and chroma of 3 or 4 (2 moist). The hue is 10YR or 7.5YR. It is loam, fine sandy loam or very fine sandy loam modified by 5 to 25 percent rock fragments.

The B horizon has color value of 5 or 6 (3 or 4 moist) and chroma of 2 through 6. The hue is 10YR. It is loam, sandy loam or very fine sandy loam modified by 15 to 35 percent rock fragments.

ETSEL FAMILY

The Etsel family consists of shallow, well drained soils that formed in material weathered from metasedimentary rocks. Soils of the Etsel family are on dissected mountain side slopes. Slopes are 40 to 80 percent. Elevation ranges from 1,500 to 4,500 feet. Mean annual precipitation ranges from 35 to 70 inches and the mean annual temperature is 55'F.

Taxonomic Class: Loamy-skeletal, mixed, nonacid, mesic Lithic Xerorthents.

Typical Pedon: Reference pedon of Etsel family from an area of Etsel family, 40 to 80 percent slopes, about 1< miles west of Lamoine, California, in Shasta County. The pit is located about 80 feet uphill from the road, about 50 feet west and 2660 feet south of the NE corner of section 17, T. 36 N., R. 5 W.:

01–> inch to 0; duff of whiteleaf manzanita and canyon oak leaves.

A11–0 to 4 inches; brown (7.5YR 5/4) very gravelly loam, brown (7.5YR 4/4) moist; weak fine granular structure; soft, friable, nonsticky and nonplastic, common very fine roots; many medium interstitial pores; 35 percent pebbles, 5 percent cobbles; slightly acid (pH 6.5); clear smooth boundary.

A12–4 to 9 inches; brown (7.5YR 5/4) very gravelly loam, brown (7.5YR 4/4) moist; weak very fine granular structure; soft, friable, nonsticky and nonplastic; common fine and few medium roots; many very fine interstitial pores; 30 percent pebbles, 15 percent cobbles; medium acid (pH 6.0); abrupt wavy boundary.

R–9 to 12 inches; slightly fractured nonweathered shale.

Range in Characteristics: The depth to a lithic contact is 4 to 20 inches. Rock fragments make up 35 to 60 percent of the profile. The reaction ranges from medium to slightly acid.

The A horizon has color value of 5 or 6 (4 or 5 moist) and chroma of 3 to 5. The hue is 10YR or 7.5YR. The texture ranges from sandy loam to loam modified by 35 to 60 percent rock fragments.

FONS FAMILY

The Fons family consists of moderately deep to deep, somewhat excessively drained soils that have formed in ash which has been deposited over slightly weathered cinders. They are on mid to lower sideslopes of cinder cones. They are 20 to 50 percent. Mean annual precipitation ranges from 20 to 45 inches and the mean annual temperature is 42'F. The elevation ranges from 4200 to 6600 feet.

Taxonomic Class: Medial over cindery, frigid Umbric Vitrandepts.

Typical Pedon: Reference pedon of Fons family from an area of Avis - Fons families association, 25 to 40 percent slopes, 0.85 miles north from intersection on road to Swamp Creek, about 2600 feet south and 20 feet east of the NW corner of section 7, T. 41 N., R. 1 W:

01–1 to 0 inches; duff and litter.

A1–0 to 3 inches; dark grayish brown (10YR 4/2) sandy loam, very dark brown (10YR 2/2) moist; single grain; loose; nonsticky and nonplastic; many very fine and fine roots; common very fine interstitial pores; 10 percent gravel size pumice; medium acid (pH 6.0); gradual smooth boundary; weakly smeary.

B2–3 to 10 inches; brown (10YR 4/3) cindery loam, dark brown (10YR 3/3) moist; weak fine and medium subangular blocky structure; loose, nonsticky and nonplastic; common very fine and fine roots; common very fine,
medium, and coarse interstitial pores; 20 percent gravel size cinders; slightly acid (pH 6.5); gradual smooth boundary; weakly smeary.

B3–10 to 21 inches; yellowish brown (10YR 5/4) cindery loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; loose, very friable, slightly sticky and nonplastic; common very fine and fine roots; common very fine and fine interstitial pores; 30 percent gravel size pumice; slightly acid (pH 6.5); gradual smooth boundary.

IIC1–21 to 40 inches; yellowish brown (10YR 5/4) extremely cindery coarse sandy loam, strong brown (7.5YR 4/6) moist; weak medium subangular blocky structure; loose, very friable, nonsticky and nonplastic; common very fine and fine interstitial pores; 60 percent gravel size cinders, 5 percent cobble size pumice; neutral (pH 7.0); abrupt smooth boundary.

IIC2–40 to 43 inches; brown (7.5YR 5/4) very cindery sandy loam, strong brown (7.5YR 4/6) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine roots; few very fine interstitial pores; 50 percent cinders, 10 percent andesitic cobbles; neutral (pH 7.0); gradual smooth boundary.

IIC3–43 to 53 inches; brown (7.5YR 5/4) extremely cindery sandy loam, strong brown (7.5YR 4/6) moist; massive; soft, very friable, nonsticky and nonplastic; few very fine roots; few very fine interstitial pores; 80 percent
gravel size cinders, 15 percent vesicular cobbles; neutral (pH 7.0); abrupt smooth boundary.

IIC4–53 inches; slightly weathered cinders.

Range in Characteristics: The depth to unweathered cinders is 24 to 50 inches. Cinder fragments constitute 35 to 70 percent of the profile. Reaction ranges from medium acid to neutral.

The A horizon has color value of 3 or 4 (2 or 3 moist) and chroma of 2 or 3. It is dominantly sandy loam. The hue is 10YR or 7.5YR.

The B horizon has a color value of 4 through 6 (3 or 4 moist) and chroma of 3 through 5. The hue is 10YR or 7.5YR. The texture is loam or a coarse sandy loam.

The IIC horizons have similar chroma, value and hue as the B horizon. The texture is a very cindery sandy loam or extremely cindery coarse sandy loam.

FORBES FAMILY

The Forbes family consists of deep, well drained soils that formed in material weathered from nonmarine alluvium. They are on mountain sideslopes dissected nonmarine terraces and benches. Slopes are 0 to 60 percent. The mean annual precipitation is 40 inches and the mean annual temperature is 55'F. Elevations range from 2,000 to 3,200 feet.

Taxonomic Class: Fine, oxidic, mesic Ultic Palexeralfs.

Typical Pedon: Reference pedon of Forbes family from an area of Forbes family, 20 to 40 percent slopes, about 1.5 miles west of Weaverville in Trinity County, California; about 1,200 feet north and 150 feet west of the center of section 11, T. 33 N., R. 10 W.:

01–1 inch to 0; moss and mixed conifer litter.

A1–0 to 2 inches; reddish brown (5YR 5/4) loam, reddish brown (5YR 4/4) moist; strong very fine and fine granular structure; loose, nonsticky and nonplastic; many very fine roots; many very fine interstitial pores; 10 percent pebbles; slightly acid (pH 6.1); abrupt smooth boundary.

A3–2 to 8 inches; yellowish red (5YR 4/6) loam, dark red (2.5YR 3/6) moist; weak fine and medium subangular blocky structure; very hard, firm, nonsticky and nonplastic; many very fine and medium roots; many very fine interstitial pores; 5 percent pebbles; slightly acid (pH 6.2); clear smooth boundary.

B21t–8 to 17 inches; yellowish red (5YR 4/6) clay, dark red (2.5Y 3/6) moist; weak coarse subangular blocky structure; hard, firm, slightly sticky and nonplastic; many fine and coarse roots; many very fine interstitial pores; common thin clay films on ped faces and in pores; 7 percent pebbles and 5 percent cobbles; strongly acid (pH 5.5); gradual wavy boundary.

B22t–17 to 45 inches; red (2.5YR 4/8) gravelly sandy clay, red (2.5Y 4/8) moist; weak coarse prismatic structure; hard, firm, sticky and slightly plastic; common fine and coarse roots; common very fine interstitial pores; 15 percent pebbles and 5 percent cobbles; many moderately thick clay films on ped faces and in pores; strongly acid (pH 5.5); gradual wavy boundary.

B3–45 to 67 inches; yellowish red (5YR 5/6) gravelly sandy clay loam, red (2.5YR 4/8) moist; massive; soft, friable, slightly sticky and nonplastic; few fine and coarse roots; common very fine interstitial pores; 20 percent pebbles and 5 percent cobbles; common thin clay films in pores; strongly acid (pH 5.3).

Range in Characteristics: The depth to bedrock is over 60 inches. Pebbles, cobbles and stones makeup 0 to 30 percent of the profile. Reaction ranges from strongly acid to neutral.

The A horizon has dry color of 5YR 5/4, 5/3, 4/6, 5/6 or 2.5YR 3/6 and moist color of 5YR 4/4, 3/4, 4/6 or 7.5YR 4/2. It is loam, silt loam, or sandy clay loam modified by up to 10 percent pebbles.

The B2t horizon has dry color of 5YR 4/8, 4/6, 2.5YR 4/6, 4/8, or 5/6 and moist color of 5YR 3/6, 3/8, 4/4, 2.5YR 3/6, 4/6, 4/8 or 5/8. It is heavy clay loam, sandy clay loam, sandy clay or clay modified by up to 25 percent pebbles and cobbles.

GERMANY FAMILY

The Germany family consists of moderately deep and deep, somewhat excessively drained soils which have formed in volcanic ash deposited over residuum from weathered extrusive igneous rock. They occupy terraces, level to gently sloping lava and mud flows. Slopes are 0 to 40 percent. Mean annual precipitation ranges from 40 to 65 inches the mean annual temperature is 53'F. Elevations range from 3,000 to 4,500 feet.

Taxonomic Class: Medial, mesic Andic Xerumbrepts.

Typical Pedon: Reference pedon of Germany family from an area of Sadie, deep-Germany, families association, 0 to 20 percent slopes, 7> miles east of McCloud, California, 0.65 miles east of the Upper Falls of the McCloud River, approximately 1000 feet east of the SW corner section 8, T. 39 N., R. 1 W.:

01–1 inch to 0; Litter and duff.

A11–0 to 10 inches; dark grayish brown (10YR 4/2) gravelly sandy loam, very dark brown (10YR 2/2) moist; weak fine and medium granular structure; soft, very friable; nonsticky and nonplastic; few medium and many very fine roots; many very fine interstitial pores; 15 percent pebbles; slightly acid (pH 6.2); diffuse smooth boundary.

A12–10 to 18 inches; dark brown (10YR 4/3) gravelly sandy loam, very dark brown (10YR 2/2) moist; weak fine and medium granular structure; soft, very friable; nonsticky and nonplastic; many fine, common medium and few coarse roots; many very fine interstitial pores; 15 percent pebbles; slightly acid (pH 6.5); clear smooth boundary.

B2–18 to 28 inches; brown (7.5YR 5/4) very gravelly sandy loam, dark brown (7.5 YR 3/2) moist; weak medium, and coarse subangular blocky structure; soft, very friable; slightly sticky and nonplastic; many fine and common medium roots; few fine tubular and common fine interstitial pores; 35 percent pebbles; slightly acid (pH 6.5); clear smooth boundary.

IIC–28 to 32 inches; brown (7.5YR 5/5) very gravelly sandy loam, dark brown (7.5YR 3/4) moist; relict rock structure; soft, very friable; nonsticky and nonplastic; common fine roots; common, fine interstitial pores; 60 percent pebbles; slightly acid (pH 6.5); abrupt wavy boundary.

R–32 to 34 inches; hard basalt with vertical fractures about 3 inches apart.

Range in Characteristics: There are two phases of the Germany Family recognized in this survey: Germany and Germany, deep.

Germany

The depth to a lithic contact is 20 to 40 inches. Rock fragments make up 10 to 50 percent of the profile. Reaction ranges from slightly acid to medium acid.

The A horizon has a color value of 3 through 5 (2 through 4 moist) and chroma of 2 through 4. It is dominantly sandy loam, loamy sand, or gravelly sandy loam. The hue is 10YR or 7.5YR.

The B2 horizon has color value of 4 through 6 (2 through 4 moist) and chroma of 4 through 8. The hue is 10YR or 7.5YR. The texture is sandy loam modified by up to 35 percent rock fragments.

The C horizon may not be present.

Germany, deep

The depth to a lithic contact ranges from 24 to 60 inches. Rock fragments make up 10 to 40 percent of the solum. Reaction ranges from medium acid to neutral.

The A horizon has a color value of 2 through 4 dry (2 or 3 moist) and chroma of 1 through 3. The texture is sandy loam or loam. The hue is 10YR or 7.5YR. Rock fragments comprise less than 15 percent of the horizon.

The B horizon has color value of 3 through 6 (3 through 5 moist) and chroma of 3 through 5. The hue is 10YR, 7.5YR, or 5YR. The texture is loam or sandy loam modified by up to 35 percent rock fragments which are often pumaceous.

The C horizon has color value of 6 (3 through 4 moist) and chroma of 4 to 6. The texture is sand loam to fine sandy loam.

GOULDING

The Goulding family consists of shallow, well drained that formed in material weathered from metavolcanic and metasedimentary rocks. They are on dissected mountain side slopes and ridgetops. Slopes are 20 to 80 percent. The mean annual precipitation ranges from 30 to 50 inches and mean annual temperature is 57'F. Elevations range from 2,000 to 4,500 feet.

Taxonomic Class: Loamy-skeletal, mixed, mesic Lithic Xerochrepts.

Typical Pedon: Reference pedon of Goulding family from an area of Parrish-Goulding families complex, 20 to 60 percent slopes about 3> miles SW of Platina, CA 100 yds. east and 350 yds. south of NW corner section 6, T. 28 N., R. 9 W.:

01–> inch to 0; chamise leaf duff and litter.

A1–0 to 7 inches; yellowish brown (10YR 5/4) very gravelly loam, dark brown (7.5YR 3/4) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; common very fine, fine and medium tubular pores; 30 percent cobbles, 10 percent pebbles; neutral (pH 7.2); clear smooth boundary.

B2–7 to 15 inches; yellowish brown (10YR 5/4) very gravelly loam, dark brown (7.5YR 3/4) moist; moderate medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common very fine, medium and few coarse roots; few fine and medium tubular pores; few thin clay films on ped faces; 45 percent pebbles, 10 percent cobbles; neutral (pH 7.0); abrupt wavy boundary.

R–15 to 21 inches; fractured metavolcanic rock.

Range in Characteristics: The profile depth to bedrock ranges from 10 to 20 inches. Rock fragments make up 35 to 65 percent of the profile. Reaction ranges from medium acid to neutral.

The A horizon has color value of 5 or 6 (3 or 4 moist) and chroma of 4 or 5. The hue is 7.5YR and 10YR. The texture is sandy loam, loam or light clay loam modified by 30 to 60 percent gravel and cobbles.

The B horizon has color value of 5 or 6 (3 or 4 moist) and chroma of 4 through 6. The hue is 7.5YR and 10YR. The texture is loam or light clay loam modified by 35 to 60 percent gravels and cobbles.

GOZEM FAMILY

The Gozem family consist of shallow, well drained soils that formed in material weathered from rock high in serpentinitic minerals. They are on moderately steep to very steep ridges, upper side slopes, and on glacial cirques with linear slopes and shallow drainage patterns. Slopes are 20 to 80 percent. The mean annual precipitation is 55 inches and the mean annual temperature is 43'F. The elevation ranges from 5,500 to 7,500 feet.

Taxonomic Class: Loamy-skeletal, serpentinitic, frigid Lithic Xerochrepts.

Typical Pedon: Reference pedon of Gozem family from an area of Gozem family-Rock outcrop - Toadlake family complex, 30 to 70 percent slopes about 10 miles west of Dunsmuir, 2 miles NW of Gray Rock Lake, about 300 feet east and 2,300 feet north of the SW corner sec. 16, T. 39 N., R. 5 W., above road, in first bare spot on Bear Ridge.

01–> inch to 0; dead grass and sparse scattered pine needles.

A1–0 to 4 inches; yellowish brown (10YR 5/6) very cobbly loam, dark yellowish brown (10YR 3/4) moist; moderate fine and medium subangular blocky structure; soft, very friable, nonsticky and slightly plastic; common very fine and few fine roots; many very fine and fine interstitial pores; 15 percent pebbles; 20 percent cobbles; slightly acid (pH 6.5); clear smooth boundary.

B1–4 to 11 inches; yellowish brown (10YR 5/6) very cobbly loam, dark yellowish brown (10YR 3/6) moist; moderate medium subangular blocky structure; slightly hard, friable, nonsticky and slightly plastic; common very fine, few fine and medium roots; common very fine and few fine interstitial pores; 30
percent pebbles, 25 percent cobbles; slightly acid (pH 6.5); clear wavy boundary.

B2–11 to 18 inches; yellowish brown (10YR 5/8) very gravelly heavy loam, dark yellowish brown (10YR 3/6) moist; strong medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few very fine, fine, medium and coarse roots; few fine interstitial and tubular pores; 35 percent pebbles, 10 percent cobbles; neutral (pH 6.8); abrupt irregular boundary.

R–18 to 22+ inches; fractured, serpentinized peridotite with root in cracks.

Range in Characteristics: The depth to bedrock ranges from 10 to 20 inches. Base saturation is over 60 percent.

The A horizon has dry color of 10YR 5/3, 5/4, 5/6, 6/3, 6/4, 7/3 or 2.5Y 5/4 and moist color of 10YR 3/2, 3/3, 3/4, 4/3, 4/4, 4/6, 7.5YR 4/4 or 2.5Y 4/4. The texture is sandy loam, loam, silt loam or light sandy clay loam with 20 to 25 percent clay modified by 15 to 50 percent rock fragments. It is neutral to mildly alkaline.

The B2 horizon has dry color of 2.5YR 5/4, 10YR 6/3, 6/4, 5/8 or 4/8 and moist color of 10YR 3/4, 3/6, 4/6, 5/6 and 2.5Y 4/4. It is loam or sandy clay loam with 20 to 30 percent clay modified by 35 to 80 percent rock fragments. It is neutral to mildly alkaline.

C horizon may be present and will have less clay and more rock fragments than the B2 horizon occurs in some pedons.

GRELL FAMILY

The Grell family consists of shallow, well drained soils that formed in material weathered from serpentine. They are on dissected mountain side slopes and ridge tops. Slopes are 20 to 40 percent. Mean annual precipitation is 40 to 60 inches and the mean annual temperature is 55'F. Elevation ranges from 4,000 to 6,000 feet.

Taxonomic Class: Loamy-skeletal, serpentinitic, mesic Lithic Haploxerolls.

Typical Pedon: Reference pedon of Grell family from an area of Grell family-Rock outcrop complex, 20 to 40 percent slopes about 7 miles southwest of Wildwood, in Trinity County, Ca, 900 ft. south and 1000 ft. east of the NW corner section 32, T. 29 N., R. 11 W., shallow pit about 100 feet east of jeep road on Red Mtn. about 3/4 mile north of old lookout:

A11–0 to 2 inches; grayish brown (2.5Y 5/2) very gravelly sandy loam, very dark grayish brown (2.5Y 3/2) moist; weak coarse subangular blocky parting to single grain structure; loose, nonsticky and nonplastic; common fine and very fine roots; many fine interstitial pores; 30 percent pebbles, 10 percent cobbles; mildly alkaline (pH 7.5); clear wavy boundary.

A12–2 to 12 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; weak very fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine, fine and few medium roots; many very fine interstitial pores; 45 percent pebbles, 15 percent cobbles; moderately alkaline (pH 8.0); clear irregular boundary.

R–12- to 16 inches; moderately fractured, slightly weathered serpentine (ultramafic), green, black and slippery.

Range in Characteristics: The depth to a lithic contact is 4 to 20 inches. Rock fragments make up 35 to 80 percent of the profile volume. Reaction ranges from neutral to moderately alkaline.

The A horizon has color value of 4 or 5 (2 or 3 moist) and chroma of 2 or 3. The hue is 2.5Y, 10YR or 7.5YR. The texture is loam or sandy loam modified by 35 percent rock fragment.

HENNEKE FAMILY

The Henneke family consists of shallow, well drained soils that formed in material weathered from serpentinized ultramafic rocks. They are on dissected mountain sideslopes. Slopes are 20 to 80 percent. Mean annual precipitation is 35 to 50 inches and the mean annual temperature is 60'F. Elevation ranges from 2,000 to 4,000 feet.

Taxonomic Class: Clayey-skeletal, serpentinitic, thermic Lithic Argixerolls.

Typical Pedon: Reference pedon of Henneke family from an area of Henneke-Dubakella families complex, 40 to 60 percent slopes, eroded, 350 feet west and 885 feet south of the NE corner of section 4, T. 28 N., R. 10 W. about 6 miles SW of Platina in Shasta County, CA:

01–> inch to 0; leather oak and whiteleaf manzanita leaves.

A11–0 to 3 inches; brown (7.5YR 5/2) gravelly loam, dark brown (7.5YR 3.2) moist; moderate medium subangular blocky structure; hard, very friable, slightly plastic and nonsticky; common fine and medium roots; common fine and medium tubular and interstitial pores; 22 percent pebbles, 10 percent cobbles; moderately alkaline (pH 8.0); clear wavy boundary.

A12–3 to 5 inches; brown (7.5YR 4/2) gravelly heavy loam, dark brown (7.5YR 3/2 moist); moderate fine and medium subangular blocky structure; hard, very friable, slightly sticky and slightly plastic; common fine and medium roots; common fine and medium tubular and interstitial pores; 27 percent pebbles, 5 percent cobbles; moderately alkaline; (pH 8.0); clear smooth boundary.

B2t–5 to 9 inches; brown (10YR 4/3) very gravelly clay, dark brown (7.5YR 3/2) moist; weak fine, medium and coarse subangular blocky structure; hard, firm, sticky and plastic; common fine roots; few fine interstitial pores; common moderately thick clay films in pores and on ped faces; 40 percent pebbles, 5 percent cobbles; moderately alkaline (pH 8.0); clear smooth boundary.

C1–9 to 15 inches; dark brown (10YR 3/3) extremely gravelly loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky structure; hard, friable, slightly sticky and plastic; few fine roots; few fine interstitial pores; common thin clay films on cobble and pebble faces; 70 percent pebbles, 10 percent cobbles; moderately alkaline (pH 8.0); clear wavy boundary.

R–15 to 17 inches; hard, fractured ultramafic rock.

Range in Characteristics: Depth to ultramafic rock is 10 to 20 inches. Rock fragments make up 35 to 80 percent of the profile. Reaction ranges from slightly acid to moderately alkaline.

The A1 horizon has color values of 4 or 5 (2 or 3 moist) and chroma of 2 or 3. The hue is 7.5YR, 10YR or 5YR. The texture is loam or clay loam modified by 25 to 45 percent rock fragments.

The B2t horizon has color values of 3 through 5 (2 through 4 moist) and chroma of 2 through 6. The hue is 10YR or 7.5YR. The texture is heavy clay loam clay modified by 35 to 80 percent rock fragments.

Some profiles lack a C horizon.

HOHMANN FAMILY

The Hohmann family consists of moderately deep, well drained soils that formed in material weathered form basic igneous rock such as diorite and meta-andesite. They are on dissected broken mountain sideslopes with gradients of 40 to 60 percent. Mean annual precipitation is 50 inches and the mean annual temperature is 50'F. Elevation ranges from 2,500 to 5,000 feet.

Taxonomic Class: Fine-loamy, mixed mesic Typic Xerochrepts.

Typical Pedon: Reference pedon of Hohmann family from an area of Hohmann-Brader families association, 40 to 60 percent slopes, 4 miles south of Hayfork in Trinity County, California. NW< of the SW<, section 6, T. 30 N., R. 11 W., M.D.M.B. (about 1.4 miles east of State Highway 36 on Dobbins Gulch Road).

01–> inch to 0; scattered needles, bark and leaves.

A1–0 to 2 inches; light brownish gray (2.5YR 6/2) gravelly loam, very dark grayish brown (2.5YR 3.2) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine roots; many very fine continuous horizontal tubular pores; 15 percent pebbles, 5 percent cobbles; medium acid (pH 6.0); gradual wavy boundary.

B1–2 to 14 inches; light brownish gray (2.5YR 6/2) silt loam, grayish brown (2.5YR 5/2) moist; weak, medium and coarse subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; many very fine and fine roots; many very fine and fine continuous horizontal tubular pores; 5 percent pebbles, 5 percent cobbles; medium acid (pH 6.0); diffuse irregular boundary.

B2–14 to 22 inches; light gray (10YR 7/2) gravelly silty clay loam, light olive brown (2.5YR 5/4) mixed with olive brown (2.5YR 4/4) moist; massive to weak fine subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; many very fine, fine, medium and coarse roots; many very fine and fine continuous horizontal tubular pores; 25 percent pebbles, 5 percent cobbles; strongly acid (pH 5.5); diffuse broken boundary.

Cr–22-24 inches; light brownish gray (2.5YR 6/2) highly fractured and weathered augite meta-andesitic rock.

Range in Characteristics: The depth to a paralithic contact is 20 to 35 inches. Rock fragments make up 15 to 25 percent of the profile volume. Reaction ranges from medium acid to neutral.

The A horizon has color values of 4 through 6 (3 or 4 moist) and chroma of 3 or 4. The hue is 10YR and 2.5Y. The texture is loam, light clay loam on silty clay loam modified by 10 to 30 percent rock fragments.

The B horizon has color values of 5 through 7 (4 through 6 moist) and chroma of 3 through 6. The hue is 10YR, 2.5YR and 7.5YR. The texture is clay loam, silt loam, silty clay loam, or light clay loam modified by 10 to 30 percent rock fragments.

The Cr horizon has color value of 6 through 8 (5 through 7 moist) and chroma of 3 through 6. Hue is 10YR.

HOLLAND FAMILY

The Holland family consists of moderately deep and deep, well drained soils formed in material weathered from metasedimentary, volcanic and diorite or granitic rocks. They are on benches, toe slopes, dissected, linear to broken mountain side slopes. Slopes are 0 to 80 percent. Mean annual precipitation ranges from 35 to 70 inches and the mean annual temperature is 54'F. Elevation ranges from 1,500 to 5,500 feet.

Taxonomic Class: Fine-loamy, mixed, mesic Ultic Haploxeralfs.

Typical Pedon: Reference pedon of Holland family from an area of Holland family, deep-Holland family complex, 20 to 40 percent slopes 1 mile SE of Castella, CA, 1850 feet due north of the SE corner of Section 22, T. 38 N., R. 4 W.:

01–2 inches to 0; conifer needles, moss and maple leaves.

A1–0 to 3 inches; brown (10YR 5/3) gravelly loam, dark brown (7.5YR 4/4) moist; strong fine granular structure; soft, very friable, slightly sticky and slightly plastic; common very fine, fine and medium roots; few very fine and fine continuous pores; 30 percent pebbles; slightly acid (pH 6.5); abrupt irregular boundary.

B21t–3 to 12 inches; light brown (7.5YR 6/4) gravelly loam, brown (7.5YR 4/4) moist; weak fine subangular blocky structure; soft, friable, slightly sticky and slightly plastic; common fine roots; few very fine, fine and medium continuous pores; few thin clay films in pores; 20 percent pebbles; slightly acid (pH 6.5); gradual wavy boundary.

B22t–12 to 18 inches; light brown (7.5YR 6/4) gravelly clay loam, brown (7.5Y 5/4) moist; moderate medium subangular blocky structure; slightly hard, firm, sticky and plastic; common medium roots; common fine continuous pores; common thin clay films in pores; 30 percent pebbles; medium acid (pH 6.0); clear irregular boundary.

B3t–18 to 26 inches; reddish yellow (7.5YR 6/6) extremely gravelly sandy clay loam, strong brown (7.5YR 5/6) moist; moderate very fine subangular blocky structure; soft, friable, slightly sticky and slightly plastic; common fine and medium roots; few fine and very fine continuous pores; common thin clay films on ped faces; 60 percent pebbles, 5 percent cobbles; medium acid; abrupt irregular boundary.

Cr–26 to 30 inches; highly fractured, moderately weathered metavolcanic rock.

Range in Characteristics: There are four phases of the Holland family recognized in this survey. They are Holland; Holland, deep; Holland, ashy; and Holland, granitic.

Holland

The depth to a paralithic contact is 20 to 40 inches. Rock fragments make up from 10 to 35 percent of the profile. Reaction ranges from medium acid to neutral.

The A horizon has color value of 4 through 6 (3 through 5 moist) and chroma of 3 and 4 moist and dry. The hue is 7.5YR, 10YR or 5YR. It is gravelly loam, loam or silt loam with up to 30% rock fragments.

The B horizon has color value of 5 through 7 (4 through 6 moist) and chroma of 4 through 6 moist and dry. The hue is 7.5YR or 5YR. It is loam, heavy loam, sandy clay loam or light clay loam with up to 35 percent rock fragments.

The C horizon may not be present.

Holland family, deep

The depth to a paralithic contact of weathered rock ranges from 40 to 60 inches. Rock fragments make up 5 to 35 percent of the profile. Reaction ranges from medium acid to neutral.

The A horizon has color value of 4 through 6 (3 through 5 moist) and chroma of 4 through 6. The hue is 7.5YR and 5YR. It is loam or clay loam modified by 15 to 35 percent rock fragments.

The B horizon has color value of 4 through 7 (4 through 6 moist) and chroma of 4 through 8. The hue is 5YR or 7.5YR in the upper part and ranges to 2.5YR in the lower part. It is sandy clay loam or clay loam with less than 35 percent clay modified by 15 to 35 percent rock fragments.

The C horizon may not be present.

Holland family, ashy

The profile depth ranges from 28 to 42 inches. The depth to bedrock ranges from 40 to over 60 inches. Rock fragments make up 5 to 35 percent of the profile, with

percent of the surface commonly covered by stones. Reaction ranges from strongly acid through neutral.

The A1 horizon has color value of 4 or 5 (3 or 4 moist) and chroma of 3 through 6. The hue is 5YR or 7.5YR. The texture is coarse sandy loam to fine sandy loam modified by 5 to 35 percent rock fragments.

The B2t horizon has color value of 4 or 5 and chroma of 4 through 6 (4 moist). The hue is 5YR or 7.5YR. It is sandy clay loam or clay loam modified by 5 to 35 percent rock fragments.

The C horizon may not be present.

Holland family, granitic

The depth to a paralithic contact ranges from 20 to 40 inches. Rock fragments make up 10 to 35 percent of the profile. Reaction ranges from strongly to slightly acid.

The A horizon has color value of 5 through 7 (4 through 6 moist) and chroma of 3 through 5. The hue is 7.5YR and 10YR. The texture is sandy loam, or coarse sandy modified by up to 25 percent rock fragments.

The B horizon has color value of 5 through 7 (4 through 6 moist) and chroma of 4 through 6. The hue is 7.5YR and 10YR. The texture is clay loam or sandy loam with 20 to 35 percent clay and up to 25 percent rock fragments.

The C horizon may not be present.

HUGO FAMILY

The Hugo family consists of moderately deep to deep, well drained soils that formed in material weathered from metavolcanic, metasedimentary, and granitic rock. They are on dissected mountain sideslopes and benches with gradients of 15 to 80 percent. Mean annual precipitation ranges from 35 to 70 inches and the mean annual temperature is 56'F. Elevation ranges from 1,500 to 5,500 feet.

Taxonomic Class: Fine-loamy, mixed, mesic Dystric Xerochrepts.

Typical Pedon: Reference pedon of Hugo family from an area of Neuns-Hugo families complex, 40 to 60 percent slopes in Shasta County, CA, 2 miles SW of Harrison Gulch Ranger Station, 1,100 feet North, 2,000 feet West of SE corner Section 21, T. 29 N., R. 10 W.:

O1–1 inches to 0; loose litter of oak leaves and conifer needles.

A11–0 to 4 inches; brown (10YR 5/3) loam, very dark grayish brown (10YR 3/2) moist; weak very fine granular structure, soft, very friable, nonsticky and nonplastic; common fine roots; common very fine interstitial pores; 10 percent pebbles; medium acid (pH 6.0); gradual smooth boundary.

B1–4 to 15 inches; light yellowish brown (10YR 6/4) loam, dark yellowish brown (10YR 3/4) moist; massive, breaking to weak fine subangular blocky structure; slightly hard, very friable slightly sticky and slightly plastic; common very fine, and few medium roots; few very fine tubular and interstitial pores; 10 percent pebbles; medium acid (pH 6.0); gradual smooth boundary.

B21t–15 to 22 inches; light yellowish brown (10YR 6/4) light clay loam, dark yellowish brown (10YR 4/4) moist; massive, breaking to weak fine and very fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and common fine roots; many very fine and interstitial and common very fine tubular pores; common few thin clay films on ped faces; 10 percent pebbles; medium acid (pH 5.7); gradual wavy boundary.

B22t–22 to 42 inches; yellowish brown (10YR 5/4) gravelly clay loam, dark brown (10YR 4/3) moist; weak fine and very fine subangular blocky structure; slightly hard; very friable, sticky and plastic; common thin clay films on ped faces; 20 percent pebbles strongly acid (pH 5.5); gradual smooth boundary.

B23–42 to 50 inches; pale brown (10YR 6/3) gravelly sandy clay loam, dark brown (10YR 4/3) moist; moderate fine subangular blocky structure; slightly hard, very friable, sticky and plastic; few fine and medium roots; many fine interstitial pores; common moderately thick clay films on ped faces; 30 percent pebbles; strongly acid (pH 5.5); abrupt wavy boundary.

Cr–50 to 68 inches; highly fractured, slightly to moderately weathered shale mixed with soil. Shale fragments increasing with depth.

Range in Characteristics: There are two phases of Hugo family recognized in this survey: Hugo and Hugo, moderately deep.

Hugo

The depth to bedrock is 40 inches or more. Rock fragments make up 0 to 35 percent of the profile. Reaction ranges from medium acid to neutral.

The A horizon has color value of 5 to 6 (3 to 4 moist) and chroma of 2 or 3. It is sandy loam, loam, or light clay loam modified by up to 35 percent rock fragments. The hue is 10YR or 7.5YR.

The B2 horizon has color value of 5 to 6 (3 or 4) and chroma of 2 to 4. It is gravelly loam, gravelly light clay loam or gravelly sandy clay loam, with up to 30% rock fragments. The hue is 7.5YR, 10YR, or 2.5Y.

The C horizon may not be present.

Hugo, moderately deep

The depth to a lithic contact is 20 to 40 inches. Reaction ranges from slightly to very strongly acid.

The A horizon has color values of 3 through 6 (3 or 4 moist) and chroma of 2 through 4. The hue is 10YR, 7.5YR, or 2.5Y. The texture is sandy loam, loam or heavy loam modified by 25 to 50 percent rock fragments.

The B horizon has color values of 4 through 6 (4 through 6 moist) and chroma of 2 through 4. The hue is 10YR and 7.5YR. The texture is loam or light clay loam modified by 15 to 35 percent rock fragments.

The C horizon has textures of loam or light clay loam modified by 20 to 35 percent rock fragments.

HUNTMOUNT FAMILY

The Huntmount family consists of deep, well drained soils that developed from basic igneous rock parent material. They are on dissected mountain sideslopes. Slopes are 15 to 60 percent. Mean annual precipitation is 50 to 60 inches and mean annual temperature is 50'F. Elevation ranges from 3000 to 5000 feet.

Taxonomic Class: Fine-loamy, mixed, mesic Typic Haploxeralfs.

Typical Pedon: Reference pedon of Huntmount family from an area of Huntmount family, 40 to 60 percent slopes, 5 miles SE of Hayfork, Trinity County, CA. SW< SW< sec. 11, T. 30 N., R. 11 W., M.D.B.M. (4.3 miles east of Hwy 3 on Dobbins Gulch Road).

01–1 inch to 0; lose duff and litter.

All–0 to 6 inches; light yellowish brown (10YR 6/4) gravelly loam, dark brown (7.5YR 3/4) moist; strong very fine subangular blocky and moderate fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and nonplastic; common very fine, fine and medium roots; many very fine continuous horizontal tubular pores; 25 percent pebbles; slightly acid (pH 6.5); gradual wavy boundary.

A12–6 to 12 inches; light yellowish brown (10YR 6/4) gravelly heavy loam, brown (7.5YR 6/4) moist; moderate medium and strong fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine and coarse, and common, fine roots; many, very fine and fine continuous, horizontal tubular pores; 15 percent pebbles; neutral (pH 7.0); gradual smooth boundary.

B21t–12 to 20 inches; pink (7.5YR 7/4) clay loam, strong brown (7.5YR 4/6) moist; strong medium subangular blocky structure, slightly hard, friable, slightly sticky and slightly plastic; few very fine and fine and common medium roots; many very fine and fine common medium continuous horizontal tubular pores; common, moderately thick clay films on ped faces and in pores; few very fine and fine common medium roots; many, very fine and fine, common medium continuous horizontal tubular pores; 10 percent pebbles; neutral (pH 7.0); gradual wavy boundary.

B22t–20 to 32 inches, light brown (7.5YR 6/4) gravelly clay loam, strong brown (7.5YR 4/6) moist; strong medium and moderate fine subangular blocky structure; slightly hard, friable, slightly sticky and plastic; few very fine, fine and medium and common coarse roots; common very fine continuous horizontal tubular pores; many thick clay films on ped faces; 20 percent pebbles, 5 percent cobbles; neutral (ph 7.0); diffuse wavy boundary.

B23t–32 to 50 inches; light brown (7.5YR 6/4) gravelly clay loam, strong brown (7.5YR 4/6) moist; strong medium and moderate fine subangular blocky structure; slightly hard, friable, slightly sticky and plastic; few very fine, fine and medium and common coarse roots; common very fine continuous horizontal tubular pores; many thick clay films on ped faces; 25 percent pebbles, 5 percent cobbles; neutral (pH 7.0); diffuse wavy boundary.

C–50 to 60 inches; light brown (7.5YR 6/4) gravelly heavy loam, strong brown (7.5YR 4/6) moist; relict rock structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots; 30 percent pebbles; neutral (pH 7.0).

Range of Characteristics: The depth to a paralithic contact is greater than 40 inches. Coarse fragments make up 15 to 35 percent of the profile volume.

The A horizon has color value of 5 or 6 (3 or 4 moist) and chroma of 4 to 6. The hue is 5YR, 7.5YR or 10YR. The texture is loam, silt loam or sandy clay loam modified by 15 to 35 percent rock fragments.

The B horizon has color value of 5 to 7 (5 moist) and chroma of 4 to 6. The hue is 5YR, 7.5YR or 10YR. The texture is clay loam, silty clay loam or sandy clay loam. It averages 15 to 35 percent rock fragments.

The C horizon has color value of 5 or 6 and chroma of 4 to 8. The hue is 7.5YR, 5YR or 10YR. The texture is gravelly loam or gravelly clay loam.

INVILLE FAMILY

The Inville family consists of deep, well drained soils that formed in material weathered from basic intrusive and metamorphic rocks. They are on moderately steep to steep, linear to broken glacial moraines and mountain side slopes. Slopes are 15 to 50 percent. Mean annual precipitation is about 60 inches and the mean annual temperature is 45'F. Elevation ranges from 4500 to 6500 feet.

Taxonomic Class: Loamy-skeletal, mixed, frigid Ultic Haploxeralfs.

Typical Pedon: Reference pedon of Inville family from an area of Inville-Jayar, deep families complex. 15 to 40 percent slopes about 10 miles west of Dunsmuir in Siskiyou County, California, about 1200 feet north and 200 feet east of the SW corner of sec. 21, T. 39 N., R. 5 W.:

01–1> inches to 0; duff of conifer needles, twigs and bark.

A1–0 to 10 inches; light yellowish brown (10YR 6/4) gravelly loam, brown (7.5YR 4/4) moist; moderate fine and medium granular structure; soft, friable, nonsticky and nonplastic; common very fine, fine and medium roots; many very fine and fine interstitial pores; 20 percent pebbles, 5 percent cobbles; strongly acid (pH 5.5); gradual wavy boundary.

A3–10 to 15 inches; reddish yellow (7.5YR 6/6) very gravelly loam, brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, firm, slightly sticky and nonplastic; few very fine, fine, common medium and coarse roots; common very fine interstitial and many very fine tubular pores; 30 percent pebbles, 5 percent cobbles; medium acid (pH 6.0); clear wavy boundary.

B21t–15 to 26 inches; brownish yellow (10YR 6/6) very cobbly clay loam, dark yellowish brown (10YR 4/6) moist; weak medium subangular blocky structure; hard, very firm, slightly sticky and slightly plastic; common very fine, few fine and medium roots; common very fine and fine tubular pores; common thin and moderately thick clay films on ped faces and in pores; 18 percent pebbles, 20 percent cobbles; medium acid (pH 6.0); gradual wavy boundary.

B22t–26 to 34 inches; brownish yellow (10YR 6/6) very cobbly clay loam, dark yellowish brown (10 YR 4/6) moist; moderate medium subangular blocky structure; hard, very firm, slightly sticky and slightly plastic; common medium, few very fine, fine and coarse roots; common very fine and fine interstitial pores; few thin and moderately thick clay films on ped faces and in pores; 15 percent pebbles, 40 percent cobbles; slightly acid (pH 6.5); clear irregular boundary.

B23t–34 to 44 inches; light yellowish brown (10YR 6/4) very cobbly clay loam, dark yellowish brown (10YR 4/4 moist; moderate fine and medium subangular blocky structures; slightly hard, firm, slightly sticky and slightly plastic; few very fine, fine, medium an coarse roots; many fine interstitial and common very fine tubular pores; few thin clay films in pores; 25 percent pebbles, 30 percent cobbles; slightly acid (pH 6.5); gradual irregular boundary.

B3t–44 to 60 inches; light yellowish brown (10YR 6/4) extremely cobbly clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; few fine, medium and coarse roots; many fine interstitial, common very fine and fine tubular pores; few thin clay films in pores; 20 percent pebbles, 50 percent cobbles; slightly acid (pH 6.5).

Range in Characteristics: The depth to bedrock or compacted glacial till is over 40 inches. The reaction ranges from strongly acid to neutral.

The A horizon has color value of 5 or 6 (3 or 4 moist) and chroma of 4 through 6. The hue is 7.5YR or 10YR. The texture is loam or heavy loam modified by 25 to 50 percent rock fragments.

The B horizon has color value of 5 or 6 (4 or 5 moist) and chroma 4 through 6 moist or dry. The hue is 7.5YR, 10YR or 2.5Y. The texture is clay loam modified by 35 to 70 percent rock fragments.

ISHI PISHI FAMILY

The Ishi Pishi family consists of moderately deep and deep, well drained soils that formed in material weathered from ultramafic rocks. They are on benches, broken and dissected mountain side slopes. Slopes are 20 to 70 percent. The mean annual precipitation is 60 inches and the mean annual temperature is 50'F. The elevation ranges from 2,200 to 6000 feet.

Taxonomic Class: Clayey-skeletal, serpentinitic, mesic Ultic Haploxeralfs.

Typical Pedon: Reference pedon of Ishi Pishi family from an area of Ishi Pishi family - Ishi Pishi, family deep complex, 35 to 70 percent slopes in Trinity County, Ca., about 13 miles WSW of Dunsmuir, at a road cut on the Cinnabar Gulch road, about 1300 feet SSE of the center of Section 23, T. 38 N., R. 6 W., 3/4 mile SE of the bridge culvert crossing of Crow Creek:

01-> to 0 inches; duff of Jeffrey pine needles and huckleberry oak leaves.

A11–0 to 3 inches; reddish yellow (7.5 YR 6/6) gravelly loam, strong brown (7.5YR 4/6) moist; moderate medium granular structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine and medium roots; common very fine and fine interstitial pores; 15 percent pebbles, 5 percent cobbles; neutral (pH 7.0); abrupt smooth boundary.

A12–3 to 7 inches; reddish yellow (7.5YR 6/6) gravelly light clay loam, strong brown (7.5YR 4/6) moist; moderate medium granular and moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine, medium and coarse roots; common very fine and fine interstitial pores; 15 percent pebbles, 5 percent cobbles; neutral (pH 7.0); clear wavy boundary.

B1t-7 to 12 inches; strong brown (7.6YR 5/6) gravelly clay loam, strong brown (7.5YR 4/6) moist; moderate fine and very fine subangular blocky structure; slightly hard, very friable, sticky and plastic; few very fine, common fine and medium roots; common fine, many medium continuous interstitial pores; common thin clay films on ped faces; 25 percent pebbles, 5 percent cobbles; neutral (pH 7.0); clear wavy boundary.

B21t–12 to 21 inches; strong brown (7.5YR 5/6) very gravelly clay, dark brown (7.6YR 4/4) moist; moderate very fine and fine subangular blocky structure; slightly hard, very friable, sticky and plastic; few very fine, fine, medium and coarse roots; common fine and many medium continuous interstitial pores; common moderately thick clay films on ped faces and in pores; 30 percent pebbles, 10 percent cobbles; neutral (pH 7.0); clear smooth boundary.

B22t-21 to 29 inches; brown (7.5YR 5/4) very gravelly clay, dark brown (7.5YR 4/4) moist; strong fine and medium subangular blocky structure; slightly hard, very friable, sticky plastic; few very fine, fine and medium roots; common fine and many medium continuous interstitial pores; many moderately thick clay films on ped faces and in pores; 35 percent pebbles, 10 percent cobbles; neutral (pH 7.0); clear wavy boundary.

B23t–29 to 34 inches; dark yellowish brown (10YR 4/4) extremely cobbly clay, dark yellowish brown (10YR 4/4) moist; strong fine subangular blocky structure; slightly hard, very friable, sticky and plastic; few very fine roots, many fine discontinuous interstitial pores; continuous thick clay films on ped faces; 30 percent pebbles, 50 percent cobbles; neutral (pH 7.0); clear irregular boundary.

R–34 to 42 inches; fractured peridotite.

Range in Characteristics: There are two phases if Ishi Pishi Family recognized in this survey: Ishi Pishi and Ishi Pishi, deep.

Ishi Pishi

The depth to bedrock ranges from 20 to 40 inches. Rock fragments make up 35 to 75 percent of the profile. The reaction ranges from slightly acid to neutral.

The A horizon has color value of 3 to 6 (3 or 4 moist) and chroma of 2 through 8. The hue is mainly 5YR and 7.5YR with occasional 2.5YR and 10YR. It is loam or clay loam modified by 15 to 35 percent rock fragment.

The B horizon has color value of 4 through 6 (3 through 5 moist) and chroma of 4 through 8. The hue is 10YR, 7.5YR or 5YR. It is heavy clay loam or clay modified by 35 to 80 percent rock fragments.

The C horizon may not be present.

Ishi Pishi, deep

The depth to bedrock is 40 to 60 inches. Gravel, stones or boulders make up 35 to 60 percent of the profile. Reaction ranges from medium acid to neutral.

The A horizon has color value of 4 or 5 dry (3 or 4 moist) and chroma of 3, 4 or 5. The hue is 7.5YR, 5YR and 2.5YR. The texture is loam or light clay loam modified by 20 to 35 percent rock fragments.

The B horizon has color value of 5, 6 or 7 dry (4 through 6 moist), chroma of 4 through 6 and hue of 10YR, 7.5YR and 5YR. The texture is heavy clay loam, or clay modified by 35 to 55 percent rock fragments. Base saturation ranges from 35 to 75 percent. Iron oxide to clay ratio is greater than 0.2.

The C horizon may not be present.

JAYAR FAMILY

The Jayar family consists of moderately deep and deep, well drained soils that formed in material weathered from metamorphosed basic intrusive, sedimentary, metavolcanic and diorite rocks. They are on dissected mountain side slopes. Slopes are 5 to 80 percent. Mean annual precipitation ranges from 50 to 70 inches and the mean annual temperature is 45'F. Elevation ranges from 5300 to 7000 feet.

Taxonomic Class: Loamy-skeletal, mixed, frigid Dystric Xerochrepts.

Typical Pedon: Reference pedon of Jayar family is from an area of Jayar family, 40 to 60 percent slopes, about 2 miles west of Dunsmuir in Siskiyou County, California, on the NE side of Mt. Bradley, > mile NW of Mt. Bradley Lookout, 100 feet NE of center of section 22, T. 39 N.,
R. 4 W.:

01–1 inch to 0; mat of partially decomposed huckleberry oak leaves, white fir and red fir needles.

A1–0 to 5 inches; light gray (10YR 7/2) very gravelly sandy loam, grayish brown (10YR 5/2) moist; moderate medium granular structure; soft, very friable, nonsticky and nonplastic; many fine, very fine, medium and few coarse roots; many fine and medium interstitial pores; 30 percent pebbles, 10 percent cobbles, medium acid (pH 60); clear wavy boundary.

B1–5 to 13 inches; light brownish gray (10YR 6/2) very cobbly very fine sandy loam, brown (10YR 5/3) moist; weak medium granular structure; soft, very friable, nonsticky and nonplastic; common fine, medium, and few coarse roots; common very fine and fine tubular pores; 17 percent pebbles, 25 percent cobbles; strongly acid (pH 5.5); gradual wavy boundary.

B2–13 to 26 inches; light gray (2.5Y 7/2) very cobbly loam, light yellowish brown (2.5Y 6/4) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common fine and medium roots; few very fine tubular pores; 15 percent pebbles, 40 percent cobbles; strongly acid (pH 5.2); gradual wavy boundary.

R–26 to 30 inches; moderately fractured, unweathered basic intrusive rock.

Range in Characteristics: There are two phases of Jayar Family recognized in this survey: Jayar and Jayar, deep.

Jayar

The profile depth to bedrock ranges from 20 to 40 inches. Reaction ranges from medium acid to strongly acid.

The A horizon has color value of 5 through 7 (4 through 5 moist) and chroma of 2 through 4. The hue is 10YR or 2.5Y. The texture is loam or sandy loam modified by 35 to 60 percent rock fragments.

The B horizon has color value of 5 through 7 (4 through 6 moist) and chroma of 2 through 4. The hue is 10YR and 2.5Y. The texture is loam or sandy loam modified by 40 to 70 percent rock fragments.

The C horizon may not be present.

Jayar, deep

The depth to bedrock or compacted glacial till or occasionally bedrock is over 40 inches. Reaction ranges from medium acid to strongly acid.

The A horizon has color value of 5 through 7 (4 through 5 moist) and chroma of 2 through 4. The hue is 10YR or 2.5Y. The texture is loam or sandy loam modified by 35 to 60 percent rock fragments.

The B horizon has color value of 5 through 7 (4 through 6 moist) and chroma of 3 through 6. The hue is 10YR or 2.5Y. The texture is loam or sandy loam modified by 35 to 60 percent rock fragments.

The C horizon has hue of 10YR or 2.5Y and textures of loam, sandy loam or loamy sand modified by 35 to 80 percent rock fragments.

KANG FAMILY

The Kang family consists of moderately deep, well drained soils that formed in material weathered from ultramafic rocks. They are on linear to broken, dissected mountain side slopes. Slopes are 20 to 80 percent. The mean annual precipitation is 35 to 40 inches and the mean annual temperature is 49'F. The elevation ranges from 4000 to 5500 feet.

Taxonomic Class: Clayey-skeletal, serpentinitic, mesic Pachic Argixerolls.

Typical Pedon: Reference pedon of Kang family from an area of Shadeleaf-Kang families complex, 20 to 40 percent slopes in Siskiyou County, CA, about 8 miles west of Weed on road to Dewey Mine, about 700 feet south and 1500 feet east of the NW corner section 3, T. 41 N., R. 6 W., road cut on loop just below spring:

01–< inch to 0; sparse cover of decomposed pine needles and litter.

A11–0 to 2 inches; very dark gray (10YR 3/1) gravelly clay loam, very dark brown (10YR 2/2) moist; moderate fine and very fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine, few fine, medium and coarse roots; many fine interstitial pores; 10 percent pebbles, 5 percent cobbles; neutral (pH 7.0); clear wavy boundary.

A12–2 to 6 inches; very dark gray (10YR 3/1) gravelly clay loam, very dark brown (10YR 2/2) moist; strong medium and coarse subangular blocky structure; very hard, very firm, slightly sticky and plastic; common very fine, few fine medium and coarse roots; common fine interstitial pores; few moderately thick and thick clay films on ped faces and in pores; 20 percent pebbles, 5 percent cobbles; mildly alkaline (pH 7.5); clear wavy boundary.

B21t–6 to 11 inches; very dark gray (10YR 3/1) gravelly clay, very dark grayish brown (10YR 3/2) moist; strong coarse and medium subangular blocky structure; extremely hard, very firm, slightly sticky and very plastic; common very fine, few fine, medium and coarse roots; common fine tubular pores; many moderately thick and thick clay films on ped faces and in pores; 15 percent pebbles, 10 percent cobbles; mildly alkaline (pH 7.5); abrupt wavy boundary.

B22t–11 to 19 inches; olive brown (2.5Y 4/4) very gravelly clay, dark brown (10YR 3/3) moist; strong coarse subangular blocky structure; extremely hard, very firm, slightly sticky, and very plastic; few medium, fine and very fine roots; common fine and very fine tubular pores; many to continuous thick clay films on ped faces and in pores; 30 percent pebbles, 20 percent cobbles; mildly alkaline (pH 7.5); gradual wavy boundary.

C1–19 to 28 inches; olive brown (2.5Y 4/4) extremely cobbly clay, dark brown (10YR 3/3) moist; relic rock structure; extremely hard, very firm; few very fine, fine and coarse roots; few fine and very fine tubular pores; common thick clay films on ped faces; 40 percent pebbles, 30 percent cobbles; mildly alkaline (pH 7.5); abrupt irregular boundary.

R–28 to 30 inches; fractured, weathered, serpentinized peridotite.

Range in Characteristics: The depth to bedrock ranges from 20 to 40 inches. The reaction ranges from neutral to moderately alkaline.

The A horizon has color value of 3 through 5 (2 through 3 dry) and chroma of 1 through 3. The hue is 10YR or 2.5Y. It is loam or clay loam modified by 15 to 35 percent rock fragments.

The Bt horizon has color value of 3 through 5 (2 through 4 moist) and chroma of 1 through 4. The hue is 10YR or 2.5Y. It is clay loam or clay modified by 35 to 55 percent rock fragments.

The C horizon has color value of 4 through 5 (3 or 4 moist) and chroma of 3 through 4. The hue is 10YR or 2.5Y. It is clay loam or clay modified by 50 to 75 percent rock fragments.

KONOCTI FAMILY

The Konocti family consists of moderately deep and deep, well drained soils that formed in material weathered from ultramafic rock. They are on moderately steep to very steep dissected mountain side slopes. Slopes are 40 to 80 percent. the mean annual precipitation is 60 inches and the mean annual temperature is 44'F. The elevation ranges from 2300 to 4800 feet.

Taxonomic Class: Loamy-skeletal, mixed, mesic Typic Haploxeralfs.

Typical Pedon: Reference pedon of Konocti family from an area of Konocti-Olete families complex, 40 to 70 percent slopes about 7 miles WSW of Dunsmuir in Shasta County, California, about 1200 feet south and 600 feet east of the NW corner of sec. 12, T. 38 N., R. 5 W.:

01–1 inch to 0; duff of huckleberry oak leaves and pine needles.

A1–0 to 3 inches; brown (7.5YR 5/4) gravelly loam, dark reddish brown (5YR 3/4) moist; weak very fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine and few fine roots; common very fine interstitial pores; 20 percent pebbles, 10 percent cobbles; slightly acid (pH 6.5); clear smooth boundary.

B1t–3 to 12 inches; yellowish red (5YR 5/6) very gravelly loam, reddish brown (5YR 4/4) moist; weak fine granular structure; soft, very friable, nonsticky and slightly plastic; common very fine, few fine and medium roots; common fine tubular pores; few thin clay films bridging grains; 20 percent pebbles, 15 percent cobbles; slightly acid (pH 6.5); gradual smooth boundary.

B21t–12 to 18 inches; brown (7.5YR 5/4) very cobbly heavy loam, dark brown (7.5YR 4/4) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; few very fine, fine and medium roots; common very fine tubular pores; common thin clay films bridging grains; 18 percent pebbles, 20 percent cobbles; slightly acid (pH 6.5); clear smooth boundary.

B22t–18 to 22 inches; dark yellowish brown (10YR 4/4) very stony clay loam, dark brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common medium, few fine and very fine roots; few very fine tubular pores; common thin clay films bridging grains; 10 percent pebbles, 35 percent stones; neutral (pH 6.7); gradual wavy boundary.

R–22 to 30 inches; jointed and fractured ultrabasic rock.

Range in Characteristics: The depth to bedrock ranges from 20 to over 40 inches. Reaction ranges from medium acid to neutral.

The A horizon has color value of 5 and 6 (4 and 5 moist). Chroma is 4 through 6 moist or dry. The hue is 5YR or 7.5YR. The texture is loam modified by 15 to 35 percent rock fragments.

The Bt horizon has color value of 4 through 5 moist or dry and chroma of 4 through 6. The hue is 5YR, 7.5YR or 10YR. The texture is heavy loam or clay loam modified by 35 to 60 percent rock fragments.

The C horizon may not be present.

LEDMOUNT FAMILY

The Ledmount family consists of shallow, somewhat excessively drained soils that formed in material weathered from basalt flow rock and wind blown ash deposits. They are on recent lava flows and ridgetops. Slopes are 0 to 30 percent. The mean annual temperature is about 53°F and the mean annual precipitation is 30 to 70 inches. The elevation ranges from 1000 to 5500 feet.

Taxonomic Class: Medial, mesic Lithic Xerumbrepts.

Typical Pedon: Reference pedon of the Ledmount family from an area of Ledmount-Germany families complex, 0 to 10 percent slopes in Siskiyou County, California, about 20 miles NE of McCloud, at the intersection of the Harris Spring Road and the Toad Mountain Road, SW<, NE<, Sec. 6, T. 41 N., R2E., M.D.M.:

A11–0 to 2 inches; dark brown (10YR 4/3) fine sandy loam, dark reddish brown (5YR 3/2) moist; single grain; fluffy and hydrophobic; loose, very friable, nonsticky and nonplastic; common very fine and fine roots; many very fine and fine pores; less than 5 percent basalt and pumice pebbles; slightly acid (pH 6.5); clear smooth boundary; very smeary.

A12–2 to 5 inches; dark yellowish brown (10YR 4/4) cobbly fine sandy loam, dark reddish brown (5YR 3/2) moist; single grain; loose, nonsticky and nonplastic; common very fine, fine and medium roots; many very fine and fine pores; 5 percent pebbles, 10 percent cobbles; medium acid (pH 6.0); clear smooth boundary. Very smeary.

A3–5 to 9 inches; brown (10YR 4/3) cobbly sandy loam, dark reddish brown (5YR 3/2) moist; weak medium and coarse subangular blocky structure; soft, friable, nonsticky and nonplastic; common very fine and few fine and medium roots; many fine and medium pores; 10 percent pebbles, 20 percent cobbles; medium acid (pH 6.0); gradual wavy boundary; moderately smeary.

B2–9 to 13 inches; yellowish brown (10YR 5/4) cobbly sandy loam, dark brown (7.5YR 3/4) moist; weak medium and coarse subangular blocky structure; soft, friable, nonsticky and nonplastic; common very fine and few fine and medium roots; many very fine and medium pores; 10 percent pebbles, 25 percent cobbles; medium acid (pH 6.0); gradual wavy boundary; slightly smeary.

R–13 to 14 inches; lithic contact with fractured basalt.

Range in Characteristics: The depth to bedrock ranges from 12 to 20 inches. Reaction ranges from medium acid to slightly acid.

The A1 horizon has color value of 4 or 5 (2 or 3 moist) and chroma of 3 or 4 (2 or 3 moist). The hue is 10YR. It is loam or fine sandy loam modified by 10 to 35 percent rock fragments.

The B horizon or C horizon (if present) has color value of 5 or 6 (3 or 4 moist) and chroma of 3 or 4. The hue is 10YR. It is loam or sandy loam modified by 10 to 35 percent rock fragments.

The C horizon may not be present.

LITHIC CRYOCHREPTS

Lithic Cryochrepts consist of shallow, well drained soils that formed in material weathered from ultramafic rocks. They occur on ridges and glacial cirques. Slopes are 20 to 70 percent. The mean annual precipitation is 50 to 60 inches and the mean annual temperature is 40'F. The elevation ranges from 7000 to 9000 feet.

Typical Pedon: Reference soil of Lithic Cryochrepts from an area of Deadfall family-Lithic Cryochrepts complex, 40 to 60 percent slopes in Siskiyou County, California, about 8 miles southwest of Weed, 1 mile east of summit of Mt. Eddy, about 600 feet south and 660 feet west of the northeast corner of Section 18, T. 40 N., R. 5 W.:

A1–0 to 7 inches; very pale brown (10YR 7/3) very gravelly sandy clay loam, brown (10YR 4/3) moist; moderate fine and very fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine, few fine and coarse roots; many very fine interstitial pores; 40 percent pebbles; neutral (pH 7.0); clear smooth boundary.

B2–7 to 17 inches; pale brown (10YR 6/3) very gravelly sandy clay loam, olive brown (2.5Y 4/4) moist; weak fine and very fine subangular blocky structure; soft, very friable, sticky and slightly plastic; few very fine roots; common very fine interstitial pores; 50 percent pebbles; mildly alkaline (pH 7.5); clear smooth boundary.

R–17 to 20 inches; serpentinized, fractured, moderately weathered ultramafic rock.

Range in Characteristics: The depth to bedrock ranges from 15 to 20 inches. Rock fragments comprise 35 to 70 percent of the profile volume. The reaction ranges from slightly acid to mildly alkaline. Mineralogy is either serpentinitic or oxidic.

The A horizon has color value of 5 through 7 (3 or 4 moist) and chroma of 3 or 4. The hue is 10YR and 2.5Y. It is sandy loam, loam or sandy clay loam modified by 20 to 70 percent rock fragments.

The B2 horizon has color value of 5 or 6 (3 or 4 moist) and chroma of 3 or 4. The hue is 10YR or 2.5Y. It is loam, sandy clay loam or light clay modified by 35 to 70 percent rock fragments.

The C horizon may not be present.

LITHIC CRYUMBREPTS

Lithic Cryumbrepts consist of shallow, well drained soils that formed in material weathered from granitic rocks. They occur on slightly dissected upper slopes, ridges, and cirques. Slopes are 30 to 80 percent. The mean annual precipitation is 55 to 65 inches and the mean annual temperature is 40'F. The elevation ranges from 6500 to 9000 feet.

Reference Pedon: Reference soil of Lithic Cryumbrepts from an area of Lithic Cryumbrepts-Stecum family association, 30 to 50 percent slopes in Trinity County, California, about 13 miles southwest of Callahan about ! mile east of Long Gulch Lake in the SW< SW< Section 33, T. 39 N., R. 9 W.:

A1–0 to 7 inches; dark grayish brown (10YR 4/2) gravelly sandy loam, black (10YR 2/1) moist; weak very fine granular structure breaking to single grain; loose, nonsticky and nonplastic; common very fine roots; many very fine interstitial pores; 10 percent pebbles, 5 percent cobbles; strongly acid (pH 5.5); abrupt wavy boundary.

C–7 to 19 inches; dark brown (10YR 4/3) very cobbly loamy sand, very dark brown (10YR 2/2) moist; weak very fine granular structure breaking to single grain; loose, nonsticky and nonplastic; few fine and very fine roots; many very fine interstitial pores; 10 percent pebbles, 40 percent cobbles; strongly acid (pH 5.5); abrupt irregular boundary.

R–19 to 21 inches; moderately fractured granodiorite with soil veining into cracks.

Range in Characteristics: The depth to bedrock ranges from 14 to 20 inches. Rock fragments comprise 35 to 80 percent of the profile volume. The reaction ranges from medium to slightly acid.

The A horizon has color value of 3 through 5 (2 or 3 moist) and chroma of 1 through 3. The hue is 10YR. It is sandy loam or loamy sand modified by 15 to 50 percent rock fragments.

The C horizon has color value of 4 through 6 (2 or 3 moist) and chroma of 3 through 6 (2 through 4 moist). The hue is 2.5Y or 10YR. It is loamy sand or sand modified by 50 to 80 percent rock fragments.

LITHIC HAPLOXERALFS

Lithic Haploxeralfs consists of shallow, well drained soils that formed in material weathered from ultramafic rocks. They occur on dissected mountain side slopes and ridgetops. Slopes are 30 to 90 percent. The mean annual precipitation is 50 to 70 inches and the mean annual temperature is 52'F. The elevation ranges from 2500 to 5000 feet.

Reference Pedon: Reference pedon of Lithic Haploxeralfs from an area of Rock outcrop-Lithic Haploxeralfs-Beaughton family complex, 60 to 80 percent slopes in Trinity County, California, about 12 miles south-southwest of Hayfork, in the SE<, SE< Sec. 29 T. 39 N., R. 11 W., at end of forest road 29N42:

01–> inch to 0; loose sparse litter from Jeffrey pine and buckbrush.

A11–0 to 1 inch; pale brown (10YR 6/3) gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate coarse and very coarse platy structure; slightly hard, nonsticky and nonplastic; few very fine roots; common fine intersitital pores; 20 percent pebbles; slightly acid (pH 6.5); abrupt smooth boundary.

A12–1 to 4 inches; yellowish brown (10YR 5/4) very gravelly loam, dark brown (10YR 3/3) moist; moderate fine and medium subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; common very fine and few fine roots; common fine interstitial pores; 35 percent pebbles; neutral (pH 7.0); clear wavy boundary.

B1–4 to 9 inches; light yellowish brown (10YR 6/4) very gravelly loam, dark brown (10YR 3/3) moist; moderate fine and medium subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; few very fine roots; common fine tubular pores; 50 percent pebbles; mildly alkaline (pH 7.5); abrupt wavy boundary.

B2–9 to 17 inches; yellowish brown (10YR 5/4) very gravelly sandy clay loam, dark yellowish brown (10YR 3/4) moist; moderate coarse subangular blocky structure; firm, slightly sticky and slightly plastic; few thin clay films in pores; 40 percent pebbles; moderately alkaline (pH 8.0); abrupt wave boundary.

R–17 to 24 inches; moderately fractured serpentine.

Range in Characteristics: The depth to bedrock ranges from 10 to 20 inches. The reaction ranges from slightly acid to moderately alkaline.

The A horizon has color value of 5 or 6 (3 through 5 moist) and chroma of 2 through 4 (2 through 6 moist). The hue is 10YR or 7.5YR. The texture is loam or clay loam modified by 25 to 60 percent rock fragments.

The C horizon may not be present.

LITHIC XERUMBREPTS

Lithic Xerumbrepts consists of shallow, well drained soils that formed in material weathered from acid igneous rocks. They occur on ridgetops and dissected mountain side slopes. Slopes are 25 to 80 percent. Mean annual precipitation is 50 to 70 inches and the mean annual temperature is 42'F. The elevation ranges from 5000 to 6500 feet.

Reference Pedon: Reference pedon of Lithic Xerumbrepts from an area of Nanny family-Lithic Xerumbrepts association, 30 to 70 percent slopes in Shasta County, California, about 5 miles west-southwest of Dunsmuir, about 1> miles southeast of Castle Lake, about 1800 feet west and 1200 feet north of the southeast corner of Sec. 30, T. 39 N., R. 4 W.:

01–3 inches to 0; mat of pinemat manzanita leaves and roots.

A11–0 to 4 inches; very dark grayish brown (10YR 3/2) very cobbly fine sandy loam, very dark brown (10YR 2/1) moist; moderate very fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine roots; many fine interstitial pores; 15 percent pebbles, 25 percent cobbles; very strongly acid (pH 5.0); abrupt wavy boundary.

A12–4 to 12 inches; dark yellowish brown (10YR 3/4) cobbly loamy sand, very dark brown (10YR 3/2) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine, few fine and medium roots; many very fine interstitial pores; 15 percent pebbles, 15 percent cobbles; medium acid (pH 5.8); clear wavy boundary.

C1–12 to 19 inches; yellowish brown (10YR 5/4) very cobbly loamy sand, dark yellowish brown (10YR 3/4) moist; single grain; loose, nonsticky and nonplastic; common very fine and few fine roots; many very fine interstitial pores; 30 percent pebbles, 25 percent cobbles; medium acid pH (6.0); abrupt irregular boundary.

R–19 to 21 inches; moderately weathered and fractured quartz mononite with veining of roots in cracks.

Range in Characteristics: The depth to bedrock is less than 20 inches. The base saturation is less than 50 percent. It is medium to very strongly acid.

The A horizon has color value of 3 through 5 (2 or 3 moist) and chroma of 1 through 3. The hue is 10YR and 2.5Y. It is sandy loam or loamy sand modified by 30 to 60 percent rock fragments.

The C horizon has color value of 4 through 8 (3 or 4 moist) and chroma of 2 through 6. The hue is 10YR and 2.5Y. It is loamy sand with 35 to 60 percent rock fragments.

LOSTSPRING FAMILY

The Lostspring family consists of deep, well drained soils formed in outwash material weathered from andesite and pyroclastics; the overburden is formed from air-laid pumice deposits. They are on outwash terraces. Slopes are 0 to 25 percent. Mean annual precipitation is about 25 inches and the mean annual air temperature is about 44'F. The elevation ranges from 5000 to 6400 feet.

Taxonomic Class: Cindery over medial, frigid Dystric Xerorthents.

Typical Pedon: Reference pedon of Lostspring family from an area of Yallani, pumice overburden-Lost Spring families association, 0 to 25 percent slopes; in the NW<, NE< Sec. 27, T. 43 N., R. 2 E., M.D.M.; 0.2 mi. north of the intersection of Forest Roads Nos. 43N08 and 43N40.

A1–0 to 2 inches; brown (10YR 4/3) very cindery coarse sand, dark brown (10YR 3/3) moist; single grain; loose, nonsticky and nonplastic; many very fine and common fine roots; many very interstitial pores; 40 percent medium gravel size pumice cinders; slightly acid (pH 6.5); gradual wavy boundary.

AC–2 to 24 inches; very pale brown (10YR 8/3) extremely cindery coarse sand, light yellowish brown (10YR 6/4) moist; single grain; loose, nonsticky and nonplastic; common very fine and few very fine roots; many medium, fine and very fine interstitial pores; 90 percent medium gravel size pumice cinders; slightly acid (pH 6.5); clear smooth boundary.

IIAb–24 to 38 inches; yellowish brown (10YR 5/4) gravelly sandy loam, dark yellowish brown (10YR 3/6) moist; weak medium and coarse subangular blocky structure; soft, very friable; nonsticky and nonplastic; few very fine roots; many very fine and fine interstitial pores; 15 percent andesite pebbles; slightly acid (pH 6.5); gradual wavy boundary.

IIB2b–38 to 60 inches; yellowish brown (10YR 5/4) gravelly sandy loam, dark yellowish brown (10YR 3/6) moist; weak medium and coarse subangular blocky structure; soft, very friable, nonsticky and nonplastic; few very fine roots; many very fine and fine interstitial pores; 20 percent andesite pebbles; slightly acid (pH 6.5).

Range in Characteristics: Thickness of the profile ranges from 60 inches to an indefinite depth. Coarse fragments in the overburden range from 30 to 90% of the profile. Reaction ranges from medium acid through neutral. Rock fragments in the buried soil range from 10 to 25 percent of the solum. Reaction ranges from medium acid to neutral.

The A horizon has color value of 6 or 7 (4 through 6 moist) and chroma of 2 or 3 (2 through 4 moist). The hue is 10YR. It is sand or loamy coarse sand modified by 40 to 90 percent pumice cinders.

The IIB horizon has color value of 4 or 5 (3 through 5 moist) and chroma of 3 or 4 (4 through 6 moist). The hue is 10YR. It is sandy loam modified by 5 to 25 percent rock fragments.

The C horizon may not be present.

MARPA FAMILY

The Marpa family consists of moderately deep and deep, well drained formed in material weathered from metavolcanic and metasedimentary and sedimentary rock. They are on dissected linear to broken mountain side slopes. Slopes are 0 to 80 percent. Mean annual precipitation is 35 to 70 inches and the mean annual temperature is 54'F. Elevation ranges from 1,000 to 5,500 feet.

Taxonomic Class: Loamy-skeletal, mixed, mesic Ultic Haploxeralfs.

Typical Pedon: Reference pedon of Marpa family about 5 miles southwest of Round Mountain, 3/4 mile north of the Mineral School near the north < corner of section 31, T. 34 N., R. 1 W., Shasta County, CA,:

01–1 inch to 0; litter and humus from black oak and Douglas-fir.

A1–0 to 6 inches; brown (7.5YR 5/2) heavy loam, dark reddish brown (5YR 3/3) moist; moderate medium granular structure; soft, very friable, nonsticky and nonplastic; many fine, common medium and few coarse roots; many very fine interstitial, few fine and medium tubular pores; 5 percent pebbles; slightly acid (pH 6.1); gradual wavy boundary.

A3–6 to 13 inches; brown (7.5YR 5/4) gravelly light clay loam, dark reddish brown (5YR 3/4) moist; weak medium granular structure, soft, friable, slightly sticky and slightly plastic; many fine, common medium and few coarse roots; common very fine interstitial, few fine and medium tubular pores;
common thin discontinuous clay films in pores; 20 percent pebbles; slightly acid (pH 6.1); gradual wavy boundary.

B2t–13 to 26 inches; light brown (7.5YR 6/4) very gravelly clay loam, brown (7.5YR 4/4) moist; massive; friable, hard, slightly sticky and slightly plastic; few fine and medium roots; common very fine interstitial, few fine and medium tubular pores; common thick discontinuous clay films in pores; 40 percent pebbles; strongly acid (pH 5.4); gradual smooth boundary.

R–26 to 32 inches; fractured shale. Fractolithic contact.

Range in Characteristics: There are two phases of Marpa Family recognized in this survey: Marpa and Marpa, deep.

Marpa

The depth to a lithic contact ranges from 20 to 40 inches. Reaction ranges from medium acid to neutral.

The A horizon has color value of 5 through 7 (3 or 4 moist) and chroma of 2 through 4. The hue is 7.5YR and 5YR. The texture is heavy sandy loam, loam, light clay loam modified by 5 to 35 percent rock fragments.

The B horizon has color value of 5 or 6 dry (3 or 4 moist) and chroma 3 or 4. The hue is 7.5YR and 5YR. The texture is clay loam modified by 35 to 60 percent rock fragments.

The C horizon may not be present.

Marpa, deep

The depth to weathered bedrock is 60 inches or more. Rock fragments make up 35 to 60 percent of the profile. Reaction ranges from strongly to slightly acid.

The A horizon has color value of 5 through 7 (2 through 4 moist) and chroma of 4 through 6. The hue is 10YR and 7.5YR. The texture is loam modified by 25 to 50 percent rock fragments.

The B horizon has color value of 5 through 7 (3 through 6 moist) and chroma 5 through 8. The texture is heavy loam to light clay loam modified by 35 to 60 percent rock fragments. The hue is 10YR and 7.5YR.

The C horizon may not be present.

McCUMBER FAMILY

The McCumber family consists of moderately deep and deep, well drained soils which have formed in glacial drift which has been overlain by volcanic ash. They are located in areas of glacial outwash and moraines. Slopes are 0 to 75 percent. Mean annual precipitation ranges from 30 to 45 inches and the mean annual temperature is 42'F. The elevation ranges from 4500 to 6500 feet.

Taxonomic Class: Ashy-skeletal, frigid Umbric Vitrandepts.

Typical Pedon: Reference pedon of McCumber family from an area of McCumber family, 0 to 35 percent slopes, two linear miles southwest of the top of Ash Creek Butte, 12 miles north of McCloud, 2640 feet south of the northeast corner of Section 4, T. 41 N., R. 2 W.:

01 and 02 – 1 inch to 0; fir needles, duff, and pumice gravels.

A11 – 0 to 4 inches; dark grayish brown (10YR 4/2) coarse sandy loam, very dark brown (10 YR 2/2) moist; weak very fine subangular blocky structure; loose, very friable, nonsticky and nonplastic; many very fine roots; many fine interstitial pores; 5 percent pebbles; medium acid (pH 6.0); abrupt smooth boundary; smeary.

A12 – 4 to 11 inches; grayish brown (10YR 5/2) light coarse sandy loam, dark brown (10 YR 3/3) moist; weak very fine subangular blocky structure; loose, very friable, nonsticky and nonplastic; many very fine, common medium and coarse roots; many very fine tubular and interstitial pores; 5 percent pebbles; slightly acid (pH 6.5); gradual wavy boundary; smeary.

B2 – 11 to 17 inches; brown (10 YR 5/3) cobbly coarse sandy loam, dark yellowish brown (10 YR 3/4) moist; weak fine subangular blocky and weak fine granular structure; soft, very friable, nonsticky, and nonplastic; many very fine and fine, common medium, few coarse roots; common very fine interstitial and tubular pores; 10 percent pebbles, 15 percent cobbles; slightly acid (pH 6.5); abrupt wavy boundary; slightly smeary.

C1 – 17 to 31 inches; brown (10 YR 5/3) very cobbly loamy sand, dark yellowish brown (10 YR 3/4) moist; 25 percent stones and cobbles; rocklike breaking to weak fine granular structure; soft, friable, nonsticky, and nonplastic; many medium, common fine roots; common fine tubular and very fine interstitial pores; 30 percent pebbles, 5 percent cobbles, 10 percent stones; slightly acid (pH 6.5); abrupt wavy boundary.

C2 – 31 to 43 inches; pale brown (10 YR 6/3) very gravelly loamy sand, dark brown (10 YR 3/3) moist; rocklike breaking to weak medium subangular blocky structure; soft, friable, nonsticky and nonplastic; few fine roots; few very fine pores; 35 percent pebbles, 10 percent stones; slightly acid (pH 6.5).

C3r – 43 to 45 inches; compacted glacial debris.

Range in Characteristics: The depth to fractolithic contact lies between 45 and 60 inches; coarse fragments compose 5 to 80 percent of the profile. Reaction ranges from medium acid to neutral.

The A1 horizon has color values of 2 to 5 (2 to 3 moist) and chromas of 1 to 3. The hue is 10YR. It is dominantly loamy fine sand to coarse sandy loam modified by 5 to 35 percent rock fragments.

The B2 horizon has dry color of 10YR 5/2, 5/3, 5/4, or 6/3 and moist color of 10YR 3/4, 3/3 or 4/4. It is coarse sandy loam or loamy coarse sand modified by 15 to 35 percent rock fragments. It is slightly acid or neutral.

The IIC horizon has color value of 3 to 6 (3 to 5 moist) and chroma of 3 or 4. The hue is 10YR. It is loamy sand or loamy fine sand modified by 35 to 80 percent rock fragments. It is slightly acid to neutral.

MERKEL FAMILY

The Merkel family consists of moderately deep and deep, well drained soils that formed in material weathered from peridotite or mafic metamorphic rocks. They are on dissected mountain side slopes, glacial ground and lateral moraines. Slopes are 0 to 80 percent. The mean annual temperature is 44'F. The mean annual precipitation is 45 to 60 inches. The elevation ranges from 4800 to 6300 feet.

Taxonomic Class: Loamy-skeletal, mixed, frigid Typic Xerochrepts.

Typical Pedon: Reference pedon of Merkel family from an area of Merkel-Toadlake-Parks families complex, 5 to 40 percent slopes in Siskiyou County, California, about 14 miles west northwest of Dunsmuir, 1 mile east of Toad Lake, 2800 feet south and 500 feet east of the northwest corner Section 30, T. 40 N., R. 5 W.:

01–4 inches to 0; duff consisting of huckleberry oak leaves and conifer needles.

A1–0 to 9 inches; reddish brown (5YR 4/4) very stony sandy loam, dark reddish brown (5YR 3/4) moist; moderate very fine granular structure; soft, very friable, slightly sticky and nonplastic; many very fine, common fine, few medium and coarse roots; many fine and very fine interstitial pores; 10 percent pebbles, 50 percent stones; slightly acid (pH 6.5); abrupt wavy boundary.

B2–9 to 16 inches; strong brown (7.5YR 5/6) stony loam, strong brown (7.5YR 5/6) with dark brown (7.5YR 3/4) variegations moist; weak to moderate medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine, few medium and coarse roots; common very fine and fine tubular pores; 15 percent pebbles, 15 percent stones; neutral (pH 7.0); abrupt wavy boundary.

B3–16 to 29 inches; brownish yellow (10YR 6/6) very stony sandy loam, dark yellowish brown (10YR 4/4) moist; massive breaking to moderate medium subangular blocky structure; soft, friable, slightly sticky and slightly plastic; few very fine, fine, medium and coarse roots; few fine and medium tubular pores; 15 percent pebbles, 25 percent stones; neutral (pH 7.0); abrupt irregular boundary.

R–29 to 49 inches; compact glacial till with various degrees of weathering consisting of cobbles and stones in a finer matrix of gravel and sand.

Range in Characteristics: The depth to consolidated glacial till or bedrock ranges from 20 to over 40 inches. The reaction ranges from medium acid to neutral.

The A horizon has dry color of 10YR 3/4, 7.5YR 4/4, 4/6, or 5YR 4/4 and moist color of 7.5YR 3/4, 5YR 3/4 or 4/2. The texture is sandy loam or loam modified by 15 to 50 percent pebbles, cobbles, and stones.

The B horizon has dry color of 7.5YR 4/6, 5/6, 10YR 4/6, 6/6, or 5/6 and moist color of 7.5YR 4/4, 10YR 4/4, 3/4, 4/3, or 2.5Y 4/4. The texture is loam or light clay loam modified by 35 to 60 percent pebbles, cobbles, and stones. A C horizon is present in some pedons.

The C horizon may not be present.

MILLSHOLM FAMILY

The Millsholm family consists of shallow, well drained soils that formed in material weathered from sedimentary rocks such as sandstone, shale and siltstone. They are on dissected mountain side slopes with gradients of 20 to 60 percent. The mean annual precipitation is 45 inches and the mean annual temperature is 50'F. Elevations range from 1000 to 2000 feet.

Taxonomic Class: Loamy, mixed, thermic Lithic Xerochrepts.

Typical Pedon: Reference pedon of Millsholm family from an area of Millsholm family, 20 to 60 percent slopes about 14 miles northeast of Redding, CA on Backbone Ridge about 1700 feet west and 1100 south of the NW corner of section 15, R.3N, T 33N. Hand dug pit about 60 feet below and east of the road:

01–1 inch to 0; dead grass and oak leaves.

A1–0 to 3 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 3/3) moist; weak coarse subangular blocky structure breaking to moderate fine granular; soft, very friable, slightly sticky and slightly plastic; many very fine, fine interstitial and common very fine tubular pores; few thin clay films on ped faces and in pores; 20 percent pebbles; slightly acid (pH 6.5) clear smooth boundary.

B2–3 to 10 inches; pinkish gray (7.5YR 6/2) gravelly loam, brown (7.5YR 4/2) moist; moderate coarse subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine roots; many very fine, fine interstitial and common very fine tubular pores; few thin clay films on ped faces and in pores; 15 percent pebbles, 5 percent cobbles; slightly acid (pH 6.5); clear smooth boundary.

B3–10 to 12 inches; light gray (10YR 7/2) gravelly loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common medium and coarse roots; many fine interstitial and common fine tubular pores; few thin clay films on ped faces and in pores; 15 percent pebbles, 10 percent cobbles; slightly acid (pH 6.5); clear wavy boundary.

R–12 to 16 inches; highly fractured, slightly weathered siltstone.

Range in Characteristics:

The depth to bedrock ranges from 10 to 20 inches. Reaction ranges from medium acid to neutral.

The A horizon has color value of 5 through 7 (3 through 5 moist) and chroma of 2 through 4. The hue is 10YR and 7.5YR. It is loam or light clay loam modified by up to 35 percent rock fragments.

The B horizon has color value of 5 through 7 (4 through 6 moist). The hue is 10YR and 7.5YR. It is heavy loam or light clay loam modified by up to 35 percent rock fragments.

The C horizon may not be present.

MORICAL

The Morical family, consists of deep, seasonally flooded, slowly permeable soils that are somewhat poorly drained soils. They formed in material weathered from outwash material from volcanic rock and pyroclastics. They are on outwash terraces. Slopes are 0 to 10 percent. Mean annual precipitation is about 30 inches and mean annual temperature is 50'F. The elevation ranges from 3500 to 4500 feet.

Taxonomic Class: Fine-loamy, mixed, mesic Mollic Haploxeralfs.

Typical Pedon: Reference pedon of Morical family, from an area of Morical family, 0 to 10 percent slopes, about 26 miles east of McCloud in Siskiyou County, California, about 1 mile east of Sand Flat Well on forest Road No. 40N38 at the intersection with Road No. 40N03.1, in the SE<, NE<, SW< of Section 21, T 40 N., R 3 E, M.D.M.

01–> to 0 inches; sparse scattered grass duff, over 30% surface area.

A1–0 to 6 inches; dark brown (10YR 4/3) sandy clay loam, dark brown (10YR 3/3) moist; single grain to weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; many very fine and fine vesicular pores; 10 percent fine pebbles; medium acid (pH 6.0); clear wavy boundary; slightly smeary.

B21t–6 to 14 inches; dark yellowish brown (10YR 4/4) sandy clay loam, dark yellowish brown (10YR 3/4) moist; strong medium and coarse subangular blocky structure; hard, friable, sticky and slightly plastic; many moderately thick clay films on ped faces and pores; few very fine and fine roots; common very fine and fine vesicular and tubular pores; slightly acid (pH 6.5); gradual wavy boundary.

B22t–14 to 27 inches; strong brown (7.5YR 4/6) with common fine to medium distinct mottles of yellowish brown (10YR 5/6) sandy clay loam, dark brown (7.5YR 3/4) with common fine to medium faint mottles of reddish yellow (7.5YR 6/8) moist; strong medium and coarse subangular blocky structure; hard, friable, sticky and plastic; continuous thick clay films on ped faces and pores and bridging sand grains; few very fine roots; few very fine pores; neutral (pH 7.0); clear wavy boundary.

C1–27 to 44 inches; strong brown (7.5YR 4/6) sandy clay loam, brown (7.5YR 4/4) with many medium distinct mottles of dark brown (7.5YR 4/6) and strong brown (7.5YR 3/4) moist; moderate medium and coarse subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; no roots; common very fine and fine vesicular pores; 5 percent pebbles; neutral (pH 7.0).

Range in Characteristics: Thickness of the profile ranges from 40 inches to over 60 inches. Rock fragments make up 0 to 15 percent of the solum. Reaction ranges from medium acid to neutral.

The A1 horizon has color value of 4 or 5 (3 or 4 moist) and chroma of 3 or 4. The hue is 10YR or 7.5YR. It is loam or sandy loam modified by 0 to 15 percent rock fragments.

The B22tg horizon has color value of 4 or 5 (3 or 4 moist) with variegations and/or mottles. The chroma is 6 through 8. The hue is 7.5YR or 10YR. The texture is loam or clay loam modified by up to 15 percent rock fragments.

The C horizon has similar colors but is loam or sandy clay loam modified 0 to 15 percent rock fragments.

NANNY FAMILY

The Nanny family consists of moderately deep and deep, well drained soils that formed in material weathered from mafic and acidic metamorphic and intrusive rocks. They are on slightly dissected mountain side slopes and moraines. Slopes are 5 to 100 percent. The mean annual precipitation is 65 inches and the mean annual temperature is 43°F. Elevation ranges from 4500 to 6300 feet.

Taxonomic Class: Loamy-skeletal, mixed, frigid Typic Xerumbrepts.

Typical Pedon: Reference pedon of Nanny family from an area of Rock outcrop-Nanny family association, 60 to 100 percent slopes in Siskiyou County, California, about 6 miles west of Dunsmuir, about 1> miles south of Castle Lake, about 1100 feet north of the southeast corner of Section 25, T. 39 N., R. 5 W.:

01–2 inches to 0; decomposed duff mixed with talus gravel.

A1–0 to 13 inches; black (10YR 2/1) very cobbly fine sandy loam, black (7.5YR 2/0) moist; moderate very fine granular structure breaking to single grain; soft, very friable, nonsticky and nonplastic; many very fine, common fine, medium and coarse roots; many very fine interstitial pores; 35 percent pebbles, 20 percent cobbles; medium acid (pH 6.0); abrupt wavy boundary.

B2–13 to 29 inches; yellowish brown (10YR 5/4) extremely gravelly sandy loam, dark brown (7.5YR 3/4) moist; weak fine subangular blocky structure breaking to single grain; loose, nonsticky and nonplastic; common very fine, fine, few medium and coarse roots; common very fine and fine interstitial pores; 60 percent pebbles, 10 percent cobbles; slightly acid (pH 6.5); clear wavy boundary.

C1–29 to 48 inches; pale brown (10YR 6/3) extremely cobbly loamy sand, dark brown (10YR 3/3) moist; single grain; loose, nonsticky and nonplastic; few very fine, fine and medium roots; many fine interstitial pores; 30 percent pebbles, 50 percent cobbles; slightly acid (pH 6.5).

C2–48 to 60 inches +; continuous gravel and cobbles with sand in voids.

Range in Characteristics: The depth to bedrock ranges from 30 to over 40 inches. The reaction ranges from strongly acid to slightly acid.

The A horizon has dry color of 10YR 2/1, 3/2 or 3/3 and moist color of 7.5YR 2/0, 10YR 2/2 or 2/1. It is fine sandy loam, sandy loam, heavy sandy loam or loamy sand modified by 40 to 60 percent rock fragments.

The B horizon has dry color of 10YR 5/4 or 6/2 and moist color of 10YR 3/4, 3/2 or 7.5YR 3/4. It is sandy loam or heavy sandy loam modified by 40 to 70 percent rock fragments. The B horizon is absent in some profiles.

The C horizon has dry color of 10YR 6/3, 6/6 or 7/3 and moist color of 10YR 3/3, 3/1, 3/2 or 3/4. It is sandy loam or loamy sand modified by 60 to 90 percent rock fragments.

NEER FAMILY

Neer family consists of moderately deep, well drained soils that have formed in material weathered from volcanic ash deposited over lava flows. They are on mountain side slopes and lava flows. Slopes are 0 to 80 percent. Mean annual precipitation is 30 to 50 inches. Mean annual temperature is 50°F. Elevation ranges from 2,500 to 5,000 feet.

Taxonomic Class: Medial skeletal mesic Andic Xerochrepts.

Typical Pedon: Reference pedon of Neer family from an area of Germany, deep-Neer families association, 0 to 20 percent slopes about 1 mile southeast of the city of Mt. Shasta and about 50 feet from a dirt road; 500 feet north and 1,200 feet west of the southeast corner of Sec. 22, T. 40 N., R. 4 W.:

01 & 02–2 inches to 0; new and partially decomposed needles, leaves, twigs, bark and other organic debris.

A11–0 to 2 inches; dark brown (10YR 4/3) gravelly sandy loam, black (N 2/0) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine, fine and medium roots; many fine interstitial pores; 30 percent fine (2 to 5mm) shot-like pebbles; weakly smeary; medium acid (pH 6.0); abrupt smooth boundary.

A12–2 to 5 inches; dark brown (10YR 4/3) gravelly sandy loam, very dark brown (10YR 2/2) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine, fine and medium roots; many fine interstitial pores; 30 percent fine (2 to 5 mm) shot-like pebbles; weakly smeary; medium acid (pH 6.0); abrupt smooth boundary.

A3–5 to 9 inches; yellowish brown (10YR 5/4) gravelly sandy loam, dark yellowish brown (10YR 3/4) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and fine, and many medium roots; few fine tubular and many fine random interstitial pores; common thin silt coatings bridging sand grains; 30 percent fine (2 to 5mm) shot-like pebbles; weakly smeary; medium acid (pH 6.0); clear smooth boundary.

B31–9 to 16 inches; light yellowish brown (10YR 6/4) very gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many medium and coarse, and common very fine and fine roots; few fine tubular pores; many thin silt coatings bridging sand grains; 35 percent fine (2 to 5mm) shot-like pebbles; weakly smeary; medium acid (pH 6.0); clear smooth boundary.

B22–16 to 26 inches; light yellowish brown (10YR 6/4) very gravelly sandy loam, dark yellowish brown (10YR 4/6) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; few very fine and fine, and many medium and coarse roots; few fine tubular pores; many thin silt coatings bridging sand grains; 40 percent fine, (2 to 5mm) shot-like pebbles; weakly smeary; medium acid (pH 6.0); abrupt smooth boundary.

IICr–26 to 35 inches; extrusive igneous rock; very fine, fine and medium roots matted on surface.

Range in Characteristics: The depth to paralithic contact is 20 to 40 inches. Rock fragments, consisting of pebbles, cobbles, and stones, make up 30 to 70 percent of the profile. Reaction ranges from slightly to medium acid.

The A horizon has color values of 4 through 6 (2 to 3 moist) and chroma of 4 or 5. The texture is sandy loam modified by 15 to 35 rock fragments. The hue is 10YR, 7.5YR, or 5YR.

The B horizon has color value of 4 through 6 (3 through 5 moist) and chroma of 4 through 6. The hue is 10YR, 7.5YR, or 5YR. The texture is sandy loam modified by 35 to 70 percent rock fragments.

The C horizon may not be present.

NEUNS FAMILY

The Neuns family* consists of moderately deep and deep, well drained soils that formed in material weathered from schist, metavolcanic and metasedimentary rocks. They are on dissected linear mountain side slopes. Slopes are 20 to 80 percent. The mean annual precipitation is 35 to 80 inches and the mean annual temperature is 52°F. The elevation ranges from 1,500 to 6,000 feet.

Taxonomic Class: Loamy-skeletal, mixed, mesic Dystric Xerochrepts.

Typical Pedon: Reference pedon of Neuns family from an area of Holland-Neuns families complex, 40 to 60 percent slopes, 630 feet south and 1056 feet east of the NW corner of section 26, T. 38 N., R. 4 W.:

01–2 inches to 0; conifer needles and oak leaves.

A1–0 to 2 inches; brown (10YR 5/3) very gravelly sandy loam, dark brown (10YR 3/3) moist; moderate medium granular structure; loose, nonsticky and nonplastic; common fine and very fine roots; many fine interstitial pores; 35 percent pebbles; slightly acid (pH 6.5); abrupt wavy boundary.

A3–2 to 11 inches; light brown (7.5YR 6/4) very gravelly sandy loam, dark brown (7.5 4/4) moist; weak medium granular structure; loose, nonsticky and nonplastic; common fine, medium and coarse roots; many very fine interstitial pores; 40 percent pebbles, 5 percent cobbles; slightly acid (pH 6.5); gradual smooth boundary.

B2–11 to 23 inches; light brown (7.5YR 6/4) very gravelly sandy loam, brown (7.5YR 5/4) moist; moderate fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common fine and very fine roots; many fine interstitial and medium tubular pores; few thin clay films bridging sand grains; 45 percent pebbles, 10 percent cobbles; slightly acid (pH 6.5); abrupt smooth boundary.

R–23 to 34 inches; highly fractured metavolcanic rock, slightly weathered, somewhat displaced; 20% air voids, 2" to 10" diameter rock fragments, metaandesite.

Range in Characteristics: There are three phase of the Neuns family recognized in this survey: Neuns (moderately deep); Neuns, deep, and Neuns, schist substratum.

Neuns

The depth of the profile to a fractured lithic contact ranges from 20 to 40 inches. Reaction ranges from neutral to medium acid. Base saturation ranges from 25 to 60 percent.

The A horizon has color value of 5 and 6 (3 and 4 moist) and chroma of 3 and 4. The hue is 2.5Y, 10YR and 7.5YR. It is very gravelly loam on very gravelly sandy loam. Rock fragments may range from 35 to 50%.

The B horizon has color value of 5 through 7 (4 through 6 moist) and chroma of 3 and 4. The hue is 2.5Y, 10YR and 7.5YR. It is heavy sandy loam on loam. Rock fragments make up 35 to 65 percent of the B horizon.

The C horizon may not be present.

Neuns, deep

The depth to weathered bedrock is 60 inches or more. Rock fragments make up 35 to 60 percent of the profile. Reaction ranges from strongly to slightly acid.

The A horizon has color value of 5 through 7 (2 through 4 moist) and chroma of 4 through 6. The hue is 10YR and 7.5YR. The texture is loam modified by 25 to 50 percent rock fragments.

The B horizon has color value of 5 through 7 (3 through 6 moist) and chroma of 5 through 8. The texture is heavy loam to light clay loam modified by 35 to 60 percent rock fragment. The hue is 10YR and 7.5YR.

The C horizon may not be present.

Neuns, schist substratum

The depth of the profile to a fractured lithic contact ranges from 20 to 40 inches.

The A horizon has color value of 3 through 7 (2 through 4 moist) and chroma of 1 through 3. The hue is 2.5Y and 10YR. The texture is gravelly loam or very gravelly loam with rock fragments of 35 to 50 percent. Reaction is slightly acid to strongly acid.

The B horizon has color of 5 through 7 (4 through 6 moist) and chroma of 2 through 6. The hue is 2.5Y, 10YR and 7.5YR. The texture is heavy loam, light sandy loam or light clay loam modified by 35 to 60 percent pebbles and cobbles. The reaction is medium to strongly acid.

The C horizon may not be present.

OLETE FAMILY

The Olete family consists of moderately deep and deep, well drained soils that formed in material weathered from ultra-mafic rocks. They are on moderately steep to very steep dissected mountain side slopes. Slopes are 20 to 90 percent. The mean annual precipitation is 60 inches and the mean annual temperature is 52°F. The elevation ranges from 2200 to 4900 feet.

Taxonomic Class: Loamy-skeletal, mixed, mesic Typic Xerochrepts.

Typical Pedon: Reference pedon of Olete family from an area of Konocti-Olete families complex, 40 to 70 percent slopes in Shasta County, California, 8 miles WSW of Dunsmuir, about 1200 feet south of the NE corner sec. 10, T. 38 N., R. 5 W.:

01–1 inch to 0; duff composed of huckleberry oak leaves.

A1–0 to 6 inches; pale brown (10YR 6/3) gravelly loam, brown (7.5YR 4/4) moist; weak very fine subangular blocky breaking to weak very fine granular structure; soft, very friable, nonsticky and nonplastic; few fine, common very fine, medium and coarse roots; common fine discontinuous interstitial pores; 30 percent pebbles; slightly acid (pH 6.5); gradual smooth boundary.

B21–6 to 16 inches; light yellowish brown (10YR 6/4) very gravelly heavy loam, dark yellowish brown (10YR 4/4) moist; weak very fine and fine subangular blocky structure; soft, very friable, slightly sticky and nonplastic; common very fine, fine and medium roots; many fine tubular pores; 35 percent pebbles; slightly acid (pH 6.5); gradual smooth boundary.

B22–16 to 25 inches; very pale brown (10YR 7/4) very gravelly heavy loam, yellowish brown (10YR 5/6) moist; weak fine and medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; few very fine and fine roots; few fine tubular pores; 30 percent pebbles, 15 percent cobbles; neutral (pH 6.7); gradual wavy boundary.

B23–25 to 35 inches; brownish yellow (10YR 6/6) very cobbly heavy loam, yellowish brown (25Y 6/3) moist; weak fine, medium and coarse subangular blocky structure; soft; very friable, slightly sticky, non plastic; common medium roots; few fine tubular pores; 25 percent pebbles, 30 percent cobbles; neutral (pH 7.0); abrupt wavy boundary.

R–35 to 38 inches; fractured ultrabasic rock.

Range in Characteristics: The depth to bedrock ranges from 20 to over 40 inches. Reaction ranges from medium acid to neutral.

The A horizon has color value of 5 through 7 (3 or 4 moist) and chroma of 3 or 4 moist or dry. The hue is 2.5Y, 10YR or 7.5YR. The texture is loam or sandy loam modified by 30 to 50 percent rock fragments.

The B horizon has color value of 5 through 7 (4 or 5 moist) and value of 4 through 6 moist or dry. The hue is 7.5YR, 10YR or 2.5Y. The texture is sandy loam or loam and modified by 35 to 60 percent rock fragments.

The C horizon may not be present.

OVALL FAMILY

The Ovall family consists of deep, well drained soils of that formed in material weathered from pyroclastics granitic and volcanic rocks. They occur on depressions between lava flows and on dissected mountain side slopes. Slopes are 0 to 60 percent. The mean annual precipitation is 30 to 50 inches and the mean annual temperature is 50°F. Elevation ranges from 3500 to 5500 feet.

Taxonomic Class: Coarse-loamy mixed mesic Typic Xerumbrepts.

Typical Pedon: Reference pedon of Ovall family from an area of Ovall family, 40 to 60 percent slopes in Trinity County about 24 miles NNE of Weaverville, about 550 feet north and 1400 feet west of the SE corner of section 8, T. 27 N., R. 8 W.:

01–> inch to 0; duff, consisting of fir needles.

A11–0 to 3 inches; brown (10YR 5/3) very gravelly sandy loam, black (10YR 2/1) moist; weak medium subangular blocky structure; soft, friable, nonsticky and nonplastic; many fine roots; common medium

and fine interstitial pores; 40 percent pebbles; slightly acid (pH 6.5); clear smooth boundary.

A12–3 to 7 inches; brown (10YR 5/3) gravelly sandy loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; soft, friable, nonsticky and nonplastic; many fine and few medium roots; common medium and coarse interstitial pores; 30 percent pebbles; slightly acid (pH 6.5); clear smooth boundary.

B1–7 to 13 inches; brown (10YR 5/3) gravelly sandy loam, dark brown (10YR 3/3) moist; moderate medium and coarse subangular blocky structure; soft, friable, nonsticky and nonplastic; common fine and medium roots; common medium and coarse interstitial pores; 30 percent pebbles; slightly acid (pH 6.5); gradual wavy boundary.

B21–13 to 18 inches; brown (10YR 5/3) gravelly fine sandy loam, dark brown (10YR 3/3) moist; moderate medium and coarse subangular blocky structure; soft, friable, nonsticky and nonplastic; common medium and few fine roots; common medium and coarse interstitial pores; 25 percent pebbles; slightly acid (pH 6.5); gradual wavy boundary.

B22–18 to 40 inches; light yellowish brown (10YR 6/4) gravelly fine sandy loam, dark brown (10YR 4/3) moist; moderate medium and coarse subangular blocky structure; soft, friable, nonsticky and nonplastic; common medium and few fine roots; common medium interstitial pores; 25 percent pebbles; medium acid (pH 6.0); gradual wavy boundary.

C1–40 to 60 inches; very pale brown (10YR 7/4) gravelly sandy loam, yellowish brown (10YR 5/4) moist; moderate medium and coarse subangular blocky structure; soft, friable, nonsticky and nonplastic; common medium interstitial pores; 30 percent pebbles; strongly acid (pH 5.5).

Cr–60 to 62 inches; granitic rock, paralithic contact.

Range in Characteristics: There are two phases of Ovall family recognized in this survey: Ovall and Ovall, ponded.

Ovall - The depth to granitic bedrock ranges from 20 to over 40 inches. The reaction ranges from slightly to strongly acid.

The A horizon has color value of 4 or 5 (2 or 3 moist) and chroma of 2 or 3 (1 through 3 moist). The hue is 10YR or 2.5Y. It is sandy loam, fine sandy loam, or coarse sandy loam modified by 10 to 35 percent rock fragments.

The B horizon has color value of 5 or 6 (3 or 4 moist) and chroma of 3 or 4 (3 moist). The hue is 10YR or 2.5Y. It is fine sandy loam, sandy loam or loam modified by 15 to 35 rock fragments.

The C horizon has color value of 6 or 7 (4 or 5 moist) and chroma of 4 (3 or 4 moist). The hue is 10YR or 2.5Y. It is sandy loam, coarse sandy loam or loamy coarse sand and modified by 15 to 35 percent rock fragments.

Ovall, ponded - The depth of the profile ranges from 40 to greater than 60 inches. Coarse fragments make up 0 to 35 percent of the profile. Reaction ranges from slightly acid through neutral.

The A1 horizon has color value of 4 or 5 (2 or 3 moist) and chroma of 3 or 4 (3 moist). The hue is 10YR or 2.5Y. The texture is sandy loam or light loam modified by up to 15 percent rock fragments.

The B2 horizon has color value of 4 through 6 (3 through 5 moist) and chroma of 4 through 6. The hue is 7.5YR or 10YR. It is sandy loam modified by up to 35 percent rock fragments.

The C horizon may not be present.

PARKS FAMILY

The Parks family consists of moderately deep to deep, well drained soils that formed in material weathered from ultramafic rocks. They are on slightly dissected mountain side slopes and glacial moraines. Slopes are 5 to 80 percent. The mean annual precipitation is 60 inches and the mean annual temperature is 43°F. Elevation ranges from 5,000 to 6,400 feet.

Taxonomic Class: Loamy-skeletal, serpentinitic, frigid Typic Xerochrepts.

Typical Pedon: Reference pedon of Parks family from an area of Parks-Toadlake families complex, 40 to 60 percent slopes in Siskiyou County about 9 miles southwest of Weed, directly east of Tamarack Flat in the NE<NW< sec. 27, T.41N., R.6W., (hand dug pit at midslope, cut on skid trail):

O1–2 inches to 0: fresh, partly decomposed and decomposed conifer needles and huckleberry oak leaves.

A1–0 to 5 inches; yellowish red (5YR 4/6) very gravelly sandy clay loam, reddish brown (5YR 4/4) moist; weak fine subangular blocky structure breaking to moderate very fine granular; soft, very friable, slightly sticky and slightly plastic; many very fine, few fine, medium and coarse roots; many fine interstitial pores; 40 percent pebbles; neutral (pH 6.7); gradual wavy boundary.

A3–5 to 13 inches; yellowish red (5YR 4/6) gravelly sandy clay loam, yellowish red (5YR 4/6) moist; weak fine subangular blocky structure breaking to moderate very fine granular; soft, very friable, sticky and slightly plastic; common very fine, fine, medium and few coarse roots; many fine interstitial pores; 30 percent pebbles, 20 percent cobbles and stones; neutral (pH 7.3); clear wavy boundary.

B2–13 to 24 inches; strong brown (7.5YR 5/6) very gravelly sandy clay loam, strong brown (7.5YR 4/6) moist; moderate medium and fine subangular blocky structure; soft, very friable, sticky and slightly plastic; common very fine and medium, few fine and coarse roots; many fine interstitial and common fine tubular pores; 30 percent pebbles, 10 percent cobbles and stones; neutral (pH 7.3); gradual wavy boundary.

C1–24 to 32 inches; strong brown (7.5YR 5/6) very gravelly heavy sandy loam, dark brown (7.5YR 4/4) moist; weak fine and medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine, few fine medium and coarse roots; many very fine interstitial pores; 30 percent pebbles, 15 percent cobbles and stones; neutral (pH 7.3); clear irregular boundary.

C2–32 to 44 inches; reddish yellow (7.5YR 6/6) very gravelly heavy sandy loam, dark yellowish brown (10YR 4/6) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few very fine, fine, medium and coarse roots; few fine and very fine tubular pores; 20 percent pebbles, 20 percent cobbles and stones; mildly alkaline (pH 7.5); gradual irregular boundary.

Cr–44 to 62 inches; highly fractured and weathered ultramafic rock.

Range in Characteristics: The depth of the profile to bedrock ranges from 20 to 60 inches. Reaction ranges from slightly acid to mildly alkaline. Rock fragments make up 35 to 60 percent of the profile.

The A horizon has color value of 4 or 5 dry (3 or 4 moist) and chroma of 6 through 8 dry (4 through 6 moist). The hue is 7.5YR, 5YR or 2.5YR. The texture is loam, silt loam or sandy clay loam, modified by 30 to 50 percent rock fragments.

The B horizon has color value of 4 or 5 dry or moist and chroma of 4 through 6 moist or dry. The hue is 5YR, 7.5YR or 10YR. The texture is loam, sandy clay loam, or clay loam modified by 35 to 50 percent rock fragments.

The C horizon may not be present.

PARRISH FAMILY

The Parrish family consists of deep and moderately deep, well drained soils that formed in material weathered from sedimentary and metasedimentary rocks. They are on dissected mountain sideslopes. Slopes are 20 to 60 percent. Mean annual precipitation is 30 to 50 inches and the mean annual temperature is 58°F. Elevation ranges from 2500 to 4000 feet.

Taxonomic Class: Fine, Vermiculitic, mesic Ultic Haploxeralfs.

Typical Pedon: Reference pedon of Parrish family from an area of Parrish family, 20 to 50 percent slopes about 5 miles SSE of Platina, CA in the SE< of the NE< section 9, T. 28 N., R. 9 W.,: 790 feet west and 1850 feet south NW corner of section 9.

01–> inch to 0; dead grass and twigs.

011–0 to 6 inches; brown (7.5YR 4/2) loam, dark brown (7.5YR 3/4) moist; weak medium subangular blocky parting to moderate fine granular structure; soft, very friable, nonsticky and nonplastic; many fine medium roots; moderate fine and very fine interstitial and tubular pores; 5 percent pebbles; slightly acid (pH 6.5); gradual smooth boundary.

A12–6 to 9 inches; brown (7.5YR 5/2) heavy loam, dark brown (7.5YR 3/4) moist; weak medium subangular blocky structure parting to weak fine subangular blocky; slightly hard, very friable, nonsticky and slightly plastic; common fine roots; many fine and very fine tubular and few medium interstitial pores; 5 percent pebbles; slightly acid (pH 6.5); clear smooth boundary.

B21t–9 to 15 inches; strong brown (7.5YR 4/6) clay loam, dark brown (5YR 3/4) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; few fine roots; common fine interstitial and tubular pores; few moderately thick clay films in pores and on ped faces; 5 percent pebbles; slightly acid (pH 6.5); gradual smooth boundary.

B22t–15 to 23 inches; strong brown (7.5YR 5/6) clay loam, yellowish red (5YR 5/6) moist; weak coarse subangular blocky parting to weak medium subangular blocky structure; hard, friable, sticky and plastic; few fine roots; many very fine tubular pores; common thick clay films in pores and on ped faces; 5 percent pebbles; slightly acid (pH 6.5); clear smooth boundary.

B23t–23 to 30 inches; strong brown (7.5YR 5/6) heavy clay loam, yellowish red (5YR 5/8) moist; weak coarse subangular blocky parting to weak medium subangular blocky structure; hard, firm, sticky and plastic; few fine roots; moderate very fine tubular pores; many thick clay films in pores and on ped faces; 5 percent pebbles; medium acid (pH 6.0); abrupt smooth boundary.

R-30 to 42 inches; highly fractured, slightly weathered shale and sandstone.

Range in Characteristics: The depth to fractured bedrock is over 20 inches. Rock fragments make up less than 35 percent of the profile. Reaction ranges from slightly acid to strongly acid.

The A horizon has color value of 4 through 6 (3 through 5 moist) and chroma of 2 through 4. The hue is 5YR, 7.5YR or 10YR. It is loam or heavy loam modified by up to 15 percent rock fragments.

The B2t horizon has color value of 4 or 5 (3 or 4 moist) and chroma of 4 through 8. The hue is 5YR, 7.5YR or 10YR. It is heavy clay loam or clay modified by up to 15 percent rock fragments.

A "C" horizon, having less clay than the B horizon, may or may not be present.

REDCAP FAMILY

The Redcap family consists of deep, well drained soils formed in material weathered from olivine andesite with a pumice overburden. They are on sideslopes of cinders and pumice cones. Slopes are 20 to 50 percent. Mean annual precipitation is 25 inches and the mean annual air temperature is 44°F. The elevation ranges from 5000 to 6600 feet.

Taxonomic Class: Cindery over medial-skeletal, frigid Dystric Xerorthents.

Typical Pedon: Reference pedon of Redcap family from an area of Yallani, pumice overburden-Redcap families association, 20 to 50 percent slopes, in Siskiyou County, CA, about 30 miles northeast of McCloud in the SW<, NW<, Section 22, T. 43 N., R. 2 E., M.D.M., 0.3 miles from the end of Forest Road No. 43N08H.

01–< inch to 0; duff consisting of red fir needles.

A1–0-3 inches; light brownish gray (10YR 6/2) cindery loamy coarse sand, dark grayish brown (10YR 4/2) moist; single grain; loose, nonsticky and nonplastic; common very fine, fine and medium roots; many very fine pores; 30 percent medium gravel size pumice cinders; slightly acid (pH 6.0); clear smooth boundary.

AC–3 to 24 inches; light brownish gray (10YR 6/2) cindery loamy coarse sand, light yellowish brown (10YR 6/4) moist; single grain; loose, nonsticky and nonplastic; common very fine and few medium roots; many very fine pores; 40 percent medium gravel size pumice cinders; slightly acid (pH 6.5); clear smooth boundary.

IIAb–24 to 32 inches; light gray (10YR 7/2) very gravelly sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; loose, friable, nonsticky and nonplastic; common fine and medium roots; many very fine pores; 40% andesite pebbles; slightly acid (pH 6.5); gradual wavy boundary; slightly smeary.

IIB2b–32 to 44 inches; light gray (10YR 7/2) very gravelly sandy loam, brown (10YR 4/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; few fine and medium roots; many fine pores; few thin clay films bridging sand grains; 40 percent andesite pebbles; slightly acid (pH 6.5); gradual wavy boundary; slightly smeary.

IIB22b–44 to 60 inches; light gray (10YR 7/2) very gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; soft, friable, nonsticky and nonplastic; common fine and medium roots; many fine pores; 50 percent pebbles, 10 percent andesite cobbles; slightly acid (pH 6.5); diffuse wavy boundary; slightly smeary.

IICr–60 to 62 inches; contact with semi-consolidated glacial till.

Range in Characteristics: The depth of the profile ranges from 40 to over 60 inches. Rock fragments make up 35 to 80 percent of the overburden soil and 40 to 60 percent of the buried soil. Reaction ranges from slightly acid to neutral.

The A1 horizon has color value of 6 through 8 (4 through 6 moist) and chroma of 2 or 3. The hue is 10YR or 2.5Y. It is sand or loamy sand modified by 25 to 50 percent rock fragments.

The IIAb horizon has color value of 6 or 7 (4 or 5 moist) and chroma of 1 through 3. The hue is 10YR or 2.5Y. It is sandy loam or fine sandy loam modified by 35 to 50 percent rock fragments.

The IIB2b horizon has color value of 6 or 7 (4 or 5 moist) and chroma of 1 through 4. The hue is 10YR or 2.5Y. The texture is sandy loam modified by 40 to 70 percent rock fragments.

The C horizon may not be present.

REVIT FAMILY

The Revit family consists of moderately deep and deep, well drained soils that formed in material weathered from basaltic scoria, lava and wind blown volcanic ash. Soils of the Revit family occur on volcanic mountainside slopes, outwashes, and lava flows. Slopes are 10 to 60 percent. The mean annual precipitation is 40 inches and the mean annual temperature is 45°F. The elevation ranges from 4,500 to 5,700 feet.

Taxonomic Class: Medial, frigid Andic Xerumbrepts.

Typical Pedon: Reference pedon of Revit family from an area of Sheld-Revit families complex, 20 to 50 percent slopes in Siskiyou County, CA, about 4 miles ESE of Mt. Shasta City and 1< miles SW of Everitt Hill summit, about 500 feet ESE of the microwave repeater in the NW< of the NE< of Section 30, T. 40 N., R. 3 W.:

01–2 inches to 0; litter of leaves, bark, and twigs in various stages of decomposition.

A11–0 to 4 inches; very dark grayish brown (10YR 3/2) fine sandy loam, very dark brown (10YR 2/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic, weakly smeary common very fine and medium roots; many very fine interstitial pores; strongly acid (pH 5.4); abrupt smooth boundary.

A12–4 to 10 inches; dark grayish brown (10YR 4/2) fine sandy loam, very dark brown (10YR 2/2) moist; weak medium subangular blocky; soft, very friable, nonsticky and nonplastic; common very fine, many medium, and common coarse roots; common very fine interstitial pores, 10 percent small pebbles, medium acid (pH 5.6); abrupt wavy boundary.

A21–10 to 20 inches; dark grayish brown (10YR 4/2) fine sandy loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; soft, friable, nonsticky and nonplastic; common few, medium and coarse horizontal roots; few fine tubular pores; 10 percent pebbles; medium acid (pH 5.6); gradual wavy boundary.

B22–20 to 27 inches; brown (10YR 5/3) dark brown (10YR 3/3) moist; weak medium subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; common fine and medium horizontal roots; 18 percent pebbles; 25 percent fine pebbles; medium acid (pH 5.8); abrupt irregular boundary. 6 to 10 inches thick.

B23–27 to 30 inches; brown (10YR 5/3) gravelly fine sandy loam, dark yellowish brown (10YR 3/4) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and nonplastic; common fine and medium horizontal roots; 30 percent pebbles; strongly acid (pH 5.5); abrupt wavy boundary. 8 to 10 inches thick.

C–30 to 36 inches; brown (10YR 5/3) extremely stony fine sandy loam, dark yellowish brown (10YR 3/4) moist; massive; soft, very friable, nonsticky and nonplastic, weakly smeary; common fine and medium and few coarse roots, few fine interstitial and tubular pores; 85 percent rock fragments, mostly stones and pebbles, strongly acid (pH 5.5); abrupt wavy boundary.

IIr–36 to 40 inches; fractured vesicular basalt with soil similar to the above horizon in the cracks.

Range in Characteristics: The depth to bedrock ranges from 20 to over 40 inches. Rock fragments comprise up to 30 percent of the A and B horizons. The reaction ranges from slightly acid to neutral.

The A horizon has color value of 3 through 5 (2 or 3 moist) and chroma of 1 through 3 (2 or 3 moist). The hue is 10YR. The texture is fine sandy loam or sandy loam modified by up to 15 percent rock fragments.

The B horizon has color value of 3 through 5 (2 through 5 moist) and chroma of 2 through 6. The hue is 10YR. The texture is fine sandy loam or sandy loam modified by 10 to 35 percent rock fragments.

The C horizon (if present) has similar color and texture as the B horizon but may have up to 70 percent rock fragments.

ROGUE

The Rogue family consists of moderately deep and deep, well drained soils that formed in material weathered from granitic rocks. They occur on dissected mountain side slopes. Slopes are 40 to 70 percent. The mean annual precipitation is 55 to 70 inches and the mean annual temperature is 45°F. Elevation ranges from 4500 to 6200 feet.

Taxonomic Class: Coarse-loamy, mixed, frigid Dystric Xerochrepts..

Typical Pedon: Reference pedon of Rogue family from an area of Rogue family, 40 to 70 percent slopes in Trinity County, California about 25 miles NNE of Weaverville, 2 miles NNE of Little Boulder Lake, about 2200 feet south and 1100 feet east of the NW corner section 16, T. 37 N., R. 8 W., on a spur road to east from end of Boulder Lake Trail Rd.:

01–1 inch to 0; duff of matted fir needles.

A11–0 to 5 inches; brown (7.5YR 4/4) sandy loam, dark yellowish brown (10YR 3/4) moist; weak very fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine, few fine and medium roots. Many fine interstitial pores; 5 percent pebbles; slightly acid (pH 6.5); abrupt wavy boundary.

A12–5 to 14 inches; light brown (7.5YR 6/4) loamy sand, dark brown (10YR 3/4) moist; weak very fine granular structure; slightly hard, firm, nonsticky and nonplastic; common very fine and medium, few fine and coarse roots; many fine interstitial pores; 5 percent pebbles; medium acid (pH 6.5); clear wavy boundary.

B21–14 to 28 inches; very pale brown (10YR 7/4) sandy loam, yellowish brown (10YR 5/4) moist; weak medium subangular blocky structure; slightly hard, firm, nonsticky and nonplastic; few very fine, fine, medium and coarse roots; many very fine interstitial pores; 5 percent pebbles; medium acid (pH 6.0); gradual wavy boundary.

C1–28 to 41 inches; light gray (2.5 7/2) loamy sand, light yellowish brown (2.5Y 6/4) moist; massive; slightly hard, firm, nonsticky and nonplastic; few very fine, medium and coarse roots; many very fine interstitial pores; 10 percent pebbles; strongly acid (pH 5.5); gradual wavy boundary.

C2–41 to 65 inches; white (2.5Y 8/2) loamy sand, pale yellow (2.5Y 7/4) moist; massive; slightly hard, firm nonsticky and nonplastic; few fine and medium roots; many very fine interstitial pores; 7 percent pebbles; 30 percent gruss; strongly acid (pH 5.5); gradual wavy boundary.

Cr–65 to 70 inches; paralithic contact with weathered granitic rock becoming hard at 72 inches.

Range in Characteristics: The depth to bedrock ranges from 36 to 65 inches. The reaction ranges from strongly acid to neutral. The base saturation is less than 60 percent.

The A horizon has color value of 3 through 6 (2 through 3 moist) and chroma of 2 through 4. The hue is 10YR or 2.5Y. It is loamy sand or sandy loam modified by up to 10 percent rock fragments.

The B horizon has color value of 5 through 7 (4 through 5 moist) and chroma of 3 or 4. The hue is 10YR or 2.5Y. It is loam or sandy loam modified by up to 15 percent rock fragments.

The C horizon has color value of 6 through 8 (4 through 7 moist) and chroma of 2 through 6 (4 through 6 moist). The hue is 10YR or 2.5Y. It is loamy sand or sand modified by up to 25 percent rock fragments.

SADIE FAMILY

The Sadie family consists of moderately deep and deep, well drained soils that formed in material weathered in volcanic ash deposited over basalt. They are on volcanic mountainside slopes or on lava flows. Slopes are 0 to 60 percent. Elevation ranges from 1800 to 4500 feet. Mean annual precipitation ranges from 30 to 60 inches and the mean annual temperature is 50°F.

Taxonomic Class: Medial, mesic Andic Xerochrepts.

Typical Pedon: Reference pedon of Sadie family from an area of Neer-Sadie families association, 20 to 40 percent slopes about 20 miles east of McCloud in Siskiyou County, about one mile southwest of the summit of Bear Mt., about < mile west and < mile south of the NE corner Section 21, T. 41 N., R. 2 E.

01–2 inches to 0; duff consisting of white fir needles and snowbrush leaves.

A11–0 to 5 inches; brown (7.5YR 4/4) sandy loam, dark brown (7.5 YR 3/2) moist; weak medium granular structure; soft, very friable nonsticky and non-plastic; many very fine and fine roots; many fine and very fine interstitial pores; 10 percent pebbles; neutral (pH 7.0); abrupt smooth boundary.

B1–5 to 12 inches; brown (7.5YR 5/4) sandy loam, dark brown (7.5YR 4/4) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; common very fine and fine interstitial pores; 10 percent pebbles; neutral (pH 7.0); clear smooth boundary.

B21–12 to 20 inches; brown (7.5YR 5/4) fine sandy loam, dark brown (7.5YR 4/4) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots; common fine and few medium roots; common very fine interstitial pores; 10 percent pebbles, 5 percent cobbles; neutral (pH 7.0); clear smooth boundary.

B22–20 to 36 inches; brown (7.5YR 5/4) gravelly fine sandy loam, dark brown (7.5YR 4/4) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; few very fine, fine and medium roots; common very fine interstitial pores; 15 percent pebbles, 10 percent cobbles; neutral (pH 7.0); abrupt wavy boundary.

R–36 to 38 inches; basalt bedrock.

Range in Characteristics: There are two phases of Sadie family recognized in this survey: Sadie and Sadie, deep.

Sadie

Depth to a lithic contact ranges from 20 to 40 inches. Rock fragments make up 10 to 35 percent of the profile. The reaction ranges from strongly acid to neutral.

The A horizon has color value of 4 through 6 (3 through 5 moist) and chroma 2 through 4. The hue is 10YR or 7.5YR. The texture is fine sandy loam, sandy loam or loam modified by 5 to 25 percent rock fragments.

The B horizon has color value of 5 through 7 (4 through 6 moist) and chroma of 3 through 5. The hue is 7.5YR or 10YR.. The texture is loam, fine sandy loam or sandy loam modified by 10 to 35 percent rock fragments.

The C horizon may not be present.

Sadie, deep

Depth to a lithic contact ranges from 40 to 80 inches. Rock fragments make up 0 to 30 percent of the profile. The reaction ranges from very strongly acid to medium acid.

The A horizon has color value of 4 through 6 (3 through 6 moist) and chroma 2 through 4. The hue is 10YR or 7.5YR. The texture is sandy loam or loam modified by up to 15 percent rock fragments.

The B horizon has color value of 4 through 6 (3 through 4 moist) and chroma of 4 through 6. The hue is 10YR or 7.5YR. The texture is sandy loam or loam modified by up to 35 percent rock fragments.

The C horizon may not be present.

SECCA FAMILY

The Secca family consists of deep, moderately well drained soils formed in material weathered from sedimentary rock, conglomerates and sandstones. They are on the lower slopes of dissected mountain sideslopes. Slopes are 20 to 60 percent. Mean annual precipitation is 40 to 60 inches and mean annual temperature is 55°F. Elevation ranges from 1500 to 3000 feet.

Taxonomic Class: Fine, mixed, mesic Mollic Haploxeralfs.

Typical Pedon: Reference pedon of Secca family from an area of Secca-Forbes families association, 20 to 40 percent slopes in Trinity County, CA, 2 miles west of Hyampom on the Kerlin Creek Road, 0.5 miles west of Hyampom Road. SE< of the SW<, sec. 22, T. 3 N., R. 6 E., HBM.

01–> inch to 0; grass litter and oak leaves.

A1–0 to 4 inches; brown (10YR 5/3) silt loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine, common fine roots; common very fine continuous horizontal tubular pores; 5 percent pebbles; slightly acid (pH 6.5); clear, smooth boundary.

Blt–4 to 9 inches; brown (10YR 5/3) gravelly clay loam, dark brown (10YR 4/3) moist; strong fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine, fine and medium roots; common very fine and fine continuous tubular pores; common thin clay films on ped faces and in pores; 20 percent pebbles; medium acid (pH 6.0); clear wavy boundary.

B21t–9 to 14 inches; brown (10YR 5/3) gravelly heavy clay loam, dark brown (10YR 4/3) moist; strong fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine, medium and coarse and many very fine roots; common very fine and fine continuous tubular pores; many thick clay films on ped faces and pores; 15 percent pebbles; medium acid (pH 6.0); gradual wavy boundary.

B22t–14 to 28 inches; yellowish brown (10YR 5/4) gravelly clay, dark yellowish brown (10YR 4/4) moist; massive; hard, firm, sticky and plastic; common very fine, fine and medium roots; common very fine and fine continuous tubular pores; 15 percent pebbles; medium acid (pH 6.0); gradual wavy boundary.

C–28 to 41 inches; yellowish brown (10YR 5/6) gravelly sandy clay loam, dark yellowish brown (10YR 4/6) moist; original rock structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine roots; many thick clay films coating gravels; 30 percent pebbles; slightly acid (pH 6.5); gradual irregular boundary.

Range in Characteristics: The thickness of the solum and depth to weathered conglomerate or sandstone bedrock is 40 to 60 inches. It is slightly to medium acid.

The A horizon has color value of 4 through 6 (3 or 4 moist) and chroma of 3 or 4. The hue is 10YR or 2.5Y. The thickness of the A horizon is 3 to 6 inches. The texture ranges from silt loam to clay loam modified by 5 to 15 percent rock fragments.

The B horizon has color value of 4 through 6 (3 through 5 moist) and chroma of 4 through 6. The hue is 10YR or 2.5Y. The texture is clay loam or clay modified by 10 to 30 percent rock fragments.

The C horizon may not be present.

SHADELEAF FAMILY

The Shadeleaf family consists of moderately deep, well drained soils that formed in material weathered from ultramafic rocks. They are on dissected mountain side slopes and ridgetops. Slopes are 20 to 70 percent. The mean annual precipitation is 35 inches and the mean annual temperature is 51°F. Elevation ranges from 3,000 to 5,500 feet.

Taxonomic Class: Fine, serpentinitic, mesic Typic Argixerolls.

Typical Pedon: Reference pedon of Shadeleaf family from an area of Shadeleaf-Kang families complex, 20 to 40 percent slopes in Siskiyou County, California, 7 miles west of Weed at a road cut on the IP road 3 miles above Stewart Springs, < mile east of the SW corner section 2, T.41N., R.6W.

01–> inch to 0; loose duff and litter of conifer needles.

A11–0 to 2 inches; dark grayish brown (10YR 4/2) gravelly clay loam, very dark brown (10YR 2/2) moist; moderate fine subangular blocky breaking to moderate fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots; many fine and very fine interstitial pores; 25 percent pebbles; neutral (pH 7.0); abrupt smooth boundary.

A12–2 to 4 inches; dark grayish brown (10YR 4/2) very gravelly clay loam, very dark brown (10YR 2/2) moist; strong fine subangular blocky structure; slightly hard, friable, slightly sticky and plastic; many very fine and few fine roots; few medium interstitial and common fine tubular pores; 35 percent pebbles, 5 percent cobbles and stones; mildly alkaline (pH 7.5); abrupt smooth boundary.

B1t–4 to 9 inches; brown (10YR 4/3) very gravelly clay, dark brown (7.5YR 3/2) moist; strong medium and fine subangular blocky structure; hard, firm, slightly sticky and plastic; common very fine, fine, medium and coarse roots; few coarse interstitial and common fine tubular pores; many moderately thick clay films on ped faces and in pores; 30 percent pebbles, 7 percent stones and cobbles; mildly alkaline (pH 7.5) abrupt wavy boundary.

B2t–9 to 18 inches; dark yellowish brown (10YR 4/4) gravelly clay, dark yellowish brown (10YR 3/4) moist; weak coarse and medium prismatic breaking to moderate coarse subangular blocky structure; extremely hard, very firm, sticky and very plastic; few very fine, fine, medium and coarse roots; few very fine and fine tubular pores; continuous thick clay films on ped faces and in pores; 20 percent pebbles; mildly alkaline (pH 7.5); clear wavy boundary.

B3t–18 to 23 inches; pale brown (10YR 6/3) gravelly clay with yellowish brown (10YR 5/4) variegations, yellowish brown (10YR 5/4) moist; weak coarse subangular blocky and medium prismatic structure; extremely hard, very firm, sticky and very plastic; few very fine and fine roots; few very fine tubular pores; continuous thick clay films on ped faces and in pores; mildly alkaline; 30 percent pebbles; (pH 7.8); clear wavy boundary.

Cr–23 to 33 inches; highly fractured and weathered ultramafic rock.

Range in Characteristics: The depth to bedrock ranges from 20 to 40 inches. Reaction ranges from slightly acid to mildly alkaline.

The A horizon has color value of 4 or 5 (2 or 3 moist) chromas are 2 through 4 dry and (1 through 3 moist). The hue is 10YR with occasional 7.5YR. The texture is heavy loam or light clay loam modified by 20 to 40 percent rock fragments.

The B horizon has color value of 4 through 6 (3 through 5 moist). The chroma is 2 through 4. The hue is 10YR or 2.5Y. The texture is clay modified by 15 to 35 rock fragments.

The C horizon may not be present.

SHASTA FAMILY

Shasta family consists of deep, somewhat excessive to well drained soils that have formed in glacial outwash and mudflows from extrusive igneous rock, volcanic ash, and glacial rock flow. They are located on glacial outwash plains. Slopes are 0 to 30 percent. Mean annual precipitation ranges from 30 to 60 inches and the mean annual temperature is about 52°F. Elevations range from 2,500 to 4,500 feet.

Taxonomic Class: Ashy, mesic Umbric Vitrandepts.

Typical Pedon: Reference pedon of Shasta family from an area of Germany-Shasta families association, 0-20 percent slopes about 0.3 mile east of Fowler campground road on the north side of the US Highway 89 and on logging road 24KG. A pit is located 3,700 feet north and 1,700 feet west of the SE corner of Section 1, T. 39 N., R. 2 W.:

01 & 02–4 inches to 0; new and partially decomposed needles, twigs, bark, leaves and other organic debris.

A11–0 to 5 inches; very dark grayish brown (10YR 3/2) coarse sandy loam, black (7.5YR 2/0) moist; moderate very fine granular structure; loose, very friable; nonsticky and nonplastic; many very fine, fine and medium roots; many very fine random interstitial pores; 7 percent pebbles; strongly acid (pH 5.5); abrupt smooth boundary.

A12–5 to 13 inches; very dark grayish brown (10YR 3/2) coarse sandy loam, black (10YR 2/1) moist; moderate very fine granular structure; loose, very friable, nonsticky and nonplastic; many very fine, fine, medium and coarse roots; many very fine random interstitial pores; 9 percent pebbles; strongly acid (pH 5.5); clear smooth boundary.

A13–13 to 22 inches; dark grayish brown (10YR 4/2) loamy sand, black (10YR 2/1) moist; moderate very fine granular structure; soft, very friable, nonsticky and nonplastic; many medium and coarse and common very fine and fine roots; many very fine random interstitial pores; 11 percent pebbles; strongly acid (pH 5.5); clear smooth boundary.

IIC1–22 to 30 inches; grayish brown (10YR 5/2) cobbly loamy sand, very dark grayish brown (10YR 3/2) moist; very weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many medium and coarse and common very fine and fine roots; many very fine and fine random interstitial pores; 11 percent pebbles, 19 percent cobbles; strongly acid (pH 5.5); abrupt wavy boundary.

IIIC2–30 to 39 inches; pale brown (10YR 6/3) very cobbly loamy sand, very dark grayish brown (10YR 3/2) moist; massive hard, firm, nonsticky and nonplastic; common very fine, fine and medium roots; many very fine random interstitial pores; medium acid (pH 5.8); 23 percent pebbles, 16 percent cobbles; brittle from weak cementation by silica; abrupt wavy boundary.

IVC3–39 to 50 inches; gray (10YR 5/1) very cobbly coarse sand, dark brown (10YR 3/3) moist; single grain; slightly hard, slightly firm to loose, nonsticky and nonplastic; few very fine and fine roots; many very fine and fine interstitial pores; medium acid (pH 5.8); 26 percent pebbles, 14 percent cobbles; abrupt wavy boundary.

VC4–50 to 60 inches; gray (10YR 5/1) coarse sand, dark brown (10YR 3/3) moist; single grain; slightly hard, slightly firm, nonsticky and nonplastic; few very fine and fine roots; many very fine and fine random interstitial pores; medium acid (pH 5.8); 10 percent pebbles; abrupt wavy boundary.

IVC5–60 to 70 inches; gray (10YR 5/1) very cobbly coarse sand, salt and pepper color moist; single grain; soft, very friable, nonsticky and nonplastic; few very fine and fine roots; many very fine and fine interstitial pores; 18 percent pebbles, 17 percent cobbles; medium acid (pH 5.8).

Range in Characteristics: The depth of the profile is greater than 60 inches. Rock fragments make up 0-35 percent of the solum. Reaction ranges from strongly to medium acid.

The A horizon has color value of 3 through 4 dry (2 to 3 moist) and chroma of 1 through 3. It is dominantly sandy loam or loamy sand modified by up to 35 percent rock fragments. The hue is 10YR or 7.5YR.

The IIC horizon has color value of 4 through 6 dry (3 to 5 moist) and chroma of 1 to 3. The hues is 10YR. The texture is loamy sand or coarse sand modified by 15 to 35 percent rock fragments.

SHELD

The Sheld family consists of moderately deep to deep, well drained soils that formed in material weathered from basalt with the surface horizon weathered from recent volcanic ash. They are on buttes and dissected upland sideslopes and lava flows. Slopes are 0 to 80 percent. Mean annual precipitation is 25 inches and mean annual air temperature is 44°F. The elevation ranges from 4,500 to 6,500 feet.

Taxonomic Class: Medial-skeletal, frigid Andic Xerumbrepts.

Typical Pedon: Reference pedon of Sheld family from an area of Sheld family, 40 to 60 percent slopes, 0.2 miles east of the intersection of Edson Creek road and Black Fox Butte lookout road in the SW<, SW< section 33, T 41 N, R 1 E, M.D.M.

01–> inch to 0; duff of ceanothus and chinquapin leaves.

A11–0 to 3 inches; dark brown (10YR 3/3) gravelly coarse sandy loam, very dark grayish brown (10YR 3/2) moist; single grain, loose, nonsticky and nonplastic; common fine roots, few medium roots; many very fine and fine interstitial pores; 15 percent pebbles, 10 percent cobbles; slightly acid (pH 6.5); clear smooth boundary.

A12–3 to 11 inches; brown (10YR 4/3) gravelly sandy loam, dark reddish brown (5YR 3/3) moist; single grain,structure; loose, very friable, nonsticky and nonplastic; common very fine, fine and medium roots; many fine and very fine random interstitial pores; 15 percent pebbles, 10 percent cobbles; slightly acid (pH 6.5); gradual wavy boundary.

B21–11 to 32 inches; dark yellowish brown (10YR 4/4) extremely cobbly fine sandy loam, dark brown (10YR 3/3) moist; very weak medium subangular blocky structure; loose, very friable, nonsticky and nonplastic; common very fine and fine roots, few medium and coarse roots; many very fine and fine random interstitial pores; 15 percent pebbles, 50 percent cobbles and 10 percent stones; weakly smeary; slightly acid (pH 6.5); clear wavy boundary.

B22–32 to 42 inches; brown (10YR 5/3) extremely cobbly fine sandy loam, dark brown (10YR 4/3) moist; strong medium subangular blocky structure (slightly compacted); hard, firm, nonsticky and nonplastic; few fine roots, few very fine and fine tubular pores; 15 percent pebbles, 50 percent cobbles and 10 percent stones; slightly acid (pH 6.5); gradual intermittent boundary.

R–42 to 44 inches; contact with consolidated glacial till.

Range in Characteristics: The depth of the profile ranges from 28 to 44 inches. Rock fragments make up 35 to 65 percent of the profile. Reaction ranges from slightly acid to neutral.

The A horizon has color values 3 or 4 (3 moist) and chroma of 3 (2 or 3 moist). The hue is 10YR. It is coarse sandy loam or sandy loam with 25 to 45 percent rock fragments.

The B horizon has color values 4 or 5 (3 or 4 moist) and chromas 4 or 3 (3 moist). The hue is 10YR. It is fine sandy loam to loam.

The C horizon may not be present.

SKYMOR FAMILY

The Skymor family consists of shallow, well drained soils that formed in material weathered from metamorphosed sedimentary and igneous rocks. They are on gentle to very steep mountain ridges and side slopes. Slopes are 15 to 90 percent. The mean annual precipitation is about 50 inches and the mean annual temperature is about 43°F. Elevation ranges from 5000 to 6500 feet.

Taxonomic Class: Loamy-skeletal, mixed frigid Dystric Lithic Xerochrepts.

Typical Pedon: Reference pedon of Skymor family from an area of Skymor-Jayar families complex, 20 to 60 percent slopes about 12 miles WSW of Dunsmuir in Shasta County, CA, in the NE<, SW<, NE<, section 11, T. 38 N., R. 6 W.:

A1–0 to 3 inches; brown (10YR 5/3) extremely cobbly sandy loam, very dark grayish brown (10YR 3/2) moist; single grain; loose, nonsticky and nonplastic; common very fine and fine roots; common very fine and fine interstitial pores; 35 percent pebbles, 20 percent cobbles, 10 percent stones; slightly acid (pH 6.5); gradual wavy boundary.

B1–3 to 12 inches; yellowish brown (10YR 5/4) extremely stony sandy loam, dark yellowish brown (10YR 4/4) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; few very fine roots; common fine and medium tubular pores; 25 percent pebbles, 20 percent cobbles, 20 percent stones; medium acid (pH 6.0); gradual wavy boundary.

B2–12 to 17 inches; very pale brown (10YR 7/4) extremely cobbly loam; yellowish brown (10YR 5/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few medium, common fine and very fine roots; common fine and medium tubular pores; 25 percent pebbles, 30 percent cobbles, 10 percent stones; few thin clay films bridging grains and peds; strongly acid (pH 5.5); clear wavy boundary.

R–17 to 19 inches; lithic contact with fractured basic igneous rock.

Range in Characteristics: The depth to bedrock ranges from 10 to 20 inches. The reaction ranges from strongly acid to neutral. Base saturation ranges from 30 to 60 percent.

The A horizon has color value of 5 or 6 (2 through 5 moist) and chroma 3 through 6 (2 through 4 moist). The hue is 10YR or 2.5Y. It is loam or sandy loam modified by 30 to 70 percent rock fragments.

The B2 horizon has color value of 5 through 7 (3 through 5 moist and chroma of 4 (4 through 6 moist). The hue is 10YR or 2.5Y. It is loam or sandy loam modified by 35 to 70 percent rock fragments.

A C horizon of similar material is present in some pedons.

SOULAJULE FAMILY

The Soulajule family consists of moderately deep, well drained soils that formed in material weathered from nonmarine sedimentary rocks. They are on remnants of nonmarine terraces and ridgetops. Slopes are 20 to 60 percent. Mean annual precipitation is 35 to 50 inches and the mean annual temperature is 55°F. The elevation ranges from 2000 to 3200 feet.

Taxonomic Class: Clayey-skeletal, mixed, mesic Ultic Haploxeralfs.

Typical Pedon: Reference pedon of Soulajule family from an area of Soulajule family, 20 to 40 percent slopes about 3 miles northeast of Weaverville in Trinity County, California, about 2200 feet east and 600 feet north of the center of sec. 32, T. 34 N., R. 9 W., at a road cut on the west side of Musser Hill road near Penny Pines Plantation, just south of Long Gulch crossing.

01–> inch to 0; duff of oak leaves.

A11–0 to 2 inches; strong brown (7.5YR 4/6) loam, dark brown (7.5YR 3/4) moist; strong fine granular structure; slightly hard, very friable, nonsticky and nonplastic; many fine and very fine roots; common medium and many fine interstitial pores; 10 percent pebbles; neutral (pH 7.0); abrupt smooth boundary.

A12–2 to 8 inches; strong brown (7.5YR 4/6) gravelly loam, dark brown (7.5YR 3/4) moist; strong fine granular structure; soft, very friable, nonsticky and nonplastic; many fine, common very fine and medium roots; many medium, fine and very fine pores; 20 percent pebbles, neutral (pH 7.0); gradual smooth boundary.

B21t–8 to 15 inches; yellowish red (5YR 4/6) very gravelly clay loam, reddish brown (5YR 4/4) moist; moderate medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common fine, medium and coarse roots; common medium, many fine and very fine pores; continuous moderately thick clay films on ped faces and in pores; 27 percent pebbles, 10 percent cobbles; slightly acid (pH 6.5); abrupt wavy boundary.

B22t–15 to 24 inches; yellowish red (5YR 5/6) very cobbly clay, yellowish red (5YR 5/6) moist; massive, extremely hard, firm, slightly sticky and plastic; common medium and coarse roots; many very fine and fine tubular pores; continuous thick clay films on ped faces and in pores; 25 percent pebbles, 15 percent cobbles; slightly acid (pH 6.5); abrupt wavy boundary.

B3t–24 to 31 inches; strong brown (7.5YR 5/6) very cobbly heavy clay loam, strong brown (7.5YR 5/6) moist; rock structure; extremely hard, firm slightly sticky and plastic; common medium and coarse roots; common very fine tubular pores; many moderately thick clay films on ped faces and in pores; 20 percent pebbles, 25 percent cobbles; slightly acid (pH 6.5); clear wavy boundary.

Cr–31 to 40 inches; paralithic contact with consolidated nonmarine sediments.

Range in Characteristics: The depth to consolidated nonmarine sediments is 20 to 40 inches. Rock fragments, consisting of pebbles and cobbles make up 5 to 35 percent of the A horizon and 35 to 60 percent of the B horizon. Recreation ranges from moderately acid to neutral. Base saturation ranges from 50 to 75 percent.

The A horizon has color value of 3 through 5 (3 or 4 moist) and chroma of 4 through 6. The hue is 10YR, 7.5YR and 5YR. The texture is loam, sandy clay loam or light clay loam modified 10 to 35 percent rock fragments.

The B horizon has color value of 4 through 6 (wet or dry) and chroma of 4 through 6. The hue is 10YR, 7.5YR and 5YR. The texture is heavy clay loam or clay modified by 35 to 60 percent rock fragments.

The C horizon may not be present.

STECUM FAMILY

The Stecum family consists of moderately deep, well drained soils formed in material weathered from granitic and ultramafic rocks. They occur on mountain ridges, cirques and moraines. Slopes are 30 to 90 percent. The mean annual precipitation is 60 to 70 inches and the mean annual temperature is 35 to 40°F. The elevation ranges from 6,500 to 8,000 feet.

Taxonomic Class: Sandy-skeletal, mixed Typic Cryorthents.

Typical Pedon: Reference pedon of Stecum family in Trinity County, California, about 15 miles north of Weaverville, ! mile north of Deer Lake, about 2500 feet south and 300 feet west of the NE corner section 28, T. 36 N., R. 9 W.:

01–< inch to 0; sparse loose litter from lupine.

A1–0 to 5 inches; light olive brown (2.5Y 5/4) very stony loamy sand, dark yellowish brown (10YR 4/4) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine, few fine and coarse roots; many very fine interstitial pores; 50 percent stones, 5 percent pebbles; slightly acid (pH 6.5); clear wavy boundary.

C1–5 to 15 inches; light olive brown (2.5Y 5/6) extremely stony loamy sand, dark yellowish brown (2.5Y 4/4) moist; weak fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common fine and very fine, few medium and coarse roots; many very fine interstitial pores; 50 percent stones, 20 percent pebbles; slightly acid (pH 6.3); clear wavy boundary.

C2–15 to 31 inches; olive yellow (2.5Y 6/6) very stony loamy sand, olive brown (2.5Y 4/4) moist; massive; loose, nonsticky and nonplastic; few very fine, fine and medium roots; many fine interstitial pores; 20 percent stones, 30 percent pebbles; slightly acid (pH 6.5); abrupt irregular boundary.

R–31 to 34 inches; compacted glacial till.

Range of Characteristics: The depth to bedrock ranges from 20 to 40 inches. The reaction ranges from slightly to strongly acid.

The A horizon has color value of 3 through 5 (2 through 4 moist) and chroma of 2 through 4. The hue is 2.5Y or 10YR. It is sandy loam or loamy sand modified by 30 to 65 percent rock fragments.

The C horizon has color value of 4 through 6 (2 through 4 moist) and chroma of 4 through 6 (2 through 4 moist). The hue is 10YR and 2.5Y. It is loamy sand modified by 35 to 75 percent rock fragments.

STONEWELL FAMILY

The Stonewell family consists of deep, excessively drained soils that formed in air-laid mantles of rhyolite pumice cinders. Soils of the Stonwell family lie on outwash terraces and gently sideslopes. Slopes are 0 to 20 percent. The mean annual precipitation is 25 inches and the mean annual temperature is 44°F. The elevation ranges from 5000 to 6600 feet.

Taxonomic Class: Cindery, frigid Dystric Xerorthents.

Typical Pedon: Reference pedon of Stonewell family from an area of Stonewell family, 0 to 20 percent slopes in the NE<, SE<, NE<, Sec. 23, T. 43 N., R. 2 E., M.D.M., 0.1 mile north of intersection of Forest roads 43N15.1 and 43N25.

01–1 inch to 0; lodgepole pine needles and duff.

A1–0 to 4 inches; light brownish gray (10YR 6/2) very cindery loamy coarse sand, dark grayish brown (10YR 4/2) moist; single grain; loose; nonsticky and nonplastic; common very fine, fine, medium and coarse roots; many very fine pores; 40 percent medium gravel size pumice cinders; strongly acid (pH 5.5); clear smooth boundary.

AC1–4 to 14 inches; light gray (10YR 7/2) very cindery loamy coarse sand, grayish brown (10YR 5/2) moist; single grain; loose, nonsticky and nonplastic; common fine and few medium roots; many very fine pores; 50 percent medium gravel size pumice cinders; medium acid (pH 6.0); gradual wavy boundary.

C1–14 to 36 inches; light gray (10YR 7/2) extremely cindery loamy coarse sand, grayish brown (10YR 5/2) moist; single grain; loose, nonsticky and nonplastic; few fine roots; many very fine, fine and medium pores; 80 percent medium and coarse gravel sized pumice cinders; slightly acid (pH 6.5); clear smooth boundary. (Note: this horizon varies greatly in depth and size of cinders due to proximity to source of pumice).

C2–36 to 62 inches; stratified layers of pumice cinders, medium gravel to cobble size; essentially no fine earth fraction exists in this horizon.

Range in Characteristics: The depth to bedrock ranges from 20 to over 60 inches. The reaction ranges from medium to slightly acid.

The A horizon has color value of 5 through 8 (4 through 6 moist) and chroma of 2 or 3. The hue is 10YR. It is loamy sand or loamy coarse sand modified by 35 to 60 percent rock fragments (cinders).

The C horizon has color value of 6 through 8 (5 through 6 moist) and chroma of 2 or 3. The hue is 10YR. It is loamy coarse and modified by 60 to 90 percent rock fragments (cinders).

STONYFORD FAMILY

The Stonyford family soils consist of shallow, well drained soils formed in material weathered from metavolcanic rocks. They are on dissected mountain side slopes. Slopes are 40 to 80 percent. Mean annual precipitation ranges from 25 to 50 inches and the mean annual temperature is 60°F. Elevations range from 2,000 to 3,000 feet.

Taxonomic Class: Loamy, mixed, thermic Lithic Mollic Haploxeralfs.

Typical Pedon: Reference pedon of Stonyford family from an area of Stonyford-Goulding families complex, 40 to 80 percent slopes about 3 miles S. SE of Platina, CA, the NE< section 1, T. 28 N., R. 10 W. (< mi. W., 100 yds. S. of NE corner sec. 1):

01–1 inch to 0; chamise leaf litter.

A1–0 to 3 inches; brown (7.5YR 5/4) loam, dark brown (7.5YR 3/4) moist; moderate very fine subangular blocky structure; soft, slightly sticky and slightly plastic; common very fine roots; many fine and medium interstitial pores; 5 percent pebbles, 8 percent cobbles; neutral (pH 6.7); abrupt smooth boundary.

B21t–3 to 7 inches; brown (7.5YR 5/4) gravelly clay loam, dark reddish brown (7.5YR 3/4) moist; weak very fine subangular blocky structure; slightly hard, sticky and plastic; common very fine roots; many medium interstitial and common very fine tubular pores; common thin clay films on ped faces and in pores; 15 percent pebbles, 10 percent cobbles; neutral (pH 6.7); clear wavy boundary.

B22t–7 to 17 inches; strong brown (7.5YR 5/6) gravelly sandy clay loam, dark brown (7.5YR 3/4) moist; moderate fine subangular blocky structure; slightly hard, sticky and plastic; few very fine, fine and medium roots; many medium interstitial and common very fine tubular pores; common moderately thick clay films line ped faces and pores; 20 percent pebbles, 10 percent cobbles; neutral (pH 7.0); clear wavy boundary.

R–17 to 24 inches; well fractured, partially weathered brown metavolcanic rock.

Range in Characteristics: The depth to bedrock ranges from 10 to 20 inches. Reaction ranges from medium acid to neutral.

The A1 horizon has color value of 4 or 5 (3 to 4 moist) and chroma of 4. The hue is 7.5YR and 10YR. It is loam or light clay loam modified by up to 25 percent gravel and cobbles.

The B2 horizon has color value of 3 to 5 (3 to 4 moist) and chroma of 4 to 6. The hue is 7.5YR or 10YR. It is gravelly clay loam or gravelly sandy clay loam.

The C horizon may not be present.

TALLAC FAMILY

The Tallac family consists of moderately deep, well drained soils formed in material weathered from schist or other metamorphic rock. They are on dissected mountain sideslopes and ridgetops. Slopes are 20 to 80 percent. Mean annual precipitation is 40 to 60 inches, and the mean annual temperature is 45°F. Elevation ranges from 5,400 to 6,800 feet.

Taxonomic Class: Loamy-skeletal, mixed, frigid Pachic Xerumbrepts.

Typical Pedon: Reference pedon of Tallac family from an area of Tallac-Yollabolly families association, 40 to 60 percent slopes in Tehama County, California about 40 miles west of Red Bluff, 3000 feet west and 50 feet south of the NE corner of section 3, T. 27 N., R. 10 W., on a ridge close to the Trinity-Tehama County boundary, approximately 150 yds. from end of road, uphill side.

01–2 inches to 0; compact fir needles, duff and twigs.

A1–0 to 2 inches; very dark grayish brown (10YR 3/2) very gravelly loam, black (10YR 2/1) moist; weak fine granular structure; slightly hard, very friable, nonsticky and nonplastic; common very fine and few fine roots; many fine discontinuous interstitial pores; 40 percent pebbles, slightly acid (pH 6.5); abrupt smooth boundary.

B2–2 to 11 inches; dark brown (10YR 3/3) very gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; slightly hard, nonsticky and nonplastic; common very fine, medium, coarse and few fine roots; many fine discontinuous interstitial pores; 40 percent pebbles; very strongly acid (pH 4.5); abrupt smooth boundary.

C–11 to 24 inches; brown (10YR 4/3) extremely cobbly loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; slightly hard, nonsticky and nonplastic; common very fine, medium, coarse and few fine roots; many fine discontinuous interstitial pores; 30 percent pebbles to 50 percent cobbles; strongly acid (pH 5.5) abrupt smooth boundary.

R–24 to 30 inches; slightly weathered, highly fractured schist.

Range in Characteristics: The depth to bedrock ranges from 20 to 40 inches. Rock fragments make up 35 to 60 percent of the profile. Reaction ranges from slightly acid through very strongly acid.

The A horizon has dry color of 10YR 3/2, 4/4, 3/4 or 3/3 and moist color of 10YR 2/2 or 2/1. It is loam or sandy loam with 35 to 50 percent rock fragments. It has 10 to 22 percent clay.

The B horizon has dry color of 10YR 3/3, 5/3, 4/4 or 4/3 and moist color of 10YR 3/2, 2/1, 2/2 or 3/1. It is loam or sandy loam with 1 to 2 percent clay increase over the A horizon and has 35 to 60 percent rock fragments. It has 12 to 25 percent clay.

The C horizon has dry color of 10YR 4/3, 3/3, 5/4 or 4/4 and moist color of 10YR 3/3, 3/1 or 3/2. It is extremely cobbly loam or extremely cobbly sandy loam with 60 to 80 percent rock fragments and 10 to 23 percent clay.

TAMFLAT FAMILY

The Tamflat family consists of shallow, well drained soils formed in material weathered from ultramafic rocks with large amounts of iron oxide. They are on moderately steep to very steep mountain side slopes and ridges. Slopes are 35 to 70 percent. The mean annual precipitation is 50 inches and the mean annual temperature is 45°F. The elevation ranges from 4,000 to 6,000 feet.

Taxonomic Class: Clayey-skeletal, serpentinitic, frigid Lithic Haploxeralfs.

Typical Pedon: Reference pedon of Tamflat family from an area of Tamflat-Toadlake families association, 40 to 70 percent slopes about 6 miles southwest of Weed in Siskiyou County, California, hand dug pit at top of road cut about 2200 feet east of the center of corner section 23, T. 41 N., R. 6 W.:

01–1 inch to 0; loose needles and litter cover 50 percent of surface. (0 to 2 inches thick)

A–0 to 1 inch; brown (7.5YR 4/4) very cobbly loam, dark reddish brown (5YR 3/3) moist; moderate thin and medium platy structure; slightly hard, friable, nonsticky and nonplastic; common very fine roots; common fine interstitial pores; 28 percent pebbles, 30 percent cobbles; neutral (pH 7.0); abrupt smooth boundary.

B1t–1 to 10 inches; yellowish red (5YR 5/6) extremely gravelly clay loam, yellowish red (5YR 4/6) moist; moderate medium and fine subangular blocky structure; hard, firm, sticky and plastic; common very fine, few fine and medium roots; common fine interstitial pores; few thin and moderately thick clay films on ped faces; 57 percent pebbles, 5 percent cobbles; mildly alkaline (pH 7.5); clear wavy boundary.

B2t–10 to 19 inches; strong brown (7.5YR 4/6) extremely gravelly clay, strong brown (7.5YR 4/6) moist; strong fine subangular blocky structure; hard, very firm, slightly sticky and very plastic; few fine, medium and coarse roots; few fine interstitial and tubular pores; continuous thick clay films on ped faces and in pores; 53 percent pebbles, 25 percent cobbles; neutral (pH 7.2); discontinuous irregular boundary.

R–19 to 24 inches; highly fractured peridotite rock.

Range in Characteristics: The depth to bedrock ranges from 10 to 20 inches. The reaction ranges from neutral to moderately alkaline.

The A horizon has dry color of 10YR 5/3, 7.5YR 4/4, 5/4, 5/6 or 5YR 4/6 and moist color of 10YR 3/3, 7.5YR 3/4, 4/6, 3/4, 5YR 3/3, 4/4 or 3/4. It is loam, silt loam or clay loam modified by 20 to 65 percent rock fragments.

The B horizon has color of 10YR 6/6, 7.5YR 4/6, 5/6, 4/4 or 5YR 4/4, 5/6 and moist color of 10YR 4/4, 7.5YR 4/6, 5/4, 6/6, 5YR 3/4, 4/6 or 4/4. It is heavy clay loam or clay modified by 35 to 85 percent rock fragments.

The C horizon may not be present.

TOADLAKE FAMILY

The Toadlake family consists of moderately deep and deep, well drained soils formed in material weathered from ultramafic rocks and glacial till. They are on slightly dissected mountain side slopes in residual positions and glacial till. Slopes are 10 to 65 percent. The annual precipitation is 45 to 65 inches and the mean annual temperature is about 45'F. Elevation ranges from 5,300 to 6,400 feet.

Taxonomic Class: Loamy-skeletal, serpentinitic, frigid Typic Haploxeralfs.

Typical Pedon: Reference pedon of Toadlake family from an area of Toadlake family, 25 to 65 percent slopes in Siskiyou County, California, 6 miles SW of Weed in the SW< SW< section 25, T.41N., R.6W., 1.5 miles up road from crossing of Eddy Creek.

01–1 inch to 0; duff of conifer needles, manzanita leaves and dead grass.

A11–0 to 3 inches; grayish brown (10YR 5/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate fine and very fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine roots; many very fine and fine interstitial pores; 35 percent pebbles; slightly acid (pH 6.5); abrupt wavy boundary.

A12–3 to 10 inches; light gray (2.5Y 7/2) very gravelly loam, dark grayish brown (2.5Y 4/2) moist; moderate very fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; few fine, common very fine and medium roots; common very fine interstitial pores; 40 percent pebbles, 5 percent cobbles and stones; neutral (pH 7.0); clear wavy boundary.

B1–10 to 17 inches; light brownish gray (2.5Y 6/2) very gravelly sandy clay loam, dark grayish brown (2.5Y 4/2) moist; moderate fine subangular blocky structure; hard, firm, sticky and plastic; common very fine, few fine, medium and coarse roots; common very fine and medium tubular pores; few moderately thick clay films on ped faces and in pores; 45 percent pebbles; mildly alkaline (pH 7.5); abrupt wavy boundary.

B2t–17 to 34 inches; light yellowish brown (2.5Y 6/4) very gravelly clay loam; olive brown (2.5Y 4/4) moist; moderate medium and coarse subangular blocky structure; very hard, very firm, sticky and plastic; few very fine, fine and coarse roots; few fine and very fine tubular pores; many moderately thick clay films on ped faces, in pores and bridging mineral grains; 40 percent pebbles, 10 percent cobbles and stones; mildly alkaline (pH 7.5); gradual wavy boundary.

B3–34 to 56 inches; light yellowish brown (2.5Y 6/4) very gravelly sandy clay loam, olive brown (2.5Y 4/4) moist; weak coarse subangular blocky structure; extremely hard, very firm, sticky and plastic; few very fine roots; few very fine tubular pores; few thin and moderately thick clay films on ped faces, in pores and bridging mineral grains; 45 percent pebbles; mildly alkaline (pH 7.5); abrupt wavy boundary.

R–56 to 59 inches; Hard, moderately fractured ultramafic rock.

Range in Characteristics: There are two phases of Toadlake family recognized in this survey: Toadlake and Toadlake, till substratum.

Toadlake - The depth to bedrock ranges from 20 to 60 inches. Reaction ranges from slightly acid to mildly alkaline. The base saturation ranges from 65 percent.

The A horizon has color value of 5 or 6 (3 or 4 moist) and chroma of 2 through 4 moist or dry. The hue is 7.5YR, 10YR or 2.5Y. The texture is loam and heavy loam modified by 30 to 50 percent rock fragments.

The B horizon has color value of 4 through 6 (3 through 4 moist) and chroma of 2 through 4. The hue is 10YR or 2.5Y. The texture is clay loam or sandy clay loam modified by 35 to 65 percent rock fragments.

The C horizon may not be present.

Toadlake, till substratum - The depth to consolidated glacial till ranges from 30 to 50 inches. Rock fragments comprise 35 to 50 percent of the control section.

The A horizon has color value of 5 or 6 (4 moist) and chroma of 4 through 6 (3 or 4 moist). The hue is 10YR or 7.5YR. It is loam modified by 25 to 65 percent rock fragments. The reaction ranges from strongly acid to neutral.

The B2t horizon has color value of 6 (4 or 5 moist) and chroma of 2 or 3. The hue is 10YR or 2.5Y. It is loam or clay loam modified by 35 to 60 percent rock fragments.

The reaction ranges from slightly acid to mildly alkaline.

The C horizon may not be present.

TYPIC CRYAQUOLLS

Typic Cryaquolls consist of shallow to very deep, very poorly drained soils formed in material weathered from mixed geological sources. A water table exists continually at less than 20 inches depth. They occur mainly on glacial ground moraines as wet meadows. Slopes are 0 to 50 percent but generally less than 10 percent. The mean annual precipitation is 50 inches and the mean annual temperature is 40°F. The elevation ranges from 5000 to 8000 feet.

Reference Pedon: Reference soil of Typic Cryaquolls from an area of Typic Cryaquolls-Merkel family, till substratum, association, 0 to 20 percent slopes, in Siskiyou County, California, about 10 miles southwest of Weed, about 1500 feet west and 1300 feet south of the northeast corner of Section 34, T. 41 N., R. 6 W.:

01–> inch to 0; litter of decomposed grass and roots.

A11g–0 to 1 inch; black (7.5YR 2/0) sandy loam, black (7.5YR 2/0) moist; strong coarse granular structure; slightly hard, nonsticky and nonplastic; many very fine roots; many fine interstitial pores; neutral (pH 7.0); abrupt smooth boundary.

A12g–1 to 3 inches; very dark grayish brown (10YR 3/2) silt loam, with strong brown (7.5YR 5/8) mottles, very dark brown (10YR 2/2) moist; moderate fine and medium subangular blocky structure; slightly hard, nonsticky and nonplastic; common very fine roots; common fine interstitial pores; slightly acid (pH 6.5); abrupt wavy boundary.

A13–3 to 7 inches; grayish brown (10YR 5/2) loam, with strong brown (7.5YR 5/8) and light gray (10YR 7/2) mottles, very dark brown (10YR 2/2) moist; massive; hard, nonsticky and slightly plastic; common very fine, few fine and coarse roots; common very fine tubular pores; 10 percent pebbles; strongly acid (pH 5.5); abrupt smooth boundary.

B2–7 to 9 inches; grayish brown (10YR 5/2) gravelly light clay loam, dark brown (10YR 3/2) moist; massive; very hard, slightly sticky and slightly plastic; common very fine and few fine roots; few very fine tubular pores; 10 percent pebbles, 5 percent cobbles; strongly acid (pH 5.5); abrupt smooth boundary.

C–9 to 12 inches; yellowish brown (10YR 5/2) very cobbly sandy clay loam, dark brown (10YR 3/3) moist; moderate coarse subangular blocky and single grain structure; hard and loose, slightly sticky and slightly plastic; few very fine roots; 30 percent pebbles, 20 percent cobbles; strongly acid (pH 5.5); abrupt smooth boundary.

IIAbg–12 to 14 inches; grayish brown (10YR 5/2) extremely cobbly silt loam, dark brown (10YR 3/1) moist; massive; very hard, slightly sticky and slightly plastic; few very fine roots; 10 percent pebbles, 60 percent cobbles; slightly acid (pH 6.2); abrupt smooth boundary; impermeable.

IIC–14 to 17 inches; brown (10YR 5/3) extremely cobbly loamy sand, dark yellowish brown (10YR 3/4) moist; single grain; soft, nonsticky and nonplastic; few fine and very fine roots; 15 percent pebbles, 60 percent cobbles; slightly acid (pH 6.5); saturated, water table, abrupt irregular boundary.

R–17 to 19 inches; consolidated glacial till.

Range in Characteristics: The depth to consolidated glacial till or bedrock ranges from 16 to over 40 inches. The reaction ranges from neutral to strongly acid. Rock fragments, consisting of pebble and cobbles, comprise 0 to 70 percent of the profile volume. The soils are continually saturated with water most of the time and the water table is no lower than 20 inches during summer months. The mean summer soil temperature at 20 inches is less than 43'F.

The A horizon has color value of 4 or 5 (2 or 3 moist) and chroma of 1 through 3. The hue is 10YR, 7.5YR or 2.5Y. It is sandy loam, loam or silt loam modified by 0 to 10 percent rock fragments.

The B or C horizon has color value of 5 through 7 (3 through 5 moist) and chroma of 2 through 4; 10YR and 7.5YR 5/6-8 mottles are common. The hue is 10YR or 2.5Y. The texture is heavy sandy loam, silt loam, sandy clay loam, silty clay loam or clay loam modified by 5 to 60 percent rock fragments.

The C horizon may or may not be present.

TYPIC XERORTHENTS

Typic Xerorthents consists somewhat excessively drained, moderately deep to deep soils formed in material weathered from metasedimentary and metavolcanic rocks. They are dissected mount side slopes. Slopes are 50 to 120 percent and associated with skree and colluvium. Mean annual precipitation ranges from 40 to 60 inches and the mean annual temperature is 55°F. Elevation ranges from 2,000 to 5,000 feet.

Reference Pedon: Reference soil of Typic Xerorthents from an area of Typic Xerorthents-Neuns family association, 60 to 80 percent slopes in Trinity County about 8 miles northeast of Hayfork, California in the NW< SE< section 33, T. 33 N., R. 11 W.:

01–1 inch to 0; compact layer of litter, duff and needles.

A11–0 to 4 inches; light brownish gray (10YR 6/2) extremely gravelly loam; very dark grayish brown (2.5Y 3/2) moist; single grain, soft, nonsticky and nonplastic; many very fine and common fine roots; common very fine and fine continuous interstitial pores; 70 percent pebbles, 5 percent cobbles; neutral (pH 7.0); clear smooth boundary.

A12–4 to 15 inches; light yellowish brown (2.5Y 6/4) extremely gravelly loam, olive brown (2.5Y 4/4) moist; single grain, soft, nonsticky, nonplastic; many very fine, fine and medium roots; common very fine and fine continuous interstitial pores; 80 percent pebbles, 5 percent cobbles; neutral (pH 6.8); gradual wavy boundary.

C1–15 to 30 inches; pebbles and cobbles, many very fine and common fine roots.

C2–30 to 48 inches; cobbles and pebbles.

Range in Characteristics: The depth to a lithic contact ranges from 20 to over 40 inches. Coarse fragments make up over 60 percent of the profile volume. Reaction ranges from medium acid to neutral.

The A horizon has color value of 6 through 7 (3 or 4 moist) and chroma of 2 through 4. The hue is 10YR or 2.5Y. The texture is sandy loam or loam. The C horizon is about 95 percent rock fragments consisting of pebbles and cobbles.

The C horizon may not be present.

WAPAL FAMILY

The Wapal family consists of deep and moderately deep, well drained soils formed in material weathered from glacial material. They are on glacial moraines. Slopes are 0 to 50 percent. Mean annual precipitation is 50 to 70 inches and the mean annual temperature is 45°F. Elevation ranges from 5,000 to 6,500 feet.

Taxonomic Class: Sandy-skeletal, mixed, frigid Typic Xerorthents.

Typical Pedon: Reference pedon of Wapal family from an area of Jayar, deep-Wapal families complex, 10 to 50 percent slopes in Shasta County, CA, about 12 miles SW of Dunsmuir, about 400 feet NNE of the SW corner section 34, T. 38 N., R. 5 W.:

01–1 inch to 0; duff of manzanita and huckleberry oak leaves.

A1–0 to 4 inches; brownish yellow (10YR 6/6) very stony loam, dark yellowish brown (10YR 4/4) moist; weak fine granular structure; soft, very friable, slightly sticky and nonplastic; many fine, medium, and few coarse roots; many very fine interstitial pores; 30 percent pebbles, 17 percent stones; slightly acid (pH 6.5); gradual wavy boundary.

C1–4 to 22 inches; very pale brown (10YR 7/4) very stony sandy loam, 30 percent stones, yellowish brown (10YR 5/6) moist; single grain; soft, very friable, nonsticky and nonplastic; common medium and few coarse roots; many very fine interstitial pores; 30 percent pebbles, 25 percent stones; neutral (pH 6.7); gradual wavy boundary.

C2–22 to 41 inches; light yellowish brown (2.5Y 6/4) extremely stony, loamy sands, (40 percent stones) olive brown (2.5Y 4/4) moist; single grain; loose, loose, nonsticky and nonplastic; common fine roots; many very fine interstitial pores; 40 percent pebbles, 40 percent stones; neutral (pH 7.0); gradual wavy boundary.

C3–41 to 65+ inches; light brownish gray (2.5Y 6/2) extremely stony loamy sands, (50 percent stones) very dark grayish brown (2.5Y 3/2) moist; massive; loose, loose, nonsticky and nonplastic; few fine and medium roots; few very fine interstitial pores; 15 percent pebbles, 50 percent stones; neutral (pH 7.0).

Range in Characteristics: The depth to bedrock or compacted glacial till is over 40 inches. Reaction ranges from medium acid through neutral.

The A horizon has color value of 4 through 6 (2 through 4 moist) and chroma of 2 through 4. The hue is 10YR and 2.5Y. (Thickness of the darker surface horizon is insufficient to make a mollic or umbric epipedon.) The texture is sand loam, loam or silt loam modified by 35 to 75 percent rock fragments.

The C horizon has color value of 5 through 7 (3 through 6 moist) and chroma of 2 through 6. The hue is 10YR and 2.5Y. The texture is sandy loam to loamy sand, modified by 50 to 80 percent rock fragments.

WASHOUGAL FAMILY

The Washougal family consists of moderately deep and deep, somewhat excessively drained soils which have formed in volcanic ash deposited over lava flows. They occur on gentle to steeply sloping portion of lava flows and glacial outwash. Slopes are 0 to 80 percent. Mean annual precipitation ranges from 35 to 70 inches and the mean annual temperature is about 53°F. Elevation ranges from 2,000 to 5,000 feet.

Taxonomic Class: Medial-skeletal, mesic Andic Xerumbrepts.

Typical Pedon: Reference pedon of the Washougal family from an area of Washougal family, 0 to 20 percent slopes, 3/4 mile west of the swobe site, > mile east of Ash Creek, approximately 660 feet south, 520 feet west of the NE corner of Section 35, T. 40 N., R. 1 W.

01–3 inches to 0; Pine needles and litter.

A11–0 to 4 inches; dark brown (10YR 3/3) gravelly loam, dark brown (7.5YR 3/2) moist; weak fine subangular blocky structure; soft, loose, nonsticky and nonplastic; common very fine interstitial pores; 15 percent pebbles; slightly acid (pH 6.5); clear smooth boundary; smeary.

A12–4 to 10 inches; dark brown (10YR 4/3) very cobbly fine sandy loam, dark brown (7.5YR 3/2) moist; weak fine subangular blocky structure; soft, loose, nonsticky and nonplastic; many very fine and fine, common medium and coarse roots; many very fine interstitial pores; 25 percent pebbles, 40 percent cobbles; neutral (pH 7.0); clear wavy boundary; smeary.

B2–10 to 30 inches; brown (7.5YR 4/4) extremely cobbly fine sandy loam, dark reddish brown (5YR 3/4) moist; weak very fine subangular blocky structure; loose, nonsticky and nonplastic; many very fine and fine, few medium and coarse roots; common fine interstitial pores; 25 percent pebbles, 45 percent cobbles; neutral (pH 7.0); on irregular boundary.

R–30 inches contact with highly fractured basalt with few coarse and common very fine roots.

Range in Characteristics: There are two phases of Washougal family recognized in this survey: Washougal and Washougal, deep.

Washougal

The depth to lithic contact ranges from 20 to 40 inches. Rock fragments compose 20 to 80 percent of the profile. Reaction ranges from medium acid to neutral.

The A horizon has color values of 3 through 5 (2 or 3 moist) and chromas of 2 through 4. The texture is dominantly sandy loam or loam modified by 15 to 65 percent rock fragments. The hue is 10YR or 7.5YR.

The B2 horizon has color value of 3 through 6 (2 through 5 moist) and chroma of 1 through 4. The hue is 10YR, 7.5YR, or 5YR. The texture ranges from fine sandy loam to loamy fine sand modified by 35 to 75 percent rock fragments.

The C horizon may not be present.

Washougal, deep

The depth to lithic contact ranges from 40 to 60 inches. Rock fragments 20 to 80 percent of the profile. Reaction ranges from slightly acid to neutral.

The A horizon has color values of 3 to 4 dry (2 or 3 moist) and chromas of 1 to 3. It is dominantly loam or sandy loam modified by 10 to 65 percent rock fragments. The hue is 10YR.

The B horizon has color value of 7 to 4 (4 to 2 moist) and chroma of 1 to 4. The texture is dominantly coarse sandy loam to loamy sand. The hue is 10YR. Rock fragments comprise 50 to 80 percent of the volume of the subsoil.

The C horizon may not be present.

WEITCHPEC FAMILY

The Weitchpec family consists of moderately deep, well drained soils formed in material weathered from ultramafic rock such as serpentine. They are on somewhat dissected mountain side slopes. Slopes are 20 to 90 percent. Mean annual precipitation ranges from 40 to 70 inches and the mean annual temperature is 55°F. Elevation ranges from 1,200 to 5,500 feet.

Taxonomic Class: Loamy-skeletal, serpentinitic, mesic Typic Xerochrepts.

Typical Pedon: Reference pedon of Weitchpec family from an area of Weitchpec family, 40 to 60 percent slopes about 11 miles west of Castella in Shasta County, CA, about 900 feet south of the north < corner section 24, T. 38 N., R. 6 W.:

01–1 inch to 0; litter and duff of squaw carpet and huckleberry oak leaves.

A1–0 to 5 inches; light gray (10YR 7/2) gravelly loam, grayish brown (10YR 5/2) moist; moderate fine and medium granular structure; soft, very friable, nonsticky and nonplastic; common very fine, fine, medium and few coarse roots; common very fine and fine interstitial and tubular pores; 30 percent pebbles; slightly acid (pH 6.5); clear smooth boundary.

B1–5 to 11 inches; white (10YR 8/2) very gravelly loam, pale brown (10YR 6/3) moist; moderate fine subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common very fine, fine, few medium and coarse roots; common very fine and fine interstitial and tubular pores; 35 percent pebbles; slightly acid (pH 6.5); clear smooth boundary.

B21–11 to 17 inches; white (10YR 8/2) very gravelly loam, light olive brown (2.5Y 5/4) moist; moderate fine subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; few very fine, fine, and medium roots; common very fine and fine interstitial pores and common very fine, fine and medium tubular pores; 40 percent pebbles; neutral (pH 7.0); clear wavy boundary.

B22–17 to 25 inches; pale yellow (2.5Y 7/4) very gravelly loam, light olive brown (2.5Y 5/4) moist; moderate fine subangular blocky structure; slightly hard, very friable slightly sticky and nonplastic; few fine roots; few very fine and fine interstitial and tubular pores; 45 percent pebbles; neutral (pH 7.0); clear wavy boundary.

R–25 to 38 inches; highly fractured, ultramafic rock.

Range in Characteristics: The depth to bedrock ranges from 20 inches to over 40 inches. Rock fragments make up 35 to 60 percent of the solum. Reaction ranges from medium acid to mildly alkaline.

The A horizon has hue of 7.5YR, 10YR and 2.5Y. The color value is 6 or 7 (3 through 5 moist). The chroma is 2 through 4. Textures are loam to sandy loam with 25 to 40 percent gravel.

The B horizon has hue of 7.5YR, 10YR or 2.5Y. Color value is 5 through 8 (4 through 6 moist). The chroma is 2 through 6. Textures are loam to sandy loam with 35 to 55 percent gravel.

The C horizon may not be present.

WINTONER FAMILY

The Wintoner family consists of moderately deep and deep, well drained soils formed in material weathered from basic intrusive rocks (principally gabbro and diorite). They are on dissected mountain side slopes. Slopes are 20 to 80 percent. The mean annual precipitation is 55 inches and the mean annual temperature is 44°F. The elevation ranges from 5,000 to 6,500 feet.

Taxonomic Class: Fine-loamy, mixed, frigid Ultic Haploxeralfs.

Typical Pedon: Reference pedon of Wintoner family from an area of Wintoner-Jayar families complex, 20 to 50 percent slopes, in Siskiyou County, California, about 6 miles northwest of Dunsmuir, about 1> miles northeast of Castle Lake, about 1000 feet south and 400 feet west of the northeast corner of section 18, T. 39 N., R. 4 W.:

01–1> inches to 0; well matted duff and litter.

A1–0 to 5 inches; dark brown (10YR 4/3) gravelly sandy loam, dark brown (7.5YR 3/3) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; common fine, few fine, medium and coarse roots; many fine interstitial pores; 15 percent pebbles; medium acid (pH 6.0); abrupt smooth boundary.

A3–5 to 11 inches; brown (7.5YR 5/4) gravelly loam, dark brown (7.5YR 4/4) moist; weak medium and fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine, fine and medium roots; common fine interstitial pores; 20 percent pebbles, 5 percent cobbles; slightly acid (pH 6.0); clear wavy boundary.

B2t–11 to 21 inches; brownish yellow (10YR 6/6) loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine, few fine medium and coarse roots; common fine tubular pores; 10 percent pebbles; few thin clay films on ped faces and in pores; strongly acid (pH 5.5); gradual smooth boundary.

B3t–21 to 30 inches; brownish yellow (10YR 6/6) gravelly loam, dark yellowish brown (10YR 4/4) moist; weak coarse subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; few very fine, fine and medium roots; few fine tubular pores; 20 percent pebbles, 5 percent cobbles; few thin clay films on ped faces and in pores; strongly acid (pH 5.5); gradual wavy boundary.

C1–30 to 45 inches; brownish yellow (10YR 6/6) very gravelly sandy clay loam, dark yellowish brown (10YR 4/4) moist; relict rock structure; hard, very firm, slightly sticky and slightly plastic; few very fine and fine roots; few fine tubular pores; 40 percent pebbles; strongly acid (pH 5.5); diffuse wavy boundary.

Cr–45 to 53 inches; highly weathered basic intrusive rock.

Range in Characteristics: The depth to bedrock ranges from 25 to 50 inches. The reaction ranges from strongly acid to slightly acid.

The A horizon has dry color of 10YR 4/4, 4/3, 5/6, 5/4, 6/4, 7.5YR 4/4 or 6/4 and moist color of 10YR 5/4 4/4, 3/4, 7.5YR 3/3, 4/4, 2/3 or 3/4. The texture is sandy loam or loam modified by 10 to 30 percent rock fragments.

The B horizon has dry color of 10YR 5/4, 5/6, 6/4, 6/6. 6/8 or 2.5Y 7/4 and moist color of 10YR 3/4, 4/4, 4/6, 6/6 or 2.5Y 4/4. The texture is fine sandy loam, loam or sandy clay loam modified by 15 to 35 percent rock fragments. Some pedons lack a C horizon.

The C horizon may not be present.

XEROFLUVENTS

Xerofluvents are brownish to dark brownish soils that have formed on flood plains, fans and terraces along streams and rivers and are subject to occasional flooding. They occur on level to gentle slopes.

Textures range from loam fine sandy to loams and are excessively drained to well drained. The amount of coarse fragments, within the profile, varies and is without order. The vegetation varies widely from brush, shrubs and hardwood to commercial timber.

XEROLLS

Xerolls consist of shallow to deep moderately well to somewhat poorly drained soils formed in residual and colluvial material weathered from mixed rock sources. They are on level to gently sloping moist to dry mountain meadows. Slopes are 0 to 20 percent. Annual precipitation ranges from 35 to 55 inches and the mean annual soil temperature is 45 to 52°F. The elevation ranges from 3,000 to 6,500 feet. The soils have a water table in the winter months. The base saturation is over 50 percent.

Reference pedon of Xerolls from an area of Aquolls-Xerolls complex, 0 to 20 percent slopes, in Sand Flat on Mt. Shasta, Section 31, T. 41 N., R. 3 W.

The surface horizon is 5 to 11 inches thick. It has color value of 3 through 5 (1 through 3 moist) and chroma of 1 through 3. The hue is 7.5YR, 10YR, or 2.5Y. It is sandy loam, loam, silt loam or silty clay loam modified by 15 to 45 percent rock fragments.

The subsoil is 6 to 40 inches thick. It has color value of 5 or 6 (2 through 4 moist) and chroma of 2 through 5. The hue is 10YR, 7.5YR, or 2.5Y. It is loam, clay loam, or silty clay loam modified by 25 to 60 percent rock fragments.

YALLANI FAMILY

The Yallani family consists of deep, well drained to excessively well drained soils that formed in material weathered from basalt and wind blown volcanic ash. They are on dissected mountainside. Slopes are 0 to 75 percent. In proximity to Little Glass Mt., Yallani family has an overburden of coarse rhyolite pumice cinders. This overburden ranges from 1 to 14 inches. Mean annual precipitation is about 40 inches and the mean annual air temperature is 45°F. The elevation ranges from 4,500 to 6,500 feet.

Taxonomic Class: Medial-skeletal, frigid Andic Xerochrepts.

Typical Pedon: Reference pedon of Yallani family from an area of Yallani-Sheld families complex, 20 to 50 percent slopes, near the center of section 32, T. 41 N., R. 1 E., M.D.M.; 0.5 mi. west from intersection of Black Fox Lookout road and Edson Creek road.

01–1 inch to 0; duff composed of white fir needles and manzanita leaves.

A1–0 to 2> inches; brown (7.5YR 4/4) coarse sandy loam, dark reddish brown (5YR 3/3) moist; single grain; loose, nonsticky and nonplastic; common very fine roots; common very fine and fine interstitial pores; 10 percent pebbles; slightly acid (pH 6.5); gradual wavy boundary.

A3–2> to 10 inches; brown (7.5YR 5/4) gravelly coarse sandy loam, dark reddish brown (5YR 3/4) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine, fine, medium and coarse roots; common fine interstitial pores; 15 percent pebbles, 5 percent cobbles; slightly acid (pH 6.5) gradual wavy boundary.

IIB1–10 to 20 inches; brown (7.5YR 5/4) very gravelly loam, reddish brown (5YR 4/4) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine and very fine roots; common fine and very fine interstitial pores; 30 percent pebbles, 5 percent cobbles; slightly acid (pH 6.5); gradual wavy boundary.

IIB21–20 to 33 inches; strong brown (7.5YR 5/6) very gravelly loam, strong brown (7.5YR 4/6) moist; weak fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common fine and very fine roots; common very fine interstitial pores; 35 percent pebbles, 5 percent cobbles; medium acid (pH 6.0); gradual wavy boundary.

IIB22–33 to 49 inches; reddish brown (5YR 5/4) very gravelly loam, reddish brown (5YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine roots; common very fine and many fine interstitial pores; 35 percent pebbles, 5 percent cobbles; medium acid (pH 6.0); gradual wavy boundary.

Cr–49 to 56 inches; paralithic contact with fractured andesite.

Range in Characteristics: There are two phases of Yallani family recognized in this survey: Yallani and Yallani, pumice overburden.

Yallani

The depth to bedrock ranges from 40 to 60 inches. Rock fragments average 35 to 60 percent of the control section. Reaction ranges from medium acid to neutral.

The A horizon has color value of 4 through 6 (3 through 5 moist) and chroma of 2 through 4. The hue is 7.5YR or 5YR. It is coarse sandy loam to fine sandy loam modified by up to 30 percent rock fragments.

The B2 horizon has color value of 4 through 6 (3 through 5 moist) and chroma of 2 through 4. The hue is 5YR or 7.5YR. It is loam or fine sandy loam modified by 35 to 50 percent rock fragments.

The C horizon may not be present.

Yallani, pumice overburden

Pumice overburden ranges from 1 to 14 inches. The overburden is very pale brown to white. The texture is coarse sandy loam to loamy coarse sand. Rock fragments in the overburden make up 40 to 80 percent.

Thickness of the solum ranges from 50 inches to an undetermined depth. Rock fragments in the overburden make up 40 to 80 percent. Rock fragments in the buried soil make up 35 to 45 percent of the solum. Reaction ranges from slightly acid to neutral.

The overburden is very pale brown to white. The texture is very cindery coarse sandy loam ranging to extremely cindery loamy coarse sand.

The buried soil has color value of 5 or 6 (3 or 4 moist) and chroma of 4 through 6. The hue is 7.5YR. It is sandy loam or fine sandy loam modified by 15 to 40 percent rock fragments.

YOLLABOLLY FAMILY

The Yollabolly family consists of shallow, well to excessively drained soils formed in material weathered from schist and other metamorphosed acidic rock. They are on dissected mountain side slopes. Slopes are 20 to 80 percent. Annual precipitation is 40 to 60 inches and the mean annual temperature is 45°F. Elevation ranges from 5,400 to 8,000 feet.

Taxonomic Class: Loamy-skeletal, mixed, acid, frigid Lithic Xerorthents.

Typical Pedon: Reference pedon of Yollabolly family from an area of Tallac-Yollabolly families association, 40 to 60 percent slopes in Tehama County, California about 40 miles west of Red Bluff, 2200 feet west and 200 feet north of the NE corner of section 3, T. 27 N., R. 10 W., on a ridge close to the Trinity-Tehama County boundary:

01–1 inch to 0; white fir needles and duff.

A1–0 to 4 inches; dark brown (10YR 3/3) very gravelly loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; slightly hard, nonsticky and nonplastic; common very fine and few fine roots; many very fine discontinuous interstitial pores; 35 percent pebbles; strongly acid (pH 5.5); clear smooth boundary.

C–4 to 6 inches; yellowish brown (10YR 5/4) very gravelly loam, dark yellowish brown (10YR 3/4) moist; massive; slightly hard, nonsticky and nonplastic; common very fine and few fine roots; many very fine discontinuous interstitial pores; 30 percent pebbles, 10 percent cobbles; very strongly acid (pH 4.5); abrupt smooth boundary.

R–6 to 10 inches; slightly weathered, highly fractured schist.

Range in Characteristics: Depth to bedrock ranges from 6 to 20 inches. Rock fragments make up 35 percent or more of the profile. Reaction ranges from strongly acid to very strongly acid.

The A horizon has color value of 5 or 6 (3 or 4 moist) and chroma of 2 or 3. The hue is 10YR or 2.5Y. Thickness ranges from 1 to 5 inches. The texture is loam or sandy loam modified by 30 to 35 percent rock fragments.

The C horizon has color value of 5 or 6 (3 or 4 moist) and chroma of 2 through 4 but not in combinations making an umbric epipedon. The hue is 10YR or 2.5Y. Thickness ranges from 2 to 15 inches. The texture is loam or sandy loam, modified by 35 or more percent rock fragments.

Taxonomic Unit Descriptions (Order 5)

Soil Subgroups (Order 5)

DYSTRIC CRYOCHREPTS

Dystric Cryochrepts are moderately deep to deep, well-drained soils formed on Pre-Cretaceous and Pre-Silurian metavolcanics. They are on mountain sideslopes and ridges at elevations of 6,200 to 8,000 feet. Slopes range from 40 to 65 percent. Annual precipitation ranges from 50 to 60 inches. The mean annual soil temperature ranges between 32°F and 47°F. The base saturation is assumed to be less than 60 percent throughout.

The A horizon is 3 to 8 inches thick. Its dry color is 10YR 3/3 or 2.5Y 7/6 and moist color is 10YR 2/2 or 2.5Y 4/5. The texture is sandy loam to loam with rock fragments ranging from 10 to 55 percent.

The B horizon is 6 to 20 inches thick. Its dry color is 10YR 5/3 or 2.5Y 7/6 and moist color is 10YR 4/3 or 2.5Y 5/6. The texture is loam to sandy clay loam with rock fragments ranging from 35 to 60 percent.

The C horizon is 5 to 36 inches thick. Its dry color is 10YR 5/4 or 2.5Y 7/8 and moist color is 10YR 3/2 or 2.5Y 5/6. The texture is loamy sand to sandy loam with rock fragments of 40 to 80 percent.

DYSTRIC XEROCHREPTS

Dystric Xerochrepts are deep, well-drained soils formed on Pre-Cretaceous metamorphics and Pre-Silurian metavolcanics. They are found on ground and lateral moraines at elevations 4,500 to 6,500 feet. Slopes range from 5 to 40 percent. Annual precipitation ranges from 50 to 70 inches. The mean annual soil temperature ranges between 47°F to 59°F. The base saturation is assumed to be less than 60 percent throughout.

The A horizon is 4 to 18 inches thick. Its dry colors are 7.5YR and 2.5Y with values ranging 4 to 6 and chromas of 3 to 6. Moist colors are 7.5YR to 2.5Y with values and chromas of 4. The textures range from sandy loam to fine sandy loam with rock fragments of 25 to 50 percent.

The B horizon is 6 to 23 inches thick. Its dry colors are 10YR and 2.5Y with values of 5 to 7 and chormas of 4 to 6. Moist colors are 10YR and 2.5Y with values of 3 to 5 and chromas of 3 to 6. The textures range from sandy loam to loam with rock fragments of 35 to 60 percent.

The C horizon is 15 to 34 inches thick. Its dry color are 10YR and 2.5Y with values of 6 and 7 and chromas of 4 to 6. Moist colors are 10YR and 2.5Y with values of 4 and 5 and chromas of 4 to 6. The textures range from loamy sand to loam with rock fragments of 50 to 80 percent.

LITHIC CRYOCHREPTS

Lithic Cryochrepts are shallow and moderately well-drained soils formed on Pre-Cretaceous metavolcanics. They are formed on mountain ridges and very steep sideslopes at elevations of 7,000 to 9,000 feet. Slopes range from 5 to 60 percent. The annual precipitation ranges from 50 to 60 inches. The mean annual soil temperature ranges between 32°F and 47°F.

The A horizon is 6 to 10 inches thick. Its dry colors are 10YR and 2.5Y with values of 5 to 7 and chromas 3 and 4. The moist colors are 10YR and 2.5Y with values of 3 and chromas of 4. The textures range from sandy loam to sandy clay loams with rock fragments of 20 to 70 percent.

The B horizon is 9 to 10 inches thick. Its dry colors are 2.5Y to 10YR with values of 5 and 7 and chromas of 3 and 4. The moist colors are 2.5Y and 10YR with values and chromas of 3 and 4. The textures range from loam to clay loam with rock fragments of 35 to 70 percent.

The bedrock is at depths less than 20 inches.

LITHIC CRYORTHENTS

Lithic Cryorthents are shallow, well-drained soils formed on Pre-Cretaceous metamorphics. They are on mountain sideslopes and ridges at elevations of 5,500 to 7,000 feet. Slopes range from 35 to 80 percent. The annual precipitation ranges from 50 to 90 inches. The mean annual soil temperature ranges from 32°F to 46°F.

The A horizon is 4 to 8 inches thick. Its dry colors are 2.5Y and 10YR with values of 5 and 4 and chromas of 4. Moist color is 10YR with values of 4 and chroma of 4. Texture ranges from loamy sand to sandy loams with rock fragments of 40 to 60 percent.

The C horizon is 9 to 10 inches thick. Its dry colors are 2.5Y to 10YR with values 5 and 7 and chromas of 3 or 4. Moist color is 2.5Y 3/4. Texture is loamy sand with 60 to 85 percent rock fragments.

The bedrock is at depths less than 20 inches.

LITHIC CRYUMBREPTS

Lithic Cryumbrepts are shallow, well-drained soils formed on granitic and Pre-Silurian metavolcanics bedrock. They are on mountain sideslopes and ridges at elevations of 6,500 to 8,500 feet. Slopes range from 40 to 70 percent. Annual precipitation is 55 to 65 inches. The mean annual soil temperature ranges between 32°F and 47°F.

The A horizon is 8 to 10 inches thick. Its dry color is 10YR 2/1 or 10YR 3/2 and moist color is 10YR 3/2. THe texture is sandy loam to loamy sand with rock fragments ranging from 15 to 50 percent.

The C horizon is 12 to 14 inches thick. Its dry color is 10YR 2/2 or 3/4 and moist color is 10YR 4/3 or 2.5Y 6/6. The texture is loam sand to sand with rock fragments ranging from 50 to 80 percent.

Bedrock is a depth of less than 20 inches.

LITHIC XEROCHREPTS

Lithic Xerochrepts are shallow, well to moderately well-drained soils formed on ultramafics, Pre-Cretaceous metamorphics, Pre-Silurian metavolcanics. They are on steep ridges and upper mountain sideslopes at elevations of 6,000 to 7,500 feet. Slopes ranges from 25 to 65 percent. The annual precipitation ranges from 50 to 55 inches. The mean annual soil temperature ranges from 42°F to 50°F.

The A horizon is 4 to 14 inches thick. Its dry colors are 10YR and 2.5Y with values of 4 to 7 and chromas of 3 to 6. The moist colors 10YR, 7.5YR and 2.5Y with values of 4 and chromas of 2 to 4. The texture is sandy loam to loam with rock fragments of 15 to 75 percent.

The B horizon is 4 to 13 inches thick. Dry colors are 10YR with values of 4 to 6 and chromas of 3 to 8. The moist colors are 10YR and 2.5Y with values of 3 to 5 and chromas of 3 to 8. The textures are loam to sandy clay loam with rock fragments of 35 to 75 percent.

Bedrock is at a depth of less than 20 inches.

LITHIC XERORTHENTS

Lithic Xerorthents are shallow, well-drained soils formed on Pre-Cretaceous metamorphics. They are on mountain sideslopes and ridges at elevations of 3,500 to 6,000 feet. Slopes range from 30 to 80 percent. The annual precipitation ranges from 50 to 65 inches. The mean annual soil temperature ranges from 47°F to 59°F.

The A horizon is 6 to 18 inches thick. Dry colors are 10YR and 7.5Y with values of 5 and 6 and chromas of 3 and 4. The moist colors are 10YR and 7.5YR with values and chromas of 4. The texture is sandy loam to loam with rock fragments of 35 to 50 percent.

Bedrock is at depth of less than 20 inches.

LITHIC XERUMBREPTS

Lithic Xerumbrepts are shallow, well-drained soils formed on granitic bedrock. They are on mountain sideslopes and ridges at elevations of 5,500 to 6,500 feet. Slopes range from 20 to 80 percent. Annual precipitation is 60 to 70 inches. The mean annual soil temperature ranges from 40°F to 50°F. The soils are usually dry from late June to mid-September and is moist the rest of the year.

The A horizon is 2 to 7 inches thick. Its dry color is 10YR 3/2 or 2.5Y 4/4 and moist color is 10YR 2/1 or 2.5Y 3/2. The texture is sandy loam with rock fragments of 30 to 60 percent.

The C horizon is 11 to 18 inches thick. Its dry color is 10YR 4/2 or 2.5Y 8/4. The textures range from loamy sand to sandy loam with rock fragments of 30 to 75 percent.

Bedrock is at a depth of less than 20 inches.

PACHIC XERUMBREPTS

Pachic Xerumbrepts are moderately deep, well-drained soils formed on granitic and Pre-Cretaceous metamorphic bedrock. They are on mountain sideslopes and ridges at elevations of 4,500 to 6,500 feet. Slopes range from 15 to 75 percent. Annual precipitation is 40 to 60 inches. The mean annual soil temperature ranges from 40°F to 55°F.

The A horizon is 21 to 26 inches thick. Its dry color is 10YR 4/3 or 3/2 and moist color is 10YR 3/2 or 3/1. The texture is loam to sandy loam with coarse fragments ranging from 20 to 45 percent.

The B horizon is 10 to 20 inches thick. Its dry color is 10YR 5/3 or 5/2 and moist color is 10YR 3/2 or 3/3. The texture is loam to sandy loam with coarse fragments ranging from 20 to 50 percent.

The C horizon is 5 to 9 inches thick. Its dry color is 2.5Y 6/2 or 5/2 and moist color is 2.5Y 4/2 or 4/1. The texture is loam with coarse fragments ranging from 30 to 60 percent.

TYPIC XEROCHREPTS

Typic Xerochrepts are moderately deep to deep, well-drained soils formed on ultramafic and Pre-Silurian metavolcanics. They are on mountain sideslopes and ground moraines at elevations of 3,500 to 4,500 feet. Slopes range from 50 to 70 percent. Annual precipitation ranges from 50 to 70 inches. The mean annual soil temperature ranges from 47°F to 59°F.

The A horizon is 4 to 23 inches thick. The dry colors are 2.5YR and 7.5YR with values of 4 and 5 and chromas of 4 to 6. The moist colors are 2.5YR and 7.5YR with values of 3 and 4 and chromas of 4 to 6. The texture is loam with rock fragments of 25 to 45 percent.

The B horizon is 12 to 22 inches thick. The dry colors are 5YR and 10YR with values of 5 and 6 and chromas of 6 to 8. The moist colors are 5YR and 10YR with values of 3 and 4 and chromas of 4 to 6. The textures are loam to sandy clay loam with rock fragments of 35 to 65 percent.

The C horizon is 15 to 22 inches thick. The dry color is 10YR 6/8. The moist color 10YR with values of 4 and 5 and chromas of 6 to 8. The textures is sandy clay loam with values of 4 and 5 and chromas of 6 to 8. The texture is sandy clay loam with rock fragments of 30 to 50 percent.

ULTIC HAPLOXERALFS

Ultic Haploxeralfs are moderately deep, moderately well-drained soils formed on ultramafics, Pre-Cretaceous metamorphics and Pre-Silurian metavolcanics. They are formed on simple to convex or undulating mountain sideslopes at elevations of 2,800 to 5,500 feet. Slopes range from 40 to 70 percent. The annual precipitation ranges from 55 to 65 percent. The mean annual soil temperature ranges from 47°F to 59°F. Base saturation ranges from 50 to 60 percent.

The A horizon is 6 to 20 inches thick. Its dry colors are 2.5Y, 7.5YR and 5YR with values of 4 to 6 and chromas of 3 to 6. The moist colors are 2.5YR, 5 YR, 7.5YR with values of 4 and chromas of 3 to 6. The textures range from loam to clay loam with rock fragments of 10 to 50 percent.

The B horizon is 16 to 30 inches thick. Its dry and moist colors are 5YR, 7.5YR and 10YR with values of 4 to 6 and chromas of 4 to 8. The textures range from clay loam to clay with rock fragments of 35 to 80 percent.

Bedrock is at a depth of 30 to 40 inches.

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(3) Soil-Vegetation Survey in California, published by State of California Resource Agency, Dept. of Conservation, Division of Forestry.

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Glossary

Alluvium. Soil material, such as sand, silt, or clay, that has been deposited on land by streams.

Amendment. Any material, such as lime, gypsum, sawdust, or synthetic conditioner, that is worked into the soil to make it more productive. A fertilizer is also an amendment, but the term "amendment" is used most commonly for material other than fertilizer that is added to soil.

Ash (volcanic). Fine *pyroclastic* material under 4.0 mm diameter.

Association, soil. A group of soils geographically associated in a characteristic repeating pattern.

Available nutrient. That quantity of a nutrient element or compound in the soil that can be readily absorbed and assimilated by growing plants.

Available water capacity (also termed available moisture capacity). The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil.

Barrens. <10% vegetation cover and including areas identified as rock, rubble, scarps, bare soil, glaciers, river wash, cultivated, and developed lands (urban, highways, etc.).

Base saturation. The degree to which material that has base-exchange properties is saturated with exchangeable cations other than hydrogen, expressed as percentage of the cation-exchange capacity.

Bedrock. The solid rock that underlies the soil and other nonconsolidated material or that is exposed at the surface.

Broken sideslopes. Uneven sideslopes (not linear) due to mass movement, stream cut terraces, and natural erosion.

Chaparral. Characterized by relatively large and vigorous woody shrubs commonly in dense stands with a large biomass.

Clay. As a soil separate, the mineral soil particles less than 0.002 millimeter in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Claypan. A compact, slowly permeable soil horizon that contains more clay than the horizon above and below it. A claypan is commonly hard when dry and plastic or stiff when wet.

Climatic vegetation. The stabilized plant community on a particular site; it reproduces itself and does not change so long as the environment does not change.

Coarse fragments. Mineral or rock particles more than 2 millimeters in diameter.

Coarse-textured soil. Sand and loamy sand.

Cobblestone. A rounded or partly rounded fragment of rock, 3 to 10 inches in diameter.

Colluvium. Soil material, rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Concretions. Grains, pellets, or nodules of various sizes, shapes, and colors consisting of concentrations of compounds or of soil grains cemented together. The composition of some concretions is unlike that of the surrounding soil. Calcium carbonate and iron oxide are examples of material commonly found in concretions.

Conglomerate. A coarse-grained, *clastic* rock composed of rounded to subangular rock fragments, (larger than 2 mm) commonly with a matrix of sand and finer material; cements include silica, calcium carbonate, and iron oxides. The consolidated equivalent of gravel. (cf. breccia)

Control section. That part of a soil containing the horizons that determine the placement of the soil in the new system of soil classification. Generally, these horizons are between a depth of 10 inches and 40 inches.

Deep. Soils that have a depth to bedrock greater than 40 inches.

Dissected. Drainage systems cut by erosion into mountain and hillsides.

Duripan. A subsurface horizon that is cemented by silica to the point that fragments from the air-dry horizon will not slake after prolonged soaking in water or hydrochloric acid.

Enriched. Applies to the variety or number of component species and does not imply that the stands have a greater growth potential, quality, or aesthetic value. An enriched mixed conifer type typically contains more than 5 conifer species as codominants.

Eluviation. The movement of material from one place to another within the soil, in either true solution or colloidal suspension. Soil horizons that have lost material through eluviation are said to be eluvial; those that have received material are illuvial.

Field moisture capacity. The moisture content of a soil, expressed as a percentage of the oven-dry weight, after the gravitational, or free, water has been allowed to drain away; the field moisture content 2 or 3 days after a soaking rain; also called normal field capacity, normal moisture capacity, or capillary capacity.

Fine-textured soils. Moderately fine textured: Clay loam, sandy clay loam, silty clay loam. Fine-textured: Sandy clay, silty clay, and clay. Roughly, soil that has a clay content of 35 percent or more.

Flood plain. Nearly level land, consisting of stream sediments, that borders a stream and is subject to flooding unless protected artificially.

Foothill. A zone identifying sites below 2,000 feet in elevation with south or west aspects. Representative soils have a thermic temperature regime.

Genesis, soil. the manner in which a soil originates. Refers especially to the processes initiated by climate and organisms that responsible for the development of the solum, or true soil, from the unconsolidated parent material, as conditioned by relief and age of landform.

Glaciation. Glaciation on the Shasta-Trinity National Forests occur on high elevation slopes of Mt. Shasta and on volcanic uplands to the east. Glaciated landforms were formed in the last glacial period. They include terminal and lateral moraines and ground moraine.

As mountain glaciers moved downslope it scoured and plucked material from some locations and deposited it in others. The material which was transported is an unsorted mixture of boulders and cobbles to fine ashy sand.

When the downslope movement of ice ceased, the debris which was pushed or plowed in front of the glacier was deposited as low mounds or ridges, or terminal moraines. Material which was carried along the margins of the glacier was deposited or "plastered" along the sides of the 'U' shaped glacial valley. These lateral moraine deposits are usually thin. As the ice melted and receded the material which was in or on the ice was laid down as ground moraine.

In many cases morainal deposits are cemented and termed "tillite".

Ground water (geology). Water that fills all the unblocked pores of underlying material below the water table, which is the upper limit of saturation.

Hardpan. A hardened or cemented soil horizon, or layer. The soil material may be sandy or clayey, and it may be cemented by iron oxide, silica, calcium carbonate, or other substance.

Heavy soil. An old term formerly used for clayey, or fine-textured, soils.

Horizon, soil. A layer of soil, approximately parallel to the surface, that has distinct characteristics produced by soil-forming processes. These are the major horizons:

O horizon. The layer of organic matter on the surface of a mineral soil. This layer consists of decaying plant residues.

A horizon. The mineral horizon at the surface or just below an O horizon. This horizon is the one in which living organisms are most active and therefore is marked by the accumulation of humus. The horizon may have lost one or more of soluble salts, clay, and sesquioxides (iron and aluminum oxides).

B horizon. The mineral horizon below an A horizon. The B horizon is in part a layer of change from the overlying distinctive characteristics caused (1) by accumulation of clay, sesquioxides, humus, or some combination of these; (2) by prismatic or blocky structure; (3) by redder or stronger colors than the A horizon; or (4) by some combination of these. Combined A and B horizons are usually called the solum, or true soil. If a soil lacks a B horizon, the A horizon alone is the solum.

C horizon. The weathered rock material immediately beneath the solum. In most cases this material is presumed to be like that form from which the overlying horizons were formed. If the material is known to be different from that in the solum, a Roman numeral precedes the letter C.

R layer. Consolidated rock beneath the soil. The rock usually underlies a C horizon but may be immediately beneath an A or B horizon.

Humus. The well-decomposed, more or less stable part of the organic matter in mineral soils.

Igneous rock. Rock formed by solidification from a molten or partially molten state; major varieties include *plutonic* and *volcanic* rocks. (cf. intrusive, extrusive; Examples: andesite, basalt, granite)

Intermittent stream. A stream or part of a stream that flows only in direct response to precipitation. It receives little or no water from springs and no long-termed supply from melting snow or other sources.

Illuviation. The accumulation of material in a soil horizon through the deposition of suspended material and organic matter removed from horizons above. Since part of the fine clay in the B horizon (or subsoil) of many soils has moved into the B horizon from the A horizon above, the B horizon is called an illuvial horizon.

Impervious soil. A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Infiltration. The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers of material.

Jeffrey Pine Mixed Conifer Forest. A mixed forest type commonly characterized by >50% Jeffrey Pine. Incense Cedar and Douglas-fir typically are associated as co-dominants. This type occurs on soils derived from ultra mafic rocks in the mid montane zone.

Klamath Enriched Mixed Conifer Forest. A mixed conifer type characterized by stands that typically have a good distribution of 6 to 8 species. These include White Fir, Douglas-fir, Jeffrey Pine, Western White Pine, Incense Cedar, Sugar Pine, and Ponderosa Pine.

Landslide. A *mass-wasting* process, and the *landform* produced, involving moderately rapid to rapid (greater than one foot per year) downslope transport, by means of gravitational stresses, of a mass of rock and *regolith* that may or may not be water saturated.

Leaching. The removal of soluble materials from soils or other material by percolating water.

Light soil. An old term formerly used for sandy, or coarse-textured, soils.

Limestone. A sedimentary rock consisting of chiefly (more than 50%) of calcium carbonate, primarily in the form of calcite. Limestones are usually formed by a combination of organic and inorganic processes and include chemical and *clastic* (soluble and insoluble) constituents; many are fossiliferous.

Linear sideslopes. A straight or gently curved mountain sideslope.

Mass wasting (mass movement). Dislodgement and downslope transport of earth (*regolith* and rock) material as a unit under direct gravitational stress. The process includes slow displacements such as *creep*, and *solifluction*, and rapid movements such as *landslides*, rock slides and falls, earthflows, *debris flows*, and *avalanches*. Agents of fluid transport (water, ice, air) may play a subordinate role in the process.

Metamorphic rock. Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement at depth in the earth's crust. Nearly all such rocks are crystalline. (Example: schist, gneiss, quartzite)

Microrelief. Minor surface configurations of the land.

Mineral soil. Soil composed mainly of inorganic (mineral) material and low in content of organic material. Its bulk density is greater than that of organic soil.

Mixed Conifer-Fir Forest. A mixed forest type in which White Fir commonly comprises >50% of the co-dominant conifer components. Douglas-fir is the more common associate.

Mixed Evergreen Sclerophyll Forests. A dense forest type dominated by an overstory mixture of hardwood tree species. These include tan-oak, Golden Chinquapin, Madrone, and Canyon Oak.

Moderately deep. Depth to bedrock ranges from 20 to 40 inches.

Montane (Low). A zone occurring at elevations between 1,000 and 3,000 feet, the lower limits of which are usually confined to sites occupying only the cooler aspects. Representative soils in this zone are classified as having a mesic temperature regime.

Montane (Mid). This zone occurs at elevations between 3,000 and 5,000 feet. Evapo-transpiration rates are somewhat less than the preceding zone but soils still are classified as mesic. This is the zone of maximum biological activity.

Montane (Upper). The lower limits of this zone is approximately 5,000 feet but the upper limit ranges from 6,500 to 7,500 feet depending on aspect. This zone is characterized by soils with a frigid temperature regime.

Montmorillonite. A fine, platy, alumino-silicate clay mineral that expands and contracts with the absorption and loss of water. It has a high cation-exchange capacity and is plastic and sticky when moist.

Moraine (general). An accumulation of drift, with an initial topographic expression of its own, built chiefly by the direct action of glacial ice. Examples are *end*, *ground*, *lateral*, *recessional*, and *terminal* moraines. (cf. glacial till)

Mottling, soil. Irregularly marked with spots of different colors that vary in number and size. Mottling in soils usually indicates poor aeration and lack of drainage. Descriptive terms are as follows: Abundance - few, common, and many; size - fine, medium, and coarse; and contrast - faint, distance, and prominent. The size measurements are these: fine, less than 5 millimeters (about 0.2 inch) in diameter along the greatest dimension; medium, ranging from 5 millimeters to 15 millimeters (about 0.2 to 0.6 inch) in diameter along the greatest dimension; and coarse, more than 15 millimeters (about 0.6 inch) in diameter along the greatest dimension.

Munsell notation. A system for designating color by degrees of the three simple variables - hue, value, and chroma. For example, a notation of 10YR 6/4 is a color with a hue of 10YR, a value of 6, and a chroma of 4.

Outwash. Stratified sand and gravel produced by glaciers and carried, sorted, and deposited by water that originated mainly from the melting of glacial ice. Outwash deposits may occur in the form of valley fills (valley trains and/or outwash terraces) or as widespread *outwash plains*. (cf. glacial drift, glaciofluvial deposits)

Parent material. Disintegrated and partly weathered rock from which soil has formed.

Ped. An individual natural soil aggregate, such as a crumb, a prism, or a block, in contrast to a clod.

Permeability. The quality that enables the soil to transmit water or air. Terms used to describe permeability are as follows: very slow, slow, moderately slow, moderate, moderately rapid, rapid, and very rapid.

Phase, soil. A subdivision of a soil, series, or other unit in the soil classification system made because of differences in the soil that affect its management but do not affect its classification in the natural landscape. A soil series, for example, may be divided into phases because of differences in slope, stoniness, thickness, or some other characteristic that affects its management but not its behavior in the natural landscape.

pH value. A numerical means for designating acidity and alkalinity in soils. A pH value of 7.0 indicates precise neutrality; a higher value, alkalinity; and a lower value, acidity.

Porosity, soil. The degree to which the soil mass is permeated with pores or cavities.

Profile, soil. A vertical section of the soil through all its horizons and extending into the parent material.

Pumice Deposits. Pumice deposits occur on the Shasta-Trinity National Forests only in the extreme northeast corner of the forest on the margin of the Medicine Lake Highlands where they are common and extensive. The primary source on this forest is Little Glass Mountain where deposits are commonly 10 ft. deep, decreasing in depth farther from the source, to a few inches in depth 10 miles to the west and south. Nearby Pumice Stone Mountain and Paint Pot Crater are very striking land forms where deep layers of pumice were deposited on older cinder cones.

The rhyolitic pumice is white and has low bulk density, less than 1.0gm/cc. It is unweathered and unconsolidated and ranges in particle size from 22mm. to 10cm., commonly sorted in stratified deposits. Due to its young age and high elevation,

little or no profile development has taken place. On shallow deposits lodgepole pine are moderately productive and a thin organic and has layer has formed on the surface, but on deposits deeper than 4 ft. timber productivity is very low. These deposits are commercially mined.

Reaction, soil. The degree of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is precisely neutral in reaction, because it is neither acid nor alkaline. An acid, or "sour," soil is one that gives an acid reaction; an alkaline soil is one that is alkaline in reaction. In words, the degrees of acidity or alkalinity are expressed thus:

Extremely acid	Below 4.5
Very strongly acid	4.5 to 5.0
Strongly acid	5.1 to 5.5
Medium acid	5.6 to 6.0
Slightly acid	6.1 to 6.5
Neutral	6.6 to 7.3
Mildly alkaline	7.4 to 7.8
Moderately alkaline	7.9 to 8.4
Strongly alkaline	8.5 to 9.0
Very strongly alkaline	9.1 and up

Residual material. Unconsolidated, partly weathered mineral material that accumulates over disintegrating solid rock. Residual material is not soil but is frequently the material in which a soil has formed.

Ridgetop. The uppermost portion of a ridge, including the upper sideslopes.

Rill. A steep-sided channel resulting from accelerated erosion. A rill normally is a few inches in depth and width and is not large enough to be an obstacle to farm machinery.

Riparian. Includes vegetation series, other than meadows, which are adapted to habitats within the immediate influence zone of seeps, streams, bogs, and lakes.

Rock Fragments. Mineral or rock particles more than 2 millimeters in diameter.

Rock Outcrop. Rock outcrop is an exposure of bedrock projecting through the overlying detritus and soils. Bedrock includes granites, diorites, sedimentary, meta-sedimentary, volcanic, metavolcanic, ultramafic, basic intrusive, limestone, undiferential metamorphics and lava flows. The type of bedrock is identified under substratum in the Mapping Unit Description.

Rubble Land. Rubble land consists of colluvial gravels, cobbles and/or boulders talus or scree slopes. Elevation ranges from 3,000 to 12,000 feet on slopes of 10 to 70 percent. Rubble land is associated with rock outcrop and fault zones. Rubble land is normally barren of vegetation, although there may be a scattering of shrubs or trees.

Runoff (hydraulics). The part of the precipitation upon a drainage area that is discharged from the area in stream channels. The water that flows off the land surface without sinking in is called surface runoff; that which enters the ground before reaching surface streams is called groundwater runoff or seepage flow from ground water.

Sand. As a soil separate, rock or mineral fragments ranging from 0.05 to 2.0 millimeters in diameter. Most sand grains consist of quartz, but sand can be of any mineral composition. As a textural class, soil that is 85 percent or more sand and not more than 10 percent clay.

Scree. Rock fragments at the base of a cliff or a sheet of coarse debris mantling a mountain slope.

Scoria Deposits. Scoria is an inclusive term for vesicular material ejected from cinder cones or vents and includes unconsolidated cinders and consolidated pyroclastic ejecta.

Cinder cones are common on the flanks of Mt. Shasta and across the McCloud district, occurring in a random distribution. These cones usually have a consolidated base of welded or fused cinder like vesicular bombs or other ejecta or the base is formed from a frothy lava. The base in covered with a mantle of finer, unconsolidated cinders. The materials making up these cinder cones is collectively called scoria. Most scoria deposits have fine ashy overburdens but little other soil development has taken place except on older cinder cones where silica cemented horizons are common.

Timber growth is variable, from moderate to poor productivity. These deposits are extensively mines.

Scrub. Multi-stemmed woody sub-shrubs and relatively slow growing shrubs typically growing in open stands and generally associated with an arid climate typical of the Great Basin Geographical Province.

Sedimentary rock. A consolidated deposit of *clastic* particles, chemical precipitates and organic remains accumulated at or near the surface of the earth under "normal" low temperature and pres-

sure conditions. Sedimentary rocks include consolidated equivalents of *alluvium*, colluvium, *glacial drift*, and *eolian*, *lacustrine* and marine deposits (e.g., *sandstone*, siltstone, *mudstone*, claystone, and *shale*, *conglomerate* and *limestone*, dolomite, coal, etc.; cf. sediment).

Semi-barrens. 10-20% vegetation cover (climax).

Series, soil. A group of soils developed from a particular type of parent material and having genetic horizons that, except for texture of the surface layer, are similar in differentiating characteristics and in arrangement in the profile.

Shallow. Depth to bedrock is less than 20 inches.

Sierran-Cascade Mixed Conifers. A forest series typically dominated in roughly equal proportions by 5 conifer species: Ponderosa Pine, Sugar Pine, Douglas-fir, Incense Cedar, White Fir.

Sideslopes. Sideslopes are defined as: Gentle, 0 to 20 percent; Moderately Steep, 20 to 40 percent; Steep, 40 to 60 percent; Very Steep, 60 to 80 percent.

Silt. As a soil separate, mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a textural class soil that is 80 percent or more silt and less than 12 percent clay.

Solum. The upper part of a soil profile, above the parent material, in which the processes of soil formation are active. The solum in mature soil includes the A and B horizons. Generally, the characteristics of the material in these horizons are unlike those of the underlying material. The living roots and other plant and animal life characteristic of the soil are largely confined to the solum.

Structure, soil. The arrangement of primary soil particles into compound particles or clusters that are separated from adjoining aggregates and have properties unlike those of a equal mass of unaggregated primary soil particles. The principal forms of soil structure are - platy (laminated), prismatic (verticle axis of aggregates longer than horizontal), columnal (prisms with rounded tops), blocky (angular or subangular) and granular. Structureless soils are single grain (each grain by itself, as in dune sand) or massive (the particles adhering together without any regular cleavage, as in many claypans and hardpans).

Sub Alpine. The lower limit of this zone ranges between 6,500 and 7,500 feet depending on aspect The upper limit is between 9,000 and 10,000 feet. This zone includes soils with a Cryic temperature regime.

Subsoil. Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum. Technically, the part of the soil below the solum.

Surface soil. The soil ordinarily moved in tillage, or its equivalent in uncultivated soil, about 5 to 8 inches in thickness. The plowed layer.

Terrace (constructed). An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that it may soak into the soil or flow slowly to a prepared outlet without harm. Terraces in fields are generally built so they can be farmed. Terraces intended mainly for drainage have a deep channel that is maintained in permanent sod.

Texture, soil. The relative proportions of sand, silt, and clay particles in a mass of soil. The basic textural classes, in order of increasing proportion of fine particles, are sand, loamy sand, sandy loam, loam, silt loam, silt, sandy clay loam, clay loam, silty clay loam, sandy clay, silty clay, and clay. The sand, loamy sand, and sandy loam classes may be further divided by specifying "coarse," "fine," or "very fine."

Till. Unsorted and unstratified glacial drift, generally unconsolidated, deposited directly by a glacier without subsequent reworking by water from the glacier, and consisting of a heterogeneous mixture of clay, sand, gravel, and boulders varying widely in size and shape. (cf. ablation till, basal till)

Tuff. Deposited volcanic ash, normally more or less stratified and consolidated.

Ultramafic rock outcrop. Ultramafic outcrops are widely distributed throughout the Klamath Mt. Province. In much of the Trinity Forest they occur as very small sporadic areas on broken linear bands of northwest-southeast oriented ultramafic intrusions. However, ultramafic rock outcrops are fairly common on the high ridges of the largest ultramafic bodies. This is a sheet like mass covering much of the upper Sacramento and Trinity River drainages which separates the rocks of the Easter Klamath Belt from those of the Central Metamorphic Belt. Characteristically the smaller rock bodies

are serpentine while the larger masses are serpentinized peridotite*, which tends to be more highly serpentinized along contacts with adjacent geologies or along the frequent internal shear zones.

Serpentinized ultramafic outcrops are generally incompetent, fractured and highly weathered. The ridges upon which the outcrops are located tend to have gentler slopes and to be smoother and somewhat more rounded (convex) than adjacent geologies.

*Broad variation in degrees of alteration of peridotite and rock ranging from pyroxinites to dunities are included.

These outcrops rarely occur as large bodies but commonly in a complex with unproductive lithic soils. Since the ferro magnesium minerals tend to weather rapidly to clays, these associated soils are frequently fine textured. They are neutral to slightly alkaline, and vary in mineralogy from serpentinitic to oxidic. Also included are some montmorilinitic clays. All have a high Mg/Ca ratio.

Variant, soil. A soil that has properties sufficiently different from other known soils to justify a new series name, but making up such a limited geographic area that establishing a new series is not justified.

Volcanic. Pertaining to (1) the deep-seated (*igneous*) processes by which magma and associated gases rise through the crust and are extruded onto the earth's surface and into the atmosphere, and (2) the structures, rocks, and landforms produced. (cf. extrusive)

Water table. The highest part of the soil or underlying rock material that is wholly saturated with water. In some places an upper, or perched, water table may be separated from a lower one by a dry zone.

Woodland. Open stands (20-40%) of non-commercial hardwoods or conifers. Typically areas occupied by series within this group occur at either extreme in elevation. Hardwood types are restricted to hot, dry low elevation sites, and the conifer woodland series identified are limited to sub-alpine habitats.

Wilting point (or permanent wilting point). The moisture content of soil, on an oven-dry basis, at which plants (specifically sunflower) wilt so much that they do not recover when placed in a dark, humid atmosphere.