

**282 Deadwood family-Rock outcrop, metasedimentary-Voorhies family
moderately deep association
40 to 85 percent slopes**

Map Unit Components	Deadwood family	Rock outcrop, metasedimentary	Voorhies family, mod. deep
Approx. Proportion	(30%)	(30%)	(20%)
Position, Slope, and Elevation	Mountain sideslopes; 40 to 75; NW to E, 2000 to 4500 ft.; SE to W, 2000 to 4800 ft.	Mountain sideslopes and cliffs; SE to W, 2000 to 4800 ft. 2000 to 4800 ft.	Mountain sideslopes; 40 to 80; NW to E, 2000 to 4500 ft.; SE to W,
Typical Vegetation	Canyon live oak	Barren	Canyon live oak

Soil Profile Description

Surface Layer	Dark brown very gravelly loam, moderate granular structure, slightly acid	Pale brown gravelly loam, moderate subangular blocky structure, slightly acid
Subsoil	Yellowish brown very gravelly weak subangular blocky to moderate structure, medium acid	Light yellowish brown to very loam, pale brown gravelly to very gravelly clay granular loam to clay, moderate subangular blocky slightly to medium acid
Substratum		

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	10-20; sedimentary and metasedimentary rock	20-40; sedimentary and metasedimentary rock
Erosion Factor (K)	.20-.37	.20-.24
Max. Erosion Hazard	High	Very high
Soil Permeability	Moderate to rapid	Moderate to moderately slow
Soil Drainage	Well to somewhat excessively	Well to moderately well
Soil Manageability Class	3-4GE	3-4GE
Group	IV	IV
Forest Site Class	5-6	3-4
Regeneration Potential	Low	Low
Available Water Capacity (AWC)	Very low	Moderate
Upper 20 inches	1.7 inches	2.3 inches
Susceptibility to Burning Damage	High	Moderate
Hydrologic Soil Group	C	D
Unified Soil Class	0-9 ML	0-26 GC
Depth Rating	9-16 GC	
Potential Failure as Road Subgrade	No	No
Seeding Recommendations	1	1
Included Areas	20 percent inclusions of Clallam and Hecker families, deep, and Skalan family, mod. deep.	

**300 Rock outcrop, metaigneous-Lithic Xerorthents complex, metaigneous
60 to 90 percent slopes**

Map Unit Components	Rock outcrop, metaigneous	Lithic Xerorthents
Approx. Proportion	(40%)	(30%)
Position, Slope, and Elevation	Ridges and mountain sideslopes; NW to E, 600 to 4500 ft.; SE to W, 600 to 4800 ft.	Ridges and mountain sideslopes; 60 to 90; NW to E, 600 to 4500 ft.; SE to W, 600 to 4800 ft.
Typical Vegetation	Barren	Douglas-fir - Tanoak - Madrone
Soil Profile Description		
Surface Layer		Very gravelly sandy loam, weak granular structure, medium acid
Subsoil		Very gravelly sandy loam, single grain, medium acid
Substratum		
Soil Properties & Management Interpretations		
Rooting Depth (in.), Underlying Material		10-20; metaigneous and metasedimentary rock
Erosion Factor (K)		Onsite Investigations Required
Max. Erosion Hazard		Onsite Investigations Required
Soil Permeability		Rapid
Soil Drainage		Somewhat excessively
Soil Manageability Class		4Gd
Group		IV
Forest Site Class		6-7
Regeneration Potential		Low
Available Water Capacity (AWC)		Very low
Upper 20 inches		<1.2 inches
Susceptibility to Burning Damage		Onsite Investigations Required
Hydrologic Soil Group	D	C
Unified Soil Class		Onsite Investigations Required
Depth Rating		
Potential Failure as Road Subgrade	No	No
Seeding Recommendations		Onsite Investigations Required
Included Areas	30 percent inclusions of Raisio family, mod. deep and frigid soils.	

**301 Rock outcrop, metaigneous-Lithic Xerorthents complex, metaigneous
60 to 90 percent slopes**

Map Unit Components	Rock outcrop, metaigneous	Lithic Xerorthents
Approx. Proportion	(40%)	(30%)
Position, Slope, and Elevation	Ridges and mountain sideslopes; NW to E, 600 to 4500 ft.; SE to W, 600 to 4800 ft.	Ridges and mountain sideslopes; 60 to 90; NW to E, 600 to 4500 ft.; SE to W, 600 to 4800 ft.
Typical Vegetation	Barren	Douglas-fir - Tanoak - Madrone

Soil Profile Description

Surface Layer	Very gravelly sandy loam, weak granular structure, medium acid
Subsoil	Very gravelly sandy loam, single grain, medium acid
Substratum	

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material and metasedimentary rock	10-20; metaigneous
Erosion Factor (K)	Onsite Investigations Required
Max. Erosion Hazard	Onsite Investigations Required
Soil Permeability	Rapid
Soil Drainage	Somewhat excessively
Soil Manageability Class	4Gd
Group	IV
Forest Site Class	6-7
Regeneration Potential	Low
Available Water Capacity (AWC)	Very low
Upper 20 inches	<1.2 inches
Susceptibility to Burning Damage	Onsite Investigations Required
Hydrologic Soil Group	D
Unified Soil Class	C
Depth Rating	Onsite Investigations Required
Potential Failure as Road Subgrade	No
Seeding Recommendations	Onsite Investigations Required
Included Areas	30 percent inclusions of Raisio family, mod. deep and frigid soils.

**311 Holland family, deep
30 to 50 percent slopes**

Map Unit Components	Holland family, deep
Approx. Proportion	(85%)
Position, Slope, and Elevation	Mountain sideslopes; 30 to 50; all aspects; 1000 to 3500 ft.
Typical Vegetation	Douglas-fir - Tanoak - Madrone

Soil Profile Description

Surface Layer	Strong brown loam, moderate granular structure, strongly acid
Subsoil	Reddish yellow clay loam, moderate subangular blocky structure, strongly acid
Substratum	

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	40-60; metaigneous rock
Erosion Factor (K)	.20-.28
Max. Erosion Hazard	High
Soil Permeability	Moderately slow
Soil Drainage	Well
Soil Manageability Class	3E
Group	III
Forest Site Class	3
Regeneration Potential	Moderate to high
Available Water Capacity (AWC)	High
Upper 20 inches	2.1 inches
Susceptibility to Burning Damage	Moderate
Hydrologic Soil Group	B-C
Unified Soil Class	0-60 ML
Depth Rating	
Potential Failure as Road Subgrade	No
Seeding Recommendations	1
Included Areas	15 percent inclusions of Aiken family, deep, Hugo family, mod. deep, soils similiar to Holland family, deep except mod. deep , and soils on slopes less than 30 percent.

**312 Holland family, deep
30 to 50 percent slopes**

Map Unit Components	Holland family, deep
Approx. Proportion	(85%)
Position, Slope, and Elevation	Mountain sideslopes; 30 to 50; all aspects; 1000 to 3500 ft.
Typical Vegetation	Douglas-fir - Tanoak - Madrone

Soil Profile Description

Surface Layer	Strong brown loam, moderate granular structure, strongly acid
Subsoil	Reddish yellow clay loam, moderate subangular blocky structure, strongly acid
Substratum	

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	40-60; metaigneous rock
Erosion Factor (K)	.20-.28
Max. Erosion Hazard	High
Soil Permeability	Moderately slow
Soil Drainage	Well
Soil Manageability Class	3E
Group	III
Forest Site Class	3
Regeneration Potential	Moderate to high
Available Water Capacity (AWC)	High
Upper 20 inches	2.1 inches
Susceptibility to Burning Damage	Moderate
Hydrologic Soil Group	B-C
Unified Soil Class	0-60 ML
Depth Rating	
Potential Failure as Road Subgrade	No
Seeding Recommendations	1
Included Areas	15 percent inclusions of Aiken family, deep, Hugo family, mod. deep, soils similiar to Holland family, deep except mod. deep , and soils on slopes less than 30 percent.

**315 Aiken-Holland families complex, deep
10 to 40 percent slopes**

Map Unit Components	Aiken family, deep	Holland family, deep
Approx. Proportion	(55%)	(35%)
Position, Slope, and Elevation	Mountain sideslopes; 10 to 40; all aspects; 1500 to 3500 ft.	Mountain sideslopes; 10 to 40; all aspects; 1500 to 3500 ft.
Typical Vegetation	Douglas-fir - Tanoak - Madrone	Douglas-fir - Tanoak - Madrone

Soil Profile Description

Surface Layer	Brown to dark brown loam, moderate subangular blocky structure, slightly acid	Strong brown loam, moderate granular structure, strongly acid
Subsoil	Brown to reddish yellow clay to heavy clay loam, moderate angular blocky structure, slightly to medium acid	Reddish yellow clay loam, moderate subangular blocky structure, strongly acid
Substratum		

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	60+; metaigneous rock	40-60; metaigneous rock
Erosion Factor (K)	.20-.37	.20-.28
Max. Erosion Hazard	High	High
Soil Permeability	Moderately slow	Moderately slow
Soil Drainage	Well	Well
Soil Manageability Class	2-3E	2-3E
Group	II	II
Forest Site Class	3	3
Regeneration Potential	High	Moderate to high
Available Water Capacity (AWC)	High to very high	High
Upper 20 inches	3.2 inches	2.1 inches
Susceptibility to Burning Damage	Low	Low
Hydrologic Soil Group	C	B-C
Unified Soil Class	0-7 CL	0-60 ML
Depth Rating	7-67 CL,CH	
Potential Failure as Road Subgrade	Yes	No
Seeding Recommendations	1	1
Included Areas	10 percent inclusions of Hugo family, deep and soils on slopes less than 10 percent and greater than 40 percent.	

**316 Aiken-Holland families complex, deep
10 to 40 percent slopes**

Map Unit Components	Aiken family, deep	Holland family, deep
Approx. Proportion	(55%)	(35%)
Position, Slope, and Elevation	Mountain sideslopes; 10 to 40; all aspects; 1500 to 3500 ft.	Mountain sideslopes; 10 to 40; all aspects; 1500 to 3500 ft.
Typical Vegetation	Douglas-fir - Tanoak - Madrone	Douglas-fir - Tanoak - Madrone

Soil Profile Description

Surface Layer	Brown to dark brown loam, moderate subangular blocky structure, slightly acid	Strong brown loam, moderate granular structure strongly acid
Subsoil	Brown to reddish yellow clay to heavy clay loam, moderate angular blocky structure, slightly to medium acid	Reddish yellow clay loam, moderate subangular blocky structure, strongly acid

Substratum

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	60+; metaigneous rock	40-60; metaigneous rock
Erosion Factor (K)	.20-.37	.20-.28
Max. Erosion Hazard	High	High
Soil Permeability	Moderately slow	Moderately slow
Soil Drainage	Well	Well
Soil Manageability Class	2-3E	2-3E
Group	II	II
Forest Site Class	3	3
Regeneration Potential	High	Moderate to high
Available Water Capacity (AWC)	High to very high	High
Upper 20 inches	3.2 inches	2.1 inches
Susceptibility to Burning Damage	Low	Low
Hydrologic Soil Group	C	B-C
Unified Soil Class	0-7 CL	0-60 ML
Depth Rating	7-67 CL,CH	
Potential Failure as Road Subgrade	Yes	No
Seeding Recommendations	1	1
Included Areas	10 percent inclusions of Hugo family, deep and soils on slopes less than 10 percent and greater than 40 percent.	

**317 Nanny family, moderately deep
50 to 70 percent slopes**

Map Unit Components	Nanny family, moderately deep
Approx. Proportion	(85%)
Position, Slope, and Elevation	Mountain sideslopes; 50 to 70; all aspects; 4500 to 6000 ft.
Typical Vegetation	White fir

Soil Profile Description

Surface Layer	Very dark grayish brown very gravelly loam, weak granular structure, medium acid
Subsoil	Light olive brown very gravelly loam, very weak granular structure, very strongly acid
Substratum	

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	20-40; metaigneous rock
Erosion Factor (K)	.20-.32
Max. Erosion Hazard	High
Soil Permeability	Moderate
Soil Drainage	Somewhat excessively
Soil Manageability Class	3-4GE
Group	IV
Forest Site Class	3-4
Regeneration Potential	Low
Available Water Capacity (AWC)	Low
Upper 20 inches	1.4 inches
Susceptibility to Burning Damage	Moderate
Hydrologic Soil Group	B
Unified Soil Class	0-35 GC
Depth Rating	
Potential Failure as Road Subgrade	No
Seeding Recommendations	1
Included Areas	15 percent inclusions of Woodseye family, soils similar to Bins family, deep, except mod. deep, and Rock outcrop, metaigneous

**318 Nanny family, moderately deep
50 to 70 percent slopes**

Map Unit Components	Nanny family, moderately deep
Approx. Proportion	(85%)
Position, Slope, and Elevation	Mountain sideslopes; 50 to 70; all aspects; 4500 to 6000 ft.
Typical Vegetation	White fir

Soil Profile Description

Surface Layer	Very dark grayish brown very gravelly loam, weak granular structure, medium acid
Subsoil	Light olive brown very gravelly loam, very weak granular structure, very strongly acid
Substratum	

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	20-40; metaigneous rock
Erosion Factor (K)	.20-.32
Max. Erosion Hazard	High
Soil Permeability	Moderate
Soil Drainage	Somewhat excessively
Soil Manageability Class	3-4GE
Group	IV
Forest Site Class	3-4
Regeneration Potential	Low
Available Water Capacity (AWC)	Low
Upper 20 inches	1.4 inches
Susceptibility to Burning Damage	Moderate
Hydrologic Soil Group	B
Unified Soil Class	0-35 GC
Depth Rating	
Potential Failure as Road Subgrade	No
Seeding Recommendations	1
Included Areas	15 percent inclusions of Woodseye family, soils similar to Bins family, deep, except mod. deep, and Rock outcrop, metaigneous

**320 Hugo family, moderately deep-Maymen family, complex
30 to 50 percent slopes**

Map Unit Components	Hugo family, mod. deep	Maymen family
Approx. Proportion	(65%)	(20%)
Position, Slope, and Elevation	Mountain sideslopes; 30 to 50; all aspects; 400 to 4500 ft.	Mountain sideslopes; 30 to 50; all aspects; 400 to 4500 ft.
Typical Vegetation	Douglas-fir - Tanoak - Madrone	Douglas-fir - Tanoak - Madrone

Soil Profile Description

Surface Layer	Pale brown gravelly loam, strong granular structure, medium acid	Brown gravelly loam, moderate granular structure, medium acid
Subsoil	Very pale brown gravelly loam, moderate subangular blocky structure, medium acid	Light yellow brown gravelly loam, weak subangular blocky structure, strongly acid
Substratum		

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	20-40; metaigneous rock	10-20; metaigneous rock
Erosion Factor (K)	.15-.28	.20-.28
Max. Erosion Hazard	High	High
Soil Permeability	Moderate	Moderate
Soil Drainage	Well	Well
Soil Manageability Class	3E	3Ed
Group	III	III
Forest Site Class	3-4	5
Regeneration Potential	Moderate	Low
Available Water Capacity (AWC)	Low to moderate	Very low to low
Upper 20 inches	2.6 inches	1.9 inches
Susceptibility to Burning Damage	Moderate	Moderate
Hydrologic Soil Group	B-C	C
Unified Soil Class	0-24 ML	0-18 ML
Depth Rating		
Potential Failure as Road Subgrade	No	No
Seeding Recommendations	1	1
Included Areas	15 percent inclusions of rubble land and Rock outcrop, metaigneous.	

**321 Hugo family, moderately deep-Maymen family complex
50 to 70 percent slopes**

Map Unit Components	Hugo family, mod. deep	Maymen family
Approx. Proportion	(50%)	(25%)
Position, Slope, and Elevation	Mountain sideslopes; 50 to 70; all aspects; 400 to 4500 ft.	Mountain sideslopes; 50 to 70; all aspects; 400 to 4500 ft.
Typical Vegetation	Douglas-fir - Tanoak - Madrone	Douglas-fir - Tanoak - Madrone
Soil Profile Description		
Surface Layer	Pale brown gravelly loam, strong granular structure, medium acid	Brown gravelly loam, moderate granular structure, medium acid
Subsoil	Very pale brown gravelly loam, moderate subangular blocky structure, strongly acid	Light yellow brown gravelly loam, weak subangular blocky structure, strongly acid
Substratum		
Soil Properties & Management Interpretations		
Rooting Depth (in.), Underlying Material	20-40; metaigneous rock	10-20; metaigneous rock
Erosion Factor (K)	.15-.28	.20-.28
Max. Erosion Hazard	High	High
Soil Permeability	Moderate	Moderate
Soil Drainage	Well	Well
Soil Manageability Class	3-4GE	3-4GE
Group	IV	IV
Forest Site Class	3-4	5
Regeneration Potential	Moderate	Low
Available Water Capacity (AWC)	Low to moderate	Very low to low
Upper 20 inches	2.6 inches	1.9 inches
Susceptibility to Burning Damage	Moderate to high	Moderate to high
Hydrologic Soil Group	B-C	C
Unified Soil Class	0-24 ML	0-18 ML
Depth Rating		
Potential Failure as Road Subgrade	No	No
Seeding Recommendations	1	1
Included Areas	25 percent inclusions of Rubble land, Rock outcrop, metaigneous, and soils on slopes less than 70 percent.	

**323 Maymen family-Rock outcrop, metaigneous complex
70 to 90 percent slopes**

Map Unit Components	Maymen family	Rock outcrop, metaigneous
Approx. Proportion	(50%)	(30%)
Position, Slope, and Elevation	Mountain sideslopes; 70 to 90; all aspects; 400 to 4500 ft.	Mountain sideslopes; all aspects; 400 to 4500 f
Typical Vegetation	Douglas-fir - Tanoak - Madrone	Barren

Soil Profile Description

Surface Layer	Brown gravelly loam, moderate granular structure, medium acid
Subsoil	Light yellow brown gravelly loam, weak subangular blocky structure, strongly acid
Substratum	

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	10-20; metaigneous rock	
Erosion Factor (K)	.20-.28	
Max. Erosion Hazard	High	
Soil Permeability	Moderate	
Soil Drainage	Well	
Soil Manageability Class	3-4GE	
Group	IV	
Forest Site Class	5	
Regeneration Potential	Low	
Available Water Capacity (AWC)	Very low to low	
Upper 20 inches	1.9 inches	
Susceptibility to Burning Damage	Moderate to high	
Hydrologic Soil Group	C	D
Unified Soil Class	0-18 ML	
Depth Rating		
Potential Failure as Road Subgrade	No	No
Seeding Recommendations	1	
Included Areas	20 percent inclusions of rubble land and soils on slopes over 70 percent.	

**324 Hugo family, deep
30 to 50 percent slopes**

Map Unit Components	Hugo family, deep
Approx. Proportion	(90%)
Position, Slope, and Elevation	Mountain sideslopes; 30 to 50; all aspects; 400 to 4500 ft.
Typical Vegetation	Douglas-fir - Tanoak - Madrone

Soil Profile Description

Surface Layer	Light yellowish brown to brown gravelly loam, moderate granular structure, medium acid
Subsoil	Brownish yellow to yellow heavy silt loam, moderate subangular blocky structure, medium acid
Substratum	Brownish yellow very gravelly heavy silt loam, weak subangular blocky structure to massive, medium acid

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	40-60; metaigneous rock
Erosion Factor (K)	.20-.28
Max. Erosion Hazard	High
Soil Permeability	Moderate
Soil Drainage	Well
Soil Manageability Class	3E
Group	III
Forest Site Class	3
Regeneration Potential	Moderate to high
Available Water Capacity (AWC)	Moderate
Upper 20 inches	3.0 inches
Susceptibility to Burning Damage	Moderate
Hydrologic Soil Group	B
Unified Soil Class	0-40 ML
Depth Rating	40-60 GC
Potential Failure as Road Subgrade	No
Seeding Recommendations	1
Included Areas	10 percent inclusions of Holland family, deep and Hugo family, mod. deep.

**325 Hugo family, moderately deep
50 to 70 percent slopes**

Map Unit Components	Hugo family, moderately deep
Approx. Proportion	(85%)
Position, Slope, and Elevation	Mountain sideslopes; 50 to 70; all aspects; 400 to 4500 ft.
Typical Vegetation	Douglas-fir - Tanoak - Madrone

Soil Profile Description

Surface Layer	Pale brown gravelly loam, strong granular structure, medium acid
Subsoil	Very pale brown gravelly heavy loam, weak subangular blocky structure to moderate granular, strongly acid
Substratum	Light gray gravelly loam, massive, very strongly acid

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	20-40; metasedimentary rock
Erosion Factor (K)	.15-.28
Max. Erosion Hazard	High
Soil Permeability	Moderate
Soil Drainage	Well
Soil Manageability Class	3-4E
Group	III-IV
Forest Site Class	3-4
Regeneration Potential	Moderate to high
Available Water Capacity (AWC)	Moderate to high
Upper 20 inches	2.6 inches
Susceptibility to Burning Damage	Low to moderate
Hydrologic Soil Group	B
Unified Soil Class	0-24 ML
Depth Rating	
Potential Failure as Road Subgrade	No
Seeding Recommendations	1
Included Areas	15 percent inclusions of Clallam family, mod. deep, Deadwood family, and soils on slopes over 70 percent.

**326 Hugo family, moderately deep
50 to 70 percent slopes**

Map Unit Components	Hugo family, moderately deep
Approx. Proportion	(85%)
Position, Slope, and Elevation	Mountain sideslopes; 50 to 70; all aspects; 400 to 4500 ft.
Typical Vegetation	Douglas-fir - Tanoak - Madrone

Soil Profile Description

Surface Layer	Pale brown gravelly loam, strong granular structure, medium acid
Subsoil	Very pale brown gravelly heavy loam, weak subangular blocky structure to moderate granular, strongly acid
Substratum	Light gray gravelly loam, massive, very strongly acid

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	20-40; metasedimentary rock
Erosion Factor (K)	.15-.28
Max. Erosion Hazard	High
Soil Permeability	Moderate
Soil Drainage	Well
Soil Manageability Class	3-4E
Group	III-IV
Forest Site Class	3-4
Regeneration Potential	Moderate to high
Available Water Capacity (AWC)	Moderate to high
Upper 20 inches	2.6 inches
Susceptibility to Burning Damage	Low to moderate
Hydrologic Soil Group	B
Unified Soil Class	0-24 ML
Depth Rating	
Potential Failure as Road Subgrade	No
Seeding Recommendations	1
Included Areas	15 percent inclusions of Clallam family, mod. deep, Deadwood family, and soils on slopes over 70 percent.

**327 Hugo family, moderately deep-Holland family, deep complex
30 to 50 percent slopes**

Map Unit Components	Hugo family, mod. deep	Holland family, deep
Approx. Proportion	(50%)	(30%)
Position, Slope, and Elevation	Mountain sideslopes; 30 to 50; all aspects; 400 to 4500 ft.	Mountain sideslopes; 30 to 50; all aspects; 1000 to 3500 ft.
Typical Vegetation	Douglas-fir - Tanoak - Madrone	Douglas-fir - Tanoak - Madrone

Soil Profile Description

Surface Layer	Pale brown gravelly loam, strong granular structure, medium acid	Pale brown loam, moderate granular structure, strongly acid
Subsoil	Very pale brown gravelly heavy loam, moderate granular structure, strongly acid	Strong brown to reddish yellow clay loam, strong subangular blocky structure, strongly acid
Substratum	Light gray gravelly loam, massive, very strongly acid	

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	20-40; metaigneous rock	40-60; metaigneous rock
Erosion Factor (K)	.15-.28	.20-.28
Max. Erosion Hazard	High	High
Soil Permeability	Moderate	Moderately slow
Soil Drainage	Well	Well
Soil Manageability Class	3E	3E
Group	III	III
Forest Site Class	3-4	3
Regeneration Potential	Moderate to high	Moderate to high
Available Water Capacity (AWC)	Low to moderate	Moderate to high
Upper 20 inches	2.6 inches	2.1 inches
Susceptibility to Burning Damage	Moderate	Low
Hydrologic Soil Group	B-C	B
Unified Soil Class	0-24 ML	0-60 ML
Depth Rating		
Potential Failure as Road Subgrade	No	No
Seeding Recommendations	1	1
Included Areas	20 percent inclusions of Hugo family, deep and soils similar to Holland family, deep, except mod. deep.	

**331 Clallam family, moderately deep-Skalan family, deep association
35 to 75 percent slopes**

Map Unit Components	Clallam family, mod. deep	Skalan family, deep
Approx. Proportion	(45%)	(35%)
Position, Slope, and Elevation	Mountain sideslopes; 50 to 75; NW to E, 600 to 4500 ft.; SE to W, 600 to 4800 ft.	Upper mountain sideslopes; 35 to 55; NW to E, 600 to 4500 ft.; SE to W, 600 to 4800 ft.
Typical Vegetation	Douglas-fir - Tanoak - Madrone	Douglas-fir - Tanoak - Madrone

Soil Profile Description

Surface Layer	Brown to very dark grayish brown very gravelly loam, moderate subangular blocky structure, medium acid	Very dark gray to pale brown gravelly loam, weak to moderate granular structure, strongly acid
Subsoil	Brown to yellowish red very gravelly loam, moderate to weak subangular blocky structure, slightly to medium acid	Pink to reddish brown very gravelly clay loam, moderate subangular blocky structure, medium to strongly acid
Substratum		

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	20-40; metaigneous rock	40-60; metaigneous rock
Erosion Factor (K)	.20-.28	.20-.37
Max. Erosion Hazard	High	High
Soil Permeability	Moderate	Moderately slow
Soil Drainage	Well	Well
Soil Manageability Class	3-4GE	3Ep
Group	IV	IV
Forest Site Class	4	3-4
Regeneration Potential	Low to moderate	Moderate
Available Water Capacity (AWC)	Low	Moderate
Upper 20 inches	1.7 inches	1.5 inches
Susceptibility to Burning Damage	Moderate	Low
Hydrologic Soil Group	B-C	B-C
Unified Soil Class	0-26 ML,GC	0-12 ML
Depth Rating		12-56 GC
Potential Failure as Road Subgrade	No	No
Seeding Recommendations	1	1
Included Areas	20 percent inclusions of Skalan family, mod. deep, Clallam family, deep, and Rock outcrop, metaigneous.	

**335 Althouse-Holland families association, deep, stony
30 to 70 percent slopes**

Map Unit Components	Althouse family, deep, stony	Holland family, deep, stony
Approx. Proportion	(45%)	(30%)
Position, Slope, and Elevation	Mountain sideslopes and glacial moraines; 30 to 70; NW to E, 3800 to 6000 ft.; SE to W, 4500 to 6000 ft.	Colluvial mountain sideslopes; 30 to 50; NW to E, 3000 to 3800 ft.; SE to W, 3000 to 4500 ft.
Typical Vegetation	Mixed Conifer-Fir	Canyon live oak

Soil Profile Description

Surface Layer	Yellowish brown gravelly loam, strong granular structure, medium acid	Yellowish brown stony loam, weak granular structure, slightly acid
Subsoil	Yellowish brown very gravelly loam, weak subangular blocky structure, medium acid	Brownish yellow to strong brown clay loam, moderate subangular blocky structure, slightly acid
Substratum	Light yellowish brown gravelly loam, weak subangular blocky structure, slightly acid	

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	40-60; metaigneous rock and glacial till	40-60+; metaigneous rock colluvium
Erosion Factor (K)	.20-.32	.20-.28
Max. Erosion Hazard	High	High
Soil Permeability	Moderate to moderately rapid	Moderate
Soil Drainage	Well	Well
Soil Manageability Class	3-4GX	3X
Group	III	III
Forest Site Class	4-5	4-5
Regeneration Potential	Low	Moderate
Available Water Capacity (AWC)	Low	Moderate
Upper 20 inches	2.2 inches	2.5 inches
Susceptibility to Burning Damage	Moderate to high	Moderate
Hydrologic Soil Group	C	C
Unified Soil Class	0-35 ML	0-45 ML
Depth Rating	35-39 GC	
Potential Failure as Road Subgrade	No	No
Seeding Recommendations	2	1
Included Areas	25 percent inclusions of soils similar to Althouse and Holland families, deep, stony, except mod. deep, Nanny and Chaix families, mod. deep, Rock outcrop, metaigneous, and soils on slopes less than 30 percent.	

**336 Clallam-Nanny families association, deep
30 to 60 percent slopes**

Map Unit Components	Clallam family, deep	Nanny family, deep
Approx. Proportion	(40%)	(40%)
Position, Slope, and Elevation	Colluvial mountain sideslopes and near drainages; 30 to 60; NW to E, 3000 to 3500 ft.; SE to W, 3000 to 4500 ft.	Colluvial mountain sideslopes; 30 to 60; NW to E, 3800 to 6000 ft.
Typical Vegetation	Mixed Conifer-Fir	Mixed Conifer-Fir

Soil Profile Description

Surface Layer	Very pale brown very gravelly loam, strong subangular blocky structure, strongly acid	Very dark grayish brown gravelly loam, weak granular structure, slightly acid
Subsoil	Very pale brown to yellow very gravelly loam, strong subangular blocky structure, strongly acid	Brown to very pale brown gravelly to very gravelly loam to light clay loam, weak subangular blocky structure, slightly to medium acid
Substratum	Very pale brown to yellow extremely gravelly loam, massive, strongly acid	

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	40-60; metaigneous rock	40-60; metaigneous rock
Erosion Factor (K)	.20-.28	.20-.32
Max. Erosion Hazard	High	High
Soil Permeability	Moderately rapid	Moderately rapid
Soil Drainage	Well	Well
Soil Manageability Class	3Ep	3Ep
Group	III	III
Forest Site Class	4	3-4
Regeneration Potential	Low	Moderate
Available Water Capacity (AWC)	Low	Moderate
Upper 20 inches	1.4 inches	1.4 inches
Susceptibility to Burning Damage	Moderate	Low
Hydrologic Soil Group	B	C
Unified Soil Class	0-60 ML,GC	0-60 GC
Depth Rating		
Potential Failure as Road Subgrade	No	No
Seeding Recommendations	1	3
Included Areas	20 percent inclusions of soils similar to Clallam and Nanny family, mod. deep, except stony, Skymor family, and soils on slopes less than 30 percent.	

**340 Clallam family, moderately deep-Rock outcrop, metaigneous complex
45 to 80 percent slopes**

Map Unit Components	Clallam family, mod. deep	Rock outcrop, metaigneous
Approx. Proportion	(50%)	(20%)
Position, Slope, and Elevation	Mountain sideslopes; 45 to 80; NW to E, 600 to 4500 ft.; SE to W, 600 to 4800 ft.	Mountain sideslopes; SE to W, 600 to 4800 ft.
Typical Vegetation	Douglas-fir - Tanoak - Madrone	Barren

Soil Profile Description

Surface Layer	Brown to very dark grayish brown gravelly loam, moderate subangular blocky structure, medium acid
Subsoil	Brown to yellowish red very gravelly loam, moderate to weak subangular blocky structure, slightly to medium acid
Substratum	

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	20-40; metaigneous rock
Erosion Factor (K)	.20-.28
Max. Erosion Hazard	High
Soil Permeability	Moderate
Soil Drainage	Well
Soil Manageability Class	3-4GE
Group	IV
Forest Site Class	4
Regeneration Potential	Moderate to low
Available Water Capacity (AWC)	Low
Upper 20 inches	1.7 inches
Susceptibility to Burning Damage	Moderate
Hydrologic Soil Group	B-C D
Unified Soil Class	0-26 ML,GC
Depth Rating	
Potential Failure as Road Subgrade	No No
Seeding Recommendations	1
Included Areas	30 percent inclusions of Maymen family, Deadwood family, and Hugo family, mod. deep.

**344 Deadwood family-Clallam family, deep, extremely gravelly-Rock outcrop
metasedimentary association
45 to 85 percent slopes**

Map Unit Components	Deadwood family	Clallam family, deep, ext. gravelly	Rock outcrop, metasedimentary
Approx. Proportion	(35%)	(25%)	(15%)
Position, Slope, and Elevation	Colluvial mountain sideslopes and ridges; 45 to 85; all aspects; 600 to 4500 ft.	Colluvial mountain sideslopes; 45 to 70; NW to E; 600 to 4500 ft.	Mountain sideslopes and cliffs; SE to W; 600 to 4800 ft.
Typical Vegetation	Canyon live oak	Canyon live oak	Barren
Soil Profile Description			
Surface Layer	Dark brown very gravelly loam, moderate granular structure, slightly acid	Light brownish gray extremely gravelly loam, weak granular structure, neutral	
Subsoil	Yellowish brown very gravelly loam, weak subangular blocky to moderate granular structure, medium acid	Light gray to white extremely gravelly loam, weak subangular blocky structure, neutral	
Substratum		Very pale brown extremely gravelly loam, weak granular structure, neutral	
Soil Properties & Management Interpretations			
Rooting Depth (in.), Underlying Material	10-20; sedimentary, metasedimentary, and metaigneous rock	40-60+; sedimentary, metasedimentary, and metaigneous rock	
Erosion Factor (K)	.20-.37	.17-.24	
Max. Erosion Hazard	Very high	Moderate	
Soil Permeability	Moderately rapid to rapid	Moderately rapid to rapid	
Soil Drainage	Somewhat excessively	Somewhat excessively	
Soil Manageability Class	3-4GE	3-4GP	
Soil Manageability Group	IV	IV	
Forest Site Class	5-6	5	
Regeneration Potential	Low	Low	
Available Water Capacity (AWC)	Very low	Very low to low	
Upper 20 inches	1.7 inches	0.7 inches	
Susceptibility to Burning Damage	Moderate	High	
Hydrologic Soil Group	C	C	D
Unified Soil Class	0-9 ML	0-60 GC	
Depth Rating	9-19 GC		
Potential Failure as Road Subgrade	No	No	No
Seeding Recommendations	1	1	
Included Areas	25 percent inclusions of Skalan family, mod. deep, soils similar to Clallam family, deep, extremely gravelly, except more developed, and soils similar to Holland family, deep, except mod. deep.		

**345 Clallam family, deep, extremely gravelly-Skalan-Goldridge families, deep association
35 to 70 percent slopes**

Map Unit Components	Clallam family, deep, ex. gravelly (40%)	Skalan family, deep (20%)	Goldridge family, deep (20%)
Approx. Proportion			
Position, Slope, and Elevation	Mountain sideslopes; 35 to 70; NW to E, 1000 to 3800 ft.; SE to W, 1000 to 4500 ft.	Mountain sideslopes; 35 to 70; NW to E, 1000 to 3800 ft.; SE to W, 1000 to 4500 ft.	Mountain sideslopes; 35 to 70; NW to E, 1000 to 3800 ft.; SE to W, 1000 to 4500 ft.
Typical Vegetation	Douglas-fir - Tanoak - Madrone	Douglas-fir - Tanoak - Madrone	Douglas-fir - Tanoak - Madrone

Soil Profile Description

Surface Layer	Light yellowish brown to light brownish gray extremely gravelly loam, weak granular structure, sl. acid to neutral	Very dark gray to pale brown very gravelly loam, weak granular structure, strongly acid	Light yellowish brown to pale brown gravelly loam, moderate granular structure, medium to slightly acid
Subsoil	White to yellow very gravelly loam, weak subangular structure, slightly acid to neutral	Pale brown dark reddish brown very gravelly loam to very gravelly clay loam, mod. subang. blocky struct., med. to strongly acid	Light yellowish brown to very pale brown grav. loam to grav. clay loam, mod. subang. blocky struct., sl. to med. acid
Substratum			

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	40-60; metaigneous rock	40-60; metaigneous rock	40-60; metaigneous rock
Erosion Factor (K)	.17-.24	.20-.37	.20-.43
Max. Erosion Hazard	Moderate	High	High
Soil Permeability	Moderate to moderately rapid	Moderately slow	Moderate to moderately slow
Soil Drainage	Well	Well	Well
Soil Manageability Class Group	3-4Gp III	3-4GE III	3-4GE III
Forest Site Class	5	3-4	2-3
Regeneration Potential	Very low to low	Low to moderate	Moderate to high
Available Water Capacity (AWC)	Very low to low	Moderate	Moderate to high
Upper 20 inches	0.7 inches	1.5 inches	2.7 inches
Susceptibility to Burning Damage	High	Moderate	Low
Hydrologic Soil Group	B	B	C
Unified Soil Class Depth Rating	0-60 GC	0-12 ML 12-56 GC	0-14 ML 14-43 CL
Potential Failure as Road Subgrade	No	No	Yes
Seeding Recommendations	1	2	1

20 percent inclusions of Deadwood family, Holland and Clallam families, mod. deep, and soils similar to Skalan and Goldridge families, deep except moderately deep.

**346 Goldridge family, deep-Clallam family, moderately deep-Aiken family, deep association
40 to 90 percent slopes**

Map Unit Components	Goldridge family, deep	Clallam family, mod. deep	Aiken family, deep
Approx. Proportion	(30%)	(20%)	(20%)
Position, Slope, and Elevation	Mountain sideslopes; 40 to 70; NW to E, 1000 to 3800 ft.; SE to W, 1000 to 4500 ft.	Mountain sideslopes; 60 to 90; NW to E, 1000 to 3800 ft.; SE to W, 1000 to 4500 ft.	Mountain sideslopes; 40 to 50; NW to E, 1000 to 3800 ft.; SE to W, 1000 to 4500 ft.
Typical Vegetation	Douglas-fir - Tanoak - Madrone	Douglas-fir - Tanoak - Madrone	Douglas-fir - Tanoak - Madrone

Soil Profile Description

Surface Layer	Light yellowish brown to pale brown gravelly loam, moderate granular structure, medium to slightly acid	Dark grayish brown to brown loam, moderate subangular blocky structure, medium acid	Dark brown loam, mod. subangular blocky structure, slightly acid
Subsoil	Light yellowish brown to very pale brown gravelly loam to clay loam, mod. subangular blocky structure, slightly to med. acid	Reddish yellow to yellowish red loam, moderate subangular blocky structure, medium acid	Yellowish red to strong brown silty clay loam to clay, moderate angular blocky structure, slightly to medium acid
Substratum			

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	40-60; metaigneous rock	20-40; metaigneous rock	40-60+; metaigneous rock
Erosion Factor (K)	.20-.43	.20-.28	.20-.37
Max. Erosion Hazard	High	High	High
Soil Permeability	Moderate to moderately slow	Moderate to moderately slow	Moderate to slow
Soil Drainage	Well	Well	Well
Soil Manageability Class	3-4GE	4GE	3E
Soil Manageability Group	III	III	III
Forest Site Class	2-3	4	3
Regeneration Potential	Moderate to high	Moderate to low	High
Available Water Capacity (AWC)	Moderate to high	Low	High
Upper 20 inches	2.7 inches	1.7 inches	3.2 inches
Susceptibility to Burning Damage	Low	Moderate	High
Hydrologic Soil Group	C	B-C	D
Unified Soil Class	0-14 ML	0-26 ML,GC	0-7 CL
Depth Rating	14-43 CL		7-67 CL,CH
Potential Failure as Road Subgrade	Yes	No	Yes
Seeding Recommendations	1	1	1
Included Areas	30 percent inclusions of Deadwood family, Hullt family, deep, and soils similar to Goldridge family, deep, except mod. deep.		

**348 Skalan-Aiken families association, deep
5 to 40 percent slopes**

Map Unit Components	Skalan family, deep	Aiken family, deep
Approx. Proportion	(35%)	(35%)
Position, Slope, and Elevation	Mountain sideslopes; 5 to 40; NW to E, 1000 to 3800 ft.; SE to W, 1000 to 4500 ft.	Mountain sideslopes and broad ridges; 5 to 40; NW to E, 1000 to 3800 ft.; SE to W, 1000 to 4500 ft.
Typical Vegetation	Knobcone Pine	Knobcone Pine
Soil Profile Description		
Surface Layer	Very dark gray very gravelly loam, weak granular structure, strongly acid	Dark brown to reddish yellow clay loam, moderate subangular blocky structure, slightly to strongly acid
Subsoil	Pale brown to dark reddish brown very gravelly loam to very gravelly clay loam, mod. subangular blocky struct., med. to strongly acid	Reddish yellow to strong brown silty clay loam to clay, moderate angular blocky structure, slightly to medium acid
Substratum		
Soil Properties & Management Interpretations		
Rooting Depth (in.), Underlying Material	40-60; metaigneous rock	40-60+; metaigneous rock
Erosion Factor (K)	.20-.37	.20-.37
Max. Erosion Hazard	High	High
Soil Permeability	Moderately slow	Moderate to slow
Soil Drainage	Well	Well
Soil Manageability Class	2-3Ep	2-3E
Group	II	II
Forest Site Class	3-4	3
Regeneration Potential	Moderate	High
Available Water Capacity (AWC)	Moderate	High
Upper 20 inches	1.5 inches	3.2 inches
Susceptibility to Burning Damage	Moderate	High
Hydrologic Soil Group	B	D
Unified Soil Class	0-12 ML	0-7 CL
Depth Rating	12-56 GC	7-67 CL,CH
Potential Failure as Road Subgrade	No	Yes
Seeding Recommendations	2	1
Included Areas	30 percent inclusions of Goldridge and Holland families, deep, and soils similar to Holland family, mod. deep, except less than 20 inches deep.	

**349 Goldridge-Aiken families association, deep
5 to 40 percent slopes**

Map Unit Components	Goldridge family, deep	Aiken family, deep
Approx. Proportion	(40%)	(40%)
Position, Slope, and Elevation	Mountain sideslopes; 5 to 40; NW to E, 1000 to 3800 ft.; SE to W, 1000 to 4500 ft.	Mountain sideslopes and broad ridges; 5 to 40; NW to E, 1000 to 3800 ft.; SE to W, 1000 to 4500 ft.
Typical Vegetation	Douglas-fir - Tanoak - Madrone	Douglas-fir - Tanoak - Madrone

Soil Profile Description

Surface Layer	Light yellowish brown to dark brown gravelly loam, moderate granular structure, medium acid	Dark brown heavy loam, moderate subangular blocky structure, slightly acid
Subsoil	Light yellowish brown to yellowish red clay loam, moderate to strong subangular blocky structure, medium acid	Reddish yellow to strong brown silty clay loam to clay, moderate angular blocky structure, slightly to medium acid
Substratum		

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	40-60; metaigneous rock	40-60; metaigneous rock
Erosion Factor (K)	.20-.43	.20-.37
Max. Erosion Hazard	High	High
Soil Permeability	Moderate to moderately slow	Moderate
Soil Drainage	Well	Well
Soil Manageability Class	2-3E	2-3E
Group	II	II
Forest Site Class	2-3	3
Regeneration Potential	Moderate to high	High
Available Water Capacity (AWC)	Moderate to high	High
Upper 20 inches	2.7 inches	3.2 inches
Susceptibility to Burning Damage	Low	Low
Hydrologic Soil Group	C	D
Unified Soil Class	0-14 ML	0-7 CL
Depth Rating	14-43 CL	7-67 CL,CH
Potential Failure as Road Subgrade	Yes	Yes
Seeding Recommendations	1	1
Included Areas	20 percent inclusions of Skalan family, deep, and soils similar to Goldridge family, deep, except mod. deep.	

**351 Skalan-Holland families association, deep
20 to 65 percent slopes**

Map Unit Components	Skalan family, deep	Holland family, deep
Approx. Proportion	(40%)	(35%)
Position, Slope, and Elevation	Narrow ridges and mountain sideslopes; 35 to 65; NW to E, 600 to 4500 ft.; SE to W, 600 to 4800 ft.	Benches and broad ridges; 20 to 40; NW to E, 600 to 4500 ft.; SE to W, 600 to 4800 ft.
Typical Vegetation	Douglas-fir - Tanoak - Madrone	Douglas-fir - Tanoak - Madrone
Soil Profile Description		
Surface Layer	Very dark gray to pale brown gravelly loam, weak granular structure, strongly acid	Pale brown gravelly loam, moderate granular structure, slightly to strongly acid
Subsoil	Pale brown to dark reddish brown very gravelly clay loam, moderate subangular blocky structure, medium to strongly acid	Strong brown to reddish yellow gravelly heavy loam to gravelly clay loam, moderate strong subangular blocky structure, medium to strongly acid
Substratum		
Soil Properties & Management Interpretations		
Rooting Depth (in.), Underlying Material	40-60; metaigneous rock	40-60; metaigneous rock
Erosion Factor (K)	.20-.37	.20-.28
Max. Erosion Hazard	High	High
Soil Permeability	Moderately slow	Moderately slow
Soil Drainage	Well	Well
Soil Manageability Class	3Ep	3E
Group	III	III
Forest Site Class	3-4	3
Regeneration Potential	Moderate	Moderate to high
Available Water Capacity (AWC)	Moderate	High
Upper 20 inches	1.5 inches	2.1 inches
Susceptibility to Burning Damage	Moderate	Low
Hydrologic Soil Group	C	C
Unified Soil Class	0-12 ML	0-60 ML
Depth Rating	12-56 GC	
Potential Failure as Road Subgrade	No	No
Seeding Recommendations	2	2
Included Areas	25 percent inclusions of Clallam and Aiken families, deep, and soils similar to Skalan family, deep except mod. deep.	

**356 Raisio-Clallam families complex, moderately deep
45 to 75 percent slopes**

Map Unit Components	Raisio family, mod. deep	Clallam family, mod. deep
Approx. Proportion	(50%)	(30%)
Position, Slope, and Elevation	Mountain sideslopes; 45 to 75; NW to E, 600 to 4500 ft.; SE to W, 600 to 4800 ft.	Mountain sideslopes; 45 to 75; NW to E, 600 to 4500 ft.; SE to W, 600 to 4800 ft.
Typical Vegetation	Douglas-fir - Tanoak - Madrone	Douglas-fir - Tanoak - Madrone

Soil Profile Description

Surface Layer	Dark grayish brown very gravelly sandy loam, weak granular structure, strongly acid	Brown very gravelly loam, moderate subangular blocky structure, medium acid
Subsoil		Reddish yellow to yellowish red very gravelly loam, moderate subangular blocky structure, slightly to medium acid
Substratum	Yellowish brown to brown very gravelly sandy loam, single grain, slightly to medium acid	

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	20-40; metaigneous rock	20-40; metaigneous rock
Erosion Factor (K)	.15-.17	.20-.28
Max. Erosion Hazard	High	High
Soil Permeability	Moderately rapid	Moderate
Soil Drainage	Somewhat excessively	Well
Soil Manageability Class	3-4GE	3-4GE
Group	IV	IV
Forest Site Class	4	4
Regeneration Potential	Moderate	Moderate
Available Water Capacity (AWC)	Very low	Low
Upper 20 inches	1.2 inches	1.7 inches
Susceptibility to Burning Damage	Moderate	Moderate
Hydrologic Soil Group	C	C
Unified Soil Class	0-6 SC	0-26 ML,GC
Depth Rating	6-25 GW	
Potential Failure as Road Subgrade	No	No
Seeding Recommendations	2	1

Included Areas: 20 percent inclusions of soils similar to Raisio family, mod. deep, except less than 20 inches deep, Rock outcrop, metaigneous, and colluvial material.

**360 Holland family, deep-Clallam family, moderately deep-Cotati family,
deep association, gabbroic
20 to 65 percent slopes**

Map Unit Components	Holland family, deep, gabbroic	Clallam family, mod. deep, gabbroic	Cotati family, deep, gabbroic
Approx. Proportion	(30%)	(25%)	(15%)
Position, Slope, and Elevation	Mountain sideslopes; 20 to 40; all aspects; 1000 to 3500 ft.	Mountain sideslopes; 40 to 65; all aspects; 1000 to 3500 ft.	Mountain sideslopes; 20 to 40; all aspects; 1000 to 3500 ft.
Typical Vegetation	Douglas-fir - Tanoak - Madrone	Douglas-fir - Tanoak - Madrone	Douglas-fir - Tanoak - Madrone

Soil Profile Description

Surface Layer	Strong brown loam, moderate subangular blocky structure, strongly acid	Brownish yellow very gravelly loam, weak granular structure, medium acid	Very pale brown gravelly loam moderate granular structure, medium acid
Subsoil	Yellowish brown to brownish yellow clay loam to gravelly loam, moderate subangular blocky structure, med. to strongly acid	Very pale brown blocky sandy clay loam, weak to moderate subangular blocky structure, medium acid	Yellow clay loam to clay, strong subangular to angular blocky structure, medium acid
Substratum	Very pale brown gravelly loam to sandy loam, weak subangular blocky structure to massive, strongly acid		Very pale brown loam, weak subangular blocky structure, medium acid

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	40-60; gabbro rock	20-40; gabbro rock	40-60; gabbro rock
Erosion Factor (K)	.20-.28	.20-.28	.20-.28
Max. Erosion Hazard	High	High	High
Soil Permeability	Moderate	Moderate to moderately rapid	Moderate to moderately rapid
Soil Drainage	Well	Well	Well
Soil Manageability Class	2-3E	3Ep	2-3E
Group	III	III	III
Forest Site Class	4-5	4-5	4
Regeneration Potential	Low to moderate	Low	Low to moderate
Available Water Capacity (AWC)	Moderate	Low	High
Upper 20 inches	2.8 inches	1.4 inches	3.0 inches
Susceptibility to Burning Damage	Moderate	Moderate	Moderate
Hydrologic Soil Group	C	C	C
Unified Soil Class	0-50 ML	0-36 ML	0-7 ML
Depth Rating	50-60 SC		7-22 CH 22-60 ML
Potential Failure as Road Subgrade	No	No	Yes
Seeding Recommendations	1	2	1
Included Areas	30 percent inclusions of soils similar to Skalan and Clallam families, deep, except on gabbro, and soils on slopes less than 20 percent and over 65 percent.		

**361 Holland family, deep-Clallam family, moderately deep-Cotati family, deep association, gabbroic
20 to 65 percent slopes**

Map Unit Components	Holland family, deep, gabbroic (30%)	Clallam family, mod. deep, gabbroic (25%)	Cotati family, deep, gabbroic (15%)
Approx. Proportion			
Position, Slope, and Elevation	Mountain sideslopes; 20 to 40; all aspects; 1000 to 3500 ft.	Mountain sideslopes; 40 to 65; all aspects; 1000 to 3500 ft.	Mountain sideslopes; 20 to 40; all aspects; 1000 to 3500 ft.
Typical Vegetation	Douglas-fir - Tanoak - Madrone	Douglas-fir - Tanoak - Madrone	Douglas-fir - Tanoak - Madrone

Soil Profile Description

Surface Layer	Strong brown loam, moderate subangular blocky structure, strongly acid	Brownish yellow very gravelly loam, weak granular structure, medium acid	Very pale brown gravelly loam, moderate granular structure, medium acid
Subsoil	Yellowish brown to brownish yellow clay loam to gravelly loam, moderate subangular blocky structure, med. to strongly acid	Very pale brown blocky sandy clay loam, weak to moderate subangular blocky structure, medium acid	Yellow clay loam to clay, strong subangular to angular blocky structure, medium acid
Substratum	Very pale brown gravelly loam to sandy loam, weak subangular blocky structure to massive, strongly acid		Very pale brown loam, weak subangular blocky structure, medium acid

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	40-60; gabbro rock	20-40; gabbro rock	40-60; gabbro rock
Erosion Factor (K)	.20-.28	.20-.28	.20-.28
Max. Erosion Hazard	High	High	High
Soil Permeability	Moderate	Moderate to moderately rapid	Moderate to moderately rapid
Soil Drainage	Well	Well	Well
Soil Manageability Class	2-3E	3Ep	2-3E
Group	III	III	III
Forest Site Class	4-5	4-5	4
Regeneration Potential	Low to moderate	Low	Low to moderate
Available Water Capacity (AWC)	Moderate	Low	High
Upper 20 inches	2.8 inches	1.4 inches	3.0 inches
Susceptibility to Burning Damage	Moderate	Moderate	Moderate
Hydrologic Soil Group	C	C	C
Unified Soil Class	0-50 ML	0-36 ML	0-7 ML
Depth Rating	50-60 SC		7-22 CH 22-60 ML
Potential Failure as Road Subgrade	No	No	Yes
Seeding Recommendations	1	2	1
Included Areas	30 percent inclusions of soils similar to Skalan and Clallam families, deep, except on gabbro, and soils on slopes less than 20 percent and over 65 percent.		

**362 Holland family, deep-Clallam family, moderately deep-Cotati family,
deep association, gabbroic
20 to 65 percent slopes**

Map Unit Components	Holland family, deep, gabbroic	Clallam family, mod. deep, gabbroic	Cotati family, deep, gabbroic
Approx. Proportion	(30%)	(25%)	(15%)
Position, Slope, and Elevation	Mountain sideslopes; 20 to 40; all aspects; 1000 to 3500 ft.	Mountain sideslopes; 40 to 65; all aspects; 1000 to 3500 ft.	Mountain sideslopes; 20 to 40; all aspects; 1000 to 3500 ft.
Typical Vegetation	Douglas-fir - Tanoak - Madrone	Douglas-fir - Tanoak - Madrone	Douglas-fir - Tanoak - Madrone

Soil Profile Description

Surface Layer	Strong brown loam, moderate subangular blocky structure, strongly acid	Brownish yellow very gravelly loam, weak granular structure, medium acid	Very pale brown gravelly loam moderate granular structure, medium acid
Subsoil	Yellowish brown to brownish yellow clay loam to gravelly loam, moderate subangular blocky structure, med. to strongly acid	Very pale brown blocky sandy clay loam, weak to moderate subangular blocky structure, medium acid	Yellow clay loam to clay, strong subangular to angular blocky structure, medium acid
Substratum	Very pale brown gravelly loam to sandy loam, weak subangular blocky structure to massive, strongly acid		Very pale brown loam, weak subangular blocky structure, medium acid

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	40-60; gabbro rock	20-40; gabbro rock	40-60; gabbro rock
Erosion Factor (K)	.20-.28	.20-.28	.20-.28
Max. Erosion Hazard	High	High	High
Soil Permeability	Moderate	Moderate to moderately rapid	Moderate to moderately rapid
Soil Drainage	Well	Well	Well
Soil Manageability Class	2-3E	3Ep	2-3E
Group	III	III	III
Forest Site Class	4-5	4-5	4
Regeneration Potential	Low to moderate	Low	Low to moderate
Available Water Capacity (AWC)	Moderate	Low	High
Upper 20 inches	2.8 inches	1.4 inches	3.0 inches
Susceptibility to Burning Damage	Moderate	Moderate	Moderate
Hydrologic Soil Group	C	C	C
Unified Soil Class	0-50 ML	0-36 ML	0-7 ML
Depth Rating	50-60 SC		7-22 CH 22-60 ML
Potential Failure as Road Subgrade	No	No	Yes
Seeding Recommendations	1	2	1
Included Areas	30 percent inclusions of soils similar to Skalan and Clallam families, deep, except on gabbro, and soils on slopes less than 20 percent and over 65 percent.		

**400 Rock outcrop-Rubble land association, ultramafic
30 to 90 percent slopes**

Map Unit Components	Rock outcrop, ultramafic	Rubble land
Approx. Proportion	(50%)	(30%)
Position, Slope, and Elevation	Mountain sideslopes	Mountain sideslopes
Typical Vegetation	Barren	Barren

Soil Profile Description

Surface Layer	Colluvium of mixed rock sizes
Subsoil	
Substratum	

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material		
Erosion Factor (K)		
Max. Erosion Hazard		
Soil Permeability		
Soil Drainage		
Soil Manageability Class		
Group		
Forest Site Class		
Regeneration Potential		
Available Water Capacity (AWC)		
Upper 20 inches		
Susceptibility to Burning Damage		
Hydrologic Soil Group	D	B
Unified Soil Class		
Depth Rating		
Potential Failure as Road Subgrade	No	No
Seeding Recommendations		
Included Areas	20 percent inclusions of Oragan family, Lithic Haploxerafs, ultramafic, and frigid soils.	

**401 Lithic Haploxeralfs, ultramafic-Ishi Pishi family, deep complex
35 to 70 percent slopes**

Map Unit Components	Lithic Haploxeralfs, ultramafic	Ishi Pishi family, deep
Approx. Proportion	(35%)	(35%)
Position, Slope, and Elevation	Mountain sideslopes; 50 to 70; NW to SE, 400 to 3800 ft.; SE to W, 400 to 4500 ft.	Mountain sideslopes; 35 to 70; NW to SE, 400 to 3800 ft.; SE to W, 400 to 4500 ft.
Typical Vegetation	Huckleberry Oak - Manzanita	Jeffrey Pine

Soil Profile Description

Surface Layer	Pale brown to reddish brown gravelly heavy loam, mod. granular to subangular blocky structure, slightly acid to neutral	Brown to reddish yellow gravelly clay loam to clay, strong granular structure, slightly acid to neutral
Subsoil	Yellowish brown to reddish brown gravelly clay loam, moderate subangular blocky structure, slightly acid to neutral	Yellowish red very gravelly clay, moderate subangular blocky structure, neutral
Substratum		White clay loam, weak subangular blocky structure, neutral

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	12-18; serpentinite rock	40-60; serpentinite rock
Erosion Factor (K)	.28-.37	.20-.32
Max. Erosion Hazard	Very high	Very high
Soil Permeability	Moderate	Moderate
Soil Drainage	Well	Well
Soil Manageability Class	3-4GE	3-4GE
Group	IV	IV
Forest Site Class	7	4-5
Regeneration Potential	Low	Low
Available Water Capacity (AWC)	Very low	Moderate
Upper 20 inches	<2.5 inches	3.1 inches
Susceptibility to Burning Damage	High	High
Hydrologic Soil Group	C-D	B
Unified Soil Class	0-15 ML	0-40 CH
Depth Rating		40-47 ML
Potential Failure as Road Subgrade	Possible	Yes
Seeding Recommendations	2	2
Included Areas	30 percent inclusions of Weitchpec family, mod. deep, and soils similar to Ishi Pishi family, deep, except mod. deep.	

**402 Lithic Haploxeralfs, ultramafic-Ishi Pishi family, deep complex
35 to 70 percent slopes**

Map Unit Components	Lithic Haploxeralfs, ultramafic	Ishi Pishi family, deep
Approx. Proportion	(35%)	(35%)
Position, Slope, and Elevation	Mountain sideslopes; 50 to 70; NW to SE, 400 to 3800 ft.; SE to W, 400 to 4500 ft.	Mountain sideslopes; 35 to 70; NW to SE, 400 to 3800 ft.; SE to W, 400 to 4500 ft.
Typical Vegetation	Huckleberry Oak - Manzanita	Jeffrey Pine

Soil Profile Description

Surface Layer	Pale brown to reddish brown gravelly heavy loam, mod. granular to subangular blocky structure, slightly acid to neutral	Brown to reddish yellow gravelly clay loam to clay, strong granular structure, slightly acid to neutral
Subsoil	Yellowish brown to reddish brown gravelly clay loam, moderate subangular blocky structure, slightly acid to neutral	Yellowish red very gravelly clay, moderate subangular blocky structure, neutral
Substratum		White clay loam, weak subangular blocky structure, neutral

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	12-18; serpentinite rock	40-60; serpentinite rock
Erosion Factor (K)	.28-.37	.20-.32
Max. Erosion Hazard	Very high	Very high
Soil Permeability	Moderate	Moderate
Soil Drainage	Well	Well
Soil Manageability Class	3-4GE	3-4GE
Group	IV	IV
Forest Site Class	7	4-5
Regeneration Potential	Low	Low
Available Water Capacity (AWC)	Very low	Moderate
Upper 20 inches	<2.5 inches	3.1 inches
Susceptibility to Burning Damage	High	High
Hydrologic Soil Group	C-D	B
Unified Soil Class	0-15 ML	0-40 CH
Depth Rating		40-47 ML
Potential Failure as Road Subgrade	Possible	Yes
Seeding Recommendations	2	2
Included Areas	30 percent inclusions of Weitchpec family, mod. deep, and soils similar to Ishi Pishi family, deep, except mod. deep.	

**403 Oragan family-Weitchpec family, moderately deep-Lithic Haploxeralfs,
ultramafic complex
30 to 50 percent slopes**

Map Unit Components	Oragan family	Weitchpec family, mod. deep	Lithic Haploxeralfs, ultramafic
Approx. Proportion	(30%)	(25%)	(15%)
Position, Slope, and Elevation	Mountain sideslopes; 30 to 50; NW to SE, 400 to 3800 ft.; SE to W, 400 to 4500 ft.	Mountain sideslopes; 30 to 50; NW to SE, 400 to 3800 ft.; SE to W, 400 to 4500 ft.	Mountain sideslopes; 30 to 50 NW to SE, 400 to 3800 ft.; SE to W, 400 to 4500 ft.
Typical Vegetation	Huckleberry Oak - Manzanita	Huckleberry Oak - Manzanita	Jeffrey Pine

Soil Profile Description

Surface Layer	Very pale brown gravelly silt loam, strong granular structure, slightly acid	Pale brown gravelly silt loam, weak granular structure, medium acid	Pale brown to reddish brown gravelly heavy loam, moderate granular structure, sl. acid to neutral
Subsoil	Very pale brown gravelly silt loam, moderate granular structure, slightly acid	Light yellowish brown very gravelly sandy loam, moderate to weak granular structure, medium acid	Yellowish brown to reddish brown gravelly clay loam, moderate granular structure, slightly acid to neutral
Substratum	Very pale brown gravelly silt loam, weak granular structure, neutral		

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	10-20; serpentinite rock	20-40; serpentinite rock	12-18; serpentinite rock
Erosion Factor (K)	.28-.43	.24-.28	.28-.37
Max. Erosion Hazard	High	High	High
Soil Permeability	Moderate	Moderate	Moderate
Soil Drainage	Well	Well	Well
Soil Manageability Class	3ED	3Ep	3ED
Group	III	III	III
Forest Site Class	7	6	7
Regeneration Potential	Low	Low	Low
Available Water Capacity (AWC)	Very low	Low	Very low
Upper 20 inches	1.5 inches	1.4 inches	<2.5 inches
Susceptibility to Burning Damage	High	High	High
Hydrologic Soil Group	C	C	C-D
Unified Soil Class Depth Rating	0-20 ML	0-8 ML 8-35 SC	0-15 ML
Potential Failure as Road Subgrade	No	No	Possible
Seeding Recommendations	2	2	2
Included Areas	30 percent inclusions of soils similar to Oragan family, except mod. deep and frigid serpentinitic soils.		

**404 Oragan family-Weitchpec family, moderately deep-Lithic Haploxerafls,
ultramafic complex
50 to 70 percent slopes**

Map Unit Components	Oragan family	Weitchpec family, mod. deep	Lithic Haploxerafls, ultramafic
Approx. Proportion	(30%)	(25%)	(15%)
Position, Slope, and Elevation	Mountain sideslopes; 50 to 70; NW to SE, 400 to 3800 ft.; SE to W, 400 to 4500 ft.	Mountain sideslopes; 50 to 70; NW to SE, 400 to 3800 ft.	Mountain sideslopes; 50 to 70; NW to SE, 400 to 3800 ft.; SE to W, 400 to 4500 ft.
Typical Vegetation	Huckleberry Oak - Manzanita	Huckleberry Oak - Manzanita	Jeffrey Pine

Soil Profile Description

Surface Layer	Very pale brown gravelly silt loam, strong granular structure, slightly acid	Pale brown gravelly silt loam, weak granular structure, medium acid	Pale brown to reddish brown gravelly heavy loam, moderate granular struc., slightly acid to neutral
Subsoil	Very pale brown gravelly silt loam, moderate granular structure, slightly acid	Light yellowish brown very gravelly sandy loam, moderate to weak granular structure, medium acid	Yellowish brown to reddish brown gravelly clay loam, mod.subang.bky. to gran.struct., slightly acid to neutral
Substratum	Very pale brown gravelly silt loam, weak granular structure, neutral		

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	10-20; serpentinite rock	20-40; serpentinite rock	12-18; serpentinite rock
Erosion Factor (K)	.28-.43	.24-.28	.28-.37
Max. Erosion Hazard	High	High	Very high
Soil Permeability	Moderate	Moderate	Moderate
Soil Drainage	Well	Well	Well
Soil Manageability Class	3-4GE	3-4GE	3-4GE
Group	IV	IV	IV
Forest Site Class	7	6	7
Regeneration Potential	Low	Low	Low
Available Water Capacity (AWC)	Very low	Low	Very low
Upper 20 inches	1.5 inches	1.4 inches	<2.5 inches
Susceptibility to Burning Damage	High	High	High
Hydrologic Soil Group	C-D	C	C-D
Unified Soil Class	0-20 ML	0-8 ML	0-15 ML
Depth Rating		8-35 SC	
Potential Failure as Road Subgrade	No	No	Possible
Seeding Recommendations	2	2	2
Included Areas	30 percent inclusions of soils similar to Oragan family, except mod. deep, and frigid serpentinitic soils.		

**405 Oragan family-Lithic Haploxeralfs, ultramafic-Rock outcrop, ultramafic complex
50 to 70 percent slopes**

Map Unit Components	Oragan family	Lithic Haploxeralfs, ultramafic	Rock outcrop, ultramafic
Approx. Proportion	(30%)	(20%)	(15%)
Position, Slope, and Elevation	Mountain sideslopes; 50 to 70; NW to SE, 400 to 3800 ft.; SE to W, 400 to 4500 ft.	Mountain sideslopes; 50 to 70; NW to SE, 400 to 3800 ft.; SE to W, 400 to 4500 ft.	Mountain sideslopes; SE to W 400 to 4500 ft.
Typical Vegetation	Huckleberry Oak - Manzanita	Jeffrey Pine	Barren

Soil Profile Description

Surface Layer	Very pale brown gravelly silt loam, strong granular structure, slightly acid	Pale brown to reddish brown gravelly heavy loam, moderate granular structure, slightly acid to neutral
Subsoil	Very pale brown gravelly silt loam, moderate granular structure, slightly acid	Yellowish brown to reddish brown grav. clay loam, moderate subangular blocky to mod. granular structure, slightly acid to neutral
Substratum	Very pale brown gravelly silt loam, weak granular structure, neutral	

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	10-20; serpentinite rock	12-18; serpentinite rock	
Erosion Factor (K)	.28-.43	.28-.37	
Max. Erosion Hazard	High	Very high	
Soil Permeability	Moderate	Moderate	
Soil Drainage	Well	Well	
Soil Manageability Class	3-4GE	3-4GE	
Group	IV	IV	
Forest Site Class	7	7	
Regeneration Potential	Low	Low	
Available Water Capacity (AWC)	Very low	Very low	
Upper 20 inches	1.5 inches	<2.5 inches	
Susceptibility to Burning Damage	High	High	
Hydrologic Soil Group	C-D	C-D	D
Unified Soil Class	0-20 ML	0-15 ML	
Depth Rating			
Potential Failure as Road Subgrade	No	Possible	No
Seeding Recommendations	2	2	
Included Areas	35 percent inclusions of soils similar to Oragan family, except mod. deep, and frigid serpentinitic soils.		

**409 Althouse family, moderately deep-Skymor family, ultramafic association
35 to 75 percent slopes**

Map Unit Components	Althouse family, mod. deep	Skymor family, ultramafic
Approx. Proportion	(40%)	(25%)
Position, Slope, and Elevation	Mountain sideslopes and near ridges; 35 to 60; NW to E, 3800 to 6000 ft.; SE to W, 4500 to 6000 ft.	Mountain sideslopes and near ridges; NW to E, 3800 to 6000 ft.; SE to W, 4500 to 6000 ft.
Typical Vegetation	Jeffrey Pine	Huckleberry Oak - Manzanita

Soil Profile Description

Surface Layer	Light yellowish brown very gravelly loam, weak granular structure, medium acid	Grayish brown to brown gravelly loam, weak granular structure, medium acid
Subsoil	Very pale brown very gravelly loam, weak subangular blocky structure breaking to weak granular structure, slightly acid	Yellowish brown very gravelly loam, weak subangular blocky structure breaking to weak granular structure, slightly acid
Substratum		

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	20-40; metaigneous and ultramafic rock	10-20; metaigneous and ultramafic rock
Erosion Factor (K)	.20-.32	.20-.32
Max. Erosion Hazard	High	High
Soil Permeability	Moderate to rapid	Moderately rapid
Soil Drainage	Well	Well
Soil Manageability Class	3Ep	3Ed
Soil Manageability Group	III	III
Forest Site Class	3-4	5
Regeneration Potential	Low	Very low
Available Water Capacity (AWC)	Low	Very low
Upper 20 inches	1.9 inches	1.7 inches
Susceptibility to Burning Damage	Moderate	Moderate
Hydrologic Soil Group	C	D
Unified Soil Class	0-46 ML	0-11 ML
Depth Rating		11-19 GC
Potential Failure as Road Subgrade	No	No
Seeding Recommendations	2	1
Included Areas	35 percent inclusions of Skalan family, deep, Rock outcrop, ultramafic and Holland family, mod. deep at lower elevations on southern aspects.	

**411 Hungry family, deep
35 to 70 percent slopes**

Map Unit Components	Hungry family, deep
Approx. Proportion	(40%)
Position, Slope, and Elevation	Mountain sideslopes; 35 to 70; NW to E, 4000 to 6000 ft.; SE to W, 4000 to 6000 ft.
Typical Vegetation	Jeffrey Pine

Soil Profile Description

Surface Layer	Light brown very gravelly clay loam, moderate granular structure, medium acid
Subsoil	Reddish yellow to pink cobbly clay loam, moderate subangular blocky structure, medium acid
Substratum	Very pale brown cobbly clay, weak subangular blocky structure, medium acid

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	40-60+; serpentinite rock
Erosion Factor (K)	.20-.28
Max. Erosion Hazard	High
Soil Permeability	Moderate to moderately slow
Soil Drainage	Well
Soil Manageability Class	3-4GE
Group	IV
Forest Site Class	5
Regeneration Potential	Very low
Available Water Capacity (AWC)	Moderate
Upper 20 inches	2.5 inches
Susceptibility to Burning Damage	Moderate to high
Hydrologic Soil Group	C
Unified Soil Class	0-16 ML
Depth Rating	16-53 GC
Potential Failure as Road Subgrade	No
Seeding Recommendations	2
Included Areas	60 percent inclusions of Lithic Haploxerafals, ultramafic, soils similar to Hungry family, deep, except not skeletal, and soils similar to Voorhies family, mod. deep, except on serpentinite rock.

**412 Madden family, moderately deep
20 to 50 percent slopes**

Map Unit Components	Madden family, mod. deep
Approx. Proportion	(60%)
Position, Slope, and Elevation	Mountain sideslopes and ridges; 20 to 50; NW to E, 1000 to 4500 ft.; SE to W, 1000 to 4800 ft.
Typical Vegetation	Jeffrey Pine

Soil Profile Description

Surface Layer	Brown clay loam, moderate subangular blocky structure, neutral
Subsoil	Brown to yellowish brown clay loam to clay, moderate subangular blocky structure, neutral
Substratum	

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	20-40; serpentinite rock
Erosion Factor (K)	.20-.32
Max. Erosion Hazard	High
Soil Permeability	Moderate
Soil Drainage	Well
Soil Manageability Class	2-3E
Group	III
Forest Site Class	5
Regeneration Potential	Moderate
Available Water Capacity (AWC)	Moderate
Upper 20 inches	3.6 inches
Susceptibility to Burning Damage	High
Hydrologic Soil Group	C
Unified Soil Class	0-24 ML
Depth Rating	24-37 CH
Potential Failure as Road Subgrade	Possible
Seeding Recommendations	2
Included Areas	40 percent inclusions of Lithic Haploxerafs, ultramafic, and soils similar to Madden family, mod. deep, except skeletal and deep.

**420 Gasquet-Walnett families, deep, stony-Jayel family, moderately deep association
10 to 50 percent slopes**

Map Unit Components	Gasquet family, deep, stony (30%)	Walnett family, deep, stony (25%)	Jayel family, mod. deep (20%)
Approx. Proportion			
Position, Slope, and Elevation	Mountain sideslopes; 10 to 40; all aspects; 500 to 3500 ft.	Mountain sideslopes; 15 to 50; all aspects; 500 to 3500 ft.	Mountain sideslopes; 15 to 40 all aspects; 500 to 3500 ft.
Typical Vegetation	Douglas-fir - Tanoak - Madrone	Douglas-fir - Tanoak - Madrone	Douglas-fir - Tanoak - Madrone

Soil Profile Description

Surface Layer	Yellowish red stony loam, moderate granular structure, medium acid	Strong brown stony loam, moderate subangular blocky structure, medium acid	Yellowish red clay loam, strong granular structure, neutral
Subsoil	Red to dark red stony clay loam, mod. subangular blocky structure breaking to mod. granular structure, medium to slightly acid	Strong brown to brownish yellow very gravelly clay loam, mod. to strong subangular blocky structure, slightly acid	Reddish yellow to yellowish red silty clay loam, moderate subangular blocky structure, neutral
Substratum		Yellow very gravelly loam, weak subangular blocky structure, slightly acid	

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	40-60+; serpentinized peridotite	40-60+; serpentinized peridotite	20-40; serpentinized peridotite
Erosion Factor (K)	.24-.43	.28-.43	.28-.49
Max. Erosion Hazard	High	High	High
Soil Permeability	Moderate to slow	Moderate	Moderate to moderately slow
Soil Drainage	Well	Well	Well
Soil Manageability Class	2-3E	2-3Ep	2-3E
Group	II	II	II
Forest Site Class	5	6	6
Regeneration Potential	Moderate	Moderate	Moderate
Available Water Capacity (AWC)	High	Low to moderate	Low to moderate
Upper 20 inches	2.9 inches	2.1 inches	3.7 inches
Susceptibility to Burning Damage	High	High	High
Hydrologic Soil Group	C	C	C
Unified Soil Class	0-60 ML	0-42 ML	0-40 ML
Depth Rating		42-60 GC	
Potential Failure as Road Subgrade	Yes	Yes	Yes
Seeding Recommendations	2	2	2
Included Areas	25 percent inclusions of Lithic Haploxeralfs, ultramafic, Oragan family, Holland family, deep, and soils similar to Walnett family, deep, except not skeletal.		

**425 Lithic Haploxerafls, ultramafic-Walnett family, deep, stony association
25 to 70 percent slopes**

Map Unit Components	Lithic Haploxerafls, ultramafic	Walnett family, deep
Approx. Proportion	(35%)	(20%)
Position, Slope, and Elevation	Mountain sideslopes and benches; 35 to 70; all aspects; 500 to 3500 ft.	Mountain sideslopes; 25 to 70; all aspects; 500 to 3500 ft.
Typical Vegetation	Perennial Grass	Huckleberry Oak - Manzanita

Soil Profile Description

Surface Layer	Pale brown gravelly loam, moderate subangular blocky structure, neutral	Strong brown stony loam, moderate subangular blocky structure, medium acid
Subsoil	Yellowish brown gravelly loam to clay loam, moderate subangular blocky structure, neutral	Strong brown to brownish yellow very gravelly clay loam, moderate to strong subangular blocky structure, slightly acid
Substratum		Yellow very gravelly clay loam, weak subangular blocky structure, slightly acid

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	12-18; serpentinite rock	40-60; serpentinitized peridotite
Erosion Factor (K)	.28-.37	.28-.43
Max. Erosion Hazard	High	High
Soil Permeability	Moderate to moderately slow	Moderate
Soil Drainage	Well	Well
Soil Manageability Class	3-4GE	3-4GE
Group	IV	IV
Forest Site Class	7	6
Regeneration Potential	Low	Low
Available Water Capacity (AWC)	Very low	Low to moderate
Upper 20 inches	<2.5 inches	2.1 inches
Susceptibility to Burning Damage	High	High
Hydrologic Soil Group	C-D	C-D
Unified Soil Class	0-15 ML	0-42 ML
Depth Rating		42-60 GC
Potential Failure as Road Subgrade	Possible	Yes
Seeding Recommendations	2	2
Included Areas	45 percent inclusions of soils similar to Walnett family, deep, except not skeletal, Lithic Haploxerafls, ultramafic, Jayel family, mod. deep, soils similar to Oragan family, except mod. deep, and so	

**430 Jayel family, moderately deep-Walnett family, deep-Lithic Xerochrepts,
ultramafic association, stony
35 to 75 percent slopes**

Map Unit Components	Jayel family, mod. deep, stony (35%)	Walnett family, deep, stony (20%)	Lithic Xerochrepts, ultramafic (20%)
Approx. Proportion			
Position, Slope, and Elevation	Mountain sideslopes and broad ridges; 35 to 60; all aspects; 1000 to 3500 ft.	Mountain sideslopes; 35 to 70; all aspects; 500 to 3500 ft.	Mountain sideslopes; 35 to 75 all aspects; 500 to 3500 ft.
Typical Vegetation	Knobcone Pine	Huckleberry Oak - Manzanita	Huckleberry Oak - Manzanita

Soil Profile Description

Surface Layer	Reddish brown stony clay loam, moderate granular structure, neutral	Strong brown stony loam, moderate subangular blocky structure, medium acid	Strong brown stony clay loam moderate granular structure, neutral
Subsoil	Yellowish red cobbly clay, weak subangular blocky structure, neutral	Strong brown to brownish yellow very gravelly clay loam, moderate to strong subangular blocky structure, slightly acid	Yellowish red clay loam, moderate subangular blocky structure, neutral
Substratum		Yellow very gravelly clay loam, weak subangular blocky structure, slightly acid	

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	20-40; serpentized peridotite rock	40-60; serpentized peridotite rock	12-20; serpentized peridotite rock
Erosion Factor (K)	.24-.29	.28-.43	.28-.43
Max. Erosion Hazard	High	High	Very high
Soil Permeability	Moderate to moderately slow	Moderate	Moderate to moderately slow
Soil Drainage	Well	Well	Well
Soil Manageability Class	3E	3-4GE	3-4GE
Group	III	III	III
Forest Site Class	6	6	7
Regeneration Potential	Low	Low to moderate	Low
Available Water Capacity (AWC)	Low to moderate	Low	Very low
Upper 20 inches	2.8 inches	2.1 inches	<2.5 inches
Susceptibility to Burning Damage	High	High	High
Hydrologic Soil Group	C-D	C-D	D
Unified Soil Class	0-31 ML	0-42 ML	0-14 ML
Depth Rating		42-60 GC	
Potential Failure as Road Subgrade	No	Yes	Yes
Seeding Recommendations	2	2	2
Included Areas	25 percent inclusions of Rock outcrop,ultramafic, Oragran family, Gasquet family, deep, stony, Lit Haploxeralfs, ultramafic, and soils similar to Walnett family, deep, except not skeletal.		

**431 Jayel family, moderately deep, stony-Walnett family, deep, stony-Oragan family complex
5 to 35 percent slopes**

Map Unit Components	Jayel family, mod. deep, stony (30%)	Walnett family, deep, stony (25%)	Oragan family (20%)
Approx. Proportion			
Position, Slope, and Elevation	Broad ridges and mountain sideslopes; 5 to 35; all aspects; 1000 to 3500 ft.	Broad ridges and mountain sideslopes; 5 to 35; all aspects; 1000 to 3500 ft.	Broad ridges and mountain sideslopes; 5 to 35; all aspects; 1000 to 3500 ft.
Typical Vegetation	Knobcone Pine	Knobcone Pine	Huckleberry Oak - Manzanita

Soil Profile Description

Surface Layer	Reddish brown stony clay loam, moderate granular structure, neutral	Strong brown stony loam, moderate subangular blocky structure, medium acid	Very pale brown gravelly silt loam, strong granular structure, slightly acid
Subsoil	Yellowish red cobbly clay, weak subangular blocky structure, neutral	Strong brown very gravelly clay loam, strong subangular blocky structure, slightly acid	Very pale brown gravelly silt loam, moderate granular structure, slightly acid
Substratum		Yellow very gravelly loam, weak subangular blocky structure, slightly acid	Very pale brown gravelly silt loam, weak granular structure, neutral

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	20-40; serpentinized peridotite rock	40-60; serpentinized peridotite rock	12-20; serpentinized peridotite rock
Erosion Factor (K)	.24-.29	.28-.43	.28-.43
Max. Erosion Hazard	High	High	High
Soil Permeability	Moderate to moderately slow	Moderate	Moderate
Soil Drainage	Well	Well	Well
Soil Manageability Class	2E	2E	2Ed
Group	II	II	II
Forest Site Class	6	6	7
Regeneration Potential	Low	Low to moderate	Low
Available Water Capacity (AWC)	Low to moderate	Low	Very low to low
Upper 20 inches	2.8 inches	2.1 inches	1.5 inches
Susceptibility to Burning Damage	High	High	High
Hydrologic Soil Group	C	C-D	C-D
Unified Soil Class	0-31 ML	0-42 ML	0-20 ML
Depth Rating		42-60 GC	
Potential Failure as Road Subgrade	No	Yes	No
Seeding Recommendations	2	2	2
Included Areas	25 percent inclusions of Weitchpec family, mod. deep, Lithic Xerochrepts, ultramafic, Gasquet family, deep, stony, and Rock outcrop, ultramafic.		

500 Rock outcrop, dioritic

Map Unit Components

Approx. Proportion

Rock outcrop, dioritic

(70%)

Position, Slope, and Elevation

Mountain peaks, ridges and sideslopes

Typical Vegetation

Barren

Soil Profile Description

Surface Layer

Subsoil

Substratum

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material

Erosion Factor (K)

Max. Erosion Hazard

Soil Permeability

Soil Drainage

Soil Manageability

Class

Group

Forest Site Class

Regeneration Potential

Available Water Capacity (AWC)

Upper 20 inches

Susceptibility to Burning Damage

Hydrologic Soil Group

D

Unified Soil Class

Depth Rating

Potential Failure as Road Subgrade

No

Seeding

Recommendations

Included Areas

30 percent inclusions of Maymen family, dioritic and soils similar to Raisio family, mod. deep, except less than 20 inches deep.

**501 Rock outcrop, dioritic-Maymen family, complex, dioritic
50 to 90 percent slopes**

Map Unit Components	Rock outcrop, dioritic	Maymen family
Approx. Proportion	(40%)	(30%)
Position, Slope, and Elevation	Mountain sideslopes and ridges; NW to E; 600 to 4500 ft.	Mountain sideslopes in pockets between rock outcrop; 50 to 90; SE to W; 600 to 4800 ft.
Typical Vegetation	Barren	Douglas-fir - Tanoak - Madrone

Soil Profile Description

Surface Layer	Light brownish gray gravelly sandy loam, weak granular structure, strongly acid
Subsoil	Light yellowish brown gravelly coarse sandy loam, weak subangular blocky structure, slightly acid
Substratum	

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	Diorite rock	12-20; diorite rock
Erosion Factor (K)		.24-.37
Max. Erosion Hazard		High
Soil Permeability		Rapid
Soil Drainage		Somewhat excessively
Soil Manageability Class		4GE
Group		IV
Forest Site Class		5
Regeneration Potential		Low
Available Water Capacity (AWC)		Very low
Upper 20 inches		1.2 inches
Susceptibility to Burning Damage		High
Hydrologic Soil Group	D	C
Unified Soil Class		0-16 SC
Depth Rating		
Potential Failure as Road Subgrade	No	No
Seeding Recommendations		2
Included Areas	30 percent inclusions of Hugo family, mod. deep, and soils similar to Raisio family, except less than 20 inches deep.	

**503 Rock outcrop, dioritic-Wapal family, moderately deep association
45 to 75 percent slopes**

Map Unit Components	Rock outcrop, dioritic	Wapal family, mod. deep
Approx. Proportion	(45%)	(40%)
Position, Slope, and Elevation	Ridges and mountain sideslopes; NW to E; 4500 to 6000 ft.	Broad ridges, drainages, and mountain sideslop 45 to 75; SE to W; 4800 to 6000 ft.
Typical Vegetation	Barren	White Fir

Soil Profile Description

Surface Layer	Dark yellowish brown gravelly coarse sandy loam, weak granular structure, strongly acid
Subsoil	
Substratum	Yellowish brown cobbly loamy sand, single grain, medium acid

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	Diorite rock	20-40; diorite rock
Erosion Factor (K)		.17-.37
Max. Erosion Hazard		Very high
Soil Permeability		Moderately rapid
Soil Drainage		Somewhat excessively
Soil Manageability Class		3-4GE
Group		IV
Forest Site Class		4-5
Regeneration Potential		Low
Available Water Capacity (AWC)		Very low
Upper 20 inches		0.7 inches
Susceptibility to Burning Damage		High
Hydrologic Soil Group	D	B
Unified Soil Class		0-5 SC
Depth Rating		5-35 GW
Potential Failure as Road Subgrade	No	No
Seeding Recommendations		3
Included Areas	15 percent inclusions of soils similar to Raisio family, mod. deep, except less than 20 inches deep and frigid, and colluvial material.	

**515 Chaix family, moderately deep
50 to 70 percent slopes**

Map Unit Components	Chaix family, mod. deep
Approx. Proportion	(80%)
Position, Slope, and Elevation	Mountain sideslopes; 50 to 70; NW to E, 2000 to 4000 ft.; SE to W, 2000 to 4500 ft.
Typical Vegetation	Mixed Conifer-Fir

Soil Profile Description

Surface Layer	Yellowish brown gravelly coarse sandy loam, weak granular structure, strongly acid
Subsoil	Yellowish brown gravelly sandy loam, single grain, strongly acid
Substratum	saprolite (weathered diorite rock)

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	20-40; diorite rock
Erosion Factor (K)	.20-.37
Max. Erosion Hazard	Very high
Soil Permeability	Moderately rapid
Soil Drainage	Well to somewhat excessively
Soil Manageability Class	3-4GE
Group	IV
Forest Site Class	4
Regeneration Potential	Low to moderate
Available Water Capacity (AWC)	Low
Upper 20 inches	1.7 inches
Susceptibility to Burning Damage	High
Hydrologic Soil Group	B
Unified Soil Class	0-19 SC
Depth Rating	19-51 SM
Potential Failure as Road Subgrade	Possible
Seeding Recommendations	2
Included Areas	20 percent inclusions of Rock outcrop, dioritic, Rubble land, Maymen family, dioritic, and soils similar to Chaix family, mod. deep, except frigid.

**517 Chaix family, moderately deep-Rock outcrop, dioritic complex
70 to 90 percent slopes**

Map Unit Components	Chaix family, mod. deep	Rock outcrop, dioritic
Approx. Proportion	(55%)	(25%)
Position, Slope, and Elevation	Mountain sideslopes; 70 to 90; NW to SE, 2000 to 4000; SE to W, 2000 to 4500 ft.	Mountain sideslopes; all aspects; 2000 to 4500 f
Typical Vegetation	Huckleberry Oak - Manzanita	Barren

Soil Profile Description

Surface Layer	Yellowish brown gravelly coarse sandy loam, weak granular structure, strongly acid
Subsoil	Yellowish brown gravelly sandy loam, single grain, strongly acid
Substratum	Weathered diorite rock

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	20-40; diorite
Erosion Factor (K)	.20-.37
Max. Erosion Hazard	Very high
Soil Permeability	Moderately rapid
Soil Drainage	Well to somewhat excessively
Soil Manageability Class	4GE
Group	IV
Forest Site Class	5-6
Regeneration Potential	Low
Available Water Capacity (AWC)	Low
Upper 20 inches	1.7 inches
Susceptibility to Burning Damage	High
Hydrologic Soil Group	B D
Unified Soil Class	0-19 SC
Depth Rating	19-40 SM
Potential Failure as Road Subgrade	No No
Seeding Recommendations	2
Included Areas	20 percent inclusions of Rubble land, Maymen family, dioritic, and soils similar to Chaix family, mod. deep, except frigid.

**520 Chaix family, moderately deep
30 to 50 percent slopes**

Map Unit Components	Chaix family, mod. deep
Approx. Proportion	(80%)
Position, Slope, and Elevation	Mountain sideslopes; 30 to 50; NW to E, 600 to 4500 ft.; SE to W, 600 to 4800 ft.
Typical Vegetation	Douglas-fir - Tanoak - Madrone

Soil Profile Description

Surface Layer	Yellowish brown to brown gravelly coarse sandy loam, weak granular structure, strongly acid
Subsoil	Yellowish brown gravelly coarse sandy loam, single grain, very strongly acid
Substratum	Weathered diorite rock

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	20-40; diorite
Erosion Factor (K)	.20-.37
Max. Erosion Hazard	Very high
Soil Permeability	Moderately rapid to rapid
Soil Drainage	Well to somewhat excessively
Soil Manageability Class	3Ep
Group	III
Forest Site Class	4
Regeneration Potential	Low
Available Water Capacity (AWC)	Low
Upper 20 inches	1.7 inches
Susceptibility to Burning Damage	High
Hydrologic Soil Group	B
Unified Soil Class	0-19 SC
Depth Rating	19-40 SM
Potential Failure as Road Subgrade	No
Seeding Recommendations	2
Included Areas	20 percent inclusions of Maymen family, dioritic, Holland family, deep, dioritic, Deadman family, deep, and soils on slopes under 30 percent and over 50 percent.

**522 Chaix family, moderately deep-Holland family, deep, dioritic association
25 to 65 percent slopes**

Map Unit Components	Chaix family, mod. deep	Holland family, deep, dioritic
Approx. Proportion	(45%)	(35%)
Position, Slope, and Elevation	Mountain sideslopes; 35 to 65; NW to E, 600 to 4500 ft.; SE to W, 600 to 4800 ft.	Mountain sideslopes and benches; 25 to 50; NW to E, 600 to 4500 ft.; SE to W, 600 to 4800 ft.
Typical Vegetation	Douglas-fir - Tanoak - Madrone	Douglas-fir - Tanoak - Madrone

Soil Profile Description

Surface Layer	Yellowish brown to brown gravelly coarse sandy loam, weak granular structure, strongly acid	Brown loam, strong granular structure, slightly acid
Subsoil	Yellowish brown gravelly coarse sandy loam, single grain, very strongly acid	Brown to reddish yellow sandy clay loam, moderate subangular blocky structure, medium acid
Substratum		

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	20-40; diorite rock	40-60+; diorite rock
Erosion Factor (K)	.20-.37	.24-.32
Max. Erosion Hazard	Very high	High
Soil Permeability	Moderately rapid to rapid	Moderately slow
Soil Drainage	Well to somewhat excessively	Well
Soil Manageability Class	3Ep	3E
Group	III	III
Forest Site Class	4	3
Regeneration Potential	Low	High
Available Water Capacity (AWC)	Low	High to very high
Upper 20 inches	1.7 inches	3.3 inches
Susceptibility to Burning Damage	High	High
Hydrologic Soil Group	B	C
Unified Soil Class	0-19 SC	0-10 ML
Depth Rating	19-40 SM	10-60 SC
Potential Failure as Road Subgrade	No	No
Seeding Recommendations	2	1
Included Areas	20 percent inclusions of Deadman family, deep, Maymen family, dioritic, frigid soils, and soils on slopes less than 25 percent.	

**524 Deadman-Rogue families association, deep
20 to 70 percent slopes**

Map Unit Components	Deadman family, deep	Rogue family, deep
Approx. Proportion	(40%)	(40%)
Position, Slope, and Elevation	Mountain sideslopes and ridges; 20 to 50; NW to E, 4500 to 6000 ft.; SE to W, 4800 to 6000 ft.	Mountain sideslopes and ridges; 30 to 70; NW to E, 4500 to 6000 ft.; SE to W, 4800 to 6000 ft.
Typical Vegetation	White Fir	Mixed Conifer-Fir

Soil Profile Description

Surface Layer	Very dark gray loam, weak granular to weak subangular blocky structure, strongly acid	Dark grayish brown sandy loam, weak granular structure, slightly acid
Subsoil	Brown gravelly loam, weak subangular blocky structure breaking to weak granular structure, strongly acid	Pale brown to pale yellow sandy loam, weak granular structure, slightly to medium acid
Substratum	Weathered diorite	Pale yellow loamy sand, weak granular structure, medium acid

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	40-60+; diorite rock	40-60+; diorite rock
Erosion Factor (K)	.20-.32	.20-.32
Max. Erosion Hazard	Very high	High
Soil Permeability	Moderately rapid	Moderate to moderately rapid
Soil Drainage	Well to somewhat excessively	Well to somewhat excessively
Soil Manageability Class	2-3E	3-4GE
Group	III	III
Forest Site Class	2-3	4
Regeneration Potential	Moderate	Low to moderate
Available Water Capacity (AWC)	High	Moderate
Upper 20 inches	3.2 inches	1.9 inches
Susceptibility to Burning Damage	Moderate	High
Hydrologic Soil Group	B	B
Unified Soil Class	0-53 OL	0-41 SC
Depth Rating	53-70 SW	41-57 SW
Potential Failure as Road Subgrade	Yes	No
Seeding Recommendations	3	2
Included Areas	20 percent inclusions of Nanny family, deep, dioritic, Maymen family, dioritic, Chaix family, deep, soils similar to Deadman family, deep, except less than 20 inches deep, and soils similar to Rogue f	

**525 Nanny family, deep, dioritic-Althouse family, deep, stony association
30 to 70 percent slopes**

Map Unit Components	Nanny family, deep, dioritic	Althouse family, deep, stony
Approx. Proportion	(40%)	(30%)
Position, Slope, and Elevation	Colluvial mountain sideslopes and glacial moraines; 30 to 70; NW to E, 3800 to 6000 ft.;SE to W, 4500 to 6000 ft.	Colluvial mountain sideslopes and glacial moraines; 30 to 70; NW to E, 3800 to 6000 ft.; SE to W, 4500 to 6000 ft.
Typical Vegetation	White Fir - Red Fir	White Fir - Red Fir

Soil Profile Description

Surface Layer	Yellowish brown gravelly loam, weak granular structure, strongly acid	Yellowish brown gravelly loam, strong granula structure, medium acid
Subsoil	Yellowish brown gravelly to very cobbly loam, weak granular structure, medium to strongly acid	Yellowish brown gravelly to very gravelly loam weak subangular blocky structure breaking to mod. granular structure, slightly to medium aci
Substratum		Light yellowish brown stony loam, weak subangular blocky structure, slightly acid

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	40-60+; igneous, metaigneous, and glacial till	40-60+; igneous, metaigneous, and glacial till
Erosion Factor (K)	.20-.32	.20-.32
Max. Erosion Hazard	High	High
Soil Permeability	Moderately rapid	Moderately rapid
Soil Drainage	Well	Well
Soil Manageability Class	3-4GE	3-4GE
Group	III	III
Forest Site Class	3-4	4-5
Regeneration Potential	Low to moderate	Low to moderate
Available Water Capacity (AWC)	Low	Moderate
Upper 20 inches	1.5 inches	2.2 inches
Susceptibility to Burning Damage	High	High
Hydrologic Soil Group	C	B
Unified Soil Class	0-55 SC	0-35 ML
Depth Rating		35-59 GC
Potential Failure as Road Subgrade	No	No
Seeding Recommendations	2	2

Included Areas 30 percent inclusions of Deadmand and Rogue families, deep, Rock outcrop,dioritic, soils similar t Nanny family, deep, dioritic and Althouse family, deep, stony, except mod. deep, and soils on slop under 30 percent.

**530 Maymen family, dioritic
45 to 70 percent slopes**

Map Unit Components	Maymen family, dioritic
Approx. Proportion	(85%)
Position, Slope, and Elevation	Mountain sideslopes; 45 to 70; NW to E, 600 to 4500 ft.; SE to W, 600 to 4800 ft.
Typical Vegetation	Douglas-fir - Tanoak - Madrone

Soil Profile Description

Surface Layer	Light brownish gray gravelly coarse sandy loam, weak granular structure, strongly acid
Subsoil	Light yellowish brown gravelly coarse sandy loam, single grain, slightly acid
Substratum	

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	12-20; diorite rock
Erosion Factor (K)	.20-.28
Max. Erosion Hazard	High
Soil Permeability	Rapid
Soil Drainage	Somewhat excessively
Soil Manageability Class	3-4Gd
Group	IV
Forest Site Class	5-6
Regeneration Potential	Low
Available Water Capacity (AWC)	Very low
Upper 20 inches	1.9 inches
Susceptibility to Burning Damage	High
Hydrologic Soil Group	C
Unified Soil Class	0-16 SC
Depth Rating	
Potential Failure as Road Subgrade	No
Seeding Recommendations	2
Included Areas	15 percent inclusions of Chaix family, deep and, Rock outcrop.

**535 Deadman family, moderately deep
0 to 30 percent slopes**

Map Unit Components	Deadman family, mod. deep
Approx. Proportion	(80%)
Position, Slope, and Elevation	Mountain sideslopes and broad ridges; 0 to 30; all aspects; 4500 to 6500 ft.
Typical Vegetation	Red Fir - Noble Fir

Soil Profile Description

Surface Layer	Dark brown gravelly coarse sandy loam, massive, very strongly acid
Subsoil	Dark yellowish brown gravelly coarse sandy loam, weak granular structure, strongly acid
Substratum	Dark yellowish brown gravelly coarse sandy loam, massive, strongly acid

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	20-40; diorite rock
Erosion Factor (K)	.20-.37
Max. Erosion Hazard	High
Soil Permeability	Moderately rapid
Soil Drainage	Somewhat excessively
Soil Manageability Class	2E
Group	II
Forest Site Class	3
Regeneration Potential	Low
Available Water Capacity (AWC)	Low
Upper 20 inches	2.6 inches
Susceptibility to Burning Damage	High
Hydrologic Soil Group	B-C
Unified Soil Class	0-24 OL
Depth Rating	24-32 SC
Potential Failure as Road Subgrade	Yes
Seeding Recommendations	2
Included Areas	20 percent inclusions of Chaix family, deep, Maymen family, dioritic, Rock outcrop, diorite, and Rubble land.

**540 Chaix family, moderately deep-Holland family, deep, dioritic association
25 to 65 percent slopes**

Map Unit Components	Chaix family, mod. deep	Holland family, deep, dioritic
Approx. Proportion	(45%)	(35%)
Position, Slope, and Elevation	Mountain sideslopes; 35 to 65; NW to E, 600 to 4500 ft.; SE to W, 600 to 4800 ft.	Mountain sideslopes and benches; 25 to 50; NW to E, 600 to 4500 ft.; SE to W, 600 to 4800 ft.
Typical Vegetation	Douglas-fir - Tanoak - Madrone	Douglas-fir - Tanoak - Madrone

Soil Profile Description

Surface Layer	Yellowish brown to brown gravelly coarse sandy loam, weak granular structure, strongly acid	Brown loam, strong granular structure, slightly acid
Subsoil	Yellowish brown gravelly coarse sandy loam, single grain, very strongly acid	Brown to reddish yellow sandy clay loam, moderate subangular blocky structure, medium acid

Substratum

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	20-40; diorite rock	40-60+; diorite rock
Erosion Factor (K)	.20-.37	.24-.32
Max. Erosion Hazard	Very high	High
Soil Permeability	Moderately rapid to rapid	Moderately slow
Soil Drainage	Well to somewhat excessively	Well
Soil Manageability Class	3Ep	3E
Group	III	III
Forest Site Class	4	3
Regeneration Potential	Low	High
Available Water Capacity (AWC)	Low	High to very high
Upper 20 inches	1.7 inches	3.3 inches
Susceptibility to Burning Damage	High	High
Hydrologic Soil Group	B	C
Unified Soil Class	0-19 SC	0-10 ML
Depth Rating	19-40 SM	10-60 SC
Potential Failure as Road Subgrade	No	No
Seeding Recommendations	2	1

Included Areas: 20 percent inclusions of Deadman family, deep, Maymen family, dioritic, frigid soils, and soils on slopes less than 25 percent.

**550 Wapal family, moderately deep
35 to 65 percent slopes**

Map Unit Components
Approx. Proportion
Position, Slope, and
Elevation
Typical Vegetation

Wapal family, mod. deep
(80%)
Mountain sideslopes; 35 to 65; NW to E, 4500
to 6000 ft.; SE to W, 4800 to 6000 ft.
White Fir

Soil Profile Description

Surface Layer

Dark yellowish brown gravelly coarse sandy
loam, weak granular structure, strongly acid

Subsoil

Substratum

Yellowish brown cobblely loamy sand, single
grain, medium acid

Soil Properties & Management Interpretations

Rooting Depth (in.),
Underlying Material

20-40; diorite rock

Erosion Factor (K)

.24-.32

Max. Erosion Hazard

Very high

Soil Permeability

Moderately rapid to rapid

Soil Drainage

Somewhat excessively

Soil Manageability

Class

3EP

Group

III

Forest Site Class

4-5

Regeneration Potential

Low

Available Water
Capacity (AWC)

Very low

Upper 20 inches

0.7 inches

Susceptibility to
Burning Damage

High

Hydrologic Soil Group

B

Unified Soil Class
Depth Rating

0-5 SC
5-35 GW

Potential Failure as
Road Subgrade

No

Seeding
Recommendations

3

Included Areas

20 percent inclusions of Rock outcrop, diorite, and soils similar to Wapal family, mod. deep, except
less than 20 inches deep.

**552 Wapal family, moderately deep-Deadman family, deep complex
35 to 65 percent slopes**

Map Unit Components	Wapal family, mod. deep	Deadman family, deep
Approx. Proportion	(50%)	(30%)
Position, Slope, and Elevation	Mountain sideslopes; 35 to 65; NW to E, 4500 to 6000 ft.; SE to W, 4800 to 6000 ft.	Mountain sideslopes and drainages; 35 to 65; NW to E, 4500 to 6000 ft.; SE to W, 4800 to 6000 ft.
Typical Vegetation	White Fir	White Fir

Soil Profile Description

Surface Layer	Dark yellowish brown gravelly coarse sandy loam, weak granular structure, strongly acid	Very dark gray loam, weak subangular blocky structure, strongly acid
Subsoil		Brown gravelly loam, weak subangular blocky structure breaking to weak granular structure, strongly acid
Substratum	Yellowish brown cobblely loamy sand, single grain, medium acid	Weathered diorite

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	20-40; diorite rock	40-60; diorite rock
Erosion Factor (K)	.20-.32	.20-.32
Max. Erosion Hazard	Very high	Very high
Soil Permeability	Moderately rapid to rapid	Moderately rapid
Soil Drainage	Somewhat excessively	Somewhat excessively
Soil Manageability Class	3EP	3E
Group	III	III
Forest Site Class	4-5	2-3
Regeneration Potential	Low	Low to moderate
Available Water Capacity (AWC)	Very low	Moderate to high
Upper 20 inches	0.7 inches	3.2 inches
Susceptibility to Burning Damage	High	Moderate
Hydrologic Soil Group	B	B
Unified Soil Class	0-5 SC	0-53 OL
Depth Rating	5-35 GW	53-60 SW
Potential Failure as Road Subgrade	No	Yes
Seeding Recommendations	3	3
Included Areas	20 percent inclusions of soils similar to Wapal family, mod. deep, except less than 20 inches deep and meadowlands.	

**554 Wapal family, moderately deep-Hugo family, deep, dioritic association
20 to 65 percent slopes**

Map Unit Components	Wapal family, mod. deep	Hugo family, deep, dioritic
Approx. Proportion	(40%)	(40%)
Position, Slope, and Elevation	Mountain sideslopes, ridges, and drainages; 40 to 65; NW to E, 4500 to 6000 ft.; SE to W, 4800 to 6000 ft.	Mountain sideslopes and benches; 20-45; NW to E, 600 to 4500 ft.; SE to W 600 to 4800 ft.
Typical Vegetation	White Fir	Douglas-fir - Tanoak - Madrone

Soil Profile Description

Surface Layer	Dark yellowish brown gravelly coarse sandy loam, weak granular structure, strongly acid	Reddish brown gravelly loam, strong subangular blocky structure, medium acid
Subsoil		Reddish brown to brown gravelly loam, moderate subangular blocky structure to massive, medium acid
Substratum	Yellowish brown cobbly loamy sand, single grain, medium acid	Brownish yellow sandy loam, massive, strongly acid

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	20-40; diorite rock	40-60; diorite rock
Erosion Factor (K)	.20-.32	.20-.28
Max. Erosion Hazard	Very high	High
Soil Permeability	Moderately rapid to rapid	Moderate
Soil Drainage	Somewhat excessively	Well
Soil Manageability Class	3EP	3E
Group	III	III
Forest Site Class	4-5	3
Regeneration Potential	Low	Moderate
Available Water Capacity (AWC)	Very low	Moderate
Upper 20 inches	0.7 inches	2.9 inches
Susceptibility to Burning Damage	High	High
Hydrologic Soil Group	B	B
Unified Soil Class	0-5 SC	0-39 ML
Depth Rating	5-35 GW	39-51 SC
Potential Failure as Road Subgrade	No	No
Seeding Recommendations	3	1
Included Areas	20 percent inclusions of soils similar to Wapal family, mod. deep, except less than 20 inches deep, and Holland family, deep, dioritic.	

**560 Hugo family, deep, dioritic
15 to 35 percent slopes**

Map Unit Components	Hugo family, deep, dioritic
Approx. Proportion	(80%)
Position, Slope, and Elevation	Mountain sideslopes and benches; 15 to 35; NW to E, 600 to 4500 ft.; SE to W, 600 to 4800 ft.
Typical Vegetation	Douglas-fir - Tanoak - Madrone

Soil Profile Description

Surface Layer	Reddish brown gravelly loam, strong subangular blocky structure, medium acid
Subsoil	Reddish brown to brown gravelly loam, moderate subangular blocky structure to massive, medium acid
Substratum	Brownish yellow sandy loam, massive, strongly acid

Soil Properties & Management Interpretations

Rooting Depth (in.), Underlying Material	40-60+; diorite rock
Erosion Factor (K)	.20-.28
Max. Erosion Hazard	High
Soil Permeability	Moderate
Soil Drainage	Well
Soil Manageability Class	2E
Group	II
Forest Site Class	3
Regeneration Potential	Moderate
Available Water Capacity (AWC)	Moderate
Upper 20 inches	2.9 inches
Susceptibility to Burning Damage	High
Hydrologic Soil Group	B
Unified Soil Class	0-39 ML
Depth Rating	39-51 SC
Potential Failure as Road Subgrade	No
Seeding Recommendations	1
Included Areas	20 percent inclusions of Holland family, deep, dioritic and Raisio family, mod. deep.

Taxonomic Units

In this section, each soil recognized in the survey area is described. The descriptions are arranged in alphabetical order.

The technical descriptions of families and phases given in the following pages use the nomenclature and standards of the Soil Survey Manual (Soil Survey Staff, 1951).

Colors are for dry soil unless otherwise stated. Dry phases were not described separately since they are similar, except for aspect.

Table 6 presents a list of the soil families, phases, and their classifications. The map units in which they are found as a major component are shown in Table 7.

TABLE 6. Classification of Taxonomic Units

SOIL NAME	FAMILY OR HIGHER TAXONOMIC CLASS
Aiken family, deep	Xeric Haplohumults, clayey, oxidic, mesic
*Albus family, deep	Ultic Haploxeralfs, loamy-skeletal, micaceous, frigid
Althouse family, deep, stony	Dystric Xerochrepts, loamy-skeletal, mixed, frigid
Althouse family, moderately deep	Dystric Xerochrepts, loamy-skeletal, mixed, frigid
Bins family, deep	Typic Xerumbrepts, fine-loamy, mixed, frigid
Chaix family, moderately deep	Dystric Xerochrepts, coarse-loamy, mixed, mesic
Chenango family, deep	Typic Dystrochrepts, loamy-skeletal, mixed, mesic
Clallam family, deep	Dystric Xerochrepts, loamy-skeletal, mixed, mesic
Clallam family, deep, dry	Dystric Xerochrepts, loamy-skeletal, mixed, mesic
Clallam family, deep, extremely gravelly	Dystric Xerochrepts, loamy-skeletal, mixed, mesic
Clallam family, moderately deep	Dystric Xerochrepts, loamy-skeletal, mixed, mesic
Clallam family, moderately deep, gabbroic	Dystric Xerochrepts, loamy-skeletal, mixed, mesic
Clallam family, moderately deep, unstable	Dystric Xerochrepts, loamy-skeletal, mixed, mesic
Cotati, family, deep, gabbroic	Ultic Palexeralfs, fine, mixed, mesic
Coyata family, deep	Typic Xerumbrepts, loamy-skeletal, mixed, mesic
Coyata family, deep, dry	Typic Xerumbrepts, loamy-skeletal, mixed, mesic
*Deadman family, deep	Pachic Xerumbrepts, coarse-loamy, mixed, frigid
*Deadman family, moderately deep	Pachic Xerumbrepts, coarse-loamy, mixed, frigid
Deadwood family	Dystric Lithic Xerochrepts, loamy-skeletal, mixed, mesic
Doty family, deep	Pachic Xerumbrepts, fine-loamy, mixed, mesic
Elioak family, deep	Typic Hapludults, clayey, kaolinitic, mesic
*Gasquet family, deep, stony	Typic Haploxerults, clayey, oxidic, mesic
Goldridge, family, deep	Typic Haploxerults, fine-loamy, mixed, mesic
**Haploxerults	Haploxerults
Hartleton family, deep	Typic Hapludults, loamy-skeletal, mixed, mesic
Hecker family, deep	Mollic Haploxeralfs, loamy-skeletal, mixed, mesic
Holland family, deep	Ultic Haploxeralfs, fine-loamy, mixed, mesic
Holland family, deep, dioritic	Ultic Haploxeralfs, fine-loamy, mixed, mesic
Holland family, deep, dry	Ultic Haploxeralfs, fine-loamy, mixed, mesic
Holland family, deep, gabbroic	Ultic Haploxeralfs, fine-loamy, mixed, mesic
Holland family, deep, stony	Ultic Haploxeralfs, fine-loamy, mixed, mesic
Holyoke family	Lithic Dystrochrepts, loamy, mixed, mesic
Horseshoe family, deep	Xeric Haplohumults, fine-loamy, mixed, mesic
Hugo family, deep	Dystric Xerochrepts, fine-loamy, mixed, mesic
Hugo family, deep, dioritic	Dystric Xerochrepts, fine-loamy, mixed, mesic
Hugo family, deep, dry	Dystric Xerochrepts, fine-loamy, mixed, mesic
Hugo family, moderately deep	Dystric Xerochrepts, fine-loamy, mixed, mesic
Hullt family, deep	Typic Xerumbrepts, fine-loamy, mixed, mesic

TABLE 6. Classification of Taxonomic Units (continued)

SOIL NAME	FAMILY OR HIGHER TAXONOMIC CLASS
Hullt family, deep, dry	Typic Xerumbrepts, fine-loamy, mixed, mesic
*Hungry family, deep	Typic Xerochrepts, loamy-skeletal, serpentinitic, frigid
*Ishi Pishi family, deep	Ultic Haploxerafals, clayey-skeletal, serpentinitic, mesic
*Jayel family, moderately deep	Dystric Xerochrepts, fine, oxidic, mesic
*Jayel family, moderately deep, stony	Dystric Xerochrepts, fine, oxidic, mesic
*Kistirn family, deep	Typic Haploxerults, loamy-skeletal, mixed, mesic
**Lithic Haploxerafals, ultramafic	Lithic Haploxerafals, ultramafic
**Lithic Xerochrepts, ultramafic	Lithic Xerochrepts, ultramafic
**Lithic Xerorthents	Lithic Xerorthents
*Madden family, moderately deep	Mollic Haploxerafals, fine, serpentinitic, mesic
Maymen family	Dystric Lithic Xerochrepts, loamy, mixed, mesic
Maymen family, dioritic	Dystric Lithic Xerochrepts, loamy, mixed mesic
Melbourne family, deep	Ultic Haploxerafals, fine, mixed, mesic
Nanny family, deep	Typic Xerumbrepts, loamy-skeletal, mixed, frigid
Nanny family, deep, dioritic	Typic Xerumbrepts, loamy-skeletal, mixed, frigid
Nanny family, moderately deep	Typic Xerumbrepts, loamy-skeletal, mixed, frigid
*Oragran family	Lithic Xerochrepts, loamy, serpentinitic, mesic
Oxalis family, deep	Vertic Xerochrepts, fine, montmorillonitic, thermic
*Race family, deep	Dystric Xerochrepts, fine-loamy, micaceous, frigid
***Raisio family, moderately deep	Typic Xerorthents, loamy-skeletal, mixed, non-acid, mesic
Rogue family, deep	Dystric Xerochrepts, coarse-loamy, mixed, frigid
Skalan family, deep	Ultic Haploxerafals, loamy-skeletal, mixed, mesic
Skalan family, moderately deep	Ultic Haploxerafals, loamy-skeletal, mixed, mesic
Skinner family, deep	Typic Dystrichrepts, fine-loamy, mixed, mesic
Skymor family	Dystric Lithic Xerochrepts, loamy-skeletal, mixed, frigid
Skymor family, ultramafic	Dystric Lithic Xerochrepts, loamy-skeletal, mixed, frigid
*Soulajule family, deep	Ultic Haploxerafals, clayey-skeletal, mixed, mesic
**Typic Xerofluvents	Typic Xerofluvents
Voorhies family, moderately deep	Typic Haploxerafals, loamy-skeletal, mixed, mesic
*Walnett family, deep, stony	Ultic Haploxerafals, loamy-skeletal, oxidic, mesic
Wapal family, moderately deep	Typic Xerorthents, sandy-skeletal, mixed, frigid
Weitchpec family, moderately deep	Typic Xerochrepts, loamy-skeletal, serpentinitic, mesic
Woodseye family	Lithic Xerumbrepts, loamy-skeletal, mixed, frigid
**Xerochrepts	Xerochrepts

* Proposed series

** Not classified to family level due to extreme variability.

*** This soil is a taxajunct. Raisio series is classified Entic Ultic Haploxerolls, loamy-skeletal, mixed, mesic.

TABLE 7. Soil Components in Map Units

COMPONENT NAME	MAP UNIT(S)
Aiken family, deep	225, 227, 316, 346, 348, 349
Aibus family, deep	258
Althouse family, deep, stony	335, 525
Althouse family, moderately deep	409
Bins family, deep	257, 259
Chaix family, moderately deep	515, 517, 520, 522
Chenango family, deep	209, 241, 244
Clallam family, deep	210, 220, 266, 336
Clallam family, deep, dry	221, 265
Clallam family, deep, extremely gravelly	280, 281, 345
Clallam family, moderately deep	211, 212, 214, 240, 245, 246, 331, 340, 346, 356
Clallam family, moderately deep, gabbroic	361
Clallam family, moderately deep, unstable	215, 237, 242
Cotati, family, deep, gabbroic	361
Coyata family, deep	220
Coyata family, deep, dry	221
Deadman family, deep	524, 552
Deadman family, moderately deep	535
Deadwood family	226, 254, 280, 281, 282
Doty family, deep	236, 250
Elioak family, deep	209, 227, 228
Gasquet family, deep, stony	420
Goldridge, family, deep	210, 222, 223, 225, 226, 230, 231, 261, 345, 346, 349
Haploxerults	103
Hartleton family, deep	209, 227, 228
Hecker family, deep	236, 250, 256
Holland family, deep	252, 253, 260, 261, 266, 312, 316, 327, 351
Holland family, deep, dioritic	522
Holland family, deep, dry	265
Holland family, deep, gabbroic	361
Holland family, deep, stony	335
Holyoke family	228, 244
Horseshoe family, deep	125
Hugo family, deep	232, 240, 245, 266, 324
Hugo family, deep, dioritic	554, 560
Hugo family, deep, dry	265
Hugo family, moderately deep	271, 272, 274, 320, 321,
Hullt family, deep	220

TABLE 7. Soil Components in Map Units (continued)

COMPONENT NAME	MAP UNIT(S)
Hullt family, deep, dry	221
Hungry family, deep	411
Ishi Pishi family, deep	402
Jayel family, moderately deep	420
Jayel family, moderately deep, stony	430, 431
Kistirn family, deep	225, 226, 260
Lithic Haploxeralfs, ultramafic	402, 403, 404, 405, 425
Lithic Xerochrepts, ultramafic	430
Lithic Xerorthents	300
Madden family, moderately deep	412
Maymen family	242, 243, 245, 246, 320, 321, 323
Maymen family, dioritic	501, 530
Melbourne family, deep	237, 238, 252, 253
Nanny family, deep	257, 336
Nanny family, deep, dioritic	525
Nanny family, moderately deep	259, 317
Oragran family	403, 404, 405, 431
Oxalis family, deep	250
Pits and Dumps	102
Race family, deep	258
Raisio family, moderately deep	356
Riverwash	100
Rock Outcrop	214, 243, 274, 280, 282, 300, 323, 340, 400, 405, 500, 501, 503, 517
Rogue family, deep	524
Rubble Land	400
Skalan family, deep	210, 230, 232, 260, 331, 345, 348, 351
Skalan family, mod. deep	235
Skinner family, deep	241, 244
Skymor family	254
Skymor family, ultramafic	409
Soulajule family, deep	238
Typic Xerofluvents	100
Voorhies family, moderately deep	282
Walnett family, deep, stony	420, 425, 430, 431
Wapal family, moderately deep	503, 550, 552, 554
Weitchpec family, moderately deep	403, 404
Woodseye family	257, 259
Xerochrepts	103

AIKEN FAMILY, DEEP

These soils are deep phase members of the clayey, oxidic, mesic family of Xeric Haplohumults. They have developed in material weathered from sedimentary, metasedimentary or metaigneous rock. They are on mountain sides, benches, and broad ridges at elevations of 500 to 4,500 feet. Slopes range from 5 to 50 percent. These soils are moderately well to well drained. Mean annual precipitation varies from 100 to 120 inches, and mean annual temperature is about 50°F.

Typical Pedon: Located in Del Norte County, California, off the Low Divide road next to a clearcut on a bend in a spur road, approximately 1.5 miles from the junction with Low Divide road; pit is about 20 feet from road on a northeast facing slope of 50 percent, under Douglas-fir, redwood, and tanoak with an understory of evergreen huckleberry, rhododendron, and tanoak, at 1,950 feet elevation; in the SE 1/4 of the SE 1/4 of section 35, T. 18 N., R. 1 E., H.B.M.

0-1 to 0 inches; fresh and decomposing needle and leaf litter.

A-0 to 7 inches; dark brown (7.5YR 4/4) loam, dark brown (7.5YR 4/4) moist; moderate very fine subangular blocky structure; soft, friable, slightly sticky and plastic; few very fine and fine roots; slightly acid (pH 6.1); abrupt smooth boundary.

Bt1-7 to 15 inches; strong brown (7.5YR 5/6) clay loam, dark brown (7.5YR 4/4) moist; moderate fine subangular blocky structure; slightly hard, friable, sticky and plastic; few very fine and fine roots; few thin clay films on ped faces and line pores; slightly acid (pH 6.1); abrupt wavy boundary.

Bt2-15 to 46 inches; brown (7.5YR 5/4) silty clay loam, reddish brown (5YR 4/4) moist; moderate fine

angular blocky structure; slightly hard, firm, sticky and plastic; few fine roots; few moderately thick and few thin clay films on ped faces and line pores; slightly acid (pH 6.1); clear smooth boundary.

Bt3-46 67 inches; strong brown (7.5YR 5/8) silty clay loam, strong brown (7.5YR 5/6) moist; moderate fine angular blocky structure; hard, firm, very sticky and plastic, many moderately thick clay films on ped faces and line pores; slightly acid (pH 6.1).

Range in Characteristics: Depth to sedimentary, metasedimentary or metaigneous rock ranges from 40 to over 60 inches. Mean annual soil temperature is estimated to be 50 to 59°F and the difference between mean summer and mean winter soil temperature is more than 9°F. The soil between the depths of about 4 and 12 inches is usually dry in all parts from mid-June to mid-October and moist throughout between November and April. The base saturation is 15 to 30 percent in the argillic horizon. These soils are estimated to have at least 0.9 percent organic carbon in the upper 15 cm of the argillic horizon. Surface rock fragments range from 0 to 15 percent.

The A horizon has dry color of 5YR 5/6, 5/8, 7.5YR 4/4, 5/4, 5/6, 6/4, 6/6, or 7/4; and moist color of 5YR 4/4, 4/6, 4/8, 5/6, 7.5YR 4/4, 4/6, 10YR 4/3, or 4/4. It is loam or clay loam with 20 to 30 percent clay and 0 to 30 percent gravel. It is medium or slightly acid.

The Bt horizon has dry color of 5YR 5/6, 5/8, 6/8, 7/8, 7.5YR 5/4, 5/5, 5/6, 5/8, 6/5, 6/6, or 6/8; and moist color of 2.5YR 4/6, 5YR 4/5, 5/6, 4/8, 5/6, 5/8, 7.5YR 4/4, 4/6, 5/6, or 5/8. It is silty clay loam, clay loam, silty clay or clay with 30 to 50 percent clay and 0 to 20 percent gravel. It is slightly to strongly acid.

ALBUS FAMILY, DEEP

These soils are deep phase members of the loamy-skeletal, micaceous, frigid family of Ultic Haploxeralfs. They have developed in material weathered from mica schist. They are on mountainsides and ridges at elevations of 4,500 to 5,800 feet. Slopes range from 35 to 70 percent. These soils are well drained. Mean annual precipitation is about 60 inches and mean annual temperature is about 48°F.

Typical Pedon: Located in Trinity County, California, on South Fork Mountain, on Forest Service Road 2S02, approximately 0.7 miles west of the Cedar Gap junction; pit is about 50 feet upslope from road on a south facing slope of 40 percent under white fir, with a few Douglas-fir, at 4,585 feet elevation; in the SE 1/4 of the SE 1/4 of section 29, T. 28 N., R. 12 W., M.D.B.M.

0-0 to 1/2 inch; fresh and decomposing needle litter.

A-0 to 8 inches; light olive gray (5Y 6/2) gravelly loam, olive gray (5Y 4/2) moist; moderate medium and coarse granular structure; soft, very friable, nonsticky and nonplastic; few very fine, fine, and medium roots; 15 percent pebbles; slightly acid (pH 6.2); clear wavy boundary.

Bt1-8 to 4 inches; pale olive (5Y 6/3) loam, olive (5Y 4/3) moist; moderate fine subangular blocky structure; soft friable, slightly sticky and slightly plastic; common fine, many medium, few coarse roots; few thin clay films on ped faces; 10 percent pebbles; slightly acid (pH 6.2); diffuse wavy boundary.

Bt2-14 to 26 inches; pale yellow (5Y 7/3) gravelly clay loam, olive (5Y 4/4) moist; moderate fine to medium subangular blocky structure; soft, friable, sticky and plastic; common fine and medium, few coarse roots; common moderately thick clay films on ped faces; 20 percent pebbles, 10 percent cobbles; medium acid (pH 6.0); diffuse wavy boundary.

Bt3-26 to 35 inches; light gray (5Y 7/2) very cobbly clay loam, olive (5Y 4/4) moist; moderate fine and medium subangular blocky structure; soft, friable, sticky and plastic; few fine and medium roots; many moderately thick clay films on ped faces; 25 percent pebbles; 20 percent cobbles; medium acid (pH 6.0);

clear wavy boundary.

Bt4-35 to 44 inches; pale yellow (5Y 8/3) very gravelly silt loam, olive yellow (5Y 6/6) moist; moderate fine subangular blocky structure; soft, very friable, slightly sticky and plastic; few fine roots; common moderately thick clay films on ped faces; 30 percent pebbles; 5 percent cobbles; medium acid (pH 5.8); diffuse wavy boundary.

C-44 to 60 inches; white (5Y 8/1) gravelly silt loam, pale olive (5Y 6/3) moist; massive; soft, very friable, slightly sticky and slightly plastic; 20 percent pebbles; medium acid (pH 5.6).

Range Characteristics: Depth to mica schist ranges from 40 to more than 60 inches. The mean annual soil temperature is estimated to be less than 47°F, mean summer soil temperature is estimated to be 25 to 50°F, and the difference between mean summer and mean winter temperature is estimated to be more than 9°F. The soil between the depths of about 8 and 24 inches is usually dry in all parts from mid-June to mid-October and moist throughout between November and April. The base saturation is about 40 percent in the upper 75 cm of the argillic horizon. All horizons contain visible flecks of mica and exhibit the greasy feel characteristic of that mineral.

The A horizon has dry color of 2.5Y 6/2, 10YR 6/2, 6/3, or 7/2; and moist color of 2.5Y 3/2, 5Y 3/2, 4/2, 10YR 3/2, or 4/3. Where colors are dark the horizon is too thin to be mollic. It is loam or silt loam with 15 to 27 percent clay and 0 to 25 percent gravel. It is neutral to medium acid.

The Bt horizon has dry color of 2.5Y 7/2, 7/4, 5Y 7/2, 7/3, or 7/4; and moist color of 2.5Y 4/4, 5/4, 5Y 4/4, 4/5, or 5/6. It is clay loam or silty clay loam with 27 to 35 percent clay and 25 to 50 percent gravel and 10 to 25 percent cobbles. It is slightly or medium acid.

The C horizon, when present has dry color of 2.5Y 7/2, 8/1, 8/2, 5Y 7/2, or 8/1; and moist color of 2.5Y 5/2, 6/4, 5Y 5/3, or 6/3. It is silty clay loam or silty clay with 10 to 35 percent gravel.

ALTHOUSE FAMILY, DEEP, STONY

These soils are deep, stony phase members of the loamy-skeletal, mixed, frigid family of Dystric Xerochrepts. They have formed in material weathered from metaigneous rock, diorite, and glacial till. They are on mountainsides and glacial moraines, at elevations of 3,800 to 6,000 feet. Slopes range from 30 to 70 percent. These soils are well drained. Mean annual precipitation is 80 to 110 inches. Mean annual temperature is about 48°F.

Typical Pedon: Located in Del Norte County, California, near Sanger Lake on the southwestern side of the lake, approximately 200 feet from parking area, on a northeast facing slope of 60 percent under white fir, red fir, some Douglas-fir, brewer spruce and Sadler oak at 5,000 feet elevation; in the NE 1/4 of the NE 1/4 of section 5, T. 17 N., R. 5 E., H.B.M.

O-4 to 0 inches; fresh and decomposing needle and leaf litter.

A-0 to 8 inches; yellowish brown (10YR 5/6) gravelly loam, dark yellowish brown (10YR 3/4) moist; strong very fine granular structure; soft, friable, nonsticky and nonplastic; many very fine, common fine, few medium and coarse roots; 20 percent pebbles, 10 percent stones; medium acid (pH 6.0); clear smooth boundary.

Bw1-8 to 20 inches; yellowish brown (10YR 5/6) gravelly loam, dark yellowish brown (10YR 4/4) moist; weak, very fine subangular blocky structure; soft, friable, slightly sticky and slightly plastic; many very fine, common fine, few medium and coarse roots; 15 percent pebbles, 10 percent cobbles; slightly acid (pH 6.2); clear smooth boundary.

Bw2-20 to 35 inches; yellowish brown (10YR 5/8) very stony loam, dark yellowish brown (10YR 4/4) moist;

weak, very fine subangular blocky structure; soft, friable, slightly sticky and slightly plastic; common very fine, fine, medium and coarse roots; 20 percent pebbles, 20 percent stones; medium acid (pH 6.0); clear wavy boundary.

C-35 to 59 inches; light yellowish brown (2.5Y 6/4) very stony loam, olive brown (2.5Y 4/4) moist; weak very fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; few very fine, fine, medium, and coarse roots; 15 percent pebbles, 20 percent stones; slightly acid (pH 6.2).

Range in Characteristics: The depth to metaigneous or diorite rock ranges from 40 to more than 60 inches. The mean annual soil temperature is estimated to be about 44°F. Mean summer soil temperature is estimated to be about 48°F, and the difference to be more than 9°F. The soil between the depths of about 8 and 24 inches is usually dry in all parts from mid-July through mid-October and moist throughout between November and April. The base saturation is about 10 to 14 percent between the depths of 10 and 30 inches. Surface stones range from 10 to 20 percent.

The A horizon has dry color of 10YR 3/2, 5/6, or 6/4; and moist color of 10YR 2/1, 2/2, 3/1, or 3/4. The horizon is too thin to be umbric. It has 20 to 45 percent gravel and 10 to 20 percent cobbles or stones. It is medium or strongly acid.

The Bw horizon has dry color of 10YR 5/6, 5/8, 6/4, 7/3, or 7/4; and moist color of 10YR 4/3, 4/4, 4/6 or 2.5Y 4/4. It is loam or sandy loam with 25 to 55 percent gravel and 10 to 25 percent cobbles or stones. It is slightly or medium acid.

Some pedons lack a C horizon.

ALTHOUSE FAMILY, MODERATELY DEEP

These soils are moderately deep phase members of the loamy-skeletal, mixed, frigid family of Dystric Xerochrepts. They have formed in colluvial material weathered from metaigneous rock. They are on mountainsides and near ridges at elevations of 3,800 to 6,000 feet. Slopes range from 35 to 60 percent. These soils are well drained. Mean annual precipitation is about 80 inches. Mean annual temperature is about 48°F.

Typical Pedon: Located in Del Norte County, California, south of Sanger Peak on the Sanger Peak road about 0.75 miles north of junction with Youngs Valley road; pit is about 50 feet above the road on a north-west facing slope of 40 percent under a brush cover of manzanita, canyon live oak and wild rose, with some knobcone pine and Douglas-fir at 5,200 feet elevation; in the SW 1/4 of the SE 1/4 of section 32, T. 18 N., R. 5 E., H.B.M.

0-1/2 to 0 inch; fresh and decomposing leaf litter.

A-0 to 5 inches; light yellowish brown (10YR 6/4) very gravelly loam, very dark gray (10YR 3/1) moist; very weak very fine granular structure; many very fine and fine, common medium, few coarse roots; 35 percent pebbles; neutral (pH 6.6); clear smooth boundary.

Bw1-5 to 18 inches; very pale brown (10YR 7/4) very gravelly loam, dark yellowish brown (10YR 4/4) moist; moderate very fine subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; common very fine and fine, many medium, few coarse roots; 35 percent pebbles; slightly acid (pH 6.4); clear smooth boundary.

Bw2-18 to 36 inches; very pale brown (10YR 7/3) very

gravelly loam, olive brown (2.5Y 4/4) moist; weak very fine subangular blocky structure, slightly hard, friable, slightly sticky and slightly plastic; few very fine, fine, medium and coarse roots; 35 percent pebbles, 10 percent cobbles and stones; slightly acid (pH 6.5); clear irregular boundary.

R-36 to 46 inches; weathered metavolcanic colluvium (serpentine influence).

Range in Characteristics: The depth to metaigneous rock (with serpentine influence) ranges from 20 to 40 inches. The mean annual soil temperature is estimated to be about 44°F, mean summer soil temperature is estimated to be about 48°F, and the difference between mean summer and mean winter soil temperatures is assumed to be more than 9°F. The soil between the depths of about 4 and 12 inches is usually dry in all parts from mid-July through mid-October and moist throughout between November and April. The base saturation is assumed to be about 20 to 40 percent between the depths of 10 and 30 inches. Surface rock fragments range from 0 to 10 percent.

The A horizon has dry color of 10YR 3/1, 3/2, 5/6, or 6/4; and moist color of 10YR 3/3, 3/4, or 4/4. Where colors are dark the horizon is too thin to be mollic or umbric. It has 30 to 50 percent gravel and 0 to 10 percent cobbles or stones. It is neutral or slightly acid.

The Bw horizon has dry color of 10YR 5/6, 5/8, 6/4, 7/3, or 7/4; and moist color of 10YR 4/3, 4/4, or 4/6. It has 35 to 50 percent gravel and 0 to 20 percent cobbles or stones.

Some pedons have a C horizon.

BINS FAMILY, DEEP

These soils are deep phase members of the fine-loamy, mixed, frigid family of Typic Xerumbrepts. They have developed in material weathered from metasedimentary or metaigneous rock. They are on mountains and broad ridges at elevations of 4,500 to 5,500 feet. Slopes range from 5 to 70 percent. These soils are well drained. Mean annual precipitation ranges from 70 to 110 inches and mean annual temperature is about 50°F.

Typical Pedon: Located in Del Norte County, California, near Bear Basin Butte, in a roadcut on a spur road that goes to the top of Bear Basin Butte, approximately 0.5 miles from junction with Forest Service road 17N04, on a northeast facing slope of 45 percent under white fir and red fir, with a few Douglas-fir, and an understory of sadler oak, Ribes sp., deerfoot, and blueberry at 5,000 feet elevation; in the SW 1/4 of the SW 1/4 of section 3, T. 16 N., R. 4 E., H.B.M.

0-2 to 0 inches; fresh and decomposing needle litter.

A-0 to 10 inches; yellowish brown (10YR 5/4) loam, dark brown (10YR 3/3) moist; weak fine granular structure; slightly hard, friable, nonsticky and nonplastic; common very fine, fine and medium, few coarse roots; strongly acid (pH 5.2); clear wavy boundary.

BA-10 to 21 inches; yellowish brown (10YR 5/4) gravelly loam, dark brown (10YR 4/3) moist; very weak very fine subangular blocky parting to weak fine granular structure; slightly hard, friable, nonsticky and nonplastic; few fine, common medium, and few coarse roots; 15 percent pebbles; strongly acid (pH 5.3); clear wavy boundary.

Bw-21 to 58 inches; light olive brown (2.5Y 5/4) loam, olive brown (2.5Y 4/4) moist; moderate very fine and fine subangular blocky structure; slightly hard, friable; nonsticky and nonplastic; few fine, common medium, and few coarse roots; strongly acid (pH 5.4); abrupt wavy boundary.

R-58 inches; highly fractured metamorphic rock (fractures less than 4.5 inches apart).

Range in Characteristics: The depth to metasedimentary or metaigneous rock ranges from 40 to more than 60 inches. The mean annual soil temperature is estimated to be less than 47°F, mean summer soil temperature is estimated to be 25 to 50°F, and the difference between mean summer and mean winter soil temperature is estimated to be more than 9°F. The soil between the depths of about 4 and 12 inches is usually dry in all parts from mid-June and to mid-October, and moist throughout between November and April. The base saturation is 6 to 10 percent in the epipedon.

The A horizon has dry color of 10YR 3/3, 4/2, 4/3, 5/3, or 5/4; and moist color of 10YR 2/2, 3/2, or 3/3. It has 15 to 25 percent clay and 0 to 15 percent gravel. It is slightly or medium acid.

The Bw horizon has dry color of 10YR 5/3, 5/4, 6/3, 6/4, 7/4, 8/3, 2.5Y 5/4, 6/2, 6/4, 7/2, 7/3, 7/4, or 7/5; and moist color of 10YR 3/2, 3/3, 4/2, 4/4, 5/3, 6/4, 2.5Y 4/2, 4/4, 5/2, 5/3, 6/6, or 6/7. It is loam, silt loam, or clay loam, with 18 to 28 percent clay, not increasing in clay content by as much as 1.2 times that of the horizon above. It has 5 to 30 percent gravel. It is medium or strongly acid.

Some pedons have a C horizon.

CHAIX FAMILY, MODERATELY DEEP

These soils are moderately deep phase members of the coarse-loamy, mixed, mesic family of Dystric Xerochrepts. They have developed in material weathered from diorite. They are on mountainsides and ridges at elevations of 600 to 4,800 feet. Slopes range from 30 to 90 percent. These soils are well to somewhat excessively drained. Mean annual precipitation is about 70 to 100 inches and mean annual temperature is about 50°F.

Typical Pedon: Located in Trinity County, California, on north end of jeep road, approximately 150 yards east of junction with Forest Service road 7N02, on a south facing slope of about 60 percent under Douglas-fir, tanoak, and madrone, with some canyon live oak, at 3,800 feet elevation; in the NE 1/4 of the NW 1/4 of section 10, T. 6 N. R. 6 E., H.B.M.

0-1 to 0 inch; fresh and decomposing needle litter.

A1-0 to 8 inches; yellowish brown (10YR 5/4) gravelly coarse sandy loam, dark brown (10YR 4/3) moist; weak fine granular structure; soft, very friable, non-sticky and nonplastic; common very fine, fine and medium, and few coarse roots; 15 percent pebbles; strongly acid (pH 5.5); gradual wavy boundary.

A2-8 to 19 inches; yellowish brown (10YR 5/6) gravelly coarse sandy loam, dark yellowish brown (10YR 4/4) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine, fine, and medium roots; 30 percent pebbles; strongly

acid (pH 5.5); gradual wavy boundary.

C-19 to 40 inches; yellowish brown (10YR 5/6) gravelly coarse sandy loam, dark yellowish brown (10YR 4/6) moist; single grain; loose, nonsticky and nonplastic; common very fine, fine, and medium, few coarse roots; 30 percent pebbles; very strongly acid (pH 5.0); abrupt wavy boundary.

Cr-40 inches; highly weathered diorite rock.

Range in Characteristics: Depth to highly weathered diorite rock ranges from 20 to 40 inches. The mean annual soil temperature is estimated to be 50 to 59°F. The soil between the depth of about 4 and 12 inches is usually dry in all parts from mid-June to mid-October and moist throughout between November and June. The base saturation is estimated to be about 30 percent between 10 and 30 inches below the surface.

The A horizon has dry color of 10YR 4/3, 5/3, 5/4, or 6/5; and moist color of 10YR 3/3, 4/3, or 4/4. Where colors are dark the horizon is too thin to be umbric. It is loam or sandy loam with 10 to 45 percent gravel and 0 to 20 percent stones. It is medium or strongly acid.

The C horizon has dry color of 10YR 5/4, 5/6, or 6/4; and moist color of 10YR 4/3, 4/4, or 4/6. It has 0 to 35 percent gravel and 0 to 25 percent stones. It is slightly to strongly acid.

CHENANGO FAMILY, DEEP

These soils are deep phase members of the loamy-skeletal, mixed, mesic family of Typic Dystrochrepts. They have developed in material weathered from metasedimentary or metaigneous rock. They are on mountainsides at elevations of about 500 to 3,500 feet. Slopes range from 35 to 70 percent. These soils are well drained. Mean annual precipitation is about 100 inches and mean annual temperature is about 50°F.

Typical Pedon: Located in Del Norte County, California, west of South Red Mountain on Simpson road above Potato Patch Creek, about 2.5 miles from junction with Simpson's private Klamath road; pit is about 15 feet above the road on a southeast facing slope of 60 percent under tanoak and madrone, with some Douglas-fir, redwood and Port Orford cedar at 2,400 feet elevation; in the SE 1/4 of the SE 1/4 of section 24, T. 13 N. R. 2 E., H.B.M.

A1-0 to 3 inches; pale brown 10YR 6/3) extremely gravelly loam, dark brown (10YR 3/3) moist; moderate fine granular structure; soft, friable, nonsticky and non-plastic; many very fine and fine, common medium roots; 65 percent pebbles; strongly acid (pH 5.4); clear smooth boundary.

A2-3 to 13 inches; light yellowish brown (10YR 6/4) very gravelly loam, dark yellowish brown (10YR 4/4) moist; moderate fine granular structure; soft, friable, nonsticky and nonplastic; few very fine, common fine, medium and coarse roots; 45 percent pebbles; strongly acid (pH 5.4); gradual wavy boundary.

Bw1-13 to 22 inches; brownish yellow (10YR 6/6) very gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate very fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine, fine, medium and coarse roots; 45 percent pebbles; strongly acid (pH 5.5); gradual wavy boundary.

Bw2-22 to 23 inches; yellowish brown (10YR 5/4) extremely gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate very fine subangular

blocky structure; slightly hard, firm, slightly sticky and slightly plastic; common very fine, few fine and medium roots; 60 percent pebbles; medium acid (pH 5.6); clear wavy boundary.

Bw3-33 to 55 inches; brownish yellow (10YR 6/6) gravelly clay loam, yellowish brown (10YR 5/6) moist; weak fine subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; few fine and medium roots; 15 percent pebbles, 5 percent cobbles;

C-55 to 60 inches; white (2.5Y 8/2) gravelly clay loam, light yellowish brown (2.5Y 6/4) moist; weak fine subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; few medium roots; 15 percent pebbles; medium acid (pH 5.7).

Range in Characteristics: The depth to metasedimentary or metaigneous rock ranges from 40 to over 60 inches. The mean annual soil temperature is estimated to be 50 to 59°F. The soil between the depths of about 8 and 24 inches is usually moist from mid-October through August. The base saturation is about 6 to 14 percent between the depths of 10 and 30 inches.

The A horizon has dry color of 10YR 5/3, 5/4, 6/2, 6/4, 6/5, or 6/6; and moist color of 10YR 3/3, 4/4, 5/3, or 5/6. It is loam or silt loam with 20 to 27 percent clay and 10 to 65 percent gravel. Where colors are dark, the horizon is too thin to be mollic.

The Bw horizon has dry color of 10YR 5/4, 6/4, 6/5, 6/6, 7/4, 7/5, 7/6, 8/2, 8/4, 2.5Y 7/2, 8/2, or 8/4. It is loam, silt loam or clay loam with 20 to 30 percent clay, not increasing in clay content by as much as 1.2 times that of the horizon above. It has 35 to 65 percent gravel. It is strongly or medium acid.

The C horizon has dry color of 2.5Y 8/2, 8/3, or 8/6; and moist color of 2.5Y 5/4, 6/4, or 8/6. It has 20 to 60 percent gravel and 0 to 10 percent cobbles.

Some pedons lack a C horizon.

CLALLAM FAMILY, DEEP

These soils are deep phase members of the loamy-skeletal, mixed, mesic family of Dystric Xerochrepts. These soils have developed in material weathered from metasedimentary or metaigneous rock. They are on mountain sides at elevations of 400 to 4,800 feet. Slopes range from 30 to 70 percent. The soils are well drained. The mean annual precipitation ranges from 50 to 100 inches. The mean annual temperature is about 50°F.

Typical Pedon: Located in Humboldt County, California, on Salyer-Mad River road, about 4 miles south of Friday Ridge road (6N08); in a roadcut on a northwest facing slope of 35 percent under Douglas-fir, tanoak, madrone and canyon live oak at 2,100 feet elevation; in the NW 1/4 of the NE 1/4 of section 34, T. 6 N., R. 5 E., H.B.M.

0-1 inch to 0; fresh and decomposing leaf and needle litter.

A-0 to 4 inches; very pale brown (10YR 7/3) very gravelly loam, brown (10YR 4/3) moist; strong medium subangular blocky structure; hard, firm, sticky and plastic, common very fine and medium, few fine and coarse roots; 35 percent pebbles; strongly acid (pH 5.3); gradual smooth boundary.

BA-4 to 13 inches; very pale brown (10YR 7/3) extremely gravelly loam, yellowish brown (10YR 5/4) moist; strong medium subangular blocky structure; hard, firm, sticky and plastic; common very fine and medium, few fine and coarse roots; 55 percent pebbles, 5 percent cobbles; strongly acid (pH 5.3); gradual smooth boundary.

Bw-13 to 30 inches; very pale brown (10YR 8/3) extremely gravelly clay loam, brown (10YR 5/3) moist; massive; slightly hard, friable, sticky and plastic; common very fine, few fine, medium, and coarse roots; 55 percent pebbles, 10 percent cobbles; strongly acid (pH 5.3); gradual smooth boundary.

C-30 to 53 inches; white (2.5Y 8/2) extremely gravelly loam, light brownish gray (2.5Y 6/2) moist; massive; slightly hard, friable, sticky and plastic; few very fine, fine, and coarse roots; 60 percent pebbles, 25 percent cobbles; strongly acid (pH 5.2); abrupt irregular boundary.

R-53 inches; fractured rock, fractures 2 to 6 inches apart.

Range in Characteristics: Depth to metasedimentary or metaigneous rock ranges from 40 to more than 60 inches. The mean annual soil temperature is estimated to be 50 to 59°F. The soil between the depths of about 8 and 24 inches is usually dry in all parts from mid-July through mid-October and moist throughout between November and April. The base saturation ranges from 15 to 45 percent between the depths of 10 and 40 inches.

The A horizon has dry color of 10YR 4/4, 5/3, 6/3, 7/3, 7/4, or 8/2; and moist color of 10YR 3/2, 3/3, 4/2, 4/3, 4/4, or 5/4. Where colors are dark the horizon is too thin to be umbric. It is sandy loam, loam, or clay loam with 15 to 45 percent gravel and 0 to 15 percent cobbles. It is slightly to strongly acid.

The Bw horizon has dry color of 10YR 5/8, 6/4, 6/6, 7/3, 7/4, 7/6, 8/3, 8/4, or 8/6; and moist color of 10YR 4/3, 4/4, 4/5, 5/3, 5/4, 5/5, 5/6, or 6/4. It is loam or clay loam, with 35 to 55 percent gravel and 0 to 15 percent cobbles.

The C horizon has dry color of 10YR 6/5, 8/4, 8/6, 2.5Y 6/4, or 8/2; and moist color of 10YR 5/4, 6/8, 2.5Y 5/2, 5/4, 6/2, or 7/4. It has 30 to 60 percent gravel and 0 to 25 percent cobbles.

Some pedons lack a C horizon.

Note: A dry phase of this soil was named as a mapping unit component. It is morphologically the same, but is located on southerly aspects.

CLALLAM FAMILY, DEEP, EXTREMELY GRAVELLY

These soils are deep, extremely gravelly phase members of the loamy-skeletal, mixed, mesic family of Dystric Xerochrepts. They have developed from sedimentary, metasedimentary or metaigneous rock. They are on ridges and colluvial mountainsides at elevations of 600 to 4,800 feet. Slopes range from 35 to 85 percent. These soils are somewhat excessively drained. Mean annual precipitation varies from 60 to 100 inches. Mean annual temperature is about 50°F.

Typical Pedon: Located in Trinity County, California, near the headwaters of South Fork Mad River, on a spur road 1.2 miles south of the intersection with Forest Service road 2S05, on a southwest facing slope of 65 percent under Douglas-fir, canyon live oak, madrone and whitethorn at 3,800 feet elevation; in the NW 1/4 of the SW 1/4 of section 6, T. 26 N., R. 12 W., M.D.B.M.

A-0 to 12 inches; light brownish gray (10YR 6/2) extremely gravelly loam, dark grayish brown (10YR 4/2) moist; weak fine granular structure; soft, very friable, non-sticky and nonplastic; many fine and medium roots; 80 percent pebbles; neutral (pH 6.8); abrupt wavy boundary.

BA-12 to 20 inches; light gray (10YR 7/2) extremely gravelly loam, brown (10YR 5/3) moist; weak fine granular structure; soft, friable, non-sticky and nonplastic; many fine and medium roots; 70 percent pebbles; neutral (pH 6.8); clear wavy boundary.

Bw-20 to 36 inches; white (10YR 8/2) extremely gravelly loam, yellowish brown (10YR 5/4) moist; weak very fine subangular structure; soft, friable, slightly sticky and slightly plastic; common medium and coarse roots; 60 percent pebbles; neutral (pH 7.0); clear wavy boundary.

C-36 to 42 inches; very pale brown (10YR 7/4) extremely gravelly loam, light yellowish brown (10YR 6/4) moist; weak fine granular structure; soft friable, non-sticky and non-plastic; common medium and coarse roots; 80 percent pebbles; neutral (pH 7.2).

R-42 inches; hard fractured graywacke.

Range in Characteristics: The depth to metasedimentary or metaigneous rock ranges from 40 to more than 60 inches. The mean annual soil temperature is estimated to be 50 to 59°F. The soil between the depths of 8 and 24 inches is usually dry in all parts from mid-July through mid-October, and moist throughout between November and April. The base saturation ranges from 15 to 45 percent between the depths of 10 and 30 inches. Surface rock fragments range from 10 to 50 percent.

The A horizon has dry color of 10YR 5/3, 5/4, 6/2, 6/3, or 6/4. Moist colors are 10YR 4/2, 4/3, or 4/4. It is loam or sandy loam, with 50 to 90 percent gravel. It is slightly acid to mildly alkaline.

The Bw horizon has dry color of 10YR 7/6, 8/2, or 8/3. Moist colors are 10YR 4/5, 5/4, or 5/5. It is loam, sandy loam, or light clay loam, not increasing in clay content by as much as 1.2 times that of the horizon above. It has 50 to 90 percent gravel. It is neutral or slightly acid.

The C horizon has dry color of 10YR 6/4, 6/5, 7/4, or 8/4. Moist colors are 10YR 5/4, 6/4. It has 50 to 80 percent gravel and 0 to 40 percent cobbles. It is neutral to medium acid.

CLALLAM FAMILY, MODERATELY DEEP

These soils are moderately deep phase members of the loamy-skeletal, mixed, mesic family of Dystric Xerochrepts. They have developed in material weathered from metasedimentary or metaigneous rock. They are on mountain sideslopes at elevations of 400 to 4,800 feet. Slopes range from 30 to 90 percent. These soils are well drained. Mean annual precipitation ranges from 60 to 100 inches. Mean annual temperature is about 50°F.

Typical Pedon: Located in Del Norte County, California, near Shelly Creek on County Road 316, approximately .5 mile north of the junction with Forest Service Road 18N17; pit is about 25 feet upslope from road on a west facing slope of 75 percent under Douglas-fir, tanoak, and madrone with some sugar pine, dogwood and Canyon live oak at 2,600 feet elevation; in the SE 1/4 of the NW 1/4 of section 11, T. 18 N., R 3 E., H.B.M.

O-4 to 0 inches; fresh and decomposing leaf and needle litter.

A-0 to 4 inches; brown (7.5YR 5/4) very gravelly loam, dark brown (7.5YR 4/4) moist; moderate very fine subangular blocky structure; soft, friable, slightly sticky and slightly plastic; common very fine roots; 50 percent pebbles; medium acid (pH 6.0); clear smooth boundary.

BA-4 to 10 inches; reddish yellow (7.5YR 6/6) very gravelly loam, dark brown (7.5YR 4/4) moist; moderate very fine subangular blocky structure; soft, friable, slightly sticky and slightly plastic; few very fine, fine, and medium roots; 35 percent pebbles; medium acid (pH 5.8); gradual smooth boundary.

Bw-10 to 26 inches; reddish yellow (5YR 6/6) very gravelly loam, yellowish red (5YR 4/6) moist; moderate very fine subangular blocky structure; soft, friable, slightly sticky and slightly plastic; few very fine, medium and coarse roots; 45 percent pebbles; slightly acid (pH 6.4); abrupt wavy boundary.

R-26 inches; hard greenstone bedrock; fractures 4-6 inches apart.

Range in Characteristics: The depth to metasedimentary or metaigneous rock ranges from 20 to 40 inches. The mean annual soil temperature is estimated to be 50 to 59°F. The soil between the depths of 8 and 24 inches is usually dry in all parts from mid-July through mid-October, and moist throughout between November and April. The base saturation ranges from 20 to 35 percent between the depths of 10 and 30 inches or above a lithic contact. Surface rock fragments range from 0 to 10 percent.

The A horizon has dry color of 7.5YR 5/2, 5/4, 10YR 4/2, 5/2, 5/3, 5/4, 5/6, 6/2, 6/3, or 6/4. Moist colors are 7.5YR 3/2, 3/4, 4/3, 4/4, 10YR 3/2, 3/3, 3/4, 4/2, 4/3, 4/4, 4/6, or 5/6. Where colors are dark the horizon is too thin to be umbric. It is loam or clay loam with 15 to 50 percent gravel. It is slightly to strongly acid.

The Bw horizon has dry color of 5YR 5/6, 6/6, 7.5YR 5/6, 6/6, 10YR 5/3, 5/6, 5/8, 6/3, 7/2, 7/4, or 7/6. Moist colors are 5YR 4/4, 4/6, 7.5YR 4/4, 4/6, 10YR 4/2, 4/3, 4/4, 5/4, 6/4, or 6/5. It has 35 to 60 percent gravel.

Some pedons have a C horizon.

CLALLAM FAMILY, MODERATELY DEEP, GABBROIC

These soils are moderately deep, gabbroic phase members of the loamy-skeletal, mixed, mesic family of Dystric Xerochrepts. They have developed in material weathered from gabbro. They are on mountain sideslopes at elevations of 1,000 to 3,500 feet. Slopes range from 40 to 65 percent. These soils are well drained. Mean annual precipitation ranges from 60 to 100 inches. Mean annual temperature is about 50°F.

Typical Pedon: Located in Del Norte County, California, near Monkey Creek on Forest Service Road 18N14, about 1 mile north of junction with 18N14; pit is below road on a southeast facing slope of 60 percent under tanoak, madrone, and Canyon live oak at about 2,500 feet; in the NW 1/4 of the NW 1/4 of section 12, T. 18 N., R. 3 E., H.B.M.

0-1 to 0 inch; leaves and decomposing litter.

A-0 to 3 inches; brownish yellow (10YR 6/6) very gravelly loam, brown (7.5YR 4/4) moist; weak very fine granular structure; soft, friable, non-sticky and non-plastic; few very fine and fine roots; 40 percent pebbles; medium acid (pH 5.8); clear smooth boundary.

BA-3 to 20 inches; very pale brown (10YR 7/4) extremely gravelly silt loam, strong brown (7.5YR 5/6) moist; weak fine subangular blocky structure; soft, friable, slightly sticky and slightly plastic; common very fine and fine roots; 60 percent pebbles; medium acid (pH 5.9); clear smooth boundary.

Bw-20 to 36 inches; very pale brown (10YR 8/4) very gravelly loam, reddish yellow (7.5YR 6/6) moist; moderate fine to very fine subangular blocky structure; slightly hard, friable, sticky and plastic; few fine, medium and coarse roots; 40 percent pebbles; medium acid (pH 5.9); clear wavy boundary.

Cr-36 to 45 inches; soft weathered gabbro.

Range in Characteristics: The depth to basic igneous rock ranges from 20 to 40 inches. The mean annual soil temperature is estimated to be 50 to 59°F. The soil between the depths of 8 and 24 inches is usually dry in all parts from mid-July through mid-October, and moist throughout between November and April. The base saturation is 20 to 35 percent between the depths of 10 and 30 inches or above a lithic contact.

The A horizon is 10YR 3/2, 5/4, 5/6, or 6/6. Moist colors are 7.5YR 4/4, 10YR 3/3, 3/4, 4/3, or 4/4. Where colors are dark, the horizon is too thin to be umbric. It has 20 to 50 percent gravel. It is slightly or medium acid.

The Bw horizon is 10YR 4/3, 4/4, 5/4, 5/6, 5/8, or 8/5. Moist colors are 7.5YR 5/6, 6/6, 10YR 4/4, 5/4, or 5/6. It has 35 to 75 percent gravel and 0 to 10 percent cobbles. It is neutral to medium acid.

Some pedons have a C horizon.

CLALLAM FAMILY, MODERATELY DEEP, UNSTABLE

These soils are moderately deep, unstable phase members of the loamy-skeletal, mixed, mesic family of Dystric Xerochrepts. These soils have developed in material weathered from highly fractured metasedimentary rock and graphitic schist. They are on unstable mountain sideslopes at elevations of 400 to 4,800 feet. Slopes range from 35 to 90 percent. The soils are well drained. Mean annual precipitation ranges from 60 to 90 inches. Mean annual temperature is about 50°F.

Typical Pedon: Located in Trinity County, California, near Mikes Rock on Forest Service Road 27N01, 1.1 miles west of intersection with 12W11, 5 feet south of road, on a north facing slope of 45 percent under white fir, Douglas-fir, ponderosa pine, white and black oaks, and incense cedar at 4,500 feet elevation; in the SE 1/4 of the NE 1/4 of section 23, T. 26 N., R. 12 W., M.D.B.M.

A1-0 to 6 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; strong coarse granular structure; soft, very friable, non-sticky and slightly plastic; many medium and coarse roots; 5 percent pebbles; slightly acid (pH 6.4); gradual wavy boundary.

A2-6 to 12 inches; pale brown (10YR 6/3), loam, dark brown (10YR 4/3); moderate medium granular structure; slightly hard very friable non-sticky and slightly plastic; many moderate and medium roots; 10 percent pebbles; medium acid (pH 5.8); clear wavy boundary.

BA-12 to 19 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 4/3) moist; moderate fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common medium and coarse roots; 20 percent shale pebbles; medium acid (pH 5.8); diffuse wavy boundary.

Bw1-19 to 28 inches; very pale brown (10YR 7/3) extremely gravelly loam, brown (10YR 5/3) moist; moderate fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common medium and coarse roots; 80 percent shale pebbles; medium acid (pH 5.6); gradual wavy bound-

ary.

Bw2-28 to 36 inches; very pale brown (10YR 7/4) very gravelly silty clay loam, yellowish brown (10YR 5/4) moist; strong fine subangular blocky structure; slightly hard, friable, sticky and slightly plastic; 35 percent shale pebbles; strongly acid (pH 5.4); diffuse wavy boundary.

C-36 to 39 inches; pale yellow (2.5Y 7/4) very gravelly silty clay loam, light olive brown (2.5Y 5/4) moist; weak fine granular structure; soft, friable, slightly sticky and slightly plastic; 40 percent shale pebbles; strongly acid (pH 5.2).

R-39 to 46 inches; sheared shale.

Range in Characteristics: The depth to sheared shale or schist ranges from 20 to 40 inches. The mean annual soil temperature is estimated to be 50 to 59°F. The soil between the depths of 8 and 24 inches is usually dry in all parts from mid-July through mid-October, and moist throughout between November and April. The base saturation ranges from 20 to 50 percent between the depths of 10 and 30 inches, or above a lithic contact. The soil has 35 to 65 percent rock fragments at depths of 10 inches to a lithic contact.

The A horizon is 10YR 5/2, 5/3, 6/2, or 6/3. Moist colors are 3/2, 4/2, 4/3, or 4/4. Where colors are dark the horizon is too thin to be umbric. It has 5 to 50 percent gravel. It is neutral to medium acid.

The Bw horizon is 10YR 6/4, 7/2, 7/3, or 7/4. Moist colors are 10YR 4/2, 4/4, 5/4, or 2.5Y 4/4. It is loam or clay loam, not increasing in clay content by as much as 1.2 times that of the horizon above. It has 35 to 65 percent gravel. It is medium or strongly acid.

The C horizon, is 2.5Y 6/2, or 7/4. Moist colors are 2.5Y 5/2, 5/4, or 5/6. It is loam or silty clay loam with 35 to 65 percent gravel.

Some pedons lack a C horizon.

COTATI FAMILY, DEEP, GABBROIC

These soils are deep, gabbroic phase members of the fine, mixed, mesic family of Ultic Palexeralfs. They have developed in material weathered from basic igneous rock. They are on mountain sideslopes at elevations of 1,000 to 3,500 feet. Slopes range from 20 to 40 percent. These soils are well drained. Mean annual rainfall is about 100 inches. Mean annual temperature is about 50°F.

Typical Pedon: Located in Del Norte County, California, near the Oregon border off county road 315, about .5 mile south of the border, downslope from the road on a southeast facing slope of 20 percent under manzanita, salal, tanoak and huckleberry with some sugar pine, incense cedar and knobcone pine at 3,200 feet; in the SE 1/4 of the NW 1/4 section 3, T. 18 N. R. 3 E. H.B.M.

0-1 inch to 0; fresh and decomposing needle litter.

A-0 to 7 inches; very pale brown (10YR 8/4) gravelly loam, dark yellowish brown (10YR 4/4) moist; moderate fine granular structure; soft, friable, slightly sticky and plastic; common very fine, few fine and medium roots; 15 percent pebbles; medium acid (pH 5.8); abrupt wavy boundary.

Bt1-7 to 15 inches; very pale brown (10YR 8/4) clay, yellowish brown (10YR 5/6) moist; strong fine subangular blocky structure; slightly hard, firm sticky and plastic; few very fine, fine, medium roots; common moderately thick clay films on ped faces and line pores; medium acid (pH 5.6); clear smooth boundary.

Bt2-15 to 22 inches; yellow (10YR 7/6) clay, yellowish brown (10YR 5/8) moist; strong, fine angular blocky structure; hard, firm, very sticky and plastic; few very fine, fine, medium and coarse roots; continuous thick clay films on ped faces and line pores;

medium acid (pH 5.6); clear smooth boundary.

Bt3-22 to 42 inches; yellow (10YR 7/8) clay loam, yellowish brown (10YR 5/8) moist; moderate fine subangular blocky structure; slightly hard, friable, sticky and plastic; few fine and medium roots; common moderately thick clay films on ped faces and line pores; medium acid (pH 5.8); clear smooth boundary.

C-42 to 60 inches; very pale brown (10YR 8/4) loam, brownish yellow (10YR 6/6) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine roots; few moderately thick clay films on ped faces and line pores; medium acid (pH 5.6).

Range in Characteristics: The depth to gabbro ranges from 40 to more than 60 inches. The mean annual soil temperature is estimated to be 50 to 59°F. The soil between the depths of 4 and 12 inches is usually dry in all parts from mid-June through mid-October, and moist throughout from November and April. The base saturation ranges between 50 and 70 percent in the upper 75 cm of the argillic horizon.

The A horizon is 10YR 5/3, 6/3, 6/4, 7/3, or 8/4. Moist colors are 10YR 3/2, 4/2, 4/3, or 4/4. Where colors are dark the horizon is too thin to be mollic. It is loam or clay loam with 15 to 30 percent clay and 5 to 35 percent gravel. It is slightly or medium acid.

The Bt horizon is 5YR 5/3, 7/2, 7.5YR 5/4, 6/4, 10YR 6/4, 7/3, 7/4, 7/6, 7/8, or 8/4. Moist colors are 5YR 4/4, 6/4, 7.5YR 4/4, 5/4, 10YR 4/3, 4/4, 5/4, 5/6, or 5/8. It is clay loam or clay with 30 to 45 percent clay, increasing by at least 15 percent over the horizon above. It has 0 to 10 percent gravel.

COYATA FAMILY, DEEP

These soils are deep phase members of the loamy-skeletal, mixed, mesic family of Typic Xerumbrepts. They have developed in place from metasedimentary rock. They occur on mountain ridges and sideslopes at elevations of 3,000 to 4,000 feet. Slopes range from 35 to 70 percent. These soils are somewhat excessively drained.

Typical Pedon: Located in Humboldt County, California, on the road between Grouse Mountain and Bee Tree Creek, about 1.5 miles from Grouse Mountain, on a northeast facing slope of 60 percent under Douglas-fir, tanoak, with a few sugar pine at 3,700 feet elevation; in the SW 1/4 of the SE 1/4 of section 32, T. 5 N., R. 5 E., H.B.M.

0-3 to 0 inches; fresh and decomposing needle and leaf litter.

A1-0 to 4 inches; brown (10YR 5/3) very gravelly loam, very dark gray (10YR 3/1) moist; weak fine granular structure; soft, very friable, non-sticky and non-plastic; many very fine and fine, common medium roots; 35 percent pebbles, 5 percent cobbles; medium acid (pH 6.0); clear smooth boundary.

A2-4 to 10 inches; brown (10YR 5/3) gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure; soft, very friable, non-sticky and non-plastic; many very fine and fine, common medium roots; 25 percent pebbles, 5 percent cobbles; medium acid (pH 6.0); clear smooth boundary.

Bw-10 to 21 inches; light yellowish brown (10YR 6/4) very gravelly clay loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine, fine, few medium roots; 35 percent pebbles, 5 percent cobbles; medium acid (pH 5.8); clear smooth boundary.

C1-21 to 35 inches; light brownish gray (2.5Y 6/2) extremely gravelly clay loam, dark grayish brown (2.5Y 4/2) moist; massive; soft, friable, slightly

sticky and slightly plastic; common very fine and fine, few medium roots; 80 percent pebbles, 10 percent cobbles; strongly acid (pH 5.4); clear, wavy boundary.

C2-35 to 51 inches; light brownish gray (2.5Y 6/2) very fine sandy loam, olive gray (5Y 4/2) moist; moderate, medium, subangular blocky structure; soft, friable, non-sticky and non-plastic; few very fine, fine, medium and coarse roots; 10 percent pebbles; 5 percent cobbles; strongly acid (pH 5.4).

R-51 inches; fractured metasedimentary rock.

Range in Characteristics: The depth to metasedimentary rock ranges from 40 to more than 60 inches. The mean annual soil temperature is estimated to be 50 to 59°F. The soil between the depths of 8 and 24 inches is usually dry in all parts from mid-June through mid-October, and moist throughout between November and April. The base saturation is estimated to be about 30 to 40 percent in the epipedon.

The A horizon has dry color of 10YR 4/3, 5/2, or 5/3; and moist color of 10YR 3/1, 3/2, or 3/3. It is loam or silt loam with 15 to 50 percent gravel, and 0 to 5 percent cobbles.

The Bw horizon has dry color of 10YR 5/4, 6/3, or 6/4; and moist colors of 10YR 3/3, 4/3, or 4/4. Dark colors do not extend to a sufficient depth to be pachic. It is sandy loam, loam, or clay loam not increasing in clay content by as much as 1.2 times that of the above horizon. It has 30 to 50 percent gravel, and 0 to 10 percent cobbles. It is slightly or medium acid.

The C horizon has dry color of 2.5Y 6/2, or 7/2; and moist colors of 2.5Y 4/1, 4/2, 5/2, or 5/3. It is sandy loam, loam, or clay loam with 10 to 90 percent gravel and 0 to 10 percent cobbles. It is medium or strongly acid.

Note: A dry phase of this soil was named as a mapping unit component. It is morphologically the same, but is located only on southerly aspects.

DEADMAN FAMILY, DEEP

These soils are deep phase members of the coarse-loamy, mixed, frigid family of Pachic Xerumbrepts. They have developed in material weathered from dioritic rock. They are on ridges and mountain sideslopes at elevations of 4,500 to 6,500 feet. Slopes range from 0 to 65 percent. The soils are well or somewhat excessively drained. Mean annual precipitation is about 70 inches. Mean annual temperature is about 48°F.

Typical Pedon: Located in Humboldt County, California on Ammon Ridge Road (5N01), about .75 mile from Grouse Mountain junction (6N01); pit is about 75 feet below the road on a southeast facing slope of 35 percent under white fir with a few chinquapin, at 5,000 feet elevation; in the SE 1/4 of the SE 1/4 of section 24, T. 5 N., R. 4 E., H.B.M.

A-0 to 7 inches; very dark gray (10YR 3/1) loam, black (10YR 2/1) moist; weak, fine granular structure; soft, very friable, non-sticky and non-plastic; many very fine, fine, medium, few coarse roots; strongly acid (pH 5.3); clear smooth boundary.

AB1-7 to 26 inches; very dark grayish brown (10YR 3/2) loam, black (10YR 2/1) moist; weak fine subangular blocky structure; soft, very friable, non-sticky and non-plastic; common very fine, fine, many medium, common coarse roots; strongly acid (pH 5.3); clear smooth boundary.

AB2-26 to 35 inches; dark brown (10YR 3/3) loam, very dark gray (10YR 3/1) moist; weak fine subangular blocky structure breaking to weak fine granular; soft, very friable, non-sticky and non-plastic; common very fine, fine, medium, and coarse roots; strongly acid (pH 5.2); clear smooth boundary.

BA-35 to 53 inches; brown (10YR 4/3) gravelly loam, very dark grayish brown (10YR 3/2) moist; weak fine subangular blocky parting to weak fine granular structure; soft, very friable, non-sticky and non-plastic; common very fine and fine, few medium and coarse roots; strongly acid (pH 5.6); clear wavy boundary.

Cr-53 to 60 inches; highly decomposed quartz diorite.

Range in Characteristics: Depth to diorite ranges from 40 to more than 60 inches. The mean annual soil temperature is 45°F, mean summer soil temperature is 48°F, and the difference between mean summer and mean winter soil temperatures is more than 9°F. The soil between the depths of 8 and 24 inches is usually dry in all parts from mid-July through mid-October, and moist throughout from November through April. The base saturation in the epipedon is about 25 to 30 percent.

The A horizon is 10YR 3/1, 3/2, 3/3, 4/2, 4/3, or 4/4. Moist colors are 10YR 2/1, 2/2, 3/1, 3/2, or 3/3. It is loam or sandy loam with 0 to 20 percent gravel. It is slightly to strongly acid.

The B horizon is 10YR 4/3, 5/4, or 2.5Y 6/4. Moist colors are 10YR 3/2, 4/4, or 2.5Y 4/4. It has 5 to 30 percent gravel.

Some pedons have a C horizon. It is 10YR 5/4, 6/4, or 5/6. Moist color is 10YR 3/4 or 7.5YR 4/4. It is loam, loamy sand, or sandy loam with 20 to 50 percent gravel.

Additional Data: Soil moisture and temperature data were obtained at this site.

DEADMAN FAMILY, MODERATELY DEEP

These soils are moderately deep phase members of the coarse-loamy, mixed, frigid family of Pachic Xerumbrepts. They have developed in material weathered from quartz diorite rock. They occur on mountain sideslopes at elevations of 4,500 to 6,500 feet. Slopes range from 0 to 30 percent. These soils are somewhat excessively drained. Mean annual precipitation is about 70 inches. Mean annual temperature is about 48°F.

Typical Pedon: Located in Humboldt County, California, on Horse Trail Ridge (trail 6E08), about 3/4 mile north of Water Dog Lakes on an east facing slope of 15 percent under sulfur flower, lupine, mountain brome, noble fir and incense cedar at 6,000 feet elevation; in the NE 1/4 of section 34, T. 9 N., R. 6 E., H.B.M.

A1-0 to 14 inches; dark brown (10YR 3/3) gravelly coarse sandy loam, very dark grayish brown (10YR 3/2) moist; massive; soft, very friable, non-sticky and non-plastic; many very fine and fine roots; many fine interstitial pores; 15 percent pebbles; very strongly acid (pH 5.0); diffuse wavy boundary.

A2-14 to 24 inches; dark yellowish brown (10YR 3/4) gravelly coarse sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, non-sticky and non-plastic; many fine and very fine roots; many fine interstitial pores; 15 percent pebbles strongly acid (pH 5.2); gradual wavy boundary.

AC-24 to 32 inches; dark yellowish brown (10YR 4/4) gravelly coarse sandy loam, brown to dark brown (7.5YR 4/4) moist; massive; soft, very friable, non-sticky and non-plastic; many fine, few medium roots; many fine interstitial pores; 20 percent pebbles; strongly acid (pH 5.5); irregular boundary.

R-32 inches; hard quartz diorite.

Range in Characteristics: The depth to diorite ranges from 20 to 40 inches. The mean annual soil temperature is estimated to be 45°F, mean summer soil temperature is estimated to be about 48°F, and the difference between mean summer and mean winter soil temperatures is more than 9°F. The soil between the depths of 8 and 24 inches is usually dry in all parts from mid-July to mid-October, and moist throughout from November to April. The base saturation in the epipedon is about 30 to 40 percent.

The A horizon has dry color of 10YR 3/2, 3/3, 3/4, 4/2, 4/3, or 4/4; and moist color of 10YR 2/2, 3/2, or 3/3. It is sandy loam or coarse sandy loam, with 0 to 20 percent gravel. It is strongly or very strongly acid.

The AC horizon has dry color of 10YR 7/4, 6/4 or 4/4; and moist color of 10YR 4/4 or 7.5YR 4/4. It is coarse sandy loam, or loamy coarse sand, with 0 to 30 percent gravel.

Some pedons lack a C horizon.

DEADWOOD FAMILY

These soils are members of the loamy-skeletal, mixed, mesic family of Dystric Lithic Xerochrepts. They have developed in material weathered from sedimentary, metasedimentary or metaigneous rock, and colluvium. They are on ridges and mountain sideslopes at elevations of 600 to 4,800 feet. Slopes range from 35 to 85 percent. The soils are well to somewhat excessively drained. Mean annual precipitation varies from about 60 to 100 inches. Mean annual temperature is about 50°F.

Typical Pedon: Located in Humboldt County, California, near Lonesome Ridge, on Forest Service Road 13N01, about 1 mile NE of the top of Barren Butte; in the roadcut on a northeast facing slope of 35 percent under rhododendron, Sadler oak, tanoak, chanquapin, with some Douglas-fir and ponderosa pine at 3,400 feet elevation; in the SE 1/4 of the SW 1/4 of section 17, T. 12 N., R. 4 E., H.B.M.

O-5 inches to 0; fresh and decomposing leaf and needle litter.

A-0 to 5 inches; yellowish brown (10YR 5/6) gravelly loam, dark yellowish brown (10YR 4/4) moist; very weak very fine sub-angular blocky structure; soft, very friable, non-sticky and slightly plastic; common very fine and fine, few medium and coarse roots; 15 percent pebbles; medium acid (pH 5.8); clear wavy boundary.

Bw1-5 to 14 inches; brownish yellow (10YR 6/6) gravelly loam, yellowish brown (10YR 5/4) moist; weak very fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; few very fine, many fine, common medium and coarse roots; 30 percent pebbles, 10 percent cobbles; medium acid (pH 5.8); clear wavy boundary.

Bw2-14 to 18 inches; light yellowish brown (2.5Y 6/4) very gravelly loam, light olive brown (2.5Y 5/6) moist; weak very fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; few very fine, fine, medium and coarse roots; 50 percent pebbles, 10 percent cobbles; medium acid (pH 5.9); abrupt wavy boundary.

R-18 inches; fractured metasedimentary rock; fractures 2-6 inches.

Range in Characteristics: The depth to metasedimentary or metaigneous rock ranges from 10 to 20 inches. The mean annual soil temperature is estimated to be 50 to 59°F. The soil between the depth of 8 inches and a lithic contact is usually dry in all parts from mid-June through mid-October, and moist throughout between November and April. The base saturation just above a lithic contact is about 10 to 20 percent. Surface rock fragments range from 0 to 25 percent.

The A horizon is 10YR 4/3, 5/6, 6/3, 7/2, 7/4, or 8/2. Moist colors are 10YR 3/4, 4/3, 4/6, or 5/4. It is loam or sandy loam, with 10 to 35 percent gravel and 0 to 5 percent cobbles. It is neutral to medium acid.

The Bw horizon is 10YR 8/3, 8/2, 7/3, 7/2, 6/6, 6/4, 6/3, 5/4, 5/2, 2.5Y 7/3, 7/2, 6/4, or 6/2. Moist colors are 10YR 5/6, 5/4, 5/3, 4/4, 4/3, 4/2, 3/4, 2.5Y 5/6, 5/4, or 4/2. It is loam, sandy loam or light clay loam, not increasing in clay content by as much as 1.2 times that of the horizon above. It has 30 to 50 percent gravel and 0 to 20 percent cobbles. It is slightly to strongly acid.

Canyon live oak and annual grass vegetation occurs on this soil on southerly aspects and in more southerly parts of the Forest.

DOTY FAMILY, DEEP

These soils are deep phase members of the fine-loamy, mixed, mesic family of Pachic Xerumbrepts. They have developed in place from metasedimentary rock. They are on ridges and mountain sideslopes at elevations of 1,000 to 4,500 feet. Slopes range from 25 to 70 percent. Mean annual precipitation varies from 55 to 75 inches. Mean annual temperature is about 50°F.

Typical Pedon: Located in Trinity County, California, along the Van Duzen River Road, about 5.5 miles from the Mad River Ranger Station; pit is about 20 yards upslope from the road on a northwest facing slope of 45 percent under white oak and Douglas-fir at 2,560 feet elevation; in the SW 1/4 of the SW 1/4 of section 9, T. 1 S., R. 6 E., H.B.M.

A-0 to 7 inches; brown (10YR 5/3) loam, very dark grayish brown (10YR 3/2) moist; strong fine subangular blocky breaking to moderate very fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine, fine and medium roots; 5 percent gravel; neutral (pH 6.8); gradual smooth boundary.

BA-7 to 14 inches; yellowish brown (10YR 5/4) clay loam, very dark grayish brown (10YR 3/2) moist; strong very fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine, common moderate, few coarse roots; 10 percent gravel; neutral (pH 6.6); gradual wavy boundary.

Bw1-14 to 25 inches; brown (10YR 5/3) cobbly clay loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; few fine, common moderate, few coarse roots; slightly acid (pH 6.2); 10 percent cobbles, 5 percent gravel; diffuse wavy

boundary.

Bw2-25 to 40 inches; pale brown (10YR 6/3) cobbly clay loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; common moderate, few coarse roots; slightly acid (pH 6.2); 10 percent cobbles, 5 percent gravel; diffuse wavy boundary.

BC-40 to 60 inches; light yellowish brown (10YR 6/4) cobbly clay loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; slightly acid (pH 6.2); 10 percent cobbles, 10 percent gravel.

Range in Characteristics: The depth to metasedimentary rock ranges from 40 to more than 60 inches. The mean annual soil temperature is estimated to be 50 to 59°F. The soil between the depths of 4 and 12 inches is usually dry in all parts from mid-July through mid-October, and moist throughout between November and April. The base saturation is about 35 to 45 percent in the epipedon.

The A horizon is 10YR 3/2, 4/1, 5/1, 5/2, 5/3, or 5/4. Moist colors are 10YR 2/2, 3/1, or 3/2. It is loam, silt loam or clay loam with 0 to 25 percent gravel. It is neutral to medium acid.

The Bw horizon is 10YR 5/2, 5/2, 5/3, 5/4, 6/2, 6/3, 6/4 or 7/2. Moist colors are 10YR 3/3, 3/4, 4/2, 4/3 or 2.5Y 4/2. It is loam, clay loam, sandy clay loam or clay with 5 to 30 percent gravel and 0 to 15 percent cobbles, the total not exceeding 35 percent.

Some pedons have a C horizon.

ELIOAK FAMILY, DEEP

These soils are deep phase members of the clayey, kaolinitic, mesic family of Typic Hapludults. They have developed in material weathered from metasedimentary or metavolcanic rock. They are on broad ridges, benches, and mountainsides at elevations of 500 to about 3,500 feet. Slopes range from 15 to 50 percent. The soils are well to moderately well drained. Mean annual precipitation is about 100 inches. Mean annual temperature is about 50°F.

Typical Pedon: Located in Del Norte County, California, near Big Flat, on the Gasquet-Orleans Road (15N01) about 1/4 mile south of the South Fork Bridge; pit is approximately 50 yards uphill from the road on a northeast facing slope of 45 percent under second growth Douglas-fir, redwood, alder and Chinquapin with an understory of tanoak, evergreen huckleberry, swordfern, and snowbrush at 800 feet elevation; in the SW 1/4 of the NE 1/4 of section 23, T. 15 N., R. 2 E., H.B.M.

O-1 inche to 0; fresh and decomposing leaf and needle litter.

A-0 to 8 inches; light yellowish brown (10YR 6/4) silt loam, yellowish brown (10YR 5/6) moist; weak very fine subangular blocky structure, parting to moderate very fine granular; slightly hard, friable, slightly sticky and slightly plastic; common very fine, fine, and medium roots; medium acid (pH. 5.6); gradual wavy boundary.

BA-8 to 19 inches; yellow (10YR 7/6) gravelly silt loam, yellowish brown (10YR 5/6) moist; moderate very fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many fine, few medium and coarse roots; few thin silt coatings on ped faces; 15 percent pebbles; medium acid (pH 5.6); gradual wavy boundary.

Bt1-19 to 30 inches; yellow (10YR 7/6) gravelly silty clay, yellowish brown (10YR 5/6) moist; moderate very fine subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; few thin clay films on ped faces and line pores; few fine,

medium, and coarse roots; 15 percent pebbles; medium acid (pH 5.7); gradual wavy boundary.

Bt2-30 to 44 inches; yellow (10YR 7/7) gravelly silty clay, yellowish brown (10YR 5/7) moist; strong very fine subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; few fine, medium and coarse roots; common moderately thick clay films on ped faces; few fine, medium and coarse roots; 25 percent pebbles; medium acid (pH 5.8); gradual wavy boundary.

C-44 to 60 inches; very pale brown (10YR 7/4) very gravelly silt loam, yellowish brown (10YR 5/6) moist; weak very fine subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; few fine, medium and coarse roots; few thin clay films on ped faces and rock fragments; 60 percent pebbles; medium acid (pH 5.8).

Range in Characteristics: The depth to metasedimentary or metavolcanic rock ranges from 40 to more than 60 inches. The mean annual soil temperature is estimated to be 50°F to 59°F. The soil between the depths of about 4 and 12 inches is usually moist in all parts from mid-October through August. The base saturation is 11 to 18 percent at depths greater than 60 inches.

The A horizon has dry color of 10YR 6/4, or 7/4; and moist color of 10YR 5/5, or 6/6. It is loam or silt loam, with 10 to 20 percent clay and 0 to 15 percent gravel. It is slightly to strongly acid.

The Bt horizon has dry color of 7.5YR 6/8, 7/6, or 7/7; and moist color of 7.5YR 4/8, 5/6, 5/8, 10YR 5/6, or 5/8. It is clay loam, silty clay loam, or silty clay with 35 to 50 percent clay and 0 to 25 percent gravel.

The C horizon has dry color of 10YR 7/4 or 2.5Y 8/2; and moist color of 10YR 5/6, or 2.5Y 7/6. It is clay loam or silt loam with 30 to 60 percent gravel. It is slightly or medium acid. It grades to highly fractured metasedimentary or metavolcanic rock.

GASQUET FAMILY, DEEP, STONY

These soils are deep, stony members of the clayey, oxidic, mesic family of Typic Haploxerults. They have developed in material weathered from peridotite. They are on mountainsides at elevations of 500 to 3,500 feet. Slopes range from 10 to 40 percent. These soils are well drained. Mean annual precipitation is 105 inches. Mean annual temperature is 50°F.

Typical Pedon: Located in Del Norte County, California, off the Old Gasquet Toll Road, off an old catroad fireline about 0.2 miles off Toll Road; pit is about 300 yards upslope from catroad, on a southwest facing slope of 25 percent under Douglas-fir, sugar pine, and some incense-cedar, with an understory of tanoak, white leaf manzanita, red and evergreen huckleberry, California coffeeberry, and poison oak at 560 feet elevation; in the NE 1/4 of the SW 1/4 of section 21, T. 17 N., R. 2 E., H.B.M.

0-1 inch to 0; fresh and decomposing leaf and needle litter.

A-0 to 9 inches; reddish yellow (5YR 6/6) stony loam, reddish brown (5YR 4/3) moist; moderate very fine granular structure; soft, friable, slightly sticky and slightly plastic; common very fine and fine, many medium and coarse roots; 15 percent stones; medium acid (pH 6.0); clear smooth boundary.

Bt1-9 to 21 inches; red (2.5YR 4/6) stony clay loam, yellowish red (5YR 4/6) moist; weak very fine subangular blocky structure parting to strong very fine granular; slightly hard, firm, sticky and plastic; common moderately thick clayfilms on ped faces and line pores; few very fine, fine, medium and coarse roots; 15 percent stones; slightly acid (pH 6.2); gradual smooth boundary.

Bt2-21 to 42 inches; dark red (2.5YR 3/6) stony clay loam, red (5YR 4/6) moist; moderate very fine subangular blocky structure parting to moderate fine granular; slightly hard, firm, slightly sticky and slightly plastic; few very fine and fine roots;

common moderately thick clay films on ped faces and line pores; 15 percent stones; slightly acid (pH 6.4); gradual smooth boundary.

Bt3-42 to 53 inches; yellowish red (5YR 4/6) stony silty clay loam, reddish brown (5YR 4/4) moist; moderate very fine subangular blocky structure parting to moderate fine granular; hard, firm, sticky and plastic; few fine roots; few moderately thick clay film on ped faces and line pores; 15 percent stones; slightly acid (pH 6.5); clear smooth boundary.

Bt4-53 to 60 inches; strong brown (7.5YR 5/6) stony silty clay loam, strong brown (7.5YR 4/6) moist; weak very fine subangular blocky structure; slightly hard, firm, sticky and plastic; few medium roots; few moderately thick clay films on ped faces and line pores; 15 percent stones; slightly acid (pH 6.4).

Range in Characteristics: The depth to peridotite ranges from 40 to more than 60 inches. The mean annual soil temperature is estimated to be 50 to 59°F. The soil between the depths of about 4 and 12 inches is usually dry in all parts from mid-June to mid-October and moist throughout between November and April. The base saturation is about 20 to 30 percent in the argillic horizon. Surface stones range from 5 to 15 percent.

The A horizon has dry color of 5YR 3/4, 5/6, or 6/6; and moist color of 5YR 3/3, 3/4, or 4/4. It has 10 to 20 percent stones or cobbles. It is slightly or medium acid.

The Bt horizon has dry color of 2.5YR 3/4, 3/6, 5YR 3/4, 4/6, or 7.5YR 5/6; and moist color of 5YR 4/4, 4/6, or 7.5YR 4/6. It is clay, clay loam, or silty clay loam, with 35 to 45 percent clay and 5 to 15 percent stones or cobbles. It is neutral or slightly acid.

Additional Data: A grab sample for mineralogy was sent to the Lincoln Laboratory, 1979. Sample No. S79CA015-6. Confirmed oxidic family classification.

GOLDRIDGE FAMILY, DEEP

These soils are deep phase members of the fine-loamy, mixed, mesic family of Typic Haploxerults. They have developed in material weathered from metasedimentary or metaigneous rock. They are on mountainsides, broad ridges, and benches at elevations of 600 to 4,800 feet. Slopes range from 5 to 70 percent. These soils are well drained. Mean annual precipitation ranges from 60 to 100 inches. Mean annual temperature is about 50°F.

Typical Pedon: Located in Del Norte County, California, on Knopki Creek Road about 3.5 miles from state highway 199; approximately 50 feet upslope from road on a southwest facing slope of 45 percent under Douglas-fir, tanoak and madrone, with some canyon live oak, salal, and poison oak at 2,000 feet elevation; in the SE 1/4 of the NW 1/4 of section 23, T. 18 N., R. 4 E., H.B.M.

0-1 inch to 0; fresh and decomposing leaf and needle litter.

A-0 to 4 inches; light yellowish brown (10YR 6/4) very gravelly loam, dark yellowish brown (10YR 4/4) moist; moderate, fine granular structure; soft, friable, slightly sticky and slightly plastic; many very fine, common fine, few medium roots; 35 percent pebbles; medium acid (pH 5.6); clear smooth boundary.

AB-4 to 14 inches; yellow (10YR 7/6) gravelly clay loam, brown (7.5YR 4/4) moist; weak very fine subangular blocky structure; slightly hard, firm, sticky and plastic; few very fine and fine, many medium, common coarse roots; 15 percent pebbles; medium acid (pH 5.8); gradual smooth boundary.

Bt1-14 to 24 inches; light yellowish brown (10YR 6/4) gravelly clay loam, strong brown (7.5YR 5/6) moist; moderate very fine subangular blocky structure; slightly hard, firm, sticky and plastic; common very fine, fine, medium, few coarse roots; few thin clay films on ped faces and line pores; 25 percent pebbles; medium acid (pH 6.0); clear wavy boundary.

Bt2-24 to 30 inches; yellow (10YR 7/6) gravelly clay loam, strong brown (7.5YR 5/6) moist; moderate very fine subangular blocky structure; hard, very firm, sticky and plastic; few very fine and fine, common medium and coarse roots; common moderately thick clay films on ped faces and line pores; 30 percent pebbles; medium acid (pH 6.0); clear smooth boundary.

Bt3-30 to 43 inches; yellow (10YR 7/8) gravelly clay, reddish yellow (7.5YR 6/6) moist; moderate very fine subangular blocky structure; hard, very firm, very sticky and very plastic; few fine, medium and coarse roots; common moderately thick clay films on ped faces and line pores; 30 percent pebbles; medium acid (pH 6.0); gradual wavy boundary.

R-43 to 59 inches; highly fractured and weathered phyllite; fractures 1 to 4 inches apart.

Range in Characteristics: The depth to metasedimentary or metaigneous rock ranges from 40 to over 60 inches. The mean annual soil temperature is estimated to be 50 to 59°F. The soil between the depths of about 4 and 12 inches is usually dry in all parts from July through October and moist throughout between November and April. The base saturation ranges from 11 to 30 percent in the argillic horizon.

The A horizon has dry color of 10YR 4/4, 5/4, 6/3, 6/4, 7/3, 7/4, or 7/6; and moist color of 7.5YR 3/3, 3/4, 4/4, 3/2, 3/3, 4/3, 4/4, or 4/6. It is loam or clay loam with 0 to 45 percent gravel. It is slightly to strongly acid.

The Bt horizon has dry color of 7.5YR 5/8, 6/6, 7/4, 7/6, 10YR 6/4, 6/6, 7/3, 7/4, 7/6, 7/8, or 8/4; and moist color of 7.5YR 4/4, 4/6, 5/4, 5/6, 5/8, 6/6, 6/8, 10YR 5/4, 5/6, or 5/8. It is loam, clay loam or clay. Clay percentages of more than 35 percent occur below the control section. It has 0 to 35 percent gravel.

Some pedons have a C horizon.

HAPLOXERULTS

Haploxerults consist of shallow to deep, well drained soils formed in residual and colluvial material weathered from metasedimentary and metaigneous rocks. They are on mountainsides and ridges at elevations of 2,500 to 4,000 feet. Slopes range from 30 to 70 percent. Annual precipitation is 70 to 100 inches. The mean annual soil temperature is 50 to 59 degrees F. The soils are usually dry from late June to mid-September and is moist the rest of the year.

The A horizon is 1 to 6 inches thick. It has dry color of 10YR 6/1, 6/2, 6/3, 7.5YR 5/4, 4/4, 5YR 6/1, or 6/2; and moist color of 10YR 4/1, 4/2, 4/3, 7.5YR 4/2, 4/4,

5YR 4/1, 4/2, or 4/3. It is loam, gravelly loam, very gravelly loam, or gravelly clay loam and averages 10 to 55 percent gravel.

The Bt horizon is 12 to 54 inches thick. It has dry color of 7.5YR 5/4, 4/4, 5YR 5/3, 5/4, 5/6, 4/3, or 4/4; and moist color of 7.5YR 4/4, 4/3, 5YR 4/3, 4/4, 5/4, or 5/6. It is clay loam, silty clay loam, gravelly clay loam or gravelly clay and averages 10 to 50 percent coarse fragments. The base saturation is 15 to 30 percent.

The vegetation varies from dense Douglas-fir stands to Jeffrey pine - grass cover.

HARTLETON FAMILY, DEEP

These soils are deep phase members of the loamy-skeletal, mixed, mesic family of Typic Hapludults. They have developed in material weathered from metasedimentary or metaigneous rock. They are on broad ridges and mountainsides at elevations of about 500 to 3,500 feet. Slopes range from 15 to 60 percent. These soils are well drained. Mean annual precipitation is about 100 inches. Mean annual temperature is about 50°F.

Typical Pedon: Located in Del Norte County, California at the northern end of the Gasquet-Orleans Road, about 0.5 miles south of the South Fork bridge; pit is approximately 250 yards upslope from the road on a northeast facing slope of 60 percent under second growth Douglas-fir and redwood, with tanoak, evergreen huckleberry, rhododendron, and swordfern at 750 feet elevation; in the SW 1/4 of the NE 1/4 of section 23, T. 15 N., R. 2 E., H.B.M.

A-0 to 7 inches; light yellowish brown (10YR 6/4) gravelly silt loam, brown (10YR 4/3) moist; strong very fine granular structure; soft, friable, nonsticky and nonplastic; many very fine, common fine, few medium roots; 10 percent pebbles, 5 percent cobbles; medium acid (pH 5.7); clear wavy boundary.

BA-7 to 15 inches; brownish yellow (10YR 6/6) gravelly silt loam, dark yellowish brown (10YR 4/4) moist; moderate very fine and fine subangular blocky structure; slightly hard, firm, nonsticky and nonplastic; few very fine, common fine, few medium and coarse roots; 15 percent pebbles, 5 percent cobbles; medium acid (pH 5.7); gradual wavy boundary.

Bt1-15 to 21 inches; yellow (10YR 7/6) very gravelly silt loam, strong brown (7.5YR 5/6) moist; moderate very fine subangular blocky structure; slightly hard, very firm, slightly sticky and slightly plastic; few very fine, few fine, few medium and few coarse roots; 30 percent pebbles, 5 percent cobbles; medium acid (pH 5.8); clear wavy boundary.

Bt2-21 to 32 inches; brownish yellow (10YR 6/6) very gravelly silt loam, yellowish brown (10YR 5/6) moist; moderate very fine subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; few very fine and fine roots; few moderately thick clay films line pores; 55 percent pebbles, 5 percent cobbles; medium acid (pH 5.8); clear wavy boundary.

Bt3-32 to 60 inches; yellow (10YR 7/7) very gravelly silt loam, yellowish brown (10YR 5/6) moist; moderate very fine subangular blocky structure; soft to slightly hard, friable, nonsticky and nonplastic; few fine roots; few thin clay films line pores; 35 percent pebbles; medium acid (pH 5.8).

Range in Characteristics: The depth to metasedimentary or metaigneous rock ranges from 40 to more than 60 inches. The mean annual soil temperature is estimated to be 50 to 59°F. The soil between the depths of about 8 and 24 inches is usually moist throughout from mid-October through August. The base saturation is about 7 to 10 percent in the argillic horizon.

The A horizon has dry color of 5YR 5/6, 10YR 6/4, 6/6, or 7/4; and moist color of 5YR 4/6, 10YR 4/3, 4/4, or 5/5. It is loam or silt loam with 20 to 25 percent clay and 0 to 25 percent gravel. It is slightly to strongly acid.

The Bt horizon has dry color of 5YR 5/8, 6/8, 10YR 6/6, 7/6, or 8/6; and moist color of 5YR 4/6, 4/8, 7.5YR 5/6, 10YR 5/6, 6/6, or 6/8. It is silt loam, clay loam or silty clay loam with 25 to 35 percent clay. It has 20 to 55 percent gravel and 0 to 30 percent cobbles. Total rock fragments exceed 35 percent. It is slightly or medium acid.

Some pedons have a C horizon.

HECKER FAMILY, DEEP

These soils are deep phase members of the loamy-skeletal, mixed, mesic family of Mollic Haploxeralfs. They have developed in material weathered from sandstone and shale. They are on mountainsides and ridges at elevations of 1,000 to 4,800 feet. Slopes range from 25 to 70 percent. The soils are well drained. Mean annual precipitation is about 60 inches. Mean annual temperature is about 50°F.

Typical Pedon: Located in Humboldt County, California, near Blake Mountain on the road between Forest Service roads 2N12 and 1N15, about 1 mile off 2N12 on a south facing slope of 55 percent under white and black oaks at 3,750 feet elevation in the SW 1/4 of the SE 1/4 of section 25, T. 2 N., R. 5 E., H.B.M.

A1-0 to 6 inches; pale brown (10YR 6/3) gravelly loam, dark brown (7.5YR 3/2) moist; moderate medium granular structure; slightly hard, very friable, sticky and plastic; many very fine and coarse roots; 15 percent pebbles; slightly acid (pH 6.5); clear wavy boundary.

A2-6 to 13 inches; light brownish gray (10YR 6/2) very gravelly light clay loam, dark brown (7.5YR 3/2) moist; moderate subangular blocky structure; slightly hard, very friable, sticky and plastic; many very fine and coarse roots; 40 percent pebbles; slightly acid (pH 6.5); clear wavy boundary.

Bt1-13 to 23 inches; light brownish gray (10YR 6/2) very gravelly clay loam, dark brown (10YR 4/3) moist; moderate fine subangular blocky structure; slightly hard, very friable, sticky and plastic; many very

fine and coarse roots; few thin clay films on ped faces and line pores; 40 percent pebbles, 5 percent cobbles; neutral (pH 6.7); clear wavy boundary.

Bt2-23 to 60 inches; light brownish gray (10YR 6/2) extremely gravelly clay loam, dark brown (10YR 4/3) moist; moderate fine subangular blocky structure; common very fine and coarse roots; few thin clay films on ped faces and line pores; 55 percent pebbles, 15 percent cobbles; neutral (pH 6.8).

Range in Characteristics: Depth to sandstone or shale ranges from 40 to more than 60 inches. The mean annual soil temperature is estimated to be 50 to 59°F. The soil between the depths of about 8 and 24 inches is usually dry in all parts from mid-July through mid-October and moist throughout between November and April. The base saturation is 80 to 90 percent in the epipedon and in the upper 75 cm of the argillic horizon. Organic carbon is assumed to be more than 0.7 percent.

The A horizon has dry color of 10YR 6/2, 6/3, or 6/4; and moist color of 7.5YR 3/2, 10YR 3/2, 3/3, or 3/4. It is loam or light clay loam with 5 to 50 percent gravel. It is neutral to medium acid.

The Bt horizon has dry color of 10YR 5/2, 6/2, 6/4, or 7/4; and moist color of 10YR 3/2, 4/2, 4/3, 4/4, 5/2, or 5/4. It has at least 5 to 10 percent more clay than the horizon above. The average clay content of the upper part of the argillic is less than 35 percent. It has 35 to 55 percent gravel, and 5 to 20 percent cobbles or stones.

HOLLAND FAMILY, DEEP

These soils are deep phase members of the fine-loamy, mixed, mesic family of Ultic Haploxeralfs. They have developed in material weathered from sedimentary, metasedimentary and metaigneous rock on mountainsides, benches and broad ridges at elevations of 600 to 4,800 feet. Slopes range from 5 to 70 percent. These soils are moderately well to well drained. Mean annual precipitation ranges from about 50 to 90 inches. Mean annual temperature is about 50°F.

Typical Pedon: Located in Humboldt County, California, off the Salyer-Mad River Road (Forest Service road 6N06) on a logging spur that is about 3.5 miles from Friday Ridge Road; roadcut is about 0.75 miles up the spur road on a northwest facing slope of 55 percent under Douglas-fir, tanoak and madrone at 1,700 feet elevation; in the SW 1/4 of the SW 1/4 of section 27, T. 6 N., R. 5 E., H.B.M.

A-0 to 6 inches; pale brown (10YR 6/3) very gravelly loam, dark brown (7.5YR 4/4) moist; moderate medium granular structure; slightly hard, friable, sticky and plastic; common very fine and fine, many medium and coarse roots; 40 percent pebbles; strongly acid (pH 5.5); clear smooth boundary.

Bt1-6 to 20 inches; strong brown (7.5YR 5/6) gravelly loam, dark brown (7.5YR 3/4) moist; moderate fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many fine and coarse roots; few thin clay films on ped faces; 15 percent pebbles; strongly acid (pH 5.4); clear smooth boundary.

Bt2-20 to 46 inches; strong brown (7.5YR 5/6) gravelly loam, dark brown (7.5YR 4/4) moist; strong medium subangular blocky structure; hard, friable, sticky and plastic; common thin clay films on ped faces; common medium and coarse roots; strongly acid (pH 5.4); clear wavy boundary.

Bt3-46 to 57 inches; reddish yellow (7.5YR 6/6) very gravelly loam, dark yellowish brown (10YR 4/4)

moist; moderate fine subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; few medium and coarse roots; common thin clay films on ped faces; 40 percent pebbles, 10 percent cobbles; strongly acid (pH 5.4); clear wavy boundary.

C-57 to 65 inches; reddish yellow (7.5YR 6/6) very gravelly loam, brown (10YR 5/4) moist; massive; soft, very friable, slightly sticky and nonplastic; few medium and coarse roots; 60 percent pebbles; medium acid (pH 5.8).

Range in Characteristics: The depth to sedimentary, metasedimentary or metaigneous rock ranges from 40 to over 60 inches. The mean annual soil temperature is estimated to be 50 to 59°F. The soil between the depths of about 4 and 12 inches is usually dry in all parts from July through October and moist throughout between November and April. The base saturation ranges from about 40 to 60 percent in the upper 75 cm of the argillic horizon.

The A horizon has dry color of 7.5YR 5/6, 6/6, 10YR 5/3, or 6/3; and moist color of 7.5YR 3/4, 4/4, 4/6, 10YR 4/3, or 4/4. It is loam or silt loam with 15 to 25 percent clay and 5 to 40 percent gravel. It is neutral to strongly acid.

The Bt horizon has dry color of 7.5YR 5/4, 5/6, 5/8, 6/6, 10YR 6/6, or 6/8; and moist color of 7.5YR 4/4, 5/6, 5/8, 10YR 4/4, 4/6, or 5/8. It is loam, clay loam, or silty clay loam with 20 to 35 percent clay, 5 to 40 percent gravel, and 0 to 10 percent cobbles. It is slightly to very strongly acid.

Some pedons lack a C horizon.

Note: A dry phase of this soil was named as a mapping unit component. It is morphologically the same, but is located only on southerly aspects.

HOLLAND FAMILY, DEEP, DIORITIC

These soils are deep, dioritic phase members of the fine-loamy, mixed, mesic family of Ultic Haploxeralfs. They have developed in material weathered from quartz diorite. They are on mountainsides at elevations of 600 to 4,800 feet. Slopes range from 25 to 50 percent. These soils are well drained. Mean annual precipitation varies from 60 to 100 inches. Mean annual temperature is about 50°F.

Typical Pedon: Located in Trinity County, California, near Zeigler Point, on Forest Service road 7N04, in the roadcut on a south facing slope of 50 percent under Douglas-fir, tanoak, and madrone at 3,700 feet elevation; in the NE 1/4 of the NE 1/4 of section 4, T. 6 N., R. 6 E., H.B.M.

01-1.5-1 inch; scattered loose twigs and leaves.

02-1 to 0 inch; partly decomposed humus.

A1-0 to 4 inches; brown (10YR 5/3) loam, dark brown (7.5YR 3/2) moist; strong medium granular structure; soft, friable, slightly sticky and slightly plastic; common very fine and fine roots; slightly acid (pH 6.5); clear wavy boundary.

A2-4 to 10 inches; strong brown (7.5YR 5/6) loam, dark reddish brown (5YR 3/4) moist; moderate medium granular structure; slightly hard, friable, slightly sticky and plastic; common very fine and fine, few coarse roots; slightly acid (pH 6.2); clear wavy boundary.

Bt1-10 to 23 inches; brown (7.5YR 5/4) sandy clay loam, dark reddish brown (5YR 3/4) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, sticky and plastic; common moderately thick clay films on ped faces and line pores; common very fine and fine, few coarse roots; medium acid (pH 6.0); gradual wavy boundary.

Bt2-23 to 44 inches; brown (7.5YR 5/4) sandy clay loam, reddish brown (5YR 4/4) moist; moderate fine and medium subangular blocky structure; soft, very friable, slightly sticky and plastic; common moderately thick clay films on ped faces and line pores; few very fine and fine, common coarse roots; medium acid (pH 6.0); gradual wavy boundary.

Bt3-44 to 68 inches; reddish yellow (7.5YR 6/6) sandy clay loam, strong brown (7.5YR 5/6) moist; weak fine and medium subangular blocky structure; soft, very friable, sticky and plastic; few very fine and fine, common medium coarse roots; strongly acid (pH 5.5).

Range in Characteristics: The depth to diorite ranges from 40 to over 60 inches. The mean annual soil temperature is estimated to be 50 to 59°F. The soil between the depths of about 4 and 12 inches is usually dry in all parts from July through October and moist throughout between November and April. The base saturation is estimated to be 30 to 50 percent in the upper 75 cm of the argillic horizon.

The A horizon has dry color of 7.5YR 5/4, 5/6, 10YR 6/2, or 6/6; and moist color of 5YR 4/4, 7.5YR 3/2, 4/6, or 10YR 3/2. Where colors are dark the horizon is too thin to be umbric. It has 0 to 40 percent gravel. It is slightly or medium acid.

The Bt horizon has dry color of 7.5YR 5/4, 5/6, 10YR 7/3, or 7/6; and moist color of 5YR 4/4, 4/6, 7.5YR 4/6, 10YR 5/4, or 5/8. It is clay loam or sandy clay loam with 0 to 30 percent gravel. Clay content decreases with depth.

Some pedons have a C horizon.

HOLLAND FAMILY, DEEP, GABBROIC

These soils are deep, gabbroic phase members of the fine-loamy, mixed, mesic family of Ultic Haploxeralfs. They have developed in material weathered from basic igneous rock. They are on mountainsides at elevations of 1,000 to 3,500 feet. Slopes range from 20 to 40 percent. These soils are well drained. Mean annual precipitation ranges from 90 to 110 inches. Mean annual temperature is about 49°F.

Typical Pedon: Located on Del Norte County, California, near Baker Flat, off Forest Service road 18N14, about 1 mile north of junction with 18N17; pit is about 25 yards below the road on a northeast facing slope of 35 percent under a brush cover of tanoak, rhododendron, salal, and chinquapin, with some Sadler oak and manzanita, and a few sugar pine and Douglas-fir at 3,100 feet elevation; in the SW 1/4 of the NW 1/4 of section 12, T. 18 N., R. 3 E., H.B.M.

O-1 inch to 0; fresh and decomposing leaf litter.

A-0 to 3 inches; strong brown (7.5YR 5/6) loam, brown (7.5YR 4/4) moist; moderate very fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine, few coarse roots; strongly acid (pH 5.4); clear smooth boundary.

Bt1-3 to 10 inches; yellowish brown (10YR 5/6) clay loam, strong brown (7.5YR 4/4) moist; moderate very fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine and medium roots; few moderately thick clay films on ped faces and line pores; strongly acid (pH 4.5); clear smooth boundary.

BC-10 to 23 inches; brownish yellow (10YR 6/6) gravelly loam, strong brown (7.5YR 5/6) moist; moderate fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine, medium and coarse roots; 30 percent pebbles; medium

acid (pH 5.6); gradual smooth boundary.

C1-23 to 50 inches; very pale brown (10YR 7/4) gravelly loam, yellowish brown (10YR 5/6) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine roots; 25 percent pebbles; strongly acid (pH 5.2); gradual smooth boundary.

C2-50 to 60 inches; very pale brown (10YR 8/4) sandy loam, yellowish brown (10YR 5/6) moist; massive; soft, friable, nonsticky and slightly plastic; strongly acid (pH 5.2).

Range in Characteristics: The depth to gabbro ranges from 40 to more than 60 inches. Mean annual soil temperature is estimated to be 50 to 59°F. The soil between the depths of about 4 and 12 inches is usually dry in all parts from July through October and moist throughout between November and April. The base saturation is about 20 to 40 percent in the upper 75 cm of the argillic horizon.

The A horizon has dry color of 5YR 4/8, 7.5YR 5/6, or 10YR 4/6; and moist color of 5YR 4/6, 7.5YR 4/4, 4/6, 10YR 3/3, or 5/4. Where colors are dark the horizon is too thin to be umbric. It has 5 to 35 percent gravel. It is medium or strongly acid.

The Bt horizon has dry color of 5YR 4/6, 4/8, 7.5YR 6/6, 10YR 5/6, or 6/6; and moist color of 5YR 3/4, 4/6, 7.5YR 4/4, 4/6, 5/6, 10YR 4/4, or 6/6. It is loam or clay loam with at least a 5 to 10 percent clay increase over the above horizon. It has 5 to 30 percent gravel. It is slightly to strongly acid.

The C horizon has dry color of 5YR 4/8, 7.5YR 6/6, 10YR 7/4, or 8/4; and moist color of 2.5YR 3/6, 7.5YR 4/6, or 10YR 5/6. It is loam or sandy loam with 0 to 15 percent gravel.

HOLLAND FAMILY, DEEP, STONY

These soils are deep, stony phase members of the fine-loamy, mixed, mesic family of Ultic Haploxeralfs. They have developed in material weathered from metaigneous colluvium. They are on mountainsides at elevations of 3,000 to 4,500 feet. Slopes range from 25 to 50 percent. These soils are well drained. Mean annual precipitation ranges from 100 to 110 inches. Mean annual temperature is about 49°F.

Typical Pedon: Located in Del Norte County, California, near Broken Rib Mountain; on a spur road about 0.25 miles from its junction with Forest Service road 18N07 about 3.5 miles east of Sanger Lake; pit is about 25 feet upslope from road on a southwest facing slope of 25 percent under a brush cover of predominantly live oak with some California bay laurel, manzanita, and a few Douglas-fir, incense-cedar and sugar pine at 3,440 feet elevation; in the NW 1/4 of the NE 1/4 of Section 6, T. 17 N., R. 5 E., H.B.M.

0-2 inches to 0; fresh and decomposing leaf and needle litter.

A-0 to 9 inches; yellowish brown (10YR 4/6) very stony loam, brown (10YR 4/3) moist; weak very fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine, common medium, few coarse roots; 30 percent pebbles, 5 percent cobbles and 5 percent stones; acid (pH 6.2); clear smooth boundary.

Bt1-9 to 23 inches; brownish yellow (10YR 6/6) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate very fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine, many fine, common medium, few coarse roots; few thin clay films line pores; 10 percent pebbles, and 5 percent cobbles;

slightly acid (pH 6.3); clear smooth boundary.

Bt2-23 to 44 inches; strong brown (7.5YR 5/8) clay loam, brown (7.5YR 4/4) moist; moderate fine subangular blocky structure; slightly hard, firm, sticky and plastic; few very fine, fine, medium and coarse roots; common thin clay films on ped faces and line pores; 10 percent cobbles and stones; slightly acid (pH 6/4); abrupt wavy boundary.

C-44 inches; colluvial metaigneous rock, 90 to 100 percent gravel.

Range in Characteristics: Depth to metaigneous colluvium ranges from 40 to more than 60 inches. Mean annual soil temperature is estimated to be 50 to 59°F. The soil between the depths of about 4 and 12 inches is usually dry in all parts from July through October and moist throughout between November and April. The base saturation is about 40 to 60 percent in the upper 75 cm of the argillic horizon. Surface rock fragments range from 10 to 20 percent.

The A horizon has dry color of 5YR 4/8, 7.5YR 5/6, 7/8, 10YR 5/6, or 6/6; and moist color of 5YR 4/6, 7.5YR 4/4, 4/6, 10YR 3/4, 4/3, or 5/4. It has 5 to 35 percent gravel and 10 to 20 percent cobbles or stones. It is neutral or slightly acid.

The Bt horizon has dry color of 5YR 4/6, 4/8, 7.5YR 5/8, 6/6, 10YR 5/6, or 6/6; and moist color of 5YR 3/4, 4/6, 7.5YR 4/4, 4/6, 5/6, 10YR 4/4, or 4/6. It has 10 to 30 percent gravel and 5 to 10 percent cobbles or stones. Total amount of rock fragments is 15 to 35 percent in the upper part of horizon. It is slightly or medium acid.

Some pedons have a C horizon.

HOLYOKE FAMILY

These soils are members of the loamy, mixed, mesic family of Lithic Dystrachrepts. They have developed in material weathered from metasedimentary rock. They are on narrow ridges and mountainsides at elevations of 500 to 3,500 feet. Slopes range from 50 to 80 percent. These soils are well drained. Mean annual precipitation is about 100 inches. Mean annual temperature is about 50°F.

Typical Pedon: Located in Del Norte County, California, on the Goose Creek Road about 5.5 miles from the Cache Saddle junction, in a roadcut on a west facing slope of 70 percent under tanoak, madrone, Douglas-fir, and redwood with some snowbrush at 2,250 feet elevation; in the NE 1/2 of the SE 1/4 of section 14, T. 14 N., R. 2 E., H.B.M.

0-1/2 inch to 0; fresh and decomposing leaf and needle litter.

A-0 to 6 inches; yellowish brown (10YR 5/4) gravelly silt loam, dark brown (10YR 4/3) moist; weak very fine granular structure; loose, very friable, nonsticky and nonplastic; many very fine, fine, and medium, common coarse roots; 15 percent pebbles; strongly acid (pH 5.5); clear wavy boundary.

Bw-6 to 14 inches; light yellowish brown (10YR 6/4) gravelly silt loam, dark yellowish brown (10YR 4/4) moist; moderate very fine subangular blocky struc-

ture; slightly hard, friable, slightly sticky and slightly plastic; common coarse roots; 15 percent pebbles; strongly acid (pH 5.4); clear wavy boundary.

BC-14 to 19 inches; light gray (2/5Y 7/2) gravelly silt loam, light olive brown (2.5Y 5/4) moist; strong very fine sub-angular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine, fine and medium roots; 25 percent pebbles; medium acid (pH 5.6).

R-19 inches; highly fractured phyllite bedrock; fractures 2 to 4 inches apart.

Range in Characteristics: Depth to metasedimentary rock ranges from 10 to 20 inches. Mean annual soil temperature is estimated to be 50 to 59°F. The soil between the depths of about 4 and 12 inches is usually moist in all parts from mid-October through August. The base saturation just above a lithic contact is 5 to 20 percent.

The A horizon has dry color of 10YR 4/2, 5/4, or 6/4; and moist color of 10YR 3/3, or 4/3. Where colors are dark the horizon is too thin to be mollic or umbric. It is loam or silt loam with 5 to 20 percent gravel. It is medium or strongly acid.

The Bw horizon has dry color of 10YR 6/4, 6/5, or 6/6; and moist color of 10YR 4/3, 4/4, or 5/4. It has 5 to 30 percent gravel.

HORSESHOE FAMILY, DEEP

These soils are deep phase members of the fine-loamy, mixed, mesic family of Xeric Haplohumults. They have developed in material weathered from mixed alluvium. They are on old terrace remnants at elevations of about 500 to 2,000 feet. Slopes range from 10 to 40 percent. These soils are well to moderately well drained. Mean annual precipitation ranges from 80 to 100 inches. Mean annual temperature is about 50°F.

Typical Pedon: Located in Humboldt County, California, on Forest Service road 15N01 approximately 0.25 miles west of Sims Gulch on a west facing slope of 10 percent under Douglas-fir, tanoak and madrone at 1,500 feet elevation; in the SE 1/4 of the NE 1/4 of section 25, T. 11 N., R. 5 E., H.B.M.

0-1 inch to 0; partially decomposed forest litter.

A-0 to 6 inches; yellowish red (5YR 5/6) gravelly loam, reddish brown (5YR 4/3) moist; moderate very fine subangular blocky structure; slightly hard, friable, nonsticky and non-plastic; few very fine, common medium, and few coarse roots; 15 percent pebbles, 10 percent cobbles; slightly acid (pH 6.3); clear smooth boundary.

BA-6 to 13 inches; yellowish red (5YR 5/8) gravelly loam, red (2.5YR 4/6) moist; moderate medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; common fine, medium and coarse roots; 15 percent pebbles, 10 percent cobbles; medium acid (pH 5.7); clear, smooth boundary.

Bt1-13 to 22 inches; red (2.5YR 5/8) gravelly clay loam, dark red (2.5YR 3/6) moist; moderate medium subangular blocky structure; hard, firm, slightly sticky and plastic; few fine, common coarse roots; many thin clay films line pores; 15 percent pebbles, 10 percent cobbles; strongly acid (pH 5.3); clear wavy boundary.

Bt2-22 to 36 inches; red (2.5YR 5/8) gravelly clay loam, red (2.5YR 4/6) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; few coarse roots; many moderately thick clay films on ped faces and line pores; 15 percent pebbles, 10 percent cobbles; very strongly acid (pH 5.0); clear smooth boundary.

Bt3-36 to 48 inches; red (2.5YR 4/8) gravelly clay loam, dark red (2.5YR 3/6) moist; moderate fine subangular blocky structure; hard, firm, sticky and plastic; common fine, few medium roots; many

moderately thick clay films on ped faces and line pores; 15 percent pebbles, 10 percent cobbles; very strongly acid (pH 5.0); clear smooth boundary.

Bc-48 to 62 inches; reddish yellow (7.5YR 6/8) very cobbly clay loam, strong brown (7.5YR 5/6) moist; moderate fine subangular blocky structure; hard, firm, slightly sticky and slightly plastic; common fine, few medium and coarse roots; common moderately thick clay films on ped faces and line pores; 20 percent pebbles, 20 percent cobbles; strongly acid (pH 5.2); clear, smooth boundary.

C-62 to 76 inches; light gray (10YR 7/2) gravelly loam with some reddish yellow (7.5YR 6/8) staining; massive; hard, firm, slightly sticky and slightly plastic; common very fine and fine roots; 15 percent pebbles, 10 percent cobbles; very strongly acid (pH 5.0).

Range in Characteristics: This soil is over 60 inches deep. The depth of the solum to mixed alluvium ranges from 40 to more than 60 inches. Mean annual soil temperature is estimated to be 50 to 59°F. The soil between the depths of about 4 and 12 inches is usually dry in all parts from July through October and moist throughout between November and April. The base saturation of similar soils is 15 to 30 percent in the argillic horizon or at depths below 60 inches. Surface rock fragments range from 0 to 10 percent.

The A horizon has dry color of 5YR 4/4, 5/6, 7.5YR 4/4, 5/6, or 6/4; and moist color of 5YR 4/3, 4/6, 7.5YR 4/4, or 4/6. It is loam or clay loam with 10 to 30 percent gravel and 0 to 15 percent cobbles. It is slightly to strongly acid.

The Bt horizon has dry color of 2.5YR 4/6, 4/8, 5/8, 5YR 4/6, 4/8, 5/8, 7.5YR 5/4, 5/5, 5/6, 5/8, or 6/4; and moist color of 2.5YR 3/6, 4/6, 5YR 4/4, 5/6, 5/8, 7.5YR 4/4, 4/6, or 5/6. It is clay loam or clay with 5 to 30 percent gravel and 5 to 15 percent cobbles. It has at least 10 to 15 percent more clay than the above horizon. The upper part of the Bt horizon averages 27 to 35 percent clay and has 15 to 35 percent rock fragments. It is slightly to very strongly acid.

The C horizon has dry color of 5YR 4/6, 5/8, 10YR 7/2, or 7/4; and moist color of 5YR 5/6, 10YR 7/2, or 7/4. It is loam, silt loam or clay loam with 0 to 30 percent gravel and 0 to 10 percent cobbles. It is strongly or very strongly acid.

HUGO FAMILY, DEEP

These soils are deep phase members of the fine-loamy, mixed, mesic family of Dystric Xerochrepts. They have developed in material weathered from metasedimentary and metaigneous rock. They are on mountainsides and ridges at elevations of 400 to 4,500 feet. Slopes range from 25 to 65 percent. These soils are well drained. Mean annual precipitation varies from 60 to 100 inches. Mean annual temperature is about 50°F.

Typical Pedon: Located in Del Norte County, California, east of Little Jones Creek, off Forest Service road 17N05 on a spur road that intersects 17N05 about 2 miles north of the Higgins Peak junction; the roadcut is 0.2 miles in on the spur road on an east facing slope of 40 percent under Douglas-fir, tanoak, madrone, chinquapin, and salal at 3,450 feet elevation; in the NW 1/4 of the SE 1/4 of section 24, T. 17 N., R. 3 E., H.B.M.

0-1 inch to 0; fresh and decomposing leaf and needle litter.

A-0 to 7 inches; light yellowish brown (10YR 6/4) gravelly loam, brown (10YR 4/3) moist; weak very fine to fine granular structure; soft, friable, non-sticky and non-plastic; many very fine, few fine and medium roots; 15 percent pebbles; medium acid (pH 5.6); clear smooth boundary.

Bw1-7 to 15 inches; brownish yellow (10YR 6/6) silt loam, yellowish brown (10YR 5/6) moist; moderate fine subangular blocky structure; slightly hard, firm, nonsticky and slightly plastic; few very fine and fine, common medium, few coarse roots; medium acid (pH 5.6); diffuse wavy boundary.

Bw2-15 to 29 inches; yellow (10YR 7/6) silt loam, yellowish brown (10YR 5/8) moist; moderate very fine subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; common very fine, few fine, medium, and coarse roots; medium acid (pH 5.6); diffuse wavy boundary.

Bw3-29 to 40 inches; yellow (10YR 7/6) gravelly silty clay loam, yellowish brown (10YR 5/8) moist; weak very fine subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; few very fine, fine and medium roots; 20 percent pebbles; medium acid (pH 5.6); gradual wavy boundary.

BC-40 to 60 inches; brownish yellow (10YR 6/6) extremely gravelly silt loam, yellowish brown (10YR 5/6) moist; weak very friable subangular blocky structure; soft, friable, nonsticky and nonplastic; few fine and medium roots; 65 percent pebbles; medium acid (pH 5.7).

Range in Characteristics: Depth to metasedimentary or metaigneous rock ranges from 40 to more than 60 inches. The mean annual soil temperature is estimated to be 50 to 59°F. The soil between the depths of about 4 and 12 inches is usually dry in all parts from mid-June through mid-October and moist throughout between November and April. The base saturation is 10 to 30 percent between the depths of 10 and 30 inches. Surface rock fragments range from 0 to 10 percent.

The A horizon has dry color of 10YR 5/4, 6/4, 7/4, 2.5Y 7/2, or 8/6; and moist color of 10YR 3/3, 4/3, 4/4, 5/4, 6/6, or 2.5Y 4/4. Where colors are dark, the horizon is too thin to be umbric. It has 5 to 35 percent gravel. It is slightly to strongly acid.

The Bw horizon has dry color of 10YR 6/4, 6/6, 7/3, 7/6, 8/6, 2.5Y 7/4, or 8/4; and moist color of 10YR 5/4, 5/6, 5/8, 6/7, 2.5Y 5/4, or 6/6. It is loam, silt loam, or clay loam, not increasing by as much as 1.2 percent clay over the horizon above. It has 5 to 35 percent gravel.

Some pedons have a C horizon.

Note: A dry phase of this soil was named as a mapping unit component. It is morphologically the same, but is located only on southerly aspects.

HUGO FAMILY, DEEP, DIORITIC

These soils are deep, dioritic phase members of the fine-loamy, mixed, mesic family of Dystric Xerochrepts. They have developed in material weathered from diorite. They are on mountainsides at elevations of 600 to 4,800 feet. Slopes range from 15 to 45 percent. Mean annual precipitation is about 70 inches. Mean annual temperature is about 50°F.

Typical Pedon: Located in Humboldt County, California, west of north Trinity Mountain on Forest Service road 10N02, about 1.5 miles north of the junction with the spur road, in a roadcut on a southwest facing slope of 30 percent under Douglas-fir, tanoak, and madrone with a few white fir at 4,600 feet elevation; in the NE 1/4 of the NE 1/4 of section 6, T. 8 N., R. 6 E., H.B.M.

A-0 to 3 inches; reddish brown (5YR 4/3) gravelly loam, dark reddish brown (5YR 2/2) moist; strong very fine and fine subangular blocky structure; soft, friable, slightly sticky and slightly plastic; common fine roots; 15 percent pebbles; medium acid (pH 6.0); abrupt smooth boundary.

BA-3 to 8 inches; reddish brown (5YR 5/4) gravelly loam, reddish brown (5YR 4/4) moist; moderate very fine and fine subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; common fine, few medium roots; 15 percent pebbles; medium acid (pH 6.0); abrupt wavy boundary.

Bw-8 to 19 inches; brown (7.5YR 5/4) loam, dark brown (7.5YR 4/4) moist; weak very fine and fine subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; few medium roots; medium acid (pH 5.7); clear wavy boundary.

BC-19 to 39 inches; light brown (7.5YR 6/4) loam, strong brown (7.5YR 5/6) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; few

medium roots; medium acid (pH 5.7); clear wavy boundary.

C-39 to 51 inches; brownish yellow (10YR 6/6) sandy loam, yellowish brown (10YR 5/6) moist; massive; soft, friable, nonsticky and slightly plastic; strongly acid (pH 5.5).

Cr-51 inches; highly decomposed diorite.

Range in Characteristics: Depth to diorite rock ranges from 40 to more than 60 inches. The mean annual soil temperature is estimated to be 47 to 49°F. The soil between the depths of about 4 and 12 inches is usually dry in all parts from mid-June through mid-October and moist throughout between November and April. The base saturation is estimated to be 30 to 40 percent between the depths of 10 and 30 inches. Surface rock fragments range from 0 to 15 percent.

The A horizon has dry color of 5YR 4/3, 7.5YR 5/4, or 4/4; and moist color of 5YR 2/2, 3/2, 4/4, 7.5YR 3/4, or 4/4. Where colors are dark the horizon is too thin to be umbric. It is loam or sandy loam with 10 to 20 percent gravel and 0 to 10 percent cobbles or stones. It is medium or strongly acid.

The Bw horizon is 5YR 5/4, 5/6, 7.5YR 5/4, or 6/4; and moist color of 5YR 4/4, 4/6, 7.5YR 4/4, or 5/6. It has 0 to 30 percent gravel and 0 to 10 percent cobbles or stones. It is slightly or medium acid.

The C horizon has dry color of 7.5YR 5/8, or 10YR 6/6; and moist color of 7.5YR 5/6, or 10YR 5/6. It is loamy sand or sandy loam with 0 to 40 percent gravel and 0 to 15 percent cobbles or stones. It is strongly acid.

HUGO FAMILY, MODERATELY DEEP

These soils are moderately deep phase members of the fine-loamy, mixed, mesic family of Dystric Xerochrepts. They have developed in material weathered from metasedimentary or metaigneous rock. They are on mountainsides at elevations of 400 and 4,500 feet. Slopes range from 30 to 70 percent. These soils are well drained. Mean annual precipitation ranges from 50 to 100 inches. Mean annual temperature is about 50°F.

Typical Pedon: Located in Humboldt County, California, near Mud Springs, on Cedar Camp Road (Forest Service road 11N05) on an east facing slope of 60 percent under Douglas-fir, some white fir and tanoak at 4,200 feet elevation; in section 13, T. 11 N., R. 4 E., H.B.M.

0-1/2 inch to 0; fresh and decomposing leaf and needle litter.

A-0 to 7 inches; pale brown (10YR 6/3) gravelly loam, light yellowish brown (10YR 6/4) moist; strong medium granular structure; soft, firm, nonsticky and nonplastic; many very fine and fine roots; 15 percent pebbles; medium acid (pH 5.5); clear smooth boundary.

BA-7 to 12 inches; very pale brown (10YR 7/3) gravelly loam, light brownish gray (2.5Y 6/2) moist; weak fine subangular blocky structure; soft, friable, nonsticky and non-plastic; many fine and medium roots; 15 percent pebbles; strongly acid (pH 5.3); clear smooth boundary.

Bw-12 to 18 inches; very pale brown (10YR 7/3) gravelly loam, very pale brown (10YR 7/4) moist; moderate fine granular structure; slightly hard, friable, sticky and slightly plastic; common medium, few coarse roots; 15 percent pebbles; strongly acid (pH 5.3); clear wavy boundary.

C-18 to 24 inches; light gray (10YR 7/1) gravelly loam, light yellowish brown (2.5Y 6/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common fine and medium roots; 15 percent pebbles; very strongly acid (pH 4.8); abrupt irregular boundary.

R-24 inches; fractured metasedimentary rock.

Range in Characteristics: Depth to metasedimentary or metaigneous rock ranges from 20 to 40 inches. The mean annual soil temperature is estimated to be 50 to 59°F. The soil between the depths of about 4 and 12 inches is usually dry in all parts from mid-July to mid-October and moist throughout from November to April. The base saturation is 10 to 30 percent between the depths of 10 and 30 inches. Surface rock fragments range from 0 to 10 percent.

The A horizon has dry color of 10YR 5/3, 5/4, 6/3, or 6/4; and moist color of 10YR 3/3, 3/4, 5/4, or 6/4. Where colors are dark the horizon is too thin to be umbric. It has 10 to 35 percent gravel. It is medium or strongly acid.

The Bw horizon has dry color of 10YR 5/4, 6/4, 7/3, or 8/4; and moist color of 10YR 4/4, 5/4, or 7/4. It has 10 to 30 percent gravel.

The C horizon has dry color of 10YR 7/1, 7/2, or 7/3; and moist color of 10YR 4/4, 5/6, 6/3, 6/4, 2.5Y 5/2, 6/4, or 7/4. It has 15 to 40 percent gravel. It is strongly or very strongly acid.

Some pedons lack C horizons.

HULLT FAMILY, DEEP

These soils are deep phase members of the fine-loamy, mixed, mesic family of Typic Xerumbrepts. They have developed in place from metasedimentary rock. They are on mountainsides and ridges at elevations of 3,000 to 4,000 feet. Slopes range from 35 to 70 percent. These soils are well drained. Mean annual precipitation is about 70 inches. Mean annual temperature is about 50°F.

Typical Pedon: Located in Humboldt County, California, near Sugarloaf Mountain, about 0.5 miles off Forest Service road 6N06, on a logging spur that curves around the west side of Sugarloaf, on a northwest facing slope of 60 percent under Douglas-fir, tanoak, and madrone at 3,400 feet elevation; in the NW 1/4 of the NE 1/4 of Section 33, T. 5 N., R. 5 E., H.B.M.

0-2 inches to 0; fresh and decomposing leaf and needle litter.

A1-0 to 2 inches; brown (10YR 5/3) gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; common fine, few coarse roots; 30 percent pebbles; strongly acid (pH 5.5); clear smooth boundary.

A2-2 to 14 inches; yellowish brown (10YR 5/4) gravelly loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common fine and coarse roots; 20 percent pebbles; medium acid (pH 6.0); clear smooth boundary.

Bw1-14 to 24 inches; light yellowish brown (10YR 6/4) gravelly loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; soft, very friable, slightly

sticky and slightly plastic; common fine, few coarse roots; 25 percent pebbles; medium acid (pH 6.0); clear smooth boundary.

Bw2-24 to 45 inches; pale brown (10YR 6/3) loam, brown (10YR 4/3) moist; weak fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; few fine roots; slightly acid (pH 6.2); clear smooth boundary.

R-45 inches; weathered and fractured phyllite; fractures 4 to 6 inches apart.

Range in Characteristics: Depth to metasedimentary rock ranges from 40 to over 60 inches. The mean annual soil temperature is estimated to be 50 to 59°F. The soil between the depths of about 4 and 12 inches is usually dry in all parts from mid-July through mid-October and moist throughout between November and April. The base saturation in the upper portion of the soil is estimated to be 30 to 40 percent.

The A horizon has dry color of 10YR 2/2, 4/3, 5/2, 5/3, or 5/4; and moist color of 10YR 2/1, 3/2, or 3/3. It has 10 to 30 percent gravel. It is medium or strongly acid.

The Bw horizon has dry color of 10YR 5/4, 6/2, 6/3, or 6/4; and moist color of 10YR 3/2, 3/4, 4/3, or 5/4. It is loam or clay loam and does not increase in clay content by as much as 1.2 times that of the above horizon. It has 10 to 25 percent gravel. It is slightly or medium acid.

Note: A dry phase of this soil was named as a mapping unit component. It is morphologically the same, but is located only on southerly aspects.

HUNGRY FAMILY, DEEP

These soils are deep phase members of the loamy-skeletal, serpentinitic, frigid family of Typic Xerochrepts. These soils have developed in place from serpentine rock. They are on mountainsides at elevations of 4,000 to 6,000 feet. Slopes range from 35 to 70 percent. These soils are well drained. Mean annual precipitation is about 75 inches. The mean annual temperature is about 52°F.

Typical Pedon: Located in Humboldt County, California, near Friday Camp on Titlow Hill Road, about 2.4 miles from junction with Friday Ridge road on an east facing slope of 60 percent under sugar pine, ponderosa pine, and incense-cedar at 4,200 feet elevation; in the SW 1/4 of the SW 1/4 of section 2, T. 5 N, R. 4 E., H.B.M.

0-1.5 inch to 0; Fresh and decomposing needle litter.

A-0 to 7 inches; light brown (7.5YR 6/4) very gravelly clay loam; dark reddish brown (5YR 3/4) moist; moderate very fine granular structure; slightly hard, friable, slightly sticky and plastic; many very fine, common fine, few medium roots; 50 percent pebbles; medium acid (pH 5.7); clear smooth boundary.

BA-7 to 16 inches; light brown (7.5YR 6/4) clay loam; dark reddish brown (5YR 3/4) moist; moderate fine subangular blocky structure breaking to moderate fine granular; slightly hard, friable, sticky and plastic; few very fine, fine, medium, and coarse roots; medium acid (pH 5.6); clear wavy boundary.

Bw-16 to 30 inches; pink (5YR 7/4) extremely cobbly clay loam, yellowish red (5YR 4/6) moist; moderate fine subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine and fine, few medium and coarse roots; 20 percent pebbles, 50 percent cobbles; medium acid (pH 5.7); clear wavy boundary.

C-30 to 53 inches; very pale brown (10YR 7/4) very cobbly clay loam; dark yellowish brown (10YR 4/6) moist; weak very fine subangular blocky structure;

slightly hard, friable, sticky and plastic; few fine and medium roots; 15 percent pebbles, 30 percent cobbles, 10 percent stones; medium acid (pH 5.7).

R-53 inches; weathered serpentine.

Range in Characteristics: Depth to serpentine rock ranges from 40 to more than 60 inches. The mean annual soil temperature is estimated to be 43° to 47°F. Mean summer soil temperature is estimated to be 48°F to 50°F and the difference between mean summer and mean winter temperatures is estimated to be more than 9°F. The soil between the depths of about 8 and 24 inches is usually dry in all parts from mid-June to mid-October and moist throughout between November and April. The base saturation, by Hach kit, is about 50 to 55 percent at about 30 cm.

The A horizon has dry color of 7.5YR 6/2, 6/4, 10YR 6/3, 7/3, or 2.5Y 6/2; and moist color of 5YR 3/4, 7.5YR 4/4, 10YR 3/2, 3/3, 3/4, 2.5YR 3/2, or 4/4. It is loam or clay loam with 25 to 32 percent clay and 15 to 50 percent gravel. It is slightly or medium acid.

The Bw horizon has dry color of 5YR 4/6, 7/4, 7.5YR 5/6, 6/6, or 2.5Y 7/2; and moist color of 5YR 3/4, 4/6, or 2.5Y 5/4. It is clay loam or silty clay loam with 28 to 35 percent clay, not increasing as much as 1.2 times more clay than the horizon above. It has 10 to 45 percent gravel and 10 to 40 percent cobbles with a weighted average of at least 35 percent rock fragments in the 10 to 40 inch control section.

The C horizon has dry color of 7.5YR 5/6, 6/6, 10YR 6/4, 7/4, 2.5Y 6/1, 6/2, or 6/4; and moist color of 7.5YR 4/4, 10YR 3/3, 4/6, 2.5Y 4/3, or 4/4. It has 15 to 50 percent gravel, 10 to 30 percent cobbles, and 0 to 10 percent stones.

Additional Data: A reference sample for mineralogy was sent to the Lincoln Laboratory, 1979; sample No. S79CA023-5.

ISHI PISHI FAMILY, DEEP

These soils are deep phase members of the clayey-skeletal, serpentinitic, mesic family of Ultic Haploxeralfs. They have developed in material weathered from serpentinite rock. Slopes range from 30 to 70 percent. They are on mountain sideslopes at elevations of 400 to 3,000 feet. These soils are well drained. Mean annual precipitation varies from 70 to 100 inches. Mean annual temperature is about 50°F.

Typical Pedon: Located in Humboldt County, California near Black Mountain, on Black Mountain Road about 1/4 mile east of junction with Forest Service road 10N01; pit is approximately 60 feet north of the road on a southeast facing slope of 35 percent under Douglas-fir, Jeffrey pine, sugar pine, madrone, incense-cedar with an understory of tanoak, California coffeeberry and grasses at 2,100 feet elevation; in section 31, T. 10 N., R. 6 E., H.B.M.

0-1 inch to 0; fresh and decomposing needle and leaf litter.

A-0 to 2 inches; brown to dark brown (7.5YR 4/4) gravelly clay loam, dark brown (7.5YR 3/2) moist; strong medium and coarse granular structure; slightly hard, friable, slightly sticky and plastic; common fine, medium, and coarse roots; many very fine, fine, common medium tubular pores; few thin clay films on ped faces; 15 percent pebbles; slightly acid (pH 6.5); gradual wavy boundary.

BA-2 to 8 inches; reddish yellow (5YR 6/6) gravelly clay, reddish brown (5YR 4/4) moist; weak very coarse subangular blocky parting to moderate very fine and fine subangular blocky structure; slightly hard, friable, sticky and plastic; common fine, medium, and coarse roots; common medium and fine tubular pores; few thin clay films on ped faces; 15 percent pebbles; slightly acid (pH 6.5); gradual wavy boundary.

Bt1-8 to 16 inches; red (2.5YR 5/6) gravelly clay, dark reddish brown (2.5YR 3/4) moist; moderate fine and medium subangular blocky parting to moderate fine granular structure; slightly hard, friable, sticky and plastic; few thin, common medium and coarse roots; many very fine, common fine tubular pores; many thin clay films on ped faces; 15 percent pebbles, 5 percent cobbles; neutral (pH 6.8); gradual wavy boundary.

Bt2-16 to 25 inches; yellowish red (5YR 5/6) very stoney

clay, reddish brown (5YR 5/5) moist; moderate fine and medium sub-angular blocky parting to moderate fine granular structure; slightly hard, friable, very sticky and plastic; few fine, common medium, and coarse roots; many very fine and common fine tubular pores; continuous thin clay films on ped faces; 20 percent pebbles, 20 percent cobbles, 15 percent stones; neutral (pH 7.0); clear wavy boundary.

Bt3-25 to 33 inches; yellowish red (5YR 5/6) very gravelly clay, dark reddish brown (5YR 3/4) moist; moderate very fine, fine, and medium subangular blocky structure; slightly hard, friable, very sticky and plastic; few fine, common medium and coarse roots; common very fine and fine tubular pores; continuous moderately thick clay films on ped faces; 35 percent pebbles, 3 percent cobbles, 15 percent stones; neutral (pH 7.0); gradual wavy boundary.

Bt4-33 to 40 inches; yellowish red (5YR 5/6) very gravelly clay, dark reddish brown (5YR 3/3) moist; moderate fine, medium, and coarse subangular blocky structure; slightly hard, friable, very sticky and very plastic; few fine, common medium and coarse roots; continuous moderately thick clay films on pedfaces; 35 percent pebbles, 3 percent cobbles; neutral (pH 7.0); gradual irregular boundary.

C-40 to 47 inches; white (5YR 5/6) saprolite that crushes to gravelly clay loam, light gray (2.5Y 7/2) moist; weak coarse and very coarse subangular blocky structure; slightly hard, friable, very sticky and plastic; few very fine, fine, and medium roots; few very fine tubular pores; many moderately thick clay films on ped faces; 35 percent pebbles; neutral (pH 7.3); clear irregular boundary.

R-47 inches; ultramafic rock (Serpentinite).

Range in Characteristics: The depth to serpentinite ranges from 40 to 60 inches. The mean annual soil temperature is 47 to 52°F. The soil between the depths of 8 and 25 inches is usually dry in all parts between June and October, and are moist throughout from November to April. The base saturation is estimated to be 50 to 60 percent in the argillic horizon. It is assumed that more than 40 percent by weight of the whole soil <2 mm diameter is serpentine minerals.

The A horizon is 7.5YR 6/4, 7/4, 5YR 4/6, or 5/6. Moist

colors are 7.5YR 3/2, 4/4, 5YR 3/3, 3/4, or 4/4. It is loam to clay loam with 15 to 35 percent gravel and 0 to 10 percent cobbles. It is slightly or medium acid.

The Bt horizon is 7.5YR 6/4, 5YR 4/4, 5/6, 6/6, or 2.5YR 3/4. Moist colors are 7.5YR 5/6, 5YR 3/3, 3/4,

4/4, or 2.5YR 3/4. It is clay loam to clay with 15 to 35 percent gravel and 0 to 10 percent cobbles. It is neutral or slightly acid.

Some pedons lack a C horizon.

JAYEL FAMILY, MODERATELY DEEP

These soils are moderately deep phase members of the fine, oxidic, mesic family of Dystric Xerochrepts. They have developed in material weathered from peridotite. They are on mountain sideslopes at elevations of 500 to 3,500 feet. Slopes range from 15 to 40 percent. Mean annual precipitation is about 105 inches. Mean annual temperature is about 50°F.

Typical Pedon: Located in Del Norte County, California near Red Mountain lookout, about 1 mile northwest of the junction with South Red Mountain Road, on a south facing slope of 15 percent under knobcone pine, huckleberry oak, California coffeeberry, tanoak and some Douglas-fir at 3,500 feet elevation; in the NE 1/4 of the SE 1/4 of section 13, T. 13 N., R. 2 E., H.B.M.

A1-0 to 3 inches; yellowish red (5YR 5/6) clay loam, dark reddish brown (5YR 3/4) moist; strong, medium to coarse granular structure; slightly hard, firm, non-sticky and non-plastic; common very fine, few medium roots; 10 percent pebbles; neutral (pH 6.7); gradual smooth boundary. .

A2-3 to 11 inches; yellowish red (5YR 5/6) clay loam, yellowish red (5YR 4/6) moist; strong, medium to coarse granular structure; slightly hard, firm, slightly sticky and slightly plastic; common very fine, few fine, medium, and coarse roots; neutral (pH 6.8); clear wavy boundary.

Bw1-11 to 24 inches; reddish yellow (7.5YR 6/6) silty clay, strong brown (7.5YR 4/6) moist; moderate very fine to fine subangular blocky structure; soft to slightly hard, firm, non-sticky and non-plastic; few

very fine, common fine, few medium roots; neutral (pH 6.8); gradual wavy boundary.

Bw2-24 to 40 inches; yellowish red (5YR 4/6) clay, reddish brown (5YR 4/4) moist; moderate fine subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; few fine and medium roots; 15 percent pebbles; neutral (pH 6.9).

R-40 inches; peridotite with soil in fractures.

Range in Characteristics: The depth to serpentinized peridotite ranges from 20 to 40 inches. Mean annual soil temperature is estimated to be 50 to 59°F. The soil between the depths of 4 and 12 inches is usually dry in all parts from mid-July through mid-October, and moist throughout between November and April. The base saturation between the depths of 10 and 30 inches is estimated to be 20 to 50 percent.

The A horizon is 5YR 4/4, 4/6, 5/6, or 7.5YR 5/6. Moist colors are 5YR 3/4, 4/4, 4/6, 7.5YR 4/4, or 4/6. It is clay loam or silty clay loam with 30 to 40 percent clay and 5 to 20 percent gravel (shot-like nodules of oxides). It is neutral or slightly acid.

The Bw horizon is 5YR 4/6, 5/6, 5/8, 7.5YR 5/6, or 5/8. Moist colors are 5YR 4/4, 4/6, 7.5YR 4/4, 4/6, or 5/6. It is clay loam or clay, with 35 to 45 percent clay, not increasing by as much as 1.2 times more than the horizon above. It has 5 to 20 percent gravel and 0 to 10 percent stones.

JAYEL FAMILY, MODERATELY DEEP, STONY

These soils are moderately deep, stony phase members of the fine, oxidic, mesic family of Dystric Xerochrepts. They have developed in material weathered from peridotite. They are on mountain sideslopes at elevations of 500 to 3,500 feet. Slopes range from 5 to 60 percent. These soils are well drained. Mean annual precipitation is about 105 inches. Mean annual temperature is about 50°F.

Typical Pedon: Located in Del Norte County, California, off Low Divide Road approximately 3/4 to 1 mile south of the junction with Rowdy Creek Road, about 13 meters upslope from road on a southeast facing slope of 10 percent under knobcone pine, tanoak, and huckleberry oak at 2,400 feet elevation; in the NE 1/4 of the NE 1/4 of section 34, T. 18 N., R. 1 E., H.B.M.

0-1 inch to 0; fresh and decomposing leaf and needle litter.

A-0 to 10 inches; reddish brown (2.5YR 4/4) stony clay loam, dark brown (7.5YR 4/4) moist; moderate very fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine, common fine and medium, few coarse roots; 15 percent pebbles, 15 percent stones; neutral (pH 6.6); clear smooth boundary.

BA-10 to 18 inches; yellowish red (5YR 4/6) stony clay, strong brown (7.5YR 5/6) moist; weak very fine subangular blocky structure; soft, very friable, slightly sticky and plastic; few very fine, common fine, few medium and coarse roots; 15 percent cobbles, 10 percent stones; neutral (pH 6.8); gradual smooth boundary.

Bw-18 to 31 inches; yellowish red (5YR 4/6) stony

clay, strong brown (7.5YR 5/6) moist; weak very fine subangular blocky structure; soft, very friable, slightly sticky and plastic, few very fine, common fine, few medium and coarse roots; 10 percent stones; neutral (pH 6.6); clear smooth boundary.

R-31 inches; fractured peridotite; fractures 25 to 50 cm apart.

Range in Characteristics: Depth to peridotite ranges from 25 to 40 inches. The mean annual soil temperature is estimated to be 50 to 59°F. The soil between the depths of 4 and 12 inches is usually dry in all part from mid-June to mid-October. The base saturation is 20 to 50 percent between the depths of 30 to 75 cm. Surface stones range from 15 to 35 percent.

The A horizon is 5YR 4/4, 4/6, or 7.5YR 5.6. Moist colors are 5YR 4/4, 4/6, 7.5YR 4/4, or 4/6. It is clay loam or silty clay loam with 30 to 40 percent clay, 10 to 30 percent gravel (shot-like nodules of oxides) and 15 to 30 percent stones. It is neutral to medium acid.

The Bw horizon is 5YR 4/6, 5/6, 5/8, 7.5YR 5/6, 5/8, or 10YR 5/8. Moist colors are 5YR 4/6, 7.5YR 4/4, 4/6, or 5/6. It is clay loam or clay, with 34 to 45 percent clay, not increasing as much as 2 percent over the horizon above. It has 5 to 15 percent gravel and 5 to 15 percent stones.

Some pedons have a C horizon.

Additional Data: Reference samples sent to Lincoln Laboratory for mineralogy and texture. Sample Nos. S79CA015-5 and 015-8.

KISTIRN FAMILY, DEEP

These soils are deep phase members of the loamy-skeletal, mixed, mesic family of Typic Haploxerults. They have formed in place from metasedimentary rock. They are on mountain sideslopes at elevations of 1,000 to 4,500 feet. Slopes range from 30 to 75 percent. These soils are well drained. Mean annual precipitation is about 65 inches. Mean annual temperature is about 50°F.

Typical Pedon: Located in Humboldt County, California on Salyer-Mad River Road, about 2.4 miles from Friday Ridge Road junction, on a north facing slope of 60 percent under Douglas-fir, tanoak, and madrone at 1,180 feet elevation; in the SE 1/4 of the SW 1/4 of section 22, T. 6 N., R. 5 E., H.B.M.

0-1 to 3 inches; fresh and decomposing leaf and needle litter.

A1-0 to 3 inches; yellowish brown (10YR 5/4) very gravelly loam, dark reddish brown (5YR 3/3) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; common very fine, fine, medium and coarse roots; 40 percent pebbles; medium acid (pH 5.7); clear smooth boundary.

A2-3 to 8 inches; light yellowish brown (10YR 6/4) very gravelly loam, dark yellowish brown (10YR 4/4) moist; weak fine granular structure; soft, friable, slightly sticky and slightly plastic; many very fine, fine, medium, and coarse roots; 40 percent pebbles; medium acid (pH 5.7); gradual smooth boundary.

Bt1-8 to 24 inches; light yellowish brown (10YR 6/4) very cobbly clay loam dark brown (7.5YR 4/4) moist; moderate medium sub-angular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine, and fine, many medium, and common coarse roots; 30 percent pebbles, 20 percent cobbles; strongly acid (pH 5.4); gradual smooth boundary.

Bt2-24 to 53 inches; strong brown (7.5YR 5/6) very gravelly clay loam, dark brown (7.5YR 4/4) moist; moderate medium subangular blocky structure;

slightly hard, friable, sticky and plastic; few very fine and fine, common medium and coarse roots; many thin clay films on ped faces; 35 percent pebbles, 5 percent cobbles; strongly acid (pH 5.4); abrupt wavy boundary.

C-53 to 79 inches; very pale brown (10YR 7/3) extremely gravelly silty clay, yellowish brown (10YR 5/4) moist; moderate medium subangular blocky structure; very hard, firm, sticky and plastic; common medium and coarse roots; many thin clay films on ped faces and line pores; 55 percent pebbles, 10 percent cobbles; strongly acid (pH 5.3).

Range in Characteristics: Depth to metasedimentary rock ranges from 40 to more than 80 inches. The mean annual soil temperature is estimated to be 50 to 59°F. The soil between the depths of 8 and 24 inches is usually dry in all parts from mid-June to mid-October. The base saturation, by Hach Kit, is 14 to 28 in the lower part of the argillic and in the C horizon.

The A horizon is 5YR 4/5, 7.5YR 6/4, 7/4, 10YR 4/2, 5/2, 5/4, 6/3, or 6/4. Moist colors are 5YR 3/3, 7.5YR 3/2, 4/4, 5/6, or 10YR 3/3. Where colors meet the criteria for a umbric epipedon the horizon lacks sufficient thickness to qualify. It is loam or silt loam with 20 to 60 percent gravel. It is slightly or medium acid.

The Bt horizon is 5YR 5/6, 7.5YR 5/6, 6/6, 6/8, 7/6, 7/8, 10YR 6/4, 7/1, 7/2, 7/3, 7/4, or 7/6. Moist colors are 5YR 4/6, 5/6, 7.5YR 4/4, 5/6, 5/8, 10YR 4/4, 5/4, 5/6, or 6/8. It is clay loam or silty clay loam, with 27 to 45 percent clay, 30 to 60 percent gravel, and 0 to 20 percent cobbles. The upper part of the Bt horizon has an average of 30 to 35 percent clay. It is slightly to strongly acid.

The C horizon is 10YR 7/2, or 7/3. Moist colors are 10YR 5/4, or 6/4. It is clay loam, clay or silty clay with 50 to 60 percent gravel and 10 to 30 percent cobbles. It is medium or strongly acid.

Some pedons lack C horizons.

LITHIC HAPLOXERALS, ULTRAMAFIC

Lithic Haploxeralfs, ultramafic soils are shallow, well drained, and formed in material weathered from serpentine. They are on mountain sideslopes and benches at elevations of 400 to 4,500 feet. Slopes range from 15 to 70 percent. Mean annual precipitation is about 115 inches.

Depth to a lithic contact is 12 to 18 inches. Mean annual soil temperature at the contact is 50 to 59°F. The soil is usually dry between 4 and 12 inches depth from mid-June to mid-October and moist the rest of the year.

The A horizon is 2 to 6 inches thick. Dry color is 10YR

6/3, 6/2 or 5/3; and moist color is 10YR 4/3, 3/3 or 3/2. Dark colors do not meet mollic criteria because they are either too thin or not directly underlain by the bedrock. The soil is gravelly loam or gravelly clay loam.

The Bt horizon is 4 to 20 inches thick. Dry color is 10YR 6/4 or 5/4; and moist color is 10YR 4/4 or 4/3. The soil is a clay loam or gravelly clay loam. There are few, thin to common, moderately thick clay films on ped faces and line pores.

Surface gravel ranges from 0 to 30 percent. Vegetation can be annual grasses, manzanita, and Jeffrey pine.

LITHIC XEROCHREPTS, ULTRAMAFIC

Lithic Xerochrepts, ultramafic soils are shallow, well drained and formed in material weathered from peridotite. They are on mountain sideslopes and ridges at elevations of 500 to 3,500 feet. Slopes range from 35 to 75 percent. Mean annual precipitation is about 105 inches.

Depth to serpentized peridotite ranges from 12 to 20 inches. Mean annual soil temperature at the contact is 50 to 59°F. The soil is dry between 4 and 12 inches depth from mid-June to mid-October and moist the rest of the year.

The A horizon is 4 to 8 inches thick. Dry colors are

7.5YR 5/4, 5/6 or 10YR 5/8; and moist colors are 7.5YR 4/4 or 2.5YR 3/6. It is clay loam or silty clay loam, with 5 to 20 percent gravel (shot-like nodules of oxides), and 5 to 20 percent stones.

The B horizon is 8 to 12 inches thick. Dry colors are 5YR 5/6 or 5/4; and moist colors are 7.5YR 5/6 or 5/4. It is a clay loam or silty clay loam.

Surface stones or cobbles range from 10 to 20 percent.

Vegetation is huckleberry oak, whiteleaf manzanita, knobcone pine, Douglas-fir, and sugar pine.

LITHIC XERORTHENTS

Lithic Xerorthents soils are very shallow or shallow, well to excessively drained soils, formed in material weathered from metasedimentary and metaigneous rocks. They are on mountain sideslopes and ridges at elevations of 600 to 4,500 feet. Slopes range from 60 to 90 percent. Annual precipitation is 60 to 90 inches.

Depth to a lithic contact is 3 to 18 inches. Mean annual soil temperature at the contact is 47 to 59°F. The soil is usually dry from late June to mid-September and is moist the rest of the year.

The A horizon is 3 to 10 inches thick. Dry color is 10YR 6/3, 6/2, 5/3, 5/2, 4/3 or 2.5Y 6/2; and moist color is 10YR 4/3, 3/3, 3/2 or 2/5Y 4/2. Dark colors do not meet mollic criteria because they are either too thin

or not directly underlain by the bedrock. The soil is gravelly sandy loam, very gravelly sandy loam, or very stony sandy loam. In some pedons the A horizon lies directly over the hard bedrock. In others a C horizon separates the A from the lithic contact. Rock fragments average 35 to 70 percent.

The C horizon is 3 to 10 inches thick. Dry color is 10YR 7/2, 6/3, 5/4, or 5/3; and moist color is 10YR 4/4, 4/3, or 3/4. It is very gravelly sandy loam, extremely gravelly sandy loam, or extremely cobbly sandy loam and averages 50 to 85 rock fragments.

Vegetation: Tanoak, madrone, canyon live oak, and some scattered Douglas-fir.

MADDEN FAMILY, MODERATELY DEEP

These soils are moderately deep phase members of the fine, serpentinitic, mesic family of Mollic Haploxeralfs. They have developed in place from serpentinitic rock. They occur on mountain ridges and sideslopes at elevations of 1,000 to 4,800 feet. Slopes range from 20 to 50 percent. These soils are well drained. Mean annual precipitation is about 55 inches. Mean annual temperature is about 54°F.

Typical Pedon: Located in Trinity County, California, on Hennessy Ridge, on Old Hennessy Road about 1/8 mile west of the junction of four roads on the ridge top, on a northwest facing slope of 25 percent under Douglas-fir, incense-cedar and ponderosa pine at 3,100 feet elevation; in the middle of section 8, T. 5 N., R. 6 E., H.B.M.

0-1 inch to 0; fresh and decomposing needle litter.

A-0 to 8 inches; brown (7.5YR 5/4) clay loam, dark brown (7.5YR 3/2) moist; moderate very fine and fine subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine, few fine roots; neutral (pH 6.8); clear smooth boundary.

Bt1-8 to 15 inches; brown (7.5YR 5/4) clay loam, dark reddish brown (5YR 3/4) moist; moderate very fine and fine subangular blocky structure; slightly hard, friable, sticky and plastic; few very fine and fine, common medium and coarse roots; very few moderately thick clay films on ped faces, few thin clay films line pores; neutral (pH 7.0); gradual smooth boundary.

Bt2-15 to 24 inches; dark brown (7.5YR 4/4) clay loam, dark reddish brown (5YR 3/4) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; few very fine and fine, common medium and coarse roots; few moderately thick clay films on ped faces, few thin clay films line pores; 5 percent cobbles; neutral (pH 7.0); clear

smooth boundary.

Bt3-24 to 31 inches; dark yellowish brown (10YR 4/4) clay, dark brown (7.5YR 3/4) moist; moderate fine and medium sub-angular blocky structure; very hard, firm, very sticky and plastic; few fine, common medium and coarse roots; continuous thin clay films line pores; neutral (pH 7.2); clear wavy boundary.

Bt4-31 to 37 inches; yellowish brown (10YR 5/4) clay, dark brown (10YR 3/3) moist; moderate fine and medium subangular blocky structure; hard, firm, very sticky and very plastic; common thin clay films line pores; few fine and common medium roots; mildly alkaline (pH 7.5); abrupt wavy boundary.

R-37 inches; fractured serpentinitic bedrock with cracks less than 4 inches apart.

Range in Characteristics: Depth to serpentinitic rock ranges from 20 to 40 inches. The mean annual soil temperature is estimated to be about 54°F. The soil between the depths of 4 and 12 inches is usually dry in all parts from mid-June through mid-October and moist throughout between November and April. The base saturation is assumed to be more than 75% throughout. It is assumed that more than 40 percent by weight of the soil >2 mm diameter is serpentine minerals.

The A horizon is 5YR 5/4, 7.5YR 5/4, or 6/4. Moist colors are 5YR 3/3, 3/4, or 7.5YR 3/2. It is loam or clay loam with 0 to 20 percent gravel. It is neutral or slightly acid.

The Bt horizon is 7.5YR 4/4, 5/4, 10YR 4/4, or 5/4. Moist colors are 5YR 3/4, 7.5YR 4/4, or 10YR 3/3. It is heavy clay loam or clay with an increase of at least 1.2 times more clay than the above horizon. It has 0 to 20 percent gravel, 0 to 5 percent cobbles. It is slightly acid to mildly alkaline.

MAYMEN FAMILY

These soils are members of the loamy, mixed, mesic family of Dystric Lithic Xerochrepts. They have developed in material weathered from sedimentary, metasedimentary, or igneous rock. They are on mountain sideslopes and ridges at elevations of 400 to 4,800 feet. Slopes range from 35 to 90 percent. These soils are well drained. Mean annual precipitation varies from 60 to 100 inches. Mean annual temperature is about 50°F.

Typical Pedon: Located in Trinity County, California, on Groves Prairie Road (Forest Service road 7N04), approximately 2 miles south of the junction with Waterman Ridge Road (Forest Service road 7N02), on a southwest facing slope of 35 percent under tanoak, madrone, canyon live oak, and some Douglas-fir at 3,150 feet elevation; in the SW 1/4 of the NW 1/4 of section 8, T. 6 N., R. 6 E., H.B.M.

0-1 inch to 0; fresh and decomposing leaf litter.

A-0 to 2 inches; pale brown (10YR 6/3) gravelly loam, very dark brown (10YR 3/2) moist; moderate very fine granular structure; soft, friable, non-sticky and slightly plastic; few very fine and fine roots; 20 percent pebbles; medium acid (pH 5.8); abrupt wavy boundary.

Bw1-2 to 6 inches; very pale brown (10YR 7/3) gravelly loam, brown (10YR 4/3) moist; weak very fine and fine subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine and fine, few medium roots; 30 percent pebbles; strongly acid (pH 5.5); clear wavy boundary.

Bw2-6 to 18 inches; very pale brown (10YR 7/3) gravelly loam, yellowish brown (10YR 5/4) moist; weak very fine and fine sub-angular blocky structure; slightly hard, friable, sticky and plastic; few very fine, fine, medium, and coarse roots; very few thin clay films on ped faces; 30 percent pebbles; medium acid (pH 5.8); abrupt wavy boundary.

R-8 inches; fractured phyllite bedrock; fractures 2 to 10 cm apart.

Range in Characteristics: The depth to metasedimentary or metaigneous rock ranges from 10 to 20 inches. The mean annual soil temperature is estimated to be 50 to 59°F. The soil between the depths of 4 and 12 inches is usually dry in all parts from mid-June through mid-October, and moist throughout between November and April. The base saturation is assumed to be 15 to 50 percent between the depths of 10 inches and a lithic contact. Surface rock fragments range from 0 to 10 percent.

The A horizon is 10YR 5/3, 5/4, 6/2, 6/3, or 7/3. Moist colors are 10YR 2/2, 4/3, 4/4, or 5/4. Where colors are dark the horizon is too thin to be umbric. It has 15 to 40 percent gravel. It is neutral to medium acid.

The Bw horizon is 10YR 6/3, 6/4, 7/3, or 7/4. Moist colors are 10YR 4/3, 4/4, 5/4, or 5/6. It has 10 to 30 percent gravel. It is slightly to strongly acid. Lacks sufficient clay increase to qualify for an argillic horizon.

MAYMEN FAMILY, DIORITIC

These soils are dioritic phase members of the loamy, mixed, mesic family of Dystric Lithic Xerochrepts. They have developed in material weathered from quartz diorite rock. They are on mountainsides and ridges at elevations of 400 to 4,800 feet. Slopes range from 30 to 90 percent. These soils are somewhat excessively drained. Mean annual precipitation ranges from 60 to 100 inches. Mean annual temperature is about 50°F.

Typical Pedon: Located in Trinity County, California, near Ziegler Point, on Waterman Ridge Road about 0.2 miles north of the junction with a jeep road; on a south facing slope of 70 percent under Douglas-fir, canyon live oak, tanoak, and madrone at 3,800 feet elevation; in the NW 1/4 of the NW 1/4 of section 10, T. 6 N., R. 6 E., H.B.M.

0-1/2 inch to 0; fresh and decomposing leaf and needle litter.

A-0 to 7 inches; light brownish gray (10YR 6/2) gravelly coarse sandy loam, dark brownish gray (10YR 4/2) moist; weak very fine and fine granular structure; loose; common very fine and fine roots; 20 percent pebbles; strongly acid (pH 5.5); abrupt wavy boundary.

Bw-7 to 16 inches; light yellowish brown (10YR 6/4)

gravelly coarse sandy loam, dark yellowish brown (10YR 4/4) moist; single grain; loose; common very fine and fine roots; 30 percent pebbles; slightly acid (pH 6.2); abrupt wavy boundary.

R-17 inches; quartz diorite bedrock.

Range in Characteristics: The depth to diorite ranges from 12 to 20 inches. The mean annual soil temperature is estimated to be 50 to 59°F. The soil between the depths of about 4 and 12 inches is usually dry in all parts from mid-June through mid-October and moist throughout between November and April. The base saturation is assumed to be 15 to 50 percent between the depth of 10 inches and a lithic contact. Surface rock fragments range from 0 to 20 percent.

The A horizon has dry color of 10YR 5/3, 5/4, 6/2, or 6/3; and moist color of 10YR 3/1, 3/2, 4/2, or 4/4. Where colors are dark the horizon is too thin to be mollic or umbric. It is sandy loam or coarse sandy loam with 15 to 35 percent gravel.

The Bw horizon has dry color of 10YR 6/3, or 6/4; and moist color of 10YR 3/4, 4/4, or 5/6. It has 10 to 35 percent gravel. It is slightly to strongly acid.

MELBOURNE FAMILY, DEEP

These soils are deep phase members of the fine, mixed, mesic family of Ultic Haploxeralfs. They have developed in material weathered from sedimentary and metasedimentary rock. They are on mountainsides and benches at elevations of 1,000 to 4,800 feet. Slopes range from 5 to 50 percent. The soils are moderately well to well drained. Mean annual precipitation is about 65 inches. Mean annual temperature is about 50°F.

Typical Pedon: Located in Trinity County, California, near Panther Peak, on county road 502, about 0.5 miles north of Panther Creek upslope from the road; on a SE facing slope of 30 percent under Douglas-fir and white oak, with some ponderosa pine at 3,650 feet elevation; in the SE 1/4 of the NW 1/4 of section 36, T. 2 S., R. 6 E., H.B.M.

A-0 to 8 inches; pale brown (10YR 6/3) clay loam, brown (10YR 4/3) moist; strong coarse granular structure; slightly hard, firm, slightly sticky, plastic; many very fine and fine, common medium roots; slightly acid (pH 6.2); gradual wavy boundary.

BA-8 to 14 inches; light yellowish brown (10YR 6/4) clay loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; slightly hard, firm, slightly sticky, plastic; many fine, common medium, few coarse roots; slightly acid (pH 6.2); gradual wavy boundary.

Bt1-14 to 27 inches; pale brown (10YR 6/3) gravelly clay loam, olive brown (2.5Y 4/3) moist; moderate medium subangular blocky structure; hard, very firm slightly sticky, plastic; many fine, common medium and coarse roots; few thin clay films on

ped faces and line pores; 25 percent pebbles, 10 percent cobbles; medium acid (pH 5.8); clear wavy boundary.

C-27 to 45 inches; grayish brown (10YR 5/2) very gravelly clay, dark gray (10YR 4/1) moist; massive; hard, firm, sticky, plastic; common fine, few medium, common coarse roots; 40 percent pebbles; medium acid (pH 5.8).

Range in Characteristics: The depth to metasedimentary rock ranges from 40 to more than 60 inches. The mean annual soil temperature is estimated to be 50 to 59°F. The soil between the depths of about 4 and 12 inches is usually dry in all parts from mid-June through mid-October, and moist throughout between November and April. The base saturation is 30 to 60 percent in the upper 30 inches of the argillic horizon.

The A horizon has dry color of 10YR 6/3, 6/4, 2.5Y 5/2, or 6/2; and moist color of 10YR 3/3, 3/4, 4/3, 4/4, 2.5Y 3/2, or 4/2. Where colors are dark the horizon is too thin to be mollic or umbric. It is loam, clay loam, or silty clay loam with 0 to 45 percent gravel. It is neutral to strongly acid.

The Bt horizon has dry color of 5YR 5/3, 6/3, 10YR 6/3, 6/6, 7/4, 7/6, or 2.5Y 6/2; and moist color of 5YR 4/3, 5/6, 10YR 4/3, 4/6, 4/7, 5/2, 5/4, 5/6, 2.5Y 3/2, or 4/3. It is clay loam, clay, or silty clay, increasing by at least 5 percent clay over the horizon above. It has 0 to 35 percent gravel.

Some pedons lack a C horizon.

NANNY FAMILY, DEEP

These soils are deep phase members of the loamy-skeletal, mixed frigid family of Typic Xerumbrepts. They have developed in material weathered from igneous, metaigneous or metasedimentary rock. They are on mountainsides and broad ridges at elevations of 3,800 to 6,000 feet. Slopes range from 5 to 70 percent. These soils are well drained. Mean annual precipitation ranges from 70 to 110 inches. Mean annual temperature is about 50°F.

Typical Pedon: Located in Del Norte County, California, on Forest Service road 18N07, approximately 1.5 miles northwest of Sanger Lake, about 50 feet upslope from road; on a SE facing slope of 30 percent under white fir, Sadler oak, ribes sp., Oregon grape, with some Douglas-fir and sugar pine at 4,600 feet elevation; in the SW 1/4 of the NW 1/4 of section 32, T. 18 N., R. 5 E., H.B.M.

0-5 to 0 inches; fresh and decomposing needle litter.

A-0 to 2 inches; very dark grayish brown (10YR 3/2) gravelly loam, black (10YR 2/1) moist; weak very fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine, few fine and medium roots; 20 percent pebbles; slightly acid (pH 6.3); clear smooth boundary.

Bw1-2 to 10 inches; brown (10YR 5/3) very gravelly loam, dark brown (10YR 3/3) moist; weak very fine subangular blocky structure; soft, friable, slightly sticky and slightly plastic; many very fine and fine, few medium and coarse roots; 45 percent pebbles; slightly acid (pH 6.3); clear wavy boundary.

Bw2-10 to 16 inches; pale brown (10YR 6/3) extremely gravelly loam, dark brown (10YR 3/3) moist; weak very fine subangular blocky structure; soft, friable, slightly sticky, slightly plastic; common very fine and fine, few medium roots; 80 percent pebbles; slightly acid (pH 6.3); clear smooth boundary.

Bw3-16 to 31 inches; very pale brown (10YR 7/3) extremely gravelly loam, brown (10YR 4/3) moist; slightly hard, firm, slightly sticky, slightly plastic; common very fine and fine, few medium roots; 75 percent pebbles; medium acid (pH 6.3); clear wavy boundary.

Bw4-31 to 60 inches; very pale brown (10YR 7/3) very gravelly loam, dark yellowish brown (10YR 4/4) moist; slightly hard, firm, slightly sticky, slightly plastic; common very fine, fine, few medium and coarse roots; few moderately thick clay films on ped faces and line pores; 60 percent pebbles; slightly acid (pH 6.3).

Range in Characteristics: The depth to metaigneous or metasedimentary rock ranges from 40 to more than 60 inches. The mean annual soil temperature is estimated to be 45°F. The mean summer soil temperature is estimated to be 48°F and the difference between mean summer and mean winter soil temperature is estimated to be more than 9°F. The soil between the depths of about 8 and 24 inches is usually dry in all parts from mid-July to mid-October and moist throughout between November and April. The base saturation is estimated to range from 25 to 35 percent. Surface rock fragments range from 5 to 20 percent.

The A horizon has dry color of 10YR 3/2, 4/2, 4/3, or 5/3; and moist color of 10YR 2/1, 3/1, 3/2, or 3/3. It has 15 to 60 percent gravel. It is neutral to medium acid.

The Bw horizon has dry color of 7.5YR 3/4, 10YR 5/3, 5/6, 6/3, 7/3, or 2.5Y 7/2; and moist color of 10YR 3/3, 3/4, 3/6, 4/3, 4/4, 2.5Y 4/6, or 5/4. The upper part of the Bw horizon has dry values of 3 or 5 and moist values and chromas of 3. It is loam or sandy loam with 35 to 80 percent gravel. It is slightly to strongly acid.

Some pedons have a C horizon.

NANNY FAMILY, DEEP, DIORITIC

These soils are deep, dioritic phase members of the loamy-skeletal, mixed, frigid family of Typic Xerumbrepts. They have developed in material weathered from quartz diorite and dioritic glacial till. They are on mountainsides at elevations of 3,800 to 6,000 feet. Slopes range from 30 to 70 percent. These soils are well drained. Mean annual precipitation ranges from about 80 to 100 inches. Mean annual temperature is about 50°F.

Typical Pedon: Located in Del Norte County, near Siskiyou Pass on Forest Service road 17N04, in a roadcut about 0.75 miles west of the Forest boundary; on a northeast facing slope of 70 percent under white fir, red fir, hazel, Sadler oak, bitter cherry, and thimbleberry, with some Douglas-fir and incense cedar at 4,300 feet elevation; in the SW 1/4 of the NW 1/4 of section 1, T. 16 N., R. 4 E., H.B.M.

0-1 inch to 0; fresh and decomposing leaf and needle litter.

A1-0 to 2 inches; yellowish brown (10YR 5/4) gravelly loam, very dark grayish brown (10YR 3/2) moist; weak very fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine, common fine, few medium roots; 25 percent pebbles, 5 percent cobbles and stones; strongly acid (pH 5.4); gradual wavy boundary.

A2-2 to 13 inches; yellowish brown (10YR 5/4) very gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; moderate, fine granular structure; soft, very friable, non-sticky and nonplastic; many very fine, common fine and medium, few coarse roots; 10 percent cobbles, 30 percent pebbles; strongly acid (pH 5.4); gradual wavy boundary.

Bw1-13 to 27 inches; yellowish brown (10YR 5/6) very gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; weak very fine granular structure; soft,

friable, nonsticky and nonplastic; common very fine and medium roots; 30 percent pebbles, 10 percent cobbles; strongly acid (pH 5.5); gradual wavy boundary.

Bw2-27 to 55 inches; brownish yellow (10YR 6/6) very gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; weak very fine granular structure; soft, very friable, non-sticky and nonplastic; common very fine, few fine roots; 30 percent pebbles, 20 percent cobbles and stones; medium acid (pH 5.6).

Cr-55 inches; weathered dioritic glacial till.

Range in Characteristics: The depth to weathered dioritic glacial till ranges from 40 to more than 60 inches. The mean annual soil temperature is estimated to be 45°F. Mean soil temperature is estimated to be 48°F and the difference between the mean summer and mean winter soil temperature is estimated to be more than 9°F. The soil between the depths of about 8 and 24 inches is usually dry in all parts from mid-June through mid-October, and moist throughout between November and April. The base saturation in the epipedon is estimated to range from 30 to 40 percent. Surface coarse fragments range from 0 to 15 percent.

The A horizon has dry color of 10YR 4/1, 5/4, 5/5, 6/4, or 7/4; and moist color of 10YR 3/2, 3/3, 3/4, or 4/3. Colors that are too light for an umbric epipedon occur below 10 inches. It is loam or sandy loam with 15 to 45 percent gravel. It is medium or strongly acid.

The Bw horizon has dry color of 10YR 5/4, 5/5, 5/6, 6/6, or 7/6; and moist color of 10YR 3/4, 4/4, or 4/6. It has 35 to 65 percent gravel.

Some pedons have a C horizon. It is underlain by weathered dioritic glacial till.

NANNY FAMILY, MODERATELY DEEP

These soils are moderately deep phase members of the loamy-skeletal, mixed, frigid family of Typic Xerumbrepts. They have developed in material weathered from sedimentary, metasedimentary, or metaigneous rock. They are on mountainsides at elevations of 4,500 to 6,000 feet. Slopes range from 35 to 70 percent. These soils are somewhat excessively drained. Mean annual precipitation ranges from 50 to 100 inches. Mean annual temperature is about 45°F.

Typical Pedon: Located in Humboldt County, California, on Forest Service trail 6E07, about 1.5 miles northwest of Whitey's Peak; on a south facing slope of 35 percent under Sadler oak, greenleaf manzanita, snowbrush, and bittercherry, with some white and noble fir at 5,600 feet elevation; in the SW 1/4 of section 25, T. 10 N., R. 6 E., H.B.M.

0-2 inches to 0; fresh and decomposing leaf litter.

A1-0 to 5 inches; very dark grayish brown (10YR 3/2) very gravelly loam, black (10YR 2/1) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine and medium roots; 40 percent pebbles, 5 percent cobbles; medium acid (pH 6.0); clear smooth boundary.

A2-5 to 17 inches; brown to dark brown (10YR 4/3) very gravelly loam, very dark brown (10YR 2/2) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine and medium roots; 40 percent pebbles, 5 percent cobbles; medium acid (pH 6.0); clear smooth boundary.

Bw-17 to 35 inches; light olive brown (2.5Y 5/4) ex-

tremely gravelly loam, olive brown (2.5Y 4/4) moist; weak fine granular structure; soft, friable, nonsticky and nonplastic; common medium roots; 60 percent pebbles, 25 percent cobbles; very strongly acid (pH 5.0); abrupt wavy boundary.

R-35 inches; fractured metabasic rock.

Range in Characteristics: The depth to metaigneous rock ranges from 20 to 40 inches. The mean annual soil temperature is estimated to be 45°F. and the difference between mean winter and mean summer soil temperatures is estimated to be more than 9°F. The soil between the depths of about 8 and 24 inches is usually dry in all parts from mid-June through mid-October and moist throughout between November and April. The base saturation in the epipedon is estimated to range from 30 to 40 percent. Surface coarse fragments range from 5 to 20 percent.

The A horizon has dry color of 7.5YR 4/4, 5/4, 10YR 3/1, 3/2, 4/2, or 5/3; and moist color of 7.5YR 3/2, 4/4, 10YR 2/1, 2/2, 3/2, or 4/4. Colors that are too light for an umbric epipedon occur below 10 inches. It has 15 to 40 percent gravel and 0 to 10 percent cobbles and stones. It is medium to very strongly acid.

The Bw horizon has dry color of 10YR 5/3, 6/4, 8/4, 2/5Y 5/4, or 8/4; and moist color of 10YR 4/3, 4/4, 5/4, 6/6, 2/5Y 4/4, or 5/6. It has 35 to 60 percent gravel and 15 to 50 percent cobbles and stones.

Some pedons have a C horizon.

ORAGRAN FAMILY

These soils are members of the loamy, serpentinitic, mesic family of Lithic Xerochrepts. They have developed in material weathered from serpentized ultramafic rock. They are on mountainsides at elevations of 400 to 4,800 feet. Slopes range from 5 to 70 percent. These soils are well drained. Mean annual precipitation ranges from 90 to 115 inches. Mean annual temperature is about 50°F.

Typical Pedon: Located in Del Norte County, California, in a roadcut on the road to Red Mountain Lookout, about 1.0 miles northwest of the junction with South Red Mountain road; on an east facing slope of 10 percent under knobcone pine, lodgepole pine, azalea, huckleberry and red huckleberry oak at 4,060 feet elevation; in the SW 1/4 of the NW 1/4 of section 13, T. 13 N., R. 2 E., H.B.M.

0-5 inches to 0; fresh and decomposing leaf and needle litter.

A1-0 to 2 inches; yellowish brown (10YR 5/4) very stony loam, dark brown (10YR 4/3) moist; moderate very fine granular structure; soft, friable, nonsticky and nonplastic; few very fine, common fine, few medium roots; many very fine interstitial and tubular pores; 15 percent pebbles, 30 percent stones; medium acid (pH 5.8); clear smooth boundary.

BA-2 to 12 inches; brownish yellow (10YR 6/6) stony silt loam, yellowish brown (10YR 5/6) moist; weak

very fine subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; few very fine, fine, medium and coarse roots; many very fine interstitial and tubular pores; 15 percent stones; medium acid (pH 6.0); abrupt irregular boundary.

R-12 inches; serpentized peridotite.

Range in Characteristics: Depth to ultramafic rock is 10 to 20 inches. The mean annual soil temperature is estimated to be 50 to 59°F. The soil between the depths of about 4 and 12 inches is usually dry in all parts from mid-June to mid-October and moist throughout between November and April. The base saturation in similar soils, by Hach kit, is about 60 percent just above the lithic contact. Surface stones and cobbles range from 5 to 30 percent.

The A horizon has dry color of 10YR 5/3, 5/4, or 7/4; and moist color of 7.5YR 5/6, 10YR 4/3, or 4/6. It is loam or silt loam with 10 to 20 percent gravel and 10 to 30 percent stones. It is slightly or medium acid.

The Bw horizon has dry color of 10YR 6/3, 6/8, or 2.5Y 7/4; and moist color of 10YR 5/6, or 6/6. It has 0 to 25 percent gravel and 0 to 15 percent stones.

The lithic contact is fractured serpentine or serpentized peridotite with fractures 0.5 to 19 inches apart.

OXALIS FAMILY, DEEP

These soils are deep phase members of the fine, montmorillonitic, thermic family of Vertic Xerochrepts. They have developed in material weathered from sheared shale and phyllite (or fault gouge). They are on hummocky mountainsides at elevations of 2,000 to 4,800 feet. Slopes range from 25 to 70 percent and typically have southern exposures. These soils are somewhat poorly to moderately well drained. Mean annual precipitation is about 65 inches. Mean annual temperature is about 52°F.

Typical Pedon: Located in Trinity County, California, north of Brown's Canyon, on Forest Service road INID, approximately 1.3 miles west of low water crossing; pit is about 100 feet upslope from road on a south facing slope of 45 percent under annual grasses, legumes and other forbs at 3,365 feet elevation; in the NE 1/4 of the SW 1/4 of section 31, T. 1 N., R. 6 E., H.B.M.

A-0 to 8 inches; light brownish gray (2.5Y 6/2) silty clay loam, very dark grayish brown (2.5Y 3/2) moist; strong fine to medium subangular blocky structure; hard, firm, slightly sticky, slightly plastic; common very fine and fine roots; slightly acid (pH 6.2); gradual wavy boundary.

BA-8 to 20 inches; light brownish gray (2.5Y 6/2) silty clay, dark grayish brown (2.5Y 4/2) moist; weak fine and coarse subangular blocky structure; very hard, very firm, sticky, plastic; gray pressure faces on peds, dark gray (10YR 4/1) moist; slightly acid (pH 6.2); diffuse wavy boundary.

Bw-20 to 40 inches; light brownish gray (2.5Y 6/2) silty clay, dark grayish brown (2.5Y 4/2) moist; weak coarse sub-angular blocky structure; extremely hard, very firm, sticky, very plastic; gray (10YR 5/1) pressure faces on peds, dark gray (10YR 4/1) moist; neutral (pH 6.6); diffuse wavy boundary.

C-40 to 60 inches; pale olive (5Y 6/4) gravelly silty clay,

olive gray (5Y 5/2) moist; common fine dark gray (10YR 4/1) mottles, very dark gray (10YR 3/1) moist; weak coarse subangular blocky structure; extremely hard, very firm, sticky, plastic; 15 percent pebbles; many large and medium distinct mottles; neutral (pH 6.6).

Range in Characteristics: Depth to sheared shale ranges from 40 to more than 60 inches. The mean annual soil temperature is estimated to be 59 to 63°F. The soil between the depths of about 4 and 12 inches is usually dry in all parts from mid-June to mid-October and moist throughout between November and April. The base saturation, by Hach kit, ranges from 60 to 70 percent in the A horizon. Clay percentage does not increase enough to qualify for an argillic horizon. In most years there are cracks at some period that are 1 cm wide in the A and B horizons.

The A horizon has dry color of 2.5Y 5/2, 6/2, 5Y 5/2, or 10YR 6/2; and moist color of 2.5Y 3/2, 4/2, 5Y 3/2, or 10YR 3/2. It is clay loam or silty clay loam, with 0 to 10 percent gravel. It is medium acid to mildly alkaline. Cracks range from 1 to 1.5 cm wide.

The Bw horizon has dry color of 2.5Y 6/2, 5/1, 5Y 6/2, or 10YR 6/1; and moist color of 2.5Y 4/1, 4/2, 5Y 5/2, or 10YR 4/1. It is silty clay or clay, with 0 to 35 percent gravel. It is medium acid to moderately alkaline. Cracks range from 1 to 1.5 cm wide.

The C horizon has dry color of 5Y 4/2, 6/4, 7/1, or 10YR 6/1; and moist color of 5Y 4/1, 5/1, 5/2, or 10YR 4/1. Mottles are 5Y 6/2, 10YR 4/1 dry, and 2.5Y 5/6, 3/2 moist. Gravel content is 0 to 35 percent. It is neutral to mildly alkaline.

Some pedons lack a C horizon.

PITS AND DUMPS

These consist of placer mines located in old terrace deposits of Tertiary river gravels. The gravels and alluvial material were removed in the mining process down to the hard underlying rock, leaving highly dissected depres-

sions containing scattered piles of large boulders. These areas have nearly vertical side slopes and flat bottoms. The vegetation on the bottoms of these depressions consist of a few scattered shrubs and trees.

RACE FAMILY, DEEP

These soils are deep phase members of the fine-loamy, micaceous, frigid family of Dystric Xerochrepts. They have developed in material weathered from mica schist. They are on mountainsides and ridges at elevations of 4,500 to 5,800 feet. Slopes range from 35 to 75 percent. These soils are well to moderately well drained. Mean annual precipitation is about 60 inches. Mean annual temperature is about 48°F.

Typical Pedon: Located in Trinity County, California, on South Fork Mountain, on Forest Service road 2502, approximately 0.8 miles west of the Cedar Gap junction; pit is upslope from road about 20 feet on a south facing slope of 45 percent under white fir, incense-cedar, and ponderosa pine, with a few Douglas-fir at 4,590 feet elevation; in the SE 1/4 of the SE 1/4 of section 29, T. 28 N., R. 12 W., M.D.B.M.

0-1.5 inches to 0; fresh and decomposing needle litter.

A-0 to 6 inches; light olive gray (5Y 6/2) gravelly loam, dark olive gray (5Y 3/2) moist; moderate and strong coarse and medium granular structure; soft, very friable, slightly sticky and slightly plastic; few very fine and fine, common medium roots; many very fine and fine interstitial and tubular pores; 20 percent pebbles; neutral (pH 6.6); clear wavy boundary.

Bw1-6 to 10 inches; light brownish gray (2.5Y 6/2) gravelly loam, olive gray (5Y 4/2) moist; moderate fine sub-angular blocky structure; soft, very friable, slightly sticky and slightly plastic; many fine and medium, few coarse roots; many very fine interstitial and tubular pores; 20 percent pebbles; slightly acid (pH 6.4); clear wavy boundary.

Bw2-10 to 16 inches; pale Yellow (5Y 7/3) gravelly loam, olive (5Y 4/3) moist; moderate fine to medium subangular blocky structure; soft, friable, slightly sticky and plastic; common fine and medium, few coarse roots; many very fine tubular pores; 20 percent pebbles, 10 percent cobbles; slightly acid (pH 6.4); gradual wavy boundary.

Bw3-16 to 30 inches; light gray (5Y 7/2) cobbly clay loam, olive (5Y 5/3) moist; moderate fine and medium sub-angular blocky structure; common fine, medium, and coarse roots; many very fine tubular pores; 10 percent pebbles, 20 percent cobbles; medium acid (pH 6.0); gradual wavy boundary.

BC-30 to 40 inches; pale yellow (5Y 8/3) gravelly loam, olive (5Y 5/4) moist; weak fine and coarse subangular blocky structure; soft, firm, slightly sticky and slightly plastic; few fine and medium roots; common very fine tubular pores; 20 percent pebbles, 10 percent cobbles; medium acid (pH 5.8) clear wavy boundary.

C-40 to 55 inches; white (5Y 8/1) gravelly silt loam, pale olive (5Y 6/3) moist; massive; soft, very friable, nonsticky and slightly plastic; common very fine tubular pores; 30 percent pebbles; medium acid (pH 5.8).

Range in Characteristics: Depth to micaceous schist ranges from 40 to more than 60 inches. The mean annual soil temperature is estimated to be less than 46°F. The mean summer soil temperature is estimated to be 48 to 40°F. and the difference between the mean summer and mean winter soil temperatures is estimated to be more than 9°F. The soil between the depths of about 4 and 12 inches is usually dry in all parts from mid-June to mid-October and moist throughout between November and April. The base saturation, by Hach kit, is about 40 percent at a depth of about 27 inches. All horizons contain visible flecks of mica and exhibit the greasy feel characteristic of that mineral. The rock fragment content of the 10 to 40 inch control section is 10 to 35 percent.

The A horizon has dry color of 10YR 6/3, 7/2, or 2.5YR 6/2; and moist color of 10YR 4/3, 3/3, or 2.5Y 3/2. It is loam or silt loam with 20 to 27 percent clay and with 0 to 30 percent gravel. It is neutral to medium acid.

The Bw horizon is 2.5Y 7/2, 7/4, 5Y 5/3, 6/3, 7/2, 7/3, 7/4, 7/6, or 8/3; and moist color of 2/5Y 4/2, 5/4, 5Y 4/2, 4/3, 5/3, 5/6, or 6/4. It is loam, silt loam, clay loam, or silty clay loam with 20 to 32 percent clay, not increasing by as much as 1.2 times over the horizon above. It has 10 to 35 percent gravel and 0 to 20 percent cobbles. It is slightly or medium acid.

The C horizon has dry color of 2.5Y 6/3, 6/2, 6/4, 5Y 8/1, or 8/6; and moist color of 2.5Y 4/2, 4/4, 6/4, 5Y 6/3, or 6/6. It is silt loam or silty clay loam with 0 to 35 percent gravel and 0 to 10 percent cobbles.

RAISIO FAMILY, MODERATELY DEEP*

These soils are moderately deep phase members of the loamy-skeletal, mixed, non-acid, mesic family of Typic Xerorthents. They have developed in material weathered from metaigneous or diorite rock. They are on mountain sideslopes at elevations of 600 to 4,800 feet. Slopes range from 45 to 75 percent. These soils are somewhat excessively drained. Mean annual precipitation is about 80 inches. Mean annual temperature is about 50°F.

Typical Pedon: Located in Trinity County, California, at the headwaters of Quinby Creek, on Forest Service road 7N04 about 1 mile southeast of the junction with Forest road 7N02, on a west facing slope of 45 percent under Douglas-fir, madrone, and tanoak at 300 feet elevation; in the NW 1/4 of section 5., T. 6 N., R. 6 E., H.B.M.

0-.5 to 0 inch; fresh and decomposing leaf and needle litter.

A-0 to 11 inches; brown (10YR 5/3) gravelly sandy loam, dark brown (10YR 4/3) moist; moderate very fine and fine granular structure; soft, very friable, non-sticky and non-plastic; common very fine roots; 35 percent pebbles; medium acid (pH 5.7); abrupt wavy boundary.

C1-11 to 29 inches; yellowish brown (10YR 5/4) very gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; loose, loose, non-sticky and non-plastic; common fine and medium roots; 60 percent pebbles; strongly acid (pH 5.5); clear wavy boundary.

C2-29 to 40 inches; brownish yellow (10YR 6/6) extremely gravelly loamy sand, dark yellowish brown (10YR 4/4) moist; single grained; loose, loose, non-sticky and non-plastic; common fine, medium and coarse roots; 85 percent pebbles; strongly acid (pH 5.5).

R-40 inches; weathered meta-diorite.

Range in Characteristics: The depth to dioritic bedrock ranges from 20 to 40 inches. Mean annual soil temperature is estimated to be 50 to 59°F. The soil between the depths of 8 and 24 inches is usually dry in all parts from mid-June to mid-October, and moist throughout between November and April. The base saturation is estimated to be 60 to 70 percent between the depths of 25 and 75 cm. Surface rock fragments range from 20 to 80 percent. The 10 to 40 inch control section has 5 to 15 percent clay content, and 50 to 75 percent sand.

The A horizon is 10YR 4/2, 5/2, or 5/3. Moist colors are 5YR 3/4, 10YR 4/3, or 4/4. It is loam or sandy loam, with 35 to 60 percent gravel.

The C horizon is 10YR 5/3, 5/4, or 6/6. Moist colors are 10YR 4/3, 4/4, 4/6, or 5/6. It is loam, sandy loam, or loamy sand, with 50 to 85 percent gravel. It is strongly or medium acid.

*This soil is a taxadjunct. The color value moist is 1 value too light to be mollic. The official Raisio series is classified Entic Ultic Haploxerolls, loamy-skeletal, mixed, mesic.

RIVERWASH

Riverwash is sand, gravel, cobble and boulder deposits between low and high water levels on major rivers. It also consists of similar deposits, somewhat systematically

piled, by the action of gold dredges. It supports little or no vegetation and is subject to frequent flooding. It is on 2 to 10 percent slopes at 500 to 4,000 ft. elevation.

ROCK OUTCROP

Rock outcrop consists of contiguous bare bedrock with less than 15 percent inclusions of soil capable of supporting plants.

The following kinds of bedrock were named as mapping unit components:

Rock outcrop, dioritic. This consists of granitic rocks including quartz diorite, diorite, and quartz monzonite.

Rock outcrop, metaigneous. This consists of igneous

rocks which have undergone metamorphism and include: metatuff, metabreccia, and greenstone.

Rock outcrop, metasedimentary. This consists of sedimentary rocks which have undergone metamorphism and include: phyllite, metachert, semischist, schist and gneiss.

Rock outcrop, ultramafic. This includes rocks dominated by pyroxene and olivine minerals and include serpentized peridotite and serpentinite.

ROGUE FAMILY, DEEP

These soils are deep phase members of the coarse-loamy, mixed, frigid family of Dystric Xerochrepts. They have developed in material weathered from dioritic rock. They are on mountain ridges and sideslopes at elevations of 4,500 to 6,000 feet. Slopes range from 30 to 70 percent. These soils are somewhat excessively drained. Mean annual precipitation varies from 60 to 80 inches. Mean annual temperature is about 48°F.

Typical Pedon: Located in Humboldt County, California, on Friday Ridge Road (Forest Service road 6N08) about .2 mile east of the Friday Camp turnoff, on a northwest facing slope of 40 percent under white fir, chinquapin, *Ceanothus* sp., Sadler oak, with some Douglas-fir and tanoak at 4,350 feet elevation; in the NE 1/4 of the SE 1/4 of section 11, T. 5 N., R. 4 E., H.B.M.

0-1 inch to 0; fresh and decomposing leaf and needle litter.

A-0 to 7 inches; dark grayish brown (10YR 4/2) gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, non-sticky and non-plastic; common very fine, few fine roots; 10 percent pebbles, 5 percent cobbles; slightly acid (pH 6.2) gradual smooth boundary.

BA-7 to 20 inches; pale brown (10YR 6/3) sandy loam, dark brown (10YR 4/3) moist; weak fine granular structure; soft, very friable, non-sticky and non-plastic; common very fine, and fine roots; slightly acid (pH 6.2); 10 percent pebbles; clear smooth boundary.

Bw-20 to 41 inches; Pale yellow (2.5Y 7/4) gravelly sandy loam, brown (10YR 4/3) moist; weak fine

subangular blocky structure breaking to weak fine granular structure; soft, very fine, common fine and medium roots; 20 percent pebbles, 8 percent cobbles; medium acid (pH 6.0); clear smooth boundary.

C-41 to 57 inches; pale yellow (2.5Y 7/4) loamy sand, yellowish brown (10YR 5/4) moist; weak fine granular structure; soft, very friable, non-sticky and non-plastic; common fine, medium, few coarse roots; 5 percent cobbles; medium acid (pH 5.8); clear wavy boundary.

Cr-57 to 61 inches; highly weathered quartz diorite.

Range in Characteristics: The depth to diorite ranges from 40 to more than 60 inches. The mean annual soil temperature is estimated to be 45°F, mean summer soil temperature is estimated to be 48°F, and the difference between mean summer and mean winter soil temperature is estimated to be more than 5°C. The soil between the depths of 8 and 24 inches is usually dry in all parts from mid-July to mid-October, and moist throughout between November and April. The base saturation in the upper 30 inches ranges from 25 to 35 percent.

The A horizon is 10YR 4/2, 4/3, or 5/3. Moist colors are 10YR 3/2, 4/3, or 4/4. It is loam or sandy loam with 10 to 30 percent gravel. It is slightly to strongly acid.

The Bw horizon is 10YR 6/3, 6/4, 2.5Y 7/4, 7/5, or 7/6. Moist colors are 10YR 4/3, 5/4, or 5/6. It is medium or strongly acid. Depth to loamy sand is greater than 40 inches.

Some pedons lack a C horizon.

RUBBLE LAND

Rubble land consists of areas of detached rock fragments (colluvium) which have accumulated on very steep

mountain sides. These areas support little or no vegetation and are subject to frequent movement.

SKALAN FAMILY, DEEP

These soils are deep phase members of the loamy-skeletal, mixed, mesic family of Ultic Haploxeralfs. They have developed in place from metasedimentary or metaigneous rock. They are on mountain ridges and sideslopes at elevation of 600 to 4,800 feet. Slopes range from 5 to 70 percent. These soils are well to somewhat excessively well drained. Mean annual precipitation varies from 50 to 90 inches. Mean annual temperature is about 50°F.

Typical Pedon: Located in Humboldt County, California, on Forest Service road 6N06, about 1/2 mile south of the Oak Knob turnoff, on a southeast facing slope of 23 percent under Douglas-fir, tanoak and madrone at 3,000 feet elevation; in the SE 1/4 of the SW 1/4 of section 10, T. 5 N., R. 5 E., H.B.M.

0-1/2 inch to 0; fresh and decomposing leaf and needle litter.

A-0 to 3 inches; very dark gray (10YR 3/1) very gravelly loam, black (10YR 2/1) moist; weak fine granular structure; soft, friable, non-sticky and non-plastic; common very fine, fine, and medium roots; 55 percent pebbles; strongly acid (pH 5.2); clear smooth boundary.

A2-3 to 12 inches; pale brown (10YR 6/3) very gravelly loam, dark yellowish brown (10YR 4/4) moist; moderate fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine, and fine, few medium roots; 45 percent pebbles, 5 percent cobbles; strongly acid (pH 5.4); clear smooth boundary.

Bt1-12 to 26 inches; very pale brown (10YR 7/4) very gravelly clay loam, dark brown (7.5YR 4/4) moist; moderate fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few very fine, fine, medium, and coarse roots; few thin clay films on ped faces; 45 percent pebbles, 10 percent cobbles; strongly acid (pH 5.4); clear smooth boundary.

Bt2-26 to 45 inches; strong brown (7.5YR 4/6) very

gravelly clay loam, yellowish brown (10YR 5/6) moist; moderate fine subangular blocky structure; slightly hard, friable, sticky and slightly plastic; few medium and coarse roots; common moderately thick clay films on ped faces and line pores; 45 percent pebbles, 5 percent cobbles; strongly acid (pH 5.5); gradual smooth boundary.

Bt3-45 to 56 inches; dark reddish brown (5YR 3/4) gravelly clay loam, yellowish red (10YR 5/6) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; few medium and coarse roots; common moderately thick clay films on ped faces and line pores; 15 percent pebbles, 5 percent cobbles; medium acid (pH 5.7); Abrupt boundary.

R-56 inches; fractured metasedimentary rock.

Range in Characteristics: The depth to metaigneous or metasedimentary rock ranges from 40 to more than 60 inches. The mean annual soil temperature is estimated to be 50 to 59°F. The soil between the depths of 8 and 24 inches is usually dry in all parts from mid-June through mid-October, and moist throughout from November through April. The base saturation is 40 to 70 percent in the upper 75 cm of the argillic horizon. Surface rock fragments range from 0 to 10 percent.

The A horizon is 10YR 3/1, 3/2, 4/3, 5/2, or 6/3. Moist colors are 10YR 2/1, 2/2, 3/1, 3/3, 4/3, or 4/4. Where colors are dark the horizon is too thin to be mollic or umbric. It has 15 to 55 percent gravel. It is slightly to strongly acid.

The B horizon is 5YR 3/4, 5/6, 6/4, 6/6, 7.5YR 4/4, 4/6, 6/4, 7/4, 10YR 5/4, 5/6, 6/3, 6/4, or 6/6. Moist colors are 5YR 4/6, 5/6, 5/8, 7.5YR 3/4, 4/4, 4/8, 5/6, 5/8, 10YR 3/2, 4/3, 4/4, 4/6, 5/4, or 5/6. It is loam or clay loam, increasing by at least 3 percent clay over the horizon above. It has 35 to 75 percent gravel, and 0 to 15 percent cobbles.

Some pedons have a C horizon.

SKALAN FAMILY, MODERATELY DEEP

These soils are moderately deep phase members of the loamy-skeletal, mixed, mesic family of Ultic Haploxeralfs. They have developed in material weathered from metasedimentary rock. They are on mountain sideslopes at elevations of 600 to 4,800 feet. Slopes range from 25 to 70 percent. These soils are well drained. Mean annual precipitation is about 70 inches. Mean annual temperature is about 50°F.

Typical Pedon: Located in Trinity County, California, near Hawkins Creek on Forest Service road 7N04, about 2 miles northwest of the junction with county road 402, on a south facing slope of 30 percent under Douglas-fir, tanoak, and madrone at 2,800 feet elevation; in the NE 1/4 of section 17, T. 6 N., R. 6 E., H.B.M.

0-.5 inch to 0; fresh and decomposing needle litter.

A-0 to 9 inches; light reddish brown (5YR 6/3) gravelly loam, yellowish red (5YR 4/6) moist; weak very fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine and fine roots; 20 percent pebbles; strongly acid (pH 5.5); clear wavy boundary.

Bt1-9 to 19 inches; light reddish brown (5YR 6/4) very gravelly clay loam, yellowish red (5YR 5/6) moist; moderate very fine and fine subangular blocky structure; slightly hard, friable, sticky and plastic; few very fine and coarse roots; common thin clay films on ped faces; 45 percent pebbles; strongly acid (pH 5.5); clear wavy boundary.

Bt2-19 to 25 inches; yellowish red (5YR 5/6) very gravelly clay loam, red (2.5YR 4/6) moist; moderate very fine and fine subangular blocky structure; hard,

firm, sticky and plastic; few very fine roots; continuous thin clay films on ped faces; 55 percent pebbles; medium acid (pH 5.7); clear wavy boundary.

Bt3-25 to 34 inches; reddish brown (2.5YR 5/4) clay loam, red (2.5YR 4/8) moist; moderate fine and medium subangular blocky structure; hard, firm, sticky and plastic; few very fine and medium roots; continuous moderately thick clay films on ped faces and line pores; 10 percent pebbles; medium acid (pH 5.6); abrupt wavy boundary.

R-34 inches; fractured phyllite with some soil in cracks; fractures 3-4 cm apart.

Range in Characteristics: The depth to metasedimentary rock ranges from 20 to 40 inches. The mean annual soil temperature is estimated to be 50 to 59°F. The soil between the depths of 8 and 24 inches is usually dry in all parts from mid-June through mid-October, and moist throughout between November and April. The base saturation is 40 to 60 percent in the upper 75 cm of the argillic horizon.

The A horizon is 5YR 6/3, 6/4, 7.5YR 5/4, 5/5, 6/4, or 6/5. Moist colors are 5YR 3/4, 4/4, 4/6, 7.5YR 4/3, or 4/4. It has 15 to 35 percent gravel. It is medium or strongly acid.

The Bt horizon is 2.5YR 5/4, 5/6, 5YR 5/4, 4/6, 6/6, 7.5YR 5/4, or 5.6. Moist colors are 2.5YR 4/6, 4/3, 5YR 5/4, 5/6, 7.5YR 5/4, 5/6, or 5/8. It increases in clay content by at least 1.2 times that of the above horizon and has 10 to 65 percent gravel. Clay content of the particle size control section is 27 to 35 percent.

SKINNER FAMILY, DEEP

These soils are deep phase members of the fine-loamy, mixed, mesic family of Typic Dystrochrepts. They have developed in material weathered from metasedimentary rock. They are on mountain sideslopes at elevations of 500 to about 3,500 feet. Slopes range from 25 to 50 percent. These soils are well to moderately well drained. Mean annual precipitation is about 105 inches. Mean annual temperature is about 50°F.

Typical Pedon: Located in Del Norte County, California, near the western Forest boundary on Forest Service road 13N15, about .3 mile from the junction with the Rocky Saddle-Klamath Glen Road, on a northwest facing slope of 40 percent under Douglas-fir, redwood, chinquapin, madrone, tanoak, salal, rhododendron, and evergreen huckleberry at 2,900 feet elevation; in the SW 1/4 of the NW 1/4 of section 11, T. 13 N., R. 2 E., H.B.M.

0-1/2 inch to 0; fresh and decomposing leaf and needle litter.

A-0 to 6 inches; very pale brown (10YR 7/4) gravelly loam, light yellowish brown (10YR 6/4) moist; moderate very fine to fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common coarse roots; 20 percent pebbles; strongly acid (pH 5.5); clear smooth boundary.

BA-6 to 22 inches; very pale brown (10YR 8/4) clay loam yellowish brown (10YR 5/4) moist; strong very fine to fine subangular blocky structure; slightly sticky and slightly plastic; few very fine, common fine and medium, few coarse roots; strongly acid (pH 5.5); gradual wavy boundary.

Bw-22 to 32 inches; pale yellow (2.5Y 7/4) gravelly

sandy clay loam, light olive brown (2.5Y 5/4) moist; weak very fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; few very fine, fine, medium and coarse roots; 15 percent pebbles; medium acid (pH 5.6); gradual wavy boundary.

C-32 to 56 inches; pale yellow (2.5Y 8/4) gravelly sandy loam, light yellowish brown (2.5Y 6/4) moist; weak very fine subangular blocky structure; few fine and medium roots; 20 percent pebbles; medium acid (pH 5.6); clean wavy boundary.

R-56 inches; fractured phyllite; fractures 2-4 cm apart.

Range in Characteristics: The depth to metasedimentary rock ranges from 40 to more than 60 inches. The mean annual soil temperature is estimated to be 50°F. The soil between the depths of 4 and 12 inches is usually moist throughout from mid-October through August. The base saturation is about 10 percent between the depths of 10 and 30 inches.

The A horizon is 10YR 5/3, 6/4, or 7/4. Moist colors are 10YR 4/3, 4/4, or 6/4. It is loam or silt loam with 18 to 27 percent clay and 0 to 20 percent gravel. It is medium or strongly acid.

The Bw horizon is 2.5Y 7/4 7/2, 10YR 6/4, 7/4, or 8/4. Moist colors are 2.5Y 5/4, 6/6, 10YR 5/4, 5/6, or 5/7. It is silt loam, clay loam, or silty clay loam with 20 to 30 percent clay, not increasing in clay content by as much as 1.2 times that of the horizon above. It has 0 to 30 percent gravel.

Some pedons lack a C horizon.

SKYMOR FAMILY

These soils are members of the loamy-skeletal, mixed, frigid family of Dystric Lithic Xerochrepts. They have developed in material weathered from metasedimentary or metaigneous rock. They are on mountain sideslopes and ridges at elevations of 4,500 to 5,500 feet. Slopes range from 35 to 70 percent. These soils are well drained. Mean annual precipitation is about 80 inches. Mean annual temperature is about 48°F.

Typical Pedon: Located in Humboldt County, California, near Board Camp Butte on the road that goes to the old lookout, about 1/4 mile west of the look out site on a south facing slope of 35 percent under scrub oak and annual grasses, with a few white fir and incense-cedar at 5,200 feet elevation; in the SE 1/4 of the NE 1/4 of section 23, T. 18 N., R. 5 E., H.B.M.

A-0 to 10 inches; grayish brown (10YR 5/2) gravelly loam, dark grayish brown (10YR 4/2) moist; moderate fine subangular blocky structure; soft, friable, slightly sticky and slightly plastic; common very fine, fine, and medium, few coarse roots; 15 percent pebbles; slightly acid (pH 6.2); gradual smooth boundary.

Bw-10 to 16 inches; light brownish gray (10YR 6/2) very gravelly loam, very grayish brown (10YR 4/2) moist; moderate fine subangular blocky structure; soft, friable, slightly sticky and slightly plastic; few very fine, common fine, few medium and coarse roots;

40 percent pebbles, 10 percent cobbles and stones; slightly acid (pH 6.2); abrupt wavy boundary.

R-16 inches; fractured graywacke; fractures about 4-7 cm apart.

Range in Characteristics: The depth to metasedimentary or metaigneous rock ranges from 10 to 20 inches. The mean annual soil temperature is estimated to be 45°F, mean summer soil temperature is estimated to be 48°F, and the difference between the mean summer and mean winter soil temperatures is more than 5°C. The soil between the depths of 8 and 24 inches is usually dry in all parts from mid-June through mid-October, and moist throughout between November and April. The base saturation below 10 inches is estimated to be about 40 to 50 percent.

The A horizon is 10YR 4/2, 5/2, 5/3, 2.5Y 3/4, or 4/4. Moist colors are 10YR 3/2, 4/2, 4/3, 2.5Y 2/2, 3/3, or 4/3. Where colors are dark the horizon is too thin to be mollic or umbric. It has 10 to 40 percent gravel. It is slightly or medium acid.

The Bw horizon is 10YR 5/2, 6/2, 6/3, 2.5Y 6/2, or 6/4. Moist colors are 10YR 4/2, 4/3, 4/4, 2.5Y 5/3, 5/4, or 6/4. It has 35 to 50 percent gravel and 0 to 10 percent cobbles and stones.

SKYMOR FAMILY, ULTRAMAFIC

These soils are ultramafic phase members of the loamy-skeletal, mixed, frigid family of Dystric Lithic Xerochrepts. They have developed in material weathered from ultrabasic rock. They are on mountainsides and ridges at elevations of 3,800 to 6,000 feet. Slopes range from 35 to 75 percent. These soils are well to somewhat excessively drained. Mean annual precipitation is about 100 inches. Mean annual temperature is about 47°F.

Typical Pedon: Located in Del Norte County, California, on the road between Sanger Lake and Sanger Peak, approximately 1 mile north of Sanger Lake, about 50 feet below the road on a southwest facing slope of 50 percent under lodgepole pine, manzanita, huckleberry oak and a few Douglas-fir at 5,200 feet elevation; in the SE 1/4 of the NE 1/4 of section 32, T. 18 N., R. 4 E., H.B.M.

0-1 inch to 0; fresh and decomposing leaf litter.

A1-0 to 5 inches; grayish brown (10YR 5/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine, common fine, few medium roots; 35 percent pebbles; medium acid (pH 6.0); clear smooth boundary.

A2-5 to 11 inches; brown (10YR 5/3) very gravelly loam, dark grayish brown (10YR 4/2) moist; weak fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine, common medium, few coarse roots; 40 percent pebbles; medium acid (pH 6.0); clear smooth boundary.

Bw-11 to 19 inches; yellowish brown (10YR 5/4) very gravelly loam, dark grayish brown (10YR 4/2) moist; weak very fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine, fine, and medium, and few coarse roots; 35 percent pebbles; slightly acid (pH 6.1); clear irregular boundary.

R-19 inches; fractured serpentinized peridotite; fractures 4 to 6 inches apart.

Range in Characteristics: The depth to ultrabasic rock ranges from 10 to 20 inches. The mean annual soil temperature is estimated to be about 45°F, the mean summer soil temperature is estimated to be about 48°F, and the difference between the mean summer and mean winter soil temperatures is more than 9°F. The soil between the depths of about 8 and 24 inches is usually dry in all parts from mid-June through mid-October, and moist throughout between November and April. The base saturation below 10 inches is estimated to be about 40 to 50 percent.

The A horizon has dry color of 10YR 5/2, 5/3, 5/4, 2.5Y 4/2, or 5/2; and moist color of 10YR 3/2, 4/2, 4/3, 2.5Y 3/3, 4/3, or 4/4. Where colors are dark the horizon is too thin to be mollic or umbric. It is loam or silt loam with 25 to 60 percent gravel. It is slightly or medium acid.

The Bw horizon has dry color of 10YR 5/2, 5/3, 6/3, 2.5Y 5/2, 5/3, 6/3, 2.5Y 5/2, or 6/2; and moist color of 10YR 4/2, 5/2, 5/3, 6/2, 2.5Y 4/2, 4/3, or 5/2. It has 35 to 70 percent gravel.

SOULAJULE FAMILY, DEEP

These soils are deep phase members of the clayey-skeletal, mixed, mesic family of Ultic Haploxeralfs. They have developed in place from sandstone, shale, or phyllite rock. They are on mountainsides at elevations of 2,000 to 4,800 feet. Slopes range from 5 to 35 percent. Typical vegetation consists mainly of Douglas-fir. The soils are well to moderately well drained. Mean annual precipitation is about 65 inches. Mean annual temperature is about 50°F.

Typical Pedon: Located in Humboldt County, California, on Forest Service road IN15, about 1.5 miles from Van Duzen River Road on a northeast facing slope of 35 percent under Douglas-fir, tanoak and madrone at 3,000 feet elevation; in the SW 1/4 of the SE 1/4 of section 2, T. 1 N., R. 5 E., H.B.M.

0-2 inches to 0; fresh and decomposing leaf and needle litter.

A1-0 to 8 inches; brown (10YR 5/3) gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure; slightly hard, very friable, sticky and plastic; many very fine and coarse roots; 20 percent pebbles; slightly acid (pH 6.4); clear wavy boundary.

A2-8 to 13 inches; brown (10YR 5/3) very gravelly clay loam, very dark grayish brown (10YR 4/2) moist; moderate fine granular structure; slightly hard, very friable, sticky and plastic; many very fine and coarse roots; 40 percent pebbles; slightly acid (pH 6.4); clear wavy boundary.

Bt1-13 to 18 inches; brown (10YR 5/3) extremely gravelly clay loam, dark brown (10YR 4/3) moist; moderate fine subangular blocky structure; hard, very friable, sticky and plastic; common very fine and fine roots; 70 percent pebbles; neutral (pH 6.7); clear wavy boundary.

Bt2-18 to 38 inches; light yellowish brown (10YR 6/4) ex-

tremely gravelly clay loam, yellowish brown (10YR 5/4) moist; moderate fine subangular blocky structure; hard, very friable, sticky and plastic; many very fine and fine roots; common moderately thick clay films on ped faces and line pores; 60 percent pebbles; slightly acid (pH 6.3); clear wavy boundary.

Bt3-38 to 60 inches; light brown (7.5YR 6/4) extremely gravelly clay loam, dark brown (7.5YR 4/4) moist; moderate fine subangular blocky structure; hard, very firm, sticky and plastic; many very fine and fine roots; common moderately thick clay films on ped faces and line pores; 80 percent pebbles; slightly acid (pH 6.4).

Range in Characteristics: Depth to sedimentary or metasedimentary rock ranges from 40 to more than 60 inches. The mean annual soil temperature is estimated to be between about 50 to 59°F. The soil between the depths of about 8 and 24 inches is usually dry in all parts from mid-June to mid-October and moist throughout between November and April. The base saturation, by Hach kit, is 35 to 70 percent in the argillic horizon. Organic carbon content is assumed to be less than 0.7 percent.

The A horizon has dry color of 10YR 4/2, 5/3, 5/4, 6/2, 6/3, 2.5Y 6/2, or 6/4; and moist color of 10YR 3/2, or 3/3. It is loam or silt loam, with 10 to 40 percent gravel. It is slightly to strongly acid.

The Bt horizon has dry color of 7.5YR 6/4, 7/1, 7/2, 10YR 5/3, 5/4, 6/3, 6/6, 2.5Y 5/2, 6/2, 6/4, or 7/4; and moist color of 7.5YR 4/2, 4/4, 5/4, 5/6, 10YR 4/3, 4/4, 5/4, 2.5Y 3/2, 4/2, 5/4, 5/5, or 5/6. It is clay loam, silty clay loam, or clay, with 35 to 45 percent clay, and 35 to 70 percent gravel. It is neutral to strongly acid.

Some pedons have a C horizon.

TYPIC XEROFLUVENTS

Typic Xerofluvents soils are deep, well to excessively drained soils formed in mixed alluvial material deposited on river terraces and fans. Elevation ranges from 300 to 4,000 feet and slopes range from 2 to 10 percent. Precipitation is from 60 to 100 inches.

The A horizon is 2 to 18 inches thick. Dry and moist colors vary greatly due to the nature and amount of the depositional material. Textures range from silt loam to extremely gravelly or cobbly loamy sand.

Organic carbon content is assumed to be less than 1 percent.

The C horizon is 24 inches to 20 feet deep. Dry and moist colors vary greatly due to nature and amount of the depositional material. Textures range from silt loam to extremely gravelly or cobbly loamy sand.

Vegetation can be annual grasses, incense cedar, ponderosa pine, Jeffrey pine, and Douglas-fir.

VOORHIES FAMILY, MODERATELY DEEP

These soils are moderately deep phase members of the loamy-skeletal, mixed, mesic family of Typic Haploxeralfs. They have developed in material weathered from sedimentary and metasedimentary rock. They are on mountainsides at elevations of 2,000 to 4,800 feet. Slopes range from 40 to 85 percent. These soils are well drained. Mean annual precipitation is about 60 inches. Mean annual temperature is about 50°F.

Typical Pedon: Located in Trinity County, California, on Browns Canyon Road (Forest Service road 1N10) about .5 mile west of the junction with Van Duzen River Road (County road 511), on a southwest facing slope of 65 percent under annual grasses, white and black oaks, and some Douglas-fir at 2,880 feet elevation; in the SE 1/4 of the SW 1/4 of section 32, T. 1 N., R. 6 E., H.B.M.

A-0 to 4 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 4/3) moist; moderate very fine subangular blocky structure; soft, friable, nonsticky and plastic; few very fine and fine roots; 20 percent pebbles; slightly acid (pH 6.2); diffuse wavy boundary.

Bt1-4 to 12 inches; very pale brown (10YR 7/4) gravelly loam, yellowish brown (10YR 5/4) moist; moderate fine and medium subangular blocky structure; soft, friable, slightly sticky and plastic; common fine and medium roots; few thin clay films line pores; 30 percent pebbles; slightly acid (pH 6.2); diffuse wavy boundary.

Bt2-12 to 26 inches; very pale brown (10YR 7/5) very gravelly clay loam, brown (10YR 5/3) moist; moderate fine to medium subangular blocky structure; slightly hard, friable, slightly sticky and plastic; common fine and medium, few coarse roots; common thin clay films line pores; 40 percent pebbles; slightly acid (pH 6.2); diffuse wavy boundary.

R-26 inches; fractured graywacke.

Range in Characteristics: Depth to sandstone or shale ranges from 20 to 40 inches. The mean annual soil temperature is estimated to be between about 50 to 59°F. The soil between the depths of about 8 and 24 inches is usually dry in all parts from mid-July through mid-October, and moist throughout between November and April. The base saturation is assumed to be about 80 percent in the upper 75 cm of the argillic horizon.

The A horizon has dry color of 2.5YR 6/2, 6/3, 10YR 5/2, 6/2, or 6/3; and moist color of 2.5YR 4/2, 4/3, 10YR 4/2, or 4/3. It is loam or clay loam with 18 to 30 percent clay and 0 to 35 percent gravel. It is slightly or medium acid.

The Bt horizon has dry color of 2.5YR 6/2, 7/2, 10YR 7/4, or 7/5; and moist color of 2.5YR 4/2, 5/2, 10YR 4/2, 4/4, 5/3, or 5/4. It is clay loam with 30 to 40 percent clay and 35 to 60 percent gravel. The particle size control section has 27 to 35 percent clay.

Some pedons have a C horizon.

WALNETT FAMILY, DEEP, STONY

These soils are deep, stony phase members of the loamy-skeletal, oxidic, mesic family of Ultic Haploxeralfs. They have developed in material weathered from peridotite. They are on mountain sideslopes at elevations of 500 to 3,500 feet. Slopes range from 5 to 70 percent. These soils are well drained. Mean annual precipitation is about 105 inches. Mean annual temperature is about 50°F.

Typical Pedon: Located in Del Norte County, California, near Holiday Mine off Holiday Road (County Road 315), about 3.7 miles from the junction with Old Gasquet Toll Road; pit is about 20 feet downslope from the road on a northeast facing slope of 40 percent under knobcone pine, huckleberry oak, California bay laurel, and tanoak at 2,940 feet elevation; in the SE 1/4 of the NW 1/4 of section 19, T. 18 N., R. 3 E., H.B.M.

0-1 inch to 0; fresh and decomposing leaf and needle litter.

A-0 to 4 inches; strong brown (7.5YR 5/6) very stony loam, strong brown (7.5YR 4/4) moist; moderate fine subangular blocky structure; slightly hard, friable, nonsticky and slightly plastic; few very fine, fine, and coarse roots; 20 percent pebbles, 15 percent stones; medium acid (pH 5.9); clear smooth boundary.

Bt1-4 to 22 inches; strong brown (7.5YR 5/6) very gravelly clay loam, strong brown (7.5YR 4/4) moist; strong fine subangular blocky structure; hard, friable, sticky and plastic; few very fine, common fine, few coarse roots; 35 percent pebbles, 5 percent cobbles; common moderately thick clay films on ped faces and line pores; slightly acid (pH 6.1); gradual wavy boundary.

Bt2-22 to 42 inches; brownish yellow (10YR 6/6) very gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate very fine subangular blocky structure; hard, friable, sticky and plastic; few fine roots; few moderately thick clay films on ped faces and line pores; 35 percent pebbles, 10 percent cobbles

and stones; slightly acid (pH 6.1); gradual smooth boundary.

C-42 to 60 inches; yellow (10YR 7/6) very gravelly loam, yellowish brown (10YR 5/6) moist; weak very fine subangular blocky structure; slightly hard, friable, slightly sticky, slightly plastic; few fine roots; 50 percent pebbles, 5 percent cobbles and stones; slightly acid (pH 6.2).

Range in Characteristics: Depth to peridotite ranges from 40 to more than 60 inches. The mean annual temperature is estimated to be between about 50 to 59°F. The soil between the depths of about 8 and 24 inches is usually dry in all parts from mid-June to mid-October, and moist throughout between November and April. The base saturation, by Hach kit, is about 40 to 50 percent in the upper 75 cm of the argillic horizon. Surface stones range from 10 to 30 percent. The particle size control section has 27 to 35 percent clay content and 35 to 60 percent rock fragments.

The A horizon has dry color of 7.5YR 4/6, 5/6, 6/6, or 10YR 7/3; and moist color of 7.5YR 4/4, 4/6, 5/6, or 10YR 4/3. It is loam or clay loam with 10 to 40 percent gravel and 10 to 20 percent stones. It is neutral to medium acid.

The Bt horizon has dry color of 7.5YR 5/6, 6/6, 6/8, 7/6, 10YR 6/8, 7/3, or 7/4; and moist color of 7.5YR 4/4, 4/6, 5/6, 5/8, 10YR 4/6, 5/4, or 5/6. It is clay loam or silty clay loam, increasing in clay by at least 1.2 times more than the A horizon. It has 20 to 55 percent gravel and 10 to 30 percent cobbles or stones. It is neutral or slightly acid.

The C horizon has dry color of 7.5YR 5/6, 6/8, or 10YR 7/6; moist color of 7.5YR 5/8, or 10YR 5/6. It has 20 to 50 percent gravel and 5 to 20 percent cobbles or stones.

Additional Data: A grab sample for mineralogy was sent to the Lincoln Laboratory, 1979. Sample No. S79CA015-7.

WAPAL FAMILY, MODERATELY DEEP

These soils are moderately deep phase members of the sandy-skeletal, mixed, frigid family of Typic Xerorthents. They have developed in material weathered from diorite rock. They are on mountainsides and ridges at elevations of 4,500 to 6,000 feet. Slopes range from 35 to 65 percent. These soils are somewhat excessively drained. Mean annual precipitation ranges between about 80 and 100 inches. Mean annual temperature is about 48°F.

Typical Pedon: Located in Humboldt County, California, on Forest Service road 10N02 approximately 4.5 miles from Middle Fork Mill Creek on a southwest facing slope of 35 percent under white fir, with some incense-cedar, *Ceanothus* sp., and thimbleberry at 5,500 feet elevation; in the NW 1/4 of the NW 1/4 of section 21, T. 9 N., R. 6 E., H.B.M.

0-2 to 0 inches; fresh and decomposing needle litter.

A-0 to 5 inches; dark yellowish brown (10YR 4/4) very gravelly coarse sandy loam, dark brown (10YR 3/3) moist; weak very fine and fine granular structure; loose, nonsticky and nonplastic; 35 percent pebbles; strongly acid (pH 5.5); abrupt wavy boundary.

C1-5 to 17 inches; yellowish brown (10YR 5/6) extremely cobbly loamy sand, dark yellowish brown (10YR 4/4) moist; single grain; loose, nonsticky and nonplastic; 50 percent pebbles, 20 percent cobbles; medium acid (pH 5.7); clear wavy boundary.

C2-17 to 35 inches; yellowish brown (10YR 5/6) extremely cobbly loamy sand, dark yellowish brown (10YR 4/4) moist; single grain; loose, nonsticky and nonplastic; 50 percent pebbles, 30 percent cobbles; medium acid (pH 5.7).

R-35 inches; weathered diorite.

Range in Characteristics: The depth to diorite rock ranges from about 20 to 40 inches. The mean annual soil temperature is estimated to be less than 46°F. The mean summer soil temperature is estimated to be between 48 and 40°F and the difference between the mean summer and mean winter soil temperatures is estimated to be more than 9°F. The soil between the depths of about 8 and 24 inches is usually dry in all parts from mid-June to mid-October and moist throughout between November and April. The base saturation is estimated to be 60 to 70 percent between the depths of 25 and 75 cm. Surface rock fragments range from 10 to 50 percent.

The A horizon has dry color of 10YR 3/2, or 4/4; and moist color of 10YR 2/2, 3/4, or 4/4. Where colors are dark, the horizon is too thin to be mollic. It is loam or sandy loam with 20 to 40 percent gravel and 0 to 20 percent cobbles.

The C horizon has dry color of 10YR 4/4, 5/4, or 5/6; and moist color of 7.5YR 4/2, 10YR 4/3, or 4/4. It is loamy sand with 35 to 60 percent gravel and 10 to 40 percent cobbles.

WEITCHEPEC FAMILY, MODERATELY DEEP

These soils are moderately deep phase members of the loamy-skeletal, serpentinitic, mesic family of Typic Xerochrepts. They have developed in material weathered from serpentinized ultrabasic rock. They are on mountainsides at elevations of 400 to 4,500 feet. Slopes range from 30 to 70 percent. These soils are well drained. Mean annual precipitation ranges from about 80 to 100 inches. Mean annual temperature is about 50°F.

Typical Pedon: Located in Del Norte County, California, approximately .75 miles west of Camp-6 Lookout on county road 411, on an east facing slope of 20 percent under huckleberry oak, manzanita, red huckleberry, common juniper, squaw carpet and bear grass, with a few Douglas-fir and Jeffrey pine at 3,650 feet elevation; in the SW 1/4 of the SE 1/4 of section 25, T. 17 N., R. 3 E., H.B.M.

A-0 to 8 inches; pale brown (10YR 6/3) gravelly silt loam, brown (10YR 4/3) moist; weak very fine and fine granular structure; slightly hard, firm, non-sticky and nonplastic; common fine, many medium, and few coarse roots; 25 percent pebbles; medium acid (pH 5.8); gradual wavy boundary.

Bw1-8 to 30 inches; light yellowish brown (10YR 7/4) extremely gravelly sandy loam, yellowish brown (10YR 5/4) moist; moderate very fine subangular blocky structure; slightly hard, firm, nonsticky and nonplastic; common very fine and fine, few medium and coarse roots; 70 percent pebbles; medium acid (pH 5.9); gradual wavy boundary.

Bw2-30 to 35 inches; brownish yellow (10YR 6/6) very

gravelly sandy loam, yellowish brown (10YR 5/4) moist; weak very fine subangular blocky structure; slightly hard, firm, nonsticky and nonplastic; few fine and medium roots; 35 percent pebbles, 10 percent cobbles and stones; medium acid (pH 5.9);

R-35 inches; fractured serpentine; fractures 2 to 4 inches apart.

Range in Characteristics: The depth to serpentinized rock ranges from about 20 to 40 inches. The mean annual soil temperature is estimated to be 50 to 59°F. The soil between the depths of about 8 and 24 inches is usually dry in all parts from mid-June through mid-October and moist throughout from November to April. The base saturation is estimated to be 60 to 70 percent between the depths of 25 and 75 cm.

The A horizon has dry color of 10YR 5/3, 6/3, 6/4, or 7/3; and moist color of 10YR 4/2, 4/3, 5/2, 5/3, or 6/2. It is loam, silt loam, or clay loam, with 20 to 30 percent clay and 10 to 35 percent gravel. It is neutral to medium acid.

The Bw horizon has dry color of 10YR 5/4, 6/4, 6/6, 7/4, 2.5Y 7/4, or 8/4; and moist color of 10YR 4/4, 5/4, 5/6, 2/5Y 5/4, or 5/6. It is silt loam, clay loam, or silty clay loam, with 20 to 30 percent clay, not increasing in clay content by as much as 1.2 times that of the A horizon. It has 35 to 50 percent gravel and 0 to 10 percent cobbles and stones.

Some pedons have a C horizon.

WOODSEYE FAMILY

These soils are members of the loamy-skeletal, mixed, frigid family of Lithic Xerumbrepts. They have developed in material weathered from metasedimentary rock. They are on mountainsides and broad ridges at elevations of 4,500 to 5,500 feet. Slopes range from 5 to 70 percent. These soils are well to somewhat excessively drained. Mean annual precipitation ranges from about 70 to 105 inches. Mean annual temperature is about 48°F.

Typical Pedon: Located in Trinity County, California, near Grizzly Mountain, on Forest Service road 2517, 1.1 miles east of the junction with Forest Service road 2508; pit is about 10 feet upslope from road on a north facing slope of 55 percent under white and red fir, with some Ribes sp. and snowbrush at 5,200 feet elevation; in the NE 1/4 of the NE 1/4 of section 34, T. 2 S., R. 6 E., H.B.M.

0-1 inch to 1; fresh and decomposing needle litter.

A-0 to 8 inches; yellowish brown (10YR 5/4) gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate very fine and fine granular structure; soft, very friable, nonsticky and nonplastic; few very fine, fine, and medium roots; 20 percent pebbles; slightly acid (pH 6.2); clear smooth boundary.

Bw-8 to 14 inches; yellowish brown (10YR 5/6) extremely

gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate very fine and fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine and fine, and few medium roots; 60 percent pebbles; medium acid (pH 6.0).

R-14 inches; fractured metasedimentary rock; fractures are 4 to 6 inches apart.

Range in Characteristics: The depth to metasedimentary rock ranges from 12 to 20 inches. The mean annual soil temperature is estimated to be 45°F, the mean summer soil temperature is estimated to be 48°F, and the difference between the mean summer and mean winter soil temperatures is more than 9°F. The soil between the depths of 8 and 20 inches is usually dry in all parts from mid-June through mid-October, and moist throughout between November and April. The base saturation in the epipedon ranges from 30 to 40 percent.

The A horizon has dry color of 10YR 3/3, 4/3, 4/4, or 5/4; and moist color of 10YR 2/1, 3/1, 3/2, or 3/3. It has 5 to 35 percent gravel. It is slightly or medium acid.

The Bw horizon has dry color of 10YR 4/3, 4/4, 5/4, 5/6, 6/4, 2.5Y 5/4, or 6/4; and moist color of 10YR 3/2, 3/3, 4/2, 4/3, 4/4, 2.5Y 4/2, or 4/4. It has 35 to 60 percent gravel. It is medium or strongly acid.

XEROCHREPTS

Xerochrepts soils consist of shallow to deep well drained soils formed in residual and colluvial material weathered from metasedimentary and metaigneous rocks. They are on mountainsides and colluvial mountainsides at elevations of 2,500 to 4,000 feet. Slopes range from 30 to 70 percent. Annual precipitation is 70 to 100 inches. The mean annual soil temperature is 50 to 59 degrees F. The soils are usually dry from late June to mid-September, and moist the rest of the year.

The shallow soils are 20 inches or less to a paralithic contact. They are usually on the steeper slopes of 50 to 70 percent. They have an A horizon that is 3 or 4 inches thick. It is loam or gravelly sandy loam and averages 10 to 35 percent rock fragments. A weak B horizon is about 6 to 13 inches thick. It is gravelly loam, very gravelly loam, or gravelly clay

loam and averages 15 to 55 rock fragments. In some pedons a thin C horizon is present.

The colluvial soils are over 60 inches deep and can be up to 10 feet deep. They are usually on the lesser slopes, 30 to 50 percent. The A horizon is 4 or 5 inches thick. It is gravelly loam, gravelly sandy loam, or very gravelly sandy loam and averages 25 to 65 percent rock fragments. The B horizon is very cobbly sandy loam or very cobbly loam and averages 35 to 80 percent rock fragments. The C horizon or colluvial sediments are very cobbly, extremely cobbly or very stony loamy sand or sandy loam and averages 50 to 90 percent rock fragments.

Vegetation varies from dense Douglas-fir stands to Jeffrey pine-grass cover.

Classification, Genesis, and Morphology

Classification

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 relationships (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.

The soils of the Six Rivers National Forest have been classified at the family level. Soil characteristics important to the use and management of the soil that are not taken into account in the definitions of the families are used as a basis for phases (management oriented subdivisions) of families.

The complete formal family names are long and complicated (e.g., Dystric Lithic Xerochrepts, loamy, mixed, mesic). The names of extensive or representative soil series are used as common names (e.g., Maymen family). The common names are used in this report as a basis for naming soil mapping units and their components.

Table 8 shows how the soils of the Forest have been classified. At the highest level, the soils have been divided into four orders: Alfisols, Entisols, Inceptisols, and Ultisols. The table lists great groups as the next subdivision but the suborders (Xeralfs, Orthents, Ochrepts, Umrepts, Humults, Udults, and Xerults) are indicated by the last two syllables of the great group names. Modifiers (such as Lithic Mollic) are added to the great group names to form subgroup names (such as Lithic Mollic Haploxeralfs). Finally, the families are named by using additional modifiers (e.g., loamy, serpentinitic, mesic) which indicate particle size, mineralogy, and soil temperature regime.

The classification is based on the morphology and other characteristics of the soils resulting from genetic processes, as discussed in the following sections.

Genesis

Soils of the Six Rivers National Forest formed under climatic conditions that promote leaching of salts and

exchangeable bases (calcium, magnesium, potassium, and sodium cations), accumulation of organic matter, movement of clay from surface to subsoil layers, and formation of clay by weathering of minerals in the bedrock and other geologic deposits.

Precipitation is relatively high but in nearly all parts of the Forest there is a distinct summer dry season. Length of the summer season too dry for plant growth tends to be greatest at lower elevations, and on southfacing slopes where high temperatures promote evapotranspiration, but varies greatly according to the moisture storage capacity of the soils.

Temperatures are moderate to cool, depending on elevation. The length of the season of winter temperatures too cool for plant growth increases with elevation.

The climate tends to support coniferous forest vegetation, but vegetation types more resistant to moisture stress are common. Much of the precipitation falls when temperatures are too cool for high levels of plant intake so a high proportion of the moisture is available for leaching and weathering of the soils.

Organic matter accumulates relatively quickly. After a few hundred years, or less, the content of organic matter tends to stabilize, as the losses from decomposition balance the additions from the vegetation. Cool temperatures (at higher elevations), short summer dry season (in the most humid zone), and vigorous forest growth (on the soils with the highest moisture storage capacity) favor high levels of organic matter content, and dark colors of surface horizons. Soils of the Forest have surface horizons with moderate to dark colors, and moderate to very high amounts of organic matter.

Leaching is partially offset by the return of exchangeable calcium, potassium, and magnesium to the soil surface through vegetative nutrient cycling. Nevertheless, the net effect is progressive leaching leading to complete removal of salts and exchangeable bases. Salts, including carbonates, have been leached from even the youngest soils of the Forest. The extent of removal of exchangeable bases varies widely depending largely on the age and nature of the soil materials. Some soils retain moderate levels of exchangeable bases throughout. Some have low levels (higher pH) in the lower part. Other soils have been highly depleted of bases to great depth.

Over long periods of time, water moving downward through the soils of the Forest tends to move clay particles from upper to lower parts of the solum. Clay tends to accumulate in subsoil layers. Favorable conditions and much time are required for a marked effect.

TABLE 8. Families Classified in the Soil Taxonomy.

ORDER	GREAT GROUP	SUBGROUP	FAMILY	SOIL NAME
ALFISOLS	Haploxeralfs	Mollic Haploxeralfs Typic Haploxeralfs Ultic Haploxeralfs	fine, serpentinitic, mesic loamy-skeletal, mixed, mesic loamy-skeletal, mixed, mesic clayey-skeletal, mixed, mesic clayey-skeletal, serpentinitic, mesic fine-loamy, mixed, mesic fine, mixed, mesic loamy-skeletal, micaceous, frigid loamy-skeletal, mixed, mesic loamy-skeletal, oxidic, mesic fine, mixed, mesic	*Madden family Hecker family Voorhies family Soulaajule family Ishi Pishi family Holland family Melbourne family *Albus family Skalan family *Walnett family Cotati family
	Palexeralfs	Ultic Palexeralfs		
ENTISOLS	Xerorthents	Typic Xerorthents	loamy-skeletal, mixed, non-acid, mesic sandy-skeletal, mixed, frigid	**Raisio family Wapal family
INCEPTISOLS	Dystrochrepts	Lithic Dystrochrepts Typic Dystrochrepts	loamy, mixed, mesic fine-loamy, mixed, mesic loamy-skeletal, mixed, mesic	Holyoke family Skinner family Chenango family
	Xerochrepts	Dystric Lithic Xerochrepts	loamy, mixed, mesic loamy-skeletal, mixed, mesic loamy-skeletal, mixed, frigid coarse-loamy, mixed, frigid coarse-loamy, mixed, mesic fine-loamy, micaceous, frigid fine-loamy, mixed, mesic	Maymen family Deadwood family Skymor family Rogue family Chaix family *Race family Hugo family

*Family name based on proposed series.

**This is a taxadjunct. Raisio is classified Entic Ultic Haploxeralfs, loamy-skeletal, mixed, mesic.

TABLE 8. Families Classified in the Soil Taxonomy. (continued)

ORDER	GREAT GROUP	SUBGROUP	FAMILY	SOIL NAME
INCEPTISOLS (continued)	Xerochrepts (continued)	Dystric Xerochrepts (continued)	fine, oxidic, mesic loamy-skeletal, mixed, frigid loamy-skeletal, mixed, mesic	*Jayel family Althouse family Clallam family
		Lithic Xerochrepts Typic Xerochrepts	loamy, serpentinitic, mesic loamy-skeletal, serpentinitic, frigid loamy-skeletal, serpentinitic, mesic	*Oragran family Hungry family Weitchpec family
	Xerumbrepts	Vertic Xerochrepts Lithic Xerumbrepts Pachic Xerumbrepts	fine, montmorillonitic, thermic loamy-skeletal, mixed, frigid coarse-loamy, mixed, frigid	*Oxalis family Woodseye family *Deadman family
		Typic Xerumbrepts	fine-loamy, mixed, mesic fine-loamy, mixed frigid fine-loamy, mixed, mesic loamy-skeletal, mixed, frigid loamy-skeletal, mixed, mesic	Doty family Bins family Hullt family Nanny family Coyata family
ULTISOLS	Haplohumults	Xeric Haplohumults	clayey, Oxidic, mesic fine-loamy, mixed, mesic	Aiken family Horseshoe family
	Hapludults	Typic Hapludults	clayey, kaolinitic, mesic loamy-skeletal, mixed, mesic	Elioak family Hartleton family
	Haploxerults	Typic Haploxerults	clayey, oxidic, mesic fine-loamy, mixed, mesic loamy-skeletal, mixed, mesic	*Gasquet family Goldridge family *Kistirn family

*Family name based on proposed series.

Very long periods of time are required to weather most of the rock materials in the Forest. Ultrabasic rock material seems to yield clay somewhat more readily than the others. Moisture promotes weathering so that south-facing soils, and soils with low moisture capacity in the driest precipitation zones, have the least tendency for clay formation. Clay in many soils has not formed by weathering in the present landscape, but has been inherited from sedimentary or metasedimentary rocks that contained clay formed in ancient environments. These genetic processes require time. Except for the relatively quick accumulation of organic matter, relative stability of the land surface is necessary for significant results from these processes. Geologic erosion has removed materials from many of the soils of the Forest at a rate sufficient to reduce or eliminate the effects of leaching, clay movement, and clay formation. Deposition of fresh sediments on the floor plains of the valley bottoms also counterbalances these processes.

Morphology

In the soil taxonomy, key combinations of soil characteristics have been defined and named as diagnostic horizons. Other key characteristics not comprehended by the diagnostic horizons have been used in the system also.

On the Six Rivers National Forest, two surficial diagnostic horizons have been recognized. The umbric epipedon is a diagnostic horizon at least 10 inches thick, with relatively dark colors and high organic matter content, and relatively low levels of exchangeable bases. The ochric epipedon is a surficial horizon that fails to meet all the requirements for umbric epipedon (and for all the other epipedons not represented on the Forest). Of the suborders (listed in the section on classification), Umbrepts require umbric epipedon; Ochrepts and Orthents require ochric epipedon; Xeralfs, Humults, Udults, and Xerults may have either umbric or ochric epipedon. Pachic Xerumbrepts have particularly thick umbric epipedons. Within the Ultisol order, the Humults have amounts of organic matter considerably higher than the minimum

amount required for Umbrepts in general, or for Pachic Xerumbrepts in particular.

Cambic and argillic horizons are the two diagnostic subsoil horizons that have been recognized in the soils of the Forest. The cambic horizon is a leached, weathered subsoil layer not enriched by the accumulation of clay. The argillic horizon shows evidence of significant accumulation of clay. The soils of the Forest that lack subsoil diagnostic horizons are classified as Entisols. Those with cambic horizon are classified as Inceptisols and those with argillic horizons as either Alfisols or Ultisols. Ultisols have been more strongly and deeply leached of exchangeable bases than Alfisols. Among the Alfisols, Ultic Haploxeralfs have been more strongly leached than Typic Haploxeralfs. Among the Inceptisols, Dystrochrepts and Xerumbrepts have been more strongly leached than Xerochrepts.

The moisture content and temperature of the soils are important soil characteristics. Soils of the Forest that are dry for relatively short periods in the summer are considered to have udic moisture regime. Soils with pronounced summer dryness have xeric moisture regime; cooler soils at higher elevations have frigid temperature regime.

The content of rock fragments, the clay content, and the soil depth are important for their influence on soil moisture storage capacity, water movement, nutrient supply, and other soil functions. Soils with high content of rock fragments (more than 35 percent by volume in the control section) are called skeletal. Sandy and coarse-loamy soils have less than 18 percent clay in the control section. Fine-loamy soils have between 18 and 35 percent clay. Depth to bedrock is greater than 40 inches, from 20 to 40 inches, and less than 20 inches, in deep, moderately deep, and shallow (or lithic) soils, respectively.

The relationship among the soils of the Forest with respect to the morphological features discussed above are shown in Table 9.

TABLE 9. Relationships of Soil Families to Particle Size, Rock Composition, Moisture, Temperature, and Depth.

Rocks Soil Derived From	Moisture Regime	Temperature Regime	Soil Depth	Soil Order	Non-Skeletal			Skeletal			
					<18% clay	18-35% clay	>35% clay	<35% clay	>35% clay		
Acidic to Basic Composition	Udic	Mesic	Deep	Inceptisols Ultisols		Skinner	Elioak	Chenango Hartleton	Soulaajule		
		Xeric	Mesic	Shallow Deep		Inceptisols Inceptisols -umbric -ochric Alfisols -mollic Ultisols		Holyoke Doty Hullt Hugo Holland		Melbourne Cotati	Coyata Clallam
	Xeric		Frigid	Moderately deep		Entisols Inceptisols Alfisols	Chaix	Hugo			Raisio Clallam Voorhies Skalan Deadwood
		Shallow Deep		Inceptisols Inceptisols -umbric -ochric Alfisols		Deadman Rogue	Maymen Bins Race	Nanny Althouse Albus			
	Xeric	Thermic	Moderately deep	Entisols Inceptisols -umbric Inceptisols -ochric -umbric Inceptisols		Deadman		Wapal		Nanny	
			Shallow	Inceptisols -ochric -umbric Inceptisols		Woodseye		Skymor			
	Xeric	Thermic	Deep	Alfisols Inceptisols				Oxalis			
			Xeric	Frigid		Deep	Alfisols Ultisols			Gasquet	Walnett
	Moderately deep	Alfisols Inceptisols Inceptisols Inceptisols					Oragran	Madden Jayel		Weitchpec	
	Xeric	Frigid	Shallow								
Deep							Hungry				

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Glossary

Association, soil. A group of soils geographically associated in a characteristic repeating pattern.

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 40 percent silt.

Cobble. A rock fragment 3 to 10 inches in diameter.

Complex, soil. A mapping unit of two or more kinds of soil occurring in such an intricate pattern that they cannot be shown separately on a soil map at the selected scale of mapping and publication.

Consistence, soil. The feel of the soil and the ease with which a ped can be crushed by the fingers. Terms commonly used to describe consistence are:

Loose.—Noncoherent when dry or moist; does not hold together in a mass.

Friable.—When moist, crushes easily under gentle pressure between thumb and forefinger and can be pressed together into a lump.

Firm.—When moist, crushes under moderate pressure between thumb and forefinger, but resistance is distinctly noticeable.

Plastic.—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a “wire” when rolled between thumb and forefinger.

Sticky.—When wet, adheres to other material, and tends to stretch somewhat and pull apart, rather than to pull free from other material.

Hard.—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

Soft.—When dry, breaks into powder or individual grains under very slight pressure.

Cemented.—Hard and brittle; little affected by moistening.

Depth classes, soil.

Shallow	<20 inches
Moderately deep	20–40 inches
Deep	40 + inches

Drainage class (natural). Refers to the conditions of, frequency, and duration of periods of saturation, or partial saturation that existed during the development of the soil. This is as opposed to altered drainage, which is commonly the result of artificial drainage, or irrigation, but may be caused by the sudden deepening of channels or the blocking of drainage outlets. Seven different classes of natural soil drainage are recognized.

Excessively drained soils are commonly very porous and rapidly permeable and have a low water-holding capacity.

Somewhat excessively drained soils are also very permeable and are free from mottling throughout their profile.

Well drained soils are nearly free from mottling and are commonly of intermediate texture.

Moderately well drained soils commonly have a slowly permeable layer in, or immediately beneath, the solum. They have uniform color in the A and upper B horizons and have mottling in the lower B and C horizons.

Somewhat poorly drained soils are wet for significant periods but not all the time. Some soils commonly have mottling at a depth below 6 to 16 inches.

Poorly drained soils are wet for long periods, are light gray, and generally mottled from the surface downward, although mottling may be absent or nearly so in some soils.

Very poorly drained soils are wet nearly all the time. They have a dark-gray or black surface layer and are gray or light gray, with or without mottling, in the deeper parts of the profile.

Gravel. A rock fragment, 2 mm to 3 inches in diameter.

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 A to the underlying C horizon. The B horizon also has 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 soils this material is presumed to be like that 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.

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.

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.

Profile, soil. A vertical section of the soil through all its horizons and extending into the parent material.

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 higher

Sand. Individual rock or mineral fragments in a soil that range in diameter from 0.05 to 2.0 millimeters. Most sand grains consist of quartz, but they may be of any mineral composition. The textural class name of any soil that contains 85 percent or more sand and not more than 10 percent clay.

Silt. Individual mineral particles in a soil that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). Soil of the silt textural class is 80 percent or more silt and less than 12 percent clay.

Soil. A natural, three-dimensional body on the earth's surface that supports plants and that has properties resulting from the integrated effect of climate and living matter acting on earthy parent material, as conditioned by relief over periods of time.

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.

Stones. Rock fragments greater than 10 inches in diameter if rounded, and greater than 15 inches along the longer axis if flat.

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 an equal mass of unaggregated primary soil particles. The principle forms of soil structure are—*platy* (laminated), *prismatic* (vertical axis of aggregates longer than horizontal), *columnar* (prisms with rounded tops), *blocky* (angular or subangular), and *granular*. Structureless soils are either 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).

Subgrade (engineering). The substratum, consisting of in-place material or fill material, that is prepared for highway construction; does not include stabilized base course or actual paving material.

Subsoil. Technically, the B horizon; roughly, the part of the solum below the A horizon.

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."

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