Classification of the Soils

The system of soil classification used by the National Cooperative Soil Survey has six categories. Beginning with the broadest, these categories are the order, suborder, great group, subgroup, family, and series. Classification is based on soil properties observed in the field or inferred from those observations or from laboratory measurements. In table 1, the soils of the survey area are listed alphabetically and are classified according to the system. The categories are defined in the following paragraphs.

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

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

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

SUBGROUP – Each great group has a typic subgroup. Other subgroups are intergrades or extragrades. The typic is the central concept of the great group; it is not necessarily the most extensive. Intergrades are transitions to other orders, suborders, or great groups. Extragrades have some properties that are not representative of the great group but do not indicate transitions to any other known kind of soil. Each subgroup is identified by one or more adjectives preceding the name of the great group. The adjective "Lithic" identifies the subgroup that has hard parent rock within 50 centimeters of the surface. An example is Lithic Haploxeralfs.

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

SERIES – The series consists of soils that have similar horizons in their profile. The horizons are similar in color, texture, structure, reaction, consistence, mineral and chemical composition, and arrangement in the profile. The texture of the surface layer of the soil can differ within a series.

This survey includes miscellaneous areas. Such areas have little or no soil material and support little or no vegetation. Rock outcrop is an example. Miscellaneous areas are shown on the soil maps.

The map unit legend at the back of this report gives the acreage and proportionate extent of each map unit. Table 2 lists the map units in which each soil occurs as a primary component. The Glossary defines many of the terms used in describing the soils.

TABLE 1. - Classification of the Soils

Soil Name	Family or Higher Taxonomic Soils
Aikman	Fine, montmorillonitic, mesic Typic Chromoxererts
Alicel	Fine-loamy, mixed, mesic Pachic Haploxerolls
Bobbitt	Loamy-skeletal, mixed, mesic Ultic Argixerolls
Boomtown	Fine, mixed, frigid Ultic Haploxeralfs
Brownlee	Fine-loamy, mixed, mesic Ultic Argixerolls
Deadwood	Loamy-skeletal, mixed, mesic Dystric Lithic Xerochrepts
De Masters	Fine-loamy, mixed, frigid Pachic Ultic Argixerolls
Gerle	Coarse-loamy, mixed, frigid Typic Xerumbrepts
Gwin	Loamy-skeletal, mixed, mesic Lithic Argixerolls
Holland	Fine-loamy, mixed, mesic Ultic Haploxeralfs
Inville	Loamy-skeletal, mixed, frigid Ultic Haploxeralfs
Keating	Fine, montmorillonitic, mesic, Typic Argixerolls
Kilmerque	Coarse-loamy, mixed, frigid Ultic Haploxerolls
Klicker	Loamy-skeletal mixed, frigid Ultic Argixerolls
Los Gatos	Fine-loamy, mixed, mesic Typic Argixerolls
Neer	Medial-skeletal, mesic Andic Xerochrepts
Pass Canyon	Loamy, mixed, mesic Lithic Argixerolls
Patio	Loamy-skeletal, mixed, frigid Ultic Haploxerolls
Portola	Medial, frigid Andic Xerochrepts
Rouen	Fine-loamy, mixed, frigid, Typic Xerochrepts
Sadie	Medial, mesic Andic Xerochrepts
Sheld	Medial-skeletal, frigid Andic Xerumbrepts
Skalan	Loamy-skeletal, mixed, mesic Ultic Haploxeralfs
Supan	Fine-loamy, mixed, mesic Pachic Argixerolls

Soil Name	Family or Higher Taxonomic Soils
Trojan	Fine-loamy, mixed, frigid Ultic Argixerolls
Washougal	Medial-skeletal, mesic Andic Xerumbrepts
Wintoner	Fine-loamy, mixed, frigid Ultic Haploxeralfs
Yallani	Medial-skeletal, frigid Andic Xerochrepts
Zynbar	Medial, frigid Entic Dystrandepts
Alfisols	Lithic Haploxeralfs
Entisols	Typic Xerorthents
Inceptisols	Andic Fragiumbrepts Lithic Xerochrepts Lithic Xerumbrepts Xeric Durandepts
Mollisols	Aquolls Durixerolls Lithic Haploxerolls Lithic Ultic Argixerolls

TABLE 2. - Soil Components in Map Units

Taxonomic Unit Family Name	Occurs as Major Component in Mapping Unit(s)
Aikman	1
Alicel	5
Andic Fragiumbrepts	2
Aquolls	3, 4, 50, 55, 69, 80, 121
Bobbitt	5, 6, 9, 10, 11, 12, 13, 14, 15, 95
Bobbitt, moderately deep	7, 8, 20, 58, 76
Boomtown	104
Brownlee	5, 9, 15, 16
Deadwood	75, 96
De Masters	17, 18, 69, 70, 71, 122
Durixerolls	1, 4, 6, 19, 20, 43
Gerle	21, 22
Gwin	7, 8
Holland	9, 10, 11, 23, 24, 25, 97, 98, 100
Holland, diatomaceous	26, 27, 101
Holland, metasedimentary	28, 29
Holland, moderately deep	99
Inville	30, 31, 32, 33, 34, 35, 36, 37, 38, 39, 47, 81, 104, 105
Inville, cobbly	40
Inville, rhyolitic	41, 42
Keating	43
Kilmerque	106
Klicker	17, 30, 31, 44, 45, 46, 49, 50, 82, 83, 107, 109
Klicker, rhyolitic	108
Klicker, sedimentary	21, 22, 44, 47
Klicker, stony	43, 45, 46, 48
Lava Flow	51, 52, 53, 127
Lithic Haploxeralfs	10, 54, 61, 68
Lithic Haploxerolls	18, 52, 55, 56, 57, 77, 110
Lithic Ultic Argixerolls	47
Lithic Xerochrepts	53, 58, 99
Lithic Xerumbrepts	59, 60, 84, 85
Los Gatos	61
Neer	62, 63, 64, 65, 66, 67, 118
Pass Canyon	68, 76
Patio	32, 33, 34, 69, 70, 71, 73, 105, 106, 121
Patio, cobbly	48
Patio, rhyolitic	125
Portola	126, 134
Portola, alluvial	72
Rock Outcrop	12, 56, 57, 59, 70, 73, 74, 77, 91, 92, 100, 102
Rouen	57, 110
Rubble Land	13, 14, 35, 59, 60, 66, 74, 75, 76

Taxonomic Unit Family Name	Occurs as Major Component in Mapping Unit(s)
Sadie,	62, 63, 77, 118
Sadie, alluvial	78
Sheld	79, 81, 86, 87, 89, 90, 91, 92, 128, 129, 134
Sheld, glacial	80, 88, 133
Sheld, moderately deep	35, 60, 81, 82, 83, 84, 85, 86, 87, 89, 90, 91, 92, 130, 131
Sheld, moderately deep, cobbly	93, 127, 132
Sheld, moderately deep, glacial	2, 88
Sheld, stony	93
Skalan	11, 12, 13, 14, 16, 24, 25, 54, 64, 65, 66, 94, 97, 98, 99, 100, 102, 119, 120
Skalan, diatomaceous	101
Skalan, moderately deep, diatomaceous	26, 27, 101
Skalan, moderately deep	28, 29, 95, 96
Supan	103
Trojan	33, 34, 44, 49, 50, 56, 71, 104, 105, 106, 107, 109, 110, 122
Trojan, rhyolitic	108
Typic Xerorthents	111, 112, 113, 114, 115
Washougal	67, 116, 118, 119, 120,
Washougal, alluvial	78
Washougal, glacial	117
Washougal, moderately deep	63, 102
Wintoner	18, 30, 31, 36, 37, 109, 121, 122,
Xeric Durandepts	123, 124
Yallani	38, 39, 112, 113, 123, 126, 128, 129, 130, 131, 134
Yallani, alluvial	72, 133
Yallani, cobbly	40, 127
Yallani, moderately deep, stony	93, 132
Yallani, rhyolitic	41, 42, 125, 135
Zynbar	114, 115

Taxonomic Unit Descriptions

In this section, each soil family or higher category recognized in the survey area is described. The descriptions are arranged in alphabetic order. Characteristics of the soil and the material in which it formed are identified for each family. The pedon, a small three-dimensional area of the soil that is typical of the soil profile in the survey area, is described. The detailed description of each soil horizon follows standards in the Soil Survey Manual.

Many of the technical terms used in the descriptions are defined in Soil Taxonomy. The soil moisture conditions at the time soil colors were described are given. Following the pedon description is the range of important characteristics of the soils in each family. The map units of each soil family are described in the section "Detailed Soil Map Units".

AIKMAN FAMILY

Aikman Family consists of deep moderately well drained soils on lava flows and benches. These soils formed in material weathering from basalt and andesite. Slopes range from 0 to 35 percent. Elevation ranges from 4000 to 5500 feet. The mean annual precipitation is about 16 to 30 inches. The mean annual air temperature is about 63 degrees F.. Typical vegetation consists of annual and perennial grasses, big sage and western juniper.

Taxonomic Class: fine, montmorillonitic, mesic Typic Chromoxererts.

Reference Pedon: Aikman Family; mapped in an area of Aikman Family-Durixerolls association, 0 to 35 percent slopes; located 1/4 mile north of the Pat Burn on the Slate Creek Road on a flat bench in the Hat Creek Ranger District of the Lassen National Forest at an elevation of 5320 feet; 1000 ft. north and 1000 ft. east of SW corner, Section 34 T35N, R9E, MDBM; Hayden Hill Quadrangle.

(Colors are for dry soil unless otherwise stated. When described of 6/1/81 the soil was dry to 4 inches and moist below).

A1–0 to 4 inches; brown (7.5YR 4/2) very cobbly clay, dark brown (7.5YR 3/2) moist; strong fine and medium granular structure; hard, firm, sticky and plastic; common very fine roots; few fine interstitial and few tubular pores; 50 percent cobbles; mildly alkaline (pH 7.4); cracks 2 to 3 inches wide; abrupt smooth boundary.

A2–4 to 12 inches; brown (7.5YR 5/2) clay, dark brown (7.5YR 3/2) moist; moderate fine angular blocky structure; very hard, very firm, very sticky and very plastic; few very fine roots; few fine tubular pores; mildly alkaline (pH 7.4); nearly continuous slickensides; cracks that are 1 to 2 inches wide; gradual smooth boundary.

AC–2 to 35 inches; brown (7.5YR 5/2) clay, dark brown (7.5YR 3/4) moist; strong medium angular blocky structure; very hard, very firm, very sticky and very plastic; few fine tubular pores; mildly alkaline (pH 7.4); nearly continuous slickensides; cracks that are 1/2 to 11/2 inches wide; clear smooth boundary.

C1–35 to 40 inches; strong brown (7.5YR 4/6) silty clay loam, brown (7.5YR 4/4) moist; strong medium angular blocky structure; slightly hard, very firm, very sticky and plastic; common moderately thick clay films on faces of peds; 5 percent cobbles; moderately alkaline (pH 8.0); clear wavy boundary.

C2–40 to 60 inches; strong brown (7.5YR 4/6) silty clay loam, brown (7.5YR 4/4) moist; strong medium angular blocky structure; slightly hard, very firm, very sticky and plastic; few moderately thick clay films on faces of peds; 15 percent cobbles; moderately alkaline (pH 8.0).

Range in Characteristics: Depth to a lithic contact of basalt or andesite ranges from 30 to 60 inches. The soil has cracks which extend from the surface to a depth of 30 inches and are at least 1/2 inch wide at this depth. Cracks open and close once each year. They remain open during a period of July 1 to October 1 and are closed the rest of the year. The A2 and AC horizons have intersecting slickensides and clay contents that range from 40 to 55 percent. Mean annual soil temperature is estimated to be between 47 and 50 degrees F. as determined by interpolation from nearby temperature sites.

The A horizons have dry colors of 7.5YR 4/2 and 5/2 and moist colors of 7.5YR 3/2, 3/3; 10YR 3/2 or 3/4.

The C horizons have dry colors of 7.5YR 4/6; 10YR 5/2 or 6/4 with moist colors of 7.5YR 4/4; 10YR 3/2 or 4/4.

The Aikman Family is of very limited extent in the Lassen National Forest, occuring only along Slate Creek Road.

ALICEL FAMILY

Alicel Family consists of deep well drained soils on basalt flows. These soils formed in material weathering from basalt on slopes ranging from 0 to 35 percent. Elevation ranges from 4000 to 5200 feet. The mean annual precipitation is about 16 to 30 inches. The mean annual air temperature is about 63 degrees F.. Typical vegetation consists of Jeffrey Pine, ponderosa pine, incense cedar, western juniper, mountain mahogany, big sage, and balsam root.

Taxonomic Class: fine-loamy, mixed, mesic Pachic Haploxerolls.

Reference Pedon: Alicel Family; in an area of Bobbitt-Brownlee-Alicel families complex, 0 to 35 percent slopes; located about 20 feet south of USFS Road 22, west of Little Valley on a 3 percent slope in the Hat Creek Ranger District of the Lassen National Forest, at an elevation of 5120 feet; 2000 feet south and 1000 feet west of NE corner, section 29, T35N, R7E, MDBM. Little Valley Quadrangle.

(Colors are for dry soil unless otherwise stated. When described on 6/2/81 the soil was moist throughout).

0–1/2 to 0 inches; pine needle duff.

A1–0 to 4 inches; brown (7.5YR 4/4) loam, dark brown (7.5YR 3/2) moist; moderate very fine and fine granular structure; soft, very friable, nonsticky and nonplastic; 7 percent pebbles; common very fine and fine roots; common very fine and fine interstitial pores; slightly acid (pH 6.5); clear smooth boundary.

A2–4 to 16 inches; brown (7.5YR 4/4) loam, dark brown (7.5YR 3/2) moist; weak fine subangular blocky structure; slightly hard, firm, nonsticky and nonplastic; 5 percent pebbles, 5 percent cobbles; few fine and common medium roots; few very fine and common fine interstitial pores; neutral (pH 6.8); clear wavy boundary.

AB–16 to 23 inches; brown (7.5YR 4/4) gravelly loam, dark brown 7.5YR 3/2) moist; moderate medium subangular blocky structure; slightly hard, firm, slightly sticky and nonplastic; 15 percent pebbles, 5 percent cobbles; few fine, medium and coarse roots; common fine interstitial pores; neutral (pH 7.0); clear wavy boundary.

Bw–23 to 42 inches; brown (7.5YR 5/4) very gravelly loam, dark brown (7.5YR 3/4) moist; moderate medium subangular blocky structure; slightly hard, firm, slightly sticky and nonplastic; 30 percent pebbles, 5 percent cobbles; few fine medium roots; common fine and medium interstitial pores; neutral (pH 7.3); abrupt wavy boundary.

R–42 to 45 inches; somewhat weathered basalt bedrock getting harder with depth.

Range in Characteristics: The depth to a lithic or paralithic contact is more than 40 inches. Mean annual soil temperature is estimated to be between 47 and 55 degrees F.. The soil is dry from July 1 to October 1 in all parts of the moisture control section during most years. Base saturation in the epipedon is estimated to be above 50 percent.

The A horizon has dry colors of 10YR 4/2, 4/3, 4/4, 5/2, 5/3, 5/4; 7.5YR 4/2, 4/4, 5/2 or 5/4. When moist it has colors of 10YR 2/2, 2/3, 3/2, 3/3; 7,5YR 2/2 or 3/2. The A horizon is a slightly acid to neutral loam with typically less than 5 percent rock fragments.

The B horizon has dry colors of 10YR 4/2, 4/3, 4/4, 5/2, 5/3, 5/4; 7.5YR 4/2, 4/4, 5/2 or 5/4. When moist it has colors of 10YR 3/2, 3/3, 4/2, 4/3; 7.5YR 3/2 or 4/2. Moist chroma will be 4 in some cases below 20 inches depth. The B horizon is a slightly acid to mildly alkaline loam with 0 to 35 percent pebbles and 0 to 10 percent cobbles. The combined rock fragments range from 15 to 35 percent.

ANDIC FRAGIUMBREPTS

Andic Fragiumbrepts consists of shallow, well to moderately well drained soils on glacial moraines and outwash. These soils formed in material weathering from volcanic sources on slopes ranging from 0 to 35 percent. Elevation ranges from 5200 to 6500 feet. The mean annual precipitation is about 60 to 80 inches. The mean annual air temperature is about 47 degrees F.. Typical vegetation consists of lodgepole pine, white fir, ponderosa pine, greenleaf manzanita and pinemat manzanita.

Taxonomic Class: Andic Fragiumbrepts.

Reference Pedon: Andic Fragiumbrepts; mapped in an area of Andic Fragiumbrepts -Sheld family, moderately deep, glacial association, 0 to 35 percent slopes; located north of Stump Ranch on a 2 percent slope in the Feather River Vallley in the Almanor Ranger District of Lassen National Forest; at an elevation of 5200 feet; 1300 feet north, 200 feet east of SW corner, section 18, T29N, R6E, MDBM; Mt. Harkness Quadrangle.

(Colors are for dry soil unless otherwise stated. When described on 6/27/81 the soil was dry throughout).

O–1/4 to 0 inches; sparse lodgepole litter and pebbles.

A1–0 to 3 inches; dark grayish brown (10YR 4/2) gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; single grain; loose, nonsticky and nonplastic; 30 percent pebbles, 2 percent cobbles; few very fine and fine roots; many very fine interstitial pores; strongly acid (pH 5.5); clear smooth boundary.

A2–3 to 7 inches; brown (10YR 4/3) gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; moderate fine and medium granular structure; soft, very friable, nonsticky and nonplastic; 15 percent pebbles, 2 percent cobbles; many very fine, common fine and few medium roots; common fine and medium interstitial pores; medium acid (pH 6.0); clear smooth boundary.

Bw1–7 to 14 inches; brown (10YR 5/3) gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; moderate fine and medium subangular blocky structure; slightly hard, firm, nonsticky and nonplastic; 20 percent pebbles, 2 percent cobbles; many very fine, few fine and medium roots; common fine interstitial and few medium tubular pores; slightly acid (pH 6.3); abrupt smooth boundary.

Bw2–14 to 20 inches; yellowish brown (10YR 5/4) very gravelly sandy loam, dark brown (10YR 3/3) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; 15 percent pebbles, 40 percent cobbles; common very fine roots; common fine interstitial pores; slightly acid (pH 6.3); abrupt wavy boundary.

Bx–20 inches; indurated pebbles and cobbles with some fine roots penetrating the top of pan.

Range in Characteristics: Depth to a fragipan is less than 20 inches. Mean annual soil temperature is estimated to be 43 to 47 degrees F.. The soil is dry from July 1 to September 15 in all parts of the moisture control section during most years. The soil is considered to be andic, with low bulk density and a dominance of amorphous materials. Base saturation in the epipedon is estimated to be below 50 percent.

The A horizon has dry colors of 10YR 3/2, 3/3, 4/2 or 4/3. When moist it has colors of 10YR 2/1, 2/2, 3/1 or 3/2. The A horizon is a slightly to strongly acid sandy loam with 0 to 30 percent pebbles and 0 to 30 percent cobbles. The combined percentage of rock fragments range from 15 to 40 percent.

The B horizon has dry colors of 10YR 3/3, 3/4, 4/3, 4/4, 5/3 or 5/4. When moist it has colors of 10YR 2/2, 2/3, 3/2 or 3/3. The B horizon is a sandy loam with 0 to 20 percent pebbles and 0 to 40 percent cobbles and stones. The combined percentage of rock fragments is always greater than 35 percent. It overlies a glacially indurated fragipan.

AQUOLLS

Aquolls consists of deep, somewhat poorly or poorly drained soils in valleys and meadows. These soils formed in material weathering from alluvium or glacial outwash derived from volcanic rocks. Slopes range from 0 to 15 percent. Elevation ranges from 4000 to 8000 feet. The mean annual precipitation is about 20 to 80 inches. The mean annual air temperature is about 47 to 63 degrees F.. Typical vegetation consists of both annual and perennial grasses, sparse lodgepole pine, alder, aspen, willow, and thistle.

Taxonomic Class: Aquolls.

Reference Pedon: Aquolls; mapped in an area of Aquolls, 0 to 15 percent slopes; located in Humbug Valley just south of the main road on a 2 percent slope in the Almanor Ranger District of the Lassen National Forest; at an elevation of 4300 feet; 900 feet south and 1100 feet west, of the NE corner, section 1, T26N, R6E, MDBM; Jonesville quadrangle.

(Colors are for dry soil unless otherwise stated. When described on 10/11/80 the soil was dry to 9 inches and moist below).

O–1/4 to 0 inches; few grasses and thistles.

A1–0 to 4 inches; grayish brown (2.5Y 5/2) silt loam, very dark grayish brown (2.5Y 3/2) moist; moderate medium subangular blocky and moderate medium and coarse granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine, fine and medium roots; many fine and medium tubular pores; medium acid (pH 5.8); clear smooth boundary.

A2–4 to 9 inches; grayish brown (2.5Y 5/2) silt loam, very dark grayish brown (2.5Y 3/2) moist; few fine distinct mottles, light olive brown (2.5Y 5/6) moist; moderate medium prismatic breaking to strong fine subangular blocky structure; hard, very friable, sticky and slightly plastic; common fine and medium roots; common fine and very fine interstitial and tubular pores; medium acid (pH 6.0); gradual smooth boundary.

Bw–9 to 16 inches; grayish brown (2.5Y 5/2) silty clay loam, very dark grayish brown (2.5Y 3/2) moist; common fine distinct mottles, light olive brown (2.5Y 5/6) moist; moderate medium and coarse subangular blocky structure; slightly hard, firm, sticky and slightly plastic; common fine and medium roots; common medium interstitial and tubular pores; slightly acid (pH 6.5); clear smooth boundary.

C1–16 to 27 inches; light brownish gray (2.5Y 6/2) gravelly silty clay loam, dark grayish brown (2.5Y 4/2) moist; common medium prominent mottles, reddish yellow (5YR 6/8) moist; moderate medium and coarse subangular blocky structure; slightly hard, firm, sticky and slightly plastic; few fine roots; common medium interstitial and tubular pores; neutral (pH 6.8); clear smooth boundary.

C2–27 to 60 inches; light brownish gray (2.5Y 6/2) gravelly silty clay loam, dark grayish brown (2.5Y 4/2) moist; common medium prominent mottles, reddish yellow (5YR 6/8) moist; massive; slightly hard, firm, sticky and slightly plastic; common medium tubular and interstitial pores; neutral (pH 7.2).

Range in Characteristics: Depth to a lithic or paralithic contact is greater than 60 inches. Depth to a seasonal water table ranges from 1 to 6 feet. Mean annual soil temperature is estimated to be 45 to 56 degrees F.. Base saturation in the epipedon is estimated to be above 50 percent.

The A horizon has dry colors of 2.5Y 4/2, 5/2; 10YR 4/2, 4/3, 5/2, 5/3; 7.5YR 4/2 or 5/2. When moist it has colors of 2.5Y 3/2; 10YR 2/1, 2/2, 2/3, 3/1, 3/2, 3/3 or 7.5YR 3/2. The A horizon is a slightly to medium acid sandy loam, loam, silt loam or loamy coarse sand. It is typically either gravelly or cobbly.

The B horizon has dry colors of 10YR 5/1, 5/2, 6/1, 6/2; 2.5Y 5/2 or 6/2. When moist it has colors of 10YR 2/1, 2/2, 2/3, 2/4, 3/1, 3/2, 3/3, 3/4, 4/1, 4/2, 4/3, 4/4; 2.5Y 3/2, 4/2 or 4/4. The B horizon is a slightly acid to mildly alkaline fine sandy loam, or silty clay loam and is typically either gravelly or cobbly.

The C horizon has a range in color similar to that cited for the B horizon. It ranges in texture from a loamy sand to a clay loam and typically contains 15 to 50 percent rock fragments.

BOBBITT FAMILY

Bobbitt Family consists of moderately deep or deep, well drained soils on mountainous uplands. These soils formed in material weathering from basalt and andesite. Slope ranges from 0 to 50 percent. Elevation ranges from 3500 to 5200 feet. The mean annual precipitation is about 16 to 45 inches and the mean annual air temperature is about 57 degrees F.. Typical vegetation consists of Jeffrey Pine, ponderosa pine, western juniper, black oak, mountain mahogany, squaw carpet and balsam root.

Taxonomic Class: loamy-skeletal, mixed, mesic Ultic Argixerolls.

Reference Pedon: Bobbitt Family; mapped in an area of Bobbitt Family, stony- Durixerolls association, 0 to 35 percent slopes; located one mile south of Wilson Spring on a northwest slope of 30 percent in the Hat Creek Ranger District of the Lassen National Forest at an elevation of 5000 feet; 1875 feet south, 2750 feet west of the NE corner, section 30, T35N, R7E, MDBM; Little Valley quadrangle.

(Colors are for dry soil unless otherwise stated. When described on 7/12/76 the soil was dry throughout).

0–1 to 0 inches; Dead grasses, needles, twigs. Total surface is covered but not thickly.

A1–0 to 5 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; strong fine subangular blocky structure; soft, very friable, nonsticky and slightly plastic; 5 percent pebbles; common very fine roots; many very fine and fine tubular and interstitial pores; neutral (pH 6.8); clear wavy boundary.

A2–5 to 12 inches; grayish brown (10YR 5/2) very gravelly loam, dark brown (7.5YR 3/2) moist; moderate fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; 40 percent pebbles; many very fine and fine and common medium roots; few fine tubular and many very fine interstitial pores; neutral (pH 6.6); clear smooth boundary.

Bt1–12 to 22 inches; brown (7.5YR 5/4) very gravelly clay loam, dark reddish brown (5YR 3/4) moist; weak fine subangular blocky structure; hard, very friable, sticky and plastic; few thin clay films in pores and on ped faces; 50 percent pebbles, 10 percent cobbles; few coarse and common fine and medium roots; common fine and medium tubular and many very fine interstitial pores; slightly acid (pH 6.5); abrupt wavy boundary.

C–22 to 44 inches; light brown (7.5YR 6/4) very gravelly sandy loam, brown (7.5YR 4/4) moist; massive structure; slightly hard, very friable, slightly sticky and slightly plastic; few moderately thick clay films in pores and colloid stains mineral grains; 50 percent pebbles, 20 percent cobbles; few fine roots; many fine and medium tubular pores; neutral (pH 6.6); abrupt wavy boundary.

CR–44 to 63 inches; white pumice material that can be dug.

Range in Characteristics: Depth to a lithic or paralithic contact ranges from 25 to 60 inches. Mean annual soil temperature is estimated to be between 47 and 55 degrees F.. The soil is dry in all parts of the moisture control section from July 1 to October 1 in most years. Base saturation in the epipedon is estimated to be 50 to 75 percent.

The A horizon has dry colors of 10YR 3/2, 3/3, 3/4, 4/2, 4/3, 4/4, 5/2, 5/3, 5/4; 7.5YR 3/2, 3/4, 4/2, 4/4, 5/2 or 5/4. When moist it has colors of 10YR 2/2, 3/2; 7.5YR 2/2 or 3/2. The A horizon is a neutral to mildly alkaline loam or silty clay loam with 5 to 40 percent pebbles and 0 to 10 percent cobbles. The combined average of rock fragments is 5 to 30 percent.

The B horizon has dry colors of 7.5YR 4/4, 4/6, 5/4, 5/6, 6/4; 10YR 4/3, 4/4, 4/6, 5/3, 5/4 or 5/6. When moist it has colors of 5YR 3/4; 7.5YR 3/4, 4/4; 10YR 3/3, 3/4, 4/3 or 4/4. The B horizon is a slightly acid to mildly alkaline loam, clay loam or silty clay loam. It contains 0 to 60 percent pebbles and 0 to 40 percent cobbles; with a combined percentage that averages more than 35 percent coarse fragments. It contains at least 1.2 times as much clay as the overlying horizon.

The C horizon has dry colors of 7.5YR 4/2, 4/4, 5/4 or 6/4. It has moist colors of 7.5YR 3/4 or 4/4. The C horizon is a slightly acid to neutral sandy loam, loam or clay loam. It contains 0 to 50 percent pebbles and 20 percent cobbles or stones with a combined percentage that averages more than 35 percent rock fragments.

Where the Bobbitt Family occurs on rocky lava ridges it often has 35 to 60 percent of the surface covered with rock fragments consisting primarily of stones and cobbles.

BOOMTOWN FAMILY

Boomtown family consists of moderately deep or deep, moderately well to somewhat poorly drained soils on relatively old volcanic flats, terraces and basins. These soils formed in material weathering from andesite and basalt or alluvium from these sources. Slope ranges from 0 to 35 percent. Elevation ranges from 5200 to 6500 feet. The mean annual precipitation is about 20 to 40 inches. The annual mean air temperature is about 45 to 55 degrees F.. Typical vegetation consists of scattered Jeffrey pine and juniper with big sage, rabbit brush, black sage, silver sage and annual and perennial grasses.

Taxonomic Class: fine, mixed, frigid Ultic Haploxeralfs.

Reference Pedon: Boomtown family; mapped in an area of Trojan-Inville- Boomtown families association, 0 to 35 percent slopes; located just north of Lassen County Road 105 in Coyote Flat on a 2 percent south facing slope, in the Eagle Lake Ranger District of the Lassen National Forest. At an elevation of 5770 feet; 1750 feet north, 1100 feet east of the SW corner, section 16, T33N, R10E, MDBM; Antelope Mtn. quadrangle.

(Colors are for dry soil unless otherwise stated. When described on 8/4/71 the soil was dry throughout).

O–1/4 to 0 inches; Dead grasses, pine needles and twigs.

A1–0 to 3 inches; dark yellowish brown (10YR 3/4) loam, very dark brown (10YR 2/2) moist; moderate medium granular structure; soft, very friable, nonsticky and slightly plastic; many very fine roots; many very fine and fine interstitial and tubular pores; slightly acid (pH 6.2); abrupt smooth boundary.

A2–3 to 7 inches; brown (7.5YR 4/4) loam, dark reddish brown (5YR 3/2) moist; moderate coarse platy structure; slightly hard, very friable, nonsticky and slightly plastic; many very fine and fine and few medium and coarse roots; many very fine interstitial and few very fine tubular pores; slightly acid (pH 6.3); clear smooth boundary.

Bt1–7 to 17 inches; brown (7.5YR 5/4) sandy clay loam, dark reddish brown (5YR 3/4) moist; massive; hard, very friable, nonsticky and slightly plastic; 10 percent cobbles; few very fine and many medium and coarse roots; many very fine and fine tubular and interstitial pores; slightly acid (pH 6.5); abrupt smooth boundary.

Bt2–17 to 30 inches; brown (7.5YR 5/4) clay, brown (7.5YR 4/4) moist; strong coarse prismatic structure; extremely hard, very firm, very sticky and very plastic; many thin clay films on faces of peds and many moderately thick clay films in pores; 5 percent pebbles, 10 percent cobbles; few very fine and fine and common medium roots; very few very fine interstitial and tubular pores; neutral (pH 7.0); gradual wavy boundary.

Cr–30 inches; highly weathered basalt that crumbles easily.

Range in Characteristics: Depth to a lithic or paralithic contact ranges from 25 to 45 inches. The underlying material will be basalt or andesite or alluvium from these sources if the soil is forming in a basin. Mean annual soil temperature is 46 degrees F. as determine from a thermistor located near by in Champs Flat in a similar soil. The soil is dry from August 1 to October 1 in all parts of the moisture control section during most years. The base saturation is less than 75 percent in the control section.

The A horizon has dry colors of 10YR 3/3, 3/4, 4/3, 4/4; 7.5YR 3/4, 4/2 or 4/4. When moist it has colors of 10YR 2/2, 3/2, 3/3, 3/4; 7.5YR 3/2, 3/4; 5YR 3/2, 3/3 or 3/4. It is a slightly acid to medium acid loam or silt loam.

The Bt horizon has dry colors of 7.5YR 4/2, 4/4, 4/6, 5/2, 5/4 or 5/6. When moist it has colors of 7.5YR 3/2, 3/4, 4/2, 4/4; 5YR 3/2, 3/3 or 3/4. It is a a neutral to moderately alkaline clay loam, sandy clay loam or clay. Distinct or prominent mottles may occur in this horizon.

The C horizon, when present, has dry colors of 10YR 6/3, 6/4, 6/6, 7/3, 7/4 or 7/6. When moist it has colors of 10YR 3/3, 3/4, 3/6, 4/3, 4/4 or 4/6. It is a moderately alkaline loam or clay loam.

BROWNLEE FAMILY

Brownlee Family consists of deep, well or moderately well drained soils on flats, mountain sideslopes and fault rims. These soils formed in material weathering from basalt. Slope ranges from 0 to 50 percent. Elevation ranges from 4000 to 5200 feet. The mean annual precipitation is about 16 to 35 inches. The mean annual air temperature is about 57 to 63 degrees F.. Typical vegetation consists of Jeffrey pine, ponderosa pine, incense cedar, white fir, western juniper, black oak, greenleaf manzanita, mountain mahogany and bitterbrush.

Taxonomic Class: fine-loamy, mixed, mesic Ultic Argixerolls.

Reference Pedon: Brownlee Family; mapped in an area of Brownlee-Bobbitt families association, 0 to 35 percent slopes. Located 3/4 mile northeast of Jellico on a 3 percent slope in the Hat Creek Ranger District of the Lassen National Forest. At an elevation of 5000 feet; 1250 feet east, 2000 feet north of the SW corner, section 35, T35N, R6E, MDBM; Jellico quadrangle.

(Colors are for dry soil unless otherwise stated. When described on 5/31/81 the soil was dry to 3 inches and moist below).

O–1/2 to 0 inches; fresh forest litter.

A–0 to 3 inches; brown (7.5YR 4/2) loam, dark brown (7.5YR 3/2) moist; moderate fine granular structure; soft, friable, nonsticky and slightly plastic; 3 percent pebbles; many very fine and fine roots; common fine interstitial pores; neutral (pH 7.2); abrupt smooth boundary.

BAt1–3 to 10 inches; brown (7.5YR 4/2) loam, dark brown (7.5YR 3/2) moist; moderate fine subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; few thin clay films in pores; 5 percent pebbles, 5 percent cobbles; few very fine, common fine and many medium roots; common fine tubular pores; neutral (pH 7.2); gradual smooth boundary.

BAt2–10 to 16 inches; brown (7.5YR 4/4) loam, dark brown (7.5YR 3/2) moist; moderate fine subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; common thin clay films on faces of peds and in pores; 5 percent pebbles, 5 percent cobbles; few fine, common medium and few coarse roots; common fine tubular pores; neutral (pH 7.2); gradual smooth boundary.

Bt1–16 to 22 inches; brown (7.5YR 5/4) clay loam, dark brown (7.5YR 3/4) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; common moderately thick clay films on faces of peds and in pores; 5 percent pebbles, 5 percent cobbles; few fine, common medium and few coarse roots; common fine and medium tubular pores; neutral (pH 7.2); gradual smooth boundary.

Bt2–22 to 33 inches; brown (7.5YR 5/4) gravelly clay loam, dark brown (7.5YR 3/2) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; common moderately thick clay films on faces of peds and in pores; 15 percent pebbles, 15 percent cobbles; few fine, medium and coarse roots; common fine and medium tubular pores; neutral (pH 7.0); gradual wavy boundary.

Bt3–33 to 45 inches; brown (7.5YR 5/4) gravelly clay loam, dark brown (7.5YR 3/4) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; common moderately thick clay films on faces of peds and in pores; 20 percent cobbles; few fine and medium roots; few fine tubular pores; neutral (pH 7.0);

R–45 inches; slightly weathered vesicular basalt.

Range in Characteristics: Depth to a lithic or paralithic contact is greater than 40 inches. Mean annual soil temperature is estimated to be between 50 and 59 degrees F.. The soil is dry from July 1 to October 1 in all parts of the moisture control section during most years. Base saturation in the epipedon is estimated to be between 50 and 75 percent.

The A horizon has dry colors of 7.5YR 4/2, 4/4, 5/2, 5/4; 10YR 4/2, 4/3, 4/4, 5/2, 5/3 or 5/4. When moist it has colors of 7.5YR 3/2; 10YR 3/2 or 3/3. The A horizon is a neutral to mildly alkaline sandy loam, loam or silt loam, with 0 to 15 percent pebbles and 0 to 5 percent cobbles; with a combined average of 5 to 15 percent.

The Bt horizon has dry colors of 7.5YR 4/2, 4/4, 4/6, 5/4 or 5/6. When moist it has colors of 7.5YR 3/2, 3/4, 3/6, 4/4 or 4/6. The Bt horizon is a neutral to mildly alkaline loam, heavy loam or clay loam with 0 to 20 percent pebbles and 0 to 20 percent cobbles and a combined average of 20 to 30 percent. The B horizon contains 1.2 times the clay content of the A horizon.

A C horizon is seldom present, with the B horizon directly overlying the R horizon. The C horizon when present is similar to the B horizon except that it has 50 to 90 percent weathered rock fragments.

DEADWOOD FAMILY

Deadwood Family consists of shallow, well to somewhat excessively drained soils on escarpments, mountain sideslopes and ridges. These soils formed in material weathering from metasedimentary shale and schist. Slope ranges from 10 to 70 percent. Elevation ranges from 4000 to 5200 feet. The mean annual precipitation is about 40 to 50 inches. The mean annual air temperature is about 56 to 63 degrees F.. Typical vegetation consists of douglas fir, ponderosa pine, sugar pine, incense cedar, white fir, greenleaf manzanita, deerbrush and squaw carpet.

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

Reference Pedon: Deadwood Family; mapped in an area of Skalan family, moderately deep-Deadwood family association, 35 to 70 percent slopes. Located at a pit 1 mile west of Butt Valley Reservoir on a southeast slope of 55 percent in the Plumas National Forest, one eight of a mile from the boundary of the Almanor Ranger District of the Lassen National Forest; at an elevation of 5040 feet; 650 feet west, 650 feet north, of the SE corner, section 29, T27N, R7E, MDBM; Almanor quadrangle.

(Colors are for dry soil unless otherwise stated. When described on 6/25/81 the soil was dry throughout).

O–1/2 to 0 inches; erosion pavement with very little litter.

A1–0 to 2 inches; dark grayish brown (2.5Y 4/2) very gravelly fine sandy loam, very dark brown (10YR 2/2) moist; weak very fine granular and single grain structure; soft, friable, nonsticky and nonplastic; 50 percent pebbles, 5 percent cobbles; few very fine and fine roots; common medium interstitial pores; slightly acid (pH 6.3); abrupt smooth boundary.

B1–2 to 10 inches; light brownish gray (2.5Y 6/2) very gravelly loam, olive brown (2.5Y 4/4) moist; moderate very fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; 50 percent pebbles, 10 percent cobbles; few very fine, common fine and medium roots; common fine and medium interstitial pores; medium acid (pH 6.0); clear wavy boundary.

B2–10 to 14 inches; light yellowish brown (2.5Y 6/4) very gravelly loam, olive brown (2.5Y 4/4) moist; weak very fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; 55 percent pebbles, 20 percent cobbles; common fine and medium roots; common fine and medium interstitial pores; medium acid (pH 5.8); abrupt irregular boundary.

R–14 inches; highly fractured shale with soil and roots in cracks. More than 90 percent of the material is greater than 2 mm in size.

Range in Characteristics: Depth to a lithic contact is 12 to 18 inches. Mean annual soil temperature is estimated to be between 47 and 55 degrees F.. The soil is dry from July 15 to October 1 in all parts of the moisture control section during most years. When the surface is dark colored it is too thin to be umbric or mollic. Base saturation is estimated to be below 60 percent in some subhorizon between the depths of 10 and 18 inches.

The A horizon has dry colors of 10YR 4/2, 4/3, 4/4, 5/2, 5/3, 5/4; 2.5Y 4/2, 4/4, 5/2 or 5/4. When moist it has colors of 10YR 2/1, 2/2, 3/1, 3/2, 3/3, 3/4 4/1, 4/2, 4/3 or 4/4. The A horizon is a neutral to slightly acid fine sandy loam, loam or sandy clay loam, with 20 to 60 percent pebbles and up to 5 percent cobbles. Combined rock fragments average over 35 percent.

The B horizon has dry colors of 7.5YR 6/4, 6/6, 7/4, 7/6; 10YR 6/3, 6/4, 6/6, 7/3, 7/4, 7/6; 2.5Y 6/2, 6/4, 6/6, 7/4 or 7/6. When moist it has colors of 7.5YR 4/4, 4/6, 5/4, 5/6, 6/4, 6/6; 10YR 4/3, 4/4, 4/6, 5/3, 5/4, 5/6, 6/3, 6/4, 6/6; 2.5Y 4/4, 5/4, 5/6, 6/4 or 6/6. The B horizon is a medium to strongly acid loam, heavy loam or sandy clay loam, with 35 to 55 percent pebbles and 0 to 20 percent cobbles. The combined average of rock fragments is 40 to 65 percent.

The R horizon consists of highly fractured shale and other marine sediments, with cracks less than 1 inch apart. Many roots penetrate the upper portion.

DE MASTERS FAMILY

De Masters Family consists of deep, well drained soils on lava flows. These soils formed in material weathering from basalt and andesite on slopes ranging from 0 to 35 percent. Elevation ranges from 5000 to 6500 feet. The mean annual precipitation ranges from 20 to 35 inches. The mean annual air temperature is 48 to 57 degrees F.. Typical vegetation consists of ponderosa pine, Jeffrey pine, white fir, red fir, incense cedar, western juniper, mountain mahogany, greenleaf manzanita, pinemat manzanita, curl leaf mahogany, ribes spp., and big sage.

Taxonomic Class: fine-loamy, mixed, frigid Pachic Ultic Argixerolls.

Reference Pedon: De Masters Family; mapped in an area of De Masters-Klicker families association, 0 to 35 percent slopes; located .75 miles SW of Bear Valley reservoir in the Hat Creek District of Lassen National Forest at an elevation of 6100 feet; 500 feet east, 1900 feet north of the SW corner, Section 25, T34N, R7E. MDBM; Little Valley quadrangle.

(Colors are for dry soil unless otherwise stated. When described on 5/29/81 the soil was moist throughout).

0–1 to 0 inches; conifer litter.

A1–0 to 4 inches; dark brown (10YR 3/3) sandy loam, very dark brown (10YR 2/2) moist; moderate fine and medium granular structure; soft, very friable, nonsticky and slightly plastic; common very fine and fine roots; common fine and medium interstitial pores; slightly acid (pH 6.5); clear smooth boundary.

A2–4 to 16 inches; brown (10YR 4/3) loam, dark brown (7.5YR 3/2) moist; moderate medium granular structure; soft, friable, nonsticky and slightly plastic; many very fine, fine and medium roots; common fine and medium interstitial pores; slightly acid (pH 6.5); clear smooth boundary.

BA–16 to 24 inches; brown (7.5YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common very fine, fine and medium roots; common fine interstitial and tubular pores; slightly acid (pH 6.3); clear wavy boundary.

Bt1–24 to 40 inches; brown (7.5YR 4/2) clay loam, dark brown (7.5YR 3/2) moist; moderate medium subangular blocky structure; hard, friable, slightly sticky and plastic; few moderately thick clay films on faces of peds and in pores; few fine, medium and coarse roots; few fine tubular pores; slightly acid (pH 6.3); gradual wavy boundary.

Bt2–40 to 55 inches; brown (7.5YR 5/2) clay loam, dark brown (7.5YR 3/2) moist; moderate coarse subangular blocky structure; slightly hard, friable, slightly sticky and plastic; common moderately thick clay films on faces of peds and in pores; few very fine, fine, and coarse roots; few fine tubular pores; slightly acid (pH 6.3); gradual wavy boundary.

Cr–5 to 60 inches; weathered basalt.

Range in Characteristics: Depth to a paralithic contact ranges from 40 to more than 70 inches. Mean annual soil temperature is estimated to be 44 to 47 degrees F.. The soil is dry from July 15 to October 1 in all parts of the moisture control section during most years. Base saturation is estimated to be between 50 and 75 percent throughout the upper 30 inches of soil.

The A horizon has dry colors of 7.5YR 3/2, 3/4, 4/2, 4/4; 10YR 3/2, 3/3, 3/4, 4/2, 4/3, or 4/4. When moist it has colors of 5YR 2/2, 2/3, 3/2, 3/3; 7.5YR 2/2, 3/2; 10YR 2/2, 3/2, or 3/3. It is a neutral to slightly acid sandy loam or loam, with 0 to 5 percent pebbles and 0 to 15 percent cobbles. It has a combined average of 5 to 20 percent rock fragments.

The B horizon has dry colors of 7.5YR 4/2, 4/4, 4/6, 5/2, 5/4, or 5/6. When moist it has colors of 5YR 3/2, 3/3, 3/4, 4/2, 4/3, 4/4; 7.5YR 3/2, 3/4, 4/2, 4/4; 10YR 3/2, 3/3, 3/4, 4/2, 4/3, or 4/4. The B horizon is a neutral to slightly acid loam, light clay loam or clay loam, with 0 to 10 percent pebbles and 0 to 25 percent cobbles. It has a combined average of 5 to 30 percent coarse fragments.

The Cr horizon consists of weathered basalt.

DURIXEROLLS

Durixerolls consists of shallow, well to somewhat poorly drained soils on alluvial fans, terraces and benches. These soils formed in material weathering from basalt. Slope ranges from 0 to 25 percent. Elevation ranges from 4000 to 6000 feet. The mean annual precipitation is about 15 to 30 inches. The mean annual air temperature is about 55 to 64 degrees F.. Typical vegetation consists of sparse Jeffrey pine and western juniper with big sage and annual and perennial grasses.

Taxonomic Class: Durixerolls.

Reference Pedon: Durixerolls; mapped in an area of Durixerolls, 0 to 15 percent slopes. Located 1/4 mile from Blacks Ridge Lookout Road on a southwest slope of 4 percent in the Hat creek Ranger District of the Lassen National Forest. At an elevation of 5200 feet; 1700 feet south, 1500 feet west, of the NE corner, section 33, T35N, R7E, MDBM; Little Valley quadrangle.

(Colors are for dry soil unless otherwise stated. When described on 5/12/81 the soil was dry to 1 inch, moist from 1 to 11 inches and dry below 11 inches).

O–1/4 to 0 inches; sage and detritus.

A1–0 to 1 inches; brown (10YR 5/3) sandy loam, dark brown (10YR 3/3) moist; moderate fine and medium granular structure; soft, very friable, nonsticky and slightly plastic; common very fine and fine roots; common very fine interstitial pores; neutral (pH 6.8); abrupt smooth boundary.

A2–1 to 7 inches; yellowish brown (10YR 5/4) sandy loam, dark brown (10YR 3/3) moist; weak fine and medium subangular blocky structure; soft, friable, slightly sticky and slightly plastic; 2 percent cobbles; common very fine and fine roots; common fine and medium interstitial pores; neutral (pH 6.8); abrupt smooth boundary.

Bt1–7 to 9 inches; dark yellowish brown (10YR 4/4) sandy clay loam, dark yellowish brown (10YR 3/4) moist; moderate medium subangular blocky structure; slightly hard, firm, slightly sticky and plastic; few thin clay films on faces of peds and in pores; few very fine and fine roots; common fine and medium interstitial pores; neutral (pH 6.8); abrupt smooth boundary.

Bt2–9 to 11 inches; dark yellowish brown (10YR 4/4) clay, dark yellowish brown (10YR 3/4) moist; strong medium prismatic structure; very hard, very firm, sticky and very plastic; common moderately thick clay films on faces of peds and in pores; few fine tubular pores; neutral (pH 7.0); abrupt smooth boundary.

Cqm–11 to 18 inches; indurated silica pan, weak fine platy structure.

R–18 inches; hard basalt.

Range in Characteristics: Depth to a duripan is less than 20 inches. The soil is dry from July 1 to October 15 in all parts of the moisture control section during most years. Base saturation in the epipedon is estimated to be above 50 percent.

The A horizon has dry colors of 10YR 3/2, 3/3, 3/4, 4/2, 4/3, 4/4, 5/2, 5/3, 5/4; 7.5YR 3/2, 3/4, 4/2, 4/4, 5/2 or 5/4. When moist it has colors of 10YR 2/2, 2/3, 3/2, 3/3, or 7.5YR 3/2. The A horizon is a neutral to slightly acid fine sandy loam, loam or clay loam with 0 to 10 percent pebbles and 0 to 50 percent cobbles. It has a combined average of rock fragments of 5 to 55 percent.

The Bt horizon has dry colors of 10YR 3/3, 3/4, 3/6, 4/3, 4/4, 4/6, 5/3, 5/4, 5/6, 6/2, 6/4, 6/6; 7.5YR 3/4, 4/4, 4/6, 5/4, 5/6, 6/4 or 6/6. When moist it has colors of 10YR 3/3, 3/4, 4/3, 4/4, 5/3, 5/4; 7.5YR 3/4, 4/4 or 5/4. The Bt is a neutral to moderately alkaline loam, clay loam, sandy clay loam or clay, with 0 to 10 percent cobbles. When the Bt is a clay it is assumed to be dominated by montmorillonite. The B horizon contains at least 1.2 times as much clay as the overlying horizon. The clay content ranges from 30 to 50 percent.

The Cq horizon consists of an indurated silica pan overlying hard bedrock.

GERLE FAMILY

Gerle Family consists of moderately deep, well drained soils on flats, rolling hills, mountain sideslopes and steep escarpments. These soils formed in material weathering from granite on slopes ranging from 0 to 70 percent. Elevation ranges from 5500 to 7000 feet. The mean annual precipitation is about 20 to 45 inches. The mean annual air temperature is about 47 to 55 degree F.. Typical vegetation consists of white and red fir, Jeffrey pine, ponderosa pine, greenleaf manzanita and snowbrush.

Taxonomic Class: coarse-loamy, mixed, frigid Typic Xerumbrepts.

Reference Pedon: Gerle Family; mapped in an area of Gerle family-Klicker family, sedimentary association, 0 to 35 percent slopes. Located on the Diamond Mtn. forest service Special Service Road near Bear Flat in the Eagle Lake Ranger District of the Lassen National Forest; at an elevation of 6700 feet; 1700 feet north, 2000 feet east of the SW corner, section 10, T28N, R12E, MDBM; Susanville quadrangle.

(Colors are for dry soil unless otherwise stated. When described on 8/5/81 the soil was dry throughout).

O–11/2 to 0 inches; Fir needles, twigs and bark.

A1–0 to 4 inches; dark grayish brown (10YR 4/2) sandy loam, black (10YR 2/1) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; 5 percent pebbles; common very fine and fine roots; many very fine and fine interstitial and tubular pores; neutral (pH 7.0); clear smooth boundary.

A2–4 to 9 inches; brown (10YR 4/3) sandy loam, very dark grayish brown (10YR 3/2) moist; moderate fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; 5 percent pebbles; common very fine and fine roots; many very fine, fine and medium interstitial and tubular pores; slightly acid (pH 6.5); clear smooth boundary.

Bw1–9 to 18 inches; brown (10YR 5/3) sandy loam, dark brown (10YR 3/3) moist; moderate fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; 5 percent pebbles; many fine and medium roots; many very fine, fine and medium interstitial and tubular pores; slightly acid (pH 6.4); clear smooth boundary.

Bw2–18 to 32 inches; pale brown (10YR 6/3) sandy loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; 15 percent pebbles; many fine and medium roots; many very fine, fine and medium interstitial and tubular pores; slightly acid (pH 6.2); gradual smooth boundary.

C–32 to 36 inches; light brownish gray (2.5Y 6/2) loamy sand, grayish brown (2.5Y 5/2) moist; single grain; soft, very friable, nonsticky and nonplastic; 10 percent pebbles; few very fine and fine roots; many very fine, fine and medium interstitial pores; medium acid (pH 6.0); clear smooth boundary.

Cr–36 inches; weathered granitic rock.

Range in Characteristics: Depth to a paralithic contact is usually between 30 and 40 inches. The depth varies greatly in short distances and ranges from about 25 to 45 inches. The greater depths usually occur on flats and wet areas. Mean annual soil temperature is estimated to be 43 to 47 degrees F.. The soil is dry from July 1 to October 1 in all parts of the moisture control section during most years. The base saturation is less than 50 percent.

The A horizon has dry colors of 10YR 4/2, 4/3, 4/4, 5/2, 5/3 or 5/4. When moist it has colors of 10YR 2/2, 3/2, 3/3 or 3/4. It is a neutral to slightly acid fine sandy loam or sandy loam. The A horizon usually contains 5 to 10 percent pebbles.

The B horizon has dry colors of 10YR 5/2, 5/3, 5/4, 6/2, 6/3 or 6/4. When moist it has colors of 10YR 3/2, 3/3, 3/4, 4/2, 4/3 or 4/4. It is a slightly acid sandy loam or loamy sand and contains 5 to 15 percent pebbles.

The C horizon has dry colors of 10YR 6/2, 6/3; 2.5Y 6/2 or 6/4. When moist it has colors of 10YR 5/2, 5/3; 2.5Y 5/2 or 5/4. It is a slightly acid to medium acid loamy sand with 10 to 20 percent pebbles. The C horizon is underlain by weathered granitic rock.

GWIN FAMILY

Gwin Family consists of shallow, well to somewhat excessively drained soils on flat lava flows and mountain sideslopes. These soils formed in material weathering from basalt. Slope ranges from 0 to 50 percent. Elevation ranges from 3500 to 5400 feet. The mean annual precipitation is about 15 to 25 inches. The mean annual air temperature is about 59 to 65 degrees F.. Typical vegetation consists of sparse Jeffrey pine, ponderosa pine, digger pine, western juniper, mountain whitethorn, bitterbrush, greenleaf manzanita and big sage.

Taxonomic Class: loamy-skeletal, mixed, mesic Lithic Argixerolls.

Reference Pedon: Gwin Family; mapped in an area of Bobbitt family, moderately deep-Gwin family association, 0 to 35 percent slopes. Located near Wilson Springs on a west aspect of 12 percent in the Hat Creek Ranger District of the Lassen National Forest. At an elevation of 4800 feet; 400 feet east, 2300 feet south of the NW corner, section 19, T35N, R7E, MDBM; Little Valley quadrangle.

(Colors are for dry soil unless otherwise stated. When described on 5/12/81 the soil was dry to 4 inches and moist below).

O–3 to 0 inches; juniper needles.

A–0 to 4 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; moderate very fine and fine granular structure; soft, very friable, slightly sticky and nonplastic; common very fine and fine roots; many very fine interstitial pores; neutral (pH 7.3); clear wavy boundary.

BAt–4 to 10 inches; very dark grayish brown (10YR 3/2) extremely cobbly loam, very dark brown (10YR 2/2) moist; moderate fine granular structure; slightly hard, friable, slightly sticky and slightly plastic; 20 percent pebbles, 40 percent cobbles; few thin clay films on faces of peds and in pores; common fine and few medium roots; common fine interstitial pores; neutral (pH 7.0); clear wavy boundary.

Bt–10 to 17 inches; dark grayish brown (10YR 4/2) extremely cobbly clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium granular structure; slightly hard, friable, sticky and plastic; 5 percent pebbles, 60 percent cobbles; common thin clay films on faces of peds and in pores; few fine and medium roots; common fine interstitial pores; neutral (pH 6.8); abrupt wavy boundary.

R–17 inches; slightly weathered basalt grading to hard basalt.

Range in Characteristics: Depth to a lithic contact is less than 20 inches. Mean annual soil temperature is estimated to be between 47 and 57 degrees F.. The soil is dry from July 1 to October 1 in all parts of the moisture control section during most years. Base saturation in the epipedon is estimated to be above 75 percent.

The A horizon has dry colors of 10YR 4/2, 4/3, 4/4, 5/2, 5/3, 5/4; 7.5YR 4/2, 4/4, 5/2 or 5/4. When moist it has colors of 10YR 2/2, 3/2, 3/3; or 7.5YR 3/2. The A horizon is a slightly acid to neutral loam with 0 to 60 percent cobbles, and 0 to 10 percent pebbles. It usually averages 5 to 20 percent rock fragments.

The Bt horizon has dry colors of 10YR 4/2, 4/3, 4/4; 7.5YR 4/2 or 4/4. When moist it has colors of 10YR 3/2, 3/3 or 7.5YR 3/2. The Bt horizon is a slightly acid to mildly alkaline loam, heavy loam or clay loam with 10 to 60 percent cobbles and 5 to 35 percent pebbles. The combined average of rock fragments is 35 to 65 percent. It contains at least 1.2 times more clay than the overlying horizon.

HOLLAND FAMILY

Holland Family consists of moderately deep to deep, well drained soils on large volcanic flats, ridges and mountain sideslopes. These soils formed in material weathering from andesite and basalt flow rocks and in a few minor areas from metasediments and diatomaceous earth. Slope ranges from 0 to 70 percent. Elevation ranges from 3500 to 5200 feet. The mean annual precipitation is about 25 to 65 inches. The mean annual air temperature is about 55 to 64 degrees F.. Typical vegetation consists of Jeffrey pine, ponderosa pine, white fir, douglas fir, sugar pine, incense cedar, mountain whitethorn, chinquapin, deerbrush, buckbrush, service berry, greenleaf manzanita and squaw carpet.

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

Reference Pedon: Holland Family; mapped in an area of Holland Family, 0 to 35 percent slopes. Located just beyond the western perimeter of Humbug Valley on a northeast slope of 16 percent in the Almanor Ranger District of the Lassen National Forest. At an elevation of 4400 feet; 2000 feet west, 1800 feet south of the NE corner, section 12, T26N, R6E, MDBM; Jonesville quadrangle.

(Colors are for dry soil unless otherwise stated. When described on 10/11/80 the soil was dry to 10 inches and moist below).

O–2 to 0 inches; forest litter.

A1–0 to 4 inches; dark reddish brown (5YR 3/4) loam, dark reddish brown (5YR 3/3) moist; moderate fine and medium granular structure; soft, very friable, nonsticky and nonplastic; 10 percent pebbles; many very fine and fine roots; many very fine and fine interstitial pores; slightly acid (pH 6.5); clear smooth boundary.

A2–4 to 10 inches; dark reddish brown (5YR 3/4) gravelly loam, dark reddish brown (5YR 3/3) moist; moderate medium breaking to fine and very fine granular structure; soft, very friable, nonsticky and slightly plastic; 20 percent pebbles; common very fine, fine and medium roots; many very fine and fine interstitial pores; slightly acid (pH 6.2); clear smooth boundary.

Bt1–10 to 24 inches; brown (7.5YR 4/4) gravelly loam, dark reddish brown (5YR 3/4) moist; moderate medium subangular blocky structure; slightly hard, firm, slightly sticky and plastic; 15 percent pebbles; common thin clay films on faces of peds and in pores; few fine, common medium and few coarse roots; few fine interstitial and tubular pores; slightly acid (pH 6.2); gradual smooth boundary.

Bt2–24 to 36 inches; yellowish red (5YR 4/6) gravelly clay loam, dark reddish brown (5YR 3/4) moist; moderate coarse subangular blocky structure; hard, very firm, slightly sticky and plastic; 15 percent pebbles; common thin clay films on faces of peds and in pores; few fine, medium and coarse roots; few fine interstitial and tubular pores; slightly acid (pH 6.4); gradual smooth boundary.

Bt3–36 to 44 inches; strong brown (7.5YR 4/6) gravelly clay loam, brown (7.5YR 4/4) moist; moderate coarse subangular blocky structure; hard, very firm, slightly sticky and plastic; 13 percent pebbles, 5 percent cobbles; common thin clay films on faces of peds and in pores; few fine and medium roots; few fine and medium tubular pores; slightly acid (pH 6.2); gradual smooth boundary.

C–44 to 60 inches; yellowish brown (10YR 5/6) gravelly silty clay loam, brown (7.5YR 4/4) moist; massive; hard, very firm, slightly sticky and plastic; 10 percent pebbles, 5 percent cobbles; few thin clay films on faces of peds; few medium roots; few fine and very fine interstitial and tubular pores; slightly acid (pH 6.2).

Range in Characteristics: Depth to a lithic or paralithic contact is greater than 40 inches. Mean annual soil temperature is estimated to be between 47 and 57 degrees F.. The soil is dry from July 15 to October 1 in all parts of the moisture control section during most years. Base saturation in the epipedon is estimated to be below 50 percent. It is estimated to be below 75 percent in the upper portion of the argillic horizon. The Holland soils weathering from metamorphosed marine sediments usually occur on steeper slopes and lower elevations than the soils weathering from basalt and andesite. The colors in both the A and B horizons of the metasedimentary phase usually have higher values and range to strongly acid in the argillic horizon.

The A horizon has dry colors of 7.5YR 3/2, 3/4, 4/2, 4/4, 4/6, 5/2, 5/4, 5/6; 5YR 3/2, 3/3, 3/4, 4/2, 4/3, 4/4, 4/6, 5/2, 5/3, 5/4 or 5/6. When moist it has colors of 7.5YR 3/4, 4/4; 5YR 3/3, 3/4, 4/3 or 4/4. The A horizon is a neutral to slightly acid sandy loam, loam or clay loam with 0 to 20 percent pebbles.

The Bt horizon has dry colors of 10YR 4/4, 4/6, 5/4,

5/6; 7.5YR 4/4, 4/6, 5/4, 5/6; 5YR 4/4, 4/6, 5/4 or 5/6. When moist it has colors of 10YR 3/3, 3/4, 3/6, 4/3, 4/4, 4/6; 7.5YR 3/4, 4/4, 4/6; 5YR 3/3, 3/4, 4/3, 4/4 or 4/6. It is a neutral to medium acid heavy loam, clay loam, sandy clay loam or silty clay loam.

The C horizon, where present, has dry colors of 10YR 4/4, 4/6, 5/4 or 5/6. When moist it has colors of 10YR 3/3, 3/4, 4/3, 4/4; 7.5YR 3/4 or 4/4. The C horizon is a loam or silty clay loam.

INVILLE FAMILY

Inville Family consists of deep, well drained soils on mountain sideslopes, ridges and canyons. These soils formed in material weathering from rhyolitic dacite, basalt and andesite flows. Slope ranges from 5 to 50 percent. Elevation ranges from 5200 to 7000 feet. The mean annual precipitation is about 20 to 70 inches. The mean annual air temperature is about 46 to 57 degrees F.. Typical vegetation consists of Jeffrey pine, ponderosa pine, red fir, white fir, sugar pine, incense cedar, greenleaf manzanita, pinemat manzanita, chinquapin and desert mountain mahogany.

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

Reference Pedon: Inville Family, mapped in an area of Wintoner-Inville families complex, 0 to 35 percent slopes. Located along the Grizzly Creek road on a northeast slope of 9 percent in the Almanor Ranger District of the Lassen National Forest. At an elevation of 5680 feet; 800 feet north, 400 feet east, of the SW corner, section !7, T26N, R6E, MDBM; Jonesville quadrangle.

(Colors are for dry soil unless otherwise stated. When described on 10/12/80 the soil was moist throughout).

O–3 to 0 inches; fresh and partially decomposed fir litter.

A1–0 to 7 inches; brown (7.5YR 4/2) bouldery sandy loam, dark brown (7.5YR 3/4) moist; moderate very fine and weak fine granular structure; soft, very friable, nonsticky and nonplastic; 10 percent pebbles, 15 percent boulders; common very fine and fine roots; many very fine interstitial pores; slightly acid (pH 6.5); clear wavy boundary.

A2–7 to 13 inches; brown (7.5YR 4/2) loam, brown (7.5YR 4/4) moist; moderate medium granular structure; soft, very friable, slightly sticky and slightly plastic; 10 percent pebbles; common very fine and fine roots; common very fine and few fine interstitial pores; slightly acid (pH 6.5); clear wavy boundary.

Bt1–13 to 17 inches; brown (7.5YR 4/2) gravelly clay loam, brown (7.5YR 4/4) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; 15 percent pebbles, 5 percent cobbles; few thin clay films on faces of peds and in pores; common fine and medium roots; common fine interstitial pores; medium acid (pH 6.0); abrupt smooth boundary.

Bt2–17 to 38 inches; brown (10YR 5/3) very gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and plastic; 30 percent pebbles, 10 percent cobbles, 5 percent stones; common thin clay films on faces of peds and in pores; few fine and medium roots; common fine interstitial pores; strongly acid (pH 5.5); clear wavy boundary.

Bt3–38 to 60 inches; brown (10YR 5/3) gravelly clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and plastic; 10 percent cobbles, 15 percent pebbles; few very fine, fine and medium roots; common fine interstitial pores; medium acid (pH 6.0).

Range in Characteristics: Depth to a lithic or paralithic contact is greater then 40 inches. Mean annual soil temperature is estimated to be 44 to 47 degrees F.. The soil is dry from July 15 to October 1 in all parts of the moisture control section during most years. Base saturation in the upper portion of the argillic horizon is estimated to be below 75 percent.

The A horizon has dry colors of 10YR 4/2, 4/3, 4/4; 7.5YR 4/2 or 4/4. When moist it has colors of 7.5YR 3/2, 3/4, 4/2, 4/4; 5YR 3/2, 3/3, 3/4, 4/2, 4/4 or 4/4. When this soil occurs on rhyolite the colors tend to be browner. The A horizon is a neutral to slightly acid sandy loam or loam with 0 to 15 percent pebbles and 0 to 15 percent cobbles. It averages 10 to 30 percent rock fragments. Surface rock fragments of cobbles, stones and boulder size occupy 20 to 80 percent of the surface.

The Bt horizon has dry colors of 10YR 4/3, 4/4, 4/6, 5/3, 5/4, 5/6; 7.5YR 4/2, 4/4, 4/6, 5/4, 5/6; 5YR 4/3, 4/4, 4/6, 5/3, 5/4 or 5/6. When moist it has colors of 10YR 3/4, 3/6, 4/4, 4/6, 5/4, 5/6; 7.5YR 3/4, 4/4, 4/6, 5/4, 5/6; 5YR 3/4, 4/4, 4/6, 5/4 or 5/6. It is a medium to strongly acid heavy loam, clay loam or sandy clay loam with 0 to 30 percent pebbles 10 to 60 percent cobbles and a combined average of 35 to 65 percent rock fragments. It contains at least 1.2 times more clay than the overlying horizon.

KEATING FAMILY

Keating Family consists of moderately deep, well to somewhat poorly drained soils on mountain sideslopes and benches and along streams. These soils formed in material weathering from basalt. Slope ranges from 0 to 25 percent. Elevation ranges from 4000 to 5600 feet. The mean annual precipitation is about 15 to 30 inches. The mean annual air temperature is about 56 to 64 degrees F.. Typical vegetation consists of sparse Jeffrey pine and incense cedar with western juniper, black oak, big sage, desert mountain mahogany, mountain mahogany, bitterbrush, balsam root, and both annual and perennial grassess.

Taxonomic Class: fine, montmorillonitic, mesic Typic Argixerolls.

Reference Pedon: Keating Family; mapped in an area of Klicker family, stony- Keating family-Durixerolls association, 0 to 35 percent slopes. Located 1/4 mile south of the Little Valley access road north of Straylor Lake on an east-northeast slope of 12 percent in the Hat Creek Ranger District of the Lassen National Forest at an elevation of 4900 feet; 2500 feet south, 2250 feet east, of the NW corner, section 4, T34N, R8E, MDBM; Little Valley quadrangle.

(Colors are for dry soil unless otherwise stated. When described on 5/28/81 the soil was dry to 8 inches and moist below).

A1–0 to 3 inches; brown (10YR 5/3) loam, very dark brown (10YR 2/2) moist; moderate medium granular structure; soft, friable, slightly sticky and slightly plastic; 2 percent pebbles, 5 percent cobbles; common very fine and fine roots; common fine interstitial pores; neutral (pH 6.6); clear smooth boundary.

A2–3 to 8 inches; brown (10YR 5/3) loam, very dark brown (10YR 2/2) moist; moderate medium and coarse granular structure; slightly hard, firm, sticky and slightly plastic; 4 percent pebbles, 5 percent cobbles; common very fine and fine roots; common fine interstitial and tubular pores; neutral (pH 6.6); clear wavy boundary.

A3–8 to 13 inches; yellowish brown (10YR 5/4) loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; slightly hard, firm, sticky and plastic; few thin clay films on faces of peds and in pores; 6 percent pebbles, 2 percent cobbles; few very fine and fine roots; common fine tubular pores; slightly acid (pH 6.4); clear wavy boundary.

Bt1–13 to 17 inches; brown (7.5YR 5/4) clay loam, dark brown (7.5YR 3/4) moist; moderate medium subangular blocky structure; hard, very firm, sticky and plastic; common moderately thick clay films on faces of peds and in pores; 3 percent pebbles, 2 percent cobbles; few very fine roots; few fine tubular pores; slightly acid (pH 6.4); clear irregular boundary.

Bt2–17 to 25 inches; brown (7.5YR 5/4) clay, brown (7.5YR 4/4) moist; moderate medium prismatic structure; very hard, very firm, very sticky and very plastic; many thick clay films on faces of peds and in pores; 2 percent pebbles, 2 percent cobbles; few very fine tubular pores; slightly acid (pH 6.4); abrupt wavy boundary.

R–25 inches; weakly cemented silica duripan over basalt bedrock.

Range in Characteristics: Depth to the basalt ranges from 20 to 38 inches. The soil is dry from July 1 to October 15 in all parts of the moisture control section during most years. Base saturation in the epipedon is estimated to be above 50 percent.

The A horizon has dry colors of 10YR 4/2, 4/3, 4/4, 5/2, 5/3 or 5/4. When moist it has colors of 10YR 2/2, 2/3, 3/2, 3/3; 7.5YR 2/2 or 3/2. The A horizon is a neutral to slightly acid fine sandy loam, loam or heavy loam with 0 to 15 percent pebbles and 0 to 5 percent cobbles; with a combined average of 5 to 15 percent rock fragments.

The B horizon has dry colors of 10YR 4/4, 5/4, 6/4; 7.5YR 4/4, 5/4 or 6/4. When moist it has colors of 10YR 4/4, 5/4; 7.5YR 4/4 or 5/4. The Bt horizon is a neutral to slightly acid heavy loam, clay loam, sandy clay loam or clay with 0 to 50 percent cobbles and pebbles. When clay subhorizons occur they are assumed to be dominated by montmorillonite. The B horizon contains at least 1.2 times more clay than the overlying horizon.

KILMERQUE FAMILY

Kilmerque Family consists of moderately deep to deep, well drained soils on alluvial fans and the flatter volcanic slopes. These soils formed in material weathering from andesite and basalt and alluvium from these sources. Slopes range from 0 to 35 percent. Elevation ranges from 5200 to 6500 feet. The mean annual precipitation is about 20 to 45 inches. The mean annual air temperature is about 47 to 55 degrees F.. Typical vegetation consists of lodgepole pine, white fir, ponderosa pine, Jeffrey pine, big sage, rabbit brush, squaw carpet and bunchgrass.

Taxonomic Class: coarse-loamy, mixed, frigid Ultic Haploxerolls.

Reference Pedon: Kilmerque Family; mapped in an area of Trojan-Kilmerque-Patio families association, 15 to 35 percent slopes; about one mile north of Mud Creek Butte on a 12 percent east facing slope in the Almanor Ranger District of the Lassen National Forest. At an elevation of 6280 feet; 1375 feet north, 1200 feet west of the SE corner, section 8, T29N, R7E, MDBM; Chester quadrangle.

(Colors are for dry soil unless otherwise stated. When described on 7/25/77 the soil was dry to 12 inches and moist below).

O–3/4 to 0 inches; Needles and twigs.

A1–0 to 2 inches; dark brown (10YR 3/3) sandy loam, very dark brown (10YR 2/2) moist; moderate fine subangular blocky structure; slightly hard, friable, nonsticky and slightly plastic; 15 percent pebbles; many fine roots; many fine interstitial pores; slightly acid (pH 6.3); abrupt smooth boundary.

A2–2 to 12 inches; brown (10YR 4/3) sandy loam, very dark brown (10YR 2/2) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; 10 percent pebbles; common very fine and few fine roots; few fine interstitial pores; neutral (pH 6.6); clear smooth boundary.

Bw1–12 to 24 inches; brown (7.5YR 4/4) sandy loam, dark reddish brown (5YR 3/4) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and slightly plastic; 5 percent pebbles; few very fine, common fine, many medium and few coarse roots; few fine interstitial pores; neutral (pH 6.6); gradual wavy boundary.

Bw2–24 to 40 inches; brown (7.5YR 4/4) sandy loam, dark brown (7.5YR 3/4) moist; weak fine subangular blocky structure; slightly hard, very friable, nonsticky and slightly plastic; 10 percent pebbles; few very fine, common fine, many medium and few coarse roots; common fine tubular pores; neutral (pH 6.7); clear wavy boundary.

C–40 to 60 inches; brown (7.5YR 5/4) gravelly sandy loam, brown (7.5YR 4/4) moist; massive; hard, friable, nonsticky and slightly plastic; 20 percent pebbles; few fine roots; neutral (pH 6.9).

Range in Characteristics: Depth to a paralithic contact is greater than 40 inches when the soil is forming over alluvium. The soil is usually moderately deep to a lithic contact when forming over basalt or andesite. Mean annual soil temperature is estimate to be 44 to 47 degrees F.. The soil is dry from August 1 to October 1 in all parts of the moisture control section during most years.

The A horizon has dry colors of 10YR 3/2, 3/3, 3/4, 4/2, 4/3, 4/4; 7.5YR 3/2, 3/4, 4/2 or 4/4. When moist it has colors of 10YR 2/2, 3/2, 3/3, 3/4; 7.5YR 3/2 or 3/4. It is a slightly acid to neutral sandy loam, fine sandy loam or loam with 0 to 15 percent pebbles and 0 to 15 percent cobbles. The combined average of rock fragments is 5 to 18 percent.

The B horizon has dry colors of 10YR 5/3, 5/4; 7.5YR 4/2, 4/4, 4/6, 5/2, 5/4 or 5/6. When moist it has colors of 10YR 3/3, 3/4; 7.5YR 3/2, 3/4, 4/2, 4/4 4/6; 5YR 3/3 or 3/4. It is a slightly acid to neutral sandy loam, fine sandy loam or loam with 2 to 10 percent pebbles and 0 to 20 percent cobbles. The combined average of rock fragments is 5 to 20 percent.

The C horizon, when present, has dry colors of 10YR 6/3, 6/4; 7.5YR 5/2, 5/4, 6/2 or 6/4. When moist it has colors of 10YR 3/3, 3/4, 4/3, 4/4; 7.5YR 3/2, 3/4, 4/2 or 4/4. It is a neutral sandy loam or loam with 20 to 50 percent pebbles and 10 to 20 percent cobbles. The combined average of rock fragments is 20 to 40 percent. The soil may be underlain by alluvium or slightly weathered andesite or basalt.

KLICKER FAMILY

Klicker Family consists of moderately deep to deep, well drained soils on mountain sideslopes and flats. These soils formed in material weathering from rhyolite, andesite and basalt flows and Eocene nonmarine sediments. Slope ranges from 5 to 50 percent. Elevation ranges from 5200 to 7300 feet. The mean annual precipitation is about 18 to 45 inches. The mean annual air temperature is about 46 to 55 degrees F.. Typical vegetation consists of Jeffrey pine, white fir, incense cedar, western juniper, mountain mahogany, big sage, greenleaf manzanita, pinemat manzanita and desert mountain mahogany.

Taxonomic Class: loamy-skeletal, mixed, frigid Ultic Argixerolls.

Reference Pedon: Klicker Family; mapped in an area of Klicker family-Klicker family, stony association, 0 to 35 percent slopes; 1/4 mile west of Schroder Lake on a southwest slope of 13 percent in the Hat Creek Ranger District of the Lassen National Forest; at an elevation of 5800 feet; 1750 feet south, 2300 feet west, of the NE corner, section 19, T34N, R8E, MDBM; Little Valley quadrangle.

(Colors are for dry soil unless otherwise stated. When described on 6/1/81 the soil was dry to 2 inches and moist below).

O–1 to 0 inches; decomposing pine needles.

A1–0 to 2 inches; brown (7.5YR 4/4) loam, dark brown (7.5YR 3/2) moist; weak very fine and fine granular structure; soft, friable, nonsticky and nonplastic; common very fine and few fine roots; common very fine interstitial pores; neutral (pH 7.0); clear smooth boundary.

A2–2 to 11 inches; dark brown (7.5YR 3/4) cobbly loam, dark brown (7.5YR 3/2) moist; moderate fine and medium granular structure; slightly hard, very friable, nonsticky and nonplastic; 3 percent pebbles, 15 percent cobbles; common very fine, fine and medium roots; common fine and medium interstitial pores; neutral (pH 6.8); gradual smooth boundary.

Bt1–11 to 18 inches; brown (7.5YR 4/4) very cobbly loam, dark brown (7.5YR 3/4) moist; weak fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; 25 percent pebbles, 20 percent cobbles; few thin clay films colloid stains mineral grains; common very fine and fine and few medium roots; common very fine and fine interstitial and few fine tubular pores; slightly acid (pH 6.5); gradual smooth boundary.

Bt2–18 to 28 inches; brown (7.5YR 4/4) very stony loam, dark brown (7.5YR 3/4) moist; moderate fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and plastic; 10 percent pebbles, 10 percent cobbles, 25 percent stones; few thin clay films on faces of peds and in pores; few fine and medium roots; common fine and medium interstitial and few fine tubular pores; slightly acid (pH 6.5); clear smooth boundary.

Bt3–28 to 48 inches; yellowish brown (10YR 5/4) extremely gravelly loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; 60 percent pebbles, 20 percent stones; few thin clay films colloid stains mineral grains; few fine and medium roots; common medium interstitial pores; slightly acid (pH 6.5); clear smooth boundary.

Cr–48 inches; weathered basalt rock.

Range in Characteristics: Depth to a lithic or paralithic contact ranges from 26 to more than 40 inches. Mean annual soil temperature is estimated to be 44 to 47 degrees F.. The soil is dry from July 15 to October 1 in all parts of the moisture control section during most years. Base saturation in the epipedon is estimated to be between 50 and 75 percent.

The A horizon has dry colors of 10YR 3/2, 3/3, 3/4, 4/2, 4/3, 4/4; 7.5YR 3/2, 3/4, 4/2 or 4/4. When moist it has colors of 10YR 2/1, 2/2, 3/1, 3/2, 3/3 or 7.5YR 3/2. The A horizon is a neutral to slightly acid sandy loam, light loam or loam with 10 to 60 percent pebbles, cobbles and stones.

The Bt horizon has dry colors of 10YR 4/3, 4/4, 5/3, 5/4; 7.5YR 4/4 or 5/4. When moist it has colors of 10YR 3/3, 3/4, 4/3, 4/4; 7.5YR 3/4 or 4/4. The Bt horizon is a neutral to slightly acid loam, heavy loam, clay loam or sandy clay loam. It contains 35 to 80 percent pebbles, cobbles and stones. The Bt horizon contains at least 1.2 times more clay than the overlying horizon.

The Cr horizon is usually slightly weathered basalt or andesite rock but in some areas it is weathered rhyolite. When the soil is weathering from rhyolite material the soil colors tend to be browner, usually 10YR.

LAVA FLOW

This miscellaneous land type consists of exposed basalt, or less commonly andesite and rhyolite flow material. Topography varies from nearly level valleys to undulating or craggy flows. Large areas of Lava Flow occur in Hat Creek Valley and in the vicinity of the Devil's Rock Garden. Slopes range from 5 to about 90 percent.

Areas mapped as Lava Flow are typically devoid of vegetation. In some areas, however, scattered brush consisting of greenleaf manzanita, juniper mountain mahogany and big sage occur. A few commercial coniferous species may also be found. These plants occur in fractures in the flow rock, and in small colluvial pockets of soil.

Lava Flow differs from Rock Outcrop in that it typically is of more recent origin and overlies bedrock. It differs from Rubble Land in consisting of competent rock rather than detached rock fragments.

LITHIC HAPLOXERALFS

Lithic Haploxeralfs consists of shallow, somewhat excessively drained soils on volcanic flows and mountain sideslopes. These soils formed in material weathering from andesite, basalt, rhyolite and rhyolitic tuff. Slope ranges from 0 to 35 percent and elevation ranges from 4000 to 5600 feet. The mean annual precipitation is about 18 to 35 inches. The mean annual air temperature is about 55 to 64 degrees F.. Typical vegetation consists of ponderosa pine, incense cedar, juniper, black oak, squaw carpet, bitterbrush, buckbrush and mule's ear.

Taxonomic Class: Lithic Haploxeralfs.

Reference Pedon: Lithic Haploxeralfs; mapped in an area of Pass Canyon family- Lithic Haploxeralfs, rhyolitic complex, 0 to 35 percent slopes. Located near Coble Spring on a northwest aspect of 13 percent in the Hat Creek Ranger District of the Lassen National Forest. At an elevation of 4800 feet; 1100 feet north, 100 feet east of the SW corner, section 32, T35N, R6E, MDBM; Jellico quadrangle.

(Colors are for dry soil unless otherwise stated. When described on 7/20/76 the soil was dry throughout).

0–1 to 0 inches; fresh and decomposing fine detritus.

A1–0 to 2 inches; light gray (10YR 6/1) gravelly sandy loam, very dark gray (10YR 3/1) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; 15 percent pebbles; few fine roots; few very fine tubular and interstitial pores; slightly acid (pH 6.3); abrupt smooth boundary.

A2–2 to 6 inches; light gray (10YR 7/2) very gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; moderate fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; 50 percent pebbles, 10 percent cobbles; common fine and medium roots; common very fine tubular and many very fine and fine interstitial pores; slightly acid (pH 6.3); gradual smooth boundary.

Bt1–6 to 18 inches; pinkish gray (7.5YR 7/2) very gravelly loam, dark reddish gray (5YR 4/2) moist; strong fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; 40 percent pebbles, 10 percent cobbles; few thin clay films on faces of peds and in pores; many fine, medium and coarse roots; many very fine and fine interstitial and tubular pores; medium acid (pH 6.0); abrupt smooth boundary.

R–18 inches; hard rhyolitic tuff.

Range in Characteristics: Depth to a lithic contact is 20 inches or less. Mean annual soil temperature is estimated to be between 46 and 58 degrees F.. The soil is dry from July 1 to October 1 in all parts of the moisture control section during most years. When the surface is dark colored it is too thin to be umbric or mollic.

The A horizon has dry colors of 10YR 5/1, 5/2, 5/3, 5/4, 5/6, 6/2, 6/3, 6/4, 7/1, 7/2, 7/3; 7.5YR 5/2, 5/4, 5/6, 6/2, 6/4 or 6/6. When moist it has colors of 10YR 3/1, 3/2, 3/3, 3/4, 4/1, 4/2, 4/3, 4/4, 5/1, 5/2, 5/3; 7.5YR 3/2, 3/4, 4/2 or 4/4. It is a slightly acid to neutral gravelly sandy loam or loam. It contains 10 to 50 percent pebbles and 0 to 10 percent cobbles with an average of 40 percent rock fragments.

The Bt horizon has dry colors of 10YR 4/2, 4/3, 5/2, 5/3; 7.5YR 4/2, 4/4, 4/6, 5/2, 5/4, 5/6, 6/2, 6/4, 7/2, 7/4; 5YR 4/3 or 4/4. When moist it has colors of 10YR 3/2, 3/3, 3/4, 4/2, 4/3, 4/4; 7.5YR 3/2, 3/4, 4/2, 4/4; 5YR 3/2, 3/3, 3/4, 4/2, 4/3, 4/4 or 4/6. It is a medium acid to mildly alkaline loam, clay loam or clay; modified by 0 to 40 percent pebbles and 0 to 40 percent cobbles. The combined average of rock fragments is usually about 40 percent. This horizon overlies hard andesite, basalt or rhyolite.

LITHIC HAPLOXEROLLS

Lithic Haploxerolls consists of shallow, well drained soils on basalt flows. These soils formed in material weathering from basalt. Slope ranges from 0 to 25 percent and elevation ranges from 3000 to 7000 feet. The mean annual precipitation is about 16 to 40 inches. The mean annual air temperature is about 57 to 65 degrees F.. Typical vegetation consists of sparse Jeffrey and ponderosa pine, juniper, digger pine, white oak, black oak, greenleaf manzanita, big sage, mountain mahogany, western redbud, yerba santa and chokecherry.

Taxonomic Class: Lithic Haploxerolls.

Reference Pedon: Lithic Haploxerolls; mapped in an area of Lava Flow-Lithic Haploxerolls association, 0 to 35 percent slopes. Located at an elevation of 3200 feet; 1000 feet north, 2450 feet east of the SW corner of section 2, T34N, R4E, MDBM; Jellico quadrangle.

(Colors are for dry soil unless otherwise stated. When described on 6/15/81 the soil was dry throughout).

O–1/2 to 0 inches; brush litter.

A1–0 to 4 inches; brown (10YR 4/3) gravelly fine sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure and single grain; soft, very friable, nonsticky and slightly plastic; 25 percent pebbles, 5 percent cobbles; common very fine and fine roots; common very fine interstitial pores; neutral (pH 6.8); abrupt smooth boundary.

A2–4 to 9 inches; brown (10YR 4/3) very gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; moderate fine and medium granular structure; slightly hard, friable, nonsticky and slightly plastic; 35 percent pebbles, 5 percent cobbles; common very fine and fine roots; common very fine interstitial pores; neutral (pH 6.8); clear wavy boundary.

Bw1–9 to 15 inches; dark yellowish brown (10YR 4/4) very cobbly loam, dark brown (10YR 3/3) moist; moderate fine and medium subangular blocky structure; slightly hard, friable, nonsticky and slightly plastic; 15 percent pebbles, 30 percent cobbles; common fine and medium roots; common very fine interstitial pores; neutral (pH 7.2); abrupt wavy boundary.

Bw2–15 to 17 inches; light brown (7.5YR 6/4) cobbly loam, brown (7.5YR 5/4) moist; massive; hard, firm, nonsticky and slightly plastic; 5 percent pebbles, 20 percent cobbles; few fine roots; few fine interstitial pores; mildly alkaline (pH 7.5); abrupt wavy boundary.

R–17 inches; hard basalt rock.

Range in Characteristics: Depth to a lithic contact is less than 20 inches. Mean annual soil temperature is estimated to be between 45 and 59 degrees F.. The soil is dry from July 1 to October 15 in all parts of the moisture control section during most years. Base saturation in the epipedon is estimated to be above 75 percent.

The A horizon has dry colors of 10YR 4/3, 4/4, 5/3 or 5/4. When moist it has colors of 10YR 3/2, 3/3 or 7.5YR 3/2. The A horizon is a neutral to slightly acid fine sandy loam, loam, or sandy clay loam with 5 to more than 40 percent pebbles and cobbles.

The B horizon has dry colors of 10YR 3/3, 3/4, 4/3, 4/4, 5/3, 5/4, 6/3, 6/4; 7.5YR 3/4, 4/4, 5/4 or 6/4. When moist it has colors of 10YR 3/2, 3/3, 3/4, 4/2, 4/3, 4/4, 5/2, 5/3, 5/4; 7.5YR 3/2, 3/4, 4/2, 4/4, 5/2 or 5/4. The B horizon is a neutral to mildly alkaline loam with 20 to 50 percent cobbles and pebbles.

LITHIC ULTIC ARGIXEROLLS

Lithic Ultic Argixerolls consists of shallow, well drained soils on mountain sideslopes and old river terraces. These soils formed in material weathering from andesite, basalt and eocene nonmarine sediments. Slope ranges from 0 to 50 percent. Elevation ranges from 5200 to 7000 feet. The mean annual precipitation is about 20 to 45 inches. The mean annual air temperature is about 46 to 55 degrees F.. Typical vegetation consists of generally barren areas with scattered big sage, silver sage and annual and perennial grasses.

Taxonomic Class: Lithic Ultic Argixerolls.

Reference Pedon: Lithic Ultic Argixerolls; mapped in an area of Klicker family, sedimentary-Lithic Ultic Argixerolls-Inville family association, 0 to 50 percent slopes; two miles northwest of Hamilton Mtn. on the road to the Forest Service Hamilton Mtn. repeater station; on a 31 percent west facing slope in the Eagle Lake Ranger District of the Lassen National Forest; at an elevation of 6640 feet; 600 feet south, 400 feet east of the NW corner, section 33, T29N, R10E, MDBM; Westwood quadrangle.

(Colors are for dry soil unless otherwise stated. When described on 6/30/81 the soil was dry throughout).

O–few dead grasses and twigs.

A–0 to 4 inches; brown (10YR 5/3) gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; moderate fine and very fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; 20 percent pebbles; few very fine and common fine roots; common very fine and fine tubular and interstitial pores; slightly acid (pH 6.5); clear smooth boundary.

BAt–4 to 10 inches; brown (10YR 5/3) gravelly sandy clay loam, very dark grayish brown (10YR 3/2) moist; moderate fine and very fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; few thin clay films on faces of peds; 20 percent pebbles; common very fine and fine roots; common fine and medium tubular and interstitial pores; neutral (pH 7.0); clear smooth boundary.

Bt1–10 to 14 inches; yellowish brown (10YR 5/4) gravelly sandy clay loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; slightly hard, very friable, slightly sticky and slightly plastic; common moderately thick clay films in pores and on faces of peds; 20 percent pebbles; common very fine and fine roots; common fine and medium tubular and interstitial pores; neutral (pH 7.2); clear smooth boundary.

Bt2–14 to 17 inches; light yellowish brown (10YR 6/4) very gravelly sandy clay loam, dark brown (10YR 3/3) moist; moderate fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common moderately thick clay films in pores and on faces of peds; 50 percent pebbles; few fine and medium roots; common fine and medium tubular and interstitial pores; neutral (pH 7.2); abrupt smooth boundary.

R–17 inches; weathered andesite rock getting harder with depth.

Range in Characteristics: Depth to a lithic contact ranges from 12 to 20 inches. Mean annual soil temperature is estimated to be 45 to 47 degrees F.. The soil is dry from July 1 to October 1 in all parts of the moisture control section during most years. Base saturation in the epipedon is estimated to be between 50 and 75 percent.

The A horizon has dry colors of 10YR 4/2, 4/3, 4/4, 5/2, 5/3 or 5/4. When moist it has colors of 10YR 3/2 or 3/3. It is a slightly acid to neutral gravelly sandy loam and contains 15 to 30 percent pebbles. It may have up to 30 percent cobbles on the surface. The mollic epipedon is 7 to 10 inches thick and includes the BAt horizon.

The B horizon has dry colors of 10YR 5/2, 5/3, 5/4, 6/2, 6/3 or 6/4. When moist it has colors of 10YR 3/2, 3/3, 3/4, 4/2, 4/3 or 4/4. It is a neutral gravelly to very gravelly sandy clay loam. The B horizon contains 15 to 50 percent pebbles and averages 25 to 40 percent.

The R horizon is slightly weathered andesite or basalt that gets harder with depth.

LITHIC XEROCHREPTS

Lithic Xerochrepts consists of shallow, well drained soils on recent basalt flows. These soils formed in material weathering from basalt on slopes ranging from 0 to 35 percent. Elevation ranges from 3000 to 5000 feet. The mean annual precipitation is about 20 to 40 inches. The mean annual air temperature is estimated to be 57 to 65 degrees F.. Typical vegetation consists of sparse Jeffrey pine, incense cedar and juniper with big sage, rabbit brush, desert mountain mahogany, greenleaf manzanita, pinemat manzanita and both annual and perennial grasses.

Taxonomic Class: Lithic Xerochrepts.

Reference Pedon: Lithic Xerochrepts; in an area of Lava Flow-Lithic Xerochrepts complex, 0 to 35 percent slopes. Located 100 yards north of Highway 44, just east of the intersection with Highway 89, on a complex slope of 8 percent in the Hat Creek Ranger District of Lassen National Forest. At an elevation of 4040 feet; 1350 feet south, 1350 feet east of the NW corner, section 34, T33N, R5E, MDBM, Prospect Peak quadrangle.

(Colors are for dry soil unless otherwise stated. When described on 10/28/81 the soil was moist throughout).

0–1 to 0 inches; sparse layer of manzanita litter.

A1–0 to 1 inches; dark grayish brown (10YR 4/2) loamy sand, very dark brown (10YR 2/2) moist; weak medium subangular blocky structure and single grain; soft, very friable, nonsticky and nonplastic; 12 percent pebbles; common very fine roots; few medium interstitial and common fine tubular pores; slightly acid (pH 6.3); abrupt smooth boundary.

A2–1 to 5 inches; dark grayish brown (10YR 4/2) cobbly sandy loam, very dark grayish brown (10YR 3/2) moist; weak very fine granular structure; soft, very friable, nonsticky and nonplastic; 8 percent pebbles, 7 percent cobbles; many fine and medium roots; common medium interstitial pores; neutral (pH 6.8); abrupt smooth boundary.

Bw1–5 to 7 inches; light yellowish brown (10YR 6/4) cobbly sandy loam, dark yellowish brown (10YR 3/4) moist; moderate fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; 5 percent pebbles, 10 percent cobbles; many fine and common medium roots; common medium interstitial pores; neutral (pH 7.3); clear smooth boundary.

Bw2–7 to 11 inches; yellowish brown (10YR 5/4) very cobbly sandy loam, dark yellowish brown (10YR 3/4) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; 5 percent pebbles, 20 percent cobbles, 15 percent stones; many fine and common medium roots; common medium interstitial pores; mildly alkaline (pH 7.7); clear wavy boundary.

BC–11 to 18 inches; yellowish brown (10YR 5/4) extremely cobbly sandy loam, dark yellowish brown (10YR 3/4) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; 5 percent pebbles, 50 percent cobbles, 20 percent stones; common fine and medium roots; common medium interstitial pores; mildly alkaline (pH 7.7); abrupt irregular boundary.

R–18 inches; hard, slightly fractured basalt bedrock.

Range in Characteristics: Depth to a lithic contact is less than 20 inches. Mean annual soil temperature is estimated to be between 49 and 59 degrees F.. The soil is dry from June 15 to October 15 in all parts of the moisture control section during most years. When the surface is dark colored it is too thin to be umbric or mollic. The minerology is considered to be that of an Andic intergrade, with low bulk density and a dominance of amorphous materials. The particle size control section is either medial or medial-skeletal.

The A horizon has dry colors of 10YR 4/2, 4/3, 5/2 or 5/3. When moist it has colors of 10YR 2/2, 3/2, 3/3 or 3/4. The A horizon is a slightly acid to neutral loamy sand or sandy loam with typically 5 to 15 percent pebbles and cobbles.

The B horizon has dry colors of 10YR 4/4, 5/4, 6/4; 7.5YR 4/4, 5/4 or 6/4. When moist it has colors of 10YR 3/4 or 7.5YR 3/4. The B horizon is a slightly acid to mildly alkaline sandy loam or loam with up to 60 percent pebbles and/or cobbles. It usually averages over 35 percent rock fragments. It does not increase in clay content by as much as 1.2 times the clay content of the overlying horizon.

LITHIC XERUMBREPTS

Lithic Xerumbrepts consists of shallow, well to somewhat excessively drained soils on flat lava flows and on mountain sideslopes and ridgetops. These soils formed in material weathering from basalt, andesite and metavolcanic rocks. Slope ranges from 0 to 70 percent. Elevation ranges from 3200 to 8000 feet. The mean annual precipitation is about 20 to 80 inches. The mean annual air temperature averages 45 to 64 degrees F.. Typical vegetation consists at the lower elevations of greenleaf manzanita, pinemat manzanita, and desert mountain mahogany, with sparse Jeffrey pine, ponderosa pine, juniper and incense cedar. At the higher elevations it is pinemat manzanita, rabbit brush, gooseberry, ponderosa pine, white fir, sugar pine, incense cedar and mountain hemlock.

Taxonomic Class: Lithic Xerumbrepts.

Reference Pedon: Lithic Xerumbrepts; mapped in an area of Lithic Xerumbrepts- Rubble Land-Sheld family, moderately deep association, 35 to 70 percent slopes. Located on Ruffa Ridge on a southeast slope of 38 percent, at an elevation of 6200 feet in the Almanor Ranger District of the Lassen National Forest; 1000 feet south, 1950 feet west of the NE corner, section 20, T27N, R5E, MDBM; Jonesville quadrangle.

(Colors are for dry soil unless otherwise stated. When described on 9/26/80 the soil was dry to 6 inches and moist below).

0–1 to 0 inches; pebbles and pine needles.

A–0 to 6 inches; brown (10YR 5/3) very gravelly sandy loam, very dark grayish brown (10YR 3/2) moist; moderate very fine granular structure; soft, very friable, nonsticky and nonplastic; 30 percent pebbles, 10 percent cobbles; common very fine and fine roots; many very fine interstitial pores; slightly acid (pH 6.5); clear smooth boundary.

Bw–6 to 10 inches; dark yellowish brown (10YR 4/4) very gravelly sandy loam, dark brown (10YR 3/3) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; 25 percent pebbles, 20 percent cobbles; common very fine, fine and coarse roots; many very fine and common fine interstitial pores; medium acid (pH 6.0); abrupt irregular boundary.

R–10 inches; hard, fractured basalt bedrock.

Range in Characteristics: Depth to a lithic contact is less than 20 inches. Mean annual soil temperature may be either mesic or frigid, ranging from 45 to 55 degrees F.. When mesic the soil is at least 10 inches deep. The soil is dry from July 1 to October 1 in all parts of the moisture control section during most years. The mineralogy of the epipedon is considered to be that of an Andic intergrade with low bulk density and a dominance of amorphous materials. The particle size control section may be either medial or medial-skeletal.

The A horizon has dry colors of 10YR 3/2, 3/3; 4/2, 4/3, 5/2, 5/3; 7.5YR 3/2, 4/2 or 5/2. When moist it has colors of 10YR 2/2, 3/2; 7.5YR 2/2 or 3/2. The A horizon is a loamy sand, sandy loam or fine sandy loam with less than 5 to more than 60 percent pebbles and cobbles. It is slightly acid to mildly alkaline.

The B horizon has dry colors of 10YR 4/3, 4/4, 5/3, 5/4; 7.5YR 4/4 or 5/4. When moist it colors of 10YR 2/2, 3/2, 3/3, 3/4; 7.5YR 3/2 or 3/4. The B horizon is a medium acid to mildly alkaline sandy loam or fine sandy loam with less than 5 to more than 50 percent pebbles and cobbles.

LOS GATOS FAMILY

Los Gatos family consists of moderately deep to deep, well drained soils on fans, terraces and benches. These soils formed in material weathering from andesite and basalt flows and colluvium and alluvium derived from these rocks. Slope ranges from 0 to 35 percent. Elevation ranges from 2500 to 5600 feet. The mean annual precipitation is about 20 to 30 inches. The mean annual air temperature is about 55 to 64 degrees F.. Typical vegetation consists of Jeffrey pine, western juniper, black oak, big sage, rabbit brush, and both annual and perennial grasses.

Taxonomic Class: fine-loamy, mixed, mesic Typic Argixerolls.

Reference Pedon: Los Gatos family; mapped in an area of Los Gatos family- Lithic Haploxeralfs, 0 to 15 percent slopes. Located 1/2 mile southeast of Chalk Reservoir on a little used jeep road in the Hat Creek Ranger District of the Lassen National Forest; at an elevation of 2760 feet; 600 feet north, 2200 feet east of the SW corner, section 32, T37N, R4E, MDBM; Burney quadrangle.

(Colors are for dry soil unless otherwise stated. When described on 7/22/81 the soil was dry throughout).

O–1/4 to 0 inches; Oak leaves and dry grass.

A–0 to 4 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; moderate coarse platy structure; hard, very friable, slightly sticky and slightly plastic; few fine and many very fine roots; common very fine interstitial and tubular pores; slightly acid (pH 6.4); abrupt wavy boundary.

BAt–4 to 10 inches; brown (10YR 5/3) clay loam, dark brown (10YR 3/3) moist; strong medium and coarse subangular blocky structure; hard, firm, sticky and plastic; common thin clay films on faces of peds; common fine, medium and coarse and many very fine roots; few fine and many very fine tubular pores; medium acid (pH 5.9); clear smooth boundary.

Bt1–10 to 18 inches; brown (10YR 5/3) clay loam, brown (10YR 4/3) moist; strong medium and coarse subangular blocky structure; hard, firm, sticky and plastic; few moderately thick clay films in pores and on faces of peds and many thin clay films on faces of peds; common very fine, fine, medium and coarse roots; common fine and many very fine tubular pores; medium acid (pH 5.8); clear smooth boundary.

Bt2–18 to 31 inches; pale brown (10YR 6/3) clay loam, brown (10YR 4/3) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic; common thin clay films on faces of peds and common moderately thick clay films in pores; few very fine and common fine and medium roots; common fine and many very fine tubular pores; medium acid (pH 5.8); clear smooth boundary.

C–31 to 48 inches; pale brown (10YR 6/3) very gravelly clay loam, brown (10YR 4/3) moist; moderate fine and medium subangular blocky structure; hard, friable, sticky and plastic; few moderately thick clay films in pores and on faces of peds; 50 percent pebbles, 10 percent cobbles; few very fine and common fine and medium roots; common fine and many very fine tubular pores; medium acid (pH 5.7); clear smooth boundary.

R–48 inches; fractured andesite with some soil in fractures.

Range in Characteristics: Depth to a lithic or paralithic contact ranges from 30 to 60 inches. Mean annual soil temperature is estimated to be between 47 and 56 degrees F.. The soil is dry from July 15 to October 1 in all parts of the moisture control section during most years. Base saturation in the epipedon is estimated to be above 75 percent.

The A horizon has dry colors of 10YR 4/2, 4/3, 5/2 or 5/3. When moist it has colors of 10YR 2/2, 3/2 or 3/3. It is a medium acid to neutral loam or light clay loam. Rock fragments, mostly pebbles, range from 0 to 30 percent.

The Bt horizon has dry colors of 10YR 5/2, 5/3, 5/4, 6/2, 6/3 or 6/4. When moist it has colors of 10YR 3/2, 3/3, 3/4, 4/2, 4/3 or 4/4. It is a medium acid to neutral clay loam, gravelly clay loam, cobbly clay loam or sandy clay loam. It contains 0 to 25 percent rock fragments.

The C horizon has dry colors of 10YR 5/2, 5/3, 6/2 or 6/3. When moist it has colors of 10YR 4/2, 4/3, 5/2 or 5/3. It is a medium acid to neutral clay loam or loam, and may be modified by 10 to 60 percent pebbles and cobbles. It usually averages 35 to 50 percent rock fragments.

NOTE: Los Gatos family soils are of minor extent on the Lassen National Forest occurring only along the extreme northern boundary near Slate Creek and near Lake Britton.

NEER FAMILY

Neer Family consists of deep, well to somewhat excessively drained soils on mountain sideslopes, escarpments of lava flows and gently sloping terrain. These soils formed in material weathering from ash overlying basalt and andesite. Slope ranges from 0 to 70 percent. Elevation ranges from 3200 to 5200 feet. The mean annual precipitation is about 20 to 60 inches. The mean annual air temperature is about 54 to 64 degrees F.. Typical vegetation consists of ponderosa pine, sugar pine, white fir, incense cedar, black oak, huckleberry oak, serviceberry, pinemat manzanita and chokecherry.

Taxonomic Class: medial-skeletal, mesic Andic Xerochrepts.

Reference Pedon: Neer Family; mapped in an area of Neer-Skalan families complex, 0 to 35 percent slopes. Located 1 mile northwest of McElroy Flat, on an east slope of 34 percent in the Hat Creek Ranger District of the Lassen National Forest. At an elevation of 4320 feet; 1000 feet east, 800 feet south of the NW corner, section 11, T33N, R4E, MDBM, Prospect Peak quadrangle.

(Colors are for dry soil unless otherwise stated. When described on 6/11/81 the soil was dry to 2 inches and moist below).

O–2 to 0 inches; mixed conifer litter.

A1–0 to 2 inches; brown (10YR 4/3) gravelly sandy loam, dark brown (7.5YR 3/2) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; 15 percent pebbles, 5 percent cobbles; common very fine and fine roots; common very fine and fine tubular pores; neutral (pH 6.8); abrupt smooth boundary.

A2–2 to 7 inches; brown (7.5YR 5/4) gravelly sandy loam, dark brown (7.5YR 3/4) moist; weak fine and medium granular structure; soft, very friable, nonsticky and nonplastic; 15 percent pebbles, 10 percent cobbles, 5 percent stones; few very fine, common fine and medium roots; common very fine and fine pores and few medium tubular pores; neutral (pH 7.0); clear smooth boundary.

Bw1–7 to 16 inches; strong brown (7.5YR 5/6) very cobbly sandy loam, dark brown (7.5YR 3/4) moist; weak fine and medium granular structure; soft, very friable, nonsticky and nonplastic; 20 percent pebbles, 15 percent cobbles, 5 percent stones; common fine and medium and few coarse roots; common very fine, fine and medium tubular pores; mildly alkaline (pH 7.5); clear smooth boundary.

Bw2–16 to 30 inches; strong brown (7.5YR 5/6) very gravelly sandy loam, dark brown (7.5YR 3/4) moist; weak fine and medium granular structure; soft, very friable, nonsticky and nonplastic; 20 percent pebbles, 10 percent cobbles, 10 percent stones; common very fine and fine and few coarse roots; common fine and medium tubular pores; mildly alkaline (pH 7.5); clear wavy boundary.

BC1–30 to 49 inches; yellowish brown (10YR 5/6) very gravelly fine sandy loam, brown (7.5YR 4/4) moist; weak fine and medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; 25 percent pebbles, 15 percent cobbles, 15 percent stones; few very fine, fine, medium and coarse roots; few fine and medium tubular and few very fine and medium interstitial pores; mildly alkaline (pH 7.5); clear wavy boundary.

BC2–49 to 60 inches; yellowish brown (10YR 5/6) extremely cobbly loam, brown (7.5YR 4/4) moist; weak fine and medium subangular blocky structure; soft, friable, slightly sticky and slightly plastic; 30 percent pebbles, 30 percent cobbles, 20 percent stones; few very fine, fine and medium roots; few fine and medium tubular and common very fine and fine interstitial pores; mildly alkaline (pH 7.5).

Range in Characteristics: Depth to a lithic contact is more than 40 inches. Mean annual soil temperature is estimated to be between 47 and 57 degrtees F.. The soil is dry from July 1 to October 15 in all parts of the moisture control section during most years. When the surface is dark colored it is too thin to be mollic or umbric. The soil is considereed to be an Andic intergrade with a low bulk density and a dominance of amorphous materials. The Neer Family, extremely stony phase, has a profile similar to that described but has 65 to 90 percent of the surface covered by stones and cobbles forming a blanket up to 3 feet thick in places.

The A horizon has dry colors of 10YR 3/3, 3/4, 3/6, 4/3, 4/4, 4/6, 5/3, 5/4 or 5/6. When moist it has colors of 10YR 2/2, 3/2, 3/3 or 3/4. The A horizon is a neutral to slightly acid sandy loam, fine sandy loam or loam with up to 35 percent pebbles, stones and cobbles.

The B horizon has dry colors of 10YR 4/4, 4/6, 5/4, 5/6; 7.5YR 4/4, 4/6, 5/4 or 5/6. When moist it has colors of 10YR 3/3, 3/4, 4/3, 4/4; 7 5YR 3/4 or 4/4. The B horizon is a slightly acid to mildly alkaline sandy loam, loam or light sandy clay loam with up to 80 percent pebbles, cobbles and stones. It averages 35 to 50 percent rock fragments.

PASS CANYON FAMILY

Pass Canyon Family consists of shallow, well drained soils on mountain sideslopes. These soils formed in material weathering from rhyolite on slopes ranging from 0 to 35 percent, with a few inclusions of slopes up to 50 percent. Elevation ranges from 4800 to 5200 feet. The mean annual precipitation is about 18 to 25 inches. The mean annual air temperature is 53 to 62 degrees F.. Typical vegetation consists of ponderosa pine, Jeffrey pine, incense cedar, big sage, and balsam root.

Taxonomic Class: loamy, mixed, mesic Lithic Argixerolls.

Reference Pedon: Pass Canyon Family; mapped in an area of Pass Canyon family- Lithic Haploxeralfs, rhyolitic complex, 0 to 35 percent slopes; near Coble Spring in the Hat Creek Ranger District of the Lassen National Forest, at an elevation of 4800 feet; 500 feet east, 400 feet north of the SW corner, section 32, T35N, R6E, MDBM; Jellico Quadrangle.

(Colors are for dry soil unless otherwise stated. When described on 5/28/81 the soil was dry to 4 inches and moist below).

O–1/2 to 0 inches; pine litter.

A1–0 to 4 inches; grayish brown (10YR 5/2) sandy loam, very dark grayish brown (10YR 3/2) moist; moderate fine and medium granular structure; soft, very friable, nonsticky and nonplastic; 5 percent pebbles; few fine and very fine roots; common very fine interstitial pores; slightly acid (pH 6.5); clear smooth boundary.

A2–4 to 11 inches; grayish brown (10YR 5/2) loam, dark brown (10YR 3/3) moist; weak fine and medium subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; 5 percent pebbles; few fine and medium roots; common very fine and fine interstitial pores; slightly acid (pH 6.5); clear smooth boundary.

Bt–11 to 17 inches; brown (10YR 5/3) loam, dark brown (10YR 3/3) moist; moderate fine and medium subangular blocky structure; hard, friable, slightly sticky and plastic; common moderately thick clay films on faces of peds and in pores; 10 percent pebbles; few fine and medium roots; common fine interstitial pores; slightly acid (pH 6.3); clear smooth boundary.

BCt–17 to 20 inches; brown (10YR 5/3) sandy clay loam, dark brown (7.5YR 3/4) moist; moderate fine and medium subangular blocky structure; hard, firm, sticky and plastic; common moderately thick clay films on faces of peds and in pores; 5 percent pebbles; few fine roots; common fine interstitial pores; slightly acid (pH 6.2).

R–20 inches; hard rhyolite.

Range in Characteristics: Depth to a lithic contact is 20 inches or less. Mean annual soil temperature is estimated to be between 47 and 55 degrees F.. The soil is dry from July 15 to October 1 in all parts of the moisture control section during most years. Base saturation in the epipedon is estimated to be above 75 percent.

The A horizon has dry colors of 10YR 4/2, 4/3, 4/4, 5/2, 5/3 or 5/4. When moist it has colors of 10YR 2/2, 3/2, 3/3 or 3/4. It is a slightly acid to neutral sandy loam or loam with 0 to 10 percent pebbles.

The B horizon has dry colors of 10YR 5/2, 5/3, 5/4, 6/2, 6/3 or 6/4. When moist it has colors of 10YR 3/2, 3/3, 3/4, 4/2, 4/3 or 4/4. It is a slightly acid to neutral loam, clay loam or sandy clay loam. It contains 0 to 15 percent pebbles and usually averages about 10 percent pebbles.

The Pass Canyon family is of very minor extent within the Lassen National Forest, occuring only in the vicinity of Coble Mountain.

PATIO FAMILY

Patio Family consists of moderately deep to deep, well to somewhat excessively drained soils on mountain sideslopes, escarpments and gently sloping hillsides. These soils formed in material weathering from rhyolite, basalt and andesite. Slope ranges from 0 to 70 percent and the elevation ranges from 5200 to 7000 feet. The mean annual precipitation is about 18 to 50 inches. The mean annual air temperature is about 47 to 57 degrees F.. Typical vegetation consists of Jeffrey pine, ponderosa pine, sugar pine, white fir, red fir, incense cedar, juniper, mountain mahogany, chinquapin, greenleaf manzanita, pinemat manzanita, desert mountain mahogany, ribes spp., and big sage.

Taxonomic Class: loamy-skeletal, mixed, frigid Ultic Haploxerolls.

Reference Pedon: Patio Family; mapped in an area of Inville-Patio families association, 15 to 35 percent slopes; located on a logging road on Blacks Mountain on a northeast slope of 15 percent in the Hat Creek Ranger District of the Lassen National Forest. At an elevation of 6560 feet; 1550 feet north, 2100 feet west, of the SW corner, section 22, T34N, R7E, MDBM; Little Valley quadrangle.

(Colors are for dry soil unless otherwise stated. When described on 6/4/81 the soil was dry to 2 inches and moist below).

O–1/2 to 0 inches; conifer litter.

A1–0 to 2 inches; brown (10YR 4/3) cobbly fine sandy loam, dark brown (7.5YR 3/2) moist; weak fine granular structure; soft, very friable, nonsticky and slightly plastic; 10 percent pebbles, 10 percent cobbles; common very fine and few fine roots; common fine and medium interstitial pores; slightly acid (pH 6.5); abrupt smooth boundary.

A2–2 to 9 inches; brown (10YR 4/3) gravelly fine sandy loam, dark brown (7.5YR 3/4) moist; moderate fine and medium granular structure; 15 percent pebbles, 5 percent cobbles; soft, very friable, nonsticky and slightly plastic; many very fine and fine and common medium roots; common fine interstitial and tubular pores; slightly acid (pH 6.5); gradual wavy boundary.

Bw–9 to 20 inches; yellowish brown (10YR 5/4) very cobbly loam, dark brown (7.5YR 3/4) moist; weak fine subangular blocky structure; soft, friable, slightly sticky and slightly plastic; 8 percent pebbles, 30 percent cobbles; common very fine, fine and medium and few coarse roots; few fine interstitial and common fine tubular pores; slightly acid (pH 6.5); clear wavy boundary.

BC–20 to 29 inches; yellowish brown (10YR 5/4) very cobbly loam, dark brown (7.5YR 3/4) moist; weak fine subangular blocky structure; soft, friable, slightly sticky and slightly plastic; 10 percent pebbles, 50 percent cobbles; few fine and medium roots; few fine interstitial and common fine tubular pores; slightly acid (pH 6.5); gradual wavy boundary.

C–29 to 38 inches; yellowish brown (10YR 5/4) extremely cobble loam, dark brown (7.5YR 3/4) moist; weak fine subangular blocky structure; soft, friable, slightly sticky and slightly plastic; 20 percent pebbles, 50 percent cobbles, 10 percent stones; few fine and medium roots; few fine interstitial and common fine tubular pores; slightly acid (pH 6.5); gradual wavy boundary.

R–38 inches; Lithic contact with platy basalt; few roots in cracks.

Range in Characteristics: Depth to a lithic or paralithic contact is usually less than 40 inches but in some cases is deeper than 40 inches. Mean annual soil temperature is estimated to be 43 to 47 degrees F.. The soil is dry from July 1 to October 15 in all parts of the moisture control section during most years. Base saturation is estimated to be between 50 and 75 percent in the upper 30 inches of soil.

The A horizon has dry colors of 10YR 3/2, 3/3, 3/4, 4/2, 4/3, 4/4, 5/2, 5/3, 5/4; 7.5YR 3/2, 3/4, 4/2, 4/4, 5/2 or 5/4. When moist it has colors of 10YR 2/2, 3/2, 3/3 or 7.5YR 3/2. The A horizon is a medium acid to neutral sandy loam or fine sandy loam, with 5 to 20 percent pebbles and 0 to 10 percent cobbles. The combined average of rock fragments is 10 to 25 percent.

The B horizon has dry colors of 10YR 4/3, 4/4, 4/5, 5/3, 5/4, 5/5; 7.5YR 4/4 or 5/4. When moist it has colors of 10YR 3/3, 3/4 or 7.5YR 3/4. The B horizon is a neutral to medium acid sandy loam or loam with 10 to 30 percent pebbles and 10 to 50 percent cobbles. It always averages over 35 percent rock fragments.

The C horizon, when present, consists of highly fractured platy basalt with about 10 to 20 percent soil between the fractures.

The cobbly phase has a profile similar to that described but has 35 to 60 percent of the soil surface covered by

stones and cobbles. These soils generally occur on rims and escarpments with slopes of 35 to 70 percent.

The rhyolitic phase resembles the described profile but colors throughout the profile tend to be browner and are typically 10YR. Typical dry colors are 10YR 6/2, 6/3, 6/4, 7/2, 7/3, 7/4, 8/3 or 8/4. The A horizon of the rhyolitic phase may contain up to 70 percent pebbles, and the B horizon may contain as much as 60 percent pebbles.

PORTOLA FAMILY

Portola Family consists of deep, well drained soils on flats and mountain sideslopes. These soils formed in material weathering from basalt and andesite and alluvium and colluvium from these rock types, on slopes ranging from 0 to 35 percent. Elevation ranges from 5200 to 7000 feet. The mean annual precipitation is about 35 to 80 inches. The mean annual air temperature is about 50 to 60 degrees F.. Typical vegetation consists of ponderosa pine, white fir, red fir, gooseberry, wedgeleaf ceanothus, and perennial bunch grasses.

Taxonomic Class: medial, frigid Andic Xerochrepts.

Reference Pedon: Portola Family; mapped in an area of Portola-Yallani families association, 0 to 35 percent slopes. Located in a borrow pit just south of Devil's Rock Garden in the Hat Creek Ranger District of the Lassen National Forest at an elevation of 5600 feet; 200 feet north, 200 feet west, of the SE corner, section 5, T32N, R4E, MDBM; Manzanita quadrangle.

(Colors are for dry soil unless otherwise stated. When described on 10/26/80 the soil was moist throughtout).

O–1/4 to 0 inches; pine litter.

A1–0 to 4 inches; brown (7.5YR 4/2) gravelly sandy loam, dark brown (7.5YR 3/2) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; 15 percent pebbles; common fine and few medium roots; common very fine interstitial pores; slightly acid (pH 6.5); gradual smooth boundary.

A2–4 to 10 inches; brown (7.5YR 4/4) gravelly fine sandy loam, dark brown (7.5YR 3/4) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; 15 percent pebbles; few fine and medium roots; common very fine interstitial pores; neutral (pH 6.8); gradual smooth boundary.

B1–10 to 19 inches; strong brown (7.5YR 5/6) gravelly fine sandy loam, brown (7.5YR 4/4) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; 15 percent pebbles; few very fine, fine and medium roots; common very fine interstitial pores; neutral (pH 7.0); gradual smooth boundary.

B2–19 to 31 inches; strong brown (7.5YR 5/6) gravelly sandy loam, strong brown (7.5YR 4/6) moist; massive; slightly hard, very friable, nonsticky and nonplastic; 15 percent pebbles; few fine and medium roots; common very fine interstitial pores; neutral (pH 7.0); gradual smooth boundary.

B3–31 to 48 inches; pale brown (10YR 6/3) gravelly fine sandy loam, dark yellowish brown (10YR 4/4) moist; massive; slightly hard, very friable, nonsticky and nonplastic; 15 percent pebbles; 5 percent cobbles; few fine and medium roots; common very fine interstitial pores; neutral (pH 7.2); abrupt wavy boundary.

C–48 to 60 inches; light brownish gray (10YR 6/2) gravelly fine sandy loam, brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; 15 percent pebbles; few fine roots; common very fine interstitial pores; neutral (pH 7.2).

Range in Characteristics: Depth to a lithic or paralithic contact is greater than 40 inches. Mean annual soil temperature is estimated to be 43 to 47 degrees F.. The soil is dry from July 15 to October 1 in all parts of the moisture control section during most years. The soil is considered to be andic with a low bulk density and a dominance of amorphous materials.

The A horizon has dry colors of 7.5YR 4/2, 4/4, 4/6, 5/2, 5/4, or 5/6. When moist it has colors of 7.5YR 3/2 or 3/4. The A horizon is a sandy loam or fine sandy loam with 0 to 15 percent pebbles and 0 to 5 percent cobbles and a combined percentage of 12 to 20 percent rock fragments. It is slightly acid to neutral in reaction.

The B horizon has dry colors of 7.5YR 4/4, 4/6, 5/4, 5/6, 6/4, 6/6; 10YR 4/3, 4/4, 4/6, 5/3, 5/4, 5/6, 6/3, 6/4 or 6/6. When moist it has colors of 7.5YR 4/4, 4/6; 10YR 3/4, 3/6, 4/4 or 4/6. The B horizon is a sandy loam or fine sandy loam with 0 to 20 percent pebbles. It is neutral to medium acid in reaction.

The C horizon has dry colors of 10YR 5/2, 5/3, 5/4, 5/6, 6/2, 6/3, 6/4 or 6/6. When moist it has colors of 10YR 3/3, 3/4, 4/3 or 4/4. The C horizon is a sandy loam, fine sandy loam or sandy clay loam with 0 to 20 percent pebbles. It usually averages about 10 percent pebbles. It is medium acid to neutral in reaction.

In some areas these soils have developed on alluvium or colluvium derived from volcanic rocks. Vegetation on the alluvial phase typically consists of lodgepole pine and perennial grasses.

ROCK OUTCROP

This miscellaneous land type consists of exposed, hard basalt, or less commonly, andesite, rhyolite or metasedimentary rocks. It typically occurs on mountain sideslopes and ridgetops at elevations ranging from 4000 to 9000 feet. Some areas, such as in Thousand Lakes Wilderness, have been subject to glaciation.

Areas mapped as Rock Outcrop are typically devoid of vegetation with the exception of widely scattered brush (greenleaf manzanita, big sage and mountain mahogany) and conifers (Jeffrey pine, lodgepole pine, white fir and mountain hemlock). These species may be found in fractures in the rock or in small colluvial pockets of soil.

Rock Outcrop differs from Lava Flow in consisting of protruding bedrock rather than overlying flow material. In this respect it is generally considered to be older than Lava Flow. It differs from Rubble Land in consisting of competent hard rock rather than detached rock fragments.

ROUEN FAMILY

Rouen Family consists of moderately deep or deep, moderately well drained soils on alluvial fans, terraces and lake deposits. These soils formed in material weathering from volcanic alluvium and lake deposits. Slope ranges from 0 to 15 percent. Elevation ranges from 5000 to 5300 feet. The mean annual precipitation is about 16 to 30 inches. The mean annual air temperature is about 48 to 56 degrees F.. Typical vegetation consists of a few scattered Jeffrey pine with big sage, silver sage, rabbit brush, and annual and perennial grasses.

Taxonomic Class: fine-loamy, mixed, frigid Typic Xerochrepts.

Reference Pedon: Rouen Family; mapped in an area of Lithic Haploxerolls-Rouen family-Rock Outcrop association, 0 to 15 percent slopes; located on the west shore of Eagle Lake at Christie Beach on a 2 percent east facing slope in the Eagle Lake Ranger District of the Lassen National Forest; at an elevation of 5114 feet; 250 feet south, 1400 feet east of the NW corner, section 10, T31N, R10E, MDBM; Antelope Mtn. quadrangle.

(Colors are for dry soil unless otherwise stated. When described on 9/24/74 the soil was dry throughout).

A1–0 to 3 inches; pale brown (10YR 6/3) sandy loam, dark yellowish brown (10YR 3/4) moist; single grain; slightly hard, very friable, nonsticky and nonplastic; many very fine and fine, common medium roots; common fine discontinuous vesicular and few medium discontinuous interstitial pores; neutral (pH 7.0); abrupt smooth boundary.

A2–3 to 8 inches; light gray (10YR 7/2) silty clay, dark grayish brown (10YR 4/2) moist; moderate medium platy structure top inch and moderate medium subangular blocky structure below; hard, firm, slightly sticky and plastic; common fine and medium roots; common fine and medium and few coarse continuous oblique tubular pores; mildly alkaline (pH 7.5); abrupt smooth boundary.

Bw–8 to 22 inches; light brownish gray (10YR 6/2) silty clay, dark brown (10YR 3/3) moist; strong very coarse prismatic structure; very hard, firm, slightly sticky and plastic; common medium roots; common fine and medium continuous vertical tubular pores; moderately alkaline (pH 8.0); clear smooth boundary.

Cx–22 to 68 inches; light brownish gray (10YR 6/2) silty clay, dark brown (10YR 3/3) moist; massive; very hard, firm, slightly sticky and plastic; few coarse vertical tubular pores; moderately alkaline (pH 8.0); clear smooth boundary.

Cr–68 to 78 inches; consolidated lake sediments.

Range in Characteristics: Depth to consolidated lake sediments is usually over 60 inches. Depth to a very hard massive horizon is usually 22 to 38 inches. This horizon is usually impervious to water and roots but is not cemented or consolidated. Mean annual soil temperature is estimated to be 46 to 47 degrees F.. The soil is dry from July 15 to October 1 in all parts of the moisture control section during most years.

The A horizon has dry colors of 10YR 6/2, 6/3, 6/4, 7/2, 7/3 or 7/4. When the soil is located away from a lake the dry colors tend to be 7.5YR 4/2, 4/4, 5/2 or 5/4. When moist it has colors of 10YR 3/3, 3/4, 4/2, 4/3, 4/4; 7.5YR 3/4, 4/4; 5YR 3/3, 3/4, 4/3 or 4/4. It is a slightly acid to mildly alkaline sandy loam or loam. The higher reactions are found near lakes or in basin areas.

The B horizon has dry colors of 10YR 6/2, 6/3, 6/4, 6/6, 7/2, 7/3, 7/4 or 7/6. When moist it has colors of 10YR 3/2, 3/3, 3/4, 4/2, 4/3 or 4/4. It is a neutral to moderately alkaline silty clay or clay.

The C horizon has colors similar to the B horizon. If it is not consolidated it is a mildly to moderately alkaline silty clay or clay.

RUBBLE LAND

This miscellaneous land type consists of highly fractured rock, talus and boulder fields. It occurs on mountain sideslopes and on numerous steep escarpments such as Hat Creek Rim. Slopes range from about 30 to 90 percent but are generally more than 50 percent, elevations range from 4000 to 9000 feet. Many of the escarpments are the result of faulting and subsequent uplift of the land surface.

Rubble Land is typically devoid of vegetation with the exception of widely scattered brush (big sage, mountain mahogany and greenleaf manzanita) and conifers (Jeffrey pine, white fir, juniper and mountain hemlock).

Rubble Land differs from Rock Outcrop and Lava Flow in consisting primarily of detached rock fragments ranging in size from 3 inches to about 5 feet in diameter.

SADIE FAMILY

Sadie Family consists of deep, well drained soils on mountain sideslopes and volcanic flows. The alluvial phase occurs in large flat drainageways and small valleys. These soils formed in material weathering from basalt and andesite and alluvium and colluvium from these rocks. Slope ranges from 0 to 80 percent and elevation ranges from 3000 to 5200 feet. The mean annual precipitation is about 25 to 60 inches. The mean annual air temperature is about 55 to 65 degrees F.. Typical vegetation consists of ponderosa pine, sugar pine, incense cedar, white fir, Jeffrey pine, douglas fir, black oak, desert mountain mahogany, rabbit brush, greenleaf manzanita, ribes spp., and big sage.

Taxonomic Class: medial, mesic Andic Xerochrepts.

Reference Pedon: Sadie Family; mapped in an area of Neer-Sadie families complex, 0 to 35 percent slopes. Located on a logging spur on Brown Butte, 1/4 mile west of Highway 89, on a norhteast slope of 33 percent in the Hat Creek Ranger District of the Lassen National Forest. At an elevation of 3400 feet; 1350 feet north, 900 feet east of the SW corner, section 33, T35N, R4E, MDBM; Burney quadrangle.

(Colors are for dry soil unless otherwise stated. When described on 5/6/81 the soil was dry throughout).

O–3 to 0 inches; duff and forest litter.

A–0 to 2 inches; dark yellowish brown (10YR 4/4) fine sandy loam, dark brown (7.5YR 3/4) moist; weak fine granular structure; soft, very friable, nonsticky and slightly plastic; common very fine and fine roots; common fine interstitial pores; slightly acid (pH 6.5); abrupt smooth boundary.

BA–2 to 10 inches; dark yellowish brown (10YR 4/4) fine sandy loam, dark brown (7.5YR 3/4) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and slightly plastic; 5 percent pebbles; common very fine, few fine, medium and coarse roots; common fine interstitial and tubular pores; neutral (pH 7.3); gradual smooth boundary.

Bw1–10 to 28 inches; dark yellowish brown (10YR 4/6) fine sandy loam, dark brown (7.5YR 3/4) moist; weak fine and medium subangular blocky structure; soft, friable, nonsticky and slightly plastic; 2 percent pebbles; common fine, many medium and common coarse roots; common fine interstitial and tubular pores; neutral (pH 7.0); gradual smooth boundary.

Bw2–28 to 51 inches; dark yellowish brown (10YR 4/6) fine sandy loam, dark brown (7.5YR 3/4) moist; weak fine and medium subangular blocky structure; soft, friable, nonsticky and slightly plastic; 10 percent pebbles, 3 percent cobbles; few very fine and common fine, medium and coarse roots; few fine interstitial and tubular pores; neutral (pH 7.0); gradual smooth boundary.

BC–51 to 58 inches; dark yellowish brown (10YR 4/4) cobbly fine sandy loam, dark brown (7.5YR 3/4) moist; weak fine and medium subangular blocky structure; soft, friable, nonsticky and slightly plastic; 12 percent pebbles, 15 percent cobbles; few very fine and common fine, medium and coarse roots; few fine interstitial and tubular pores; neutral (pH 7.3); clear smooth boundary.

Cr–58 inches; weathered vesicular basalt.

Range in Characteristics: Depth to a lithic or paralithic contact is greater than 40 inches. Mean annual soil temperature is estimated to be between 47 and 58 degrees F.. The soil is dry from July 1 to October 15 in all parts of the moisture control section during most years. When the surface is dark colored it is too thin to be umbric. The soil is considered to be an Andic intergrade, with low bulk density and a dominance of amorphous materials in the exchange complex.

The A horizon has dry colors of 10YR 3/2, 3/3, 3/4, 4/2, 4/3, 4/4, 5/2, 5/3, 5/4, 6/2, 6/3, 6/4; 7.5YR 3/2, 3/4, 4/2, 4/4, 5/2, 5/4, 6/2 or 6/4. When moist it has colors of 10YR 2/2, 3/2, 3/3, 3/4, 4/2, 4/3, 4/4; 7.5YR 3/2, 3/4, 4/2 or 4/4. The A horizon is a slightly acid to neutral sandy loam, fine sandy loam or loam, with 0 to 20 percent pebbles.

The B horizon has dry colors of 10YR 4/3, 4/4, 4/6, 5/3, 5/4, 5/6, 6/3, 6/4, 6/6; 7.5YR 4/4, 4/6, 5/4, 5/6, 6/4 or 6/6. When moist it has colors of 10YR 3/2, 3/3, 3/4, 4/2, 4/3, 4/4; 7.5YR 3/2, 3/4, 4/2 or 4/4. The B horizon is a strongly acid to neutral coarse sandy loam, sandy loam, fine sandy loam or loam with 0 to 20 percent pebbles and 0 to 15 percent cobbles. It usually averages 10 to 20 percent rock fragments.

The Cr horizon consists of weathered basalt or andesite.

SHELD FAMILY

Sheld Family consists of moderately deep to deep, well to excessively drained soils on upland flats, mountain sideslopes, undulating hills and glacial moraines. These soils formed in material weathering from andesite and basalt flows and glacial outwash from volanic origin. Slope ranges from 0 to 70 percent. Elevation ranges from 5200 to about 8000 feet. The mean annual precipitation is about 25 to 85 inches. The mean annual air temperature averages 45 to 55 degrees F.. Typical vegetation consists of red fir, white fir, sugar pine, incense cedar, Jeffrey pine, ponderosa pine, lodgepole pine, mountain hemlock, chinquapin, greenleaf manzanita and pinemat manzanita.

Taxonomic Class: medial-skeletal, frigid Andic Xerumbrepts.

Reference Pedon: Sheld Family; mapped in an area of Sheld Family, 0 to 35 percent slopes; on the Humbug Summit Road on a southwest aspect in the Almanor Ranger District of the Lassen National Forest, at an elevation of 6340 feet; 550 feet south, 500 feet west of the NE corner, section 22, T26N, R5E, MDBM; Jonesville Quadrangle.

(Colors are for dry soil unless otherwise stated. When described on September 29, 1980 the soil was moist throughout).

O–1 to 0 inches; red fir litter.

A–0 to 7 inches; dark brown (10YR 3/3) stony sandy loam, very dark brown (10YR 2/2) moist; weak very fine and fine granular structure; soft, very friable, nonsticky and nonplastic; 10 percent pebbles, 5 percent cobbles, 5 percent stones; common very fine and fine roots; common very fine, fine and medium interstitial pores; slightly acid (pH 6.5); clear smooth boundary.

AB–7 to 14 inches; brown (10YR 4/3) cobbly sandy loam, dark brown (10YR 3/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; 10 percent pebbles, 15 percent cobbles, 6 percent stones; common very fine, fine, and medium and few coarse roots; common fine and medium tubular pores; medium acid (pH 6.0); gradual smooth boundary.

B–14 to 34 inches; dark yellowish brown (10YR 4/4) very stony loam, dark yellowish brown (10YR 3/4) moist; weak fine subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; 20 percent pebbles, 10 percent cobbles, 11 percent stones; common medium and coarse roots; few very fine and fine tubular pores; strongly acid (pH 5.5); diffuse smooth boundary.

BC–34 to 60 inches; dark yellowish brown (10YR 4/4) very stony sandy loam, dark yellowish brown (10YR 3/4) moist; weak fine subangular blocky structure breaking to single grain; soft, very friable, slightly sticky and nonplastic; 30 percent pebbles, 10 percent cobbles, 15 percent stones; common medium and coarse roots; few very fine and fine tubular pores; strongly acid (pH 5.5).

Range in Characteristics: Depth to a lithic or paralithic contact ranges from 22 to more than 60 inches. Mean annual soil temperature is estimated to be below 47 degrees F.. The soil is dry from July 15 to October 1 in all parts of the moisture control section during most years. The soil is considered to be Andic, with a low bulk density and a dominance of amorphous material within the upper 7 inches of the epipedon. Base saturation in the epipedon is estimated to be below 50 percent.

The A horizon has colors of 10YR 3/2, 3/3, 3/4, 4/2, 4/3, 4/4, 5/2, 5/3, 5/4; 7.5YR 3/2, 3/4, 4/2, 4/4, 5/2 or 5/4. When moist it has colors of 10YR 2/2, 3/2, 3/3 or 7.5YR 3/2. It is a neutral to medium acid sandy loam, fine sandy loam, or light sandy clay loam, with 5 to 30 percent pebbles, 2 to 15 percent cobbles and 5 to 30 percent stones. The combined average is 15 to 35 percent rock fragments. The glacial phase has at least 15 percent stones and boulders on the surface, and the stony and cobbly phases has anywhere from 35 to 90 percent stones and cobbles on the surface.

The B horizon has colors of 10YR 4/3, 4/4, 4/6, 5/3, 5/4, 5/6; 7.5YR 4/4, 4/6, 5/4 or 5/6. When moist it has colors of 10YR 3/3, 3/4 or 7.5YR 3/4. It is a slightly to strongly acid sandy loam, fine sandy loam, loam or light sandy clay loam, with 5 to 30 percent pebbles, 5 to 20 percent cobbles, and 20 to 50 percent stones. The B horizon averages 40 to 60 percent rock fragments.

The C horizon, when present, is similar to the B horizon except that it has a higher percentage of rock fragments.

SKALAN FAMILY

Skalan Family consists of deep, well to somewhat excessively drained soils on mountain sideslopes, gently sloping hills and undulating flats. These soils formed in material weathering from andesite and basalt flows. Slope ranges from 0 to 70 percent and elevation ranges from 3000 to 5200 feet. The mean annual precipitation is about 20 to 65 inches. The mean annual air temperature is about 55 to 65 degree degrees F.. Typical vegetation consists of Jeffrey pine, ponderosa pine, sugar pine, white fir, incense cedar, black oak, huckleberry oak, western serviceberry, pinemat manzanita and chokecherry.

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

Reference Pedon: Skalan Family; mapped in an area of Skalan-Holland families association, 35 to 50 percent slopes. Located 3/4 mile southwest of the intersection of Highway 89 and Wilcox Road on an east slope of 35 percent in the Hat Creek Ranger District of the Lassen National Forest. At an elevation of 4280 feet; 450 feet north, 2000 feet east of the SW corner, section 2, T33N, R4E, MDBM; Prospect Peak quadrangle.

(Colors are for dry soil unless otherwise stated. When described on 6/11/81 the soil was moist throughout).

O–1 to 0 inches; pine and fir duff.

A1–0 to 3 inches; brown (10YR 4/3) gravelly sandy loam, dark brown (7.5YR 3/2) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; 15 percent pebbles, 3 percent cobbles, 3 percent stones; common very fine and fine roots; common very fine and fine interstitial pores; slightly acid (pH 6.5); abrupt smooth boundary.

A2–3 to 8 inches; brown (7.5YR 4/4) cobbly sandy loam, dark brown (7.5YR 3/4) moist; weak fine and medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; 15 percent pebbles, 10 percent cobbles, 3 percent stones; common very fine, fine and medium roots; common very fine and fine interstitial and few medium tubular pores; slightly acid (pH 6.5); clear smooth boundary.

BA–8 to 14 inches; brown (7.5YR 4/4) cobbly loam, dark brown (7.5YR 3/4) moist; weak fine and medium subangular blocky structure; soft, very friable, slightly sticky and nonplastic; 15 percent pebbles, 10 percent cobbles, 3 percent stones; common fine and medium and few coarse roots; common fine and medium tubular and few fine interstitial pores; neutral (pH 6.7); clear wavy boundary.

Bt1–14 to 23 inches; brown (7.5YR 4/4) very cobbly loam, dark brown (7.5YR 3/4) moist; moderate fine subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; few thin clay films colloid stains mineral grains; 25 percent pebbles, 15 percent cobbles, 5 percent stones; few very fine, common fine and few medium roots; common fine and medium tubular and interstitial pores; neutral (pH 6.7); clear wavy boundary.

Bt2–23 to 31 inches; strong brown (7.5YR 4/6) very cobbly clay loam, dark brown (7.5YR 3/4) moist; moderate fine and medium subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; few moderately thick clay films on faces of peds and in pores; 25 percent pebbles, 15 percent cobbles, 10 percent stones; few fine and medium roots; common fine and medium interstitial and tubular pores; neutral (pH 6.7); clear wavy boundary.

BCt–31 to 60 inches; yellowish brown (10YR 5/6) very cobbly clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; common moderately thick clay films on faces of peds and in pores; 25 percent pebbles, 20 percent cobbles, 8 percent stones; few medium roots; common fine and medium interstitial and tubular pores; neutral (pH 6.7).

Range in Characteristics: Depth to a lithic or paralithic contact is greater than 40 inches. When this soil occurs on diatomaceous earth depth to a paralithic contact is 25 to 40 inches. Mean annual soil temperature is estimated to be between 47 and 58 degrees F.. The soil is dry from July 1 to October 15 in all parts of the moisture control section during most years. When the surface is dark colored it is too thin to be umbric or mollic. Base saturation is estimated to be between 35 and 75 percent in the upper portion of the argillic horizon.

The A horizon has dry colors of 10YR 4/2, 4/3, 4/4, 4/6, 5/2, 5/3, 5/4, 5/6, 6/2, 6/3, 6/4, 6/6; 7.5YR 4/2, 4/4, 4/6, 5/2, 5/4, 5/6, 6/2, 6/4, 6/6; 5YR 4/2, 4/3, 4/4, 4/6, 5/2, 5/3, 5/4, 5/6, 6/2, 6/3, 6/4 or 6/6. When moist it has colors of 10YR 2/1, 2/2, 3/1, 3/2, 3/3, 3/4; 7.5YR 3/2, 3/4; 5YR 2/2, 3/2, 3/3, 3/4; 2.5YR 2/2, 2/4, 3/2 or 3/4. The A horizon is a neutral sandy loam

or light loam with 0 to 20 percent pebbles and 0 to 30 percent cobbles. They average 15 to 25 percent rock fragments.

The Bt horizon has dry colors of 10YR 3/4, 3/6, 4/4, 4/6, 5/4, 5/6; 7.5YR 3/4, 4/4, 4/6, 5/4, 5/6; 5YR 3/4, 4/4, 4/6, 5/4 or 5/6. When moist it has colors of 7.5YR 3/2, 3/4, 4/2, 4/4; 5YR 3/3, 3/4, 4/3 or 4/4. The Bt horizon is a neutral to strongly acid sandy clay loam, clay loam, light clay loam or loam, with 5 to 35 percent pebbles and 10 to 30 percent cobbles and stones. They always average over 35 percent rock fragments. The Bt horizon contains at least 1.2 times more clay than the overlying horizon.

A C horizon may or may not be present. When it is present it is similar to the B horizon but contains higher percentages of rock fragments.

Skalan Family, extremely stony phase soils, have a profile similar to that described above, but have between 65 and 90 percent of the surface covered by stones and cobbles forming a blanket up to three feet thick in some areas.

SUPAN FAMILY

Supan Family consists of moderately deep to very deep, well drained soils in larger valleys and mountain sideslopes. These soils formed in material weathering from volcanic alluvium and andesite and basalt bedrock. Slope ranges from 0 to 15 percent. Elevation ranges from 3500 to 5000 feet. The mean annual precipitation is about 15 to 30 inches. The mean annual air temperature is about 60 to 65 degrees F.. Typical vegetation, where uncleared, consists of ponderosa pine, Jeffrey pine, digger pine, western juniper, incense cedar, black oak, white oak, bitterbrush, big sage, desert mountain mahogany and annual grasses.

Taxonomic Class: fine-loamy, mixed, mesic Pachic Argixerolls.

Reference Pedon: Supan Family; mapped in an area of Supan family, 0 to 15 perecent slopes. Located just outside of the University of California Radio Astronomy Facility in Hat Creek Valley, on a flat in the Hat Creek Ranger District of the Lassen National Forest. At an elevation of 3520 feet; 50 feet north, 2000 feet west, of the SE corner, section 1, T34N, R4E, MDBM; Jellico quadrangle.

(Colors are for dry soil unless otherwise stated. When described on 6/9/81 the soil was dry to 4 inches and moist below).

A1–0 to 1 inches; dark grayish brown (10YR 4/2) sandy loam, very dark gray (10YR 3/1) moist; weak fine granular and single grain structure; soft, very friable, slightly sticky and nonplastic; 5 percent pebbles; common very fine and fine roots; few very fine and fine interstitial pores; slightly acid (pH 6.2); abrupt smooth boundary.

A2–1 to 4 inches; dark grayish brown (10YR 4/2) sandy loam, very dark gray (10YR 3/1) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few thin clay film colloid stains mineral grains; 5 percent pebbles; few fine and common very fine roots; common fine and medium interstitial pores; slightly acid (pH 6.5); clear smooth boundary.

Bt1–4 to 10 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; moderate fine and medium subangular blocky structure; slightly hard, firm, slightly sticky and slightly plastic; few thin clay films on faces of peds and in pores; 3 percent pebbles; common fine and medium roots; few fine interstitial and common fine tubular pores; slightly acid (pH 6.3); clear smooth boundary.

Bt2–10 to 20 inches; grayish brown (10YR 5/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; common moderately thick clay films on faces of peds and in pores; 3 percent pebbles; few fine and medium roots; common fine interstitial and common medium tubular pores; neutral (pH 7.0); clear smooth boundary.

Bt3–20 to 33 inches; light brownish gray (10YR 6/2) clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; common moderately thick clay films on faces of peds and in pores; 3 percent pebbles; few fine and medium roots; common fine interstitial and common medium tubular pores; neutral (pH 7.0); abrupt wavy boundary.

2C–33 to 60 inches; brown (7.5YR 5/2) loamy sand, dark brown (7.5YR 3/2) moist; massive; loose, nonsticky and nonplastic; few thin clay film colloid stains mineral grains; few fine and medium roots; few fine and medium tubular pores; mildly alkaline (pH 7.5).

Range in Characteristics: Depth to a lithic or paralithic contact ranges from 26 to over 60 inches. Mean annual soil temperature is estimated to be between 50 and 58 degrees F.. The soil is dry between July 15 and October 1 in all parts of the moisture control section during most years. Base saturation in the upper 30 inches of soil is estimated to be greater than 75 percent. This soil is mapped in a few areas at the higher elevations with greater rainfall. The soil may be ultic in these areas.

The A horizon has dry colors of 10YR 4/2, 4/3, 5/2 or 5/3. When moist it has colors of 10YR 3/1, 3/2 or 3/3. The A horizon is a slightly acid to mildly alkaline sandy loam, loam or clay loam with less than 5 percent pebbles.

The Bt horizon has dry colors of 10YR 4/2, 4/3, 4/4, 5/2, 5/3, 5/4; 7.5YR 4/2, 4/4, 5/2, 5/4; 5YR 4/2, 4/3, 4/4, 5/2, 5/3 or 5/4. When moist it has colors of 10YR 3/2, 3/3, 3/4; 7.5YR 3/2, 3/4; 5YR 3/2, 3/3 or 3/4. The redder colors occur on the mountain sideslopes. The Bt horizon is a slightly acid to moderately alkaline loam or clay loam with less than 5 percent pebbles. It contains at least 1.2 times the clay content of the overlying horizon.

The C horizon has dry colors of 10YR 4/2, 5/2; 7.5YR 4/2 or 5/2. When moist it has colors of 10YR 3/2 or 7.5YR 3/2. It is a loamy sand with 0 to 10 percent pebbles.

TROJAN FAMILY

The Trojan Family consists of deep, well drained soils on mountain sideslopes, ridges, flats and gently sloping hills. These soils formed in material weathering from basalt and andesite flow rocks and rhyolite on slopes ranging from 0 to 50 percent. Elevation ranges from 5100 to 7000 feet. The mean annual precipitation is about 16 to 35 inches. The mean annual air temperature ranges from 47 to 55 degrees F.. Typical vegetation consists of Jeffrey pine, white fir, incense cedar, western juniper, mountain mahogany, big sage, greenleaf manzanita, pinemat manzanita and desert mountain mahogany.

Taxonomic Class: fine-loamy, mixed, frigid Ultic Argixerolls.

Reference Pedon: Trojan Family; mapped in an area of Trojan-Klicker families associaton, 0 to 35 percent slopes; on Forest Service Road No. 22 about 1 1/2 miles southwest of Pat Morris Station in the Eagle Lake Ranger District of the Lassen National Forest; at an elevation of 6000 feet; 1750 feet north, 1200 feet west, of the SE corner, section 11, T34N, R9E, MDBM; Hayden Hill quadrangle.

(Colors are for dry soil unless otherwise stated. When described on 6/2/81 the soil was moist throughout).

0–2 to 1 inches; fresh and decomposed pine and fir needles.

A–0 to 5 inches; dark yellowish brown (10YR 4/4) loam, dark brown (7.5YR 3/2) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; 2 percent pebbles; common fine and medium roots; common fine and medium interstitial pores; slightly acid (pH 6.3); clear smooth boundary.

AB–5 to 11 inches; dark yellowish brown (10YR 4/4) loam, dark reddish brown (5YR 3/3) moist; weak medium subangular blocky structure breaking to weak fine granular structure; soft, very friable, slightly sticky and nonplastic; 5 percent pebbles, 2 percent cobbles; few fine and medium roots; common fine and medium interstitial pores; slightly acid (pH 6.5); clear smooth boundary.

BAt–11 to 22 inches; brown (7.5YR 4/4) loam, dark reddish brown (5YR 3/4) moist; weak fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few thin clay films on faces of peds and colloid stains mineral grains; 5 percent pebbles, 5 percent cobbles; few fine and common medium and coarse roots; common fine and medium interstitial pores and common fine tubular pores; slightly acid (pH 6.5); abrupt smooth boundary.

Bt1–22 to 34 inches; brown (7.5YR 4/4) gravelly sandy clay loam, dark brown (7.5YR 3/4) moist; weak fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few thin clay films on faces of peds and in pores; 20 percent pebbles, 5 percent cobbles; few fine, medium and coarse roots; common fine and medium interstitial and common fine tubular pores; slightly acid (pH 6.5); clear smooth boundary.

Bt2–34 to 46 inches; brown (7.5YR 5/4) gravelly clay loam, dark brown (7.5YR 3/4) moist; weak fine and medium subangular blocky structure; slightly hard, friable, slightly sticky and plastic; common moderately thick clay films on faces of peds and in pores; 10 percent pebbles, 5 percent cobbles; few fine and medium roots; common fine and medium interstitial and common fine tubular pores; slightly acid (pH 6.5); abrupt irregular boundary.

Cr–46 to 60 inches; slightly weathered basalt rock with soil from above horizon in the fractures.

Range in Characteristics: Depth to a lithic or paralithic contact is greater than 40 inches. Mean annual soil temperature is estimated to be 43 to 47 degrees F.. The soil is dry from July 1 to October 1 in all parts of the moisture control section during most years. Base saturation in the epipedon is estimated to be between 50 and 75 percent.

The A horizon has dry colors of 10YR 4/2, 4/3, 4/4, 5/2, 5/3 or 5/4. When moist it has colors of 10YR 2/2, 3/2, 3/3; 7.5YR 3/2; 5YR 2/2, 3/2 or 3/3. When this soil is weathering from rhyolite material the colors are 10YR. It is a slightly acid loam with 0 to 5 percent pebbles.

The Bt horizon has dry colors of 10YR 4/3, 4/4, 5/3, 5/4, 6/3, 6/4; 7.5YR 4/4, 5/4, 6/4; 5YR 4/3, 4/4, 5/3, 5/4, 6/3 or 6/4. When moist it has colors of 7.5YR 3/4, 4/4 or 5YR 3/4. It is a neutral to slightly acid loam, sandy clay loam or clay loam, modified by 5 to 20 percent pebbles and 0 to 5 percent cobbles. The combined average of rock fragments is 10 to 20 percent.

The C horizon is slightly weathered basalt, andesite or rhyolite rock with soil from the Bt horizon in the fractures.

TYPIC XERORTHENTS

Typic Xerorthents consists of deep, somewhat excessively drained soils on cinder cones. These soils formed in material weathering from cinders. Slope ranges from 10 to 65 percent. Elevation ranges from 3500 to 7500 feet. The mean annual precipitation is about 30 to 55 inches. The mean annual air temperature is about 45 to 64 degrees F.. Typical vegetation consists of red fir, white fir, Jeffrey pine, ponderosa pine, mountain hemlock, chinquapin, pinemat manzanita, bitterbrush and currant.

Taxonomic Class: Typic Xerorthents.

Reference Pedon: Typic Xerorthents; mapped in an area of Typic Xerorthents- Yallani family association, 0 to 35 percent slope. Located along USFS Road 35N17 near Bear Wallow Butte on a northeast aspect of 16 percent in the Hat Creek Ranger District of the Lassen National Forest. At an elevation of 5560 feet; 1500 feet south, 2400 feet east of NW corner, Section 9, T32N, R4E, MDBM; Manzanita Lake quadrangle.

(Colors are for dry soil unless otherwise stated. When described on 10/26/80 the soil was dry to 12 inches, moist from 12 to 20 and dry below 20 inches).

0–1 to 0 inches; forest litter.

A1–0 to 4 inches; brown (10YR 4/3) gravelly sandy loam, very dark brown (10YR 2/2) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; 20 percent pebbles; common very fine and many fine roots; common fine interstitial pores; slightly acid (pH 6.5); abrupt smooth boundary.

A2–4 to 12 inches; light brown (7.5YR 6/4) gravelly coarse sandy loam, dark brown (7.5YR 3/4) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; 30 percent pebbles; common fine and medium roots; common fine and medium interstitial pores; neutral (pH 7.0); clear smooth boundary.

C1–12 to 20 inches; light brown (7.5YR 6/4) very gravelly loamy coarse sand, dark brown (7.5YR 3/4) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; 40 percent pebbles; common very fine and few fine and medium roots; common fine and medium interstitial pores; neutral (pH 7.0); abrupt smooth boundary.

C2–20 to 26 inches; brownish yellow (10YR 6/6) very gravelly loamy coarse sand, strong brown (7.5YR 4/6) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; 40 percent pebbles; few fine and medium roots; common fine and medium interstitial pores; neutral (pH 7.0); abrupt smooth boundary.

C3–26 to 41 inches; brownish yellow (10YR 6/6) very gravelly loamy coarse sand, brown (7.5YR 4/4) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; 40 percent pebbles; few fine and medium roots; common fine and medium interstitial pores; neutral (pH 7.0); clear smooth boundary.

C4–41 to 60 inches; basaltic cinders, predominantly 1 to 10 mm in diameter.

Range in Characteristics: Depth to unconsolidated cinders is typically greater than 35 inches. Mean annual soil temperature is estimated to be 40 to 55 degrees F.. The soil is dry from July 1 to October 1 in all parts of the moisture control section during most years. When the surface is dark it is too thin to be umbric. These soils have a low bulk density and greater than 60 percent volcanic cinders and other pyroclastic material by weight in the upper 35 centimeters.

The A horizon has dry colors of 10YR 3/2, 3/3, 3/4, 4/2, 4/3, 4/4, 5/2, 5/3 or 5/4. When moist it has colors of 10YR 2/2, 2/3, 2/4, 3/2, 3/3 or 3/4. The A horizon is a slightly to moderately acid sandy loam or loamy sand with 20 to 40 percent pebble sized cinders.

The C horizon has dry colors of 10YR 6/4, 6/6; 7.5YR 6/4 or 6/6. When moist it has colors of 7.5YR 3/4, 4/4 or 4/6. It is a slightly acid to neutral loamy sand or loamy coarse sand with more than 35 percent volcanic cinders by volume. It overlies unconsolidated volcanic cinders.

WASHOUGAL FAMILY

Washougal Family consists of moderately deep to deep, well drained soils on upland flats, mountain sideslopes, undulating hills, glacial moraines and glacial valleys. These soils formed in material weathering from basalt and andesite. Slope ranges from 0 to 50 percent. Elevation ranges from 3500 to 5300 feet. The mean annual precipitation is about 25 to 80 inches. The mean annual air temperature is 55 to 64 degrees F.. Typical vegetation consists of Jeffrey pine, incense cedar, ponderosa pine, white fir, lodgeopole pine, greenleaf manzanita, and desert mountain mahogany.

Taxonomic Class: medial-skeletal, mesic Andic Xerumbrepts.

Reference Pedon: Washougal Family; mapped in an area of Washougal Family, 0 to 35 percent slopes; on the Warner Valley Highway about 1/2 mile north of Warner Camp Ground on a west slope of 5 percent, in the Almanor Ranger District of the Lassen National Forest at an elevation of 5040 feet; 2100 feet south, 675 feet west of the NE corner, section 16, T29N, R6E, MDBM; Mt Harkness Quadrangle.

(Colors are for dry soil unless otherwise stated. When described on 6/28/81 the soil was dry throughout).

O–1 to 0 inches; forest litter and grass.

A1–0 to 3 inches; very dark grayish brown (10YR 3/2) gravelly sandy loam, black (10YR 2/1) moist; weak very fine granular structure and single grain; soft, very friable, nonsticky and nonplastic; 10 percent pebbles, 5 percent cobbles; common very fine and few fine roots; common very fine and fine interstitial pores; medium acid (pH 6.0); abrupt smooth boundary.

A2–3 to 10 inches; very dark grayish brown (10YR 3/2) cobbly sandy loam, black (10YR 2/1) moist; weak fine and medium granular structure; soft, very friable, nonsticky and nonplastic; 10 percent pebbles, 10 percent cobbles; common very fine, many fine and few medium roots; common fine interstitial and few fine tubular pores; slightly acid (pH 6.3); clear smooth boundary.

B1–10 to 23 inches; dark brown (10YR 3/3) very cobbly sandy loam, black (10YR 2/1) moist; weak fine and medium granular structure; soft, very friable, nonsticky and nonplastic; 20 percent pebbles, 20 percent cobbles, 10 percent stones; many fine and medium and few coarse roots; common very fine and fine interstitial and common fine and medium tubular pores; slightly acid (pH 6.5); clear smooth boundary.

B2–23 to 42 inches; dark brown (10YR 3/3) very stony sandy loam, black (10YR 2/1) moist; weak very fine and fine granular structure; soft, very friable, nonsticky and nonplastic; 20 percent pebbles, 15 percent cobbles, 15 percent stones; few very fine, common fine and medium and few coarse roots; common very fine and fine interstitial and common fine and medium tubular pores; slightly acid (pH 6.5); abrupt smooth boundary.

Cqm–42 inches; indurated glacial till consisting of silica cemented pebbles and cobbles with a few roots penetrating the upper few inches.

Range in Characteristics: Depth to a lithic or paralithic contact or to an indurated pan is 26 to 60 inches. Mean annual soil temperature is estimated to be between 47 and 56 degrees F.. The soil is dry from July 15 to October 1 in all parts of the moisture control section during most years. The soil is considered to be Andic, with low bulk density and a dominance of amorphous material within the upper 7 inches of the epipedon. Base saturation in the epipedon is estimated to be below 50 percent.

The A horizon has colors of 10YR 3/2, 3/3, 3/4, 4/2, 4/3, 4/4; 7.5YR 3/2 or 3/4. When moist it has colors of 10YR 2/1, 2/2 or 7.5YR 2/1. The A horizon is a neutral to medium acid sandy loam, light sandy loam or light sandy clay loam with 5 to 20 percent pebbles and 5 to 15 percent cobbles. It averages 10 to 20 percent rock fragments.

The B horizon has colors of 10YR 3/3, 3/4, 3/6, 4/3, 4/4, 4/6; 7.5YR 3/4, 4/4 or 4/6. When moist it has colors of 10YR 2/1, 2/2, 3/1, 3/2, 3/3, 3/4, 4/1, 4/2, 4/3, 4/4; 7.5YR 3/2, 3/4, 4/2 or 4/4. It is a neutral to medium acid sandy loam, loam or light sandy clay loam with 15 to 25 percentd pebbles and 15 to 35 percent cobbles and stones. The B horizon averages 40 to 55 percent rock fragments.

The Cqm horizon is an indurated glacial till or stratified alluvium.

The glacial phase of the Washougal Family is similar to the described profile. Rock fragments, however, range up to 35 percent in the A horizon, 60 percent in the B horizon and 80 percent in the underlying till. Textures throughout the profile are sandy loams. The underlying till may have a loamy sand texture.

WINTONER FAMILY

Wintoner Family consists of deep well drained soils on gently to steeply sloping mountain sideslopes, ridges and canyons. These soils formed in material weathering from andesitic and basaltic flow rocks on slopes ranging from 5 to 50 percent. Elevation ranges from 5200 to 7000 feet. The mean annual precipitation is about 20 to 50 inches. The mean annual air temperature is 45 to 55 degrees F.. Typical vegetation consists of red fir, white fir, sugar pine, ponderosa pine, Jeffrey pine, incense cedar and chinquapin.

Taxonomic Class: fine-loamy, mixed, frigid Ultic Haploxeralfs.

Reference Pedon: Wintoner Family; mapped in an area of Wintoner-Inville Families complex, 0 to 35 percent slopes; located 0.2 miles down an unmarked logging spur off the Humbug Valley-Humbug Summit Road on a 25 percent northeast facing slope, in the Almanor Ranger District of the Lassen National Forest at an elevation of 5700 feet; 1200 feet north, 2250 feet west of the SE corner, section 4, T26N, R6E, MDBM; Jonesville quadrangle.

(Colors are for dry soil unless otherwise stated. When described on 10/12/80 the soil was moist throughtout).

0–1 to 0 inches; conifer litter.

A–0 to 5 inches; dark yellowish brown (10YR 3/4) gravelly sandy loam, dark brown (7.5YR 3/2) moist; moderate very fine granular structure; soft, very friable, nonsticky and nonplastic; 15 percent pebbles; many very fine and fine and common medium roots; many very fine and fine interstitial pores; neutral (pH 7.0); clear smooth boundary.

BAt–5 to 22 inches; strong brown (7.5YR 4/6) loam, dark brown (7.5YR 3/4) moist; moderate medium granular structure; soft, very friable, slightly sticky and slightly plastic; few thin clay films on faces of peds and common moderately thick clay films in pores; 10 percent pebbles; many fine and medium roots; many very fine and fine interstitial pores; slightly acid (pH 6.2); gradual smooth boundary.

Bt–22 to 34 inches; brown (7.5YR 4/4) loam, dark brown (7.5YR 3/4) moist; moderate medium subangular blocky structure; slightly hard, firm, sticky and slightly plastic; common moderately thick clay films on faces of peds and in pores; 6 percent pebbles, 5 percent cobbles; common fine, medium, and coarse roots; common fine interstitial and tubular pores; medium acid (pH 6.0); gradual wavy boundary.

BCt–34 to 43 inches; dark yellowish brown (10YR 4/4) clay loam, brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; common moderately thick clay films on faces of peds and in pores; 6 percent pebbles; few fine, medium and coarse roots; few fine and medium tubular pores; strongly acid (pH 5.5); gradual wavy boundary.

Cr–43 to 50 inches; strongly weathered andesite bedrock with some roots penetrating fractures.

Range in Characteristics: Depth to a lithic or paralithic contact is 40 to 60 inches. Mean annual soil temperature is estimated to be 45 to 47 degrees F.. The soil is dry from July 15 to October 1 in all parts of the moisture control section during most years. Base saturation is estimated to be below 75 percent in the upper portion of the argillic horizon.

The A horizon has dry colors of 10YR 3/2, 3/3, 3/4, 4/2, 4/3, 4/4, 5/2, 5/3, 5/4; 7.5YR 3/2, 3/4, 4/2, 4/4, 5/2, or 5/4. When moist it has colors of 10YR 3/2, 3/3, 3/4; 7.5YR 3/2, 3/4; 5YR 3/2, 3/3 or 3/4. The A horizon is a moderately acid to neutral sandy loam, fine sandy loam or loam with 0 to 15 percent pebbles and 0 to 10 percent cobbles, and a combined average of 5 to 15 percent rock fragments.

The Bt horizon has dry colors of 10YR 3/4, 3/6, 4/4, 4/6, 5/4, 5/6; 7.5YR 4/6 or 5/6. When moist it has colors of 7.5YR 3/4 or 4/4. The Bt horizon is a strongly acid to neutral sandy loam, sandy clay loam or clay loam with 0 to 30 percent pebbles and 0 to 5 percent cobbles. It averages 5 to 20 percent rock fragments. It contains at least 1.2 times the clay content of the above horizon.

The soil overlies strongly weathered basalt or andesite rock.

XERIC DURANDEPTS

Xeric Durandepts consists of moderately deep, moderately well to well drained soils on glacial ridges, valleys and ground moraines. These soils formed in material weathering from glacial alluvial outwash and glacial deposit. Slope ranges from 0 to 35 percent. Elevation ranges from 5200 to 7500 feet. The mean annual precipitation is about 35 to 45 inches. The mean annual air temperature is about 46 to 55 degrees F.. Typical vegetation consists of scattered red and white fir and lodgepole pine with some Jeffrey pine, greenleaf manzanita and annual and perennial grasses.

Taxonomic Class: Xeric Durandepts.

Reference Pedon: Xeric Durandepts; mapped in an area of Xeric Durandepts-Xeric Durandepts, ashy association, 0 to 35 percent slopes; one mile east of Caribou Peak and 100 feet north of a logging road in a flat valley in the Eagle Lake Ranger District on the Lassen National Forest; at an elevation of 6450 feet; 350 feet east, 1300 feet south of the NW corner, section 23, T31N, R7E, MDBM; Harvey Mtn. quadrangle.

(Colors are for dry soil unless otherwise stated. When described on 8/1/77 the soil was dry to 51 inches and moist below).

O–2 to 0 inches; Dead grasses and lodgepole needles.

A1–0 to 4 inches; dark brown (10YR 3/3) sandy loam, very dark brown (10YR 2/2) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; 15 percent pebbles; many very fine roots; many very fine interstitial pores; medium acid (pH 6.0); clear smooth boundary.

A2–4 to 13 inches; brown (10YR 4/3) sandy loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; 10 percent pebbles; common very fine and fine and few medium roots; many very fine interstitial pores; slightly acid (pH 6.3); clear smooth boundary.

C–13 to 24 inches; yellowish brown (10YR 5/4) gravelly loamy sand, dark reddish brown (5YR 3/4) moist; weak fine subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; 30 percent pebbles; common very fine and fine roots; few fine and medium interstitial pores; neutral (pH 6.8); abrupt smooth boundary.

2Cqm–24 to 32 inches; yellowish brown (10YR 5/4) extremely gravelly sand, dark reddish brown (5YR 3/4) moist; massive; extremely hard, very firm, nonsticky and nonplastic; 90 percent pebbles: few very fine and medium roots; neutral (pH 7.0); clear smooth boundary.

2C1–32 to 51 inches; light brown (7.5YR 6/4) extremely gravelly coarse sand, dark reddish brown (5YR 3/4) moist; massive; loose, nonsticky and nonplastic; 90 percent pebbles; neutral (pH 7.0);abrupt smooth boundary.

2C2–51 to 73 inches; dark reddish brown (5YR 3/4) and reddish brown (5YR 5/3) extremely gravelly coarse sand; dark reddish brown (2.5YR 2/4) and very dusky red (2.5YR 2/2) moist; massive; loose, nonsticky and nonplastic; 60 percent pebbles; neutral (pH 7.0).

Range in Characteristics: Depth to cemented glacial till ranges from 22 to 38 inches. Mean annual soil temperature is estimated to be 43 to 47 degrees F.. The soil is dry from July 15 to October 1 in all parts of the moisture control section during most years. The soil has a low bulk density and a dominance of amorphous material.

The A horizon has dry colors of 10YR 3/2, 3/3, 3/4, 4/2, 4/3, 4/4, 5/2, 5/3 or 5/4. When moist it has colors of 10YR 2/1, 2/2, 3/1, 3/2, 3/3 or 3/4. The A horizon is a medium acid to neutral loam, fine sandy loam, sandy loam, gravelly sandy loam or cobbly loamy sand. It contains 5 to 15 percent pebbles and 10 to 15 percent cobbles. The combined average of rock fragments is 10 to 25 percent.

The C horizon has dry colors of 10YR 4/4, 5/2, 5/3, 5/4, 6/2, 6/3, 6/4, 6/6, 7/4 or 7/6. When moist it has colors of 10YR 3/2, 3/3, 3/4, 4/2, 4/4, 4/6, 5/4, 5/6; 7.5YR 3/2, 3/4; 5YR 3/2, 3/3 or 3/4. Faint to distinct mottling is sometimes present. The C horizon is a medium acid to neutral gravelly to extremely gravelly sandy loam or loam, gravelly loamy sand, cobbly loamy sand, very cobbly loamy sand or extremely cobbly loamy sand. It contains 15 to 50 percent pebbles and 0 to 40 percent cobbles and stones. The combined average of rock fragments is 30 to 60 percent.

The 2Cqm horizon is a compacted glacial till that is possible to dig through in some cases. The colors are the same as the C horizon. This horizon may become loose below the compacted layer. Soil colors then become redder and very variable. Textures are extremely gravelly coarse sand with 60 to 90 percent rock fragments. May be underlain by hard andesite or basalt.

YALLANI FAMILY

Yallani Family consists of moderately deep or deep, well drained soils on mountain sideslopes, ridges and canyons. These soils formed in material weathering from rhyolite, andesite and basalt flow rocks and alluvium from these rocks. Slope ranges from 5 to 70 percent. Elevation ranges from 5200 to 8000 feet. The mean annual precipitation is about 30 to 80 inches. The mean annual air temperature is about 45 to 55 degrees F.. Typical vegetation consists of red fir, white fir, Jeffrey pine, ponderosa pine, sugar pine, lodgepole pine, mountain hemlock, incense cedar, greenleaf manzanita, pinemat manzanita, chinquapin and squaw carpet.

Taxonomic Class: medial-skelatal, frigid Andic Xerochrepts.

Reference Pedon: Yallani Family; mapped in an area of Yallani-Sheld families complex, 0 to 35 percent slopes; located on the Shanghai Creek Road on a northwest slope of 22 percent in the Almanor Ranger District of the Lassen National Forest. At an elevation of 6500 feet; 2250 feet east, 525 feet north of the SW corner, section 14, T27N, R5E, MDBM; Jonesville quadrangle.

(Colors are for dry soil unless otherwise stated. When described on 8/26/80 the soil was moist throughout).

0–2 to 0 inches; fresh and decomposing red fir litter.

A–0 to 8 inches; brown (7.5YR 4/4) gravelly fine sandy loam, dark brown (7.5YR 3/4) moist; weak very fine granular structure; soft, very friable, nonsticky and nonplastic; 20 percent pebbles, 2 percent cobbles; many very fine and common fine roots; many very fine interstitial pores; slightly acid (pH 6.3); clear smooth boundary.

Bw–8 to 24 inches; brown (7.5YR 4/4) gravelly fine sandy loam, dark brown (7.5YR 3/4) moist; moderate medium granular and subangular blocky structure; soft, friable, slightly sticky and nonplastic; 28 percent pebbles, 2 percent cobbles; common very fine and fine and few medium roots; many fine interstitial pores; medium acid (pH 6.0); gradual wavy boundary.

BC–24 to 39 inches; dark yellowish brown (10YR 4/4) very gravelly fine sandy loam, dark yellowish brown (10YR 3/4) moist; massive; slightly hard, firm, slightly sticky and nonplastic; 38 percent pebbles, 4 percent cobbles; common fine and many medium roots; many fine interstitial pores; medium acid (pH 6.0); clear wavy boundary.

C–39 to 60 inches; dark yellowish brown (10YR 4/4) gravelly sandy loam, dark yellowish brown (10YR 3/4) moist; massive; slightly hard, firm, nonsticky and nonplastic; 22 percent pebbles, 10 percent cobbles; few fine, common medium and few coarse roots; many fine interstitial pores; medium acid (pH 6.0);

Range in Characteristics: Depth to a lithic or paralithic contact is greater than 40 inches. Mean annual soil temperature is estimated to be 42 to 47 degrees F.. The soil is dry from July 15 to October 1 in all parts of the moisture control section during most years. When the surface is dark colored it is too thin to be umbric or mollic. The soil is considered to be an Andic intergrade, with a low bulk density and a dominance of amorphous material within the upper 7 inches of the epipedon. The very cobbly phase of this soil has 35 to 60 percent rock fragments, mostly cobbles but some stones, on the surface.

The A horizon has dry colors of 10YR 3/2, 3/3, 3/4, 4/2, 4/3, 4/4, 5/2, 5/3, 5/4; 7.5YR 3/2, 3/4, 4/2, 4/4, 5/2 or 5/4. When moist it has colors of 10YR 2/1, 2/2, 3/1, 3/2, 3/3, 3/4; 7.5YR 3/2 or 3/4. The A horizon is a neutral to medium acid light loam, fine sandy loam, sandy loam or loamy fine sand with 5 to 25 percent pebbles and 0 to 20 percent cobbles and stones. The combined average is 15 to 35 percent rock fragments.

The B horizon has dry colors of 10YR 3/4, 4/4, 5/4, 6/4; 7.5YR 3/4, 4/4, 5/4 or 6/4. When moist it has colors of 10YR 3/3, 3/4, 4/3, 4/4; 7.5YR 3/4 or 4/4. The B horizon is a neutral to strongly acid sandy loam or fine sandy loam with 30 to 60 percent pebbles and 0 to 20 percent cobbles and stones. The combined average is 35 to 65 percent rock fragments.

When this soil occurs on rhyolite the A horizon has dry colors of 10YR 6/2, 6/3, 7/2, 7/3; 2.5Y 3/2, 4/2, 5/2, 6/2 or 7/2. When moist it has colors of 10YR 4/1, 4/2, 4/3 or 7.5YR 4/4. The A horizon is a slightly to strongly acid sandy loam, fine sandy loam, coarse sandy loam or loamy sand with 0 to 35 percent pebbles and 5 to 10 percent cobbles and stones. The combined average is 15 to 35 percent rock fragments.

The B horizon has dry colors of 10YR 6/2, 6/3, 7/2 or 7/3. When moist it has colors of 10YR 5/3, 5/4, 5/6, 6/3, 6/4, 6/6; 7.5YR 5/4 or 6/4. The B horizon is a slightly to very strongly acid sandy loam, fine sandy loam, coarse sandy loam or loamy sand with 10 to 40 percent pebbles, 20 percent cobbles and 20 percent stones. The combined average of coarse fragments is always over 35 percent.

A C horizon with characteristics similar to the B horizon may or may not be present.

ZYNBAR FAMILY

Zynbar Family consists of deep, well drained soils that occur on flats and mountain sideslopes. These soils formed in material weathered from volcanic ash. Slopes range from 0 to 30 percent. Elevation ranges from 5200 to 6500 feet. The mean annual precipitation is about 30 to 55 inches. Mean annual air temperature is 46 to 57 degrees F.. Typical vegetation consists of white fir, red fir, ponderosa pine, and incense cedar.

Taxonomic Class: medial, frigid Entic Dystrandepts.

Reference Pedon: Zynbar Family; mapped in an area of Typic Xerorthents-Zynbar family association, 0 to 35 percent slopes; located north of Raker Peak on an unmarked logging road on a 3 percent slope in the Hat Creek Ranger District of the Lassen National Forest; at an elevation of 6300 feet; 500 feet east, 2000 feet south of the NW corner, Section 12, T31N, R4E, MDBM; Prospect Peak quadrangle.

(Colors are for dry soil unless otherwise stated. When described on 6/14/81 the soil was moist to three inches and dry below).

O–1 to 0 inches; fir litter.

A1–0 to 3 inches; gray (10YR 5/1) coarse sandy loam, black (10YR 2/1) moist; moderate medium granular structure; soft, very friable, nonsticky and nonplastic; 5 percent pebbles; common very fine roots; common medium interstitial pores; medium acid (pH 6.0); abrupt smooth boundary.

A2–3 to 8 inches; pale red (2.5YR 6/2) loamy coarse sand, weak red (2.5YR 4/2) moist; weak fine subangular blocky structure; soft, very friable, nonsticky and nonplastic; 8 percent pebbles; common very fine and fine roots; common medium interstitial pores; slightly acid (pH 6.3); clear wavy boundary.

A3–8 to 13 inches; light brownish gray (10YR 6/2) gravelly sandy loam, dark grayish brown (10YR 4/2) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; 15 percent pebbles; common very fine, fine and medium roots; common fine interstitial pores; medium acid (pH 6.0); abrupt wavy boundary.

A4–13 to 21 inches; light brownish gray (10YR 6/2) fine sandy loam, dark grayish brown (10YR 4/2) moist; moderate fine and medium subangular blocky structure; soft, friable, nonsticky and slightly plastic; few very fine, common fine and few medium roots; few fine interstitial and tubular pores; strongly acid (pH 5.2); abrupt wavy boundary;

2Ab–21 to 27 inches; light yellowish brown (10YR 6/4) extremely gravelly coarse sand, dark yellowish brown (10YR 4/4) moist; single grain; loose, nonsticky and nonplastic; 70 percent pebbles; common very fine and few fine roots; common coarse interstitial pores; slightly acid (pH 6.3); abrupt wavy boundary.

2Bb–27 to 60 inches; light yellowish brown (10YR 6/4) gravelly coarse sandy loam, brown (10YR 4/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; 25 percent pebbles, 5 percent cobbles; few fine and common medium and coarse roots; many fine interstitial pores; neutral (pH 6.7).

Range in Characteristics: Depth to a lithic or paralithic contact is greater than 40 inches. Mean annual soil temperature is estimated to be 45 to 47 degrees F. and the soil is dry from July 1 to October 1 in all parts of the moisture control section during most years.

The A horizon has dry colors of 10YR 5/1, 5/2, 5/3, 6/1, 6/2, 6/3; 2.5Y 5/2 or 6/2. When moist it has colors of 10YR 2/1, 2/2, 3/1 3/2 3/3, 3/4, 4/1, 4/2, 4/3 or 4/4. The A horizon is a neutral to strongly acid loamy sand, sandy loam or fine sandy loam with 0 to 15 percent pebbles.

The B horizon has dry colors of 10YR 5/2, 5/3, 5/4, 5/6, 6/2, 6/3, 6/4, 6/6; 7.5YR 5/2, 5/4, 5/6, 6/2, 6/4 or 6/6. When moist it has colors of 10YR 4/2, 4/3, 4/4, 4/6, 5/2, 5/3, 5/4, 5/6; 7.5YR 4/2, 4/4, 4/6, 5/2, 5/4 or 5/6. The B horizon is a neutral to strongly acid sandy loam, coarse sandy loam or coarse sand with 0 to 30 percent pebbles and 0 to 30 percent cobbles, and a combined average of 20 to 35 percent rock fragments.

The soil has a low bulk density and is dominated by amorphous clays.

References

(1) USDA - Forest Service - Title 2500 Manual, Watershed Management

(2) USDA - Soil Conservation Service - Soil Survey Manual

(3) USDA - Soil Conservation Service - National Soils Handbook

(4) USDA - Soil Conservation Service 1975. Soil Taxonomy, Agriculture Handbook No. 436, 754 pp, illus.

(5) Kane, Phillip S. 1980. Through Vulcan's Eye. Loomis Museum Association. 118 pp, illus.

(6) USDA - Forest Service - Calveg. 158 pp, plus maps

(7) State of California - Division of Mines. Geologic Map of California. 1958 Alturas Sheet, 1960 Westwood (Susanville) Sheet, 1962 Chico Sheet

TABLE 3. - Acreage and Proportionate Extent of the Map Units

Map Symbol	Mapping Unit Field Name	Acres	% of Survey Area
1	Aikman family-Durixerolls association, 0 to 35 percent slopes.	1,210	0.11
2	Andic Fragiumbrepts-Sheld family, moderately deep, glacial association, 0 to 35 percent slopes.	2,093	0.18
3	Aquolls, 0 to 15 percent slopes.	6,841	0.60
4	Aquolls-Durixerolls association, 0 to 15 percent slopes.	4,759	0.42
5	Bobbitt-Brownlee-Alicel families complex, 0 to 35 percent slopes.	11,056	0.98
6	Bobbitt family Durixerolls association, 0 to 35 percent slopes.	4,352	0.38
7	Bobbitt family, moderately deep-Gwin family association, 0 to 35 percent slopes.	4,230	0.37
8	Bobbitt family, moderately deep-Gwin family association, 35 to 50 percent slopes.	2,063	0.18
9	Bobbitt-Holland-Brownlee families association, 35 to 50 percent slopes.	3,009	0.27
10	Bobbitt-Holland families-Lithic Haploxeralfs association, 0 to 15 percent slopes.	8,404	0.74
11	Bobbitt-Holland-Skalan families association, 0 to 15 percent slopes.	6,753	0.60
12	Bobbitt-Skalan families-Rock Outcrop association, 0 to 15 percent slopes.	10,310	0.91
13	Bobbitt-Skalan families-Rubble Land association, 15 to 35 percent slopes.	2,514	0.22
14	Bobbitt-Skalan families-Rubble Land association, 35 to 50 percent slopes.	1,833	0.16
15	Brownlee-Bobbitt families association, 0 to 35 percent slopes.	8,251	0.73
16	Brownlee-Skalan families association, 0 to 35 percent slopes.	3,909	0.35

Map Symbol	Mapping Unit Field Name	Acres	% of Survey Area
17	De Masters-Klicker families association, 0 to 35 percent slopes.	17,494	1.55
18	De Masters family-Lithic Haploxerolls-Wintoner family association, 0 to 35 percent slopes.	5,775	0.51
19	Durixerolls, 0 to 15 percent slopes.	6,123	0.54
20	Durixerolls-Bobbitt family, moderately deep association, 0 to 35 percent slopes.	7,162	0.64
21	Gerle family-Klicker family, sedimentary association, 0 to 35 percent slopes.	4,721	0.42
22	Gerle family-Klicker family, sedimentary association, 35 to 70 percent slopes.	4,419	0.39
23	Holland family, 0 to 35 percent slopes.	6,746	0.60
24	Holland-Skalan families association, 0 to 35 percent slopes.	45,530	4.02
25	Holland-Skalan families association, 35 to 50 percent slopes.	2,913	0.26
26	Holland family-Skalan family, moderately deep association, diatomaceous, 15 to 35 percent slopes.	1,173	0.10
27	Holland family-Skalan family, moderately deep association, diatomaceous, 35 to 50 percent slopes.	1,293	0.11
28	Holland family, metasedimentary-Skalan family, moderately deep association, 0 to 35 percent slopes.	2,769	0.24
29	Holland family, metasedimentary-Skalan family, moderately deep association, 35 to 70 percent slopes.	5,088	0.45
30	Inville-Klicker-Wintoner families association, 0 to 35 percent slopes.	6,456	0.57
31	Inville-Klicker-Wintoner families association, 35 to 50 percent slopes.	4,580	0.40
32	Inville-Patio families association, 15 to 35 percent slopes.	8,493	0.75

Map Symbol	Mapping Unit Field Name	Acres	% of Survey Area
33	Inville-Patio-Trojan families association, 0 to 35 percent slopes.	21,316	1.89
34	Inville-Patio-Trojan families association, 35 to 50 percent slopes.	3,417	0.30
35	Inville family Sheld family, moderately deep Rubble Land association, 15 to 50 percent slopes.	7,506	0.66
36	Inville-Wintoner families complex, 0 to 35 percent slopes.	46,790	4.14
37	Inville-Wintoner families complex, 35 to 50 percent slopes.	5,483	0.49
38	Inville-Yallani families complex, 0 to 35 percent slopes.	7,551	0.67
39	Inville-Yallani families complex, 35 to 50 percent slopes.	3,054	0.27
40	Inville-Yallani families, cobbly complex, 15 to 50 percent slopes.	4,704	0.42
41	Inville-Yallani families, rhyolitic association, 0 to 35 percent slopes.	4,103	0.36
42	Inville-Yallani families, rhyolitic association, 35 to 50 percent slopes.	3,540	0.31
43	Klicker Keating families-Durixerolls association, 0 to 35 percent slopes.	3,851	0.34
44	Klicker family-Klicker family, sedimentary-Trojan family, complex, 0 to 35 percent slopes.	7,688	0.68
45	Klicker family-Klicker family, very stony association, 0 to 35 percent slopes.	14,073	1.24
46	Klicker family-Klicker family, very stony association, 35 to 50 percent slopes.	3,034	0.26
47	Klicker family, sedimentary-Lithic Ultic Argixerolls-Inville family association, 0 to 50 percent slopes.	9,293	0.82
48	Klicker-Patio families complex, 15 to 70 percent slopes.	5,092	0.45

Map Symbol	Mapping Unit Field Name	Acres	% of Survey Area
49	Klicker-Trojan families association, 0 to 35 percent slopes.	37,191	3.30
50	Klicker-Trojan families-Aquolls association, 0 to 15 percent slopes.	9,446	0.83
51	Lava Flow.	48,500	4.29
52	Lava Flow-Lithic Haploxerolls association, 0 to 35 percent slopes.	3,554	0.31
53	Lava Flow-Lithic Xerochrepts complex, 0 to 35 percent slopes.	16,803	1.48
54	Lithic Haploxeralfs-Skalan family complex, 0 to 15 percent slopes.	1,528	0.14
55	Lithic Haploxerolls-Aquolls complex, 0 to 15 percent slopes.	10,771	0.95
56	Lithic Haploxerolls-Rock Outcrop-Trojan family association, 0 to 15 percent slopes.	9,852	0.87
57	Lithic Haploxerolls-Rouen family-Rock Outcrop association, 0 to 15 percent slopes.	2,806	0.25
58	Lithic Xerochrepts-Bobbitt family, moderately deep association, 0 to 15 percent slopes.	1,639	0.14
59	Lithic Xerumbrepts-Rock Outcrop-Rubble Land association, 15 to 50 percent slopes.	10,044	0.88
60	Lithic Xerumbrepts-Rubble Land-Sheld family, moderately deep association, 35 to 70 percent slopes.	8,295	0.73
61	Los Gatos family-Lithic Haploxeralfs association, 0 to 15 percent slopes.	4,687	0.41
62	Neer-Sadie families complex, 0 to 35 percent slopes.	1,290	0.11
63	Neer-Sadie families-Washougal family, moderately deep complex, 0 to 35 percent slopes.	4,107	0.36
64	Neer-Skalan families complex, 0 to 35 percent slopes.	5,187	0.46
65	Neer-Skalan families complex, 35 to 50 percent slopes.	3,364	0.29

Map Symbol	Mapping Unit Field Name	Acres	% of Survey Area
66	Neer-Skalan families Rubble Land complex, 15 to 70 percent slopes.	4,331	0.38
67	Neer-Washougal families complex, 0 to 35 percent slopes.	3,529	0.31
68	Pass Canyon family-Lithic Haploxeralfs, rhyolitic complex, 0 to 35 percent slopes.	1,166	0.10
69	Patio-De Masters families-Aquolls association, 0 to 15 percent slopes.	11,090	0.98
70	Patio family-Rock Outcrop-De Masters family association, 0 to 35 percent slopes.	7,607	0.67
71	Patio-Trojan-De Masters families association, 0 to 35 percent slopes.	10,891	0.86
72	Portola-Yallani families, alluvial association, 0 to 15 percent slopes.	1,884	0.17
73	Rock Outcrop-Patio family association, 0 to 50 percent slopes.	12,960	1.15
74	Rock Outcrop-Rubble Land complex.	17,730	1.57
75	Rubble Land-Deadwood family association, 35 to 70 percent slopes.	1,198	0.11
76	Rubble Land-Pass Canyon family-Bobbitt family, moderately deep association, 35 to 70 percent slopes.	9,151	0.81
77	Sadie family-Lithic Haploxerolls-Rock Outcrop association, 70 to 80 percent slopes.	1,943	0.17
78	Sadie-Washougal families, alluvial association, 0 to 15 percent slopes.	3,448	0.30
79	Sheld family, 0 to 35 percent slopes.	16,682	1.48
80	Sheld family, glacial-Aquolls association, 0 to 35 percent slopes.	10,159	0.90
81	Sheld-Inville families-Sheld family, moderately deep complex, 0 to 35 percent slopes.	11,634	1.02
82	Sheld family, moderately deep-Klicker family complex, 0 to 35 percent slopes.	1,650	0.15

Map Symbol	Mapping Unit Field Name	Acres	% of Survey Area
83	Sheld family, moderately deep-Klicker family complex, 35 to 50 percent slopes.	621	0.05
84	Sheld family, moderately deep-Lithic Xerumbrepts association, 0 to 35 percent slopes.	18,414	1.63
85	Sheld family, moderately deep-Lithic Xerumbrepts association, 35 to 70 percent slopes.	13,951	1.23
86	Sheld family-Sheld family, moderately deep complex, 0 to 35 percent slopes.	18,116	1.60
87	Sheld family-Sheld family, moderately deep complex, 35 to 50 percent slopes.	8,213	0.73
88	Sheld family-Sheld family, moderately deep complex, glacial, 0 to 35 percent slopes.	11,524	1.02
89	Sheld family-Sheld family, moderately deep association, 15 to 35 percent slopes.	1,785	0.16
90	Sheld family-Sheld family, moderately deep association, 35 to 50 percent slopes.	1,141	0.10
91	Sheld family, moderately deep-Sheld family Rock Outcrop complex, 0 to 35 percent slopes.	7,801	0.69
92	Sheld family, moderately deep-Sheld family-Rock Outcrop complex, 35 to 70 percent slopes.	5,429	0.48
93	Sheld-Yallani families, moderately deep-Sheld family complex, stony, 15 to 50 percent slopes.	4,147	0.37
94	Skalan family, 0 to 15 percent slopes.	1,519	0.13
95	Skalan-Bobbitt families association, 0 to 35 percent slopes.	4,794	0.42
96	Skalan family, moderately deep-Deadwood family association, 35 to 70 percent slopes.	5,380	0.48
97	Skalan-Holland families association, 0 to 35 percent slopes.	9,208	0.81
98	Skalan-Holland families association, 35 to 50 percent slopes.	2,222	0.20

Map Symbol	Mapping Unit Field Name	Acres	% of Survey Area
99	Skalan family-Holland family, moderately deep-Lithic Xerochrepts association, 15 to 35 percent slopes.	1,424	0.13
100	Skalan-Holland families-Rock Outcrop association, 35 to 50 percent slopes.	1,528	0.13
101	Skalan-Holland families-Skalan family, moderately deep, association, diatomaceous, 15 to 50 percent slopes.	3,771	0.33
102	Skalan family-Washougal family, moderately deep Rock Outcrop association, 0 to 35 percent slopes.	525	0.05
103	Supan family, 0 to 15 percent slopes.	4,478	0.40
104	Trojan-Inville-Boomtown families assoication, 0 to 35 percent slopes.	1,762	1.55
105	Trojan-Inville-Patio families association, 0 to 35 percent slopes.	128,002	11.32
106	Trojan-Kilmerque-Patio families association, 15 to 35 percent slopes.	4,180	0.37
107	Trojan-Klicker families association, 35 to 50 percent slopes.	4,544	0.40
108	Trojan-Klicker families, rhyolitic association, 0 to 35 percent slopes.	6,569	0.58
109	Trojan-Klicker-Wintoner families association, 0 to 35 percent slopes.	1,488	0.13
110	Trojan family-Lithic Haploxerolls-Rouen family association, 0 to 15 percent slopes.	1,790	0.16
111	Typic Xerorthents, 15 to 50 percent slopes.	1,045	0.09
112	Typic Xerorthents-Yallani family association, 0 to 35 percent slopes.	6,972	0.62
113	Typic Xerorthents-Yallani family association, 35 to 50 percent slopes.	5,480	0.48
114	Typic Xerorthents-Zynbar family association, 0 to 35 percent slopes.	2,515	0.22

Map Symbol	Mapping Unit Field Name	Acres	% of Survey Area
115	Typic Xerorthents-Zynbar family association, 35 to 50 percent slopes.	1,229	0.11
116	Washougal family, 0 to 35 percent slopes.	4,120	0.36
117	Washougal family, glacial, 0 to 35 percent slopes.	856	0.08
118	Washougal-Neer-Sadie families complex, 35 to 70 percent slopes.	746	0.07
119	Washougal-Skalan families association, 15 to 35 percent slopes.	2,708	0.24
120	Washougal-Skalan families association, 35 to 50 percent slopes.	2,094	0.19
121	Wintoner family-Aquolls-Patio family association, 0 to 15 percent slopes.	21,944	1.94
122	Wintoner-Trojan-De Masters families association, 0 to 15 percent slopes.	9,643	0.85
123	Wintoner-Yallani families complex, 0 to 35 percent slopes.	2,355	0.21
124	Xeric Durandepts-Xeric Durandepts, ashy association, 0 to 35 percent slopes.	18,983	1.68
125	Yallani-Patio families, rhyolitic complex, 15 to 50 percent slopes.	3,135	0.28
126	Yallani-Portola families association, 0 to 35 percent slopes.	8,110	0.71
127	Yallani family Lava Flow-Sheld family, moderately deep association, 0 to 35 percent slopes.	2,636	0.23
128	Yallani-Sheld families complex, 0 to 35 percent slopes.	17,791	1.57
129	Yallani-Sheld families complex, 35 to 50 percent slopes.	7,192	0.64
130	Yallani family-Sheld family, moderately deep association, 15 to 35 percent slopes.	7,074	0.63
131	Yallani family-Sheld family, moderately deep association, 35 to 70 percent slopes.	1,951	0.17

Map Symbol	Mapping Unit Field Name	Acres	% of Survey Area
132	Yallani-Sheld families, moderately deep, cobbly complex, 0 to 35 percent slopes.	4,119	0.36
133	Yallani-Sheld families, glacial complex, 0 to 35 percent slopes.	7,593	0.67
134	Yallani-Sheld-Portola families association, 0 to 35 percent slopes.	22,341	1.98
135	Yallani family-Yallani family, moderately deep association, rhyolitic, 15 to 50 percent slopes.	5,802	0.52

Glossary

Aeration, soil – The exchange of air in the soil with air from the atmosphere. The air in a well aerated soil is similar to that in the atmosphere; the air in a poorly aerated soil is considerably higher in carbon dioxide and lower in oxygen.

Aggregate, soil – Many fine particles held in a single mass or cluster. Natural soil aggregates, such as granules, blocks, or prisms, are called peds. Clods are aggregates produced by tillage or logging.

Alkali (sodic) soil – Soil having so high a degree of alkalinity (pH 8.5 or higher), or so high a percentage of exchangeable sodium (15 percent or more of the total exchangeable bases), or both, that plant growth is restricted.

Alluvial fan – The fanlike deposit of a stream where it issues from a gorge upon a plain or of a tributary stream near or at its junction with its main stream.

Alluvium – Material, such as sand, silt, or clay, deposited on land by streams.

Amorphous material – Noncrystalline constituents that either do not fit the definition of allophane or it is not certain if the constituent meets allphane criteria.

Andesite – A dark-colored, fine-grained extrusive rock that, when porphyritic, contains phenocrysts composed primarily of zoned sodic plagioclase (esp. andesine) and one or more of the mafic minerals (e.g., biotite, hornblende, pyroxene), with a groundmass composed generally of the same minerals as the phenocrysts, although the plagioclase may be more sodic and quartz is generally present; the extrusive equivalent of diorite. Andesite grades into latite with increasing alkali feldspar content, and into dacite with more alkali feldspar and quartz.

Animal-unit-month (AUM) – The amount of forage required by one mature cow of approximately 1,000 pounds weight, with or without a calf, for 1 month.

Ash – Uncemented volcanic ejecta less than 4.0 mm in diameter.

Association, soil – A group of soils or miscellaneous areas geographically associated in a characteristic repeating pattern and defined and delineated as a single map unit.

Available water capacity (available moisture capacity) – The capacity of soils to hold water available for use by most plants. It is commonly defined as the difference between the amount of soil water at field moisture capacity and the amount at wilting point. It is commonly expressed as inches of water per inch of soil.

Basal area – The area of a cross section of a tree, generally referring to the section at breast height and measured outside the bark. It is a measure of stand density, commonly expressed in square feet.

Basalt [ign] – A general term for dark-colored mafic igneous rocks, commonly extrusive but locally intrusive (e.g. as dikes), composed chiefly of calcic plagioclase and clinopyroxene; the fine-grained equivalent of gabbro. Nepheline, olivine, orthopyroxene, and quartz may be present in the CIPW norm, but not all simultaneously: nepheline and olivine can occur together, as can olivine and orthopyroxene, and orthopyroxene and quartz, but nepheline does not coexist with orthopyroxene or quartz, nor quartz with nepheline or olivine.

Base saturation – The degree to which material having cation exchange properties is saturated with exchangeable bases (sum of Ca, Mg, Na, K), expressed as a percentage of the total cation exchange capacity.

Bedrock – The solid rock that underlies the soil and other unconsolidated amterial or that is exposed at the surface.

Boulders – Rock fragments larger than 2 feet (60 centimeters) in diameter.

Breaks – The steep to very steep broken land at the border of an upland summit that is dissected by ravines.

Breast height – An average height of 4 1/2 feet above the ground surface; the point on a tree where diameter measurements are ordinarily taken.

Bulk density – The mass of dry soil per unit bulk vol-

ume; usually measured as grams per cubic centimeter.

Caldera – A large, basin-shaped volcanic depression, more or less circular in form. Two basic types are from explosion or collapse.

Canopy – The leafy crown of trees or shrubs (See Crown).

Canyon – A long, deep, narrow, very steep sided valley with high, precipitous walls in an area of high local relief.

Capillary water – Water held as a film around soil particles and in tiny spaces between particles. Surface tension is the adhesive force that holds capillary water in the soil.

Cation – An ion carrying a positive charge of electricity. The common soil cations are calcium, potassium, magnesium, sodium, and hydrogen.

Cation-exchange capacity – The total amount of exchangeable cations that can be held by the soil, expressed in terms of milliequivalents per 100 grams of soil at neutrality (pH 7.0) or at some other stated pH value. The term, as applied to soils, is synonymous with base-exchange capacity, but is more precise in meaning.

Cinder – A juvenile vetric vesicular pyroclastic fragment that falls to the ground in an essentially solid condition.

Cinder cone – A conical hill formed by the accumulation of cinders and other pyroclasts, normally of basaltic or andesitic composition. Steepness of the slopes depends on coarseness of the ejecta, height of eruption, wind velocity, and other factors, but is normally greater than 10 degrees.

Cirque – Semicircular, concave, bowllike areas that have steep faces primarily resulting from glacial ice and snow abrasion.

Clay – As a soil separate, the mineral soil particles less than 0.002 millimeter, in diameter. As a soil textural class, soil material that is 40 percent or more clay, less than 45 percent sand, and less than 40 percent silt.

Clay film – A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay skin.

Clay skin – A thin coating of oriented clay on the surface of a soil aggregate or lining pores or root channels. Synonyms: clay coating, clay film.

Claypan – A slowly permeable soil horizon that contains much more clay than the horizons above it. A claypan is commonly hard when dry and plastic or stiff when wet.

Climax plant community – The plant community on a given site that will be established if present environmental conditions continue to prevail and the site is properly managed.

Coarse fragments – Mineral or rock particles larger than 2 millimeters in diameter.

Coarse textured soil – Sand or loamy sand.

Cobble (or cobblestone) – A rounded or partly rounded fragment of rock 3 to 10 inches (7.6 to 25 centimeters) in diameter.

Colluvium – Soil material, rock fragments, or both, moved by creep, slide, or local wash and deposited at the base of steep slopes.

Compaction – The packing together of soil particles by forces exerted at the soil surface, resulting in increased soil density.

Complex slope – Irregular or variable slope. Planning or constructing terraces, diversions, and other water-control measures on a complex slope is difficult.

Complex, soil – A map unit of two or more kinds of soil or miscellaneous areas in such an intricate pattern or so small in area that it is not practical to map them separately at the selected scale of mapping. The pattern and proportion of the soils or miscellaneous areas are somewhat similar in all areas.

Conglomerate – A coarse grained, clastic rock composed of rounded to subangular rock fragments more than 2 millimeters in diameter. It commonly has a matrix of sand and finer material. Conglomerate is the consolidated equivalent of gravel.

Consistence, soil – The feel of the soil and the ease with which a lump 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 resistence is distinctly noticeable.

Plastic - Readily deformed by moderate pressure but can be pressed into a lump; will form a "wire" when rolled between thumb and forefinger.

Sticky - 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; little affected by moistening.

Continental climate – Climate, as that in the interior of a continent, characterized by considerable variation in temperature and in other weather conditions.

Control section – The part of the soil on which classification is based. The thickness varies among different kinds of soil, but for many it is that part of the soil profile between depths of 10 inches and 40 inches.

Crown – The upper part of a tree or shrub, including the living branches and their foliage.

Culmination of the mean annual increment (CMAI) – The average annual increase per acre in the volume of a stand. Computed by dividing the total volume of the stand by its age. As the stand increases in age, the mean annual increment continues to increase until mortality begins to reduce the rate of increase. The point where the stand reaches its maximum annual rate of growth is called the culmination of the mean annual increment.

Decreasers – The most heavily grazed climax range plants. Because they are the most palatable, they are the first to be destroyed by overgrazing.

Deferred grazing – Postponing grazing or arresting grazing for a prescribed period.

Dense layer – A very firm, massive layer that has a bulk density of more than 1.8 grams per cubic centimeter. Such a layer affects the ease of digging and can affect filling and compaction.

Drainage class (natural) – Refers to the frequency and duration of periods of saturation or partial saturation during soil formation, 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 classes of natural soil drainage are recognized:

Excessively drained - These soils have very high and high hydraulic conductivity and low water holding capacity. (They are not suited to crop production unless irrigated).

Somewhat excessively drained - These soils have high hydraulic conductivity and low water holding capacity. (Without irrigation, only a narrow range of crops can be grown and yields are low).

Well drained - These soils have intermediate water holding capacity. They retain optimum amounts of moisture, but they are not wet close to the surface or long enough during the growing season to adversely affect yields.

Moderately well drained - These soils are wet close to the surface or long enough that planting or harvesting operations or yields of some field crops are adversely affected unless artificial drainage is provided. Moderately well drained soils commonly have a layer with low hydraulic conductivity, a wet layer relatively high in the profile, additions of water by seepage, or some combination of these.

Somewhat poorly drained - These soils are wet close enough to the surface or long enough that planting or harvesting operations or crop growth is markedly restricted unless artificial drainage is provided. Somewhat poorly drained soils commonly have a layer with low hydraulic conductivity, a wet layer high in the profile, additions of water through seepage, or a combination of these.

Poorly drained - These soils commonly are so wet at or near the surface during a considerable part of the year that field crops cannot be grown under natural conditions. Poorly drained conditions are caused by a saturated zone, a layer with low hydraulic conductivity, seepage, or a combination of these.

Very poorly drained - These soils are wet to the surface most of the time. They are wet enough to prevent the growth of important crops unless artifically drained.

Drainage, surface – Runoff, or surface flow of water, from an area.

Duff. A term used to identify a generally firm organic layer on the surface of mineral soils. It consists of fallen plant material that is in the process of decomposition and includes everything from litter on the surface to underlying pure humus.

Durinodes – Silica-cemented soil aggregates.

Duripan – A subsurface horizon that is so cemented by silica that fragments from this horizon will not slake after prolonged soaking in water or hydrochloric acid. A duripan can also contain accessory cements, for example, calcium carbonate.

Effervescence – The fizz that results when diluted hydrochloric acid is applied to soil material that contains free carbonates.

Eluviation – The movement of material in true solution or colloidal suspension from one place to another within the soil. Soil horizons that have lost material through eluviation are eluvial; those that have received material are illuvial.

Eolian soil material – Earthy parent material accumulated through wind action; commonly refers to sandy material in dunes or to loess in blankets on the surface.

Ephemeral stream – A stream, or reach of a stream, that flows only in direct response to precipitation. It receives no long-continued supply from melting snow or other source, and its channel is above the water table at all times.

Erosion – The wearing away of the land surface by water, wind, ice, or other geologic agents.

Erosion (geologic) – Erosion caused by geologic processes acting over long geologic periods and resulting in the wearing away of mountains and the building up of such landscape features as flood plains and coastal plains. Synonym: natural erosion.

Erosion (accelerated) – Erosion much more rapid than geologic erosion, mainly as a result of the activities of man or other animals or of a catastrophe in nature; for example, fire that exposes the surface.

Erosion pavement – A layer of gravel or stones that remains on the surface after fine particles are removed by sheet or rill erosion.

Escarpment – A relatively continuous and steep slope or cliff breaking the general continuity of more gently sloping land surfaces and produced by erosion or faulting.

Evapotranspiration – Water transpired by vegetation plus that evaporated from the soil.

Extrusive rock – Igneous rock derived from deep-seated molten matter (magma) emplaced on the earth's surface.

Fault – A fracture or fracture zone along which there has been displacement on one side with respect to the other.

Fertility, soil – The quality that enables a soil to provide plant nutrients, in adequate amounts and in proper balance, for the growth of specified plants when light, moisture, temperature, tilth, and other growth factors are favorable.

Fibric soil material (peat) – The least decomposed of all organic soil material. Peat contains a large amount of well preserved fiber that is readily identifiable according to botanical origin. Peat has the lowest bulk density and the highest water content at saturation of all organic soil material.

Field moisture capacity – The moisture content of a soil, expressed as a percentage of the ovendry weight, after the gravitational, or free, water has drained away; the field moisture content 2 or 3 days after a soaking rain; also called normal field capcaity, normal moisture capacity, or capillary capacity.

Fine textured soil – Sandy clay, silty clay, and clay.

Flood plain – A nearly level alluvial plain that borders a stream and is subject to flooding unless protected artifically.

Fluvial – Of or pertaining to rivers; produced by river action, as a fluvial plain.

Foothill – A steeply sloping upland that has relief of as much as 1,000 feet (or 300 meters) and fringes a mountain range or high-plateau escarpment.

Forb – Any herbaceous plant not a grass or a sedge.

Forest cover – All trees and other woody plants (underbrush) covering the ground of the forest.

Forest type – A stand of trees similar in composition

and development because of given physical and biological factors by which it may be differentiated from other stands.

Fragile – A soil that is easily damaged by use or disturbance.

Frost action – Freezing and thawing of soil moisture. Frost action can damage roads, buildings and other structures, and plant roots.

Genesis, soil – The mode of origin of the soil. Refers especially to the processes or soil-forming factors responsible for the formation of the solum, or true soil, from the unconsolidated parent material.

Glacial outwash – Gravel, sand, and silt, commonly stratified, deposited by glacial melt water.

Glacial till – Unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

Gleyed soil – Soil that formed under poor drainage, resulting in the reduction of iron and other elements in the profile and in gray colors and mottles.

Geomorphology – The study of landforms as they relate to geologic composition and history.

Gravel – Rounded or angular fragments of rock as much as 3 inches (2 milimeters to 7.6 centimeters) in diameter. An individual piece is a pebble.

Habitat – The natural abode of a plant or animal; refers to the kind of environment in which a plant or animal normally lives, as opposed to the range or geographical distribution.

Hardpan – A hardened or cemented soil horizon, or layer. The soil material is sandy, loamy, or clayey and is cemented by iron oxide, silica, calcium carbonate, or other substance.

Horizon, soil – A layer of soil, approximately parallel to the surface, having distinct characteristics produced by soil-forming processes. In the identification of soil horizons, an upper case letter represents the major horizons. Numbers or lower case letters that follow represent subdivisions of the major horizons. An explanation of the subdivisions is given in the Soil Survey Manual. The major horizons of mineral soil are as follows:

O horizon - An organic layer of fresh and decaying plant residue.

A horizon - The mineral horizon at or near the surface in which an accumulation of humified organic matter is mixed with the mineral material. Also, a plowed surface horizon, most of which was originally part of a R horizon.

B horizon - The mineral horizon below an A horizon. The B horizon is in part a layer of transition from the overlying A to the underlying C horizon. The B horizon also has distinctive characteristics such as (1) accumulation of clay, sesquioxides, humus, or a combination of these; (2) prismatic or blocky structure; (3) redder or browner colors than those in the A horizon; or (4) a combination of these.

C horizon - The mineral horizon or layer, excluding indurated bedrock, that is little affected by soil-forming processes and does not have the properties typical of the overlying soil material. The material of a C horizon may be either like or unlike that in which the solum formed. If the material is known to differ from that in the solum, the number 2 precedes the letter C.

R layer - Consolidated rock beneath the soil. The rock commonly underlies a C horizon, but it can be directly below an A or a B horizon.

Igneous rock – Rock formed by solidification from a molten or partially molten state. Major varieties include plutonic and volcanic rock. Examples are andesite, basalt, and granite.

Illuviation – The movement of soil material from one horizon to another in the soil profile. Generally, material is removed from an upper horizon and deposited in a lower horizon.

Impervious soil – A soil through which water, air, or roots penetrate slowly or not at all. No soil is absolutely impervious to air and water all the time.

Increasers – Species in the climax vegetation that increase in amount as the more desirable plants are reduced by close grazing. Increasers commonly are the shorter plants and the less palatable to livestock.

Infiltration – The downward entry of water into the immediate surface of soil or other material, as contrasted with percolation, which is movement of water through soil layers or material.

Infiltration rate – The rate at which water penetrates the surface of the soil at any given instant, usually expressed in iches per hour. The rate can be limited

by the infiltration capacity of the soil or the rate at which water is applied at the surface.

Intermittent stream – A stream, or reach of a stream, that flows for prolonged periods only when it receives ground water discharge or long, continued contributions from melting snow or other surface and shallow subsurface sources.

Invaders – On range, plants that encroach into an area and grow after the climax vegetation has been reduced by grazing. Generally, plants invade following disturbance of the surface.

Knoll – A small, low, rounded hill rising above adjacent landforms.

Landslide – The rapid downhill movement of a mass of soil and loose rock, generally when wet or saturated. The speed and distance of movement, as well as the amount of soil and rock material, vary greatly.

Lava flow – A lateral, surficial outpouring of molten lava from a vent or a fissure; also, the solidified body of rock that is so formed.

Lava plateau – A broad, elevated tableland or flat-topped highland, usually many hundreds or thousands of square kilometers in extent, underlain by a thick succession of lava flows, most of which are tholeiitic basalts and the product of fissure eruption. Syn: basaltic plateau.

Leaching – The removal of soluable material from soil or other material by percolating water.

Liquid limit – The moisture content at which the soil passes from a plastic to a liquid state.

Loam – Soil material that is 7 to 27 percent clay particles, 28 to 50 percent silt particles, and less than 52 percent sand particles.

Low strength – The soil is not strong enough to support loads.

Microrelief – Minor surface irregularities in the land surface, for example, low mounds or shallow depressions.

Metamorphic rock – Rock of any origin altered in mineralogical composition, chemical composition, or structure by heat, pressure, and movement. Nearly all such rocks are crystalline.

Mineral soil – Soil that is mainly mineral material and low in organic material. Its bulk density is more than that of organic soil.

Miscellaneous area – An area that has little or no natural soil and supports little or no vegetation.

Moraine – An accumulation of earth, stones, and other debris deposited by a glacier. Some types are terminal, lateral, medial, and ground.

Morphology, soil – The physical makeup of the soil, including the texture, structure, porosity, consistence, color, and other physical, mineral, and biological properties of the various horizons, and the thickness and arrangement of those horizons in the soil profile.

Mottling, soil – Irregular spots of different colors that vary in number and size. Mottling generally indicates poor aeration and impeded drainage. Descriptive terms are as follows: abundance few, common, and many; size fine, medium, and coarse; and contrast faint, distinct, and prominent. The size measurements are of the diamter along the greatest dimension. Fine indicates less than 5 millimeters (about 0.2 inch); medium, from 5 to 15 millimeters (about 0.2 to 0.6 inch); and coarse, more than 15 millimeters (about 0.6 inch).

Mountain – A natural elevation of the land surface, rising more than 1,000 feet above surrounding lowlands, commonly of restricted summit area (relative to a plateau) and generally having steep sides and considerable bare-rock surface. A mountain can occur as a single, isolated mass or in a group forming a chain or range.

Munsell notation – A designation of color by degrees of the three simple variables hue, value, and chroma. For example, a notation of 10YR 6/4 is color in hue of 10YR, value of 6, and chroma of 4.

Nuetral soil – A soil having a pH value between 6.6 and 7.3. (See Reaction, soil).

Nurtient, plant – Any element taken in by a plant essential to its growth. Plant nutrients are mainly nitrogen, phosphorus, potassium, calcium, magnesium, sulfur, iron, manganese, copper, boron, and zinc obtained from the soil and carbon, hydrogen, and oxygen obtained from the air and water.

Observed rooting depth – Depth to which roots have been observed to penetrate.

Obsidian – A black or dark-colored volcanic glass,

usually of rhyolite composition, characterized by conchoidal fracture. It is sometimes banded or has microlites.

Organic matter – Plant and animal residue in the soil in various stages of decomposition.

Overburden – In this survey area relates to a relatively recent deposit of pyroclastic volcanic pumice of 2 to 40 inches of thickness which has been deposited over an older more developed soil.

Pan – A compact, dense layer in a soil that impedes the movement of water and the growth of roots. For example, hardpan, fragipan, claypan, plowpan, and traffic pan.

Parent material – The unconsolidated organic and mineral material in which soil forms.

Peat – Unconsolidated material, largely undecomposed organic matter, that has accumulated under excess moisture. (See Fibric soil material).

Ped – An individual natural soil aggregate, such as a granule, a prism, or a block.

Pedon – The smallest volume that can be called "a soil". A pedon is three dimensional and large enough to permit study of all horizons. Its area ranges from about 10 to 100 square feet (1 square meter to 20 square meters), depending on the variability of the soil.

Percolation – The downward movement of water through the soil.

Permeability – The quality of the soil that enables water to move downward through the profile. Permeability is measured as the number of inches per hour that water moves downward through the saturated soil.

Phase, soil – A subdivision of a soil series based on features that affect its use and management. For example, slope, stoniness, and thickness.

pH value – A numerical designation of acidity and alkalinity in soil. (See Reaction, soil).

Physiographic position – Broad landforms based on the physical features of the landscape.

Plasticity index – The numerical difference between the liquid limit and the plastic limit; the range of moisture content within which the soil remains plastic.

Plastic limit – The moisture content at which a soil changes from semisolid to plastic.

Plateau – An extensive upland mass with relatively flat summit area that is considerably elevated (more than 100 meters) above adjacent lowlands and separated from them on one or more sides by escarpments.

Playa – The generally dry and nearly level lake plain that occupies the lowest parts of closed depressional areas, such as those on intermontane basin floors. Temporary flooding occurs primarily in response to precipitation and runoff.

Potential native plant community – The plant community on a given site that will be established if present environmental conditions continue to prevail and the site is properly managed. (See climax plant community).

Potential rooting depth (effecitve rooting depth) – Depth to which roots could penetrate if the content of moisture in the soil were adequate. The soil has no properties restricting the penetration of roots to this depth.

Prescribed burning – The application of fire to land under such conditions of weather, soil moisture, and time of day as presumably will result in the intensity of heat and spread required to accomplish specific forest management, wildife, grazing, or fire hazard reduction purposes.

Productivity, soil – The capability of a soil for producing a specified plant or sequence of plants under specific management.

Profile, soil – A vertical section of the soil extending through all its horizons and into the parent material.

Proper grazing use – Grazing at an intensity that maintains enough cover to protect the soil and maintain or improve the quantity and quality of the desirable vegetation. This increases the vigor and reproduction of the key plants and promotes the accumulation of litter and mulch necessary to conserve soil and water.

Pumice – A light-colored vesicular glassy rock commonly having the composition of rhyolite. It is often sufficiently buoyant to float on water and is economically useful as a lightweight aggregate and as

an abrasive. The adjectival form, pumiceous, is usually applied to pyroclastic ejecta.

Pyroclastic – A general term applied to rocks formed from volcanic material that has been explosively or aerially ejected from a volcanic vent.

Rangeland – Land on which the potential natural vegetation is predominately grasses, grasslike plants, forbs, or shrubs suitable for grazing or browsing. It includes natural grasslands, savannas, many wetlands, some deserts, tundras, and areas that support certain forb and shrub communities.

Range condition – The present composition of the plant community on a range site in relation to the potential natural plant community for that site. Range condition is expressed as excellent, good, fair, or poor on the basis of how much the present plant community has departed from the potential.

Range site – An area of rangeland where climate, soil, and relief are sufficiently uniform to produce a distinct natural plant community. A range site is the product of all the environmental factors responsible for its development. It is typified by an association of species that differ from those on other range sites in kind or proportion of species or total production.

Reaction, soil – A measure of acidity or alkalinity of a soil, expressed in pH values. A soil that tests to pH 7.0 is described as precisely neutral in reaction because it is neither acid nor alkaline. The degree of acidity or alkalinity is expressed as:

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

Relief – The elevations or inequalities of a land surface, considered collectively.

Residuum (residual soil material) – Unconsolidated, weathered, or partly weathered mineral material that accumulated as consolidated rock disintegrated in place.

Rill – A steep sided channel resulting from accelerated erosion. A rill is generally a few inches deep and not wide enough to be an obstacle to farm machinery.

Rock fragments – Rock or mineral fragments having a diameter or 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

Root zone – The part of the soil that can be penetrated by plant roots.

Runoff – The precipitation discharged into stream channels from an area. The water that flows off the surface of the land without sinking into the soil is called surface runoff. Water that enters the soil before reaching surface streams is called groundwater runoff or seepage flow from ground water.

Sand – As a soil separate, individual rock or mineral fragments from 0.05 millimeter to 2.0 millimeters in diameter. Most sand grains consist of quartz. As a soil texture class, a soil that is 85 percent or more sand and not more than 10 percent clay.

Sedimentary rock – Rock made up of particles deposited from suspension in water. The chief kinds of sedimentary rock are conglomerate, formed from gravel; sandstone, formed from sand; shale, formed from clay; and limestone, formed from masses of calcium carbonate. There are many intermediate types.

Series, soil – A group of soils that have profiles that are almost alike, except for differences in texture of the surface layer or of the underlying material. All the soils of a series have horizons that are similar in composition, thickness, and arrangement.

Sheet erosion – The removal of a fairly uniform layer of soil material from the land surface by the action of rainfall and runoff water.

Shield volcano – A volcano in the shape of a flattened dome, broad and low, built by flows of very fluid basaltic lava or by rhyolitic ash flows. Cf: lava shield; ignimbrite shield. Syn: lava dome; basaltic dome.

Shrink-swell – The shrinking of soil when dry and the swelling when wet. Shrinking and swelling can damage roads, dams, building foundations, and other structures. It can also damage plant roots.

Silica – A combination of silicon and oxygen. The mineral form is called quartz.

Silt – As a soil separate, individual mineral particles that range in diameter from the upper limit of clay (0.002 millimeter) to the lower limit of very fine sand (0.05 millimeter). As a soil textural class, soil that is 80 percent or more silt and less than 12 percent clay.

Site class – A grouping of site indexes into 5 to 7 production capability levels. Each level can be represented by a site curve.

Site curve (100-year) – A set of related curves on a graph that show the average height of dominant and codominate trees for a range of ages on soils that differ in productivity. Each level is represented by a curve. The basis of the curves is the height of dominant and codominant trees that are 100 years old or are 100 years old at breast height.

Site index – A designation of the quality of a forest site based on the height of the dominant stand at an arbitrarily chosen age. For example, if the average height attained by dominant and codominant trees in a fully stocked stand at the age of 50 years is 75 feet, the site index is 75.

Slickensides – Polished and grooved surfaces produced by one mass sliding past another. In soils, slickensides may occur at the bases of slip surfaces on the steeper slopes; on faces of blocks, prisms, and columns; and in swelling clayey soils, where there is marked change in moisture content.

Slippage – Soil mass susceptible to movement downslope when loaded, excavated, or wet.

Slope – The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distnace, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance.

Smeariness – The extent to which a soil exhibits smeariness determines whether or not it is thixotropic. Thixotrophy is the property exhibited by various gels of becoming fluid when disturbed and of setting again to a gel when allowed to stand. Thixotrophy apparently is the result of structure that, if broken down, can rebuild itself. The breakdown may be caused by any of several actions - agitation, shearing, even ultrasonic waves.

In evaluating thixotropic soil material, force is applied to a standard test specimen at field moisture capacity until it smears. Classes are based on the degree of force applied.

Weakly smeary - Under moderately strong force between thumb and forefinger, the soil material changes suddenly to fluid, the fingers skid, and the soil smears. After the soil smears, little or no free water remains on the fingers.

Moderately smeary - Under moderate force between thumb and forefinger, the soil material changes suddenly to fluid, the fingers skid, and the soil smears. After the soil smears, little or no free water remains on the fingers.

Strongly smeary - Under slight force between thumb and forefinger, the soil material suddenly changes to fluid, the fingers skid, and the soil smears and is very slippery. After the soil smears, free water is easily seen on the fingers

Soil – A natural, three-dimensional body at the earth's surface. It is capable of supporting plants and 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.

Soil separates – Mineral particles less than millimeters in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows:

Millimeters
Very coarse sand 2.0 to 1.0
Coarse sand 1.0 to 0.5
Medium sand 0.5 to 0.25
Fine sand 0.25 to 0.10
Very fine sand 0.10 to 0.05
Silt 0.05 to 0.002
Clay less than 0.002

Solum – The upper part of a soil profile, above the C horizon, in which the processes of soil formation are active. The solum in soil consists of 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 plant and animal activities are largely confined to the solum.

Stones – Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter if rounded or 6 to 15 inches (15 to 38 centimeters) in length if flat.

Stony – Refers to a soil containing stones in numbers that interfere with or prevent tillage.

Structure, soil – The arrangement of primary soil particles into compound particles or aggregates. The

principal 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 grained (each grain by itself, as in dune sand) or massive (the particles adhering without any regular cleavage, as in many hardpans).

Subsoil – Technically, the B horizon; roughly, the part of the solum below plow depth.

Substratum – The part of the soil below the solum.

Surface layer – As used in this survey refers to the "A" horizon and the organic layer if present.

Talus – Rock fragments of any size or shape, commonly coarse and angular, derived from and lying at the base of a cliff or very steep, rock slope. The accumulated mass of such loose, broken rock formed chiefly by falling, rolling, or sliding.

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".

Tilth, soil – The physical condition of the soil as related to tillage, seedbed preparation, seedling emergence, and root penetration.

Toe slope – The outermost inclined surface at the base of a hill; part of a foot slope.

Topsoil – The upper part of the soil, which is the most favorable material for plant growth. It is ordinarily rich in organic matter and is used to topdress roadbanks, lawns, and land affected by mining.

Tuff – A compacted deposit that is 50 percent or more volcanic ash and dust.

Upland (geology) – Land at higher elevation, in general, than the alluvial plain or stream terrace; land above the lowlands along streams.

Vesicular crust – A dense, structureless, and highly porous surface soil layer from 1 to 3 inches thick, normally light in color and usually associated with arid or semiarid rangelands.

Water table – The upper limit of the soil or underlying rock material that is wholly saturated with water.

Water table, apparent – A thick zone of free water in the soil. An apparent water table is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil.

Weathering – All physical and chemical changes produced in rocks or other deposits at or near the earth's surface by atmospheric agents. These changes result in disintegration and decomposition of the material.

Well graded – Refers to soil material consisting of coarse grained particles that are well distributed over a wide range in size or diameter. Such soil normally can be easily increased in density and bearing properties by compaction. Contrasts with poorly graded soil.

Wilting point (or permanent wilting point) – The moisture content of soil, on an ovendry basis, at which a plant (specifically sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

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