

# soil properties

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Data relating to soil properties are collected during the course of the soil survey. The data and the estimates of soil and water features, listed in tables, are explained on the following pages.

Soil properties are determined by field examination of the soils and by laboratory index testing of some benchmark soils. Established standard procedures are followed. During the survey, many shallow borings are made and examined to identify and classify the soils and to delineate them on the soil maps. Samples are taken from some typical profiles and tested in the laboratory to determine grain-size distribution, plasticity, and compaction characteristics.

Estimates of soil properties are based on field examinations, on laboratory tests of samples from the survey area, and on laboratory tests of samples of similar soils in nearby areas. Tests verify field observations, verify properties that cannot be estimated accurately by field observation, and help characterize key soils.

The estimates of soil properties shown in the tables include the range of grain-size distribution and Atterberg limits, the engineering classifications, and the physical and chemical properties of the major layers of each soil. Pertinent soil and water features also are given.

## engineering index properties

Table 17 gives estimates of the engineering classification and of the range of index properties for the major layers of each soil in the survey area. Most soils have layers of contrasting properties within the upper 5 or 6 feet.

*Depth* to the upper and lower boundaries of each layer is indicated. The range in depth and information on other properties of each layer are given for each soil series under "Soil series and their morphology."

*Texture* is given in the standard terms used by the U.S. Department of Agriculture. These terms are defined according to percentages of sand, silt, and clay in the fraction of the soil that is less than 2 millimeters in diameter. "Loam," for example, is soil that is 7 to 27 percent clay, 28 to 50 percent silt, and less than 52 percent sand. If a soil contains particles coarser than sand, an appropriate modifier is added, for example, "gravelly." Textural terms are defined in the Glossary.

*Classification* of the soils is determined according to the Unified soil classification system (2) and the system

adopted by the American Association of State Highway and Transportation Officials (1).

The Unified system classifies soils according to properties that affect their use as construction material. Soils are classified according to grain-size distribution of the fraction less than 3 inches in diameter and according to plasticity index, liquid limit, and organic matter content. Sandy and gravelly soils are identified as GW, GP, GM, GC, SW, SP, SM, and SC; silty and clayey soils as ML, CL, OL, MH, CH, and OH; and highly organic soils as Pt. Soils exhibiting engineering properties of two groups can have a dual classification, for example, SP-SM.

The AASHTO system classifies soils according to those properties that affect roadway construction and maintenance. In this system, the fraction of a mineral soil that is less than 3 inches in diameter is classified in one of seven groups from A-1 through A-7 on the basis of grain-size distribution, liquid limit, and plasticity index. Soils in group A-1 are coarse grained and low in content of fines (silt and clay). At the other extreme, soils in group A-7 are fine grained. Highly organic soils are classified in group A-8 on the basis of visual inspection.

If laboratory data are available, the A-1, A-2, and A-7 groups are further classified as A-1-a, A-1-b, A-2-4, A-2-5, A-2-6, A-2-7, A-7-5, or A-7-6. As an additional refinement, the suitability of a soil as subgrade material can be indicated by a group index number. Group index numbers range from 0 for the best subgrade material to 20 or higher for the poorest.

*Rock fragments* larger than 3 inches in diameter are indicated as a percentage of the total soil on a dry-weight basis. The percentages are estimates determined mainly by converting volume percentage in the field to weight percentage.

*Percentage (of soil particles) passing designated sieves* is the percentage of the soil fraction less than 3 inches in diameter based on an oven-dry weight. The sieves, numbers 4, 10, 40, and 200 (USA Standard Series), have openings of 4.76, 2.00, 0.420, and 0.074 millimeters, respectively. Estimates are based on laboratory tests of soils sampled in the survey area and in nearby areas and on estimates made in the field.

*Liquid limit and plasticity index* (Atterberg limits) indicate the plasticity characteristics of a soil. The estimates are based on test data from the survey area or from nearby areas and on field examination.

The estimates of grain-size distribution, liquid limit, and plasticity index are rounded to the nearest 5 percent.

Thus, if the ranges of gradation and Atterberg limits extend a marginal amount (1 or 2 percentage points) across classification boundaries, the classification in the marginal zone is omitted in the table.

## physical and chemical properties

Table 18 shows estimates of some characteristics and features that affect soil behavior. These estimates are given for the major layers of each soil in the survey area. The estimates are based on field observations and on test data for these and similar soils.

*Clay* as a soil separate consists of mineral soil particles that are less than 0.002 millimeter in diameter. In this table, the estimated clay content of each major soil layer is given as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The amount and kind of clay greatly affect the fertility and physical condition of the soil. They determine the ability of the soil to adsorb cations and to retain moisture. They influence shrink-swell potential, permeability, and plasticity, the ease of soil dispersion, and other soil properties. The amount and kind of clay in a soil also affect tillage and earth-moving operations.

*Permeability* refers to the ability of a soil to transmit water or air. The estimates indicate the rate of downward movement of water when the soil is saturated. They are based on soil characteristics observed in the field, particularly structure, porosity, and texture. Permeability is considered in the design of soil drainage systems, septic tank absorption fields, and construction where the rate of water movement under saturated conditions affects behavior.

*Available water capacity* refers to the quantity of water that the soil is capable of storing for use by plants. The capacity for water storage is given in inches of water per inch of soil for each major soil layer. The capacity varies, depending on soil properties that affect the retention of water and the depth of the root zone. The most important properties are the content of organic matter, soil texture, bulk density, and soil structure. Available water capacity is an important factor in the choice of plants or crops to be grown and in the design and management of irrigation systems. Available water capacity is not an estimate of the quantity of water actually available to plants at any given time.

*Soil reaction* is a measure of acidity or alkalinity and is expressed as a range in pH values. The range in pH of each major horizon is based on many field tests. For many soils, values have been verified by laboratory analyses. Soil reaction is important in selecting crops and other plants, in evaluating soil amendments for fertility and stabilization, and in determining the risk of corrosion.

*Salinity* is a measure of soluble salts in the soil at saturation. It is expressed as the electrical conductivity of the saturation extract, in millimhos per centimeter at 25 degrees C. Estimates are based on field and

laboratory measurements at representative sites of nonirrigated soils. The salinity of irrigated soils is affected by the quality of the irrigation water and by the frequency of water application. Hence, the salinity of soils in individual fields can differ greatly from the value given in the table. Salinity affects the suitability of a soil for crop production, the stability of soil if used as construction material, and the potential of the soil to corrode metal and concrete.

*Shrink-swell potential* is the potential for volume change in a soil with a loss or gain in moisture. Volume change occurs mainly because of the interaction of clay minerals with water and varies with the amount and type of clay minerals in the soil. The size of the load on the soil and the magnitude of the change in soil moisture content influence the amount of swelling of soils in place. Laboratory measurements of swelling of undisturbed clods were made for many soils. For others, swelling was estimated on the basis of the kind and amount of clay minerals in the soil and on measurements of similar soils.

If the shrink-swell potential is rated moderate to very high, shrinking and swelling can cause damage to buildings, roads, and other structures. Special design is often needed.

Shrink-swell potential classes are based on the change in length of an unconfined clod as moisture content is increased from air-dry to field capacity. The change is based on the soil fraction less than 2 millimeters in diameter. The classes are *low*, a change of less than 3 percent; *moderate*, 3 to 6 percent; and *high*, more than 6 percent. *Very high*, greater than 9 percent, is sometimes used.

*Erosion factor K* indicates the susceptibility of a soil to sheet and rill erosion by water. Factor K is one of six factors used in the Universal Soil Loss Equation (USLE) to predict the average annual rate of soil loss by sheet and rill erosion in tons per acre per year. The estimates are based primarily on percentage of silt, sand, and organic matter (up to 4 percent) and on soil structure and permeability. Values of K range from 0.05 to 0.69. The higher the value the more susceptible the soil is to sheet and rill erosion by water.

*Erosion factor T* is an estimate of the maximum average annual rate of soil erosion by wind or water that can occur without affecting crop productivity over a sustained period. The rate is in tons per acre per year.

*Wind erodibility groups* are made up of soils that have similar properties affecting their resistance to wind erosion in cultivated areas or in areas where the cover has been disturbed by overgrazing or excessive traffic. The groups indicate the susceptibility of soil to wind erosion and the amount of soil lost. In this survey area, wind erodibility groups are shown only for the soils in an area east and northeast of Lake Shastina. Winds in this area are at a velocity that can cause soil blowing, resulting in damage to the soils and plants. Soils are grouped according to the following distinctions:

1. Sands, coarse sands, fine sands, and very fine sands. These soils are generally not suitable for crops. They are very highly erodible, and vegetation is difficult to establish.

2. Loamy sands, loamy fine sands, and loamy very fine sands. These soils are highly erodible. Crops can be grown if intensive measures to control wind erosion are used.

3. Sandy loams, coarse sandy loams, fine sandy loams, and very fine sandy loams. These soils are moderately erodible. Crops can be grown if intensive measures to control wind erosion are used.

4L. Calcareous loamy soils that are less than 35 percent clay and more than 5 percent finely divided calcium carbonate. These soils are moderately erodible. Crops can be grown if intensive measures to control wind erosion are used.

4. Clays, silty clays, clay loams, and silty clay loams that are more than 35 percent clay. These soils are moderately erodible. Crops can be grown if measures to control wind erosion are used.

5. Loamy soils that are less than 18 percent clay and less than 5 percent finely divided calcium carbonate and sandy clay loams and sandy clays that are less than 5 percent finely divided calcium carbonate. These soils are slightly erodible. Crops can be grown if measures to control wind erosion are used.

6. Loamy soils that are 18 to 35 percent clay and less than 5 percent finely divided calcium carbonate, except silty clay loams. These soils are very slightly erodible. Crops can easily be grown.

7. Silty clay loams that are less than 35 percent clay and less than 5 percent finely divided calcium carbonate. These soils are very slightly erodible. Crops can easily be grown.

8. Stony or gravelly soils and other soils not subject to wind erosion.

*Organic matter* is the plant and animal residue in the soil at various stages of decomposition.

In table 18, the estimated content of organic matter of the plow layer is expressed as a percentage, by weight, of the soil material that is less than 2 millimeters in diameter.

The content of organic matter of a soil can be maintained or increased by returning crop residue to the soil. Organic matter affects the available water capacity, infiltration rate, and tilth. It is a source of nitrogen and other nutrients for crops.

## soil and water features

Table 19 gives estimates of various soil and water features. The estimates are used in land use planning that involves engineering considerations.

*Hydrologic soil groups* are used to estimate runoff from precipitation. Soils not protected by vegetation are assigned to one of four groups. They are grouped according to the intake of water when the soils are

thoroughly wet and receive precipitation from long-duration storms.

The four hydrologic soil groups are:

Group A. Soils having a high infiltration rate (low runoff potential) when thoroughly wet. These consist mainly of deep, well drained to excessively drained sands or gravelly sands. These soils have a high rate of water transmission.

Group B. Soils having a moderate infiltration rate when thoroughly wet. These consist chiefly of moderately deep or deep, moderately well drained or well drained soils that have moderately fine texture to moderately coarse texture. These soils have a moderate rate of water transmission.

Group C. Soils having a slow infiltration rate when thoroughly wet. These consist chiefly of soils having a layer that impedes the downward movement of water or soils of moderately fine texture or fine texture. These soils have a slow rate of water transmission.

Group D. Soils having a very slow infiltration rate (high runoff potential) when thoroughly wet. These consist chiefly of clays that have a high shrink-swell potential, soils that have a permanent high water table, soils that have a claypan or clay layer at or near the surface, and soils that are shallow over nearly impervious material. These soils have a very slow rate of water transmission.

*Flooding*, the temporary inundation of an area, is caused by overflowing streams, by runoff from adjacent slopes, or by tides. Water standing for short periods after rainfall or snowmelt and water in swamps and marshes are not considered flooding.

Table 19 gives the frequency and duration of flooding and the time of year when flooding is most likely.

Frequency, duration, and probable dates of occurrence are estimated. Frequency is expressed as none, rare, common, occasional, and frequent. *None* means that flooding is not probable; *rare* that it is unlikely but possible under unusual weather conditions; *common* that it is likely under normal conditions; *occasional* that it occurs on an average of once or less in 2 years; and *frequent* that it occurs on an average of more than once in 2 years. Duration is expressed as *very brief* if less than 2 days, *brief* if 2 to 7 days, and *long* if more than 7 days. Probable dates are expressed in months; November-May, for example, means that flooding can occur during the period November through May.

The information is based on evidence in the soil profile, namely thin strata of gravel, sand, silt, or clay deposited by floodwater; irregular decrease in organic matter content with increasing depth; and absence of distinctive horizons that form in soils that are not subject to flooding.

Also considered are local information about the extent and levels of flooding and the relation of each soil on the landscape to historic floods. Information on the extent of flooding based on soil data is less specific than that provided by detailed engineering surveys that delineate flood-prone areas at specific flood frequency levels.

*High water table* (seasonal) is the highest level of a saturated zone in the soil in most years. The depth to a seasonal high water table applies to undrained soils. The estimates are based mainly on the evidence of a saturated zone, namely grayish colors or mottles in the soil. Indicated in table 19 are the depth to the seasonal high water table; the kind of water table—that is, perched, artesian, or apparent; and the months of the year that the water table commonly is high. A water table that is seasonally high for less than 1 month is not indicated in table 19.

An apparent water table is a thick zone of free water in the soil. It is indicated by the level at which water stands in an uncased borehole after adequate time is allowed for adjustment in the surrounding soil. An artesian water table is under hydrostatic head, generally beneath an impermeable layer. When this layer is penetrated, the water level rises in an uncased borehole. A perched water table is water standing above an unsaturated zone. In places an upper, or perched, water table is separated from a lower one by a dry zone.

Only saturated zones within a depth of about 6 feet are indicated. A plus sign preceding the range in depth indicates that the water table is above the surface of the soil. The first numeral in the range indicates how high the water rises above the surface. The second numeral indicates the depth below the surface.

*Depth to bedrock* is given if bedrock is within a depth of 5 feet. The depth is based on many soil borings and on observations during soil mapping. The rock is specified as either soft or hard. If the rock is soft or fractured, excavations can be made with trenching machines, backhoes, or small rippers. If the rock is hard

or massive, blasting or special equipment generally is needed for excavation.

*Cemented pans* are cemented or indurated subsurface layers within a depth of 5 feet. Such pans cause difficulty in excavation. Pans are classified as thin or thick. A thin pan is less than 3 inches thick if continuously indurated or less than 18 inches thick if discontinuous or fractured. Excavations can be made by trenching machines, backhoes, or small rippers. A thick pan is more than 3 inches thick if continuously indurated or more than 18 inches thick if discontinuous or fractured. Such a pan is so thick or massive that blasting or special equipment is needed in excavation.

*Risk of corrosion* pertains to potential soil-induced electrochemical or chemical action that dissolves or weakens uncoated steel or concrete. The rate of corrosion of uncoated steel is related to such factors as soil moisture, particle-size distribution, acidity, and electrical conductivity of the soil. The rate of corrosion of concrete is based mainly on the sulfate and sodium content, texture, moisture content, and acidity of the soil. Special site examination and design may be needed if the combination of factors creates a severe corrosion environment. The steel in installations that intersect soil boundaries or soil layers is more susceptible to corrosion than steel in installations that are entirely within one kind of soil or within one soil layer.

For uncoated steel, the risk of corrosion, expressed as *low*, *moderate*, or *high*, is based on soil drainage class, total acidity, electrical resistivity near field capacity, and electrical conductivity of the saturation extract.

For concrete, the risk of corrosion is also expressed as *low*, *moderate*, or *high*. It is based on soil texture, acidity, and amount of sulfates in the saturation extract.

# classification of the soils

The system of soil classification used by the National Cooperative Soil Survey has six categories (13). 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 20, the soils of the survey area 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 Haploxeralfs (*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 *Typic* identifies the subgroup that typifies the great group. An example is *Typic Haploxeralfs*.

**FAMILY.** Families are established within a subgroup on the basis of physical and chemical properties and other characteristics that affect management. Mostly the properties are those of horizons below plow depth where there is much biological activity. Among the properties

and characteristics considered are particle-size class, mineral content, temperature regime, depth of the root zone, consistence, moisture equivalent, slope, and permanent cracks. A family name consists of the name of a subgroup preceded by terms that indicate soil properties. An example is *fine, montmorillonitic, mesic Typic Haploxeralfs*.

**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 or of the substratum can differ within a series.

## soil series and their morphology

In this section, each soil series 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 series. The soil is compared with similar soils and with nearby soils of other series. A *pedon*, a small three-dimensional area of soil, that is typical of the series in the survey area is described. The detailed description of each soil horizon follows standards in the Soil Survey Manual (12). Many of the technical terms used in the descriptions are defined in Soil Taxonomy (13). Unless otherwise stated, colors in the descriptions are for dry soil. Following the *pedon* description is the range of important characteristics of the soils in the series.

The map units of each soil series are described in the section "Detailed soil map units."

### Asta series

The Asta series consists of very deep, well drained soils on glacial outwash terraces (fig. 4). These soils formed in volcanic ash overlying glacial outwash. Slope ranges from 5 to 50 percent.

Typical *pedon* of Asta gravelly sandy loam, 5 to 15 percent slopes; 800 feet west and 1,680 feet south of the northeast corner of sec. 32, T. 40 N., R. 4 W.

O1—2 inches to 1 inch; undecomposed needles, leaves, bark, twigs, and other organic debris.

O2—1 inch to 0; partially decomposed needles, leaves, twigs, bark, and other organic debris.

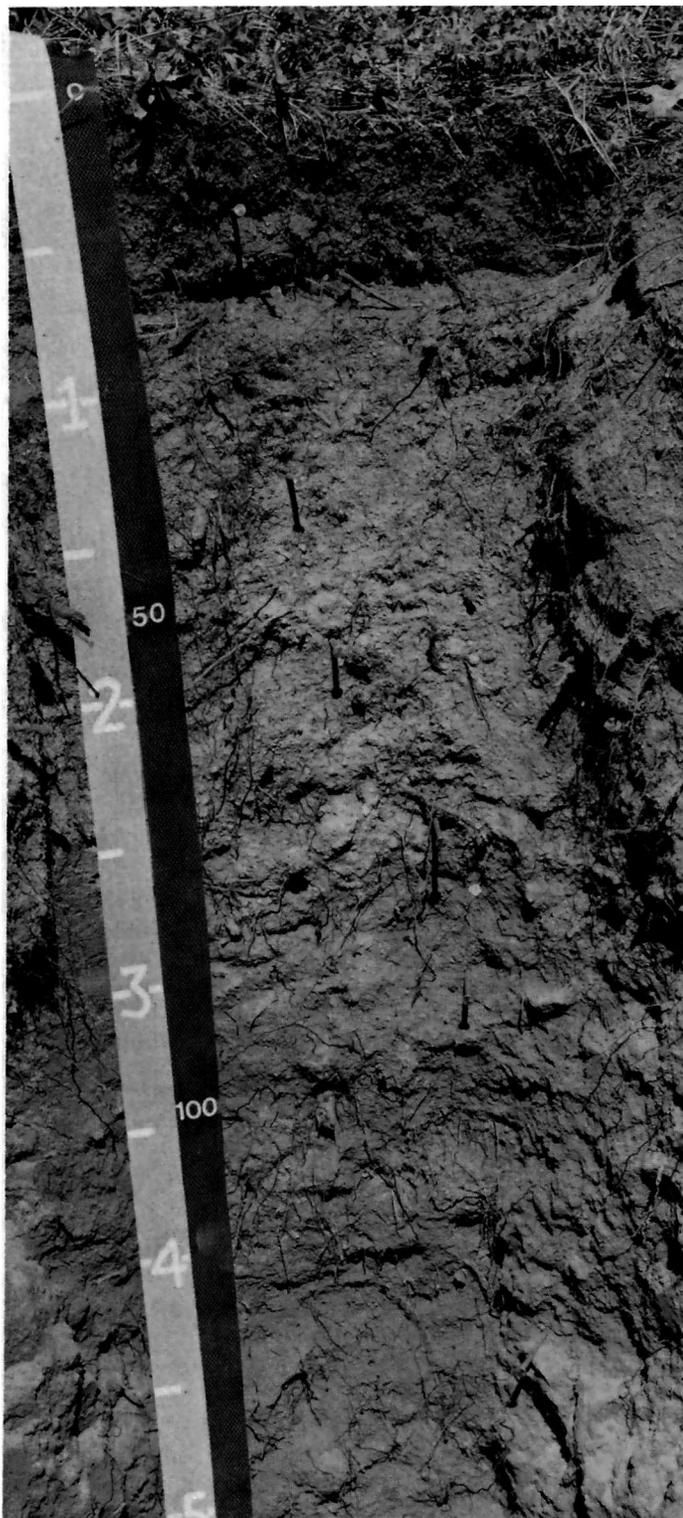


Figure 4.—Profile of Asta gravelly sandy loam, 5 to 15 percent slopes. Tape measure on right gives depth in centimeters, and that on left gives depth in feet.

- A11—0 to 3 inches; dark brown (7.5YR 4/4) gravelly sandy loam, black (5YR 2/1) moist; weak fine granular structure; soft, very friable, slightly sticky and nonplastic; many very fine, fine, and medium roots; many fine interstitial pores; 25 percent fine iron concretions and rounded pebbles 2 to 5 millimeters in diameter; weakly smeary; strongly acid; abrupt smooth boundary.
- A12—3 to 6 inches; dark brown (7.5YR 4/4) gravelly sandy loam, dark reddish brown (5YR 3/2) moist; weak fine granular structure; soft, very friable, slightly sticky and nonplastic; many very fine, fine, and medium roots; many fine interstitial pores; 30 percent fine iron concretions and rounded pebbles 2 to 5 millimeters in diameter; weakly smeary; strongly acid; abrupt smooth boundary.
- A3—6 to 13 inches; brown (7.5YR 5/4) gravelly sandy loam, dark reddish brown (5YR 3/4) moist; very weak medium subangular blocky structure parting to moderate fine granular; slightly hard, very friable, slightly sticky and slightly plastic; many very fine, fine, and medium roots; many fine interstitial pores; 30 percent fine iron concretions and rounded pebbles 2 to 5 millimeters in diameter; weakly smeary; strongly acid; clear smooth boundary.
- B1—13 to 20 inches; brown (7.5YR 5/4) loam, reddish brown (5YR 4/4) moist; moderate fine granular structure; slightly hard, friable, sticky and plastic; many medium roots and common very fine and fine roots; few very fine tubular pores; strongly acid; abrupt wavy boundary.
- B21t—20 to 27 inches; brown (7.5YR 5/4) loam, reddish brown (5YR 4/4) moist; weak medium subangular blocky structure parting to moderate fine granular; hard, friable, sticky and plastic; many medium roots and common very fine and fine roots; common very fine vesicular pores and few very fine tubular pores; common thin clay films in pores and on peds; strongly acid; abrupt wavy boundary.
- 11B22t—27 to 34 inches; strong brown (7.5YR 5/6) loam, reddish brown (5YR 4/4) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic; many medium roots and few very fine and fine roots; common very fine and fine tubular pores and few very fine vesicular pores; continuous thin clay films in pores and on peds; strongly acid; clear wavy boundary.
- 11B23t—34 to 50 inches; strong brown (7.5YR 5/6) silt loam, reddish brown (5YR 4/4) moist; massive; hard, friable, sticky and plastic; many medium roots and few very fine and fine roots; common very fine and fine tubular pores and few very fine vesicular pores; continuous thin clay films in pores; 5 percent fine rounded pebbles 2 to 5 millimeters in diameter; strongly acid; clear wavy boundary.
- 11B24t—50 to 60 inches; strong brown (7.5YR 5/6) silt loam, reddish brown (5YR 4/4) moist; massive; hard, friable, sticky and plastic; many medium roots

and few very fine and fine roots; common very fine and fine tubular pores and few very fine vesicular pores; few thick clay films on pebbles and many thin clay films in pores; 5 percent fine rounded pebbles 2 to 5 millimeters in diameter; weakly smeary; strongly acid; abrupt wavy boundary.

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

Depth to glacial outwash is more than 60 inches. Bulk density ranges from 0.6 to 1 gram per cubic centimeter to a depth of 10 to 20 inches. It is 0.85 gram per cubic centimeter or more to a depth of 10 to 14 inches.

The A1 horizon has value of 3 to 6 when dry and 2 to 5 when moist, chroma of 3, 4, or 6 when dry and 1 to 4 when moist, and hue of 10YR, 7.5YR, or 5YR. Reaction is very strongly acid to slightly acid. Texture is gravelly sandy loam or cobbly sandy loam. The horizon is 10 to 15 percent clay and 15 to 35 percent rock fragments. Thickness ranges from 3 to 8 inches. Base saturation ranges from 25 to 35 percent. The sodium fluoride reaction ranges from 9 to 10.

The B2t and IIB2t horizons have value of 3 to 7 when dry and 4 to 6 when moist, chroma of 2, 3, 4, or 6 when dry and 2, 3, 4, 6, or 8 when moist, and hue of 10YR, 7.5YR, or 5YR. Reaction is very strongly acid or strongly acid. Texture is loam, silt loam, cobbly loam, or cobbly silt loam. The horizon is 0 to 35 percent rock fragments. The weighted average clay content of the upper 20 to 30 inches of the argillic horizon ranges from 18 to 25 percent. Base saturation ranges from 25 to 35 percent. Bulk density of the upper 20 inches of the argillic horizon ranges from 1 gram to 1.2 grams per cubic centimeter.

## Atter series

The Atter series consists of very deep, somewhat excessively drained soils on alluvial fans. These soils formed in mixed alluvium. Slope ranges from 0 to 30 percent.

Typical pedon of Atter very cobbly sandy loam, 0 to 5 percent slopes; 265 feet south and 320 feet west of the northeast corner of sec. 36, T. 43 N., R. 10 W.

A11—0 to 9 inches; dark grayish brown (10YR 4/2) very cobbly sandy loam, very dark gray (10YR 3/1) moist; massive; soft, very friable, slightly sticky and nonplastic; many very fine, fine, and medium roots; few fine interstitial and tubular pores; 25 percent pebbles and 25 percent cobbles; slightly acid; abrupt smooth boundary.

A12—9 to 12 inches; pale brown (10YR 6/3) very cobbly sandy loam, very dark grayish brown (10YR 3/2) moist; massive; soft, very friable, slightly sticky and nonplastic; common very fine and fine roots and

many medium roots; few fine interstitial and tubular pores; 25 percent pebbles and 25 percent cobbles; slightly acid; abrupt wavy boundary.

AC—12 to 18 inches; pale brown (10YR 6/3) very cobbly sandy loam, dark brown (10YR 3/3) moist; massive; soft, very friable, slightly sticky and nonplastic; common very fine and fine roots and many medium roots; common fine interstitial and tubular pores; 25 percent pebbles and 25 percent cobbles; slightly acid; abrupt wavy boundary.

C1—18 to 33 inches; pale brown (10YR 6/3) very cobbly loamy sand, dark brown (10YR 4/3) moist; single grain; loose; few very fine and fine roots and common medium roots; common fine interstitial pores; 25 percent pebbles and 25 percent cobbles; medium acid; abrupt wavy boundary.

C2—33 to 60 inches; light brownish gray (10YR 6/2) very cobbly sand, dark brown (10YR 4/2) moist; single grain; loose; common fine interstitial pores; 30 percent pebbles and 20 percent cobbles; medium acid.

Thickness of the solum ranges from 7 to 39 inches. Content of rock fragments ranges from 35 to 60 percent. The solum is 0 to 10 percent clay. Reaction is medium acid to neutral.

The A1 horizon has value of 4 to 6 when dry and 3 or 4 when moist, and it has chroma of 1 to 3 when dry. Texture is very cobbly sandy loam, very gravelly sandy loam, or very bouldery loamy fine sand. Organic matter content is less than 1 percent in the upper 7 inches of the horizon, and it decreases regularly with depth. Thickness of the A1 horizon ranges from 7 to 25 inches.

The C horizon has value of 4 to 6 when dry and 3 or 4 when moist, and it has chroma of 2 to 4. It is very cobbly or very bouldery sand or loamy sand and is 0 to 5 percent clay.

## Avis series

The Avis series consists of very deep, somewhat excessively drained soils on mountains (fig. 5). These soils formed in volcanic ash. Slopes range from 5 to 50 percent.

Typical pedon of an Avis very stony sandy loam in an area of Avis-Oosen complex, 5 to 30 percent slopes; 2,150 feet south and 300 feet west of the northeast corner of sec. 21, T. 45 N., R. 3 W.

O1&O2—3 inches to 0; undecomposed and partially decomposed needles, twigs, bark, leaves, and other organic debris.

A11—0 to 6 inches; yellowish brown (10YR 5/4) very stony sandy loam, dark yellowish brown (10YR 3/4) moist; weak fine and very fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine, fine, medium, and coarse roots; many very fine and fine interstitial pores; 5 percent pebbles, 10 percent cobbles, and 15 percent stones; neutral; abrupt smooth boundary.



Figure 5.—Profile of Avis very stony sandy loam in an area of Avis-Oosen complex, 5 to 30 percent slopes. Tape measure on right gives depth in centimeters, and that on left gives depth in feet.

A12—6 to 13 inches; yellowish brown (10YR 5/4) very stony sandy loam, dark yellowish brown (10YR 4/4) moist; weak very fine and fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine, fine, medium, and coarse roots; many very fine and fine interstitial pores; 5 percent pebbles, 10 percent cobbles, and 15 percent stones; slightly acid; abrupt wavy boundary.

C1—13 to 34 inches; light yellowish brown (10YR 6/4) very gravelly loamy sand, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; many very fine, fine, medium, and coarse roots; many fine interstitial pores; 30 percent pebbles, 10 percent cobbles, and 2 percent stones; slightly acid; abrupt wavy boundary.

IIC2—34 to 47 inches; yellowish brown (10YR 5/4) very gravelly loamy sand, dark yellowish brown (10YR 3/4) moist; massive; soft, very friable, nonsticky and nonplastic; many very fine, fine, medium, and coarse roots; many very fine and fine interstitial pores; 30 percent pebbles, 10 percent cobbles, and 5 percent stones; slightly acid; abrupt wavy boundary.

IIC3—47 to 60 inches; yellowish brown (10YR 5/4) very gravelly sand, dark yellowish brown (10YR 3/4) moist; single grain; loose; many very fine, fine, medium, and coarse roots; 30 percent pebbles, 10 percent cobbles, and 5 percent stones; medium acid; gradual wavy boundary.

IIC4—60 to 72 inches; yellowish brown (10YR 5/4) very gravelly sand, dark yellowish brown (10YR 3/4) moist; single grain; loose; 30 percent pebbles, 15 percent cobbles, and 5 percent stones; medium acid.

Depth to fractured lava flow material ranges from 60 to 80 inches. The profile is 0 to 5 percent clay. Base saturation ranges from 20 to 50 percent throughout the profile. The sodium fluoride reaction ranges from 10.9 at the surface to 9.9 at a depth of 40 to 72 inches. The 10- to 40-inch control section averages 35 to 70 percent rock fragments.

The A horizon has value of 5 or 6 when dry and chroma of 2 to 4 when dry or moist. Reaction is medium acid to neutral. Content of rock fragments ranges from 15 to 35 percent. Thickness ranges from 9 to 14 inches. Where the A horizon is dark-colored, it lacks the thickness to qualify it as a mollic epipedon.

The C horizon has value of 5 or 6 when dry and 3 to 5 when moist, chroma of 2 to 4 when dry and 3 or 4 when moist, and hue of 10YR or 7.5YR. Reaction is medium acid or slightly acid. The C horizon is very gravelly loamy fine sand or very gravelly loamy sand. It is 35 to 60 percent rock fragments.

The IIC horizon has value of 5 or 6 when dry and 3 to 5 when moist, and it has chroma of 3 or 4. It is very gravelly loamy fine sand, very gravelly loamy sand, or very gravelly sand and is 35 to 60 percent rock fragments.

## Bogus series

The Bogus series consists of very deep, well drained soils on mountains. These soils formed in residuum derived from tuff. Slopes range from 15 to 50 percent.

Typical pedon of Bogus stony loam, 15 to 50 percent slopes; 600 feet west and 1,375 feet north of the southeast corner of sec. 16, T. 46 N., R. 4 W.

O1&O2—1 inch to 0; undecomposed and partially decomposed needles, leaves, twigs, bark, and other organic debris.

A11—0 to 3 inches; very dark grayish brown (10YR 3/2) stony loam, very dark brown (10YR 2/2) moist; moderate fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine, fine, medium, and coarse roots; 10 percent stones, 2 percent cobbles, and 10 percent pebbles; slightly acid; abrupt smooth boundary.

A12—3 to 11 inches; dark grayish brown (10YR 4/2) clay loam, very dark brown (10YR 2/2) moist; strong medium granular structure; hard, friable, sticky and plastic; many very fine, fine, medium, and coarse roots; few fine tubular pores; 2 percent cobbles and 5 percent pebbles; slightly acid; abrupt smooth boundary.

B1t—11 to 20 inches; grayish brown (10YR 5/2) clay loam, dark brown (7.5YR 3/2) moist; strong fine angular blocky structure; very hard, firm, sticky and very plastic; common very fine and fine roots and many medium and coarse roots; common very fine tubular pores and fine vesicular pores; few thin clay films on peds and lining pores; 10 percent cobbles and 5 percent pebbles; medium acid; abrupt wavy boundary.

B21t—20 to 29 inches; yellowish brown (10YR 5/4) heavy clay loam, dark yellowish brown (10YR 4/4) moist; strong medium angular blocky structure; extremely hard, very firm, sticky and very plastic; few very fine and fine roots and many medium and coarse roots; few very fine tubular pores; few moderately thick clay films on peds and common thin clay films on peds and in pores; 10 percent cobbles and 5 percent pebbles; medium acid; clear wavy boundary.

B22t—29 to 39 inches; yellowish brown (10YR 5/4 and 5/6) clay, dark yellowish brown (10YR 4/4) moist; strong medium prismatic structure; extremely hard, very firm, very sticky and very plastic; few very fine and fine roots and many medium roots; few very fine tubular pores; continuous thick clay films on peds and lining pores; 5 percent cobbles; strongly acid; clear wavy boundary.

B23t—39 to 53 inches; yellowish brown (10YR 5/4) clay, dark brown (10YR 4/3) when moist and when rubbed; dark yellowish brown (10YR 4/4) ped faces; strong medium prismatic structure; extremely hard, very firm, very sticky and very plastic; few very fine

and fine roots and common medium roots; few very fine tubular pores; pressure faces or continuous thick clay films on ped faces; common large slickensides; very strongly acid; clear wavy boundary.

B3t—53 to 62 inches; yellowish brown (10YR 5/4) sandy clay, dark yellowish brown (10YR 4/4) when moist and rubbed; strong medium angular blocky structure; extremely hard, very firm, very sticky and very plastic; few very fine and fine roots and common medium roots; few very fine discontinuous tubular pores; continuous thick clay films or pressure faces; common large slickensides; very strongly acid.

Cr—62 inches; weathered tuff.

Few to many stones are on the surface. Depth to weathered tuff ranges from 60 to 80 inches. Organic matter content is 1 to 4 percent to a depth of 20 to 25 inches, and it decreases regularly with depth. Base saturation is 50 to 75 percent in some or all of the A horizon and in the upper part of the Bt horizon.

The A horizon has value of 3 or 4 when dry and 2 or 3 when moist, chroma of 1 to 3, and hue of 10YR and 7.5YR. Reaction is medium acid or slightly acid. The A horizon is stony loam or very stony loam. The A1 horizon is 25 to 27 percent clay and 15 to 35 percent rock fragments. Thickness ranges from 3 to 6 inches. The A12 horizon is 27 to 35 percent clay and 0 to 15 percent rock fragments. Thickness ranges from 8 to 10 inches.

The B2t horizon has value of 4 to 7 when dry and 3 to 6 when moist, chroma of 4 or 6 when dry and 3, 4, or 6 when moist, and hue of 10YR or 2.5Y. Reaction is very strongly acid to medium acid. The B2t horizon is 35 to 60 percent clay and 5 to 15 percent rock fragments.

## Bonnet series

The Bonnet series consists of very deep, well drained soils on alluvial fans. These soils formed in mixed alluvium. Slope ranges from 0 to 5 percent.

Typical pedon of Bonnet gravelly loam, 0 to 2 percent slopes; 800 feet south and 1,050 feet east of the northwest corner of sec. 28, T. 43 N., R. 6 W.

Ap1—0 to 4 inches; grayish brown (2.5Y 5/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; 30 percent fine and medium pebbles; moderately alkaline; abrupt smooth boundary.

Ap2—4 to 14 inches; grayish brown (2.5Y 5/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; common very fine and fine roots; 30 percent fine and medium pebbles; moderately alkaline; clear smooth boundary.

AC—14 to 26 inches; grayish brown (2.5Y 5/2) very gravelly loam, dark brown (10YR 3/3) moist;

massive; slightly hard, very friable, slightly sticky and slightly plastic; few very fine and fine roots; 45 percent fine and medium pebbles; moderately alkaline; clear smooth boundary.

C1ca—26 to 35 inches; pale brown (10YR 6/3) very gravelly loam, dark brown (10YR 3/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; 60 percent fine and medium pebbles; slightly effervescent with disseminated lime, strongly effervescent with carbonate accumulations on the undersides of about 50 percent of the pebbles; strongly alkaline; abrupt smooth boundary.

C2ca—35 to 46 inches; pale brown (10YR 6/3) very gravelly sandy loam, dark brown (10YR 4/3) moist; massive; slightly hard, friable, nonsticky and nonplastic; 60 percent fine and medium pebbles; slightly effervescent with disseminated lime, violently effervescent with carbonate accumulations on the undersides of about 65 percent of the pebbles; moderately alkaline; clear smooth boundary.

C3ca—46 to 61 inches; pale brown (10YR 6/3) extremely gravelly loamy sand, dark brown (10YR 4/3) moist; massive; slightly hard, very friable, nonsticky and nonplastic; 80 percent fine and medium pebbles; slightly effervescent with disseminated lime, violently effervescent with carbonate accumulations on the undersides of about 85 percent of the pebbles and on most of the larger rock fragments; moderately alkaline.

Depth to lime ranges from 20 to 30 inches. The solum is 21 to 32 inches thick. It is 10 to 18 percent clay.

The A horizon has value of 4 or 5 when dry and 2 or 3 when moist, chroma of 2 or 3 when dry and 1 to 3 when moist, and hue of 2.5Y or 10YR. Reaction is slightly acid to moderately alkaline. Texture is loam or gravelly loam. Organic matter content of the upper 10 to 14 inches ranges from 1 to 2 percent. Thickness of the A horizon ranges from 11 to 18 inches.

The C horizon has value of 5 to 7 when dry, chroma of 3 or 4, and hue of 2.5Y or 10YR. Reaction is moderately alkaline or strongly alkaline. The upper part of the C horizon is 10 to 18 percent clay and 35 to 60 percent rock fragments. The lower part is very gravelly or extremely gravelly loamy sand, sandy loam, or loam. It is 5 to 15 percent clay and 60 to 80 percent rock fragments.

### Boomer series

The Boomer series consists of deep, well drained soils on mountains. These soils formed in residuum derived from metamorphic rock. Slope ranges from 5 to 70 percent.

Typical pedon of a Boomer gravelly loam in an area of Marpa-Kinkel-Boomer, cool complex, 15 to 50 percent slopes; 2,450 feet north and 650 feet west of the southeast corner of sec. 3, T. 44 N., R. 9 W.

O1—1 inch to 0; needles, leaves, bark, twigs, and other organic debris.

A11—0 to 3 inches; brown (7.5YR 5/4) gravelly loam, dark reddish brown (5YR 3/4) moist; weak fine granular structure; slightly hard, friable, sticky and slightly plastic; many very fine and fine roots; many very fine interstitial pores; 20 percent pebbles; slightly acid; abrupt smooth boundary.

A12—3 to 10 inches; brown (7.5YR 5/4) gravelly loam, reddish brown (5YR 4/4) moist; weak medium subangular blocky structure; hard, friable, sticky and plastic; many very fine and fine roots, common medium roots, and many coarse roots; many very fine interstitial pores and many fine tubular pores; 20 percent pebbles; slightly acid; clear wavy boundary.

B21t—10 to 15 inches; yellowish red (5YR 5/6) gravelly clay loam, reddish brown (5YR 4/4) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic; common fine roots and many coarse roots; many fine interstitial and tubular pores; common thin clay films on peds and lining pores; 20 percent pebbles; slightly acid; clear smooth boundary.

B22t—15 to 31 inches; yellowish red (5YR 5/6) gravelly clay loam, yellowish red (5YR 4/6) moist; moderate medium subangular blocky structure; hard, friable, very sticky and very plastic; few very fine, fine, and medium roots; common fine interstitial and tubular pores; many moderately thick clay films on peds and lining pores; 20 percent pebbles; slightly acid; clear smooth boundary.

B23t—31 to 40 inches; yellowish red (5YR 5/6) gravelly clay loam, yellowish red (5YR 4/6) moist; weak medium subangular blocky structure; hard, friable, very sticky and plastic; few very fine, fine, and medium roots; common fine interstitial pores and few fine tubular pores; many moderately thick clay films on peds and lining pores; 25 percent pebbles; medium acid; gradual smooth boundary.

B3t—40 to 53 inches; yellowish red (5YR 5/6) gravelly sandy clay loam, yellowish red (5YR 4/6) moist; weak medium subangular blocky structure; hard, friable, very sticky and plastic; few very fine, fine, and medium roots; few fine tubular pores and common fine interstitial pores; 25 percent pebbles; medium acid; gradual smooth boundary.

Cr—53 inches; weathered metamorphosed basic igneous rock.

Depth to weathered rock ranges from 40 to 60 inches. The profile is 5 to 35 percent rock fragments.

The A1 horizon has value of 5 or 6 when dry and 3 to 5 when moist, and it has hue of 10YR, 7.5YR, or 5YR. Reaction is neutral to medium acid. Texture is gravelly loam or loam. The A1 horizon is 18 to 27 percent clay. It ranges from 5 to 10 inches in thickness.

The B2t horizon has value of 4 to 6 when dry and 4 or 5 when moist, and it has chroma of 4, 6, or 8 when dry

and 4 or 6 when moist. Reaction is strongly acid to slightly acid. Texture is clay loam or gravelly clay loam. The B2t horizon is 25 to 35 percent clay.

### Boomer Variant

The Boomer Variant consists of very deep, well drained soils on mountains. These soils formed in residuum derived from sandstone. Slope ranges from 5 to 70 percent.

Typical pedon of Boomer Variant sandy loam, 30 to 50 percent slopes; 1,750 feet east and 1,200 feet south of the northwest corner of sec. 34, T. 48 N., R. 7 W.

- O1&O2—1 inch to 0; undecomposed and partially decomposed organic debris.
- A11—0 to 2 inches; brown (10YR 5/3) sandy loam, dark brown (10YR 3/3) moist; weak fine granular structure; slightly hard, friable, slightly sticky and nonplastic; many very fine and fine roots and common medium roots; many interstitial pores and common fine tubular pores; medium acid; abrupt smooth boundary.
- A12—2 to 6 inches; light brown (7.5YR 6/4) sandy loam, dark brown (7.5YR 3/4) moist; massive; slightly hard, friable, slightly sticky and nonplastic; common fine and medium roots; common very fine tubular pores and few fine tubular pores; medium acid; abrupt smooth boundary.
- A3—6 to 10 inches; light brown (7.5YR 6/4) sandy loam, dark brown (7.5YR 3/4) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine and medium roots; many random interstitial pores and few fine tubular pores; few thin clay films in pores; strongly acid; clear smooth boundary.
- B1t—10 to 25 inches; light yellowish brown (10YR 6/4) sandy loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; hard, friable, sticky and plastic; common fine, medium, and coarse roots; many very fine and fine tubular pores; common thick and moderately thick clay films in pores and few thin clay films on peds; strongly acid; clear smooth boundary.
- B21t—25 to 36 inches; yellowish brown (10YR 5/6) sandy clay loam, yellowish brown (10YR 5/4) moist; weak medium prismatic structure parting to moderate medium subangular blocky; very hard, slightly firm, sticky and very plastic; many medium and coarse roots and common fine roots; common fine tubular pores; common thick clay films and many moderately thick clay films on peds and in pores; strongly acid; gradual wavy boundary.
- B22t—36 to 50 inches; yellowish brown (10YR 5/6) loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; very hard, firm, sticky and plastic; many medium roots and common fine roots; many fine tubular pores;

many moderately thick clay films in pores and on peds; strongly acid; gradual wavy boundary.

- B23t—50 to 70 inches; yellowish brown (10YR 5/6) sandy loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; very hard, firm, sticky and plastic; many medium roots and common fine roots; many fine tubular pores; many moderately thick clay films in pores and on peds; medium acid; clear smooth boundary.

Cr—70 inches; weathered sandstone.

Depth to sandstone ranges from 60 to 80 inches. The profile is 0 to 35 percent rock fragments. A few stones are on the surface.

The A1 horizon has value of 4 to 6 when dry and 2 to 4 when moist, chroma of 3 to 5, and hue of 7.5YR or 10YR. Where it is dark-colored, it lacks the organic matter content and thickness to qualify as a mollic epipedon. Reaction of the A1 horizon is medium acid or slightly acid. The horizon is sandy loam or stony sandy loam and is 5 to 18 percent clay. Thickness ranges from 5 to 13 inches.

The B2t horizon has value of 4 to 6 when dry and 3 to 5 when moist, and it has chroma of 4 or 6. It is sandy clay loam, loam, or sandy loam and is 18 to 25 percent clay. The B2t horizon is stony in places. Reaction is strongly acid to slightly acid.

### Chaix series

The Chaix series consists of moderately deep, well drained soils on mountains. These soils formed in residuum derived from granitic rock. Slope ranges from 5 to 70 percent.

Typical pedon of a Chaix gravelly coarse sandy loam in an area of Chaix-Chawanakee gravelly coarse sandy loams, 50 to 70 percent slopes; 1,000 feet east and 500 feet south of the northwest corner of sec. 18, T. 42 N., R. 9 W.

- O1—1 inch to 0; leaves, needles, and twigs, some partially decomposed.
- A1—0 to 4 inches; brown (10YR 5/3) gravelly coarse sandy loam, very dark grayish brown (10YR 3/2) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine interstitial and tubular pores; 20 percent pebbles; slightly acid; abrupt smooth boundary.
- B2t—4 to 28 inches; very pale brown (10YR 7/3) gravelly coarse sandy loam, brown (10YR 5/3) moist; weak medium subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; few very fine, fine, medium, and coarse roots; many very fine interstitial pores and few fine tubular pores; few thin clay films bridging mineral grains; 20 percent pebbles; medium acid; clear wavy boundary.
- C—28 to 34 inches; light yellowish brown (10YR 6/4) gravelly coarse sandy loam, yellowish brown (10YR

5/4) moist; massive; soft, very friable, nonsticky and nonplastic; few coarse roots; many fine interstitial pores; 20 percent pebbles; strongly acid; clear wavy boundary.

Cr—34 inches; weathered granite.

Depth to weathered granite ranges from 20 to 40 inches. Thickness of the solum ranges from 20 to 30 inches. The profile is 15 to 35 percent rock fragments.

The A1 horizon has value of 4 to 6 when dry and 2 or 3 when moist, and it has chroma of 2 or 3. Reaction is medium acid or slightly acid. Thickness ranges from 3 to 6 inches.

The B2t horizon has value of 6 or 7 when dry and 3 to 5 when moist, and it has chroma of 3 or 4. Reaction is strongly acid or medium acid. The B2t horizon has 1 to 2 percent more clay than the A horizon.

### Chawanakee series

The Chawanakee series consists of shallow, somewhat excessively drained soils on mountains. These soils formed in residuum derived from granitic rock. Slope ranges from 5 to 70 percent.

Typical pedon of a Chawanakee gravelly coarse sandy loam in an area of Chaix-Chawanakee gravelly coarse sandy loams, 50 to 70 percent slopes; 1,720 feet north and 2,630 feet west of the southeast corner of sec. 18, T. 42 N., R. 9 W.

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

A1—0 to 4 inches; light brownish gray (10YR 6/2) gravelly coarse sandy loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, very friable, nonsticky and nonplastic; common very fine interstitial and tubular pores; 25 percent pebbles; medium acid; abrupt smooth boundary.

B2t—4 to 16 inches; pale brown (10YR 6/3) gravelly coarse sandy loam, brown (10YR 5/3) moist; weak coarse granular structure; soft, very friable, nonsticky and nonplastic; common very fine interstitial and tubular pores; common thin clay films bridging mineral grains; 25 percent pebbles; medium acid; clear wavy boundary.

Cr—16 inches; weathered granite.

Depth to weathered granite ranges from 10 to 20 inches. The profile is 15 to 35 percent rock fragments. Reaction of the solum is medium acid or slightly acid.

The A1 horizon has value of 5 or 6 when dry and 2 to 4 when moist, and it has chroma of 2 or 3. Thickness ranges from 2 to 5 inches.

The B2t horizon has value of 5 or 6 when dry and 4 or 5 when moist, and it has chroma of 2 or 3.

### Copsey series

The Copsey series consists of very deep, poorly drained soils on alluvial fans. These soils have formed in alluvium derived from serpentine rock. Slope ranges from 0 to 9 percent.

Typical pedon of Copsey clay, 0 to 9 percent slopes; 1,080 feet north and 10 feet west of the southeast corner of sec. 31, T. 42 N., R. 5 W.

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

A12—3 to 18 inches; black (10YR 2/1) clay, black (10YR 2/1) moist; weak fine subangular blocky structure; slightly hard, slightly firm, sticky and plastic; many very fine and fine roots; 5 percent fine pebbles; slightly acid; abrupt smooth boundary.

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

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

C2—31 to 37 inches; dark grayish brown (10YR 4/2) gravelly clay, very dark brown (10YR 2/2) moist, dark gray (N 4/0) moist and rubbed; strong medium subangular blocky structure; extremely hard, firm, very sticky and very plastic; few very fine and fine roots; few fine tubular pores; 25 percent very fine, fine, and medium pebbles and 2 percent cobbles; mildly alkaline; clear wavy boundary.

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

Thickness of the solum ranges from 17 to 30 inches. Cracks 1 to 3 centimeters extend to a depth of 20 to 30 inches when the soils are dry. A water table is at a depth of 6 to 18 inches from December through March and at a depth of 18 to 40 inches the rest of the year.

The A1 horizon has value of 2 to 4 when dry and 2 or 3 when moist, chroma of 0 to 2 when dry, and hue of 2.5Y, 10YR, or neutral. Reaction is slightly acid or

neutral. The A1 horizon is clay, gravelly clay, or cobbly clay. It is 40 to 60 percent clay and 5 to 35 percent rock fragments. Organic matter content ranges from 2 to 6 percent in the upper 18 inches.

The C horizon has hue of 5Y, 2.5Y, 10YR, or neutral. Reaction is slightly acid to mildly alkaline. The C horizon is gravelly or cobbly clay. It is 40 to 60 percent clay and 15 to 35 percent rock fragments.

### Deetz series

The Deetz series consists of very deep, somewhat excessively drained soils on glacial outwash fans (fig. 6). These soils formed in alluvium derived from extrusive igneous rock and ash. Slope ranges from 0 to 30 percent.

Typical pedon of Deetz gravelly loamy sand, 5 to 15 percent slopes; 1,600 feet south and 1,200 feet east of the northwest corner of sec. 19, T. 41 N., R. 4 W.

O1&O2—1/2 inch to 0; undecomposed and partially decomposed leaves, needles, twigs, bark, and other organic debris.

A11—0 to 1 1/2 inches; very dark grayish brown (10YR 3/2) gravelly loamy sand, black (10YR 2/1) moist; weak fine granular structure; soft, very friable, slightly sticky and nonplastic; many very fine and fine roots; 15 percent pebbles; medium acid; abrupt smooth boundary.

A12—1 1/2 to 4 inches; dark brown (10YR 4/3) gravelly loamy sand, very dark brown (10YR 2/2) and very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; 15 percent pebbles; medium acid; abrupt smooth boundary.

A13—4 to 7 inches; brown (10YR 5/3) gravelly loamy sand, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; 15 percent pebbles; medium acid; clear smooth boundary.

C1—7 to 12 inches; pale brown (10YR 6/3) gravelly loamy sand, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine, fine, and medium roots; 15 percent pebbles; medium acid; clear smooth boundary.

C2—12 to 18 inches; light yellowish brown (10YR 6/4) gravelly loamy sand, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; many medium roots and common very fine and fine roots; 15 percent pebbles; medium acid; abrupt wavy boundary.

C3—18 to 28 inches; pale brown (10YR 6/3) gravelly loamy sand, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; many medium roots and common very fine and fine roots; 23 percent pebbles and 2 percent cobbles; medium acid; clear wavy boundary.

C4—28 to 38 inches; pale brown (10YR 6/3) and very pale brown (10YR 7/3) gravelly loamy sand, dark yellowish brown (10YR 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; common very

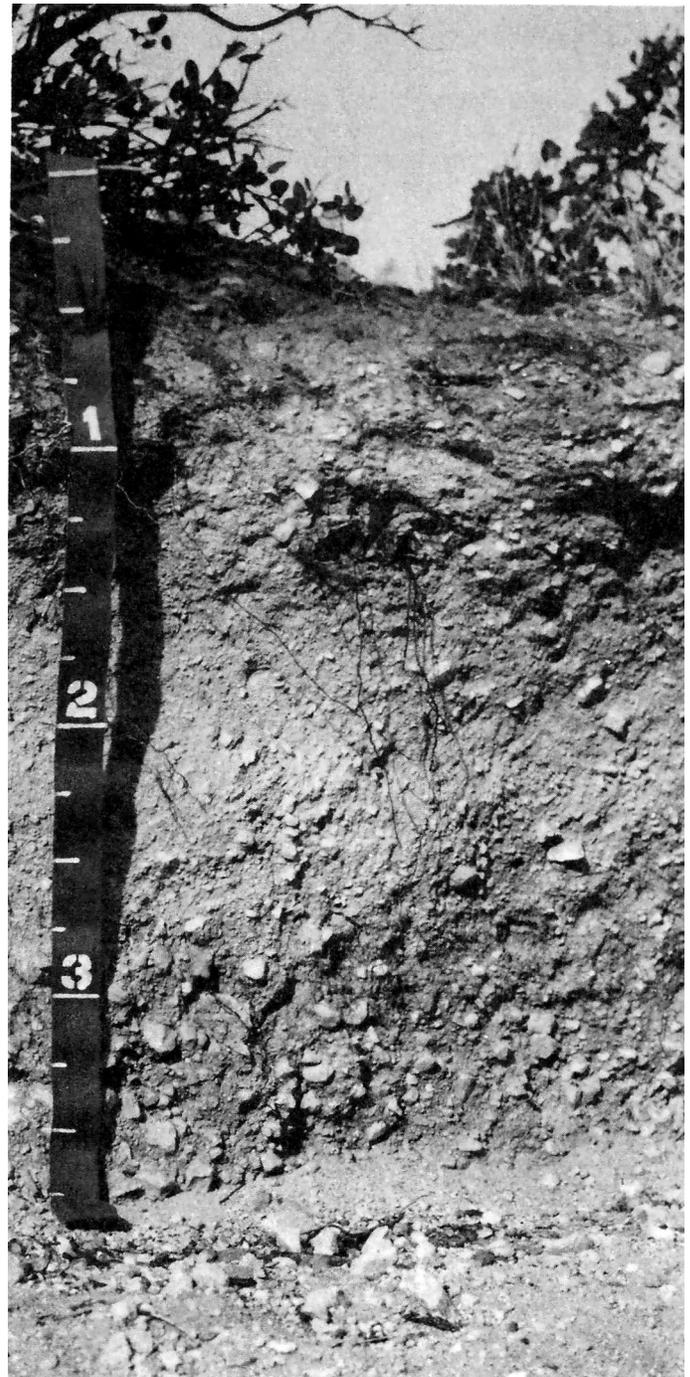


Figure 6.—Typical profile of Deetz gravelly loamy sand, 0 to 5 percent slopes. Tape measure gives depth in feet.

fine and fine roots; 30 percent pebbles and 2 percent cobbles; medium acid; abrupt wavy boundary.

IIC5—38 to 53 inches; pale brown (10YR 6/3) very gravelly sand, strong brown (7.5YR 4/6) moist; single grain; loose; many medium roots and few very fine and fine roots; 38 percent pebbles and 7 percent cobbles; medium acid; abrupt wavy boundary.

IIIC6—53 to 65 inches; gray (10YR 6/1) and light gray (10YR 7/1) very gravelly sand; single grain; loose; many medium roots and few very fine and fine roots; 48 percent pebbles and 2 percent cobbles; medium acid.

Thickness of the solum ranges from 5 to 12 inches. Reaction is strongly acid or medium acid. The weighted average of rock fragments in the 10- to 40-inch control section is less than 35 percent. The A horizon is too thin or the base saturation is too low to qualify it as a mollic epipedon. Base saturation ranges from 40 to 70 percent in the A horizon and from 15 to 50 percent between depths of 10 and 40 inches. Base saturation commonly decreases with depth. The sodium fluoride reaction ranges from 9.6 to 10.7 throughout the profile. In places a few stones are on the surface.

The A horizon is gravelly loamy sand or stony loamy sand. It is 0 to 5 percent clay and 15 to 35 percent rock fragments.

The C horizon has value of 4 to 6 when moist, and it has chroma of 1 to 4 when dry and 2 to 6 when moist. It is stratified loamy sand or sand. This horizon is 0 to 2 percent clay. It is 5 to 35 percent gravel and cobbles in the upper 40 inches and 35 to 60 percent below a depth of 40 inches.

## Delaney series

The Delaney series consists of deep or very deep, somewhat excessively drained soils on glacial outwash fans. These soils formed in alluvium weathered from extrusive igneous rock and volcanic ash. Slope ranges from 0 to 15 percent.

Typical pedon of Delaney sand, 0 to 9 percent slopes; 550 feet east and 10 feet north of the southwest corner of sec. 30, T. 43 N., R. 4 W.

A11—0 to 5 inches; grayish brown (10YR 5/2) sand, very dark grayish brown (10YR 3/2) moist; very weak fine granular structure; soft, very friable, nonsticky and nonplastic; common fine and very fine roots and many medium roots; few fine tubular pores and many fine interstitial pores; medium acid; abrupt smooth boundary.

A12—5 to 9 inches; grayish brown (10YR 5/2) sand, dark brown (10YR 3/3) moist; weak thick platy structure, massive in some parts; soft, very friable, nonsticky and nonplastic; common fine and very fine

roots and many medium roots; few fine tubular pores and many fine interstitial pores; medium acid; abrupt smooth boundary.

AC—9 to 13 inches; grayish brown (10YR 5/2) sand, olive brown (2.5Y 3/4) moist; weak medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common fine roots and many medium roots; few fine tubular pores and many fine interstitial pores; medium acid; clear smooth boundary.

C1—13 to 23 inches; pale brown (10YR 6/3) sand, olive brown (2.5Y 4/4) moist; massive; soft, very friable, nonsticky and nonplastic; common fine roots and many medium roots; few fine tubular pores and many fine interstitial pores; medium acid; abrupt smooth boundary.

C2—23 to 32 inches; light gray (10YR 7/2) sand, brown (10YR 5/3) moist; massive; soft, very friable, nonsticky and nonplastic; few fine roots and common medium roots; many fine interstitial pores; medium acid; clear smooth boundary.

C3—32 to 41 inches; very pale brown (10YR 7/3) sand, dark grayish brown (2.5Y 4/2) moist; massive; soft, very friable, nonsticky and nonplastic; few fine roots and common medium roots; many fine interstitial pores; medium acid; clear smooth boundary.

C4—41 to 68 inches; white (10YR 8/2) sand, dark grayish brown (10YR 4/2) moist; single grain; loose; few fine roots and common medium roots; medium acid.

In a few areas, stones are on the surface. Depth to bedrock or to a strongly contrasting layer of alluvium ranges from 40 to 80 inches. Reaction is medium acid to neutral throughout the profile. Base saturation is more than 60 percent in some parts of the upper 10 to 30 inches.

The A1 horizon has value of 5 to 7 when dry and 3 or 4 when moist, chroma of 2 or 3, and hue of 10YR or 2.5Y. It is sandy loam, sand, gravelly sand, or stony sand. The horizon is 0 to 5 percent clay and 5 to 35 percent rock fragments. Organic matter content ranges from 0.5 to 1.0 percent in the A horizon. Thickness of the A horizon ranges from 8 to 11 inches.

The C horizon has value of 6 to 8 when dry and 3 to 5 when moist, chroma of 2 to 4 when dry or moist, and hue of 10YR or 2.5Y. The horizon is 0 to 5 percent clay and 5 to 35 percent rock fragments. It is sand or loamy sand. The sand is gravelly, cobbly, or stony in places, and the loamy sand is gravelly in places. In some pedons very gravelly sand is below a depth of 40 inches.

## Delaney Variant

The Delaney Variant consists of very deep, well drained soils on glacial outwash fans. These soils formed in glaciofluvial deposits derived from extrusive igneous rock. Slope ranges from 0 to 2 percent.

Typical pedon of Delaney Variant silt, 0 to 2 percent slopes; 1,100 feet north and 500 feet east of the southwest corner of sec. 22, T. 43 N., R. 4 W.

- A1—0 to 7 inches; gray (10YR 6/1) silt, dark gray (10YR 4/1) moist; moderate medium platy structure parting to weak fine granular; soft, very friable, slightly sticky and slightly plastic; many fine roots; neutral; abrupt smooth boundary.
- C1—7 to 14 inches; gray (10YR 6/1) loamy fine sand, very dark grayish brown (10YR 3/2) moist; massive and very weak fine granular structure; soft, very friable, nonsticky and nonplastic; many fine roots; few interstitial pores; neutral; abrupt smooth boundary.
- IIC2—14 to 22 inches; light gray (10YR 7/2) silt, dark grayish brown (10YR 4/2) moist; very weak thick platy structure and massive; slightly hard, friable, slightly sticky and slightly plastic; many fine roots; many fine and medium discontinuous tubular and vesicular pores; neutral; abrupt smooth boundary.
- IIIC3—22 to 34 inches; grayish brown (10YR 5/2) loamy sand, very dark grayish brown (10YR 3/2) moist; massive; soft, very friable, nonsticky and nonplastic; common fine roots; few interstitial pores; 10 percent pumice pebbles; neutral; clear wavy boundary.
- IVC4—34 to 53 inches; light gray (10YR 7/2) sandy loam, dark brown (10YR 3/3) moist; massive; soft, friable, nonsticky and nonplastic; common fine and medium roots; common interstitial pores; neutral; clear wavy boundary.
- VC5—53 to 60 inches; light gray (10YR 7/2) coarse sand, dark brown (10YR 3/3) moist; massive; slightly hard, friable, nonsticky and nonplastic; few fine and medium roots; few interstitial pores; mildly alkaline.

Thickness of the solum ranges from 6 to 8 inches. The textural control section is stratified layers of silt, loamy fine sand, loamy sand, and sandy loam. Clay content ranges from 0 to 5 percent throughout the profile.

The A1 horizon has value of 5 to 7 when dry and 3 or 4 when moist, chroma of 1 or 2, and hue of 2.5Y or 10YR. Reaction is slightly acid or neutral. Content of rock fragments ranges from 0 to 5 percent. Organic matter content ranges from 0.3 to 0.6 percent.

The C horizon has value of 5 to 8 when dry, chroma of 1 to 4, and hue of 2.5Y or 10YR. Reaction is slightly acid or neutral in the upper part of the C horizon and neutral or mildly alkaline in the lower part. Content of rock fragments ranges from 0 to 10 percent.

### Deven series

The Deven series consists of shallow, well drained soils on plateaus. These soils formed in residuum derived from andesitic rock. Slope ranges from 0 to 30 percent.

Typical pedon of a Deven loam in an area of Deven-Rubble land complex, 0 to 30 percent slopes; 2,280 feet south and 1,550 feet east of the northwest corner of sec. 20, T. 48 N., R. 4 W.

- A1—0 to 5 inches; dark brown (10YR 4/3) loam, very dark grayish brown (10YR 3/2) moist; moderate fine subangular blocky structure; hard, friable, slightly sticky and slightly plastic; common very fine roots; 2 percent pebbles; slightly acid; clear smooth boundary.
- B21t—5 to 12 inches; dark brown (10YR 4/3) clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; common very fine roots; common very fine tubular pores; many moderately thick clay films on peds and lining pores; 2 percent pebbles; neutral; clear smooth boundary.
- B22t—12 to 17 inches; dark brown (10YR 4/3) clay, dark grayish brown (10YR 4/2) moist; moderate coarse subangular blocky structure; hard, firm, sticky and plastic; few very fine roots; few very fine tubular pores; continuous moderately thick clay films on peds and lining pores; 10 percent pebbles and cobbles; mildly alkaline; abrupt wavy boundary.
- R—17 inches; hard andesite.

Depth to andesitic rock ranges from 10 to 20 inches. Reaction is slightly acid to mildly alkaline.

The A1 horizon has value of 4 or 5 when dry and chroma of 2 or 3 when dry. Organic matter content ranges from 1 to 3 percent in the upper 7 inches. Content of rock fragments ranges from 0 to 10 percent. Thickness ranges from 1 to 5 inches.

The B2t horizon has value of 4 or 5 when dry and 3 or 4 when moist, and it has chroma of 2 or 3. It is 35 to 50 percent clay and contains at least 8 percent more clay than the A horizon. Content of rock fragments ranges from 0 to 15 percent.

### Diyou series

The Diyou series consists of very deep, somewhat poorly drained soils on flood plains. These soils formed in mixed alluvium. Slope ranges from 0 to 2 percent.

Typical pedon of Diyou loam, drained; 1,830 feet east and 250 feet north of the southwest corner of sec. 13, T. 41 N., R. 9 W.

- A1—0 to 11 inches; dark grayish brown (2.5Y 4/2) loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; many very fine roots; common fine and very fine tubular pores; mildly alkaline; clear smooth boundary.
- C1t—11 to 15 inches; grayish brown (2.5Y 5/2) sandy loam, dark grayish brown (2.5Y 4/2) moist; massive; soft, very friable, nonsticky and nonplastic; common

medium roots; common medium tubular pores; mildly alkaline; clear smooth boundary.

- IIAb—15 to 36 inches; gray (5Y 5/1) sandy clay loam, dark gray (5Y 4/1) moist; common fine prominent brownish yellow (10YR 6/6) and yellowish brown (10YR 5/6, moist) mottles; massive; very hard, firm, sticky and plastic; common fine roots; common fine and very fine tubular pores; saturated with water at a depth of 30 inches; mildly alkaline; clear smooth boundary.
- IIC2—36 to 47 inches; light olive gray (5Y 6/2) clay loam, dark olive gray (5Y 3/2) moist; common prominent brownish yellow (10YR 6/6) and yellowish brown (10YR 5/6, moist) mottles; massive; very hard, firm, sticky and very plastic; saturated with water; mildly alkaline; clear smooth boundary.
- IIC3—47 to 60 inches; light olive gray (5Y 6/2) sandy loam, dark olive gray (5Y 3/2) moist; massive; hard, very friable, nonsticky and nonplastic; free water; mildly alkaline.

The textural control section is stratified sandy loam, loam, sandy clay loam, and clay loam. It averages 18 to 25 percent clay. Some pedons do not have a buried A horizon. The profile is 0 to 15 percent rock fragments. Reaction is neutral or mildly alkaline. Some of these soils are artificially drained. In some pedons, peat is at a depth of 40 to 60 inches. Except where the soil is drained, a water table is at a depth of 24 to 36 inches from February through June, and it fluctuates between depths of 24 and 60 inches from July through January.

The A1 horizon has value of 4 or 5 when dry and 2 or 3 when moist, and it has chroma of 1 or 2. Thickness ranges from 10 to 12 inches. Organic matter content ranges from 2 to 5 percent.

The C horizon has value of 5 or 6 when dry and chroma of 2 or 3.

### **Dotta series**

The Dotta series consists of very deep, well drained soils on alluvial fans. These soils formed in mixed alluvium. Slope ranges from 0 to 9 percent.

Typical pedon of Dotta loam, 0 to 2 percent slopes; 600 feet east and 200 feet south of the northwest corner of sec. 18, T. 44 N., R. 4 W.

- A1p—0 to 7 inches; dark grayish brown (10YR 4/2) loam, black (10YR 2/1) moist; weak medium subangular blocky structure; slightly hard, friable, sticky and plastic; common fine and very fine roots; few fine vesicular pores; 10 percent fine and medium pebbles; slightly acid; abrupt smooth boundary.
- A12—7 to 15 inches; dark grayish brown (10YR 4/2) loam, black (10YR 2/1) moist; weak medium subangular blocky structure; hard, friable, sticky and plastic; few fine and very fine roots; few fine tubular

and vesicular pores; 10 percent fine and medium pebbles; slightly acid; clear smooth boundary.

- B2t—15 to 31 inches; dark grayish brown (10YR 4/2) clay loam, very dark grayish brown (10YR 3/2) moist, weak medium prismatic structure parting to moderate medium subangular blocky; hard, firm, sticky and plastic; few fine and very fine roots; few medium, fine, and very fine tubular pores; few thin clay films on peds, lining pores, and bridging mineral grains; 10 percent pebbles; slightly acid; clear smooth boundary.
- B3—31 to 52 inches; dark brown (10YR 4/3) sandy clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; few fine and very fine roots; common medium, fine, and very fine tubular pores; few thin clay films in pores and many clay bridges between mineral grains; 10 percent pebbles; slightly acid; abrupt smooth boundary.
- C—52 to 62 inches; brown (10YR 5/3) sandy clay loam, dark brown (10YR 4/3) moist; weak medium subangular blocky structure; hard, friable, sticky and plastic; many medium and fine interstitial pores; slightly acid.

Thickness of the solum ranges from 37 to 56 inches. The profile is 0 to 35 percent rock fragments. Organic matter content ranges from 1 to 3 percent in the upper 20 inches or more, and it decreases regularly with depth.

The A1 horizon has value of 3 to 5 when dry, chroma of 1 to 3 when dry and 1 or 2 when moist, and hue of 10YR or 7.5YR. It is loam or gravelly loam and is 10 to 25 percent clay. Thickness ranges from 10 to 16 inches.

The B2t horizon has value of 4 or 5 when dry and 3 or 4 when moist, chroma of 2 or 3, and hue of 10YR or 7.5YR. Reaction is medium acid or slightly acid. The B2t horizon is clay loam or gravelly clay loam. It is 27 to 30 percent clay and 0 to 35 percent rock fragments.

The C horizon is medium acid or slightly acid. It is sandy clay loam or loam and is gravelly in some pedons. The C horizon is 20 to 27 percent clay and 0 to 35 percent rock fragments.

### **Dubakella series**

The Dubakella series consists of moderately deep, well drained soils on mountains (fig. 7). These soils formed in residuum derived from serpentine. Slope ranges from 5 to 50 percent.

Typical pedon of a Dubakella stony loam in an area of Dubakella-lpish complex, 5 to 30 percent slopes; 1,500 feet west and 2,480 feet south of the northeast corner of sec. 1, T. 44 N., R. 8 W.

- O1&O2—2 inches to 0; undecomposed and partially decomposed needles, twigs, bark, leaves, and other organic debris.
- A11—0 to 2 inches; pale brown (10YR 6/3) stony loam, very dark grayish brown (10YR 3/2) moist; weak thick platy structure parting to moderate fine

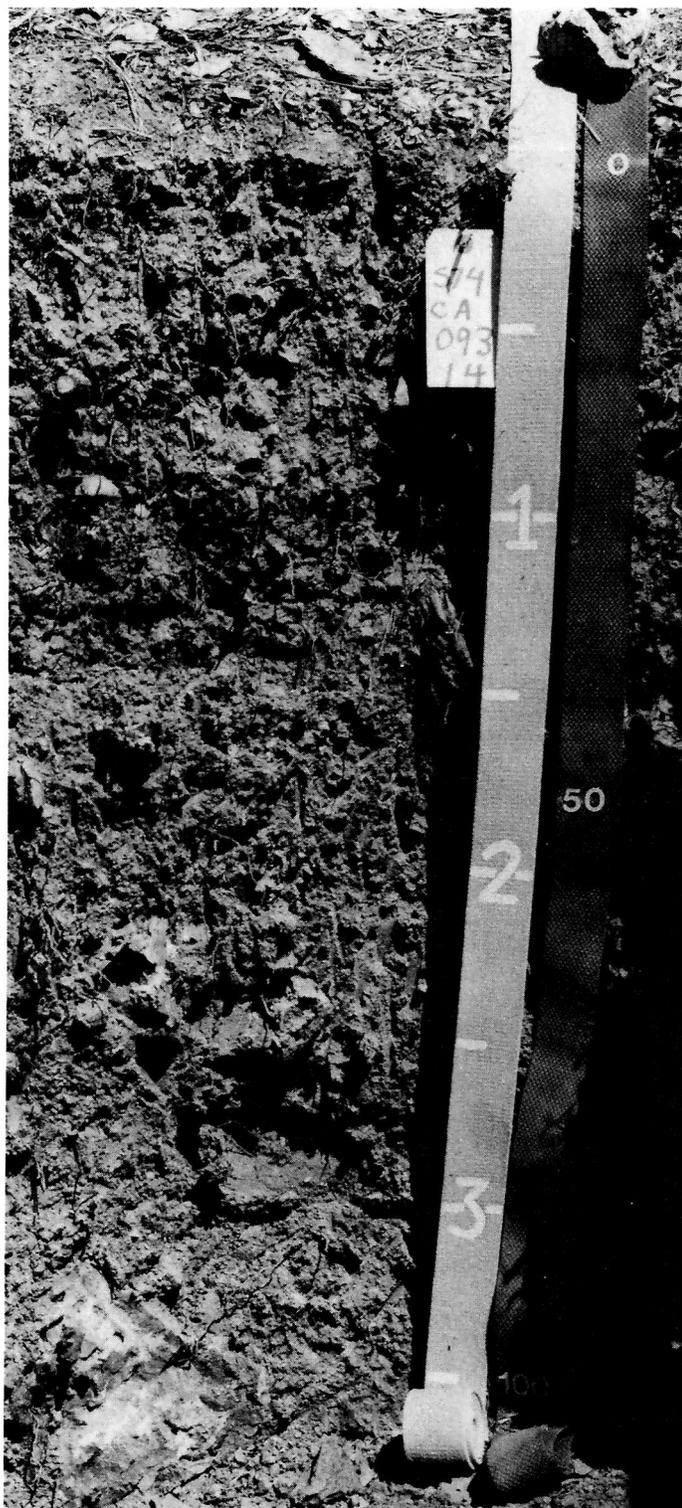


Figure 7.—Typical profile of a Dubakella stony loam in an area of Dubakella-Ipish complex, 5 to 30 percent slopes. Tape measure on right gives depth in centimeters, and that on left gives depth in feet.

subangular blocky; slightly hard, friable, sticky and plastic; many medium roots and common very fine and fine roots; few fine tubular pores; 25 percent pebbles, cobbles, and stones; medium acid; abrupt smooth boundary.

A12—2 to 5 inches; pale brown (10YR 6/3) stony loam, very dark grayish brown (10YR 3/2) moist; moderate fine subangular blocky structure; slightly hard, friable, sticky and plastic; many medium roots and common very fine and fine roots; few fine tubular pores; 35 percent pebbles, cobbles, and stones; medium acid; abrupt smooth boundary.

A3—5 to 11 inches; pale brown (10YR 6/3) stony loam, dark brown (7.5YR 4/2) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic; many medium roots and common very fine and fine roots; few very fine tubular pores; 30 percent pebbles, cobbles, and stones; medium acid; clear smooth boundary.

B21t—11 to 15 inches; brown (7.5YR 5/4) very gravelly clay loam, dark brown (10YR 3/3) moist; strong medium subangular blocky structure; very hard, firm, sticky and plastic; many medium and coarse roots and few very fine and fine roots; few very fine tubular pores; many thin clay films lining pores and on peds; 35 percent pebbles, cobbles, and stones; slightly acid; clear smooth boundary.

B22t—15 to 26 inches; brown (7.5YR 5/4) very gravelly clay loam, reddish brown (5YR 4/4) moist; moderate medium subangular blocky structure; very hard, firm, sticky and very plastic; many medium and coarse roots and few very fine and fine roots; few very fine tubular pores; few thin clay films and common moderately thick and thick clay films lining pores and on peds; 40 percent pebbles, cobbles, and stones; slightly acid; clear smooth boundary.

B23t—26 to 36 inches; brown (7.5YR 5/4) very gravelly clay loam, reddish brown (5YR 4/4) moist; moderate medium subangular blocky structure; very hard, firm, sticky and very plastic; many medium and coarse roots and few very fine and fine roots; few very fine tubular pores; few thick and thin clay films and many moderately thick clay films lining pores and on peds; 40 percent pebbles, cobbles, and stones; slightly acid; gradual wavy boundary.

R—36 inches; highly fractured serpentine.

Depth to serpentine ranges from 20 to 40 inches. A few stones are on the surface in places.

The A1 horizon has value of 3 or 4 when moist, chroma of 3 or 4 when dry and 2 or 3 when moist, and hue of 10YR or 7.5YR. Reaction is medium acid to neutral. Content of rock fragments is 15 to 35 percent. Thickness ranges from 8 to 12 inches.

The B2t horizon has value of 4 or 5 when dry and chroma of 3 or 4 when dry. Reaction is slightly acid or neutral. The B2t horizon is very gravelly clay or very gravelly clay loam. It is 35 to 50 percent clay and

contains at least 8 percent more clay than the A horizon. Content of rock fragments ranges from 35 to 60 percent.

### Duzel series

The Duzel series consists of moderately deep, well drained soils on mountains. These soils formed in residuum derived from metamorphic rock. Slope ranges from 5 to 50 percent.

Typical pedon of a Duzel gravelly loam in an area of Duzel-Jilson-Facey complex, 15 to 50 percent slopes; 2,050 feet south and 900 feet east of the northwest corner of sec. 31, T. 46 N., R. 6 W.

- A11—0 to 4 inches; dark brown (10YR 4/3) gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine roots; common fine and very fine vesicular pores; 20 percent pebbles; slightly acid; abrupt smooth boundary.
- A12—4 to 8 inches; dark brown (10YR 4/3) gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic; many very fine, fine, and medium roots; common fine and very fine vesicular and tubular pores; 15 percent pebbles; slightly acid; abrupt smooth boundary.
- A3—8 to 13 inches; dark brown (10YR 4/3) gravelly loam, dark brown (7.5YR 3/2) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic; many medium roots and common very fine and fine roots; few fine and very fine tubular pores; few thin clay films lining pores; 15 percent pebbles; medium acid; clear smooth boundary.
- B21t—13 to 16 inches; dark brown (7.5YR 4/4) gravelly loam, dark reddish brown (5YR 3/3) moist; very weak medium prismatic structure parting to moderate medium subangular blocky; hard, slightly firm, sticky and plastic; many medium roots and common fine and very fine roots; few fine and very fine tubular pores; common thin clay films on peds and lining pores; 15 percent pebbles; medium acid; clear smooth boundary.
- B22t—16 to 23 inches; brown (7.5YR 5/4) gravelly loam, dark reddish brown (5YR 3/3) moist; very weak medium prismatic structure parting to moderate medium subangular blocky; hard, firm, sticky and plastic; many coarse and medium roots and few very fine and fine roots; few very fine and fine tubular pores; few moderately thick clay films and common thin clay films on peds and lining pores; 15 percent pebbles; medium acid; clear smooth boundary.
- B23t—23 to 30 inches; brown (7.5YR 5/4) gravelly loam, dark reddish brown (5YR 3/3) moist; moderate medium subangular blocky structure; very hard, firm,

sticky and very plastic; many medium roots and few very fine and fine roots; few very fine and fine tubular pores; common thin clay films on peds; 15 percent pebbles; medium acid; abrupt wavy boundary.

- B3t—30 to 38 inches; reddish brown (5YR 4/4) very gravelly clay loam, dark reddish brown (5YR 3/4) moist; massive; very hard, firm, sticky and very plastic; few fine and very fine roots; few very fine and fine tubular pores; many thick clay films on peds and pebbles; 45 percent pebbles and 10 percent cobbles; medium acid; abrupt wavy boundary.
- Cr—38 inches; highly fractured greenstone.

Depth to weathered bedrock ranges from 20 to 40 inches. Base saturation ranges from 75 to 95 percent throughout the profile. Organic matter content ranges from 1 to 2 percent in the upper 13 inches of the profile.

The A horizon has value of 3 to 5 when dry and 2 or 3 when moist, chroma of 2 or 3 when dry and 1 to 3 when moist, and hue of 10YR or 7.5YR. Reaction is medium acid to neutral. The A horizon is 10 to 18 percent clay. Thickness ranges from 4 to 8 inches.

The B2t horizon has value of 3 to 5 when dry and 3 or 4 when moist, and it has hue of 10YR, 7.5YR, or 5YR. Reaction is medium acid to mildly alkaline. Texture is gravelly loam or gravelly clay loam. The B2t horizon is 18 to 35 percent clay.

### Esro series

The Esro series consists of very deep, very poorly drained soils in basins. These soils formed in alluvium derived from extrusive igneous rock. Slope is 0 to 2 percent.

Typical pedon of Esro silt loam, drained; 600 feet south and 400 feet east of the northeast corner of sec. 21, T. 44 N., R. 3 W.

- A11—0 to 7 inches; dark gray (10YR 4/1) silt loam, black (N 2/0) moist; moderate medium platy structure; slightly hard, friable, sticky and plastic; many very fine and fine roots; few fine tubular pores; neutral; abrupt smooth boundary.
- A12—7 to 14 inches; gray (N 5/0) silt loam, black (N 2/0) moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, friable, very sticky and plastic; many fine roots and common medium roots; common very fine tubular pores and few fine tubular pores; neutral; abrupt smooth boundary.
- A13—14 to 32 inches; gray (10YR 5/1) silt loam, very dark grayish brown (10YR 3/2) moist; moderate medium prismatic structure; hard, slightly firm, very sticky and very plastic; few fine roots and many medium roots; common very fine and medium tubular pores and few fine tubular pores; neutral; abrupt wavy boundary.

C1g—32 to 43 inches; variegated gray (10YR 5/1, 6/1) silt loam, dark grayish brown (10YR 4/2) moist; common fine distinct light olive gray (5Y 6/2), olive gray (5Y 5/2), and greenish gray (5GY 6/1) mottles; moderate medium subangular blocky structure; hard, slightly firm, very sticky and plastic; few fine and medium roots; few fine tubular pores; neutral; abrupt wavy boundary.

C2g—43 to 46 inches; light gray (10YR 7/2) silt loam, olive gray (5Y 4/2) if rubbed or crushed when moist; faces of peds are black (N 2/0); many fine to large distinct pale yellow (2.5Y 7/4) mottles when moist, and many fine to large distinct light olive brown (2.5Y 5/4) and reddish brown (5YR 5/3) mottles when moist; massive; very hard, firm, very sticky and plastic; few fine roots; very few very fine pores; mildly alkaline; clear smooth boundary.

IIC3g—46 to 49 inches; very pale brown (10YR 7/3) sandy loam, dark brown (10YR 4/3) when crushed and moist; many fine to large distinct pale yellow (2.5Y 7/4) and yellow (2.5Y 7/6) mottles when moist and many fine to large distinct and prominent olive brown (2.5Y 4/4) and olive (5Y 5/4, 5/6) mottles when moist; massive; very hard, firm, slightly sticky and slightly plastic; neutral; abrupt smooth boundary.

IIIC4g—49 to 51 inches; light brownish gray (10YR 6/2) sandy clay loam, dark brown (10YR 4/3) when crushed and moist; many fine to coarse distinct pale yellow (2.5Y 7/4) mottles when moist, and many fine to coarse faint and distinct dark brown (10YR 3/3) and yellowish brown (10YR 5/6) mottles when moist; massive; hard, firm, sticky and slightly plastic; neutral; abrupt smooth boundary.

IVC5g—51 to 79 inches; light brownish gray (10YR 6/2) sandy loam, dark brown (10YR 4/3) moist; many medium distinct yellowish brown (10YR 5/6, moist) mottles; massive; soft, very friable, nonsticky and nonplastic; neutral.

The textural control section is strata of silt loam, loam, silty clay loam, and clay loam. It averages 60 to 75 percent silt and very fine sand and 18 to 30 percent clay. Where the soils are not drained, the water table is at a depth of 0 to 12 inches from December to August.

The A horizon has value of 3 to 5 when dry, chroma of 0 to 2, and hue of 10YR, 5Y, or neutral. Reaction is slightly acid or neutral. Organic matter content ranges from 2 to 6 percent. Thickness ranges from 24 to 37 inches.

The C horizon has value of 2 to 4 when moist, chroma of 0 to 3 when moist, and hue of 10YR, 5Y, or neutral. Reaction is neutral or mildly alkaline. The upper part of the C horizon is stratified loam to silty clay loam, and the lower part is silty loam, silty clay loam, or clay loam. The C horizon ranges from 0 to 15 percent rock fragments, mostly gravel. Mottles range from few to many, fine to large, and faint to prominent.

## Etsel series

The Etsel series consists of very shallow, somewhat excessively drained soils on mountains. These soils formed in residuum derived from metamorphic rock. Slope ranges from 30 to 75 percent.

Typical pedon of Etsel very gravelly loam, 30 to 75 percent slopes; 800 feet north and 400 feet east of the southwest corner of sec. 16, T. 43 N., R. 10 W.

O1&O2—2 inches to 0; undecomposed and partially decomposed needles, leaves, twigs, bark, and other organic debris.

A1—0 to 7 inches; pale brown (10YR 6/3) very gravelly loam, dark brown (10YR 4/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; common very fine, fine, medium, and coarse roots; common fine and medium pores; 25 percent pebbles and 10 percent cobbles and stones; slightly acid; abrupt irregular boundary.

R—7 inches; fractured schist.

Depth to metamorphic bedrock ranges from 6 to 10 inches. The profile is 35 to 55 percent rock fragments. The content of clay ranges from 12 to 18 percent. Reaction is medium acid or slightly acid.

The A1 horizon has value of 5 or 6 when dry, chroma of 3 or 4 when dry and 2 or 3 when moist, and hue of 10YR or 7.5YR.

## Facey series

The Facey series consists of deep, well drained soils on mountains. These soils formed in residuum derived from metamorphosed rock. Slope ranges from 5 to 50 percent.

Typical pedon of a Facey loam in an area of Duzel-Jilson-Facey complex, 15 to 50 percent slopes; 2,080 feet west and 700 feet north of the southeast corner of sec. 13, T. 43 N., R. 7 W.

A11—0 to 3 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; moderate fine granular structure; slightly hard, friable, sticky and plastic; many very fine and fine roots; many interstitial pores; 10 percent pebbles; neutral; abrupt smooth boundary.

A12—3 to 10 inches; grayish brown (10YR 5/2) loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; common very fine and fine roots and many medium roots; few very fine tubular pores and common fine vesicular pores; 10 percent pebbles; neutral; abrupt smooth boundary.

B1t—10 to 19 inches; brown (10YR 5/3) clay loam, dark brown (10YR 4/3) moist; strong medium subangular blocky structure; slightly hard, friable, sticky and plastic; few very fine and fine roots and many

medium and coarse roots; common very fine and fine tubular pores; common thin clay films lining pores; 10 percent pebbles; neutral; clear wavy boundary.

B21t—19 to 28 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) moist; strong medium subangular blocky structure; hard, firm, sticky and plastic; few very fine and fine roots and common medium roots; common very fine and fine pores and few medium tubular pores; common thin clay films on peds and lining pores; 15 percent pebbles; slightly acid; gradual wavy boundary.

B22t—28 to 39 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; few very fine and fine roots and common medium roots; common very fine and fine tubular pores; many thin clay films on peds and lining pores and few moderately thick clay films lining pores; 10 percent pebbles; slightly acid; gradual wavy boundary.

B23t—39 to 46 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; few very fine and fine roots, common medium roots, and many coarse roots; few medium tubular pores and common very fine and fine tubular pores; common thin and moderately thick clay films on peds and lining pores; 10 percent pebbles; slightly acid; abrupt wavy boundary.

B3t—46 to 59 inches; very pale brown (10YR 7/3, 7/4) clay loam, dark yellowish brown (10YR 4/4) moist; massive; hard, firm, sticky and plastic; few very fine and fine roots and common medium roots; few fine tubular pores; few moderately thick clay films lining pores and common thin clay films lining pores; 10 percent pebbles; neutral; abrupt wavy boundary.

R—59 inches; hard metasedimentary rock.

Depth to lithic contact ranges from 40 to 60 inches. Base saturation ranges from 75 to 95 percent throughout the profile.

The A1 horizon has value of 3 to 5 when dry and 2 or 3 when moist, chroma of 2 or 3 when dry and 1 to 3 when moist, and hue of 10YR or 7.5YR. Reaction is slightly acid or neutral. The horizon is 15 to 20 percent clay and 5 to 15 percent rock fragments. Organic matter content is 1 to 2 percent in the upper 10 inches.

Thickness of the A1 horizon ranges from 9 to 19 inches.

The B2t horizon has value of 4 to 6 when dry and 3 to 5 when moist, chroma of 3 or 4, and hue of 10YR or 7.5YR. Reaction is medium acid to neutral. The B2t horizon is loam or clay loam. It is 18 to 35 percent clay and 0 to 35 percent rock fragments.

### Gazelle series

The Gazelle series consists of very poorly drained soils in basins. These soils are moderately deep to a

duripan. They formed in mixed alluvium. Slope ranges from 0 to 2 percent.

Typical pedon of Gazelle silt loam, 800 feet east and 50 feet south of the northwest corner of sec. 32, T. 43 N., R. 5 W.

A11—0 to 6 inches; light brownish gray (10YR 6/2) silt loam, dark grayish brown (10YR 4/2) moist; weak fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; few fine tubular pores; strongly effervescent with disseminated lime; strongly alkaline; abrupt smooth boundary.

A12—6 to 11 inches; light gray (10YR 7/2) silt loam, light brownish gray (10YR 6/2) moist; weak thick platy structure parting to moderate thin platy; slightly hard, very friable, slightly sticky and slightly plastic; many very fine and fine roots; few very fine and fine tubular pores; strongly effervescent with disseminated lime; strongly alkaline; abrupt smooth boundary.

C1—11 to 20 inches; white (10YR 8/1) silt loam, white (10YR 8/1) moist; moderate thin platy structure; hard, firm, slightly sticky and slightly plastic; common fine tubular pores; thin coatings of calcium carbonate or silica on some peds; strongly effervescent with disseminated lime and violently effervescent in seams; moderately alkaline; abrupt smooth boundary.

C2—20 to 25 inches; white (10YR 8/1) silt loam, white (10YR 8/2) moist; moderate thin platy structure; very hard, firm, slightly sticky and slightly plastic; common very fine and fine roots; common very fine and fine tubular pores; thin coatings of calcium carbonate or silica on some ped faces; strongly effervescent with disseminated lime and violently effervescent in seams; moderately alkaline; abrupt smooth boundary.

C3casim—25 to 38 inches; white (10YR 8/1) strongly cemented thin laminar duripan with thin continuous indurated laminar seams, white (10YR 8/2) moist; very hard, very firm and brittle; thin mat of roots on surface; few very pale brown (10YR 7/4) beadlike coatings of silica or calcium carbonate on undersides of some platelets; violently effervescent in seams; moderately alkaline; abrupt smooth boundary.

C4—38 to 60 inches; white (10YR 8/1) silt loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; strongly effervescent with disseminated lime; strongly alkaline.

Depth to the duripan ranges from 20 to 40 inches. The solum is 8 to 18 percent clay. It is slightly effervescent to violently effervescent. Depth to the water table ranges from 0 to 18 inches from December to March. The electrical conductivity ranges from 4 to 6 millimhos per

cubic centimeter, and the sodium absorption ratio ranges from 2 to 8.

The A1 horizon has value of 4 to 6 when moist, chroma of 1 to 4 when dry and 1 to 3 when moist, and hue of 2.5Y or 10YR. It is 6 to 16 inches.

The C horizon has value of 7 or 8 when dry and 4 to 8 when moist, chroma of 1 to 3 when dry, and hue of 2.5Y, 5Y, or 10YR. It is stratified loamy sand to silty clay loam, and it averages from 10 to 30 percent clay.

### Gazelle Variant

The Gazelle Variant consists of very poorly drained soils in basins. These soils are shallow to a duripan. They formed in mixed alluvium. Slope ranges from 0 to 2 percent.

Typical pedon of Gazelle Variant sandy clay loam, 2,200 feet north and 1,500 feet west of the southeast corner of sec. 34, T. 45 N., R. 5 W.

A1—0 to 12 inches; light brownish gray (10YR 6/2) sandy clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium platy structure; very hard, firm, sticky and plastic; many very fine and fine roots; common fine tubular pores; weakly effervescent; moderately alkaline; abrupt smooth boundary.

C1casim—12 to 18 inches; light brownish gray (10YR 6/2) and dark grayish brown (10YR 4/2) moderately cemented duripan; laminar to massive; extremely hard, very firm; many very fine and fine roots matted on surface; weakly effervescent with disseminated lime; moderately alkaline; clear smooth boundary.

C2ca—18 to 60 inches; white (10YR 8/1) silt loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, very friable, slightly sticky and slightly plastic; 5 percent pebbles; violently effervescent.

Depth to the duripan ranges from 10 to 20 inches. The solum is 20 to 38 percent clay. It is moderately alkaline or strongly alkaline. A seasonal high water table is at a depth of 0 to 12 inches from December through April. Electrical conductivity ranges from 6 to 8 millimhos per cubic centimeter throughout.

The A1 horizon has value of 6 to 8 when dry and 2 to 4 when moist, chroma of 1 or 2, and hue of 2.5Y or 10YR. Organic matter content ranges from 1 to 2 percent in the upper 12 inches.

The Ccasim horizon has value of 4 to 8 when dry and 4 or 5 when moist, and it has hue of 2.5Y or 10YR. It is massive or laminar and is weakly to very strongly cemented with lime and silica. Below the duripan, the C horizon has value of 6 to 8 when dry and 4 or 5 when moist, chroma of 1 or 2, and hue of 2.5Y, 5Y, or 10YR. It is moderately alkaline or strongly alkaline. The C horizon is stratified layers of sandy loam to silty clay loam. It averages 10 to 30 percent clay and 5 to 15 percent rock fragments.

### Hilt series

The Hilt series consists of moderately deep, well drained soils on hills. These soils formed in residuum derived from sandstone. Slope ranges from 2 to 50 percent.

Typical pedon of Hilt sandy loam, 15 to 30 percent slopes; 2,600 feet west and 1,750 feet south of the northeast corner of sec. 26, T. 46 N., R. 6 W.

A11—0 to 2 inches; brown (10YR 5/3) sandy loam, very dark grayish brown (10YR 3/2) moist; weak medium platy structure; slightly hard, friable, slightly sticky and slightly plastic; many very fine roots; many fine tubular pores; neutral; abrupt smooth boundary.

A12—2 to 6 inches; brown (10YR 5/3) sandy loam, very dark grayish brown (10YR 3/2) moist; moderate medium platy structure; slightly hard, friable, sticky and slightly plastic; many fine and very fine roots; common fine tubular pores; neutral; abrupt smooth boundary.

A3—6 to 11 inches; dark brown (7.5YR 4/4) sandy loam, dark brown (10YR 3/3) moist; moderate medium platy structure; slightly hard, friable, sticky and plastic; many fine and very fine roots; many fine tubular pores; few thin clay films in pores; slightly acid; clear wavy boundary.

B1t—11 to 23 inches; dark brown (7.5YR 4/4) sandy clay loam, dark yellowish brown (10YR 3/4) rubbed and moist; faces of peds are dark brown (7.5YR 3/2) when moist; weak medium prismatic structure; hard, friable, sticky and very plastic; common fine roots; common fine and medium tubular pores; common thin clay films on peds and in pores; slightly acid; clear wavy boundary.

B21t—23 to 31 inches; yellowish red (5YR 4/6) sandy clay loam, dark yellowish brown (10YR 3/4) rubbed and moist; faces of peds are dark brown (7.5YR 3/4) when moist; weak medium prismatic structure parting to moderate medium subangular blocky; hard, friable, very sticky and very plastic; few fine roots; common fine tubular pores and few medium tubular pores; continuous thin clay films and common moderately thick clay films in pores and on peds; neutral; clear wavy boundary.

B22t—31 to 38 inches; yellowish red (5YR 4/6) sandy clay loam, dark brown (7.5YR 4/4) rubbed and moist; faces of peds are dark brown (7.5YR 3/4) when moist; moderate medium prismatic structure parting to moderate medium subangular blocky; hard, slightly firm, very sticky and very plastic; few fine roots; common fine tubular pores and few medium tubular pores; continuous thin and moderately thick clay films in pores and on peds; neutral; clear wavy boundary.

Cr—38 to 47 inches; yellowish red (5YR 4/8) moderately weathered sandstone that crushes to sandy clay loam, dark brown (7.5YR 4/4) rubbed and moist;

mostly rock structure; few fine roots in fractures; many thin clay films and common moderately thick clay films on fractures; abrupt wavy boundary.

R—47 inches; sandstone with some weathering in cracks and seams; few fine roots in cracks and seams; continuous moderately thick clay films on faces of rock; some soil material in cracks and seams.

A few stones are on the surface in places. Depth to weathered sandstone ranges from 20 to 40 inches. The profile is medium acid to neutral.

The A1 horizon has value of 4 or 5 when dry, chroma of 3 or 4 when dry and 2 to 4 when moist, and hue of 10YR, 7.5YR, or 5YR. It is sandy loam or stony sandy loam. This horizon is 10 to 20 percent clay and 0 to 35 percent rock fragments. Organic matter content ranges from 1.0 to 1.3 percent in the upper 4 inches and from 0.2 to 0.5 below. Thickness of the A1 horizon ranges from 5 to 11 inches.

The B2t horizon has value of 4 or 5 when dry and 3 or 4 when moist, chroma of 4, 6, or 8 when dry and 2 to 4 when moist, and hue of 10YR, 7.5YR, or 5YR. This horizon is loam or sandy clay loam. It averages 20 to 35 percent clay and 0 to 15 percent rock fragments.

### Iller series

The Iller series consists of very deep, well drained soils on mountains. These soils formed in volcanic ash deposited over material weathered from extrusive igneous rock. Slope ranges from 9 to 50 percent.

Typical pedon of an Iller stony sandy loam in an area of Sheld-Iller stony sandy loams, 9 to 30 percent slopes; 1,525 feet west and 100 feet south of the northeast corner of sec. 19, T. 44 N., R. 3 W.

O1&O2—1 inch to 0; undecomposed and partially decomposed needles, bark, twigs, leaves, and other organic debris.

A11—0 to 2 inches; dark brown (7.5YR 4/4) stony sandy loam, dark reddish brown (5YR 3/2) moist; weak fine granular structure; soft, very friable, slightly sticky and nonplastic; few very fine and fine roots; few fine tubular pores and many very fine interstitial pores; 7 percent pebbles, 2 percent cobbles, and 7 percent stones; weakly smeary; strongly acid; abrupt smooth boundary.

A12—2 to 13 inches; brown (7.5YR 5/4) stony sandy loam, dark brown (7.5YR 3/2) moist; weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; common very fine and fine roots; few fine tubular pores and many very fine interstitial pores; 15 percent pebbles, cobbles, and stones; weakly smeary; strongly acid; clear smooth boundary.

B1—13 to 21 inches; brown (7.5YR 5/4) sandy loam, dark reddish brown (5YR 3/3) moist; weak medium

subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; few very fine and fine roots and many medium roots; few fine tubular pores and many very fine interstitial pores; 7 percent pebbles, 2 percent cobbles, and 1 percent stones; weakly smeary; strongly acid; gradual wavy boundary.

B2t—21 to 28 inches; brown (7.5YR 5/4) sandy loam, dark reddish brown (5YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; few very fine and fine roots and many medium and coarse roots; common very fine and fine vesicular pores and few very fine tubular pores; few thin clay films on peds and in pores and many thin clay films bridging sand grains; 7 percent pebbles, 2 percent cobbles, and 1 percent stones; moderately smeary; strongly acid; abrupt wavy boundary.

IIB1tb—28 to 37 inches; yellowish brown (10YR 5/4) very stony sandy loam, dark reddish brown (5YR 3/4) moist; strong medium subangular blocky structure parting to strong fine subangular blocky; slightly hard, friable, sticky and slightly plastic; few very fine roots and many medium and coarse roots; common very fine vesicular pores and few very fine tubular pores; common thin clay films on peds and in pores; slightly brittle; 15 percent pebbles, 5 percent cobbles, and 30 percent stones; strongly acid; abrupt wavy boundary.

IIB21tb—37 to 42 inches; brown (7.5YR 5/4) extremely stony loam, dark reddish brown (5YR 3/4) moist; strong medium subangular blocky structure; hard, friable, sticky and plastic; few very fine and fine roots and many medium roots; common very fine vesicular pores and few very fine tubular pores; common thin clay films on peds and in pores; 10 percent pebbles, 10 percent cobbles, and 50 percent stones; strongly acid; clear wavy boundary.

IIB22tb—42 to 54 inches; brown (7.5YR 5/4) extremely stony loam, dark brown (7.5YR 3/4) moist; massive; hard, friable, sticky and plastic; few very fine and fine roots and many medium roots; common very fine vesicular pores and few very fine tubular pores; common thin clay films and few moderately thick clay films on rock fragments; 10 percent pebbles, 10 percent cobbles, and 50 percent stones; slightly brittle; strongly acid; clear wavy boundary.

IIB23tb—54 to 65 inches; brown (7.5YR 5/4) extremely stony loam, dark brown (7.5YR 3/4) moist; massive; hard, friable, sticky and plastic; few very fine and fine roots and many medium roots; common very fine vesicular pores and few very fine tubular pores; common thin clay films and few moderately thick clay films on rock fragments; slightly brittle; 10 percent pebbles, 10 percent cobbles, and 50 percent stones; strongly acid.

A few stones are on the surface in places. Bulk density ranges from 0.6 to 0.95 grams per cubic

centimeter to a depth of 10 to 20 inches. It is 0.85 gram per cubic centimeter at a depth of 10 to 14 inches. The profile is 5 to 35 percent andesite or basalt rock fragments in the overlying ash deposits. The buried soil material is 35 to 80 percent rock fragments that are similar to those in the ash deposits. Reaction ranges from slightly acid to strongly acid throughout the profile.

The A1 horizon has chroma of 2 to 4 when dry and 2 or 3 when moist, and it has hue of 10YR, 7.5YR, or 5YR. Base saturation ranges from 40 to 60 percent but is less than 50 percent in some part of the upper 10 inches. The sodium fluoride reaction ranges from 9.6 to 10.7. Content of clay ranges from 3 to 10 percent. Thickness ranges from 10 to 17 inches.

The B2t horizon has value of 5 or 6 when dry and 3 or 4 when moist, chroma of 3 or 4, and hue of 10YR, 7.5YR, or 5YR. Content of clay is about 5 to 12 percent. Base saturation ranges from 30 to 60 percent. The sodium fluoride reaction is 9 to 10.

The IIBtb horizon has colors similar to those of the B2t horizon. The IIBtb horizon is very stony sandy loam, extremely stony loam, or extremely stony sandy clay loam. It is 5 to 12 percent clay in the upper part and 10 to 23 percent clay in the lower part. Base saturation is 50 to 60 percent, and it commonly increases slightly with depth. The sodium fluoride reaction ranges from 8.5 to 9.0.

### Ipish series

The Ipish series consists of very deep, well drained soils on mountains. These soils formed in residuum derived from serpentine. Slope ranges from 5 to 50 percent.

Typical pedon of an Ipish gravelly clay loam in an area of Dubakella-Ipish complex, 5 to 30 percent slopes; 250 feet west and 100 feet north of the southeast corner of sec. 14, T. 44 N., R. 8 W.

O1—1/4 inch to 0; undecomposed and partially decomposed needles, leaves, twigs, bark, and other organic debris.

A1g—0 to 2 inches; dark brown (10YR 4/3) gravelly loam, dark brown (10YR 3/3) moist; moderate fine granular structure; hard, friable, very sticky and plastic; common very fine and fine roots; common fine vesicular pores; 35 percent pebbles; slightly acid; abrupt smooth boundary.

B11t—2 to 5 inches; dark brown (10YR 4/3) gravelly clay loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure parting to fine subangular blocky; very hard, firm, very sticky and very plastic; common very fine and fine roots; few very fine tubular pores and common fine vesicular pores; few thin clay films on peds and in pores; 25 percent pebbles; slightly acid; clear smooth boundary.

B12t—5 to 10 inches; dark brown (10YR 4/3) gravelly clay loam, dark yellowish brown (10YR 3/4) moist;

strong medium subangular blocky structure; very hard, firm, very sticky and very plastic; many medium and coarse roots and common very fine and fine roots; few very fine tubular pores; many thin clay films on peds and in pores; 30 percent pebbles; slightly acid; clear wavy boundary.

B21t—10 to 15 inches; dark brown (7.5YR 4/4, dry and moist) gravelly clay loam; moderate medium subangular blocky structure; very hard, very firm, very sticky and very plastic; many medium and coarse roots and common very fine and fine roots; common very fine tubular pores; continuous thin clay films on peds and in pores; 25 percent pebbles; neutral; clear wavy boundary.

B22t—15 to 21 inches; dark brown (7.5YR 3/4) gravelly clay loam, dark yellowish brown (10YR 4/4) moist and rubbed; very weak medium prismatic structure parting to strong medium subangular blocky; very hard, very firm, very sticky and very plastic; many medium roots and few very fine and fine roots; few very fine tubular pores; continuous thin dark brown (7.5YR 3/4, moist) clay films on peds and in pores; 30 percent pebbles; mildly alkaline; clear wavy boundary.

B23t—21 to 34 inches; dark brown (7.5YR 4/4) gravelly clay loam, dark yellowish brown (10YR 4/4) moist and rubbed; strong medium subangular blocky structure; very hard, very firm, very sticky and very plastic; many medium roots and few very fine and fine roots; few very fine tubular pores; many moderately thick dark reddish brown (5YR 3/4, moist) clay films on peds and in pores; 35 percent pebbles; mildly alkaline; gradual wavy boundary.

B24t—34 to 44 inches; dark brown (7.5YR 4/4, dry and moist) gravelly clay loam; very weak medium prismatic structure parting to strong medium subangular blocky; very hard, very firm, very sticky and very plastic; many medium roots and few very fine and fine roots; few very fine tubular pores; continuous thick dark reddish brown (5YR 3/4, moist) clay films on peds and in pores; 30 percent pebbles; mildly alkaline; gradual wavy boundary.

B3t—44 to 65 inches; dark brown (7.5YR 4/4) very gravelly clay loam, dark brown (7.5YR 4/4) moist and rubbed; strong medium subangular blocky structure; very hard, very firm, very sticky and very plastic; common medium roots and few very fine and fine roots; few very fine tubular pores; continuous thick reddish brown (5YR 4/4) and dark reddish brown (5YR 3/4, moist) clay films on peds and in pores; 40 percent pebbles; moderately alkaline; abrupt wavy boundary.

R—65 inches; shattered serpentine.

Depth to serpentine ranges from 60 to 80 inches.

The A1 horizon has value of 4 to 6 when dry and 3 or 4 when moist, chroma of 2 to 4 when dry and 2 or 3 when moist, and hue of 10YR or 7.5YR. Reaction is

slightly acid to mildly alkaline. Base saturation ranges from 50 to 70 percent. The A1 horizon is 18 to 27 percent clay and 15 to 35 percent rock fragments. Thickness ranges from 2 to 5 inches. Some pedons have an A3 horizon.

The B2t horizon has value of 3 to 5, chroma of 2, 3, 4, or 6 when dry and 2 to 4 when moist, and hue of 10YR or 7.5YR. Reaction is slightly acid to mildly alkaline. The B2t horizon is 27 to 35 percent clay. Base saturation ranges from 75 to 100 percent. The B3t horizon is mildly alkaline or moderately alkaline. It is 35 to 60 percent rock fragments.

### Jenny series

The Jenny series consists of very deep, well drained soils on terraces. These soils formed in alluvium weathered from extrusive igneous rock. Slope ranges from 0 to 15 percent.

Typical pedon of Jenny clay, 2 to 15 percent slopes; 2,300 feet north and 2,250 feet east of the southwest corner of sec. 3, T. 45 N., R. 5 W.

- Ap—0 to 4 inches; dark gray (10YR 4/1) clay, very dark brown (10YR 2/2) moist; strong fine and coarse subangular blocky structure; hard, friable, slightly sticky and plastic; slightly acid; abrupt wavy boundary.
- A12—4 to 7 inches; dark gray (10YR 4/1) clay, very dark brown (10YR 2/2) moist; massive; hard, friable, slightly sticky and plastic; slightly acid; clear smooth boundary.
- A13—7 to 16 inches; dark gray (10YR 4/1) clay, very dark brown (10YR 2/2) moist; weak medium prismatic structure; very hard, very firm, very sticky and very plastic; thin continuous pressure faces and slickensides; neutral; clear smooth boundary.
- C1—16 to 23 inches; dark grayish brown (10YR 4/2) clay, very dark grayish brown (10YR 3/2) moist; strong coarse prismatic structure; very hard, very firm, very sticky and very plastic; thin continuous pressure faces and intersecting slickensides; moderately alkaline; clear smooth boundary.
- C2—23 to 34 inches; brown (10YR 5/3) clay loam, dark brown (10YR 3/3) moist; massive; hard, firm, slightly sticky and plastic; thin continuous pressure faces; strongly effervescent, lime in seams and coating peds; moderately alkaline; clear wavy boundary.
- C3—34 to 60 inches; mixed light brownish gray (10YR 6/2) and white (10YR 8/2) loam, dark grayish brown (10YR 4/2) moist; massive; slightly hard, firm, nonsticky and slightly plastic; disseminated lime; strongly effervescent; calcium carbonate content increases with depth; moderately alkaline.

Cracks 1 to 10 centimeters wide extend to a depth of 20 to 24 inches when the soils are dry. Slickensides intersect in the lower part of the A horizon and the upper

part of the C horizon, between depths of 4 and 42 inches. The profile is 5 to 30 percent rock fragments. A few cobbles are on the surface in places.

The A horizon has value of 3 or 4 when dry and 2 or 3 when moist, chroma of 1 to 3 when dry and 2 or 3 when moist, and hue of 10YR, 7.5YR, or 5YR. Reaction is slightly acid to mildly alkaline. Texture is clay or cobbly clay. The A horizon is 40 to 50 percent clay. Thickness ranges from 13 to 42 inches.

The upper part of the C horizon has value of 3 to 5 when dry, chroma of 1 to 4 when dry and 2 to 4 when moist, and hue of 10YR, 7.5YR, or 5YR. Reaction is neutral to moderately alkaline. Texture is clay or silty clay. The upper part of the C horizon is 40 to 50 percent clay. The lower part of the C horizon has value of 5 to 8 when dry and 3 to 6 when moist, chroma of 1 to 3, and hue of 10YR, 7.5YR, or 5YR. Reaction is moderately alkaline or strongly alkaline. The lower part of the C horizon is strongly effervescent or violently effervescent. Lime is disseminated or is segregated in seams and masses. Texture is stratified clay to loam.

### Jilson series

The Jilson series consists of shallow, well drained soils on mountains. These soils formed in residuum derived from metamorphic rock. Slope ranges from 5 to 65 percent.

Typical pedon of a Jilson gravelly loam in an area of Duzel-Jilson-Facey complex, 15 to 50 percent slopes; 2,400 feet south and 2,960 feet east of the northwest corner of sec. 20, T. 43 N., R. 7 W.

- A1—0 to 3 inches; brown (10YR 5/3) gravelly loam, dark brown (10YR 3/3) moist; weak fine subangular blocky structure; slightly hard, friable, nonsticky and nonplastic; few fine roots and common very fine roots; common very fine tubular pores; 20 percent pebbles; neutral; clear smooth boundary.
- B21t—3 to 7 inches; brown (10YR 5/3) gravelly loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; few very fine and fine roots; common very fine tubular pores; very few thin clay films on peds and lining pores; 20 percent pebbles; neutral; clear smooth boundary.
- B22t—7 to 14 inches; yellowish brown (10YR 5/4) gravelly loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; few very fine and fine roots; common very fine tubular pores; few thin clay films on peds and lining pores; 25 percent pebbles; slightly acid; abrupt wavy boundary.
- R—14 inches; fractured metasedimentary rock.

Depth to metasedimentary rock ranges from 10 to 20 inches. The profile is 15 to 35 percent rock fragments, mostly fine and medium gravel. Reaction is slightly acid to mildly alkaline throughout the profile.

The A1 horizon has value of 4 or 5 when dry and 2 or 3 when moist, chroma of 2 or 3, and hue of 10YR or 7.5YR. It is 12 to 18 percent clay. Thickness ranges from 2 to 4 inches.

The B2t horizon has value of 4 to 6 when dry and 3 to 5 when moist, chroma of 3, 4, or 6, and hue of 10YR or 7.5YR. It is gravelly loam or gravelly clay loam and is 18 to 35 percent clay.

### Kindig series

The Kindig series consists of deep, well drained soils on mountains. These soils formed in residuum derived from metamorphic rock. Slope ranges from 15 to 80 percent.

Typical pedon of a Kindig gravelly loam in an area of Kindig-Neuns gravelly loams, 50 to 80 percent slopes; 1,950 feet west and 900 feet south of the northeast corner of sec. 16, T. 43 N., R. 10 W.

O1&O2—2 inches to 0; undecomposed and partially decomposed needles, leaves, twigs, bark, and other organic debris.

A1—0 to 5 inches; brown (10YR 5/3) gravelly loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure parting to moderate fine granular; slightly hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; common very fine and fine tubular pores; 4 percent cobbles and stones, 6 percent pebbles 3/4 inch to 3 inches in diameter, and 10 percent pebbles less than 3/4 inch in diameter; medium acid; abrupt smooth boundary.

B1—5 to 15 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 4/3) moist; moderate medium subangular blocky structure parting to weak fine subangular blocky; hard, friable, slightly sticky and slightly plastic; many very fine and fine roots; common very fine and fine tubular pores; 4 percent cobbles and stones, 6 percent pebbles 3/4 inch to 3 inches in diameter, and 20 percent pebbles less than 3/4 inch in diameter; medium acid; clear smooth boundary.

B21t—15 to 30 inches; light yellowish brown (10YR 6/4) very gravelly loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; many very fine, fine, medium, and coarse roots; common very fine and fine tubular pores; few thin clay films in pores; 4 percent cobbles and stones, 6 percent pebbles 3/4 inch to 3 inches in diameter, and 25 percent pebbles 1/8 to 3/4 inch in diameter; medium acid; clear smooth boundary.

B22t—30 to 38 inches; light yellowish brown (10YR 6/4) very gravelly loam, dark yellowish brown (10YR 4/6) moist; weak medium subangular blocky structure; hard, firm, slightly sticky and slightly plastic; few very fine roots and many medium roots; few very fine and

fine tubular pores; few thin clay films on peds and common moderately thick clay films in pores; 4 percent cobbles and stones, 6 percent pebbles 3/4 inch to 3 inches in diameter, and 33 percent pebbles 1/8 to 3/4 inch in diameter; medium acid; gradual wavy boundary.

B23t—38 to 60 inches; light yellowish brown (10YR 6/4) very gravelly loam, dark yellowish brown (10YR 4/6) moist; massive; hard, firm, slightly sticky and slightly plastic; few very fine and medium roots; common very fine and fine tubular pores; common moderately thick clay films in pores; 5 percent cobbles and stones, 6 percent pebbles 3/4 inch to 3 inches in diameter, and 35 percent pebbles 1/8 to 3/4 inch in diameter; medium acid; clear irregular boundary.

Cr—60 inches; highly fractured weathered schist; some soil material in fractures.

Depth to paralithic contact ranges from 40 to 60 inches.

The A1 horizon has value of 3 to 6 when dry and 3 or 4 when moist, chroma of 2 to 4 when dry and 2 or 3 when moist, and hue of 10YR, 7.5YR, or 2.5Y. Reaction is medium acid to neutral. The A1 horizon is 5 to 16 percent clay and 15 to 35 percent rock fragments. Organic matter content ranges from 0.5 to 1 percent in the upper 7 inches. This horizon ranges from 3 to 12 inches in thickness.

The B2t horizon has value of 5 to 7 when dry and 4 or 5 when moist, chroma of 1, 2, 3, 4, or 6 when dry and 3, 4, or 6 when moist, and hue of 10YR, 2.5Y, or 5Y. Reaction is medium acid or slightly acid. The B2t horizon is very gravelly sandy loam or very gravelly loam. It has 1 to 2 percent more clay than the A horizon. It is 35 to 60 percent rock fragments.

### Kinkel series

The Kinkel series consists of very deep, well drained soils on mountains. These soils formed in residuum derived from metamorphic rock. Slope ranges from 2 to 50 percent.

Typical pedon of a Kinkel gravelly loam in an area of Marpa-Kinkel-Boomer, cool complex, 15 to 50 percent slopes; 2,400 feet north and 1,030 feet west of the southeast corner of sec. 35, T. 45 N., R. 8 W.

O1&O2—1 inch to 0; recent needles, leaves, twigs, bark, and other organic debris.

A11—0 to 2 inches; grayish brown (10YR 5/2) very gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate fine and medium granular structure; hard, very friable, sticky and slightly plastic; many very fine, fine, and medium roots; common very fine and fine tubular pores; 35 percent pebbles and 3 percent cobbles; slightly acid; abrupt smooth boundary.

A12—2 to 9 inches; brown (10YR 5/3) very gravelly loam, dark brown (7.5YR 3/2) moist; moderate

- medium subangular blocky structure; hard, friable, sticky and slightly plastic; many coarse and medium roots and common very fine and fine roots; common very fine and fine tubular pores and few medium tubular pores; 35 percent pebbles and 8 percent cobbles; strongly acid; clear wavy boundary.
- B11t—9 to 14 inches; light yellowish brown (10YR 6/4) very gravelly loam, dark brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic; many coarse and medium roots and common very fine and fine roots; common very fine and fine tubular pores and few medium tubular pores; common thin clay films in pores and on peds; 35 percent pebbles, 5 percent cobbles, and 1 percent stones; strongly acid; clear wavy boundary.
- B12t—14 to 19 inches; light brown (7.5YR 6/4) very gravelly loam, dark brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; very hard, friable, sticky and plastic; many coarse and medium roots and common very fine and fine roots; common fine and very fine tubular pores; many thin clay films in pores and on peds and few moderately thick clay films in pores; 30 percent pebbles, 4 percent cobbles, and 1 percent stones; strongly acid; gradual wavy boundary.
- B21t—19 to 23 inches; variegated brown (7.5YR 5/4) and light brown (7.5YR 6/4) very gravelly loam, dark brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; very hard, friable, sticky and plastic; many coarse and medium roots and few very fine and fine roots; common very fine and fine tubular pores; many thick and thin clay films in pores and many thin strong brown (7.5YR 5/6) and reddish yellow (7.5YR 6/6) clay films on peds; 30 percent pebbles, 4 percent cobbles, and 1 percent stones; strongly acid; gradual wavy boundary.
- B22t—23 to 36 inches; variegated strong brown (7.5YR 5/6) and reddish yellow (7.5YR 6/6) very gravelly loam, brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; very hard, friable, sticky and plastic; many coarse and medium roots and few very fine and fine roots; common very fine and fine tubular pores; common thin and moderately thick strong brown (7.5YR 5/6) and reddish yellow (7.5YR 6/6) clay films on peds and in pores and few thick clay films in pores; 38 percent pebbles and 2 percent cobbles; strongly acid; gradual wavy boundary.
- B23t—36 to 42 inches; variegated strong brown (7.5YR 5/6) and reddish yellow (7.5YR 6/6) very gravelly loam, brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; very hard, friable, sticky and plastic; many coarse and medium roots and few very fine and fine roots; common very fine and fine tubular pores; common thin and moderately thick strong brown (7.5YR 5/6) and reddish yellow (7.5YR 6/6) clay films in pores and on peds and few thick clay films in some pores; 38 percent pebbles, 2 percent cobbles, and 1 percent stones; strongly acid; gradual wavy boundary.
- B24t—42 to 56 inches; variegated strong brown (7.5YR 5/6) and reddish yellow (7.5YR 6/6) very gravelly loam, brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; very hard, friable, sticky and plastic; many coarse and medium roots and few very fine and fine roots; common very fine and fine tubular pores; common thin and moderately thick strong brown (7.5YR 5/6) and reddish yellow (7.5YR 6/6) clay films in pores and on peds and few thick clay films in pores; 40 percent pebbles, 2 percent cobbles, and 1 percent stones; strongly acid; gradual wavy boundary.
- B3t—56 to 60 inches; variegated strong brown (7.5YR 5/6) and reddish yellow (7.5YR 6/6) very gravelly loam, strong brown (7.5YR 5/6) moist; moderate medium subangular blocky structure; very hard, friable, sticky and plastic; many coarse and medium roots and few very fine and fine roots; many very fine and fine tubular pores; common thin and moderately thick clay films in pores and on peds and few thick clay films in some pores; 40 percent pebbles and 3 percent cobbles; strongly acid.
- Depth to metasedimentary or metavolcanic bedrock ranges from 60 to 80 inches. A few stones are on the surface in places.
- The A1 horizon has value of 4 to 6 when dry and 2 to 4 when moist, chroma of 1 to 4 when dry and 2 to 4 when moist, and hue of 10YR or 7.5YR. Reaction is strongly acid to slightly acid. The A1 horizon is 10 to 15 percent clay and 35 to 60 percent rock fragments. Organic matter content ranges from 3 to 10 percent. Thickness ranges from 4 to 9 inches.
- The B2t horizon has value of 5 to 7 when dry and 3 to 6 when moist, chroma of 3 to 6 when moist, and hue of 10YR, 7.5YR, or 5YR. Reaction is medium acid or strongly acid. The B2t horizon is very gravelly loam or very gravelly sandy loam. It averages 13 to 20 percent clay and 35 to 60 percent rock fragments. Base saturation is less than 50 percent.

### Kuck series

The Kuck series consists of moderately deep, well drained soils on hills. These soils formed in residuum derived from extrusive igneous rock. Slope ranges from 2 to 50 percent.

Typical pedon of a Kuck clay loam in an area of Lassen-Kuck complex, 15 to 50 percent slopes; 2,300 feet north and 240 feet east of the southwest corner of sec. 6, T. 45 N., R. 4 W.

A11—0 to 3 inches; dark brown (10YR 3/3) clay loam, very dark brown (10YR 2/2) moist; strong very fine subangular blocky structure and strong very fine

- granular; hard, friable, sticky and plastic; many fine roots; neutral; abrupt smooth boundary.
- A12—3 to 6 inches; dark brown (10YR 3/3) clay loam, very dark brown (10YR 2/2) moist; moderate thick platy structure parting to moderate medium and fine subangular blocky; hard, friable, sticky and plastic; many fine roots; few medium tubular pores and many interstitial pores; neutral; abrupt smooth boundary.
- B21t—6 to 8 inches; dark gray (10YR 4/1) clay loam, very dark brown (10YR 2/2) moist; strong thick platy structure parting to strong medium subangular blocky; very hard, firm, sticky and plastic; many fine roots; few interstitial pores; many thin clay films on peds; neutral; clear smooth boundary.
- B22t—8 to 11 inches; dark gray (10YR 4/1) clay loam, very dark brown (10YR 2/2) moist; moderate medium prismatic structure; very hard, firm, sticky and plastic; many fine roots; many interstitial pores and few fine tubular pores; few moderately thick clay films and many thin clay films on peds; 10 percent pebbles and cobbles; neutral; clear smooth boundary.
- B23t—11 to 20 inches; dark gray (10YR 4/1) clay, very dark brown (10YR 2/2) moist; weak medium prismatic structure parting to strong medium subangular blocky; very hard, very firm, very sticky and very plastic; many fine roots; many very fine tubular pores; continuous moderately thick clay films on peds and in pores; 10 percent cobbles and pebbles; neutral; abrupt irregular boundary.
- B3t—20 to 32 inches; dark grayish brown (10YR 4/2) gravelly clay loam, dark yellowish brown (10YR 3/4) moist; strong medium angular and subangular blocky structure; very hard, very firm, sticky and very plastic; few fine roots; many thin, moderately thick, and thick clay films on peds; 20 percent cobbles and pebbles; neutral; abrupt smooth boundary.
- Cr—32 inches; fractured and slightly weathered to strongly weathered andesite.

A few stones are on the surface in places. Depth to weathered andesite ranges from 20 to 40 inches. Cracks 1 to 2 centimeters wide extend to a depth of 20 to 30 inches when the soils are dry. The profile is 5 to 30 percent rock fragments. Organic matter content ranges from 0.6 to 1.0 percent to a depth of 7 to 20 inches.

The A1 horizon has value of 2 or 3, and it has chroma of 1 to 3 when dry and 2 or 3 when moist. It is stony clay loam, very stony clay loam, or clay loam and is 27 to 35 percent clay. Reaction is slightly acid to neutral. Content of organic matter ranges from 1 to 2 percent in the upper 7 inches. Thickness of the A1 horizon ranges from 4 to 9 inches.

The B2t horizon has value of 4 or 5 when dry and 2 to 4 when moist, chroma of 1 or 2 when dry and 2 or 3 when moist, and hue of 10YR to 7.5YR. It is clay loam, stony clay loam, silty clay loam, stony silty clay loam,

stony clay, or clay and is 35 to 50 percent clay. Reaction is neutral or mildly alkaline.

### Lassen series

The Lassen series consists of moderately deep, well drained soils on hills. These soils formed in residuum derived from extrusive igneous rock. Slope ranges from 2 to 50 percent.

Typical pedon of Lassen clay, 9 to 15 percent slopes; 400 feet north and 70 feet west of the southeast corner of sec. 16, T. 46 N., R. 5 W.

- A11—0 to 4 inches; dark grayish brown (10YR 4/2) clay, very dark grayish brown (10YR 3/2) moist; strong medium subangular blocky structure parting to strong fine angular blocky; very hard, firm, very sticky and very plastic; many very fine and fine roots; cracks 1 to 2 inches wide and 1 to 3 feet apart; 5 percent pebbles and 2 percent cobbles; mildly alkaline; abrupt smooth boundary.
- A12—4 to 9 inches; dark grayish brown (10YR 4/2) clay, very dark grayish brown (10YR 3/2) moist; strong coarse prismatic structure; extremely hard, very firm, very sticky and very plastic; few very fine and fine roots; few very fine discontinuous tubular pores; weakly expressed continuous pressure faces; cracks 1 to 2 inches wide and 1 to 3 feet apart; 5 percent pebbles and 2 percent cobbles; mildly alkaline; clear smooth boundary.
- A13—9 to 26 inches; dark grayish brown (10YR 4/2) clay, very dark grayish brown (10YR 3/2) moist; strong coarse prismatic structure and some wedge shaped structural aggregates; extremely hard, very firm, very sticky and very plastic; few very fine and fine roots; few discontinuous pores; strongly expressed continuous pressure faces, many small intersecting slickensides; cracks 1/8 to 1 inch wide; 5 percent pebbles and 2 percent cobbles; mildly alkaline; abrupt wavy boundary.
- C—26 to 28 inches; dark grayish brown (2.5Y 4/2) gravelly clay, dark grayish brown (2.5Y 4/2) and dark brown (10YR 3/3) moist; massive; extremely hard, very firm, very sticky and very plastic; few very fine and fine roots; few very fine and fine discontinuous tubular pores; strongly expressed continuous pressure faces; 25 percent pebbles 2 to 3 centimeters in diameter; mildly alkaline; abrupt wavy boundary.
- R—28 inches; hard extrusive igneous bedrock.

A few to many stones are on the surface in places. Depth to extrusive igneous rock ranges from 20 to 40 inches. Cracks 1 to 10 centimeters wide extend to a depth of 20 to 26 inches when the soils are dry.

The A1 horizon has value of 3 to 5 when dry and 2 or 3 when moist, chroma of 2 or 3, and hue of 10YR, 7.5YR, or 5YR. Reaction is neutral or mildly alkaline.

This horizon is clay, cobbly clay, stony clay, or very stony clay. It is 40 to 60 percent clay and 5 to 35 percent rock fragments. Thickness ranges from 18 to 35 inches. Slickensides intersect at a depth of 9 to 27 inches in the lower part of the A horizon in some pedons.

The C horizon has value of 3 to 5 when dry, chroma of 2 to 4, and hue of 2.5Y, 10YR, 7.5YR, or 5YR. Reaction is neutral to moderately alkaline. This horizon is gravelly clay, gravelly clay loam, cobbly clay, or cobbly clay loam. It is 35 to 60 percent clay and 15 to 35 percent rock fragments.

### Louie series

The Louie series consists of well drained soils on terraces. These soils are moderately deep to a hardpan. They formed in alluvium weathered from extrusive igneous rock. Slope ranges from 0 to 15 percent.

Typical pedon of a Louie stony loam in an area of Rock outcrop-Louie complex, 0 to 15 percent slopes; 2,700 feet east and 200 feet north of the southwest corner of sec. 1, T. 43 N., R. 5 W.

- A11—0 to 3 inches; light brownish gray (10YR 6/2) stony loam, very dark grayish brown (10YR 3/2) moist; weak medium platy structure; slightly hard, friable, sticky and slightly plastic; many very fine and fine roots; many very fine and fine interstitial pores; 5 percent stones, 10 percent cobbles, and 15 percent pebbles; slightly acid; abrupt smooth boundary.
- A12—3 to 6 inches; light brownish gray (10YR 6/2) stony loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; slightly hard, friable, sticky and slightly plastic; many very fine and fine roots; few very fine tubular pores and fine interstitial pores; 5 percent stones, 10 percent cobbles, and 10 percent pebbles; neutral; clear smooth boundary.
- A13—6 to 12 inches; light brownish gray (10YR 6/2) cobbly loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and slightly plastic; many very fine and fine tubular pores; few very thin clay films in pores and on peds; 3 percent stones, 10 percent cobbles, and 10 percent pebbles; neutral; abrupt smooth boundary.
- B1t—12 to 21 inches; yellowish brown (10YR 5/4) cobbly loam, dark brown (10YR 3/3) rubbed; faces of peds are very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic; few very fine and fine roots; common very fine and fine tubular pores; common thin clay films in pores and on peds; 3 percent stones, 10 percent cobbles, and 10 percent pebbles; mildly alkaline; clear smooth boundary.
- B2t—21 to 29 inches; yellowish brown (10YR 5/4) cobbly sandy clay loam, dark brown (10YR 3/3)

rubbed; faces of peds are dark yellowish brown (10YR 4/4) moist; strong medium subangular blocky structure; hard, friable, sticky and plastic; few very fine and fine roots; few very fine and fine tubular pores; continuous moderately thick clay films in pores and on peds; 3 percent stones, 10 percent cobbles, and 10 percent pebbles; mildly alkaline; abrupt wavy boundary.

- C1sim—29 to 32 inches; light yellowish brown (10YR 6/4) strongly cemented duripan, dark yellowish brown (10YR 3/4) moist; laminar to platy structure; few masses or thin seams of segregated lime; cementing agent is dominantly silica with some lime and iron; abrupt smooth boundary.
- C2—32 to 60 inches; stratified sand, gravel, cobbles, and some stones.

A few stones are on the surface in places. Depth to the duripan ranges from 20 to 40 inches. The duripan is moderately cemented to very strongly cemented and is continuously indurated in some places. Lime is in some cracks or seams. The profile is 0 to 35 percent rock fragments.

The A1 horizon has value of 5 or 6 when dry and 3 or 4 when moist, chroma of 2 or 3, and hue of 2.5Y or 10YR. Reaction is slightly acid to mildly alkaline. This horizon is loam, cobbly loam, or stony loam and is 10 to 20 percent clay. Content of organic matter is less than 1 percent. Thickness of the A1 horizon ranges from 8 to 17 inches.

The B2t horizon has value of 5 to 7 when dry and 3 to 5 when moist, and it has chroma of 3 or 4 when dry and 2 to 4 when moist. Reaction is neutral to moderately alkaline. This horizon is sandy clay loam, clay loam, stony clay loam, cobbly sandy clay loam, or stony sandy clay loam. It averages 20 to 30 percent clay.

### Louie Variant

The Louie Variant consists of well drained soils on terraces. These soils are moderately deep to a hardpan. They formed in alluvium weathered from extrusive igneous rock. Slope ranges from 2 to 9 percent.

Typical pedon of Louie Variant sandy clay loam, 2 to 9 percent slopes; 1,600 feet south and 1,600 feet west of the northeast corner of sec. 6, T. 45 N., R. 5 W.

- Ap—0 to 7 inches; gray (10YR 6/1) sandy clay loam, dark grayish brown (10YR 4/2) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; many very fine and fine roots; violently effervescent; moderately alkaline; abrupt smooth boundary.
- A12—7 to 15 inches; light brownish gray (10YR 6/2) sandy clay loam, dark grayish brown (10YR 4/2) moist; moderate medium subangular blocky structure; slightly hard, firm, sticky and plastic; many very fine and fine roots; many fine tubular pores; few thin clay films in pores; violently effervescent; moderately alkaline; clear smooth boundary.

B22t—15 to 26 inches; light brownish gray (10YR 6/2) sandy clay loam, dark brown (10YR 4/3) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; common fine roots; few medium tubular pores; many moderately thick clay films on peds and in pores and common thin clay films on peds; violently effervescent; moderately alkaline; clear wavy boundary.

C1ca—26 to 33 inches; light gray (10YR 7/2) loam, brown (10YR 5/3) moist; massive; slightly hard, friable, sticky and nonplastic; common fine roots; few medium tubular pores; violently effervescent; moderately alkaline; abrupt irregular boundary.

C2casi—33 to 60 inches; duripan that has white (10YR 8/2) coating and light brownish gray (10YR 6/2) interior, pale brown (10YR 6/3) moist; massive; hard, very firm; moderately cemented with lime and silica; coatings of silica on some structure faces; violently effervescent; moderately alkaline.

Depth to the duripan ranges from 20 to 40 inches. The duripan has value of 6 to 8 when dry and 4 to 6 when moist, and it has chroma of 1 or 2 when dry and 2 or 3 when moist. It is weakly cemented or moderately cemented but is not continuously indurated in any part. Thickness of the solum ranges from 20 to 30 inches. The profile is 0 to 5 percent rock fragments. Reaction is mildly alkaline or moderately alkaline.

The A1 horizon has value of 6 or 7 when dry and 3 to 5 when moist, and it has chroma of 1 to 3. It is 20 to 27 percent clay. Content of organic matter is less than 1 percent in the upper 15 inches. Thickness of the A1 horizon ranges from 6 to 19 inches.

The B2t horizon has value of 6 or 7 when dry and 4 or 5 when moist, and it has chroma of 1 or 2 when dry and 2 or 3 when moist. It is sandy clay loam or clay loam and is 25 to 35 percent clay.

The C horizon has value of 6 to 8 when dry and 4 to 6 when moist, and it has chroma of 1 or 2 when dry and 2 or 3 when moist. The C horizon is loam or sandy loam and is 15 to 25 percent clay.

### Marpa series

The Marpa series consists of moderately deep, well drained soils on mountains. These soils formed in residuum derived from metamorphic rock. Slope ranges from 5 to 50 percent.

Typical pedon of a Marpa gravelly loam in an area of Marpa-Kinkel-Boomer, cool complex, 15 to 50 percent slopes; 2,200 feet north and 1,250 feet east of the southwest corner of sec. 12, T. 40 N., R. 9 W.

O1&O2—2 inches to 0; partially decomposed and undecomposed needles, leaves, twigs, bark, and other organic debris.

A11—0 to 3 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 4/3) moist; weak fine

granular structure; slightly hard, friable, sticky and nonplastic; many fine roots; 30 percent pebbles; slightly acid; abrupt smooth boundary.

A12—3 to 14 inches; pale brown (10YR 6/3) gravelly loam, dark brown (10YR 4/3) moist; weak medium subangular blocky structure; slightly hard, friable, sticky and slightly plastic; many fine and medium roots; many fine tubular pores and fine random interstitial pores; 30 percent pebbles; medium acid; clear smooth boundary.

B22t—14 to 30 inches; light yellowish brown (10YR 6/4) very gravelly sandy clay loam, dark brown (7.5YR 4/4) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic; many fine, medium, and coarse roots; many fine tubular pores and many fine random interstitial pores; common thin clay films on peds and lining pores; 40 percent pebbles; strongly acid; abrupt irregular boundary.

R—30 inches; fractured metasedimentary bedrock; some soil material and roots in cracks.

Depth to fractured metamorphic bedrock ranges from 20 to 40 inches.

The A1 horizon has value of 5 to 7 when dry and 3 or 4 when moist, chroma of 2 or 4, and hue of 10YR or 7.5YR. Reaction is medium acid or slightly acid. This horizon is 15 to 25 percent clay and 15 to 35 percent rock fragments. Content of organic matter is less than 1 percent. Thickness of the A1 horizon ranges from 11 to 16 inches.

The B2t horizon has value of 5 or 6 when dry and 3 or 4 when moist, chroma of 3 or 4, and hue of 10YR, 7.5YR, or 5YR. Reaction is medium acid or strongly acid. This horizon is very gravelly clay loam or very gravelly sandy clay loam. It averages 27 to 35 percent clay and 35 to 60 percent rock fragments.

### Mary series

The Mary series consists of moderately deep, well drained soils on hills. These soils formed in residuum derived from extrusive igneous rock. Slope ranges from 2 to 50 percent.

Typical pedon of Mary stony loam, 2 to 50 percent slopes; 700 feet south and 1,500 feet west of the northeast corner of sec. 19, T. 46 N., R. 5 W.

A11—0 to 2 inches; dark brown (10YR 4/3) stony loam, very dark grayish brown (10YR 3/2) moist; weak medium platy structure; slightly hard, friable, sticky and plastic; many very fine and fine roots; many fine interstitial pores; 3 percent stones, 3 percent cobbles, and 1 percent fine pebbles; neutral; abrupt smooth boundary.

A12—2 to 10 inches; dark brown (10YR 4/3) stony loam, very dark grayish brown (10YR 3/2) moist; weak medium prismatic structure parting to moderate medium subangular blocky; hard, friable, sticky and

plastic; common very fine and fine roots; few very fine and fine tubular pores and few very fine vesicular pores; 3 percent stones, 1 percent cobbles, and 1 percent fine pebbles; neutral; gradual smooth boundary.

B1t—10 to 17 inches; dark brown (10YR 4/3) loam, very dark grayish brown (10YR 3/2) moist, dark brown (10YR 3/3) moist and rubbed; weak medium prismatic structure; hard, slightly firm, sticky and very plastic; few very fine and fine roots; few very fine and fine tubular pores and few very fine vesicular pores; common thin clay films on peds; 1 percent fine pebbles; neutral; gradual smooth boundary.

B2t—17 to 24 inches; dark yellowish brown (10YR 4/4) clay loam, very dark grayish brown (10YR 3/2) moist, dark brown (10YR 3/3) moist and rubbed; weak medium prismatic structure; very hard, slightly firm, sticky and very plastic; few very fine and fine roots; few medium, fine, and very fine tubular pores; common thin clay films on peds and many thin clay films lining pores; 1 percent cobbles and 1 percent pebbles; neutral; abrupt wavy boundary.

B3t—24 to 28 inches; dark yellowish brown (10YR 4/4) sandy clay loam, dark brown (10YR 3/3) moist; weak medium prismatic structure; very hard, slightly firm, sticky and very plastic; few very fine and fine roots; few very fine, fine, and medium tubular pores; many thin clay films on peds and lining pores and few moderately thick clay films on peds; 1 percent cobbles and 1 percent pebbles; neutral; abrupt wavy boundary.

R—28 inches; extrusive igneous bedrock.

A few stones are on the surface in places. Depth to igneous bedrock ranges from 20 to 40 inches.

The A1 horizon has value of 4 or 5 when dry and 2 or 3 when moist, chroma of 2 to 4 when dry and 2 or 3 when moist, and hue of 10YR or 7.5YR. Reaction is slightly acid or neutral. This horizon is loam or stony loam. It is 12 to 25 percent clay and 5 to 30 percent rock fragments. Thickness of the A1 horizon ranges from 7 to 14 inches. Organic matter content ranges from 1 to 3 percent in the upper 2 to 5 inches but is less than 1 percent below a depth of 5 inches.

The B2t horizon has value of 4 or 5 when dry and 3 or 4 when moist, chroma of 2 to 4 when dry or moist, and hue of 10YR or 7.5YR. Reaction is neutral or mildly alkaline. This horizon is heavy loam or clay loam. It averages 20 to 35 percent clay and 0 to 15 percent rock fragments.

### Medford series

The Medford series consists of very deep, moderately well drained soils on alluvial fans. These soils formed in mixed alluvium. Slope ranges from 0 to 15 percent.

Typical pedon of Medford clay loam, cool, 5 to 15 percent slopes; 2,080 feet north and 1,450 feet east of the southwest corner of sec. 21, T. 46 N., R. 4 W.

A11—0 to 6 inches; very dark grayish brown (10YR 3/2) clay loam, black (10YR 2/1) moist; strong fine granular structure; hard, friable, sticky and plastic; many very fine and fine roots; few fine vesicular pores and common fine tubular pores; slightly acid; abrupt smooth boundary.

A12—6 to 12 inches; very dark grayish brown (10YR 3/2) clay loam, black (10YR 2/1) moist; strong fine granular structure; hard, friable, sticky and very plastic; many very fine and fine roots; few very fine tubular pores and common fine vesicular pores; slightly acid; clear smooth boundary.

A3—12 to 18 inches; very dark grayish brown (10YR 3/2) clay loam, very dark brown (10YR 2/2) moist; weak medium prismatic structure and moderate medium subangular blocky; hard, firm, sticky and very plastic; common very fine and fine roots; common fine and very fine tubular pores; common thin clay films on peds and lining pores; slightly acid; clear smooth boundary.

B1t—18 to 26 inches; dark brown (10YR 4/3) clay, dark brown (10YR 3/3) moist; weak medium prismatic structure and strong medium subangular blocky; very hard, very firm, very sticky and very plastic; few very fine and fine roots; few very fine and fine tubular pores; many thin clay films on peds and lining pores; slightly acid; clear smooth boundary.

B21t—26 to 35 inches; yellowish brown (10YR 5/4) clay, dark yellowish brown (10YR 4/4) moist; moderate medium prismatic structure and moderate fine prismatic; extremely hard, very firm, very sticky and very plastic; few very fine and fine roots; few very fine and fine tubular pores; continuous thick clay films and many moderately thick clay films on peds and lining pores; slightly acid; clear smooth boundary.

B22t—35 to 41 inches; yellowish brown (10YR 5/4) clay, dark yellowish brown (10YR 4/4) moist; strong medium prismatic structure; extremely hard, very firm, sticky and very plastic; few very fine and fine roots; few very fine and fine tubular pores; common moderately thick and thick clay films on peds and lining pores; neutral; clear smooth boundary.

B23t—41 to 49 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) moist; strong medium prismatic structure; very hard, very firm, sticky and very plastic; few very fine and fine roots; few very fine and fine tubular pores; few moderately thick clay films and many thin clay films on peds and lining tubular pores; neutral; clear smooth boundary.

C—49 to 60 inches; yellowish brown (10YR 5/4) clay loam, dark yellowish brown (10YR 4/4) moist; massive; very hard, very firm, sticky and very plastic; few very fine and fine roots; few very fine and fine tubular pores; neutral.

Thickness of the solum ranges from 40 to 60 inches. The profile is 0 to 15 percent rock fragments. Reaction is medium acid to neutral. The mollic epipedon is more than 20 inches thick.

The A1 horizon has value of 3 to 5 when dry and chroma of 1 to 3. It is 27 to 35 percent clay. Content of organic matter ranges from 1 to 4 percent in the upper part, and it decreases regularly with depth. Thickness of the A1 horizon ranges from 10 to 22 inches.

The B2t horizon has chroma of 2 to 4. It is clay, clay loam, silty clay, or silty clay loam, and it averages 35 to 45 percent clay.

### Montague series

The Montague series consists of moderately deep, well drained soils on terraces. These soils formed in alluvium weathered from extrusive igneous rock. Slope ranges from 0 to 9 percent.

Typical pedon of Montague clay, 2 to 9 percent slopes; 1,800 feet west and 430 feet north of the southeast corner of sec. 29, T. 46 N., R. 5 W.

Ap—0 to 4 inches; dark gray (10YR 4/1) clay, very dark gray (10YR 3/1) moist; strong coarse angular blocky structure parting to strong medium angular blocky; very hard, firm, very sticky and very plastic; few very fine and fine roots; few fine tubular pores; neutral; abrupt smooth boundary.

A12—4 to 16 inches; brown (10YR 5/3) clay, dark brown (10YR 3/3) moist and rubbed; faces of peds are very dark grayish brown (10YR 3/2) when dry or moist; strong medium prismatic structure; very hard, firm, very sticky and very plastic; few very fine and fine roots; few fine tubular pores; common intersecting slickensides and pressure faces; neutral; gradual smooth boundary.

A13—16 to 24 inches; brown (10YR 5/3) clay, dark brown (10YR 3/3) moist and rubbed; faces of peds are very dark grayish brown (10YR 3/2) when dry or moist; moderate medium prismatic structure; very hard, firm, very sticky and very plastic; few very fine and fine roots; few fine tubular pores; common intersecting slickensides and pressure faces; neutral; abrupt smooth boundary.

C1cam—24 to 36 inches; white (10YR 8/2) strongly cemented petrocalcic horizon; violently effervescent with dilute acid; silica in thin discontinuous seams; moderately alkaline; abrupt smooth boundary.

IIC2r—36 inches; weathered tuff.

A few cobbles are on the surface in places. Depth to the petrocalcic horizon is 20 to 40 inches. Depth to weathered tuff is 30 to 48 inches. Cracks 1 to 10 centimeters wide extend to a depth of 20 to 24 inches when the soils are dry. Slickensides intersect at a depth of 4 to 24 inches. The profile is 0 to 35 percent rock fragments. Reaction of the solum is slightly acid or neutral.

The A horizon has value of 3 to 5 when dry and 2 or 3 when moist, chroma of 1 to 4 when dry and 1 to 3 when moist, and hue of 10YR or 7.5YR. Chroma of 1 when moist is only in the upper 2 to 8 inches. The A horizon is clay or cobbly clay and is 40 to 50 percent clay.

The Ccam horizon is strongly effervescent or violently effervescent. It commonly is 6 to 12 inches thick, but it is as much as 24 inches thick. This horizon is moderately cemented to strongly cemented.

### Montague Variant

The Montague Variant consists of shallow, well drained soils on terraces. These soils formed in alluvium weathered from extrusive igneous rock. Slope ranges from 0 to 9 percent.

Typical pedon of Montague Variant clay, 0 to 9 percent slopes; 1,400 feet west and 1,400 feet north of the southeast corner of sec. 28, T. 45 N., R. 6 W.

A11—0 to 4 inches; grayish brown (10YR 5/2) clay, very dark brown (10YR 2/2) moist; moderate thin platy structure parting to strong fine granular; hard, firm, sticky and plastic; many very fine and fine roots; few fine tubular pores and common fine vesicular pores; 5 percent pebbles; slightly acid; abrupt smooth boundary.

A12—4 to 12 inches; grayish brown (10YR 5/2) clay, very dark grayish brown (10YR 3/2) moist; strong medium prismatic structure parting to strong medium angular blocky; very hard, firm, sticky and very plastic; common very fine and fine roots; few very fine tubular pores; slightly acid; abrupt smooth boundary.

C1cam—12 to 15 inches; very strongly cemented to indurated lime hardpan; massive; very hard; thin laminar silica coatings in some of the upper parts of the hardpan.

IIC2r—15 inches; weathered tuff.

Depth to the petrocalcic horizon is 10 to 20 inches, and depth to weathered tuff is 15 to 44 inches. The profile is 0 to 5 percent rock fragments. The solum is 40 to 50 percent clay. It is slightly acid or neutral.

The A1 horizon has value of 4 or 5 when dry and chroma of 2 or 3. Content of organic matter ranges from 1 to 2 percent in the upper 12 inches.

The C1cam horizon is 3 to 24 inches thick.

### Neer series

The Neer series consists of moderately deep, well drained soils on hills. These soils formed in volcanic ash overlying extrusive igneous rock. Slope ranges from 2 to 50 percent.

Typical pedon of a Neer gravelly sandy loam in an area of Ponto-Neer complex, 2 to 15 percent slopes; 500 feet north and 1,200 feet west of the southeast corner of sec. 22, T. 40 N., R. 4 W.

O1&O2—2 inches to 0; undecomposed and partially decomposed needles, leaves, twigs, bark, and other organic debris.

A11—0 to 2 inches; dark brown (10YR 4/3) gravelly sandy loam, black (N 2/0) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine, fine, and medium roots; many fine interstitial pores; 30 percent fine shotlike pebbles 2 to 5 millimeters in diameter; weakly smeary; medium acid; abrupt smooth boundary.

A12—2 to 5 inches; dark brown (10YR 4/3) gravelly sandy loam, very dark brown (10YR 2/2) moist; moderate fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine, fine, and medium roots; many fine interstitial pores; 30 percent fine shotlike pebbles 2 to 5 millimeters in diameter; weakly smeary; medium acid; abrupt smooth boundary.

A3—5 to 9 inches; yellowish brown (10YR 5/4) gravelly sandy loam, dark yellowish brown (10YR 3/4) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots and many medium roots; few fine tubular pores and many fine random interstitial pores; common thin silt coatings bridging sand grains; 30 percent fine shotlike pebbles 2 to 5 millimeters in diameter; weakly smeary; medium acid; clear smooth boundary.

B21—9 to 16 inches; light yellowish brown (10YR 6/4) very gravelly sandy loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many medium and coarse roots and common very fine and fine roots; few fine tubular pores; many thin silt coatings bridging sand grains; 35 percent mostly fine shotlike pebbles 2 to 5 millimeters in diameter and 5 percent cobbles; weakly smeary; medium acid; clear smooth boundary.

B22—16 to 26 inches; light yellowish brown (10YR 6/4) very gravelly sandy loam, dark yellowish brown (10YR 4/6) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; few very fine and fine roots and many medium and coarse roots; few fine tubular pores; many thin silt coatings bridging sand grains; 40 percent mostly fine shotlike pebbles 2 to 5 millimeters in diameter and 5 percent cobbles; weakly smeary; medium acid; abrupt smooth boundary.

IIcR—26 inches; extrusive igneous rock; very fine, fine, and medium roots matted on surface.

A few stones are on the surface in some places. Depth to paralithic contact ranges from 20 to 40 inches. The solum is strongly acid to slightly acid. Bulk density ranges from 0.5 to 0.95 gram per cubic centimeter or more to a depth of 10 to 30 inches, but it is 0.85 gram per cubic centimeter at a depth of 10 to 14 inches. The sodium fluoride reaction ranges from 10.0 to 10.7 throughout the profile.

The A horizon has value of 3 to 6 when dry and 2 to 4 when moist, chroma of 2 to 4 when dry and 0, 2, 3, or 4 when moist, and hue of 10YR, 7.5YR, or 5YR. This horizon is gravelly sandy loam or stony sandy loam. It is 3 to 15 percent clay and 15 to 35 percent rock fragments. Thickness ranges from 4 to 18 inches. Base saturation ranges from 20 to 50 percent.

The B2 horizon has value of 5 to 7 when dry and 4 or 5 when moist, chroma of 4 or 6, and hue of 10YR, 7.5YR, or 5YR. This horizon has 1 to 2 percent more clay than the A horizon, and it is 35 to 60 percent rock fragments.

### Neuns series

The Neuns series consists of moderately deep, well drained soils on mountains. These soils formed in residuum derived from metamorphic rock. Slope ranges from 15 to 80 percent.

Typical pedon of a Neuns gravelly loam in an area of Kindig-Neuns gravelly loams, 50 to 80 percent slopes; 1,300 feet west and 1,600 feet north of the southeast corner of sec. 16, T. 43 N., R. 10 W.

O1—2 inches to 0; undecomposed and partially decomposed needles, leaves, bark, stems, and other organic debris.

A1—0 to 3 inches; dark brown (10YR 4/3) gravelly loam, very dark brown (10YR 2/2) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine, fine, and medium roots; 20 percent pebbles; medium acid; clear smooth boundary.

A3—3 to 8 inches; light yellowish brown (10YR 6/4) gravelly loam, dark yellowish brown (10YR 4/4) moist; weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine, fine, medium, and coarse roots; 20 percent pebbles; medium acid; clear wavy boundary.

B21t—8 to 16 inches; yellowish brown (10YR 5/4) very gravelly loam, dark yellowish brown (10YR 3/4) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many very fine, fine, medium, and coarse roots; few thin clay bridges between mineral grains; 10 percent stones and cobbles and 40 percent pebbles; medium acid; clear wavy boundary.

B22t—16 to 35 inches; pale brown (10YR 6/3) very gravelly loam, brown (10YR 5/3) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; common very fine and fine roots and many medium and coarse roots; few thin clay bridges between mineral grains; 10 percent stones and cobbles and 40 percent pebbles; medium acid; abrupt wavy boundary.

R—35 inches; fractured, hard metamorphosed siltstone; some soil material in fractures.

Depth to hard, fractured bedrock ranges from 20 to 40 inches. The solum is strongly acid to slightly acid. Base saturation is 50 to 60 percent below a depth of 10 inches. The control section averages 8 to 18 percent clay.

The A1 horizon has value of 3 to 6 when dry and 2 or 3 when moist, chroma of 2 to 4 when dry and 2 or 3 when moist, and hue of 2.5Y, 10YR, or 7.5YR. Content of organic matter ranges from 0.5 to 0.9 percent in the upper 7 inches. Thickness of the A1 horizon ranges from 2 to 8 inches.

The Bt horizon has value of 4 to 6 when dry and 3 to 5 when moist, and it has hue of 2.5Y, 10YR, or 7.5YR. This horizon is very gravelly sandy loam or very gravelly loam. It has 1 to 2 percent more clay than the A horizon and is 35 to 60 percent rock fragments.

Some pedons have a C horizon that is 35 to 80 percent rock fragments.

### Odas series

The Odas series consists of very deep, poorly drained soils on flood plains. These soils formed in alluvium weathered from extrusive igneous rock. Slope ranges from 0 to 2 percent.

Typical pedon of Odas sandy loam, 1,200 feet south and 700 feet west of the northeast corner of sec. 24, T. 39 N., R. 3 W. (outside the soil survey area).

A11—0 to 3 inches; dark grayish brown (10YR 4/2) sandy loam, black (10YR 2/1) moist; weak very fine granular structure; soft, friable, slightly sticky and slightly plastic; many very fine and fine matted roots; 5 percent pebbles; strongly acid; abrupt smooth boundary.

A12—3 to 8 inches; dark grayish brown (10YR 4/2) sandy loam, black (10YR 2/1) moist; massive; slightly hard, friable, slightly sticky and nonplastic; many very fine, fine, and medium roots; few fine tubular pores and common fine vesicular pores; 5 percent pebbles; strongly acid; abrupt smooth boundary.

A13—8 to 16 inches; dark grayish brown (10YR 4/2) sandy loam, black (10YR 2/1) moist; very weak fine subangular blocky structure parting to moderate fine granular; slightly hard, very friable, slightly sticky and nonplastic; many very fine, fine, and medium roots; few fine tubular pores and common fine vesicular pores; 5 percent pebbles; strongly acid; abrupt wavy boundary.

A14—16 to 31 inches; dark grayish brown (2.5Y 4/2) sandy loam, very dark brown (10YR 2/2) moist; few fine distinct olive brown (2.5Y 4/4, moist) mottles; very weak fine subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine, fine, and medium roots; few fine tubular pores and common vesicular pores; 5 percent pebbles; strongly acid; abrupt wavy boundary.

C1—31 to 34 inches; grayish brown (2.5Y 5/2) sandy loam, very dark grayish brown (10YR 3/2) moist; common fine distinct olive brown (2.5YR 4/4, moist) mottles; very weak fine and medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; many medium roots and common very fine and fine roots; few very fine and fine tubular pores and common fine vesicular pores; 5 percent pebbles; strongly acid; abrupt wavy boundary.

C2—34 to 41 inches; grayish brown (2.5Y 5/2) sandy loam, very dark grayish brown (10YR 3/2) moist; common fine distinct dark yellowish brown (10YR 4/4, moist) mottles; very weak medium subangular blocky structure; slightly hard, very friable, slightly sticky and nonplastic; many very fine and medium roots; few very fine and fine tubular pores; 5 percent pebbles; medium acid; clear wavy boundary.

C3g—41 to 53 inches; light brownish gray (10YR 6/2) sandy loam, very dark grayish brown (10YR 3/2) moist; common large distinct dark yellowish brown (10YR 4/4, moist) mottles; massive; soft, very friable, nonsticky and nonplastic; few very fine and fine roots and common medium roots; few fine and very fine tubular pores and common fine vesicular pores; slightly brittle in pockets; 5 percent pebbles; medium acid; abrupt wavy boundary.

C4g—53 to 60 inches; gray (10YR 6/1) sandy loam, dark grayish brown (2.5Y 4/2) moist; common medium distinct olive brown (2.5Y 4/4, moist) mottles; massive; slightly hard, very friable, nonsticky and nonplastic; common medium roots and few fine and very fine roots; few fine and very fine tubular pores; 5 percent pebbles; medium acid; water table at a depth of 54 inches.

The profile is 6 to 18 percent clay. Reaction is strongly acid or medium acid. The water table is at the surface 1 to 2 weeks in March and April and fluctuates between depths of 18 and 36 inches the rest of the year. Content of rock fragments in the profile ranges from 5 to 15 percent.

The A1 horizon has value of 3 to 5 when dry and 2 or 3 when moist, chroma of 1 or 2 when dry and 0 to 2 when moist, and hue of 10YR, 2.5Y, or neutral. Base saturation ranges from 35 to 60 percent but is less than 50 percent in the upper 5 to 10 inches.

The C horizon has chroma of 1 to 3 and hue of 10YR or 2.5Y.

### Oosen series

The Oosen series consists of very deep, somewhat excessively drained soils on mountains (fig. 8). These soils formed in coarse volcanic ash. Slope is 2 to 50 percent.

Typical pedon of an Oosen loamy sand in an area of Avis-Oosen complex, 5 to 30 percent slopes; 1,200 feet



Figure 8.—Typical profile of an Oosen loamy sand in an area of Avis-Oosen complex, 5 to 30 percent slopes. Tape measure on left gives depth in centimeters, and that on right gives depth in feet.

west and 1,030 feet south of the northeast corner of sec. 33, T. 45 N., R. 3 W.

- O1—1/4 inch to 0; fresh needles, twigs, bark, and other organic debris.
- A11—0 to 1 inch; dark brown (10YR 4/3) loamy sand, very dark grayish brown (10YR 3/2) moist; very weak fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; many very fine interstitial pores; 2 percent cobbles and 5 percent pebbles; medium acid; abrupt smooth boundary.
- A12—1 inch to 4 inches; dark brown (10YR 4/3) loamy sand, very dark grayish brown (10YR 3/2) moist; very weak fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine, fine, medium, and coarse roots; many very fine interstitial pores; medium acid; abrupt smooth boundary.
- A13—4 to 12 inches; light yellowish brown (10YR 6/4) loamy sand, dark yellowish brown (10YR 3/4) moist; very weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine, fine, medium, and coarse roots; many very fine interstitial pores; medium acid; abrupt smooth boundary.
- C1—12 to 28 inches; yellowish brown (10YR 5/4) loamy sand, dark yellowish brown (10YR 3/4) moist; very weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine, fine, medium, and coarse roots; many very fine interstitial pores; the lower 6 to 15 inches is a discontinuous stone line that is mostly a single layer of stones and cobbles; medium acid; clear wavy boundary.
- IIC2—28 to 35 inches; dark brown (10YR 4/3) sand, very dark grayish brown (10YR 3/2) moist; massive; hard and firm in the upper part, soft and very friable in the lower part, nonsticky and nonplastic; many very fine, fine, medium, and coarse roots; weakly cemented with silica in upper part; medium acid; clear smooth boundary.
- IIC3—35 to 42 inches; dark brown (10YR 3/3) sand, very dark brown (10YR 3/2) moist; single grain; loose; individual sand grains are mostly black and orange and are porous; medium acid; clear smooth boundary.
- IIC4—42 to 72 inches; dark brown (10YR 3/3) sand, black (10YR 2/1) moist; single grain; loose; individual sand grains are mostly black and orange and are porous; medium acid.

The profile is 0 to 15 percent rock fragments and 0 to 5 percent clay. Reaction is neutral to medium acid. Base saturation ranges from 5 to 40 percent throughout the profile. The sodium fluoride reaction ranges from 10.9 at the surface to 9.6 at a depth of 40 to 72 inches. The 10- to 40-inch control section has a weighted average of 10 to 20 percent very coarse sand and coarse sand and 35 to 50 percent fine sand and very fine sand.

The A horizon has value of 3 to 6 when dry and chroma of 2 to 4 when dry. Thickness ranges from 10 to 20 inches.

The C horizon has value of 5 or 6 when dry and 3 or 4 when moist, and it has chroma of 2 to 4 when dry. It is loamy sand or loamy fine sand. The IIC horizon has chroma of 1 to 3 when dry.

### Orset series

The Orset series consists of very deep, well drained soils on terraces. These soils formed in alluvium weathered from extrusive igneous rock. Slope ranges from 0 to 9 percent.

Typical pedon of Orset sandy loam, 0 to 9 percent slopes; 800 feet east and 325 feet south of the northwest corner of sec. 33, T. 45 N., R. 2 W. (outside the soil survey area).

O1—1/2 inch to 0; undecomposed and partially decomposed needles, bark, grass, and other organic debris.

A1—0 to 4 inches; grayish brown (10YR 5/2) sandy loam, very dark brown (10YR 2/2) moist; weak fine granular structure; soft, very friable, slightly sticky and nonplastic; many medium roots and common fine roots; many fine interstitial pores; slightly acid; abrupt smooth boundary.

AC—4 to 13 inches; pale brown (10YR 6/3) sandy loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many medium roots and common fine roots; many fine interstitial pores; medium acid; abrupt smooth boundary.

C1—13 to 26 inches; very pale brown (10YR 7/3) loam, dark brown (10YR 3/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; many fine roots; few medium tubular pores and many fine interstitial pores; medium acid; abrupt smooth boundary.

C2—26 to 42 inches; very pale brown (10YR 7/3) loam, dark brown (10YR 3/3) moist; massive; hard, friable, slightly sticky and slightly plastic; few fine roots and common medium roots; few fine tubular pores and many fine interstitial pores; medium acid; clear smooth boundary.

C3si—42 to 48 inches; very pale brown (10YR 7/4) loam, dark brown (10YR 3/3) moist; massive; hard, friable, slightly sticky and slightly plastic; few fine and medium roots; few fine tubular pores; discontinuous weak silica cementation; medium acid; abrupt wavy boundary.

C4si—48 to 60 inches; very pale brown (10YR 7/4) loam, dark brown (10YR 3/3) moist; massive; hard, firm, slightly sticky and slightly plastic; few fine and medium roots; few fine tubular pores and many fine interstitial pores; discontinuous moderate silica cementation; medium acid.

Thickness of the solum ranges from 9 to 17 inches. The profile is 0 to 15 percent rock fragments and 10 to 18 percent clay. Reaction is medium acid or slightly acid throughout. Base saturation ranges from 50 to 80 percent and is more than 60 percent in some part of the upper 3 inches of the profile.

The A1 horizon has value of 5 or 6 when dry and 2 or 3 when moist, and it has chroma of 2 or 3. Content of organic matter ranges from 0.50 to 0.95 percent in the upper part. Thickness ranges from 2 to 6 inches.

The C horizon has value of 6 to 8 when dry and 3 or 4 when moist, chroma of 2 to 4 when dry and 2 or 3 when moist, and hue of 10YR to 2.5Y.

### Pinehurst series

The Pinehurst series consists of deep, well drained soils on mountains. These soils formed in residuum derived from extrusive igneous rock. Slope ranges from 2 to 50 percent.

Typical pedon of Pinehurst stony loam, 2 to 15 percent slopes; 340 feet west and 200 feet north of the southeast corner of sec. 33, T. 47 N., R. 4 W.

O1&O2—1 inch to 0; undecomposed and partially decomposed needles, twigs, leaves, bark, grass, and other organic debris.

A11—0 to 3 inches; dark brown (10YR 3/3) stony loam, very dark brown (10YR 2/2) moist; moderate fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; 10 percent stones and cobbles and 15 percent pebbles; slightly acid; abrupt smooth boundary.

A12—3 to 10 inches; dark brown (7.5YR 4/2) stony loam, dark brown (7.5YR 3/2) moist; weak medium subangular blocky structure; hard, friable, sticky and plastic; many very fine, fine, and medium roots; few very fine and fine vesicular pores; 10 percent stones and cobbles and 15 percent pebbles; medium acid; abrupt smooth boundary.

A3—10 to 14 inches; reddish brown (5YR 4/3) gravelly loam, dark reddish brown (5YR 3/3) moist; moderate medium subangular blocky structure; very hard, firm, sticky and plastic; many medium and coarse roots and common very fine and fine roots; few very fine and fine vesicular pores; 8 percent stones and cobbles and 17 percent pebbles; slightly acid; clear wavy boundary.

B1t—14 to 20 inches; reddish brown (5YR 4/3) gravelly loam, dark reddish brown (5YR 3/3) moist; moderate medium subangular blocky structure; very hard, friable, sticky and plastic; many medium and coarse roots and common very fine and fine roots; few fine vesicular and tubular pores; common thin and moderately thick clay films lining pores and on peds; 10 percent stones and cobbles and 20 percent pebbles; slightly acid; clear wavy boundary.

B21t—20 to 28 inches; dark brown (7.5YR 4/2) gravelly clay loam, dark reddish brown (5YR 3/3) moist;

weak medium subangular blocky structure; very hard, firm, very sticky and very plastic; many medium roots and few very fine and fine roots; few very fine and fine tubular pores; many moderately thick clay films lining pores and on peds; 10 percent stones and cobbles and 20 percent pebbles; slightly acid; gradual wavy boundary.

B22t—28 to 39 inches; dark brown (7.5YR 4/2) gravelly clay loam, dark brown (7.5YR 3/2) moist; weak medium subangular blocky structure; very hard, firm, very sticky and very plastic; many medium roots and few very fine and fine roots; many moderately thick clay films lining pores and on peds; 10 percent stones and cobbles and 20 percent pebbles; slightly acid; gradual wavy boundary.

B23t—39 to 48 inches; dark brown (7.5YR 4/2) gravelly clay loam, dark brown (7.5YR 3/2) moist; weak medium subangular blocky structure; very hard, firm, very sticky and very plastic; many medium roots and few very fine and fine roots; few very fine tubular pores; continuous moderately thick clay films lining pores and on peds; 10 percent stones and cobbles and 20 percent pebbles that are mostly saprolite; slightly acid; gradual wavy boundary.

B31t—48 to 55 inches; dark brown (10YR 4/3) very stony clay loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; very hard, firm, very sticky and very plastic; few very fine and fine roots and many medium roots; few very fine tubular pores; common thin and moderately thick clay films lining pores and on peds; 30 percent stones and cobbles and 30 percent pebbles that are mostly saprolite; slightly acid; abrupt irregular boundary.

B32t—55 to 60 inches; dark brown (10YR 4/3) very stony clay loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; very hard, firm, very sticky and very plastic; few very fine and fine roots and many medium roots; few very fine tubular pores; common moderately thick and thin clay films lining pores and on peds; 30 percent stones and cobbles and 30 percent pebbles that are mostly saprolite; slightly acid; clear wavy boundary.

Cr—60 inches; weathered extrusive igneous bedrock.

Depth to bedrock ranges from 40 to 60 inches. The mollic epipedon is more than 20 inches thick. Content of organic matter ranges from 1 to 4 percent in the upper 15 inches.

The A horizon has value of 3 to 5 when dry and hue of 10YR, 7.5YR, or 5YR. Reaction is medium acid or slightly acid. This horizon is 15 to 25 percent clay and 15 to 35 percent rock fragments. Base saturation is less than 75 percent in some parts of the upper 30 inches. Organic matter content decreases regularly with depth. The A horizon is 13 to 16 inches thick.

The B2t horizon has value of 4 or 5 when dry and 3 or 4 when moist, chroma of 2 to 4, and hue of 10YR,

7.5YR, or 5YR. It is strongly acid to slightly acid. This horizon is gravelly loam or gravelly clay loam. It averages 20 to 35 percent clay and 15 to 35 percent rock fragments. The B3t horizon is 20 to 30 percent clay and 35 to 60 percent rock fragments.

### Pinehurst Variant

The Pinehurst Variant consists of moderately deep, well drained soils on mountains. These soils formed in residuum derived from andesite. Slope ranges from 0 to 65 percent.

Typical pedon of Pinehurst Variant very stony loam, 0 to 15 percent slopes; 1,800 feet east and 1,350 feet south of the northwest corner of sec. 19, T. 48 N., R. 4 W.

A11—0 to 2 inches; dark brown (7.5YR 4/4) very stony loam, dark reddish brown (5YR 3/2) moist; moderate fine granular structure; soft, friable, slightly sticky and slightly plastic; few very fine and fine roots and common medium roots; many very fine vesicular pores, common fine vesicular pores, and few medium vesicular pores; 25 percent stones and 20 percent pebbles; slightly acid; abrupt smooth boundary.

A12—2 to 6 inches; dark reddish brown (5YR 3/4) very stony loam, dark reddish brown (5YR 3/3) moist; weak medium subangular blocky structure parting to moderate fine granular; slightly hard, friable, slightly sticky and slightly plastic; few very fine roots and common fine and medium roots; few very fine and fine tubular pores; 25 percent stones and 20 percent pebbles; slightly acid; abrupt smooth boundary.

A3—6 to 12 inches; dark reddish brown (5YR 3/4) very stony loam, dark reddish brown (5YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, friable, sticky and plastic; few very fine and fine roots and common medium roots; few very fine and medium tubular pores and common fine vesicular pores; few thin clay films lining tubular pores; 25 percent stones and 20 percent pebbles; neutral; abrupt smooth boundary.

B2t—12 to 26 inches; dark reddish brown (5YR 3/4) very cobbly clay loam, dark reddish brown (5YR 3/3) moist; moderate medium subangular blocky structure; hard, firm, sticky and plastic; few very fine roots and many medium and coarse roots; common very fine and fine tubular pores; continuous thin clay films on peds and in pores; 1 percent stones, 25 percent cobbles, and 20 percent pebbles; neutral; clear smooth boundary.

Cr—26 inches; weathered andesite.

Depth to weathered andesite ranges from 20 to 40 inches. The profile is 35 to 60 percent rock fragments. The solum is slightly acid to mildly alkaline. Content of organic matter ranges from 1 to 2 percent in the upper 7

inches. It is less than 1 percent below a depth of 20 inches.

The A horizon has value of 2 or 3 when moist and chroma of 2 or 4 when dry. It is 16 to 27 percent clay. Thickness ranges from 8 to 14 inches. Base saturation ranges from 75 to 100 percent.

The B2t horizon has value of 3 to 6 when dry and 3 to 5 when moist, chroma of 3 to 6 when dry and 3 or 4 when moist, and hue of 7.5YR or 5YR. This horizon is 27 to 35 percent clay.

### Pit series

The Pit series consists of very deep, poorly drained soils on flood plains. These soils formed in alluvium derived from extrusive igneous rock. Slope ranges from 0 to 2 percent.

Typical pedon of Pit clay, 225 feet east and 950 feet north of the southwest corner of sec. 9, T. 44 N., R. 6 W.

A11—0 to 2 inches; dark gray (10YR 3/1) clay, black (10YR 2/1) moist; moderate medium platy structure; very hard, firm, sticky and very plastic; many very fine, fine, and medium roots; few fine and very fine tubular pores; mildly alkaline; abrupt smooth boundary.

A12—2 to 20 inches; dark gray (10YR 3/1) clay, black (10YR 2/1) moist; strong coarse prismatic structure parting to strong fine angular blocky; very hard, very firm, sticky and very plastic; many medium roots and common fine and very fine roots; common very fine tubular pores; cracks 1/2 inch wide in lower part; many intersecting slickensides; mildly alkaline; clear wavy boundary.

A13ca—20 to 38 inches; dark gray (10YR 4/1) clay, very dark brown (10YR 2/2) moist; strong medium prismatic structure parting to strong fine angular blocky; very hard, very firm, sticky and very plastic; many medium roots and common fine and very fine roots; common fine and very fine tubular pores; common intersecting slickensides; seams and soft masses of lime; violently effervescent; moderately alkaline; abrupt wavy boundary.

C1ca—38 to 44 inches; pale brown (10YR 6/3) clay loam, dark yellowish brown (10YR 4/4) moist; massive; hard, firm, sticky and very plastic; few fine and very fine roots; common fine vesicular pores and few fine tubular pores; seams and soft masses of lime; strongly effervescent; moderately alkaline; clear wavy boundary.

C2ca—44 to 49 inches; pale brown (10YR 6/3) clay loam, dark yellowish brown (10YR 4/4) moist; massive; hard, firm, sticky and very plastic; few very fine roots; common fine vesicular pores and very fine tubular pores; seams and soft masses of lime; strongly effervescent; moderately alkaline; clear wavy boundary.

C3—49 to 61 inches; pale brown (10YR 6/3) clay loam, yellowish brown (10YR 5/4) moist; few fine distinct dark yellowish brown (10YR 4/4) mottles, dark yellowish brown (10YR 3/4) moist; massive; hard, firm, sticky and very plastic; common fine vesicular pores and common very fine tubular pores; mildly alkaline.

Cracks 1 to 5 centimeters wide extend to a depth of 20 to 24 inches when the soils are dry. The water table is at a depth of 24 to 36 inches from December through May.

The upper part of the A horizon has value of 3 to 5 when dry and 2 or 3 when moist, chroma of 0 or 1, and hue of 10YR or neutral. It is neutral or mildly alkaline. The lower part has value of 4 to 5 when dry and 2 or 3 when moist. It is mildly alkaline or moderately alkaline. Slickensides intersect in the lower part of the A horizon.

The C horizon has value of 5 or 6 when dry and chroma of 2 or 3 when dry. Reaction is mildly alkaline or moderately alkaline. This horizon is clay loam or silty clay loam and is 30 to 40 percent clay.

### Plutos series

The Plutos series consists of moderately deep, somewhat excessively drained soils on glacial fans. These soils formed in glaciofluvial deposits weathered from extrusive igneous rock and volcanic ash. Slope ranges from 0 to 30 percent.

Typical pedon of a Plutos loamy sand in an area of Plutos-Rock outcrop complex, 0 to 30 percent slopes; 2,400 feet east and 200 feet south of the northwest corner of sec. 26, T. 43 N., R. 4 W.

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

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

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

C—14 to 23 inches; pale brown (10YR 6/3) sand, dark brown (10YR 3/3) moist; massive; soft, very friable,

nonsticky and nonplastic; few very fine and fine roots and common medium and coarse roots; few fine tubular pores and many fine interstitial pores; 10 percent pebbles; neutral; abrupt smooth boundary.  
 IIR—23 inches; vesicular hard basalt; high olivine content; highly fractured.

Depth to fractured basalt ranges from 20 to 40 inches. Thickness of the solum ranges from 11 to 20 inches. The profile is 2 to 15 percent rock fragments and 3 to 8 percent clay. Reaction is medium acid to neutral. Base saturation is 60 to 75 percent in some part of the upper 10 to 30 inches of the profile. Content of organic matter ranges from 0.5 to 0.9 percent in the upper 7 inches of the profile.

The A1 horizon has value of 5 or 6 when dry and hue of 10YR or 2.5Y. Thickness ranges from 5 to 10 inches. Where the A1 horizon is dark, it lacks either the organic matter content or thickness to qualify it as a mollic epipedon.

The C horizon has value of 5 or 6 when dry and 2 or 3 when moist, chroma of 2 or 3, and hue of 10YR to 2.5Y. It is sand or loamy sand.

### Ponto series

The Ponto series consists of very deep, well drained soils on hills. These soils formed in volcanic ash. Slope ranges from 2 to 50 percent.

Typical pedon of a Ponto sandy loam in an area of Ponto-Neer complex, 2 to 15 percent slopes; 1,600 feet north and 860 feet east of the southwest corner of sec. 35, T. 40 N., R. 4 W.

- O1&O2—1 inch to 0; undecomposed and partially decomposed needles, leaves, bark, and other organic debris.
- A11—0 to 3 inches; very dark grayish brown (10YR 3/2) sandy loam, black (N 2/0) moist; very weak medium platy structure parting to moderate fine granular; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; many very fine and fine interstitial and vesicular pores; 5 percent fine pebbles 2 to 5 millimeters in diameter; weakly smeary; strongly acid; abrupt smooth boundary.
- A12—3 to 8 inches; brown (7.5YR 5/4) sandy loam, very dark grayish brown (10YR 3/2) moist; very weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and fine roots; common very fine and fine interstitial and vesicular pores; 5 percent fine pebbles 2 to 5 millimeters in diameter; weakly smeary; strongly acid; abrupt smooth boundary.
- B21—8 to 21 inches; light brown (7.5YR 6/4) sandy loam, dark brown (7.5YR 4/4) moist; very weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; common very fine and fine roots and many medium and coarse roots;

- common very fine and fine vesicular pores; 10 percent fine pebbles 2 to 5 millimeters in diameter; weakly smeary; strongly acid; abrupt wavy boundary.
- B22—21 to 26 inches; pink (7.5YR 7/4) light sandy loam, dark brown (7.5YR 4/4) moist; weak medium subangular blocky structure; hard, slightly firm, nonsticky and nonplastic; few very fine and fine roots and many medium and coarse roots; common very fine and fine vesicular pores; 10 percent fine pebbles; weakly smeary; very strongly acid; abrupt wavy boundary.
- B3—26 to 53 inches; very pale brown (10YR 7/4) sandy loam, dark brown (7.5YR 4/4) moist; massive; hard, slightly firm, nonsticky and nonplastic; few very fine and fine roots and many medium roots; 5 percent fine pebbles; weakly smeary; very strongly acid; abrupt smooth boundary.
- Cg—53 to 80 inches; light brown (7.5YR 6/4) stony sandy loam, dark brown (7.5YR 4/4) moist; massive; hard, firm, nonsticky and nonplastic; few very fine, fine, and medium roots; common very fine and fine vesicular pores; 10 percent fine pebbles and 10 percent stones; weakly smeary; very strongly acid.

A few stones are on the surface in places. Thickness of the solum ranges from 42 to 62 inches. Bulk density ranges from 0.5 to 0.95 gram per cubic centimeter to a depth of 10 to 30 inches but is 0.85 gram or more at a depth of 10 to 14 inches.

The A1 horizon has value of 3 to 5 when dry and 2 or 3 when moist, chroma of 2 to 4 when dry and 0 to 4 when moist, and hue of 10YR, 7.5YR, or neutral. Reaction is strongly acid or medium acid. Base saturation ranges from 15 to 40 percent. The A1 horizon is sandy loam or stony sandy loam. It is 6 to 15 percent clay and 0 to 35 percent rock fragments. Thickness ranges from 6 to 9 inches.

The B2 horizon has value of 5 to 7 when dry and 3 or 4 when moist, chroma of 3, 4, or 6, and hue of 10YR or 7.5YR. Reaction is very strongly acid to medium acid. The B2 horizon is sandy loam or loam. It is 8 to 18 percent clay and 5 to 15 percent rock fragments. Base saturation is 10 to 30 percent.

The C horizon has value of 5 to 7 when dry and 4 or 5 when moist, chroma of 4 or 6, and hue of 10YR, 7.5YR, or 5YR. It is stony sandy loam or stony loam. This horizon is 10 to 18 percent clay and 15 to 35 percent rock fragments.

### Redola series

The Redola series consists of very deep, well drained soils on alluvial fans. These soils formed in mixed alluvium. Slope ranges from 0 to 9 percent.

Typical pedon of Redola loam, 0 to 2 percent slopes; 650 feet west and 50 feet north of the southeast corner of sec. 4, T. 43 N., R. 4 W.

Ap—0 to 6 inches; dark grayish brown (10YR 4/2) loam, very dark brown (10YR 2/2) moist; moderate medium subangular blocky structure; soft, very friable, slightly sticky and slightly plastic; many fine roots; mildly alkaline; abrupt smooth boundary.

A12—6 to 13 inches; dark grayish brown (10YR 4/2) loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; hard, friable, slightly sticky and slightly plastic; few medium and coarse roots and many fine roots; common fine tubular pores; moderately alkaline; clear smooth boundary.

A13—13 to 19 inches; dark brown (10YR 4/3) clay loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic; few fine and coarse roots and many medium roots; common fine tubular pores; moderately alkaline; abrupt smooth boundary.

C1—19 to 33 inches; brown (10YR 5/3) sandy loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; hard, very friable, slightly sticky and nonplastic; many medium roots; moderately alkaline; abrupt smooth boundary.

C2ca—33 to 39 inches; pale brown (10YR 6/3) loam, dark brown (10YR 4/3) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; common medium roots; common fine tubular pores; strongly effervescent; strongly alkaline; abrupt wavy boundary.

IIc3ca—39 to 60 inches; gray (10YR 6/1) gravelly sand, very dark grayish brown (10YR 3/2); single grain; loose; strongly effervescent; strongly alkaline.

Thickness of the solum ranges from 15 to 30 inches. The profile is either stratified or it has a buried A horizon. Content of clay in the 10- to 40-inch control section ranges from 7 to 18 percent by weighted average.

The A1 horizon has value of 4 or 5 when dry and chroma of 2 or 3. It is mildly alkaline or moderately alkaline. The A horizon is noncalcareous.

The C horizon has chroma of 1 to 3 and hue of 2.5Y or 10YR. It is moderately alkaline or strongly alkaline. The C horizon is 0 to 35 percent coarse fragments. In some pedons it has discontinuous seams of lime that are weakly cemented.

The soils in the Redola series, as mapped in this survey area, do not have carbonates in the upper 25 to 40 inches of the profile, have thin clay loam strata, and are strongly alkaline in the C horizon. These properties are outside the accepted range of characteristics for the Redola series, but they do not significantly affect the use and management of the soils.

### Salisbury series

The Salisbury series consists of well drained soils on terraces. These soils are moderately deep to a hardpan. They formed in mixed alluvium. Slope ranges from 0 to 9 percent.

Typical pedon of Salisbury cobbly loam, 0 to 9 percent slopes; 1,875 feet east and 100 feet south of the northwest corner of sec. 8, T. 44 N., R. 5 W.

A11—0 to 2 inches; gray (10YR 5/1) cobbly loam, very dark brown (10YR 2/2) moist; strong medium platy structure; hard, friable, sticky and plastic; many very fine and fine roots; common fine and medium vesicular pores; 10 percent cobbles and 10 percent pebbles; mildly alkaline; abrupt smooth boundary.

A12—2 to 4 inches; gray (10YR 5/1) cobbly loam, very dark brown (10YR 2/2) moist; strong medium platy structure; very hard, friable, sticky and plastic; common very fine and fine roots; common fine interstitial pores and few very fine and fine tubular pores; 10 percent cobbles and 10 percent pebbles; mildly alkaline; abrupt smooth boundary.

B21t—4 to 8 inches; dark grayish brown (10YR 4/2) gravelly clay loam, very dark brown (10YR 2/2) moist; moderate medium prismatic structure parting to strong fine prismatic; very hard, firm, sticky and very plastic; few very fine and fine roots; common very fine tubular pores; continuous thin clay films on peds and lining pores; 2 percent stones, 3 percent cobbles, and 10 percent pebbles; neutral; clear smooth boundary.

B22t—8 to 14 inches; dark grayish brown (10YR 4/2) gravelly clay, very dark grayish brown (10YR 3/2) moist; strong medium prismatic structure; extremely hard, very firm, very sticky and very plastic; few very fine and fine roots; common thick clay films and continuous moderately thick clay films on peds and lining pores; 2 percent stones, 3 percent cobbles, and 10 percent pebbles; neutral; clear smooth boundary.

B23t—14 to 24 inches; dark brown (10YR 4/3) gravelly clay, dark brown (10YR 3/3) moist; strong medium prismatic structure; extremely hard, very firm, very sticky and very plastic; few very fine and fine roots; few very fine tubular pores; 2 percent stones, 3 percent cobbles, and 10 percent pebbles; neutral; clear smooth boundary.

C1sim—24 to 32 inches; very strongly silica cemented duripan; some white segregated lime in seams; 2 to 3 percent pebbles and cobbles in the pan.

C2—32 to 60 inches; stratified sand, gravel, cobbles, and stones.

A few cobbles are on the surface in places. Depth to the duripan ranges from 20 to 40 inches. Content of organic matter ranges from 1 to 2 percent in the upper 11 inches of the profile.

The A1 horizon has value of 4 or 5 when dry and 2 or 3 when moist, and it has chroma of 1 to 3 when dry and 2 or 3 when moist. Reaction is neutral or mildly alkaline. This horizon is clay loam, gravelly clay loam, or cobbly loam. It is 20 to 35 percent clay and 0 to 35 percent rock fragments. Thickness ranges from 4 to 8 inches.

The B2t horizon has value of 4 to 6 when dry and 2 to 4 when moist, chroma of 2 to 4, and hue of 10YR or 7.5YR. It is neutral to moderately alkaline. This horizon is clay or clay loam. It is 40 to 50 percent clay and 5 to 35 percent rock fragments.

The Csim horizon ranges from 6 to 36 inches in thickness.

### Settlemeier series

The Settlemeier series consists of very deep, poorly drained soils on flood plains. These soils formed in mixed alluvium. Slope ranges from 0 to 5 percent.

Typical pedon of Settlemeier loam, 0 to 2 percent slopes; 1,300 feet east and 1,080 feet south of the northwest corner of sec. 3, T. 44 N., R. 6 W.

A11—0 to 2 inches; gray (10YR 5/1) loam, very dark gray (10YR 3/1) moist; weak fine subangular blocky structure; slightly hard, friable, sticky and slightly plastic; common very fine and fine roots; common fine tubular pores; slightly effervescent; moderately alkaline; abrupt smooth boundary.

A12—2 to 10 inches; gray (10YR 5/1) loam, very dark gray (10YR 3/1) moist; weak medium subangular blocky structure; slightly hard, friable, sticky and slightly plastic; common very fine and fine roots; common fine tubular pores; slightly effervescent; moderately alkaline; abrupt smooth boundary.

A13—10 to 11 inches; gray (10YR 5/1) fine sandy loam, very dark gray (10YR 3/1) moist; few fine distinct pale brown (10YR 6/3) mottles; very weak medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; common very fine and fine roots; few very fine interstitial pores; disseminated lime in pores; slightly effervescent; moderately alkaline; abrupt smooth boundary.

A14—11 to 17 inches; gray (10YR 5/1) loam, very dark gray (10YR 3/1) moist; few fine distinct pale brown (10YR 6/3) mottles; massive; hard, friable, sticky and plastic; common very fine and fine roots; common fine tubular pores; disseminated lime in pores, slightly effervescent; moderately alkaline; abrupt smooth boundary.

A15t—17 to 22 inches; gray (10YR 5/1) loam, very dark gray (10YR 3/1) moist; massive; hard, friable, sticky and plastic; common very fine and fine roots; common fine and medium tubular pores; lime in pores; noncalcareous in matrix; slightly effervescent; moderately alkaline; clear smooth boundary.

A16—22 to 36 inches; gray (10YR 5/1) silt loam, very dark gray (10YR 3/1) moist; massive; hard, friable, sticky and plastic; common very fine and fine roots; common fine tubular pores; moderately alkaline; gradual smooth boundary.

C—36 to 44 inches; gray (10YR 6/1) silt loam, dark gray (10YR 4/1) moist; massive; hard, friable, sticky and plastic; few very fine and fine roots; few fine tubular

pores; moderately alkaline; gradual smooth boundary.

A11b—44 to 53 inches; gray (10YR 5/1) silt loam, very dark gray (10YR 3/1) moist; massive; hard, firm, sticky and plastic; moderately alkaline; gradual smooth boundary.

IIA12b—53 to 66 inches; gray (10YR 5/1) sandy clay loam, very dark gray (10YR 3/1) moist; massive; hard, firm, sticky and plastic; moderately alkaline.

Thickness of the solum ranges from 32 to 38 inches. The textural control section is strata of loam, silt loam, fine sandy loam, silty clay loam, clay, or clay loam. It averages from 18 to 35 percent clay. The profile is either stratified or it has a buried A horizon or a buried C horizon, or both. Reaction is mildly alkaline or moderately alkaline. The water table is at the surface from December through June, and it fluctuates between depths of 12 and 24 inches the rest of the year unless the soils are artificially drained. Organic carbon content is 0.6 to 1.2 percent in the upper 11 inches of the profile, and it decreases irregularly with increasing depth. The upper part of the A horizon is calcareous, but some parts of the profile at a depth of 10 to 20 inches are noncalcareous.

The A1 and IIA1b horizons have value of 4 or 5 when dry and 2 or 3 when moist, and they have chroma of 1 or 2. The A1 horizon is 18 to 27 percent clay, and the IIA1b horizon is 18 to 35 percent clay.

The C horizon has value of 5 or 6 when dry and 3 or 4 when moist, chroma of 1 to 3, and hue of 2.5Y or 10YR.

### Settlemeier Variant

The Settlemeier Variant consists of very deep, poorly drained soils on alluvial fans. These soils formed in mixed alluvium. Slope ranges from 0 to 2 percent.

Typical pedon of Settlemeier Variant silt loam, 550 feet south and 880 feet east of the northwest corner of sec. 25, T. 43 N., R. 9 W.

A11—0 to 11 inches; very dark gray (N 3/0) silt loam, black (N 2/0) moist; moderate medium platy structure; very hard, friable, very sticky and very plastic; many fine roots; moderately alkaline; abrupt smooth boundary.

A12—11 to 19 inches; dark gray (N 4/0) silt loam, very dark gray (N 3/0) moist; moderate medium subangular blocky structure; very hard, firm, very sticky and very plastic; many fine roots; moderately alkaline; clear smooth boundary.

B21tg—19 to 32 inches; dark gray (5Y 4/1) silty clay loam, very dark gray (5Y 3/1) moist; black (5Y 2/1, moist) and olive gray (5Y 4/2, moist) mottles; strong medium prismatic structure parting to strong medium subangular blocky; very hard, very firm, very sticky and very plastic; common fine and medium roots; common fine tubular pores; many moderately thick

clay films in pores and on peds; moderately alkaline; clear smooth boundary.

B22tg—32 to 53 inches; light olive gray (5Y 6/2) silty clay loam, olive gray (5Y 5/2) moist; common medium distinct light olive brown (2.5Y 5/6) and olive (5Y 5/3) mottles; strong medium prismatic structure parting to strong medium subangular blocky; very hard, very firm, very sticky and very plastic; few medium and fine roots; few fine tubular pores; many moderately thick clay films in pores and on peds; moderately alkaline; clear smooth boundary.

B23tg—53 to 68 inches; olive gray (5Y 5/2) silty clay loam, olive gray (5Y 4/2) moist; many medium and large distinct olive brown (2.5Y 4/4) and olive gray (5Y 4/2) mottles; moderate medium prismatic structure parting to moderate medium angular blocky; very hard, very firm, very sticky and very plastic; few medium roots; few fine tubular pores; many moderately thick clay films in pores and on peds; moderately alkaline; abrupt smooth boundary.

Cg—68 to 80 inches; greenish gray (5BG 6/1, moist) gravelly clay loam, massive; hard, firm, very sticky and very plastic; 30 percent fine and medium pebbles; strongly alkaline.

The water table is at a depth of 0 to 18 inches from February through June, and it fluctuates between depths of 18 and 36 inches the rest of the year. The profile is mildly alkaline to strongly alkaline throughout.

The A1 horizon has value of 2 to 4 when dry, chroma of 0 or 1, and hue of 2.5Y, 10YR, or neutral. It is 20 to 27 percent clay. Organic matter content ranges from 2 to 4 percent. Thickness ranges from 16 to 25 inches.

The B2tg horizon has value of 4 to 6 when dry, chroma of 0 to 2, and hue of 2.5Y, 5Y, 10YR, or neutral. It is silty clay loam, clay loam, or clay and averages 35 to 45 percent clay.

### Sheld series

The Sheld series consists of deep, well drained soils on mountains. These soils formed in volcanic ash deposited over material weathered from extrusive igneous rock (fig. 9). Slope ranges from 9 to 65 percent.

Typical pedon of a Sheld stony sandy loam in an area of Sheld-Iller stony sandy loams, 30 to 50 percent slopes; 2,600 feet south and 145 feet east of the northwest corner of sec. 29, T. 44 N., R. 3 W.

O1&O2—2 inches to 0; undecomposed and partially decomposed needles, leaves, twigs, bark, and other organic debris.

A11—0 to 2 inches; dark brown (10YR 4/3) stony sandy loam, dark reddish brown (5YR 3/2) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine, fine, and medium roots; many very fine and fine interstitial pores; 10 percent pebbles, 5 percent cobbles, and 4 percent

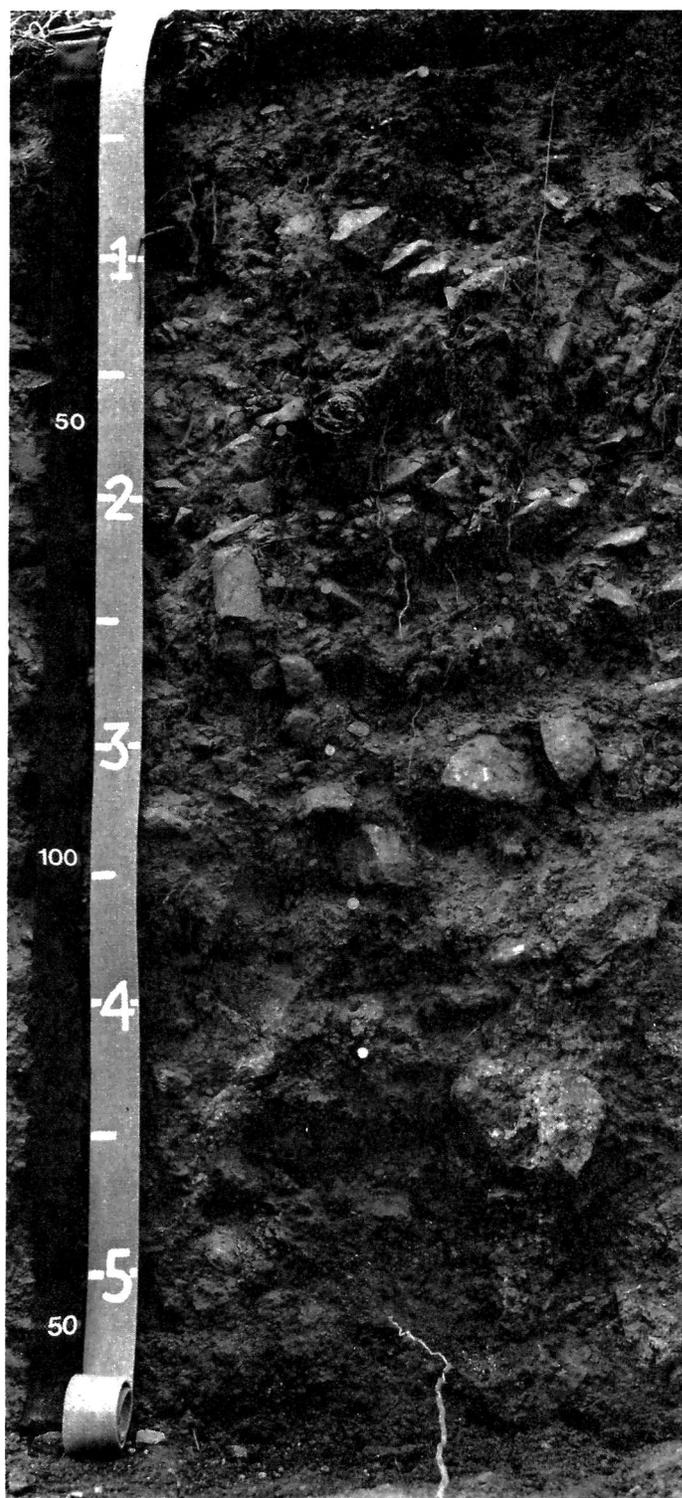


Figure 9—Typical profile of a Sheld stony sandy loam in an area of Sheld-Iller stony sandy loams, 30 to 50 percent slopes. Tape measure on right gives depth in feet, and that on left gives depth in centimeters

- stones; weakly smeary; strongly acid; clear smooth boundary.
- A12—2 to 7 inches; brown (10YR 5/3) stony sandy loam, dark reddish brown (5YR 3/3) moist; weak fine granular structure; soft, very friable, nonsticky and nonplastic; many very fine, fine, and medium roots; many very fine and fine interstitial pores; 10 percent pebbles, 5 percent cobbles, and 4 percent stones; weakly smeary; slightly acid; clear wavy boundary.
- A13—7 to 19 inches; brown (7.5YR 5/2) gravelly sandy loam, dark reddish brown (5YR 3/3) moist; very weak medium subangular blocky structure; soft, very friable, nonsticky and nonplastic; many very fine and medium roots; many very fine and fine random interstitial pores; 20 percent pebbles, 5 percent cobbles, and 2 percent stones; weakly smeary; slightly acid; gradual irregular boundary.
- B21t—19 to 27 inches; brown (7.5YR 5/2) very gravelly sandy loam, dark reddish brown (5YR 3/3) moist; very weak medium subangular blocky structure; slightly hard, very friable, nonsticky and nonplastic; many very fine, fine, and medium roots; few very fine and fine tubular pores; 40 percent pebbles, 5 percent cobbles, and 5 percent stones; moderately smeary; medium acid; gradual wavy boundary.
- B22t—27 to 33 inches; reddish gray (5YR 5/2) very gravelly sandy loam, dark reddish brown (5YR 3/3) moist; weak fine subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many medium roots and common very fine and fine roots; few very fine and fine tubular pores; few thin clay films in pores and on peds; 40 percent pebbles, 5 percent cobbles, and 5 percent stones; moderately smeary; medium acid; clear wavy boundary.
- IIB23tb—33 to 40 inches; reddish gray (5YR 5/2) very gravelly loam, dark reddish brown (5YR 3/3) moist; weak fine subangular blocky structure; hard, friable, slightly sticky and slightly plastic; many medium roots and common very fine roots; few very fine and fine tubular pores; common thin clay films in pores and on peds; 40 percent pebbles, 5 percent cobbles, and 5 percent stones; medium acid; clear wavy boundary.
- IIB24tb—40 to 46 inches; weak red (2.5YR 5/2) very gravelly loam, dark reddish brown (2.5YR 2/4) moist; weak fine subangular blocky structure; hard, slightly firm, sticky and plastic; common very fine and fine roots and many medium roots; few very fine and fine tubular pores; common thin clay films in pores and on peds; 40 percent pebbles, 5 percent cobbles, and 5 percent stones; medium acid; clear wavy boundary.
- IICr—46 inches; weak red (2.5YR 5/2) weathered rock, dark reddish brown (2.5YR 2/4) moist; about 60 percent saprolite and 30 percent hard andesite; soil material in cracks and seams.

A few to many stones are on the surface. Depth to weathered rock ranges from 40 to 60 inches. Bulk density ranges from 0.6 to 1 gram per cubic centimeter to a depth of 10 to 20 inches. It is 0.85 or more at a depth of 10 to 14 inches.

The A horizon has value of 2 or 3 when moist, chroma of 2 to 4 when dry, and hue of 10YR, 7.5YR, or 5YR. Reaction is strongly acid to slightly acid. This horizon is stony sandy loam or very stony sandy loam. It is 5 to 10 percent clay and 15 to 45 percent rock fragments. Base saturation ranges from 40 to 60 percent, but it is less than 50 percent in at least part of the upper 10 inches. The sodium fluoride reaction ranges from 9.8 to 10.6.

The B2t horizon has value of 5 or 6 when dry and 3 or 4 when moist, chroma of 2 to 4 when dry, and hue of 7.5YR or 5YR. Reaction is slightly acid or medium acid. This horizon is very gravelly sandy loam or very gravelly loam. It is 6 to 12 percent clay. The B2t horizon is 35 to 60 percent rock fragments. The IIB2tb horizon has value of 5 or 6 when dry and 2 to 5 when moist, chroma of 2 to 4 when dry or moist, and hue of 7.5YR, 5YR, or 2.5YR. Reaction is slightly acid to strongly acid. This horizon is very gravelly sandy loam or very gravelly loam. It is 35 to 60 percent rock fragments.

### Snell series

The Snell series consists of moderately deep, well drained soils on mountains. These soils formed in residuum derived from extrusive igneous rock. Slope ranges from 5 to 30 percent.

Typical pedon of Snell very stony loam, 5 to 30 percent slopes; 1,200 feet north and 1,200 feet west of the southeast corner of sec. 20, T. 45 N., R. 2 W. (outside the survey area).

- A11—0 to 2 inches; grayish brown (10YR 5/2) very stony loam, very dark grayish brown (10YR 3/2) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; many fine interstitial pores; 25 percent cobbles and stones and 10 percent pebbles; slightly acid; abrupt smooth boundary.
- A12—2 to 4 inches; grayish brown (10YR 5/2) very stony loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; slightly hard, very friable, sticky and slightly plastic; many very fine and fine roots; many fine interstitial pores; 20 percent cobbles and stones and 15 percent pebbles; slightly acid; abrupt smooth boundary.
- B1t—4 to 7 inches; brown (10YR 5/3) very cobbly clay loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; hard, friable, sticky and plastic; many very fine and fine roots; many fine interstitial pores and few fine tubular pores; many sand grains bridged with clay; 20 percent cobbles and 15 percent pebbles; slightly acid; clear smooth boundary.

B21t—7 to 10 inches; brown (10YR 5/3) very cobbly clay loam, dark brown (10YR 3/3) moist; weak medium subangular blocky structure; hard, firm, sticky and very plastic; common very fine and fine roots; many fine interstitial pores and few fine tubular pores; few thin clay films lining pores and many sand grains bridged with clay; 20 percent cobbles and 15 percent pebbles; slightly acid; abrupt wavy boundary.

B22t—10 to 21 inches; brown (10YR 5/3) very cobbly clay, dark brown (10YR 3/3) moist; weak medium prismatic structure parting to strong medium subangular blocky; very hard, firm, very sticky and very plastic; few fine roots; few fine tubular pores; many moderately thick clay films on peds and lining pores; 30 percent cobbles and stones and 25 percent pebbles; slightly acid; abrupt wavy boundary.

R—21 inches; fractured andesite.

Depth to andesite ranges from 20 to 40 inches. The profile is 35 to 60 percent rock fragments. Reaction of the solum is slightly acid or neutral.

The A1 horizon has value of 4 or 5 when dry and 2 or 3 when moist. It is 20 to 27 percent clay. Thickness is 4 to 11 inches.

The Bt horizon has value of 4 or 5 when dry, chroma of 2 or 3, and hue of 10YR to 7.5YR. It averages 35 to 45 percent clay.

### Stoner series

The Stoner series consists of very deep, well drained soils on alluvial fans. These soils formed in mixed alluvium. Slope ranges from 0 to 15 percent.

Typical pedon of Stoner gravelly sandy loam, 5 to 15 percent slopes; 1,800 feet west and 2,500 feet south of the northeast corner of sec. 5, T. 41 N., R. 8 W.

A11—0 to 1 inch; brown (10YR 3/4, 5/3) gravelly sandy loam, dark brown (10YR 3/3) rubbed and moist; faces of peds are dark brown (10YR 3/4) moist; weak fine granular structure; soft, very friable, slightly sticky and slightly plastic; many very fine and fine roots; 25 percent fine and medium pebbles; medium acid; abrupt smooth boundary.

A12—1 inch to 3 inches; brown (10YR 5/3) gravelly sandy loam, dark yellowish brown (10YR 3/4) moist; massive; slightly hard, friable, slightly sticky and slightly plastic; many fine and very fine roots; common fine tubular pores and few medium tubular pores; 25 percent fine and medium pebbles; medium acid; abrupt smooth boundary.

A13—3 to 12 inches; brown (10YR 5/3) gravelly sandy loam, dark yellowish brown (10YR 3/4) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and plastic; many fine and very fine roots; many fine tubular pores; few thin clay

films in pores; 17 percent fine and medium pebbles; medium acid; abrupt smooth boundary.

B21t—12 to 21 inches; brown (10YR 5/3) gravelly sandy loam, dark brown (10YR 4/3) moist; very weak medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, sticky and plastic; common very fine, fine, and medium roots; many fine tubular pores; few thin clay films in pores and on peds; 18 percent fine and medium pebbles; medium acid; clear smooth boundary.

B22t—21 to 27 inches; light yellowish brown (10YR 6/4) gravelly sandy loam, yellowish brown (10YR 5/4) rubbed and moist; faces of peds are yellowish brown (10YR 5/6) moist; very weak medium prismatic structure parting to moderate medium subangular blocky; slightly hard, friable, sticky and plastic; common fine and very fine roots; common fine tubular pores; many thin clay films and common moderately thick clay films in pores and on peds; 17 percent fine and medium pebbles; medium acid; clear smooth boundary.

B23t—27 to 36 inches; light yellowish brown (10YR 6/4) gravelly sandy loam, yellowish brown (10YR 5/6) rubbed and moist; faces of peds are dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic; common fine and very fine roots; common fine tubular pores; many thin clay films and common moderately thick clay films in pores and on peds; 20 percent fine and medium pebbles; medium acid; abrupt smooth boundary.

IIB24t—36 to 60 inches; strong brown (7.5YR 5/6) very gravelly loam, yellowish brown (10YR 5/8) moist; massive; hard, firm, very sticky and plastic; few fine roots; few fine tubular pores; many moderately thick clay films in pores; 55 percent pebbles; medium acid.

The 10- to 40-inch control section averages 15 to 35 percent rock fragments. The solum is medium acid or slightly acid.

The A horizon has value of 4 to 6 when dry, chroma of 2 or 3 when dry and 2 to 4 when moist, and hue of 10YR or 7.5YR. It is 8 to 17 percent clay. Thickness ranges from 11 to 16 inches.

The B2t horizon has value of 5 to 7 when dry and 3 to 5 when moist, chroma of 3, 4, or 6 when dry or moist, and hue of 10YR or 7.5YR. This horizon is gravelly sandy loam or gravelly loam. It is 9 to 18 percent clay. The IIB2 horizon is very gravelly loam or very gravelly sandy loam. It is 35 to 60 percent rock fragments.

### Terwilliger series

The Terwilliger series consists of moderately deep, well drained soils on hills. These soils formed in residuum derived from siltstone. Slope ranges from 2 to 50 percent.

Typical pedon of Terwilliger stony silty clay loam, 2 to 50 percent slopes; 2,190 feet north and 2,540 feet west of the southeast corner of sec. 19, T. 46 N., R. 5 W.

A11—0 to 2 inches; light brownish gray (2.5Y 6/2) stony silty clay loam, dark grayish brown (2.5Y 4/2) moist; weak thick platy structure; hard, friable, sticky and plastic; many very fine and fine roots; common very fine tubular pores; 3 percent stones, 2 percent cobbles, and 5 percent pebbles; slightly acid; abrupt smooth boundary.

A12—2 to 6 inches; light brownish gray (2.5Y 6/2) stony silty clay loam, dark grayish brown (2.5Y 4/2) moist; moderate thick platy structure; very hard, friable, sticky and very plastic; common very fine and fine roots; few very fine tubular pores; 3 percent stones, 2 percent cobbles, and 5 percent pebbles; slightly acid; abrupt smooth boundary.

B1t—6 to 13 inches; pale brown (10YR 6/3) silty clay loam, dark grayish brown (2.5Y 4/2) moist; moderate medium prismatic structure; very hard, firm, very sticky and very plastic; few very fine and fine roots; few very fine tubular pores; many thin clay films on peds and lining pores; 1 percent stones, 3 percent cobbles, and 5 percent pebbles; neutral; clear smooth boundary.

B21t—13 to 19 inches; light olive brown (2.5Y 5/4) silty clay loam, dark grayish brown (2.5Y 4/2) moist; strong medium prismatic structure; very hard, very firm, very sticky and very plastic; few very fine and fine roots; few very fine tubular pores; many thin clay films on peds and lining pores; 1 percent stones, 2 percent cobbles, and 5 percent pebbles; neutral; abrupt wavy boundary.

B22t—19 to 30 inches; light yellowish brown (2.5Y 6/4) silty clay, light olive brown (2.5Y 5/4) rubbed and moist; faces of peds are olive brown (2.5Y 3/4) moist; strong coarse prismatic structure; extremely hard, very firm, very sticky and very plastic; few very fine and fine roots; few very fine tubular pores; continuous pressure faces or thin clay films on peds and lining pores; 1 percent cobbles and 5 percent pebbles; neutral; abrupt wavy boundary.

B3t—30 to 34 inches; olive (5Y 5/4) gravelly silty clay, light olive brown (2.5Y 5/4) rubbed and moist; faces of peds are olive brown (2.5Y 4/4) moist; moderate coarse prismatic structure; extremely hard, very firm, very sticky and very plastic; few very fine and fine roots; few very fine tubular pores; continuous pressure faces or thin and moderately thick clay films on peds and lining pores; 20 percent fine and medium siltstone pebbles; moderately alkaline; abrupt wavy boundary.

Cr—34 inches; weathered massive siltstone.

A few stones are on the surface in places. Depth to weathered siltstone ranges from 20 to 40 inches.

The A horizon has value of 5 or 6 when dry, chroma of 2 or 3, and hue of 5Y or 2.5Y. Reaction is slightly acid or

neutral. This horizon is stony silty clay loam or silty clay loam. It is 27 to 35 percent clay and 0 to 35 percent rock fragments. Thickness ranges from 3 to 7 inches.

The B2t horizon has chroma of 2 to 4 and hue of 5Y, 2.5Y, or 10YR. Reaction is neutral or mildly alkaline. This horizon averages 35 to 50 percent clay and is 0 to 15 percent rock fragments.

The B3t horizon is neutral to moderately alkaline. It is 15 to 35 percent rock fragments.

## Uhlig Variant

The Uhlig Variant consists of deep, well drained soils on terrace escarpments. These soils formed in alluvium weathered from extrusive igneous rock. Slope ranges from 5 to 50 percent.

Typical pedon of Uhlig Variant stony loam, 5 to 50 percent slopes; 1,600 feet north and 100 feet east of the southwest corner of sec. 27, T. 42 N., R. 5 W.

O1&O2—1 inch to 0; partially decomposed and undecomposed twigs, bark, leaves, and other organic debris.

A11—0 to 2 inches; dark grayish brown (10YR 4/2) stony loam, very dark brown (10YR 2/2) moist; weak medium platy structure; slightly hard, friable, slightly sticky and slightly plastic; many fine and very fine roots; many very fine tubular pores; 7 percent pebbles and 20 percent stones and cobbles; medium acid; abrupt smooth boundary.

A12—2 to 4 inches; dark grayish brown (10YR 4/2) stony loam, very dark brown (10YR 2/2) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; many fine and medium roots; few fine tubular pores and common very fine tubular pores; 7 percent pebbles and 20 percent cobbles and stones; medium acid; clear smooth boundary.

A13—4 to 14 inches; dark grayish brown (10YR 4/2) stony loam, very dark grayish brown (10YR 3/2) moist; weak medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; common fine and very fine roots and many medium roots; few fine tubular pores; 7 percent pebbles and 20 percent cobbles and stones; medium acid; clear smooth boundary.

B21t—14 to 24 inches; pale brown (10YR 6/3) stony loam, dark brown (10YR 3/3) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine roots and many medium roots; few fine and very fine tubular pores; few thin clay films in pores; 6 percent pebbles and 20 percent cobbles and stones; medium acid; clear smooth boundary.

B22t—24 to 38 inches; pale brown (10YR 6/3) stony loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly

plastic; few fine roots and many medium roots; few fine tubular pores and common very fine tubular pores; few thin clay films on peds and common thin films in pores; 7 percent pebbles and 20 percent cobbles and stones; medium acid; clear smooth boundary.

B3t—38 to 42 inches; pale brown (10YR 6/3) stony loam, dark yellowish brown (10YR 4/4) moist; moderate medium subangular blocky structure; slightly hard, friable, slightly sticky and slightly plastic; few fine roots and many medium roots; few fine tubular pores and common very fine tubular pores; common thin clay films on peds and in pores; 6 percent pebbles and 30 percent cobbles and stones; medium acid; abrupt wavy boundary.

Cr—42 inches; weathered tuff.

Depth to weathered tuff ranges from 40 to 60 inches. The profile is 20 to 35 percent rock fragments. The solum is medium acid or slightly acid. A few stones are on the soil surface. Content of organic matter ranges from 1 to 2 percent in the upper 7 inches and decreases to less than 1 percent at a depth of 20 inches.

The A horizon has value of 3 or 4 when dry and chroma of 2 or 3. It is 10 to 16 percent clay. Thickness ranges from 12 to 18 inches.

The B2t horizon has value of 3 to 6 when dry and 3 to 5 when moist, and it has chroma of 3 or 4 when dry and 2 to 4 when moist. The B2t horizon is stony loam or stony sandy loam. It averages 12 to 18 percent clay.

### Weitchpec Variant

The Weitchpec Variant consists of shallow, well drained soils on mountains. These soils formed in residuum derived from serpentine. Slope ranges from 5 to 65 percent.

Typical pedon of a Weitchpec Variant gravelly loam in an area of Weitchpec Variant-Rock outcrop complex, 5

to 65 percent slopes; 1,351 feet west and 1,126 feet north of the southeast corner of sec. 25, T. 44 N., R. 8 W.

A1—0 to 4 inches; grayish brown (10YR 5/2) gravelly loam, very dark grayish brown (10YR 3/2) moist; moderate fine granular structure; slightly hard, very friable, slightly sticky and slightly plastic; many fine roots; slightly acid; abrupt smooth boundary.

B21t—4 to 8 inches; grayish brown (10YR 5/2) gravelly clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; hard, friable, sticky and plastic; common fine roots; many fine and very fine tubular pores; few thin clay films on peds; 25 percent pebbles and 5 percent cobbles; slightly acid; clear smooth boundary.

B22t—8 to 16 inches; grayish brown (10YR 5/2) very gravelly clay loam, very dark grayish brown (10YR 3/2) moist; moderate medium subangular blocky structure; very hard, friable, sticky and plastic; common fine roots; common fine tubular pores; many thin clay films in pores and on peds; 30 percent pebbles and 15 percent cobbles and stones; neutral; abrupt wavy boundary.

R—16 inches; hard serpentine.

Depth to serpentine ranges from 10 to 20 inches. The solum is slightly acid or neutral.

The A1 horizon has value of 4 or 5 when dry and 2 or 3 when moist, and it has chroma of 2 or 3 when dry. It is 20 to 27 percent clay. Organic matter content is 1 to 2 percent. This horizon is 15 to 35 percent rock fragments. Thickness ranges from 2 to 6 inches.

The B2t horizon has value of 4 or 5 when dry and 2 or 3 when moist, and it has chroma of 2 or 3 when dry. It is 30 to 35 percent clay and averages 35 to 60 percent rock fragments.



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# glossary

**Aeration, soil.** The exchange of air in 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.** A 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.

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

**Area reclaim** (in tables). An area difficult to reclaim after the removal of soil for construction and other uses. Revegetation and erosion control are extremely difficult.

**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. The capacity, in inches, in a 60-inch profile or to a limiting layer is expressed as—

	<i>Inches</i>
Very low . . . . .	0 to 2.5
Low . . . . .	2.5 to 5.0
Moderate . . . . .	5.0 to 7.5
High . . . . .	7.5 to 10.0
Very high. . . . .	More than 10.0

**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 material or that is exposed at the surface.

**Bisequum.** Two sequences of soil horizons, each of which consists of an illuvial horizon and the overlying eluvial horizons.

**Bottom land.** The normal flood plain of a stream, subject to flooding.

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

**Calcareous soil.** A soil containing enough calcium carbonate (commonly combined with magnesium carbonate) to effervesce visibly when treated with cold, dilute hydrochloric acid.

**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.

**Chiseling.** Tillage with an implement having one or more soil-penetrating points that loosen the subsoil and bring clods to the surface. A form of emergency tillage to control soil blowing.

**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.

**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 vegetation.** The stabilized plant community on a particular site. The plant cover reproduces itself and does not change so long as the environment remains the same.

**Coarse fragments.** If round, mineral or rock particles 2 millimeters to 25 centimeters (10 inches) in diameter; if flat, mineral or rock particles (flagstone) 15.2 to 38.1 centimeters (6 to 15 inches) long.

**Coarse textured soil.** Sand or loamy sand.

**Cobblestone (or cobble).** A rounded or partly rounded fragment of rock 3 to 10 inches (7.5 to 25 centimeters) in diameter.

**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 resistance is distinctly noticeable.

*Plastic.*—When wet, readily deformed by moderate pressure but can be pressed into a lump; will form a “wire” when rolled between thumb and forefinger.

*Sticky.*—When wet, adheres to other material and tends to stretch somewhat and pull apart rather than to pull free from other material.

*Hard.*—When dry, moderately resistant to pressure; can be broken with difficulty between thumb and forefinger.

*Soft.*—When dry, breaks into powder or individual grains under very slight pressure.

*Cemented.*—Hard; little affected by moistening.

**Contour stripcropping.** Growing crops in strips that follow the contour. Strips of grass or close-growing crops are alternated with strips of clean-tilled crops or summer fallow.

**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 or 80 inches.

**Corrosive.** High risk of corrosion to uncoated steel or deterioration of concrete.

**Cover crop.** A close-growing crop grown primarily to improve and protect the soil between periods of regular crop production, or a crop grown between trees and vines in orchards and vineyards.

**Cutbanks cave** (in tables). The walls of excavations tend to cave in or slough.

**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.

**Depth to rock** (in tables). Bedrock is too near the surface for the specified use.

**Diversion (or diversion terrace).** A ridge of earth, generally a terrace, built to protect downslope areas by diverting runoff from its natural course.

**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.*—Water is removed from the soil very rapidly. Excessively drained soils are commonly very coarse textured, rocky, or shallow. Some are steep. All are free of the mottling related to wetness.

*Somewhat excessively drained.*—Water is removed from the soil rapidly. Many somewhat excessively drained soils are sandy and rapidly pervious. Some

are shallow. Some are so steep that much of the water they receive is lost as runoff. All are free of the mottling related to wetness.

*Well drained.*—Water is removed from the soil readily, but not rapidly. It is available to plants throughout most of the growing season, and wetness does not inhibit growth of roots for significant periods during most growing seasons. Well drained soils are commonly medium textured. They are mainly free of mottling.

*Moderately well drained.*—Water is removed from the soil somewhat slowly during some periods. Moderately well drained soils are wet for only a short time during the growing season, but periodically they are wet long enough that most mesophytic crops are affected. They commonly have a slowly pervious layer within or directly below the solum, or periodically receive high rainfall, or both.

*Somewhat poorly drained.*—Water is removed slowly enough that the soil is wet for significant periods during the growing season. Wetness markedly restricts the growth of mesophytic crops unless artificial drainage is provided. Somewhat poorly drained soils commonly have a slowly pervious layer, a high water table, additional water from seepage, nearly continuous rainfall, or a combination of these.

*Poorly drained.*—Water is removed so slowly that the soil is saturated periodically during the growing season or remains wet for long periods. Free water is commonly at or near the surface for long enough during the growing season that most mesophytic crops cannot be grown unless the soil is artificially drained. The soil is not continuously saturated in layers directly below plow depth. Poor drainage results from a high water table, a slowly pervious layer within the profile, seepage, nearly continuous rainfall, or a combination of these.

*Very poorly drained.*—Water is removed from the soil so slowly that free water remains at or on the surface during most of the growing season. Unless the soil is artificially drained, most mesophytic crops cannot be grown. Very poorly drained soils are commonly level or depressed and are frequently ponded. Yet, where rainfall is high and nearly continuous, they can have moderate or high slope gradients.

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

**Erosion.** The wearing away of the land surface by water, wind, ice, or other geologic agents and by such processes as gravitational creep.

*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.

**Excess alkali** (in tables). Excess exchangeable sodium in the soil. The resulting poor physical properties restrict the growth of plants.

**Excess fines** (in tables). Excess silt and clay in the soil. The soil does not provide a source of gravel or sand for construction purposes.

**Excess lime** (in tables). Excess carbonates in the soil that restrict the growth of some plants.

**Excess salts** (in tables). Excess water-soluble salts in the soil that restrict the growth of most plants.

**Fallow.** Cropland left idle in order to restore productivity through accumulation of moisture. Summer fallow is common in regions of limited rainfall where cereal grains are grown. The soil is tilled for at least one growing season for weed control and decomposition of plant residue.

**Fast intake** (in tables). The rapid movement of water into the soil.

**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.

**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 artificially.

**Foot slope.** The inclined surface at the base of a hill.

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

**Frost action** (in tables). 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** (geology). Gravel, sand, and silt, commonly stratified, deposited by glacial melt water.

**Glacial till** (geology). Unsorted, nonstratified glacial drift consisting of clay, silt, sand, and boulders transported and deposited by glacial ice.

**Glaciofluvial deposits** (geology). Material moved by glaciers and subsequently sorted and deposited by streams flowing from the melting ice. The deposits are stratified and occur as kames, eskers, deltas, and outwash plains.

**Grayed 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.

**Grassed waterway.** A natural or constructed waterway, typically broad and shallow, seeded to grass as

protection against erosion. Conducts surface water away from cropland.

**Gravel.** Rounded or angular fragments of rock up to 3 inches (2 millimeters to 7.5 centimeters) in diameter. An individual piece is a pebble.

**Gravelly soil material.** Material that is 15 to 50 percent, by volume, rounded or angular rock fragments, not prominently flattened, up to 3 inches (7.5 centimeters) in diameter.

**Green manure crop** (agronomy). A soil-improving crop grown to be plowed under in an early stage of maturity or soon after maturity.

**Ground water** (geology). Water filling all the unblocked pores of underlying material below the water table.

**Gully.** A miniature valley with steep sides cut by running water and through which water ordinarily runs only after rainfall. The distinction between a gully and a rill is one of depth. A gully generally is an obstacle to farm machinery and is too deep to be obliterated by ordinary tillage; a rill is of lesser depth and can be smoothed over by ordinary tillage.

**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 at the surface of a mineral soil.

*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 B 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. The combined A and B horizons are generally called the solum, or true soil. If a soil does not have a B horizon, the A horizon alone is the solum.

*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 A or B horizon. 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 Roman numeral II precedes the letter C.

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

**Humus.** The well decomposed, more or less stable part of the organic matter in mineral soils.

**Hydrologic soil groups.** Refers to soils grouped according to their runoff-producing characteristics. The chief consideration is the inherent capacity of soil bare of vegetation to permit infiltration. The slope and the kind of plant cover are not considered but are separate factors in predicting runoff. Soils are assigned to four groups. In group A are soils having a high infiltration rate when thoroughly wet and having a low runoff potential. They are mainly deep, well drained, and sandy or gravelly. In group D, at the other extreme, are soils having a very slow infiltration rate and thus a high runoff potential. They have a claypan or clay layer at or near the surface, have a permanent high water table, or are shallow over nearly impervious bedrock or other material. A soil is assigned to two hydrologic groups if part of the acreage is artificially drained and part is undrained.

**Infiltration rate.** The rate at which water penetrates the surface of the soil at any given instant, usually expressed in inches 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.

**Irrigation.** Application of water to soils to assist in production of crops. Methods of irrigation are—*Border.*—Water is applied at the upper end of a strip in which the lateral flow of water is controlled by small earth ridges called border dikes, or borders. *Basin.*—Water is applied rapidly to nearly level plains surrounded by levees or dikes.

*Controlled flooding.*—Water is released at intervals from closely spaced field ditches and distributed uniformly over the field.

*Corrugation.*—Water is applied to small, closely spaced furrows or ditches in fields of close-growing crops or in orchards so that it flows in only one direction.

*Drip (or trickle).*—Water is applied slowly and under low pressure to the surface of the soil or into the soil through such applicators as emitters, porous tubing, or perforated pipe.

*Furrow.*—Water is applied in small ditches made by cultivation implements. Furrows are used for tree and row crops.

*Sprinkler.*—Water is sprayed over the soil surface through pipes or nozzles from a pressure system.

*Subirrigation.*—Water is applied in open ditches or tile lines until the water table is raised enough to wet the soil.

*Wild flooding.*—Water, released at high points, is allowed to flow onto an area without controlled distribution.

**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.

**Large stones** (in tables). Rock fragments 3 inches (7.5 centimeters) or more across. Large stones adversely affect the specified use of the soil.

**Leaching.** The removal of soluble 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.

**Medium textured soil.** Very fine sandy loam, loam, silt loam, or silt.

**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.

**Minimum tillage.** Only the tillage essential to crop production and prevention of soil damage.

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

**Moderately coarse textured soil.** Sandy loam and fine sandy loam.

**Moderately fine textured soil.** Clay loam, sandy clay loam, and silty clay loam.

**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 diameter 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).

**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 a color of 10YR hue, value of 6, and chroma of 4.

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

**Nutrient, 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.

- Outwash, glacial.** Stratified sand and gravel produced by glaciers and carried, sorted, and deposited by glacial melt water.
- Outwash plain.** A landform of mainly sandy or coarse textured material of glaciofluvial origin. An outwash plain is commonly smooth; where pitted, it is generally low in relief.
- 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 10 square meters), depending on the variability of the soil.
- Percolation.** The downward movement of water through the soil.
- Percs slowly** (in tables). The slow movement of water through the soil adversely affecting the specified use.
- 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. Terms describing permeability are:
 

Very slow.....	less than 0.06 inch
Slow.....	0.06 to 0.20 inch
Moderately slow.....	0.2 to 0.6 inch
Moderate.....	0.6 inch to 2.0 inches
Moderately rapid.....	2.0 to 6.0 inches
Rapid.....	6.0 to 20 inches
Very rapid.....	more than 20 inches
- 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.)
- Piping** (in tables). Formation of subsurface tunnels or pipelike cavities by water moving through the soil.
- 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.

- Plowpan.** A compacted layer formed in the soil directly below the plowed layer.
- Poorly graded.** Refers to a coarse grained soil or soil material consisting mainly of particles of nearly the same size. Because there is little difference in size of the particles, density can be increased only slightly by compaction.
- Poor outlets** (in tables). Refers to areas where surface or subsurface drainage outlets are difficult or expensive to install.
- 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.
- Rangeland.** Land on which the potential natural vegetation is predominantly 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—

	pH
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

- Regolith.** The unconsolidated mantle of weathered rock and soil material on the earth's surface; the loose earth material above the solid rock.
- 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 of 2 millimeters or more; for example, pebbles, cobbles, stones, and boulders.

**Rooting depth** (in tables). Shallow root zone. The soil is shallow over a layer that greatly restricts roots.

**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 ground-water runoff or seepage flow from ground water.

**Saline soil.** A soil containing soluble salts in an amount that impairs growth of plants. A saline soil does not contain excess exchangeable sodium.

**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 textural class, a soil that is 85 percent or more sand and not more than 10 percent clay.

**Sandstone.** Sedimentary rock containing dominantly sand-size particles.

**Saprolite.** (geology). Soft, earthy, clay-rich, thoroughly decomposed rock formed in place by chemical weathering of igneous and metamorphic rock. In soil science, saprolite is any unconsolidated residual material underlying the soil and grading to hard bedrock below.

**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 soft masses of calcium carbonate. There are many intermediate types. Some wind-deposited sand is consolidated into sandstone.

**Seepage** (in tables). The movement of water through the soil. Seepage adversely affects the specified use.

**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.

**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.

**Siltstone.** Sedimentary rock made up of dominantly silt-sized particles.

**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 feet.

**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.

**Slick spot.** A small area of soil having a puddled, crusted, or smooth surface and an excess of exchangeable sodium. The soil is generally silty or clayey, is slippery when wet, and is low in productivity.

**Slope.** The inclination of the land surface from the horizontal. Percentage of slope is the vertical distance divided by horizontal distance, then multiplied by 100. Thus, a slope of 20 percent is a drop of 20 feet in 100 feet of horizontal distance. In this survey the following slope classes are recognized—

	<i>Percent slope</i>
Nearly level.....	0 to 2
Gently sloping .. .	2 to 5
Moderately sloping .. .	5 to 9
Strongly sloping.....	9 to 15
Moderately steep.....	15 to 30
Steep .. .	30 to 50
Very steep .. .	More than 50

**Slow intake** (in tables). The slow movement of water into the soil.

**Slow refill** (in tables). The slow filling of ponds, resulting from restricted permeability in the soil.

**Small stones** (in tables). Rock fragments less than 3 inches (7.5 centimeters) in diameter. Small stones adversely affect the specified use of the soil.

**Sodicity.** The degree to which a soil is affected by exchangeable sodium. Sodicity is expressed as a sodium absorption ratio (SAR) of a saturation extract, or the ratio of  $Na^+$  to  $Ca^{++} + Mg^{++}$ . The degrees of sodicity are—

	<i>SAR</i>
Slight .. .	Less than 13.1
Moderate .. .	13-30.1
Strong .. .	More than 30.1

**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 2 mm in equivalent diameter and ranging between specified size limits. The names and sizes of separates recognized in the United States are as follows:

	<i>Millimeters</i>
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.

**Stone line.** A concentration of coarse fragments in a soil. Generally it is indicative of an old weathered surface. In a cross section, the line may be one fragment or more thick. It generally overlies material that weathered in place and is overlain by recent sediment of variable thickness.

**Stones.** Rock fragments 10 to 24 inches (25 to 60 centimeters) in diameter.

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

**Stripcropping.** Growing crops in a systematic arrangement of strips or bands which provide vegetative barriers to wind and water erosion.

**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).

**Stubble mulch.** Stubble or other crop residue left on the soil or partly worked into the soil. It protects the soil from wind and water erosion after harvest, during preparation of a seedbed for the next crop, and during the early growing period of the new crop.

**Subsoil.** Technically, the B horizon; roughly, the part of the solum below the A horizon.

**Subsoiling.** Tilling a soil below normal plow depth, ordinarily to shatter a hardpan or claypan.

**Substratum.** The part of the soil below the solum.

**Summer fallow.** The tillage of uncropped land during the summer to control weeds and allow storage of moisture in the soil for the growth of a later crop. A practice common in semiarid regions, where annual precipitation is not enough to produce a crop every year. Summer fallow is frequently practiced before planting winter grain.

**Surface layer.** Technically, the A horizon but excluding the A2 horizon. Generally, that part of the profile that is highest in content of organic matter and is darkest in color.

**Taxadjuncts.** Soils that cannot be classified in a series recognized in the classification system. Such soils are named for a series they strongly resemble and are designated as taxadjuncts to that series because they differ in ways too small to be of consequence in interpreting their use and behavior.

**Terrace.** An embankment, or ridge, constructed across sloping soils on the contour or at a slight angle to the contour. The terrace intercepts surface runoff so that water soaks into the soil or flows slowly to a prepared outlet. A terrace in a field is generally built so that the field can be farmed. A terrace intended mainly for drainage has a deep channel that is maintained in permanent sod.

**Terrace (geologic).** An old alluvial plain, ordinarily flat or undulating, bordering a river, a lake, or the sea.

**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."

**Thin layer (in tables).** Otherwise suitable soil material too thin for the specified use.

**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.

**Trace elements.** Chemical elements, for example, zinc, cobalt, manganese, copper, and iron, are in soils in extremely small amounts. They are essential to plant growth.

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

**Underlying material.** The part of the soil below the A or Ac horizon that is relatively unaffected by the processes of soil formation.

**Unstable fill (in tables).** Risk of caving or sloughing on banks of fill material.

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

**Valley fill.** In glaciated regions, material deposited in stream valleys by glacial melt water. In nonglaciated regions, alluvium deposited by heavily loaded streams.

**Variant, soil.** A soil having properties sufficiently different from those of other known soils to justify a new series name, but occurring in such a limited geographic area that creation of a new series is not justified.

**Variation.** Refers to patterns of contrasting colors assumed to be inherited from the parent material rather than to be the result of poor drainage.

**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 oven-dry basis, at which a plant (specifically sunflower) wilts so much that it does not recover when placed in a humid, dark chamber.

# tables

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TABLE 1.--TEMPERATURE AND PRECIPITATION  
 [Recorded in the period 1951-77 at Fort Jones, California]

Month	Temperature						Precipitation					
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have--		Average number of growing degree days <sup>1</sup>	Average	2 years in 10 will have--		Average number of days with 0.1 inch or more	Average snowfall	
				Maximum temperature higher than--	Minimum temperature lower than--			Less than--	More than--			
<u>OF</u>	<u>OF</u>	<u>OF</u>	<u>OF</u>	<u>OF</u>	<u>Units</u>	<u>In</u>	<u>In</u>	<u>In</u>	<u>In</u>	<u>In</u>		
January----	43.2	23.8	33.5	60	.3	36	4.93	2.32	7.06	9	11.8	
February---	51.7	26.6	39.2	69	9	71	2.74	.88	4.22	7	2.5	
March-----	56.9	28.4	42.7	74	15	118	2.04	.54	3.23	5	3.3	
April-----	64.4	31.5	48.0	83	19	262	1.01	.26	1.60	3	.3	
May-----	73.4	37.3	55.4	93	23	477	.76	.11	1.25	3	.1	
June-----	82.6	43.9	63.2	101	30	696	.77	---	1.34	2	.1	
July-----	91.7	47.8	69.8	104	35	924	.31	---	.53	1	.0	
August-----	89.9	46.3	68.1	104	35	871	.46	---	.77	2	.0	
September--	84.2	39.2	61.7	99	25	651	.61	.05	1.02	1	.0	
October----	70.6	32.2	51.4	92	18	353	1.39	.27	2.25	3	.0	
November---	54.0	28.6	41.3	72	13	94	3.05	1.01	4.69	6	2.9	
December---	43.2	25.6	34.4	60	5	50	4.65	1.69	7.02	8	8.8	
Yearly:												
Average--	67.2	34.3	50.7	---	---	---	---	---	---	---	---	
Extreme--	---	---	---	105	-5	---	---	---	---	---	---	
Total	---	---	---	---	---	4,603	22.72	18.19	27.00	50	29.8	

See footnote at end of table.

TABLE 1.--TEMPERATURE AND PRECIPITATION--Continued  
 [Recorded in the period 1951-77 at Mount Shasta, California]

Month	Temperature						Precipitation					
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have--		Average number of growing degree days <sup>1</sup>	Average	2 years in 10 will have--		Average number of days with 0.1 inch or more	Average snowfall	
				Maximum temperature higher than--	Minimum temperature lower than--			Less than--	More than--			
	°F	°F	°F	°F	°F	Units	In	In	In		In	
January---	41.9	25.5	33.7	61	5	21	6.93	2.92	10.17	10	36.3	
February--	47.4	28.5	38.0	67	10	56	5.33	1.33	8.51	8	18.1	
March-----	50.6	29.5	40.0	71	15	76	4.05	1.25	6.28	8	19.0	
April-----	57.9	33.3	45.7	80	20	217	2.58	.68	4.10	5	9.7	
May-----	67.0	39.7	53.4	88	26	420	1.59	.26	2.59	4	1.3	
June-----	75.6	46.6	61.1	95	32	633	.78	.12	1.30	3	.0	
July-----	85.3	50.8	68.0	98	38	868	.26	---	.43	1	.0	
August----	83.5	49.2	66.4	98	37	818	.45	---	.78	1	.0	
September-	77.7	44.5	61.1	95	31	633	767	.03	1.27	1	.0	
October---	65.1	37.5	51.3	87	23	357	1.99	.34	3.25	3	.6	
November--	50.8	31.2	41.1	73	16	92	5.50	1.58	8.63	7	12.1	
December--	43.6	26.9	35.3	63	8	49	6.33	2.02	9.75	9	25.7	
Yearly:												
Average--	62.2	36.9	49.6	---	---	---	---	---	---	---	---	
Extreme-	---	---	---	99	4	---	---	---	---	---	---	
Total---	---	---	---	---	---	4,240	36.55	28.36	44.26	60	122.8	

See footnote at end of table.

TABLE 1.--TEMPERATURE AND PRECIPITATION--Continued  
 [Recorded in the period 1951-77 at Yreka, California]

Month	Temperature						Precipitation					
	Average daily maximum	Average daily minimum	Average daily	2 years in 10 will have--		Average number of growing degree days <sup>1</sup>	Average	2 years in 10 will have--		Average number of days with 0.1 inch or more	Average snowfall	
				Maximum temperature higher than--	Minimum temperature lower than--			Less than--	More than--			
	°F	°F	°F	°F	°F	Units	In	In	In		In	
January---	43.1	24.4	33.8	59	4	34	3.71	1.73	5.32	7	8.6	
February--	50.5	27.6	39.1	66	15	65	2.15	.70	3.30	5	2.3	
March-----	54.7	29.9	42.3	74	18	111	1.84	.56	2.85	5	2.6	
April-----	62.5	34.3	48.4	83	23	274	.84	.26	1.29	3	.7	
May-----	72.0	40.7	56.4	94	27	508	.77	.22	1.20	3	.0	
June-----	80.9	48.1	64.5	100	34	735	.85	.14	1.39	3	.0	
July-----	90.7	53.3	72.0	104	40	992	.39	.02	.65	1	.0	
August----	88.8	52.1	70.5	103	41	946	.58	---	1.00	2	.0	
September--	82.5	45.6	64.1	99	33	723	.48	.05	.81	1	.0	
October---	68.9	36.8	52.9	91	25	400	1.25	.24	2.03	3	.0	
November--	53.4	30.5	41.9	73	15	94	2.38	.75	3.66	6	3.2	
December--	44.1	26.1	35.1	60	9	38	3.99	1.39	6.07	7	6.1	
Yearly:												
Average--	66.0	37.5	51.8	---	---	---	---	---	---	---	---	
Extreme--	---	---	---	105	2	---	---	---	---	---	---	
Total---	---	---	---	---	---	4,920	19.23	15.50	22.78	46	23.5	

<sup>1</sup>A growing degree day is an index of the amount of heat available for plant growth. It can be calculated by adding the maximum and minimum daily temperatures, dividing the sum by 2, and subtracting the temperature below which growth is minimal for the principal crops in the area (40° F).

TABLE 2.--FREEZE DATES IN SPRING AND FALL

Probability	Temperature		
	24° F or lower	28° F or lower	32° F or lower
Recorded in the period 1951-77 at Fort Jones, California			
Last freezing temperature in spring:			
1 year in 10 later than--	May 21	June 1	June 22
2 years in 10 later than--	May 13	May 26	June 15
5 years in 10 later than--	April 27	May 14	June 3
First freezing temperature in fall:			
1 year in 10 earlier than--	September 26	September 16	August 21
2 years in 10 earlier than--	October 4	September 22	August 29
5 years in 10 earlier than--	October 4	October 2	September 15
Recorded in the period 1951-77 at Mount Shasta, California			
Last freezing temperature in spring:			
1 year in 10 later than--	May 4	May 22	June 9
2 years in 10 later than--	April 26	May 15	June 4
5 years in 10 later than--	April 11	May 2	May 23
First freezing temperature in fall:			
1 year in 10 earlier than--	October 22	September 30	August 29
2 years in 10 earlier than--	October 29	October 7	September 8
5 years in 10 earlier than--	November 11	October 22	September 27

TABLE 2.--FREEZE DATES IN SPRING AND FALL--Continued

Probability	Temperature		
	24° F or lower	28° F or lower	32° F or lower
Recorded in the period 1951-77 at Yreka, California			
Last freezing temperature in spring:			
1 year in 10 later than--	April 24	May 15	May 31
2 years in 10 later than--	April 16	May 9	May 25
5 years in 10 later than--	March 31	April 28	May 15
First freezing temperature in fall:			
1 year in 10 earlier than--	October 30	October 13	September 25
2 years in 10 earlier than--	November 5	October 18	September 30
5 years in 10 earlier than--	November 16	October 29	October 10

TABLE 3.--GROWING SEASON

Probability	Daily minimum temperature		
	Higher than 24° F	Higher than 28° F	Higher than 32° F
	<u>Days</u>	<u>Days</u>	<u>Days</u>
Recorded in the period 1951-77 at Fort Jones, California			
9 years in 10	140	114	70
8 years in 10	152	123	81
5 years in 10	174	140	103
2 years in 10	197	157	125
1 year in 10	209	166	136
Recorded in the period 1951-77 at Mount Shasta, California			
9 years in 10	180	144	93
8 years in 10	192	154	104
5 years in 10	214	172	126
2 years in 10	236	190	147
1 year in 10	247	199	159
Recorded in the period 1951-77 at Yreka, California			
9 years in 10	201	162	126
8 years in 10	211	169	133
5 years in 10	229	183	147
2 years in 10	248	197	161
1 year in 10	258	204	168

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS

Map symbol	Soil name	Acres	Percent
101	Asta gravelly sandy loam, 5 to 15 percent slopes	1,075	0.1
102	Asta gravelly sandy loam, 15 to 50 percent slopes	4,400	0.5
103	Asta cobbly sandy loam, 15 to 50 percent slopes	2,565	0.3
104	Atter very gravelly sandy loam, 0 to 5 percent slopes	2,475	0.3
105	Atter very cobbly sandy loam, 0 to 5 percent slopes	5,440	0.6
106	Atter very bouldery loamy fine sand, 5 to 30 percent slopes	780	0.1
107	Avis-Oosen complex, 5 to 30 percent slopes	8,625	1.0
108	Avis-Oosen complex, 30 to 50 percent slopes	2,195	0.2
109	Avis-Lava flows complex, 5 to 30 percent slopes	6,845	0.8
110	Bogus stony loam, 15 to 50 percent slopes	6,885	0.8
111	Bogus very stony loam, 15 to 50 percent slopes	4,010	0.5
112	Bonnet loam, 0 to 2 percent slopes	1,195	0.1
113	Bonnet gravelly loam, 0 to 2 percent slopes	3,275	0.4
114	Bonnet gravelly loam, 2 to 5 percent slopes	3,200	0.4
115	Boomer loam, cool, 5 to 30 percent slopes	2,190	0.2
116	Boomer, cool-Neuns complex, 30 to 70 percent slopes	560	0.1
117	Boomer Variant sandy loam, 30 to 50 percent slopes	2,050	0.2
118	Boomer Variant stony sandy loam, 5 to 30 percent slopes	575	0.1
119	Chaix-Chawanakee gravelly coarse sandy loams, 5 to 30 percent slopes	2,685	0.3
120	Chaix-Chawanakee gravelly coarse sandy loams, 30 to 50 percent slopes	8,280	0.9
121	Chaix-Chawanakee gravelly coarse sandy loams, 50 to 70 percent slopes	11,540	1.3
122	Copsey clay, 0 to 9 percent slopes	1,010	0.1
123	Copsey gravelly clay, 2 to 9 percent slopes	2,260	0.3
124	Copsey cobbly clay, 2 to 9 percent slopes	1,265	0.1
125	Deetz gravelly loamy sand, 0 to 5 percent slopes	5,985	0.7
126	Deetz gravelly loamy sand, 5 to 15 percent slopes	3,810	0.4
127	Deetz stony loamy sand, 2 to 15 percent slopes	5,215	0.6
128	Deetz stony loamy sand, 15 to 30 percent slopes	1,710	0.2
129	Delaney sand, 0 to 9 percent slopes	4,155	0.5
130	Delaney gravelly sand, 0 to 9 percent slopes	2,880	0.3
131	Delaney stony sand, 0 to 15 percent slopes	2,390	0.3
132	Delaney sandy loam, 0 to 2 percent slopes	730	0.1
133	Delaney sandy loam, 2 to 5 percent slopes	1,025	0.1
134	Delaney Variant silt, 0 to 2 percent slopes	760	0.1
135	Deven-Rubble land complex, 0 to 30 percent slopes	4,980	0.6
136	Diyou loam	6,065	0.7
137	Diyou loam, drained	7,415	0.8
138	Diyou loam, pe <sup>r</sup> substratum	600	0.1
139	Dotta loam, 0 to 2 percent slopes	1,815	0.2
140	Dotta loam, 2 to 9 percent slopes	2,170	0.2
141	Dotta gravelly loam, 0 to 2 percent slopes	1,930	0.2
142	Dotta gravelly loam, 2 to 5 percent slopes	1,870	0.2
143	Dubakella-Ipish complex, 5 to 30 percent slopes	2,980	0.3
144	Dubakella-Ipish complex, 30 to 50 percent slopes	8,350	0.9
145	Dumps	2,600	0.3
146	Duzel gravelly loam, 5 to 9 percent slopes	3,550	0.4
147	Duzel gravelly loam, 9 to 15 percent slopes	3,610	0.4
148	Duzel-Jilson-Facey complex, 15 to 50 percent slopes	87,785	9.8
149	Esro silt loam	1,265	0.1
150	Esro silt loam, drained	610	0.1
151	Etsel very gravelly loam, 30 to 75 percent slopes	4,940	0.6
152	Facey loam, 5 to 15 percent slopes	2,230	0.3
153	Gazelle silt loam	16,480	1.9
154	Gazelle Variant sandy clay loam	470	0.1
155	Hilt sandy loam, 2 to 15 percent slopes	3,770	0.4
156	Hilt sandy loam, 15 to 30 percent slopes	800	0.1
157	Hilt stony sandy loam, 2 to 50 percent slopes	1,725	0.2
158	Hilt-Rock outcrop complex, 2 to 50 percent slopes	5,310	0.6
159	Jenny clay, 0 to 2 percent slopes	350	*
160	Jenny clay, 2 to 15 percent slopes	4,410	0.5
161	Jenny cobbly clay, 0 to 15 percent slopes	1,940	0.2
162	Jilson gravelly loam, 50 to 65 percent slopes	2,790	0.3
163	Jilson-Duzel gravelly loams, 5 to 50 percent slopes	28,440	3.2
164	Kindig-Neuns gravelly loams, 15 to 50 percent slopes	3,380	0.4
165	Kindig-Neuns gravelly loams, 50 to 80 percent slopes	46,590	5.1
166	Kinkel very gravelly loam, 2 to 15 percent slopes	530	0.1
167	Kuck clay loam, 2 to 9 percent slopes	4,210	0.5
168	Kuck clay loam, 9 to 15 percent slopes	1,955	0.2

See footnote at end of table.

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Acres	Percent
169	Lassen clay, 2 to 9 percent slopes-----	4,085	0.5
170	Lassen clay, 9 to 15 percent slopes-----	950	0.1
171	Lassen cobbly clay, 2 to 15 percent slopes-----	6,190	0.7
172	Lassen-Kuck complex, 15 to 50 percent slopes-----	2,300	0.3
173	Lassen-Kuck complex, stony, 2 to 50 percent slopes-----	46,410	5.1
174	Lassen-Rock outcrop-Kuck complex, 2 to 50 percent slopes-----	35,845	3.9
175	Lava flows-----	4,190	0.5
176	Lava flows-Xerorthents complex, 0 to 50 percent slopes-----	5,190	0.6
177	Lithic Haploxerolls-Rock outcrop complex, 0 to 65 percent slopes-----	23,885	2.7
178	Lithic Xerorthents-Rock outcrop complex, 0 to 65 percent slopes-----	21,095	2.4
179	Louie loam, 0 to 2 percent slopes-----	2,940	0.3
180	Louie loam, 2 to 9 percent slopes-----	3,310	0.4
181	Louie stony loam, 0 to 9 percent slopes-----	6,500	0.7
182	Louie Variant sandy clay loam, 2 to 9 percent slopes-----	1,765	0.2
183	Marpa-Kinkel-Boomer, cool complex, 5 to 15 percent slopes-----	5,800	0.7
184	Marpa-Kinkel-Boomer, cool complex, 15 to 50 percent slopes-----	80,230	8.9
185	Mary loam, 2 to 9 percent slopes-----	1,340	0.2
186	Mary loam, 9 to 15 percent slopes-----	610	0.1
187	Mary stony loam, 2 to 50 percent slopes-----	16,280	1.8
188	Mary-Rock outcrop complex, 2 to 50 percent slopes-----	22,160	2.5
189	Medford clay loam, cool, 0 to 2 percent slopes-----	1,780	0.2
190	Medford clay loam, cool, 2 to 5 percent slopes-----	2,270	0.3
191	Medford clay loam, cool, 5 to 15 percent slopes-----	1,430	0.2
192	Montague clay, 0 to 2 percent slopes-----	1,630	0.2
193	Montague clay, 2 to 9 percent slopes-----	6,200	0.7
194	Montague cobbly clay, 0 to 9 percent slopes-----	1,880	0.2
195	Montague Variant clay, 0 to 9 percent slopes-----	660	0.1
196	Neer-Ponto stony sandy loams, 15 to 50 percent slopes-----	5,460	0.6
197	Neer-Ponto complex, 15 to 50 percent slopes-----	2,350	0.3
198	Odas sandy loam-----	2,320	0.3
199	Oosen loamy sand, 2 to 15 percent slopes-----	875	0.1
200	Orset sandy loam, 0 to 9 percent slopes-----	685	0.1
201	Pinehurst stony loam, 2 to 15 percent slopes-----	10,190	1.1
202	Pinehurst stony loam, 15 to 30 percent slopes-----	8,700	1.0
203	Pinehurst stony loam, 30 to 50 percent slopes-----	7,800	0.9
204	Pinehurst Variant very stony loam, 0 to 15 percent slopes-----	1,455	0.2
205	Pinehurst Variant very stony loam, 15 to 65 percent slopes-----	500	0.1
206	Pit clay-----	2,000	0.2
207	Plutos-Rock outcrop complex, 0 to 30 percent slopes-----	8,915	1.0
208	Ponto sandy loam, 5 to 15 percent slopes-----	1,350	0.2
209	Ponto-Neer complex, 2 to 15 percent slopes-----	5,370	0.6
210	Redola loam, 0 to 2 percent slopes-----	765	0.1
211	Redola loam, 2 to 9 percent slopes-----	1,905	0.2
212	Riverwash-----	3,540	0.4
213	Rock outcrop-Dubakella complex, 30 to 50 percent slopes-----	3,050	0.3
214	Rock outcrop-Louie complex, 0 to 15 percent slopes-----	8,010	0.9
215	Rock outcrop-Terwilliger complex, 2 to 50 percent slopes-----	1,375	0.2
216	Rock outcrop-----	16,685	1.9
217	Salisbury clay loam, 0 to 2 percent slopes-----	1,780	0.2
218	Salisbury clay loam, 2 to 9 percent slopes-----	2,770	0.3
219	Salisbury gravelly clay loam, 0 to 5 percent slopes-----	7,520	0.8
220	Salisbury gravelly clay loam, 5 to 9 percent slopes-----	5,380	0.6
221	Salisbury cobbly loam, 0 to 9 percent slopes-----	14,110	1.6
222	Settlemeier loam, 0 to 2 percent slopes-----	13,430	1.5
223	Settlemeier loam, drained, 2 to 5 percent slopes-----	2,440	0.3
224	Settlemeier Variant silt loam-----	1,890	0.2
225	Sheld very stony sandy loam, 50 to 65 percent slopes-----	505	0.1
226	Sheld-Iller stony sandy loams, 9 to 30 percent slopes-----	9,790	1.1
227	Sheld-Iller stony sandy loams, 30 to 50 percent slopes-----	8,115	0.9
228	Snell very stony loam, 5 to 30 percent slopes-----	345	*
229	Stoner gravelly sandy loam, 0 to 2 percent slopes-----	6,505	0.7
230	Stoner gravelly sandy loam, 2 to 5 percent slopes-----	7,840	0.9
231	Stoner gravelly sandy loam, 5 to 15 percent slopes-----	3,535	0.4
232	Terwilliger silty clay loam, 2 to 9 percent slopes-----	945	0.1
233	Terwilliger silty clay loam, 9 to 15 percent slopes-----	255	*
234	Terwilliger silty clay loam, 15 to 50 percent slopes-----	985	0.1
235	Terwilliger stony silty clay loam, 2 to 50 percent slopes-----	2,795	0.3
236	Uhlig Variant stony loam, 5 to 50 percent slopes-----	1,230	0.1

See footnote at end of table.

TABLE 4.--ACREAGE AND PROPORTIONATE EXTENT OF THE SOILS--Continued

Map symbol	Soil name	Acres	Percent
237	Weitchpec Variant-Rock outcrop complex, 5 to 65 percent slopes	6,825	0.8
238	Xerofluvents, nearly level	1,695	0.2
	Water	4,900	0.6
	Total	887,765	100.0

\* Less than 0.1 percent.

TABLE 5.--YIELDS PER ACRE OF IRRIGATED AND NONIRRIGATED CROPS AND PASTURE

[Yields in the N columns are for nonirrigated soils; those in the I columns are for irrigated soils. Yields are those that can be expected under a high level of management. Absence of a yield indicates that the soil is not suited to the crop or the crop generally is not grown on the soil. Only soils suitable for these crops are listed]

Soil name and map symbol	Pasture	Barley	Grass-legume hay	Wheat	
	I AUM*	I Ton	I Ton	N Ton	I Ton
112, 113----- Bonnet	11	2.0	5.0	0.75	2
114----- Bonnet	11	2.0	5.0	0.75	2
122, 123----- Copsey	15	---	5.0	---	---
129----- Delaney	11	---	5.0	---	---
130----- Delaney	7	---	4.0	---	---
132----- Delaney	11	---	5.0	---	---
133----- Delaney	11	---	5.0	---	---
134----- Delaney Variant	11	---	5.5	---	---
136, 137----- Diyou	10	1	5.0	---	2
139----- Dotta	12	2	7.0	0.75	2
140----- Dotta	12	2	7.0	0.75	2
141----- Dotta	12	2	5.0	0.5	2
142----- Dotta	12	2	5.0	0.5	2
152----- Facey	11	2.0	5.5	0.75	2
153----- Gazelle	8	---	4.0	---	---
154----- Gazelle Variant	7	---	2.0	---	---
155, 156----- Hilt	---	---	---	0.75	---
159----- Jenny	11	2	5.5	0.75	2
160----- Jenny	11	2	5.5	0.75	2
161----- Jenny	10	1.5	5.5	0.50	1.5

See footnote at end of table.

TABLE 5.--YIELDS PER ACRE OF IRRIGATED AND NONIRRIGATED CROPS AND PASTURE--Continued

Soil name and map symbol	Pasture	Barley	Grass-legume hay	Wheat	
	I AUM*	I Ton	I Ton	N Ton	I Ton
167, 168 Kuck	10	1.75	5	0.75	1.75
169, 170 Lassen	10	1.75	5	0.75	1.75
171 Lassen	8	1.25	4	0.5	1.25
179 Louie	10	1.75	5.0	---	1.75
180 Louie	10	1.75	5.0	---	1.75
185, 186 Mary	---	1.2	---	0.5	1.2
189 Medford	12	2.0	6.0	0.75	2.0
190 Medford	12	2.0	6.0	0.75	2.0
191 Medford	12	1.5	5.5	0.5	1.5
192 Montague	11	1.5	5.5	0.75	1.5
193 Montague	11	1	5.5	0.75	1
194 Montague	10	---	5.0	---	---
195 Montague Variant	10	---	5.0	---	---
206 Pit	10.0	---	5	0.75	2.0
210 Redola	11	2	5.5	0.75	2
211 Redola	11	2	5.5	0.75	2
217 Salisbury	10	1.75	5.0	0.5	1.75
218 Salisbury	10	1.75	5.0	0.5	1.75
219, 220 Salisbury	10	1.50	5.0	0.5	1.50
223 Settlemeier	12	---	6	---	---
224 Settlemeier Variant	10	---	5.0	---	---
229 Stoner	11	3.5	5.5	0.75	3.5

See footnote at end of table.

TABLE 5.--YIELDS PER ACRE OF IRRIGATED AND NONIRRIGATED CROPS AND PASTURE--Continued

Soil name and map symbol	Pasture	Barley	Grass-legume hay	Wheat	
	I AUM*	I Ton	I Ton	N Ton	I Ton
230----- Stoner	11	3.5	5.5	0.75	3.5
231----- Stoner	10	2	5.0	0.5	2
232----- Terwilliger	8.0	1.25	4.0	0.5	1.25
233----- Terwilliger	7.0	1	3.0	0.5	1.0

\* Animal-unit-month: The amount of forage or feed required to feed one animal unit (one cow, one horse, one mule, five sheep, or five goats) for 30 days.

TABLE 6.--STORIE INDEX RATING  
[The symbol < means less than]

Map symbol	Map unit	Rating factors				Index	Grade	Limitation in X factor
		A	B	C	X			
101	Asta gravelly sandy loam, 5 to 15 percent slopes-----	95	60	90	90	46	3	Acidity.
102	Asta gravelly sandy loam, 15 to 50 percent slopes-----	95	60	50	90	26	4	Acidity.
103	Asta cobbly sandy loam, 15 to 50 percent slopes-----	95	50	50	90	21	4	Acidity.
104	Atter very gravelly sandy loam, 0 to 5 percent slopes-----	80	50	95	100	38	4	None.
105	Atter very cobbly sandy loam, 0 to 5 percent slopes-----	80	45	95	100	34	4	None.
106	Atter very bouldery loamy fine sand, 5 to 30 percent slopes-----	70	20	70	100	10	5	None.
107	Avis-Oosen complex, 5 to 30 percent slopes-----	---	---	---	---	17*	5	---
	Avis part-----	80	30	50	95	---	---	Nutrient level.
	Oosen part-----	95	60	50	90	---	---	Nutrient level.
108	Avis-Oosen complex, 30 to 50 percent slopes-----	---	---	---	---	10*	5	---
	Avis part-----	80	30	30	95	---	---	Nutrient level.
	Oosen part-----	95	70	30	90	---	---	Nutrient level.
109	Avis-Lava flows complex, 5 to 30 percent slopes-----	---	---	---	---	8	6	---
	Avis part-----	80	20	50	95	---	---	Nutrient level.
	Lava flows part-----	---	---	---	---	---	---	---
110	Bogus stony loam, 15 to 50 percent slopes-----	80	50	30	95	11	5	Nutrient level.
111	Bogus very stony loam, 15 to 50 percent slopes-----	80	30	30	95	7	6	Nutrient level.
112	Bonnet loam, 0 to 2 percent slopes-----	80	95	100	100	76	2	None.
113	Bonnet gravelly loam, 0 to 2 percent slopes-----	80	60	100	100	48	3	None.
114	Bonnet gravelly loam, 2 to 5 percent slopes-----	80	60	95	100	46	3	None.
115	Boomer loam, cool, 5 to 30 percent slopes-----	70	90	65	95	39	4	Nutrient level.
116	Boomer, cool-Neuns complex, 30 to 70 percent slopes-----	---	---	---	---	13*	5	---
	Boomer, cool part-----	70	90	25	95	---	---	Nutrient level.
	Neuns part-----	70	60	25	95	---	---	Nutrient level.
117	Boomer Variant sandy loam, 30 to 50 percent slopes-----	90	95	30	90	23	4	Nutrient level.
118	Boomer Variant stony sandy loam, 5 to 30 percent slopes-----	90	70	50	90	28	4	Nutrient level.

See footnote at end of table.

TABLE 6.--STORIE INDEX RATING--Continued

Map symbol	Map unit	Rating factors				Index	Grade	Limitation in X factor
		A	B	C	X			
119	Chaix-Chawanakee gravelly coarse sandy loams, 5 to 30 percent slopes-----	---	---	---	---	14*	5	Acidity.
	Chaix part-----	70	50	50	95	---	---	Nutrient level.
	Chawanakee part-----	40	50	50	95	---	---	Nutrient level.
120	Chaix-Chawanakee gravelly coarse sandy loams, 30 to 50 percent slopes-----	---	---	---	---	8*	6	---
	Chaix part-----	70	45	30	95	---	---	Nutrient level.
	Chawanakee part-----	40	45	30	95	---	---	Nutrient level.
121	Chaix-Chawanakee gravelly coarse sandy loams, 50 to 70 percent slopes-----	---	---	---	---	5*	6	---
	Chaix part-----	70	45	20	95	---	---	Nutrient level.
	Chawanakee part-----	40	45	20	95	---	---	Nutrient level.
122	Copsey clay, 0 to 9 percent slopes-----	95	45	95	60x90	22	4	Drainage, nutrient level.
123	Copsey gravelly clay, 2 to 9 percent slopes-----	95	45	95	60x90	22	4	Drainage, nutrient level.
124	Copsey cobbly clay, 2 to 9 percent slopes-----	95	40	95	60x90	19	5	Drainage, nutrient level.
125	Deetz gravelly loamy sand, 0 to 5 percent slopes-----	90	40	95	90	31	4	Nutrient level.
126	Deetz gravelly loamy sand, 5 to 15	90	40	85	90	27	4	Nutrient level.
127	Deetz stony loamy sand, 2 to 15 percent slopes-----	90	30	90	90	22	4	Nutrient level.
128	Deetz stony loamy sand, 15 to 30 percent slopes-----	90	30	65	90	16	5	Nutrient level.
129	Delaney sand, 0 to 9 percent slopes-----	90	60	95	90	46	3	Nutrient level.
130	Delaney gravelly sand, 0 to 9 percent slopes-----	90	40	95	90	31	4	Nutrient level.
131	Delaney stony sand, 0 to 15 percent slopes-----	90	30	90	90	22	4	Nutrient level.
132	Delaney sandy loam, 0 to 2 percent slopes-----	90	95	100	90	77	2	Nutrient level.
133	Delaney sandy loam, 2 to 5 percent slopes-----	90	95	75	90	73	2	Nutrient level.
134	Delaney Variant silt, 0 to 2 percent slopes-----	95	100	100	75x95	68	2	Flooding, nutrient level.
135	Deven-Rubble land complex, 0 to 30 percent slopes-----	---	---	---	---	14	5	---
	Deven part-----	40	55	65	100	---	---	None.
	Rubble land-----	---	---	---	---	---	---	---
136	Diyou loam-----	95	100	100	80x60	46	3	Flooding, water table.
137	Diyou loam, drained-----	95	100	100	95x80	72	2	Flooding, water table.
138	Diyou loam, peat substratum-----	95	100	100	95x60	54	3	Flooding, water table.

See footnote at end of table.

TABLE 6.--STORIE INDEX RATING--Continued

Map symbol	Map unit	Rating factors				Index	Grade	Limitation in X factor
		A	B	C	X			
139	Dotta loam, 0 to 2 percent slopes-----	85	100	100	100	85	1	None.
140	Dotta loam, 2 to 9 percent slopes-----	85	100	95	100	81	1	None.
141	Dotta gravelly loam, 0 to 2 percent slopes-----	85	70	100	100	59	3	None.
142	Dotta gravelly loam, 2 to 5 percent slopes-----	85	70	95	100	56	3	None.
143	Dubakella-Ipish complex, 5 to 30 percent slopes-----	---	---	---	---	21*	4	---
	Dubakella part-----	60	70	50	85	---	---	Nutrient level.
	Ipish part-----	80	70	50	85	---	---	Nutrient level.
144	Dubakella-Ipish complex, 30 to 50 percent slopes-----	---	---	---	---	12*	5	---
	Dubakella part-----	60	70	30	85	---	---	Nutrient level.
	Ipish part-----	80	70	30	85	---	---	Nutrient level.
145	Dumps-----	---	---	---	---	<10	6	---
146	Duzel gravelly loam, 5 to 9 percent slopes-----	70	70	90	95	42	3	Nutrient level.
147	Duzel gravelly loam, 9 to 15 percent slopes-----	70	70	80	95	37	4	Nutrient level.
148	Duzel-Jilson-Facey complex, 15 to 50 percent slopes-----	---	---	---	---	13*	5	---
	Duzel part-----	70	65	30	95	---	---	Nutrient level.
	Jilson part-----	35	65	30	95	---	---	Nutrient level.
	Facey part-----	90	95	30	95	---	---	Nutrient level.
149	Esro silt loam-----	100	100	100	50x20	10	5	Flooding, water table.
150	Esro silt loam, drained-----	100	100	100	90x60	54	3	Flooding, water table.
151	Etsel very gravelly loam, 30 to 75 percent slopes-----	20	60	20	95	2	6	Nutrient level.
152	Facey loam, 5 to 15 percent slopes-----	85	100	85	100	72	2	None.
153	Gazelle silt loam-----	20	80	100	80x70 x80	13	5	Salts and sodium, flooding, water table.
154	Gazelle Variant sandy clay loam-----	20	80	100	80x90 x80	9	6	Salts and sodium, flooding, water table.
155	Hilt sandy loam, 2 to 15 percent slopes-----	75	90	85	100	57	3	None.
156	Hilt sandy loam, 15 to 30 percent slopes-----	75	90	50	100	34	4	None.
157	Hilt stony sandy loam, 2 to 50 percent slopes-----	75	60	30	100	13	5	None.
158	Hilt-Rock outcrop complex, 2 to 50 percent slopes-----	---	---	---	---	6	6	---
	Hilt part-----	75	25	30	100	---	---	None.
	Rock outcrop part-----	---	---	---	---	---	---	---
159	Jenny clay, 0 to 2 percent slopes-----	100	60	100	100	60	2	None.
160	Jenny clay, 2 to 15 percent slopes-----	100	60	85	100	51	3	None.

See footnote at end of table.

TABLE 6.--STORIE INDEX RATING--Continued

Map symbol	Map unit	Rating factors				Index	Grade	Limitation in X factor
		A	B	C	X			
161	Jenny cobbly clay, 0 to 15 percent slopes-----	100	40	85	100	34	4	None.
162	Jilson gravelly loam, 50 to 65 percent slopes-----	40	70	25	100	7	6	None.
163	Jilson-Duzel gravelly loams, 5 to 50 percent slopes-----	---	---	---	---	10*	5	---
	Jilson part-----	40	50	40	100	---	---	None.
	Duzel part-----	70	50	40	95	---	---	Nutrient level.
164	Kindig-Neuns gravelly loams, 15 to 50 percent slopes-----	---	---	---	---	15*	5	---
	Kindig part-----	80	55	40	95	---	---	Nutrient level.
	Neuns part-----	60	55	40	95	---	---	Nutrient level.
165	Kindig-Neuns gravelly loams, 50 to 80 percent slopes-----	---	---	---	---	10*	5	---
	Kindig part-----	80	70	20	95	---	---	Nutrient level.
	Neuns part-----	60	70	20	95	---	---	Nutrient level.
166	Kinkel very gravelly loam, 2 to 15 percent slopes-----	80	60	85	90	37	4	Nutrient level.
167	Kuck clay loam, 2 to 9 percent slopes--	50	85	90	100	38	4	None.
168	Kuck clay loam, 9 to 15 percent slopes--	50	85	85	100	36	4	None.
169	Lassen clay, 2 to 9 percent slopes-----	50	60	90	100	27	4	None.
170	Lassen clay, 9 to 15 percent slopes-----	50	60	85	100	25	4	None.
171	Lassen cobbly clay, 2 to 15 percent slopes-----	50	40	85	100	17	5	None.
172	Lassen-Kuck complex, 15 to 50 percent slopes-----	---	---	---	---	11*	5	---
	Lassen part-----	50	50	40	100	---	---	None.
	Kuck part-----	50	75	40	100	---	---	None.
173	Lassen-Kuck complex, stony, 2 to 50 percent slopes-----	---	---	---	---	10*	5	---
	Lassen part-----	50	40	40	100	---	---	None.
	Kuck part-----	50	65	40	100	---	---	None.
174	Lassen-Rock outcrop-Kuck complex, 2 to 50 percent slopes-----	---	---	---	---	7*	6	---
	Lassen part-----	50	20	40	100	---	---	None.
	Rock outcrop part-----	---	---	---	---	---	---	---
	Kuck part-----	50	65	40	100	---	---	None.
175	Lava flows-----	---	---	---	---	<10	6	---
176	Lava flows-Xerorthents complex, 0 to 50 percent slopes-----	---	---	---	---	<10	6	---
177	Lithic Haploxerolls-Rock outcrop complex, 0 to 65 percent slopes-----	---	---	---	---	7	6	---
	Lithic Haploxerolls part-----	25	70	40	100	---	---	None.
	Rock outcrop part-----	---	---	---	---	---	---	---
178	Lithic Xerorthents-Rock outcrop complex, 0 to 65 percent slopes-----	---	---	---	---	7	6	---
	Lithic Xerorthents part-----	25	70	40	100	---	---	None.
	Rock outcrop part-----	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 6.--STORIE INDEX RATING--Continued

Map symbol	Map unit	Rating factors				Index	Grade	Limitation in X factor
		A	B	C	X			
179	Louie loam, 0 to 2 percent slopes-----	35	100	100	100	35	4	None.
180	Louie loam, 2 to 9 percent-----	35	100	90	100	31	4	None.
181	Louie stony loam, 0 to 9 percent slopes-----	35	70	90	100	22	4	None.
182	Louie Variant sandy clay loam, 2 to 9 percent slopes-----	40	80	90	100	29	4	None.
183	Marpa-Kinkel-Boomer, cool complex, 5 to 15 percent slopes-----	---	---	---	---	29*	4	---
	Marpa part-----	50	60	85	95	---	---	Nutrient level.
	Kinkel part-----	80	50	85	95	---	---	Nutrient level.
	Boomer, cool part-----	70	60	85	95	---	---	Nutrient level.
184	Marpa-Kinkel-Boomer, cool complex, 15 to 50 percent slopes-----	---	---	---	---	13*	5	---
	Marpa part-----	50	55	40	95	---	---	Nutrient level.
	Kinkel part-----	80	45	40	95	---	---	Nutrient level.
	Boomer, cool part-----	70	55	40	95	---	---	Nutrient level.
185	Mary loam, 2 to 9 percent slopes-----	55	100	90	100	49	3	None.
186	Mary loam, 9 to 15 percent slopes-----	55	95	85	100	44	3	None.
187	Mary stony loam, 2 to 50 percent slopes-----	55	70	40	100	15	5	None.
188	Mary-Rock outcrop complex, 2 to 50 percent slopes-----	---	---	---	---	12	5	---
	Mary part-----	55	55	40	100	---	---	None.
	Rock outcrop part-----	---	---	---	---	---	---	---
189	Medford clay loam, cool, 0 to 2 percent slopes-----	75	85	100	95	61	2	Nutrient level.
190	Medford clay loam, cool, 2 to 5 percent slopes-----	75	85	95	95	57	3	Nutrient level.
191	Medford clay loam, cool, 5 to 15 percent slopes-----	75	85	85	95	51	3	Nutrient level.
192	Montague clay, 0 to 2 percent slopes---	30	60	100	100	18	5	None.
193	Montague clay, 2 to 9 percent slopes---	30	60	90	100	16	5	None.
194	Montague cobbly clay, 0 to 9 percent slopes-----	30	40	90	100	11	5	None.
195	Montague Variant clay, 0 to 9 percent slopes-----	20	60	90	100	11	5	None.
196	Neer-Ponto stony sandy loams, 15 to 50 percent slopes-----	---	---	---	---	12*	5	---
	Neer part-----	50	50	40	90	---	---	Nutrient level.
	Ponto part-----	90	50	40	90	---	---	Nutrient level.
197	Neer-Ponto complex, 15 to 50 percent slopes-----	---	---	---	---	20*	4	---
	Neer part-----	50	70	40	90	---	---	Nutrient level.
	Ponto part-----	90	95	40	90	---	---	Nutrient level.
198	Odas sandy loam-----	100	95	100	40x90 x90	31	4	Water table, flooding, nutrient level.

See footnote at end of table.

TABLE 6.--STORIE INDEX RATING--Continued

Map symbol	Map unit	Rating factors				Index	Grade	Limitation in X factor
		A	B	C	X			
199	Oosen loamy sand, 2 to 15 percent slopes-----	95	75	80	90	51	3	Nutrient level.
200	Orset sandy loam, 0 to 9 percent slopes-----	95	95	85	95	73	2	Nutrient level.
201	Pinehurst stony loam, 2 to 15 percent slopes-----	70	70	80	90	35	4	Nutrient level.
202	Pinehurst stony loam, 15 to 30 percent slopes-----	70	70	50	90	22	4	Nutrient level.
203	Pinehurst stony loam, 30 to 50 percent slopes-----	70	70	30	90	13	5	Nutrient level.
204	Pinehurst Variant very stony loam, 0 to 15 percent slopes-----	40	40	80	95	12	5	Nutrient level.
205	Pinehurst Variant very stony loam, 15 to 65 percent slopes-----	40	45	30	95	5	6	Nutrient level.
206	Pit clay-----	100	60	100	70x60	25	4	Flooding, water table.
207	Plutos-Rock outcrop complex, 0 to 30 percent slopes-----	---	---	---	---	10	5	---
	Plutos part-----	50	45	50	90	---	---	Nutrient level.
	Rock outcrop part-----	---	---	---	---	---	---	---
208	Ponto sandy loam, 5 to 15 percent slopes-----	90	95	80	90	62	2	Nutrient level.
209	Ponto-Neer complex, 2 to 15 percent slopes-----	---	---	---	---	46*	3	---
	Ponto part-----	90	95	80	90	---	---	Nutrient level.
	Neer part-----	50	70	80	90	---	---	Nutrient level.
210	Redola loam, 0 to 2 percent slopes-----	80	100	100	90	72	2	Sodic subsurface.
211	Redola loam, 2 to 9 percent slopes-----	80	100	90	90	65	2	Sodic subsurface.
212	Riverwash-----	---	---	---	---	<10	6	---
213	Rock outcrop-Dubakella complex, 30 to 50 percent slopes-----	---	---	---	---	3	6	---
	Rock outcrop part-----	---	---	---	---	---	---	---
	Dubakella part-----	60	20	30	85	---	---	Nutrient level.
214	Rock outcrop-Louie complex, 0 to 15 percent slopes-----	---	---	---	---	6	6	---
	Rock outcrop part-----	---	---	---	---	---	---	---
	Louie part-----	30	25	80	100	---	---	None.
215	Rock outcrop-Terwilliger complex, 2 to 50 percent slopes-----	---	---	---	---	5	6	---
	Rock outcrop part-----	---	---	---	---	---	---	---
	Terwilliger part-----	60	20	40	95	---	---	Nutrient level.
216	Rock outcrop-----	---	---	---	---	<10	6	---
217	Salisbury clay loam, 0 to 2 percent slopes-----	30	85	100	100	25	4	None.
218	Salisbury clay loam, 2 to 9 percent slopes-----	30	85	90	100	23	4	None.

See footnote at end of table.

TABLE 6.--STORIE INDEX RATING--Continued

Map symbol	Map unit	Rating factors				Index	Grade	Limitation in X factor
		A	B	C	X			
219	Salisbury gravelly clay loam, 0 to 5 percent slopes-----	30	70	95	100	20	4	None.
220	Salisbury gravelly clay loam, 5 to 9 percent slopes-----	30	70	90	100	19	5	None.
221	Salisbury cobbly loam, 0 to 9 percent slopes-----	30	60	90	100	16	5	None.
222	Settlemeier loam, 0 to 2 percent slopes-----	100	100	100	70x30	21	4	Flooding, water table.
223	Settlemeier loam, drained, 2 to 5 percent slopes-----	100	100	95	90x50	43	3	Flooding, water table.
224	Settlemeier Variant silt loam-----	80	100	100	50	40	3	Water table.
225	Sheld very stony sandy loam, 50 to 65 percent slopes-----	65	50	25	90	7	6	Nutrient level.
226	Sheld-Iller stony sandy loams, 9 to 30 percent slopes-----	---	---	---	---	18*	5	---
	Sheld part-----	65	50	50	90	---	---	Nutrient level.
	Iller part-----	80	70	50	85	---	---	Nutrient level.
227	Sheld-Iller stony sandy loams, 30 to 50 percent slopes-----	---	---	---	---	10*	5	---
	Sheld part-----	65	50	30	90	---	---	Nutrient level.
	Iller part-----	80	70	30	85	---	---	Nutrient level.
228	Snell very stony loam, 5 to 30 percent slopes-----	35	50	50	95	8	6	Nutrient level.
229	Stoner gravelly sandy loam, 0 to 2 percent slopes-----	90	70	100	95	60	2	Nutrient level.
230	Stoner gravelly sandy loam, 2 to 5 percent slopes-----	90	70	95	95	57	3	Nutrient level.
231	Stoner gravelly sandy loam, 5 to 15 percent slopes-----	90	70	80	95	48	3	Nutrient level.
232	Terwilliger silty clay loam, 2 to 9 percent slopes-----	60	90	90	95	46	3	Nutrient level.
233	Terwilliger silty clay loam, 9 to 15 percent slopes-----	65	90	80	95	41	3	Nutrient level.
234	Terwilliger silty clay loam, 15 to 50 percent slopes-----	60	90	40	95	20	4	Nutrient level.
235	Terwilliger stony silty clay loam, 2 to 50 percent slopes-----	60	60	40	95	14	5	Nutrient level.
236	Uhlrig Variant stony loam, 5 to 50 percent slopes-----	75	60	40	95	17	5	Nutrient level.
237	Weitchpec Variant-Rock outcrop complex, 5 to 65 percent slopes-----	---	---	---	---	7	5	---
	Weitchpec Variant part-----	40	70	30	85	---	---	Nutrient level.
	Rock outcrop part-----	---	---	---	---	---	---	---
238	Xerofluvents, nearly level-----	80	50	100	50x60 x75	9	6	Flooding, channels, deposition.

\* Weighted average of major components.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES  
 [Only the soils that support rangeland vegetation suitable for grazing are listed]

Soil name and map symbol	Range site	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight Lb/acre		
112 Bonnet	Loamy	Favorable	1,200	Idaho fescue	20
		Normal	1,000	Bluebunch wheatgrass	20
		Unfavorable	600	Beardless wheatgrass	15
				Buckbrush	10
				Bottlebrush squirreltail	5
				Junegrass	5
				Sandberg bluegrass	5
Thurber needlegrass	5				
Bulbous bluegrass	5				
113, 114 Bonnet	Gravelly Loam	Favorable	800	Beardless wheatgrass	20
		Normal	600	Bottlebrush squirreltail	20
		Unfavorable	400	Western juniper	20
				Idaho fescue	10
				Bluebunch wheatgrass	10
				Thurber needlegrass	5
				Antelope bitterbrush	5
Buckbrush	5				
122, 123 Copsey	Wet Meadow	Favorable	5,000	Carex	25
		Normal	4,000	Redtop	15
		Unfavorable	3,000	Rush	10
				Kentucky bluegrass	10
				Tufted hairgrass	5
				Timothy	5
				Oniongrass	5
Meadow fescue	5				
Clover	5				
124 Copsey	Wet Meadow	Favorable	4,500	Carex	25
		Normal	3,000	Redtop	15
		Unfavorable	2,500	Rush	10
				Bluegrass	10
				Tufted hairgrass	5
				Timothy	5
				Oniongrass	5
Meadow fescue	5				
Clover	5				
129 Delaney	Sandy	Favorable	1,400	Western juniper	20
		Normal	800	Manzanita	20
		Unfavorable	400	Antelope bitterbrush	20
				Big sagebrush	10
Ponderosa pine	10				
130 Delaney	Sandy	Favorable	1,400	Western juniper	20
		Normal	800	Manzanita	20
		Unfavorable	400	Antelope bitterbrush	20
				Ponderosa pine	10
				Big sagebrush	10
131 Delaney	Stony Sands	Favorable	1,200	Western juniper	30
		Normal	800	Manzanita	25
		Unfavorable	600	Big sagebrush	10
				Rabbitbrush	10

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production		Characteristic vegetation	Composition
		Kind of year	Dry		
			weight Lb/acre		
132, 133 Delaney	Coarse Loamy	Favorable	1,600	Bottlebrush squirreltail	20
		Normal	1,000	Thurber needlegrass	15
		Unfavorable	700	Redstem filaree	15
				Rubber rabbitbrush	10
				Idaho fescue	5
				Bulbous oniongrass	5
				Bulbous bluegrass	5
				Western juniper	5
				Big sagebrush	5
				Manzanita	5
Antelope bitterbrush	5				
134 Delaney Variant	Loamy	Favorable	1,200	Idaho fescue	20
		Normal	1,000	Bluebunch wheatgrass	20
		Unfavorable	600	Beardless wheatgrass	15
				Buckbrush	10
				Bottlebrush squirreltail	5
				Junegrass	5
				Sandberg bluegrass	5
				Thurber needlegrass	5
Bulbous bluegrass	5				
135*: Deven	Shallow Loamy	Favorable	750	Bluebunch wheatgrass	15
		Normal	600	Nevada bluegrass	15
		Unfavorable	450	Western juniper	15
				Thurber needlegrass	10
				Danthonia	10
				Bottlebrush squirreltail	5
				Lupine	5
				Buckwheat	5
				Low phlox	5
				Antelope bitterbrush	5
				Low sagebrush	5
				Curlleaf mountainmahogany	5
				Rubble land.	
136 Diyou	Wet Meadow	Favorable	5,000	Carex	25
		Normal	4,000	Redtop	15
		Unfavorable	3,000	Rush	10
				Bluegrass	10
				Tufted hairgrass	5
				Timothy	5
				Melic	5
				Meadow fescue	5
Clover	5				
137 Diyou	Wet Meadow	Favorable	6,000	Carex	25
		Normal	5,000	Rush	25
		Unfavorable	4,000	Tufted hairgrass	10
				Redtop	5
				Timothy	5
				Melic	5
				Bluegrass	5
				Meadow fescue	5
Clover	5				
138 Diyou	Wet Meadow	Favorable	4,000	Carex	20
		Normal	3,000	Rush	10
		Unfavorable	2,500	Tufted hairgrass	10
				Bluegrass	10
				Redtop	5
				Timothy	5
				Melic	5
				Meadow fescue	5
				Clover	5
				California oatgrass	5
				Northern mannagrass	5
Bluejoint reedgrass	5				

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight		
			Lb/acre		
139, 140 Dotta	Loamy	Favorable	1,400	Bluebunch wheatgrass	25
		Normal	1,000	Idaho fescue	20
		Unfavorable	800	Beardless wheatgrass	10
				Buckbrush	10
				Big sagebrush	10
				Bottlebrush squirreltail	5
				Sandberg bluegrass	5
Antelope bitterbrush	5				
141, 142 Dotta	Gravelly Loam	Favorable	1,200	Beardless wheatgrass	20
		Normal	1,000	Bottlebrush squirreltail	20
		Unfavorable	800	Western juniper	15
				Bluebunch wheatgrass	10
				Idaho fescue	10
				Big sagebrush	10
				Thurber needlegrass	5
				Antelope bitterbrush	5
Buckbrush	5				
146, 147 Duzel	Gravelly Loam	Favorable	1,400	Beardless wheatgrass	20
		Normal	900	Bottlebrush squirreltail	20
		Unfavorable	600	Western juniper	20
				Bluebunch wheatgrass	10
				Idaho fescue	10
				Thurber needlegrass	5
				Antelope bitterbrush	5
Buckbrush	5				
148*: Duzel	Gravelly Loam	Favorable	1,400	Beardless wheatgrass	20
		Normal	900	Bottlebrush squirreltail	20
		Unfavorable	600	Western juniper	20
				Bluebunch wheatgrass	10
				Idaho fescue	10
				Thurber needlegrass	5
				Antelope bitterbrush	5
Buckbrush	5				
Jilson	Shallow Gravelly Loam	Favorable	800	Bottlebrush squirreltail	20
		Normal	600	Cheatgrass	15
		Unfavorable	400	Eulbous bluegrass	10
				Thurber needlegrass	10
				Redstem filaree	10
				Hog fennel	5
				Western juniper	5
				Rabbitbrush	5
				Bluebunch wheatgrass	5
				Idaho fescue	5
Sandberg bluegrass	5				
Facey	Loamy	Favorable	1,400	Idaho fescue	20
		Normal	1,000	Bluebunch wheatgrass	20
		Unfavorable	800	Beardless wheatgrass	15
				Buckbrush	10
				Bottlebrush squirreltail	5
				Junegrass	5
				Sandberg bluegrass	5
Thurber needlegrass	5				
149 Esro	Wet Meadow	Favorable	2,000	Tufted hairgrass	40
		Normal	1,500	Northern mannagrass	20
		Unfavorable	1,000	Clover	5
				California oatgrass	5
				Bluejoint reedgrass	5
				Willow	5

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight Lb/acre		
150----- Esro	Wet Meadow-----	Favorable	2,200	Tufted hairgrass-----	40
		Normal	1,600	Northern mannagrass-----	20
		Unfavorable	1,200	Clover-----	10
				California oatgrass-----	10
				Bluejoint reedgrass-----	5
				Willow-----	5
151----- Etsel	Shallow Stony Loam-----	Favorable	2,400	Ceanothus-----	20
		Normal	1,800	Manzanita-----	20
		Unfavorable	1,400	Lemmon ceanothus-----	15
				Sierra chinquapin-----	10
				Mountain brome-----	5
				California scrub oak-----	5
				California black oak-----	5
152----- Facey	Loamy-----	Favorable	1,400	Idaho fescue-----	20
		Normal	1,000	Bluebunch wheatgrass-----	20
		Unfavorable	800	Beardless wheatgrass-----	15
				Buckbrush-----	10
				Bottlebrush squirreltail-----	5
				Junegrass-----	5
				Sandberg bluegrass-----	5
				Thurber needlegrass-----	5
153----- Gazelle	Saline Meadow-----	Favorable	1,800	Carex-----	40
		Normal	1,400	Rush-----	20
		Unfavorable	1,000	Bluegrass-----	10
				Inland saltgrass-----	5
				Alkali bluegrass-----	5
				Basin wildrye-----	5
				Alkali sacaton-----	5
154----- Gazelle Variant	Saline Meadow-----	Favorable	1,800	Carex-----	40
		Normal	1,400	Rush-----	20
		Unfavorable	1,000	Bluegrass-----	10
				Inland saltgrass-----	5
				Alkali bluegrass-----	5
				Basin wildrye-----	5
				Alkali sacaton-----	5
155, 156----- Hilt	Coarse Loamy-----	Favorable	1,800	Bottlebrush squirreltail-----	20
		Normal	1,500	Thurber needlegrass-----	15
		Unfavorable	800	Redstem filaree-----	15
				Rubber rabbitbrush-----	10
				Idaho fescue-----	5
				Bulbous oniongrass-----	5
				Bulbous bluegrass-----	5
				Cheatgrass-----	5
				Western juniper-----	5
				Big sagebrush-----	5
157----- Hilt	Stony Coarse Loamy-----	Favorable	1,000	Idaho fescue-----	15
		Normal	600	Beardless wheatgrass-----	15
		Unfavorable	300	Bottlebrush squirreltail-----	10
				Ceanothus-----	10
				Bluebunch wheatgrass-----	5
				Sandberg bluegrass-----	5
				Thurber needlegrass-----	5
				Cheatgrass-----	5
				Oregon white oak-----	5

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight Lb/acre		
158*: Hilt	Coarse Loamy	Favorable	1,000	Idaho fescue	15
		Normal	600	Beardless wheatgrass	15
		Unfavorable	300	Bottlebrush squirreltail	10
				Ceanothus	10
				Bluebunch wheatgrass	5
				Sandberg bluegrass	5
				Thurber needlegrass	5
				Cheatgrass	5
				Oregon white oak	5
Rock outcrop. 159, 160- Jenny	Clayey	Favorable	1,400	Bluebunch wheatgrass	10
		Normal	800	Beardless wheatgrass	10
		Unfavorable	400	Idaho fescue	10
				Sheep fescue	10
				Sulphurflower	10
				Bulbous bluegrass	5
				Sandberg bluegrass	5
				Foxtail fescue	5
				Bottlebrush squirreltail	5
				Hog fennel	5
	Lupine	5			
	California black oak	5			
	Poison-oak	5			
	Western juniper	5			
161- Jenny	Cobbly Clay	Favorable	700	Bottlebrush squirreltail	15
		Normal	500	Western juniper	15
		Unfavorable	300	Bluebunch wheatgrass	10
				Idaho fescue	10
				Beardless wheatgrass	5
				Thurber needlegrass	5
				Sandberg bluegrass	5
				Bulbous bluegrass	5
				Buckwheat	5
				Hog fennel	5
	Western yarrow	5			
	California black oak	5			
162- Jilson	Shallow Gravelly Loam	Favorable	800	Bottlebrush squirreltail	20
		Normal	600	Cheatgrass	15
		Unfavorable	400	Bulbous bluegrass	10
				Thurber needlegrass	10
				Redstem filaree	10
				Hog fennel	5
				Western juniper	5
				Rabbitbrush	5
				Bluebunch wheatgrass	5
				Idaho fescue	5
	Sandberg bluegrass	5			
163*: Jilson	Shallow Gravelly Loam	Favorable	800	Bottlebrush squirreltail	20
		Normal	600	Cheatgrass	15
		Unfavorable	400	Bulbous bluegrass	10
				Thurber needlegrass	10
				Redstem filaree	10
				Hog fennel	5
				Western juniper	5
				Rabbitbrush	5
				Bluebunch wheatgrass	5
				Idaho fescue	5
	Sandberg bluegrass	5			

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range name	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight Lb/acre		
163*: Duzel	Gravelly Loam	Favorable	1,400	Beardless wheatgrass	20
		Normal	900	Bottlebrush squirreltail	20
		Unfavorable	600	Western juniper	20
				Bluebunch wheatgrass	10
				Idaho fescue	10
				Thurber needlegrass	5
				Antelope bitterbrush	5
		Buckbrush	5		
167, 168 Kuck	Clayey	Favorable	1,200	Bluebunch wheatgrass	10
		Normal	900	Beardless wheatgrass	10
		Unfavorable	500	Idaho fescue	10
				Bottlebrush squirreltail	10
				Western juniper	10
				Sheep fescue	5
				Sandberg bluegrass	5
				Sulphurflower	5
				Lupine	5
				California black oak	5
169, 170 Lassen	Clayey	Favorable	1,200	Bluebunch wheatgrass	10
		Normal	900	Beardless wheatgrass	10
		Unfavorable	500	Idaho fescue	10
				Bottlebrush squirreltail	10
				Western juniper	10
				Sheep fescue	5
				Sandberg bluegrass	5
				Sulphurflower	5
				Lupine	5
				California black oak	5
		Poison-oak	5		
171 Lassen	Cobbly Clay	Favorable	1,100	Beardless wheatgrass	20
		Normal	700	California black oak	10
		Unfavorable	500	Western juniper	10
				Idaho fescue	10
				Bluebunch wheatgrass	10
				Thurber needlegrass	10
				Sulphurflower	5
				Bottlebrush squirreltail	5
				Sandberg bluegrass	5
				Lupine	5
172*: Lassen	Clayey	Favorable	1,200	Bluebunch wheatgrass	10
		Normal	900	Beardless wheatgrass	10
		Unfavorable	500	Idaho fescue	10
				Bottlebrush squirreltail	10
				Western juniper	10
				Sheep fescue	5
				Sandberg bluegrass	5
				Sulphurflower	5
				Lupine	5
				California black oak	5
		Poison-oak	5		
Kuck	Clayey	Favorable	1,200	Bluebunch wheatgrass	10
		Normal	900	Beardless wheatgrass	10
		Unfavorable	500	Idaho fescue	10
				Bottlebrush squirreltail	10
				Western juniper	10
				Sheep fescue	5
				Sandberg bluegrass	5
				Sulphurflower	5
		Lupine	5		
		California black oak	5		

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight Lb/acre		
173*: Lassen	Stony Clay	Favorable	1,100	Beardless wheatgrass	20
		Normal	700	California black oak	10
		Unfavorable	500	Western juniper	10
				Idaho fescue	10
				Bluebunch wheatgrass	10
				Thurber needlegrass	10
				Sulphurflower	5
				Bottlebrush squirreltail	5
				Sandberg bluegrass	5
	Lupine	5			
Kuck	Stony Clay	Favorable	1,100	Beardless wheatgrass	20
		Normal	700	Bluebunch wheatgrass	10
		Unfavorable	500	Idaho fescue	10
				Thurber needlegrass	10
				Western juniper	10
				California black oak	10
				Bottlebrush squirreltail	5
				Sandberg bluegrass	5
				Lupine	5
	Sulphurflower	5			
174*: Lassen	Stony Clay	Favorable	1,100	Beardless wheatgrass	20
		Normal	700	California black oak	10
		Unfavorable	500	Western juniper	10
				Idaho fescue	10
				Bluebunch wheatgrass	10
				Thurber needlegrass	10
				Sulphurflower	5
				Bottlebrush squirreltail	5
				Sandberg bluegrass	5
	Lupine	5			
Rock outcrop. Kuck	Stony Clay	Favorable	1,100	Beardless wheatgrass	20
		Normal	700	Bluebunch wheatgrass	10
		Unfavorable	500	Idaho fescue	10
				Thurber needlegrass	10
				Western juniper	10
				California black oak	10
				Bottlebrush squirreltail	5
				Sandberg bluegrass	5
				Lupine	5
	Sulphurflower	5			
179, 180 Louie	Loamy	Favorable	1,200	Idaho fescue	20
		Normal	1,000	Bluebunch wheatgrass	20
		Unfavorable	600	Beardless wheatgrass	15
				Buckbrush	10
				Bottlebrush squirreltail	5
				Junegrass	5
				Sandberg bluegrass	5
				Thurber needlegrass	5
				Bulbous bluegrass	5
181 Louie	Stony Loam	Favorable	1,000	Bottlebrush squirreltail	25
		Normal	700	Bluebunch wheatgrass	15
		Unfavorable	500	Idaho fescue	10
				Western juniper	10
				Beardless wheatgrass	5
				Junegrass	5
				Sandberg bluegrass	5
				Thurber needlegrass	5
				California black oak	5
				Buckbrush	5
	Lupine	5			

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production		Characteristic vegetation	Compo-
		Kind of year	Dry weight Lb/acre		sition Pct
182----- Louie Variant	Fine Loamy-----	Favorable	1,600	Bottlebrush squirreltail-----	20
		Normal	1,000	Thurber needlegrass-----	15
		Unfavorable	700	Redstem filaree-----	15
				Rubber rabbitbrush-----	10
				Idaho fescue-----	5
				Bulbous oniongrass-----	5
				Bulbous bluegrass-----	5
				Cheatgrass-----	5
				Western juniper-----	5
Big sagebrush-----	5				
185, 186----- Mary	Loamy-----	Favorable	1,200	Idaho fescue-----	20
		Normal	1,000	Bluebunch wheatgrass-----	20
		Unfavorable	600	Beardless wheatgrass-----	15
				Sandberg bluegrass-----	10
				Buckbrush-----	10
				Bottlebrush squirreltail-----	5
				Junegrass-----	5
				Thurber needlegrass-----	5
				Bulbous bluegrass-----	5
187----- Mary	Stony Loam-----	Favorable	1,000	Idaho fescue-----	15
		Normal	600	Bottlebrush squirreltail-----	15
		Unfavorable	400	Bluebunch wheatgrass-----	10
				Redstem filaree-----	10
				Buckbrush-----	10
				Beardless wheatgrass-----	5
				Junegrass-----	5
				Sandberg bluegrass-----	5
				Thurber needlegrass-----	5
				Bulbous bluegrass-----	5
				Buckbrush-----	5
				Foxtail fescue-----	5
				Hog fennel-----	5
188*: Mary-----	Stony Loam-----	Favorable	1,000	Idaho fescue-----	15
		Normal	600	Bottlebrush squirreltail-----	15
		Unfavorable	400	Bluebunch wheatgrass-----	10
				Redstem filaree-----	10
				Buckbrush-----	10
				Beardless wheatgrass-----	5
				Junegrass-----	5
				Sandberg bluegrass-----	5
				Thurber needlegrass-----	5
				Bulbous bluegrass-----	5
				Buckbrush-----	5
				Foxtail fescue-----	5
				Hog fennel-----	5
Rock outcrop.					
189, 190, 191----- Medford	Fine Loamy-----	Favorable	1,200	Western juniper-----	30
		Normal	600	Bottlebrush squirreltail-----	25
		Unfavorable	400	Bulbous bluegrass-----	15
				Thurber needlegrass-----	10
				Cheatgrass-----	5
				Redstem filaree-----	5

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight Lb/acre		
192, 193 Montague	Clayey	Favorable	1,000	Bluebunch wheatgrass	10
		Normal	800	Beardless wheatgrass	10
		Unfavorable	400	Idaho fescue	10
				Sheep fescue	10
				Sulphurflower	10
				Bulbous bluegrass	5
				Sandberg bluegrass	5
				Foxtail fescue	5
				Bottlebrush squirreltail	5
				Hog fennel	5
				Lupine	5
				California black oak	5
				Poison-oak	5
	Western juniper	5			
194 Montague	Cobbly Clay	Favorable	700	Bottlebrush squirreltail	15
		Normal	500	Western juniper	15
		Unfavorable	300	Bluebunch wheatgrass	10
				Idaho fescue	10
				Beardless wheatgrass	5
				Thurber needlegrass	5
				Sandberg bluegrass	5
				Bulbous bluegrass	5
				Buckwheat	5
				Hog fennel	5
				Western yarrow	5
				Poison-oak	5
				California black oak	5
195 Montague Variant	Clayey	Favorable	600	Redstem filaree	30
		Normal	400	Bottlebrush squirreltail	20
		Unfavorable	200	Bulbous bluegrass	5
				Bulbous oniongrass	5
				Bluebunch wheatgrass	5
				Big sagebrush	5
	Rabbitbrush	5			
198 Odas	Wet Meadow	Favorable	5,000	Carex	25
		Normal	4,000	Redtop	15
		Unfavorable	3,000	Rush	10
				Bluegrass	10
				Tufted hairgrass	5
				Timothy	5
				Melic	5
				Meadow fescue	5
	Clover	5			
206 Pit	Wet Meadow	Favorable	---	Carex	20
		Normal	---	Tufted hairgrass	15
		Unfavorable	---	Alpine timothy	15
				Bluegrass	10
				Ligusticum	10
				Common cowparsnip	10
				Baltic rush	10
				Willow	5
	Silver sagebrush	5			
207*: Plutos	Very Rocky Sands	Favorable	1,400	Western juniper	20
		Normal	800	Antelope bitterbrush	20
		Unfavorable	400	Manzanita	20
				Big sagebrush	10
				Bottlebrush squirreltail	5
	Junegrass	5			
Rock outcrop.					

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight Lb/acre		
210, 211 Redola	Coarse Loamy	Favorable	1,600	Bottlebrush squirreltail	20
		Normal	1,000	Thurber needlegrass	15
		Unfavorable	700	Filaree	15
				Rubber rabbitbrush	10
				Idaho fescue	5
				Bulbous oniongrass	5
				Bulbous bluegrass	5
				Cheatgrass	5
				Common juniper	5
				Big sagebrush	5
214*: Rock outcrop.  Louie	Stony Loam	Favorable	1,000	Bottlebrush squirreltail	25
		Normal	700	Bluebunch wheatgrass	15
		Unfavorable	500	Idaho fescue	10
				Western juniper	10
				Beardless wheatgrass	5
				Junegrass	5
				Sandberg bluegrass	5
				Thurber needlegrass	5
				California black oak	5
				Buckbrush	5
	Lupine	5			
215*: Rock outcrop.  Terwilliger	Stony Loam	Favorable	600	Western juniper	30
		Normal	400	Idaho fescue	10
		Unfavorable	200	Oregon white oak	10
				Rabbitbrush	10
				Big sagebrush	10
				Bottlebrush squirreltail	5
				Bluebunch wheatgrass	5
				Western chokecherry	5
				Redstem filaree	5
				Manzanita	5
217, 218 Salisbury	Fine Loamy	Favorable	1,200	Bottlebrush squirreltail	20
		Normal	600	Bulbous bluegrass	15
		Unfavorable	400	Western juniper	15
				Thurber needlegrass	10
				Idaho fescue	10
				Cheatgrass	5
				Redstem filaree	5
				Bluebunch wheatgrass	5
				Sandberg bluegrass	5
				Sagebrush	5
219, 220 Salisbury	Gravelly Fine Loamy	Favorable	900	Thurber needlegrass	15
		Normal	700	Western juniper	15
		Unfavorable	300	Bottlebrush squirreltail	10
				Gray rabbitbrush	10
				Bulbous bluegrass	5
				Bulbous oniongrass	5
				Bluebunch wheatgrass	5
				Pepperweed	5
				Redstem filaree	5
				Green rabbitbrush	5
	Sagebrush	5			
	Idaho fescue	5			
	Sandberg bluegrass	5			

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight Lb/acre		
221----- Salisbury	Cobbly Loam-----	Favorable	800	Bottlebrush squirreltail-----	20
		Normal	500	Thurber needlegrass-----	10
		Unfavorable	300	Idaho fescue-----	10
				Bulbous bluegrass-----	5
				Cheatgrass-----	5
				Western juniper-----	5
				Bluebunch wheatgrass-----	5
				Sandberg bluegrass-----	5
				Sagebrush-----	5
222----- Settlemeier	Wet Meadow-----	Favorable	2,800	Redtop-----	15
		Normal	2,500	Carex-----	10
		Unfavorable	2,000	Rush-----	10
				Bluegrass-----	10
				Tufted hairgrass-----	5
				Clover-----	5
				California oatgrass-----	5
				Willow-----	5
				Northern mannagrass-----	5
				Bluejoint reedgrass-----	5
				Melic-----	5
				Timothy-----	5
Meadow fescue-----	5				
223----- Settlemeier	Wet Meadow-----	Favorable	2,600	Redtop-----	15
		Normal	1,800	Carex-----	10
		Unfavorable	1,200	Rush-----	10
				Bluegrass-----	10
				Tufted hairgrass-----	5
				Clover-----	5
				California oatgrass-----	5
				Willow-----	5
				Northern mannagrass-----	5
				Bluejoint reedgrass-----	5
				Melic-----	5
				Timothy-----	5
Meadow fescue-----	5				
224----- Settlemeier Variant	Wet Meadow-----	Favorable	2,800	Carex-----	15
		Normal	2,200	Tufted hairgrass-----	15
		Unfavorable	1,800	Rush-----	10
				Bluegrass-----	10
				Redtop-----	5
				Timothy-----	5
				Melic-----	5
				Meadow fescue-----	5
				Clover-----	5
				California oatgrass-----	5
				Northern mannagrass-----	5
				Bluejoint reedgrass-----	5
228----- Snell	Shallow Stony Loam-----	Favorable	2,500	Mountainmahogany-----	15
		Normal	2,000	Gooseberry-----	15
		Unfavorable	1,800	Western juniper-----	10
				Antelope bitterbrush-----	10
				Bluebunch wheatgrass-----	5
				Sandberg bluegrass-----	5
				Idaho fescue-----	5
				Buckwheat-----	5
				Ponderosa pine-----	5
				Sierra chinquapin-----	5
				Tanoak-----	5

See footnote at end of table.

TABLE 7.--RANGELAND PRODUCTIVITY AND CHARACTERISTIC PLANT COMMUNITIES--Continued

Soil name and map symbol	Range site	Total production		Characteristic vegetation	Composition
		Kind of year	Dry weight Lb/acre		
229, 230, 231----- Stoner	Gravelly Coarse Loamy-----	Favorable	1,200	Bottlebrush squirreltail-----	25
		Normal	800	Bluebunch wheatgrass-----	15
		Unfavorable	300	Idaho fescue-----	15
				Buckbrush-----	10
				Sandberg bluegrass-----	5
				Redstem filaree-----	5
				White oak-----	5
Manzanita-----	5				
Rabbitbrush-----	5				
232, 233, 234----- Terwilliger	Loamy-----	Favorable	1,000	Idaho fescue-----	20
		Normal	800	Bluebunch wheatgrass-----	15
		Unfavorable	400	Beardless wheatgrass-----	15
				Buckbrush-----	10
				Bottlebrush squirreltail-----	5
				Junegrass-----	5
				Sandberg bluegrass-----	5
Thurber needlegrass-----	5				
Bulbous bluegrass-----	5				
235----- Terwilliger	Stony Loam-----	Favorable	600	Western juniper-----	30
		Normal	400	Idaho fescue-----	10
		Unfavorable	200	Oregon white oak-----	10
				Rabbitbrush-----	10
				Big sagebrush-----	10
				Bottlebrush squirreltail-----	5
				Bluebunch wheatgrass-----	5
Western chokecherry-----	5				
Redstem filaree-----	5				
Manzanita-----	5				
236----- Uhlig Variant	Stony Loam-----	Favorable	1,000	Bottlebrush squirreltail-----	25
		Normal	700	Bluebunch wheatgrass-----	15
		Unfavorable	500	Big sagebrush-----	15
				Idaho fescue-----	10
				Western juniper-----	10
				Redstem filaree-----	5
				Rabbitbrush-----	5
Buckbrush-----	5				
Western chokecherry-----	5				
Manzanita-----	5				
237*: Weitchpec Variant-	Shallow Gravelly Loam-----	Favorable	1,400	Manzanita-----	40
		Normal	1,000	Western juniper-----	10
		Unfavorable	600	Buckbrush-----	10
				Redstem filaree-----	10
				Cheatgrass-----	5
Rock outcrop.					

\* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY

[Only the soils suitable for production of commercial trees are listed. Absence of an entry indicates that information was not available]

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Equipment limitation	Seedling mortality	Wind-throw hazard	Plant competition	Common trees	Site index	
101----- Asta	2o	Slight	Slight	Slight	Severe	Ponderosa pine----- Incense-cedar----- White fir----- Douglas-fir-----	111 --- --- ---	Ponderosa pine, Douglas-fir, white fir.
102----- Asta	2r	Moderate	Slight	Slight	Severe	Ponderosa pine----- Incense-cedar----- White fir----- Douglas-fir-----	111 --- --- ---	Ponderosa pine, Douglas-fir, white fir.
103----- Asta	2x	Moderate	Slight	Slight	Severe	Ponderosa pine----- White fir----- Douglas-fir----- Incense-cedar-----	111 --- --- ---	Ponderosa pine, white fir, Douglas-fir.
104----- Atter	4f	Slight	Severe	Slight	Moderate	Ponderosa pine----- Jeffrey pine----- Douglas-fir----- Incense-cedar----- White fir----- Sugar pine-----	71 99 --- --- --- ---	Ponderosa pine, Douglas-fir.
105----- Atter	4f	Slight	Severe	Slight	Moderate	Ponderosa pine----- Sugar pine----- Jeffrey pine----- Douglas-fir----- Incense-cedar----- White fir-----	71 --- 99 --- --- ---	Ponderosa pine, Douglas-fir.
106----- Atter	4x	Severe	Severe	Slight	Moderate	Ponderosa pine----- Jeffrey pine----- Douglas-fir----- Incense-cedar----- White fir----- Sugar pine-----	71 99 --- --- --- ---	Ponderosa pine, Douglas-fir.
107*: Avis-----	4f	Moderate	Moderate	Slight	Moderate	Ponderosa pine----- Douglas-fir----- White fir----- California red fir-- Incense-cedar-----	73 --- 64 46 ---	White fir, ponderosa pine, California red fir.
Cosen-----	2o	Slight	Moderate	Slight	Severe	Ponderosa pine----- White fir----- Douglas-fir----- California red fir-- Incense-cedar-----	107 53 --- --- ---	White fir, California red fir.
108*: Avis-----	4f	Severe	Moderate	Slight	Moderate	Ponderosa pine----- Douglas-fir----- White fir----- California red fir-- Incense-cedar-----	73 --- 64 46 ---	White fir, ponderosa pine, California red fir.
Oosen-----	2r	Moderate	Moderate	Slight	Severe	Ponderosa pine----- White fir----- Douglas-fir----- California red fir-- Incense-cedar-----	107 53 --- --- ---	White fir, California red fir.

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Equipment limitation	Seedling mortality	Wind-throw hazard	Plant competition	Common trees	Site index	
109*: Avis-----	4f	Moderate	Moderate	Slight	Moderate	Ponderosa pine----- Douglas-fir----- White fir----- California red fir-- Incense-cedar-----	73 --- 64 46 ---	White fir, ponderosa pine, California red fir.
Lava flows.								
110----- Bogus	3x	Severe	Slight	Slight	Moderate	Ponderosa pine----- Jeffrey pine----- Douglas-fir----- Incense-cedar----- White fir----- Black oak----- White oak-----	90 99 100 --- --- --- ---	Douglas-fir, Jeffrey pine.
111----- Bogus	3x	Severe	Slight	Slight	Moderate	Ponderosa pine----- Jeffrey pine----- Douglas-fir----- Incense-cedar----- White fir----- Black oak----- White oak-----	90 99 100 --- --- --- ---	Douglas-fir, Jeffrey pine.
115----- Boomer	3r	Slight	Slight	Slight	Moderate	Ponderosa pine----- Douglas-fir----- Incense-cedar----- Sugar pine----- Black oak-----	90 --- --- --- ---	Ponderosa pine.
116*: Boomer-----	3r	Severe	Slight	Slight	Moderate	Ponderosa pine----- Douglas-fir----- Incense-cedar----- Sugar pine----- Black oak-----	90 --- --- --- ---	Ponderosa pine.
Neuns-----	4f	Severe	Moderate	Slight	Moderate	Douglas-fir----- Ponderosa pine----- Sugar pine----- Black oak-----	117 93 --- ---	Ponderosa pine, Douglas-fir.
117----- Boomer Variant	3o	Slight	Slight	Slight	Severe	Ponderosa pine----- Douglas-fir----- Sugar pine----- Black oak----- Oregon white oak----- White fir----- Incense-cedar-----	92 115 --- --- --- --- ---	Ponderosa pine, Douglas-fir.
118----- Boomer Variant	3x	Slight	Slight	Slight	Severe	Ponderosa pine----- Douglas-fir----- Sugar pine----- Black oak----- Oregon white oak----- White fir-----	92 115 --- --- --- ---	Ponderosa pine, Douglas-fir.
119*: Chaix-----	3f	Slight	Severe	Slight	Moderate	Ponderosa pine----- Douglas-fir----- White fir----- Sugar pine-----	87 119 60 40	Douglas-fir, ponderosa pine.
Chawanakee-----	4d	Slight	Severe	Moderate	Moderate	Ponderosa pine----- Douglas-fir----- White fir----- Sugar pine-----	81 115 60 40	Ponderosa pine, Douglas-fir.

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Equipment limitation	Seedling mortality	Wind-throw hazard	Plant competition	Common trees	Site index	
120*: Chaix-----	3f	Moderate	Severe	Slight	Moderate	Ponderosa pine----- Douglas-fir----- White fir----- Sugar pine-----	87 119 60 40	Douglas-fir, ponderosa pine.
Chawanakee-----	4d	Moderate	Severe	Moderate	Moderate	Ponderosa pine----- Douglas-fir----- White fir----- Sugar pine-----	81 115 60 40	Ponderosa pine, Douglas-fir.
121*: Chaix-----	3f	Severe	Severe	Slight	Moderate	Ponderosa pine----- Douglas-fir----- White fir----- Sugar pine-----	87 119 60 40	Douglas-fir, ponderosa pine.
Chawanakee-----	4d	Severe	Severe	Moderate	Moderate	Ponderosa pine----- Douglas-fir----- White fir----- Sugar pine-----	81 115 60 40	Ponderosa pine, Douglas-fir.
125, 126, 127, 128- Deetz	2f	Slight	Moderate	Slight	Severe	Ponderosa pine----- White fir----- Douglas-fir----- Sugar pine----- Incense-cedar----- Black oak-----	104 --- --- --- --- ---	Ponderosa pine, Douglas-fir.
143*: Dubakella-----	5t	Slight	Severe	Moderate	Moderate	Digger pine----- Ponderosa pine----- Jeffrey pine----- Incense-cedar----- Douglas-fir-----	--- 60 60 --- 95	
Ipish-----	5t	Slight	Severe	Slight	Slight	Jeffrey pine----- Incense-cedar-----	70 ---	Jeffrey pine.
144*: Dubakella-----	5t	Moderate	Severe	Moderate	Moderate	Digger pine----- Ponderosa pine----- Jeffrey pine----- Incense-cedar----- Douglas-fir-----	--- 60 60 --- 95	
Ipish-----	5t	Moderate	Severe	Slight	Slight	Jeffrey pine----- Incense-cedar-----	70 ---	Jeffrey pine.
164*: Kindig-----	4r	Severe	Slight	Slight	Severe	Douglas-fir----- Ponderosa pine----- Sugar pine----- Incense-cedar----- Black oak-----	121 93 --- --- ---	Douglas-fir, ponderosa pine.
Neuns-----	4f	Moderate	Moderate	Slight	Moderate	Douglas-fir----- Ponderosa pine----- Sugar pine----- Black oak-----	117 93 --- ---	Ponderosa pine, Douglas-fir.

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Equipment limitation	Seedling mortality	Wind-throw hazard	Plant competition	Common trees	Site index	
165*: Kindig-----	4r	Severe	Slight	Slight	Severe	Douglas-fir----- Ponderosa pine----- Sugar pine----- Incense-cedar----- Black oak-----	121 93 --- --- ---	Douglas-fir, ponderosa pine.
Neuns-----	4f	Severe	Moderate	Slight	Moderate	Douglas-fir----- Ponderosa pine----- Sugar pine----- Black oak-----	117 93 --- ---	Ponderosa pine, Douglas-fir.
166----- Kinkel	4f	Slight	Slight	Slight	Moderate	Ponderosa pine----- Douglas-fir----- White fir----- Incense-cedar----- Sugar pine-----	82 99 59 --- ---	Ponderosa pine, Douglas-fir.
183*: Marpa-----	3f	Slight	Moderate	Slight	Moderate	Ponderosa pine----- Douglas-fir----- White fir----- Black oak-----	87 97 62 ---	Ponderosa pine, Douglas-fir.
Kinkel-----	4f	Slight	Slight	Slight	Moderate	Ponderosa pine----- Douglas-fir----- White fir----- Incense-cedar----- Sugar pine-----	82 99 59 --- ---	Ponderosa pine, Douglas-fir.
Boomer-----	3o	Slight	Slight	Slight	Moderate	Ponderosa pine----- Douglas-fir----- Incense-cedar----- Sugar pine----- Black oak-----	90 --- --- --- ---	Ponderosa pine.
184*: Marpa-----	3f	Moderate	Moderate	Slight	Moderate	Ponderosa pine----- Douglas-fir----- White fir----- Black oak-----	87 97 62 ---	Ponderosa pine, Douglas-fir.
Kinkel-----	4f	Moderate	Slight	Slight	Moderate	Ponderosa pine----- Douglas-fir----- White fir----- Incense-cedar----- Sugar pine-----	82 99 59 --- ---	Ponderosa pine, Douglas-fir.
Boomer-----	3r	Moderate	Slight	Slight	Moderate	Ponderosa pine----- Douglas-fir----- Incense-cedar----- Sugar pine----- Black oak-----	90 --- --- --- ---	Ponderosa pine.
196*: Neer-----	4x	Moderate	Moderate	Slight	Moderate	Ponderosa pine----- Douglas-fir----- White fir----- Incense-cedar----- Sugar pine----- Black oak-----	82 --- --- --- --- ---	Douglas-fir, white fir.
Ponto-----	1x	Moderate	Slight	Slight	Severe	Ponderosa pine----- Douglas-fir----- Incense-cedar----- Black oak----- Sugar pine----- White fir-----	120 --- --- --- --- ---	Ponderosa pine, Douglas-fir.

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Equipment limitation	Seedling mortality	Wind-throw hazard	Plant competition	Common trees	Site index	
197*: Neer-----	4f	Moderate	Moderate	Slight	Moderate	Ponderosa pine----- Douglas-fir----- White fir----- Incense-cedar----- Sugar pine----- Black oak-----	82 --- --- --- --- ---	Douglas-fir, white fir.
Ponto-----	1r	Moderate	Slight	Slight	Severe	Ponderosa pine----- Douglas-fir----- Incense-cedar----- Black oak----- Sugar pine----- White fir-----	120 --- --- --- --- ---	Ponderosa pine, Douglas-fir.
199----- Oosen	2o	Slight	Moderate	Slight	Severe	Ponderosa pine----- White fir----- Douglas-fir----- California red fir----- Incense-cedar-----	107 53 --- --- ---	White fir, California red fir.
200----- Orset	4o	Slight	Moderate	Slight	Moderate	Ponderosa pine----- Douglas-fir----- White fir-----	81 --- ---	Douglas-fir, ponderosa pine.
201----- Pinehurst	4o	Slight	Slight	Slight	Severe	Douglas-fir----- White fir----- Sugar pine----- Ponderosa pine----- Incense-cedar----- Black oak-----	105 55 --- 85 --- ---	Douglas-fir, ponderosa pine, white fir.
202----- Pinehurst	4o	Slight	Slight	Slight	Severe	Douglas-fir----- White fir----- Sugar pine----- Ponderosa pine----- Incense-cedar----- Black oak-----	105 55 --- 85 --- ---	Douglas-fir, ponderosa pine, white fir.
203----- Pinehurst	4r	Moderate	Slight	Slight	Severe	Douglas-fir----- White fir----- Sugar pine----- Ponderosa pine----- Incense-cedar----- Black oak-----	105 55 --- 85 --- ---	Douglas-fir, ponderosa pine, white fir.
204----- Pinehurst Variant	5x	Moderate	Moderate	Slight	Slight	Douglas-fir----- Ponderosa pine-----	84 76	Douglas-fir, ponderosa pine.
205----- Pinehurst Variant	5x	Severe	Moderate	Slight	Slight	Douglas-fir----- Ponderosa pine-----	84 76	Douglas-fir, ponderosa pine.
208----- Ponto	1o	Slight	Slight	Slight	Severe	Ponderosa pine----- Douglas-fir----- Incense-cedar----- Black oak----- Sugar pine----- White fir-----	120 --- --- --- --- ---	Ponderosa pine, Douglas-fir.
209*: Ponto-----	1o	Slight	Slight	Slight	Severe	Ponderosa pine----- Douglas-fir----- Incense-cedar----- Black oak----- Sugar pine----- White fir-----	120 --- --- --- --- ---	Ponderosa pine, Douglas-fir.

See footnote at end of table.

TABLE 8.--WOODLAND MANAGEMENT AND PRODUCTIVITY--Continued

Soil name and map symbol	Ordination symbol	Management concerns				Potential productivity		Trees to plant
		Equipment limitation	Seedling mortality	Wind-throw hazard	Plant competition	Common trees	Site index	
209*: Neer-----	4f	Slight	Moderate	Slight	Moderate	Ponderosa pine----- Douglas-fir----- White fir----- Incense-cedar----- Sugar pine----- Black oak-----	82 --- --- --- --- ---	Douglas-fir, white fir.
225----- Sheld	4x	Severe	Severe	Slight	Moderate	Ponderosa pine----- Douglas-fir----- Incense-cedar----- White fir----- California red fir--	75 --- --- 64 ---	White fir.
226*: Sheld-----	4x	Slight	Severe	Slight	Moderate	Ponderosa pine----- Douglas-fir----- Incense-cedar----- White fir----- California red fir--	75 --- --- 64 ---	White fir.
Iller-----	4x	Moderate	Moderate	Slight	Severe	White fir----- California red fir-- Ponderosa pine-----	60 43 92	White fir, California red fir, ponderosa pine.
227*: Sheld-----	4x	Moderate	Severe	Slight	Moderate	Ponderosa pine----- Douglas-fir----- Incense-cedar----- White fir----- California red fir--	75 --- --- 64 ---	White fir.
Iller-----	4x	Severe	Moderate	Slight	Severe	White fir----- California red fir-- Ponderosa pine-----	60 43 92	White fir, California red fir, ponderosa pine.

\* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 9.--WOODLAND UNDERSTORY VEGETATION

[Only the soils suitable for production of commercial trees are listed]

Soil name and map symbol	Total production		Characteristic vegetation	Composition
	Kind of year	Dry weight		
		Lb/acre		Pct
101, 102, 103----- Asta	Favorable	3,200	Oak-----	50
	Normal	2,500	Common snowberry-----	15
	Unfavorable	2,000	Brackenfern-----	10
			Gooseberry-----	5
			Manzanita-----	5
Rose-----	5			
104----- Atter	Favorable	600	Antelope bitterbrush-----	20
	Normal	400	Marlahan mustard-----	15
			California brome-----	15
	Unfavorable	300	Idaho fescue-----	10
			Oak-----	10
			Cheatgrass-----	10
			Sulphurflower-----	10
			Bottlebrush squirreltail-----	5
			Thurber needlegrass-----	5
105----- Atter	Favorable	800	Antelope bitterbrush-----	20
	Normal	500	Marlahan mustard-----	15
			California brome-----	15
	Unfavorable	300	Idaho fescue-----	10
			Oak-----	10
			Cheatgrass-----	10
			Sulphurflower-----	10
			Bottlebrush squirreltail-----	5
			Thurber needlegrass-----	5
106----- Atter	Favorable	500	Antelope bitterbrush-----	20
	Normal	300	Marlahan mustard-----	15
			California brome-----	15
	Unfavorable	200	Idaho fescue-----	10
			Oak-----	10
			Cheatgrass-----	10
			Sulphurflower-----	10
			Bottlebrush squirreltail-----	5
			Thurber needlegrass-----	5
107*, 108*: Avis-----	Favorable	900	Snowbrush ceanothus-----	25
	Normal	400	Sierra chinquapin-----	25
			Bearberry manzanita-----	10
	Unfavorable	250	Oregon-grape-----	5
			Poison-oak-----	5
			Blueblossom ceanothus-----	5
			Snowberry-----	5
			Carex-----	5
Oosen-----	Favorable	900	Sierra chinquapin-----	25
	Normal	500	Greenleaf manzanita-----	20
			Squawcarpet-----	15
	Unfavorable	300	Ceanothus-----	10
			Snowberry-----	10
109*: Avis-----	Favorable	900	Snowbrush ceanothus-----	25
	Normal	400	Sierra chinquapin-----	25
			Bearberry manzanita-----	10
	Unfavorable	250	Oregon-grape-----	5
			Poison-oak-----	5
			Blueblossom ceanothus-----	5
			Snowberry-----	5
			Carex-----	5
Lava flows.				

See footnote at end of table.

TABLE 9.--WOODLAND UNDERSTORY VEGETATION--Continued

Soil name and map symbol	Total production		Characteristic vegetation	Composition			
	Kind of year	Dry weight					
		Lb/acre		Pct			
110, 111 Bogus	Favorable	900	Roundleaf snowberry	60			
	Normal	600	Lupine	10			
	Unfavorable	500	Needlegrass	10			
			Vetch	5			
			Strawberry	5			
			Fescue	5			
			Bluegrass	5			
115 Boomer	Favorable	1,000	California black oak	10			
	Normal	600	Bluegrass	10			
	Unfavorable	400	Mountain brome	10			
			Blue wildrye	10			
			Needlegrass	10			
			Buckbrush	5			
			Brackenfern	5			
			Greenleaf manzanita	5			
			Deerbrush	5			
Common snowberry	5						
116*: Boomer	Favorable	1,000	California black oak	10			
	Normal	600	Bluegrass	10			
	Unfavorable	400	Mountain brome	10			
			Blue wildrye	10			
			Needlegrass	10			
			Buckbrush	5			
			Brackenfern	5			
			Greenleaf manzanita	5			
			Deerbrush	5			
Common snowberry	5						
Neuns	Favorable	700	Manzanita	15			
	Normal	400	Squawcarpet	15			
	Unfavorable	200	Deerbrush	10			
			Sierra chinquapin	10			
			Tanoak	10			
			Oak	5			
			Serviceberry	5			
			Dogwood	5			
			Buckbrush	5			
			California black oak	5			
			Brackenfern	5			
			117 Boomer Variant	Favorable	600	Thurber needlegrass	40
				Normal	400	Oak	40
Unfavorable	250	Vetch		10			
		Birchleaf mountainmahogany	5				
		Manzanita	5				
118 Boomer Variant	Favorable	400	Needlegrass	40			
	Normal	300	Ceanothus	20			
	Unfavorable	100	Birchleaf mountainmahogany	10			
			Vetch	10			
			Gooseberry	10			
			Rabbitbrush	5			
119*, 120*, 121*: Chaix	Favorable	900	Lupine	5			
	Unfavorable	400	Manzanita	20			
			Buckbrush	15			
			Mountain misery	15			
			Canyon live oak	10			
			California black oak	10			
			Mountain brome	5			
Pine bluegrass	5						

See footnote at end of table.

TABLE 9.--WOODLAND UNDERSTORY VEGETATION--Continued

Soil name and map symbol	Total production		Characteristic vegetation	Composition	
	Kind of year	Dry weight			
		Lb/acre		Pct	
119*, 120*, 121*: Chawanakee-----	Favorable	700	Manzanita-----	30	
	Normal	400	Buckbrush-----	20	
	Unfavorable	300	Mountain misery-----	10	
125, 126----- Deetz	Favorable	900	Manzanita-----	25	
	Normal	700	Squawcarpet-----	15	
	Unfavorable	500	Bitterbrush-----	10	
			Bluegrass-----	10	
127, 128----- Deetz	Favorable	800	Manzanita-----	25	
	Normal	600	Squawcarpet-----	15	
	Unfavorable	500	Bitterbrush-----	10	
			Bluegrass-----	10	
143*, 144*: Dubakella-----	Favorable	1,000	Bluebunch wheatgrass-----	35	
	Normal	600	Bottlebrush squirreltail-----	25	
	Unfavorable	300	California scrub oak-----	5	
				Manzanita-----	5
				Buckbrush-----	5
				Leather oak-----	5
				Hog fennel-----	5
		Rubber rabbitbrush-----	5		
Ipish-----	Favorable	1,200	Beardless wheatgrass-----	70	
	Normal	1,000	Buckwheat-----	10	
	Unfavorable	750	Idaho fescue-----	5	
				Bottlebrush squirreltail-----	5
		Buckbrush-----	5		
164*, 165*: Kindig-----	Favorable	600	Oak-----	70	
	Normal	300	Deerbrush-----	10	
	Unfavorable	200	Sulphurflower-----	5	
				Manzanita-----	5
		Fescue-----	5		
Neuns-----	Favorable	700	Manzanita-----	15	
	Normal	400	Squawcarpet-----	15	
	Unfavorable	200	Deerbrush-----	10	
				Sierra chinquapin-----	10
				Tanoak-----	10
				Oak-----	5
				Serviceberry-----	5
				Dogwood-----	5
				Buckbrush-----	5
		California black oak-----	5		
		Brackenfern-----	5		
166----- Kinkel	Favorable	500	Deerbrush-----	30	
	Normal	400	Needlegrass-----	20	
	Unfavorable	200	Buckbrush-----	10	
				Common snowberry-----	10
				Mountain brome-----	5
				Western yarrow-----	5
		Canby bluegrass-----	5		
		California brome-----	5		
183*, 184*: Marpa-----	Favorable	1,000	Vetch-----	30	
	Normal	600	Western mountainmahogany-----	30	
	Unfavorable	400	Tall Oregon-grape-----	10	
				Needlegrass-----	5
				Mustard-----	5
				Larkspur-----	5
		Mountain brome-----	5		

See footnote at end of table.

TABLE 9.--WOODLAND UNDERSTORY VEGETATION--Continued

Soil name and map symbol	Total production		Characteristic vegetation	Composition
	Kind of year	Dry weight Lb/acre		
183*, 184*: Kinkel-----	Favorable	500	Deerbrush-----	30
	Normal	400	Needlegrass-----	20
	Unfavorable	200	Buckbrush-----	10
			Common snowberry-----	10
			Mountain brome-----	5
			Western yarrow-----	5
			Canby bluegrass-----	5
			California brome-----	5
Boomer-----	Favorable	1,000	California black oak-----	10
	Normal	600	Bluegrass-----	10
	Unfavorable	400	Mountain brome-----	10
			Blue wildrye-----	10
			Needlegrass-----	10
			Buckbrush-----	5
			Brackenfern-----	5
			Greenleaf manzanita-----	5
			Deerbrush-----	5
			Common snowberry-----	5
196*: Neer-----	Favorable	1,600	Manzanita-----	50
	Normal	900	Sierra chinquapin-----	10
	Unfavorable	600	Serviceberry-----	10
			Snowbrush ceanothus-----	5
			Needlegrass-----	5
			Bluegrass-----	5
			Wheatgrass-----	5
Ponto-----	Favorable	2,500	Manzanita-----	40
	Normal	1,800	Sierra chinquapin-----	10
	Unfavorable	1,500	Serviceberry-----	10
			Whitethorn ceanothus-----	5
			Bitter cherry-----	5
			Snowbrush ceanothus-----	5
			Deerbrush-----	5
			Squawcarpet-----	5
			Tanoak-----	5
			Mountain brome-----	5
197*: Neer-----	Favorable	1,800	Manzanita-----	40
	Normal	1,200	Antelope bitterbrush-----	10
	Unfavorable	1,000	Sierra chinquapin-----	10
			Serviceberry-----	5
			Snowbrush ceanothus-----	5
			Needlegrass-----	5
			Bluegrass-----	5
			Bluebunch wheatgrass-----	5
Ponto-----	Favorable	2,600	Manzanita-----	40
	Normal	1,500	Sierra chinquapin-----	10
	Unfavorable	1,200	Whitethorn ceanothus-----	5
			Bitter cherry-----	5
			Snowbrush ceanothus-----	5
			Deerbrush-----	5
			Squawcarpet-----	5
			Tanoak-----	5
			Antelope bitterbrush-----	5
			Mountain brome-----	5
199----- Oosen	Favorable	900	Sierra chinquapin-----	25
	Normal	500	Greenleaf manzanita-----	20
	Unfavorable	300	Squawcarpet-----	15
			Ceanothus-----	10
			Snowberry-----	10

See footnote at end of table.

TABLE 9.--WOODLAND UNDERSTORY VEGETATION--Continued

Soil name and map symbol	Total production		Characteristic vegetation	Composition			
	Kind of year	Dry weight					
		Lb/acre		Pct			
200----- Orset	Favorable	1,000	Bottlebrush squirreltail-----	15			
	Normal	800	Needlegrass-----	10			
	Unfavorable	600	Cheatgrass-----	10			
			Lupine-----	10			
			Antelope bitterbrush-----	10			
			Big sagebrush-----	5			
			Gooseberry-----	5			
			Rabbitbrush-----	5			
			Ponderosa pine-----	5			
			Douglas fir-----	5			
			Squawcarpet-----	5			
201, 202, 203----- Pinehurst	Favorable	2,500	Deerbrush-----	30			
	Normal	1,800	Snowbrush ceanothus-----	5			
			Bearberry-----	5			
			Bitter cherry-----	5			
			Serviceberry-----	5			
			Snowberry-----	5			
			Idaho fescue-----	5			
			Needlegrass-----	5			
			Buckwheat-----	5			
			Lupine-----	5			
			Mountain brome-----	5			
			Squawcarpet-----	5			
			204, 205----- Pinehurst Variant	Favorable	800	Deerbrush-----	15
				Normal	500	Squawcarpet-----	10
Fescue-----	10						
Bluegrass-----	10						
California black oak-----	5						
Mountainmahogany-----	5						
Arrowleaf balsamroot-----	5						
Carex-----	5						
Lupine-----	5						
Snowberry-----	5						
Bottlebrush squirreltail-----	5						
Junegrass-----	5						
Serviceberry-----	5						
208----- Ponto	Favorable	2,600				Manzanita-----	40
	Normal	1,500	Sierra chinquapin-----	10			
			Whitethorn ceanothus-----	5			
			Bitter cherry-----	5			
			Snowbrush ceanothus-----	5			
			Deerbrush-----	5			
			Squawcarpet-----	5			
			Tanoak-----	5			
			Antelope bitterbrush-----	5			
Unfavorable	1,200	Mountain brome-----	5				
		209*: Ponto-----	Favorable	2,600	Manzanita-----	40	
			Normal	1,500	Sierra chinquapin-----	10	
Whitethorn ceanothus-----	5						
Bitter cherry-----	5						
Snowbrush ceanothus-----	5						
Deerbrush-----	5						
Squawcarpet-----	5						
Tanoak-----	5						
Antelope bitterbrush-----	5						
Mountain brome-----	5						
Unfavorable	1,200						

See footnote at end of table.

TABLE 9.--WOODLAND UNDERSTORY VEGETATION--Continued

Soil name and map symbol	Total production		Characteristic vegetation	Composition
	Kind of year	Dry weight		
		Lb/acre		Pct
209*: Neer-----	Favorable	1,800	Manzanita-----	40
	Normal	1,200	Antelope bitterbrush-----	10
	Unfavorable	1,000	Sierra chinquapin-----	10
			Serviceberry-----	5
			Snowbrush ceanothus-----	5
			Needlegrass-----	5
			Bluegrass-----	5
			Bluebunch wheatgrass-----	5
225----- Sheld	Favorable	1,200	Bottlebrush squirreltail-----	40
	Normal	900	Snowbrush ceanothus-----	40
	Unfavorable	700	Fiddleneck-----	5
			Sage-----	5
			California brome-----	5
226*, 227*: Sheld-----	Favorable	1,200	Bottlebrush squirreltail-----	40
	Normal	900	Snowbrush ceanothus-----	40
	Unfavorable	700	Fiddleneck-----	5
			Sage-----	5
			California brome-----	5
Iller-----	Favorable	900	Sierra chinquapin-----	25
	Normal	500	Snowberry-----	20
	Unfavorable	300	Strawberry-----	10
			Thistle-----	10
			Gooseberry-----	5
			California brome-----	5
			Bedstraw-----	5
			Squawcarpet-----	5

\* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 10.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS

[The symbol < means less than; > means more than. Absence of an entry indicates that trees generally do not grow to the given height on that soil]

Soil name and map symbol	Trees having predicted 20-year average heights, in feet, of--				
	<8	8-15	16-25	26-35	>35
112, 113, 114----- Bonnet	---	Siberian peashrub, Tatarian honeysuckle, fourwing saltbush.	American plum, Siberian elm.	Black locust, Lombardy poplar, ponderosa pine, honeylocust, giant sequoia, Arizona cypress.	---
122, 123----- Copsey	---	Golden willow-----	Russian-olive, American plum.	Willow, Lombardy poplar, black cottonwood.	---
124----- Copsey	---	Golden willow-----	Russian-olive, American plum.	Willow, Lombardy poplar, black cottonwood.	---
129----- Delaney	---	Lilac, Tatarian honeysuckle, fourwing saltbush.	American plum, Siberian elm.	Black locust, Lombardy poplar, ponderosa pine, honeylocust, giant sequoia, Arizona cypress.	---
132, 133----- Delaney	---	Lilac, Tatarian honeysuckle, fourwing saltbush.	American plum, Siberian elm.	Black locust, Lombardy poplar, ponderosa pine, honeylocust, giant sequoia, Arizona cypress.	---
134----- Delaney Variant	---	Siberian peashrub, Tatarian honeysuckle, fourwing saltbush.	American plum, Siberian elm,	Lombardy poplar, ponderosa pine, honeylocust, giant sequoia, Arizona cypress, black locust.	---
136, 137----- Diyou	---	Golden willow, rose.	Russian-olive, American plum.	Willow, Lombardy poplar, Fremont cottonwood.	---
139, 140, 141, 142----- Dotta	---	Siberian peashrub, Tatarian honeysuckle, fourwing saltbush.	Russian-olive, Lombardy poplar, American plum, honeylocust, Siberian elm, Arizona cypress.	Ponderosa pine, giant sequoia, black locust.	---
155----- Hilt	---	Siberian peashrub, Tatarian honeysuckle, fourwing saltbush.	American plum, Siberian elm.	Black locust, Lombardy poplar, ponderosa pine, honeylocust, giant sequoia, Arizona cypress.	---
161----- Jenny	Redosier dogwood, Sierra currant.	Siberian peashrub, lilac, American plum.	Russian-olive, Rocky Mountain juniper.	Golden willow, black locust, honeylocust, Lombardy poplar.	---

TABLE 10.--WINDBREAKS AND ENVIRONMENTAL PLANTINGS--Continued

Soil name and map symbol	Trees having predicted 20-year average heights, in feet, of--				
	<8	8-15	16-25	26-35	>35
169, 170----- Lassen	---	Siberian peashrub, Tatarian honeysuckle, fourwing saltbush.	American plum, Siberian elm.	Black locust, Lombardy poplar, ponderosa pine, honeylocust, giant sequoia, Arizona cypress.	---
182----- Louie Variant	---	Siberian peashrub, Tatarian honeysuckle, fourwing saltbush.	American plum, Siberian elm.	Lombardy poplar, ponderosa pine, honeylocust, Arizona cypress, black locust.	---
189, 190, 191----- Medford	---	Fourwing saltbush, Siberian peashrub, Tatarian honeysuckle.	Russian-olive, American plum, Siberian elm.	Lombardy poplar, ponderosa pine, honeylocust, black locust, Arizona cypress.	---
198----- Odas	---	Golden willow, rose, pampasgrass.	Russian-olive, American plum.	Lombardy poplar, Fremont cottonwood, willow.	---
206----- Pit	---	Golden willow, rose, pampasgrass.	Russian-olive-----	Willow, Lombardy poplar, Fremont cottonwood.	---
210, 211----- Redola	---	Siberian peashrub, Tatarian honeysuckle, fourwing saltbush.	Russian-olive, American plum.	Arizona cypress, ponderosa pine, honeylocust, black locust.	---
217, 218, 219, 220----- Salisbury	---	Lilac, Siberian peashrub, Tatarian honeysuckle.	Russian-olive, American plum, Siberian elm.	Lombardy poplar, honeylocust, Arizona cypress.	Ponderosa pine, black locust.
221----- Salisbury	---	Lilac, Siberian peashrub, Tatarian honeysuckle.	Russian-olive, American plum, Siberian elm.	Lombardy poplar, ponderosa pine, honeylocust, black locust, Arizona cypress.	---
223----- Settlemyer	---	Golden willow, pampasgrass, rose.	Russian-olive-----	Lombardy poplar, willow, Fremont cottonwood.	---
224----- Settlemyer Variant	---	Golden willow, rose, pampasgrass.	Russian-olive-----	Fremont cottonwood, Lombardy poplar, willow.	---
229, 230, 231----- Stoner	---	Siberian peashrub, Tatarian honeysuckle, fourwing saltbush.	Russian-olive, American plum, Siberian elm.	Lombardy poplar, honeylocust, Arizona cypress.	Ponderosa pine, giant sequoia, black locust.
232, 233----- Terwilliger	---	Siberian peashrub, Tatarian honeysuckle, fourwing saltbush.	Russian-olive, American plum, Siberian elm.	Lombardy poplar, honeylocust, Arizona cypress.	Ponderosa pine, giant sequoia, black locust.

TABLE 11.--RECREATIONAL DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
101----- Asta	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight.
102----- Asta	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
103----- Asta	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Severe: slope.
104----- Atter	Severe: floods, small stones.	Severe: small stones.	Severe: small stones.	Severe: small stones.
105----- Atter	Severe: floods, large stones.	Severe: large stones.	Severe: large stones, small stones.	Severe: large stones.
106----- Atter	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Moderate: large stones, slope.
107*: Avis-----	Severe: slope.	Severe: slope.	Severe: large stones, slope.	Moderate: large stones, slope.
Oosen-----	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
108*: Avis-----	Severe: slope.	Severe: slope.	Severe: large stones, slope.	Severe: slope.
Oosen-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
109*: Avis-----	Severe: slope.	Severe: slope.	Severe: large stones, slope.	Moderate: large stones, slope.
Lava flows.				
110----- Bogus	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
111----- Bogus	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Severe: slope.
112----- Bonnet	Slight-----	Slight-----	Moderate: small stones.	Moderate: dusty.
113, 114----- Bonnet	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Moderate: dusty.

See footnote at end of table.

TABLE 11.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
115----- Boomer	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope, dusty.
116*: Boomer-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Neuns-----	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
117----- Boomer Variant	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
118----- Boomer Variant	Severe: slope.	Severe: slope.	Severe: slope, large stones.	Moderate: large stones, slope.
119*: Chaix-----	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.
Chawanakee-----	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Moderate: slope.
120*, 121*: Chaix-----	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
Chawanakee-----	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope.
122----- Copsey	Severe: wetness, percs slowly.	Severe: wetness, too clayey, percs slowly.	Severe: too clayey.	Severe: wetness, too clayey.
123----- Copsey	Severe: wetness, percs slowly.	Severe: wetness, too clayey, percs slowly.	Severe: small stones, too clayey.	Severe: wetness, too clayey.
124----- Copsey	Severe: wetness, percs slowly.	Severe: wetness, too clayey, percs slowly.	Severe: large stones, small stones.	Severe: wetness, too clayey.
125----- Deetz	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight.
126----- Deetz	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight.
127----- Deetz	Moderate: slope, large stones.	Moderate: slope, large stones.	Severe: slope, large stones.	Moderate: large stones.
128----- Deetz	Severe: slope.	Severe: slope.	Severe: slope, large stones.	Moderate: large stones, slope.

See footnote at end of table.

TABLE 11.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
129----- Delaney	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.	Severe: too sandy.
130----- Delaney	Severe: too sandy.	Severe: too sandy.	Severe: small stones, too sandy.	Severe: too sandy.
131----- Delaney	Severe: too sandy.	Severe: too sandy.	Severe: slope, too sandy.	Severe: too sandy.
132----- Delaney	Slight-----	Slight-----	Moderate: small stones.	Slight.
133----- Delaney	Slight-----	Slight-----	Moderate: slope, small stones.	Slight.
134----- Delaney Variant	Severe: floods.	Moderate: floods, percs slowly.	Severe: floods.	Severe: erodes easily.
135*: Deven-----  Rubble land.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Moderate: slope, dusty.
136----- Diyou	Severe: floods.	Moderate: wetness, percs slowly.	Moderate: small stones, wetness, floods.	Slight.
137----- Diyou	Severe: floods.	Moderate: percs slowly.	Moderate: small stones, percs slowly.	Slight.
138----- Diyou	Severe: floods.	Moderate: wetness, percs slowly.	Moderate: small stones, wetness, percs slowly.	Severe: erodes easily.
139----- Dotta	Moderate: dusty.	Moderate: dusty.	Moderate: small stones, dusty.	Moderate: dusty.
140----- Dotta	Moderate: dusty.	Moderate: dusty.	Moderate: slope, small stones, dusty.	Moderate: dusty.
141, 142----- Dotta	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Moderate: dusty.
143*: Dubakella-----	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.
Ipish-----	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.
144*: Dubakella-----	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.

See footnote at end of table.

TABLE 11.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
144*: Ipish-----	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
145*. Dumps				
146----- Duzel	Moderate: small stones.	Moderate: small stones.	Severe: slope, small stones.	Moderate: dusty.
147----- Duzel	Moderate: small stones, slope.	Moderate: small stones, slope.	Severe: slope, small stones.	Moderate: dusty.
148*: Duzel-----	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
Jilson-----	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope.
Facey-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.
149----- Esro	Severe: floods, wetness.	Severe: wetness.	Severe: wetness, floods.	Severe: wetness, erodes easily.
150----- Esro	Severe: floods.	Moderate: wetness, percs slowly.	Moderate: wetness, percs slowly.	Severe: erodes easily.
151----- Etsel	Severe: slope, small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope, small stones.
152----- Facey	Moderate: slope, dusty.	Moderate: slope, dusty.	Severe: slope.	Severe: erodes easily.
153----- Gazelle	Severe: floods, wetness.	Severe: wetness.	Severe: wetness, floods.	Severe: wetness, erodes easily.
154----- Gazelle Variant	Severe: floods, wetness, cemented pan.	Severe: wetness, cemented pan.	Severe: wetness, cemented pan.	Severe: wetness.
155----- Hilt	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
156----- Hilt	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
157----- Hilt	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
158*: Hilt-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

See footnote at end of table.

TABLE 11.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
158*: Rock outcrop.				
159----- Jenny	Moderate: too clayey.	Moderate: too clayey.	Moderate: small stones.	Moderate: too clayey.
160----- Jenny	Moderate: slope, too clayey.	Moderate: slope, too clayey.	Severe: slope.	Moderate: too clayey.
161----- Jenny	Moderate: large stones.	Moderate: large stones.	Severe: large stones, slope.	Moderate: too clayey.
162----- Jilson	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope.
163*: Jilson-----	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope.
Duzel-----	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
164*, 165*: Kindig-----	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
Neuns-----	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
166----- Kinkel	Severe: small stones.	Severe: small stones.	Severe: slope, small stones.	Severe: small stones.
167----- Kuck	Slight-----	Slight-----	Moderate: slope, small stones, depth to rock.	Slight.
168----- Kuck	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
169----- Lassen	Moderate: too clayey.	Moderate: too clayey.	Moderate: slope, small stones, too clayey.	Moderate: too clayey.
170----- Lassen	Moderate: slope, too clayey.	Moderate: slope, too clayey.	Severe: slope.	Moderate: too clayey.
171----- Lassen	Moderate: large stones, slope.	Moderate: large stones, slope.	Severe: large stones, slope.	Moderate: large stones.
172*: Lassen-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

See footnote at end of table.

TABLE 11.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
172*: Kuck-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
173*: Lassen-----	Severe: slope.	Severe: slope.	Severe: large stones, slope.	Severe: slope.
Kuck-----	Severe: slope.	Severe: slope.	Severe: slope, large stones.	Severe: slope.
174*: Lassen-----	Severe: slope.	Severe: slope.	Severe: large stones, slope.	Severe: slope.
Rock outcrop. Kuck-----	Severe: slope.	Severe: slope.	Severe: slope, large stones.	Severe: slope.
175*. Lava flows				
176*: Lava flows. Xerorthents.				
177*: Lithic Haploxerolls. Rock outcrop.				
178*: Lithic Xerorthents. Rock outcrop.				
179----- Louie	Moderate: dusty.	Moderate: dusty.	Moderate: small stones.	Moderate: dusty.
180----- Louie	Moderate: dusty.	Moderate: dusty.	Moderate: slope, small stones, cemented pan.	Moderate: dusty.
181----- Louie	Moderate: large stones.	Moderate: large stones.	Moderate: slope, large stones.	Moderate: dusty.
182----- Louie Variant	Slight-----	Slight-----	Moderate: slope, cemented pan.	Slight.
183*: Marpa-----	Moderate: slope, small stones, dusty.	Moderate: slope, small stones, dusty.	Severe: slope, small stones.	Moderate: dusty.
Kinkel-----	Severe: small stones.	Severe: small stones.	Severe: slope, small stones.	Severe: small stones.

See footnote at end of table.

TABLE 11.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
183*: Boomer-----	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Moderate: dusty.
184*: Marpa-----	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
Kinkel-----	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.	Severe: slope, small stones.
Boomer-----	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
185----- Mary	Moderate: dusty.	Moderate: dusty.	Moderate: slope, small stones, depth to rock.	Severe: erodes easily.
186----- Mary	Moderate: slope, dusty.	Moderate: slope, dusty.	Severe: slope.	Severe: erodes easily.
187----- Mary	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
188*: Mary-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Rock outcrop.				
189----- Medford	Slight-----	Slight-----	Moderate: small stones.	Slight.
190----- Medford	Slight-----	Slight-----	Moderate: small stones, slope.	Slight.
191----- Medford	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
192----- Montague	Moderate: too clayey.	Moderate: too clayey.	Moderate: too clayey.	Moderate: too clayey.
193----- Montague	Moderate: too clayey.	Moderate: too clayey.	Moderate: slope, too clayey.	Moderate: too clayey.
194----- Montague	Moderate: large stones, too clayey.	Moderate: large stones, too clayey.	Severe: large stones.	Moderate: large stones, too clayey.
195----- Montague Variant	Severe: too clayey, depth to rock, cemented pan.	Severe: too clayey, depth to rock, cemented pan.	Severe: too clayey, depth to rock.	Severe: too clayey.
196*: Neer-----	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.

See footnote at end of table.

TABLE 11.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
196*: Ponto	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
197*: Neer	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
Ponto	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
198: Odas	Severe: floods.	Moderate: wetness.	Moderate: small stones, wetness.	Moderate: wetness.
199: Oosen	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
200: Orset	Slight	Slight	Moderate: slope, small stones.	Slight.
201: Pinehurst	Moderate: slope, dusty.	Moderate: slope, dusty.	Severe: slope.	Moderate: large stones, dusty.
202: Pinehurst	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: large stones, slope, dusty.
203: Pinehurst	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
204: Pinehurst Variant	Moderate: large stones, small stones.	Moderate: large stones, small stones.	Severe: large stones, slope, small stones.	Moderate: large stones.
205: Pinehurst Variant	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Severe: slope.
206: Pit	Severe: floods.	Moderate: wetness, too clayey.	Moderate: slope, wetness, floods.	Slight.
207*: Plutos	Severe: slope.	Severe: slope.	Severe: slope.	Moderate: slope.
Rock outcrop.				
208: Ponto	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
209*: Ponto	Moderate: slope.	Moderate: slope.	Severe: slope.	Slight.
Neer	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight.

See footnote at end of table.

TABLE 11.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
210----- Redola	Moderate: dusty.	Moderate: dusty.	Moderate: dusty.	Moderate: dusty.
211----- Redola	Moderate: dusty.	Moderate: dusty.	Moderate: slope, dusty.	Moderate: dusty.
212*. Riverwash				
213*: Rock outcrop.				
Dubakella-----	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
214*: Rock outcrop.				
Louie-----	Moderate: large stones.	Moderate: large stones.	Severe: slope.	Moderate: dusty.
215*: Rock outcrop.				
Terwilliger-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.
216*. Rock outcrop				
217----- Salisbury	Slight-----	Slight-----	Moderate: small stones.	Slight.
218----- Salisbury	Slight-----	Slight-----	Moderate: slope, small stones, cemented pan.	Slight.
219----- Salisbury	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight.
220----- Salisbury	Moderate: small stones.	Moderate: small stones.	Severe: slope, small stones.	Slight.
221----- Salisbury	Moderate: large stones.	Moderate: large stones.	Severe: large stones, small stones.	Moderate: large stones.
222----- Settlemeier	Severe: floods, wetness.	Severe: wetness.	Severe: wetness.	Severe: wetness, erodes easily.
223----- Settlemeier	Severe: floods.	Moderate: wetness, percs slowly.	Moderate: slope, wetness, floods.	Severe: erodes easily.
224----- Settlemeier Variant	Severe: floods, wetness.	Severe: wetness.	Severe: wetness, floods.	Severe: wetness, erodes easily.

See footnote at end of table.

TABLE 11.--RECREATIONAL DEVELOPMENT--Continued

Soil name and map symbol	Camp areas	Picnic areas	Playgrounds	Paths and trails
225----- Shield	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Severe: slope.
226*: Shield-----	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Moderate: slope.
Iller-----	Severe: slope.	Severe: slope.	Severe: slope, large stones.	Moderate: slope.
227*: Shield-----	Severe: slope.	Severe: slope.	Severe: slope, small stones.	Severe: slope.
Iller-----	Severe: slope.	Severe: slope.	Severe: slope, large stones.	Severe: slope.
228----- Snell	Severe: slope.	Severe: slope.	Severe: large stones, slope, small stones.	Moderate: large stones, slope.
229, 230----- Stoner	Moderate: small stones.	Moderate: small stones.	Severe: small stones.	Slight.
231----- Stoner	Moderate: slope, small stones.	Moderate: slope, small stones.	Severe: slope, small stones.	Slight.
232----- Terwilliger	Slight-----	Slight-----	Moderate: slope, small stones, depth to rock.	Severe: erodes easily.
233----- Terwilliger	Moderate: slope.	Moderate: slope.	Severe: slope.	Severe: erodes easily.
234, 235----- Terwilliger	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope, erodes easily.
236----- Uhlig Variant	Severe: slope.	Severe: slope.	Severe: slope, large stones.	Severe: slope.
237*: Weitchpec Variant-----	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: slope, small stones, depth to rock.	Severe: slope.
Rock outcrop.				
238*. Xerofluvents				

\* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 12.--WILDLIFE HABITAT POTENTIALS

[See text for definitions of "good," "fair," "poor," and "very poor." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--				
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hard- wood trees	Conif- erous plants	Shrubs	Wetland plants	Shallow water areas	Open- land wild- life	Wood- land wild- life	Wetland wild- life	Range- land wild- life
101----- Asta	Fair	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.	Good.
102----- Asta	Poor	Poor	Good	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.	Good.
103----- Asta	Very poor.	Poor	Good	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.	Good.
104----- Atter	Poor	Poor	Good	Fair	Fair	Good	Very poor.	Very poor.	Poor	Fair	Very poor.	Good.
105----- Atter	Very poor.	Very poor.	Good	Fair	Good	Good	Very poor.	Very poor.	Very poor.	Fair	Very poor.	Good.
106----- Atter	Very poor.	Very poor.	Good	Fair	Fair	Good	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Good.
107*, 108*: Avis-----	Poor	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.	Fair.
Oosen-----	Very poor.	Poor	Good	Fair	Good	Good	Very poor.	Very poor.	Very poor.	Good	Very poor.	Fair.
109*: Avis-----	Poor	Poor	Fair	Good	Good	Good	Very poor.	Very poor.	Poor	Fair	Very poor.	Poor.
Lava flows.												
110, 111----- Bogus	Poor	Poor	Good	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.	Good.
112, 113, 114----- Bonnet	Good	Good	Good	Good	Good	Good	Poor	Very poor.	Good	Fair	Poor	Good.
115----- Boomer	Poor	Fair	Good	---	Good	---	Very poor.	Very poor.	Fair	Good	Very poor.	---
116*: Boomer-----	Very poor.	Very poor.	Good	---	Good	---	Very poor.	Very poor.	Poor	Poor	Very poor.	---
Neuns-----	Very poor.	Poor	Good	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.	Good.
117----- Boomer Variant	Fair	Good	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.	Good.
118----- Boomer Variant	Poor	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.	Good.
119*, 120*, 121*: Chaix-----	Very poor.	Very poor.	Good	Fair	Good	Good	Very poor.	Very poor.	Very poor.	Good	Very poor.	Good.
Chawanakee-----	Very poor.	Poor	Good	Fair	Poor	Good	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Good.
122, 123----- Copsey	Fair	Fair	Good	Fair	Fair	Good	Poor	Very poor.	Fair	Fair	Very poor.	Good.

See footnote at end of table.

TABLE 12.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--				
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hard- wood trees	Conif- erous plants	Shrubs	Wetland plants	Shallow water areas	Open- land wild- life	Wood- land wild- life	Wetland wild- life	Range- land wild- life
124----- Copsey	Fair	---	Good	Fair	Fair	Good	Very poor.	Very poor.	Fair	Fair	Very poor.	---
125, 126----- Deetz	Fair	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.	Good.
127, 128----- Deetz	Poor	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.	Good.
129----- Delaney	Fair	Fair	Good	Poor	Poor	Good	Very poor.	Very poor.	Fair	Very poor.	Very poor.	Good.
130----- Delaney	Poor	Poor	Fair	Poor	Poor	Fair	Very poor.	Very poor.	Poor	Very poor.	Very poor.	Good.
131----- Delaney	Poor	Poor	Fair	Very poor.	Very poor.	Fair	Very poor.	Very poor.	Poor	Very poor.	Very poor.	Fair.
132, 133----- Delaney	Fair	Fair	Good	Poor	Poor	Good	Very poor.	Very poor.	Fair	Very poor.	Very poor.	Good.
134----- Delaney Variant	Fair	Fair	Good	Poor	Poor	Good	Poor	Very poor.	Fair	Very poor.	Very poor.	Good.
135*: Deven-----  Rubble land.	Poor	Fair	Good	---	Poor	Fair	Very poor.	Very poor.	Poor	Poor	Very poor.	Fair.
136----- Diyou	Fair	Good	Good	Good	Poor	Good	Good	Good	Good	Very poor.	Good	Good.
137----- Diyou	Good	Good	Good	---	---	Good	Good	Good	Good	---	Good	Good.
138----- Diyou	Fair	Good	Good	Good	Poor	Good	Good	Good	Good	Very poor.	Good	Good.
139----- Dotta	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good.
140----- Dotta	Good	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.	Good.
141----- Dotta	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good	Good.
142----- Dotta	Good	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.	Good.
143*, 144*: Dubakella-----  Ipish-----	Very poor.	Very poor.	Good	Poor	Poor	Good	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Fair.
145*. Dumps	Very poor.	Very poor.	Fair	Poor	Poor	Good	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Poor.
146, 147----- Duzel	Good	Good	Good	Good	Fair	Good	Very poor.	Very poor.	Good	Poor	Very poor.	Good.
148*: Duzel-----	Very poor.	Poor	Good	Fair	Fair	Good	Very poor.	Very poor.	Poor	Poor	Very poor.	Good.

See footnote at end of table.

TABLE 12.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herbaceous plants	Hardwood trees	Coniferous plants	Shrubs	Wetland plants	Shallow water areas	Openland wildlife	Woodland wildlife	Wetland wildlife	Rangeland wildlife
148*: Jilson-----	Very poor.	Very poor.	Good	Poor	Poor	Fair	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Fair.
Facey-----	Poor	Fair	Good	---	Poor	Good	Very poor.	Very poor.	Fair	Very poor.	Very poor.	Good.
149----- Esro	Poor	Poor	Good	---	---	Good	Good	Good	Poor	---	Good	Good.
150----- Esro	Poor	Fair	Good	---	---	Good	Fair	Good	Fair	---	Fair	Good.
151----- Etsel	Very poor.	Very poor.	Fair	Very poor.	Very poor.	Fair	Very poor.	Very poor.	Very poor.	Very poor.	Very poor.	Fair.
152----- Facey	Fair	Good	Good	---	Poor	Good	Very poor.	Very poor.	Fair	Very poor.	Very poor.	Good.
153----- Gazelle	Very poor.	Fair	Good	Very poor.	Very poor.	Good	Good	Good	Good	Very poor.	Good	Good.
154----- Gazelle Variant	Very poor.	Very poor.	Fair	Very poor.	Very poor.	Fair	Good	Good	Fair	Very poor.	Good	Fair.
155----- Hilt	Good	Good	Good	Fair	Fair	Good	Very poor.	Very poor.	Good	Poor	Very poor.	Good.
156----- Hilt	Poor	Fair	Good	Poor	Poor	Good	Very poor.	Very poor.	Fair	Poor	Very poor.	Good.
157----- Hilt	Poor	Poor	Good	Poor	Very poor.	Good	Very poor.	Very poor.	Poor	Very poor.	Very poor.	Good.
158*: Hilt-----	Poor	Poor	Good	Poor	Very poor.	Good	Very poor.	Very poor.	Poor	Very poor.	Very poor.	Good.
Rock outcrop.												
159----- Jenny	Good	Good	Good	Poor	Poor	Poor	Good	Fair	Good	Poor	Fair	Good.
160----- Jenny	Good	Good	Good	Poor	Poor	Poor	Very poor.	Very poor.	Good	Poor	Very poor.	Good.
161----- Jenny	Good	Good	Good	Poor	Poor	Good	Very poor.	Very poor.	Good	Poor	Very poor.	Good.
162----- Jilson	Very poor.	Very poor.	Good	Poor	Poor	Fair	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Fair.
163*: Jilson-----	Very poor.	Very poor.	Good	Poor	Poor	Fair	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Fair.
Duzel-----	Good	Good	Good	Good	Fair	Good	Very poor.	Very poor.	Good	Poor	Very poor.	Good.
164*, 165*: Kindig-----	Poor	Poor	Good	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.	Good.
Neuns-----	Very poor.	Poor	Good	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.	Good.

See footnote at end of table.

TABLE 12.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--				
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hard- wood trees	Conif- erous plants	Shrubs	Wetland plants	Shallow water areas	Open- land wild- life	Wood- land wild- life	Wetland wild- life	Range- land wild- life
166----- Kinkel	Poor	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.	Fair.
167, 168----- Kuck	Good	Good	Good	Poor	Poor	Fair	Very poor.	Very poor.	Good	Poor	Very poor.	Good.
169, 170----- Lassen	Fair	Good	Good	Poor	Poor	Poor	Very poor.	Very poor.	Good	Poor	Very poor.	Good.
171----- Lassen	Poor	Fair	Good	Poor	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.	Good.
172*: Lassen----- Kuck-----	Poor	Fair	Good	Poor	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.	Good.
173*: Lassen----- Kuck-----	Poor	Fair	Good	Poor	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.	Good.
174*: Lassen----- Rock outcrop. Kuck-----	Fair	Good	Good	Poor	Poor	Fair	Very poor.	Very poor.	Fair	Poor	Very poor.	Good.
175*. Lava flows	Poor	Fair	Good	Poor	Poor	Poor	Very poor.	Very poor.	Fair	Poor	Very poor.	Good.
176*: Lava flows. Xerorthents.	Fair	Good	Good	Poor	Poor	Fair	Very poor.	Very poor.	Fair	Poor	Very poor.	Good.
177*: Lithic Haploxerolls. Rock outcrop.												
178*: Lithic Xerorthents. Rock outcrop.												
179----- Louie	Good	Good	Good	Poor	Poor	Good	Good	Fair	Good	Very poor.	Fair	Good.
180----- Louie	Good	Good	Good	Poor	Poor	Good	Very poor.	Very poor.	Good	Very poor.	Very poor.	Good.
181----- Louie	Fair	Good	Good	Poor	Poor	Good	Very poor.	Very poor.	Good	Very poor.	Very poor.	Good.
182----- Louie Variant	Fair	Good	Good	---	Poor	Fair	Very poor.	Very poor.	Fair	Very poor.	Very poor.	Fair.

See footnote at end of table.

TABLE 12.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements								Potential as habitat for--			
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hard- wood trees	Conif- erous plants	Shrubs	Wetland plants	Shallow water areas	Open- land wild- life	Wood- land wild- life	Wetland wild- life	Range- land wild- life
183*: Marpa-----	Fair	Good	Good	Good	Fair	Good	Very poor.	Very poor.	Fair	Fair	Very poor.	Good.
Kinkel-----	Poor	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.	Fair.
Boomer-----	Fair	Good	Good	---	Good	---	Very poor.	Very poor.	Good	Good	Very poor.	---
184*: Marpa-----	Fair	Good	Good	Good	Fair	Good	Very poor.	Very poor.	Fair	Fair	Very poor.	Good.
Kinkel-----	Poor	Poor	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.	Fair.
Boomer-----	Very poor.	Poor	Good	---	Good	---	Very poor.	Very poor.	Fair	Fair	Very poor.	---
185, 186----- Mary	Fair	Good	Good	Fair	Very poor.	Good	Very poor.	Very poor.	Fair	Very poor.	Very poor.	Good.
187----- Mary	Poor	Poor	Good	Fair	Very poor.	Good	Very poor.	Very poor.	Poor	Very poor.	Very poor.	Good.
188*: Mary-----	Poor	Poor	Good	Fair	Very poor.	Good	Very poor.	Very poor.	Poor	Very poor.	Very poor.	Good.
Rock outcrop.												
189----- Medford	Good	Good	Good	Good	Good	Good	Good	Fair	Good	Good	Fair	Good.
190, 191----- Medford	Good	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Good	Very poor.	Good.
192----- Montague	Good	Good	Good	---	---	Fair	Good	Good	Good	---	Good	Good.
193----- Montague	Good	Good	Good	---	---	Fair	Very poor.	Very poor.	Good	---	Very poor.	Good.
194----- Montague	Fair	Fair	Good	---	---	Fair	Very poor.	Very poor.	Good	---	Very poor.	Good.
195----- Montague Variant	Poor	Fair	Good	---	---	Fair	Very poor.	Very poor.	Fair	---	Very poor.	Good.
196*: Neer-----	Poor	Poor	Good	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.	Good.
Ponto-----	Very poor.	Poor	Good	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.	Fair.
197*: Neer-----	Poor	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Fair	Good	Very poor.	Good.
Ponto-----	Very poor.	Poor	Good	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.	Fair.
198----- Odas	Fair	Good	Good	---	---	Good	Good	Good	Good	---	Good	Good.

See footnote at end of table.

TABLE 12.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--				
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hard- wood trees	Conif- erous plants	Shrubs	Wetland plants	Shallow water areas	Open- land wild- life	Wood- land wild- life	Wetland wild- life	Range- land wild- life
199----- Oosen	Very poor.	Poor	Good	Fair	Good	Good	Very poor.	Very poor.	Very poor.	Good	Very poor.	---
200----- Orset	Very poor.	Poor	Good	Good	Good	Good	Very poor.	Very poor.	Very poor.	Good	Very poor.	Good.
201, 202, 203----- Pinehurst	Poor	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.	Good.
204, 205----- Pinehurst Variant	Poor	Poor	Good	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.	Fair.
206----- Pit	Fair	Good	Good	---	---	Good	Fair	Very poor.	Good	---	Poor	Good.
207*: Plutos----- Rock outcrop.	Very poor.	Very poor.	Fair	Poor	Fair	Good	Very poor.	Very poor.	Very poor.	Poor	Very poor.	Fair.
208----- Ponto	Fair	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.	Fair.
209*: Ponto----- Neer-----	Fair	Fair	Good	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.	Fair.
210, 211----- Redola	Good	Good	Good	---	---	Good	Very poor.	Very poor.	Good	---	Very poor.	Good.
212*. Riverwash												
213*: Rock outcrop. Dubakella-----	Very poor.	Very poor.	Good	Poor	Poor	Good	Very poor.	Very poor.	Very poor.	Poor	Very poor.	---
214*: Rock outcrop. Louie-----	Fair	Good	Good	Poor	Poor	Good	Very poor.	Very poor.	Good	Very poor.	Very poor.	Good.
215*: Rock outcrop. Terwilliger-----	Poor	Fair	Good	---	---	Good	Very poor.	Very poor.	Fair	Very poor.	---	Good.
216*. Rock outcrop												
217, 218, 219, 220----- Salisbury	Poor	Fair	Good	---	---	Fair	Very poor.	Very poor.	Fair	---	Very poor.	Fair.
221----- Salisbury	Poor	Fair	Good	---	---	Fair	Very poor.	Very poor.	Fair	---	Very poor.	Fair.
222----- Settlemeier	Poor	Fair	Fair	---	---	Good	Good	Good	Fair	---	Good	Fair.

See footnote at end of table.

TABLE 12.--WILDLIFE HABITAT POTENTIALS--Continued

Soil name and map symbol	Potential for habitat elements							Potential as habitat for--				
	Grain and seed crops	Grasses and legumes	Wild herba- ceous plants	Hard- wood trees	Conif- erous plants	Shrubs	Wetland plants	Shallow water areas	Open- land wild- life	Wood- land wild- life	Wetland wild- life	Range- land wild- life
223----- Settlemeier	Good	Good	Good	Good	Poor	Good	Very poor.	Very poor.	Good	Very poor.	Very poor.	Good.
224----- Settlemeier Variant	Fair	Good	Good	---	---	Good	Good	Good	Good	---	Good	Good.
225----- Sheld	Poor	Poor	Good	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.	Good.
226*, 227*: Sheld-----	Poor	Poor	Good	Good	Good	Good	Very poor.	Very poor.	Poor	Good	Very poor.	Good.
Iller-----	Very poor.	Poor	Good	Good	Fair	Good	Very poor.	Very poor.	Very poor.	Good	Very poor.	Good.
228----- Snell	Very poor.	Poor	Fair	---	---	Fair	Very poor.	Very poor.	Very poor.	---	Very poor.	Fair.
229----- Stoner	Good	Good	Good	Good	Good	Good	Fair	Poor	Good	Poor	Poor	Good.
230, 231----- Stoner	Good	Good	Good	Good	Good	Good	Very poor.	Very poor.	Good	Poor	Very poor.	Good.
232, 233----- Terwilliger	Fair	Good	Good	---	---	Good	Very poor.	Very poor.	Good	---	Very poor.	Good.
234----- Terwilliger	Poor	Fair	Good	---	---	Good	Very poor.	Very poor.	Fair	---	Very poor.	Good.
235----- Terwilliger	Poor	Fair	Good	---	---	Good	Very poor.	Very poor.	Fair	---	Very poor.	Good.
236----- Uhlig Variant	Poor	Fair	Good	---	---	Good	Very poor.	Very poor.	Fair	---	Very poor.	Good.
237*: Weitchpec Variant-	Very poor.	Very poor.	Fair	---	---	Fair	Very poor.	Very poor.	Very poor.	---	Very poor.	Fair.
Rock outcrop. 238*. Xerofluvents												

\* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 13.--BUILDING SITE DEVELOPMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Shallow excavations	Dwellings without basements	Small commercial buildings	Local roads and streets
101----- Asta	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
102, 103----- Asta	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
104----- Atter	Severe: cutbanks cave.	Severe: floods.	Severe: floods.	Moderate: floods, large stones.
105----- Atter	Severe: cutbanks cave, large stones.	Severe: floods, large stones.	Severe: floods, large stones.	Severe: large stones.
106----- Atter	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.
107*, 108*: Avis-----	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.
Oosen-----	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.
109*: Avis-----	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.
Lava flows.				
110, 111----- Bogus	Severe: slope.	Severe: shrink-swell, slope.	Severe: shrink-swell, slope.	Severe: low strength, slope, shrink-swell.
112, 113, 114----- Bonnet	Severe: cutbanks cave.	Slight-----	Slight-----	Slight.
115----- Boomer	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.
116*: Boomer-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.
Neuns-----	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.
117, 118----- Boomer Variant	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
119*, 120*, 121*: Chaix-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

See footnote at end of table.

TABLE 13.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Small commercial buildings	Local roads and streets
119*, 120*, 121*: Chawanakee-----	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.
122, 123, 124----- Copsey	Severe: wetness.	Severe: wetness, shrink-swell.	Severe: wetness, shrink-swell.	Severe: low strength, wetness, shrink-swell.
125----- Deetz	Severe: cutbanks cave.	Slight-----	Slight-----	Slight.
126----- Deetz	Severe: cutbanks cave.	Moderate: slope.	Severe: slope.	Moderate: slope.
127----- Deetz	Severe: cutbanks cave.	Moderate: slope, large stones.	Severe: slope.	Moderate: slope, large stones.
128----- Deetz	Severe: cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.
129, 130, 131----- Delaney	Severe: cutbanks cave.	Slight-----	Moderate: slope.	Slight.
132, 133----- Delaney	Severe: cutbanks cave.	Slight-----	Slight-----	Slight.
134----- Delaney Variant	Severe: cutbanks cave.	Severe: floods.	Severe: floods.	Severe: floods, frost action.
135*: Deven-----	Severe: depth to rock, slope.	Severe: shrink-swell, slope, depth to rock.	Severe: shrink-swell, slope, depth to rock.	Severe: depth to rock, low strength, slope.
Rubble land.				
136----- Diyou	Severe: wetness.	Severe: floods.	Severe: floods.	Severe: floods.
137----- Diyou	Moderate: wetness.	Severe: floods.	Severe: floods.	Moderate: frost action, shrink-swell, floods.
138----- Diyou	Severe: excess humus, wetness.	Severe: floods.	Severe: floods.	Moderate: wetness, floods, frost action.
139----- Dotta	Slight-----	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.
140----- Dotta	Slight-----	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: shrink-swell.
141, 142----- Dotta	Slight-----	Moderate: shrink-swell.	Moderate: shrink-swell.	Moderate: shrink-swell.
143*, 144*: Dubakella-----	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.

See footnote at end of table.

TABLE 13.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Small commercial buildings	Local roads and streets
143*, 144*: Ipish-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
145*. Dumps				
146----- Duzel	Moderate: depth to rock.	Moderate: shrink-swell.	Moderate: shrink-swell, slope.	Moderate: shrink-swell.
147----- Duzel	Moderate: depth to rock, slope.	Moderate: shrink-swell, slope.	Severe: slope.	Moderate: slope, shrink-swell.
148*: Duzel-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Jilson-----	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock, slope.
Facey-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
149----- Esro	Severe: wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: wetness, floods, frost action.
150----- Esro	Severe: wetness.	Severe: floods.	Severe: floods.	Severe: frost action.
151----- Etsel	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock, slope.
152----- Facey	Moderate: depth to rock, slope.	Moderate: shrink-swell, slope.	Severe: slope.	Moderate: low strength, slope, shrink-swell.
153----- Gazelle	Severe: cutbanks cave, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: wetness, floods.
154----- Gazelle Variant	Severe: cemented pan, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: wetness, floods.
155----- Hilt	Moderate: depth to rock, slope.	Moderate: shrink-swell, slope.	Severe: slope.	Moderate: slope, shrink-swell.
156, 157----- Hilt	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
158*: Hilt-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Rock outcrop.				
159----- Jenny	Severe: cutbanks cave.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.

See footnote at end of table.

TABLE 13.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Small commercial buildings	Local roads and streets
160----- Jenny	Severe: cutbanks cave.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.
161----- Jenny	Severe: cutbanks cave.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.
162----- Jilson	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock, slope.
163*: Jilson-----	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock, slope.
Duzel-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
164*, 165*: Kindig-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Neuns-----	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.
166----- Kinkel	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
167----- Kuck	Moderate: depth to rock.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell, low strength.
168----- Kuck	Moderate: depth to rock, slope.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: shrink-swell, low strength.
169----- Lassen	Severe: depth to rock, cutbanks cave.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.
170, 171----- Lassen	Severe: depth to rock, cutbanks cave.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.
172*: Lassen-----	Severe: depth to rock, cutbanks cave, slope.	Severe: shrink-swell, slope.	Severe: shrink-swell, slope.	Severe: low strength, slope, shrink-swell.
Kuck-----	Severe: slope.	Severe: shrink-swell, slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell, low strength.
173*: Lassen-----	Severe: depth to rock, cutbanks cave, slope.	Severe: shrink-swell, slope.	Severe: shrink-swell, slope.	Severe: low strength, slope, shrink-swell.
Kuck-----	Severe: slope.	Severe: shrink-swell, slope.	Severe: shrink-swell, slope.	Severe: slope, low strength, shrink-swell.

See footnote at end of table.

TABLE 13.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Small commercial buildings	Local roads and streets
174*: Lassen-----  Rock outcrop.	Severe: depth to rock, cutbanks cave, slope.	Severe: shrink-swell, slope.	Severe: shrink-swell, slope.	Severe: low strength, slope, shrink-swell.
Kuck-----	Severe: slope.	Severe: shrink-swell, slope.	Severe: shrink-swell, slope.	Severe: slope, low strength, shrink-swell.
175*. Lava flows				
176*: Lava flows.  Xerorthents.				
177*: Lithic Haploxerolls.  Rock outcrop.				
178*: Lithic Xerorthents.  Rock outcrop.				
179----- Louie	Severe: cutbanks cave.	Slight-----	Slight-----	Slight.
180----- Louie	Severe: cutbanks cave.	Slight-----	Moderate: slope.	Slight.
181----- Louie	Severe: cutbanks cave.	Moderate: large stones.	Moderate: slope, large stones.	Moderate: large stones.
182----- Louie Variant	Severe: cemented pan.	Moderate: shrink-swell, cemented pan.	Moderate: shrink-swell, slope, cemented pan.	Moderate: cemented pan, shrink-swell.
183*: Marpa-----	Severe: depth to rock.	Moderate: slope, depth to rock.	Severe: slope.	Moderate: depth to rock, slope.
Kinkel-----	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
Boomer-----	Moderate: slope.	Moderate: shrink-swell, slope.	Severe: slope.	Severe: low strength.
184*: Marpa-----	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.
Kinkel-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

See footnote at end of table.

TABLE 13.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Small commercial buildings	Local roads and streets
184*: Boomer-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.
185----- Mary	Severe: depth to rock.	Moderate: shrink-swell, depth to rock.	Moderate: shrink-swell, slope, depth to rock.	Severe: low strength.
186----- Mary	Severe: depth to rock.	Moderate: shrink-swell, slope, depth to rock.	Severe: slope.	Severe: low strength.
187----- Mary	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.
188*: Mary-----	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: low strength, slope.
Rock outcrop.				
189, 190----- Medford	Moderate: too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.
191----- Medford	Moderate: too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.
192, 193, 194----- Montague	Severe: cemented pan, cutbanks cave.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.
195----- Montague Variant	Severe: depth to rock, cemented pan.	Severe: shrink-swell, cemented pan.	Severe: shrink-swell, cemented pan.	Severe: cemented pan, low strength, shrink-swell.
196*, 197*: Neer-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Ponto-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
198----- Odas	Severe: wetness.	Severe: floods.	Severe: floods.	Moderate: wetness, floods.
199----- Oosen	Severe: cutbanks cave.	Moderate: slope.	Severe: slope.	Moderate: slope.
200----- Orset	Slight-----	Slight-----	Moderate: slope.	Moderate: frost action.
201----- Pinehurst	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope, frost action.
202, 203----- Pinehurst	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.

See footnote at end of table.

TABLE 13.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Small commercial buildings	Local roads and streets
204----- Pinehurst Variant	Moderate: depth to rock, large stones.	Moderate: shrink-swell, large stones.	Moderate: shrink-swell, slope, large stones.	Moderate: shrink-swell, large stones.
205----- Pinehurst Variant	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
206----- Pit	Severe: cutbanks cave, wetness.	Severe: floods, shrink-swell.	Severe: floods, shrink-swell.	Severe: low strength, floods, frost action.
207*: Plutos-----  Rock outcrop.	Severe: depth to rock, cutbanks cave, slope.	Severe: slope.	Severe: slope.	Severe: slope.
208----- Ponto	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
209*: Ponto-----  Neer-----	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
210----- Redola	Severe: cutbanks cave.	Slight-----	Slight-----	Moderate: frost action.
211----- Redola	Severe: cutbanks cave.	Slight-----	Moderate: slope.	Moderate: frost action.
212*. Riverwash				
213*: Rock outcrop.  Dubakella-----	Severe: depth to rock, slope.	Severe: slope.	Severe: slope.	Severe: slope.
214*: Rock outcrop.  Louie-----	Severe: cutbanks cave.	Moderate: large stones.	Moderate: slope, large stones.	Moderate: large stones.
215*: Rock outcrop.  Terwilliger-----	Severe: slope.	Severe: shrink-swell, slope.	Severe: shrink-swell, slope.	Severe: low strength, slope, shrink-swell.
216*. Rock outcrop				

See footnote at end of table.

TABLE 13.--BUILDING SITE DEVELOPMENT--Continued

Soil name and map symbol	Shallow excavations	Dwellings without basements	Small commercial buildings	Local roads and streets
217, 218----- Salisbury	Severe: cemented pan.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.
219, 220, 221----- Salisbury	Severe: cemented pan.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: shrink-swell.
222----- Settlemeier	Severe: wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: low strength, wetness, floods.
223----- Settlemeier	Severe: wetness.	Severe: floods.	Severe: floods.	Severe: low strength, floods.
224----- Settlemeier Variant	Severe: wetness.	Severe: floods, wetness, shrink-swell.	Severe: floods, wetness, shrink-swell.	Severe: low strength, wetness, floods.
225----- Sheld	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
226*, 227*: Sheld-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
Iller-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
228----- Snell	Severe: depth to rock, slope.	Severe: shrink-swell, slope.	Severe: shrink-swell, slope.	Severe: slope, shrink-swell.
229, 230----- Stoner	Slight-----	Slight-----	Slight-----	Slight.
231----- Stoner	Moderate: slope.	Moderate: slope.	Severe: slope.	Moderate: slope.
232----- Terwilliger	Moderate: depth to rock, too clayey.	Severe: shrink-swell.	Severe: shrink-swell.	Severe: low strength, shrink-swell.
233----- Terwilliger	Moderate: depth to rock, too clayey, slope.	Severe: shrink-swell.	Severe: shrink-swell, slope.	Severe: low strength, shrink-swell.
234, 235----- Terwilliger	Severe: slope.	Severe: shrink-swell, slope.	Severe: shrink-swell, slope.	Severe: low strength, slope, shrink-swell.
236----- Uhlig Variant	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.
237*: Weitchpec Variant	Severe: depth to rock, slope.	Severe: slope, depth to rock.	Severe: slope, depth to rock.	Severe: depth to rock, slope.
Rock outcrop.				
238*. Xerofluvents				

\* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 14.--SANITARY FACILITIES

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," "good," "fair," and other terms. Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
101----- Asta	Moderate: percs slowly, slope.	Severe: seepage, slope.	Moderate: slope.	Severe: seepage.	Fair: small stones, slope.
102----- Asta	Severe: slope.	Severe: seepage, slope.	Severe: slope.	Severe: seepage, slope.	Poor: slope.
103----- Asta	Severe: slope.	Severe: large stones, slope.	Severe: slope, large stones.	Severe: seepage, slope.	Poor: large stones, slope.
104----- Atter	Severe: poor filter.	Severe: seepage, floods.	Severe: seepage, too sandy, large stones.	Severe: seepage.	Poor: seepage, too sandy, large stones.
105----- Atter	Severe: poor filter, large stones.	Severe: seepage, floods, large stones.	Severe: seepage, too sandy, large stones.	Severe: seepage.	Poor: seepage, too sandy, large stones.
106----- Atter	Severe: poor filter, slope.	Severe: seepage, slope, large stones.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, large stones.
107*, 108*: Avis-----	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, small stones.
Oosen-----	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, slope.
109*: Avis-----	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, small stones.
Lava flows.					
110, 111----- Bogus	Severe: percs slowly, slope.	Severe: slope.	Severe: slope, too clayey.	Severe: slope.	Poor: too clayey, hard to pack, slope.
112, 113, 114----- Bonnet	Severe: poor filter.	Severe: seepage.	Severe: seepage.	Severe: seepage.	Poor: small stones.
115----- Boomer	Severe: percs slowly, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Poor: slope.
116*: Boomer-----	Severe: percs slowly, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Poor: slope.

See footnote at end of table.

TABLE 14.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
116*: Neuns-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: area reclaim, small stones, slope.
117----- Boomer Variant	Severe: slope.	Severe: seepage, slope.	Severe: slope.	Severe: seepage, slope.	Poor: slope.
118----- Boomer Variant	Severe: slope.	Severe: seepage, slope, large stones.	Severe: slope, large stones.	Severe: seepage, slope.	Poor: large stones, slope.
119*, 120*, 121*: Chaix-----	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: area reclaim, small stones, slope.
Chawanakee-----	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, seepage, slope.	Poor: area reclaim, small stones, slope.
122, 123, 124----- Copsey	Severe: wetness, percs slowly.	Severe: wetness.	Severe: wetness, too clayey.	Severe: wetness.	Poor: too clayey, hard to pack, small stones.
125----- Deetz	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
126, 127----- Deetz	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy, small stones.
128----- Deetz	Severe: poor filter, slope.	Severe: seepage, slope.	Severe: seepage, slope, too sandy.	Severe: seepage, slope.	Poor: seepage, too sandy, small stones.
129, 130----- Delaney	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
131----- Delaney	Severe: poor filter.	Severe: seepage, slope.	Severe: depth to rock, seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
132, 133----- Delaney	Severe: poor filter.	Severe: seepage.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
134----- Delaney Variant	Severe: floods, poor filter.	Severe: seepage, floods.	Severe: floods, seepage.	Severe: floods, seepage.	Fair: thin layer.
135*: Deven-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: area reclaim, too clayey, hard to pack.

See footnote at end of table.

TABLE 14.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
135*: Rubble land.					
136----- Diyou	Severe: floods, wetness, percs slowly.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Fair: too clayey, wetness.
137----- Diyou	Severe: wetness, percs slowly.	Severe: wetness, floods.	Severe: wetness.	Severe: wetness.	Fair: too clayey, wetness.
138----- Diyou	Severe: wetness, percs slowly, poor filter.	Severe: seepage, floods, excess humus.	Severe: seepage, wetness.	Severe: wetness.	Fair: too clayey, wetness, thin layer.
139, 140----- Dotta	Severe: percs slowly.	Severe: seepage.	Severe: seepage.	Slight-----	Fair: too clayey.
141, 142----- Dotta	Severe: percs slowly.	Severe: seepage.	Severe: seepage.	Slight-----	Poor: small stones.
143*, 144*: Dubakella-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: area reclaim, too clayey, small stones.
Ipish-----	Severe: percs slowly, slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: small stones, slope.
145*. Dumps					
146, 147----- Duzel	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim, small stones.
148*: Duzel-----	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: area reclaim, small stones, slope.
Jilson-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: area reclaim, small stones, slope.
Facey-----	Severe: percs slowly, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Poor: slope.
149----- Esro	Severe: floods, wetness, percs slowly.	Severe: floods, wetness.	Severe: floods, wetness.	Severe: floods, wetness.	Poor: wetness.
150----- Esro	Severe: wetness, percs slowly.	Severe: floods, wetness.	Severe: wetness.	Severe: wetness.	Fair: wetness.
151----- Etsel	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: area reclaim, slope.

See footnote at end of table.

TABLE 14.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
152----- Facey	Severe: percs slowly.	Severe: slope.	Severe: depth to rock.	Moderate: depth to rock, slope.	Fair: area reclaim, too clayey, slope.
153----- Gazelle	Severe: floods, cemented pan, wetness.	Severe: seepage, cemented pan, floods.	Severe: floods, wetness.	Severe: floods, cemented pan, wetness.	Poor: area reclaim, wetness.
154----- Gazelle Variant	Severe: floods, cemented pan, wetness.	Severe: cemented pan, floods, wetness.	Severe: floods, wetness.	Severe: floods, cemented pan, wetness.	Poor: area reclaim, wetness.
155----- Hilt	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock, seepage.	Poor: area reclaim.
156, 157----- Hilt	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, seepage, slope.	Poor: area reclaim, slope.
158*: Hilt-----  Rock outcrop.	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, seepage, slope.	Poor: area reclaim, slope.
159----- Jenny	Severe: percs slowly.	Slight-----	Severe: too clayey.	Slight-----	Poor: too clayey, hard to pack.
160----- Jenny	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey, hard to pack.
161----- Jenny	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Slight-----	Poor: too clayey, hard to pack.
162----- Jilson	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: area reclaim, small stones, slope.
163*: Jilson-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: area reclaim, small stones, slope.
Duzel-----	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: area reclaim, small stones, slope.
164*, 165*: Kindig-----	Severe: slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Poor: small stones, slope.

See footnote at end of table.

TABLE 14.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
164*, 165*: Neuns-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: area reclaim, small stones, slope.
166----- Kinkel	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Poor: small stones.
167----- Kuck	Severe: depth to rock, percs slowly.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim, small stones.
168----- Kuck	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim, small stones.
169----- Lassen	Severe: depth to rock, percs slowly.	Severe: depth to rock.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: area reclaim, too clayey, hard to pack.
170, 171----- Lassen	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: area reclaim, too clayey, hard to pack.
172*, 173*: Lassen-----	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: area reclaim, too clayey, hard to pack.
Kuck-----	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: area reclaim, small stones, slope.
174*: Lassen-----	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: area reclaim, too clayey, hard to pack.
Rock outcrop.					
Kuck-----	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: area reclaim, small stones, slope.
175*. Lava flows					
176*: Lava flows.					
Xerorthents.					
177*: Lithic Haploxerolls.					
Rock outcrop.					
178*: Lithic Xerorthents.					

See footnote at end of table.

TABLE 14.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
178*: Rock outcrop.					
179, 180----- Louie	Severe: cemented pan, percs slowly, poor filter.	Severe: seepage, cemented pan.	Severe: seepage, too sandy.	Severe: cemented pan, seepage.	Poor: area reclaim, seepage, too sandy.
181----- Louie	Severe: cemented pan, percs slowly, poor filter.	Severe: seepage, cemented pan.	Severe: seepage, too sandy, large stones.	Severe: cemented pan, seepage.	Poor: area reclaim, seepage, too sandy.
182----- Louie Variant	Severe: cemented pan, percs slowly.	Severe: seepage, cemented pan.	Severe: cemented pan, seepage.	Severe: cemented pan, seepage.	Poor: area reclaim.
183*: Marpa-----	Severe: depth to rock.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim, small stones.
Kinkel-----	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Poor: small stones.
Boomer-----	Severe: percs slowly.	Severe: slope.	Severe: depth to rock.	Moderate: depth to rock, slope.	Fair: area reclaim, too clayey, slope.
184*: Marpa-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: area reclaim, small stones, slope.
Kinkel-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: small stones, slope.
Boomer-----	Severe: percs slowly, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Poor: slope.
185----- Mary	Severe: depth to rock, percs slowly.	Severe: depth to rock.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim.
186----- Mary	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock.	Severe: depth to rock.	Poor: area reclaim.
187----- Mary	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: area reclaim, slope.
188*: Mary-----	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: area reclaim, slope.
Rock outcrop.					
189----- Medford	Severe: percs slowly.	Slight-----	Severe: too clayey.	Slight-----	Poor: too clayey.

See footnote at end of table.

TABLE 14.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
190----- Medford	Severe: percs slowly.	Moderate: slope.	Severe: too clayey.	Slight-----	Poor: too clayey.
191----- Medford	Severe: percs slowly.	Severe: slope.	Severe: too clayey.	Moderate: slope.	Poor: too clayey.
192, 193, 194----- Montague	Severe: depth to rock, cemented pan.	Severe: depth to rock, cemented pan.	Severe: depth to rock, cemented pan, too clayey.	Severe: depth to rock, cemented pan.	Poor: area reclaim, too clayey, hard to pack.
195----- Montague Variant	Severe: depth to rock, cemented pan.	Severe: depth to rock, cemented pan.	Severe: depth to rock, cemented pan, too clayey.	Severe: depth to rock, cemented pan.	Poor: area reclaim, too clayey, hard to pack.
196*, 197*: Neer-----	Severe: depth to rock, poor filter, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: area reclaim, small stones, slope.
Ponto-----	Severe: slope.	Severe: slope.	Severe: slope.	Severe: slope.	Poor: slope.
198----- Odas	Severe: wetness.	Severe: seepage, floods, wetness.	Severe: seepage, wetness.	Severe: seepage, wetness.	Fair: small stones, wetness.
199----- Oosen	Severe: poor filter.	Severe: seepage, slope.	Severe: seepage, too sandy.	Severe: seepage.	Poor: seepage, too sandy.
200----- Orset	Severe: percs slowly.	Moderate: seepage, slope.	Slight-----	Slight-----	Fair: small stones.
201----- Pinehurst	Severe: percs slowly.	Severe: slope.	Severe: depth to rock.	Moderate: depth to rock, slope.	Poor: small stones.
202, 203----- Pinehurst	Severe: percs slowly, slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Poor: small stones, slope.
204----- Pinehurst Variant	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope, large stones.	Severe: depth to rock, large stones.	Severe: depth to rock.	Poor: area reclaim, small stones.
205----- Pinehurst Variant	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope, large stones.	Severe: depth to rock, slope, large stones.	Severe: depth to rock, slope.	Poor: area reclaim, small stones, slope.
206----- Pit	Severe: floods, wetness, percs slowly.	Severe: floods, wetness.	Severe: floods, wetness, too clayey.	Severe: floods, wetness.	Poor: too clayey, hard to pack.
207*: Plutos-----	Severe: depth to rock, slope.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage, slope.	Severe: depth to rock, seepage, slope.	Poor: area reclaim, too sandy, slope.
Rock outcrop.					

See footnote at end of table.

TABLE 14.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
208----- Ponto	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: small stones, slope.
209*: Ponto-----	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Fair: small stones, slope.
Neer-----	Severe: depth to rock, poor filter.	Severe: seepage, depth to rock, slope.	Severe: depth to rock, seepage.	Severe: depth to rock, seepage.	Poor: area reclaim, small stones.
210----- Redola	Moderate: percs slowly.	Moderate: seepage.	Moderate: too clayey.	Slight-----	Fair: too clayey, thin layer.
211----- Redola	Moderate: percs slowly.	Moderate: seepage, slope.	Moderate: too clayey.	Slight-----	Fair: too clayey, thin layer.
212*. Riverwash					
213*: Rock outcrop. Dubakella-----	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: area reclaim, too clayey, small stones.
214*: Rock outcrop. Louie-----	Severe: cemented pan, percs slowly, poor filter.	Severe: seepage, cemented pan, slope.	Severe: seepage, too sandy, large stones.	Severe: cemented pan, seepage.	Poor: area reclaim, seepage, too sandy.
215*: Rock outcrop. Terwilliger-----	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: area reclaim, too clayey, hard to pack.
216*. Rock outcrop					
217, 218, 219----- Salisbury	Severe: cemented pan.	Severe: cemented pan.	Severe: cemented pan, too clayey.	Severe: cemented pan.	Poor: area reclaim, too clayey, hard to pack.
220----- Salisbury	Severe: cemented pan.	Severe: cemented pan, slope.	Severe: cemented pan, too clayey.	Severe: cemented pan.	Poor: area reclaim, too clayey, hard to pack.
221----- Salisbury	Severe: cemented pan.	Severe: cemented pan.	Severe: cemented pan, too clayey.	Severe: cemented pan.	Poor: area reclaim, too clayey, hard to pack.

See footnote at end of table.

TABLE 14.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
222----- Settlemeier	Severe: floods, wetness, percs slowly.	Severe: floods, wetness.	Severe: floods, wetness, too clayey.	Severe: floods, wetness.	Poor: too clayey, wetness.
223----- Settlemeier	Severe: floods, wetness, percs slowly.	Severe: floods, wetness.	Severe: floods, wetness, too clayey.	Severe: floods, wetness.	Poor: too clayey.
224----- Settlemeier Variant	Severe: floods, wetness, percs slowly.	Severe: floods, wetness.	Severe: floods, wetness, too clayey.	Severe: floods, wetness.	Poor: too clayey, wetness.
225----- Sheld	Severe: slope.	Severe: seepage, slope.	Severe: depth to rock, slope.	Severe: seepage, slope.	Poor: small stones, slope.
226*, 227*: Sheld-----	Severe: slope.	Severe: seepage, slope.	Severe: depth to rock, slope.	Severe: seepage, slope.	Poor: small stones, slope.
Iller-----	Severe: slope.	Severe: seepage, slope.	Severe: slope, large stones.	Severe: seepage, slope.	Poor: large stones, slope.
228----- Snell	Severe: depth to rock, slope.	Severe: depth to rock, slope, large stones.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: area reclaim, too clayey, small stones.
229----- Stoner	Moderate: percs slowly.	Moderate: seepage.	Slight-----	Slight-----	Poor: small stones.
230----- Stoner	Moderate: percs slowly.	Moderate: seepage, slope.	Slight-----	Slight-----	Poor: small stones.
231----- Stoner	Moderate: percs slowly, slope.	Severe: slope.	Moderate: slope.	Moderate: slope.	Poor: small stones.
232----- Terwilliger	Severe: depth to rock, percs slowly.	Severe: depth to rock.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: area reclaim, too clayey, hard to pack.
233----- Terwilliger	Severe: depth to rock, percs slowly.	Severe: depth to rock, slope.	Severe: depth to rock, too clayey.	Severe: depth to rock.	Poor: area reclaim, too clayey, hard to pack.
234, 235----- Terwilliger	Severe: depth to rock, percs slowly, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope, too clayey.	Severe: depth to rock, slope.	Poor: area reclaim, too clayey, hard to pack.
236----- Uhlig Variant	Severe: slope.	Severe: slope.	Severe: depth to rock, slope.	Severe: slope.	Poor: large stones, slope.
237*: Weitchpec Variant--	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Severe: depth to rock, slope.	Poor: area reclaim, small stones, slope.

See footnote at end of table.

TABLE 14.--SANITARY FACILITIES--Continued

Soil name and map symbol	Septic tank absorption fields	Sewage lagoon areas	Trench sanitary landfill	Area sanitary landfill	Daily cover for landfill
237*: Rock outcrop.					
238*. Xerofluvents					

\* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 15.--CONSTRUCTION MATERIALS

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "good," "fair," "poor," "probable," and "improbable." Absence of an entry indicates that the soil was not rated]

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
101----- Asta	Good-----	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
102----- Asta	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
103----- Asta	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones, area reclaim, slope.
104----- Atter	Fair: large stones.	Improbable: large stones.	Improbable: large stones.	Poor: area reclaim, small stones.
105----- Atter	Poor: large stones.	Improbable: large stones.	Improbable: large stones.	Poor: large stones, area reclaim.
106----- Atter	Fair: large stones, slope.	Probable-----	Probable-----	Poor: large stones, area reclaim, slope.
107*: Avis-----	Fair: large stones, slope.	Probable-----	Probable-----	Poor: small stones, area reclaim, slope.
Oosen-----	Fair: slope.	Probable-----	Improbable: too sandy.	Poor: small stones, slope.
108*: Avis-----	Poor: slope.	Probable-----	Probable-----	Poor: small stones, area reclaim, slope.
Oosen-----	Poor: slope.	Probable-----	Improbable: too sandy.	Poor: small stones, slope.
109*: Avis-----	Fair: large stones, slope.	Probable-----	Probable-----	Poor: small stones, area reclaim, slope.
Lava flows.				
110, 111----- Bogus	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
112, 113, 114----- Bonnet	Good-----	Improbable: small stones.	Probable-----	Poor: small stones, area reclaim.

See footnote at end of table.

TABLE 15.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
115----- Boomer	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
116*: Boomer-----	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Neuns-----	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
117----- Boomer Variant	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
118----- Boomer Variant	Fair: large stones, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones, area reclaim, slope.
119*: Chaix-----	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Chawanakee-----	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.
120*, 121*: Chaix-----	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Chawanakee-----	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.
122, 123, 124----- Copsey	Poor: low strength, wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, area reclaim.
125, 126----- Deetz	Good-----	Probable-----	Probable-----	Poor: small stones, area reclaim.
127----- Deetz	Fair: large stones.	Probable-----	Probable-----	Poor: small stones, area reclaim.
128----- Deetz	Fair: large stones, slope.	Probable-----	Probable-----	Poor: small stones, area reclaim, slope.
129----- Delaney	Good-----	Probable-----	Improbable: too sandy.	Poor: too sandy, small stones.
130----- Delaney	Good-----	Probable-----	Probable-----	Poor: too sandy, small stones, area reclaim.

See footnote at end of table.

TABLE 15.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
131----- Delaney	Fair: area reclaim, thin layer.	Improbable: thin layer.	Improbable: too sandy.	Poor: too sandy, small stones.
132, 133----- Delaney	Good-----	Probable-----	Improbable: too sandy.	Poor: small stones.
134----- Delaney Variant	Good-----	Probable-----	Improbable: too sandy.	Fair: small stones.
135*: Deven-----  Rubble land.	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.
136----- Diyou	Fair: wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
137----- Diyou	Fair: shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
138----- Diyou	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
139, 140----- Dotta	Good-----	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
141, 142----- Dotta	Good-----	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
143*: Dubakella-----	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Ipish-----	Fair: slope, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
144*: Dubakella-----	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Ipish-----	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
145*. Dumps				
146, 147----- Duzel	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
148*: Duzel-----	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.

See footnote at end of table.

TABLE 15.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
148*: Jilson-----	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.
Facey-----	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
149----- Esro	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
150----- Esro	Fair: wetness, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Good.
151----- Etsel	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.
152----- Facey	Fair: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, area reclaim, slope.
153----- Gazelle	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
154----- Gazelle Variant	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, wetness.
155----- Hilt	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, small stones, slope.
156----- Hilt	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
157----- Hilt	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
158*: Hilt-----	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Rock outcrop.				
159, 160----- Jenny	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
161----- Jenny	Poor: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones.
162----- Jilson	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.

See footnote at end of table.

TABLE 15.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
163*: Jilson-----	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.
Duzel-----	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
164*, 165*: Kindig-----	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Neuns-----	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
166----- Kinkel	Good-----	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
167, 168----- Kuck	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
169, 170----- Lassen	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones.
171----- Lassen	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones.
172*: Lassen-----	Poor: area reclaim, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, small stones, slope.
Kuck-----	Poor: area reclaim, slope, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
173*: Lassen-----	Poor: area reclaim, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones, slope.
Kuck-----	Poor: area reclaim, slope, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
174*: Lassen-----	Poor: area reclaim, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones, slope.
Rock outcrop.				

See footnote at end of table.

TABLE 15.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
174*: Kuck-----	Poor: area reclaim, slope, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
175*. Lava flows				
176*: Lava flows.  Xerorthents.				
177*: Lithic Haploxerolls.  Rock outcrop.				
178*: Lithic Xerorthents.  Rock outcrop.				
179, 180----- Louie	Good-----	Probable-----	Probable-----	Poor: small stones, area reclaim.
181----- Louie	Fair: large stones.	Probable-----	Probable-----	Poor: small stones, area reclaim.
182----- Louie Variant	Fair: thin layer, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, too clayey, thin layer.
183*: Marpa-----	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
Kinkel-----	Good-----	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
Boomer-----	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
184*: Marpa-----	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Kinkel-----	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Boomer-----	Poor: low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
185----- Mary	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, small stones.

See footnote at end of table.

TABLE 15.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
186----- Mary	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: area reclaim, small stones, slope.
187----- Mary	Poor: area reclaim, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
188*: Mary-----	Poor: area reclaim, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Rock outcrop.				
189, 190, 191----- Medford	Fair: low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
192, 193----- Montague	Poor: area reclaim, low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
194----- Montague	Poor: area reclaim, low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey, large stones.
195----- Montague Variant	Poor: area reclaim, low strength, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, too clayey.
196*: Neer-----	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Ponto-----	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
197*: Neer-----	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
Ponto-----	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: slope.
198----- Odas	Fair: wetness.	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones.
199----- Oosen	Good-----	Probable-----	Improbable: too sandy.	Poor: small stones.
200----- Orset	Good-----	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
201----- Pinehurst	Fair: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.

See footnote at end of table.

TABLE 15.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
202----- Pinehurst	Fair: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
203----- Pinehurst	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
204----- Pinehurst Variant	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
205----- Pinehurst Variant	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
206----- Pit	Fair: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: too clayey.
207*: Plutos-----  Rock outcrop.	Poor: area reclaim.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
208----- Ponto	Good-----	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, slope.
209*: Ponto-----  Neer-----	Good-----  Poor: area reclaim.	Improbable: excess fines.  Improbable: excess fines.	Improbable: excess fines.  Improbable: excess fines.	Fair: small stones, slope.  Poor: small stones.
210, 211----- Redola	Good-----	Improbable: excess fines.	Improbable: excess fines.	Fair: small stones, area reclaim.
212*. Riverwash				
213*: Rock outcrop.  Dubakella-----	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
214*: Rock outcrop.  Louie-----	Fair: large stones.	Probable-----	Probable-----	Poor: small stones, area reclaim.
215*: Rock outcrop.  Terwilliger-----	Poor: area reclaim, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.

See footnote at end of table.

TABLE 15.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
216*. Rock outcrop				
217, 218----- Salisbury	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
219, 220, 221----- Salisbury	Poor: area reclaim, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
222----- Settlemeier	Poor: low strength, wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: wetness.
223----- Settlemeier	Poor: low strength.	Improbable: excess fines.	Improbable: excess fines.	Fair: thin layer.
224----- Settlemeier Variant	Poor: wetness.	Improbable: excess fines.	Improbable: excess fines.	Poor: thin layer, wetness.
225----- Sheld	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
226*: Sheld-----	Fair: area reclaim, thin layer, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Iller-----	Fair: large stones, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones, area reclaim, slope.
227*: Sheld-----	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim, slope.
Iller-----	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones, area reclaim, slope.
228----- Snell	Poor: area reclaim, shrink-swell.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.
229, 230, 231----- Stoner	Good-----	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, area reclaim.
232, 233----- Terwilliger	Poor: area reclaim, low strength.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones.
234, 235----- Terwilliger	Poor: area reclaim, low strength, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: small stones, slope.

See footnote at end of table.

TABLE 15.--CONSTRUCTION MATERIALS--Continued

Soil name and map symbol	Roadfill	Sand	Gravel	Topsoil
236----- Uhlig Variant	Poor: slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: large stones, area reclaim, slope.
237*: Weitchpec Variant----	Poor: area reclaim, slope.	Improbable: excess fines.	Improbable: excess fines.	Poor: area reclaim, small stones, slope.
Rock outcrop.				
238*. Xerofluvents				

\* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 16.--WATER MANAGEMENT

[Some terms that describe restrictive soil features are defined in the Glossary. See text for definitions of "slight," "moderate," and "severe." Absence of an entry indicates that the soil was not evaluated]

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
101, 102----- Asta	Severe: slope.	Severe: piping.	Deep to water	Soil blowing, slope.	Slope, soil blowing.	Slope.
103----- Asta	Severe: slope.	Severe: piping, large stones.	Deep to water	Large stones, soil blowing, slope.	Large stones, slope.	Large stones, slope.
104, 105----- Atter	Severe: seepage.	Severe: seepage, large stones.	Deep to water	Large stones, droughty.	Large stones, too sandy.	Large stones, droughty.
106----- Atter	Severe: seepage, slope.	Severe: seepage, large stones.	Deep to water	Large stones, droughty, fast intake.	Slope, large stones, too sandy.	Large stones, slope, droughty.
107*, 108*: Avis-----	Severe: seepage, slope.	Severe: seepage.	Deep to water	Large stones, droughty, slope.	Slope, large stones, too sandy.	Large stones, slope, droughty.
Oosen-----	Severe: seepage, slope.	Severe: seepage, piping.	Deep to water	Droughty, fast intake, slope.	Slope, too sandy.	Slope, droughty.
109*: Avis-----	Severe: seepage, slope.	Severe: seepage.	Deep to water	Large stones, droughty, slope.	Slope, large stones, too sandy.	Large stones, slope, droughty.
Lava flows.						
110, 111----- Bogus	Severe: slope.	Moderate: hard to pack.	Deep to water	Percs slowly, slope.	Slope, percs slowly.	Slope, percs slowly.
112, 113----- Bonnet	Severe: seepage.	Severe: seepage.	Deep to water	Droughty-----	Favorable-----	Droughty.
114----- Bonnet	Severe: seepage.	Severe: seepage.	Deep to water	Droughty, slope.	Favorable-----	Droughty.
115----- Boomer	Severe: slope.	Moderate: thin layer, piping.	Deep to water	Slope-----	Slope-----	Slope.
116*: Boomer-----	Severe: slope.	Moderate: thin layer, piping.	Deep to water	Slope-----	Slope-----	Slope.
Neuns-----	Severe: slope.	Severe: seepage.	Deep to water	Droughty, depth to rock, slope.	Slope, depth to rock.	Slope, droughty, depth to rock.
117----- Boomer Variant	Severe: seepage, slope.	Severe: piping.	Deep to water	Slope-----	Slope-----	Slope.
118----- Boomer Variant	Severe: seepage, slope.	Severe: piping, large stones.	Deep to water	Large stones, droughty, slope.	Slope, large stones.	Large stones, slope, droughty.
119*, 120*, 121*: Chaix-----	Severe: seepage, slope.	Severe: seepage.	Deep to water	Droughty, depth to rock, slope.	Slope, depth to rock.	Slope, droughty, depth to rock.

See footnote at end of table.

TABLE 16.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
119*, 120*, 121*: Chawanakee-----	Severe: depth to rock, slope.	Severe: thin layer, seepage.	Deep to water	Droughty, depth to rock, slope.	Slope, depth to rock.	Slope, droughty, depth to rock.
122, 123----- Copsey	Moderate: slope.	Severe: wetness.	Percs slowly, slope.	Wetness, slow intake, percs slowly.	Wetness, percs slowly.	Wetness, percs slowly.
124----- Copsey	Moderate: slope.	Severe: wetness.	Percs slowly, large stones, slope.	Large stones, wetness, droughty.	Large stones, wetness.	Large stones, wetness.
125----- Deetz	Severe: seepage.	Severe: seepage.	Deep to water	Droughty, fast intake.	Too sandy-----	Droughty.
126----- Deetz	Severe: seepage, slope.	Severe: seepage.	Deep to water	Droughty, fast intake, slope.	Slope, too sandy.	Slope, droughty.
127, 128----- Deetz	Severe: seepage, slope.	Severe: seepage.	Deep to water	Large stones, droughty, fast intake.	Slope, large stones, too sandy.	Large stones, slope, droughty.
129, 130, 131----- Delaney	Severe: seepage.	Severe: seepage.	Deep to water	Droughty, fast intake, soil blowing.	Too sandy, soil blowing.	Droughty.
132, 133----- Delaney	Severe: seepage.	Severe: seepage.	Deep to water	Droughty, soil blowing.	Too sandy, soil blowing.	Droughty.
134----- Delaney Variant	Severe: seepage.	Severe: piping.	Deep to water	Droughty, erodes easily, floods.	Erodes easily	Erodes easily, droughty.
135*: Deven-----	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Percs slowly, depth to rock, slope.	Slope, depth to rock, percs slowly.	Slope, depth to rock, percs slowly.
Rubble land.						
136----- Diyou	Slight-----	Severe: piping.	Floods-----	Wetness, floods.	Wetness-----	Favorable.
137----- Diyou	Slight-----	Severe: piping.	Deep to water	Favorable-----	Favorable-----	Favorable.
138----- Diyou	Moderate: seepage.	Severe: piping.	Favorable-----	Wetness, erodes easily.	Erodes easily, wetness.	Erodes easily.
139----- Dotta	Moderate: seepage.	Severe: thin layer.	Deep to water	Favorable-----	Erodes easily	Erodes easily.
140----- Dotta	Moderate: seepage, slope.	Severe: thin layer.	Deep to water	Slope-----	Erodes easily	Erodes easily.
141----- Dotta	Moderate: seepage.	Severe: thin layer.	Deep to water	Droughty-----	Favorable-----	Droughty.
142----- Dotta	Moderate: seepage, slope.	Severe: thin layer.	Deep to water	Droughty, slope.	Favorable-----	Droughty.

See footnote at end of table.

TABLE 16.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
143*, 144*: Dubakella-----	Severe: slope.	Severe: thin layer.	Deep to water	Large stones, droughty, percs slowly.	Slope, large stones, depth to rock.	Large stones, slope, droughty.
Ipish-----	Severe: slope.	Slight-----	Deep to water	Slope-----	Slope-----	Slope.
145*. Dumps						
146----- Duzel	Moderate: depth to rock, slope.	Moderate: thin layer.	Deep to water	Droughty, depth to rock, slope.	Depth to rock	Droughty, depth to rock.
147----- Duzel	Severe: slope.	Moderate: thin layer.	Deep to water	Droughty, depth to rock, slope.	Slope, depth to rock.	Slope, droughty, depth to rock.
148*: Duzel-----	Severe: slope.	Moderate: thin layer.	Deep to water	Droughty, depth to rock, slope.	Slope, depth to rock.	Slope, droughty, depth to rock.
Jilson-----	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Depth to rock, slope.	Slope, depth to rock.	Slope, depth to rock.
Facey-----	Severe: slope.	Moderate: thin layer, piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
149----- Esro	Moderate: seepage.	Severe: piping, wetness.	Floods, frost action.	Wetness, erodes easily, floods.	Erodes easily, wetness.	Wetness, erodes easily.
150----- Esro	Moderate: seepage.	Severe: piping.	Frost action---	Wetness, erodes easily.	Erodes easily, wetness.	Erodes easily.
151----- Etsel	Severe: depth to rock, slope.	Slight-----	Deep to water	Droughty, depth to rock, slope.	Slope, depth to rock.	Slope, droughty, depth to rock.
152----- Facey	Severe: slope.	Moderate: thin layer, piping.	Deep to water	Slope, erodes easily.	Slope, erodes easily.	Slope, erodes easily.
153----- Gazelle	Severe: seepage.	Severe: piping, wetness.	Cemented pan, floods, cutbanks cave.	Wetness, cemented pan, erodes easily.	Cemented pan, erodes easily, wetness.	Wetness, excess salt, erodes easily.
154----- Gazelle Variant	Severe: cemented pan.	Severe: piping, wetness.	Cemented pan, floods.	Wetness, cemented pan, floods.	Cemented pan, erodes easily, wetness.	Wetness, excess salt, erodes easily.
155, 156----- Hilt	Severe: slope.	Severe: thin layer.	Deep to water	Depth to rock, slope.	Slope, depth to rock.	Slope, depth to rock.
157----- Hilt	Severe: slope.	Severe: thin layer.	Deep to water	Depth to rock, slope.	Slope, large stones, depth to rock.	Large stones, slope, depth to rock.
158*: Hilt-----	Severe: slope.	Severe: thin layer.	Deep to water	Depth to rock, slope.	Slope, large stones, depth to rock.	Large stones, slope, depth to rock.
Rock outcrop.						

See footnote at end of table.

TABLE 16.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
159----- Jenny	Slight-----	Moderate: hard to pack.	Deep to water	Slow intake, percs slowly.	Percs slowly---	Percs slowly.
160----- Jenny	Severe: slope.	Moderate: hard to pack.	Deep to water	Slow intake, percs slowly, slope.	Slope, percs slowly.	Slope, percs slowly.
161----- Jenny	Moderate: slope.	Moderate: hard to pack.	Deep to water	Slow intake, percs slowly, slope.	Percs slowly---	Percs slowly.
162----- Jilson	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Depth to rock, slope.	Slope, depth to rock.	Slope, depth to rock.
163*: Jilson-----	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Depth to rock, slope.	Slope, depth to rock.	Slope, depth to rock.
Duzel-----	Severe: slope.	Moderate: thin layer.	Deep to water	Droughty, depth to rock, slope.	Slope, depth to rock.	Slope, droughty, depth to rock.
164*, 165*: Kindig-----	Severe: slope.	Severe: seepage.	Deep to water	Droughty, slope.	Slope-----	Slope, droughty.
Neuns-----	Severe: slope.	Severe: seepage.	Deep to water	Droughty, depth to rock, slope.	Slope, depth to rock.	Slope, droughty, depth to rock.
166----- Kinkel	Severe: slope.	Moderate: seepage.	Deep to water	Droughty, slope.	Slope-----	Slope, droughty.
167----- Kuck	Moderate: depth to rock, slope.	Moderate: thin layer.	Deep to water	Percs slowly, depth to rock, slope.	Depth to rock, percs slowly.	Depth to rock, percs slowly.
168----- Kuck	Severe: slope.	Moderate: thin layer.	Deep to water	Percs slowly, depth to rock, slope.	Slope, depth to rock, percs slowly.	Slope, depth to rock, percs slowly.
169----- Lassen	Moderate: depth to rock, slope.	Severe: thin layer.	Deep to water	Slow intake, percs slowly, depth to rock.	Depth to rock, percs slowly.	Depth to rock, percs slowly.
170----- Lassen	Severe: slope.	Severe: thin layer.	Deep to water	Slow intake, percs slowly, depth to rock.	Slope, depth to rock, percs slowly.	Slope, depth to rock, percs slowly.
171----- Lassen	Severe: slope.	Severe: thin layer.	Deep to water	Large stones, droughty, slow intake.	Slope, large stones, depth to rock.	Large stones, slope, droughty.
172*: Lassen-----	Severe: slope.	Severe: thin layer.	Deep to water	Slow intake, percs slowly, depth to rock.	Slope, depth to rock, percs slowly.	Slope, depth to rock, percs slowly.
Kuck-----	Severe: slope.	Moderate: thin layer.	Deep to water	Percs slowly, depth to rock, slope.	Slope, depth to rock, percs slowly.	Slope, depth to rock, percs slowly.

See footnote at end of table.

TABLE 16.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
173*: Lassen-----	Severe: slope.	Severe: thin layer.	Deep to water	Large stones, droughty, slow intake.	Slope, large stones, depth to rock.	Large stones, slope, droughty.
Kuck-----	Severe: slope.	Moderate: thin layer, large stones.	Deep to water	Large stones, percs slowly, depth to rock.	Slope, large stones, depth to rock.	Large stones, slope, depth to rock.
174*: Lassen-----	Severe: slope.	Severe: thin layer.	Deep to water	Large stones, droughty, slow intake.	Slope, large stones, depth to rock.	Large stones, slope, droughty.
Rock outcrop.						
Kuck-----	Severe: slope.	Moderate: thin layer, large stones.	Deep to water	Large stones, percs slowly, depth to rock.	Slope, large stones, depth to rock.	Large stones, slope, depth to rock.
175*. Lava flows						
176*: Lava flows.						
Xerorthents.						
177*: Lithic Haploxerolls.						
Rock outcrop.						
178*: Lithic Xerorthents.						
Rock outcrop.						
179----- Louie	Severe: seepage.	Severe: seepage.	Deep to water	Cemented pan---	Large stones, cemented pan.	Large stones.
180----- Louie	Severe: seepage.	Severe: seepage.	Deep to water	Cemented pan, slope.	Large stones, cemented pan.	Large stones.
181----- Louie	Severe: seepage.	Severe: seepage.	Deep to water	Large stones, droughty, cemented pan.	Large stones, cemented pan.	Large stones, droughty.
182----- Louie Variant	Severe: seepage.	Severe: thin layer.	Deep to water	Cemented pan, slope.	Cemented pan, erodes easily.	Erodes easily, cemented pan.
183*, 184*: Marpa-----	Severe: slope.	Severe: thin layer.	Deep to water	Droughty, depth to rock, slope.	Slope, depth to rock.	Slope, droughty, depth to rock.
Kinkel-----	Severe: slope.	Moderate: seepage.	Deep to water	Droughty, slope.	Slope-----	Slope, droughty.
Boomer-----	Severe: slope.	Moderate: thin layer, piping.	Deep to water	Slope-----	Slope-----	Slope.
185----- Mary	Moderate: depth to rock, slope.	Severe: thin layer.	Deep to water	Depth to rock, slope, erodes easily.	Depth to rock, erodes easily.	Erodes easily, depth to rock.

See footnote at end of table.

TABLE 16.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
186----- Mary	Severe: slope.	Severe: thin layer.	Deep to water	Depth to rock, slope, erodes easily.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
187----- Mary	Severe: slope.	Severe: thin layer.	Deep to water	Depth to rock, slope.	Slope, depth to rock.	Slope, depth to rock.
188*: Mary-----  Rock outcrop.	Severe: slope.	Severe: thin layer.	Deep to water	Depth to rock, slope.	Slope, depth to rock.	Slope, depth to rock.
189----- Medford	Slight-----	Slight-----	Deep to water	Favorable-----	Favorable-----	Favorable.
190----- Medford	Moderate: slope.	Slight-----	Deep to water	Slope-----	Favorable-----	Favorable.
191----- Medford	Severe: slope.	Slight-----	Deep to water	Slope-----	Slope-----	Slope.
192----- Montague	Moderate: depth to rock, cemented pan.	Severe: thin layer.	Deep to water	Slow intake, percs slowly, depth to rock.	Depth to rock, cemented pan.	Depth to rock, cemented pan.
193----- Montague	Moderate: depth to rock, cemented pan, slope.	Severe: thin layer.	Deep to water	Slow intake, percs slowly, depth to rock.	Depth to rock, cemented pan.	Depth to rock, cemented pan.
194----- Montague	Moderate: depth to rock, cemented pan, slope.	Severe: large stones.	Deep to water	Large stones, droughty, slow intake.	Large stones, depth to rock.	Large stones, droughty.
195----- Montague Variant	Severe: depth to rock, cemented pan.	Severe: thin layer.	Deep to water	Slow intake, percs slowly, depth to rock.	Depth to rock, cemented pan.	Depth to rock, cemented pan.
196*: Neer-----	Severe: seepage, slope.	Severe: seepage.	Deep to water	Droughty, depth to rock, slope.	Slope, large stones, depth to rock.	Large stones, slope, droughty.
Ponto-----	Severe: slope.	Severe: piping.	Deep to water	Droughty, slope.	Slope-----	Slope, droughty.
197*: Neer-----	Severe: seepage, slope.	Severe: seepage.	Deep to water	Droughty, depth to rock, slope.	Slope, large stones, depth to rock.	Large stones, slope, droughty.
Ponto-----	Severe: slope.	Severe: piping.	Deep to water	Slope-----	Slope-----	Slope.
198----- Odas	Severe: seepage.	Severe: piping, wetness.	Favorable-----	Wetness, droughty.	Wetness-----	Droughty.
199----- Oosen	Severe: seepage, slope.	Severe: seepage, piping.	Deep to water	Droughty, fast intake, slope.	Slope, too sandy.	Slope, droughty.
200----- Orset	Moderate: slope.	Severe: piping.	Deep to water	Droughty, slope.	Favorable-----	Droughty.

See footnote at end of table.

TABLE 16.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
201, 202, 203----- Pinehurst	Severe: slope.	Moderate: thin layer, large stones.	Deep to water	Droughty, slope.	Slope, large stones.	Large stones, slope, droughty.
204----- Pinehurst Variant	Moderate: depth to rock, slope.	Severe: large stones.	Deep to water	Large stones, droughty, depth to rock.	Large stones, depth to rock.	Large stones, droughty.
205----- Pinehurst Variant	Severe: slope.	Severe: large stones.	Deep to water	Large stones, droughty, depth to rock.	Slope, large stones, depth to rock.	Large stones, slope, droughty.
206----- Pit	Slight-----	Moderate: thin layer, hard to pack, wetness.	Percs slowly, floods, frost action.	Wetness, slow intake, percs slowly.	Erodes easily, wetness, percs slowly.	Erodes easily, percs slowly.
207*: Plutos-----  Rock outcrop.	Severe: seepage, slope.	Severe: seepage, piping.	Deep to water	Droughty, fast intake, soil blowing.	Slope, depth to rock, too sandy.	Slope, droughty, depth to rock.
208----- Ponto	Severe: slope.	Severe: piping.	Deep to water	Slope-----	Slope-----	Slope.
209*: Ponto-----	Severe: slope.	Severe: piping.	Deep to water	Slope-----	Slope-----	Slope.
Neer-----	Severe: seepage, slope.	Severe: seepage.	Deep to water	Droughty, depth to rock, slope.	Slope, large stones, depth to rock.	Large stones, slope, droughty.
210----- Redola	Moderate: seepage.	Severe: piping.	Deep to water	Favorable-----	Favorable-----	Favorable.
211----- Redola	Moderate: seepage, slope.	Severe: piping.	Deep to water	Slope-----	Favorable-----	Favorable.
212*. Riverwash						
213*: Rock outcrop.						
Dubakella-----	Severe: slope.	Severe: thin layer.	Deep to water	Large stones, droughty, percs slowly.	Slope, large stones, depth to rock.	Large stones, slope, droughty.
214*: Rock outcrop.						
Louie-----	Severe: seepage.	Severe: seepage.	Deep to water	Large stones, droughty, cemented pan.	Large stones, cemented pan.	Large stones, droughty.
215*: Rock outcrop.						
Terwilliger-----	Severe: slope.	Severe: thin layer.	Deep to water	Percs slowly, depth to rock, slope.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.

See footnote at end of table.

TABLE 16.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--			Features affecting--		
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
216*. Rock outcrop						
217----- Salisbury	Moderate: cemented pan.	Severe: thin layer.	Deep to water	Percs slowly, cemented pan.	Cemented pan---	Cemented pan.
218----- Salisbury	Moderate: cemented pan, slope.	Severe: thin layer.	Deep to water	Percs slowly, cemented pan, slope.	Cemented pan---	Cemented pan.
219----- Salisbury	Moderate: cemented pan.	Severe: thin layer.	Deep to water	Percs slowly, cemented pan.	Cemented pan, percs slowly.	Cemented pan, percs slowly.
220----- Salisbury	Moderate: cemented pan, slope.	Severe: thin layer.	Deep to water	Percs slowly, cemented pan, slope.	Cemented pan, percs slowly.	Cemented pan, percs slowly.
221----- Salisbury	Moderate: cemented pan, slope.	Severe: thin layer.	Deep to water	Percs slowly, cemented pan.	Large stones, cemented pan.	Large stones.
222----- Settlemeier	Moderate: seepage.	Severe: wetness.	Floods-----	Wetness, erodes easily.	Erodes easily, wetness.	Wetness, erodes easily.
223----- Settlemeier	Moderate: seepage, slope.	Moderate: piping, wetness.	Floods, slope.	Wetness, slope, erodes easily.	Erodes easily, wetness.	Erodes easily.
224----- Settlemeier Variant	Slight-----	Severe: wetness.	Percs slowly, floods.	Wetness, percs slowly, erodes easily.	Erodes easily, wetness, percs slowly.	Wetness, erodes easily, percs slowly.
225----- Sheld	Severe: slope.	Severe: seepage.	Deep to water	Droughty, slope.	Slope, large stones.	Large stones, slope, droughty.
226*, 227*: Sheld-----	Severe: slope.	Severe: seepage.	Deep to water	Droughty, slope.	Slope, large stones.	Large stones, slope, droughty.
Iller-----	Severe: seepage, slope.	Severe: piping.	Deep to water	Large stones, droughty, slope.	Slope, large stones.	Large stones, slope, droughty.
228----- Snell	Severe: slope.	Severe: large stones.	Deep to water	Large stones, droughty, depth to rock.	Slope, large stones, depth to rock.	Large stones, slope, droughty.
229----- Stoner	Moderate: seepage.	Moderate: thin layer, seepage, piping.	Deep to water	Droughty-----	Favorable-----	Droughty.
230----- Stoner	Moderate: seepage, slope.	Moderate: thin layer, seepage, piping.	Deep to water	Droughty, slope.	Favorable-----	Droughty.
231----- Stoner	Severe: slope.	Moderate: thin layer, seepage, piping.	Deep to water	Droughty, slope.	Slope-----	Slope, droughty.
232----- Terwilliger	Moderate: depth to rock, slope.	Severe: thin layer.	Deep to water	Percs slowly, depth to rock, slope.	Depth to rock, erodes easily.	Erodes easily, depth to rock.

See footnote at end of table.

TABLE 16.--WATER MANAGEMENT--Continued

Soil name and map symbol	Limitations for--		Features affecting--			
	Pond reservoir areas	Embankments, dikes, and levees	Drainage	Irrigation	Terraces and diversions	Grassed waterways
233, 234, 235----- Terwilliger	Severe: slope.	Severe: thin layer.	Deep to water	Percs slowly, depth to rock, slope.	Slope, depth to rock, erodes easily.	Slope, erodes easily, depth to rock.
236----- Uhlig Variant	Severe: slope.	Severe: piping.	Deep to water	Large stones, slope.	Slope, large stones.	Large stones, slope.
237*: Weitchpec Variant	Severe: depth to rock, slope.	Severe: thin layer.	Deep to water	Depth to rock, slope.	Slope, large stones, depth to rock.	Large stones, slope, depth to rock.
Rock outcrop.						
238*. Xerofluvents						

\* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 17.--ENGINEERING INDEX PROPERTIES

[The symbol < means less than; > means more than. Absence of an entry indicates that data were not estimated]

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
101, 102----- Asta	0-13	Gravelly sandy loam.	SM	A-1, A-2	0-10	75-85	50-75	30-45	15-30	20-25	NP-5
	13-60	Loam, silt loam	ML	A-4	0-10	80-100	75-100	60-100	50-85	25-35	5-10
	60-71	Silt loam, loam, very fine sandy loam.	ML	A-4	0-10	80-100	75-100	60-100	50-85	20-35	NP-10
103----- Asta	0-13	Cobbly sandy loam	SM	A-1, A-2	20-40	70-85	50-75	30-45	15-30	20-25	NP-5
	13-60	Cobbly loam, cobbly silt loam.	ML	A-4	20-40	80-95	75-85	60-80	50-60	25-35	5-10
	60-71	Cobbly silt loam, cobbly loam, cobbly very fine sandy loam.	ML	A-4	20-40	80-95	75-85	60-80	50-60	20-35	NP-10
104----- Atter	0-18	Very gravelly sandy loam.	GM	A-1	0-10	30-55	25-50	20-35	10-20	15-20	NP-5
	18-60	Stratified very cobbly sand to very cobbly loamy sand.	SP-SM, SM	A-1	40-60	60-80	50-75	25-50	5-15	---	NP
105----- Atter	0-18	Very cobbly sandy loam.	SM	A-1, A-2	40-60	60-80	50-75	30-50	15-35	15-20	NP-5
	18-60	Stratified very cobbly sand to very cobbly loamy sand.	SP-SM, SM	A-1	40-60	60-80	50-75	25-50	5-15	---	NP
106----- Atter	0-23	Very bouldery loamy fine sand.	SM	A-1, A-2	30-50	60-80	60-75	30-60	10-25	---	NP
	23-60	Very bouldery loamy sand, very bouldery sand.	SP-SM, SM	A-1	30-50	60-80	50-75	25-50	5-15	---	NP
107*, 108*: Avis-----	0-13	Very stony sandy loam.	SM	A-2, A-4	25-40	80-95	75-95	40-60	30-50	15-20	NP-5
	13-72	Very gravelly loamy sand, very gravelly sand, very gravelly loamy fine sand.	GP-GM, GM	A-1	10-25	40-55	35-50	15-30	5-15	---	NP
Oosen-----	0-12	Loamy sand-----	SM	A-2	0-5	90-100	75-100	50-75	15-30	---	NP
	12-28	Loamy sand, loamy fine sand.	SM	A-2	0-5	90-100	75-100	50-75	15-30	---	NP
	28-75	Sand-----	SM, SP-SM	A-1, A-2, A-3	0-5	90-100	75-100	40-70	5-15	---	NP
109*: Avis-----	0-13	Very stony sandy loam.	SM	A-2, A-4	25-40	80-95	75-95	40-60	30-50	15-20	NP-5
	13-75	Very gravelly loamy sand, very gravelly sand, very gravelly loamy fine sand.	GP-GM, GM	A-1	10-25	40-55	35-50	15-30	5-15	---	NP
Lava flows.											

See footnote at end of table.

TABLE 17.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
110----- Bogus	0-3	Stony loam-----	CL	A-6	10-20	80-100	75-85	60-80	50-70	30-40	10-20
	3-11	Clay loam-----	CL	A-6	0-5	80-100	75-100	60-90	50-85	30-40	10-20
	11-20	Clay loam-----	CL	A-6	5-15	80-95	75-95	60-90	50-85	30-40	10-20
	20-53	Clay loam, clay	CL, CH	A-7	5-15	80-95	75-95	65-95	55-90	40-60	20-35
	53-62	Sandy clay loam, clay loam, sandy clay.	CL, SC	A-6, A-7	0-5	85-95	75-95	60-85	40-60	35-45	15-20
	62	Weathered bedrock	---	---	---	---	---	---	---	---	---
111----- Bogus	0-3	Very stony loam	CL	A-6	20-30	80-100	60-75	60-70	50-65	30-40	10-20
	3-11	Clay loam-----	CL	A-6	0-5	80-100	75-100	60-90	50-85	30-40	10-20
	11-20	Clay loam-----	CL	A-6	5-15	80-95	75-95	60-90	50-85	30-40	10-20
	20-53	Clay loam, clay	CL, CH	A-7	5-15	80-95	75-95	65-95	55-90	40-60	20-35
	53-62	Sandy clay loam, clay loam, sandy clay.	CL, SC	A-6, A-7	0-5	85-95	75-95	60-85	40-60	35-45	15-20
112----- Bonnet	0-14	Loam-----	SM, ML	A-4	0	80-95	75-90	60-80	35-60	20-35	NP-10
	14-46	Very gravelly sandy loam, very gravelly loam.	GM	A-1, A-2	0	30-55	25-50	15-40	10-35	20-35	NP-10
	46-61	Stratified extremely gravelly loamy sand to very gravelly loam.	GP, GP-GM, GM	A-1	0	15-40	10-35	5-25	0-15	---	NP
113, 114----- Bonnet	0-14	Gravelly loam-----	SM, GM	A-2, A-4, A-1	0	55-80	50-75	30-50	20-50	20-35	NP-10
	14-46	Very gravelly sandy loam, very gravelly loam.	GM	A-1, A-2	0	30-55	25-50	15-40	10-35	20-35	NP-10
	46-61	Stratified extremely gravelly loamy sand to very gravelly loam.	GP, GP-GM, GM	A-1	0	15-40	10-35	5-25	0-15	---	NP
115----- Boomer	0-10	Loam-----	CL, CL-ML	A-4, A-6	0-5	85-95	75-95	70-80	50-70	25-40	5-15
	10-53	Sandy clay loam, clay loam, silty clay loam.	CL, SC	A-6, A-7	0-5	85-95	75-95	70-85	45-80	30-50	10-25
	53	Weathered bedrock	---	---	---	---	---	---	---	---	---
116*: Boomer-----	0-10	Loam-----	CL, CL-ML	A-4, A-6	0-5	85-95	75-95	70-80	50-70	25-40	5-15
	10-53	Sandy clay loam, clay loam, silty clay loam.	CL, SC	A-6, A-7	0-5	85-95	75-95	70-85	45-80	30-50	10-25
	53	Weathered bedrock	---	---	---	---	---	---	---	---	---
Neuns-----	0-8	Gravelly loam-----	SM, GM	A-4	0-5	55-80	50-75	40-60	35-50	15-25	NP-5
	8-35	Very gravelly sandy loam, very gravelly loam.	GM	A-1, A-2	0-10	30-55	25-50	20-45	10-35	15-25	NP-5
	35	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
117----- Boomer Variant	0-25	Sandy loam-----	SM	A-4	0-5	80-100	75-100	50-80	35-50	15-20	NP-5
	25-36	Sandy clay loam	CL-ML, CL	A-4, A-6	0-5	80-100	75-100	60-80	50-60	25-35	5-15
	36-50	Loam-----	ML, CL-ML	A-4	0-5	80-100	75-100	60-80	50-60	25-35	5-10
	50-70	Sandy loam-----	SM	A-4	0-5	80-100	75-100	50-80	35-50	15-20	NP-5
	70	Weathered bedrock	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 17.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
118----- Boomer Variant	0-25	Stony sandy loam	SM	A-4	25-45	90-100	80-100	50-80	35-50	15-20	NP-5
	25-36	Stony sandy clay loam.	CL-ML, CL	A-4, A-6	25-45	90-100	80-100	60-80	50-60	25-35	5-15
	36-50	Stony loam-----	ML, CL-ML	A-4	25-45	90-100	80-100	60-80	50-60	25-35	5-10
	50-70	Stony sandy loam	SM	A-4	25-45	90-100	80-100	50-80	35-50	15-20	NP-5
	70	Weathered bedrock	---	---	---	---	---	---	---	---	---
119*, 120*, 121*: Chaix-----	0-4	Gravelly coarse sandy loam.	SM	A-1, A-2	0-5	80-95	50-75	30-50	15-30	---	NP
	4-34	Gravelly coarse sandy loam.	SM	A-1, A-2	0-5	80-95	50-75	30-50	15-30	---	NP
	34	Weathered bedrock	---	---	---	---	---	---	---	---	---
Chawanakee-----	0-16	Gravelly coarse sandy loam.	SM	A-1, A-2	0-5	80-95	50-75	30-50	15-30	---	NP
	16	Weathered bedrock	---	---	---	---	---	---	---	---	---
122----- Copsey	0-18	Clay-----	CH	A-7	0	80-100	75-100	65-100	55-95	50-65	25-35
	18-60	Gravelly clay----	CH	A-7	0-15	60-85	55-75	50-75	50-70	50-65	25-35
123----- Copsey	0-18	Gravelly clay----	CH	A-7	0-5	60-85	55-75	50-75	50-70	50-65	25-35
	18-60	Gravelly clay----	CH	A-7	0-15	60-85	55-75	50-75	50-70	50-65	25-35
124----- Copsey	0-18	Cobbly clay----	CH	A-7	15-30	70-90	60-80	50-75	50-70	50-65	25-35
	18-60	Cobbly clay----	CH	A-7	15-30	70-90	60-80	50-75	50-70	50-65	25-35
125, 126----- Deetz	0-7	Gravelly loamy sand.	SM	A-1, A-2	0-5	60-90	50-75	30-60	10-30	---	NP
	7-38	Stratified gravelly loamy sand to sand.	SM, SP-SM	A-1	0-10	60-90	50-75	25-50	5-25	---	NP
	38-65	Stratified gravelly loamy sand to very gravelly sand.	GP-GM, SP-SM, GM, SM	A-1	5-15	40-60	25-50	15-35	5-15	---	NP
127, 128----- Deetz	0-7	Stony loamy sand	SM	A-1, A-2	15-30	75-90	60-80	30-60	10-30	---	NP
	7-38	Stratified cobbly loamy sand to sand.	SM, SP-SM	A-1	15-30	75-90	60-80	25-50	5-25	---	NP
	38-65	Stratified very cobbly loamy sand to very gravelly sand.	GP-GM, SP-SM, GM, SM	A-1	40-50	40-60	30-50	15-35	5-15	---	NP
129----- Delaney	0-9	Sand-----	SM, SP-SM	A-1, A-2, A-3	0-10	85-100	75-90	40-70	5-30	---	NP
	9-68	Sand, loamy sand	SM, SP-SM	A-1, A-2, A-3	0-10	85-100	75-90	40-70	5-30	---	NP
130----- Delaney	0-9	Gravelly sand----	SM, SP-SM	A-1, A-2, A-3	0-10	80-95	70-85	30-60	5-30	---	NP
	9-44	Gravelly sand, gravelly loamy sand.	SM, SP-SM	A-1, A-2, A-3	0-10	80-95	70-85	30-60	5-30	---	NP
	44-68	Very gravelly sand.	GP, GP-GM	A-1	5-15	30-55	25-50	15-35	0-10	---	NP
131----- Delaney	0-9	Stony sand-----	SP-SM, SM	A-1, A-2	5-15	80-95	75-90	30-50	5-30	---	NP
	9-45	Cobbly sand, stony sand.	SP-SM	A-1	5-15	80-95	75-90	30-50	5-10	---	NP
	45	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 17.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
132, 133-- Delaney	0-9	Sandy loam-----	SM	A-2	0-10	85-100	75-90	40-70	25-35	---	NP
	9-68	Sand, loamy sand	SM, SP-SM	A-1, A-2, A-3	0-10	85-100	75-90	40-70	5-30	---	NP
134-- Delaney Variant	0-7	Silt-----	ML	A-4	0	95-100	90-100	85-100	85-95	25-35	NP-5
	7-14	Loamy fine sand	SM	A-4	0	95-100	85-100	60-85	35-50	---	NP
	14-22	Silt-----	ML	A-4	0	95-100	85-100	80-100	75-95	25-35	NP-5
	22-34	Loamy sand-----	SM	A-2	0	95-100	85-100	50-75	25-35	---	NP
	34-53	Sandy loam-----	SM	A-4	0	95-100	85-100	60-85	35-50	20-25	NP-5
	53-60	Coarse sand-----	SP, SP-SM	A-1	0	95-100	85-100	30-50	0-10	---	NP
135*: Deven	0-5	Loam-----	CL-ML, ML	A-4	0	90-100	80-100	75-90	50-75	25-35	5-10
	5-17	Clay loam, clay	CL, CH	A-7	0-5	80-100	75-100	70-95	60-95	40-55	20-30
	17	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rubble land.											
136-- Diyou	0-11	Loam-----	ML	A-4	0-5	80-100	80-100	80-90	50-75	20-35	NP-10
	11-60	Stratified sandy loam to clay loam.	CL-ML, CL	A-4, A-6	0-5	80-100	75-100	70-95	50-60	25-35	5-15
137-- Diyou	0-11	Loam-----	ML	A-4	0-5	80-100	80-100	80-95	50-75	20-35	NP-10
	11-60	Stratified sandy loam to clay loam.	CL-ML, CL	A-4, A-6	0-5	80-100	75-100	70-95	50-60	25-35	5-15
138-- Diyou	0-11	Loam-----	ML	A-4	0-5	80-100	80-100	80-95	50-75	20-35	NP-10
	11-40	Stratified sandy loam to clay loam.	CL-ML, CL	A-4, A-6	0-5	80-100	75-100	70-95	50-60	25-35	5-15
	40-62	Peat-----	PT	A-8	---	---	---	---	---	---	---
139, 140-- Dotta	0-15	Loam-----	ML	A-4	0	80-100	75-100	60-85	50-75	20-35	NP-10
	15-62	Sandy clay loam, clay loam, loam.	SC, CL	A-6	0	80-100	75-100	60-85	35-60	30-40	10-15
141, 142-- Dotta	0-15	Gravelly loam-----	SM, GM	A-2, A-4	0-5	55-80	50-75	40-70	30-50	20-35	NP-10
	15-62	Gravelly sandy clay loam, gravelly clay loam, gravelly loam.	SC, GC	A-6	0-5	55-80	50-75	40-70	35-50	30-40	10-15
143*, 144*: Dubakella	0-11	Stony loam-----	SC, SM-SC, CL, CL-ML	A-4, A-6	10-25	85-95	70-85	60-70	40-60	25-40	5-15
	11-36	Very gravelly clay loam, very gravelly clay, very cobbly clay.	GC, SC	A-7	10-30	50-75	35-60	35-60	35-50	40-55	15-30
	36	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Ipish	0-2	Gravelly loam-----	SM, GM	A-4	0-5	55-80	50-75	45-60	35-50	30-40	5-10
	2-44	Gravelly clay loam.	SC, GC	A-6, A-7	0-5	55-80	50-75	45-65	35-50	30-45	10-20
	44-65	Very gravelly clay loam, very gravelly clay.	GC	A-2	0-10	35-60	25-50	20-50	15-35	30-45	10-20
	65	Unweathered bedrock.	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 17.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
145*. Dumps											
146, 147----- Duzel	0-13	Gravelly loam-----	SM-SC, GM-GC	A-4	5-10	55-80	50-75	40-70	35-50	20-30	5-10
	13-30	Gravelly loam, gravelly clay loam.	SC, GC	A-6	5-10	55-80	50-75	40-75	35-50	25-40	10-20
	30-38	Very gravelly loam, very gravelly clay loam.	GC	A-2	5-10	30-60	25-50	20-50	15-35	25-40	10-20
	38	Weathered bedrock	---	---	---	---	---	---	---	---	---
148*: Duzel-----	0-13	Gravelly loam-----	SM-SC, GM-GC	A-4	0-10	55-80	50-75	40-70	35-50	20-30	5-10
	13-30	Gravelly loam, gravelly clay loam.	SC, GC	A-6	0-10	55-80	50-75	40-75	35-50	25-40	10-20
	30-38	Very gravelly loam, very gravelly clay loam.	GC	A-2	5-10	30-60	25-50	20-50	15-35	25-40	10-20
	38	Weathered bedrock	---	---	---	---	---	---	---	---	---
Jilson-----	0-3	Gravelly loam-----	SM-SC, GM-GC	A-4	0-5	60-80	50-75	40-70	35-50	20-30	5-10
	3-14	Gravelly loam, gravelly clay loam.	SC, GC	A-6	0-5	60-80	50-75	40-75	35-50	30-40	10-15
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Facey-----	0-10	Loam-----	CL-ML, ML	A-4	0	80-100	75-95	60-95	50-70	25-35	5-10
	10-59	Clay loam, loam	CL, SC	A-6	0	60-100	50-100	50-100	40-80	30-40	10-15
	59	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
149, 150----- Esro	0-32	Silt loam-----	ML	A-4	0	100	95-100	95-100	80-100	30-40	NP-10
	32-46	Silt loam, silty clay loam, clay loam.	ML	A-4, A-6	0	100	95-100	95-100	80-100	30-40	5-15
	46-79	Stratified sandy loam to sandy clay loam.	SM-SC, SC	A-4, A-6	0	85-100	75-100	50-80	35-50	25-35	5-15
151----- Etsel	0-7	Very gravelly loam.	GM-GC	A-1, A-2	0-5	35-55	30-50	20-45	15-35	20-30	5-10
	7	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
152----- Facey	0-10	Loam-----	CL-ML, ML	A-4	0	80-100	75-95	60-95	50-70	25-35	5-10
	10-59	Clay loam, loam	CL	A-6	0	80-100	75-100	60-100	50-80	30-40	10-15
	59	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
153----- Gazelle	0-11	Silt loam-----	ML	A-4	0	100	95-100	85-100	70-85	25-35	NP-10
	11-25	Silt loam, loam	ML	A-4	0	100	95-100	80-100	60-85	25-35	NP-10
	25-38	Cemented-----	---	---	0	---	---	---	---	---	---
	38-60	Stratified loamy sand to silty clay loam.	CL-ML, CL, SM-SC, SC	A-4, A-6	0	80-100	75-100	50-80	35-60	25-40	5-15

See footnote at end of table.

TABLE 17.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth In	USDA texture	Classification		Frag- ments > 3 inches Pct	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
154----- Gazelle Variant	0-12	Sandy clay loam	SC	A-6	0	100	95-100	70-85	35-50	30-40	10-15
	12-18	Indurated	---	---	---	---	---	---	---	---	---
	18-60	Stratified sandy loam to silty clay loam.	SM-SC, SC, CL-ML, CL	A-4, A-6	0	80-100	75-95	50-80	35-60	25-40	5-15
155, 156----- Hilt	0-11	Sandy loam	SM	A-4	0-5	95-100	80-100	60-80	35-50	20-25	NP-5
	11-38	Loam, sandy clay loam.	SC, CL	A-6	0-5	95-100	80-100	60-90	35-60	30-40	10-20
	38-47 47	Weathered bedrock Unweathered bedrock.	---	---	---	---	---	---	---	---	---
157----- Hilt	0-11	Stony sandy loam	SM	A-4	15-30	95-100	80-100	60-70	35-50	20-25	NP-5
	11-38	Loam, sandy clay loam.	SC, CL	A-6	5-15	95-100	80-100	60-90	35-60	30-40	10-20
	38-47 47	Weathered bedrock Unweathered bedrock.	---	---	---	---	---	---	---	---	---
158*: Hilt-----	0-11	Stony sandy loam	SM	A-4	15-30	95-100	80-100	60-70	35-50	20-25	NP-5
	11-38	Loam, sandy clay loam.	SC, CL	A-6	5-15	95-100	80-100	60-90	35-60	30-40	10-20
	38-47 47	Weathered bedrock Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
159, 160----- Jenny	0-16	Clay	CH, CL	A-7	0	95-100	75-95	75-90	70-85	40-60	20-30
	16-23	Clay, silty clay	CH, CL	A-7	0	95-100	75-95	75-90	70-90	40-60	20-30
	23-60	Stratified clay to loam.	CL, CH	A-6, A-7	0	95-100	75-95	75-90	50-85	35-55	15-30
161----- Jenny	0-16	Cobbly clay	CL, CH	A-7	10-25	80-100	75-100	75-90	70-85	40-60	20-30
	16-23	Clay, silty clay	CL, CH	A-7	0-5	80-100	75-100	75-90	70-85	40-60	20-30
	23-60	Stratified clay to loam.	CL, CH	A-6, A-7	0-5	80-100	75-100	75-90	50-85	35-55	15-30
162----- Jilson	0-3	Gravelly loam	SM-SC, GM-GC	A-4	0-5	60-80	50-75	40-70	35-50	20-30	5-10
	3-14	Gravelly loam, gravelly clay loam.	SC, GC	A-6	0-5	60-80	50-75	40-75	35-50	30-40	10-15
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
163*: Jilson-----	0-3	Gravelly loam	SM-SC, GM-GC	A-4	0-5	60-80	50-75	40-70	35-50	20-30	5-10
	3-14	Gravelly loam, gravelly clay loam.	SC, GC	A-6	0-5	60-80	50-75	40-75	35-50	30-40	10-15
	14	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Duzel-----	0-13	Gravelly loam	SM-SC, GM-GC	A-4	5-10	55-80	50-75	40-70	35-50	20-30	5-10
	13-30	Gravelly loam, gravelly clay loam.	SC, GC	A-6	5-10	55-80	50-75	40-75	35-50	25-40	10-20
	30-38	Very gravelly loam, very gravelly clay loam.	GC	A-2	5-10	30-60	25-50	20-50	15-35	25-40	10-20
	38	Weathered bedrock	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 17.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
164*, 165*: Kindig-----	0-5	Gravelly loam----	SM, GM	A-4	0-5	55-80	50-75	40-60	35-50	15-25	NP-5
	5-15	Gravelly loam, gravelly sandy loam.	SM, GM	A-2, A-4	0-10	55-80	50-75	35-60	30-50	15-25	NP-5
	15-60	Very gravelly loam, very gravelly sandy loam.	GM	A-1, A-2	0-10	30-60	25-50	15-50	10-35	15-25	NP-5
	60	Weathered bedrock	---	---	---	---	---	---	---	---	---
Neuns-----	0-8	Gravelly loam----	SM, GM	A-4	0-5	55-80	50-75	40-60	35-50	15-25	NP-5
	8-35	Very gravelly sandy loam, very gravelly loam.	GM	A-1, A-2	0-10	30-55	25-50	20-45	10-35	15-25	NP-5
	35	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
166----- Kinkel	0-9	Very gravelly loam.	GM	A-1, A-2	5-15	35-55	30-50	25-45	20-35	20-25	NP-5
	9-60	Very gravelly loam, very gravelly sandy loam.	GM	A-1, A-2	5-15	35-55	30-50	25-45	20-35	20-25	NP-5
167, 168----- Kuck	0-6	Clay loam-----	CL	A-6	0-10	80-100	75-95	70-95	60-80	30-40	10-15
	6-20	Clay loam, silty clay loam, clay.	CL, CH	A-7	0-10	80-100	75-95	70-95	60-90	40-55	15-30
	20-32	Gravelly clay loam.	SC, CL, GC	A-6, A-7	0-10	65-85	55-75	50-70	35-60	35-45	15-20
	32	Weathered bedrock	---	---	---	---	---	---	---	---	---
169, 170----- Lassen	0-9	Clay-----	CL, CH	A-7	0-5	85-100	75-95	70-90	70-85	40-60	20-30
	9-26	Clay loam, clay	CL, CH	A-7	0-5	85-100	75-95	70-90	70-85	40-60	15-30
	26-28	Gravelly clay loam, gravelly clay.	SC, CL, CH, GC	A-7	0-5	60-85	50-75	45-70	35-65	40-60	15-30
	28	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
171----- Lassen	0-9	Cobbly clay-----	CL, CH	A-7	15-30	80-95	70-90	65-85	50-80	40-60	20-30
	9-28	Cobbly clay, cobbly clay loam.	CL, CH	A-7	15-30	80-95	70-90	65-85	50-80	40-60	15-30
	28	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
172*: Lassen-----	0-9	Clay-----	CL, CH	A-7	0-5	85-100	75-95	70-90	70-85	40-60	20-30
	9-26	Clay loam, clay	CL, CH	A-7	0-5	85-100	75-95	70-90	70-85	40-60	15-30
	26-28	Gravelly clay loam, gravelly clay.	SC, CL, CH, GC	A-7	0-5	60-85	50-75	45-70	35-65	40-60	15-30
	28	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Kuck-----	0-6	Clay loam-----	CL	A-6	0-10	80-100	75-95	70-95	60-80	30-40	10-15
	6-20	Clay loam, silty clay loam, clay.	CL, CH	A-7	0-10	80-100	75-95	70-95	60-90	40-55	15-30
	20-32	Gravelly clay loam.	SC, CL, GC	A-6, A-7	0-10	65-85	55-75	50-70	35-60	35-45	15-20
	32	Weathered bedrock	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 17.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Fragments > 3 inches	Percentage passing sieve number--				Liquid limit	Plasticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
173*: Lassen-----	0-9	Stony clay-----	CL, CH	A-7	15-30	80-95	70-90	65-85	50-80	40-60	20-30
	9-28	Cobbly clay, cobbly clay loam.	CL, CH	A-7	15-30	80-95	70-90	65-85	50-80	40-60	15-30
	28	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Kuck-----	0-6	Stony clay loam	CL	A-6	10-25	85-95	80-95	70-90	60-80	30-40	10-15
	6-20	Stony clay loam, stony silty clay loam, stony clay.	CL, CH	A-7	10-25	85-95	80-95	70-90	60-85	40-55	15-30
	20-32	Stony clay loam	SC, CL	A-6, A-7	10-30	75-90	60-75	50-70	35-60	35-45	15-20
	32	Weathered bedrock	---	---	---	---	---	---	---	---	---
174*: Lassen-----	0-9	Very stony clay	CL, CH	A-7	20-30	80-95	70-90	65-85	50-80	40-60	15-30
	9-28	Cobbly clay, cobbly clay loam.	CL, CH	A-7	15-30	80-95	70-90	65-85	50-80	40-60	15-30
	28	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
Kuck-----	0-6	Very stony clay loam.	CL	A-6	20-30	85-95	80-95	70-90	60-80	30-40	10-15
	6-20	Stony clay loam, stony silty clay loam, stony clay.	CL, CH	A-7	10-25	85-95	80-95	70-90	60-85	40-55	15-30
	20-32	Stony clay loam	SC, CL	A-6, A-7	10-30	75-90	60-75	50-70	35-60	35-45	15-20
	32	Weathered bedrock	---	---	---	---	---	---	---	---	---
175*. Lava flows											
176*: Lava flows.											
Xerorthents.											
177*: Lithic Haploxerolls.											
Rock outcrop.											
178*: Lithic Xerorthents.											
Rock outcrop.											
179, 180----- Louie	0-12	Loam-----	CL-ML	A-4	0-5	85-100	75-100	60-95	50-75	20-30	5-10
	12-21	Loam-----	CL-ML, ML	A-4	0-5	85-100	75-100	60-95	50-80	25-35	5-10
	21-29	Sandy clay loam, clay loam.	SC, CL	A-6	0-5	85-100	75-100	65-95	35-80	30-40	10-15
	29-32	Indurated-----	---	---	---	---	---	---	---	---	---
	32-60	Stratified gravelly sand to stony sand.	GP, SP	A-1	10-60	40-60	30-40	15-25	0-5	---	NP

See footnote at end of table.

TABLE 17.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
181----- Louie	0-12	Stony loam-----	CL-ML	A-4	15-25	80-100	75-95	60-85	50-75	20-30	5-10
	12-21	Stony loam, cobble loam.	CL-ML, ML	A-4	15-25	80-100	75-95	60-85	50-75	25-35	5-10
	21-29	Stony sandy clay loam, cobbly sandy clay loam, stony clay loam.	SC, CL	A-6	15-25	80-100	75-95	65-85	35-60	30-40	10-15
	29-32 32-60	Indurated----- Stratified gravelly sand to stony sand.	GP, SP	A-1	10-60	40-60	30-40	15-25	0-5	---	NP
182----- Louie Variant	0-15	Sandy clay loam	SC	A-6	0	95-100	95-100	75-85	35-50	30-40	10-15
	15-26	Sandy clay loam, clay loam.	SC, CL	A-6	0	95-100	95-100	75-95	35-65	30-40	10-20
	26-33	Sandy loam, loam	SM-SC, SM, CL-ML, ML	A-2, A-4	0	95-100	95-100	60-95	30-60	25-35	5-10
	33-60	Cemented-----	---	---	---	---	---	---	---	---	---
183*, 184*: Marpa-----	0-14	Gravelly loam----	SM, GM	A-4	0-10	55-80	50-75	40-70	35-50	25-35	NP-10
	14-30	Very gravelly clay loam, very gravelly sandy clay loam.	GC	A-2, A-6	5-10	30-55	25-50	20-45	10-40	30-40	10-15
	30	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Kinkel-----	0-9	Very gravelly loam.	GM	A-1, A-2	5-15	35-55	30-50	25-45	20-35	20-25	NP-5
	9-60	Very gravelly loam, very gravelly sandy loam, gravelly loam.	GM	A-1, A-2	5-15	35-55	30-50	25-45	20-35	20-25	NP-5
Boomer-----	0-10	Gravelly loam----	SC, SM-SC	A-4, A-6	0-5	75-85	50-75	40-60	35-50	25-40	5-15
	10-53	Gravelly sandy clay loam, gravelly clay loam.	CL, SC	A-6, A-7	0-5	75-85	50-75	45-70	35-60	30-50	10-25
	53	Weathered bedrock	---	---	---	---	---	---	---	---	---
185, 186----- Mary	0-10	Loam-----	ML, CL-ML	A-4	0-5	80-100	80-95	60-90	50-65	25-35	5-10
	10-24	Loam, clay loam	CL	A-6	0-5	80-100	80-95	60-90	60-85	30-40	10-20
	24-28	Sandy clay loam	SC	A-6	0-5	80-100	80-95	60-80	35-50	30-40	10-20
	28	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
187----- Mary	0-10	Stony loam-----	ML, CL-ML	A-4	5-10	80-100	80-95	60-90	50-65	25-35	5-10
	10-24	Loam, clay loam	CL	A-6	0-5	80-100	80-95	60-90	60-85	30-40	10-20
	24-28	Sandy clay loam	SC	A-6	0-5	80-100	80-95	60-80	35-50	30-40	10-20
	28	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
188*: Mary-----	0-10	Stony loam-----	ML, CL-ML	A-4	5-10	80-100	80-95	60-90	50-65	25-35	5-10
	10-24	Loam, clay loam	CL	A-6	0-5	80-100	80-95	60-90	60-85	30-40	10-20
	24-28	Sandy clay loam	SC	A-6	0-5	80-100	80-95	60-80	35-50	30-40	10-20
	28	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											

See footnote at end of table.

TABLE 17.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth In	USDA texture	Classification		Frag- ments > 3 inches	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
189, 190, 191- Medford	0-18	Clay loam-----	CL	A-6	0-10	90-100	80-100	75-100	55-85	35-40	15-20
	18-60	Silty clay loam, clay loam, clay, silty clay.	CL	A-7	0-10	90-100	80-100	75-100	70-95	40-50	20-25
192, 193- Montague	0-4	Clay-----	CL, CH	A-7	0-5	95-100	95-100	80-100	75-95	45-60	20-30
	4-24	Clay, silty clay, clay loam.	CL, CH	A-7	0-5	95-100	95-100	80-100	70-95	40-60	15-30
	24-36 36	Cemented----- Weathered bedrock	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---
194- Montague	0-4	Cobbly clay-----	CL, CH	A-7	20-40	85-100	80-100	70-100	60-95	45-60	20-30
	4-24	Cobbly clay, cobbly clay loam.	CL, CH	A-7	20-40	85-100	80-100	70-100	60-95	40-60	15-30
	24-36 36	Cemented----- Weathered bedrock	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---	--- ---
195- Montague Variant	0-12	Clay-----	CL, CH	A-7	0	100	95-100	95-100	70-95	45-55	20-30
	12-15	Indurated-----	---	---	---	---	---	---	---	---	---
	15	Weathered bedrock	---	---	---	---	---	---	---	---	---
196*: Neer	0-9	Stony sandy loam	SM, GM	A-1, A-2	15-20	60-90	55-75	30-50	20-35	25-35	NP-5
	9-26	Very gravelly sandy loam.	GM, SM	A-1	5-20	30-70	25-50	20-40	10-25	25-35	NP-5
	26	Weathered bedrock	---	---	---	---	---	---	---	---	---
Ponto	0-8	Stony sandy loam	SM, GM	A-4	10-25	65-85	60-80	50-75	35-50	20-30	NP-5
	8-53	Sandy loam, loam	SM	A-4	5-10	80-100	75-95	50-80	35-50	20-30	NP-5
	53-80	Stony sandy loam, stony loam.	SM	A-2, A-4	15-30	75-85	65-80	50-75	30-50	20-30	NP-5
197*: Neer	0-9	Gravelly sandy loam.	SM, GM	A-1, A-2	5-15	60-90	50-75	30-50	20-35	25-35	NP-5
	9-26	Very gravelly sandy loam.	GM, SM	A-1	5-20	30-70	25-50	20-40	10-25	25-35	NP-5
	26	Weathered bedrock	---	---	---	---	---	---	---	---	---
Ponto	0-8	Sandy loam-----	SM	A-4	0-5	80-100	75-100	50-75	35-50	20-30	NP-5
	8-53	Sandy loam, loam	SM, ML	A-4	0-5	80-100	75-95	50-80	35-60	20-30	NP-5
	53-80	Stony sandy loam, stony loam.	SM	A-2, A-4	15-30	75-85	65-80	50-75	30-50	20-30	NP-5
198- Odas	0-31	Sandy loam-----	SM	A-2, A-4	0-5	80-100	75-95	50-70	25-50	15-25	NP-5
	31-60	Sandy loam, loam	SM	A-2, A-4	0-5	80-100	75-95	50-80	25-50	15-25	NP-5
199- Oosen	0-12	Loamy sand-----	SM	A-2	0-5	90-100	75-100	50-75	15-30	---	NP
	12-28	Loamy sand, loamy fine sand.	SM	A-2	0-5	90-100	75-100	50-75	15-30	---	NP
	28-75	Sand-----	SM, SP-SM	A-1, A-2, A-3	0-5	90-100	75-100	40-70	5-15	---	NP
200- Orset	0-13	Sandy loam-----	SM	A-4	0-5	85-100	75-100	40-70	35-50	20-30	NP-5
	13-60	Sandy loam, loam	SM, ML	A-4	0-5	85-100	75-100	40-75	35-60	20-35	NP-10
201, 202, 203- Pinehurst	0-10	Stony loam-----	SM, ML	A-4	20-30	80-95	75-85	60-75	40-55	25-35	NP-10
	10-48	Gravelly loam, gravelly clay loam.	SC, GC	A-6	5-15	55-80	50-75	50-75	35-50	30-40	10-20
	48-60	Very stony loam, very stony clay loam.	SC, GC	A-6	30-50	55-80	50-75	50-75	35-50	30-40	10-20
	60	Weathered bedrock	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 17.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag-ments > 3 inches	Percentage passing sieve number--				Liquid limit	Plas-ticity index
			Unified	AASHTO		4	10	40	200		
	In				Pct					Pct	
214*: Louie-----	0-12	Stony loam-----	CL-ML	A-4	15-25	80-100	75-95	60-85	50-75	20-30	5-10
	12-21	Stony loam, cobble loam.	CL-ML, ML	A-4	15-25	80-100	75-95	60-85	50-75	25-35	5-10
	21-29	Stony sandy clay loam, cobble sandy clay loam, stony clay loam.	SC, CL	A-6	15-25	80-100	75-95	65-85	35-60	30-40	10-15
	29-32	Indurated-----	---	---	---	---	---	---	---	---	---
	32-60	Stratified gravelly sand to stony sand.	GP, SP	A-1	10-60	40-60	30-40	15-25	0-5	---	NP
215*: Rock outcrop.											
Terwilliger----	0-6	Stony silty clay loam.	CL	A-6	5-20	85-100	75-90	65-85	60-80	30-40	10-20
	6-30	Silty clay loam, silty clay.	CL, CH	A-7	0-10	80-100	75-100	70-100	65-95	40-55	15-30
	30-34	Gravelly silty clay, gravelly silty clay loam.	CL, CH	A-7	0-10	55-80	50-75	50-75	50-70	40-55	15-30
	34	Weathered bedrock	---	---	---	---	---	---	---	---	---
216*. Rock outcrop											
217, 218----- Salisbury	0-4	Clay loam-----	CL	A-6	0-5	80-100	75-100	70-90	60-85	30-40	10-20
	4-24	Clay, clay loam, silty clay.	CL, CH	A-7	0-5	80-100	75-95	70-90	65-90	40-60	15-35
	24-32	Indurated-----	---	---	---	---	---	---	---	---	---
	32-60	Stratified sand to stony sand.	GP, SP	A-1	10-60	40-60	30-40	15-25	0-5	---	NP
219, 220----- Salisbury	0-4	Gravelly clay loam.	SC, GC	A-6	5-10	60-80	55-75	50-70	35-50	30-40	10-20
	4-24	Gravelly clay, gravelly silty clay, gravelly clay loam.	SC, GC, CH, CL	A-7	5-10	60-80	55-75	50-70	35-60	40-60	15-30
	24-32	Indurated-----	---	---	---	---	---	---	---	---	---
	32-60	Stratified sand	GP, SP	A-1	10-60	40-60	30-40	15-25	0-5	---	NP
221----- Salisbury	0-4	Cobbly loam-----	SM-SC, SM, GM-GC, GM	A-4	20-35	65-85	60-80	45-70	35-50	25-35	5-10
	4-24	Gravelly clay, gravelly silty clay, gravelly clay loam.	SC, GC, CH, CL	A-7	5-10	60-80	55-75	50-70	35-60	40-60	15-30
	24-32	Indurated-----	---	---	---	---	---	---	---	---	---
	32-60	Stratified sand	SP, GP	A-1	10-60	40-60	30-40	15-25	0-5	---	NP
222, 223----- Settlemeier	0-10	Loam-----	CL	A-6	0	100	95-100	75-85	60-70	25-35	10-15
	10-66	Stratified clay to fine sandy loam.	CL	A-6	0	100	95-100	75-90	60-80	25-40	10-20
224----- Settlemeier Variant	0-19	Silt loam-----	ML	A-4	0	90-100	80-100	70-100	60-85	30-35	5-10
	19-68	Silty clay loam, clay loam, clay.	CL	A-7	0	90-100	80-100	70-100	65-95	40-50	15-25
	68-80	Stratified gravelly loam to gravelly clay loam.	SC, GC	A-6	0	55-80	50-75	40-70	35-50	30-40	10-15

See footnote at end of table.

TABLE 17.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth In	USDA texture	Classification		Frag- ments > 3 inches Pct	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
204, 205----- Pinehurst Variant	0-12	Very stony loam	SM, GM	A-4	25-35	65-80	60-75	50-65	35-50	25-40	NP-10
	12-26	Very cobbly clay loam.	SC, GC	A-6	30-40	55-80	50-75	50-65	35-50	30-40	10-15
	26	Weathered bedrock	---	---	---	---	---	---	---	---	---
206----- Pit	0-38	Clay-----	MH, CH	A-7	0	100	100	95-100	85-95	50-65	20-35
	38-61	Silty clay loam, clay loam.	ML, CL	A-6, A-7	0	100	100	90-100	75-90	30-50	10-20
207*: Plutos-----	0-7	Loamy sand-----	SM	A-1, A-2	0-10	80-100	75-95	40-70	15-30	---	NP
	7-23	Loamy sand, sand	SM	A-1, A-2	0-10	80-100	75-95	40-70	10-30	---	NP
	23	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
208----- Ponto	0-8	Sandy loam-----	SM	A-4	0-5	80-100	75-100	50-75	35-50	20-30	NP-5
	8-53	Sandy loam, loam	SM, ML	A-4	0-5	80-100	75-95	50-80	35-60	20-30	NP-5
	53-80	Stony sandy loam, stony loam.	SM	A-2, A-4	15-30	75-85	65-80	50-75	30-50	20-30	NP-5
209*: Ponto-----	0-8	Sandy loam-----	SM	A-4	0-5	80-100	75-100	50-75	35-50	20-30	NP-5
	8-53	Sandy loam, loam	SM, ML	A-4	0-5	80-100	75-95	50-80	35-60	20-30	NP-5
	53-80	Stony sandy loam, stony loam.	SM	A-2, A-4	15-30	75-85	65-80	50-75	30-50	20-30	NP-5
Neer-----	0-9	Gravelly sandy loam.	SM, GM	A-1, A-2	5-15	60-90	50-75	30-50	20-35	25-35	NP-5
	9-26	Very gravelly sandy loam.	GM, SM	A-1	5-20	30-70	25-50	20-40	10-25	25-35	NP-5
	26	Weathered bedrock	---	---	---	---	---	---	---	---	---
210, 211----- Redola	0-13	Loam-----	CL-ML, ML	A-4	0	100	95-100	75-90	50-75	20-30	NP-10
	13-39	Stratified sandy loam to clay loam.	CL-ML, ML, SM-SC, SM	A-4	0	95-100	80-100	60-95	35-60	20-30	NP-10
	39-60	Stratified gravelly sand to gravelly loam.	SM, SM-SC, GM-GC, GM	A-2, A-1	0	60-80	50-75	25-60	15-35	20-30	NP-10
212*. Riverwash											
213*: Rock outcrop.											
Dubakella-----	0-11	Stony loam-----	SC, SM-SC, CL, CL-ML	A-4, A-6	10-25	85-95	70-85	60-70	40-60	25-40	5-15
	11-36	Very gravelly clay loam, very gravelly clay, very cobbly clay.	GC, SC	A-7	10-30	50-75	35-60	35-60	35-50	40-55	15-30
	36	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
214*: Rock outcrop.											

See footnote at end of table.

TABLE 17.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth In	USDA texture	Classification		Frag- ments > 3 inches Pct	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
225----- Sheld	0-7	Very stony sandy loam.	SM, GM	A-1, A-2	10-25	65-80	60-75	40-60	20-35	15-25	NP-5
	7-19	Gravelly sandy loam.	SM, GM	A-1, A-2	5-15	55-80	50-75	40-60	20-35	15-25	NP-5
	19-33	Very gravelly sandy loam, very gravelly loam.	GM	A-1, A-2	10-20	35-60	30-50	25-45	15-30	15-25	NP-5
	33-46	Very gravelly loam, very gravelly sandy loam.	GM	A-1, A-2	15-20	35-60	30-50	25-45	15-35	15-25	NP-5
	46	Weathered bedrock	---	---	---	---	---	---	---	---	---
226*, 227*: Sheld	0-7	Stony sandy loam	SM, GM	A-1, A-2	5-15	65-80	60-75	40-60	20-35	15-25	NP-5
	7-19	Gravelly sandy loam.	SM, GM	A-1, A-2	5-15	55-80	50-75	40-60	20-35	15-25	NP-5
	19-33	Very gravelly sandy loam, very gravelly loam.	GM	A-1, A-2	10-20	35-60	30-50	25-45	15-30	15-25	NP-5
	33-46	Very gravelly loam, very gravelly sandy loam.	GM	A-1, A-2	15-20	35-60	30-50	25-45	15-35	15-25	NP-5
	46	Weathered bedrock	---	---	---	---	---	---	---	---	---
Iller-----	0-13	Stony sandy loam	SM	A-2, A-4	10-20	80-95	75-90	40-70	25-50	---	NP
	13-28	Sandy loam	SM	A-2, A-4	0-10	80-95	75-90	40-70	25-50	---	NP
	28-37	Very stony sandy loam.	SM	A-2, A-4	35-50	80-95	75-90	40-70	25-50	25-35	NP-5
	37-65	Extremely stony sandy clay loam, extremely stony loam.	SM	A-4	50-75	80-95	75-90	55-80	35-50	30-40	5-10
228----- Snell	0-4	Very stony loam	ML, GM, SM	A-4, A-6	15-30	65-85	60-80	50-70	40-60	30-40	5-15
	4-21	Very cobbly clay, very cobbly clay loam.	GC, SC	A-7	30-40	65-80	50-70	40-60	35-50	40-50	20-25
	21	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
229, 230, 231---- Stoner	0-12	Gravelly sandy loam.	SM, GM	A-2	0-5	55-80	50-75	35-60	25-35	20-25	NP-5
	12-36	Gravelly sandy loam, gravelly loam.	SM, GM	A-2, A-4	0-5	55-80	50-75	35-65	25-50	20-25	NP-5
	36-60	Very gravelly loam, very gravelly sandy loam.	GM, GM-GC	A-1, A-2	0-5	30-55	25-50	20-50	15-30	20-30	NP-10
232, 233, 234---- Terwilliger	0-6	Silty clay loam	CL	A-6	0-5	80-100	75-100	70-100	60-85	30-40	10-20
	6-30	Silty clay loam, silty clay.	CL, CH	A-7	0-5	80-100	75-100	70-100	65-95	40-55	15-30
	30-34	Gravelly silty clay, gravelly silty clay loam.	CL, CH, GC	A-7	0-5	55-80	50-75	45-75	40-70	40-55	15-30
	34	Weathered bedrock	---	---	---	---	---	---	---	---	---
235----- Terwilliger	0-6	Stony silty clay loam.	CL	A-6	5-20	85-100	75-90	65-85	60-80	30-40	10-20
	6-30	Silty clay loam, silty clay.	CL, CH	A-7	0-10	80-100	75-100	70-100	65-95	40-55	15-30
	30-34	Gravelly silty clay, gravelly silty clay loam.	CL, CH	A-7	0-10	55-80	50-75	50-75	50-70	40-55	15-30
	34	Weathered bedrock	---	---	---	---	---	---	---	---	---

See footnote at end of table.

TABLE 17.--ENGINEERING INDEX PROPERTIES--Continued

Soil name and map symbol	Depth	USDA texture	Classification		Frag- ments > 3 inches Pct	Percentage passing sieve number--				Liquid limit Pct	Plas- ticity index
			Unified	AASHTO		4	10	40	200		
236----- Uhlig Variant	0-14	Stony loam-----	SM, ML	A-4	20-35	80-95	75-90	60-80	35-60	20-25	NP-5
	14-42	Stony loam, stony sandy loam.	SM, ML	A-4	20-35	80-95	75-90	50-80	35-60	20-25	NP-5
	42	Weathered bedrock	---	---	---	---	---	---	---	---	---
237*: Weitchpec Variant-----	0-4	Gravelly loam----	GM, SM, GM-GC, SM-SC	A-4	10-15	55-80	50-75	40-70	35-50	25-35	5-10
	4-8	Gravelly clay loam.	GC, SC	A-6	10-15	55-80	50-75	50-75	35-50	30-40	10-20
	8-16	Very gravelly clay loam.	GC	A-2, A-6	10-25	30-55	25-50	20-50	15-40	30-40	10-20
	16	Unweathered bedrock.	---	---	---	---	---	---	---	---	---
Rock outcrop.											
238*. Xerofluvents											

\* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 18.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS

[The symbol < means less than; > means more than. Entries under "Erosion factors--T" apply to the entire profile. Entries under "Wind erodibility group" and "Organic matter" apply only to the surface layer. Absence of an entry indicates that data were not available or were not estimated]

Soil name and map symbol	Depth	Clay <2mm		Permeability In/hr	Available water capacity In/in	Soil reaction pH	Salinity Mmos/cm	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter Pot
		In	Pct						K	T		
101, 102----- Asta	0-13	10-15	2.0-6.0	0.09-0.12	4.5-6.5	<2	Low-----	0.20	5	---	1-2	
	13-60	18-25	0.6-2.0	0.21-0.26	4.5-5.5	<2	Low-----	0.28				
	60-71	5-15	0.6-2.0	0.21-0.26	4.5-5.5	<2	Low-----	0.28				
103----- Asta	0-13	10-15	2.0-6.0	0.09-0.11	4.5-6.5	<2	Low-----	0.20	5	---	1-2	
	13-60	18-25	0.6-2.0	0.15-0.17	4.5-5.5	<2	Low-----	0.24				
	60-71	5-15	0.6-2.0	0.15-0.17	4.5-5.5	<2	Low-----	0.24				
104, 105----- Atter	0-18	5-10	6.0-20	0.04-0.08	5.6-7.3	<2	Low-----	0.15	5	---	<1	
	18-60	0-5	>20	0.03-0.05	5.6-7.3	<2	Low-----	0.10				
106----- Atter	0-23	0-5	>20	0.02-0.03	6.1-6.5	<2	Low-----	0.15	5	---	<1	
	23-60	0-5	>20	0.02-0.03	6.1-6.5	<2	Low-----	0.15				
107*, 108*: Avis-----	0-13	0-5	2.0-6.0	0.04-0.07	5.6-7.3	<2	Low-----	0.10	5	---	<1	
	13-72	0-5	6.0-20	0.03-0.05	5.6-6.5	<2	Low-----	0.10				
Oosen-----	0-12	0-5	6.0-20	0.06-0.10	5.6-7.3	<2	Low-----	0.15	5	---	2-6	
	12-28	0-5	6.0-20	0.06-0.10	5.6-7.3	<2	Low-----	0.15				
	28-75	0-5	6.0-20	0.06-0.08	5.6-7.3	<2	Low-----	0.10				
109*: Avis-----	0-13	0-5	2.0-6.0	0.04-0.07	5.6-7.3	<2	Low-----	0.10	5	---	<1	
	13-75	0-5	6.0-20	0.03-0.05	5.6-6.5	<2	Low-----	0.10				
Lava flows.												
110----- Bogus	0-3	25-27	0.2-0.6	0.15-0.17	5.6-6.5	<2	Moderate	0.24	5	---	1-4	
	3-11	27-35	0.2-0.6	0.16-0.18	5.6-6.5	<2	Moderate	0.28				
	11-20	27-35	0.2-0.6	0.15-0.17	5.6-6.5	<2	Moderate	0.28				
	20-53	35-60	0.06-0.2	0.12-0.15	4.5-6.0	<2	High-----	0.28				
	53-62	27-40	0.2-0.6	0.15-0.17	4.5-6.0	<2	Moderate	0.28				
	62	---	---	---	---	---	---	---				
111----- Bogus	0-3	25-27	0.2-0.6	0.15-0.17	5.6-6.5	<2	Moderate	0.24	5	---	1-4	
	3-11	27-35	0.2-0.6	0.16-0.18	5.6-6.5	<2	Moderate	0.28				
	11-20	27-35	0.2-0.6	0.15-0.17	5.6-6.5	<2	Moderate	0.28				
	20-53	35-60	0.06-0.2	0.12-0.15	4.5-6.0	<2	High-----	0.28				
	53-62	27-40	0.2-0.6	0.15-0.17	4.5-6.0	<2	Moderate	0.28				
112----- Bonnet	0-14	10-18	2.0-6.0	0.13-0.15	6.1-8.4	<2	Low-----	0.32	5	---	1-2	
	14-46	10-18	2.0-6.0	0.04-0.08	7.9-9.0	<2	Low-----	0.24				
	46-61	5-15	6.0-20	0.01-0.02	7.9-9.0	<2	Low-----	0.20				
113, 114----- Bonnet	0-14	10-18	2.0-6.0	0.06-0.11	6.1-8.4	<2	Low-----	0.28	5	---	1-2	
	14-46	10-18	2.0-6.0	0.04-0.08	7.9-9.0	<2	Low-----	0.24				
	46-61	5-15	6.0-20	0.01-0.02	7.9-9.0	<2	Low-----	0.20				
115----- Boomer	0-10	18-27	0.6-2.0	0.13-0.16	5.6-7.3	<2	Low-----	0.32	3	---	1-3	
	10-53	25-35	0.2-0.6	0.15-0.19	5.1-6.5	<2	Moderate	0.28				
53	---	---	---	---	---	---	---					
116*: Boomer-----	0-10	18-27	0.6-2.0	0.13-0.16	5.6-7.3	<2	Low-----	0.32	3	---	1-3	
	10-53	25-35	0.2-0.6	0.15-0.19	5.1-6.5	<2	Moderate	0.28				
	53	---	---	---	---	---	---	---				
Neuns-----	0-8	6-17	0.6-2.0	0.09-0.13	5.1-6.5	<2	Low-----	0.24	2	---	<1	
	8-35	8-18	0.6-2.0	0.05-0.08	5.1-6.5	<2	Low-----	0.20				
	35	---	---	---	---	---	---	---				

See footnote at end of table.

TABLE 18.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Clay <2mm	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	In/hr	In/in	pH	Mmhos/cm					Pct
117----- Boomer Variant	0-25	5-18	2.0-6.0	0.08-0.12	5.1-6.5	<2	Low-----	0.24	5	---	1-3
	25-36	20-25	0.6-2.0	0.14-0.16	5.1-6.5	<2	Moderate	0.28			
	36-50	18-25	0.6-2.0	0.14-0.16	5.1-6.5	<2	Low-----	0.32			
	50-70 70	15-20 ---	0.6-2.0 ---	0.08-0.12 ---	5.1-6.5 ---	<2 ---	Low-----	0.17			
118----- Boomer Variant	0-25	5-18	2.0-6.0	0.05-0.09	5.1-6.5	<2	Low-----	0.17	5	---	1-3
	25-36	20-25	0.6-2.0	0.09-0.12	5.1-6.5	<2	Moderate	0.24			
	36-50	18-25	0.6-2.0	0.09-0.12	5.1-6.0	<2	Low-----	0.32			
	50-70 70	15-20 ---	0.6-2.0 ---	0.05-0.08 ---	5.1-6.0 ---	<2 ---	Low-----	0.17			
119*, 120*, 121*: Chaix-----	0-4	5-15	2.0-6.0	0.06-0.09	5.6-6.5	<2	Low-----	0.20	2	---	2-6
	4-34 34	5-15 ---	2.0-6.0 ---	0.06-0.09 ---	5.1-6.0 ---	<2 ---	Low-----	0.20			
Chawanakee-----	0-16 16	5-15 ---	2.0-6.0 ---	0.06-0.09 ---	5.1-6.5 ---	<2 ---	Low-----	0.20	1	---	<1
122----- Copsey	0-18	40-60	0.06-0.2	0.11-0.15	6.1-7.3	<2	High-----	0.20	5	---	2-6
	18-60	40-60	<0.06	0.10-0.14	6.1-7.8	<2	High-----	0.17			
123----- Copsey	0-18	40-60	0.06-0.2	0.10-0.14	6.1-7.3	<2	High-----	0.17	5	---	2-6
	18-60	40-60	<0.06	0.10-0.14	6.1-7.8	<2	High-----	0.17			
124----- Copsey	0-18	40-60	0.06-0.2	0.09-0.14	6.1-7.3	<2	High-----	0.17	5	---	1-4
	18-60	40-60	<0.06	0.09-0.14	6.1-7.8	<2	High-----	0.17			
125, 126----- Deetz	0-7	0-5	6.0-20	0.05-0.09	4.5-6.0	<2	Low-----	0.15	2	---	1-5
	7-38	0-2	6.0-20	0.04-0.06	4.5-6.0	<2	Low-----	0.10			
	38-65	0-2	6.0-20	0.03-0.04	4.5-6.0	<2	Low-----	0.10			
127, 128----- Deetz	0-7	0-5	6.0-20	0.04-0.07	4.5-6.0	<2	Low-----	0.15	2	---	1-5
	7-38	0-2	6.0-20	0.04-0.05	4.5-6.0	<2	Low-----	0.10			
	38-65	0-2	6.0-20	0.02-0.03	4.5-6.0	<2	Low-----	0.10			
129----- Delaney	0-9	0-5	6.0-20	0.05-0.07	5.6-7.3	<2	Low-----	0.15	5	2	<1
	9-68	0-5	6.0-20	0.05-0.07	5.6-7.3	<2	Low-----	0.15			
130----- Delaney	0-9	0-5	6.0-20	0.04-0.06	5.6-7.3	<2	Low-----	0.10	5	2	<1
	9-44	0-5	6.0-20	0.04-0.06	5.6-7.3	<2	Low-----	0.10			
	44-68	0-5	6.0-20	0.04-0.05	5.6-7.3	<2	Low-----	0.10			
131----- Delaney	0-9	0-5	6.0-20	0.04-0.05	5.6-7.3	<2	Low-----	0.10	3	2	<1
	9-45 45	0-5 ---	6.0-20 ---	0.04-0.05 ---	5.6-7.3 ---	<2 ---	Low-----	0.10			
132, 133----- Delaney	0-9	3-10	6.0-20	0.07-0.09	5.6-7.3	<2	Low-----	0.15	5	3	<1
	9-68	0-5	6.0-20	0.05-0.07	5.6-7.3	<2	Low-----	0.15			
134----- Delaney Variant	0-7	0-5	0.2-0.6	0.15-0.17	6.1-7.3	<2	Low-----	0.64	3	5	<1
	7-14	0-5	2.0-6.0	0.07-0.10	6.1-7.3	<2	Low-----	0.28			
	14-22	0-5	0.2-0.6	0.15-0.17	6.1-7.3	<2	Low-----	0.64			
	22-34	0-5	2.0-6.0	0.05-0.08	6.1-7.3	<2	Low-----	0.28			
	34-53	0-5	0.6-2.0	0.08-0.10	6.6-7.8	<2	Low-----	0.32			
	53-60	0-5	6.0-20	0.04-0.06	6.6-7.8	<2	Low-----	0.15			
135*: Deven-----	0-5	20-27	0.6-2.0	0.13-0.16	6.1-7.8	<2	Low-----	0.32	1	---	1-3
	5-17 17	35-50 ---	0.06-0.2 ---	0.13-0.17 ---	6.1-7.8 ---	<2 ---	High-----	0.28			
Rubble land.											
136, 137----- Diyou	0-11	18-25	0.6-2.0	0.14-0.16	6.6-7.8	<2	Low-----	0.32	5	---	2-5
	11-60	18-25	0.2-0.6	0.15-0.17	6.6-7.8	<2	Moderate	0.32			

See footnote at end of table.

TABLE 18.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Clay <2mm	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	In/hr	In/in	pH	Mmhos/cm					Pct
138----- Diyou	0-11	10-20	0.6-2.0	0.14-0.16	6.6-7.8	<2	Low-----	0.37	5	---	2-5
	11-40	18-25	0.2-0.6	0.15-0.17	6.6-7.8	<2	Moderate	0.32			
	40-62	---	6.0-20.0	0.26-0.30	6.6-7.8	<2	Low-----	---			
139, 140----- Dotta	0-15	10-25	0.6-2.0	0.13-0.16	6.1-6.5	<2	Low-----	0.32	5	---	1-3
	15-62	20-30	0.2-0.6	0.14-0.17	5.6-6.5	<2	Moderate	0.24			
141, 142----- Dotta	0-15	10-25	0.6-2.0	0.07-0.12	6.1-6.5	<2	Low-----	0.28	5	---	1-3
	15-62	20-30	0.2-0.6	0.08-0.13	6.1-6.5	<2	Moderate	0.20			
143*, 144*: Dubakella-----	0-11	20-35	0.2-0.6	0.10-0.15	5.6-7.3	<2	Moderate	0.28	2	---	4-10
	11-36	35-50	0.06-0.2	0.08-0.10	6.1-7.3	<2	Moderate	0.24			
	36	---	---	---	---	---	---	---			
Ipish-----	0-2	18-27	0.2-0.6	0.12-0.13	6.1-7.8	<2	Low-----	0.32	5	---	1-4
	2-44	27-35	0.2-0.6	0.12-0.13	6.1-7.8	<2	Moderate	0.24			
	44-65	27-45	0.2-0.6	0.07-0.11	7.4-8.4	<2	Moderate	0.20			
65	---	---	---	---	---	---	---				
145*. Dumps											
146, 147----- Duzel	0-13	10-18	0.6-2.0	0.09-0.13	5.6-7.3	<2	Low-----	0.32	2	---	1-2
	13-30	18-35	0.2-0.6	0.09-0.15	5.6-7.8	<2	Moderate	0.32			
	30-38	18-35	0.2-0.6	0.06-0.11	5.6-7.8	<2	Moderate	0.24			
	38	---	---	---	---	---	---	---			
148*: Duzel-----	0-13	10-18	0.6-2.0	0.09-0.13	5.6-7.3	<2	Low-----	0.32	2	---	1-2
	13-30	18-35	0.2-0.6	0.09-0.15	5.6-7.8	<2	Moderate	0.32			
	30-38	18-35	0.2-0.6	0.06-0.11	5.6-7.8	<2	Moderate	0.24			
	38	---	---	---	---	---	---	---			
Jilson-----	0-3	12-18	0.6-2.0	0.11-0.13	6.1-7.8	<2	Low-----	0.32	1	---	1-2
	3-14	18-35	0.6-2.0	0.11-0.14	6.1-7.8	<2	Low-----	0.24			
	14	---	---	---	---	---	---	---			
Facey-----	0-10	15-20	0.6-2.0	0.12-0.14	6.1-7.3	<2	Low-----	0.37	4	---	1-2
	10-59	18-35	0.2-0.6	0.12-0.16	5.6-7.3	<2	Moderate	0.32			
59	---	---	---	---	---	---	---				
149, 150----- Esro	0-32	18-25	0.6-2.0	0.14-0.17	6.1-7.3	<2	Low-----	0.37	5	---	2-6
	32-46	18-30	0.2-0.6	0.14-0.18	6.6-7.8	<2	Moderate	0.43			
	46-79	15-25	0.2-0.6	0.11-0.17	6.6-7.8	<2	Moderate	0.24			
151----- Etsel	0-7	12-18	0.6-2.0	0.04-0.10	5.6-6.5	<2	Low-----	0.28	1	---	1-2
7	---	---	---	---	---	---	---				
152----- Facey	0-10	15-20	0.6-2.0	0.12-0.14	6.1-7.3	<2	Low-----	0.37	4	---	1-2
	10-59	18-35	0.2-0.6	0.12-0.16	5.6-7.3	<2	Moderate	0.32			
59	---	---	---	---	---	---	---				
153----- Gazelle	0-11	8-18	2.0-6.0	0.14-0.17	>7.8	4-6	Low-----	0.49	2	---	1-2
	11-25	10-30	2.0-6.0	0.14-0.17	>7.8	4-6	Low-----	0.49			
	25-38	---	---	---	---	<2	---	---			
	38-60	10-30	0.2-0.6	0.11-0.16	>7.8	4-6	Low-----	0.37			
154----- Gazelle Variant	0-12	20-30	0.2-0.6	0.15-0.18	7.9-9.0	6-8	Moderate	0.28	1	---	1-2
	12-18	---	---	---	---	<2	---	---			
	18-60	10-30	0.2-0.6	0.11-0.16	7.9-9.0	6-8	Moderate	0.37			
155, 156----- Hilt	0-11	10-20	2.0-6.0	0.08-0.11	5.6-7.3	<2	Low-----	0.28	2	---	<1
	11-38	20-35	0.2-0.6	0.13-0.17	5.6-7.3	<2	Moderate	0.32			
	38-47	---	---	---	---	---	---	---			
47	---	---	---	---	---	---	---				

See footnote at end of table.

TABLE 18.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Clay <2mm	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	In/hr	In/in	pH	Mmhos/cm					Pct
157----- Hilt	0-11	10-20	2.0-6.0	0.06-0.08	5.6-7.3	<2	Low-----	0.24	2	---	<1
	11-38	20-35	0.2-0.6	0.12-0.16	5.6-7.3	<2	Moderate	0.32			
	38-47	---	---	---	---	---	-----	-----			
	47	---	---	---	---	---	-----	-----			
158*: Hilt-----	0-11	10-20	2.0-6.0	0.06-0.08	5.6-7.3	<2	Low-----	0.24	2	---	<1
	11-38	20-35	0.2-0.6	0.12-0.16	5.6-7.3	<2	Moderate	0.32			
	38-47	---	---	---	---	---	-----	-----			
	47	---	---	---	---	---	-----	-----			
Rock outcrop.											
159, 160----- Jenny	0-16	40-50	0.06-0.2	0.13-0.16	6.1-7.8	<2	High-----	0.28	5	---	<2
	16-23	40-50	0.06-0.2	0.13-0.16	6.6-8.4	<2	High-----	0.32			
	23-60	25-50	0.06-0.2	0.13-0.17	7.9-9.0	<2	High-----	0.32			
161----- Jenny	0-16	40-50	0.06-0.2	0.10-0.15	6.1-7.8	<2	High-----	0.24	5	---	<2
	16-23	40-50	0.06-0.2	0.13-0.16	6.6-8.4	<2	High-----	0.32			
	23-60	25-50	0.06-0.2	0.13-0.17	7.9-9.0	<2	High-----	0.32			
162----- Jilson	0-3	12-18	0.6-2.0	0.11-0.13	6.1-7.8	<2	Low-----	0.32	1	---	1-2
	3-14	18-35	0.6-2.0	0.11-0.14	6.1-7.8	<2	Low-----	0.24			
	14	---	---	---	---	---	-----	-----			
163*: Jilson-----	0-3	12-18	0.6-2.0	0.11-0.13	6.1-7.8	<2	Low-----	0.32	1	---	1-2
	3-14	18-35	0.6-2.0	0.11-0.14	6.1-7.8	<2	Low-----	0.24			
	14	---	---	---	---	---	-----	-----			
Duzel-----	0-13	10-18	0.6-2.0	0.09-0.13	5.6-7.3	<2	Low-----	0.32	2	---	1-2
	13-30	18-35	0.2-0.6	0.09-0.15	5.6-7.8	<2	Moderate	0.32			
	30-38	18-35	0.2-0.6	0.06-0.11	5.6-7.8	<2	Moderate	0.24			
	38	---	---	---	---	---	-----	-----			
164*, 165*: Kindig-----	0-5	5-16	0.6-2.0	0.08-0.12	5.6-7.3	<2	Low-----	0.32	3	---	<1
	5-15	6-18	0.6-2.0	0.06-0.12	5.6-6.5	<2	Low-----	0.32			
	15-60	6-18	0.6-2.0	0.05-0.09	5.6-6.5	<2	Low-----	0.28			
	60	---	---	---	---	---	-----	-----			
Neuns-----	0-8	6-17	0.6-2.0	0.09-0.13	5.1-6.5	<2	Low-----	0.24	2	---	<1
	8-35	7-19	0.6-2.0	0.05-0.08	5.1-6.5	<2	Low-----	0.20			
	35	---	---	---	---	---	-----	-----			
166----- Kinkel	0-9	10-15	0.6-2.0	0.06-0.10	5.1-6.5	<2	Low-----	0.24	3	---	3-10
	9-60	13-20	0.6-2.0	0.06-0.10	5.1-6.0	<2	Low-----	0.24			
167, 168----- Kuck	0-6	27-35	0.2-0.6	0.15-0.17	6.1-7.3	<2	Moderate	0.32	2	---	1-2
	6-20	35-50	0.06-0.2	0.13-0.16	6.6-7.8	<2	High-----	0.32			
	20-32	30-40	0.06-0.2	0.12-0.14	6.6-7.8	<2	Moderate	0.28			
	32	---	---	---	---	---	-----	-----			
169, 170----- Lassen	0-9	40-60	0.06-0.2	0.13-0.16	6.6-7.8	<2	High-----	0.28	2	---	1-2
	9-26	40-60	0.06-0.2	0.13-0.16	6.6-8.4	<2	High-----	0.28			
	26-28	35-60	0.06-0.2	0.12-0.15	6.6-8.4	<2	High-----	0.24			
	28	---	---	---	---	---	-----	-----			
171----- Lassen	0-9	40-60	0.06-0.2	0.09-0.13	6.6-7.8	<2	High-----	0.24	2	---	1-2
	9-28	35-60	0.06-0.2	0.09-0.13	6.6-8.4	<2	High-----	0.24			
	28	---	---	---	---	---	-----	-----			
172*: Lassen-----	0-9	40-60	0.06-0.2	0.13-0.16	6.6-7.8	<2	High-----	0.28	2	---	1-2
	9-26	40-60	0.06-0.2	0.13-0.16	6.6-8.4	<2	High-----	0.28			
	26-28	35-60	0.06-0.2	0.12-0.15	6.6-8.4	<2	High-----	0.24			
	28	---	---	---	---	---	-----	-----			

See footnote at end of table.

TABLE 18.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Clay <2mm	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	In/hr	In/in	pH	Mmhos/cm					Pct
172*: Kuck-----	0-6	27-35	0.2-0.6	0.15-0.17	6.1-7.3	<2	Moderate	0.32	2	---	1-2
	6-20	35-50	0.06-0.2	0.13-0.16	6.6-7.8	<2	High-----	0.32			
	20-32	30-40	0.06-0.2	0.12-0.14	6.6-7.8	<2	Moderate	0.28			
	32	---	---	---	---	---	---	---			
173*: Lassen-----	0-9	40-60	0.06-0.2	0.09-0.13	6.6-7.8	<2	High-----	0.24	2	---	1-2
	9-28	35-60	0.06-0.2	0.09-0.13	6.6-8.4	<2	High-----	0.24			
	28	---	---	---	---	---	---	---			
Kuck-----	0-6	27-35	0.2-0.6	0.13-0.15	6.1-7.3	<2	Moderate	0.28	2	---	1-2
	6-20	35-50	0.06-0.2	0.12-0.15	6.6-7.8	<2	High-----	0.28			
	20-32	30-40	0.06-0.2	0.12-0.14	6.6-7.8	<2	Moderate	0.24			
	32	---	---	---	---	---	---	---			
174*: Lassen-----	0-9	35-60	0.06-0.2	0.09-0.13	6.6-7.8	<2	High-----	0.24	2	---	1-2
	9-28	35-60	0.06-0.2	0.09-0.13	6.6-8.4	<2	High-----	0.24			
	28	---	---	---	---	---	---	---			
Rock outcrop.											
Kuck-----	0-6	27-35	0.2-0.6	0.12-0.14	6.1-7.3	<2	Moderate	0.28	2	---	1-2
	6-20	35-50	0.06-0.2	0.12-0.15	6.6-7.8	<2	High-----	0.28			
	20-32	30-40	0.06-0.2	0.12-0.14	6.6-7.8	<2	Moderate	0.24			
	32	---	---	---	---	---	---	---			
175*. Lava flows											
176*: Lava flows.											
Xerorthents.											
177*: Lithic Haploxerolls.											
Rock outcrop.											
178*: Lithic Xerorthents.											
Rock outcrop.											
179, 180----- Louie	0-12	10-20	0.6-2.0	0.13-0.16	6.1-7.8	<2	Low-----	0.32	2	---	<1
	12-21	20-27	0.2-0.6	0.13-0.16	6.6-8.4	<2	Low-----	0.32			
	21-29	20-30	0.2-0.6	0.15-0.18	6.6-8.4	<2	Moderate	0.28			
	29-32	---	---	---	---	<2	---	---			
	32-60	0-5	>20	0.02-0.04	6.6-8.4	<2	Low-----	0.15			
181----- Louie	0-12	10-20	0.6-2.0	0.11-0.13	6.1-7.8	<2	Low-----	0.28	2	---	<1
	12-21	20-27	0.2-0.6	0.11-0.14	6.6-8.4	<2	Low-----	0.28			
	21-29	20-30	0.2-0.6	0.13-0.14	6.6-8.4	<2	Moderate	0.24			
	29-32	---	---	---	---	---	---	---			
	32-60	3-10	6.0-20.0	0.02-0.04	6.6-8.4	<2	Low-----	0.17			
182----- Louie Variant	0-15	20-27	0.2-0.6	0.16-0.18	7.4-8.4	<2	Moderate	0.28	2	---	<1
	15-26	25-35	0.2-0.6	0.16-0.18	7.4-8.4	<2	Moderate	0.32			
	26-33	15-25	0.6-6.0	0.10-0.15	7.4-8.4	<2	Low-----	0.37			
	33-60	---	---	---	---	---	---	---			

See footnote at end of table.

TABLE 18.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Clay <2mm	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	In/hr	In/in	pH	Mmhos/cm					Pct
183*, 184*: Marpa-----	0-14 14-30 30	15-25 27-35 ---	0.6-2.0 0.6-2.0 ---	0.10-0.12 0.06-0.10 ---	5.6-6.5 5.1-6.0 ---	<2 <2 ---	Low----- Low----- ---	0.32 0.24 ---	2 ---	---	<1
Kinkel-----	0-9 9-60	10-15 13-20	0.6-2.0 0.6-2.0	0.06-0.10 0.06-0.10	5.1-6.5 5.1-6.0	<2 <2	Low----- Low-----	0.24 0.24	3 ---	---	3-10
Boomer-----	0-10 10-53 53	18-27 25-35 ---	0.6-2.0 0.2-0.6 ---	0.11-0.15 0.12-0.15 ---	5.6-7.3 5.1-6.5 ---	<2 <2 ---	Low----- Moderate ---	0.28 0.24 ---	3 ---	---	1-3
185, 186----- Mary	0-10 10-24 24-28 28	12-25 20-35 20-30 ---	0.6-2.0 0.2-0.6 0.2-0.6 ---	0.13-0.16 0.14-0.18 0.15-0.18 ---	6.1-7.3 6.6-7.8 6.6-7.8 ---	<2 <2 <2 ---	Low----- Moderate Moderate ---	0.37 0.28 0.28 ---	1 ---	---	<1
187----- Mary	0-10 10-24 24-28 28	12-25 20-35 20-30 ---	0.6-2.0 0.2-0.6 0.2-0.6 ---	0.12-0.15 0.14-0.17 0.14-0.17 ---	6.1-7.3 6.6-7.8 6.6-7.8 ---	<2 <2 <2 ---	Low----- Moderate Moderate ---	0.28 0.28 0.28 ---	1 ---	---	<1
188*: Mary-----	0-10 10-24 24-28 28	12-25 20-35 20-30 ---	0.6-2.0 0.2-0.6 0.2-0.6 ---	0.12-0.15 0.14-0.17 0.14-0.17 ---	6.1-7.3 6.6-7.8 6.6-7.8 ---	<2 <2 <2 ---	Low----- Moderate Moderate ---	0.28 0.28 0.28 ---	1 ---	---	<1
Rock outcrop.											
189, 190, 191---- Medford	0-18 18-60	27-35 35-45	0.2-0.6 0.2-0.6	0.16-0.18 0.14-0.17	5.6-7.3 5.6-7.3	<2 <2	Moderate High-----	0.32 0.28	5 ---	---	1-4
192, 193----- Montague	0-4 4-24 24-36 36	40-50 35-50 --- ---	0.06-0.2 0.06-0.2 --- ---	0.12-0.16 0.12-0.16 --- ---	6.1-7.3 6.1-7.3 --- ---	<2 <2 --- ---	High----- High----- --- ---	0.20 0.20 --- ---	2 ---	---	1-2
194----- Montague	0-4 4-24 24-36 36	40-50 35-50 --- ---	0.06-0.2 0.06-0.2 --- ---	0.08-0.11 0.08-0.11 --- ---	6.1-7.3 6.1-7.3 --- ---	<2 <2 --- ---	High----- High----- --- ---	0.20 0.20 --- ---	2 ---	---	1-2
195----- Montague Variant	0-12 12-15 15	40-50 --- ---	0.06-0.2 --- ---	0.13-0.16 --- ---	6.1-7.3 --- ---	<2 --- ---	High----- --- ---	0.20 --- ---	1 ---	---	1-2
196*: Neer-----	0-9 9-26 26	3-15 4-17 ---	6.0-20.0 6.0-20.0 ---	0.08-0.11 0.07-0.10 ---	5.1-6.5 5.1-6.5 ---	<2 <2 ---	Low----- Low----- ---	0.17 0.10 ---	2 ---	---	4-15
Ponto-----	0-8 8-53 53-80	6-15 8-18 10-18	2.0-6.0 0.6-2.0 0.6-2.0	0.08-0.10 0.10-0.16 0.08-0.10	5.1-6.0 4.5-6.0 4.5-6.0	<2 <2 <2	Low----- Low----- Low-----	0.17 0.20 0.17	5 ---	---	1-5
197*: Neer-----	0-9 9-26 26	3-15 4-17 ---	6.0-20.0 6.0-20.0 ---	0.09-0.12 0.07-0.10 ---	5.1-6.5 5.1-6.5 ---	<2 <2 ---	Low----- Low----- ---	0.17 0.10 ---	2 ---	---	4-15
Ponto-----	0-8 8-53 53-80	6-15 8-18 10-18	2.0-6.0 0.6-2.0 0.6-2.0	0.10-0.13 0.10-0.16 0.08-0.10	5.1-6.0 4.5-6.0 4.5-6.0	<2 <2 <2	Low----- Low----- Low-----	0.17 0.20 0.17	5 ---	---	1-5
198----- Odas	0-31 31-53 53-60	6-18 6-18 6-18	2.0-6.0 2.0-6.0 2.0-6.0	0.09-0.12 0.09-0.15 0.08-0.12	5.1-6.0 5.1-6.0 5.1-6.0	<2 <2 <2	Low----- Low----- Low-----	0.20 0.28 0.24	5 ---	---	4-6

See footnote at end of table.

TABLE 18.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Clay <2mm	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	In/hr	In/in	pH	Mmhos/cm					Pct
199----- Oosen	0-12	0-5	6.0-20	0.06-0.10	5.6-7.3	<2	Low-----	0.15	5	---	2-6
	12-28	0-5	6.0-20	0.06-0.10	5.6-7.3	<2	Low-----	0.15			
	28-75	0-5	6.0-20	0.06-0.08	5.6-7.3	<2	Low-----	0.10			
200----- Orset	0-13	10-18	2.0-6.0	0.09-0.11	5.6-6.5	<2	Low-----	0.24	5	---	<1
	13-62	10-18	0.2-0.6	0.09-0.16	5.6-6.5	<2	Low-----	0.32			
201, 202, 203----- Pinehurst	0-10	15-25	0.6-2.0	0.10-0.13	5.6-6.5	<2	Low-----	0.20	3	---	1-4
	10-48	20-35	0.2-0.6	0.08-0.14	5.1-6.5	<2	Low-----	0.28			
	48-60	20-30	0.2-0.6	0.07-0.11	5.1-6.5	<2	Low-----	0.28			
	60	---	---	---	---	---	---	---			
204, 205----- Pinehurst Variant	0-12	16-27	0.6-2.0	0.08-0.12	6.1-7.8	<2	Low-----	0.24	2	---	1-2
	12-26	27-35	0.2-0.6	0.08-0.13	6.1-7.8	<2	Moderate	0.24			
	26	---	---	---	---	---	---				
206----- Pit	0-38	40-60	0.06-0.2	0.14-0.16	6.6-7.8	<2	High-----	0.32	5	---	1-4
	38-61	30-40	0.06-0.2	0.16-0.19	7.4-8.4	<4	Moderate	0.37			
207*: Plutos-----	0-7	3-8	6.0-20	0.05-0.07	5.6-7.3	<2	Low-----	0.17	2	2	<1
	7-23	3-8	6.0-20	0.05-0.07	5.6-7.3	<2	Low-----	0.15			
	23	---	---	---	---	---	---				
Rock outcrop.											
208----- Ponto	0-8	6-15	2.0-6.0	0.10-0.13	5.1-6.0	<2	Low-----	0.17	5	---	1-5
	8-53	8-18	0.6-2.0	0.10-0.16	4.5-6.0	<2	Low-----	0.20			
	53-80	10-18	0.6-2.0	0.08-0.10	4.5-6.0	<2	Low-----	0.17			
209*: Ponto-----	0-8	6-15	2.0-6.0	0.10-0.13	5.1-6.0	<2	Low-----	0.17	5	---	1-5
	8-53	8-18	0.6-2.0	0.10-0.16	4.5-6.0	<2	Low-----	0.20			
	53-80	10-18	0.6-2.0	0.08-0.10	4.5-6.0	<2	Low-----	0.17			
Neer-----	0-9	3-15	6.0-20.0	0.09-0.12	5.1-6.5	<2	Low-----	0.17	2	---	4-15
	9-26	4-17	6.0-20.0	0.07-0.10	5.1-6.5	<2	Low-----	0.10			
	26	---	---	---	---	---	---				
210, 211----- Redola	0-13	7-18	0.6-2.0	0.14-0.16	7.4-8.4	<2	Low-----	0.32	5	4L	1-2
	13-39	7-18	0.6-2.0	0.12-0.17	7.4-9.0	<2	Low-----	0.28			
	39-60	2-18	0.6-2.0	0.04-0.12	7.4-9.0	<2	Low-----	0.28			
212*. Riverwash											
213*: Rock outcrop.											
Dubakella-----	0-11	20-35	0.2-0.6	0.10-0.15	5.6-7.3	<2	Moderate	0.28	2	---	4-10
	11-36	35-50	0.06-0.2	0.08-0.10	6.1-7.8	<2	Moderate	0.24			
	36	---	---	---	---	---	---				
214*: Rock outcrop.											
Louie-----	0-12	10-20	0.6-2.0	0.11-0.13	6.1-7.8	<2	Low-----	0.28	2	---	<1
	12-21	20-27	0.2-0.6	0.11-0.14	6.6-8.4	<2	Low-----	0.28			
	21-29	20-30	0.2-0.6	0.13-0.14	6.6-8.4	<2	Moderate	0.24			
	29-32	---	---	---	---	---	---				
	32-60	3-10	6.0-20.0	0.02-0.04	6.6-8.4	<2	Low-----	0.17			
215*: Rock outcrop.											

See footnote at end of table.

TABLE 18.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Clay <2mm	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	In/hr	In/in	pH	Mmhos/cm					Pct
215*: Terwilliger	0-6 6-30 30-34 34	27-35 27-50 35-50 ---	0.2-0.6 0.06-0.2 0.06-0.2 ---	0.13-0.16 0.12-0.16 0.10-0.14 ---	6.1-7.3 6.6-7.8 6.6-8.4 ---	<2 <2 <2 ---	Moderate High High ---	0.37 0.37 0.32 ---	2 2 2 ---	---	<1
216*. Rock outcrop											
217, 218----- Salisbury	0-4 4-24 24-32 32-60	27-35 40-50 --- 0-5	0.2-0.6 0.06-0.2 --- 6.0-20.0	0.15-0.19 0.13-0.16 --- 0.02-0.04	6.6-7.8 6.6-8.4 --- 6.6-8.4	<2 <2 --- <2	Moderate High --- Low	0.32 0.28 --- 0.17	2 2 --- 2	---	1-2
219, 220----- Salisbury	0-4 4-24 24-32 32-60	27-35 40-50 --- 0-5	0.06-0.2 0.06-0.2 --- 6.0-20.0	0.14-0.18 0.12-0.15 --- 0.02-0.04	6.6-7.8 6.6-8.4 --- 6.6-8.4	<2 <2 --- <2	Moderate High --- Low	0.28 0.24 --- 0.17	2 2 --- 2	---	1-2
221----- Salisbury	0-4 4-24 24-32 32-60	20-27 40-50 --- 0-5	0.6-2.0 0.06-0.2 --- 6-20.0	0.10-0.12 0.12-0.15 --- 0.02-0.04	6.6-7.8 6.6-8.4 --- 6.6-8.4	<2 <2 --- <2	Low High --- Low	0.32 0.24 --- 0.17	2 2 --- 2	---	1-2
222, 223----- Settlemyer	0-10 10-66	18-27 27-35	0.6-2.0 0.2-0.6	0.14-0.16 0.11-0.15	7.4-8.4 7.4-8.4	<2 <2	Moderate Moderate	0.37 0.24	5 5	---	1-2
224----- Settlemyer Variant	0-19 19-68 68-80	20-27 35-45 18-35	0.6-2.0 0.06-0.2 0.2-0.6	0.14-0.17 0.16-0.19 0.09-0.12	7.4-8.4 7.4-8.4 7.9-9.0	<2 <2 <2	Low High Moderate	0.43 0.37 0.28	5 5 5	---	2-4
225----- Sheld	0-7 7-19 19-33 33-46 46	5-10 5-10 6-12 10-20 ---	2.0-6.0 2.0-6.0 0.6-2.0 0.6-2.0 ---	0.06-0.10 0.11-0.14 0.07-0.09 0.07-0.09 ---	5.1-6.5 5.1-6.5 5.6-6.5 5.1-6.5 ---	<2 <2 <2 <2 ---	Low Low Low Low ---	0.20 0.20 0.20 0.20 ---	3 3 3 3 ---	---	1-4
226*, 227*: Sheld	0-7 7-19 19-33 33-46 46	5-10 5-10 6-12 10-20 ---	2.0-6.0 2.0-6.0 0.6-2.0 0.6-2.0 ---	0.11-0.14 0.11-0.14 0.07-0.09 0.07-0.09 ---	5.1-6.5 5.1-6.5 5.6-6.5 5.1-6.5 ---	<2 <2 <2 <2 ---	Low Low Low Low ---	0.20 0.20 0.20 0.20 ---	3 3 3 3 ---	---	1-4
Iller-----	0-13 13-28 28-37 37-65	3-10 5-12 5-12 10-23	2.0-6.0 2.0-6.0 0.6-2.0 0.6-2.0	0.09-0.12 0.09-0.15 0.08-0.11 0.07-0.09	5.1-6.5 5.1-6.5 5.1-6.5 5.1-6.5	<2 <2 <2 <2	Low Low Low Low	0.17 0.20 0.15 0.15	5 5 5 5	---	<1
228----- Snell	0-4 4-21 21	20-27 35-45 ---	0.6-2.0 0.2-0.6 ---	0.08-0.12 0.06-0.10 ---	6.1-7.3 6.1-7.3 ---	<2 <2 ---	Low High ---	0.28 0.20 ---	2 2 ---	---	1-2
229, 230, 231---- Stoner	0-12 12-36 36-60	8-17 9-18 10-20	2.0-6.0 0.6-2.0 0.6-2.0	0.07-0.10 0.07-0.11 0.06-0.08	5.6-6.5 5.6-6.5 5.6-6.5	<2 <2 <2	Low Low Low	0.20 0.24 0.24	5 5 5	---	1-2
232, 233, 234---- Terwilliger	0-6 6-30 30-34 34	27-35 27-50 35-50 ---	0.2-0.6 0.06-0.2 0.06-0.2 ---	0.15-0.18 0.12-0.16 0.10-0.14 ---	6.1-7.3 6.6-7.8 6.6-8.4 ---	<2 <2 <2 ---	Moderate High High ---	0.43 0.37 0.32 ---	2 2 2 ---	---	<1
235----- Terwilliger	0-6 6-30 30-34 34	27-35 27-50 35-50 ---	0.2-0.6 0.06-0.2 0.06-0.2 ---	0.13-0.16 0.12-0.16 0.10-0.14 ---	6.1-7.3 6.6-7.8 6.6-8.4 ---	<2 <2 <2 ---	Moderate High High ---	0.37 0.37 0.32 ---	2 2 2 ---	---	<1

See footnote at end of table.

TABLE 18.--PHYSICAL AND CHEMICAL PROPERTIES OF SOILS--Continued

Soil name and map symbol	Depth	Clay <2mm	Permeability	Available water capacity	Soil reaction	Salinity	Shrink-swell potential	Erosion factors		Wind erodibility group	Organic matter
								K	T		
	In	Pct	In/hr	In/in	pH	Mmhos/cm					Pct
236----- Uhlrig Variant	0-14 14-42 42	10-16 12-18 ---	0.6-2.0 0.6-2.0 ---	0.11-0.13 0.11-0.13 ---	5.6-6.5 5.6-6.5 ---	<2 <2 ---	Low----- Low----- ---	0.28 0.28 ---	3	8	1-2
237*: Weitchpec Variant-----	0-4 4-8 8-16 16	20-27 30-35 30-35 ---	0.6-2.0 0.2-0.6 0.2-0.6 ---	0.10-0.11 0.12-0.13 0.09-0.10 ---	6.1-7.3 6.1-7.3 6.1-7.3 ---	<2 <2 <2 ---	Low----- Moderate Low----- ---	0.28 0.28 0.24 ---	1	---	1-2
Rock outcrop.											
238*. Xerofluvents											

\* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 19.--SOIL AND WATER FEATURES

["Flooding" and "water table" and terms such as "rare," "brief," "apparent," and "perched" are explained in the text. The symbol > means more than. Absence of an entry indicates that the feature is not a concern or that data were not estimated]

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Cemented pan		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Depth	Hardness	Uncoated steel	Concrete
					Ft			In		In			
101, 102, 103-- Asta	B	None-----	---	---	>6.0	---	---	>60	---	---	---	High-----	Moderate.
104, 105-- Atter	A	Rare-----	---	---	>6.0	---	---	>60	---	---	---	Moderate	Moderate.
106-- Atter	A	None-----	---	---	>6.0	---	---	>60	---	---	---	Moderate	Moderate.
107*, 108*: Avis	A	None-----	---	---	>6.0	---	---	>60	---	---	---	Moderate	Moderate.
Oosen	A	None-----	---	---	>6.0	---	---	>60	---	---	---	Moderate	Moderate.
109*: Avis	A	None-----	---	---	>6.0	---	---	>60	---	---	---	Moderate	Moderate.
Lava flows.													
110, 111-- Bogus	C	None-----	---	---	>6.0	---	---	60-80	---	---	---	High-----	High.
112, 113, 114-- Bonnet	B	None-----	---	---	>6.0	---	---	>60	---	---	---	High-----	Low.
115-- Boomer	B	None-----	---	---	>6.0	---	---	40-60	Soft	---	---	Moderate	Moderate.
116*: Boomer	B	None-----	---	---	>6.0	---	---	40-60	Soft	---	---	Moderate	Moderate.
Neuns	C	None-----	---	---	>6.0	---	---	20-40	Hard	---	---	Moderate	Moderate.
117, 118-- Boomer Variant	B	None-----	---	---	>6.0	---	---	60-80	---	---	---	Moderate	Moderate.
119*, 120*, 121*: Chaix	B	None-----	---	---	>6.0	---	---	20-40	Soft	---	---	High-----	High.
Chawanakee	C	None-----	---	---	>6.0	---	---	10-20	Soft	---	---	Moderate	Moderate.
122, 123, 124-- Copsey	D	None-----	---	---	0.5-1.5	Apparent	Dec-Mar	>60	---	---	---	High-----	Low.
125, 126, 127, 128-- Deetz	A	None-----	---	---	>6.0	---	---	>60	---	---	---	Moderate	Moderate.

See footnote at end of table.

TABLE 19.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Cemented pan		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Depth	Hardness	Uncoated steel	Concrete
					<u>Ft</u>			<u>In</u>		<u>In</u>			
129, 130----- Delaney	A	None-----	---	---	>6.0	---	---	>60	---	---	---	Moderate	Low.
131----- Delaney	A	None-----	---	---	>6.0	---	---	40-60	Hard	---	---	Moderate	Low.
132, 133----- Delaney	A	None-----	---	---	>6.0	---	---	>60	---	---	---	Moderate	Low.
134----- Delaney Variant	C	Frequent----	Brief-----	Jul-Sep	>6.0	---	---	>60	---	---	---	Moderate	Low.
135*: Deven----- Rubble land.	D	None-----	---	---	>6.0	---	---	10-20	Hard	---	---	High-----	Low.
136----- Diyou	C	Occasional	Brief-----	Dec-May	2.0-3.0	Apparent	Feb-Jun	>60	---	---	---	High-----	Moderate.
137----- Diyou	C	Rare-----	---	---	3.0-5.0	Apparent	Feb-Jun	>60	---	---	---	Moderate	Moderate.
138----- Diyou	C	Rare-----	---	---	2.0-3.0	Apparent	Feb-Jun	>60	---	---	---	High-----	Moderate.
139, 140, 141, 142----- Dotta	B	None-----	---	---	>6.0	---	---	>60	---	---	---	Moderate	Moderate.
143*, 144*: Dubakella-----	C	None-----	---	---	>6.0	---	---	20-40	Hard	---	---	High-----	Low.
Ipish-----	C	None-----	---	---	>6.0	---	---	60-80	---	---	---	High-----	Moderate.
145*. Dumps													
146, 147----- Duzel	C	None-----	---	---	>6.0	---	---	20-40	Soft	---	---	Low-----	Moderate.
148*: Duzel-----	C	None-----	---	---	>6.0	---	---	20-40	Soft	---	---	Low-----	Moderate.
Jilson-----	D	None-----	---	---	>6.0	---	---	10-20	Hard	---	---	Moderate	Low.
Facey-----	B	None-----	---	---	>6.0	---	---	40-60	Hard	---	---	Moderate	Moderate.
149----- Esro	D	Frequent----	Very long	Jan-Jun	0-1.0	Apparent	Dec-Aug	>60	---	---	---	High-----	Moderate.

See footnote at end of table.

TABLE 19.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Cemented pan		Risk of corrosion	
		Frequency	Duration	Months	Depth Ft	Kind	Months	Depth In	Hardness	Depth In	Hardness	Uncoated steel	Concrete
150----- Esro	D	Rare-----	---	---	2.0-4.0	Apparent	Dec-Jul	>60	---	---	---	High-----	Moderate.
151----- Etsel	D	None-----	---	---	>6.0	---	---	6-10	Hard	---	---	Low-----	Moderate.
152----- Facey	B	None-----	---	---	>6.0	---	---	40-60	Hard	---	---	Moderate	Moderate.
153----- Gazelle	D	Frequent---	Long-----	Nov-May	0-1.5	Perched	Dec-Mar	>60	---	20-40	Thin	High-----	Low.
154----- Gazelle Variant	D	Occasional	Brief-----	Dec-Jan	0-1.0	Perched	Dec-Apr	>60	---	10-20	Thin	High-----	Low.
155, 156, 157----- Hilt	B	None-----	---	---	>6.0	---	---	20-40	Soft	---	---	Moderate	Moderate.
158*: Hilt----- Rock outcrop.	B	None-----	---	---	>6.0	---	---	20-40	Soft	---	---	Moderate	Moderate.
159, 160, 161----- Jenny	D	None-----	---	---	>6.0	---	---	>60	---	---	---	High-----	Low.
162----- Jilson	D	None-----	---	---	>6.0	---	---	10-20	Hard	---	---	Moderate	Low.
163*: Jilson----- Duzel-----	D	None-----	---	---	>6.0	---	---	10-20	Hard	---	---	Moderate	Low.
	C	None-----	---	---	>6.0	---	---	20-40	Soft	---	---	Low-----	Moderate.
164*, 165*: Kindig----- Neuns-----	B	None-----	---	---	>6.0	---	---	40-60	Soft	---	---	Moderate	Moderate.
	C	None-----	---	---	>6.0	---	---	20-40	Hard	---	---	Moderate	Moderate.
166----- Kinkel	B	None-----	---	---	>6.0	---	---	60-80	---	---	---	High-----	High.
167, 168----- Kuck	C	None-----	---	---	>6.0	---	---	20-40	Soft	---	---	High-----	Low.
169, 170, 171----- Lassen	D	None-----	---	---	>6.0	---	---	20-40	Hard	---	---	High-----	Low.

See footnote at end of table.

TABLE 19.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Cemented pan		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Depth	Hardness	Uncoated steel	Concrete
					Fe			In		In			
172*, 173*: Lassen-----	D	None-----	---	---	>6.0	---	---	20-40	Hard	---	---	High-----	Low.
Kuck-----	C	None-----	---	---	>6.0	---	---	20-40	Soft	---	---	High-----	Low.
174*: Lassen-----	D	None-----	---	---	>6.0	---	---	20-40	Hard	---	---	High-----	Low.
Rock outcrop.													
174*: Kuck-----	C	None-----	---	---	>6.0	---	---	20-40	Soft	---	---	High-----	Low.
175*. Lava flows													
176*: Lava flows. Xerorthents.													
177*: Lithic Haploxerolls. Rock outcrop.													
178*: Lithic Xerorthents. Rock outcrop.													
179, 180, 181----- Louie	C	None-----	---	---	>6.0	---	---	>60	---	20-40	Thin	High-----	Low.
182----- Louie Variant	C	None-----	---	---	>6.0	---	---	>60	---	20-40	Thick	Low-----	Low.
183*, 184*: Marpa-----	C	None-----	---	---	>6.0	---	---	20-40	Hard	---	---	Moderate	Moderate.
Kinkel-----	B	None-----	---	---	>6.0	---	---	60-80	---	---	---	High-----	High.
Boomer-----	B	None-----	---	---	>6.0	---	---	40-60	Soft	---	---	Moderate	Moderate.
185, 186, 187----- Mary	D	None-----	---	---	>6.0	---	---	20-40	Hard	---	---	Moderate	Low.
188*: Mary----- Rock outcrop.	D	None-----	---	---	>6.0	---	---	20-40	Hard	---	---	Moderate	Low.

See footnote at end of table.

TABLE 19.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Cemented pan		Risk of corrosion	
		Frequency	Duration	Months	Depth Ft	Kind	Months	Depth In	Hard-ness	Depth In	Hardness	Uncoated steel	Concrete
189, 190, 191----- Medford	C	None-----	---	---	>6.0	---	---	>60	---	---	---	High-----	Low.
192, 193, 194----- Montague	D	None-----	---	---	>6.0	---	---	30-48	Soft	20-40	Thick	High-----	Low.
195----- Montague Variant	D	None-----	---	---	>6.0	---	---	15-44	Soft	10-20	Thick	High-----	Low.
196*, 197*: Neer-----	B	None-----	---	---	>6.0	---	---	20-40	Soft	---	---	Moderate	Moderate.
Ponto-----	B	None-----	---	---	>6.0	---	---	>60	---	---	---	High-----	High.
198----- Odas	D	Rare-----	---	---	1.5-3.0	Apparent	Jan-Dec	>60	---	---	---	Moderate	Moderate.
199----- Oosen	A	None-----	---	---	>6.0	---	---	>60	---	---	---	Moderate	Moderate.
200----- Orset	B	None-----	---	---	>6.0	---	---	>60	---	---	---	Moderate	Moderate.
201, 202, 203----- Pinehurst	B	None-----	---	---	>6.0	---	---	40-60	Soft	---	---	Moderate	Moderate.
204, 205----- Pinehurst Variant	C	None-----	---	---	>6.0	---	---	20-40	Soft	---	---	Moderate	Low.
206----- Pit	D	Occasional	Long-----	Dec-Mar	2.0-3.0	Apparent	Dec-May	>60	---	---	---	High-----	Low.
207*: Plutos----- Rock outcrop.	B	None-----	---	---	>6.0	---	---	20-40	Hard	---	---	Moderate	Moderate.
208----- Ponto	B	None-----	---	---	>6.0	---	---	>60	---	---	---	High-----	High.
209*: Ponto-----	B	None-----	---	---	>6.0	---	---	>60	---	---	---	High-----	High.
Neer-----	B	None-----	---	---	>6.0	---	---	20-40	Soft	---	---	Moderate	Moderate.
210, 211----- Redola	B	None-----	---	---	>6.0	---	---	>60	---	---	---	High-----	Low.
212*. Riverwash													

See footnote at end of table.

TABLE 19.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Cemented pan		Risk of corrosion	
		Frequency	Duration	Months	Depth	Kind	Months	Depth	Hardness	Depth	Hardness	Uncoated steel	Concrete
				Ft				In					
213*: Rock outcrop. Dubakella-----	C	None-----	---	---	>6.0	---	---	20-40	Hard	---	---	High-----	Low.
214*: Rock outcrop. Louie-----	C	None-----	---	---	>6.0	---	---	>60	---	20-40	Thin	High-----	Low.
215*: Rock outcrop. 215*: Terwilliger-----	D	None-----	---	---	>6.0	---	---	20-40	Soft	---	---	High-----	Low.
216*. Rock outcrop 217, 218, 219, 220, 221----- Salisbury	D	None-----	---	---	>6.0	---	---	>60	---	20-40	Thick	High-----	Low.
222----- Settlemeier	D	Occasional	Brief-----	Jan-Mar	0	Apparent	Dec-Jun	>60	---	---	---	High-----	Low.
223----- Settlemeier	D	Occasional	Brief-----	Jan-Mar	0-2.0	Apparent	Feb-Jun	>60	---	---	---	High-----	Low.
224----- Settlemeier Variant	D	Common-----	Brief-----	Dec-Mar	0-1.5	Apparent	Dec-Apr	>60	---	---	---	High-----	Low.
225----- Sheld	B	None-----	---	---	>6.0	---	---	40-60	Soft	---	---	Moderate	Moderate.
226*, 227*: Sheld-----	B	None-----	---	---	>6.0	---	---	40-60	Soft	---	---	Moderate	Moderate.
Iller-----	B	None-----	---	---	>6.0	---	---	>60	---	---	---	Moderate	Moderate.
228----- Snell	C	None-----	---	---	>6.0	---	---	20-40	Hard	---	---	High-----	Low.
229, 230, 231----- Stoner	B	None-----	---	---	>6.0	---	---	>60	---	---	---	Moderate	Moderate.
232, 233, 234, 235----- Terwilliger	D	None-----	---	---	>6.0	---	---	20-40	Soft	---	---	High-----	Low.

See footnote at end of table.

TABLE 19.--SOIL AND WATER FEATURES--Continued

Soil name and map symbol	Hydro-logic group	Flooding			High water table			Bedrock		Cemented pan		Risk of corrosion	
		Frequency	Duration	Months	Depth Ft	Kind	Months	Depth In	Hard-ness	Depth In	Hardness	Uncoated steel	Concrete
236----- Uhlig Variant	B	None-----	---	---	>6.0	---	---	40-60	Soft	---	---	Moderate	Moderate.
237*: Weitchpec Variant Rock outcrop.	D	None-----	---	---	>6.0	---	---	10-20	Hard	---	---	High-----	Low.
238*. Xerofluvents													

\* See description of the map unit for composition and behavior characteristics of the map unit.

TABLE 20.--CLASSIFICATION OF THE SOILS

Soil name	Family or higher taxonomic class
Asta-----	Fine-loamy, mixed, mesic Andeptic Haplohumults
Atter-----	Sandy-skeletal, mixed, mesic Typic Xerorthents
Avis-----	Ashy-skeletal, frigid Dystric Xerorthents
Bogus-----	Fine, montmorillonitic, mesic Pachic Ultic Argixerolls
Bonnet-----	Loamy-skeletal, mixed, mesic Calcic Haploxerolls
Boomer-----	Fine-loamy, mixed, mesic Ultic Haploxeralfs
Boomer Variant-----	Fine-loamy, mixed, mesic Ultic Haploxeralfs
Chaix-----	Coarse-loamy, mixed, mesic Dystric Xerochrepts
Chawanakee-----	Loamy, mixed, mesic, shallow Dystric Xerochrepts
Copsey-----	Fine, serpentinitic, mesic Vertic Haplaquolls
Deetz-----	Ashy, mesic Dystric Xeropsamments
Delaney-----	Ashy, mesic Typic Xeropsamments
Delaney Variant-----	Coarse-loamy, mixed, nonacid, mesic Typic Xerofluvents
Deven-----	Clayey, montmorillonitic, mesic Lithic Argixerolls
Diyou-----	Fine-loamy, mixed, mesic Fluvaquentic Haploxerolls
Dotta-----	Fine-loamy, mixed, mesic Pachic Argixerolls
Dubakella-----	Clayey-skeletal, serpentinitic, mesic Mollic Haploxeralfs
Duzel-----	Fine-loamy, mixed, mesic Typic Argixerolls
Esro-----	Fine-silty, mixed, frigid Cumulic Haplaquolls
Etsel-----	Loamy-skeletal, mixed, nonacid, mesic Lithic Xerorthents
Facey-----	Fine-loamy, mixed, mesic Typic Argixerolls
Gazelle-----	Coarse-loamy, mixed, mesic Aquic Durorthids
Gazelle Variant-----	Loamy, mixed, mesic, shallow Aquic Durorthids
Hilt-----	Fine-loamy, mixed, mesic Mollic Haploxeralfs
Iller-----	Medial over loamy-skeletal, mixed, frigid Andic Xerumbrepts
Ipish-----	Fine-loamy, serpentinitic, mesic Mollic Haploxeralfs
Jenny-----	Fine, montmorillonitic, mesic Typic Chromoxererts
Jilson-----	Loamy, mixed, mesic Lithic Argixerolls
Kindig-----	Loamy-skeletal, mixed, mesic Dystric Xerochrepts
Kinkel-----	Loamy-skeletal, mixed, mesic Ultic Palexeralfs
Kuck-----	Fine, montmorillonitic, mesic Vertic Argixerolls
Lassen-----	Fine, montmorillonitic, mesic Typic Chromoxererts
Louie-----	Fine-loamy, mixed, mesic Typic Durixeralfs
Louie Variant-----	Fine-loamy, mixed, mesic Haplic Durixeralfs
Marpa-----	Loamy-skeletal, mixed, mesic Ultic Haploxeralfs
Mary-----	Fine-loamy, mixed, mesic Mollic Haploxeralfs
Medford-----	Fine, montmorillonitic, mesic Pachic Argixerolls
Montague-----	Fine, montmorillonitic, mesic Typic Chromoxererts
Montague Variant-----	Clayey, montmorillonitic, mesic, shallow Petrocalcic Palexerolls
Neer-----	Medial-skeletal, mesic Andic Xerochrepts
Neuns-----	Loamy-skeletal, mixed, mesic Dystric Xerochrepts
Odas-----	Coarse-loamy, mixed, nonacid, mesic Cumulic Humaquepts
Oosen-----	Ashy, frigid Dystric Xeropsamments
Orset-----	Coarse-loamy, mixed, nonacid, frigid Typic Xerorthents
Pinehurst-----	Fine-loamy, mixed, frigid Pachic Ultic Argixerolls
Pinehurst Variant-----	Loamy-skeletal, mixed, mesic Typic Argixerolls
Pit-----	Fine, montmorillonitic, mesic Chromic Pelloxererts
Plutos-----	Ashy, mesic Typic Xeropsamments
Ponto-----	Medial, mesic Andic Xerochrepts
*Redola-----	Coarse-loamy, mixed, mesic Cumulic Haploxerolls
Salisbury-----	Fine, montmorillonitic, mesic Typic Durixerolls
Settlemyer-----	Fine-loamy, mixed, mesic Fluvaquentic Haplaquolls
Settlemyer Variant-----	Fine, mixed, mesic Typic Argiaquolls
Sheld-----	Medial-skeletal, frigid Andic Xerumbrepts
Snell-----	Clayey-skeletal, montmorillonitic, frigid Pachic Argixerolls
Stoner-----	Coarse-loamy, mixed, mesic Typic Xerochrepts
Terwilliger-----	Fine, montmorillonitic, mesic Typic Haploxeralfs
Uhlig Variant-----	Coarse-loamy, mixed, mesic Typic Haploxerolls
Weitchpec Variant-----	Loamy-skeletal, serpentinitic, mesic Lithic Argixerolls

\* The soil is a taxadjunct to the series. See text for a description of those characteristics of the soil that are outside the range of the series.



U.S. DEPARTMENT OF AGRICULTURE

Washington, D.C. 20013

Soil Survey of Siskiyou County, California, Central Part

E R R A T U M

The following errors were made in printing the soil maps of the soil survey of Siskiyou County, Central Part, California.

Measurements are based on the scale of 1/10 inch = 200 feet,  
1/2 inch = 1,000 feet, and 1 inch = 2,000 feet

Map Sheet #2 HORN BROOK, NE. QUADRANGLE

- (A) 2,000 feet E. and 1,300 feet N. from the SW. cor. sec. 8, R. 6 W., T. 47 N., arrow in symbol 167 in soil delineation.
- (B) 800 feet W. and 1,200 feet N. from the SE. cor. sec. 20, R. 6 W., T. 47 N., change soil Henly to Henley.

Map Sheet #3 COPCO, NW. QUADRANGLE

- (A) 1,200 feet N. on sec. line from the SW. cor. sec. 7, R. 5 W., T. 47 N., put symbol 174 in soil delineation.
- (B) 1,600 feet N. and 1,900 feet W. from the SE. cor. sec. 14, R. 5 W., T. 47 N., change soil symbol 127 to 172.
- (C) Sec. 25, R. 5 W., T. 47 N., cross out SOUTHERN PACIFIC.

Map Sheet #4 COPCO, NE. QUADRANGLE

- (A) 2,200 feet S. and 600 feet E. from the NE. cor. sec. 36, R. 5 W., T. 47 N., change soil symbol 153 to 171.
- (B) In sections 1, 3, 21 and 33, R. 4 W., T. 47 N., change SNF\* to KNF\*.
- (C) 200 feet N. and 100 feet E. from the cor. of where the neat line of the map and the limit of soil survey boundary meet, put in the symbol (S) in map unit 201 for the Pinehurst modal soil site.

Map Sheet #5 MACDOEL, NW. QUADRANGLE

- (A) 1,500 feet S. and 600 feet E. from the NW. cor. sec. 32, R. 3 W., T. 48 N., change soil symbol from 133 to 160. Also in same sec., change SNF\* to KNF\*.

Map Sheet #8 COPCO, SE. QUADRANGLE

- (A) 1,000 feet N. and 300 feet E. from the SW. cor. sec. 18, R. 4 W., T. 46 N., change soil symbol 100 to 160.
- (B) In sec. 35, R. 4 W., T. 46 N., change SHASTA TO KLAMATH.

Map Sheet #11 FT. JONES, NE. QUADRANGLE

- (A) 2,600 feet S. and 700 feet W. from the NE. cor. sec. 3, R. 9 W., T. 44 N., put the (S) symbol in map unit 184 for the Boomer modal soil site.

Map Sheet #12 YREKA, NW. QUADRANGLE

- (A) 2,400 feet N. and 1,700 feet E. from the SW. cor. sec. 23, R. 8 W., T. 44 N., change soil symbol 142 to 144.
- (B) 2,000 feet N. and 1,700 feet E. from the SW. cor. sec. 23, R. 8 W., T. 44 N., change soil symbol 232 to 237.

## Soil Survey of Siskiyou County, California, Central Part

## E R R A T U M

Map Sheet #14 LAKE SHASTINA, NW. QUADRANGLE

- (A) 300 feet S. and 900 feet W. from the NE. cor. sec. 22, R. 5 W., T. 45 N., change soil symbol 157 to 173.

Map Sheet #15 LAKE SHASTINA, NE. QUADRANGLE

- (A) In sec. 23, R. 4 W., T. 45 N., change SHASTA TO KLAMATH.  
 (B) In sections 2, 14, and 24, R. 4 W., T. 44 N., change SNF\* to KNF\*.

Map Sheet #17 SCOTT BAR, NE. QUADRANGLE

- (A) 1,300 feet S. and 2,500 feet E. from the NW. cor. sec. 28, R. 10 W., T. 44 N., change soil symbol 184 to 213.  
 (B) In same sec. 28, add a delineation line from where soil<sup>a</sup> delineation line 165 peaks, north to the river. This will split the soil delineation 184 from the changed 213.

Map Sheet #18 FT. JONES, SW. QUADRANGLE

- (A) 3,300 feet N. and 2,000 feet E. from the SW. cor. sec. 32, R. 9 W., T. 44 N., change soil symbol 172 to 137.

Map Sheet #22 LAKE SHASTINA, SW. QUADRANGLE

- (A) 300 feet S. and 2,000 feet E. from the NW. cor. sec. 23, R. 5 W., T. 43 N., change soil symbol 104 to 185.  
 (B) 2,700 feet S. and 1,000 feet E. from the NW. cor. sec. 24, R. 5 W., T. 43 N., change soil symbol 203 to 132.

Map Sheet #23 LAKE SHASTINA, SE. QUADRANGLE

- (A) 2,400 feet N. and 2,200 feet W. from the SE. cor. sec. 24, R. 5 W., T. 43 N., change soil symbol 203 to 132.  
 (B) 1,500 feet N. and 3,400 feet W. from the SE. cor. sec. 24, R. 5 W., T. 43 N., change soil symbol 203 to 132.  
 (C) In sections 8, 10, 14, 18, and 20, R. 4 W., T. 43 N., change SNF\* to KNF\*.

Map Sheet #27 CHINA MTN., NW. QUADRANGLE

- (A) 1,300 feet N. and 2,000 feet W. from the SW. cor. sec. 18, R. 7 W., T. 41 N., change soil symbol 107 to 231.

Index to Map Sheets

Location of Profiles Representative of Soil Series. Montaque and Montaque Variant should be Montague and Montague Variant.

\* SNF = Shasta National Forest  
 \* KNF = Klamath National Forest

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