SISKIYOU NATIONAL FOREST
SOIL RESOURCE INVENTORY

Pacific Northwest Region

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PREFACE

This Soil Resource Inventory of the Siskiyou National Forest was made to provide some basic soil, bedrock, and landform information for management interpretations. The inventory is part of the Regional soils program developed by the Soil Management Branch of the Division of Watershed Management to assist forest land managers in applying multiple-use principles.

The objective of this Soil Resource Inventory is to provide soils information in a form useful to the land manager as an aid to multiple-use management as directed by Public Law 86-517. This law states that the National Forests are to be administered to achieve and maintain in perpetuity a high level of annual or regular periodic output of the various renewable resources of the National Forests without impairment of the productivity of the land.

All renewable surface resources of the National Forest are dependent upon soil, which is a nonrenewable resource. Soils develop at a slow rate. This fact necessitates conservation, wise use, and in many instances, preservation of this basic resource in order to produce high-level, sustained yields of water, timber, recreation, wildlife, and forage. To accomplish sustained yield of renewable resources, to conserve or preserve the soil resource while making wise use of this resource, it is necessary to have basic soils information and to make sound management interpretations.

This report contains information on climate, soils, geology, recreation, range, wildlife, vegetation, landform features, and some management interpretations. Also included are tables of Management Interpretations; Table of Soil Characteristics of Modal Sites; Table of Landtype Unit Characteristics, Features, and Qualities; and Table of Bedrock Characteristics.

Included in a separate document entitled Photo Mosaic Map Appendix are SRI mapping on aerial photo mosaics, a bedrock geology map, and an isohyetal map.

Field mapping was conducted from August 1974 through April 1978 by Soil Scientists LeRoy C. Meyer and Michael P. Amaranthus. Periodic supervision was provided by Loren Herman and George Badura (1974-1976).

Valuable assistance, advice, and cooperation received from Forest personnel during the course of the survey was sincerely appreciated.

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1/ SRI mapping is found in a separate document entitled Photo Mosaic Map Appendix.

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USE

Land management activities generally relate to the soil resource. Timber harvest, road construction, recreation development, and many other activities have an effect on the soil resource to some degree. It is extremely important for the land manager to thoroughly understand the effect of the various activities on the soil. It is equally important for the land manager to fully understand the capabilities of the soil resource. Basic soils information contained in this report will help the land managers and planners to: 1) Determine the effects of management on the soil and water resource; and, 2) evaluate the capabilities of the soil for various uses.

The information in this report is presented at the landtype unit level and is the basic level of soil identification and management interpretation used in the report. The landtype unit is derived and defined on the basis of its soil, landform, geology, and vegetation characteristics. The average delineation size is 50 to 600 acres.

At this level, management problems related to the landform and soil are defined and interpretations are made. This information has been tabulated and can be found within the Appendix of this report.

The Soil Resource Inventory (SRI) has its primary use at the planning level. Soils, landforms, and bedrock characteristics are defined at an intensity sufficient to help develop resource management policies and basic plans. Due to the reconnaissance nature of this survey, it lacks detail for use in high-intensity, small-area projects. These projects require additional on-site study by various technical specialists, including soil scientists.

There are many uses for the information in this report. Some are quite simple and apparent, while others have not yet been conceived. The real work lies ahead in effectively and fully using this information. The use of this information is achieved best by those with full understanding of the interrelationships of the basic earth features.

Examples of how SRI information can be used are listed below:

1. Land and Resource Management Plans - The soils information in this report should be incorporated into the Land and Resource Management plans. As an example of application, the soil areas in this report can provide a map to show the critical soil areas and their associated problems. These problems are discussed for individual landtypes. This is the kind of information that will support the policy and directives, and assist in multiple use. Another example of use would be to color-code the photo maps to illustrate various soil management relationships. For instance, the maps can be colored to show stability, erosion, site index, etc.

2. Transportation Planning - This is an area where the soils information has key application. Conditions and problems can be met or avoided based on information such as landscape stability, soil depth, soil drainage, and/or bedrock type and competency. Roads may be selected that avoid unstable areas, and construction and maintenance costs may be more accurately estimated. Sources of road rock may also be located through use of soil maps. SRI information is available for assistance in road design such as cutbank ratios and road rock thickness.

3. Timber Management Plan - The soils information can suggest direction and support policy for allowable cut determinations, logging systems, slash disposal methods, operating season, and deferred cutting areas. With a better understanding of problems and their location, the cut can be planned so that at a given time the majority of cutting is not taking place in critical areas. By spreading out and deferring the more critical areas, more time is available for proper road location and design on these areas. Also, within a few years, logging technology may have developed so that harvest methods are compatible with critical soil areas without causing excessive soil and resource damage.

4. 5-Year Action Plan - This report provides information on the relative susceptibility of soil and other resource damage from timber harvest, road construction, and other timber-related activities. Provided also, is information on regeneration problems and erosion control requirements.

5. Recreation Planning - The SRI information indicates the various soil suitabilities and limitations that may apply to ski areas, camping areas, trails, roads, and other aspects of recreation development. By knowing the soil suitabilities and limitations, the planner is better able to make plans that are consistent with the capabilities of the land.

6. Environmental Assessment Report - Any report involving the impact of a management activity requires soils input. Whether it is a ski area, timber sale, recreation, or dam site proposal, there are soil factors that must be considered to make the report complete.

7. Land Appraisal and Exchange - Soils information should be used for land appraisal and exchange activities. The value of the land is related to such soil factors as texture, depth, drainage, productivity, and stability. Without knowledge of these and other soil factors, it is difficult to appraise land value.

8. The following is a list of more specific uses of the report. These uses are adaptable and compatible with the survey data, and are well within the scope and intensity of the survey:

   a. Engineering Testing - By using the soil maps, more efficient testing can be done. The soil maps can be used to determine which soils are most susceptible to certain engineering problems. These problem soils may need more closely spaced testing than soils in which few problems are anticipated.

   b. Reservoir Sites - This report gives information that can be used to determine problems that may be encountered for a reservoir site. The soil interpretations will enable the planner to better determine the general suitability of a particular site and the soil stability as they affect reservoir uses.

   c. Hydrologic Analysis - The information in the SRI is sufficient to determine a broad hydrologic analysis and water balance on the Forest, and is a basis for comparisons between larger watersheds.

   d. Timber Harvest Methods - Additional facts known about the potential for erosion and landscape stability will encourage selection of timber harvest methods that cause minimum damage to soil and other resources.

   e. Timber Harvest and Road Construction Operating Season - These activities should be scheduled at times when they will cause minimum soil damage. Many soils are subject to damage (compaction, erosion, site deterioration) by timber harvest activities when overly wet or excessively dry.

   f. Erosion Control - Since there is wide variability in soil texture, depth, structure, permeability, drainage, and topography, wide differences also occur in the ability of the soil to resist erosion. Forest soils are rated as to their potential erosion class. The land manager can use this information to determine which areas will need special erosion protective measures. These will need to be developed on a site-by-site basis.

   g. Recreational Developments - Several kinds of information are available in this report to assist in selecting favorable sites for campground development. Among these are soil and landform properties and characteristics, specific ratings of filter drainage filed suitability, the relative resistance of soil and vegetation to site deterioration, and indications of special problems which may be encountered.

DEFINITIONS AND DESCRIPTIONS OF LANDTYPE UNITS

Definitions of Landtype Units

This section defines the numbers and symbols found on the soil maps. The numbers identify landtype units. The symbols represent land features important to land management that are too small to delineate at the scale used for this survey. The symbols used in this survey are listed below:

✓	Rock Outcrop
X	Unstable Area
	Wet Spot and Small Marshes
	Slump or Slide Scarp
P29	Soil Description Location 1/
P29M	Modal Site Location
P29S	Sample Location
	Debris Avalanche or Slide Track

Landtype Units are shown on the landtype maps as numbers. 2/ Landtype units contain a dominant landtype which accounts for at least 70 percent of the landtype delineation.

The dominant landtype of the landtype unit is described in the landtype unit description and identified by the same number as used for the landtype unit. Within the landtype unit, other landtypes occur. Those most commonly associated with the dominant landtype of the landtype unit are included in the descriptions as inclusions. These inclusions of other landtypes account for no more than 30 percent of the landtype unit.

The management interpretations apply only to the dominant landtype in each landtype unit. The interpretations for most inclusions within any landtype unit are listed on the interpretative tables according to the appropriate landtype number. The Tables of Landtype Unit Characteristics, Features, and Qualities, and Table of Bedrock Characteristics of Landtype Units are also numbered according to the dominant landtype in the landtype unit and apply to that dominant landtype.

1/ The number 29 refers to the Soil Landtype.
2/ Landtype units contain a dominant taxonomic unit.

Landtype Unit Complexes

Most of the symbols shown on the maps having three digits are called "Landtype Unit Complexes." 1/ These are landtype units used in areas where two or more defined landtype units are present in an arrangement too complex to separate at the one inch per mile scale. The Legend of Complexes indicates the landtype unit components of the complex and the approximate percentage of each component.

Landtype Unit Descriptions

Most of the landtype units are described in detail. These landtypes have a definable range of characteristics that can be represented by a soil profile description. Landtype Units 0 through 9c are miscellaneous landtypes, quite variable, and not described in detail. They are described in a short narrative.

Information in Landtype Unit Descriptions

The first paragraph states the primary soil and land form characteristics, location, and common inclusions. The second paragraph gives a brief generalized description of the climate, including precipitation and soil temperature class. The third paragraph briefly describes elevation, slope, aspect, and stability. The fourth paragraph describes the typical vegetation. The fifth paragraph describes the soil profile and the modal site location. The sixth section describes the geology and bedrock. Reference should be made to the appropriate Appendix for definition of terms used in these descriptions.

Range of Profile Characteristics

This describes the range of soil profile characteristics that have been established for the dominant landtype within the landtype unit.

1/ Landtype Units 100, 121-125, 176-178, 186, 191-194, and 196-197 are not complexes but are individual Landtype Units.

Grouped Landtype Units

Designation	
0-9	Miscellaneous landtypes.
10-19	Deep soils, bedrock undifferentiated.
21-22	Metagabbro's with related gabbros. East side of Klamath Mountains.
26-29	Dacite and rhyollite. West side of Klamath Mountains.
31-35	Serpentine and peridotite. East side of Klamath Mountains.
36-39	Serpentine and peridotite. West side of Klamath Mountains.
41-43	Rhythmically bedded sandstones of the Umpqua Formation. West side of Klamath Mountains.
46-48	Conglomerates. West side of Klamath Mountains.
50	Dothan Formation and Colebrooke Formation volcanics.
51-55	Dothan Formation sediments and related volcanics. West side of Klamath Mountains.
61-62	Colebrooke Formation schists. West side of the Klamath Mountains.
66-68	Gneissic rock. East side of Klamath Mountains.
71-72	Sedimentary rocks including siltstones, mudstones, claystones, and related metasediments. Siskiyou Mountains.
76-77	Galice Formation metasedimentary rocks and related sediments. East side of Klamath Mountains.
81-83	Metavolcanics and related metasediments. Siskiyou Mountains.
86-87	Galice Formation metavolcanics and related Galice Formation metasediments. East side of Klamath Mountains.
91-95	Diorites, granodiorites, quartz diorites, and locally, gabbros. East side of Klamath Mountains and in the Siskiyou Mountains.
96-98	Gabbros with local diorites. East side of Klamath Mountains and in the Siskiyou Mountains.
99-100	Olivine gabbro. Along the crest of the Klamath Mountains.
120-125	Rhythmically bedded sandstones and siltstones of the Tyee Formation. North portion of Klamath Mountains.
176-178	Galice Formation metasediments and related sediments and metavolcanics. West side of Klamath Mountains.
186-187	Galice Formation metavolcanics and related sediments and metavolcanics. West side of Klamath Mountains.
191-194	Diorites, granodiorites, quartz diorites, and locally, gabbros. West side of Klamath Mountains.
196-197	Gabbros with local diorites. West side of Klamath Mountains.

Legend of Complexes 1/

Landtype Unit No.	Landtype Unit Complexes
101	60 percent Unit 100 and 40 percent Unit 11.
126	65 percent Unit 120 and 35 percent Unit 2.
127	50 percent Unit 120 and 50 percent Unit 121.
128	55 percent Unit 121 and 45 percent Unit 122.
170	70 percent Unit 176 and 30 percent Unit 2
171	60 percent Unit 176 and 40 percent Unit 19.
175	60 percent Unit 176 and 40 percent Unit 177.
179	60 percent Unit 178 and 40 percent Unit 19.
190	65 percent Unit 196 and 35 percent Unit 1.
195	55 percent Unit 191 and 45 percent Unit 192.
198	55 percent Unit 196 and 45 percent Unit 197.
199	65 percent Unit 191 and 35 percent Unit 1.
210	60 percent Unit 21 and 40 percent Unit 1.
212	60 percent Unit 21 and 40 percent Unit 22.
312	65 percent Unit 31 and 35 percent Unit 32.
313	65 percent Unit 31 and 35 percent Unit 3.
314	60 percent Unit 31 and 40 percent Unit 34.
315	60 percent Unit 31 and 40 percent Unit 35.
343	60 percent Unit 34 and 40 percent Unit 3.
352	60 percent Unit 35 and 40 percent Unit 32.
353	65 percent Unit 35 and 35 percent Unit 3.
363	70 percent Unit 36 and 30 percent Unit 3.
367	60 percent Unit 36 and 40 percent Unit 37.
369	65 percent Unit 36 and 35 percent Unit 39.
378	50 percent Unit 37 and 50 percent Unit 38.
379	65 percent Unit 37 and 35 percent Unit 39.
393	65 percent Unit 39 and 35 percent Unit 3.
410	70 percent Unit 41 and 30 percent Unit 2.
412	50 percent Unit 41 and 50 percent Unit 42.
419	60 percent Unit 41 and 40 percent Unit 19.
429	50 percent Unit 42 and 50 percent Unit 19.
430	65 percent Unit 43 and 35 percent Unit 2.
439	65 percent Unit 43 and 35 percent Unit 19.
469	65 percent Unit 46 and 35 percent Unit 19.
480	70 percent Unit 48 and 30 percent Unit 2.
500	70 percent Unit 50 and 30 percent Unit 1.
509	65 percent Unit 50 and 35 percent Unit 19.
510	70 percent Unit 51 and 30 percent Unit 2.
510u	65 percent Unit 51u and 35 percent Unit 2.
512	60 percent Unit 51 and 40 percent Unit 52.
512u	60 percent Unit 51u and 40 percent Unit 52u
516	70 percent Unit 51 and 30 percent Unit 26.
519	60 percent Unit 51 and 40 percent Unit 19.
527	70 percent Unit 52 and 30 percent Unit 27.
529	60 percent Unit 52 and 40 percent Unit 19.
530	60 percent Unit 53 and 40 percent Unit 2.
530u	60 percent Unit 53u and 40 percent Unit 2.
534	65 percent Unit 53 and 35 percent Unit 54.
538	70 percent Unit 53 and 30 percent Unit 28.
539	65 percent Unit 53 and 35 percent Unit 19.
540	65 percent Unit 54 and 35 percent Unit 2.
549	70 percent Unit 54 and 30 percent Unit 29
612	60 percent Unit 61 and 40 percent Unit 62.

1/ These percentages may differ slightly from landtype unit to landtype unit. These total 100%, but other inclusions as described in individual landtypes may be present.

Landtype Unit No.	Landtype Unit Complexes
619	60 percent Unit 61 and 40 percent Unit 19.
660	70 percent Unit 66 and 30 percent Unit 1.
667	60 percent Unit 66 and 40 percent Unit 67.
678	60 percent Unit 67 and 40 percent Unit 68.
712	60 percent Unit 71 and 40 percent Unit 72.
714	70 percent Unit 71 and 30 percent Unit 4.
718	65 percent Unit 71 and 35 percent Unit 18.
724	60 percent Unit 72 and 40 percent Unit 4
760	70 percent Unit 76 and 30 percent Unit 2.
767	60 percent Unit 76 and 40 percent Unit 77.
768	65 percent Unit 76 and 35 percent Unit 18.
768u	65 percent Unit 76u and 35 percent Unit 18u.
770	70 percent Unit 77 and 30 percent Unit 2.
778	60 percent Unit 77 and 40 percent Unit 18.
778u	60 percent Unit 77u and 40 percent Unit 18u.
810	70 percent Unit 81 and 30 percent Unit 1.
810u	65 percent Unit 81u and 35 percent Unit 1.
812	60 percent Unit 81 and 40 percent Unit 82.
812u	60 percent Unit 81u and 40 percent Unit 82u.
816	70 percent Unit 81 and 30 percent Unit 16.
816u	70 percent Unit 81u and 30 percent Unit 16u.
818	60 percent Unit 81 and 40 percent Unit 18.
818u	60 percent Unit 81u and 40 percent Unit 18u.
823	60 percent Unit 82 and 40 percent Unit 83.
823u	60 percent Unit 82u and 40 percent Unit 83u.
824	60 percent Unit 82 and 40 percent Unit 4.
826u	60 percent Unit 82u and 40 percent Unit 16u.
828u	60 percent Unit 82u and 40 percent Unit 18u.
860	70 percent Unit 86 and 30 percent Unit 1.
867	60 percent Unit 86 and 40 percent Unit 87.
868	65 percent Unit 86 and 35 percent Unit 18.
878	60 percent Unit 87 and 40 percent Unit 18.
910	70 percent Unit 91 and 30 percent Unit 1.
912	60 percent Unit 91 and 40 percent Unit 92.
912u	65 percent Unit 91u and 35 percent Unit 92u.
914u	65 percent Unit 91u and 35 percent Unit 14.
918	65 percent Unit 91 and 35 percent Unit 18.
918u	65 percent Unit 91u and 35 percent Unit 18u.
923	65 percent Unit 92 and 35 percent Unit 93.
923u	65 percent Unit 92u and 35 percent Unit 93u
928	60 percent Unit 92 and 40 percent Unit 18.
928u	60 percent Unit 92u and 40 percent Unit 18u.
952	60 percent Unit 95 and 40 percent Unit 92.
952u	60 percent Unit 95u and 40 percent Unit 92u.
960	70 percent Unit 96 and 30 percent Unit 1.
967	60 percent Unit 96 and 40 percent Unit 97.
967u	65 percent Unit 96u and 35 percent Unit 97u.
968	65 percent Unit 96 and 35 percent Unit 18.
968u	65 percent Unit 96u and 35 percent Unit 18u.
978	65 percent Unit 97 and 35 percent Unit 98.
990	70 percent Unit 99 and 30 percent Unit 1.
991	65 percent Unit 99 and 35 percent Unit 11.

SOIL SERIES CORRELATION LEGEND

SRI Mapping Units	Soil Series
1, 2	Witzel rock outcrops
3, 34, 35	Pearsoll extremely stony clay loam
4	Pollard-Beekman gravelly loam complex
5, 31	Dubakella-Pearsoll gravelly loam complex
6	Bigelow gravelly loam
7	Woodseye-Craggy rock outcrops complex
10, 11	Takilma varient gravelly loam
12	Eightlar extremely stony clay loam
13, 14, 16, 16u	Bigelow gravelly fine sandy loam
15	Abegg gravelly loam
18	Speaker-Josephine gravelly loam complex
18u	Goodwin very gravelly fine sandy loam
21	Speaker gravelly loam
22, 72, 82	Josephine gravelly loam
31u, 32u, 34u, 35u	Perdin cobbly loam rock outcrops
32	Eightlar extremely stony clay loam
50, 51, 81	Beekman gravelly loam
51u	Woodseye extremely gravelly loam
53, 54, 71, 77, 87	Beekman-Colestine gravelly loam complex
66, 91	Siskiyou gravelly sandy loam
67, 92, 95, 97	Tethrick gravelly sandy loam
68, 93, 98	Holland sandy loam
76, 86, 96	Vermisa-Beekman extremely gravelly loam complex
99	Frantz very gravelly loam
100	Knapke extremely gravelly loam

LANDTYPE UNIT DESCRIPTIONS

Landtype Unit 0

Riverwash areas consisting of sparsely vegetated, unsorted gravels and sands immediately adjacent to riverbeds. This landtype is subject to flooding for up to 6 months of the year.

Landtype Unit 1

Rockoutcrop: Andesites, basalts, gabbros, dioriotes, gneiss, metavolcanics, metasediments, rhyollites, and dacites, forming cliffs "rock knobs" and talus slopes. This landtype is usually associated with volcanic and metavolcanic dikes, vents, and plugs as well as diorite, gabbro, metasedimentary, rhyollite, and dacite outcrops. This landtype is usually found on or near ridgetops and locally near stream bottoms. Material from this landtype is usually well suited for road rock. Landtype Unit 1 is stable. Stability Class I.

Vegetation usually consists of low site and noncommercial timber, serviceberry, manzanita, huckleberry, canyon live oak, forbs, grasses, mosses, and lichens.

Unit 1 construction characteristics:

1. Road rock.
2. Blasting usually required.

Landtype Unit 2

Rockoutcrop: Sediments, pyroclastic sediments, volcanic breccias, tuffs, agglomerates, conglomerates, and sandstones. These rockoutcrops are usually more easily weathered than Landtype 1. Generally, materials from this landtype are not as well suited for road rock as those from Landtype 1. Colluvial rock and soil is found adjacent to rockoutcrops within this unit. Landtype Unit 2 is stable. Stability Class I.

Vegetation ususally consists of tanoak, canyon live oak, huckleberry oak, manzanita, patches of low site and noncommercial timber, manzanita, serviceberry, grasses, forbs, mosses, and lichens.

Unit 2 construction characteristics:

1. Not well suited for road rock.
2. Usually can be ripped.

Landtype Unit 3

Rockoutcrop: Peridotite and serpentine, hard peridotite and serpentine forming rock knobs. Rockoutcrops are dominantly on the upper slopes and near creek bottoms. Minor amounts of diorite, gabbro, and olivine gabbro outcrops may be present. Material from this landtype is usually not well suited for road rock; peridotite is ususally hard enough, but it disintegrates rapidly under heavy traffic. Colluvial rock and shallow soil is usually found adjacent to rockoutcrops within the unit. Landtype Unit 3 is stable. Stability Class I.

Vegetation consists of gnarled Jeffrey pine and local western white pine, azalea, prostrate juniper, forbs, grasses, mosses, and lichens.

Landtype Unit 4

Landflow and landslump, terrain generally on or derived from metamorphic and sedimentary rocks on the east side of the Forest.

This landtype consists of landflow and landslump terrain that either is or has been active during the past history of the slope. The slope shape (discontinuous, benchy, and hummocky) is a direct result of present or past movement. Soil materials vary from shallow loams to clay loams on headwalls, to deep to very deep clay loams and clays in basin areas over incompetent to moderately competent rock. Boulders, as well as stones, cobbles, and gravels, are often found in the soil mass. Basically, there are three components within this landtype:

1. Headwalls: (scarps) shallow soils (10 to 20 inches deep) on steep slopes, greater than 65 percent.

2. Intermediate areas: Moderately deep to deep soils (20 to 40 inches and 40 to 60 inches deep) over highly fractured bedrock on moderate slopes, 35 to 65 percent.

3. Basins: Very deep soils (greater than 60 inches) on gentle slopes, less than 35 percent.

Landtype 4 is usually found adjacent to drainages and on mid to lower slopes. Landtype 4 is unstable to locally very unstable. Stability class IV (Locally V in drainages). Surface soil erosion potential is moderate to severe. Erosion class III and IV.

Native vegetation consists of Douglas-fir, western redcedar, Port-Orford-cedar, red alder, madrone, tanoak, chinkapin, Pacific yew, incense-cedar, white fir, vine maple, bluestem ceanothus, elderberry, whitethorn ceanothus, grasses, forbs, salal, reeds, sedges, rushes, ferns, and mosses. This landtype is found on the east side of the Klamath Mountains and Siskiyou Mountains on metavolcanics, metasediments, and sediments primarily.

Landtype Unit 5

Landflow and landslump terrain generally on or derived from serpentine and peridotite.

This landtype consists of landflow and landslump terrain that is active now or has been active during the past history of the slope. The slope shape (benchy, undulating, and hummocky) is a direct result of present or past movement. Soil materials vary from shallow to very deep, extremely stony clays and clay loams. Large unattached boulders as well as stones, cobbles, and gravels are often found in the soil mass. Basically there are two components within this landtype:

1. Headwalls and intermediate areas: Scarps with shallow to moderately deep soils (10 to 20 inches and 20 to 40 inches deep) on moderately steep slopes (35 to 65 percent) over moderately hard bedrock.

2. Basins: Deep to very deep soils (40 to 60 inches and greater than 60 inches deep) over soft to moderately hard bedrock on less than 35 percent slopes.

Land type unit 5 is unstable to very unstable. Stability class IV, and V, but most commonly IV. Surface soil erosion potential is severe. Erosion class IV.

Native vegetation includes Douglas-fir, Jeffrey pine, incense-cedar, western redcedar, Port-Orford-cedar, red alder, elderberry, California coffeeberry, grasses, forbs, reeds, and sedges. Landtype 5 is found in the Siskiyou and Klamath Mountains on ultrabasic rocks (serpentine and peridotite).

Landtype Unit 6

Wet Meadow Land: This landtype consists of areas that have high water tables and are seasonally ponded or have seepage areas adjacent to springs. These units are found in the upper Forest zone. This landtype is highly variable in topographic position and is found in depressions, on flats, along streamside areas, and locally on steeper sideslopes. Boulder fields or talus areas vegetated with red alder are found on this unit on steep slopes. Land type unit 6 is stable. Stability Class I. Surface soil erosion is slight to moderate. Erosion Class II and III.

Vegetation consists of sedges, rushes, grasses, red alder, wetland forbs, and willow.

Many of these areas are not delineated, but rather are inclusions of other landtypes because of the small scale photos used for SRI mapping.

Landtype Unit 7

Dry Nonforest: Dry nonforested areas supporting various grasses, forbs, and shrubs, including deerbrush and chokecherry. These units are found in the upper forest zone, along ridgetops, and in areas of cirque topography. Landtype 7 usually occurs on moderately steep to steep slopes, and is well drained. Soils are shallow to moderately deep. Small patches of low site timber may be included in this landtype. Unit 7 includes seasonally wet areas. Wet meadows may occur during the spring season. Landtype unit 7 is moderately stable. Stability Class II. Surface soil erosion potential is very severe to severe. Erosion Class V and IV.

In the Siskiyou Mountains, Landtype 7 is a relatively homogeneous unit.

Landtype Unit 8

Landflow and landslump terrain generally on or derived from sedimentary rocks. All rocks are highly fractured.

This landtype consists of landflows and landslump terrain that is active or has been active in the past history of the slope. The slope shape (benchy and hummocky) is a direct result of present or past movement. Materials vary in depth from shallow to very deep and consist of three main components:

1. Shallow soils (10 to 20 inches deep) over hard to moderately hard bedrock on steep slopes over 65 percent slope (headwall areas) (scarps).

2. Moderately deep to deep soils (20 to 40 inches and 40 to 60 inches deep) on moderate slopes (35 to 65 percent).

3. Very deep soils (greater than 60 inches deep) on gentle slopes ranging from 0 to 35 percent slope (slump basin areas). Includes sag ponds and wet spots.

Large unattached boulders, as well as stones, cobbles, and gravels, are often found in the soil mass.

Native vegetation includes Douglas-fir, western redcedar, Port-Orford-cedar, western hemlock, red alder, tanoak, madrone, manzanita, rhododendron, salal, evergreen huckleberry, reeds, rushes, sedges, grasses, forbs, ferns, and mosses.

Landtype 8 is unstable to very unstable. Stability Class IV and V. Surface soil erosion potential is severe to very severe. Erosion Class IV and V.

Landtype 8 is found on the coastal (west) side of the Klamath Mountains on sediments on uneven slopes.

Landtype Unit 8c

Landflow and landslump terrain generally on or derived from schists of the Colebrooke schist formation. This landtype differs from Landtype 8 in that it is slightly more unstable and erosive.

This landtype consists of landflow and landslump terrain that is active or has been active in the past history of the slope. The slope shape (benchy and hummocky) is a direct result of present or past movement. Materials vary in depth from shallow to very deep and consist of three main components:

1. Shallow soils (10 to 20 inches deep) on steep slopes over 65 percent slope (headwall areas).

2. Moderately deep to deep soils (20 to 40 inches and 40 to 60 inches deep) on moderate slopes (35 to 65 percent).

3. Very deep soils (greater than 60 inches deep) on gentle slopes ranging from 0 to 35 percent slope (slump basin areas). Includes sag ponds and wet spots.

Large unattached boulders, as well as stones, cobbles, and gravels, are often found in the soil mass.

Native vegetation includes Douglas-fir, western redcedar, Port-Orford-cedar, western hemlock, red alder, tanoak, madrone, rhododendron, manzanita, salal, evergreen huckleberry, reeds, rushes, sedges, grasses, forbs, ferns, and mosses.

Landtype 8c is very unstable to unstable. Stability Class V and IV. Surface soil erosion potential is very severe to severe. Erosion Class V and IV.

Landtype 8c is found on the coastal (west) side of the Klamath Mountains; on schists on uneven slopes.

Landtype Unit 9

Landflow and landslump terrain generally on or derived from sedimentary rocks.

This landtype consists of landflow and landslump terrain that is active or has been active during the past history of the slope. The slope shape (benchy and hummocky) is a direct result of present or past movement. Materials are highly variable in depth and range from shallow to very deep, and consist of three main components:

1. Shallow soils (10 to 20 inches deep) on steep slopes, over 65 percent slopes (headwall and scarp areas, rejuvenated slopes).

2. Moderately deep to deep soils (20 to 40 inches and 40 to 60 inches deep), 35 to 65 percent slopes (intermediate areas).

3. Very deep soils (greater than 60 inches) on gentle slopes, less than 35 percent slopes (slump basins). Includes sag ponds and wet spots.

This landtype has a greater percentage of shallow and moderately deep soils than Landtypes 4, 5, 8, or 8c. Landtype 9 is more dissected and has more developed drainages and less basins than the other three landflow, landslump units. Large unattached boulders, as well as stones, cobbles, and gravels are often found in the soil mass.

Native vegetation includes Douglas-fir, Port-Orford-cedar, western redcedar, red alder, tanoak, madrone, rhododendron, salal, evergreen huckleberry, reeds, rushes, sedges, grasses, forbs, ferns, and mosses. Landtype 9 is unstable to very unstable. Stablility class IV and V. Surface soil erosion potential is very severe to severe. Erosion class V and IV.

Landtype 9 is found on the coastal (west) side of the Klamath Mountains; on sediments and dissected slopes.

Landtype Unit 9c

Landflow or landslump terrain generally on or derived from schists of the Colebrooke formation. This landtype differs from Landtype 9 in that it is slightly more unstable and erosive, and mass movements generally are larger.

This landtype consists of landflow and landslump terrain that is active or has been active during the past. The slope shape (benchy and hummocky) is a direct result of present or past movement. Materials are highly variable in depth and range from shallow to very deep, and consist of three main components:

1. Shallow soils (10 to 20 inches deep) on steep slopes, over 65 percent slopes (headwall areas).

2. Moderately deep to deep soils (20 to 40 inches to 40 to 60 inches deep) on moderate slopes, 35 to 65 percent.

3. Very deep soils (greater than 60 inches deep) on gentle slopes, less than 35 percent slopes (slump basins). Includes sag ponds and wet spots.

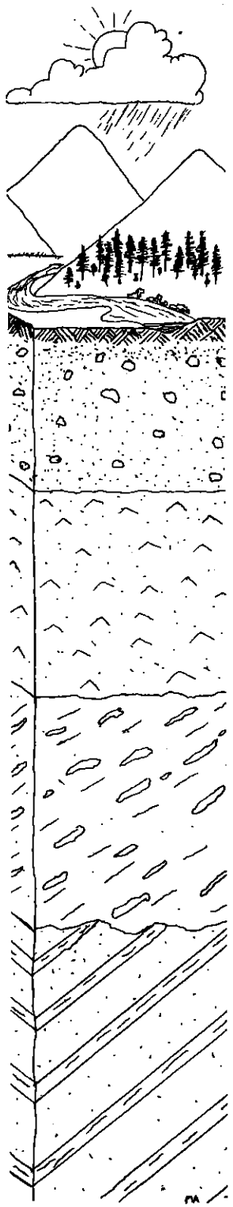
This landtype has a greater percentage of 1 and 2 (see 3 points above) than Landtypes 4, 5, 8, or 8c. Landtype 9c is more dissected and has more developed drainages, entrenched streams, and less basins than the aforementioned landflow and landslump units. Large unattached boulders, as well as stones, cobbles, and gravels, are often found in the soil mass. Native vegetation includes Douglas-fir, Port-Orford-cedar, western redcedar, red alder, tanoak, madrone, rhododendron, salal, evergreen huckleberry, reeds, rushes, sedges, grasses, forbs, ferns, and mosses.

Landtype 9c is very unstable to unstable. Stability class V, and IV. Surface soil erosion potential is very severe. Erosion class V.

Slope failures are concentrated along entrenched streams.

Landtype 9c occurs on the coastal (west) side of the Klamath Mountains on dissected slopes.

10



LANDTYPE UNIT: Landtype 10 occupies valley bottom positions with alluvial serpentine and peridotite deposits on the east side of the Klamath Mountains. Common inclusions are fresh sands, gravels, cobbles, and stones or riverwash adjacent to streams, and Landtypes 12 and 32.

CLIMATE: Precipitation: 60 to 80 inches/year. 152 to 203 cm/year.
Soil Temperature Class: Mesic.

TOPOGRAPHY: Slope: 5 to 20 percent, no dissections.
Aspect: All aspects.
Elevation: 500 to 2,000 feet. 153 to 610 meters.
Stability: Landtype 10 is stable to moderately stable, (except when undercut by streams). Stability Class I and II.

VEGETATION: This unit supports Site Class V and lower Douglas-fir. Other species include: Jeffrey pine, knobcone pine, incense-cedar, ponderosa pine, greenleaf manzanita, prostrate juniper, serviceberry, western azalea, Oregon myrtle, Idaho fescue, needlegrass, forbs, and mosses.

SOIL: Soil 10 is a deep to very deep soil derived from alluvium, with shallow and moderately deep inclusions. The soil materials are generally well drained, but are moderately drained locally. Surface soil erosion potential is moderate. Erosion Class III.

Litter: Undecomposed leaves, needles, and twigs, 1/4 to 3/4 inches thick.

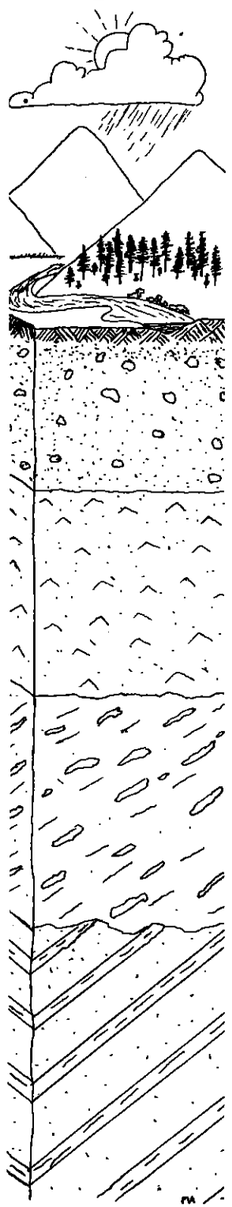
Surface Layers: Surface layers are gravelly to extremely gravelly loams and clay loams. Colors are dark brown to dark reddish brown. Structure is weak fine granular to strong fine and medium subangular blocky. Rock fragments range from 25 to 75 percent by volume. Consistence is soft to hard, friable to firm, slightly sticky to sticky, and nonplastic to plastic. The pH ranges from 5.4 to 6.2. Surface thickness ranges from 18 to 40 inches thick. Surface layers are moderately permeable.

Subsoil Layers: Subsoil layers are extremely cobbly clay loams and clay. Colors are brown, light brown, and reddish brown. Structure is massive. Rock fragments range from 60 to 80 percent by volume. Consistence is very hard, very firm, sticky, and plastic. The pH ranges from 5.8 to 6.2. Subsoil thickness ranges from 20 to 40 plus inches. Subsoil layers have moderate permeability rates.

Modal Site Location: NW¼, SE¼, Section 19, T.38S., R.8W.

GEOLOGY: Soil materials are derived dominately from alluvium, from serpentine and peridotite rock.

11



LANDTYPE UNIT: Landtype 11 is found on moderately steep toe slope areas adjacent to or on olivine gabbro areas. Common inclusions to this unit are Landtypes 99 and 100.

CLIMATE: Precipitation: 60 to 90 inches/year. 152 to 229 cm/year.
Soil Temperature Class: Mesic.

TOPOGRAPHY: Slope: 35 to 65 percent, smooth slopes.
Aspect: All aspects.
Elevation: 1,000 to 3,500 feet. 305 to 1,067 meters.
Stability: Landtype 11 is moderately unstable. Stability Class III.

VEGETATION: This unit supports Site Class IV and V Douglas-fir. Other species include: Knobcone pine, incense-cedar, ponderosa pine, serviceberry, greenleaf manzanita, Oregon myrtle, Idaho fescue, needlegrass, forbs, and mosses.

SOIL: Soil 11 is a very deep soil derived from slope wash and colluvium. Soil depth is greater than 60 inches. The soil materials are generally well drained. Surface soil erosion potential is moderate to severe. Erosion Class III and IV.

Litter: Needles, leaves, and twigs, a trace to 1 inch thick. Decomposed humus material, 1/4 inch to 1 inch thick.

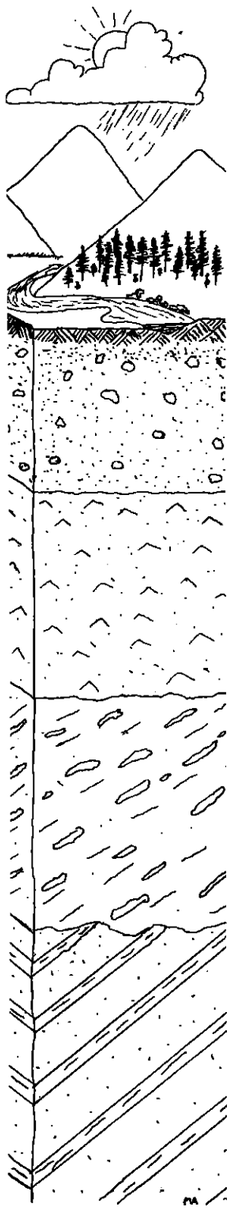
Surface Layers: Surface layers are gravelly to extremely gravelly loams. Colors are very dark brown and very dark grayish brown. Structure is weak fine granular to weak and moderate medium subangular blocky. Rock fragments range from 20 to 80 percent by volume. Consistence is soft to slightly hard, friable to firm, slightly sticky, and slightly plastic. The pH ranges from 6.3 to 6.8. Surface thickness ranges from 20 to 40 inches. Surface layers have rapid permeability rates.

Subsoil Layers: Subsoil layers are extremely gravelly sandy loams and loams. Colors are dark yellowish brown. Structure is massive to weak fine subangular blocky. Rock fragments range from 60 to 85 percent by volume. Consistence is soft, friable, slightly sticky, and slightly plastic. The pH ranges from 6.4 to 7.0. Subsoil thickness ranges from 20 to 40 plus inches. Subsoil layers have rapid permeability rates.

Modal Site Location: NE¼, SE¼, Section 6, T.32S., R.9W.

GEOLOGY: Bedrock materials are variable and not differentiated in this landtype. Soil materials are primarily derived from olivine gabbro rock, but may be found on other bedrock types adjacent to olivine gabbro areas.

12



LANDTYPE UNIT: Landtype 12 is found on upper terrace levels with soil materials derived from alluvium and colluvium from serpentine and peridotite. Common inclusions to this unit are Landtypes 10 and 32.

CLIMATE: Precipitation: 60 to 80 inches/year. 152 to 203 cm/year.
Soil Temperature Class: Mesic.

TOPOGRAPHY: Slope: 0 to 20 percent, no dissections.
Aspect: All aspects.
Elevation: 500 to 2,000 feet. 153 to 610 meters.
Stability: Landtype 12 is stable to moderately stable. Stability Class I and II.

VEGETATION: This unit supports Site Class V and lower Douglas-fir. Other species include: Jeffrey pine, knobcone pine, incense-cedar, ponderosa pine, greeleaf manzanita, whiteleaf manzanita, postrate juniper, serviceberry, western azalea, Oregon myrtle, Idaho fescue, needlegrass, forbs, and mosses.

SOIL: Soil 12 is a very deep soil derived from old alluvium and colluvium. Soil depth is generally greater than 60 inches. The soil materials are generally moderately to well drained. Surface soil erosion potential is moderate. Erosion Class III.

Litter: Needles, leaves, and twigs, a trace to 3/4 inch thick.

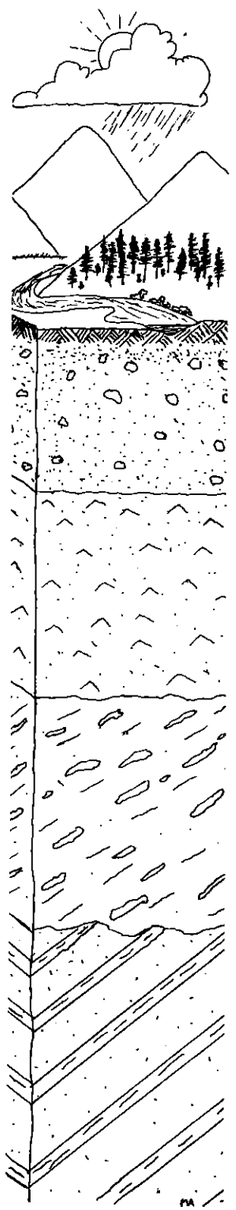
Surface Layers: Surface layers are extremely gravelly to extremely cobbly loams and clay loams. Colors are dark brown to dark reddish brown. Structure is moderate and strong fine and medium granular, subangular and angular blocky. Rock fragments range from 30 to 80 percent by volume. Consistence is hard and very hard, firm and very firm, very sticky, and very plastic. The pH ranges from 6.0 to 6.8. Surface thickness ranges from 20 to 40 inches. Surface layers have a moderate to rapid permeability rate.

Subsoil Layers: Subsoil layers are very gravelly to extremely stony clays. Colors are dark brown to brown. Structure is massive to strong medium subangular blocky. Rock fragments range from 55 to 85 percent by volume. Consistence is hard, firm, very sticky, and very plastic. The pH ranges from 5.8 to 6.8. Subsoil thickness ranges from 20 to 40 plus inches. Subsoil permeability ranges from slow to moderate.

Modal Site Location: SW¼, SW¼, Section 28, T.38S., R.8W.

GEOLOGY: Bedrock materials are not differentiated in this unit. Soil materials are principally formed from alluvium and colluvium from serpentine and peridotite areas.

13



LANDTYPE UNIT: Landtype 13 is found in gentle glacial basins on the Illinois Valley District. Common inclusions to this unit are Landtypes 6, 14, 15u, 83u, 93u, and 98u.

CLIMATE: Precipitation: 60 to 90 inches/year. 152 to 229 cm/year.
Soil Temperature Class: Frigid 4,000 to 5,500 feet, cryic greater than 5,500 feet.

TOPOGRAPHY: Slope: 5 to 35 percent, no dissections.
Aspect: All aspects.
Elevation: 4,000 to 6,000 feet. 1,220 to 2,135 meters.
Stability: Landtype 13 is moderately stable. Stability Class II.

VEGETATION: This unit supports Site Class II and III Shasta red fir. Other species include: Mountain hemlock, white fir, Port-Orford-cedar, some Douglas-fir, rhododendron, western azalea (high elevation), salal, kinnikinnick, pachystima, bedstraw, oxalis, grasses, sedges, reeds, and mosses.

SOIL: Soil 13 is a deep soil derived from glacial till and locally from colluvium. Soil depth to a moderately compacted till layer generally occurs between 40 to 60 inches. The soil materials are generally moderately drained with inclusions of poorly drained soils. Surface soil erosion potential is slight to moderate. Erosion Class II and III.

Litter: Leaves, needles, and twigs 1/2 to 1 1/2 inches thick. Decomposed humus material, 1/4 to 1 inch thick.

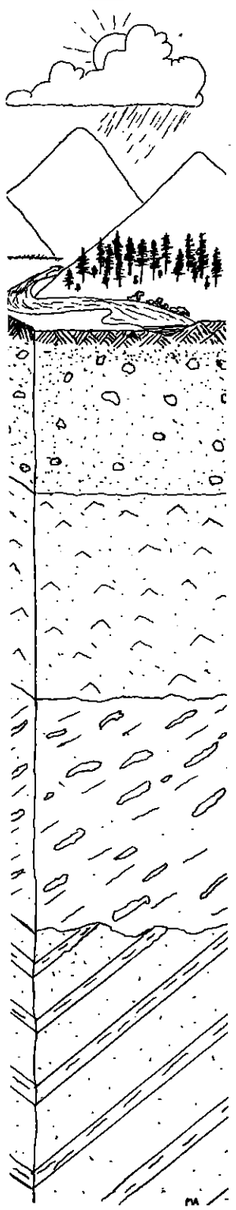
Surface Layers: Surface layers are very gravelly or stony sandy loams. Colors are very dark brown, dark brown, and dark grayish brown. Structure is weak very fine and fine granular to massive. Rock fragments range from 30 to 65 percent by volume. Consistence is soft, very friable to friable, non sticky, and non plastic. The pH ranges from 5.2 to 6.2. Surface thickness ranges from 13 to 40 inches. Surface layers have rapid permeability rates.

Subsoil Layers: Subsoil layers are very to extremely gravelly or stony sandy loams. Colors are yellowish brown and brown. Structure is weak fine granular to massive. Rock fragments range from 50 to 75 percent by volume. Consistence is soft, very friable to friable, non sticky, and non plastic. The pH ranges from 5.2 to 6.0. Subsoil thickness ranges from 6 to 30 inches. Subsoil layers have rapid permeability to the impermeable layer.

Modal Site Location: SE¼, NE¼, Section 6, T.41S., R.6W.

GEOLOGY: Bedrock materials are variable.

14



LANDTYPE UNIT: Landtype 14 is found on moderately sloping troughs below glacial basins on the Illinois Valley District. Common inclusions to this unit are Landtypes 6, 13, 16u, 18u, 82u, 92u, and 97u.

CLIMATE: Precipitation: 60 to 90 inches/year. 152 to 229 cm/year. Soil Temperature Class: Frigid 4,000 to 5,500 feet, cyric above 5,500 feet.

TOPOGRAPHY: Slope: 35 to 65 percent, slight to moderately dissected slopes.
Aspect: All aspects.
Elevation: 4,000 to 6,500 feet. 1,220 to 2,135 meters.
Stability: Landtype 14 is moderately stable, but locally moderately unstable adjacent to stream channels. Stability Class II and III.

VEGETATION: This unit supports Site Class II and III Shasta red fir and white fir. Other species include: Port-Orford-cedar, mountain hemlock, some Douglas-fir, rhododendron, western azalea (high elevation), grasses, and mosses.

SOIL: Soil 14 is a very deep soil derived from glacial till and locally from colluvium. Soil depth is greater than 60 inches, A weakly compacted layer occurs from 5 to 6 feet below the surface. The soil materials are moderately well drained. Surface soil erosion potential is severe. Erosion Class IV.

Litter: Needles, leaves, and twigs, 1/2 to 2 inches thick. Decomposed humus material, a trace to one inch thick.

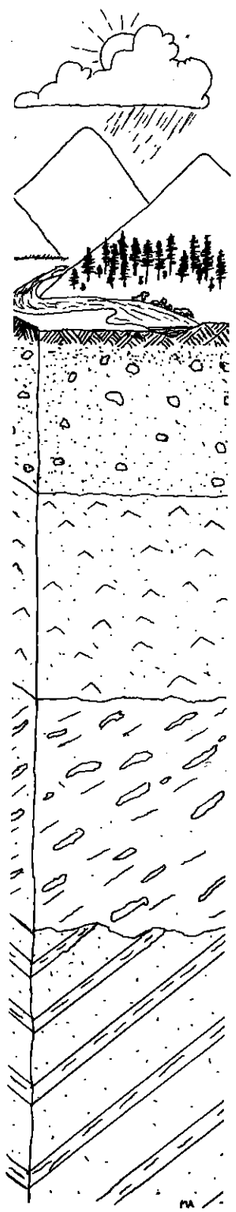
Surface Layers: Surface layers are gravelly to extremely gravelly fine sandy loams. Colors are very dark brown, dark brown, and very dark grayish brown. Structure is weak very fine and fine granular. Rock fragments range from 25 and 65 percent by volume. Consistence is soft, friable, slightly sticky, and non plastic. The pH ranges from 5.5 to 6.5. Surface thickness ranges from 25 to 45 inches. Surface layers have a rapid permeability rate.

Subsoil Layers: Subsoil layers are very to extremely gravelly or stony sandy loams and loams. Colors are dark yellowish brown and brown. Structure is weak very fine granular to massive. Rock fragments range from 60 to 80 percent by volume. Consistence is soft, very friable, non sticky, and non plastic. The pH ranges from 5.5 to 6.2. Subsoil thickness ranges from 20 to 45 inches. Subsoil layers have rapid permeability rates to a compacted layer approximately 60 to 72 inches below the surface.

Modal Site Location: SW¼, SE¼, Section 11, T.40S., R.6W.

GEOLOGY: Bedrock materials are variable.

15



LANDTYPE UNIT: Landtype 15 is found on gentle valley bottoms along streams and is locally subjected to flooding. Common inclusions in this unit are fresh sands and gravels adjacent to stream channels and Landtypes 0, 16 and 18.

CLIMATE: Precipitation: 40 to 120 inches/year. 102 to 300 cm/year.
Soil Temperature Class: Mesic, 15u is frigid.

TOPOGRAPHY: Slope: 0 to 20 percent, smooth.
Aspect: All aspects.
Elevation: 100 to 4,000 feet. 30 to 1,220 meters.
Stability: Landtype 15 is moderately stable. Stability Class II. Failures occur locally as the stream undercuts the creek banks.

VEGETATION: This unit supports Site Class III and locally Site Class II Douglas-fir. Other species include: Western red-cedar, Port-Orford-cedar, red alder, western hemlock (along the coast), salal, vine maple, serviceberry, oceanspray, willows, Oregon grape, forbs, grasses, sedges, reeds, and mosses.

SOIL: Soil 15 is a very deep soil derived from alluvium and colluvium. Soil depth is greater than 60 inches. The soil materials are generally moderately to well drained. Surface soil erosion potential is moderate. Erosion Class III.

Litter: Leaves, needles, and twigs, 1/4 to 1 inch thick. Decomposed humus material, a trace to 1/4 inch thick.

Surface Layers: Surface layers are gravelly loamy sands through very gravelly silt loams. Colors are dark brown, very dark grayish brown, dark reddish brown, and reddish brown. Structure is weak to moderate fine granular to subangular blocky structure. Rock fragments range from 15 to 60 percent by volume. Consistence is soft to slightly hard, friable, slightly sticky and slightly plastic to plastic. The pH ranges from 5.9 to 7.0. Surface thickness ranges from 20 to 35 inches thick. Surface layers have rapid permeability rates.

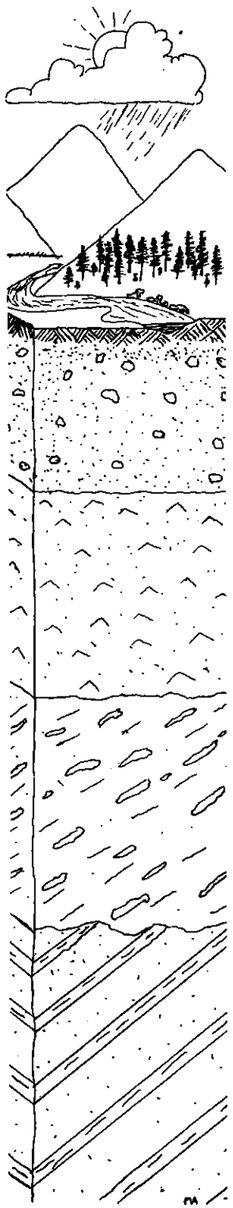
Subsoil Layers: Subsoil layers are extremely gravelly to cobbly sand through clay loam. Colors are brown to reddish yellow. Structure is single grain to massive. Rock fragments range from 65 to 90 percent by volume. Consistence is loose to hard, loose to firm, non sticky to slightly sticky and non plastic to plastic. The pH ranges from 5.9 to 7.2. Subsoil thickness is usually greater than 40 inches thick. Subsoil layers have rapid permeability rates.

Modal Site Location: SW¼, NE¼, Section 18, T.36S, R.8W.

GEOLOGY: Bedrock materials are variable and not usually differentiated in this landtype.

Landtype 15u is similar to Landtype 15 except that it is found in the upper forest zone, generally above 3,500 feet elevation, and supports Site Class II and I Shasta red fir and white fir.

16



LANDTYPE UNIT: Landtype 16 occurs on moderately steep toe slopes and is primarily found on the Illinois Valley District. Common inclusions in this Unit are Landtypes 15, and 18.

CLIMATE: Precipitation: 60 to 80 inches/year. 152 to 203 cm/year.
Soil Temperature Class: Mesic, 16u is frigid.

TOPOGRAPHY: Slope: 30 to 70 percent, slight to moderately dissected slopes.
Aspect: All aspects.
Elevation: 500 to 4,000 feet. 150 to 1,220 meters.
Stability: Landtype 16 is moderately stable to moderately unstable and locally unstable. Stability Class II and III. Locally IV along streams.

VEGETATION: This unit supports Site Class III and IV Douglas-fir. Other species include: Western redcedar, Port-Orford-cedar, ponderosa pine, serviceberry, vine maple, whitethorn ceanothus, forbs, grasses, and mosses.

SOIL: Soil 16 is a very deep soil derived from colluvium. Soils are greater than 60 inches deep. The soil materials are well drained. Surface soil erosion potential is moderate to severe. Erosion Class III and IV.

Litter: Needles, leaves, and twigs, approximately 1 inch thick. Decomposed humus material, a trace to 1/2 inch thick.

Surface Layers: Surface layers are very gravelly loams and sandy loams. Colors are dark brown and brown. Structure is weak fine granular. Rock fragments range from 40 to 65 percent by volume. Consistence is soft, friable, non sticky, and non plastic. The pH ranges from 5.8 to 6.3. Surface thickness ranges from 15 to 30 inches. Surface layers have rapid permeability rates.

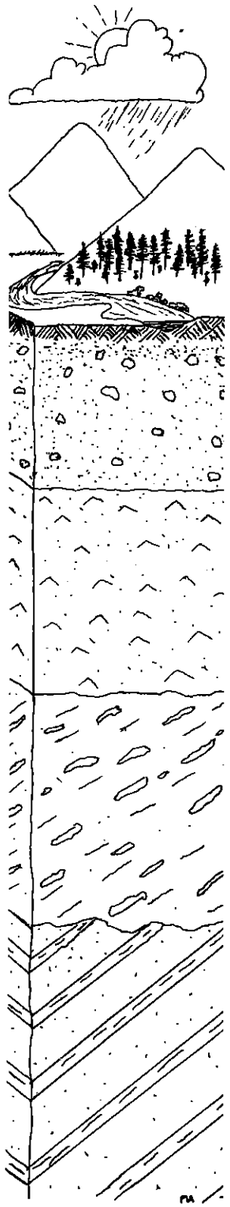
Subsoil Layers: Subsoil layers are usually extremely gravelly to cobbly loamy sands, sandy loams and loams. Colors are brown to dark yellowish brown. Structure is single grained. Rock fragments range from 60 to 90 percent by volume. Consistence is loose, non sticky, and non plastic. The pH ranges from 5.8 to 6.3. Subsoil thickness ranges from 25 to 40 plus inches thick. Subsoil layers have rapid permeability rates.

Modal Site Location: NE¼, NE¼, Section 11, T.41S., R.6W.

GEOLOGY: Bedrock materials are variable.

Landtype 16u is similar to Landtype 16 except that it may have a weakly compacted layer in the Sucker Creek area of the Illinois Valley District; and is found in the upper forest zone, generally above 4,000 feet elevation, and supports Site Class II and III Shasta red fir and white fir.

17



LANDTYPE UNIT: Landtype 17 is found on toe slopes on the west side of the Klamath Mountains. Common inclusions in this unit are Landtypes 8, 8c, 9, 9c, 19, 51, 52, 53, 54, 55, 61, and 62.

CLIMATE: Precipitation: 90 to 140 inches/year. 229 to 356 cm/year.
Soil Temperature Class: Mesic.

TOPOGRAPHY: Slope: 50 to 90 percent, oversteepened moderately dissected slopes.
Aspect: All aspects.
Elevation: 500 to 2,500 feet. 152 to 760 meters.
Stability: Landtype 17 is very unstable. Stability Class V.

VEGETATION: This unit supports Site Class II and III Douglas-fir. Other species include: Port-Orford-cedar, western redcedar, red alder, tanoak, madrone, willow, rhododendron, salal, evergreen huckleberry, vine maple, California hazel, sword fern, twin-flower, starflower, bracken fern, sedges, grasses, and mosses.

SOIL: Soil 17 is a deep to very deep soil derived from colluvium. Soil depth is generally greater than 60 inches, but may be shallower in local slide areas. The soil materials are generally moderate to moderately well drained. Surface soil erosion potential is severe. Erosion Class IV.

Litter: Needles, leaves, and twigs, a trace to 1 inch thick. Decomposed humus material, a trace to 3/4 inch thick.

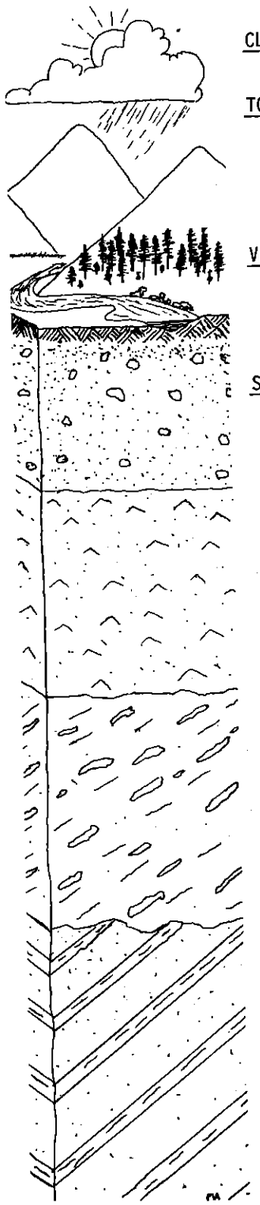
Surface Layers: Surface layers are gravelly to very gravelly loams. Colors are very dark grayish brown to brown. Structure is weak fine granular to weak fine, medium subangular blocky. Rock fragments range from 30 to 65 percent by volume. Consistence is soft to slightly hard, friable to firm, non sticky to slightly sticky, and non plastic to slightly plastic. The pH ranges from 5.5 to 6.5. Surface thickness ranges from 10 to 30 inches. Surface layers have moderate to rapid permeability rates.

Subsoil Layers: Subsoil layers are very gravelly to extremely gravelly loams to clay loams. Colors are brown to yellowish brown. Structure is weak fine subangular blocky to massive. Rock fragments range from 50 to 80 percent by volume. Consistence is soft to hard, friable to firm, slightly sticky to sticky, and slightly plastic to plastic. The pH ranges from 5.5 to 6.6. Subsoil thickness ranges from 20 to 40 inches. Subsoil layers have moderate to rapid permeability rates.

Modal Site Location: SW¼, SW¼, Section 14, T.38S., R.13W.

GEOLOGY: Bedrock materials are variable.

18



LANDTYPE UNIT: Landtype 18 is found on moderate sideslopes and toe slopes on the east side of the Klamath Mountains. Common inclusions in this unit are Landtypes 16, 71, 72, 76, 77, 81, 82, 86, 87, 91, 92, and 95.

CLIMATE: Precipitation: 40 to 80 inches/year. 102 to 203 cm/year.
Soil Temperature Class: Mesic, 18u is frigid.

TOPOGRAPHY: Slope: 35 to 65 percent, slightly to moderately dissected.
Aspect: All aspects.
Elevation: 1,000 to 4,000 feet. 304 to 1,216 meters.
Stability: Landtype 18 is moderately unstable. Stability Class III. Locally unstable, Stability Class IV.

VEGETATION: This unit supports Site Class III and IV Douglas-fir. Other species include: Western redcedar, sugar pine, Port-Orford-cedar, serviceberry, vine maple, red huckleberry, wild blackberry, wild currant, lupine, grasses, and mosses.

SOIL: Soil 18 is a deep soil derived from colluvium. Soil depth is 40 to 60 inches but ranges greater than 60 inches locally. The soil materials are generally well drained to moderately well drained. Surface soil erosion potential is moderate to severe. Erosion Class III and IV.

Litter: Undecomposed leaves, needles, and twigs, a trace to 1 1/2 inches thick. Decomposed humus material, a trace to 3/4 inch thick.

Surface Layers: Surface layers are gravelly to very gravelly loams and sandy loams. Colors are very dark grayish brown to brown and light reddish brown. Structure is weak fine granular to moderately fine and medium subangular blocky. Rock fragments range from 30 to 60 percent by volume. Consistence is soft to slightly hard, friable to firm, non sticky to slightly sticky, and non plastic to slightly plastic. The pH ranges from 6.0 to 6.8. Surface thickness ranges from 10 to 20 inches. Surface layers have moderate to rapid permeability rates.

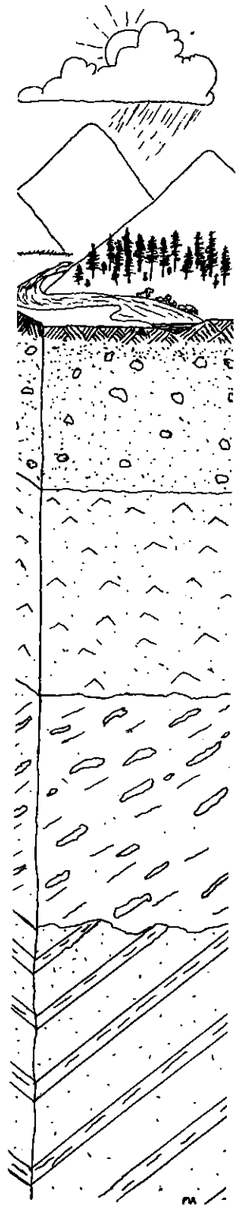
Subsoil Layers: Subsoil layers are very gravelly to extremely gravelly sandy loams, to heavy loams. Colors are brown to yellowish brown. Structure is weak to moderate, fine and medium subangular blocky to massive. Rock fragments range from 50 to 80 percent by volume. Consistence is soft to hard, friable to firm, non sticky to slightly sticky, and non plastic to slightly plastic. The pH ranges from 5.5 to 6.5. Subsoil thickness ranges from 25 to 40 plus inches. The subsoil materials have moderate to rapid permeability rates.

Modal Site Location: NW¼, SE¼, Section 14, T.37S., R.8W.

GEOLOGY: Bedrock materials are variable.

Landtype 18u is similar to Landtype 18 except that it is found in the upper forest zone, generally above 4,000 feet elevation, and supports Site Class II and III Shasta red fir and white fir.

19



LANDTYPE UNIT: Landtype 19 occurs on toe slopes on the west side of the Klamath Mountains. Common inclusions in this unit are Landtypes 17, 41, 43, 51, 52, 61, 176, and 191.

CLIMATE: Precipitation: 90 to 140 inches/year. 229 to 356 cm/year.
Soil Temperature Class: Mesic.

TOPOGRAPHY: Slope: 35 to 70 percent, moderately dissected slopes.
Aspect: All aspects.
Elevation: 500 to 3,500 feet. 152 to 1,064 meters.
Stability: Landtype 19 is moderately unstable to unstable. Stability Class III and IV.

VEGETATION: This unit supports Site Class II and III Douglas-fir. Other species include: Western white pine, sugar pine, redwood, incense-cedar, tanoak, madrone, red alder, bigleaf maple, myrtle, rhododendron, vine maple, evergreen huckleberry, salal, California hazel, sword fern, twinflower, bedstraw, starflower, bracken fern, grasses, and mosses.

SOIL: Soil 19 is a deep to very deep soil derived from colluvium. Soil depth is 40 to 60 inches but ranges to greater than 60 inches locally. Minor inclusions of deeply entrenched stream channels with shallow soils also occur locally. The soil materials are generally moderately to well drained. Surface soil erosion potential is moderate to severe. Erosion Class III and IV.

Litter: Needles, leaves, and twigs, a trace to 1 inch thick. Decomposed humus material, a trace to 3/4 inch thick.

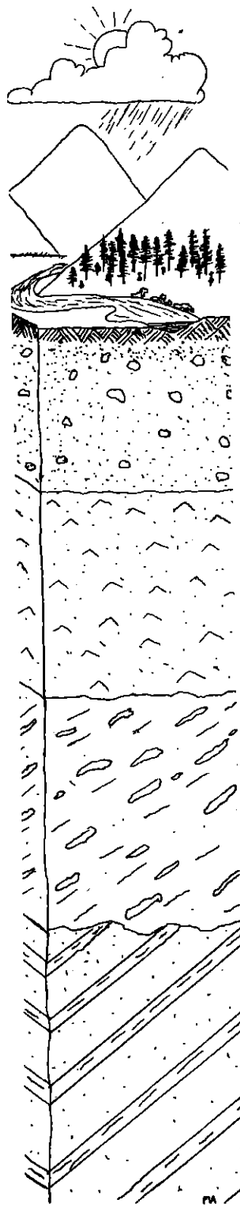
Surface Layers: Surface layers are gravelly to very gravelly loams. Colors are very dark grayish brown to brown. Structure is weak fine granular to weak fine and medium subangular blocky. Rock fragments range from 30 to 65 percent by volume. Consistence is soft to slightly hard, friable to firm, non sticky to slightly sticky, and non plastic to slightly plastic. The pH ranges from 5.5 to 6.5. Surface thickness ranges from 10 to 30 inches. Surface layers have a moderate to rapid permeability rate.

Subsoil Layers: Subsoil layers are very gravelly to extremely gravellly loams to clay loams. Colors are brown to yellowish brown. Structure is weak fine subangular blocky to massive. Rock fragments range from 55 to 85 percent by volume. Consistence is soft to hard, friable to firm, slightly sticky, and slightly plastic. The pH ranges from 5.5 to 6.5. Subsoil thickness is usually greater than 30 inches. Subsoil layers have a moderately rapid to rapid permeability rate.

Modal Site Location: SE¼, NW¼, Section 29, T.41S., R.12W.

GEOLOGY: Bedrock materials are variable.

21



LANDTYPE UNIT: Landtype 21 is found on steep sideslope positions east of the Klamath Mountains. Common inclusions in this unit are Landtypes 18, 22, 96, and 97.

CLIMATE: Precipitation: 35 to 70 inches/year. 89 to 178 cm/year.
Soil Temperature Class: Mesic.

TOPOGRAPHY: Slope: 50 to 90 percent, smooth to slightly dissected.
Aspect: All aspects.
Elevation: 1,500 to 3,500 feet. 456 to 1,067 meters.
Stability: Landtype 21 is moderately stable. Stability Class II.

VEGETATION: This unit supports Site Class IV and locally V Douglas-fir. Other species include: Incense-cedar, western white pine, sugar pine, tanoak, chinkapin, madrone, elderberry, manzanita, Oregon grape, wild rose, trailing blackberry, snowbrush ceanothus, grasses, forbs, and mosses.

SOIL: Soil 21 is a shallow soil derived from residuum and colluvium. Soil depth is generally from 10 to 20 inches but ranges to 40 inches. The soil materials are generally well to excessively drained. Surface soil erosion potential is severe. Erosion Class IV.

Litter: Needles, twigs, and leaves, a trace to 1 inch thick.

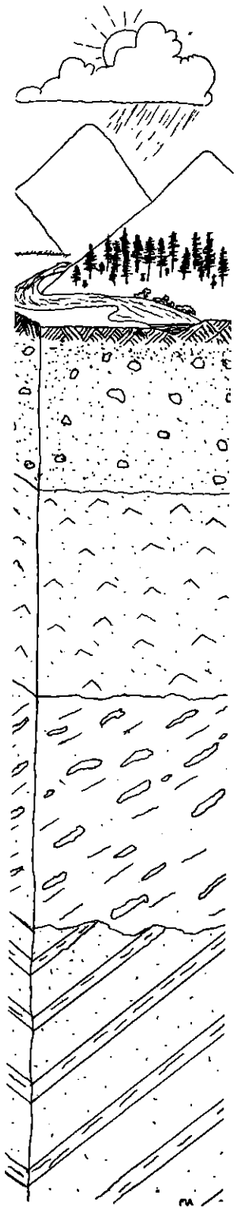
Surface Layers: Surface layers are gravelly to very gravelly sandy loams and loams. Colors are generally dark brown. Structure is weak to moderate medium granular and subangular blocky. Rock fragments range from 20 to 50 percent by volume. Consistence is soft, very friable to friable, non sticky to slightly sticky, and non plastic to slightly plastic. The pH ranges from 6.4 to 7.0. Surface thickness ranges from 5 to 12 inches. Surface layers have rapid permeability.

Subsoil Layers: Subsoil layers are gravelly to extremely gravelly loams and silt loams. Colors are brown and yellowish brown. Structure is moderate medium subangular blocky to massive. Rock fragments range from 35 to 70 percent by volume. Consistence is slightly hard, friable to firm, slightly sticky, and slightly plastic. The pH ranges from 6.3 to 7.0. Subsoil thickness ranges from 8 to 30 inches. Subsoil layers have rapid permeability.

Modal Site Location: NW¼, SW¼, Section 17, T.36S., R.7W.

GEOLOGY: Bedrock consists of moderately hard to hard, highly fractured metagabbro rock.

22



LANDTYPE UNIT: Landtype 22 is found on moderately steep slopes east of the Klamath Mountains. Common inclusions in this unit are Landtypes 18, 21, and 97.

CLIMATE: Precipitation: 35 to 70 inches/year. 89 to 178 cm/year.
Soil Temperature Class: Mesic.

TOPOGRAPHY: Slope: 30 to 60 percent, smooth slopes.
Aspect: All aspects.
Elevation: 1,500 to 3,500 feet. 456 to 1,067 meters.
Stability: Landtype 22 is moderately stable to moderately unstable. Stability Class II and III.

VEGETATION: This unit supports Site Class IV Douglas-fir. Other species include: Incense-cedar, western white pine, sugar pine, tanoak, chinkapin, madrone, elderberry, manzanita, Oregon grape, wild rose, trailing blackberry, snowbrush ceanothus, grasses, forbs, and mosses.

SOIL: Soil 22 is a moderately deep to deep soil derived from residuum and colluvium. Soil depth is 40 to 60 inches deep, but may be shallower locally. The soil materials are generally well drained. Surface soil erosion potential is moderate. Erosion Class III.

Litter: Needles, twigs, and leaves, a trace to 1 inch thick.

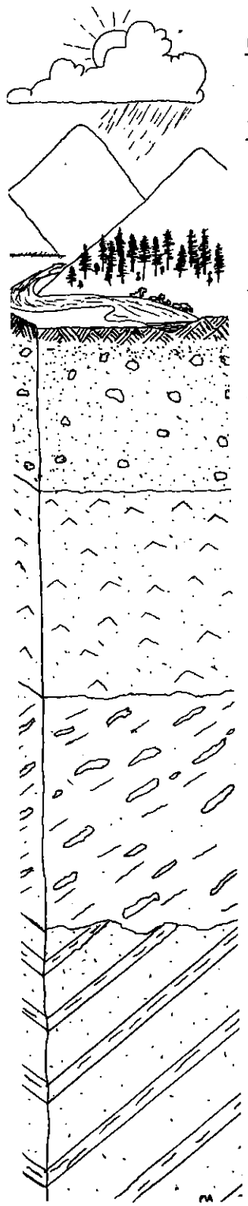
Surface Layers: Surface layers are gravelly loams and loams. Colors are dark reddish brown and dark brown. Structure is weak medium granular to subangular blocky. Rock fragments range from 15 to 30 percent by volume. Consistence is soft to slightly hard, very friable to friable, slightly sticky, and slightly plastic. The pH ranges from 6.3 to 6.7. Surface thickness ranges from 12 to 25 inches. Surface layers have moderate permeability.

Subsoil Layers: Subsoil layers are gravelly loams and clay loams. Colors are dark red and red. Structure is fine to moderate coarse and medium subangular blocky and massive. Rock fragments range from 15 to 30 percent by volume. Consistence is hard, firm, slightly sticky, and slightly plastic to plastic. The pH ranges from 6.7 to 7.2. Subsoil thickness ranges from 20 to 40 inches. Subsoil layers have moderate permeability.

Modal Site Location: SW¼, NE¼, Section 20, T.36S., R.7W.

GEOLOGY: Bedrock consists of moderately hard, highly fractured to moderately decomposed metagabbro rock.

26



LANDTYPE UNIT: Landtype 26 is found on moderately steep to steep side-slope positions in the Mt. Emily Area of the Chetco Ranger District. Common inclusions in this unit are Landtypes 19, 27, 28, and 51.

CLIMATE: Precipitation: 110 to 130 inches/year. 279 to 329 cm/year.
Soil Temperature Class: Mesic.

TOPOGRAPHY: Slope: 40 to 90 percent, smooth to moderately dissected slopes.
Aspect: Generally north, northwest, northeast, and east.
Elevation: 500 to 3,000 feet. 152 to 912 meters.
Stability: Landtype 26 is moderately stable. Stability Class II.

VEGETATION: This unit supports Site Class III and IV Douglas-fir. Other species include: Port-Orford- cedar, red alder, tanoak, madrone, manzanita, salal, sword fern, beargrass, bracken fern, grasses, lichens, and mosses.

SOIL: Soil 26 is a shallow soil derived from colluvium and residuum. Soil depth is generally 10 to 20 inches. The soil materials are generally well drained. Surface soil erosion potential is severe to very severe. Erosion Class IV and V.

Litter: Needles, leaves, and twigs, a trace to 3/4 inch thick.

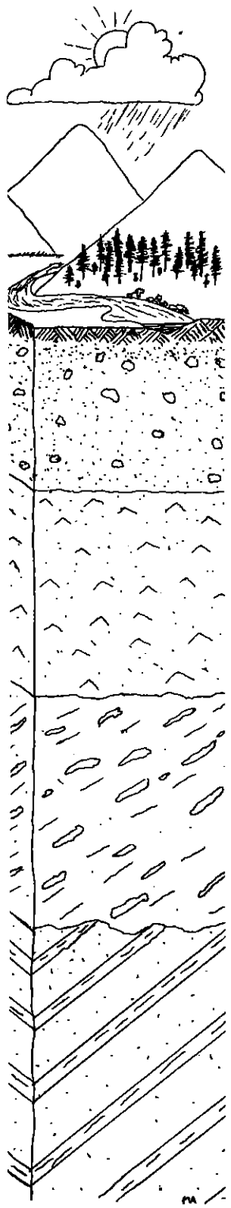
Surface Layers: Surface layers are sandy loams and loams. Colors are light brownish gray to gray. Structure is weak fine granular to weak fine subangular blocky. Rock fragments range from 0 to 15 percent by volume. Consistence is soft, very friable to friable, non sticky, and non plastic. The pH ranges from 6.0 to 6.5. Surface thickness ranges from 6 to 12 inches. Surface layers have rapid permeability.

Subsoil Layers: Subsoil layers are sandy loam and loams. Colors are light brownish gray to light gray. Structure is weak fine subangular blocky to massive. Rock fragments range from 5 to 15 percent by volume. Consistence is soft to hard, friable to firm, non sticky to slightly sticky, and non plastic. The pH ranges from 6.0 to 6.5. Subsoil thickness ranges from 5 to 15 inches. Subsoil layers have rapid permeability rates.

Modal Site Location: NE¼, SW¼, Section 9, T.40S., R.12W.

GEOLOGY: Bedrock consists of moderately hard to hard, highly fractured rhyollites, dacites, and syenites.

27



LANDTYPE UNIT: Landtype 27 is found on gentle to moderately steep ridge-top positions in the Mt. Emily area of the Chetco Ranger District. Common inclusions in this unit are Landtypes 19, 26, 29, and 52.

CLIMATE: Precipitation: 110 to 130 inches/year. 279 to 329 cm/year.
Soil Temperature Class: Mesic.

TOPOGRAPHY: Slope: 10 to 40 percent, smooth ridgetops.
Aspect: Generally north, northwest, northeast, and east.
Elevation: 500 to 3,000 feet. 152 to 912 meters.
Stability: Landtype 27 is moderately stable. Stability Class II.

VEGETATION: This unit supports Site Class III and locally IV Douglas-fir. Other species include: Port-Orford-cedar, redwood, red alder, tanoak, madrone, salal, sword fern, beargrass, grasses, lichens, and mosses.

SOIL: Soil 27 is a moderately deep soil derived from residuum and colluvium. Soil depth is generally 20 to 40 inches. The soil materials are generally well drained. Surface soil erosion potential is moderate, locally severe. Erosion Class III, locally IV.

Litter: Needles, leaves, and twigs, a trace to 3/4 inch thick.

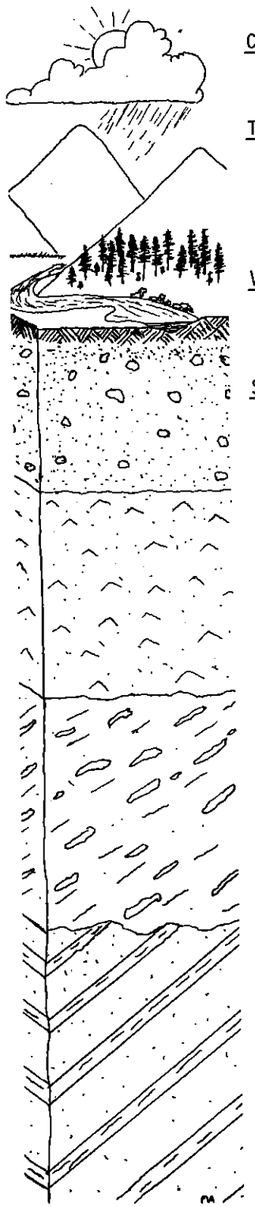
Surface Layers: Surface layers are loams to fine sandy loams. Colors are dark yellowish. Structure is weak fine grandular to weak fine subangular blocky. Rock fragments range from 5 to 15 percent by volume. Consistence is soft, very friable to friable, non sticky, and non plastic. The pH ranges from 5.5 to 6.0. Surface thickness ranges from 10 to 20 inches. Surface layers have rapid permeability.

Subsoil Layers: Subsoil layers are very cobbly loams to loams. Colors are dark yellowish brown to yellowish brown. Structure is weak fine subangular blocky and weak fine granular. Rock fragments range from 20 to 50 percent by volume. Consistence is soft to hard, friable to firm, non sticky to slightly sticky, and non plastic. The pH ranges from 6.0 to 6.5. Subsoil thickness ranges from 10 to 30 inches. Subsoil layers have rapid permeability rates.

Modal Site Location: NE¼, SE¼, Section 8, T.40S., R.12W.

GEOLOGY: Bedrock consists of soft to moderately hard dacites, rhylollites, and syenites.

28



LANDTYPE UNIT: Landtype 28 is found on moderately steep to very steep sideslope positions in the Mt. Emily area of the Chetco Ranger District. Common inclusions in this unit are Landtypes 19, 26, 29, and 53.

CLIMATE: Precipitation: 110 to 130 inches/year. 279 to 329 cm/year.
Soil Temperature Class: Mesic.

TOPOGRAPHY: Slope: 40 to 90 percent, smooth to moderately dissected slopes.
Aspect: Generally south, southeast, southwest, and west.
Elevation: 500 to 3,000 feet. 152 to 912 meters.
Stability: Landtype 28 is moderately stable. Stability Class II.

VEGETATION: This unit supports Site Class IV and V Douglas-fir. Other species include: Knobcone pine, tanoak, madrone, canyon live oak, manzanita, salal, bracken fern, beargrass, grasses, lichens, and mosses.

SOILS: Soil 28 is a shallow soil derived from colluvium and residuum. Soil depth is generally 10 to 20 inches. The soils are generally well drained. Surface soil erosion potential is very severe to severe. Erosion Class V and IV.

Litter: Needles, leaves, and twigs, a trace to 1/2 inch thick.

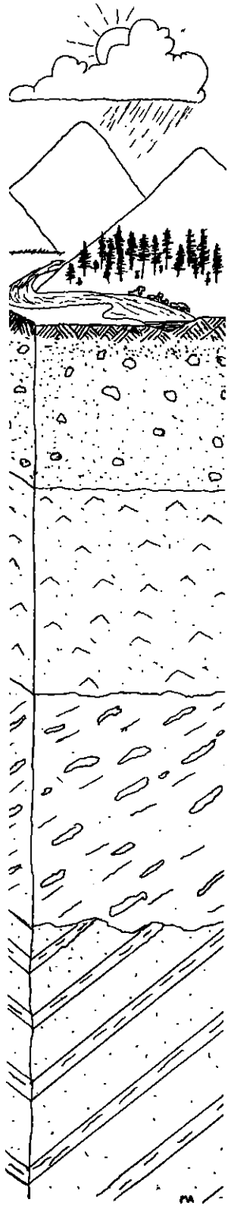
Surface Layers: Surface layers are sandy loams and loams. Colors are light brownish gray to gray. Structure is weak fine granular to weak fine subangular blocky. Rock fragments range from 0 to 15 percent by volume. Consistence is soft, very friable to friable, non sticky, and non plastic. The pH ranges from 6.0 to 6.5. Surface thickness ranges from 5 to 10 inches. Surface layers have rapid permeability.

Subsoil Layers: Subsoil layers are sandy loams and loams. Colors are light brownish gray to light gray. Structure is weak fine subangular blocky to massive. Rock fragments range from 5 to 15 percent by volume. Consistence is soft to hard, friable to firm, non sticky to slightly sticky, and non plastic. The pH ranges from 6.0 to 6.5. Subsoil thickness ranges from 5 to 10 inches. Subsoil layers have rapid permeability rates.

Modal Site Location: NE¼, SW¼, Section 9, T.40S., R.12W.

GEOLOGY: Bedrock consists of hard to moderately hard, highly fractured dacites, rhyollites, and syenites.

29



LANDTYPE UNIT: Landtype 29 is found on gentle to moderately steep ridgetop positions in the Mt. Emily area of the Chetco Ranger District. Common inclusions in this unit are Landtypes 19, 27, 28, and 54.

CLIMATE: Precipitation: 110 to 130 inches/year. 279 to 329 cm/year.
Soil Temperature Class: Mesic.

TOPOGRAPHY: Slope: 10 to 40 percent, smooth ridgetops.
Aspect: Generally south, southeast, southwest, and west.
Elevation: 500 to 3,000 feet. 152 to 912 meters.
Stability: Landtype 29 is moderately stable. Stability Class II.

VEGETATION: This unit supports Site Class IV and locally V Douglas-fir. Other species include: Knobcone pine, tanoak, madrone, hairy manzanita, salal, beargrass, bracken fern, grasses, mosses, and lichens.

SOIL: Soil 29 is a moderately deep soil derived from residuum and colluvium. Soil depth is generally 20 to 40 inches. The soil materials are generally well drained. Surface soil erosion potential is moderate to severe. Erosion Class III and IV.

Litter: Needles, leaves, twigs, a trace to 1/2 inch thick.

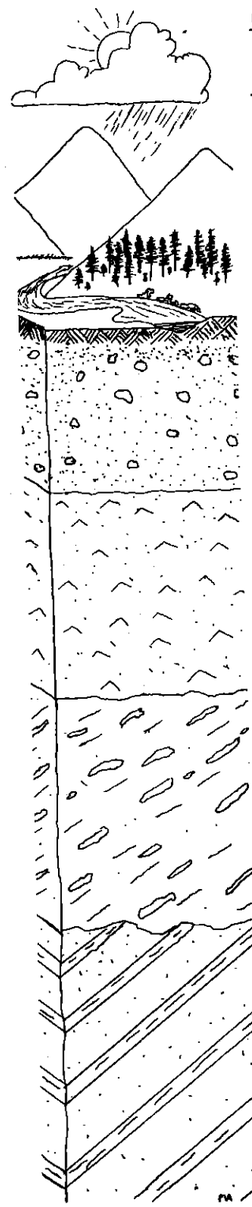
Surface Layers: Surface layers are loams to sandy loams. Colors are dark yellowish brown to yellowish brown. Structure is weak fine granular to weak fine subangular blocky. Rock fragments range from 5 to 15 percent by volume. Consistence is soft, very friable to friable, non sticky, and non plastic. The pH ranges from 5.5 to 6.0. Surface thickness ranges from 10 to 20 inches. Surface layers have rapid permeability.

Subsoil Layers: Subsoil layers are cobbly loams to stony loams. Colors are dark yellowish brown to yellowish brown. Structure is weak fine subangular blocky and weak fine granular. Rock fragments range from 30 to 50 percent by volume. Consistence is soft to hard, friable to firm, non sticky to slightly sticky, and non plastic. The pH ranges from 6.0 to 6.5. Subsoil thickness ranges from 10 to 30 inches. Subsoil layers have rapid permeability rates.

Modal Site Location: NE¼, SW¼, Section 8, T.40S., R.12W.

GEOLOGY: Bedrock consists of hard to moderately hard dacites, rhyollites, and syenites.

31



LANDTYPE UNIT: Landtype 31 is found on moderately steep sideslopes on the east side of the Klamath Mountains. Common inclusions in this unit are Landtypes 3, 32, 34, and 35.

CLIMATE: Precipitation: 40 to 90 inches/year. 102 to 229 cm/year.
Soil Temperature Class: Mesic, frigid on 31u.

TOPOGRAPHY: Slope: 35 to 65 percent, slightly dissected slopes.
Aspect: All aspects.
Elevation: 1,000 to 4,000 feet. 305 to 1,220 meters.
Stability: Landtype 31 is moderately stable. Stability Class II.

VEGETATION: This unit supports Site Class V and lower Douglas-fir. Other species include: Jeffrey pine, knobcone pine, incense-cedar, whiteleaf manzanita, western azalea, prostrate juniper, grasses, forbs, and mosses.

SOIL: Soil 31 is a shallow soil derived from residuum and colluvium. Soil depth is generally 10 to 20 inches. The soil materials are generally well to excessively drained. Surface soil erosion potential is severe to moderate. Erosion Class IV and III.

Litter: Needles, twigs, and leaves, less than 1/2 inch thick. Decomposed humus material, 0 to 1/4 inch thick.

Surface Layers: Surface layers are very gravelly and extremely gravelly loams stony loams and clay loams. Colors are dark brown to light gray. Structure is weak fine granular to moderate medium subangular blocky. Rock fragments range from 40 to 70 percent by volume. Consistence is soft to slightly hard, friable, slightly sticky to sticky, and slightly plastic to plastic. The pH ranges from 6.5 to 7.5. Surface thickness ranges from 4 to 11 inches. Surface layers have a rapid permeability rate.

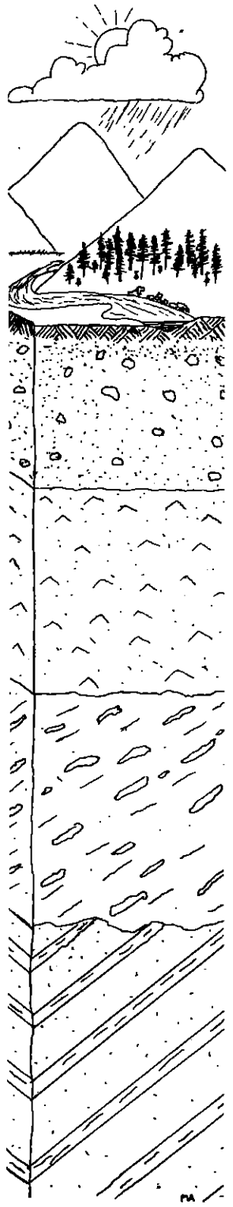
Subsoil Layers: Subsoil layers are extremely gravelly to cobbly clay loams to clays. Colors are dark reddish brown to dark yellowish brown. Structure is moderate to fine and medium subangular and angular blocky to massive. Rock fragments range from 40 to 70 percent by volume. Consistence is slightly hard, friable to firm, sticky to very sticky, plastic to very plastic. The pH ranges from 6.7 to 7.5. Subsoil thickness ranges from 7 to 17 inches. Subsoil layers have slow to moderate permeability rates.

Modal Site Location: NE¼, SE¼, Section 20, T.36S., R.7W.

GEOLOGY: Bedrock ranges from green, moderately hard, highly sheared serpentine to hard blocky, rust-colored peridotite.

Landtype 31u is similar to Landtype 31 except that it is found in the upper forest zone, generally between 4,000 and 4,600 feet in elevation, and supports Site Class V sugar pine, Shasta red fir and white fir.

32



LANDTYPE UNIT: Landtype 32 is found on gentle ridgetops and sideslopes on the east side of the Klamath Mountains. Common inclusions in this unit are Landtypes 10, 12, 31 and 35.

CLIMATE: Precipitation: 40 to 90 inches/year. 102 to 229 cm/year.
Soil Temperature Class: Mesic, frigid on 32u.

TOPOGRAPHY: Slope: 0 to 35 percent, smooth slopes.
Aspect: All aspects.
Elevation: 1,000 to 4,000 feet. 305 to 1,220 meters.
Stability: Landtype 32 is moderately stable to moderately unstable. Stability Class II and III.

VEGETATION: This unit supports low site, (Site Class V and lower) Douglas-fir. Other species include: Jeffrey pine, knobcone pine, incense-cedar, ponderosa pine, whiteleaf and greenleaf manzanita, western azalea, California coffeeberry, prostrate juniper, grasses, forbs, and mosses.

SOIL: Soil 32 is a moderately deep soil derived from residuum and colluvium. Soil depth generally is 20 to 40 inches. The soil materials are generally well drained. Surface soil erosion potential is moderate. Erosion Class III.

Litter: Needles, leaves, and twigs, a trace to 1 inch thick. Decomposed humus material, a trace to 1 inch thick.

Surface Layers: Surface layers are heavy loams to gravelly clay loams. Colors are dark reddish brown to dark brown. Structure is moderate fine and medium granular and subangular blocky. Rock fragments range from 10 to 35 percent by volume. Consistence is soft to hard, friable to firm, slightly sticky to sticky, and slightly plastic to plastic. The pH ranges from 6.0 to 7.0. Surface thickness ranges from 8 to 19 inches. Surface layers have moderately slow to moderate permeability rate.

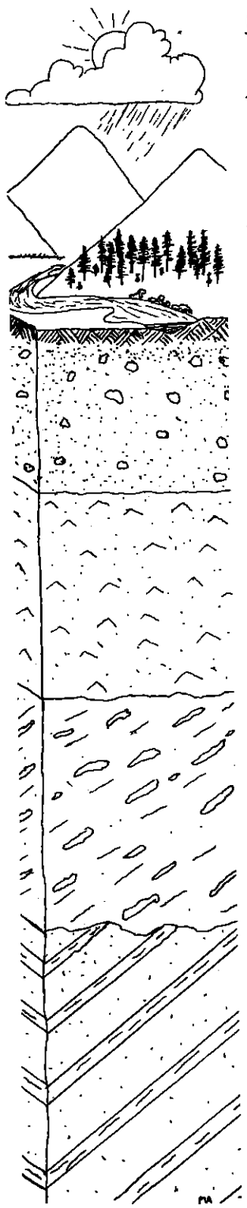
Subsoil Layers: Subsoil layers are gravelly to very gravelly clay loams and clays. Colors are reddish brown and brown. Structure is moderate fine and medium subangular blocky. Rock fragments range from 15 to 40 percent by volume. Consistence is hard to very hard, firm to very firm, sticky, and plastic. The pH ranges from 6.0 to 7.2. Subsoil thickness ranges from 12 to 30 inches. Subsoil layers have a slow to moderate permeability rate.

Modal Site Location: SW¼, NE¼, Section 22, T.40S., R.7W.

GEOLOGY: Bedrock consists of soft weathered serpentine and peridotite.

Landtype 32u is similar to Landtype 32 except that it is found in the upper forest zone, generally between 4,000 and 4,500 feet in elevation. This landtype supports sugar pine and Site Class IV and V Shasta red fir and white fir.

34



LANDTYPE UNIT: Landtype 34 is found on steep highly dissected sideslopes on the east side of the Klamath Mountains. Common inclusions in this unit are Landtypes 3, 31, and 35.

CLIMATE: Precipitation: 50 to 90 inches/year. 127 to 229 cm/year.
Soil Temperature Class: Mesic.

TOPOGRAPHY: Slope: 50 to 90 percent, highly to extremely dissected.
Aspect: All aspects.
Elevation: 1,200 to 4,000 feet. 366 to 1,220 meters.
Stability: Landtype 34 is moderately stable to moderately unstable. Stability Class II and III.

VEGETATION: This unit supports low Site Class V and lower Douglas-fir. Other species include: Jeffrey pine, knobcone pine, incense-cedar, ponderosa pine, whiteleaf manzanita, western azalea, prostrate juniper, grasses, forbs, and mosses.

SOIL: Soil 34 is a shallow, locally moderately deep soil derived from colluvium and residuum. Soil depth to bedrock is usually 10 to 20 inches but ranges to 40 inches. The soil materials are generally well to excessively drained. Surface soil erosion potential is severe. Erosion Class IV.

Litter: Needles, twigs, and leaves, less than 1/2 inch thick. Decomposed humus material, a trace to 1/4 inch thick.

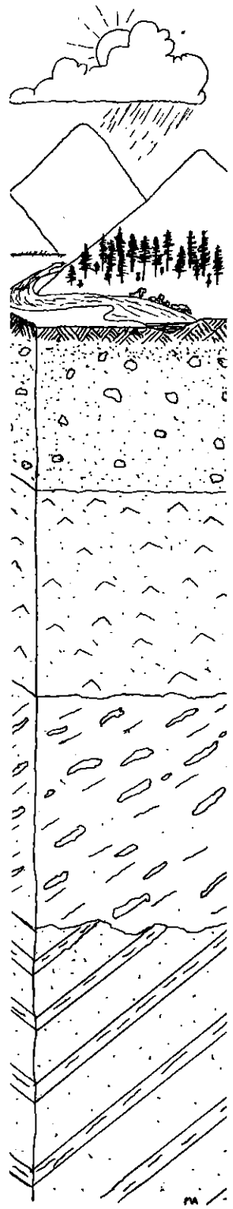
Surface Layers: Surface layers are very gravelly and extremely gravelly to stony loams to clay loams. Colors are dark brown to light gray. Structure is weak fine granular to moderate medium subangular blocky. Rock fragments range from 40 to 70 percent by volume. Consistence is soft to slightly hard, friable, slightly sticky to sticky, and slightly plastic to plastic. The pH ranges from 6.5 to 7.5. Surface thickness ranges from 4 to 11 inches. Surface layers have a rapid permeability rate.

Subsoil Layers: Subsoil layers are extremely gravelly to cobbly clay loams to clays. Colors are dark reddish brown to dark yellowish brown. Structure is moderate, fine and medium subangular and angular blocky to massive. Rock fragments range from 50 to 80 percent by volume. Consistence is hard, firm, sticky to very sticky, plastic to very plastic. The pH ranges from 6.7 to 7.5. Subsoil thickness ranges from 7 to 17 inches. Subsoil permeability is slow to moderate.

Modal Site Location: NE¼, SW¼, Section 34, T.39S., R.9W.

GEOLOGY: Bedrock ranges from green hard to moderately hard, highly sheared serpentine to hard, blocky, rust-colored peridotite.

35



LANDTYPE UNIT: Landtype 35 is found on ridgetops on the east side of the Klamath Mountains. Common inclusions in this unit are Landtypes 3, 31, 32, and 34.

CLIMATE: Precipitation: 40 to 90 inches/year. 127 to 229 cm/year.
Soil Temperature Class: Mesic, frigid on 35u.

TOPOGRAPHY: Slope: 0 to 35 percent, smooth slopes.
Aspect: All aspects.
Elevation: 1,500 to 4,000 feet. 458 to 1,220 meters.
Stability: Landtype 35 is moderately stable. Stability Class II.

VEGETATION: This unit supports lower than Site Class V Douglas-fir (non-commercial timber). Other species include: Jeffrey pine, incense-cedar, knobcone pine, ponderosa pine, whiteleaf manzanita, prostrate juniper, western azalea, grasses, forbs, and mosses.

SOIL: Soil 35 is a shallow soil derived from residuum and colluvium. Soil depth is generally 10 to 20 inches. The soil materials are generally well drained. Surface soil erosion potential is moderate. Erosion Class III.

Litter: Needles, leaves, and twigs, a trace to 1 inch thick.

Surface Layers: Surface layers are gravelly loams. Colors are dark brown to grayish brown. Structure is weak, fine granular to moderate, medium subangular blocky. Rock fragments range from 15 to 50 percent by volume. Consistence is soft to slightly hard, friable to firm, slightly sticky to slightly plastic. The pH ranges from 6.7 to 7.7. Surface thickness ranges from 8 to 11 inches. Surface layers have moderate to rapid permeability rates.

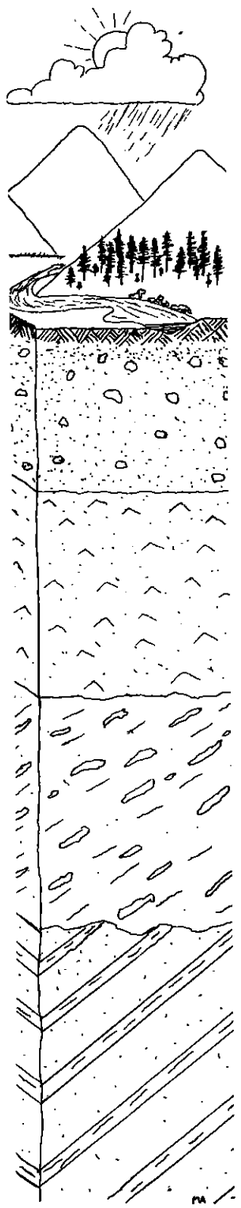
Subsoil Layers: Subsoil layers are gravelly to extremely gravelly clay loams. Colors are dark yellowish brown and brown. Structure is moderate and strong medium to coarse subangular blocky. Rock fragments range from 10 to 50 percent by volume. Consistence is hard to very hard, firm to very firm, sticky, and plastic. The pH ranges from 6.5 to 7.5. Subsoil thickness ranges from 6 to 18 inches. Subsoil layers have moderate permeability rates.

Modal Site Location: SE¼, NE¼, Section 22, T.40S., R.7W.

GEOLOGY: Bedrock consists of moderately hard to hard serpentine and peridotite. Serpentine is often highly sheared and peridotite is characteristically blocky.

Landtype 35u is similar to Landtype 35 except that it is found in the upper forest zone, generally between 4,000 and 5,000 feet in elevation. This landtype supports Site Class V Shasta red fir and white fir.

36



LANDTYPE UNIT: Landtype 36 is found on moderately steep sideslopes on the west side of the Klamath Mountains. Common inclusions in this unit are Landtypes 3, 37, and 39.

CLIMATE: Precipitation: 100 to 125 inches/year. 254 to 325 cm/year.
Soil Temperature Class: Mesic.

TOPOGRAPHY: Slope: 35 to 65 percent, slightly dissected slopes.
Aspect: All aspects.
Elevation: 1,000 to 3,500 feet. 305 to 1,067 meters.
Stability: Landtype 36 is moderately stable to moderately unstable. Stability Class II and III.

VEGETATION: This unit supports low site (Site Class V and lower) Douglas-fir. Stocking levels are usually low. Other species include: Incense-cedar, Jeffrey pine, knobcone pine, western white pine, Port-Orford-cedar, madrone, chinkapin, rhododendron, western azalea, bearberry, Oregon myrtle, canyon live oak, California coffeeberry, wedgeleaf ceanothus, sumac, birchleaf mountain mahogany, salal, prostrate juniper, silk tassel, Oregon grape, serviceberry, dogbane, lomatium, and onion grass.

SOIL: Soil 36 is a shallow to moderately deep soil derived from residuum and colluvium. Soil depth to bedrock is generally 10 to 20 inches, but may be deeper locally. The soil materials are generally well drained. Surface soil erosion potential is severe. Erosion Class IV.

Litter: Needles, leaves, and twigs, a trace to 1 inch thick.

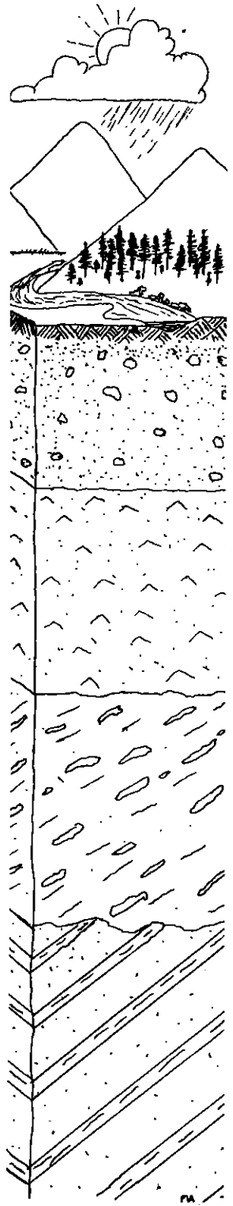
Surface Layers: Surface layers are gravelly to very cobbly loams. Colors are very dark grayish brown and dark brown. Structure is weak and moderate, fine granular to subangular blocky. Rock fragments range from 15 to 45 percent by volume. Consistence is soft to slightly hard, friable to firm, non sticky to slightly sticky, and non plastic to slightly plastic. The pH ranges from 6.0 to 6.8. Surface thickness ranges from 6 to 12 inches. Surface layers have moderate to rapid permeability.

Subsoil Layers: Subsoil layers are very gravelly to extremely gravelly loams, silt loams, and clay loams. Colors are brown and reddish brown. Structure is moderate, fine and medium subangular blocky to massive. Rock fragments range from 35 to 75 percent by volume. Consistence is hard, firm, sticky, and plastic. The pH ranges from 5.5 to 7.0. Subsoil thickness ranges from 8 to 18 inches. Subsoil layers have moderate permeability.

Modal Site Location: NW¼, SW¼, Section 35, T.33S., R.12W.

GEOLOGY: Bedrock consists of moderately hard, highly sheared serpentine and blocky peridotite.

37



LANDTYPE UNIT: Landtype 37 is found on gentle ridgetops and gentle to moderately steep sideslopes on the west side of the Klamath Mountains. Common inclusions in this unit are Landtypes 36, 38, and 39.

CLIMATE: Precipitation: 100 to 125 inches/year. 254 to 325 cm/year.
Soil Temperature Class: Mesic.

TOPOGRAPHY: Slope: 10 to 45 percent, smooth to slightly dissected slopes.
Aspect: All aspects.
Elevation: 1,000 to 3,500 feet. 305 to 1,067 meters.
Stability: Landtype 37 is moderately unstable, to unstable locally. Stability Class III, locally IV.

VEGETATION: This unit supports Site Class V Douglas-fir. Stocking levels are usually low. Other species include: Port-Orford-cedar, sugar pine, incense-cedar, western white pine, knobcone pine, Jeffrey pine, lodgepole pine, madrone, tanoak, chinkapin, rhododendron, cascara, ninebark, Oregon myrtle, canyon live oak, wedgeleaf ceanothus, sumac, birchleaf mountain mahogany, salal, prostrate juniper, silk tassel, Oregon grape, serviceberry, California coffeeberry, hucklberry oak, dogbane, lomatium, and onion grass.

SOIL: Soil 37 is a moderately deep to deep soil derived from residuum and colluvium. Soil depth is generally 20 to 40 inches, but ranges to 50 inches. The soil materials are generally moderately well to well drained. Surface soil erosion potential is moderate. Erosion Class III.

Litter: Needles, leaves, and twigs, a trace to 1 inch thick.

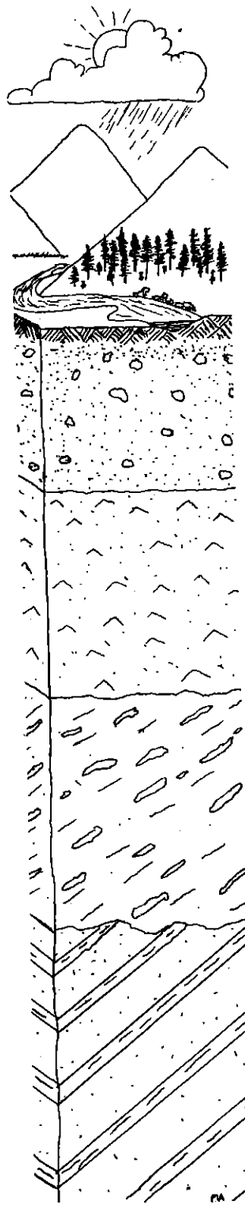
Surface Layers: Surface layers are gravelly to very gravelly loams. Colors are very dark brown and dark brown. Structure is weak fine granular to subangular blocky. Rock fragments range from 15 to 55 percent by volume. Consistence is soft to slightly hard, friable to firm, slightly sticky, and slightly plastic. The pH ranges from 6.0 to 6.8. Surface thickness ranges from 7 to 18 inches. Surface layers have moderate permeability.

Subsoil Layers: Subsoil layers are extremely gravelly or cobbly clay loams to clays. Colors are reddish brown to dark brown. Structure is moderate to strong medium subangular blocky and massive. Rock fragments range from 50 to 80 percent by volume. Consistence is hard, firm, sticky, and plastic. The pH ranges from 5.5 to 6.6. Subsoil thickness ranges from 14 to 35 inches. Subsoil layers have moderate permeability.

Modal Site Location: SE¼, NE¼, Section 35, T.33S., R.12W.

GEOLOGY: Bedrock consists of soft to moderately hard serpentine and peridotite. Bedrock is often highly sheared.

38



LANDTYPE UNIT: Landtype 38 is found on moderately steep to steep sideslopes in the northern portion of the Forest on the Powers District. Common inclusions in this unit are Landtypes 5, 37, and 186.

CLIMATE: Precipitation: 90 to 100 inches/year. 229 to 254 cm/year.
Soil Temperature Class: Mesic.

TOPOGRAPHY: Slope: 35 to 75 percent, slightly dissected.
Aspect: Northeast, north, and west.
Elevation: 1,500 to 3,500 feet. 456 to 1,067 meters.
Stability: Landtype 38 is moderately unstable. Stability Class III.

VEGETATION: This unit supports Site Class V and some IV Douglas-fir. Other species include: Incense-cedar, Port-Orford-cedar, western redcedar, tanoak, madrone, rhododendron, salal, oceanspray, Oregon grape, serviceberry, swordfern, mosses, and grasses.

SOIL: Soil 38 is a deep to very deep soil derived from colluvium and residuum. Soil depth is generally greater than 60 inches with minor inclusions of shallower soils. The soil materials are generally well drained. Surface soil erosion potential is severe. Erosion Class IV.

Litter: Needles, twigs and leaves, less than 1/2 inch thick.

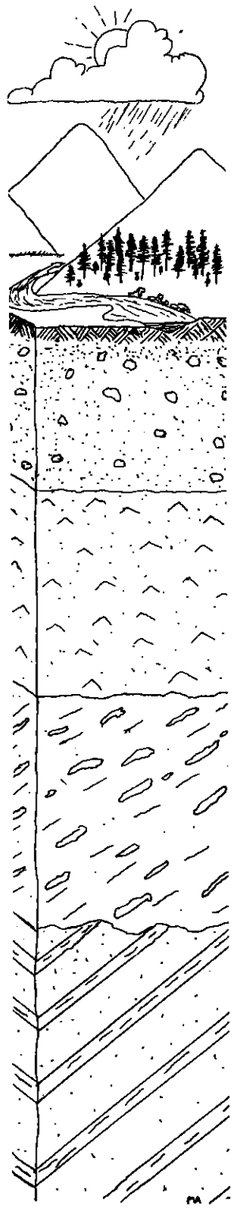
Surface Layers: Surface layers are extremely gravelly loams and silt loams. Colors are very dark brown and dark brown to dark reddish brown. Structure is weak medium granular to weak fine subangular blocky. Rock fragments range from 45 to 80 percent by volume. Consistence is soft to slightly hard, very friable to friable, slightly sticky to sticky, and slightly plastic. The pH ranges from 7.0 to 7.8. Surface thickness ranges from 15 to 28 inches. Surface layers have moderately rapid to rapid permeability rates.

Subsoil Layers: Subsoil layers are very cobbly to extremely cobbly loams and silt loams. Colors are dark yellowish brown to reddish brown. Structure is weak very fine and fine subangular blocky. Rock fragments range from 50 to 80 percent by volume. Consistence is friable, slightly sticky to sticky, and slightly plastic. The pH ranges from 7.0 to 8.0. Subsoil thickness ranges from 30 to 50 plus inches thick. Subsoil layers have moderately rapid to rapid permeability rates.

Modal Site Location: SE¼, NE¼, Section 3, T.32S., R.12W.

GEOLOGY: Bedrock consists of highly fractured serpentine and peridotite.

39



LANDTYPE UNIT: Landtype 39 is found on gentle ridgetops on the west side of the Klamath Mountains. Common inclusions in this unit are Landtypes 3, 36, and 37.

CLIMATE: Precipitation: 100 to 150 inches/year. 254 to 381 cm/year.
Soil Temperature Class: Mesic.

TOPOGRAPHY: Slope: 0 to 35 percent, smooth slopes.
Aspect: All aspects.
Elevation: 500 to 3,500 feet. 153 to 1,067 meters.
Stability: Landtype 39 is moderately stable. Stability Class II.

VEGETATION: This unit supports Site Class V and lower Douglas-fir. Stocking levels are very low. Other species include: Incense-cedar, sugar pine, western white pine, Port-Orford-cedar, lodgepole pine, knobcone pine, Jeffrey pine, madrone, chinkapin, rhododendron, ninebark, Oregon myrtle, canyon live oak, wedgeleaf ceanothus, sumac, birchleaf mountain mahogany, salal, prostrate juniper, oceanspray, silk tassel, Oregon grape, serviceberry, evergreen huckleberry, wild rose, dogbane, lomatium, and onion grass.

SOIL: Soil 39 is a shallow soil derived from residium and colluvium. Soil depth is generally 10 to 20 inches. The soil materials are generally moderately well drained. Surface soil erosion potential is moderate. Erosion Class III.

Litter: Needles, leaves, and twigs, a trace to 1 inch thick.

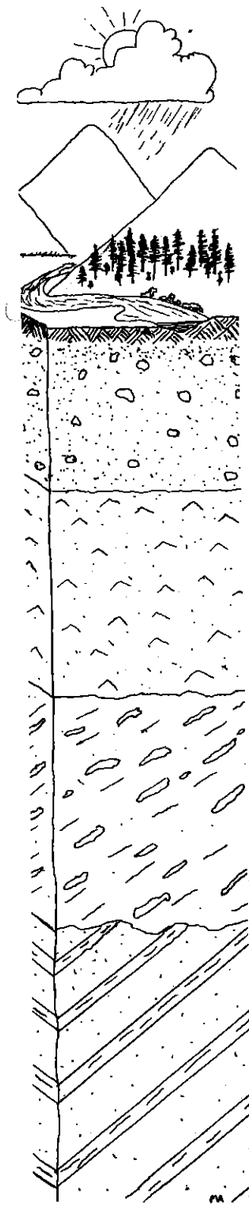
Surface Layers: Surface layers are very gravelly to extremely gravelly loams and clay loams. Colors are very dark brown to reddish brown. Structure is weak fine granular to subangular blocky. Rock fragments range from 35 to 65 percent by volume. Consistence is soft to slightly hard, friable to firm, slightly sticky, and slightly plastic. The pH ranges from 5.5 to 6.6. Surface thickness ranges from 5 to 10 inches. Surface layers have moderate permeability.

Subsoil Layers: Subsoil layers are very to extremely gravelly clay loams and clays. Colors are reddish brown. Structure is moderate to strong, fine and medium subangular blocky. Rock fragments range from 45 to 75 percent by volume. Consistence is hard, firm, sticky, and plastic. The pH ranges from 5.8 to 6.7. Subsoil thickness ranges from 7 to 16 inches. Subsoil layers have slow to moderate permeability.

Modal Site Location: NW¼, SW¼, Section 33, T.33S., R.12W.

GEOLOGY: Bedrock consists of moderately hard to hard peridotite and serpentine.

41



LANDTYPE UNIT: Landtype 41 is found on moderately steep sideslopes on the west side of the Klamath Mountains. Common inclusions in this unit are Landtypes 19, 42, 43, and 46.

CLIMATE: Precipitation: 100 to 135 inches/year. 254 to 333 cm/year.
Soil Temperature Class: Mesic.

TOPOGRAPHY: Slope: 40 to 90 percent, moderate to highly dissected.
Aspect: Generally north, northeast, northwest, and east.
Elevation: 800 to 3,500 feet. 243 to 1,067 meters.
Stability: Landtype 41 is moderately stable to moderately unstable. Stability Class II and III.

VEGETATION: This unit supports Site Class III and IV Douglas-fir. Other species include: Western hemlock, western white pine, tanoak, chinkapin, red alder, serviceberry, Oregon grape, vanillaleaf, ferns, and fescue.

SOIL: Soil 41 is a moderately deep soil derived from residuum and colluvium. Soil depth is generally 20 to 40 inches, but may be shallower locally. The soil materials are generally well to excessively drained. Surface soil erosion potential is severe. Erosion Class IV.

Litter: Needles, leaves, and twigs, a trace to 1 inch thick.

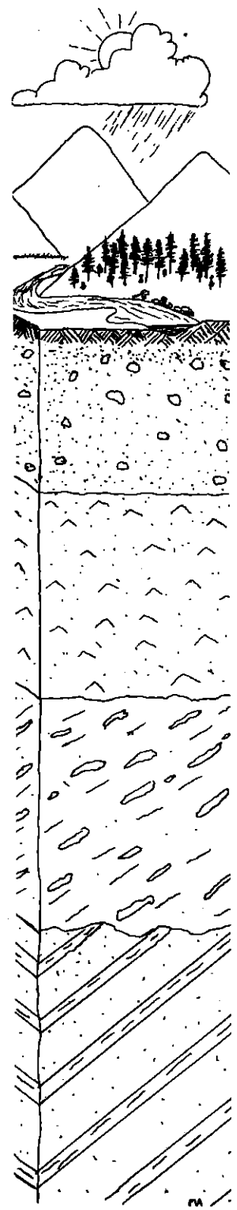
Surface Layers: Surface layers are gravelly sandy loams and loams. Colors are grayish brown to dark yellowish brown. Structure is moderate, medium granular and fine subangular blocky. Rock fragments range from 15 to 35 percent by volume. Consistence is soft to slightly hard, friable, non sticky, and non plastic. The pH ranges from 6.0 to 7.0. Surface thickness ranges from 6 to 16. Surface layers have rapid permeability rates.

Subsoil Layers: Subsoil layers range from gravelly sandy loams through silt loams. Colors are brown to yellowish brown. Structure is weak to moderately fine and medium subangular blocky. Rock fragments range from 15 to 35 percent by volume. Consistence is slightly hard, friable to firm, slightly sticky, and slightly plastic. The pH ranges from 6.2 to 6.7. Subsoil thickness ranges from 10 to 30 inches. Subsoil layers have moderate to rapid permeability rates.

Modal Site Location: SE¼, SE¼, Section 25, T.35S., R.12W.

GEOLOGY: Bedrock consists of moderately hard rhythmically bedded sandstones and siltstones of the Umpqua Formation, and moderately hard siltstones of the Days Creek member of the Umpqua Formation.

42



LANDTYPE UNIT: Landtype 42 is found on gentle ridgetops to moderately steep sideslope positions on the west side of the Klamath Mountains. Common inclusions in this unit are Landtypes 19, 41, and 46.

CLIMATE: Precipitation: 80 to 130 inches/year. 203 to 330 cm/year.
Soil Temperature Class: Mesic.

TOPOGRAPHY: Slope: 5 to 45 percent, slight to moderate dissections.
Aspect: All aspects.
Elevation: 800 to 3,500 feet. 243 to 1,067 meters.
Stability: Landtype 42 is moderately stable to moderately unstable. Stability Class II and III.

VEGETATION: This unit supports Site Class III and some Site II Douglas-fir. Other species include: Western hemlock, Port-Orford-cedar, western redcedar, western white pine, tanoak, madrone, chinkapin, red alder, rhododendron, Oregon grape, oceanspray, salal, vanillaleaf, forbs, mosses, and grasses.

SOIL: Soil 42 is mostly a deep soil derived from residuum and colluvium. Soil depth is generally 40 to 60 inches with minor inclusions of shallower soil. The soil materials are generally well drained. Surface soil erosion potential is moderate. Erosion Class III.

Litter: Needles, leaves, and twigs, a trace to 1 1/2 inch thick. Decomposed humus material, a trace to 1/2 inch thick.

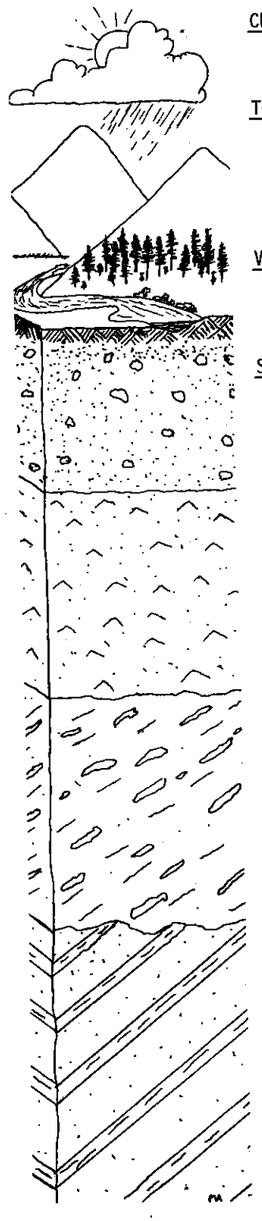
Surface Layers: Surface layers are gravelly sandy loams and loams. Colors are dark grayish brown to dark yellowish brown. Structure is weak and moderate fine granular to subangular blocky. Rock fragments range from 5 to 35 percent by volume. Consistence is soft to slightly hard, friable to firm, slightly sticky, and non plastic to slightly plastic. The pH ranges from 6.0 to 6.7. Surface thickness ranges from 7 to 20 inches. Surface layers have moderate permeability rates.

Subsoil Layers: Subsoil layers are silt loams to gravelly clay loams. Colors are brown and yellowish brown. Structure is moderate fine and medium subangular blocky to massive. Rock fragments range from 5 to 35 percent by volume. Consistence is slightly hard to hard, firm, slightly sticky to sticky, and slightly plastic. The pH ranges from 5.8 to 6.8. Subsoil thickness ranges from 20 to 45 inches. Subsoil layers have moderate permeability rates.

Modal Site Location: NW¼, SE¼, Section 13, T.35S., R.11W.

GEOLOGY: Bedrock consists of moderately hard to soft rhythmically bedded sandstones and siltstones of the Umpqua Formation and siltstones of the Days Creek member of the Umpqua Formation.

43



LANDTYPE UNIT: Landtype 43 is found on moderately steep to steep sideslopes on the west side of the Klamath Mountains. Common inclusions in this unit are Landtypes 19, 41, and 42.

CLIMATE: Precipitation: 90 to 120 inches/year. 229 to 304 cm/year.
Soil Temperature Class: Mesic.

TOPOGRAPHY: Slope: 40 to 90 percent, moderate to highly dissected slopes.
Aspect: Generally south, southwest, southeast, and west.
Elevation: 1,000 to 3,500 feet. 305 to 1,067 meters.
Stability: Landtype 43 is moderately stable. Stability Class II.

VEGETATION: This unit supports Site Class IV and V Douglas-fir. Other species include: Madrone, tanoak, canyon live oak, knobcone pine, chinkapin, Oregon grape, oceanspray, greenleaf manzanita, bracken fern, and fescue.

SOIL: Soil 43 is a shallow soil derived from residuum and colluvium. Soil depth is generally between 10 and 20 inches. The soil materials are generally well to excessively drained. Surface soil erosion potential is severe to very severe. Erosion Class IV and V.

Litter: Needles, leaves, and twigs, a trace to 1/2 inch thick.

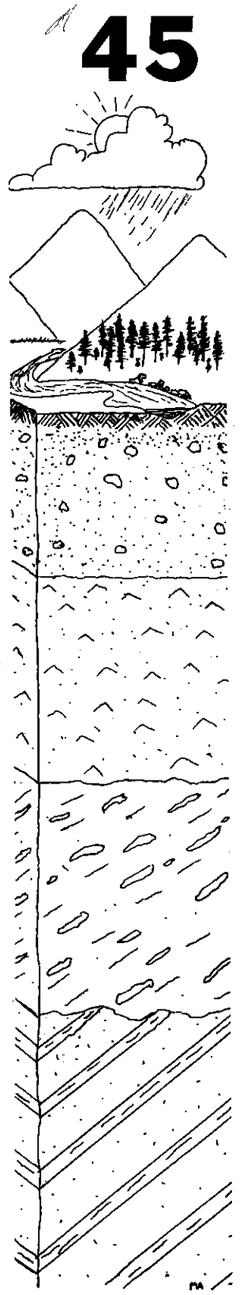
Surface Layers: Surface layers are gravelly to very gravelly sandy loams and loams. Colors are dark brown and dark yellowish brown. Structure is weak medium granular to subangular blocky. Rock fragments range from 15 to 50 percent by volume. Consistence is soft, very friable to friable, non sticky, and slightly plastic. The pH ranges from 6.4 to 7.2. Surface thickness ranges from 3 to 10 inches. Surface layers have rapid permeability.

Subsoil Layers: Subsoil layers are gravelly to very gravelly sandy loams to silt loams. Colors are yellowish brown to brown. Structure is weak to moderate fine to medium subangular blocky. Rock fragments range from 10 to 50 percent by volume. Consistence is slightly hard, friable to firm, non sticky to slightly sticky, and slightly plastic. The pH ranges from 6.4 to 6.9. Subsoil thickness ranges from 7 to 15 inches. Subsoil layers have moderate to rapid permeability rates.

Modal Site Location: NW¼, NW¼, Section 36, T.35S., R.12W.

GEOLOGY: Bedrock consists of moderately hard rhythmically bedded sandstones and siltstones of the Umpqua Formation, and moderately hard siltstone of the Days Creek member of the Umpqua Formation.

45



LANDTYPE UNIT: Landtype 45 is found on gentle to moderately steep ridgetop and sideslope positions. Common inclusions in this unit are Landtypes 8, 8c, 19, 41, 42, 61, 62, 176, and 177.

CLIMATE: Precipitation: 90 to 130 inches/year. 229 to 330 cm/year.
Soil Temperature Class: Mesic.

TOPOGRAPHY: Slope: 10 to 50 percent, slight to moderate dissections.
Aspect: All aspects.
Elevation: 800 to 3,500 feet. 243 to 1,067 meters.
Stability: Landtype 45 is moderately unstable. Stability Class III.

VEGETATION: This unit supports Site Class II and III Douglas-fir. Other species include: Western hemlock, western redcedar, Port-Orford-cedar, red alder, tanoak, madrone, rhododendron, salal, evergreen huckleberry, sword fern, lady fern, vanillaleaf, twin flower, twisted stalk, oxalis, grasses, and mosses.

SOIL: Soil 45 is a very deep soil derived from colluvium. Soil depth is generally greater than 60 inches with minor inclusions of more shallow soil near the ridgetops. The soil materials are generally somewhat poorly to moderately well drained. Surface soil erosion potential is slight to moderate. Erosion Class II and III.

Litter: Needles, leaves, and twigs, a trace to 3 inches thick. Decomposed humus material, 1/2 to 1 1/2 inches thick.

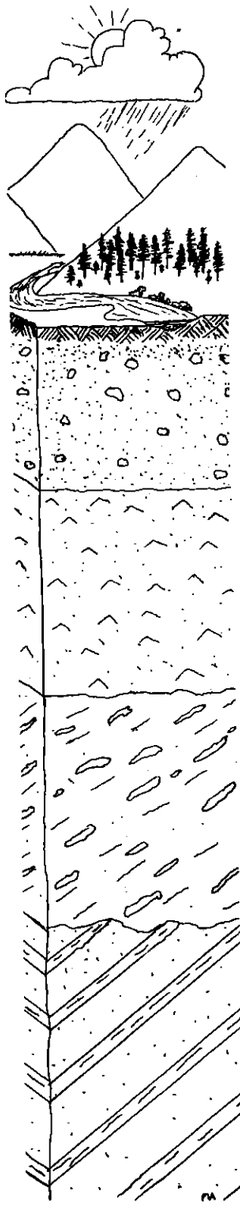
Surface Layers: Surface layers are loams and gravelly silt loams. Colors are very dark grayish brown, dark brown, and brown. Structure is weak to moderate, fine and medium granular to subangular blocky. Rock fragments range from 5 to 30 percent by volume. Consistence is soft, very friable to friable, non sticky to slightly sticky, and non plastic to slightly plastic. The pH ranges from 6.0 to 6.8. Surface thickness ranges from 12 to 20 inches. Surface layers have moderate permeability rates.

Subsoil Layers: Subsoil layers are loams, clay loams and silty clay loams. Colors are brown and strong brown. Structure is moderate medium and fine subangular blocky. Rock fragments range from 3 to 15 percent by volume. Consistence is slightly hard to hard, friable to firm, slightly sticky to sticky, and slightly plastic to plastic. The pH ranges from 5.7 to 6.5. Subsoil thickness ranges from 30 to 50 inches. Subsoil layers have moderate permeability rates.

Modal Site Location: NE¼, SW¼, Section 11, T.32S., R.12W.

GEOLOGY: Bedrock consists of highly fractured soft to moderately hard sedimentary and metasedimentary rocks north of the Rogue River on the west side of the Klamath Mountains.

46



LANDTYPE UNIT: Landtype 46 is found on moderately steep to very steep sideslope positions on the west side of the Klamath Mountains. Common inclusions in this unit are Landtypes 19, 41, 43, 48, and 176.

CLIMATE: Precipitation: 100 to 130 inches/year. 254 to 329 cm/year.
Soil Temperature Class: Mesic.

TOPOGRAPHY: Slope: 40 to 90 percent, slightly to moderately dissected slopes.
Aspect: Generally north, northwest, northeast, and east.
Elevation: 500 to 3,500 feet. 152 to 1,067 meters.
Stability: Landtype 46 is moderately stable to moderately unstable. Stability Class II and III.

VEGETATION: This unit supports Site Class IV Douglas-fir. Other species include: Western white pine, sugar pine, Port-Orford-cedar, western hemlock, madrone, tanoak, chinkapin, red alder, ceanothus, serviceberry, trailing blackberry, assorted forbs, grasses, and mosses.

SOIL: Soil 46 is a moderately deep soil derived from colluvium and residuum. Soil depth is generally 20 to 40 inches. The soil materials are generally excessively drained. Surface soil erosion potential is severe to very severe. Erosion Class IV and V.

Litter: Needles, leaves, and twigs, a trace to 3/4 inch thick.

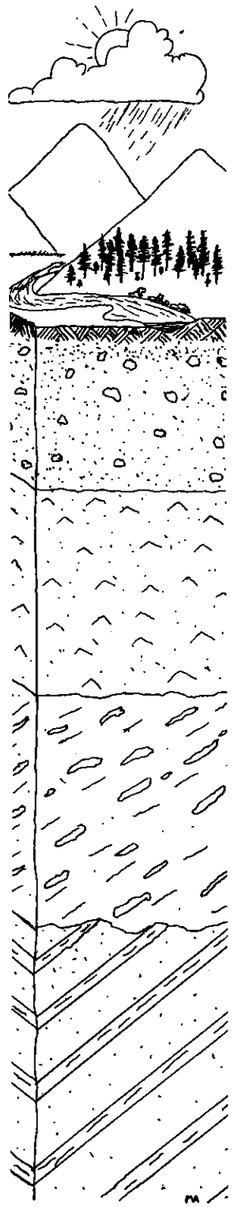
Surface Layers: Surface layers are gravelly to very gravelly sandy loams and loams. Colors are dark brown and dark grayish brown. Structure is weak fine granular to subangular blocky. Rock fragments range from 20 to 55 percent by volume. Consistence is soft to slightly hard, very friable to friable, non sticky, and non plastic. The pH ranges from 6.0 to 6.9. Surface thickness ranges from 6 to 16 inches. Surface layers have rapid permeability.

Subsoil Layers: Subsoil layers are very to extremely gravelly sand loams and loams. Colors are brown to strong brown. Structure is weak to moderate, very fine and fine subangular blocky. Rock fragments range from 40 to 80 percent by volume. Consistence is soft to hard, friable to firm, slightly sticky, and non plastic to slightly plastic. The pH ranges from 6.0 to 6.7. Subsoil thickness ranges from 10 to 30 inches. Subsoil layers have rapid permeability rates.

Modal Site Location: NW¼, NE¼, Section 33, T.32S., R.13W.

GEOLOGY: Bedrock consists of moderately hard to hard massive conglomerate with thin interbeds of poorly sorted sandstone.

48



LANDTYPE UNIT: Landtype 48 is found on moderately steep to very steep sideslopes. Common inclusions in this unit are Landtypes 19, 43, 46, and 178.

CLIMATE: Precipitation: 100 to 130 inches/year. 254 to 329 cm/year.
Soil Temperature Class: Mesic.

TOPOGRAPHY: Slope: 40 to 90 percent plus, slightly to moderately dissected slopes.
Aspect: Generally south, southeast, southwest, and west.
Elevation: 500 to 3,500 feet. 152 to 1,067 meters.
Stability: Landtype 46 is moderately stable to moderately unstable. Stability Class II and III.

VEGETATION: This unit supports Site Class V Douglas-fir. Other species include: Western white pine, canyon live oak, Port-Orford-cedar, western hemlock, sugar pine, tanoak, madrone, chinkapin, poison oak, red alder, ceanothus, serviceberry, assorted forbs, grasses, and mosses.

SOIL: Soil 48 is a moderately deep soil derived from residuum and colluvium. Soil depth is generally 20 to 40 inches deep but may be greater than 40 inches deep locally. The soil materials are generally excessively drained. Surface soil erosion potential is very severe to severe. Erosion Class Vand IV.

Litter: Needles, leaves, and twigs, a trace to 1/2 inch thick.

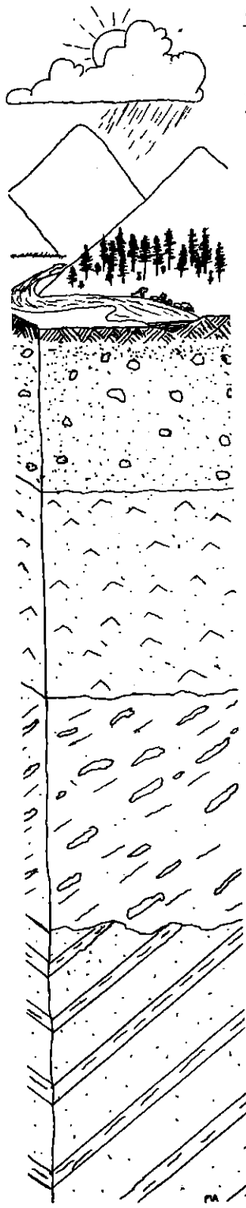
Surface Layers: Surface layers are gravelly to very gravelly sandy loams and loams. Colors are dark brown and dark grayish brown. Structure is weak fine and medium granular to subangular blocky. Rock fragments range from 25 to 55 percent by volume. Consistence is soft to slightly hard, very friable to friable, non sticky, and non plastic. The pH ranges from 5.8 to 6.8. Surface thickness ranges from 4 to 12 inches. Surface layers have rapid permeability.

Subsoil Layers: Subsoil layers are very to extremely gravelly sandy loams and loams. Colors are brown to strong brown. Structure is weak to moderate very fine subangular blocky. Rock fragments range from 35 to 80 percent by volume. Consistence is soft to hard, friable to firm, non sticky to slightly sticky, and non plastic to slightly plastic. The pH ranges from 5.5 to 6.5. Subsoil thickness ranges from 10 to 25 inches. Subsoil layers have rapid permeability rates.

Modal Site Location: NW¼, NE¼, Section 35, T.35S., R.12W.

GEOLOGY: Bedrock consists of moderately hard to hard massive conglomerate with thin interbeds of poorly sorted sandstone.

50



LANDTYPE UNIT: Landtype 50 is found on moderately steep to steep terrain on the west side of the Klamath Mountains. Common inclusions in this unit are Landtypes 19, 51, 53.

CLIMATE:

Precipitation: 110 to 150 inches/year. 279 to 381 cm/year.
Soil Temperature Class: Mesic, frigid on Landtype 50u.

TOPOGRAPHY:

Slope: 40 to 90 percent, moderate to highly dissected slopes.
Aspect: All aspects.
Elevation: 2,000 to 4,000 feet. 610 to 1,220 meters.
Stability: Landtype 50 is moderately stable. Stability Class II.

VEGETATION: This unit supports Site Class IV Douglas-fir. Other species include: Western white pine, sugar pine, tanoak, madrone, chinkapin, canyon live oak, ceanothus, serviceberry, trailing blackberry, bracken fern, grasses, and mosses.

SOIL:

Soil 50 is a shallow soil derived from residuum and colluvium. Soil depth is 10 to 20 inches. The soil materials are generally well to excessively drained. Surface soil erosion potential is severe. Erosion Class IV.

Litter: Needles, leaves, and twigs, a trace to 1 inch thick. Decomposed humus materials, a trace to 1 inch thick.

Surface Layers: Surface layers are very gravelly to extremely gravelly loams. Colors are dark brown to brown. Structure is weak to moderate fine granular. Rock fragments range from 40 to 75 percent by volume. Consistence is soft, friable, non sticky to slightly sticky, and non plastic to slightly plastic. The pH ranges from 6.0 to 7.0. Surface thickness ranges from 3 to 8 inches. Surface layers have moderately rapid to very rapid permeability rates.

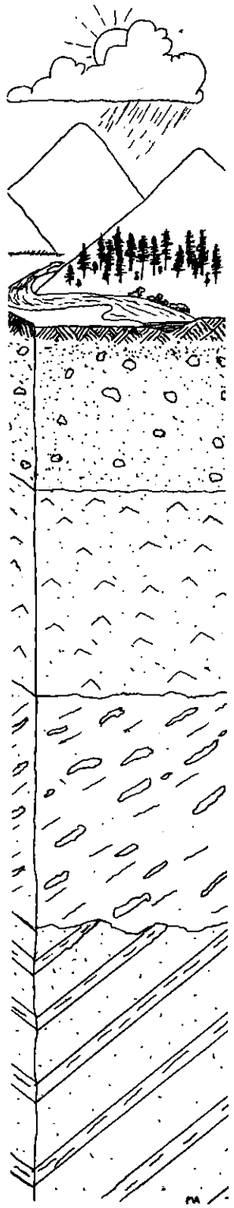
Subsoil Layers: Subsoil layers are very gravelly loams to extremely gravelly loams. Colors are dark brown to brown. Structure is weak fine subangular blocky. Rock fragments range from 40 to 75 percent by volume. Consistence is soft, friable, slightly sticky, and slightly plastic. The pH ranges from 5.5 to 6.5. Subsoil thickness ranges from 12 to 17 inches. Subsoil layers have moderately rapid to rapid permeability rates.

Modal Site Location: SE¼, SE¼, Section 35, T.36S., R.13W.

GEOLOGY: Bedrock consists of hard, highly fractured volcanics of the Dothan and Colebrooke Formations.

Landtype 50u is similar to Landtype 50 except that it is found in the upper forest zone, generally ranging from 4,000 to 5,500 feet in elevation, and supports Site Class III and IV Shasta red fir and white fir.

51



LANDTYPE UNIT: Landtype 51 is found on moderately steep to steep terrain on the west side of the Klamath Mountains. Common inclusions in this unit are Landtypes 19, 50, 52, and 53.

CLIMATE:

Precipitation: 110 to 150 inches/year. 279 to 381 cm/year.
Soil Temperature Class: Mesic, frigid on Landtype 51u.

TOPOGRAPHY:

Slope: 40 to 90 percent, moderate to highly dissected slopes.
Aspect: Generally north, northwest, northeast, and east.
Elevation: 500 to 4,000 feet. 152 to 1,220 meters.
Stability: Landtype 51 is moderately stable to moderately unstable. Stability Class II and III.

VEGETATION: This unit supports Site Class III and IV Douglas-fir. Other species include: Western white pine, western hemlock, sugar pine, redwood, tanoak, madrone, chinkapin, red alder, rhododendron, greenleaf mazanita, salal, ceanothus, serviceberry, blackcap raspberry, bracken fern, bear grass, grasses, and mosses.

SOIL:

Soil 51 is a moderately deep soil derived from residuum and colluvium. Soil depth is generally 20 to 40 inches. The soil materials are generally well drained. Surface soil erosion potential is severe. Erosion Class IV.

Litter: Needles, leaves, and twigs, a trace to 1 inch thick. Decomposed humus materials, a trace to 1/2 inch thick.

Surface Layers: Surface layers are sandy loams to very gravelly loams. Colors are very dark brown to dark yellowish brown. Structure is weak fine granular to moderate medium subangular blocky. Rock fragments range from 15 to 55 percent by volume. Consistence is soft to slightly hard, very friable to friable, non sticky to slightly sticky, and non plastic to slightly plastic. The pH ranges from 5.5 to 7.0. Surface thickness ranges from 4 to 14 inches. Surface layers have moderate to rapid permeability rates.

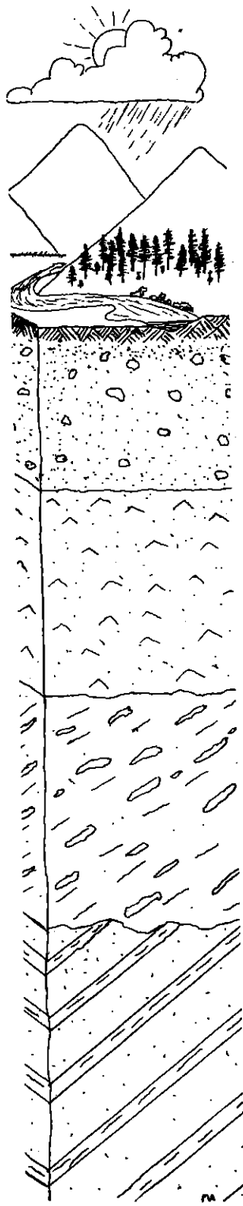
Subsoil Layers: Subsoil layers are extremely gravelly loams to light clay loams. Colors are yellowish brown to olive brown. Structure is weak very fine subangular blocky to moderate fine subangular blocky. Rock fragments range from 20 to 80 percent by volume. Consistence is soft to hard, very friable to very firm, non sticky to sticky, and non plastic to slightly plastic. The pH ranges from 5.5 to 6.5. Subsoil thickness ranges from 10 to 25 inches. Subsoil layers have moderate to rapid permeability rates.

Modal Site Location: NW¼, NE¼, Section 24, T.38S., R.13W.

GEOLOGY: Bedrock consists of moderately hard, highly fractured sandstones and siltstones of the Dothan Formation.

Landtype 51u is similar to Landtype 51 except that it is found in the upper forest zone, generally ranging from 4,000 to 5,500 feet elevation, and supports Site Class III Shasta red fir and white fir.

52



LANDTYPE UNIT: Landtype 52 is found on gentle to moderately steep terrain on the west side of the Klamath Mountains. Common inclusions in this unit are Landtypes 19, 51, and 54.

CLIMATE:

Precipitation: 110 to 150 inches/year. 279 to 381 cm/year.
Soil Temperature Class: Mesic, frigid on Landtype 52u.

TOPOGRAPHY:

Slope: 10 to 40 percent, smooth to moderately dissected slopes.
Aspect: Generally north, northwest, northeast, and east.
Elevation: 500 to 4,000 feet. 152 to 1,220 meters.
Stability: Landtype 52 is moderately unstable to moderately stable. Stability Class III and II.

VEGETATION: This unit supports Site Class II and III Douglas-fir. Other species include: Western white pine, sugar pine, redwood, Port-Orford-cedar, western hemlock, tanoak, madrone, chinkapin, red alder, ceanothus, serviceberry, salal, Sadlers oak, greenleaf manzanita, bracken fern, grasses, and mosses.

SOIL:

Soil 52 is a deep to moderately deep soil, derived from residuum and colluvium. Soil depth is generally 40 to 60 inches, but may range to 20 to 40 inches. The soil materials are generally well drained. Surface soil erosion potential is moderate. Erosion Class III.

Litter: Needles, leaves, and twigs, a trace to 1 1/2 inch thick. Decomposed humus materials, a trace to 1 inch thick.

Surface Layers: Surface layers are loams to extremely gravelly loams. Colors are very dark brown to brown. Structure is weak fine granular to moderate medium subangular blocky. Rock fragments range from 5 to 55 percent by volume. Consistence is soft to slightly hard, very friable to friable, non sticky to slightly sticky, and non plastic to slightly plastic. The pH ranges from 5.5 to 7.0. Surface thickness ranges from 8 to 20 inches. Surface layers have moderately rapid to rapid permeability.

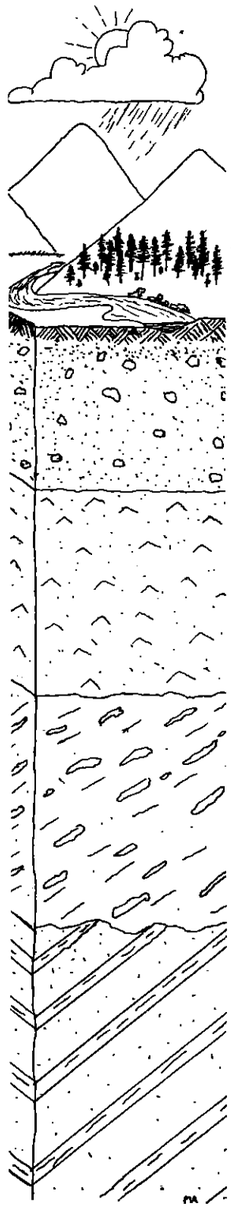
Subsoil Layers: Subsoil layers are extremely gravelly sandy loams to clay loams. Colors are dark brown to yellowish brown. Structure is weak fine granular to moderate medium subangular blocky. Rock fragments range from 30 to 90 percent by volume. Consistence is slightly hard to hard, friable to firm, slightly sticky, and slightly plastic to plastic. The pH ranges from 5.5 to 6.5. Subsoil thickness ranges from 10 to 40 inches. Subsoil layers have moderate to very rapid permeability rates.

Modal Site Location: NW¼, SE¼, Section 28, T.38S., R.13W.

GEOLOGY: Bedrock consists of soft to moderately hard siltstone, mudstone, and sandstone of the Dothan Formation.

Landtype 52u is similar to Landtype 52 except that it is found in the upper forest zone, at elevations of 4,000 to 5,500 feet, and supports Site Class II and III Shasta red fir and white fir.

53



LANDTYPE UNIT: Landtype 53 is found on moderately steep to steep terrain on the west side of the Klamath Mountains. Common inclusions in this unit are Landtypes 19, 50, 51, and 54.

CLIMATE:

Precipitation: 110 to 150 inches/year. 279 to 381 cm/year.
Soil Temperature Class: Mesic, frigid on Landtype 53u.

TOPOGRAPHY:

Slope: 40 to 90 percent, moderately to highly dissected.
Aspect: Generally south, southeast, southwest, and west.
Elevation: 2,000 to 4,000 feet. 610 to 1,220 meters.
Stability: Landtype 53 is moderately stable. Stability Class II.

VEGETATION: This unit supports Site Class IV and V Douglas-fir. Other species include: Incense-cedar, knobcone pine, western white pine, sugar pine, tanoak, madrone, ceanothus, serviceberry, manzanita, forbs, grasses, and mosses.

SOIL:

Soil 53 is a shallow soil derived from residuum and colluvium. Soil depth is generally 10 to 20 inches. The soil materials are generally well drained. Surface soil erosion potential is severe. Erosion Class IV.

Litter: Needles, leaves, and twigs, a trace to 1/2 inch thick.

Surface Layers: Surface layers are sandy loams to extremely gravelly loams. Colors are very dark grayish brown to dark yellowish brown. Structure is weak, fine granular to moderate, medium granular. Rock fragments range from 15 to 55 percent by volume. Consistence is soft to slightly hard, very friable to friable, non sticky to slightly sticky, and non plastic to slightly plastic. The pH ranges from 5.5 to 6.5. Surface thickness ranges from 3 to 9 inches. Surface layers have rapid permeability rates.

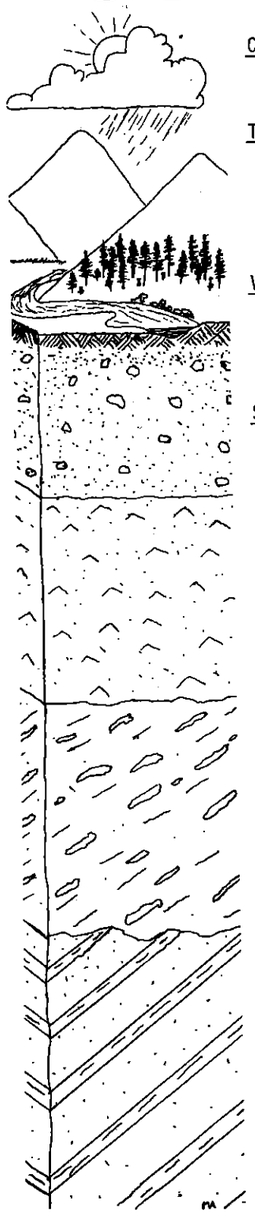
Subsoil Layers: Subsoil layers are sandy loams to extremely gravelly loam. Colors are dark brown to brown. Structure is weak fine and medium subangular blocky to moderate fine and medium subangular blocky. Rock fragments range from 20 to 80 percent by volume. Consistence is slightly hard to hard, friable to firm, non sticky, and non plastic. The pH ranges from 5.5 to 6.5. Subsoil thickness ranges from 10 to 15 inches. Subsoil layers have moderately rapid to very rapid permeability rates.

Modal Site Location: SE¼, SW¼, Section 8, T.39S., R.11W.

GEOLOGY: Bedrock consists of moderately hard, highly fractured sandstone and siltstones of the Dothan Formation.

Landtype 53u is similar to Landtype 53 except that it is found in the upper forest zone, generally ranging from 4,000 to 5,500 feet elevation, and supports Site Class III and IV Shasta red fir and white fir.

54



LANDTYPE UNIT: Landtype 54 is found on gentle to moderately steep terrain on the west side of the Klamath Mountains. Common inclusions in this unit are Landtypes 19, 52, and 53.

CLIMATE: Precipitation: 110 to 150 inches/year. 279 to 381 cm/year.
Soil Temperature Class: Mesic, frigid on Landtype 54u.

TOPOGRAPHY: Slope: 10 to 40 percent, smooth to moderately dissected slopes.
Aspect: South, southeast, southwest, and west.
Elevation: 2,000 to 4,000 feet. 610 to 1,220 meters.
Stability: Landtype 54 is moderately stable to moderately unstable. Stability Class II and III.

VEGETATION: This unit supports Site Class IV Douglas-fir. Other species include: Western white pine, sugar pine, knobcone pine, incense-cedar, tanoak, madrone, chinkapin, ceanothus, serviceberry, manzanita, bracken fern, grasses, and mosses.

SOIL: Soil 54 is a moderately deep, locally deep soil, from residuum and colluvium. Soil depth is generally 20 to 40 inches, but locally it may range deeper than 40 inches. The soil materials are generally well drained. Surface soil erosion potential is moderate. Erosion Class III.

Litter: Needles, leaves, and twigs, a trace to 1/2 inch thick.

Surface Layers: Surface layers are sandy loams to extremely gravelly loams. Colors are dark brown to dark yellowish brown. Structure is weak, fine granular to weak, medium subangular blocky. Rock fragments range from 15 to 55 percent by volume. Consistence is soft to slightly hard, friable to firm, non sticky, and non plastic. The pH ranges from 5.5 to 6.5. Surface thickness ranges from 5 to 15 inches. Surface layers have moderately rapid to rapid permeability rates.

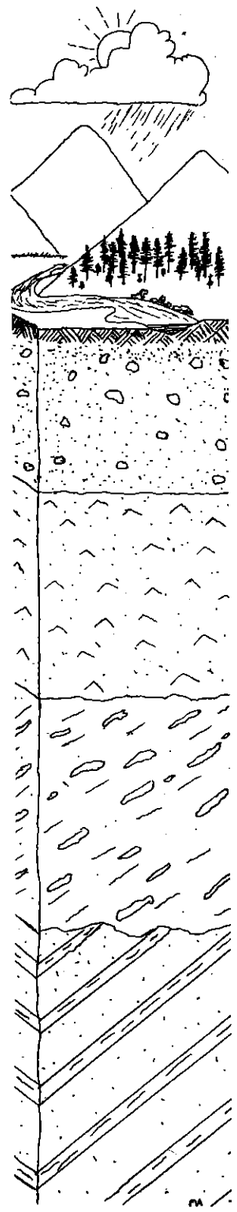
Subsoil Layers: Subsoil layers are loams to extremely gravelly sandy loams. Colors are dark yellowish brown to brown. Structure is weak, medium subangular blocky to moderate, medium subangular blocky. Rock fragments range from 20 to 80 percent by volume. Consistence is slightly hard to hard, friable to firm, non sticky to slightly sticky, and non plastic. The pH ranges from 5.5 to 6.5. Subsoil thickness ranges from 15 to 30 inches. Subsoil layers have moderately rapid to very rapid permeability rates.

Modal Site Location: NE¼, NW¼, Section 17, T.39S., R.11W.

GEOLOGY: Bedrock consists of moderately hard to soft siltstones and sandstones of the Dothan Formation.

Landtype 54u is similar to Landtype 54 except that it is found in the upper forest zone, between 4,000 and 5,500 feet elevation, and supports Site Class III Shasta red fir and white fir.

55



LANDTYPE UNIT: Landtype 55 is found on moderately steep terrain on the west side of the Klamath Mountains. Common inclusions in this unit are Landtypes 8, 17, 19, and 52.

CLIMATE: Precipitation: 110 to 150 inches/year. 279 to 381 cm/year.
Soil Temperature Class: Mesic, frigid on Landtype 55u.

TOPOGRAPHY: Slope: 35 to 70 percent, shallow entrenched, moderate to highly dissected slopes.
Aspect: All aspects.
Elevation: 1,000 to 4,000 feet. 305 to 1,220 meters.
Stability: Landtype 55 is moderately unstable (locally unstable along drainages). Stability Class III, (locally IV).

VEGETATION: This unit supports Site Class III and II Douglas-fir. Other species include: Western hemlock, Port-Orford-cedar, tanoak, red alder, madrone, salal, rhododendron, evergreen huckleberry, Oregon grape, equisetum, ferns, grasses, and mosses.

SOIL: Soil 55 is a very deep to deep soil derived from colluvium and local residuum. Soil depth is generally greater than 60 inches deep, but may be as shallow as 40 to 60 inches. The soil materials are generally moderately drained. Surface soil erosion potential is moderate. Erosion Class III.

Litter: Needles, leaves, and twigs, a trace to 1/2 inch thick. Decomposed humus materials, 1/4 to 1/2 inch thick.

Surface Layers: Surface layers are generally loams to clay loams. Colors are very dark grayish brown to brown. Structure is weak fine granular to strong medium granular. Rock fragments range from 15 to 25 percent by volume. Consistence is soft to hard, very friable to firm, non sticky to sticky, and slightly plastic. The pH ranges from 5.0 to 6.5. Surface thickness ranges from 2 to 18 inches. Surface layers have moderate to moderately rapid permeability rates.

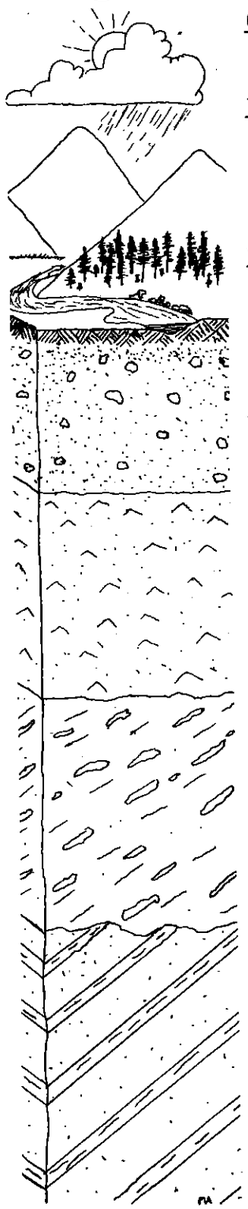
Subsoil Layers: Subsoil layers are clay to very cobbly loams. Colors are very dark brown to olive brown. Structure is weak fine subangular blocky to coarse subangular blocky. Rock fragments range from 15 to 90 percent by volume. Consistence is soft to very hard, friable to very firm, slightly sticky to sticky, and slightly plastic to plastic. The pH ranges from 5.0 to 6.0. Subsoil thickness ranges from 30 to 58 inches. Subsoil layers have slow to moderately rapid permeability rates.

Modal Site Location: SE¼, SE¼, Section 35, T.36S., R.13W.

GEOLOGY: Bedrock consists of soft to moderately hard siltstones, mudstones and sandstones of the Dothan Formation.

Landtype 55u is similar to Landtype 55 except that it is found in the upper forest zone, generally at 4,000 to 5,500 feet elevation, and supports Site Class II Shasta red fir and white fir.

61



LANDTYPE UNIT: Landtype 61 is found on moderately steep to steep terrain on the west side of the Klamath Mountains. Common inclusions in this unit are Landtypes 17, 19, and 62.

CLIMATE: Precipitation: 110 to 130 inches/year. 279 to 330 cm/year.
Soil Temperature Class: Mesic.

TOPOGRAPHY: Slope: 40 to 90 percent, moderate to highly dissected slopes.
Aspect: All aspects.
Elevation: 500 to 3,500 feet. 152 to 1,064 meters.
Stability: Landtype 61 is moderately unstable. Stability Class III.

VEGETATION: This unit supports Site Class III and II Douglas-fir. Other species include: Western hemlock, western white pine, western redcedar, Port-Orford-cedar, red alder, tanoak, madrone, chinkapin, rhododendron, Oregon grape, salal, evergreen huckleberry, bracken fern, twin-flower, sword fern, beargrass, grasses, sedges, and mosses.

SOIL: Soil 61 is generally a moderately deep soil derived from residuum and colluvium. Soil depth is generally 20 to 40 inches, but locally it may be less than 20 inches. The soil materials are generally well drained. Surface soil erosion potential is severe. Erosion Class IV.

Litter: Needles, leaves, and twigs, 1/4 to 3/4 inch thick. Decomposed humus materials a trace to 1/2 inch thick.

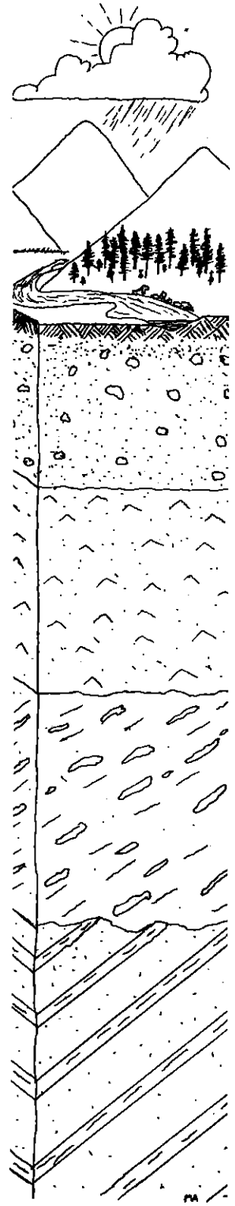
Surface Layers: Surface layers are loams to gravelly loams. Colors are dark brown to grayish brown. Structure is weak fine granular to strong medium granular. Rock fragments range from 10 to 30 percent by volume. Consistence is soft to slightly hard, very friable to friable, non sticky to slightly sticky, and non plastic to slightly plastic. The pH ranges from 5.5 to 6.5. Surface thickness ranges from 4 to 24 inches. Surface layers have moderate to moderately rapid permeability rates.

Subsoil Layers: Subsoil layers are very gravelly loams to silt loams. Colors are dark brown to grayish brown. Structure is weak fine subangular blocky to strong medium subangular blocky. Rock fragments range from 10 to 50 percent by volume. Consistence is soft to hard, very friable to firm, slightly sticky to sticky, and slightly plastic to plastic. The pH ranges from 6.0 to 7.0. Subsoil thickness ranges from 16 to 36 inches. Subsoil layers have moderate to moderately rapid permeability rates.

Modal Site Location: SE¼, SE¼, Section 24, T.36S., R.12W.

GEOLOGY: Bedrock consists of moderately hard highly sheared schists of the Colebrook Formation.

62



LANDTYPE UNIT: Landtype 62 is found on gentle to moderately steep terrain on the west side of the Klamath Mountains. Common inclusions in this unit are Landtypes 17, 19, and 61.

CLIMATE: Precipitation: 110 to 130 inches/year. 279 to 330 cm/year.
Soil Temperature Class: Mesic.

TOPOGRAPHY: Slope: 10 to 40 percent, smooth to moderately dissected, benchy sideslopes.
Aspect: All aspects.
Elevation: 500 to 3,500 feet. 152 to 1,064 meters.
Stability: Landtype 62 is moderately unstable to unstable. Stability Class III and IV.

VEGETATION: This unit supports Site Class II and III Douglas-fir. Other species include: Western hemlock, western white pine, western redcedar, Port-Orford-cedar, tanoak, madrone, chinkapin, salal, rhododendron, evergreen huckleberry, twin-flower, sword fern, lady fern, deer fern, bracken fern, beargrass, grasses, sedges, rushes, reeds, and mosses.

SOIL: Soil 62 is mostly from residuum and colluvium. Soil depth is 40 to 60 inches, but may range to 20 to 40 inches. The soil materials are generally moderately well drained. Surface soil erosion potential is moderate, locally severe. Erosion Class III and locally IV.

Litter: Needles, leaves, and twigs, 1/2 to 1 1/2 inches thick. Decomposed humus materials, a trace to 1/2 inch thick.

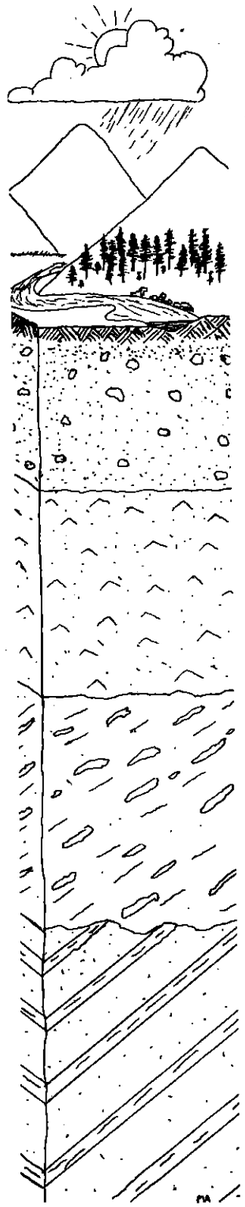
Surface Layers: Surface layers are loams to gravelly loams. Colors are very dark brown to brown. Structure is weak fine granular, moderate medium granular and strong fine granular. Rock fragments range from 3 to 20 percent by volume. Consistence is soft, very friable to friable, non sticky to slightly sticky, and non plastic to slightly plastic. The pH ranges from 5.0 to 6.0. Surface thickness ranges from 5 to 15 inches. Surface layers have moderate to rapid permeability.

Subsoil Layers: Subsoil layers are gravelly loams to extremely gravelly silty clay loams. Colors are dark yellowish brown to light olive brown. Structure is moderate medium and fine subangular blocky to massive. Rock fragments range from 35 to 80 percent by volume. Consistence is slightly hard to hard, friable to firm, slightly sticky to sticky, and slightly plastic to plastic. The pH ranges from 6.0 to 6.5. Subsoil thickness ranges from 25 to 55 inches. Subsoil layers have moderate to moderately rapid permeability rates.

Modal Site Location: SW¼, SW¼, Section 8, T.36S., R.12W.

GEOLOGY: Bedrock consists of soft highly sheared schists of the Colebrooke Formation.

66



LANDTYPE UNIT: Landtype 66 is found on moderately steep to very steep sideslopes positions on the east side of the Klamath Mountains. Common inclusions in this unit are Landtypes 18, 67, 68, 76, and 86.

CLIMATE: Precipitation: 50 to 90 inches/year. 127 to 229 cm/year.
Soil Temperature Class: Mesic.

TOPOGRAPHY: Slope: 50 to 90 percent, moderate, locally highly dissected slopes.
Aspect: All aspects.
Elevation: 2,000 to 4,000 feet. 610 to 1,220 meters.
Stability: Landtype 66 is moderately stable. Stability Class II.

VEGETATION: This unit supports Site Class IV and V Douglas-fir. Other species include: Sugar pine, incense-cedar, Pacific yew, white fir, western white pine, chinkapin, tanoak, madrone, manzanita, ceanothus, blue elderberry, wild gooseberry, wild rose, Oregon grape, trailing blackberry, forbs, grasses, and mosses.

SOIL: Soil 66 is mostly moderately deep, derived from residuum and colluvium. Soil depth is 20 to 40 inches, with inclusions less than 20 inches. The soil materials are generally excessively drained. Surface soil erosion potential is severe. Erosion Class IV.

Litter: Needles, leaves, and twigs, a trace to 1 inch thick.

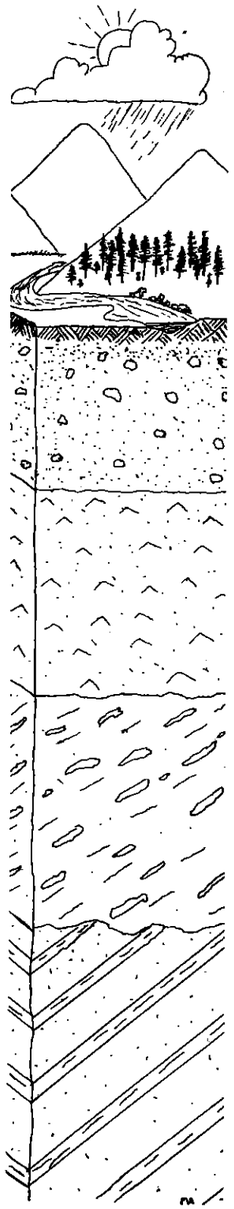
Surface Layers: Surface layers are non gravelly to very gravelly sandy loams and loams. Colors are dark brown, brown, and dark reddish brown. Structure is weak fine granular. Rock fragments range from 5 to 45 percent by volume. Consistence is soft to slightly hard, friable, slightly sticky, and non plastic to slightly plastic. The pH ranges from 5.8 to 6.6. Surface thickness ranges from 7 to 15 inches. Surface layers have rapid permeability rates.

Subsoil Layers: Subsoil layers are gravelly to extremely gravelly loams, silt loams, and clay loams. Colors are strong brown, reddish yellow, and yellowish red. Structure is weak to moderate fine and medium subangular blocky. Rock fragments range from 25 to 65 percent by volume. Consistence is hard, firm, sticky, and slightly plastic. The pH ranges from 5.8 to 6.8. Subsoil thickness ranges from 10 to 30 inches. Subsoil layers have moderate to rapid permeability rates.

Modal Site Location: SW¼, NW¼, Section 18, T.36S., R.8W.

GEOLOGY: Bedrock consists of moderately hard to hard moderately fractured amphibole gneiss.

67



LANDTYPE UNIT: Landtype 67 is on moderately steep sideslopes on the east side of the Klamath Mountains. Common inclusions in this unit are Landtypes 18, 66, 68, 77, and 87.

CLIMATE: Precipitation: 50 to 90 inches/year. 127 to 229 cm/year.
Soil Temperature Class: Mesic.

TOPOGRAPHY: Slope: 35 to 65 percent, slightly to moderately dissected slopes.
Elevation: 2,000 to 4,000 feet. 610 to 1,220 meters.
Stability: Landtype 67 is moderately stable to moderately unstable. Stability Class II and III.

VEGETATION: This unit supports Site Class III and IV Douglas-fir. Other species include: Sugar pine, western white pine, Pacific yew, incense-cedar, white fir, chinkapin, madrone, tanoak, manzanita, wild gooseberry, wild rose, Oregon grape, trailing blackberry, forbs, grasses, and mosses.

SOIL: Soil 67 is a deep soil derived from residuum and colluvium. Soil depth is generally 40 to 60 inches. The soil materials are generally well drained. Surface soil erosion potential is moderate. Erosion Class III.

Litter: Needles, leaves, and twigs, a trace to 1 inch thick. Decomposed humus material, a trace to 1/2 inch thick.

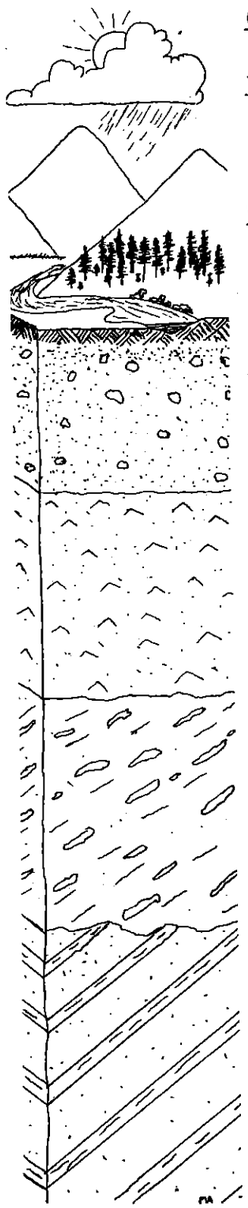
Surface Layers: Surface layers are gravelly loams. Colors are dark brown, brown, and reddish brown. Structure is moderate fine to coarse granular and subangular blocky. Rock fragments range from 10 to 35 percent by volume. Consistence is hard, firm, slightly sticky, and slightly plastic. The pH ranges from 6.5 to 7.7. Surface thickness ranges from 9 to 22 inches. Surface layers have moderate to rapid permeability rates.

Subsoil Layers: Subsoil layers are gravelly silt loams, loams, and clay loams. Colors are yellowish red, reddish brown, and red. Structure is moderate medium and coarse subangular blocky. Rock fragments range from 15 to 35 percent by volume. Consistence is hard, firm, slightly sticky to sticky, and slightly plastic to plastic. The pH ranges from 6.0 to 7.0. Subsoil thickness ranges from 25 to 45 inches. Subsoil layers have moderate permeability rates.

Modal Site Location: NW¼, NW¼, Section 16, T.34S., R.9W.

GEOLOGY: Bedrock consists of soft to moderately hard, highly fractured amphibole gneiss.

68



LANDTYPE UNIT: Landtype 68 is on gentle rolling terrain on the east side of the Klamath Mountains. Common inclusions in this unit are Landtypes 18, 67, 77, and 87.

CLIMATE: Precipitation: 50 to 90 inches/year. 127 to 229 cm/year.
Soil Temperature Class: Mesic.

TOPOGRAPHY: Slope: 2 to 35 percent, rolling slopes.
Aspect: All aspects.
Elevation: 2,000 to 4,000 feet. 610 to 1,220 meters.
Stability: Landtype 68 is moderately stable to moderately unstable. Stability Class II and III.

VEGETATION: This unit supports Site Class III Douglas-fir. Other species include: Port-Orford-cedar, western white pine, sugar pine, incense-cedar, Pacific yew, white fir, madrone, tanoak, chinkapin, manzanita, snowbrush ceanothus, whitethorn ceanothus, Oregon grape, blue elderberry, trailing blackberry, forbs, grasses, and mosses.

SOIL: Soil 68 is a very deep soil derived from residuum and colluvium. Soil depth is greater than 60 inches. The soil materials are generally moderately well drained. Surface soil erosion potential is slight to moderate. Erosion Class II and III.

Litter: Needles, leaves, and twigs, a trace to 1 1/2 inches thick. Decomposed humus material, a trace to 1 inch deep.

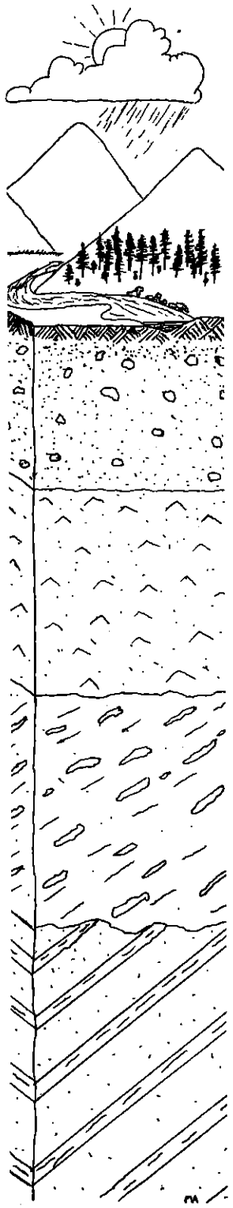
Surface Layers: Surface layers are gravelly to very gravelly sandy loams to silt loams. Colors are very dark grayish brown to reddish brown. Structure is moderate medium granular to subangular blocky. Rock fragments range from 10 to 50 percent by volume. Consistence is soft to slightly hard, friable to firm, non sticky to slightly sticky, and non plastic to slightly plastic. The pH ranges from 6.2 to 7.2. Surface thickness ranges from 8 to 20 inches thick. Surface layers have moderate to rapid permeability rates.

Subsoil Layers: Subsoil layers are gravelly loams silt loams, and clay loams. Colors are brown, yellowish red, and reddish brown. Structure is moderate to strong medium subangular blocky. Rock fragments range from 15 to 40 percent by volume. Consistence is slightly hard to hard, firm, slightly sticky to sticky, and slightly plastic to plastic. The pH ranges from 6.0 to 6.8. Subsoil thickness ranges from 25 to 50 inches thick. Subsoil layers have moderate permeability rates.

Modal Site Location: SW¼, NW¼, Section 8, T.34S., R.9W.

GEOLOGY: Bedrock consists of soft, massive, highly decomposed amphibole gneiss.

71



LANDTYPE UNIT: Landtype 71 is found on moderately steep to steep slopes in the Siskiyou Mountains. Common inclusions in this unit are Landtypes 18, 72, 76, 81, and 86.

CLIMATE: Precipitation: 50 to 80 inches/year. 127 to 203 cm/year.
Soil Temperature Class: Mesic.

TOPOGRAPHY: Slope: 40 to 90 percent, moderately to highly (locally extremely) dissected terrain.
Aspect: All aspects.
Elevation: 1,000 to 3,500 feet. 305 to 1,064 meters.
Stability: Landtype 71 is moderately stable. Stability Class II.

VEGETATION: This unit supports Site Class III and IV Douglas-fir. Other species include: Sugar pine, western white pine, incense-cedar, white fir, Pacific yew, ponderosa pine, tanoak, madrone, chinkapin, canyon live oak, California black oak, snowbrush ceanothus, serviceberry, vine maple, white leaf manzanita, whitethorn ceanothus, blueblossom ceanothus, poison oak, bracken fern, dogbane, fescue, and mosses.

SOIL: Soil 71 is generally moderately deep, and derived from residuum and colluvium. Soil depth is 20 to 40 inches, but locally ranges to less than 20 inches. The soil materials are generally well drained. Surface soil erosion potential is severe. Erosion Class IV.

Litter: Needles, leaves, and twigs, a trace to 1/2 inch thick. Moderately decomposed to decomposed humus materials, a trace to 1/2 inch thick.

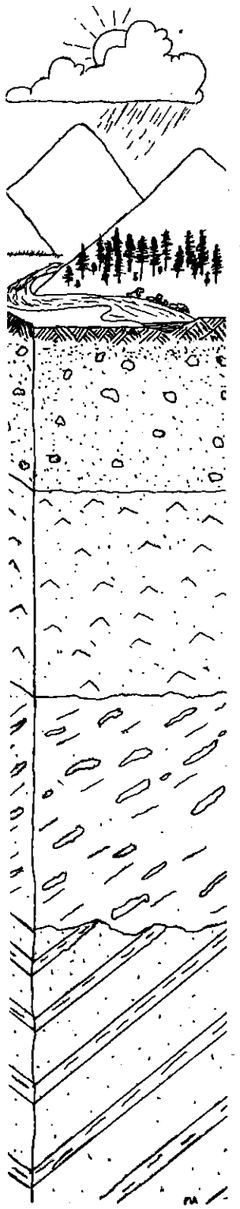
Surface Layers: Surface layers are loams to very gravelly loams. Colors are very dark grayish brown to yellowish brown. Structure is weak fine granular to moderate medium granular. Rock fragments range from 30 to 40 percent by volume. Consistence is soft, very friable to friable, non sticky to slightly sticky, and non plastic to slightly plastic. The pH ranges from 6.0 to 8.0. Surface thickness ranges from 3 to 12 inches. Surface layers have rapid to moderate permeability rates.

Subsoil Layers: Subsoil layers are gravelly loams to very gravelly silt loams. Colors are dark yellowish brown to reddish yellow. Structure is weak fine granular to moderate medium subangular blocky. Rock fragments range from 20 to 50 percent by volume. Consistence is slightly hard to hard, firm, slightly sticky to sticky, and non plastic to slightly plastic. The pH ranges from 5.5 to 7.0. Subsoil thickness ranges from 4 to 14 inches thick. Subsoil layers have moderate to rapid permeability rates.

Modal Site Location: NE¼ SW¼, Section 14, T.37S., R.8W.

GEOLOGY: Bedrock consists of moderately hard, highly fractured siltstones, mudstones, and local metasedimentary rocks, with interspersed stringers of metavolcanic rock.

72



LANDTYPE UNIT: Landtype 72 is found on gentle to moderately steep terrain in the Siskiyou Mountains. Common inclusions in this unit are Landtypes 4, 18, 71, 77, and 82.

CLIMATE: Precipitation: 50 to 80 inches/year. 127 to 203 cm/year.
Soil Temperature Class: Mesic.

TOPOGRAPHY: Slope: 10 to 40 percent, smooth to moderately dissected terrain.
Aspect: All aspects.
Elevation: 1,000 to 3,500 feet. 305 to 1,064 meters.
Stability: Landtype 72 is moderately stable to moderately unstable. Stability Class II and III.

VEGETATION: This unit supports Site Class III and locally IV Douglas-fir. Other species include: Sugar pine, ponderosa pine, incense-cedar, white fir, tanoak, madrone, California black oak, chinkapin, Sadler oak, Oregon grape, Salal, snowbrush ceanothus, trailing blackberry, snowberry, wild rose, greenleaf manzanita, thimbleberry, poison oak, whiteleaf manzanita, serviceberry, princess pine, wild iris, dogbane, bracken fern, vetch, fescue, and mosses.

SOIL: Soil 72 is a deep to moderately deep soil, derived from residuum and colluvium. Soil depth is generally 40 to 60 inches, but may range to 20 to 40 inches deep. The soil materials are generally well to moderately well drained. Surface soil erosion potential is moderate. Erosion Class III.

Litter: Needles, leaves, and twigs, a trace to 2 inches thick. Decomposed humus, a trace to 1/2 inch thick.

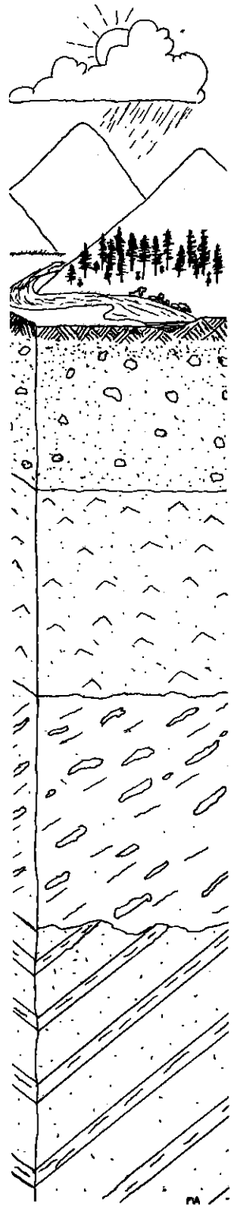
Surface Layers: Surface layers are loams, very gravelly silt loams, very gravelly loams and extremely gravelly sandy loams. Colors are very dark brown to dark yellowish brown. Structure is weak very fine and fine granular to moderate fine and medium granular and moderate fine and medium subangular blocky. Rock fragments range from 3 to 60 percent by volume. Consistence is soft to slightly hard, very friable to firm, non sticky to slightly sticky, and non plastic to slightly plastic. The pH ranges from 5.0 to 6.5. Surface thickness ranges from 3 to 23 inches. Surface layers have rapid to moderate permeability rates.

Subsoil Layers: Subsoil layers are very gravelly sandy loam to clay loam. Colors are dark brown to yellowish red. Structure is weak fine and medium subangular blocky to strong medium subangular blocky to massive. Rock fragments range from 5 to 50 percent by volume. Consistence is soft to hard, very friable to firm, slightly sticky to very sticky, slightly plastic to very plastic. The pH ranges from 5.0 to 6.8. Subsoil thickness ranges from 15 to 55 inches thick. Subsoil layers have moderately slow to moderately rapid permeability rates.

Modal Site Location: SW¼, SW¼, Section 30, T.37S., R.7W.

GEOLOGY: Bedrock consists of soft to moderately hard siltstones, mudstones, and local metasedimentary rocks, with interspersed stringers of metavolcanic rocks.

76



LANDTYPE UNIT: Landtype 76 is found on moderately steep to steep sideslopes on the east side of the Klamath Mountains. Common inclusions in this unit are Landtypes 18, 71, 77, and 86.

CLIMATE: Precipitation: 45 to 85 inches/year. 114 to 215 cm/year.
Soil Temperature Class: Mesic, frigid on Landtype 76u.

TOPOGRAPHY: Slope: 45 to 90 percent, moderately to locally highly dissected.terrain.
Aspect: All aspects.
Elevation: 1,000 to 4,000 feet. 304 to 1,216 meters.
Stability: Landtype 76 is moderately stable. Stability Class II.

VEGETATION: This unit supports Site Class IV and V Douglas-fir. Other species include: Ponderosa pine, sugar pine, incense-cedar, tanoak, madrone, chinkapin, snowbrush ceanothus, Oregon grape, whitethorn ceanothus, serviceberry, Sadler oak, snowberry, vine maple, manzanita, poison oak, wild iris, grasses, and mosses.

SOIL: Soil 76 is a shallow soil derived from residuum and colluvium. Soil depth is generally 10 to 20 inches, but may be deeper locally. The soil materials are generally excessively drained. Surface soil erosion potential is severe. Erosion Class IV.

Litter: Needles, leaves, and twigs, a trace to 3/4 inch deep.

Surface Layers: Surface layers are very gravelly loams and sandy loams. Colors are dark grayish brown to dark reddish brown. Structure is weak very fine to medium granular and subangular blocky. Rock fragments range from 40 to 60 percent by volume. Consistence is soft, very friable to friable, non sticky to slightly sticky and non plastic to slightly plastic. The pH ranges from 6.0 to 6.8. Surface thickness ranges from 4 to 10 inches. Surface layers have rapid permeability rates.

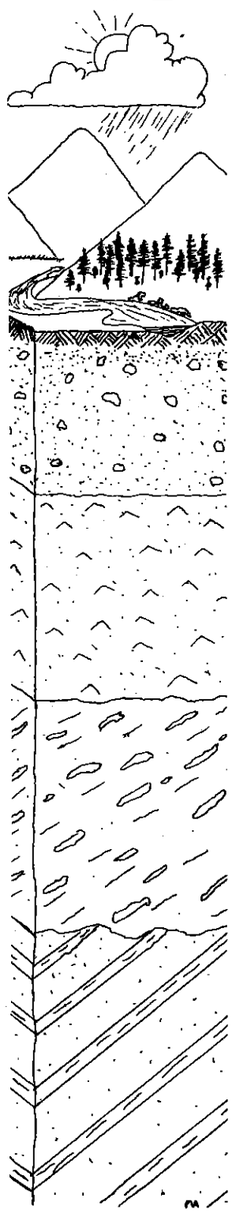
Subsoil Layers: Subsoil layers are usually very cobbly to extremely cobbly or gravelly sandy loams to clay loams. Colors are reddish brown to yellowish brown. Structure is weak to moderate, very fine and fine subangular blocky. Rock fragments range from 50 to 80 percent by volume. Consistence is soft to slightly hard, very friable to friable, slightly sticky, and non plastic to plastic. The pH ranges from 6.0 to 6.6. Subsoil thickness ranges from 6 to 16 inches. Subsoil layers have rapid permeability rates.

Modal Site Location: NE¼, NE¼, Section 2, T.38S., R.9W.

GEOLOGY: Bedrock consists of hard, highly to moderately fractured metasedimentary of the Galice Formation. Small inclusions of metavolcanic rock and pebbly conglomerate are interspersed locally. The hardest bedrock is usually found on steep slopes and adjacent to drainages.

Landtype 76u is similar to Landtype 76 except that it is found in the upper forest zone, generally 4,000 to 5,000 feet in elevation, and supports Site Class III and IV Shasta red fir and white fir.

77



LANDTYPE UNIT: Landtype 77 is found on moderately steep sideslopes to gentle ridgetops on the east side of the Klamath Mountains. Common inclusions in this unit are Landtypes 18, 72, 76, and 87.

CLIMATE: Precipitation: 45 to 85 inches/year. 114 to 215 cm/year.
Soil Temperature Class: Mesic, frigid on Landtype 77u.

TOPOGRAPHY: Slope: 3 to 45 percent, slightly dissected slopes.
Aspect: All aspects.
Elevation: 1,000 to 4,000 feet. 304 to 1,216 meters.
Stability: Landtype 77 is moderately stable to moderately unstable. Stability Class II and III.

VEGETATION: This unit supports Site Class IV and locally III Douglas-fir. Other species include: Sugar pine, western white pine, incense-cedar, tanoak, madrone, Pacific yew, chinkapin, Oregon grape, snowbrush ceanothus, whitethorn ceanothus, Sadler oak, snowberry, trailing blackberry, poison oak, princess pine, wild iris, fescue and other grasses, and mosses.

SOIL: Soil 77 is a moderately deep to deep soil derived from residuum and colluvium. Soil depth is 20 to 40 inches, but may be 40 to 60 inches deep locally. The soil materials are generally well drained. Surface soil erosion potential is moderate. Erosion Class III.

Litter: Needles, leaves, and twigs, a trace to 1 1/2 inches thick. Decomposed humus material, a trace to 3/4 inches thick.

Surface Layers: Surface layers are very gravelly loams. Colors are dark grayish brown to dark reddish brown. Structure is weak fine granular to subangular blocky. Rock fragments range from 35 to 60 percent by volume. Consistence is soft to slightly hard, friable, non sticky to slightly sticky, and non plastic to slightly plastic. The pH ranges from 6.0 to 7.0. Surface thickness ranges from 8 to 12 inches. Surface layers have rapid permeability rates.

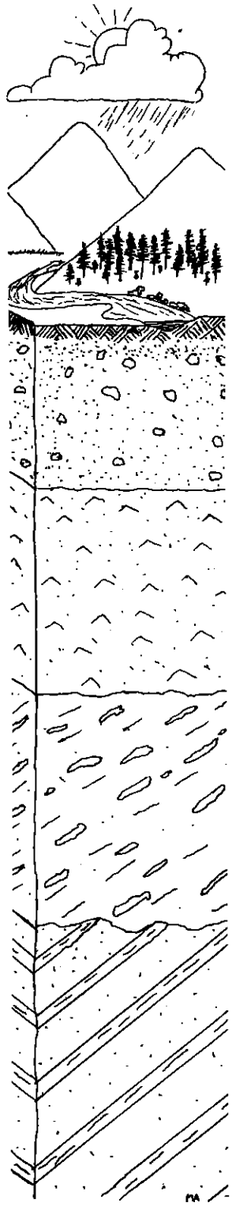
Subsoil Layers: Subsoil layers are very gravelly loams and clay loams. Colors are reddish brown, brown, and yellowish brown. Structure is generally moderate fine and medium subangular blocky. Rock fragments range from 35 to 50 percent by volume. Consistence is hard, firm, slightly sticky to sticky, and slightly plastic to plastic. The pH ranges from 5.8 to 6.8. Subsoil thickness ranges from 12 to 28 inches. Subsoil layers have moderate permeability rates.

Modal Site Location: NE¼, NE¼, Section 2, T.38S., R.9W.

GEOLOGY: Bedrock consists of soft saprolitic to moderately hard metasedimentary rocks of the Galice Formation. Inclusions of metavolcanic rocks are interspersed locally.

Landtype 77u is similar to Landtype 77 except that it is found in the upper forest zone, generally 4,000 to 5,000 feet in elevation, and supports Site Class III Shasta red fir and white fir.

81



LANDTYPE UNIT: Landtype 81 is found on steep slopes in the Siskiyou Mountains. Common inclusions in this uUnit are Landtypes 18, 71, and 82.

CLIMATE: Precipitation: 50 to 80 inches/year. 127 to 203 cm/year.
Soil Temperature Class: Mesic, frigid on Landtype 81u.

TOPOGRAPHY: Slope: 60 to 90 percent, moderately locally highly, dissected terrain.
Aspect: All aspects.
Elevation: 1,000 to 4,000 feet. 305 to 1,220 meters.
Stability: Landtype 81 is moderately stable. Stability Class II.

VEGETATION: This unit supports Site Class IV and III Douglas-fir. Other species include: Incense-cedar, Port-Orford-cedar, white fir, chinkapin, tanoak, madrone, ceanothus, manzanita, princess pine, grasses, and mosses.

SOIL: Soil 81 is generally a moderately deep soil derived from residuum and colluvium. Soil depth is 20 to 40 inches, but locally ranges from 10 to 20 inches. The soil materials are generally well drained. Surface soil erosion potential is severe. Erosion Class IV.

Litter: Needles, leaves, and twigs, a trace to 1 inch thick. Moderately decomposed to decomposed humus, and trace to 1/2 inch thick.

Surface Layers: Surface layers are loams to extremely gravelly loams. Colors are reddish brown to pale brown. Structure is weak, fine granular. Rock fragments range from 15 to 65 percent by volume. Consistence is soft to slightly hard, very friable to friable, non sticky to slightly sticky. The pH ranges from 5.5 to 6.5. Surface thickness ranges from 4 to 24 inches thick. Surface layers have moderately rapid to rapid permeability rates.

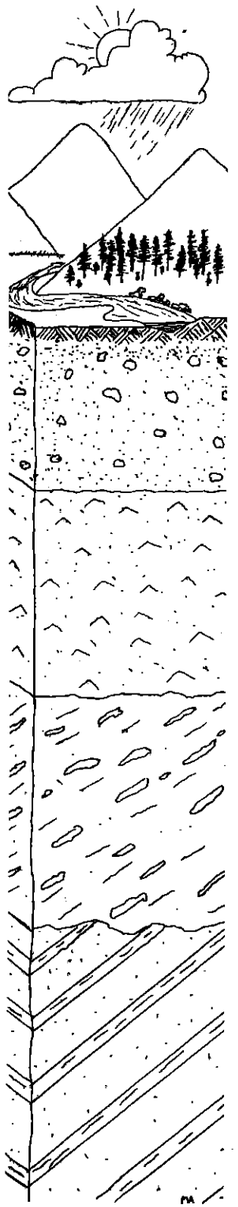
Subsoil Layers: Subsoil layers are gravelly loams to very gravelly loams. Colors are brown to yellowish brown. Structure is moderate very fine and fine granular to moderate very fine subangular blocky. Rock fragments range from 30 to 50 percent by volume. Consistence is soft to slightly hard, very friable to friable, non sticky to slightly sticky, and non plastic to slightly plastic. The pH ranges from 5.5 to 6.5. Subsoil thickness ranges from 10 to 30 inches thick. Subsoil layers have moderate to rapid permeability rates.

Modal Site Location: NE¼, SW¼, Section 16, T.40S., R.6W.

GEOLOGY: Bedrock consists of moderately hard to hard highly fractured metavolcanic rocks with interspersed sediments and metasediments.

Landtype 81u is similar to Landtype 81 except that it is found in the upper forest zone, generally between 4,000 and 5,500 feet elevation, is 10 to 20 inches deep, and supports Site Class III Shasta red fir and white fir.

82



LANDTYPE UNIT: Landtype 82 is found on moderately steep slopes in the Siskiyou Mountains. Common inclusions in this unit are Landtypes 4, 16, 18, 72, 81, and 83.

CLIMATE: Precipitation: 50 to 80 inches/year. 127 to 203 cm/year.
Soil Temperature Class: Mesic, frigid on Landtype 82u.

TOPOGRAPHY: Slope: 30 to 60 percent, smooth to moderately dissected slopes.
Aspect: All aspects.
Elevation: 1,000 to 4,000 feet. 305 to 1,220 meters.
Stability: Landtype 82 is moderately unstable to moderately stable. Stability Class III and II.

VEGETATION: This unit supports Site Class III and IV Douglas-fir. Other species include: Sugar pine, western white pine, incense-cedar, Port-Orford-cedar, white fir, madrone, chinkapin, tanoak, canyon live oak, oceanspray, California hazel, trailing blackberry, whiteleaf and greenleaf manzanita, bearberry, bracken fern, sword fern, grasses, and mosses.

SOIL: Soil 82 is generally a deep soil derived from colluvium and residuum. Soil depth is generally 40 to 60 inches, but locally it may range from 20 to 40 inches deep. The soil materials are generally moderately well drained. Surface soil erosion potential is moderate. Erosion Class III.

Litter: Needles, leaves, and twigs, a trace to 1 1/4 inches thick. Highly decomposed humus, 1/4 to 3/4 inches thick.

Surface Layers: Surface layers are loams to gravelly loams. Colors are dark brown to brown. Structure is weak very fine and fine granular to weak fine subangular blocky. Rock fragments range from 10 to 30 percent by volume. Consistence is soft, very friable to friable, non sticky to slightly sticky, and non plastic. The pH ranges from 5.5 to 6.5. Surface thickness ranges from 6 to 16 inches. Surface layers have moderately rapid to rapid permeability rates.

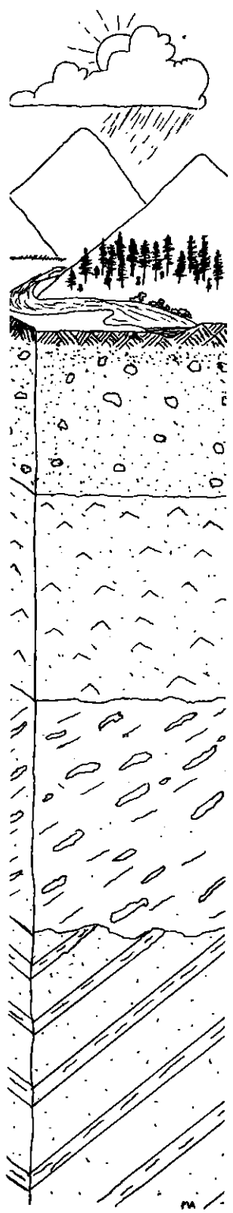
Subsoil Layers: Subsoil layers are very gravelly loams to clay loams. Colors are dark yellowish brown to brown. Structure is weak fine and medium subangular blocky, moderate fine and medium and moderate medium subangular blocky. Rock fragments range from 15 to 35 percent by volume. Consistence is soft to hard, friable to firm, slightly sticky to sticky, and non plastic to slightly plastic. The pH ranges from 5.5 to 6.5. Subsoil thickness ranges from 34 to 44 inches. Subsoil layers have moderate to rapid permeability rates.

Modal Site Location: NE¼, NE¼, Section 26, T.40S., R.7W.

GEOLOGY: Bedrock consists of moderately hard to soft highly fractured metavolcanic rock with interspersed stringers of sediments and metasediments.

Landtype 82u is similar to Landtype 82 except that it is found in the upper forest zone, generally between 4,000 and 5,500 feet in elevation, and supports Site Class II and III Shasta red fir and white fir.

83



LANDTYPE UNIT: Landtype 83 is found on gentle terrain in the Siskiyou Mountains. Common inclusions in this unit are Landtypes 4, 15, 16, 72, and 82.

CLIMATE: Precipitation: 50 to 80 inches/year. 127 to 203 cm/year.
Soil Temperature Class: Mesic, frigid on Landtype 83u.

TOPOGRAPHY: Slope: 0 to 30 percent, rolling, benchy terrain.
Aspect: All aspects.
Elevation: 1,000 to 4,000 feet. 305 to 1,220 meters.
Stability: Landtype 83 is moderately unstable. Stability Class III.

VEGETATION: This unit supports Site Class III Douglas-fir. Other species include: Port-Orford-cedar, incense-cedar, sugar pine, western white pine, white fir, madrone, chinkapin, willow, serviceberry, ceanothus, oceanspray, California hazel, bearberry, bracken fern, sword fern, grasses, and mosses.

SOIL: Soil 83 is generally a very deep soil derived from colluvium and residuum. Soil depth is greater than 60 inches, but locally is less than 60 inches deep. The soil materials are generally moderate to moderately well drained. Surface soil erosion potential is slight to moderate. Erosion Class II and III.

Litter: Needles, leaves, and twigs, a trace to 1 1/2 inches thick. Decomposed humus 1/4 to 1 inches thick.

Surface Layers: Surface layers are gravelly loams to very gravelly loams. Colors are very dark brown to brown. Structure is weak fine granular to weak and moderate fine and medium granular. Rock fragments range from 20 to 50 percent by volume. Consistence is soft to slightly hard, friable non sticky to slightly sticky, and non plastic. The pH ranges from 5.5 to 6.5. Surface thickness ranges from 10 to 20 inches. Surface layers have moderately rapid to rapid permeability.

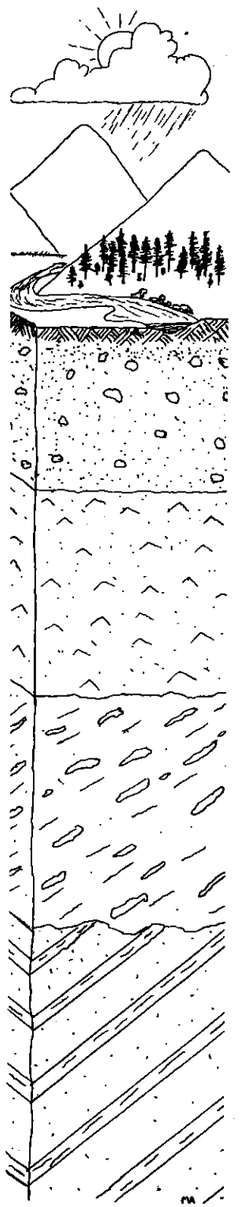
Subsoil Layers: Subsoil layers are very gravelly loams to clay loams. Colors are brown, yellowish brown, and reddish brown. Structure is weak fine subangular blocky, moderate fine and medium subangular blocky, and massive. Rock fragments range from 10 to 85 percent by volume. Consistence is slightly hard to hard, friable to firm, slightly sticky to sticky, and slightly plastic to plastic. The pH ranges from 5.5 to 7.0. Subsoil thickness ranges from 20 to 95 inches. Subsoil layers have moderately slow to moderately rapid permeability.

Modal Site Location: NE¼, NE¼, Section 23, T.40S., R.7W.

GEOLOGY: Bedrock consists of soft to moderately hard metavolcanic rock with interspersed dikes and sills of sediments and metasediments.

Landtype Unit 83u is similar to Landtype 83 except that it is found in the upper forest zone, generally between 4,000 and 5,500 feet in elevation, and supports Site Class II and I Shasta red fir and white fir.

86



LANDTYPE UNIT: Landtype 86 is found on steep to very steep sideslopes on the east side of the Klamath Mountains. Common inclusions in this unit are Landtypes 18, 76, and 87.

CLIMATE: Precipitation: 45 to 85 inches/year. 114 to 215 cm/year.
Soil Temperature Class: Mesic, frigid on Landtype 86u.

TOPOGRAPHY: Slope: 60 to 90 plus percent, moderately, locally highly dissected terrain.
Aspect: All aspects.
Elevation: 1,000 to 4,000 feet. 304 to 1,216 meters.
Stability: Landtype 86 is moderately stable. Stability Class II.

VEGETATION: This unit supports Site Class IV and V Douglas-fir. Other species include: Incense-cedar, sugar pine, western white pine, ponderosa pine, white fir, tanoak, madrone, chinkapin, whitethorn ceanothus, greanleaf and whiteleaf manzanita, Oregon grape, poison oak, California hazel, princess pine, grasses, and mosses.

SOIL: Soil 86 is a shallow soil derived from residuum and colluvium. Soil depth is 10 to 20 inches. The soil materials are generally excessively drained. Surface soil erosion potential is severe. Erosion Class IV.

Litter: Needles, leaves, and twigs, a trace to 1/2 inch thick.

Surface Layers: Surface layers are very gravelly loams. Colors are dark brown to brown. Structure is weak fine granular to subangular blocky. Rock fragments range from 30 to 60 percent by volume. Consistence is soft to slightly hard, friable, slightly sticky, and slightly plastic. The pH ranges from 5.8 to 6.6. Surface thickness ranges from 6 to 12 inches. Surface layers have rapid permeability rates.

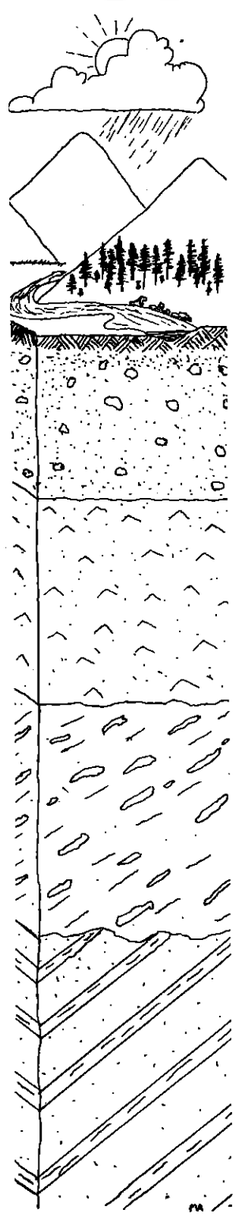
Subsoil Layers: Subsoil layers are very gravelly silt loams, loams and clay loams. Colors are dark brown to yellowish red. Structure is moderate fine and medium subangular blocky. Rock fragments range from 30 to 45 percent by volume. Consistence is slightly hard to hard, friable to firm, slightly sticky to sticky, and slightly plastic to plastic. The pH ranges from 5.8 to 6.8. Subsoil thickness ranges from 8 to 14 inches. Subsoil layers have a rapid permeability rate.

Modal Site Location: SW¼, SW¼, Section 1, T.38S., R.9W.

GEOLOGY: Bedrock consists of hard, slightly to highly fractured metavolcanic rocks of the Galice Formation. Inclusions of metasedimentary rocks occur locally.

Landtype 86u is similar to Landtype 86 except that it is found in the upper forest zone, generally between 4,000 and 5,000 feet in elevation, and supports Site Class III and IV Shasta red fir and white fir.

87



LANDTYPE UNIT: Landtype 87 is found on gentle ridgetops to moderately steep sideslopes on the east side of the Klamath Mountains. Common inclusions in this unit are Landtypes 4, 16, 18, 77, and 86.

CLIMATE: Precipitation: 45 to 85 inches/year. 114 to 215 cm/year.
Soil Temperature Class: Mesic, frigid on Landtype 87u.

TOPOGRAPHY: Slope: 10 to 45 percent, smooth to moderately dissected terrain.
Aspect: All aspects.
Elevation: 1,500 to 4,000 feet. 456 to 1,216 meters.
Stability: Landtype 87 is moderately stable to moderately unstable. Stability Class II and III.

VEGETATION: This unit supports Site Class IV, locally III, Douglas-fir. Other species include: Sugar pine, western white pine, incense-cedar, ponderosa pine, tanoak, madrone, chinkapin, California hazel, Oregon grape, greenleaf manzanita, whitethorn ceanothus, Sadler oak, poison oak, canyon live oak, oceanspray, bracken fern, sword fern, grasses, and mosses.

SOIL: Soil 87 is a moderately deep soil derived from residuum and colluvium. Soil depth is generally between 20 to 40 inches. The soil materials are generally well drained. Surface soil erosion potential is moderate. Erosion Class III.

Litter: Needles, leaves, and twigs, a trace to 1 inch thick. Decomposed humus material, a trace to 1/2 inch thick.

Surface Layers: Surface layers are loams to gravelly clay loams. Colors are dark grayish brown and dark brown. Structure is moderate fine and medium granular to subangular blocky. Rock fragments range from 5 to 30 percent by volume. Consistence is slightly hard, friable, slightly sticky, and slightly plastic. The pH ranges from 5.8 to 6.8. Surface thickness ranges from 6 to 10 inches. Surface layers have moderate permeability rates.

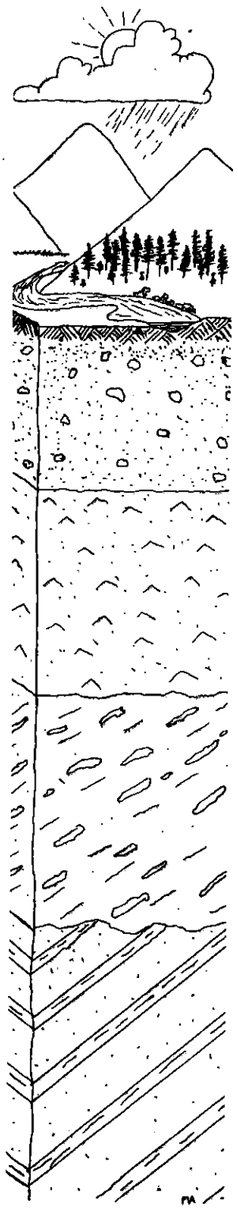
Subsoil Layers: Subsoil layers are loams to gravelly clay loams. Colors are strong brown to yellowish red. Structure is massive to moderate medium subangular blocky. Rock fragments range from 10 to 35 percent by volume. Consistence is slightly hard to hard, friable to firm, slightly sticky to sticky, and plastic. The pH ranges from 5.3 to 6.5. Subsoil thickness ranges from 8 to 30 inches. Subsoil layers have moderate to slow permeability rates.

Modal Site Location: SE¼, SE¼, Section 1, T.38S., R.9W.

GEOLOGY: Bedrock consists of moderately hard to highly fractured metavolcanic rock of Galice Formation. Inclusions of metasedimentary rocks are interspersed locally.

Landtype 87u is similar to Landtype 87 except that it is found in the upper forest zone, generally between 4,000 and 5,000 feet elevation, and supports Site Class III Shasta red fir and white fir.

91



LANDTYPE UNIT: Landtype 91 is found on steep to very steep sideslopes in the Siskiyou Mountains and on the east slope of the Klamath Mountains. Common inclusions in this unit are Landtypes 18, 92, 95, and 96.

CLIMATE: Precipitation: 60 to 100 inches/year. 152 to 254 cm/year.
Soil Temperature Class: Mesic on Landtype 91, frigid on Landtype 91u, and cryic above 5,500 feet elevation.

TOPOGRAPHY: Slope: 60 to 90+ percent, moderately dissected slopes.
Aspect: All aspects.
Elevation: 1,000 to 4,000 feet. 305 to 1,220 meters.
Stability: Landtype 91 is moderately stable. Stability Class II.

VEGETATION: This unit supports Site Class IV Douglas-fir. Other species include: Port-Orford-cedar, ponderosa pine, incense-cedar, white fir, chinkapin, tanoak, madrone, snowbrush ceanothus, blue elderberry, manzanita, wild gooseberry, wild rose, Oregon grape, trailing blackberry, princess pine, grasses, and mosses.

SOIL: Soil 91 is generally a shallow soil, derived from residuum and colluvium. Soil depth is 10 to 20 inches, with minor inclusions of deeper soil. The soil materials are generally well drained. Surface soil erosion potential is very severe. Erosion Class V.

Litter: Needles, leaves, and twigs, 1/2 to 2 inches thick. Decomposed humus, a trace to 1/2 inch thick.

Surface Layers: Surface layers are gravelly fine sandy loams to very gravelly fine sandy loams. Colors are very dark grayish brown to dark grayish brown. Structure is weak fine granular. Rock fragments range from 25 to 50 percent by volume. Consistence is soft, very friable to friable, non sticky, and non plastic. The pH ranges from 6.0 to 7.0. Surface thickness ranges from 4 to 10 inches. Surface layers have rapid to very rapid permeability rates.

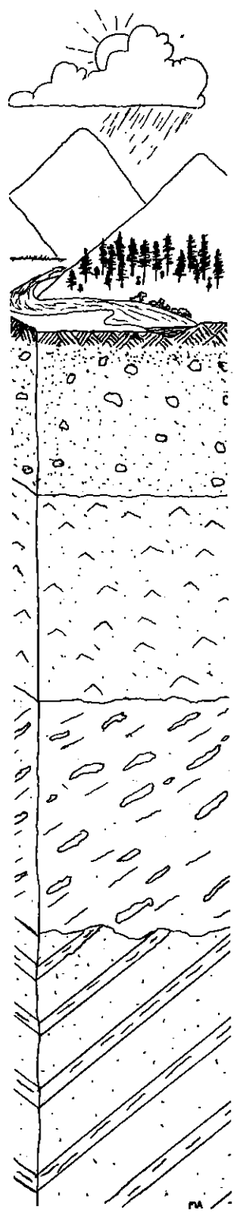
Subsoil Layers: Subsoil layers are very gravelly sandy loams to extremely stony sandy loams. Colors are dark grayish brown to grayish brown. Structure is weak, fine granular to massive. Rock fragments range from 30 to 80 percent by volume. Consistence is soft, very friable to friable, non sticky, and non plastic. The pH ranges from 5.0 to 6.0. Subsoil thickness ranges from 5 to 15 inches. Subsoil layers have rapid to very rapid permeability.

Modal Site Location: SW¼, NW¼, Section 22, T.40S., R.6W.

GEOLOGY: Bedrock consists of hard highly fractured diorites, granodiorites, and locally gabbros.

Landtype 91u is similar to Landtype 91 except that it is found in the upper forest zone, generally 4,000 to 7,000 feet elevation, and supports Site Class III and IV Shasta red fir and white fir.

92



LANDTYPE UNIT: Landtype 92 is found on moderately steep sideslopes in the Siskiyou Mountains and on the east slope of the Klamath Mountains. Common inclusions in this unit are Landtypes 18, 91, 93, 95, and 97.

CLIMATE: Precipitation: 60 to 100 inches/year. 152 to 254 cm/year.
Soil Temperature Class: Mesic on Landtype 92, frigid on Landtype 92u, and cryic above 5,500 feet elevation.

TOPOGRAPHY: Slope: 30 to 60 percent, smooth to moderately dissected slopes.
Aspect: All aspects.
Elevation: 1,000 to 4,000 feet. 305 to 1,220 meters.
Stability: Landtype 92 is moderately stable. Stability Class II.

VEGETATION: This unit supports Site Class III and IV Douglas-fir. Other species include: Port-Orford-cedar, incense-cedar, western white pine, sugar pine, white fir, ponderosa pine, madrone, chinkapin, tanoak, wild rose, blue elderberry, snowbrush ceanothus, greenleaf manzanita, wild gooseberry, oceanspray, California hazel, Pacific dogwood, poison oak, trailing blackberry, salal, sword fern, bracken fern, grasses, and mosses.

SOIL: Soil 92 is generally a moderately deep soil, derived from colluvium and residuum. Soil depth is 20 to 40 inches, with minor inclusions of deeper soils. The soil materials are generally well drained. Surface soil erosion potential is severe. Erosion Class IV.

Litter: Needles, leaves, and twigs, 1/2 to 1 1/2 inches thick. Decomposed humus, a trace to 1/2 inch thick.

Surface Layers: Surface layers are silt loams, loams, and sandy loams to gravelly loams. Colors are very dark gray to dark brown. Structure is weak, fine granular to moderate, fine and medium subangular blocky. Rock fragments range from 3 to 30 percent by volume. Consistence is soft to hard, friable to firm, non sticky to slightly sticky, and non plastic to slightly plastic. The pH ranges from 6.0 to 7.5. Surface thickness ranges from 4 to 24 inches. Surface layers have moderate to rapid permeability rates.

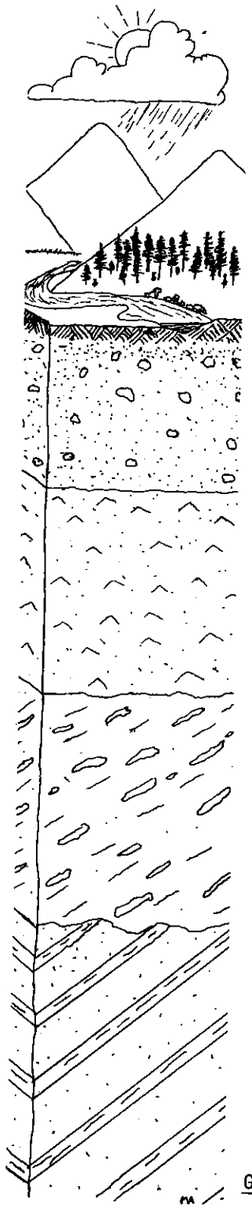
Subsoil Layers: Subsoil layers are very gravelly sandy loams, gravelly sandy loams, loams, silt loams and clay loams. Colors are dark yellowish brown to yellowish brown. Structure is weak fine subangular blocky, moderate fine and medium subangular blocky, and massive. Rock fragments range from 20 to 85 percent by volume. Consistence is slightly hard to hard, friable to firm, non sticky to slightly sticky, and non plastic to slightly plastic. The pH ranges from 6.0 to 7.0. Subsoil thickness ranges from 30 to 55 inches. Subsoil layers have moderate to very rapid permeability rates.

Modal Site Location: NW¼, NE¼, Section 27, T.40S., R.6W.

GEOLOGY: Bedrock consists of moderately hard to soft highly fractured diorite and granodiorite with inclusions of gabbro.

Landtype 92u is similar to Landtype 92 except that it is found in the upper forest zone, generally above 4,000 feet elevation, and supports Site Class II Shasta red fir and white fir.

93



LANDTYPE UNIT: Landtype 93 is found on gentle ridgetops and sideslopes in the Siskiyou Mountains and on the east slope of the Klamath Mountains. Common inclusions in this unit are Landtypes 92, 95, and 18.

CLIMATE: Precipitation: 60 to 100 inches/year. 152 to 254 cm/year. Soil Temperature Class: Mesic, except frigid on Landtype 93u.

TOPOGRAPHY: Slope: 2 to 30 percent, smooth to rolling ridgetops and sideslopes.
Aspect: All aspects.
Elevation: 1,000 to 4,000 feet. 305 to 1,220 meters.
Stability: Landtype 93 is moderately stable to moderately unstable. Stability Class II and III.

VEGETATION: This unit supports Site Class III Douglas-fir. Other species include: Port-Orford-cedar, incense-cedar, sugar pine, western white pine, Shasta red fir, white fir, tanoak, madrone, snowbrush ceanothus, blue elderberry, greenleaf manzanita, salal, Oregon grape, wild rose, red huckleberry, California hazel, Pacific dogwood, wild azalea, bracken fern, and grasses.

SOIL: Soil 93 is generally a very deep soil, derived from residuum and colluvium. Soil depth is greater than 60 inches, with inclusions of shallower soils. The soil materials are generally moderately well drained. Surface soil erosion potential is moderate. Erosion Class III.

Litter: Needles, leaves, and twigs, 1/2 to 1 1/2 inches thick. Decomposed humus, a trace to 3/4 inch thick.

Surface Layers: Surface layers are silt loams to very gravelly loams. Colors are very dark grayish brown to brown. Structure is weak, fine granular to strong, fine granular and weak, medium subangular blocky to strong medium subangular blocky. Rock fragments range from 5 to 65 percent by volume. Consistence is soft to hard, friable to firm, non sticky to slightly sticky, and non plastic to slightly plastic. The pH ranges from 6.5 to 7.5. Surface thickness ranges from 10 to 20 inches thick. Surface layers have moderate to moderately rapid permeability.

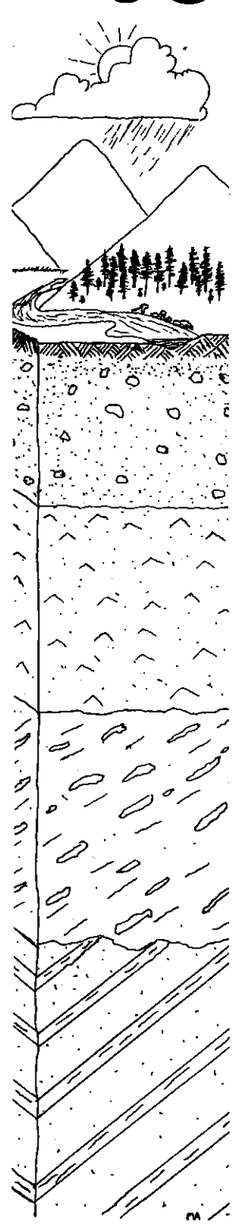
Subsoil Layers: Subsoil layers are silt loams to silty clay loams. Colors are brown, brownish yellow, reddish yellow, and very pale brown. Structure is weak, fine and medium subangular blocky to strong, medium and coarse subangular blocky to massive. Rock fragments range from 5 to 25 percent by volume. Consistence is slightly hard to hard, friable to firm, slightly sticky to sticky, and slightly plastic to plastic. The pH ranges from 5.0 to 7.0. Subsoil thickness ranges from 30 to 50 inches thick. Subsoil layers have moderate to moderately rapid permeability.

Modal Site Location: NE¼, NE¼, Section 7, T.37S., R.9W.

GEOLOGY: Bedrock consists of soft diorites, granodiorites, and inclusions of gabbros.

Landtype 93u is similar to Landtype 93 except that it is found in the upper forest zone, generally between 4,000 and 5,500 feet elevation, and supports Site Class II Shasta red fir and white fir.

95



LANDTYPE UNIT: Landtype 95 is found on steep sideslopes in the Siskiyou Mountains and on the east slope of the Klamath Mountains. Common inclusions in this unit are Landtypes 18, 91, 92, 96, and 97.

CLIMATE: Precipitation: 60 to 100 inches/year. 152 to 254 cm/year. Soil Temperature Class: Mesic, frigid on Landtype 95u, and cryic above 5,500 feet elevation.

TOPOGRAPHY: Slope: 60 to 90 percent, smooth to moderately dissected terrain.
Aspect: All aspects.
Elevation: 1,000 to 4,000 feet. 305 to 1,220 meters.
Stability: Landtype 95 is moderately stable to moderately unstable. Stability Class II and III.

VEGETATION: This unit supports Site Class III and IV Douglas-fir. Other species include: Western white pine, Port-Orford-cedar, incense-cedar, white fir, ponderosa pine, chinkapin, tanoak, madrone, Pacific dogwood, blue elderberry, greenleaf manzanita, bearberry, poison oak, salal, princess pine, twisted-stalk, bedstraw, starflower, bracken fern, sword fern, grasses, and mosses.

SOIL: Soil 95 is generally a deep soil, on residuum and colluvium. Soil depth is 40 to 60 inches, with inclusions of shallower soils. The soil materials are generally well drained. Surface soil erosion potential is very severe. Erosion Class V.

Litter: Needles, leaves, and twigs, 1/2 to 1 1/2 inches thick. Decomposed humus, a trace to 1/2 inch thick.

Surface Layers: Surface layers are gravelly to extremely gravelly fine sandy loams to silt loams. Colors are dark brown to dark yellowish brown. Structure is weak fine granular, moderate fine and medium granular and subangular blocky and strong fine and medium subangular blocky. Rock fragments range from 15 to 85 percent by volume. Consistence is slightly hard to hard, friable to firm, non sticky to slightly sticky, and non plastic to slightly plastic. The pH ranges from 6.5 to 7.5. Surface thickness ranges from 10 to 22 inches. Surface layers have moderate to rapid permeability rates.

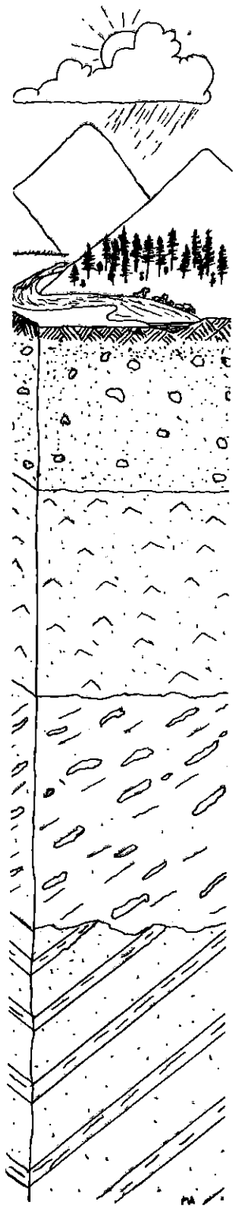
Subsoil Layers: Subsoil layers are very gravelly fine sandy loams to clay loams. Colors are dark yellowish brown to brownish yellow. Structure is weak, fine granular to strong, fine medium, and coarse subangular blocky and massive. Rock fragments range from 20 to 85 percent by volume. Consistence is soft to hard, friable to firm, non sticky to sticky, and non plastic to plastic. The pH ranges from 6.0 to 7.5. Subsoil thickness ranges from 25 to 55 inches. Subsoil layers have moderate to moderately rapid permeability rates.

Modal Site Location: NW¼, SW¼, Section 15, T.37S., R.9W.

GEOLOGY: Bedrock consists of soft to moderately hard diorite and granodiorite with inclusions of gabbro.

Landtype 95u is similar to Landtype 95 except it is found in the upper forest zone, generally above 4,000 feet elevation, and supports Site Class II and III Shasta red fir and white fir.

96



LANDTYPE UNIT: Landtype 96 is found on steep to very steep sideslopes on the east side of the Klamath Mountains. Common inclusions in this unit are Landtypes 91, 95, and 97.

CLIMATE: Precipitation: 50 to 75 inches/year. 127 to 190 cm/year.
Soil Temperature Class: Mesic, frigid on 96u and cryic above 5,500 feet elevation.

TOPOGRAPHY: Slope: 60 to 90+ percent, moderately dissected slopes.
Aspect: All aspects.
Elevation: 1,000 to 4,000 feet. 304 to 1,216 meters.
Stability: Landtype 96 is moderately stable. Stability Class II.

VEGETATION: This unit supports Site Class V locally IV Douglas-fir. Other species include: Incense-cedar, knobcone pine, canyon live oak, tanoak, madrone, elderberry, manzanita, Oregon grape, wild rose, trailing blackberry, snowbrush ceanothus, bearberry, bracken fern, sword fern, grasses, and mosses.

SOIL: Soil 96 is a shallow soil derived from residuum and colluvium. Soil depth is 10 to 20 inches. The soil materials are generally excessively drained. Surface soil erosion potential is very severe. Erosion Class V.

Litter: Needles, leaves, and twigs, a trace to 1/2 inch thick.

Surface Layers: Surface layers are gravelly to extremely gravelly sandy loams and loams. Colors are very dark grayish brown, grayish brown, and dark brown. Structure is weak fine granular to moderate medium subangular blocky. Rock fragments range from 20 to 60 percent by volume. Consistence is soft, friable, non sticky to slightly sticky, and non plastic. The pH ranges from 6.0 to 7.0. Surface thickness ranges from 4 to 10 inches. Surface layers have rapid permeability rates.

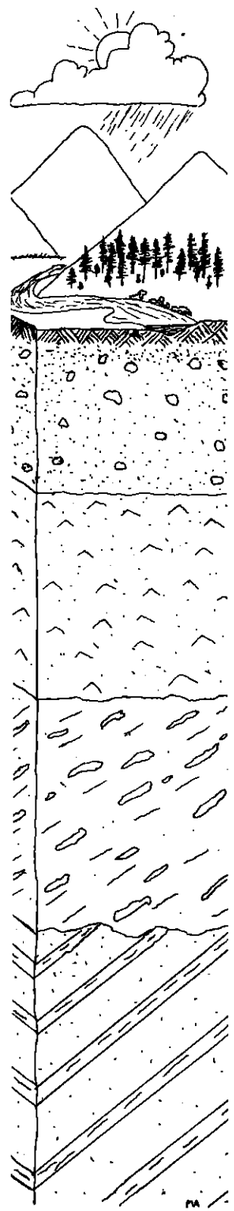
Subsoil Layers: Subsoil layers are very gravelly to extremely gravelly loams and silt loams. Colors are dark brown, grayish brown, and olive gray. Structure is moderate fine and medium subangular blocky. Rock fragments range from 35 to 75 percent by volume. Consistence is slightly hard, firm, non sticky to slightly sticky, and non plastic. The pH ranges from 5.5 to 6.5. Subsoil thickness ranges from 6 to 14 inches. Subsoil layers have rapid permeability rates.

Modal Site Location: NE¼, NW¼, Section 18, T.34S., R.9W.

GEOLOGY: Bedrock consists of hard to moderately hard, highly to moderately fractured gabbros and locally diorites.

Landtype 96u is similar to Landtype 96 except that it is found in the upper forest zone, generally between 4,000 and 6,000 feet in elevation, and supports Site Class IV Shasta red fir and white fir.

97



LANDTYPE UNIT: Landtype 97 is found on moderately steep slopes on the east side of the Klamath Mountains. Common inclusions in this unit are Landtypes 92, 95, 96, and 98.

CLIMATE: Precipitation: 50 to 75 inches/year. 127 to 190 cm/year.
Soil Temperature Class: Mesic, frigid on 97u, and cryic above 5,500 feet elevation.

TOPOGRAPHY: Slope: 30 to 60 percent, smooth to moderately dissected slopes.
Aspect: All aspects.
Elevation: 1,000 to 4,000 feet. 304 to 1,216 meters.
Stability: Landtype 97 is moderately stable. Stability Class II.

VEGETATION: This unit supports Site Class IV and V Douglas-fir. Other species include: Incense-cedar, western white pine, Port-Orford-cedar, Brewer spruce, sugar pine, white fir, madrone, tanoak, chinkapin, snowbrush ceanothus, manzanita, bearberry, bracken fern, sword fern, grasses, and mosses.

SOIL: Soil 97 is a moderately deep soil derived from residuum and colluvium. Soil depth is 20 to 40 inches but it may be less than 20 inches locally. The soil materials are generally well drained. Surface soil erosion potential is severe to moderate. Erosion Class IV and III.

Litter: Needles, leaves, and twigs, a trace to 1 inch thick. Decomposed humus material, a trace to 1/2 inch thick.

Surface Layers: Surface layers are very gravelly sandy loams to silt loams. Colors are dark brown and grayish brown. Structure is weak fine granular to moderate medium subangular blocky. Rock fragments range from 30 to 60 percent by volume. Consistence is soft to slightly hard, very friable to friable, non sticky to slightly sticky, and non plastic to slightly plastic. The pH ranges from 6.2 to 7.0. Surface thickness ranges from 8 to 14 inches. Surface layers have rapid permeability rates.

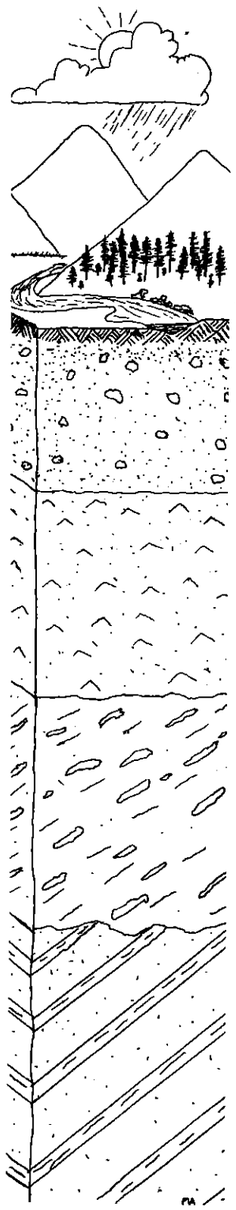
Subsoil Layers: Subsoil layers are very gravelly to extremely gravelly or cobbly loams and clay loams. Colors are dark yellowish brown and yellowish brown. Structure is moderate to medium subangular blocky. Rock fragments range from 40 to 80 percent by volume. Consistence is slightly hard, firm, slightly sticky to sticky, and slightly plastic. The pH ranges from 5.5 to 6.4. Subsoil thickness ranges from 10 to 26 inches. Subsoil layers have moderate to rapid permeability rates.

Modal Site Location: SW¼, NE¼, Section 24, T.35S., R.9W.

GEOLOGY: Bedrock consists of moderately hard, highly fractured gabbros with local diorites.

Landtype 97u is similar to Landtype 97 except that it is found in the upper forest zone, generally 4,000 to 6,000 feet in elevation, and supports Site Class III Shasta red fir and white fir.

98



LANDTYPE UNIT: Landtype 98 is found on ridges and benches on the east side of the Klamath Mountains. Common inclusions in this unit are Landtypes 92, 93, 97, and 100.

CLIMATE: Precipitation: 60 to 85 inches/year. 152 to 216 cm/year.
Soil Temperature Class: Mesic, frigid on 98u and cryic above 5,500 feet elevation.

TOPOGRAPHY: Slope: 2 to 30 percent, smooth.
Aspect: All aspects.
Elevation: 2,000 to 4,000 feet. 608 to 1,216 meters.
Stability: Landtype 98 is moderately stable to moderately unstable. Stability Class II and III.

VEGETATION: This unit supports Site Class IV and some III Douglas-fir. Other species include: White fir, Brewer spruce, ponderosa pine, western redcedar, Port-Orford-cedar, sugar pine, western white pine, chinkapin, tanoak, madrone, ceanothus, manzanita, princess pine, sword fern, bracken fern, grasses, and mosses.

SOIL: Soil 98 is a deep, locally moderately deep soil derived from residuum and colluvium. Soil depth is generally between 40 to 60 inches, but may be less than 40 inches locally. The soil materials are generally moderately drained. Surface soil erosion potential is moderate. Erosion Class III.

Litter: Needles, leaves, and twigs, a trace to 1 1/2 inches thick. Decomposed humus material, a trace to 1/2 inch thick.

Surface Layers: Surface layers are gravelly and very gravelly loams. Colors are very dark grayish brown and dark brown. Structure is weak, fine granular to moderate fine and medium subangular blocky. Rock fragments range from 15 to 40 percent by volume. Consistence is soft friable, non sticky to slightly sticky, and non plastic. The pH ranges from 5.5 to 6.5. Surface thickness ranges from 9 to 25 inches. Surface layers have moderate permeability rates.

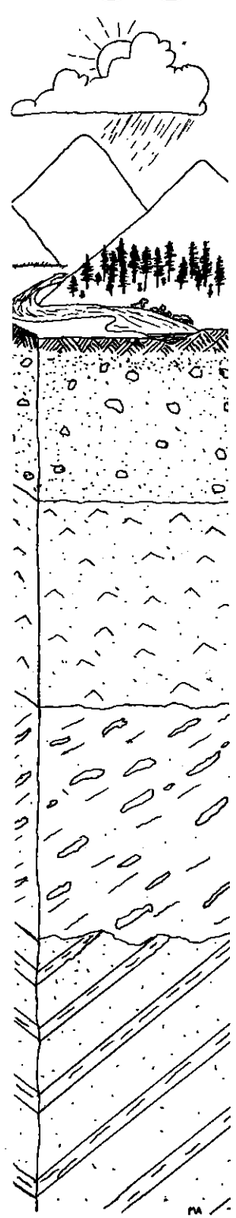
Subsoil Layers: Subsoil layers are gravelly and very gravelly loams, silt loams and clay loams. Colors are dark yellowish brown and yellowish brown. Structure is moderate fine and medium subangular blocky to massive. Rock fragments range from 20 to 55 percent by volume. Consistence is hard, firm, slightly sticky to sticky, and slightly plastic to plastic. The pH ranges from 5.0 to 6.2. Subsoil thickness ranges from 15 to 35 inches. Subsoil layers have moderate permeability rates.

Modal Site Location: SE¼, SW¼, Section 11, T.48N., R.5E.

GEOLOGY: Bedrock consists of soft, massive to slightly fractured, gabbros and locally diorites.

Landtype 98u is similar to Landtype 98 except that it is found in the upper forest zone, generally from 4,000 to 6,000 feet in elevation.

99



LANDTYPE UNIT: Landtype 99 is found on moderately steep to steep sideslopes along the Klamath Mountain crest. Common inclusions in this unit are Landtypes 11, 31, 34, 96, 97, and 100.

CLIMATE: Precipitation: 60 to 100 inches/year. 152 to 254 cm/year.
Soil Temperature Class: Mesic, frigid on 99u.

TOPOGRAPHY: Slope: 35 to 85 percent, slightly to moderately dissected sideslopes.
Aspect: All aspects.
Elevation: 800 to 4,000 feet. 243 to 1,216 meters.
Stability: Landtype 99 is moderately stable to moderately unstable. Stability Class II and III.

VEGETATION: This unit supports Site Class V Douglas-fir. Other species include: Ponderosa pine, Jeffrey pine, Oregon myrtle, tanoak, manzanita, serviceberry, canyon live oak, sword fern, bracken fern, and grasses.

SOIL: Soil 99 is a moderately deep soil derived from residuum and colluvium. Soil depth is generally 20 to 40 inches. The soil materials are generally well drained. Surface soil erosion potential is severe to very severe. Erosion Class IV and V.

Litter: Needles, leaves, and twigs, a trace to 1 inch thick.

Surface Layers: Surface layers are very gravelly to extremely gravelly loams. Colors are very dark brown to very dark grayish brown. Structure is weak fine granular. Rock fragments range from 35 to 75 percent by volume. Consistence is soft, very friable to friable, non sticky to slightly sticky, and non plastic to slightly plastic. The pH ranges from 5.8 to 6.5. Surface thickness ranges from 8 to 15 inches. Surface layers have rapid permeability rates.

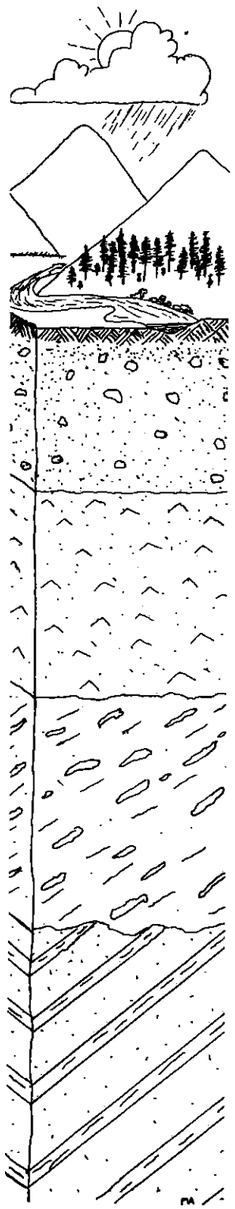
Subsoil Layers: Subsoil layers are extremely cobbly loam. Colors are dark brown and dark yellowish brown. Structure is weak fine subangular blocky to massive. Rock fragments range from 60 to 85 percent by volume. Consistence is soft, very friable, slightly sticky, and slightly plastic. The pH ranges from 5.2 to 6.5. Subsoil thickness ranges from 12 to 25 inches thick. Subsoil layers have rapid permeability rates.

Modal Site Location: SE¼, NW¼, Section 21, T.37S., R.9W.

GEOLOGY: Bedrock consists of highly fractured olivine gabbro.

Landtype 99u is similar to Landtype 99 except that it is found in the upper forest zone, generally from 4,000 to 5,500 feet in elevation, and supports Site Class IV and V Shasta red fir and white fir.

100



LANDTYPE UNIT: Landtype 100 is found on gentle ridgetops on the crest of the Klamath Mountains. Common inclusions in this unit are Landtypes 11, 32, 35, 98, and 99.

CLIMATE:

Precipitation: 90 to 110 inches/year. 229 to 279 cm/year.
Soil Temperature Class: Frigid.

TOPOGRAPHY:

Slope: 5 to 30 percent, smooth slopes.
Aspect: All aspects.
Elevation: 4,000 to 5,000 feet. 912 to 1,520 meters.
Stability: Landtype 100 is moderately stable to moderately unstable. Stability Class II and III.

VEGETATION: This unit supports Site Class III and IV Shasta red fir and white fir. Other species include: Ponderosa pine, Jeffrey pine, incense-cedar, Douglas-fir, sugar pine, western white pine, Sadler oak, manzanita, serviceberry, silktassel, sword fern, beargrass, grasses, and mosses.

SOIL: Soil 100 is a deep, locally moderately deep soil derived from residuum and colluvium. Soil depth is generally 40 to 60 inches, but may be 20 to 40 inches locally. The soil materials are generally moderately well drained. Surface soil erosion potential is moderate. Erosion Class III.

Litter: Needles, leaves, and twigs, a trace to 1 inch thick. Decomposed humus material, a trace to 1/2 inch thick.

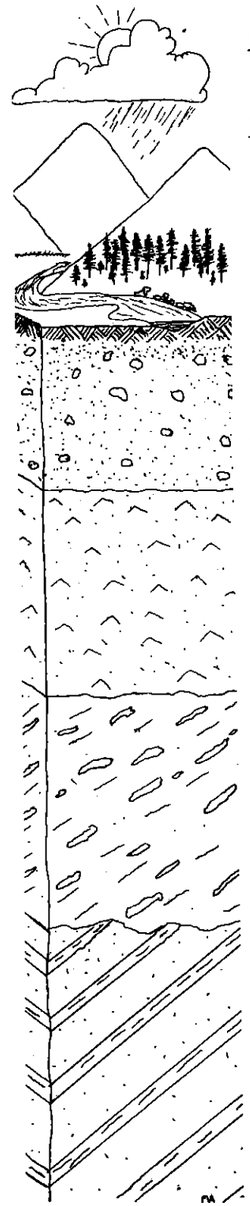
Surface Layers: Surface layers are generally very gravelly to extremely gravelly loams. Colors are very dark brown to very dark grayish brown. Structure is weak fine granular. Rock fragments range from 35 to 75 percent by volume. Consistence is soft to slightly hard, friable to firm, slightly sticky, and slightly plastic. The pH ranges from 5.8 to 6.6. Surface thickness ranges from 10 to 20 inches. Surface layers have rapid permeability rates.

Subsoil Layers: Subsoil layers are very cobbly to extremely cobbly clay loams. Colors are brown and dark brown. Structure is moderate to strong, medium subangular blocky to massive. Rock fragments range from 45 to 80 percent by volume. Consistence is hard, firm, sticky, and plastic. The pH ranges from 5.8 to 6.6. Subsoil thickness ranges from 20 to 40 inches thick. Subsoil layers have moderate to rapid permeability rates.

Modal Site Location: NW¼, SW¼, Section 20, T.36S., R.9W.

GEOLOGY: Bedrock consists of moderately hard to soft, massive to slightly fractured olivine gabbro.

120



LANDTYPE UNIT: Landtype 120 is found on very steep sideslopes in the northern portion of the Forest on the Powers District. Common inclusions in this unit are Landtype 121 and rock outcrop.

CLIMATE:

Precipitation: 80 to 100 inches/year. 203 to 254 cm/year.
Soil Temperature Class: Mesic.

TOPOGRAPHY:

Slope: 65 to 120+ percent, smooth to slightly dissected slopes.
Aspect: All aspects.
Elevation: 500 to 3,500 feet. 152 to 1,067 meters.
Stability: Landtype 120 is moderately stable. Stability Class II.

VEGETATION: This unit supports Site Class IV Douglas-fir. Stocking levels may be low however. Other species include: Western hemlock, Port-Orford-cedar, tanoak, chinkapin, huckleberry, salal, Oregon grape, trailing blackberry, blackcap raspberry, grasses, twinflower, bedstraw, and mosses.

SOIL: Soil 120 is a shallow soil derived from colluvium and residuum. Soil depth is generally 10 to 20 inches. The soil materials are generally excessively drained. Surface soil erosion potential is very severe. Erosion Class V.

Litter: Scattered trace amounts of twigs and litter.

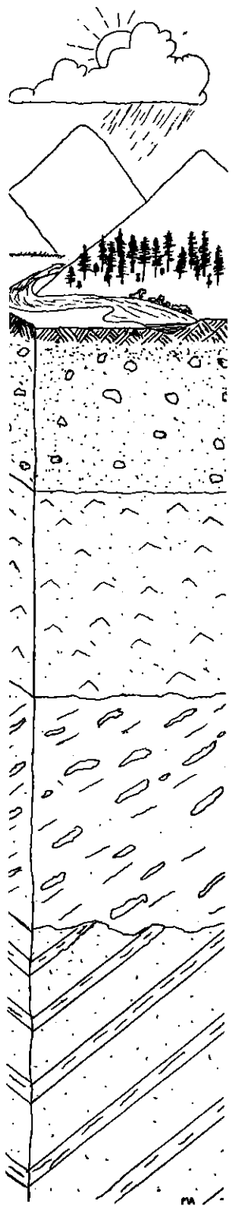
Surface Layers: Surface layers are very gravelly sandy loams and loams. Colors are dark brown and brown. Structure is moderate medium granular to weak fine subangular blocky. Rock fragments range from 35 to 60 percent by volume. Consistence is loose, very friable, non sticky, and non plastic. The pH ranges from 5.8 to 6.4. Surface thickness ranges from 3 to 10 inches. Surface layers have rapid permeability rates.

Subsoil Layers: Subsoil layers are very gravelly or cobbly loams. Colors are brown and grayish brown. Structure is weak fine and very fine subangular blocky. Rock fragments range from 30 to 65 percent by volume. Consistence is soft, very friable and friable, non sticky, and non plastic. The pH ranges from 5.8 to 6.4. Subsoil thickness ranges from 4 to 14 inches. Subsoil layers have rapid permeability.

Modal Site Location: NW¼, NW¼, Section 4, T.32S., R.11W.

GEOLOGY: Bedrock consists of hard to moderately hard, thick sequences of rhythmically bedded sandstone with thin interbeds of soft siltstone and mudstone of the Tyee Formation.

121



LANDTYPE UNIT: Landtype 121 is found on steep sideslopes in the northern area of the Forest on the Powers District. Common inclusions in this unit are Landtypes 19, 120, and 122.

CLIMATE: Precipitation: 80 to 100 inches/year. 203 to 254 cm/year.
Soil Temperature Class: Mesic.

TOPOGRAPHY: Slope: 55 to 90 percent, moderately dissected.
Aspect: All aspects.
Elevation: 500 to 3,500 feet. 152 to 1,067 meters.
Stability: Landtype 121 is moderately stable. Stability Class II.

VEGETATION: This unit supports Site Class III and IV Douglas-fir. Other species include: Western hemlock, Port-Orford-cedar, western redcedar, red alder, bigleaf maple, tanoak, chinkapin, rhododendron, Oregon grape, salal, gooseberry, elderberry, huckleberry, thimbleberry, trailing blackberry, blackcap raspberry, sword fern, bedstraw, twinflower, starflower, grasses, and mosses.

SOIL: Soil 121 is a moderately deep, locally shallow soil derived from colluvium and residuum. Soil depth is 20 to 40 inches. The soil materials are generally well drained. Surface soil erosion potential is severe. Erosion Class IV.

Litter: Needles, leaves, and twigs, a trace to 1/2 inch thick.

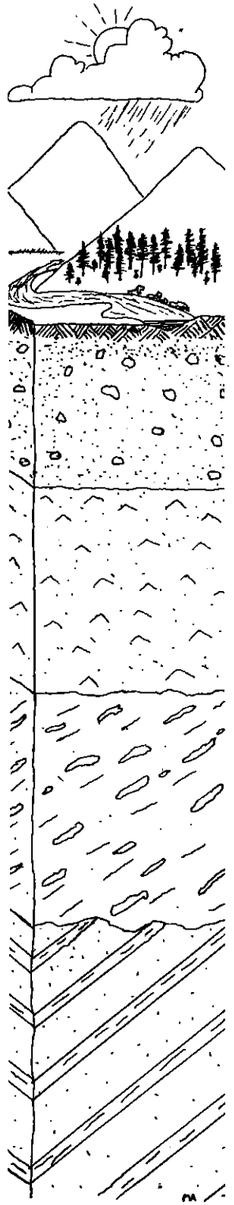
Surface Layers: Surface layers are gravelly loams and sandy loams. Colors are dark brown, and brown. Structure is moderate medium granular to subangular blocky. Rock fragments range from 2 to 45 percent by volume. Consistence is soft, friable to very friable, non sticky to slightly sticky, and non plastic to slightly plastic. The pH ranges from 5.8 to 6.4. Surface thickness ranges from 5 to 17 inches. Surface layers have moderately rapid permeability rates.

Subsoil Layers: Subsoil layers are gravelly loams and loams. Colors are dark yellowish brown to yellowish brown. Structure is moderate, medium subangular blocky. Rock fragments range from 2 to 45 percent by volume. Consistence is soft, friable, slightly sticky, and slightly plastic. The pH ranges from 5.6 to 6.1. Subsoil thickness ranges from 10 to 30 inches. Subsoil layers have moderately rapid permeability rates.

Modal Site Location: SE¼, NE¼, Section 8, T.32S., R.11W.

GEOLOGY: Bedrock consists of moderately hard to hard, thick sequences of rhythmically bedded sandstone with thin interbeds of soft siltstone and mudstone of the Tyee Formation.

122



LANDTYPE UNIT: Landtype 122 is found on moderately steep sideslopes in the northern area of the Forest on the Powers District. Common inclusions in this unit are Landtypes 19, 121, and 125.

CLIMATE: Precipitation: 80 to 100 inches/year. 203 to 254 cm/year.
Soil Temperature Class: Mesic.

TOPOGRAPHY: Slope: 25 to 55 percent, smooth to moderately dissected slopes.
Aspect: All aspects.
Elevation: 500 to 3,500 feet. 152 to 1,067 meters.
Stability: Landtype 122 is moderately stable to moderately unstable. Stability Class II and III.

VEGETATION: This unit supports Site Class III and some II Douglas-fir. Other species include: Western hemlock, Port-Orford-cedar, western redcedar, red alder, bigleaf maple, salal, rhododendron, elderberry, mountain ash, Oregon grape, vanillaleaf, huckleberry, thimbleberry, gooseberry, peasly everlasting, coltsfoot, sword fern, bedstraw, twistedstalk, twinflower, grasses, and mosses.

SOIL: Soil 122 is a moderately deep to deep soil derived from residuum and colluvium. Soil depth is generally 40 to 60 inches, but exceeds 60 inches locally. The soil materials are generally well drained. Surface soil erosion potential is moderate. Erosion Class III.

Litter: Needles, leaves, and twigs, a trace to 1/2 inch thick.

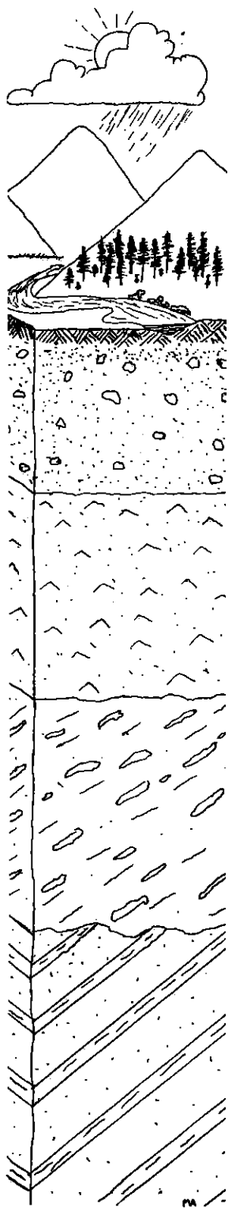
Surface Layers: Surface layers are gravelly loams and loams. Colors are dark brown to brown. Structure is moderate medium grandular to subangular blocky. Rock fragments range from 2 to 25 percent by volume. Consistence is soft, friable to very friable, non sticky to slightly sticky, and non plastic to slightly plastic. The pH ranges from 5.8 to 6.4. Surface thickness ranges from 13 to 28 inches. Surface layers have moderate to moderately rapid permeability rates.

Subsoil Layers: Subsoil layers are loams and gravelly clay loams. Colors are dark yellowish brown to yellowish brown. Structure is moderate medium subangular blocky. Rock fragments range from 3 to 20 percent by volume. Consistence is soft to slightly hard, friable, slightly sticky, and slightly plastic. The pH ranges from 5.6 to 6.1. Subsoil thickness ranges from 20 to 35 inches. Subsoil layers have moderate permeability rates.

Modal Site Location: NE¼, SW¼, Section 14, T.32S., R.11W.

GEOLOGY: Bedrock consists of moderately hard, thick sequences of rhythmically bedded sandstone with thin interbeds of soft siltstone and mudstone of the Tyee Formation.

125



LANDTYPE UNIT: Landtype 125 is found on broad flat to gently rolling ridgetop and benches in the northern area of the Forest on the Powers District. A common inclusion in this unit is Landtype 122.

CLIMATE:

Precipitation: 80 to 100 inches/year. 203 to 254 cm/year.
Soil Temperature Class: Mesic.

TOPOGRAPHY:

Slope: 2 to 25 percent, smooth slopes.
Aspect: All aspects.
Elevation: 1,000 to 3,500 feet. 305 to 1,067 meters.
Stability: Landtype 125 is moderately stable. Stability Class II.

VEGETATION: This unit supports Site Class II and III Douglas-fir. Other species include: Western hemlock, Port-Orford-cedar, western redcedar, red alder, bigleaf maple, rhododendron, salal, Oregon grape, gooseberry, elderberry, mountain ash, sword fern, wild ginger, huckleberry, oxalis, vanillaleaf, twistedstalk, twinflower, thimbleberry, grasses, and mosses.

SOIL: Soil 125 is a very deep soil derived from residuum and colluvium. Soil depth is usually greater than 60 inches, but may be shallower locally. The soil materials are generally well drained. Surface soil erosion potential is slight. Erosion Class II.

Litter: Needles, leaves, and twigs, a trace to 1 1/2 inches thick. Decomposed humus material, 1 to 1 1/2 inches thick.

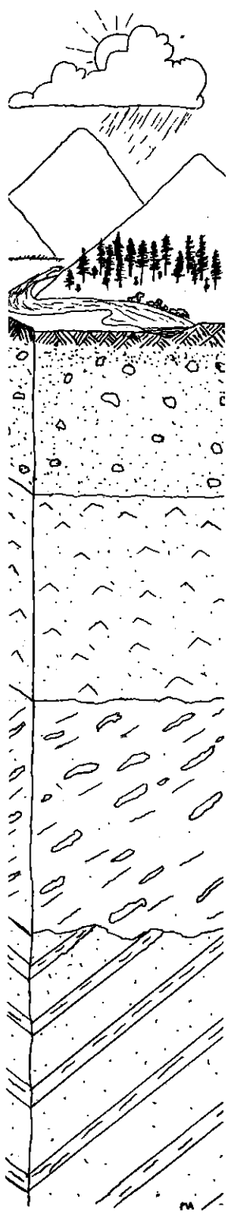
Surface Layers: Surface layers are sandy loams through clay loams. Colors are dark brown. Structure is moderate, medium granular and subangular blocky. Rock fragments range from 5 to 20 percent by volume. Consistence is soft, very friable to friable, non sticky to sticky, and non plastic to plastic. The pH ranges from 5.9 to 6.5. Surface thickness ranges from 20 to 35 inches. Surface layers are moderately permeable.

Subsoil Layers: Subsoil layers are loams to very gravelly loams through heavy clay loams. Colors are brown to strong brown. Structure is weak to moderate, medium subangular blocky. Rock fragments range from 10 to 45 percent by volume. Consistence is soft, friable to firm, sticky to slightly sticky, and slightly plastic to plastic. The pH ranges from 5.7 to 6.1. Subsoil thickness ranges from 20 to 40 inches plus. Subsoil layers have moderate permeability rates.

Modal Site Location: SW¼, NE¼, Section 16, T.32S., R.11W.

GEOLOGY: Bedrock consists of soft to moderately hard, thick sequences of rhythmically bedded sandstone with thin interbeds of soft siltstone of the Tyee Formation.

176



LANDTYPE UNIT: Landtype 176 is found on moderately steep to very steep sideslopes on the west side of the Klamath Mountains. Common inclusions in this unit are Landtypes 19, 46, 48, 178, 191, and 194.

CLIMATE:

Precipitation: 90 to 140 inches/year. 229 to 356 cm/year.
Soil Temperature Class: Mesic.

TOPOGRAPHY:

Slope: 50 to 90+ percent, moderately to highly dissected slopes.
Aspect: Generally north, northwest, northeast, and east.
Elevation: 1,000 to 3,500 feet. 304 to 1,067 meters.
Stability: Landtype 176 is moderately unstable to locally unstable. Stability Class III, locally IV.

VEGETATION: This unit supports Site Class IV and some Site Class III Douglas-fir. Other species include: Western hemlock, Port-Orford-cedar, western redcedar, red alder, tanoak, Pacific Madrone, Canyon live oak, Oregon myrtle, California hazel, evergreen huckleberry, dogwood, chinkapin, poison oak, serviceberry, sword fern, whitethorn ceanothus, vine maple, salal, rhododendron, Oregon grape, oxalis, grasses, and mosses.

SOIL: Soil 176 is a shallow to moderately deep soil derived from residuum and colluvium. Soil depth is 10 to 20 inches, but ranges to 40 inches. The soil materials are generally excessively drained. Surface soil erosion potential is severe to very severe. Erosion Class IV and V.

Litter: Needles, leaves, and twigs, a trace to 1 inch thick.

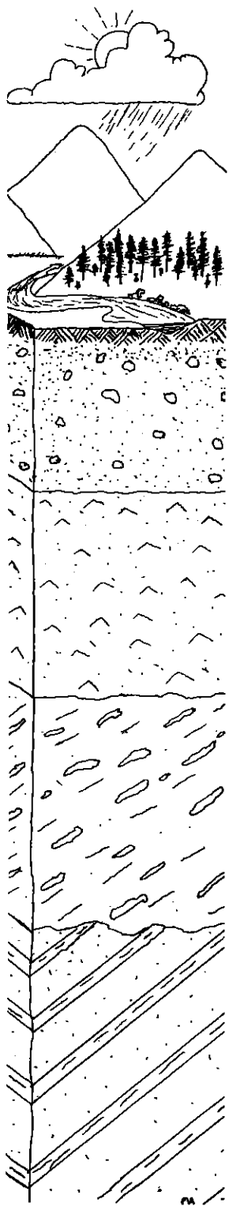
Surface Layers: Surface layers are very gravelly loams and sandy loams. Colors are dark grayish brown to dark brown. Structure is weak very fine to medium granular and subangular blocky. Rock fragments range from 40 to 65 percent by volume. Consistence is soft, very friable to friable, slightly sticky, and non plastic. The pH ranges from 6.0 to 6.6. Surface thickness ranges from 6 to 13 inches. Surface layers have rapid permeability rates.

Subsoil Layers: Subsoil layers are usually very cobbly to extremely cobbly or gravelly loams and silt loams. Colors are brown, dark brown, and yellowish brown. Structure is weak, very fine and fine subangular blocky. Rock fragments range from 50 to 80 percent by volume. Consistence is soft to slightly hard, very friable to friable, slightly sticky, and non plastic. The pH ranges from 6.0 to 6.6. Subsoil thickness ranges from 6 to 24 inches. Subsoil layers have rapid permeability rates.

Modal Site Location: SE¼, NE¼, Section 8, T.32S., R.13W.

GEOLOGY: Bedrock consists of hard to moderately hard fractured metasedimentary rocks of the Galice and related formations. Small inclusions of metavolcanic rock and pebbly conglomerate are interspersed locally. Hardest bedrock is usually found on steep slopes and adjacent to drainages. Highly fractured bedrock may be subject to failure.

177



LANDTYPE UNIT: Landtype 177 is found on gentle ridgetops to moderately steep sideslope positions on the west side of the Klamath Mountains. Common inclusions in this unit are Landtypes 19, 42, 176, and 178.

CLIMATE:

Precipitation: 100 to 130 inches/year. 254 to 330 cm/year.
Soil Temperature Class: Mesic.

TOPOGRAPHY:

Slope: 20 to 55 percent, slight to moderate dissected slopes.
Aspect: All aspects.
Elevation: 800 to 3,500 feet. 243 to 1,067 meters.
Stability: Landtype 177 is moderately stable to moderate unstable. Stability Class II and III.

VEGETATION: This unit supports Site Class III Douglas-fir. Other species include: Western hemlock, Port-Orford-cedar, western redcedar, red alder, tanoak, Pacific madrone, Oregon myrtle, evergreen huckleberry, dogwood, service-berry, sword fern, rhododendron, Oregon grape, oxalis, grasses, and mosses.

SOIL: Soil 177 is a deep soil derived from colluvium and residuum. Soil depth is generally 40 to 60 inches with minor inclusions of shallower soil. The soil materials are generally well drained. Surface soil erosion potential is moderate to severe. Erosion Class III and IV.

Litter: Needles, leaves, and twigs, a trace to 1 1/2 inches thick. Decomposed humus material, a trace to 1/2 inch thick.

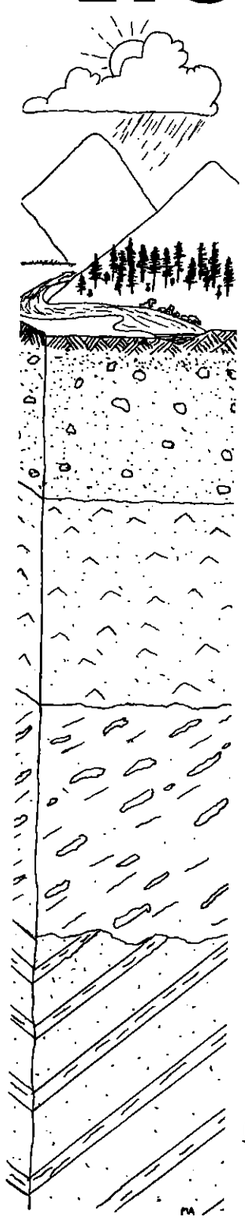
Surface Layers: Surface layers are gravelly to very gravelly loams. Colors are dark grayish brown to dark brown. Structure is weak, fine and medium granular to subangular blocky. Rock fragments range from 20 to 50 percent by volume. Consistence is soft, very friable to friable, non sticky to slightly sticky, and non plastic. The pH ranges from 5.8 to 6.6. Surface thickness ranges from 10 to 22 inches. Surface layers have rapid permeability rates.

Subsoil Layers: Subsoil layers are generally very gravelly loams through light clay loams. Colors are brown and yellowish brown. Structure is moderate, fine and medium subangular blocky. Rock fragments range from 30 to 60 percent by volume. Consistence is slightly hard, friable to firm, slightly sticky, and slightly plastic. The pH ranges from 5.8 to 6.6. Subsoil thickness ranges from 20 to 38 inches. Subsoil layers have moderate to rapid permeability rates.

Modal Site Location: NW¼, NW¼, Section 35, T.33S., R.12W.

GEOLOGY: Bedrock consists of moderately hard, highly fractured metasedimentary rocks of the Galice and related formations.

178



LANDTYPE UNIT: Landtype 178 is found on steep to very steep sideslopes positions on the west side of the Klamath Mountains. Common inclusions in this unit are Landtypes 19, 48, 176, 177, and 194.

CLIMATE:

Precipitation: 90 to 140 inches/year. 229 to 356 cm/year.
Soil Temperature Class: Mesic.

TOPOGRAPHY:

Slope: 60 to 90+ percent, moderate to highly dissected slopes.
Aspect: Generally southeast, south, southwest, and west.
Elevation: 1,000 to 3,500 feet. 304 to 1,067 meters.
Stability: Landtype 178 is moderately stable with inclusions of moderately unstable areas. Stability Class II, locally III.

VEGETATION: This unit supports Site Class IV and V Douglas-fir. Other species include: Western hemlock, Port-Orford-cedar, western redcedar, red alder, tanoak, madrone, canyon live oak, Oregon myrtle, sword fern, Oregon grape, bracken fern, grasses, and mosses.

SOIL: Soil 178 is a shallow soil derived from residuum and colluvium. Soil depth is generally 10 to 20 inches with minor inclusions of slightly deeper soils. The soil materials are generally excessively drained. Surface soil erosion potential is severe to very severe. Erosion Class IV and V.

Litter: Needles, leaves, and twigs, a trace to 1/2 inch thick.

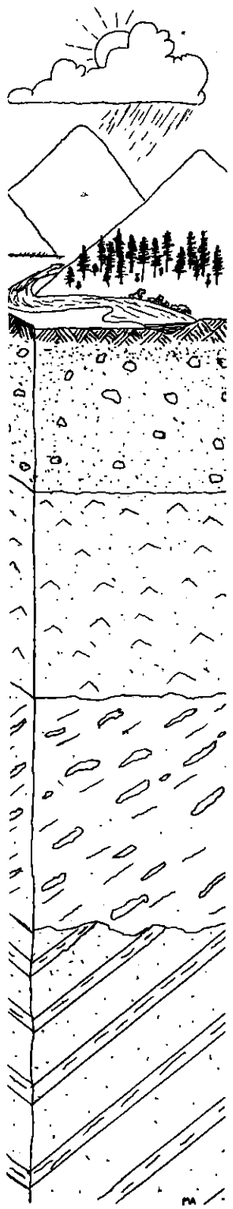
Surface Layers: Surface layers are very gravelly sandy loams and loams. Colors are dark grayish brown to dark brown. Structure is weak, very fine and fine granular. Rock fragments range from 35 to 65 percent by volume. Consistence is soft, very friable to friable, non sticky, and non plastic. The pH ranges from 6.0 to 6.6. Surface thickness ranges from 4 to 11 inches. Surface layers have rapid permeability rates.

Subsoil Layers: Subsoil layers are very gravelly to extremely gravelly or cobbly loams and silt loams. Colors are brown and yellowish brown. Structure is weak, very fine and fine subangular blocky. Rock fragments range from 50 to 80 percent by volume. Consistence is soft to slightly hard, friable, slightly sticky, and non plastic. The pH ranges from 6.0 to 6.6. Subsoil thickness ranges from 6 to 16 inches. Subsoil layers have rapid permeability rates.

Modal Site Location: SE¼, SW¼, Section 14, T.33S., R.14W.

GEOLOGY: Bedrock consists of hard, moderately to highly fractured metasedimentary rocks of the Galice and related formations. Small inclusions of metavolcanic rocks and pebbly components are interspersed throughout the unit.

186



LANDTYPE UNIT: Landtype 186 is found on steep sideslope positions west of the Klamath Mountains. Common inclusions to this unit include Landtypes 176 and 178.

CLIMATE:

Precipitation: 80 to 100 inches/year. 203 to 254 cm/year.
Soil Temperature Class: Mesic.

TOPOGRAPHY:

Slope: 55 to 90+ percent, moderately dissected slopes.
Aspect: All aspects.
Elevation: 1,500 to 4,000 feet. 456 to 1,216 meters.
Stability: Landtype 186 is moderately stable. Stability Class II.

VEGETATION: This unit supports Site Class IV and III Douglas-fir. Other species include: Tanoak, madrone, western hemlock, incense-cedar, Port-Orford-cedar, huckleberry, ceanothus, rhododendron, Oregon grape, salal, mosses, and grasses.

SOIL:

Soil 186 is a shallow to moderately deep soil derived from residuum and colluvium. Soil depth is 10 to 20 inches but ranges to 40 inches deep. The soil materials are generally excessively drained. Surface soil erosion potential is severe. Erosion Class IV.

Litter: Needles, leaves, and twigs, a trace to 1 inch thick.

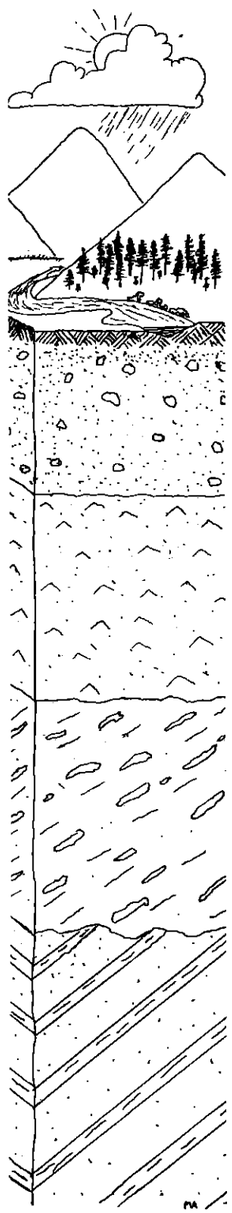
Surface Layers: Surface layers are very gravelly to extremely gravelly sandy loams and loams. Colors are dark brown. Structure is weak, very fine granular to fine subangular blocky structure. Rock fragments range from 35 to 80 percent by volume. Consistence is soft, very friable, non sticky, and non plastic. The pH ranges from 5.8 to 6.2. Surface thickness ranges from 3 to 12 inches. Surface layers have rapid permeability rates.

Subsoil Layers: Subsoil layers are very gravelly to extremely gravelly loams and sandy loams. Colors are dark brown to dark yellowish brown. Structure is weak, fine and very fine subangular blocky. Rock fragments range from 35 to 70 percent by volume. Consistence is loose, friable, non sticky, and non plastic. The pH ranges from 5.6 to 6.2. Subsoil thickness ranges from 6 to 28 inches thick. Subsoil layers have rapid permeability rates.

Modal Site Location: NW¼, SW¼, Section 3, T.32S., R.12W.

GEOLOGY: Bedrock consists of hard metavolcanic rocks of the Galice Formation.

191



LANDTYPE UNIT: Landtype 191 is found on steep to very steep sideslope positions on the west side of the Klamath Mountains. Common inclusions in this unit are Landtypes 19, 46, 176, 192, and 194.

CLIMATE:

Precipitation: 90 to 150 inches/year. 219 to 381 cm/year.
Soil Temperature Class: Mesic.

TOPOGRAPHY:

Slope: 50 to 90+ percent, moderate to highly dissected slopes.
Aspect: Generally northwest, north, northeast, and east.
Elevation: 500 to 3,500 feet. 152 to 1,067 meters.
Stability: Landtype 191 is moderately stable to moderately unstable. Stability Class II and III.

VEGETATION: This unit supports Site Class IV Douglas-fir. Other species include: Western hemlock, Port-Orford-cedar, western redcedar, red alder, tanoak, madrone, canyon live oak, Oregon myrtle, evergreen huckleberry, dogwood, chinkapin, poison oak, serviceberry, sword fern, whitethorn ceanothus, vine maple, Oregon grape, beargrass, grasses, and mosses.

SOIL:

Soil 191 is a shallow soil derived from residuum and colluvium. Soil depth is generally 10 to 20 inches, but may be deeper. The soil materials are generally excessively drained. Surface soil erosion potential is very severe. Erosion Class V.

Litter: Needles, leaves, and twigs, a trace to 1 inch thick.

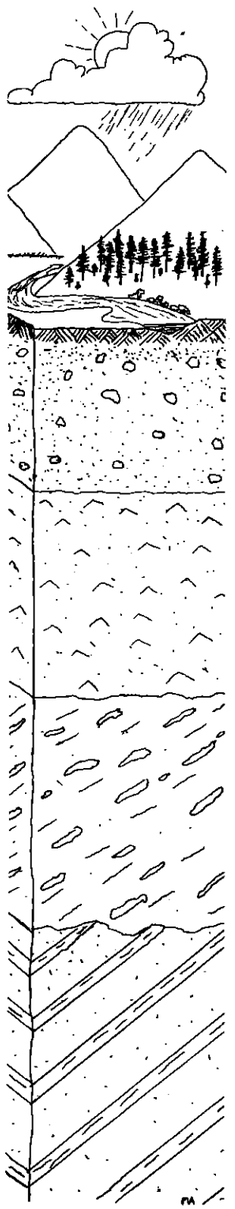
Surface Layers: Surface layers are very gravelly sandy loams and loams. Colors are very dark grayish brown and dark brown. Structure is weak, fine and medium granular. Rock fragments range from 35 to 60 percent by volume. Consistence is soft, very friable, non sticky, and non plastic. The pH ranges from 5.5 to 6.5. Surface thickness ranges from 6 to 10 inches. Surface layers have rapid permeability rates.

Subsoil Layers: Subsoil layers are very gravelly to extremely gravelly or cobbly loams. Colors are brown and dark yellowish brown. Structure is weak, very fine and fine subangular blocky. Rock fragments range from 45 to 80 percent by volume. Consistence is soft, friable, slightly sticky, and non plastic. The pH ranges from 5.5 to 6.5. Subsoil thickness ranges from 8 to 15 inches. Subsoil layers have rapid permeability rates.

Modal Site Location: SW¼, SE¼, Section 28, T.33S., R.14W.

GEOLOGY: Bedrock consists of hard slightly to moderately fractured diorites, granodiorites, and locally granites.

192



LANDTYPE UNIT: Landtype 192 is found on moderately steep sideslope positions on the west side of the Klamath Mountains. Common inclusions in this unit are Landtypes 19, 46, 177, 191, and 193.

CLIMATE:

Precipitation: 90 to 150 inches/year. 219 to 381 cm/year.
Soil Temperature Class: Mesic.

TOPOGRAPHY:

Slope: 30 to 60 percent, moderately dissected sideslopes.
Aspect: All aspects.
Elevation: 500 to 3,500 feet. 152 to 1,067 meters.
Stability: Landtype 192 is moderately stable to moderately unstable. Stability Class II and III.

VEGETATION: This unit supports Site Class III and IV Douglas-fir. Other species include: Western hemlock, Port-Orford-cedar, western redcedar, red alder, tanoak, Sadler oak, madrone, canyon live oak, Oregon myrtle, California hazel, evergreen huckleberry, dogwood, chinkapin, cascara, poison oak, serviceberry, whitethorn ceanothus, vine maple, Oregon grape, twinflower, bedstraw, grasses, and mosses.

SOIL: Soil 192 is a moderately deep soil derived from residuum and colluvium. Soil depth is generally 20 to 40 inches, with minor inclusions of deeper soils. The soil materials are generally well drained. Surface soil erosion potential is severe. Erosion Class IV.

Litter: Needles, leaves, and twigs, 1/2 to 1 1/2 inches thick. Decomposed humus material, a trace to 1/2 inch thick.

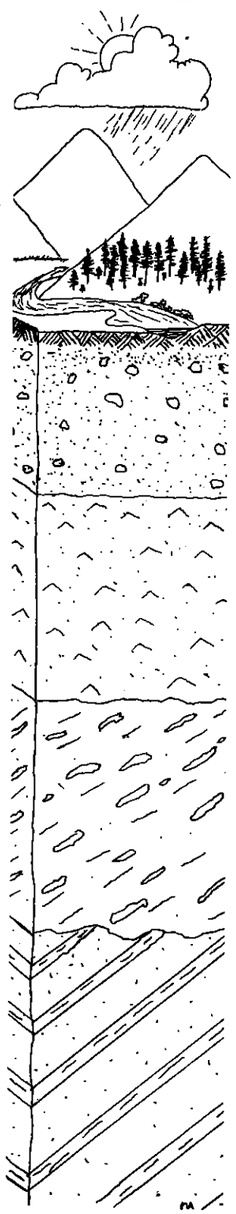
Surface Layers: Surface layers are loams and gravelly sandy loams. Colors are very dark brown, very dark grayish brown, and dark brown. Structure is weak, fine granular to subangular blocky. Rock fragments range from 5 to 30 percent by volume. Consistence is soft, friable, non sticky, and non plastic. The pH ranges from 5.3 to 6.3. Surface thickness ranges from 8 to 15 inches. Surface layers have moderate to rapid permeability rates.

Subsoil Layers: Subsoil layers are gravelly heavy loams to extremely gravelly loamy sands. Colors are dark yellowish brown, yellowish brown, and brown. Structure is weak, fine subangular blocky to massive. Rock fragments range from 20 to 75 percent by volume. Consistence is loose to hard, loose to firm, non sticky to sticky, and non plastic to plastic. The pH ranges from 5.3 to 6.2. Subsoil thickness ranges from 15 to 25 inches. Subsoil layers have moderate to very rapid permeability rates.

Modal Site Location: NE¼, NW¼, Section 22, T.34S., R.12W.

GEOLOGY: Bedrock consists of moderately hard, moderate to highly fractured diorite. Mineral composition ranges from granite to gabbro in local areas.

193



LANDTYPE UNIT: Landtype 193 is found on gentle ridgetops on the west side of the Klamath Mountains. Common inclusions in this unit are Landtypes 177 and 192.

CLIMATE:

Precipitation: 110 to 150 inches/year. 279 to 381 cm/year.
Soil Temperature Class: Mesic.

TOPOGRAPHY:

Slope: 0 to 30 percent, smooth slopes.
Aspect: All aspects.
Elevation: 1,200 to 3,500 feet. 366 to 1,067 meters.
Stability: Landtype 193 is moderately stable. Stability Class II.

VEGETATION: This unit supports Site Class III Douglas-fir. Other species include: Western hemlock, Port-Orford-cedar, western redcedar, tanoak, Oregon myrtle, red alder, evergreen huckleberry, chinkapin, cascara, poison oak, Oregon grape, bearberry, ferns, beargrass, grasses, and mosses.

SOIL: Soil 193 is a deep to very deep soil derived from colluvium and residuum. Soil depth is 40 to 60 inches with minor inclusions of deeper soil. The soil materials are generally moderately well drained. Surface soil erosion potential is moderate. Erosion Class III.

Litter: Needles, leaves, and twigs, 1/2 to 3 inches thick. Decomposed humus material, a trace to 1/2 inch thick.

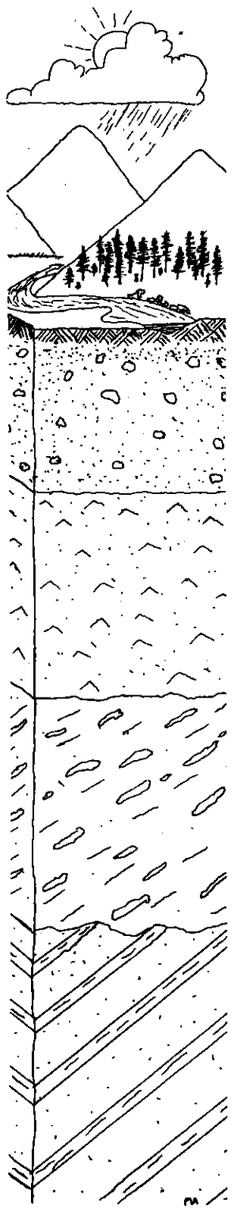
Surface Layers: Surface layers are loams to gravelly loams. Colors are very dark brown, very dark grayish brown, and dark brown. Structure is weak, fine granular. Rock fragments range from 5 to 35 percent by volume. Consistence is soft, very friable to friable, non sticky, and non plastic. The pH ranges from 5.3 to 6.2. Surface thickness ranges from 10 to 18 inches. Surface layers have moderate to rapid permeability rates.

Subsoil Layers: Subsoil layers are gravelly clay loams to extremely gravelly loams. Colors are dark yellowish brown and yellowish brown. Structure is weak to moderate, fine and medium subangular blocky to massive. Rock fragments range from 20 to 70 percent by volume. Consistence is slightly hard to hard, friable to firm, slightly sticky to sticky, and slightly plastic to plastic. The pH ranges from 5.3 to 6.2. Subsoil thickness ranges from 30 to 42 inches. Subsoil layers have moderate permeability rates.

Modal Site Location: NE¼, NW¼, Section 22, T.34S., R.12W.

GEOLOGY: Bedrock consists of soft to moderately hard, massive to slightly fractured diorites. Minor inclusions of granite also occur in this unit.

194



LANDTYPE UNIT: Landtype 194 is found on steep to very steep sideslope positions on the west side of the Klamath Mountains. Common inclusions in this unit are Landtypes 19, 48, 178, 191, and 192.

CLIMATE: Precipitation: 90 to 150 inches/year. 219 to 381 cm/year.
Soil Temperature Class: Mesic.

TOPOGRAPHY: Slope: 60 to 90+ percent, moderately to highly dissected slopes.
Aspect: Generally south, southwest, southeast, and west.
Elevation: 500 to 3,500 feet. 152 to 1,067 meters.
Stability: Landtype 194 is moderately stable to moderately unstable. Stability Class II and III.

VEGETATION: This unit supports Site Class IV and V Douglas-fir. Other species include: Western hemlock, western redcedar, Port-Orford-cedar, red alder, tanoak, canyon live oak, Oregon myrtle, chinkapin, evergreen huckleberry, poison oak, serviceberry, grasses, forbs, and mosses.

SOIL: Soil 194 is a shallow soil derived from colluvium and residuum. Soil depth is generally 10 to 20 inches. The soil materials are generally excessively drained. Surface soil erosion potential is very severe. Erosion Class V.

Litter: Needles, leaves, and twigs, a trace to 1 inch thick.

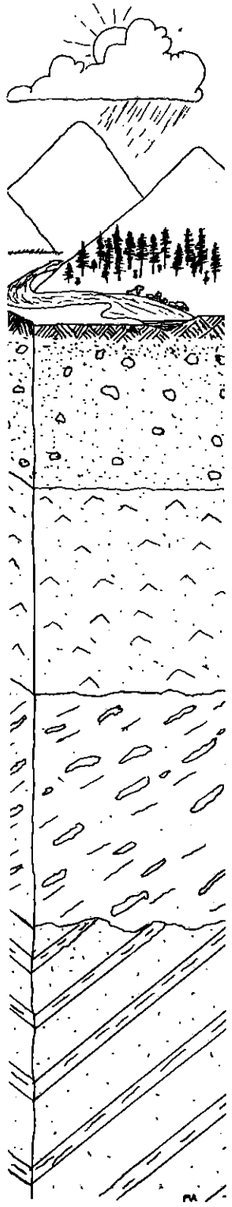
Surface Layers: Surface layers are gravelly to very gravelly loams and sandy loams. Colors are dark brown and very dark grayish brown. Structure is weak, fine granular and subangular blocky. Rock fragments range from 20 to 60 percent by volume. Consistence is soft, friable, non sticky, and non plastic. The pH ranges from 5.5 to 6.5. Surface thickness ranges from 5 to 10 inches. Surface layers have rapid permeability rates.

Subsoil Layers: Subsoil layers are very gravelly to extremely gravelly sandy loams and loams. Colors are dark brown, dark yellowish brown, and yellowish brown. Structure is weak, fine subangular blocky to massive. Rock fragments range from 35 to 75 percent by volume. Consistence is slightly hard to loose, firm to loose, slightly sticky to non sticky, non plastic to slightly plastic. The pH ranges from 5.5 to 6.5. Subsoil thickness ranges from 7 to 17 inches. Subsoil layers have rapid permeability rates.

Modal Site Location: SE¼, NW¼, Section 5, T.34S., R.12W.

GEOLOGY: Bedrock consists of moderately hard to hard, slightly to moderately fractured diorites, granodiorites, and locally granite.

196



LANDTYPE UNIT: Landtype 196 is found on moderately steep to very steep sideslopes on the west side of the Klamath Mountains. Common inclusions in this unit are Landtypes 19, 36, 50, 53, 178, 192, and 194.

CLIMATE: Precipitation: 100 to 140 inches/year. 254 to 356 cm/year.
Soil Temperature Class: Mesic.

TOPOGRAPHY: Slope: 50 to 90+ percent, moderate to highly dissected slopes.
Aspect: All aspects.
Elevation: 1,500 to 4,000 feet. 456 to 1,216 meters.
Stability: Landtype 196 is moderately stable to moderately unstable. Stability Class II and III.

VEGETATION: This unit supports Site Class IV and V Douglas-fir. Other species include: Port-Orford-cedar, incense-cedar, western white pine, Brewer spruce, sugar pine, white fir, madrone, tanoak, chinkapin, kalmiopsis leachiana, snowbrush cenaothus, manzanita, twin-flower, bedstraw, grasses, and mosses.

SOIL: Soil 196 is a shallow soil derived from residuum and colluvium. Soil depth is 10 to 20 inches thick. The soil materials are generally excessively drained. Surface soil erosion potential is very severe. Erosion Class V.

Litter: Needles, leaves, and twigs, a trace to 1/2 inch thick.

Surface Layers: Surface layers are very gravelly to extremely gravelly sandy loams and loams. Colors are very dark grayish brown, grayish brown, and dark brown. Structure is weak, fine granular to weak fine subangular blocky. Rock fragments range from 40 to 80 percent by volume. Consistence is soft, friable, non sticky to slightly sticky, and non plastic. The pH ranges from 6.0 to 7.0. Surface thickness ranges from 3 to 6 inches. Surface layers have rapid permeability rates.

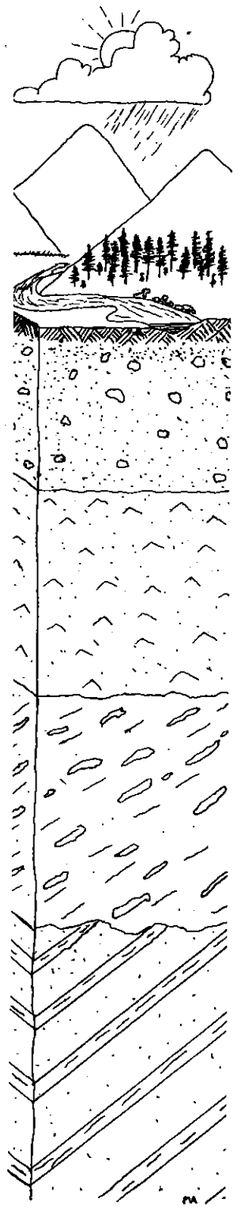
Subsoil Layers: Subsoil layers are very gravelly to extremely gravelly loams and silt loams. Colors are dark brown, grayish brown, and olive gray. Structure is moderate, fine and medium subangular blocky. Rock fragments range from 45 to 85 percent by volume. Consistence is slightly hard, firm, non sticky to slightly sticky, and non plastic. The pH ranges from 5.5 to 6.5. Subsoil thickness ranges from 6 to 16 inches. Subsoil layers have rapid permeability rates.

Modal Site Location: NW¼, SE¼, Section 32, T.39S., R.10W.

GEOLOGY: Bedrock consists of hard highly fractured gabbros and locally diorites.

Landtype 196u is similar to Landtype 196 except that it is found in the upper forest zone, generally between 4,000 and 5,500 feet in elevation, and supports Site Class IV Shasta red fir and white fir.

197



LANDTYPE UNIT: Landtype 197 includes the soil and environmental conditions described below. Landtype 197 is found on moderately steep sideslopes on the west side of the Klamath Mountains. Common inclusions in this unit are Landtypes 19, 36, 50, 53, 178, 192, and 193.

CLIMATE:

Precipitation: 100 to 140 inches/year. 254 to 356 cm/year.
Soil Temperature Class: Mesic.

TOPOGRAPHY:

Slope: 30 to 60 percent, moderate dissected slopes.
Aspect: All aspects.
Elevation: 1,500 to 4,000 feet. 456 to 1,216 meters.
Stability: Landtype 197 is moderately unstable to moderately stable. Stability Class II and III.

VEGETATION: This unit supports Site Class IV and some V Douglas-fir. Other species include: Port-Orford-cedar, incense-cedar, western white pine, Brewer spruce, sugar pine, white fir, madrone, tanoak, chinkapin, kalmiopsis leachiana, snowbrush cenaothus, manzanita, twin-flower, bedstraw, grasses, and mosses.

SOIL: Soil 197 is a moderately deep soil derived from residuum and colluvium. Soil depth is 20 to 40 inches thick. The soil materials are generally excessively drained. Surface soil erosion potential is moderate to severe. Erosion Class III and IV.

Litter: Needles, leaves, and twigs, a trace to 1/2 inch thick.

Surface Layers: Surface layers are gravelly to very gravelly sandy loams to clay loams. Colors are very dark grayish brown, grayish brown and dark brown. Structure is weak and moderate fine granular to weak fine subangular blocky. Rock fragments range from 15 to 60 percent by volume. Consistence is soft, friable, slightly sticky, and slighty plastic. The pH ranges from 6.0 to 7.0. Surface thickness ranges from 6 to 12 inches. Surface layers have moderate to rapid permeability rates.

Subsoil Layers: Subsoil layers are very gravelly to extremely gravelly loams, silt loams, and clay loams. Colors are dark brown, grayish brown, and olive gray. Structure is moderate, fine and medium subangular blocky. Rock fragments range from 45 to 85 percent by volume. Consistence is slightly hard, firm, slightly sticky, and slightly plastic. The pH ranges from 5.5 to 6.5. Subsoil thickness ranges from 12 to 30 inches. Subsoil layers have moderate permeability rates.

Modal Site Location: SE¼, Section 23, T.37S., R.10W.

GEOLOGY: Bedrock consists of hard highly fractured gabbros and locally diorites.

Landtype 197u is similar to Landtype 197 except that it is found in the upper forest zone, generally between 4,000 and 5,500 feet in elevation, and supports Site Class IV Shasta red fir and white fir.

APPENDIX I

CLIMATE

General

The topography and location of the Klamath Region dictates a wide range of climatic conditions. Within the boundaries of the Siskiyou National Forest, three distinct climatic areas exist: 1) West Side Klamath Mountain Range, 2) East Side Klamath Mountain Range, and 3) Siskiyou Mountain Range.

West Side Klamath Range

Precipitation

Due to its proximity to the Pacific Ocean the West Side of the Klamath Mountains are subjected to considerable marine influence. The coastal climate is characterized by high precipitation and humidity, abundant fog, and a more limited range of temperature extremes. This tends to lower evaporation and transpiration rates and increases soil moisture from fog condensation. The general movement of nearly all large moist air masses crossing the area is from southwest to northeast. Most rainfall occurs during the late fall, winter and early spring. Normal annual rainfall ranges from 80 to 150 inches per year. Local wind patterns influence rainfall distribution by funneling rain up specific drainages. Precipitation occurs primarily as rain and generally increases with elevation. Snowfall along the coast is minimal and transient. With increasing distances and elevation from the coast, snowfall becomes more common and more persistent. However, depth rarely exceeds 1 to 2 feet and usually melts by mid-spring.

West Side Klamath Range - Mt. Emily

Temperature

Mean temperatures during winter months are in the low to mid 40° F range, with infrequent short period extremes as low as 0° F. Mean summer temperatures are in the mid 60° F range with infrequent short period extremes ranging near 100° F. Temperature fluctuation in both degree and duration tend to increase with distance from the coast and its moderate marine influence.

Wind

The coastal influence also results in relatively high wind velocities, particularly during winter storms. These generally westerly and southwesterly winds commonly reach speeds of 40 mph, with winds of up to 100 mph occasionally re-corded near the coast and on the higher ridges. Damage from winds is usually confined to power and communication lines and to timber blowdown. Northwesterly winds predominate during the summer months and have much lower velocities.

Flooding

Flooding, due to heavy rain, occurs about once in ten years and may be expected during the winter months. In the coastal drainages the most recent flood occurrences have been in 1955, 1964, and 1974. Coastal fronts which produce major floods usually cause problems on other areas of the forest. Localized storm and watershed conditions may cause extreme damage to forest roads and stream channels. Some areas are susceptible to more frequent flood damage due to rainfall, soils, debris and channel conditions.

Winter Conditions

During the fall and winter low pressure systems form in the north Pacific Ocean. Counter clockwise air circulation around these low pressure systems result in a prevailaing south-westerly air flow. This results in a wet season from mid-October to mid-April causing 75 to 80 percent of the annual rainfall. About one-half of the annual rainfall occurs during the winter months; December, January and February. The forced ascent and cooling of moisture laden air masses up the west slope of the Klamath Range causes them to release moisture.

Summer Conditions

During mid to late spring, low pressure centers move further north and are gradually re-placed by high pressure systems with their clockwise circulation, resulting in a north-westerly flow of air. This air becomes warmer and drier as it moves inland, resulting in a dry season beginning in late spring, reaching a peak in summer and ending in early fall. Only 6 percent of the average annual precipitation occurs during the summer months and approximately 20 percent during the spring months. The hottest weather and lowest relative humidity occur during periods of easterly winds. Warmer drier conditions prevail with increasing distance from the coast.

East Side Klamath Range

Precipitation

By the time the incoming marine air has reached the east side of the Klamath Mountains it has been greatly modified by its passage up the west slope of the range. Considerable amounts of moisture are condensed and precipitated on the west slope and does not reach the east side of the range. Fog and humidity are decreased on the east side of the mountains and transpiration and evapo-transpiration are increased. Land surfaces, because they heat and cool faster than ocean air masses, tend to increase temperature extremes on the east side of the Klamath Range. Storm fronts generally enter from the west and southwest direction. Normal annual rainfall ranges from 35 to 80 inches per year. Snow is common at higher elevation but rarely exceeds a depth of two to three feet. Snow usually persists to mid-spring.

East Side Klamath Range - Bald Mountain

Temperature

Average monthly mean temperature ranges from 35 to 40° F in January to the mid to upper 60° F range in July. Short period temperature extremes of less than 0° F and greater than 100° F have been recorded but are not common.

Wind

Most of the high winds of this area move in from the southwest with oncoming storm fronts. The highest elevations usually experience the greatest wind velocities. Maximum velocities seldom exceed 50 mph. A more gentle wind from the northwest predominates during the summer months.

Flooding

Heavy flooding, due to heavy rain, occurs about once in 10 years. Flood producing storms occur chiefly during the winter months, but are not uncommon in late fall or early spring. Flooding occurs when soils are saturated and there are long periods of successive heavy rains.

Winter Conditions

During late fall, winter and early spring low pressure systems form in the north Pacific Ocean. Counterclockwise air circulation around these systems results in a southwesterly flow of air. This results in a wet season from November to mid-April in which 75 to 80 percent of the average annual precipitation falls.

Summer Conditions

High pressure systems replace low pressure centers about mid-spring, changing the circulation of air to a prevailing northwesterly direction. Air moves in across the coastal mountains becoming warmer and drier as it reaches the east side of the mountains. A dry season occurs mid to late spring and extends and intensifies through the summer, ending in early fall. Thunderstorms are more frequent during the summer months and usually enter from the south and southeast and east. Precipitation from thunderstorms is usually light, with higher elevations receiving the greatest amount of rainfall. Only 5 percent of the average annual precipitation occurs during the summer months.

Siskiyou Mountain Range

Precipitation

The Siskiyou Mountains, because of their location and orientation, exhibit an unusual climatic pattern. This area within the borders of the Siskiyou National Forest lies east of Oregon Mountain and west of Grayback and Swan mountains and extends both north and south of the Oregon-California border. The Siskiyou's are so positioned that they receive both the cold, wet polar storms characteristic of Oregon north of the Klamath Province and the warm, wet marine storms of northern California and southern Oregon. These cold and warm wet influxes combine with an existing xeric 1/ climate and an unusual east-west orientation to produce a unique climatic situation. Precipitation ranges from 50 to 90 inches per year. Rain and snow generally increase with elevation. Rain generally decreases eastward while snow generally increases. Many local variations exist to this pattern however, due to the east-west orientation of the range which lies parallel to incoming storm fronts and allows precipitation to be channeled up specific drainages according to topography and wind patterns. Because the Siskiyou Mountain area has higher elevations than the rest of the Forest, a wider range of snow accumulation occurs. At elevations of 4,000 feet, one foot of snow is the average annual snow depth, while at 4,500 feet the average is two feet. Snow at these elevations usually melts by mid-spring. Above 5,000 feet, and especially on north facing slopes, snow depth may exceed 8 feet and persist to mid-June. Thunderstorms occasionally occur in the area during the summer months, and the resulting lightning strikes are a major cause of forest fires. Precipitation during these storms is generally light, although at higher elevations the frequency and duration of summer showers may be more significant.

Temperature

Temperature increases proceed west to east along the Siskiyou Mountain Range. Midslope temperature ranges tend to be less extreme than on valley bottom and ridge positions. Average temperature for the whole unit is 53° F. Extreme temperatures of 100° F or higher and 0° or lower are infrequent. However, temperatures exceeding 100° F occur during summer months in valley positions and temperatures of 0° F occur during the winter months at the higher elevations.

Wind

Prevailing winds are from the southwest during the winter months. Maximum wind velocities of 80 mph have been recorded, but their occurrence is rare and usually limited to the higher elevations. Northwesterly winds predominate during the summer months and are usually of low intensity.

Flooding

Local flooding due to heavy rains occurs about once in 10 years and can be expected in late fall, winter or early spring. Major flooding often is a result of waves of warm heavy rain falling on an existing snowpack. The warm rains rapidly melt the snow and lead to saturated soils, high runoff rate, and peak stream discharges.

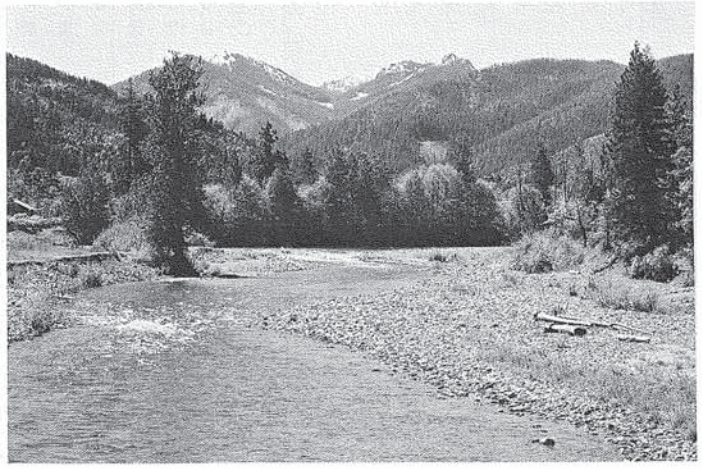
1/ Characterized by moist and cool winters and warm and dry summers.

Winter Conditions

During the fall and winter months low pressure systems drive both cold, wet influxes from the north Pacific Ocean and warm wet influxes from northern California in the area. During mid-October to mid-April 75 to 80 percent of the areas average annual precipitation occurs. As storms are driven over the Klamath Mountains, forced assent of the air masses causes them to lose moisture. The rainbearing potential of these storms lessens generally from west to east but this is modified by topography and localized wind conditions.

Summer Conditions

During mid to late spring, low pressure centers are replaced by high pressure systems resulting in warmer and drier air circulation as it moves inland. A dry warm season exists from late spring through summer. Only about 5 percent of the annual average precipitation occurs during the summer months.



Siskiyou Mountain Range - East Fork Illinois River

PRECIPITATION: MEANS, MONTHLY AND ANNUAL, 1931-1976

Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Bandon	9.61	7.58	6.78	3.65	2.62	1.45	.43	.39	1.59	5.13	7.67	9.14	56.04
Brookings	13.63	10.10	9.01	5.66	4.60	1.64	.64	.94	1.96	7.29	12.23	13.24	80.94
Gold Beach RD	14.51	10.30	10.05	5.92	4.40	1.74	.56	.85	1.92	7.29	12.22	13.59	83.35
Grants Pass	5.82	4.50	3.20	1.69	1.63	.91	.26	.18	.76	2.71	3.94	5.51	31.07
Illahe	16.05	12.55	10.10	4.66	3.61	1.46	.39	.55	1.75	7.16	12.67	15.95	86.90
Port Orford	12.40	9.71	9.63	4.89	3.57	1.98	.69	.74	2.10	6.54	8.76	11.85	72.86
Powers	11.21	8.02	7.78	4.05	3.03	1.46	.34	.46	1.22	5.25	8.70	11.17	62.65
Williams	8.24	4.88	3.49	1.18	1.42	.77	.21	.31	.68	3.68	4.54	6.76	36.16

TEMPERATURES: MEANS, MONTHLY AND ANNUAL, 1931-1976

Location	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep	Oct	Nov	Dec	Annual
Bandon	45.9	46.5	46.7	49.2	52.3	55.9	57.4	57.4	56.3	53.4	50.0	47.2	51.5
Brookings	47.0	48.3	48.7	50.6	54.1	57.5	58.5	58.9	59.6	55.8	51.8	48.5	53.03
Gold Beach RD	47.1	47.6	48.1	50.0	53.4	56.6	58.5	58.8	58.3	54.8	51.2	48.7	52.8
Grants Pass	39.2	43.4	48.0	53.7	59.4	64.6	70.6	69.4	64.4	54.7	44.5	40.7	54.4
Illahe	41.0	45.0	48.1	53.4	58.6	63.7	70.1	69.8	66.0	56.0	47.3	43.5	55.2
Port Orford	46.7	47.3	48.2	50.7	53.8	57.0	59.2	59.7	58.3	54.9	50.7	48.5	52.9
Powers	43.4	46.1	47.3	50.6	55.0	59.4	63.5	63.8	61.4	55.3	49.8	44.9	52.2

SNOW COURSE

February, March, April

Page Mt., 4,080 Ft.

	February				March				April			
Year	Snow 1/	Snow Avg.	Equiv. Water	Water Avg.	Snow	Snow Avg.	Equiv. Water	Water Avg.	Snow	Snow Avg.	Equiv. Water	Water Avg.
1955	16	-	4.4	-	28	-	5.6	-	8	-	2.6	-
1956	15	15.5	1.6	3.0	72	50.0	18.0	11.8	54	31.0	19.6	11.1
1957	24	18.3	5.0	3.7	0	33.3	0	7.9	0	20.7	0	7.4
1958	2	14.3	.2	2.8	0	25.0	0	5.9	13	18.7	1.6	6.0
1959	0	11.4	0	2.2	29	25.8	8.6	6.4	8	16.6	2.6	5.3
1960	6	10.5	1.3	2.1	4	22.2	1.2	5.6	1	14.0	.2	4.4
1961	0	9.0	0	1.8	0	19.0	0	4.8	11	13.6	3.7	4.3
1962	3	8.3	1.0	1.7	3	17.0	.6	4.3	17	14.0	5.6	4.5
1963	1	7.4	.1	1.5	0	15.1	0	3.8	2	12.7	.4	4.0
1964	14	8.1	6.2	2.0	6	14.2	2.4	3.6	10	12.4	3.6	4.0
1965	12	8.5	5.7	2.3	3	13.2	1.6	3.5	0	11.3	0	3.6
1966	36	10.8	16.0	3.5	41	15.5	17.0	4.6	33	13.1	15.0	4.6
1967	8	10.5	3.4	3.5	0	14.3	0	4.2	10	12.8	2.6	4.4
1968	18	11.1	2.6	3.4	0	13.3	0	3.9	0	11.9	0	4.1
1969	52	13.8	17.3	4.3	61	16.5	18.7	4.9	40	13.8	15.8	4.9
1970	1	13.0	.1	4.0	6	15.4	0	4.6	0	12.9	0	4.6
1971	8	12.7	3.1	4.0	7	14.9	.9	4.4	8	12.6	2.8	4.5
1972	12	12.7	2.7	3.9	4	14.3	2.4	4.3	0	11.9	.8	4.3
1973	16	12.8	4.0	3.9	0	13.6	0	4.1	3	11.5	.8	4.1
1974	0	12.2	0	3.7	16	13.7	3.4	4.0	6	11.2	2.6	4.0
1975	3.2	11.8	.32	3.5	10	13.5	4.1	4.0	17.4	11.5	6.2	4.1
1976	0	11.2	0	3.4	.2	13.5	.1	4.0	8.5	11.3	2.3	4.1
1977	0	10.7	0	3.3	17.0	13.1	3.1	3.8	10.5	11.3	3.6	4.0
1978	0	10.3	0	3.1	0	12.6	0	3.6	0	10.4	0	3.7

1/ All figures listed in inches.

SNOW COURSE
February, March, April

Althouse #1, 4,500 Ft.

Year	February				March				April			
	Snow 1/	Snow Avg.	Equiv. Water	Water Avg.	Snow	Snow Avg.	Equiv. Water	Water Avg.	Snow	Snow Avg.	Equiv. Water	Water Avg.
1937	49		19.1						55		22.2	
1938	2	25.5	.5	9.8					64	59.5	29.0	25.6
1939	15	22.0	2.5	7.4					15	44.7	6.2	19.1
1940	0	16.5	0	5.5	9	8.5	2.0		0	33.5	0	14.4
1941	16	16.4	5.8	5.6	8	10.0	2.9	2.5	0	26.8	0	11.5
1942	2	14.0	.5	4.7	13	7.8	3.7	2.9	5	23.2	1.8	9.9
1943	8	13.1	1.9	4.3	1	7.2	.1	2.2	1	20.0	.1	8.5
1944	1	11.6	.1	3.8	5	6.2	1.3	2.0	1	17.6	.1	7.4
1945	1	10.4	.1	3.4	1	7.3	.1	1.7	20	17.9	7.4	7.4
1946	8	10.2	1.6	3.2	14	6.4	4.3	2.1	14	17.5	5.5	7.2
1947	8	10.0	1.3	3.0	0	5.8	0	1.8	0	15.9	0	6.7
1948	10	10.0	3.0	3.0	1	7.4	.1	1.6	8	15.3	2.7	6.3
1949	12	10.2	3.0	3.0	22	9.6	7.7	2.2	19	15.5	6.7	6.3
1950	40	12.3	11.3	3.6	32	9.3	12.6	3.2	37	17.1	14.7	6.9
1951	12	12.3	3.6	3.6	5	12.7	1.2	3.0	2	16.1	.6	6.5
1952	51	14.7	21.4	4.7	54	12.6	22.7	4.5	62	18.9	25.4	7.7
1953	14	14.6	5.6	4.7	12	13.0	5.1	4.6	17	18.8	5.2	7.5
1954	29	15.4	9.9	5.1	18	13.3	6.6	4.4	15	18.6	4.4	7.3
1955	8	15.0	2.2	4.9	18	15.9	3.8	4.6	6	17.9	2.0	7.1
1956	11	14.8	1.8	4.8	57	15.0	15.9	5.3	47	19.4	18.2	7.8
1957	16	14.9	3.1	4.7	1	14.3	.1	5.0	0	18.5	0	7.4
1958	1	14.3	.1	4.5	0	14.9	0	4.7	10	18.1	2.4	7.0
1959	0	13.6	0	4.3	27	14.7	7.4	4.6	13	17.9	4.6	6.9
1960	8	13.4	.7	4.1	10	14.1	3.3	4.6	1	17.2	1.0	6.7
1961	0	12.9	0	4.0	1	14.3	.1	4.6	21	17.3	6.8	6.7
1962	1	12.4	.1	3.8	6	13.1	1.4	4.5	26	17.7	9.2	6.8
1963	1	12.0	.1	3.7	0	13.1	0	4.3	1	17.1	.1	6.5
1964	21	12.3	9.2	3.9	13	13.1	5.7	4.3	24	17.3	11.5	6.7
1965	23	12.7	11.2	4.1	12	13.1	6.0	4.4	2	16.8	.8	6.5
1966	43	13.7	19.0	4.6	59	14.8	24.1	5.1	63	18.3	29.5	7.3
1967	14	13.7	5.3	4.6	12	14.7	5.0	5.1	24	18.5	7.8	7.3
1968	14	13.7	4.6	4.6	0	14.2	0	4.9	0	17.9	0	7.1
1969	72	15.5	27.7	5.3	82	16.4	29.2	5.4	61	19.2	27.2	7.7
1970	4	15.1	.8	5.2	1	15.9	.4	5.6	0	18.6	0	7.4
1971	28	15.9	10.6	5.4	21	16.1	5.6	5.6	32	19.0	12.6	7.6
1972	25	15.7	8.4	5.4	20	16.2	8.7	5.7	0	18.5	0	7.4
1973	25	16.0	6.3	5.5	13	16.1	5.6	5.7	21	18.6	8.2	7.4

1/ All figures listed in inches.

SNOW COURSE

February, March, April

Althouse #2, 4,600 Ft.

Year	February				March				April			
	Snow 1/	Snow Avg.	Equiv. Water	Water Avg.	Snow	Snow Avg.	Equiv. Water	Water Avg.	Snow	Snow Avg.	Equiv. Water	Water Avg.
1969	71.9		27.7		82.3		29.3		61.4		27.2	
1970	3.6	37.8	.9	14.3	1.1	41.7	.5	14.9	0	30.7	0	13.6
1971	27.6	34.4	10.6	13.1	20.8	34.7	5.7	11.8	32.4	31.3	12.6	13.3
1972	25.1	32.1	8.4	11.9	20.2	31.1	8.5	11.0	0	23.5	0	10.0
1973	26.4	30.9	6.2	10.8	12.5	27.4	5.1	9.8	18.6	22.5	7.2	9.4
1974	3.9	26.4	1.6	9.2	27.1	27.3	7.2	9.4	22.1	22.4	9.9	9.5
1975	4.3	23.3	.3	8.0	20.5	26.4	8.1	9.2	38.9	24.8	14.1	10.1
1976	0	20.4	0	6.9	8.9	27.6	2.8	9.6	17.0	23.8	5.0	9.5
1977	0	18.1	0	6.2	21.4	23.9	4.4	8.0	19.6	23.3	7.5	9.3
1978	7.3	17.0	2.4	5.8	3.7	21.9	1.6	7.3	0	21.0	0	8.4

1/ All figures listed in inches.

APPENDIX II

GEOLOGY AND PHYSIOGRAPHY

The Siskiyou National Forest is located in the Klamath geologic province. The area consists predominately of pre-tertiary sediments and volcanics that have been folded, faulted, and intruded by serpentinized masses of ultra-basic and granitoid rocks. The area is rugged with narrow canyons generally between 2,000 and 5,000 feet in elevation. Rocks of the Klamath Mountain region are much older than those of other parts of western Oregon and the area probably contains the oldest formations in the State.

The Klamath geologic province is geologically diverse and has a complex history. Many geologic processes have had a major effect upon this region including major periods of sea floor subduction at the continental border, volcanism, faulting, intrusion, erosion, mass wasting, and uplift. The overall structural pattern of the Klamath province consists of north-south trending bands which curve around to the northeast. Generally the boundaries between the bands are fault contacts, with serpentine and granitic plutons occurring in the zones of faulting.

The most apparent geomorphic processes occurring on the Siskiyou National Forest are fluviation (degradation of the land surface by running water) and mass wasting. Fluviation is most evident on the steep, rugged slopes which dominate the terrain of the Forest. Mass wasting is widespread across the Forest and commonly occurs along geologic contacts, fault zones, in highly fractured parent material, and in areas of moisture accumulation and stream channel cutting of toe slopes.

The following is a brief description of each bedrock type, its general location, and corresponding SRI units as they appear on the Siskiyou National Forest.

Metagabbro

This dark gray, medium-grained altered rock is found in the Limpy, Shan, and Upper Silver Creek areas of the Galice Ranger District. The metagabbro occurs as an elongated intrusion between meta-volcanics and meta-sediments of the Galice Formation, and is adjacent to serpentine areas. The metagabbro tends in a northeasterly direction. This bedrock type occurs in conjunction with SRI units 21 through 23.

Dacite and Rhyolite

These porphry dikes and sills are commonly white, light gray, fine grained with euhedral feldspar phenocrysts. The dacite and rhyollite occur along ridgetops in the Mt. Emily area of the Chetco Ranger District. These bedrock types occur in conjunction with SRI Units 26 through 29.

Serpentine and Peridotite

Peridotite is a green to rust colored, medium grained rock consisting of differing proportions of olivine and pyroxene that has in part been altered to serpentine and broken by innumerable braided shear planes into small blocks or curved shiny translucent plates. Serpentine ranges in color from yellow through olive greens to black. These ultrabasic rocks occur most often along faults and geologic contacts. Often there are patches of the native rock complexed within the intruding peridotite and serpentine. Segments of these ultrabasics are distributed in most areas of the Forest. The major block of serpentine extends from Eight Dollar Mountain on the Illinois Valley District, south through Rough and Ready Creek to the California boarder, west to the north fork of the Smith River, and north extending into the Kalmiopsis Wilderness. Isolated bands branch off into the Limpy Creek, Shan Creek, and Chrome ridge areas of the Galice Ranger District. A large block of serpentine peridotite is found on the west side of the Klamath Mountains in the Iron Mountain area of the Powers and Gold Beach Districts. These bedrock types occur in conjunction with SRI Units 30 through 35 on the east side of the Klamath Mountains, and SRI Units 36 through 39 on the west side of the Klamath Mountains.

Serpentinite and Peridotite East of Josephine Creek

Umpqua Formation

This formation consists of rhythmically bedded sandstones and siltstones. Beds are alternating, very thin, dark brown siltstones and slightly thicker light grayish-brown sandstones. The Umpqua Formation is found widely distributed in the north Gold Beach and Powers Districts of the Forest. A large block of Umpqua Formaton extends north from Agness through Ilahe and contacts the Tyee Formation at Bald Knob. This bedrock type occurs in conjunction with SRI Units 41 through 45.

Humbug Mountain Conglomerate

This rock type consists of massive to thickly bedded, well-indurated conglomerate which grades into dark gray sandstone. Clasts in the conglomerate consist of chert, schist, diorite, and altered extrusive volcanic rocks. The conglomerate covers a wide area of the western Powers District. Major blocks of conglomerate occur along the upper and lower reaches of the Elk River, south fork of the Sixes River, Anvil Mountain, Mt. Butler, and Copper Mountain areas of the District. This bedrock type occurs in conjunction with SRI Units 46 through 48.

Dothan Formation

The Dothan Formation is dominantly a medium-grained, well indurated graywacke sandstone, massively thick-bedded to thin-bedded and intermixed with dark gray or black layers of mudstone, shale, or siltstone, with local slaty cleavage. Volcanic rocks are interspersed within the formation as well as minor inclusions of chert and conglomerate. A large band of Dothan trending in a northeasterly direction cuts diagonally through the Forest. The Dothan Formation occupies most of the western section of the Chetco District, including most of the Winchuck, Chetco, and Pistol River drainages. This wide band continues in a northeasterly direction crossing the Illinois River, Silver Creek, Silver Peak, Indigo Creek, Upper Shasta Costa Creek, and on through Bear Camp Mountain and Marial. This bedrock type occurs in conjunction with SRI Units 50 through 55.

The Colebrooke Schist

The Colebrooke Schist is a diverse assemblage of quartz-mica phyllite, and schist, well foliated sandstone and meta-volcanics. The unit is highly contorted and sheared. Most of this material occurs in the western part of the Gold Beach Ranger District. A large block of Colebrooke Schist occurs along the lower reaches of the Rogue River west of Agness extending north to Brushy Mountain and Upper Lobster Creek and branching south in a narrow band through Quosatana Creek and the north fork of the Pistol River. This bedrock type occurs in conjunction with SRI Units 61 and 62.

Gneissic Rock

The amphibole gneiss is a banded crystalline rock made up of dark colored hornblende-rich layers and light colored silceous layers. It is believed to be metamorphosed from the Galice Formation. The gneiss occurs in a narrow northeasterly trending band from Horse Mountain up through Briggs Valley and Galice Creek. This bedrock type occurs in conjunction with SRI Units 66 through 68.

Soft Marine Sediments

The marine sediments are buff to grayish-brown, soft, finely, bedded siltstones, mudstones, and claystones. These sediments occur in a generally northeasterly trending band through Leuizenger Creek, Brushy Creek, Elk Valley, and Hazel View Summit in the southern Illinois Valley District. This bedrock type occurs in conjunction with SRI Units 71 and 72.

Galice Metasedimentary Rock

The Galice metasediments are hard, dark gray to black, fine grained, thinly layered, slaty to phyllitic mudstones interbedded with hard dark gray or buff, medium grained, lithic, poorly sorted sandstones. Minor inclusions include andesitic flows, breccias, tuffs, and agglomerates altered to greenstones. The Galice metasediments are characteristically sheared locally along contacts with other geologic formations. A large northeasterly trending block of Galice metasediments begins in the Kalmiopsis Wilderness near Hawks Rest and extends through Babyfoot Lake, Onion Camp, Fiddler Mountain, and crosses the Illinois River. North of the Illinois it passes through Sixmile Creek, Onion Creek, Secret Creek, Taylor Creek, and Galice Creek. Large areas of Galice metasediments occur in the western portion of the Powers District in proximity to Purple Mountain, Panther Mountain, Copper Mountain, and Barklow Mountain. This bedrock type occurs in conjunction with SRI Units 76 and 77 on the east side of the Klamath Mountains, and with Units 176 through 178 on the west side of the Klamath Mountains.

Metavolcanics

The metavolcanics consist of pale green to grayish-green altered flows and minor inclusions of tuff, breccia, stratified tuff, and related intrusive rocks mostly of andesitic or basaltic composition. Flows are commonly fine to coarse-grained, porphyritic, vesicular, or amygdaloidal. Bedrock is commonly moderately hard to hard in steep topography and ranges to soft on more gentle terrain with interspersed stringers of sediments and metasediments locally. A large block of these metavolcanics occur in the eastern portion of the Illinois Valley District and includes those areas surrounding Althouse Creek, French Peak, Sucker Creek, Horse Mountain, Lower Grayback Creek, and Little Grayback Mountain. This bedrock type occurs in conjunction with SRI Units 80 through 83.

Metavolcanics of the Galice Formation

The Galice metavolcanics consist of thick volcanic flows mainly porphyritic with breccias and tuffs. The Galice metavolcanics are generally harder than the metavolcanics found in the eastern portion of the Illinois Valley District. A large northeasterly trending block of Galice metavolcanics occurs adjacent to and interspersed within the Galice metasediments. The metavolcanics can be found in the Squaw Mountain area, northward past Serpentine Point, and through Onion Creek, Secret Creek, Limpy Creek, Shan Creek, Taylor Creek, and Galice Creek. A smaller block of Galice metavolcanics occurs in the Johnson Mountain area in the northern Powers District. This bedrock type occurs in conjunction with SRI Units 86 and 87 on the east side of the Klamath Mountains and 186 on the west side of the Klamath Mountains.

Granitic Rocks

The granitoid rocks consist of light gray, fine to coarse-grained granites through diorites. Diorites and quartz diorites are the most abundant members. Minor inclusions of gabbro are also found in this unit. Small granitoid rock intrusions can be found in the form of dikes and sills in many areas of the Forest. Larger stocks of granitic rocks exist in the Grayback Mountain, Upper Grayback Creek, and Upper East Fork of Williams Creek areas. Another stock extends in a band from the upper reaches of the Chetco River, through Klondike Creek, the Illinois River, and Upper Silver Creek. A smaller intrusive body can be found along the lower reaches of the Elk River near Pearse Peak. Bedrock immediately surrounding these intruding granitoid rocks are characteristically altered mineralogically and highly fractured. This bedrock type is found in conjunction with SRI Units 91 through 95 on the east side of the Klamath Mountains, and 191 through 194 on the west side of the Klamath Mountains.

Gabbro

The gabbros are a moderately hard to hard, dark gray to black, fine to coarse grained basic intrusive rock. Small intrusions of gabbro in the form of dikes and sills are present in many areas of the Forest. A larger block of gabbro occurs in the southernmost extension of the Illinois Valley District encompassing the Crazy Peak, Chicago Peak, Black Butte, and Lookout Mountain areas. Another large area of gabbroic rock occurs in the southern Kalmiopsis Wilderness near the Upper Chetco and Little Chetco Rivers. This bedrock type occurs in conjunction with SRI Units 96, 97, and 98 on the east side of the Klamath Mountains and with Unit 196 on the west side of the Klamath Mountains.

Olivine Gabbro

A hard, dark colored, fine to coarse-grained rock containing bluish feldspar, pyroxene, and olivine. Most of the Olivine Gabbro occurs in a band from Illinois River north through York Butte to Flat Top Mountain on the Galice Ranger District. This bedrock type occurs in conjunction with SRI Units 99 and 100.

Olivine Gabbro - Silver Creek Drainage

Tyee Formation

The Tyee Formation is composed of thick rhythmically bedded, buff to greenish-gray sandstone with thin interbedded dark colored mudstone. The sandstone is composed of medium to coarse-grained, micaceous, arkosic, and lithic wackes. Some conglomerates of andesite, quartzite, chert, and basalt as well as local coal beds are also found in this Unit. The Tyee Formation is present in a large block in the Powers District spreading from Sand Rock Mountain to Eden Ridge, all along the south fork of the Coquille River, south from Hanging Rock, along Panther Ridge to Bald Knob. This bedrock type occurs in conjunction with SRI Units 120 through 125.

APPENDIX III

TOPOGRAPHY

The Klamath Mountains occupy the southwestern corner of Oregon, south of the Coast Range and west of the Cascade Range. The area is generally characterized by steep rugged terrain with broken ridge systems and narrow canyons.

In the southern part of the Siskiyou National Forest (the Chetco and Illinois Valley Districts), the elevation ranges from 100 feet near the coast to approximately 5,000 feet at Pearsoll Peak on the crest of the Klamath Mountains, then drops to approximately 1,300 feet in the Illinois Valley and rises again to over 7,000 feet at Grayback Mountain on the crest of the Siskiyou Mountain range. The topography of this area varies widely, however, a general description can be made. The Kalmiopsis Wilderness is characterized by steep, rocky, brushy sideslopes and sharp ridges. South of the Chetco River convex short sideslopes and sharp ridges prevail, while north of the Chetco River longer concave slopes predominate. The Siskiyou Mountain area of the Illinois Valley District contains the highest elevations on the Siskiyou National Forest and is generally characterized by an east-west orientation; steep, long, convex sideslopes; and sharp ridges.

Elevations in the middle of the Siskiyou National Forest (the Gold Beach and Galice Districts), range from 100 feet along the Rogue River at the west boundary of the Forest to 5,318 feet at the summit of Brandy Peak. Ridge direction varies from east-west in the central portion to primarily north-south in the rest of the area. Sideslopes vary from flat to extremely steep. About 10 percent of the land has slopes of 30 percent or less, 50 percent of the land has slopes between 30 and 60 percent, and 40 percent of the land has

Salmon Mountain

slopes greater than 60 percent. Rock Bluffs and slopes in excess of 100 percent are localized, and, with the exception of the Big Craggies and streamside areas, are not common. In the eastern portion of the area convex steep sideslopes and sharp ridges dominate, while in the western portion more moderate concave slopes dominate.

In the northernmost part of the Siskiyou National Forest (the Powers Ranger District) the elevation ranges from about 100 feet along the Elk River at the western boundary of the Forest to 4,319 foot Mt. Bolivar on the east boundary. Wide topographical variation exists moving west to east across this unit. The Mt. Bulter-Dry Creek area in the extreme northwest part of the Forest is characterized by consistently steep slopes, averaging about 80 percent, and extremely rugged terrain. Razorback ridgetops and steep rocky sideslopes are common throughout this area. In the northeastern portion of the Forest, a large area of gentle slopes can be found.

Valleys, such as Eden Valley and Foggy Creek, are wide in comparison to other valley areas of the Forest. Gently rolling sideslopes and long gently sloping slab-like ridgetops are also topographical features that exist almost exclusively in this area of the Forest. Very steep, almost vertical slopes can be found bordering the gently sloping sandstone slabs.

APPENDIX IV

VEGETATION

The Siskiyou National Forest lies in the Klamath Region, an area of exceptional ecological interest. The Klamath Region, between the Southern Cascade Range and the Pacific Ocean, is an old and geologically complex range. This area supports a complex pattern of natural communities in relation to steep climatic gradients, diverse parent materials, and a transitional geographic location where species common to the Pacific Northwest and California merge.

Over 1,400 plant species have been identified on the Siskiyou National Forest. Most of these can be found in the southern section of the Forest. Douglas-fir is the primary sawtimber species. It grows in association with several other coniferous species including sugar pine, Port-Orford-cedar, western hemlock, white fir, incense-cedar, knobcone pine, Jeffrey pine, ponderosa pine, western white pine, western red cedar, Brewer spruce, grand fir, Shasta red fir, and redwood. Associated hardwoods include tanoak, red alder, Pacific madrone, golden chinkapin, canyon live oak, Oregon white oak, California black oak, willow, bigleaf maple, dogwood, and Oregon myrtle. The large variation in climatic conditions and soil types combined with a severe fire history have altered vegetative cover in relation to site, density, and species composition.

Douglas-fir - Tanoak Vegetative Pattern

Southwest Portion

The southwestern portion of the Forest is less diversified than the southeastern Siskiyou Mountain area. Douglas-fir and tanoak are the predominate tree species in the southwest portion of the Forest. Extensive stands of tanoak occur in the area. Madrone, chinkapin, and blueblossom ceanothus are frequent understory species. Intense brush competition characterizes this portion of the Forest.

Siskiyou Mountains

The Siskiyou Mountains in the southeast portion of the Forest contain a diverse mosaic of vegetation. The middle elevations or mixed conifer zone have Douglas-fir as the predominant timber species. Considerable hardwood competition from tanoak and madrone is present in this zone. Tanoak occurs most frequently on the better sites and madrone occurrence is usually correlated with recent fire or disturbance. Between 3,000 to 4,000 feet, depending upon aspect, white fir becomes the dominant understory species. At approximately 5,000 feet Shasta red fir becomes the dominant tree species. Some white fir and mountain hemlock are also present at the higher elevations.

Middle Portion

The middle section of the Siskiyou National Forest contains most of those species found in the south section. Species density, frequency, and distribution fluctuate according to changing environmental conditions. Tanoak is less prominent as an overstory and understory species. West of the Klamath Mountains, alder dominates along draws and waterways, especially in wet and disturbed areas. Douglas-fir is the dominant timber species. Port-Orford-cedar and western hemlock are found on the wetter, more protected sites. West of the Klamath Mountains, huckleberry, ceanothus, salal, rhododendron, and Oregon myrtle are common understory species. East of the Klamath Mountains canyon live oak, madrone, and Oregon white oak increase in number and distribution. Douglas-fir is still the prominent timber species, but stocking levels may be low on unfavorable aspects. Sugar pine and ponderosa pine are more abundant in this area of the Forest. Ceanothus, poison oak, and manzanita are common understory species. Pacific dogwood and bigleaf maple occur frequently along drainages.

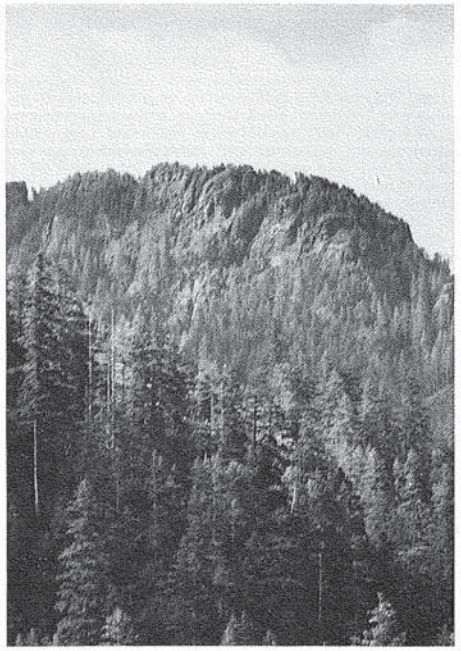
Peridotite and Serpentine bedrock areas have dramatic species composition changes. Jeffrey pine and incense-cedar become dominant overstory species. Stocking is usually low and crown closure seldom exceeds 10 to 40 percent. Whiteleaf manzanita, wedgeleaf ceanothus, silktassle, western azalea, and grasses are common understory species.

Mt. Butler-Dry Creek

The primary tree species found in the Mt. Butler-Dry Creek area in the northwest corner of the Forest are: Douglas-fir, western hemlock, and tanoak. Other tree species include: Western red cedar, Port-Orford-cedar, sugar pine, grand fir, knobcone pine, Pacific yew, madrone, Oregon myrtle, red alder, bigleaf maple, canyon live oak, and Pacific dogwood. A large number of other shrubs, herbs, and grasses are also found in the various plant communities within this area. These include five or more fern species, two huckleberry species, nine maple species, rhododendron, salal, Oregon grape, manzanita, and poison oak.

Large variation in productivity and species composition occurs between north and south slopes in this area of the Forest. North slopes are typically dominated by Douglas-fir overstory.

The typical old-growth stand in this area has 40 to 70 percent crown closure, while the typical second-growth stand has 70 to 100 percent crown closure. Considerable amounts of tanoak, western hemlock, rhododendron, salal, and Douglas-fir occur in the understory. As much as one-third of all south aspects in this area can be classified as dense brushfields or hardwood stands. Tanoak, canyon live oak, and chinkapin dominate these areas. Douglas-fir, when it occurs, is the predominant species. Conifer stocking is low, however, with only 10 to 40 percent crown closure. Little or no conifer regeneration is present in the understory of this area. The lower slopes of these unfavorable aspects have higher conifer



Mt. Butler

stocking levels, since environmental conditions are more favorable. Red alder occurs principally along the coast in wet disturbed areas. Port-Orford-cedar and bigleaf maple occur largely in wet, protected areas such as in secondary streams and draws. Western red cedar and western hemlock are most commonly found on wet, older disturbed areas.

Northeastern Portion

In the extreme northeastern portion of the Forest vegetation types tend to be more typical of the westside Douglas-fir zone. Douglas-fir is the primary species. Associated species include Port-Orford-cedar, western hemlock, sugar pine, tanoak, madrone, bigleaf maple, red alder, vine maple, rhododendron, and salal. Timber stands tend to be well-stocked. Brush competition appears to be lower than in any other area of the Forest.

APPENDIX V

RANGE

Lands used for grazing livestock primarily occur in the southeastern part of the Forest on the Illinois Valley Ranger District. The various soils have strikingly different production and suitabilities. The most limiting factor is brush and tree competition. Management of these lands are varied to meet the demands of multiple-use management. Livestock grazing is often a secondary use of the land and must conform to the needs of timber production or wildlife habitat in critical deer or elk winter-range areas. Adjacent private lands also have an important impact on the management needs and decisions in the area.

In forested areas, livestock forage is transient. Grass and other forage species increase as the timber is harvested. Then, as the stand becomes re-established, the forage production decreases.

In some areas, cattle use and deer winter range are in conflict. Use by cattle must be limited to the spring season and a period of rest provided for restoration of plant vigor. On these areas, cattle are used mainly to form the plants for deer use and not for cattle production.

Other areas of conflicting use include small wet and dry non-forest areas that dot the timber lands of the high Siskiyou Mountains.

Transitory Range

APPENDIX VI

WILDLIFE

Game and non-game wildlife species in the Forest are an important part of the living environment. Wildlife require an adequate supply of food, water, and cover. The change or destruction of food and cover plants can cause a reduction in fish and animal numbers. Forest roads, necessary for timber removal, must be properly located and timber harvest methods carefully planned to protect wildlife habitat.

Wildlife that live in a particular area depend upon the types of habitat available. Under natural conditions various kinds and combinations of vegetation grow in response to varying soil conditions. Suitability of soils for different kinds of wildlife differs according to soil fertility, climatic conditions, and soil properties that affect water-holding capacity. Aspect and slope are also important because they are related to proximity of water, feeding, and cover areas. Important game and non-game wildlife habitat requirements can impact goals of Forest Management.

Deer and elk use areas of dense vegetation for cover. Timber harvest along ridge lines lowers the quality of these important wildlife cover areas. Browse production is increased as forest canopy is opened, however, browse is less critical on the west side of the Cascade Range.

Southerly aspects and low elevations produce forage plants for wildlife use during winter and early spring. Deer and elk concentrate where slopes are free of snow. Plantations adjacent to these areas receive heavy browsing and may need to be protected. Roads traversing south slopes and low elevations degrade wildlife habitat by encouraging harassment and illegal harvest of wildlife during winter months. Opening the forest canopy increases the snow accumulation, causing areas to be less desirable for deer and elk during critical winter months.

Spotted Owl
(Courtesy of Nietro, B.L.M.)

Soils and associated vegetation influence the distribution of many species of rodents. Rodent concentration areas such as clearcuts, meadows, and natural forest openings affect the understory vegetation in adjacent mature timber stands. Rodent populations generally increase when timber is removed. Gophers, porcupines, rabbits, deer mice, chipmunks, and other rodents are associated with open and forested plant communities of the area.

Many important birds of prey feed and nest in the mature forest canopy. They are generally dependent on large trees for nest sites and roosting places. Several birds feed on rodents and insects that cause tree damage. Management of these species includes their protection.

Increases in sedimentation and water temperature are the two adverse factors which influence fish populations on the Forest. Temperature is dependent on quality of riparian habitat. The adverse impact of sedimentation depends on time, location, and magnitude of occurrence. Forest practices involve surface disturbance that contributes to stream bedload and detrimental effects on aquatic habitat. Soils of the inventory area respond differently to management techniques and erosion control measures. Soil texture in combination with degree, location, and time of disturbance affects water quality and aquatic life. The drainage system of the Forest supports major runs of anadromous fish including coho and chinook salmon, steelhead, sea-run cutthroat trout, green sturgeon, and shad. Native cutthroat and rainbow trout inhabit the many minor drainageways.

APPENDIX VII

DEFINITIONS OF MANAGEMENT INTERPRETATIONS 1/

This appendix contains the definitions for the management interpretations used in the Soil Resource Inventory. These definitions are used in compiling information for the tables of Engineering, Erosion and Hydrology, Range and Wildlife, Recreation, and Timber Management.

Engineering

Interpretations for engineering include characteristics for roads, foundations, bedrock, and some miscellaneous interpretations. These interpretations are explained and defined in this section. Generally, the following interpretations and ratings are based only on the soil material or bedrock. The interpretations pertaining to roads are based on standard Forest Service regulations and construction methods presently used.

Unified and AASHO Classification

Each soil is classified as to its Unified and AASHO Classification. Most soils will be classified into one class. Those soils with significant layers of different soil materials will have a classification for each layer designated. The classification will be made for some representative soils by laboratory testing. Those soils not tested will be classified by comparing their properties to those tested.

Suitability for Use as Topsoil Source

This rating evaluates each soil as to its suitability for use as topsoil. It does not specify any particular use of the topsoil. Ratings are based on soil characteristics.

Suited - Soil texture ranges from sandy loam to clay loam; gravel content is less than 35 percent and soil layer is at least 36 inches thick.

Unsuited - This rating indicates the soils do not satisfy the requirements specified under "Suited". However, soils rated "Unsuited" may still satisfy a particular requirement. See the "Table of Soil Characteristics" for soil texture, thickness, and gravel content.

Suitability of Soil as Sand and/or Gravel Source

This interpretation indicates the suitability of each landtype as a possible source of sand and/or gravel. It does not indicate the kind of quality of sand or gravel, or refer to any specific use of the sand and/or gravel.

Suited - This rating indicates that sand and/or gravel is present and the following conditions are satisfied: There is a layer present which is composed of 80 percent, by volume, of sand and/or gravel. This layer is at least 48 inches thick.

Unsuited - This rating indicates that sand and/or gravel is generally not present in amounts which satisfy the requirements under "Suited". However, soils rated "Unsuited" may still satisfy a particular requirement. See the Table of Soil Characteristics for soil depth and gravel content.

1/ Unless otherwise noted, the following definitions were developed for use in Soil Resource Inventories, R-6.

Soil Suitable for Sand and Gravel Source

Suitability of Soil as a Possible Clay Source

This rating indicates the suitability of each soil as a possible source of clay. It does not indicate the kind or quality of clay, or refer to any specific use of the clay.

Suited - This rating indicates that the soil is a possible source of clay. Soils with this rating have the following: Texture ranges from clay loam to clay. Gravel content is less than 35 percent. This layer is at least 24 inches thick.

Unsuited - Soils with this rating generally are not possible sources for clay.

Suitability of Bedrock for Road Rock

This interpretation indicates the general suitability of rock when used as road rock for base course or wearing surface. These ratings are based on rock hardness, density, and susceptibility to weathering and breakdown. Soils are not rated when depth to bedrock is greater than 60 inches. (Cautionary note: This information is for broad planning purposes only. Specific onsite characterization data are required to accurately determine rock suitability).

Unsuited - Rock is soft and breaks down rapidly under logging traffic.

Poor - Rock is only moderately hard and breaks down easily under logging traffic, usually in one or two years' time.

Fair - Rock is hard and dense but tends to break down under logging traffic after about two to four years' use.

Good - Rock is hard, dense, and resists breakdown under logging traffic.

Limitations of Bedrock for Road Rock

This column indicates the major limitation of the bedrock for road rock use.

Native Rock Suited for Road Surfacing

Estimate of Road Rock Thickness

This interpretation refers to estimated amount of road rock (base course and wearing surface) generally needed on heavy-vehicle, all-weather-use roads constructed on each landtype. Factors involved in making this interpretation include field observation, texture, and plasticity of soil, depth of bedrock, drainage, and kind of subgrade the road generally will have--common material or bedrock. Ratings are based on compacted fills and on the use of high quality rock. (Cautionary note: This information is for broad planning purposes only. Specific onsite characterization data are required to accurately determine thickness needs).

Very thin - Generally less than 8 inches.

Thin - Approximately 8 to 18 inches.

Thick - Approximately 18 to 32 inches.

Very thick - Generally over 32 inches.

Consideration for Road Location and Construction

This column indicates the major considerations for road location and construction through each landtype. The rating evaluates the impact of road construction on other resources and/or road construction problems likely to be encountered.

Method of Excavation

This interpretation refers to excavation methods most commonly used and required for each landtype. This includes soil, bedrock, and cemented and/or compacted layers in the soil. Methods are blading, ripping, and/or blasting. (Cautionary note: These appraisals are subject to change as machinery capabilities change).

Cutbank and Ditch Erosion Potential

This interpretation indicates the potential for subsoil erosion by running water on each landtype. Subsoil refers to that material from approximately the 40-inch depth extending to bedrock. It includes erosion which takes place along road ditches and on cutslopes. Rating is of soil material only and does not apply when cutbank or ditch is in bedrock. Factors considered in making ratings are field observations, texture and structure of subsoil materials, permeability, compaction, and climate.

Low - Factors indicate that little or no subsoil erosion is likely to occur.

Moderate - Factors indicate that the subsoils have moderate erosion potential.

High - Factors indicate that the subsoils are likely to erode severely.

Susceptibility to Cutbank Sloughing and Raveling

This rating evaluates each unit for its susceptibility to sloughing or raveling after excavation. Ratings are based on cutbanks at least 10 feet high. Factors include field observations, soil and bedrock characteristics, backslope ratio, frost action, climate, and potential for revegetation.

Low - Sloughing and/or raveling is a minor problem requiring occasional road maintenance.

Moderate - Sloughing and/or raveling cause some damage. Annual road maintenance is usually adequate.

High - Sloughing and raveling occur at a rate that often plugs culverts and fills inside ditches. Frequent road maintenance with heavy equipment such as front-end loader is required.

Moderate Susceptibility to Cutbank Sloughing and Raveling

Estimated Cutslope Ratio

This interpretation estimates the cutslope ratio which generally will result in the most stable cutbank condition. Ratings made are for cutbanks at least 10 feet high and pertain both to soil and bedrock material. Ratings are based on soil and bedrock factors and on observations. (Specific onsite characterization data is needed to determine the proper ratio).

Steep - Cutbank ratio from vertical to ¼:1

Moderate - Cutbank ratio from about 1:1 to 1½:1

Flat - Cutbank ratio flatter than 1½:1

Probability of Cutbank Failures

This interpretation indicates the probability of failures in cutbanks following road construction or excavations for buildings. Failures are considered to be at least 10 cubic yards of material in volume. Ratings are based on cutbanks of at least 10 feet in height and refer to more than a 50 percent chance for failures. These ratings are the same as in the Mantle Stability Surveys.

I. Very stable - practically no probability of cutbank failures.

II. Stable - probability of more than 3 failures per mile of road cutbank.

III. Moderate stable - probability of 4 to 8 failures per mile of road cutbank.

IV. Unstable - probability of 9 to 15 failures per mile of road cutbank.

V. Very unstable - probability of more than 15 failures per mile of road cutbank.

Suggestion for Cutbank Stability Problems

This rating gives suggestions, when applicable, to increase stability of cutbanks or reduce damage from raveling and sloughing.

Failure Potential on Road Waste and Fills

This interpretation rates the landtype units as to the susceptibility of failure occurring on fill and sidecast waste material and related damage to resources. Failures are defined as a loss or partial loss of road fill or sidecast material on the fillslope. Considered are initial and subsequent failures caused by construction, erosion, and additional sidecast during maintenance. Failures result in damage to various resources. Stream sedimentation levels are increased, resulting in an adverse effect on both water quality and fisheries. Timber growth potential is affected as fillslope areas no longer contribute to production. Occasionally the failures do damage to the road itself. The ratings are based on current road construction practices and procedures, and on type of soil materials, natural drainage of the site, landform, slope of the fill, and field observation.

Low - Failure on road waste and fills is sufficiently low to result in only minor damage to resource values.

Moderate - Failures on road waste and fills occur with sufficient frequency to cause moderate damage to resource values.

High - Failures on road waste and fills occur at a rate and magnitude sufficient to cause major damage to resource values.

Erosion Potential on Road Waste and Fills

This interpretation rates the landtype units as to the susceptibility of erosion occurring on fill and sidecast waste material and related damage to resources. Erosion is a loss of surface soil from fill or sidecast.

This erosion contributes sedimentation to streams. Timber growth potential is affected as fillslope areas no longer contribute to production. The ratings are based on current road construction practices and procedures, and on type of soil materials, natural drainage of the site, landform, slope of the fill, and field observation.

Low - Erosion on road waste and fills is sufficiently low to result in only minor damage to resource values.

Moderate - Erosion on road waste and fills occurs with sufficient magnitude to cause moderate damage to resource values.

High - Erosion on road waste and fills occurs at a magnitude sufficient to cause major damage to resource values.

Suitability of Road Waste and Fillslopes to Seeding

This interpretation indicates the probable success of fillslope seeding. Factors considered in making ratings are soil characteristics, elevation, slope, climate, snowpack, and frost hazard. Ratings are based on current methods and practices of seeding, grass species, fertilizer application, and time of seeding.

Poor - Probability of success is low. Seeding, generally, is not successful and requires three or more reseedings and special treatments.

Fair - Success is likely on about 50 percent of area treated. Requires one or two followup treatments. Seeding usually becomes well established within two years. Little followup seeding necessary.

Good - Probability of high success. Seeding usually becomes well established within two years. Little followup seeding is necessary.

Limitations to Road Waste and Fillslope Seeding

This indicates the major limitations to success of fillslope seeding, such as raveling, droughtiness, stoniness, coarse soil textures, and predominance of subsoil.

Suggestions for Road Waste and Fillslope Seeding

This indicates special treatment to be given, when applicable, to increase the chance of success of fillslope seeding. A statement indicates the necessary requirements other than normal fillslope seeding practices carried on by the Forest.

Suitability of Cutbanks to Seeding

This interpretation indicates the probable success of cutbank seeding. Factors considered in making ratings are soil characteristics, elevation, slope, climate, snowpack, and frost hazard. Ratings are based on current methods and practices of seeding, grass species, fertilizer application, and time of seeding.

Poor - Probability of success is low. Seeding generally is not successful and requires three or more reseedings and special treatments.

Fair - Success is likely on about 50 percent of area treated. Requires one or two followup treatments. Seeding is usually spotty; some areas become easily established, while others fail completely.

Good - Probability of high success. Seeding usually becomes well established within two years. Little followup seeding necessary.

Limitations to Cutbank Seeding

This indicates the major limitations to success of cutbank seeding, such as doughtiness, stoniness, coarse textures, subsoil, and exposed rock.

Suggestions for Cutbank Seeding

This indicates special treatment to be given, when applicable, to increase the chance of success of cutbank seedings, such as hand or machine terracing, mulching, fertilization, and special seed mixtures.

TABLE OF INTERPRETATIONS

ENGINEERING TABLE I

Landtype No. 1/	Classifications Unified 4/	Classifications AASHO 4/	Suitability for Use as Topsoil Source	Suitability of Soil for Sand and/or Gravel Source	Suitability of Soil as a Possible Clay Source	Suitability of Bedrock for Road Rock	Limitations of Bedrock for Road Rock	Estimate of Road Rock Thickness	Consideration for Road Location and Construction	Method of Excavation	Cutbank and Ditch Erosion Potential	Susceptibility to Cutbank Sloughing and Ravelling	Estimated Cutslope Ratio	Probability of Cutbank Failure
1	N/A	N/A	Unsuited	Unsuited	Unsuited	Good	Metavolcanics, granites, and gabbros-none	Very thin	Steep slopes, rock falls, and, poor alignment	Blasting	N/A	High	Steep	I
2	N/A	N/A	Unsuited	Unsuited	Unsuited	Fair to unsuited	Metasediments and sediments break down rapidly under heavy use	Very thin to thin	Steep slopes, rock falls, slough, and poor alignment	Blasting and ripping	N/A	High	Steep	I to II
3	N/A	N/A	Unsuited	Unsuited	Unsuited	Good to unsuited	Peridotite and serpentine (serpentine will break down rapidly under heavy use)	Very thin, locally thin	Rock falls and poor alignment	Blasting and ripping	N/A	High to moderate	Steep	I to II
4	GMu	A-1-6(0)	Suited	Unsuited	Suited	Unsuited	Soft and saprolitic	Very thick	Slump basins and unstable areas; wet areas require extra culverts; keep cuts and fills to a minimum; minimum standard road; roll grade	Blading	High	High	Flat	IV to V
5	GMu	A-1-6(0)	Unsuited	Unsuited	Suited, locally unsuited	Unsuited	Soft and saprolitic	Very thick	Slump basins and unstable areas; wet areas require extra culverts; keep cuts and fills to a minimum; minimum standard road; roll grade	Blading	High	High	Flat	IV to V
6	N/A	N/A	Unsuited	Unsuited	Unsuited	N/A	N/A	Very thick	Wet non-forest land	Blading	N/A	N/A	N/A	N/A
7	N/A	N/A	Unsuited	Unsuited	Unsuited	Unsuited to fair	Variable hardness	Thin	Local shallow soils and rock outcrops	Blading; some blasting	Moderate	Moderate	Steep	II
8,8c	SMu GMu GMGC	A-5(1) A-2-5 A-2-4 A-2-6(0)	Suited	Unsuited	Suited	Unsuited	Soft and saprolitic	Very thick	Slump basins and unstable areas; wet areas require extra culverts; keep cuts and fills to a minimum; minimum standard road; roll grade	Blading	High	High	Flat	V and IV
9,9c	SMu GMu GMGC	A-5(1) A-2-5 A-2-4 A-2-6(0)	Suited	Unsuited	Suited, locally unsuited	Unsuited	Soft and saprolitic	Very thick	Slump basins and unstable areas; wet areas require extra culverts; keep cuts and fills to a minimum; minimum standard road; roll grade	Blading	High	High	Flat	V and IV

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10	SMu	A-4-0	Unsuited	Unsuited	Unsuited	N/A	N/A	Thick	Local wet areas and old stream channels may require extra drainage features. Flooding may be a problem	Blading	Low	Low to moderate	Steep	II
11	SMd	A-1-b(0)	Unsuited	Unsuited	Unsuited	N/A	N/A	Thin	None	Blading	Low to moderate	Moderate	Steep to moderate	II to III
12	SMu	A-4-0	Unsuited	Unsuited	Unsuited	N/A	N/A	Thick	Local wet areas and old stream channels may require extra drainage features. Flooding may be a problem	Blading	Low	Low to moderate	Steep	II
13	GM 2/ SM, GM 3/	A1,A2 2/ A1,A2 3/	Unsuited	Unsuited	Unsuited	N/A	N/A	Thin to thick	Local wet areas may require thicker base course and extra culverts	Blading	Moderate	Moderate	Moderate	II to III
14	GM 2/ SM, GM 3/	A1,A2	Unsuited	Unsuited	Unsuited	N/A	N/A	Thin	None	Blading	Moderate to high	Moderate to high	Moderate	II to III
15	SMu GMu	A-2-4(0) A-4(1)	Unsuited	Suited	Unsuited	N/A	N/A	Thin	Flooding may be a problem. Local wet areas and old stream channels may require extra drainage features	Blading	Low	Moderate	Steep	II
16	SMu	A-4(2)	Unsuited	Unsuited locally suited	Unsuited	N/A	N/A	Thin to thick	None	Blading, some ripping	Moderate	Moderate	Moderate	II
17	ML	A-5(3)	Unsuited	Unsuited	Unsuited	N/A	N/A	Very thick	Potential damage to soils and other resources from natural slides	Blading, local ripping	High	High	Moderate	V
18	ML SMu	A-7-5(5) A-5 A-5(4)	Unsuited	Unsuited	Unsuited	N/A	N/A	Thin to thick	Potential damage to soils and other resources from natural slides	Blading, some ripping	Moderate	Moderate	Moderate	II
19	ML OH MH SMu	A-4(8) A-7-5(7) A-7-5(12) A-7-5 A-4 A-2-7(0)	Unsuited	Unsuited	Unsuited	N/A	N/A	Thick	Potential damage to soils and other resources from natural slides	Blading, local ripping	Moderate to high	Moderate to high	Moderate	III
21	ML	A-4(0)	Unsuited	Unsuited	Unsuited	Fair	None	Thin	Steep slopes, shallow soils, and local rock outcrops	Blasting and ripping	Moderate	Moderate	Steep	II to III

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22	ML	A-4(4)	Unsuited	Unsuited	Unsuited to suited	Fair	None	Thin to thick	May be localized unstable areas	Ripping and blading	Moderate	Low to moderate	Moderate	II to III
26	OL SMu	A-4(0)	Unsuited	Unsuited	Unsuited	Poor	Breaks down rapidly under heavy use	Thin	Steep slopes, shallow soils, and local rock outcrops	Blasting and ripping	High	Moderate	Steep	II to III
27	OH	A-7-5(6)	Unsuited	Unsuited	Unsuited	Poor	Breaks down rapidly under heavy use	Thin to thick	None	Ripping and blading	High	Low to moderate	Steep	II to III
28	SMu	A-4(0)	Unsuited	Unsuited	Unsuited	Poor	Breaks down rapidly under heavy use	Thin	Steep slopes, shallow soils, and local rock outcrops	Blasting and ripping	High	Moderate	Steep	II to III
29	OH	A-7-5(6)	Unsuited	Unsuited	Unsuited	Poor	Breaks down rapidly under heavy use	Thin to thick	None	Ripping and blading	High	Low to moderate	Steep	II to III
31	SMu GMu	A-2-6(0) A-2-7-0 A-6(3)	Unsuited	Unsuited	Unsuited	Unsuited to poor	Breaks down rapidly under heavy use	Thin	Shallow soils and local rock outcrops	Blasting and ripping	High	Moderate	Steep	II
32	SMu ML	A-5(0) A-7-5(10)	Unsuited	Unsuited	Unsuited but locally suited	Unsuited	Soft and saprolitic	Thick	Local wet areas, slump basins, and unstable areas	Ripping and blading	Moderate to high	Moderate to high	Moderate	III and IV
34	SMu	A-2-6(0)	Unsuited	Unsuited	Unsuited	Unsuited to fair	Breaks down rapidly under heavy use	Thin	Steep slopes, shallow soils, and local rock outcrops	Blasting and ripping	High	Moderate	Steep	II
35	SMu	A-5(0)	Unsuited	Unsuited	Unsuited	Unsuited to fair	Breaks down rapidly under heavy use	Thin to very thin	Shallow soils and local rock outcrops	Blasting and ripping	Moderate	Low to moderate	Steep	II to I
36	SMu SMd	A-2-7(0) A-2-4(0)	Unsuited	Unsuited	Unsuited	Unsuited to poor	Breaks down rapidly under heavy use	Thin to thick	Shallow soils and local unstable areas	Blasting and ripping	High	Moderate to high	Steep	II to III
37	ML SMu	A-7-5(6) A-2-7(0)	Unsuited	Unsuited	Suited to unsuited	Unsuited	Breaks down rapidly under heavy use	Thick	Local slump basins and unstable areas	Ripping and blading	Moderate to high	Moderate to high	Moderate	IV
38	GMd	A-1-9(0)	Unsuited	Unsuited	Unsuited	Unsuited	Breaks down rapidly under heavy use	Thick	Local slump basins, unstable areas, and steep slopes	Ripping and blading	High	Moderate to high	Steep	III
39	SMu	A-2-7(0)	Unsuited	Unsuited	Unsuited	Unsuited to poor	Breaks down rapidly under heavy use	Thin to thick	Shallow soils and local rock outcrop	Blasting ripping	Moderate and	Moderate	Steep	II
41	SMu GC GMu	A-4(1) A-2-6(0) A-1-6(0)	Unsuited	Unsuited	Unsuited	Poor	Breaks down rapidly under heavy use	Thin	Steep slopes, shallow soils, and sloughing	Blasting and ripping	High	High	Steep	II to III
42	SMu SC GC	A-2-7(0) A-2-6(0) A-6(1)	Unsuited	Unsuited	Unsuited	Poor	Breaks down rapidly under heavy use	Thin to thick	Sloughing	Ripping and blading	High	High	Moderate	II to III
43	SMu	A-4(1)	Unsuited	Unsuited	Unsuited	Poor	Breaks down rapidly under heavy use	Thin	Steep slopes, shallow soils, and sloughing	Blasting and ripping	High	High	Steep	II to III

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45	SMu	A-2-7	Unsuited to suited	Unsuited	Unsuited	Poor	Soft and saprolitic generally breaks down rapidly under heavy use	Thick	May be local wet areas, slump basins, and unstable areas	Ripping and blading	Moderate	Moderate	Moderate to flat	III and IV
46	GMu	A-1-6(0)	Unsuited	Unsuited	Unsuited	Unsuited to poor	Breaks down under heavy use to small rounded gravels	Thin	Steep slopes and shallow soils	Blasting and ripping	Moderate	Moderate to high	Steep	III
48	GMu	A-1-6(0)	Unsuited	Unsuited	Unsuited	Unsuited to poor	Breaks down under heavy use to small rounded gravels	Thin	Steep slopes, shallow soils, and rock falls	Blasting and ripping	Moderate	Moderate to high	Steep	III
50	SMu	A-2-7	Unsuited	Unsuited	Unsuited	Fair	Volcanics-none, (small amounts of Dothan sediments may be intermixed)	Very thin to thin	Steep slopes, shallow soils, and rock falls	Blasting and ripping	High	High to moderate	Steep	I
51	SMu, SMd GP-GMu GMd	A-4(0) A-2-7(0) A-5-(2) A-1-6(0) A-1-a(0)	Unsuited	Unsuited	Unsuited	Fair	Sediments break down rapidly under heavy use	Thin	Steep slopes, and shallow soils	Blasting and ripping	High	Moderate to high	Steep	I and II
52	SMu GMu	A-5(1) A-2-4(0) A-7-5(2) A-2-7(0)	Unsuited	Unsuited	Unsuited	Poor	Soft and saprolitic	Thick	Sloughing	Ripping and blading	High	Moderate to low	Moderate to steep	II
53	GMu SMu SC	A-2-5(0) A-2-7(0) A-6(4)	Unsuited	Unsuited	Unsuited	Fair	Sediments break down rapidly under heavy use	Thin	Steep slopes, and shallow soils	Blasting and ripping	High	High to moderate	Steep	I
54	GMu	A-2-5(0)	Unsuited	Unsuited	Unsuited	Poor	Generally soft and saprolitic	Thin to thick	Sloughing	Ripping and blading	High	Moderate to low	Steep to moderate	II
55	OL	A-5(4)	Unsuited to suited	Unsuited	Unsuited, locally suited	Unsuited	Soft and saprolitic	Thick	Local slump basins, unstable areas, and sloughing	Blading	High	Moderate, locally high	Moderate	III and IV
61	SC	A-7-5(7)	Unsuited	Unsuited	Unsuited	Poor	Schists break down very rapidly under heavy use	Thin to thick	Steep slopes and shallow soils	Ripping and blading	High	High	Steep	II to III
62	SC SMu GMu ML	A-7-5(7) A-5(1) A-7-5 A-4(3)	Unsuited	Unsuited	Unsuited, locally suited	Poor	Soft and saprolitic	Thick	Local slump basins, unstable areas, and sloughing	Blading	High	High	Moderate	III, locally IV
66	SMu GMu	A-1-d	Unsuited	Unsuited	Unsuited	Fair to poor	Interspersed areas of softer rock	Thin	Steep slopes and shallow soils	Blasting and ripping	High	High	Steep	II to III
67	SMu	A-2-5(2)	Unsuited	Unsuited	Unsuited	Fair to poor	Interspersed areas of softer rock	Thin to thick	May contain local unstable soils	Blasting and ripping	Moderate to high	High	Steep	II to III
68	SMu	A-2-5(2)	Suited to unsuited	Unsuited	Unsuited	Unsuited	Weathered, soft	Thick	None	Ripping and blading	Moderate to high	Moderate	Moderate to flat	II to III
71	SMu	A-1-6(0)	Unsuited	Unsuited	Unsuited	Poor to unsuited	Softer, platy rock interspersed	Thin	Steep dissected slopes and shallow soils	Ripping and blasting	High	High to moderate	Steep	II to III

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72	SMu	A-1-6(0)	Unsuited	Unsuited	Unsuited	Unsuited	Weathered, soft	Thin to thick	None	Ripping and blading	High	Moderate	Steep to moderate	III
76	ML SMu GP-GMd GP-GMd	A-2-4(0) A-2-6(0) A-4-(0) A-1-6(0) A-2-5(0) A-1-9(0) A-4 A-1-9	Unsuited	Unsuited	Unsuited	Fair to good	Softer, platy rock interspersed	Thin	Steep slopes, shallow soils, and local outcropping	Blasting and ripping	High	High	Steep	II to III
77	MH ML	A-5(10) A-7-5(10) A-5(4) A-7-5(14)	Unsuited	Unsuited	Unsuited	Poor to fair	Softer, platy rock interspersed	Thin to thick	None	Blading and ripping	High	High	Steep to moderate	II to III
81	SC SMu CL SMd	A-2-4 A-4(4) A-2-4(0) A-4(0)	Unsuited	Unsuited	Unsuited	Good	None	Thin	Steep slopes, shallow soils, and local rock outcrops	Blasting and ripping	High	Moderate	Steep	II to III
82	SMu GP-GMu SC MH 2/ GM,GM-GC 3/	A-7-5(17) A-7-5(4) A-7-5(2) A-2-4(0) A-2-6(0) A-6(2) A-7-5(6) A-4 2/ A-1, A-2 3/	Unsuited	Unsuited	Unsuited	Fair to good	None	Thin to thick	None	Blasting and ripping	Moderate to high	Moderate	Steep	II to III
83	MH	A-7-5(6)	Unsuited	Unsuited	Unsuited, locally suited	Unsuited	Soft and saprolitic	Thick	None	Ripping and blading	Moderate to high	Moderate to low	Moderate	II to III
86	SMu	A-5(1) A-4(2) A-6(2)	Unsuited	Unsuited	Unsuited	Good	None	Thin	Steep slopes, shallow soils, and local rock outcropping	Blasting and ripping	High	Moderate	Steep	II to III
87	SMu	A-5(1)	Unsuited	Unsuited	Unsuited	Fair to good	None	Thin	None	Blasting and ripping	High	Moderate	Steep	II to III
91	GM 2/ SM 3/	A-1 2/ A-2 3/	Unsuited	Unsuited	Unsuited	Good	None	Thin	Steep slopes, shallow soils, and local rock outcrops	Blasting and ripping	High	Moderate to high	Steep	II to III
92	SMu	A-2-7(1)	Unsuited	Unsuited	Unsuited	Poor to unsuited	Most bedrock is soft and granular (gruss)	Thin to thick	None	Blasting and ripping	High	Moderate to high	Steep	II to III
93	SMu	A-2-7(1)	Unsuited	Unsuited	Unsuited	Unsuited	Gruss	Thick	None	Blading and ripping	High	Moderate	Moderate	II to III
95	ML 2/ GW-GM, GM 3/	A-4(2) A-1,A-2	Unsuited	Unsuited	Unsuited	Poor to unsuited	Most bedrock is soft and granular (gruss)	Thin	Steep slopes	Blasting and ripping	High	Moderate to high	Steep	II to III
96	GMu	A-2-7(0)	Unsuited	Unsuited	Unsuited	Good	None	Thin	Steep slopes, shallow soils, and local rock outcrops	Blasting and ripping	High	High	Steep	II to III
97	GMu	A-2-7(0)	Unsuited	Unsuited	Unsuited	Fair to poor	Most bedrock is too soft for road rock	Thin to thick	None	Blasting and ripping	High	Moderate to high	Steep	II to III

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98	GMu	A-2-7(0)	Unsuited	Unsuited	Unsuited	Fair to poor	Soft and weathered	Thick	None	Blading and ripping	High	Moderate	Moderate	II to III
99	GM 2/ SMd MH 3/	A-2,A-1 2/ A-4(0) A-7-5(9) 3/	Unsuited	Unsuited	Unsuited	Fair to good	Soft and weathered in fractures	Thin	Steep slopes	Blasting and ripping	High	Moderate to high	Steep	II to III
100	ML	A-5(4)	Unsuited to suited	Unsuited	Unsuited	Poor to unsuited	Soft and weathered	Thin to thick	None	Blading and ripping	Moderate to high	Moderate	Moderate	II
120	None	None	Unsuited	Unsuited	Unsuited	Fair	Poorly cemented	Very thin to thin	Extremely steep slopes and rockfall	Blasting and ripping	Moderate	Moderate	Steep	II to III
121	SMu	A-2-6(0)	Unsuited	Unsuited	Unsuited	Fair	Soft and poorly cemented	Thin	Steep slopes	Ripping and blasting	Moderate	Low to moderate	Steep	II to III
122	SW-SMu	A-1-b(0)	Suited to unsuited	Unsuited	Unsuited	Poor	Soft and poorly cemented	Thin to thick	None	Ripping and blading	Moderate	Low to moderate	Moderate to steep	II to III
125	SMu	A-2-6(0)	Suited	Unsuited	Unsuited	Unsuited	Soft	Thick	Local wet spots may require base course and extra culverts	Blading	Moderate	Low to moderate	Flat to moderate	II to III
176	SMu	A-2-7(0)	Unsuited	Unsuited	Unsuited	Poor to fair	Breakdown under heavy logging traffic	Thin	Steep slopes, shallow soils, and slide potential	Blasting and ripping	High	Moderate to high	Steep	II to III
177	GMu ML	A-1-6(0) A-5(2)	Unsuited	Unsuited	Unsuited	Poor to fair	Breaks down under heavy logging traffic	Thin to thick	None	Blasting and ripping	Moderate to high	Moderate to high	Moderate to steep	II to III
178	SMd	A-1-6	Unsuited	Unsuited	Unsuited	Poor to fair	None	Thin	Steep slopes, shallow soils, some localized outcrop, and slide potential	Blasting and ripping	High	High	Steep	II to III
186	SMu	A-5(1)	Unsuited	Unsuited	Unsuited	Good	None	Thin	Steep slopes, shallow soils, and some localized outcropping	Blasting and ripping	High	Moderate to high	Steep	II to III
191	GM SM	A-1,A-2	Unsuited	Unsuited	Unsuited	Good	None	Thin	Steep slopes, shallow soils, and slide potential	Blasting and ripping	High	Moderate to high	Steep	II to III
192	SMu	A-2-7(1)	Unsuited	Unsuited	Unsuited	Fair to good	Soft rock, locally	Thin to thick	None	Blasting and ripping	High	Moderate to high	Steep	II to III
193	SMu	A-2-7(1)	Suited	Unsuited	Unsuited	Unsuited	Soft, saprolitic	Thick	None	Ripping and blading	High	Moderate	Moderate	II to III
194	ML	A-4-(2)	Unsuited	Unsuited	Unsuited	Good	None	Thin	Steep slopes, shallow soils, and slide potential	Blasting and ripping	High	High	Steep	II to III

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196	GMu	A-2-7(0)	Unsuited	Unsuited	Unsuited	Good	None	Thin	Steep slopes, shallow soils, and slide potential	Blasting and ripping	High	High	Steeep	II to III
197	GMu	A-2-7(0)	Unsuited	Unsuited	Unsuited	Fair to Poor	Most bedrock is too soft for road rock	Thin to thick	Some local unstable areas	Blasting and ripping	Moderate to high	Moderate to high	Steep	II to III

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ENGINEERING TABLE II

Landtype No.	Suggestions for Cutbank Stability Problems	Failure Potential on Road Wastes and Fills	Erosion Potential on Road Wastes and Fills	Suitability of Road Waste and Fill Slope for Seeding	Limitations to Road Waste and Fill Slope Seeding	Suggestions for Road Waste and Fill Slope Seeding	Suitability of Cutbanks to Seeding	Limitations to Cutbank Seeding	Suggestions for Cutbank Seeding
0	N/A	N/A	N/A	N/A	Flooding	N/A	N/A	Flooding	N/A
1	N/A	High	N/A	N/A	Rock outcrop	N/A	N/A	Rock outcrop	N/A
2	N/A	High	N/A	N/A	Rock outcrop	N/A	N/A	Rock outcrop	N/A
3	N/A	High	N/A	N/A	Rock outcrop and serpentinitic influence	N/A	N/A	Rock outcrop	N/A
4	Seed grass; drain off excess water; bench cutslopes; intercept and remove subsurface water; horizontal drains and retaining walls may be useful: plant brush or trees where applicable	High	High	Good	Erosion and slough	1/ Keep slopes vegetated; plantings of willow may be useful	Good	Erosion, slough, and frost heave	1/ 2/
5	Seed grass; drain off excess water; bench cutslopes; intercept and remove subsurface water; horizontal drains and retaining walls may be useful	High	High	Good to fair	Erosion, slough, and serpentinitic influence	1/ Keep slopes vegetated; plantings of willow may be useful	Good to fair	Erosion, slough, frost heave, and serpentinitic influence	1/ 2/
6	N/A	Low	Low	Good	High water table	Use willows for soil where it is too wet for grass	N/A	N/A	N/A
7	N/A	Low to moderate	Moderate	Fair	Droughty soils, and short growing season	1/ 3/	Fair	Shallow, droughty soils, and rock outcrops	1/ 3/ 4/
8,8c	Seed grass; drain off excess water; bench cutslopes; intercept and remove subsurface water; horizontal drains and retaining walls may be useful; plant brush or trees where applicable	High	High	Good	Erosion and slough	1/ Keep slopes vegetated; plantings of willow may be useful	Good	Erosion and slough	1/ 2/
9,9c	Seed grass; drain off excess water; bench cutslopes; intercept and remove subsurface water; horizontal drains and retaining walls may be useful; plant brush or trees where applicable	High	High	Good	Erosion and slough	1/ Keep slopes vegetated	Good	Erosion and slough	1/ 2/ 4/
10	N/A	Low	Low	Fair to poor	Droughty and stony serpentinitic soils	1/ 4/ Repeated fertilization and liming may be required to establish seedlings	Poor	Stony, droughty soils, and serpentinitic influence	1/ 2/ 4/
11	N/A	Low to moderate	Moderate	Fair	Droughty soils	1/ 4/	Fair	Droughty and gravelly soils	1/ 4/
12	N/A	Low	Low	Fair to poor	Droughty, stony, and serpentinitic soils	1/ 2/ Repeated fertilization and liming may be required to establish seedlings	Poor	Stony, droughty soil, and serpentinitic influence	1/ 2/ 4/
13	N/A	Low	Moderate	Fair	Wet, cold soils; frost heaving; and gravelly soils	1/ 3/	Fair	Frost heave, ravel, erosion, and gravelly soils	1/ 3/
14	N/A	Moderate	High	Fair	Cold soils; frost heaving; and gravelly soils	1/ 3/	Fair	Frost heave, ravel, erosion, and gravelly soils	1/ 3/

1/ Seed grass, fertilize, and mulch.
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4/ Use species adaptable to droughty soils.

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15	N/A	Low	Low	Good to fair	Gravelly and droughty soils	1/ 4/	Fair to good	Ravel and gravelly soils	1/
16	Seed grass; local wet areas may require extra culverts or horizontal drains	Low to moderate	Moderate	Good to fair	Gravelly and droughty soils	1/ 4/	Good	Ravel and gravelly soils	1/
17	Seed grass; drain off excess water; bench cutslopes; intercept and remove excess water; horizontal drains and retaining walls may be useful; plant brush or trees where applicable	High	High	Good	Erosion and slough	1/ Keep slopes vegetated; plantings of willow may be useful	Good	Erosion and slough	1/ 2/
18	Seed grass; local wet areas may require extra culverts or horizontal drains; plant brush or trees where applicable	Low to moderate	Moderate	Good to fair	Gravelly and droughty soils	1/ 4/	Good	Ravel and gravelly soils	1/
19	Seed grass; local wet areas may require extra culverts or horizontal drains; plant brush or trees where applicable	Moderate	Moderate to high	Good	Gravelly soils	1/ Keep slopes vegetated; plantings of willow may be useful locally	Good	Ravel, slough, and gravelly soils	1/
21	Seed grass on soil portion	Moderate	High	Poor to fair	Gravelly and droughty areas	1/ 4/	Fair to poor	Ravel and gravelly areas	1/ 4/
22	Seed grass; plant brush or trees where applicable	Moderate	Moderate	Good to fair	None	1/	Fair to good	None	1/
26	Seed grass on soil portion	High	High	Fair to poor	Gravelly and droughty soils	1/ 4/	Poor to fair	Gravelly, shallow, and droughty soils	1/ 4/
27	Seed grass	Moderate to low	High	Fair	Droughty soils	1/ 4/	Fair	Droughty soils	1/ 4/
28	Seed grass on soil portion	High	High	Poor	Droughty and nutrient poor soils	1/ 4/ Repeated fertilization may be required to establish seedlings	Poor	Gravelly, shallow, droughty soils	1/ 4/
29	Seed grass	Moderate to low	High	Poor to fair	Gravelly and droughty, nutrient poor soils	1/ 4/ Repeated fertilization may be required to establish seedlings	Poor to fair	Droughty soils	1/ 4/
31	Seed grass on soil portion only	Moderate	High	Poor	Droughty, gravelly, and serpentinitic soils	1/ 4/ Repeated fertilization and liming may be required to establish seedlings	Poor	Gravelly, droughty, serpentinitic soils	1/ 4/
32	Seed grass	Moderate	Low to moderate	Poor to fair	Droughty, gravelly, and serpentinitic soils	1/ 4/ Repeated fertilization and liming may be required to establish seedlings	Poor	Gravelly, droughty,, serpentinitic soils	1/ 4/
34	Seed grass on soil portion only	Moderate to high	High	Poor	Droughty, gravelly, and serpentinitic soils	1/ 4/ Repeated fertilization and liming may be required to establish seedlings	Poor	Gravelly, droughty, serpentinitic soils	1/ 4/
35	Seed grass on soil portion only	Low	Low to moderate	Poor	Droughty, gravelly, and serpentinitic soils	1/ 4/ Repeated fertilization and liming may be required to establish seedlings	Poor	Gravelly, droughty, serpentinitic soils	1/ 4/

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36	Seed grass on soil portion only	Moderate	High	Poor to fair	Cobbly, gravelly, serpentinitic, and ravelly soils	1/ 4/ (May want to seed with grass that occurs naturally on serpentine)	Poor to fair	Cobbly, gravelly and serpentinitic soils	1/ 4/ (May want to seed with grass that is adapted to serpentinitic conditions)
37	Seed grass	Moderate to high	Moderate	Poor to fair	Cobbly, gravelly, and serpentinitic soils	1/ (May want to seed with grass that occurs naturally on serpentine)	Poor to fair	Cobbly, gravelly and serpentinitic soils	1/ (May want to seed with grass that is adapted to serpentinitic conditions)
38	Seed grass	Moderate to high	High	Poor to fair	Cobbly, gravelly, and serpentinitic soils	1/ 4/ (May want to seed with grass that occurs naturally on serpentine)	Poor to fair	Cobbly, gravelly and serpentinitic soils	1/ 4/ (May want to seed with grass that is adapted to serpentinitic conditions)
39	Seed grass	Moderate	Moderate	Poor to fair	Gravelly, cobbly, and serpentinitic soils	1/ 4/ (May want to seed with grass that occurs naturally on serpentine)	Poor to fair	Cobbly, gravelly and serpentinitic soils	1/ 4/ (May want to seed with grass that is adapted to serpentinitic conditions)
41	Seed grass on soil portion only	Moderate to high	High	Poor	Gravelly and droughty soils	1/ 4/	Poor	Gravelly and droughty soils	1/ 4/
42	Seed grass; plant brush or trees where applicable	Moderate	High	Poor to fair	Gravelly soils	1/	Poor to fair	Gravelly soils	1/
43	Seed grass on soil portion only	Moderate to high	High	Poor	Gravelly and droughty soils	1/ 4/	Poor	Gravelly and droughty soils	1/ 4/
45	Seed grass; local wet areas may require extra culverts or horizontal drains; plant brush or trees where applicable	Moderate	Moderate	Fair to good	None	1/	Fair to good	None	1/
46	Seed grass	High	High	Poor	Gravelly, droughty, and nutrient poor soils	1/ 4/	Poor	Gravelly, droughty, and nutrient poor soils	1/ 4/
48	Seed grass	High	High	Poor	Gravelly, droughty, and nutrient poor soils	1/ 4/	Poor	Gravelly, droughty, and nutrient poor soils	1/ 4/
50	Seed grass on soil portion only	High	High	Fair to poor	Gravelly and droughty soils	1/ 4/ Keep slopes vegetated	Poor to fair	Gravelly, shallow, and droughty soils	1/ 4/
51	Seed grass on soil portion only	High	High	Fair	Gravelly and droughty soils	1/ 4/ Keep slopes vegetated	Fair to poor	Gravelly, shallow, and droughty soils	1/ 4/
52	Seed grass; plant brush or trees where applicable	Moderate	High	Good	Erosion and slough	1/ Keep slopes vegetated	Good	Erosion and slough	1/ 2/
53	Seed grass on soil portion only	High	High	Poor to fair	Gravelly, droughty, and nutrient poor soils	1/ 4/ Repeated fertilization may be required to establish seedlings	Poor	Gravelly, shallow, and droughty soils	1/ 4/
54	Seed grass	Moderate	High	Fair	Gravelly, droughty, and nutrient poor soils	1/ 4/ Repeated fertilization may be be required to establish seedlings	Fair to poor	Gravelly and droughty soils	1/ 4/

1/ Seed grass, fertilize, and mulch.
2/ Prepare rough cutslopes to catch grass seeds and fertilizer.
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55	Seed grass; local wet areas may require extra culverts or horizontal drains; plant brush or trees where applicable	Moderate to high	High	Good	Erosion and slough	1/ Keep slopes vegetated; plantings of willow may be necessary locally	Good	Erosion and slough	1/ 2/
61	Seed grass on soil portion only	High	High	Fair to good	Erosion and slough	1/ Keep slopes vegetated	Fair to good	Shallow soils, erosion, and slough	1/ 2/
62	Seed grass; plant brush or trees where applicable	High	High	Good	Erosion and slough	1/ Keep slopes vegetated	Good	Erosion and slough	1/ 2/
66	Seed grass on soil portion only	Moderate to high	High	Poor	Gravelly and droughty soils	1/ Keep slopes vegetated	Poor	Gravelly and droughty soils	1/ 4/
67	Seed grass on soil portion only; plant brush or trees where applicable	Moderate to high	High	Poor to fair	Gravelly and droughty soils	1/ 4/ Keep slopes vegetated	Poor to fair	Gravelly and droughty soils	1/ 4/
68	Seed grass; plant brush or trees where applicable	Moderate	Moderate	Fair to good	None	1/	Fair to good	None	1/
71	Seed grass on soil portion only	High	High	Fair	Gravelly and droughty soils	1/ 4/ Keep slopes vegetated	Fair to poor	Gravelly, shallow, and droughty soils	1/ 4/
72	Seed grass; plant brush or trees where applicable	Moderate to low	High	Good to fair	Erosion, slough, and gravelly soils	1/	Fair to good	Gravelly soils	1/
76	Seed grass on soil portion only	Moderate to high	High	Poor	Gravelly, droughty, and nutrient poor soils	1/ 4/ Keep slopes vegetated	Poor	Gravelly, droughty, and nutrient poor soils	1/ 4/
77	Seed grass; plant brush or trees where applicable	Moderate to high	High	Poor to fair	Gravelly and droughty soils	1/ 4/ Keep slopes vegetated	Poor	Gravelly and droughty soils	1/ 4/
81	Seed grass on soil portion only	Moderate to high	High	Fair	Gravelly and droughty soils	1/ 4/ Keep slopes vegetated	Poor to fair	Shallow, gravelly, and droughty soils	1/ 4/
82	Seed grass; plant brush or trees where applicable	Moderate to high	High	Fair to good	Slough and gravelly soils	1/ Keep slopes vegetated	Fair	Gravelly soils	1/
83	Seed grass; plant brush or trees where applicable	Moderate	Moderate	Good	Slough	1/	Good	Slough	1/
86	Seed grass on soil portion only	Moderate to high	High	Poor	Gravelly, droughty, and nutrient poor soils	1/ 4/ Keep slopes vegetated	Poor	Gravelly, droughty, and nutrient poor soils	1/ 4/
87	Seed grass on soil portion only; plant brush or trees where applicable	Moderate to high	High	Poor	Gravelly and droughty soils	1/ 4/ Keep slopes vegetated	Poor	Gravelly and droughty soils	1/ 4/
91	Seed grass on soil portion only	Moderate to high	High	Poor	Gravelly, droughty, and highly erosive soils	1/ 4/ Keep slopes vegetated	Poor	Shallow, gravelly, droughty, and highly erosive soils	1/ 4/
92	Seed grass; plant brush or trees where applicable	Moderate to high	High	Fair to poor	Gravelly, droughty, and highly erosive soils	1/ 4/ Keep slopes vegetated	Poor to fair	Gravelly, droughty and highly erosive soils	1/ 4/
93	Seed grass; plant brush or trees where applicable	Moderate	High	Fair to good	Slough and highly erosive soils	1/	Fair	Highly erosive soils	1/

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95	Seed grass on soil portion only	Moderate to high	High	Poor to fair	Gravelly, droughty, and highly erosive soils	1/ 4/ Keep slopes vegetated	Poor	Shallow, gravelly, droughty, and highly erosive soils	1/ 4/
96	Seed grass on soil portion only	Moderate to high	High	Poor	Gravelly, droughty, and erosive soils	1/ 4/ Keep slopes vegetated	Poor	Shallow, gravelly, droughty, and erosive soils	1/ 4/
97	Seed grass; plant brush or trees where applicable	Moderate	High	Fair	Gravelly, droughty, and erosive soils	1/ 4/ Keep slopes vegetated	Fair to poor	Gravelly, droughty, and erosive soils	1/ 4/
98	Seed grass; plant brush or trees where applicable	Moderate	Moderate	Fair to good	Erosion and slough	1/	Good to fair	Erosive soils	1/
99	Seed grass on soil portion only	Moderate to high	High	Poor	Gravelly, droughty, and erosive soils	1/ 4/ Keep slopes vegetated	Poor	Gravelly, droughty, and erosive soils	1/ 4/
100	Seed grass	Moderate	Moderate	Fair	Erosion and slough	1/	Fair to good	Erosive soils	1/
120	Seed grass on soil portion only	Moderate to high	Moderate to high	Poor	Gravelly, droughty, and nutrient poor soils	1/ Repeated fertilization may be required to establish seedlings	Poor	Gravelly and droughty soils	1/ 4/
121	Seed grass; plant brush or trees where applicable	Moderate	Moderate to high	Fair	Droughtiness	1/ Keep slopes vegetated	Fair	Droughtiness	1/ 4/
122	Seed grass; plant brush or trees where applicable	Moderate to low	Moderate to high	Good	None	1/ Keep slopes vegetated	Good	Droughtiness	1/
125	Local wet areas may require horizontal drains or extra culverts; plant brush or trees where applicable	Low	Low	Good	None	1/	Good	Droughtiness	1/
176	Seed grass on soil portion only	Moderate to high	High	Poor	Gravelly, droughty, and erosive soils	1/ 4/ Keep slopes vegetated	Poor	Gravelly, droughty, and erosive soils	1/ 4/
177	Seed grass; plant brush or trees where applicable	Moderate	High	Poor to fair	Gravelly and erosive soils	1/ 4/ Keep slopes vegetated	Poor to fair	Gravelly and erosive soils	1/ 4/
178	Seed grass on soil portion only	Moderate to high	High	Poor	Gravelly, droughty, and erosive soils	1/ 4/ Repeated fertilization may be required to establish seedlings	Poor	Gravelly, droughty, and erosive soils	1/ 4/ Repeated fertilization may be necessary to establish seedlings
186	Seed grass on soil portion only	Moderate to high	High	Poor	Gravelly, droughty, and erosive soils	1/ 4/ Keep slopes vegetated	Poor	Gravelly, droughty, and erosive soils	1/ 4/
191	Seed grass on soil portion only	Moderate to high	High	Poor	Gravelly, droughty, and highly erosive soils	1/ 4/ Keep slopes vegetated	Poor	Gravelly, droughty, and erosive soils	1/ 4/
192	Seed grass; plant brush or trees where applicable	Moderate	High	Poor	Gravelly, droughty, and highly erosive soils	1/ 4/ Keep slopes vegetated	Poor	Gravelly, droughty, and erosive soils	1/ 4/
193	Seed grass	Moderate	High	Fair to good	Erosion and slough	1/	Fair to good	Droughtiness	1/

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194	Seed grass on soil portion only	Moderate to high	High	Poor	Gravelly, droughty, and highly erosive soils	1/ 4/ Repeated fertilization may be required to establish seedlings	Poor	Gravelly, droughty, and erosive soils	1/ 4/ Repeated fertilization may be necessary to establish seedlings
196	Seed grass on soil portion only	Moderate to high	High	Poor	Gravelly, droughty, and erosive soils	1/ 4/ Repeated fertilization may be required to establish seedlings	Poor	Gravelly and droughty soils	1/ 4/
197	Seed grass; plant brush or trees where applicable	Moderate to high	Moderate	Fair to poor	Cobbly, often droughty soils	1/ Keep slopes vegetated	Poor to fair	Gravelly, often droughty soils	1/

1/ Seed grass, fertilize, and mulch.
2/ Prepare rough cutslopes to catch grass seeds and fertilizer.
3/ Use species adaptable to cold winter conditons.
4/ Use species adaptable to droughty soils.

Erosion and Hydrology

Erosion and some hydrologic interpretations include erosion and water management interpretations. Interpretations for erosion include the two major kinds of erosion--surface and mass movement. Surface erosion pertains only to surface soil loss by runoff and overland flow. Mass movement pertains to all types of soil and bedrock movement which occur below the soil surface, such as landslips, slumps, slides, rockfall, and landflow.

Natural Stability

This rating is based on the relative stability of the landtype units as they occur in the natural state. This includes any movement or loss other than surface erosion. Kind of movement includes slumps, slides, and all kinds of deep-seated failures. This rating applies throughout Region 6.

I. Stable - occasional failures.

II. Moderately stable - several failures are observed.

III. Moderately unstable - common failures are observed.

IV. Unstable - many failures are observed.

V. Very unstable - entire area shows evidence of recent and past failures.

Nature of Mass Movement

This is an estimation of the kind and/or size of mass movement observed.

Expected Mass Movement as a Result of Man's Activities

This rating indicates the expected mass movement resulting from man's activities as compared to stability under natural conditions. Ratings are based on soil and bedrock characteristics, slopes, revegetation potential, and effects of timber removal, road construction, and fire.

Unchanged - the expected mass movement is relatively unchanged from that of the natural state.

Increased - the expected mass movement is greater than that of the natural state.

Greatly increased - the expected mass movement is much greater than that of the natural state.

Surface Soil Erosion Potential

This rating is based on expected losses of surface soil when all vegetative cover, including litter, is removed. Evaluations of climate, slope gradient and length, soil characteristics, hydrologic characteristics of the soil, and bedrock materials of each landtype unit are considered in making ratings.

I. Very slight - little loss of surface soil material is expected. Less than 50 cubic feet per acre per year.

II. Slight - little loss of soil materials is expected. Some minor sheet and rill erosion may occur. 50 to 100 cubic feet per acre per year.

III. Moderate - some loss of surface soil materials can be expected. Rill erosion and some small gullies or sheet erosion may be occurring. Sheet erosion can be determined by some soil pedestals and observable accumulation of soil materials along the upslope edge of rocks and debris. At this level of erosion there is a possible fertility loss. 100 to 300 cubic feet per acre per year.

IV. Severe - considerable loss of surface soil materials can be expected. Rill erosion, numerous small gullies, or evidence that considerable loss from sheet erosion may occur. Sheet erosion is indicated by frequent occurrence of soil pedestals and considerable accumulation of soil materials along the upslope edge of rocks and debris. This is accompanied by a probable fertility loss. 300 to 600 cubic feet per acre per year.

V. Very severe - large loss of surface soil material can be expected in the form of many large gullies and/or numerous small gullies or large loss from sheet erosion. Sheet erosion loss is exhibited by numerous examples of soil pedestals and extensive accumulation of soil materials along the upslope edge of rocks and debris. This is accompanied by a fertility loss. Greater than 600 cubic feet per acre per year.

Grass Seeding Requirements for Timber Harvest Units 1/

Low - this rating indicates that grass seeding is usually not necessary.

Moderate - this rating indicates that grass seeding may be required when the surface litter layer is removed from the soil by either logging activities or slash burning.

High - This rating indicates that grass seeding will be required to maintain soil productivity and water quality when the surface litter layer is removed by logging activities or slash burning, and may be required when the litter layer is still intact because of the high erosion hazard of the area.

Subsoil Erosion Potential

This interpretation indicates the potential for subsoil erosion by water for each unit. It includes erosion which takes place after the surface soil has been removed (at least to 12-inch depth) such as in skid trails and firebreaks. Factors considered in making ratings are texture and structure of subsoil materials, slope, permeability, compaction, climate, and landform.

Low - factors are such that little or no erosion may occur. Very little evidence of erosion.

Moderate - considerable erosion occurring such as rills and small gullies. Factors indicate considerable erosion is likely to occur.

High - factors indicate severe erosion may occur.

Suggestions for Controlling Subsoil Erosion

In this column suggestions are given, when applicable for controlling erosion.

Water Yield Class

This interpretation is an indication of the rate and amount of water yield expected from each soil. It is based on factors such as soil characteristics, infiltration rates, permeability, slope, climate, vegetation, and drainage patterns.

Class I - These soils have a high water detention storage capacity and a low rate of runoff. Little water is yielded to peak flows until detention storage capacity is exceeded or unless the soils are initially saturated or frozen. They are important in sustaining high base flow due to a relatively large volume of water held in detention storage.

Class II - These soils have a moderate water detention storage capacity and a moderate rate of runoff. Water contributes to both peak flows and base flow.

1/ Grass seeding requirement based on extent of slash burning and whether or not surface litter layer is burned off or not.

Class III - These soils have a low water detention storage capacity and a high rate of runoff. The storage capacity is low and easily exceeded with most of the water contributing to peak flow. Little water is yielded to sustain base flow.

Bedrock Hydrologic Characteristics

This interpretation indicates the relative capacity of bedrock to store and transmit water. The rating is based on bedrock kind, texture, type and extent of fracturing, frequency of jointing, bedding characteristics, and degree of weathering.

Class I - This indicates that the bedrock has a relatively high capacity to store water. The water transmission rate is low unless the storage capacity is exceeded. Rocks in this class include sandstones because of their texture, fracture, and bedding characteristics, and basalts where water occurs in large tubes and other cavities or in the interflow zone between successive lava flows.

Class II - This indicates that the bedrock has a moderate capacity to store water. The rate of water transmission is moderate. Rocks in this class are generally hard to moderately hard, moderately fine-textured, and moderately to highly fractured siltstone, mudstone, pyroclastics, argillite, and schist.

Class III - This indicates that the bedrock has a relatively low capacity to store water. The rate of water transmission is rapid. Rocks generally in this class are fractured coarse crystalline rocks such as granite, gabbro, and gneiss, and other hard-fractured rocks such as conglomerate.

Class IV - This indicates that the bedrock has both low storage capacity and low rate of water transmission. Rocks in this class are generally highly weathered, fine textured, and lack open fracture channels.

Hydrologic Group

This interpretation is a grouping of soils into four classes, indicating the general infiltration and water movement ability of the soil and bedrock materials. This method of ratings has been developed by the Soil Conservation Service. The four groups are the standard SCS groupings and definitions.

Group A - Soils having high infiltration rates even when thoroughly wetted, consisting chiefly of deep, well to excessively drained sands and/or gravel. These soils have a high rate of water transmission and would result in a low runoff potential.

Group B - Soils have moderate infiltration rates when thoroughly wetted, consisting chiefly of moderately deep to deep, moderately well to well drained soils, with moderately fine to moderately coarse textures. These soils have a moderate rate of water transmission.

Group C - Soils having slow infiltration rates when thoroughly wetted, consisting chiefly of 1) soils with a layer that impedes the downward movement of water, or 2) soils with moderately fine to fine texture and a slow infiltration rate. These soils have a slow rate of water transmission.

Group D - Soils having very slow infiltration rates when thoroughly wetted, consisting chiefly of 1) clay soils with high swelling potential, 2) soils with a high permanent water table, 3) soils with claypan or clay layer at or near the surface, and 4) shallow soils over nearly impervious materials. These soils have a very slow rate of water transmission.

Silt and Clay Sediment Yield Potential

This interpretation indicates the potential for water sedimendation and pollution from silt and clay particles carried in suspension following timber harvest, road construction, or other activities. Factors considered in making ratings are soil texture and structure, drainage patterns, landform, and climate.

High Potential for Sediment Yield

Impacts of Sedimentation Upon the Fisheries

Impact of sediment yield on fisheries is extremely difficult to evaluate because it is highly dependent upon the following:

1. Time of occurrence - should streambed sedimentation occur when fish spawn is in the gravel, the eggs can be killed by lack of intra-gravel water movement and reduction of dissolved oxygen levels.

2. Quantity - even a small amount of sediment can be lethal to salmonid fish spawn, especially if it occurs at lower flows when velocity is insufficient to carry sediment out of the gravel.

3. Impacts upon aquatic insect life - aquatic insects provide the major source of food for juvenile salmon, steelhead, and resident trout. Many species of aquatic insects have a much higher dissolved oxygen requirement than fish and are destroyed by sedimentation and resulting dissolved oxygen depletion.

4. Carrying capacity - sediment often fills in rearing pools, thus reducing fish carrying capacity of stream environment.

5. Emergence - sedimentation can prevent juvenile salmonids from emerging from gravel.

The above items are only a few of the adverse impacts of sedimentation. Soil particle size is not the only criteria for evaluating impacts of sedimentation upon aquatic life.

Low - Sedimentation levels of silt and clay particles are not expected to be significant following management activities. Soils are generally moderately coarse-textured.

Moderate - Sedimentation levels of silt and clay particles may be significantly increased following management activities with moderate loss of water quality and damage to fisheries. Soils are generally medium-textured.

High - Sedimentation levels of silt and clay particles are expected to be high following management activities. Streams become turbid and there is considerable loss of water quality and damage to fisheries. Soils are generally fine to moderately fine-textured.

Expected Sediment Size

This interpretation indicates the expected sediment size reaching the streams resulting from erosion of each unit. This interpretation is a statement of the two dominant separates expected (gravel, sand, silt, or clay) from each soil unit. The ratings are presented in two columns. The first column indicates the separates expected from the surface soils, and the second indicates the separates expected from the subsoils.

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EROSION AND HYDROLOGY

Landtype No.	Natural Stability	Nature of Mass Movement 1/	Expected Mass Movement as a Result of Man's Activities	Surface Soil Erosion Potential	Grass Seeding Requirement for Timber Harvest Units 3/	Subsoil Erosion Potential	Suggestions for Controlling Subsoil Erosion	Water Yield Class	Bedrock Hydrologic Characteristics	Hydrologic Group	Sedimentation Yield Potential	Expected Sediment Size: Surface Soil	Expected Sediment Size: Subsoil
0	Stable	N/A	Unchanged	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1	Stable	Rock falls and debris slides	Unchanged	N/A	N/A	N/A	N/A	N/A	II and III	N/A	N/A	N/A	N/A
2	Stable	Rock falls and debris slides	Unchanged	N/A	N/A	N/A	N/A	N/A	I, II, and III	N/A	N/A	N/A	N/A
3	Stable	Rock falls and debris slides	Unchanged	N/A	N/A	N/A	N/A	N/A	I and II	N/A	N/A	N/A	N/A
4	Unstable (locally very unstable)	Slumps	Increased (locally greatly increased)	Moderate to severe	Moderate to high	Moderate to high	2/	I	IV	D	Moderate to high	Gravel, silt, and clay	Gravel, silt, and clay
5	Unstable to very unstable	Slumps and channel scour	Increased to greatly increased	Severe	High	Moderate to high	2/	I	IV	D	Moderate to high	Gravel, silt, and clay	Gravel, silt, and clay
6	Stable	N/A	Unchanged	Slight to moderate	N/A	Low	2/	I	III and IV	D	Moderate to high	Sand and silt	Silt
7	Moderately stable	Debris slides	Increased	Very severe to severe	N/A	High	2/	III	III	B	Moderate	Gravel, sand, and silt	Gravel, sand, and silt
8	Unstable to very unstable	Slumps, land flows, and channel scour	Increased to greatly increased	Severe to very severe	High	High	2/	I	IV	D	High	Gravel, silt, and clay	Gravel, silt, and clay
8c	Very unstable to unstable	Land flows, slumps, and channel scour	Greatly increased	Very severe to severe	High	High	2/	I	IV	D	High	Gravel, silt, and clay	Gravel, silt, and clay
9	Unstable to very unstable	Slumps, debris slides, and channel scour	Increased to greatly increased	Very severe to severe	High	High	2/	I and II	IV	D	High	Gravel, silt, and clay	Gravel, silt, and clay
9c	Very unstable to unstable	Slumps, debris slides, and channel scour	Greatly increased	Very severe	High	High	2/	I and II	IV	D	High	Gravel, silt, and clay	Gravel, silt, and clay
10	Stable to moderately stable	Creek bank ravel	Unchanged	Moderate	Moderate	Moderate	2/	I	N/A	A	Moderate	Gravel, sand, silt and clay	Gravel, silt, and clay
11	Moderately unstable	Debris slides	Increased	Moderate to severe	Moderate to high	Moderate to high	2/	II	N/A	A	Moderate	Gravel, sand, and silt	Gravel, sand, and silt
12	Stable to moderately stable	Occasional small slumps	Unchanged	Moderate	Moderate	Moderate	2/	I	N/A	A	Moderate to high	Silt and clay	Silt and clay
13	Moderately stable	Occasional deep seated slumps	Unchanged	Slight to moderate	Low to moderate	Low to moderate	2/	II	N/A	B and C	Low	Gravel, sand, and silt	Gravel, sand, and silt
14	Moderately stable to moderately unstable	Occasional small debris slides and channel scour	Increased	Severe	High	Moderate to high	2/	II	N/A	A	Low	Gravel, sand, and silt	Gravel, sand, and silt
15	Moderately stable	Creek bank ravel	Unchanged	Moderate	Moderate	Moderate	2/	I	N/A	A	Moderate	Gravel, sand, and silt	Gravel, sand, silt, and clay
16	Moderately stable to moderately unstable	Debris slides	Unchanged	Moderate to severe	Moderate to high	Moderate	2/	I and II	N/A	A	Moderate	Gravel, sand, and silt	Gravel, sand, and silt

1/ These definitions are from Highway Research Board, Landslides and Engineering Practice, Special Report #28, Washington, D.C. 1958.
2/ Water bars; prevent water concentration; revegetate barren areas; consider mulch of hay, straw, or chips.
3/ Grass seeding requirements based on extent of slash burning and whether or not surface litter layer is burned off.

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EROSION AND HYDROLOGY

Landtype No.	Natural Stability	Nature of Mass Movement 1/	Expected Mass Movement as a Result of Man's Activities	Surface Soil Erosion Potential	Grass Seeding Requirement for Timber Harvest Units 3/	Sub-soil Erosion Potential	Suggestions for Controlling Subsoil Erosion	Water Yield Class	Bedrock Hydrologic Characteristics	Hydrologic Group	Sedimentation Yield Potential	Expected Sediment Size: Surface Soil	Expected Sediment Size: Subsoil
17	Very unstable	Slumps, debris slides, and channel scour	Greatly increased	Severe	High	High	2/	I	N/A	D	High	Gravel, sand, and silt	Gravel, silt, and clay
18	Moderately unstable	Debris slides and occasional channel scour	Increased	Moderate to severe	Moderate to high	Moderate	2/	II	N/A	B	Moderate	Gravel, sand, and silt	Gravel, sand, and silt
19	Moderately unstable to unstable	Debris slides, small slumps, and channel scour	Increased	Moderate to severe	Moderate to high	Moderate to high	2/	II	N/A	B and D	Moderate to high	Gravel, sand, and silt	Gravel, silt, and clay
21	Moderately stable	Occasional debris slides	Unchanged to increased	Severe	Moderate to high	Moderate	2/	II	II and III	B	Moderate	Gravel, sand, and silt	Gravel, silt, and clay
22	Moderately stable to moderately unstable	Small slumps	Unchanged to increased	Moderate	Moderate	Moderate	2/	I and II	II and III	C	Moderate	Sand, silt, and clay	Gravel, silt, and clay
26	Moderately stable	Occasional debris slide and channel scour	Increased	Severe to very severe	High	High	2/	III	III	C and D	Moderate	Sand and silt	Sand and silt
27	Moderately stable	Occasional debris slides	Increased	Moderate, locally severe	High	Moderate to high	2/	II	III	B	Moderate to low	Sand and silt	Sand and silt
28	Moderately stable	Occasional debris slides and channel scour	Increased	Very severe to severe	High	High	2/	III	III	C and D	Moderate	Sand and silt	Sand and silt
29	Moderately stable	Occasional debris slides	Increased	Moderate to severe	High	Moderate to high	2/	II	III	B	Moderate to low	Sand and silt	Sand and silt
31	Moderately stable	Occasional debris slides	Increased	Severe to moderate	High	Moderate to high	2/	III	II and III	D	High	Gravel, silt, and clay	Gravel, silt, and clay
32	Moderately stable to moderately unstable	Slumps	Increased	Moderate	Moderate	Moderate	2/	II	III	C	High	Silt and clay	Silt and clay
34	Moderately stable to moderately unstable	Debris slides and channel scour	Increased	Severe	High	High	2/	III	II and III	D	High	Gravel, silt, and clay	Gravel, silt, and clay
35	Moderately stable	Occasional debris slides	Unchanged	Moderate	Moderate	Moderate	2/	III	II and III	D	Moderate	Sand and silt	Silt and clay
36	Moderately stable to moderately unstable	Occasional debris slides and slumps	Increased	Severe	High	Severe	2/	II	III	C	High	Gravel, silt, and clay	Gravel, silt, and clay
37	Moderately stable to locally unstable	Debris slides and slumps	Increased	Severe	High	Severe	2/	II	III	C	High	Gravel, silt, and clay	Gravel, silt, and clay
38	Moderately unstable	Debris slides, channel scour and occasional slumps	Increased	Severe	High	Severe	2/	II	III	B and C	High	Gravel, silt, and clay	Gravel, silt, and clay

1/ These definitions are from Highway Research Board, Landslides and Engineering Practice, Special Report #28, Washington, D.C. 1958.
2/ Water bars; prevent water concentration; revegetate barren areas; consider mulch of hay, straw, or chips.
3/ Grass seeding requirements based on extent of slash burning and whether or not surface litter layer is burned off.

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39	Moderately stable	Occasional slumps	Unchanged to increased	Moderate	Moderate	Moderate	2/	II	III	C	Moderate to high	Gravel, silt, and clay	Gravel, silt, and clay
41	Moderately stable to moderately unstable	Debris slides and occasional slumps	Increased	Severe	High	High	2/	II	II	C	Moderate	Gravel, sand, and silt	Gravel, silt, and clay
42	Moderately stable to moderately unstable	Occasional debris slides and slumps	Increased	Moderate	Moderate	Moderate	2/	II	II	B	Moderate to high	Sand, silt, and clay	Silt and clay
43	Moderately stable	Debris slides and occasional slumps	Increased	Severe to very severe	High	High	2/	II to III	II	C	Moderate	Gravel, sand, and silt	Gravel, sand, and silt
45	Moderately unstable	Slumps	Increased	Slight to moderate	Low	Low	2/	I	I and II	B	Moderate to high	Sand, silt, and clay	Silt and clay
46	Moderately stable to moderately unstable	Debris slides, channel scouring, and occasional slump	Increased	Severe to very severe	High	High	2/	III	III	C and D	Moderate	Gravel, sand, and silt	Gravel, sand, and silt
48	Moderately stable to moderately unstable	Debris slides, channel scouring, and occasional slumps	Increased	Severe to very severe	High	High	2/	III	III	C and D	Moderate	Gravel, sand, and silt	Gravel, sand, and silt
50	Moderately stable	Occasional debris slides and channel scour	Increased	Severe	High	High	2/	III	II	C and D	Moderate	Gravel, sand, and silt	Gravel, sand, and silt
51	Moderately stable to moderately unstable	Debris slides and channel scour	Increased	Severe	High	High	2/	III	II	D	Moderate to high	Gravel, sand, and silt	Gravel, sand, silt and clay
52	Moderately unstable to moderately stable	Small slumps	Increased	Moderate	Moderate	Moderate	2/	II	II and IV	C	Moderate	Sand and silt	Sand, silt, and clay
53	Moderately stable	Occasional debris slides and channel scour	Increased	Severe	High	High	2/	III	II	D	Moderate to high	Gravel, sand, and silt	Gravel, sand, and silt
54	Moderately stable to moderately unstable	Small slumps	Increased	Moderate	Moderate	Moderate	2/	II	II	C	Moderate	Gravel, sand, and silt	Gravel, sand, and silt
55	Moderately unstable (locally unstable)	Slumps and channel scouring	Increased	Moderate	Moderate	Moderate	2/	I	IV	D	High to moderate	Sand, silt, and clay	Sand, silt, and clay
61	Moderately unstable	Debris slides, channel scouring, and small slumps	Increased	Severe	High	High	2/	III	II	B and C	Moderate to high	Sand and silt	Sand and silt
62	Moderately unstable to unstable	Slumps and channel scour	Increased	Moderate, locally severe	High	High	2/	I and II	II	B and C	High to moderate	Sand and silt	Silt and clay
66	Moderately stable	Debris slides and channel scouring	Increased	Severe	High	High	2/	III	III	C and D	Moderate	Gravel, sand, and silt	Gravel, sand, and silt

1/ These definitions are from Highway Research Board, Landslides and Engineering Practice, Special Report #28, Washington, D.C. 1958.
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Landtype No.	Natural Stability	Nature of Mass.Movement 1/	Expected Mass Movement as a Result of Man's Activities	Surface Soil Erosion Potential	Grass Seeding Requirement for Timber Harvest Units 3/	Subsoil Erosion Potential	Suggestions for Controlling Subsoil Erosion	Water Yield Class	Bedrock Hydrologic Characteristics	Hydrologic Group	Sedimentation Yield Potential	Expected Sediment Size	
												Surface Soil	Subsoil
67	Moderately stable to moderately unstable	Debris slides and slumps	Increased	Moderate	High to	Moderate	2/	II	III	B and C	Moderate to high	Sand, silt, and clay	Silt and clay
68	Moderately stable to moderately unstable	Slumps	Increased	Slight to moderate	Low	Low	2/	I and II	III	B	Moderate to high	Silt and clay	Silt and clay
71	Moderately stable	Occasional debris slides and channel scour	Increased	Severe	High	High	2/	III	II	C and D	Moderate	Sand and silt	Sand and silt
72	Moderately stable to moderately unstable	Slumps	Increased	Moderate	Moderate	Moderate	2/	II	II	B	Moderate	Sand and silt	Sand, silt and clay
76	Moderately stable	Occasional debris slides and channel scours	Increased	Severe	High	High	2/	III	II to III	C and D	Moderate	Gravel, sand, and silt	Gravel, sand, and silt
77	Moderately stable to moderately unstable	Slumps	Increased	Moderate	High	Moderate	2/	II	II to III	B and C	Moderate	Gravel, sand, and silt	Sand, silt, and clay
81	Moderately stable	Occasional debris slides and channel scour	Increased	Severe	High	High	2/	III	I and II	B and C	Moderate	Gravel, sand, and silt	Gravel, sand, and silt
82	Moderately unstable to moderately stable	Slumps, occasional debris slides, and channel scour	Increased	Moderate	Moderate to high	Moderate	2/	II	I and II	B and C	Moderate to high	Sand and silt	Silt and clay
83	Moderately unstable	Slumps	Increased	Slight to moderate	Low to moderate	Low to moderate	2/	I	I and II	B and C	Moderate	Sand and silt	Silt and clay
86	Moderately stable	Occasional debris slides and channel scouring	Increased	Severe	High	High	2/	III	III	C and D	Moderate	Gravel, sand, and silt	Gravel, sand, and silt
87	Moderately stable to moderately unstable	Slumps	Increased	Moderate	High	Moderate	2/	II	III	B and C	Moderate to high	Gravel, silt, and clay	Silt and clay
91	Moderately stable	Occasional debris slides and channel scour	Increased	Very severe	High	High	2/	III	III	C and D	Moderate	Gravel and sand	Gravel and sand
92	Moderately stable	Occasional debris slides and channel scouring	Increased	Severe	High	High	2/	II	III	B	Moderate to high	Sand and silt	Sand, silt, and clay
93	Moderately stable to moderately unstable	Slumps	Increased	Moderate	Moderate to high	Moderate	2/	I	III	A and B	Moderate	Sand and silt	Sand, silt, and clay

1/ These definitions are from Highway Research Board, Landslides and Engineering Practice, Special Report #28, Washington, D.C. 1958.
2/ Water bars; prevent water concentration; revegetate barren areas; consider mulch of hay, straw, or chips.
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												Surface Soil	Subsoil
95	Moderately stable to moderately unstable	Debris slides, channel scour, and occasional slumps	Increased	Very severe	High	High	2/	II	III	A and B	High to moderate	Gravel, sand, and silt	Gravel, sand, silt, and clay
96	Moderately stable	Occasional debris slides and channel scour	Increased	Very severe	High	High	2/	III	III	D	Moderate to high	Gravel, sand, and silt	Gravel, sand, and silt
97	Moderately stable	Occasional debris slides and channel scour	Increased	Severe to moderate	High	High to moderate	2/	II	III	B	Moderate to high	Gravel, sand, and silt	Gravel, sand, silt, and clay
98	Moderately stable to moderately unstable	Slumps	Increased	Moderate	Moderate to high	Moderate	2/	I	III	A and B	Moderate	Sand and silt	Sand, silt, and clay
99	Moderately stable to moderately unstable	Debris slides, channel scour, and slumps	Increased	Severe to very severe	High	High	2/	II	III	B	Moderate	Gravel, sand, and silt	Gravel, sand, and silt
100	Moderately stable to moderately unstable	Slumps	Increased	Moderate	Moderate	Moderate	2/	I and II	III	B	Moderate	Sand and silt	Sand, silt, and clay
120	Moderately stable	Debris slides, channel scour, and occasional slumps	Increased	Very severe	High	High	2/	III	I	C and D	Moderate	Gravel, sand, and silt	Gravel, sand, and silt
121	Moderately stable	Debris slides and occasional slumps	Increased	Severe	High	High	2/	II	I	B and C	Moderate	Sand and silt	Sand and silt
122	Moderately stable to moderately unstable	Slumps	Increased	Moderate	Low to moderate	Moderate	2/	I and II	I	B	Moderate	Sand, silt, and clay	Sand, silt, and clay
125	Moderately stable	Occasional slumps	Usually unchanged	Slight	Low	Low	2/	I	I	B	Moderate	Sand, silt, and clay	Sand, silt, and clay
176	Moderately unstable to locally unstable	Channel scouring, debris slides, and slumps	Increased	Severe to very severe	High	High	2/	III	II to III	C and D	Moderate	Gravel, sand, and silt	Gravel, sand, and silt
177	Moderately stable to moderately unstable	Slumps	Increased	Moderate to severe	Moderate to high	Moderate	2/	II	II to III	B	Moderate	Gravel, sand, silt, and clay	Gravel, sand, silt, and clay
178	Moderately stable to moderately unstable	Channel scouring, debris slides, and slumps	Increased	Severe to very severe	High	High	2/	III	II to III	C and D	Moderate	Gravel, sand, and silt	Gravel, sand, and silt
186	Moderately stable	Occasional channel scouring, debris slides and slumps	Increased	Severe	High	High	2/	III	III	C and D	Moderate	Gravel, sand, and silt	Gravel, sand, and silt
191	Moderately stable to moderately unstable	Channel scouring and debris slides	Increased	Very severe	High	High	2/	III	III	C and D	Moderate	Gravel, sand, and silt	Gravel, sand, and silt

1/ These definitions are from Highway Research Board, Landslides and Engineering Practice, Special Report #28, Washington, D.C. 1958.
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192	Moderately stable to moderately unstable	Channel scouring and debris slides	Increased	Severe	High	High	2/	II	III	B	Moderate	Sand, silt, and clay	Sand, silt, and clay
193	Moderately stable	Occasional slumps	Unchanged to increased	Moderate	Moderate	Moderate	2/	I and II	III	B	Moderate	Gravel, sand, and silt	Sand, silt, and and silt
194	Moderately stable to moderately unstable	Channel scouring and debris slides	Increased	Very severe	High	High	2/	III	III	C and D	Moderate	Gravel, sand, and silt	Gravel, sand, and silt
196	Moderately stable to moderately unstable	Debris slides and channel scour	Increased	Very severe	High	High	2/	III	III	D	Moderate to high	Gravel, sand, and silt	Gravel, sand, and silt
197	Moderately unstable to moderately stable	Slumps and debris slides	Increased	Moderate to severe	Moderate to high	Moderate to high	2/	II	III	B	Moderate to high	Gravel, sand, and silt	Gravel, silt, and clay

1/ These definitions are from Highway Research Board, Landslides and Engineering Practice, Special Report #28, Washington, D.C. 1958.
2/ Water bars; prevent water concentration; revegetate barren areas; consider mulch of hay, straw, or chips.
3/ Grass seeding requirements based on extent of slash burning and whether or not surface litter layer is burned off.

Range and Wildlife

Range and wildlife management interpretations are presented to enable better management through utilization of soil information. These interpretations are oriented toward use by domestic livestock, deer, and elk.

Limitations for Domestic Livestock and Wildlife Use

This interpretation indicates the major topographic and site limitations existing on the landtype unit that would hinder use by domestic livestock and wildlife. Some examples include: steep slopes, rocky slopes, cliffs, high elevations, and winter availability. Forage, or the potential for estabilishing good forage, is not considered in this interpretation.

Susceptibility to Soil Compaction

This interpretation indicates the soil's inherent ability to resist compaction by hoofed animals. Soil properties important to this interpretation are: soil texture, structure, bulk density, pore size, and distribution and rate of infiltration.

Low - Soil properties indicate that the soil will resist compaction by livestock and wildlife use.

Moderate - Soil properties indicate that the soil has tendencies to become compacted under livestock and wildlife use. Time of grazing on these soil units is important.

High - Soil properties indicate that soil compaction will be severe unless livestock use is withheld until the soils have dried adequately.

Susceptibility to Soil Displacement

This interpretation indicates the general susceptibility of the soil to be displaced by livestock grazing and wildlife browsing. Soil displacement is the downslope movement of the soil.

Animal trampling causes loosening of soil particles which are moved downslope by gravity, wind, and water. Displacement is based on soil texture, slope, and field observations.

Low - Soil displacement is likely to be insignificant. Slopes are usually less than 35 percent.

Moderate - Soil displacement occurs. Lateral displacement less than three feet on slopes.

High - 35 to 60 percent soil displacement is severe. Lateral displacement greater than three feet on slopes that exceed 60 percent.

Limitations for Wildlife Use

This interpretation indicates the major topographic and site limitations existing on the landtype unit that would hinder use by wildlife.

Key Species

Key species refers to wildlife to be managed and the major browse and cover plants supported by soils of the area. A dash indicates that a great variety of conditions occur.

Wildlife Habitat Considerations

This includes important considerations for wildlife habitat, for example, critical winter range, rodent infestation problems, and tree plantation damage.

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RANGE AND WILDLIFE MANAGEMENT

Landtype No.	Limitations for Domestic Livestock and Wildlife Use	Susceptibility to Soil Compaction 1/	Susceptibility to Soil Displacement 2/	Key Species			Wildlife Habitat Considerations	Remarks
				Wildlife	Browse	Cover		
0	Gravelly, stony areas	Low	Low	Black-tailed deer and elk	Willow	-	-	Deer and elk watering areas
1,2,3	Steep rocky cliffs	Low	High (where soil exists)	Black-tailed deer and elk	Wedgeleaf ceanothus, serviceberry, silktassel, mountain mahogany, grasses, and sedges	Douglas-fir, Shasta red fir, Jeffrey pine, incense-cedar	High rodent populations in soil areas included within rock outcrop units	Deer and elk feed in open brushfields, particularly brushfields on the serpentinitic rock outcrop (unit 3). Cover is on adjacent forested soils
4	Steep headwall areas	High	Low to high	Black-tailed deer	Wedgeleaf ceanothus, deer-brush ceanothus, snowbrush ceanothus, serviceberry, trailing blackberry, grasses, sedges, and legumes	Douglas-fir, ponderosa pine, incense-cedar	Critical winter range	Deer and elk feed on open southerly aspects. Cover is on slump benches and in drainage ways
5	Steep headwall areas	High	Low to high	Black-tailed deer and elk	Wedgeleaf ceanothus, silk-tassel, serviceberry, grasses, and sedges	Douglas-fir, Jeffrey pine, incense-cedar	Plantation browsing	Deer and elk feed on open southerly aspects. Cover is on slump benches and in drainage ways
6	None	High	Low	Black-tailed deer	Serviceberry, elderberry, willow, grasses, legumes, and sedges	Meadow	High rodent populations	Deer and elk feed in open brushfields and meadows. Cover is on adjacent forested soils
7	None	Moderate	Moderate	Black-tailed deer	Serviceberry, elderberry, snowbrush ceanothus, western bitter cherry, grasses, legumes, and sedges	Meadow	High rodent populations	Deer and elk feed in open brushfields and meadows. Cover is on adjacent forested soils
8,8c, 9,9c	Steep headwall areas	High	Low to high	Black-tailed deer and elk	Trailing blackberry, elderberry, blueblossom ceanothus, grasses, sedges, and legumes	Douglas-fir, hemlock, Port-Orford-cedar, tanoak, madrone, Oregon myrtle, western red-cedar, rhododendron, red alder, chinkapin, evergreen huckleberry 3/	Plantation browsing	Cover is on slump basins and in drainage ways
10,12	None	Low to moderate	Low	Black-tailed deer	Wedgeleaf ceanothus, silk tassel, serviceberry, grasses, and sedges	Douglas-fir, Jeffrey pine, incense-cedar	Critical winter range	Deer and elk feed in open stock common to these serpentinitic areas
11	None	Low	Moderate	Black-tailed deer	Wedgeleaf ceanothus, white-thorn ceanothus, service-berry, legumes, grasses, and sedges	Douglas-fir, incense-cedar, madrone, tanoak	Critical winter range	Deer and elk feed on open southerly aspects
13,14	High elevation	Low	Low to moderate	Black-tailed deer and elk	Serviceberry, elderberry, willow, grasses, legumes, and sedges	Shasta red fir, white fir	Plantation browsing in summer months	Deer and elk feed in openings on south slopes
15	None	Low	Low	Black-tailed deer and elk	Blueblossom ceanothus, whitethorn ceanothus, trailing blackberry, snow-brush ceanothus, redstem ceanothus, salal, grasses, legumes, and sedges	Douglas-fir, incense-cedar, madrone, tanoak, chinkapin, red alder 3/	Critical winter range, plantation browsing	Deer and elk feed in openings
16,18	None	Low	Moderate	Black-tailed deer and elk	Whitethorn ceanothus, blueblossom ceanothus, snowbrush ceanothus, red-stem ceanothus, legumes, grasses, and sedges	Douglas-fir, madrone, tanoak	Critical winter range, plantation browsing	Deer and elk feed in openings and use these streamside areas extensively for cover

1/ Soil compaction by wildlife is much less than that caused by livestock or that resulting from man's activities.
2/ Soil displacement by livestock and wildlife is much less than that resulting from man's activities.
3/ Red alder, being a deciduous tree, is generally valuable to wildlife as summer cover only.

TABLE OF INTERPRETATIONS

RANGE AND WILDLIFE MANAGEMENT

Landtype No.	Limitations for Domestic Livestock and Wildlife Use	Susceptibility to Soil Compaction 1/	Susceptibility to Soil Displacement 2/	Key Species: Wildlife	Key Species: Browse	Key Species: Cover	Wildlife Habitat Considerations	Remarks
17,19	None	Moderate	Moderate	Black-tailed deer and elk	Blueblossom ceanothus, trailing blackberry, salal, grasses, sedges, and legumes	Douglas-fir, Port-Orford-cedar, western red cedar, western hemlock, Oregon myrtle, chinkapin, tanoak, madrone, red alder, rhododendron, evergreen huckleberry 3/	Plantation browsing	Deer and elk feed in openings and use these streamside areas extensively for cover
21,66,76, 86	Steep slopes	Low	High	Black-tailed deer and elk	Whitethorn ceanothus, blueblossom ceanothus, snowbrush ceanothus, red-stem ceanothus, legumes, grasses, and sedges	Douglas-fir, madrone, tanoak	Critical winter range	Deer and elk feed in openings on south slopes and use cover on north slopes and in drainage ways
22,67,68, 77,87	None	Moderate to high	Moderate to low	Black-tailed deer and elk	Whitethorn ceanothus, blueblossom ceanothus, snowbrush ceanothus, red-stem ceanothus, legumes, grasses, and sedges	Douglas-fir, madrone, tanoak	Critical winter range, plantation browsing	Deer and elk feed in openings on south slopes
26	Steep slopes	Low	High	Black-tailed deer and elk	Blueblossom ceanothus, salal, grasses, legumes, and sedges	Douglas-fir, western hemlock, Port-Orford-cedar, western red cedar, chinkapin, madrone, tanoak	Plantation browsing	Deer and elk feed in openings, seek cover in thickets
27	None	Low	Low to moderate	Black-tailed deer and elk	Blueblossom ceanothus, trailing blackberry, salal, grasses, and legumes	Douglas-fir, western hemlock, Port-Orford-cedar, western red cedar, chinkapin, Oregon myrtle, madrone, tanoak	Plantation browsing	Deer and elk feed in openings, seed cover in thickets
28	Steep slopes	Low	High	Black-tailed deer and elk	Blueblossom ceanothus (locally), salal, grasses, and sedges	Douglas-fir, chinkapin, madrone, tanoak	High rodent populations in openings	Deer and elk feed in numerous natural openings
29	None	Low	Low to moderate	Black-tailed deer	Blueblossom ceanothus (locally), salal, grasses, and sedges	Douglas-fir, chinkapin, madrone, tanoak	High rodent populations in openings	Deer and elk feed in numerous natural openings
31,34	Water availability	Low	Moderate to high	Black-tailed deer	Wedgeleaf ceanothus, silktassel, grasses, and sedges	Jeffrey pine, incense-cedar	Critical winter range	Deer feed in open stands common to these serpentinitic areas
32,35	Water availability	Moderate to low	Low	Black-tailed deer	Wedgeleaf ceanothus, silktassel, grasses, and sedges	Jeffrey pine, incense-cedar, Douglas-fir	Critical winter range	Deer feed in open stands common to these serpentinitic areas
36,38	None	Moderate to low	Moderate to high	Black-tailed deer and elk	Blueblossom ceanothus, silktassel, grasses, and sedges	Douglas-fir, Port-Orford-cedar, incense-cedar	Plantation browsing	Deer feed in open stands common to these serpentinitic areas
37,39	None	Moderate	Low	Black-tailed deer and elk	Blueblossom ceanothus, silktassel, grasses, and sedges	Douglas-fir, Port-Orford-cedar, incense-cedar	Plantation browsing	Deer feed in open stands common to these serpentinitic areas

1/ Soil compaction by wildlife is much less than that caused by livestock or that resulting from man's activities.
2/ Soil displacement by livestock and wildlife is much less than that resulting from man's activities.
3/ Red alder, being a deciduous tree, is generally valuable to wildlife as summer cover only.

TABLE OF INTERPRETATIONS

RANGE AND WILDLIFE MANAGEMENT

Landtype No.	Limitations for Domestic Livestock and Wildlife Use	Susceptibility to Soil Compaction 1/	Susceptibility to Soil Displacement 2/	Key Species: Wildlife	Key Species: Browse	Key Species: Cover	Wildlife Habitat Considerations	Remarks
41,46,51, 61, 121, 176,186, 191,196	Steep slopes	Low to moderate	High	Black-tailed deer and elk	Blueblossom ceanothus, trailing blackberry, salal, grasses, sedges, and legumes	Douglas-fir, western red cedar, Port-Orford-cedar, western hemlock, Oregon myrtle, chinkapin, tanoak, madrone, red alder, rhododendron, evergreen huckleberry 3/	Plantation browsing	Deer and elk feed in openings and seek cover in draws and thickets on side slopes
42,52,62, 122,177, 192,193, 197	None	Moderate to high	Low to moderate	Black-tailed deer and elk	Blueblossom ceanothus, trailing blackberry, salal, grasses, sedges, and legumes	Douglas-fir, Port-Orford-cedar, western hemlock, western red cedar, Oregon myrtle, chinkapin, tanoak, madrone, red alder, rhododendron, evergreen huckleberry 3/	Plantation browsing	Deer and elk feed in openings and seek cover in draws and lower slopes or wherever thickets exist
43,48,50, 53,120, 178,194	Steep slopes, rocky areas	Low	High	Black-tailed deer and elk	Blueblossom ceanothus, salal, grasses, sedges, and legumes	Douglas-fir, chinkapin, tanoak, madrone, rhododendron	High rodent populations in openings common to area	Deer and elk browse in the many openings found on these landtypes and seed cover on adjacent north slope areas
45,55, 125	None	High	Low to moderate	Black-tailed deer and elk	Blueblossom ceanothus, trailing blackberry, salal, grasses, sedges, and legumes	Douglas-fir, western hemlock, Port-Orford-cedar, western red cedar, Oregon myrtle, chinkapin, tanoak, madrone, red alder, rhododendron, evergreen huckleberry 3/	Plantation browsing	Good deer and elk cover areas. Some browsing in limited openings
54	None	Low	Low to moderate	Black-tailed deer and elk	Salal, grasses and sedges	Douglas-fir, chinkapin, tanoak, madrone, rhododendron	High rodent populations in openings common to area	Deer and elk browse in the openings found on this landtype and seek cover on adjacent north slope areas
71	Steep slopes	Low to moderate	High	Black-tailed deer	Whitethorn ceanothus, blueblossom ceanothus, snowbrush ceanothus, grasses, and sedges	Douglas-fir, madrone, tanoak	Critical winter range	Deer browse in openings, particularly on south slopes
72	None	Moderate to high	Low to moderate	Black-tailed deer	Whitethorn ceanothus, blueblossom ceanothus, snowbrush ceanothus, red stem ceanothus, legumes, grasses, and sedges	Douglas-fir, madrone, tanoak	Critical winter range	Deer browse in openings, particularly on south slopes
81	Steep slopes	Low	High	Black-tailed deer	Whitethorn ceanothus, snowbrush ceanothus, grasses, and sedges	Douglas-fir, madrone, tanoak	Critical winter range	Deer browse in openings, particularly on south slopes
82,83	None	High	Low to moderate	Black-tailed deer	Whitethorn ceanothus, Blueblossom ceanothus, snowbrush ceanothus, redstem ceanothus, legumes, grasses, and sedges	Douglas-fir, madrone, tanoak	Critical winter range	Deer browse in openings, particularly on south slopes

1/ Soil compaction by wildlife is much less than that caused by livestock or that resulting from man's activities.
2/ Soil displacement by livestock and wildlife is much less than that resulting from man's activities.
3/ Red alder, being a deciduous tree, is generally valuable to wildlife as summer cover only.

TABLE OF INTERPRETATIONS

RANGE AND WILDLIFE MANAGEMENT

Landtype No.	Limitations for Domestic Livestock and Wildlife Use	Susceptibility to Soil Compaction 1/	Susceptibility to Soil Displacement 2/	Key Species			Wildlife Habitat Considerations	Remarks
				Wildlife	Browse	Cover		
91,95,96	Steep slopes, extremely erosive soils	Low	High	Black-tailed deer	Whitethron ceanothus, blueblossom ceanothus, snowbrush ceanothus, legumes, sedges, and grasses	Douglas-fir, madrone, tanoak	Critical winter range	Deer browse in openings, particularly on south slopes
92,92,97, 98	None	Moderate	Low to moderate	Black-tailed deer	Whitethorn ceanothus, blueblossom ceanothus, redstem ceanothus, snowbrush ceanothus, legumes, grasses, and sedges	Douglas-fir, madrone, tanoak	Critical winter range	Deer browse in openings
99	Steep slopes, rocky areas	Low	High	Black-tailed deer and elk	Whitethorn ceanothus, snowbrush ceanothus, grasses, and sedges	Douglas-fir, madrone, tanoak	Critical winter range	Deer browse in the many openings common to this landtype
100	None	Moderate	Low	Black-tailed deer and elk	Whitethorn ceanothus, snowbrush ceanothus, redstem ceanothus, blueblossom ceanothus, sedges, grasses, and legumes	Douglas-fir, Shasta red fir, white fir, tanoak	Plantation browsing in summer months	Deer browse in openings

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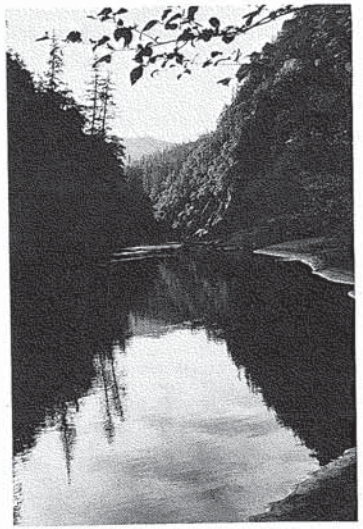
2/ Soil displacement by livestock and wildlife is much less than that resulting from man's activities.
3/ Red alder, being a deciduous tree, is generally valuable to wildlife as summer cover only.

Recreation



High Suitability for Dispersed Camping

Interpretations for recreation pertain primarily to recreation development. They are based on soil and bedrock properties, drainage, landform, and vegetation. Factors such as aesthetics and accessibility are not considered when making these ratings. The following interpretations are some most generally needed for planning recreation developments.

Landtype Suitability for Recreation Area Development

This rating is based on soil and bedrock characteristics and topographic features of each unit as related to recreation development such as campground and picnic sites. Factors important to this interpretation are soil depth, texture, structure, permeability, drainage, topography, and susceptibility to flooding.

Unsuited - this rating indicates that soils and/or topography are of a nature which would prohibit recreation development without extensive modification.

Low - These soil units have major limitations to recreation development, but limited development is feasible.

Moderate - This rating indicates that the soil unit is generally suitable for recreation development, but has minor limitations.

High - These soils are particularly well suited for recreation development. Generally, they have no limitations.

Landtype Limitations for Recreation Development

This indicates the major soil limitations to recreation development.

Treatment to Increase Suitability

This indicates, when applicable, the treatment necessary to increase the suitability for recreation development.

Soil and Site Damage Susceptibility

This interpretation applies to recreational areas after development. Each soil that is suitable or can be made suitable for campground development is rated for its susceptibility to damage of soil and/or site by normal recreation use. Site includes vegetation as well as soil conditions. Factors used in determining ratings include erosion potential, soil compactibility, and vegetative growth potential.

Low - These soils resist compaction and have low erosion potential. The native vegetation is hardy and not readily destroyed. These soils will withstand and hold up well under continual use.

Moderate - These soils are not readily compacted or eroded and vegetative types are somewhat hardy. In general, these soils and site can sustain continual use but require some rehabilitation.

High - These soils are fragile and easily damaged and have vegetation that is not hardy, and generally herbaceous. Under normal use, the vegetation will very likely be destroyed, the soil compacted and/or eroded to such a degree that periodic nonuse and major rehabilitation will be required.

Susceptibility to Dustiness

This interpretation pertains only to the soils suitable for recreation development, and applies primarily to unsurfaced roads within recreation areas.

Low - Factors indicate dust will not be a problem.

Moderate - Under normal conditions dust will not be a problem, but under heavy use and droughty conditions dust very likely will be a problem.

High - Factors indicate dust will be a problem. Dust abatement measures are necessary under normal conditions and use.

Susceptibility to Muddiness

This interpretation pertains only to the soils suitable, or those that can be made suitable, for recreation development. This interpretation rates each soil as to its susceptibility to becoming muddy. The rating is limited to the surface soil under normal conditions. Factors include soil characteristics, climate, and drainage.

Low - Muddiness is not likely to be a problem. Factors indicate soils are not susceptible to muddiness.

Moderate - Soils become muddy at times for short periods, occasionally causing problems. Road rock is usually necessary.

High - Soils are very likely to become muddy and stay muddy for long periods. Road rock is necessary. Campground closure may be necessary during wet periods.

Trail Suitability

This interpretation indicates the suitability of each soil for trails. Factors include soil and bedrock characteristics, drainage, climate, and slope.

Poor - These soils have properties which severely limit their use for trails. Extensive treatment measures are required.

Moderate - These soils have some limitations for trail development. Certain treatment measures may be required.

Well - These soils have no limitations for trail development.

Limitation for Trails

This indicates the limitations for trails.

Consideration for Trail Improvements

This indicates some treatment measures to be considered in improving suitability and protecting trails.

Suitability for Sewage Filter Field

This interpretation evaluates the soil as to its suitability as a sewage filter field. Ratings are based on soil depth, texture, permeability, drainage, and slope. Only those soils suitable for recreation development are rated. Onsite investigation is recommended before design or installation of filter systems.

Poor - These soils have properties which make them poorly suited as sewage filter fields. Sewage filter disposal in these soils would be ineffective and create major problems.

Moderate - These soils have properties which limit their use as sewage filter field. They require a large filter area for adequate drainage, which limits the capacity of the campground.

Well - These soils are well suited to sewage filter use and offer only minor limitations, if any.

Soil Limitation to Sewage Filter Field Use

This indicates the major limitations to sewage filter field use.

TABLE OF INTERPRETATIONS

RECREATION

Landtype No.	Landtype Suitability for Recreation Area Development	Landtype Limitations for Recreation Development	Suggested Treatment to Increase Suitability	Soil and Site Damage Susceptibility	Susceptibility to Dustiness	Susceptibility to Muddiness	Trail Suitability	Limitations for Trails	Considerations for Trail Improvements	Suitability for Sewage Filter Field	Soil Limitations for Sewage Filter Field Use
0	Unsuited	Flooding hazard	N/A	N/A	N/A	N/A	Poor	Flooding hazard	N/A	N/A	N/A
1,2,3	Unsuited	Steep, rocky slopes	N/A	N/A	N/A	N/A	Poor	Steep, rocky slopes; cliffs	N/A	N/A	N/A
4	Low to Unsuited	Unstable soils, wet areas, muddiness, unsuited filter field characteristics	N/A	Moderate	Moderate	High	Poor	Unstable soils, muddiness, soil erosion, wet areas	Surface trails, drain wet areas, water bar; puncheons	Poor	Restricted filter field drainage, fine-textured soils, unstable soils
5	Unsuited	Unstable soils, wet areas, unsuited filter field characteristics, muddiness	N/A	N/A	N/A	N/A	Poor	Unstable soils, muddiness, soil erosion, wet areas	Frequent water bars, surface trails, drain wet areas, puncheons	N/A	N/A
6	Unsuited	High water table, muddiness	Drainage	High	Low	High	Poor to moderate	Muddiness, high water table	Use puncheons, build up subgrade, drain wet areas	Poor	High water tables
7	Moderate to low	Some steep slopes, shallow soils	N/A	Moderate to high	Moderate, locally high	Low	Moderate, locally poor	Soil erosion, coarse-textured soils	Water bar	Poor to moderate	Shallow soils, steep slopes
8	Low to Unsuited	Unstable soils, wet areas, muddiness, unsuited filter field characteristics	N/A	Moderate	Moderate	High	Poor	Unstable soils, muddiness, soil erosion, wet areas	Surface trails, drain wet areas, water bar, puncheons	Poor	Restricted filter field drainage, fine-textured soils, unstable soils
8c	Unsuited	Unstable soils, wet areas, unsuited filter field characteristics, muddiness	N/A	N/A	N/A	N/A	Poor	Unstable soils, muddiness, soil erosion, wet areas	Frequent water bars, surface trails, drain wet areas, puncheons	N/A	N/A
9	Low to unsuited	Unstable soils, wet areas, muddiness, unsuited filter field characteristics	N/A	Moderate	Moderate	High	Poor	Unstable soils, muddiness, soil erosion, wet areas	Surface trails, drain wet areas, water bar, puncheons	Poor	Restricted filter field drainage, fine-textured soils, unstable soils
9c	Unsuited	Unstable soils, wet areas, unsuited filter field characteristics, muddiness	N/A	N/A	N/A	N/A	Poor	Unstable soils, muddiness, soil erosion, wet areas	Frequent water bars, surface trails, drain wet areas, puncheons	N/A	N/A
10,12	Low to moderate	Possible local flooding	N/A	Moderate	Moderate	Moderate	Moderate	Local flooding and muddiness	N/A	Moderate to poor	Close proximity to streams, local excessive drainage/flooding, local fine-textured soils
11	Unsuited	Steep slopes	N/A	Moderate	Moderate	Low	Well to moderate	Steep slope, trail erosion	Water bars	Poor to moderate	Steep slopes
13	Moderate	Local wet areas	Drain wet areas	Moderate to low	Low	Low	Well	N/A	Water bars	Moderate to poor	Coarse-textured soils, excessive drainage, local wet areas, compacted till layer at 36 inches ±
14	Unsuited to low	Steep slopes	N/A	Moderate	Low	Low	Well	Steep slopes, trail erosion	Water bars	Poor	Steep slopes, compacted till layer at 60 inches ±, coarse-textured soils, excessive drainage
15	High	Possible local flooding or high water table	N/A	Moderate	Low	Low	Well	N/A	N/A	Moderate	Close proximity to streams, local excessive drainage/flooding

Landtype No.	Landtype Suitability for Recreation Area Development	Landtype Limitations for Recreation Development	Suggested Treatment to Increase Suitability	Soil and Site Damage Susceptibility	Susceptibility to Dustiness	Susceptibility to Muddiness	Trail Suitability	Limitations for Trails	Considerations for Trail Improvements	Suitability for Sewage Filter Field	Soil Limitations for Sewage Filter Field Use
16	Unsuited to low	Steep slopes	N/A	Moderate	Low	Moderate	Well	Steep slopes, local muddiness, trail erosion	Water bars	Poor to moderate	Steep slopes, locally coarse-textured soils
17	Unsuited	Unstable soils, wet areas, unsuited filter field characteristics, muddiness	N/A	N/A	N/A	N/A	Poor	Unstable soils, muddiness, soil erosion, wet areas	Frequent water bars, surface trails, drain wet areas, puncheons	N/A	N/A
18	Unsuited to low	Steep slopes	N/A	Moderate	Low	Moderate	Well	Steep slopes, local muddiness, trail erosion	Water bars	Poor to moderate	Steep slopes, locally coarse-textured soils
19	Unsuited to low	Steep slopes, local wet spots	Drain wet areas	Moderate	Low	Moderate to high	Well to moderate	Steep slopes, local wet areas	Water bars, drain wet spots, use puncheons	Poor	Local wet areas, local coarse-textured soils, steep slopes
21	Unsuited	Steep slopes	N/A	N/A	N/A	N/A	Poor	Steep slope shallow soils	Water bars	N/A	N/A
22	Moderate	Some unfavorable topographic positions	Design to fit topography	Moderate	Moderate to high	Moderate	Moderate	Dustiness, soil erosion, and compaction	Water bars	Moderate	Restricted drainage and fine-textured soils
26	Unsuited	Steep slopes, shallow soils	N/A	N/A	N/A	N/A	Moderate	Steep slopes, shallow soils	Water bars	N/A	N/A
27	Moderate	Poor filter field characteristics	N/A	Moderate	High	Moderate to low	Moderate	Erosion hazard, dustiness	Water bars	Moderate	Generally relatively coarse-textured soils
28	Unsuited	Steep slopes, shallow soils	N/A	N/A	N/A	N/A	Moderate	Steep slopes, shallow soils	Water bars	N/A	N/A
29	Low to moderate	Poor filter field characteristics	N/A	High	High	Low to moderate	Moderate	Erosion hazard, dustiness	Water bars	Moderate to poor	Generally coarse-textured soils
31	Unsuited	Steep slopes, shallow soils	N/A	N/A	N/A	N/A	Moderate to well	Steep slopes, shallow soils	Water bars	N/A	N/A
32	Low	Poor filter field characteristics	N/A	High	Moderate	High	Moderate	Muddiness and local wet areas	Surface trails, drain local wet areas	Poor	Restricted filter field drainage, and fine-textured soils
34	Unsuited	Steep dissected slopes, shallow soils	N/A	N/A	N/A	N/A	Moderate	Steep slopes, shallow soils	Water bars	N/A	N/A
35	Unsuited	Shallow soils, unacceptable filter field characteristics	N/A	N/A	N/A	N/A	Well to moderate	Shallow, fragile soils	Water bars	N/A	N/A
36	Unsuited	Steep slopes, shallow soils	N/A	N/A	N/A	N/A	Moderate	Steep slopes shallow soils	Water bars	N/A	N/A
37	Low	Poor filter field characteristics	N/A	High	Moderate	High	Moderate	Muddiness and local wet areas	Surface trails and drain local wet areas	Poor	Restricted drainage on fine-textured soils
38	Low	Steep slopes, extremely stony soils	N/A	N/A	N/A	N/A	Poor	Steep slopes	Water bars	Poor	Excessive slope
39	Unsuited	Shallow soils, unacceptable filter field conditions	N/A	N/A	N/A	N/A	Poor	Steep slopes, shallow soils	Water bars	N/A	N/A
41	Unsuited	Steep slopes, shallow soils	N/A	N/A	N/A	N/A	Poor	Steep slopes, shallow soils	Water bars	N/A	N/A
42	Moderate	Moderately steep slopes, topography unfavorable in certain areas	Drain wet areas, design to fit topography	Moderate	Moderate	Low	Moderate	Trail erosion, local wet areas	Water bars, drain wet areas	Moderate	Local steep slopes

Landtype No.	Landtype Suitability for Recreation Area Development	Landtype Limitations for Recreation Development	Suggested Treatment to Increase Suitability	Soil and Site Damage Susceptibility	Susceptibility to Dustiness	Susceptibility to Muddiness	Trail Suitability	Limitations for Trails	Considerations for Trail Improvements	Suitability for Sewage Filter Field	Soil Limitations for Sewage Filter Field Use
43	Unsuited	Steep slopes, shallow soils	N/A	N/A	N/A	N/A	Poor	Steep slopes, shallow soils	Water bars	N/A	N/A
45	Moderate to high	-	Drain wet areas	Low	Low	Moderate	Moderate to well	-	Drain wet areas	Moderate to high	Local restricted drainage
46	Unsuited	Steep slopes, shallow soils	N/A	N/A	N/A	N/A	Poor	Steep slopes, shallow soils	Water bars	N/A	N/A
48	Unsuited	Steep slopes, shallow soils	N/A	N/A	N/A	N/A	Poor	Steep slopes, shallow soils	Water bars	N/A	N/A
50	Unsuited	Steep slopes, shallow soils	N/A	N/A	N/A	N/A	Moderate to poor	Steep slopes, shallow soils	Water bars	N/A	N/A
51	Unsuited	Steep slopes, shallow soils	N/A	N/A	N/A	N/A	Moderate	Steep slopes, shallow soils	Water bars	N/A	N/A
52	Moderate	Muddiness, soil compaction	Design to fit topography, surface drains	Moderate to high	Moderate	Moderate to high	Moderate	Muddiness, soil erosion, soil compaction	Water bars	Moderate	Restricted drainage and fine-textured soils, locally
53	Unsuited	Steep slopes, shallow soils	N/A	N/A	N/A	N/A	Moderate	Steep slopes, shallow soils	Water bars	N/A	N/A
54	Moderate	Dustiness, soil compaction locally	Design to fit topography	Moderate to high	Moderate to high	Moderate	Moderate	Dustiness, soil erosion	Water bars	Moderate	Coarse-textured gravelly soils locally, excessive drainage
55	Unsuited to low	Steep slopes, soil compaction, muddiness, poor filter characteristics	N/A	High	Moderate	High	Moderate	Muddiness, soil compaction, soil erosion	Surface wet areas, water bars	Poor	Restricted filter field drainage, fine-textured soils, steep slopes
61	Unsuited	Steep slopes	N/A	N/A	N/A	N/A	Poor	Steep slopes, erosive soils	Water bars	N/A	N/A
62	Low	Muddiness, poor filter field characteristics, soil compaction and erosiveness	Design to fit topography, surface drains	High	Moderate	High	Moderate to poor	Muddiness, soil compaction and erosion	Surface wet areas, water bars	Poor	Restricted drainage and fine-textured soils
66	Unsuited	Steep slopes, shallow soils	N/A	N/A	N/A	N/A	Poor	Steep slopes, shallow soils, trail erosion	Water bars	N/A	N/A
67	Unsuited	Steep slopes	N/A	N/A	N/A	N/A	Poor	Steep slopes, trail erosion	Water bars	N/A	N/A
68	Moderate	Soil compaction, dustiness	Design to fit topography	Moderate	Moderate to high	Moderate	Moderate	Muddiness, soil compaction	Surface trails, Water bars	Moderate to well	Some fine-textured soils
71	Unsuited	Steep slopes, shallow soils	N/A	N/A	N/A	N/A	Poor	Steep, dissected slopes, soil erosion	Water bars	N/A	N/A
72	Moderate	Dustiness, soil compaction	Design to fit topography	Moderate	Moderate to high	Moderate	Moderate	Dustiness, soil erosion and compaction	Water bars	Moderate	Restricted drainage and fine-textured soils
76	Unsuited	Steep slopes, shallow soils	N/A	N/A	N/A	N/A	Poor	Steep slopes, shallow soils	Water bars	N/A	N/A
77	Low to moderate	Soil compaction, dustiness	Design to fit topography	Moderate	Moderate to high	Moderate	Moderate	Moderately steep slopes, trail erosion	Water bars, surface trails	Poor to moderate	Rocky material, moderately steep slopes
81	Unsuited	Steep slopes, shallow soils	N/A	N/A	N/A	N/A	Poor	Steep slopes, shallow soils, soil erosion	Water bars	N/A	N/A
82	Unsuited	Steep slopes	N/A	N/A	N/A	N/A	Moderate to poor	Steep slopes, soil erosion	Water bars	N/A	N/A

Landtype No.	Landtype Suitability for Recreation Area Development	Landtype Limitations for Recreation Development	Suggested Treatment to Increase Suitability	Soil and Site Damage Susceptibility	Susceptibility to Dustiness	Susceptibility to Muddiness	Trail Suitability	Limitations for Trails	Considerations for Trail Improvements	Suitability for Sewage Filter Field	Soil Limitations for Sewage Filter Field Use
83	Moderate	Soil compaction, muddiness, dustiness	Design to fit topography	Moderate	Moderate to high	High to moderate	Moderate	Soil compaction, muddiness and and dustiness	Surface wet areas, water bars	Moderate to well	Fine-textured soils
86	Unsuited	Steep slopes, shallow soils	N/A	N/A	N/A	N/A	Poor	Steep slopes, shallow soils	Water bars	N/A	N/A
87	Low to moderate	Soil compaction, dustiness	Design to fit topography	Moderate	Moderate to high	Moderate	Moderate	Some steep slopes, trail erosion	Water bars, surface trails	Poor to moderate	Rocky material, some steep slopes
91	Unsuited	Steep slopes, shallow, highly erosive soils	N/A	N/A	N/A	N/A	Poor	Steep slopes, shallow soils, very severe erosion hazard	Frequent water bars	N/A	N/A
92	Unsuited	Steep slopes	N/A	N/A	N/A	N/A	Poor	Steep slopes, high erosion hazard	Frequent water bars	N/A	N/A
93	Moderate to low	Dustiness, soil compaction	Design to fit topography	Moderate	Moderate to high	Low to moderate	Moderate	Erosion hazard, dustiness	Water bars	Poor to moderate	Generally coarse-textured soils, excessive drainage
95	Unsuited	Steep slopes, highly erosive soils	N/A	N/A	N/A	N/A	Poor	Steep slopes, very severe erosion hazard	Frequent water bars	N/A	N/A
96	Unsuited	Steep slopes, shallow soils	N/A	N/A	N/A	N/A	Poor	Steep slopes, shallow soils, severe erosion hazard	Frequent water bars	N/A	N/A
97	Unsuited	Steep slopes	N/A	N/A	N/A	N/A	Poor to moderate	Steep slopes, high erosion hazard	Frequent water bars	N/A	N/A
98	Moderate	Poor filter field characteristics, soil compaction, dustiness	Design to fit topography	Moderate	Moderate to high	Moderate	Moderate	Erosion hazard dustiness, compaction	Water bars	Moderate	Some fine textured soils
99	Unsuited	Steep slopes	N/A	N/A	N/A	N/A	Poor	Steep slopes, high erosion hazard	Frequent water bars	N/A	N/A
100	Moderate	Soil compaction, muddiness, dustiness	Drain wet areas, design to fit topography	Moderate	Moderate to high	Moderate to high	Moderate	Muddiness, dustiness, soil compaction	Surface wet areas, water bars	Moderate to well	Some fine-textured soils
120	Unsuited	Very steep slopes, shallow soils	N/A	N/A	N/A	N/A	Poor	Very steep slopes, shallow soils	Water bars	N/A	N/A
121	Unsuited	Steep slopes, shallow soils	N/A	N/A	N/A	N/A	Poor	Steep slopes, shallow soils	Water bars	N/A	N/A
122	Moderate	Moderate steep slopes	Design to fit topography	Low to moderate	Moderate	Moderate	Moderate	Muddiness, soil compaction	Surface wet areas, water bars	Moderate to well	Moderately steep slopes
125	Moderate to high	Local wet areas	Drain wet areas, design to fit topography	Low to moderate	Low to moderate	Moderate	Well	Muddiness, soil compaction	Surface and drain wet areas	Well	
176	Unsuited	Steep slopes, shallow soils	N/A	N/A	N/A	N/A	Poor	Steep slopes, soil erosion, shallow soils	Water bars	N/A	N/A
177	Low to moderate	Soil compaction, dustiness	Design to fit topography	Moderate	Moderate to high	Moderate	Moderate	Moderately steep slopes, trail erosion	Water bars, surface trails	Poor	Rocky material, moderately steep slopes

Landtype No.	Landtype Suitability for Recreation Area Development	Landtype Limitations for Recreation Development	Suggested Treatment to Increase Suitability	Soil and Site Damage Susceptibility	Susceptibility to Dustiness	Susceptibility to Muddiness	Trail Suitability	Limitations for Trails	Considerations for Trail Improvements	Suitability for Sewage Filter Field	Soil Limitations for Sewage Filter Field Use
178	Unsuited	Steep slopes, shallow soils	N/A	N/A	N/A	N/A	Poor	Steep slopes, soil erosion, trail erosion	Water bars	N/A	N/A
186	Unsuited	Steep slopes, shallow soils	N/A	N/A	N/A	N/A	Poor	Steep slopes, soil erosion, shallow soils	Water bars	N/A	N/A
191	Unsuited	Steep slopes, shallow soil	N/A	N/A	N/A	N/A	Poor	Steep slopes, soil erosion,	Surfacing trails, water bars	N/A	N/A
192	Low to moderate	Moderately steep slopes	Design to fit topography	Moderate	Low to moderate	Low to moderate	Poor to moderate	Moderately steep slopes, soil erosion	Surfacing trails, water bars	Poor to moderate	Moderately steep slopes, coarse-textured material
193	Moderate	Soil compaction	Design to fit topography	Moderate	Low to moderate	Moderate	Moderate to well	Soil compaction	Surfacing trails, water bars	Moderate to well	Some fine-textured soils that would restrict drainage
194	Unsuited	Steep slopes, shallow soils	N/A	N/A	N/A	N/A	Poor	Steep slopes, soil erosion, shallow soils	Surfacing trails, water bars	N/A	N/A
196	Unsuited	Steep slopes, shallow soils	N/A	N/A	N/A	N/A	Poor	Steep slopes, shallow soils, severe erosion hazard	Frequent water bars	N/A	N/A
197	Unsuited	Steep slopes	N/A	N/A	N/A	N/A	Poor to moderate	Steep slopes, muddiness	Water bars	N/A	N/A

Timber (Reforestation)

Interpretations for Timber Management are of two types. One type includes some interpretations that directly affect timber management such as "Potential for Regeneration". The other type indicates the effect on soils and other resources from timber harvest activities.

Susceptibility to Brush Revegetation

This indicates the susceptibility of landtype units to revegetate naturally by brush following timber harvest. These ratings are based on soil characteristics, field observation, slope, aspect, climate, and elevation.

Low - Indicates brush vegetation is insignificant.

Moderate - Indicates that some brush revegetation will occur.

High - Indicates brush revegetation is very dense.

Potential for Regeneration

This interpregation indicates the potential for each landtype unit to regenerate at a minimum level of stocking as set by the Forest Service. Factors included in this interpretation are soil characteristics, climate, aspect, elevation, frost potential, brush competition, and tree species. Includes planted stock and natural regeneration.

Low - This rating indicates the potential for regeneration is low. Probability of success is very limited. Major regeneration problems can be expected, and reseeding or replanting may be required throughout the area. Several years may elapse before an adequate stocking level is achieved.

Moderate - This rating indicates that some problems will be encountered in attaining a satisfactory stocking level. Usually regeneration is spotty and some replanting will be necessary.

High - This rating indicates that regeneration has a high probability of success. Few problems should be encountered in attaining good stocking levels.

Limitations to Regeneration

This indicates the major soil limitations to regeneration of planted stock and naturals.

Susceptibility to Tanoak Revegetation

This interpretation indicates the susceptibility of landtype units to revegetate to tanoak following clearcut timber harvest. These ratings are based on soil characteristics, drainage, elevation, climate, topographic position, and field observations.

Low - Factors do not encourage tanoak establishment and growth.

Moderate - Factors are moderately favorable for tanoak establishment and growth.

High - Factors are highly favorable for tanoak establishment and growth.

Susceptibility to Madrone Revegetation

This interpretation indicates the susceptibility of landtype units to revegetate to madrone following clearcutting. These ratings are based on soil characteristics, drainage, elevation, climate, topographic position, and field observations.

Low - Factors do not encourage madrone establishment and growth.

Moderate - Factors are moderately favorable for madrone establishment and growth.

High - Factors are highly favorable for madrone establishment and growth.

Susceptibility to Alder Revegetation

This interpretation indicates the susceptibility of landtype units to revegetate to alder following clearcutting. These ratings are based on soil characteristics, drainage, elevation, climate, topographic position, and field observations.

Low - Factors do not encourage alder establishment and growth.

Moderate - Factors are moderately favorable for alder establishment and growth.

High - Factors are highly favorable for alder establishment and growth.

Low Potential for Regeneration

High Potential for Regeneration

TABLE OF INTERPRETATIONS

TIMBER

Landtype No.	Susceptibility to Brush Vegetation	Potential for Regeneration	Limits to Regeneration	Suggested Tree Planting Species	Susceptibility to Tanoak Revegetation	Susceptibility to Madrone Revegetation	Susceptibility to Red Alder Revegetation
0	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4	Moderate to high	High to moderate	Local wetness; brush competition and unstable areas	Douglas-fir	High	Moderate	N/A
5	Moderate to high	Moderate	Serpentinitic influence; local wetness, brush competition and unstable areas	Jeffrey pine	Moderate	Moderate	N/A
6	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7	N/A	N/A	N/A	N/A	Low	Low	N/A
8	Moderate to high	High	Local wetness, brush competition and unstable areas	Douglas-fir	High	Moderate	High
8c	High	High	Brush competition; local wetness, and highly unstable areas	Douglas-fir	High	Moderate	High
9	Moderate to high	High	Local wetness, brush competition and unstable areas	Douglas-fir	High	Moderate	High
9c	High	High	Brush competition; local wetness, and highly unstable areas	Douglas-fir	High	Moderate	High
10	Moderate	Low	Serpentinitic influence; low fertility; coarse-textured, gravelly soils; droughtiness, and brush competition	Jeffrey pine	Low	Low	N/A
11	Moderate	Low to moderate	Low fertility; coarse-textured, gravelly soils; droughtiness, and brush competition	Douglas-fir	Moderate	Moderate	N/A
12	Moderate to low	Low	Serpentinitic influence; low fertility; coarse-textured, gravelly soils; droughtiness, and local brush competition	Jeffrey pine	Low	Low	N/A
13	Moderate to high	Low to moderate	Coarse-textured, gravelly soils; low fertility; frost heaving, and brush competition	Shasta red fir, white fir	Low	Low	N/A
14	Moderate	Moderate	Coarse-textured, gravelly soils; low fertility; brush competition, and frost heaving	Shasta red fir, white fir	Low	Low	N/A
15	Moderate to high	Moderate to high	Coarse-textured, gravelly soils; brush competition, local frost heaving, and wet spots	Douglas-fir	High	Moderate	Moderate
16	Moderate to high	Moderate to high	Coarse-textured, gravelly soils; brush competition, and local droughtiness	Douglas-fir	High	Moderate	N/A
17	High	High	Brush competition; local wetness, and highly unstable areas	Douglas-fir	High	Moderate	High
18	Moderate to high	Moderate	Coarse-textured, gravelly soils; droughtiness, and brush competition	Douglas-fir	High	Moderate	N/A
19	High	Moderate to high	Brush competition; local wetness, and unstable areas	Douglas-fir	High	Moderate	High
21	High to moderate	Low to moderate	Brush competition, shallow soils, and droughtiness	Douglas-fir	High	High	N/A
22	High to moderate	Moderate	Brush competition	Douglas-fir, ponderosa pine	High	High	N/A
26	High to moderate	Low to moderate	Shallow, coarse-textured soils, low in fertility and moisture-holding capacity; droughtiness on south slopes; local debris slides, and channel scouring	Douglas-fir	Moderate	High	N/A
27	High to moderate	Moderate	Coarse-textured soils, low in fertility and moisture-holding capacity	Douglas-fir	Moderate	High	Low
28	High	Low	Shallow, coarse-textured soils, low in fertility and moisture-holding capacity; very droughty; local debris slides and channel scouring	Douglas-fir (knobcone pine does best on these shallow droughty soils)	Moderate	High	N/A
29	High	Low	Coarse-textured soils, low in fertility and and moisture-holding capacity. Soils are very droughty	Douglas-fir	Moderate	High	N/A
31	Low to moderate	Low	Serpentinitic influence, shallow, coarse-textured, gravelly, cobbly, stony soils, low in fertility and moisture-holding capacity; very droughty soils	Jeffrey pine	Low	Low	N/A

Landtype No.	Susceptibility to Brush Vegetation	Potential for Regeneration	Limits to Regeneration	Suggested Tree Planting Species	Susceptibility to Tanoak Revegetation	Susceptibility to Madrone Revegetation	Susceptibility to Red Alder Revegetation
32	Moderate	Low	Serpentinitic influence, to gravelly, cobbly soils low in fertility with summer droughtiness	Jeffrey pine	Low	Low	N/A
34	Low to moderate	Low	Serpentinitic influence, shallow, coarse-textured, gravelly, cobbly, stony soils, low in fertility and moisture-holding capacity; very droughty soils	Jeffrey pine	Low	Low	N/A
35	Low	Low	Serpentinitic influence, shallow, coarse-textured, gravelly, cobbly, stony soils, low in fertility and moisture-holding capacity; very droughty soils	Jeffrey pine	N/A	N/A	N/A
36	Moderate to high	Low	Serpentinitic soils, coarse-textured, gravelly, cobbly soils, low in fertility and moisture-holding capacity, and droughty in the summer	Jeffrey pine, Douglas-fir	Low	Moderate	N/A
37	High	Low to moderate	Serpentinitic influence, gravelly, cobbly soils, low in fertility with summer droughtiness	Douglas-fir, Port-Orford-cedar	Moderate	High	Low
38	Low to moderate	Low to moderate	Serpentinitic influence, gravelly, cobbly soils, low in fertility with summer droughtiness	Port-Orford-cedar, Douglas-fir	Low	Low	Low
39	Moderate	Low	Serpentinitic influence, shallow, coarse-textured, gravelly, cobbly, soils low in fertility and moisture-holding capacity, and droughty in the summer	Jeffrey pine	Low	Low to moderate	N/A
41	Moderate to high	Moderate	Shallow, gravelly soils, droughty conditions, and brush competition	Douglas-fir	Moderate	Moderate	Moderate
42	Moderate	Moderate to high	Brush competition	Douglas-fir	Moderate	Moderate	Moderate
43	High	Low	Unfavorable aspect, shallow soils, gravelly, droughty conditions, and brush competition	Douglas-fir	High	High	Low
45	Moderate to high	High	Brush competition	Douglas-fir	Moderate	Moderate	Moderate
46	Moderate to high	Moderate	Brush competition, shallow, coarse-textured soils, high gravel content, and very droughty	Douglas-fir	Moderate to high	Moderate to high	Low to high
48	High	Low	Brush competition, unfavorable aspect, coarse-textured soils, shallow soils, high gravel content, and very droughty conditions	Douglas-fir	High	High	Low
50	Low to moderate	Low	Shallow, coarse-textured, gravelly soils, low in fertility and moisture-holding capacity; very droughty soils, local debris slides, and channel scouring	Douglas-fir	Moderate	Low	Low
51	Moderate to high	Moderate to high	Coarse-textured gravelly soils, low in moisture-holding capacity; local debris slides, channel scouring, and brush competition	Douglas-fir	High	Moderate	Moderate to low
52	High	Moderate to high	Brush competition	Douglas-fir	High	Moderate	High
53	High	Low	Shallow, coarse-textured, gravelly soils, low in fertility and moisture-holding capacity; very droughty; local debris slides, channel scouring, and brush competition	Douglas-fir (locally knobcone pine does best on these shallow droughty soils)	Moderate	High	N/A
54	High	Low to moderate	Coarse-textured gravelly soils low in fertility and moisture-holding capacity; very droughty, and brush competition	Douglas-fir (locally knobcone pine does best on these droughty soils)	Moderate	High	N/A
55	High	High	Brush competition	Douglas-fir	High	Moderate	High
61	Moderate to high	High to moderate	Gravelly soils and brush competition	Douglas-fir	High	Moderate	Moderate
62	High	High	Brush competition	Douglas-fir	High	Moderate	High
66	High	Low to moderate	Brush competition; gravelly, shallow, and droughty	Douglas-fir	High	High	N/A
67	High	Moderate	Brush competition; gravelly and droughty soils	Douglas-fir, ponderosa pine	High	High	N/A
68	Moderate to high	Moderate to high	Brush competition	Douglas-fir ponderosa pine	Moderate to high	Moderate to high	N/A
71	High	Moderate to low	Brush competition, gravelly, shallow, and droughty soils	Douglas-fir	High	High	N/A
72	High	Moderate	Brush competition and gravelly soils	Douglas-fir	High	Moderate to high	N/A

Landtype No.	Susceptibility to Brush Vegetation	Potential for Regeneration	Limits to Regeneration	Suggested Tree Planting Species	Susceptibility to Tanoak Revegetation	Susceptibility to Madrone Revegetation	Susceptibility to Red Alder Revegetation
76	High	Low	Brush competition, gravelly, coarse-textured, shallow and very droughty soils	Douglas-fir	High	High	N/A
77	High	Moderate	Brush competition, gravelly and coarse-textured soils	Douglas-fir, ponderosa pine	High	High	N/A
81	High	Low	Brush competition, gravelly, shallow and droughty soils	Douglas-fir	High	High	N/A
82	High	Moderate	Brush competition, and gravelly soils	Douglas-fir, ponderosa pine	High	High	N/A
83	High	Moderate to high	Brush competition	Douglas-fir, ponderosa pine	High	Moderate	N/A
86	High	Low	Brush competition; gravelly, cobbly, coarse-textured, shallow, and very droughty soils	Douglas-fir	High	High	N/A
87	High	Moderate	Brush competition, gravelly and cobbly soils	Douglas-fir, ponderosa pine	High	High	N/A
91	High	Low	Brush competition; coarse-textured, gravelly, droughty and shallow soils	Douglas-fir,	Moderate	High	N/A
92	Moderate to high	Moderate	Brush competition; coarse-textured and droughty soils	Douglas-fir, ponderosa pine	High	Moderate	N/A
93	Moderate	Moderate to high	Brush competition and summer droughtiness	Douglas-fir, ponderosa pine	Moderate	Moderate	N/A
95	High	Low	Brush competition, coarse-textured, gravelly and droughty soils	Douglas-fir	Moderate to high	High	N/A
96	High	Low	Brush competition; infertile, gravelly, shallow and droughty soils	Douglas-fir	High	High	N/A
97	High	Low	Brush competition; infertile, gravelly and droughty soils	Douglas-fir, ponderosa pine	High	High	N/A
98	Moderate to high	Moderate	Brush competition	Douglas-fir, ponderosa pine	High	Moderate to high	N/A
99	High	Low	Brush competition; infertile, gravelly and droughty soils	Douglas-fir, ponderosa pine	High	High	N/A
100	Moderate	Moderate	Frost heaving; gravelly soils and brush competition	Douglas-fir, white and Shasta red fir	Low to moderate	Low	N/A
120	Moderate to high	Low	Shallow, rocky, coarse-textured, and droughty soils	Douglas-fir	Moderate	Low	Low
121	Low to moderate	Moderate to high	Shallow and coarse-textured soils	Douglas-fir	Low to moderate	Low	Low
122	Low	High	-	Douglas-fir	Low	Low	Moderate
125	Low	High	-	Douglas-fir	Low	Low	Moderate
176	High	Low to moderate	Brush competition; shallow, gravelly, coarse-textured and droughty soils	Douglas-fir	High	High	Low
177	Moderate to high	Moderate	Brush competition; gravelly and coarse-textured soils	Douglas-fir	Moderate to high	Moderate to high	Low
178	High	Low	Unfavorable aspect; brush competition; shallow, gravelly, coarse-textured and droughty soils	Douglas-fir	High	High	Low
186	High to moderate	Low to moderate	Brush competition; shallow, gravelly, cobbly, coarse-textured and droughty soils	Douglas-fir	High	Moderate	Low
191	High	Low to moderate	Coarse-textured, gravelly and droughty soils; brush competition	Douglas-fir	High	High	Low
192	High to moderate	Moderate	Brush competition; coarse-textured and droughty soils	Douglas-fir	High	High	Low
193	Moderate	Moderate to high	Brush competition	Douglas-fir	Moderate to high	Moderate to high	Low
194	High	Low	Unfavorable aspect; brush competition; and coarse-textured soils	Douglas-fir	High	High	Low
196	High	Low	Coarse-textured, infertile, gravelly, droughty, shallow soils; and brush competition	Douglas-fir	High	High	Low
197	High	Low to moderate	Infertile, often droughty soils and brush competition	Douglas-fir	High	High	Low

Potential Soil and Water Impacts from Various Timber Harvest Methods

This interpretation indicates the susceptibility of soil and water resources to incur damage from various timber harvest methods. Each landtype is evaluated as to the potential impact from each of the following harvest methods: Tractor logging, cable (no suspension), cable (partial suspension), cable (full suspension), and aerial logging. 1/ The evaluation of potential impact includes soil and water resource damages from timber removal, spur roads, landings, and other activities that may be associated with the harvest method being evaluated. The evaluations are based on a full operating season. Damage is caused to soils by creating soil disturbance which may destroy soil structure, cause compaction, and increase erosion. This may affect other resources through loss of production, lower water quality and yield, and loss of fisheries. Field observations indicate the most important factors to consider in making these ratings are wetness of soil, soil texture and structure, percentage of coarse fragments, slope, drainage, climate, and field observations.

Low - This rating indicates that the impacts to the soil and water resources are minor. Little or no soil damage is expected.

Moderate - This rating indicates that the impacts to the soil and water resources are moderate. Soil and water resources are expected to incur moderate damage.

High - This rating indicates that the impacts to the soil and water resources are major. Excessive damage to soil and water resources is likely to occur.

Type of Damage Expected During and Subsequent to Timber Harvest Operations

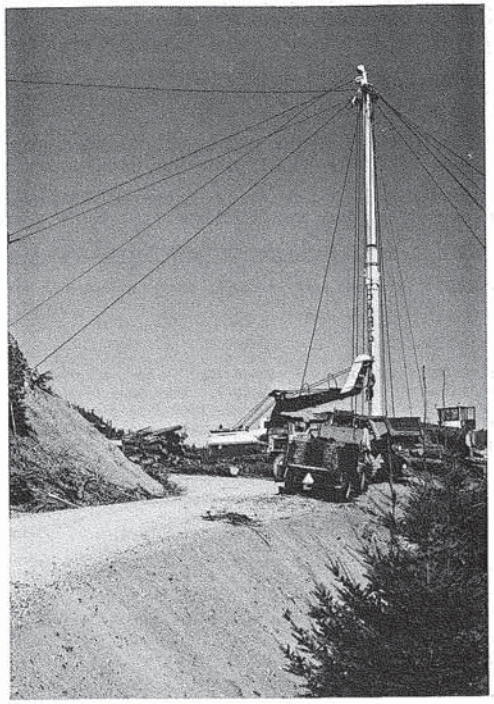
This indicates the type of soil and water resource damage expected on each soil from various harvest methods.

Recommended Slash Disposal Method

This rating indicates the slash disposal method that is best adapted to conserving and protecting the soil and water values of each soil. When more than one method is listed, the first method is the more preferable. Factors considered in these recommendations include soil properties, elevation, aspect, slope, litter thickness, drainage, and the ability of the site to revegetate. The methods considered in this rating are numbered and defined as follows:

1. No treatment - The slash is left on the ground with no burning.
2. Broadcast burn - Standard methods of broadcast burning.
   a. Spring
   b. Fall
3. Clean logging - Culls and tops are pulled or swung to landing, piled and burned.
4. Accumulation burning
   a. Hand piling.
   b. Spot burning.

1/ See Glossary for definition of methods.



Skyline Logging

TABLE OF INTERPRETATIONS

POTENTIAL SOIL AND WATER IMPACTS FROM VARIOUS TIMBER HARVEST METHODS

Land-type No.	Potential Impact from Tractor, FMC, and Rubber Tired Skidder Logging 5/	Type of Damage	Potential Impact from High Lead 1/	Type of Damage	Potential Impact from Skyline (Partial Suspension) 1/	Type of Damage	Potential Impact from Skyline (Full Suspension)	Type of Damage	Potential Impact from Helicopter and Balloon	Type of Damage
0	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
1	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
2	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
3	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
4	High	Soil compaction will occur when the soil is wet which is most of the year. Tractor turning along with log gouging destroys protective duff layer, loosens and displaces soil, destroys soil structure, increasing erosion, and stream sedimentation. Instability may be increased. 4/ 5/	High to moderate	Log skidding and gouging damages the duff layer, loosens and displaces the soil and destroys soil structure, increasing erosion and stream sedimentation. Instability may be increased. 4/ Compaction will occur in skid trails when the soil is wet, which is most of the year.	Moderate	The primary impact is from access roads. Soil damage may occur from logs skidding along the ground, becoming temporarily airborne and slamming into the soil. This results in duff displacement, loss of soil structure and loosening and displacement of soil, resulting in increased erosion and stream sedimentation. 4/	Moderate to low	The primary impact is from access roads. 4/	Low to moderate	3/ 4/
5	High	Soil compaction will occur when the soil is wet which is most of the year. Tractor turning along with log gouging destroys protective duff layer, loosens and displaces soil, destroys soil structure, increasing erosion, and stream sedimentation. Instability may be increased. 4/ 5/	High to moderate	Log skidding and gouging damages the duff layer, loosens and displaces the soil and destroys soil structure, increasing erosion and stream sedimentation. Instability may be increased. 4/ Compaction will occur in skid trails when the soil is wet, which is most of the year.	Moderate	The primary impact is from access roads. Soil damage may occur from logs skidding along the ground, becoming temporarily airborne and slamming into the soil. This results in duff displacement, loss of soil structure and loosening and displacement of soil, resulting in increased erosion and stream sedimentation. 4/	Moderate to low	The primary impact is from access roads. 4/	Low to moderate	3/ 4/
6	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
7	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A
8	High	Soil compaction will occur when the soil is wet, which is most of the year. Tractor turning along with log gouging destroys protective duff layer, loosens and displaces soil, destroys soil structure, increasing erosion, and stream sedimentation potential. Instability may be increased. 4/ 5/	High	Log skidding and gouging damages the duff layer, loosens and displaces the soil and destroys soil structure, increasing erosion and stream sedimentation potential. Instability may be increased. 4/ Compaction will occur in skid trails when the soil is wet, which is most of the year.	Moderate to high	The primary impact is from access roads. Soil damage may occur from logs skidding along the ground, becoming temporarily airborne and slamming into the soil. This results in duff displacement, loss of soil structure and loosening and displacement of soil, resulting in increased erosion and stream sedimentation potential. Instability may be increased.	Moderate	The primary impact is from access roads. 4/	Low to moderate	3/ 4/

1/ Ratings are based on impacts from uphill yarding. The impacts from downhill yarding are generally more severe.
2/ Relative impact depends on road density, design, and steepness of slope. Roads create exposed soil on cutslopes and waste slopes that have potential to ravel, slough, and erode, causing damage to soils and other resources. The potential increases with slope and is generally very high on slopes greater than 60 percent.
3/ Tree felling and limb gouging may loosen soil locally, resulting in some erosion.
4/ Total tree removal may increase water content and reduce soil binding properties of the roots, resulting in an increased mass movement potential.
5/ Less damage to the soil resource when FMC tractors are used by a prudent operator.
6/ Tractors, FMC, and rubber-tired skidders not allowed.

TABLE OF INTERPRETATIONS

POTENTIAL SOIL AND WATER IMPACTS FROM VARIOUS TIMBER HARVEST METHODS

Land-type No.	Potential Impact from Tractor, FMC, and Rubber Tired Skidder Logging 5/	Type of Damage	Potential Impact from High Lead 1/	Type of Damage	Potential Impact from Skyline (Partial Suspension) 1/	Type of Damage	Potential Impact from Skyline (Full Suspension)	Type of Damage	Potential Impact from Helicopter and Balloon	Type of Damage
8c	High	Soil compaction will occur when the soil is wet which is most of the year. Tractor turning along with log gouging destroys protective duff layer, loosens and displaces soil, destroys soil structure, increasing erosion, and stream sedimentation potential. Instability may be increased. 4/ 5/	High	Log skidding and gouging damages the duff layer, loosens and displaces the soil and destroys soil structure, increasing erosion and stream sedimentation potential. Instability may be increased. 4/ Compaction will occur in skid trails when the soil is wet, which is most of the year.	High to moderate	The primary impact is from access roads. Soil damage may occur from logs skidding along the ground, becoming temporarily airborne and slamming into the soil. This results in duff displacement, loss of soil structure and loosening and displacement of soil, resulting in increased erosion and stream sedimentation potential. Instability may be increased.	Moderate	The primary impact is from access roads. 4/	Moderate to low	3/ 4/
9	High	Soil compaction will occur when the soil is wet which is most of the year. Tractor turning along with log gouging destroys protective duff layer, loosens and displaces soil, destroys soil structure, increasing erosion, and stream sedimentation potential. Instability may be increased. 4/ 5/	High	Log skidding and gouging damages the duff layer, loosens and displaces the soil and destroys soil structure, increasing erosion and stream sedimentation potential. Instability may be increased. 4/ Compaction will occur in skid trails when the soil is wet, which is most of the year.	Moderate to high	The primary impact is from access roads. Soil damage may occur from logs skidding along the ground, becoming temporarily airborne and slamming into the soil. This results in duff displacement, loss of soil structure and loosening and displacement of soil, resulting in increased erosion and stream sedimentation potential. Instability may be increased.	Moderate	The primary impact is from access roads. 4/	Low to moderate	3/ 4/
9c	High	Soil compaction will occur when the soil is wet which is most of the year. Tractor turning along with log gouging destroys protective duff layer, loosens and displaces soil, destroys soil structure, increasing erosion, and stream sedimentation potential. Instability may be increased. 4/ 5/	High	Log skidding and gouging damages the duff layer, loosens and displaces the soil and destroys soil structure, increasing erosion and stream sedimentation. Instability may be increased. 4/ Compaction will occur in skid trails when the soil is wet, which is most of the year.	High to moderate	The primary impact is from access roads. Soil damage may occur from logs skidding along the ground, becoming temporarily airborne and slamming into the soil. This results in duff displacement, loss of soil structure and loosening and displacement of soil, resulting in increased erosion and stream sedimentation potential. Instability may be increased.	Moderate	The primary impact is from access roads. 4/	Moderate to low	3/ 4/
10	Moderate	Soil compaction will occur when the soil is wet. Tractor turning along with log gouging destroys duff and soil structure as well as loosening and displacing soil, increasing erosion and stream sedimentation potential.	Low to moderate	Log skidding and gouging damages the duff layer, loosens and displaces the soil and destroys soil structure. Erosion potential and stream sedimentation are increased on disturbed areas.	Low	Occasional gouging will damage protective duff cover and loosens and displaces soil and destroys soil structure. Erosion potential and stream sedimentation are increased on disturbed areas.	Low	3/	Low	3/

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2/ Relative impact depends on road density, design, and steepness of slope. Roads create exposed soil on cutslopes and waste slopes that have potential to ravel, slough, and erode, causing damage to soils and other resources. The potential increases with slope and is generally very high on slopes greater than 60 percent.
3/ Tree felling and limb gouging may loosen soil locally, resulting in some erosion.
4/ Total tree removal may increase water content and reduce soil binding properties of the roots, resulting in an increased mass movement potential.
5/ Less damage to the soil resource when FMC tractors are used by a prudent operator.
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TABLE OF INTERPRETATIONS

POTENTIAL SOIL AND WATER IMPACTS FROM VARIOUS TIMBER HARVEST METHODS

Land-type No.	Potential Impact from Tractor, FMC, and Rubber Tired Skidder Logging 5/	Type of Damage	Potential Impact from High Lead 1/	Type of Damage	Potential Impact from Skyline (Partial Suspension) 1/	Type of Damage	Potential Impact from Skyline (Full Suspension)	Type of Damage	Potential Impact from Helicopter and Balloon	Type of Damage
11	High	6/	Moderate	Log skidding and gouging damages the duff layer, loosens and displaces the soil and destroys soil structure. Erosion and stream sedimentation potential are increased on disturbed areas.	Low to moderate	Occasional gouging will damage protective duff cover and loosens and displaces soil and destroys soil structure. Erosion and stream sedimentation potential are increased on disturbed areas.	Low	3/	Low	3/
12	Moderate	Soil compaction will occur when the soil is wet. Tractor turning along with log gouging destroys duff and soil structure as well as loosening and displacing soil, increasing erosion and stream sedimentation.	Low to moderate	Log skidding and gouging damages the duff layer, loosens and displaces the soil and destroys soil structure. Erosion and stream sedimentation potential are increased on disturbed areas.	Low	Occasional gouging will damage protective duff cover and loosens and displaces soil and destroys soil structure. Erosion and stream sedimentation potential are increased on disturbed areas.	Low	3/	Low	3/
13	High	6/	Low to moderate	Log skidding and gouging damages the duff layer and loosens and displaces soil and destroys soil structure. Erosion and stream sedimentation potential are increased on disturbed areas.	Low	Occasional gouging will damage protective duff cover and loosens and displaces soil and destroys soil structure. Erosion and stream sedimentation potential are increased on disturbed areas.	Low	3/	Low	3/
14	High	6/	Moderate	Log skidding and gouging damages the duff layer and loosens and displaces soil and destroys soil structure. Erosion and stream sedimentation potential are increased on disturbed areas.	Low to moderate	Occasional gouging will damage protective duff cover and loosens and displaces soil and destroys soil structure. Erosion and stream sedimentation potential are increased on disturbed areas.	Low	2/ 3/	Low	3/
15	Moderate	Tractor turning and gouging may destroy protective duff cover, loosen and displace soil, and destroy soil structure. Soil disturbance may be severe on local wet areas. Erosion will be increased on disturbed areas.	Low to moderate	Log skidding and gouging damages the duff layers, loosens and displaces soil and destroys soil structure, resulting in increased erosion and stream sedimentation potential.	Low	Occasional gouging may damage duff cover, loosen and displace surface soil and destroy soil structure, resulting in increased erosion and stream sedimentation potential.	Low	3/	Low	3/
16	High	6/	Moderate to high	Log skidding and gouging destroys duff, soil structure, and exposes the soil to increased erosion and stream sedimentation potential.	Moderate to low	Soil damage may occur from logs skidding on the ground and becoming temporarily airborne, then slamming into the soil, resulting in an increased erosion and stream sedimentation potential.	Low	The significant impact is from access roads. 2/	Low	3/

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3/ Tree felling and limb gouging may loosen soil locally, resulting in some erosion.
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17	High	6/	High	Log skidding and gouging damages the duff layer, destroys soil structure and loosens and displaces soil, resulting in an increased soil erosion and stream sedimentation potential. Instability may be increased. Compaction will occur in the skid trails when the soil is wet which is most of the year.	High to moderate	The primary damage is from logging access roads. Damage occurs when logs are temporarily airborne and slam into the soil. Log gouging results in duff destruction, loss of soil structure, and loosening and displacement of soil, increasing erosion and stream sedimentation potential. Instability may be increased.	Moderate	The impact is primarily from access roads.	Moderate to low	3/ 4/
18	High	6/	Moderate to high	Log skidding and gouging damages the duff layer, destroys soil structure and loosens and displaces soil, resulting in an increased erosion and stream sedimentation potential.	Moderate to low	The primary damage is from logging access roads. Damage occurs when logs are temporarily airborne and slam into the soil. Log gouging results in duff destruction, loss of soil structure, and loosening and displacement of soil, increasing erosion and stream sedimentation potential.	Low	The significant impact is from access roads. 2/	Low	3/
19	High	6/	High to moderate	Log skidding and gouging damages the duff layer, destroys soil structure and loosens and displaces soil, resulting in an increased erosion and stream sedimentation potential. Instability may be increased and compaction will occur in the skid trails when the soil is wet which is most of the year.	Moderate	The primary damage is from logging access roads. Damage occurs when logs are temporarily airborne and slam into the soil. Log gouging results in duff destruction, loss of soil structure, and loosening and displacement of soil, increasing erosion and stream sedimentation potential. Instability may be increased.	Low to moderate	The significant impact is from access roads. 2/ 4/	Low to moderate	3/ 4/
21	High	6/	High to moderate	Log skidding results in duff destruction, loss of soil structure, and loss of porosity, increasing runoff and erosion.	Moderate	The primary damage is from logging access roads. Logs skidding along the ground, becoming airborne, then slamming into the ground churns the surface soil making it susceptible to detachment and transport.	Low to moderate	The significant impact is from logging access roads. 2/ 4/	Low	3/ 4/
22	High	6/	Moderate	Soil compaction occurs in skid trails. Loss of duff, reduced surface porosity and impaired infiltration, affect regeneration by reducing the amount of water and air moving into the soil.	Moderate to low	The primary damage is from logging access roads. Logs skidding along the ground, becoming airborne, then slamming into the ground churns the surface soil making it susceptible to detachment and transport.	Low	3/	Low	3/

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26	High	6/	High	Log skidding results in duff destruction, loss of soil structure, and loosening and displacement of soil, resulting in severe erosion. Regeneration is slow, resulting in long periods of exposure to erosion.	Moderate to high	Soil damage will occur from logs becoming temporarily airborne and then slamming into the ground, resulting in duff destruction, loss of soil structure, and loosening and displacement of soil. Subsequent damage results in severe erosion potential. Regeneration is slow, resulting in prolonged exposure to erosion.	Low to moderate	The significant impact is from access roads on these steep slopes. 2/	Low	3/
27	Moderate to high	6/	Moderate	Log skidding results in duff destruction, loss of soil structure, and loosening and displacement of the soil, resulting in increased erosion. Regeneration is slow, resulting in long periods of exposure to erosion.	Low to moderate	Occasional gouging will damage duff cover, loosen and displace surface soil, and destroy soil structure, resulting in an increased erosion potential.	Low	3/	Low	3/
28	High	6/	High	Log skidding results in duff destruction, loss of soil structure, and loosening and displacement of soil, resulting in severe erosion. Regeneration is very slow, resulting in long periods of exposure to erosion.	High to moderate	Soil damage will occur from logs becoming temporarily airborne and then slamming into the ground, resulting in duff destruction, loss of soil structure, and loosening and displacement of soil. Subsequent damage results in severe erosion potential. Regeneration is very slow, resulting in prolonged exposure to erosion.	Moderate to low	The significant impact is from access roads on these steep slopes. 2/	Low	3/
29	High to moderate	6/	Moderate to high	Log skidding results in duff destruction, loss of soil structure, and loosening and displacement of the soil, resulting in increased erosion. Regeneration is very slow, resulting in prolonged exposure to erosion.	Moderate to low	Occasional gouging will damage duff cover, loosen and displace surface soil, and destroy soil structure, resulting in an increased erosion potential. Regeneration is very slow, resulting in prolonged exposure to erosion.	Low	3/	Low	3/
31	High	6/	High	Log skidding results in duff destruction, loss of soil structure, and loosening and displacement of soil, resulting in severe erosion. Regeneration is very slow, resulting in long periods of exposure to erosion.	High to moderate	Soil damage may occur from logs becoming temporarily airborne and then slamming into the ground, resulting in duff destruction, loss of soil structure, and loosening and displacement of soil. Subsequent damage results in severe erosion potential. Regeneration is very slow, resulting in prolonged exposure to erosion.	Moderate	The significant impact is from access roads on these fragile soils. 2/ 3/	Low to moderate	3/

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32	High	Soil compaction will occur when the soil is wet. Tractor turning along with log gouging, destroys protective duff layer, loosens and displaces soil, destroying soil structure, and increases soil erosion. Regeneration is very slow, resulting in long periods of exposure to erosion.	High	Log skidding results in duff destruction, loss of soil structure, and displacement of the soil, resulting in increased erosion. Regeneration is very slow, resulting in long periods of exposure to erosion. Compaction will occur in the skid trails when the soil is wet.	Moderate	Occasional gouging will damage duff cover, loosen and displace surface soil, and destroy soil structure, resulting in an increased erosion potential. Regeneration is very slow, resulting in prolonged exposure to erosion.	Low to moderate	The significant impact is from access roads on these fragile soils. 2/ 3/	Low	3/
34	High	6/	High	Log skidding results in duff destruction, loss of soil structure, and loosening and displacement of soil, resulting in severe erosion. Regeneration is very slow, resulting in long periods of exposure to erosion.	High	Soil damage will occur from logs becoming temporarily airborne and then slamming into the ground, resulting in duff destruction, loss of soil structure, and loosening and displacement of soil. Subsequent damage results in severe erosion potential. Regeneration is very slow, resulting in prolonged exposure to erosion.	Moderate	The significant impact is from access roads on these steep rocky slopes. 2/ 3/	Low to moderate	3/
35	High	Tractor turning along with log gouging destroys protective duff layer, loosens and displaces soil, destroying soil structure, and increases soil erosion. Regeneration is extremely slow, resulting in long periods of exposure to erosion. Equipment operation may cause irreparable damage to these fragile areas.	High	Log skidding results in duff destruction, loss of soil structure, and displacement of the soil, resulting in erosion. Regeneration is very slow, resulting in long periods of exposure to erosion. Compaction will occur in the skid trails when the soil is wet.	Moderate	Occasional gouging will damage duff cover, loosen and displace surface soil, and destroy soil structure, resulting in an increased erosion potential. Regeneration is ver slow, resulting in prolonged exposure to erosion.	Low to moderate	The significant impact is from access roads on these fragile soils. 2/ 3/	Low	3/
36	High	6/	High	Log skidding results in compaction on wet soils, and destruction of duff layer and surface structure, increases soil displacement and erosion occurs due to long periods of soil exposure.	Moderate	Soil damage will occur from logs becoming temporarily airborne and then slamming into the ground, resulting in duff destruction, loss of soil structure, and loosening and displacement of soil. Subsequent damage results in severe erosion potential. Regeneration is very slow, resulting in prolonged exposure to erosion.	Low to moderate	The significant impact is from access roads on these fragile soils. 2/ 4/	Low	3/

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37	High	Soil is easily compacted, reducing porosity and infiltration. Soil is loosened and displaced and more easily eroded. Revegetation is slow, leaving long periods of exposure to erosion. Equipment operation may cause irreparable damage to these fragile areas.	High to moderate	Log skidding results in compaction on wet soils resulting in reduced porosity. Destruction of duff layer, and surface structure also occurs. Erosion is increased in disturbed areas due to long periods of soil exposure.	Moderate to low	Occasional gouging will damage duff cover, loosen and displace surface soil, and destroy soil structure, resulting in an increased erosion potential. Regeneration is very slow resulting in prolonged exposure to erosion.	Low	The significant impact is from access roads on these fragile soils. 2/ 4/	Low	3/
38	High	6/	High	Log skidding results in compaction on wet soils and destruction of duff layer and surface structure, increasing soil displacement and erosion occurs due to exposure.	Moderate	Occasional gouging will damage duff cover, loosen and displace surface soil, and destroy soil structure, resulting in an increased erosion potential resulting in prolonged exposure to erosion.	Low to moderate	The significant impact is from access roads on these fragile soils. 2/ 4/	Low	3/
39	High	Soil is easily compacted, reducing porosity and infiltration. Soil is loosened and displaced and more easily eroded. Revegetation is slow, leaving long periods of exposure to erosion. Equipment operation may cause irreparable damage to these fragile areas.	High	Log skidding results in compaction on wet soils resulting in reduced porosity. Destruction of duff layer, and surface structure, also occurs. Erosion is increased in disturbed areas, due to long periods of soil exposure.	Moderate	Occasional gouging will damage duff cover, loosen and displace surface soil, and destroy soil structure, resulting in an increased erosion potential. Regeneration is very slow, resulting in prolonged exposure to erosion.	Low to moderate	The significant impact is from access roads on these fragile soils. 2/ 4/	Low	3/
41	High	6/	High	Log skidding results in soil disturbance, including duff removal, loss of soil structure, and loosening and displacement of the soil. This results in increased runoff, severe erosion, and high sediment production.	Moderate	Soil damage will occur from logs becoming temporarily airborne and then slamming into the ground, resulting in duff destruction, loss of soil structure, and loosening and displacement of soil. Subsequent damage results in severe erosion potential.	Low to moderate	The significant impact is from access roads on these steep slopes. 2/	Low	3/
42	High	6/	High	Log skidding results in duff destruction, loss of soil structure, and loosening and displacement of soil, resulting in increased erosion. Soil compaction will occur in the skid trails when the soil is wet, which is most of the year.	Low to moderate	Occasional gouging will damage protective duff cover, loosen and displace surface soil, and destroy soil structure, resulting in an increased erosion potential.	Low	3/	Low	3/

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43	High	6/	High	Log skidding results in duff destruction, loss of soil structure, and loosening and displacement of the soil, resulting in severe erosion. Regeneration is slow, resulting in prolonged exposure to erosion.	Moderate to high	Soil damage will occur from logs becoming temporarily airborne and then slamming into the ground, resulting in duff destruction, loss of soil structure, and loosening and displacement of soil. Subsequent damage results in severe erosion potential. Regeneration is slow, resulting in prolonged exposure to erosion.	Moderate	The significant impact is from access roads on these steep slopes. 2/	Low	3/
46	High	6/	High	Log skidding results in soil disturbance; including duff removal; loss of soil structure, and loosening and displacement of the soil. This results in increased runoff, severe erosion, and sediment production.	Moderate	Soil damage will occur from logs becoming temporarily airborne and then slamming into the ground, resulting in duff destruction, loss of soil structure, and loosening and displacement of soil. Subsequent damage results in severe erosion potential.	Low to moderate	The significant impact is from access roads on these steep slopes. 2/	Low	3/
48	High	6/	High	Log skidding results in duff destruction, loss of soil structure, and loosening and displacement of the soil, resulting in severe erosion. Regeneration is slow, resulting in prolonged exposure to erosion.	Moderate to high	Soil damage will occur from logs becoming temporarily airborne and then slamming into the ground, resulting in duff destruction, loss of soil structure, and loosening and displacement of soil. Subsequent damage results in severe erosion potential. Regeneration is slow, resulting in prolonged exposure to erosion.	Low to moderate	The significant impact is from access roads on these steep slopes. 2/	Low	3/
50	High	6/	High	Log skidding results in duff destruction, loss of soil structure, and loosening and displacement of the soil, resulting in severe erosion. Regeneration is slow, resulting in prolonged exposure to erosion.	Moderate to high	Soil damage will occur from logs becoming temporarily airborne and then slamming into the ground, resulting in duff destruction, loss of soil structure, and loosening and displacement of soil. Subsequent damage results in severe erosion potential. Regeneration is slow, resulting in prolonged exposure to erosion.	Low to moderate	The significant impact is from access roads on these steep rocky slopes. 2/	Low	3/

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51	High	6/	High	Log skidding results in duff destruction, loss of soil structure, and loosening and displacement of the soil, resulting in severe erosion.	Moderate	Soil damage will occur from logs becoming temporarily airborne and then slamming into the ground, resulting in duff destruction, loss of soil structure, and loosening and displacement of soil. Subsequent damage results in severe erosion potential.	Low	The significant impact is from access roads on these steep slopes. 2/	Low	3/
52	High	6/	Moderate	Log skidding results in duff destruction, loss of soil structure, and loosening and displacement of soil, resulting in increased erosion. Soil compaction will occur in the skid trails when the soil is wet, which is most of the year.	Low to moderate	Occasional gouging will damage protective duff cover, loosen and displace surface soil, and destroy soil structure, resulting in an increased erosion potential.	Low	3/	Low	3/
53	High	6/	High	Log skidding results in duff destruction, loss of soil structure, and loosening and displacement of the soil, resulting in severe erosion. Regeneration is very slow, resulting in prolonged exposure to erosion.	Moderate to high	Soil damage will occur from logs becoming temporarily airborne and then slamming into the ground, resulting in duff destruction, loss of soil structure, and loosening and displacement of soil. Subsequent damage results in severe erosion potential. Regeneration is very slow, resulting in prolonged exposure to erosion.	Low to moderate	The primary impact is from access roads on these steep rocky slopes. 2/	Low	3/
54	High	6/	Moderate	Log skidding results in duff destruction, loss of soil structure, and loosening and displacement of soil, resulting in increased erosion. Soil compaction will occur in the skid trail when the soil is wet. Regeneration is slow, resulting in prolonged exposure to erosion.	Moderate to low	Occasional gouging will damage protective duff cover, loosen and displace surface soil, and destroy soil structure, resulting in an increased erosion potential. Regeneration is slow, resulting in prolonged exposure to erosion.	Low	3/	Low	3/
55	High	6/	Moderate	Log skidding results in duff destruction, loss of soil structure, and loosening and displacement of soil, resulting in increased erosion. Soil compaction will occur when the soil is wet, which is most of the year.	Low to moderate	Occasional gouging will damage protective duff cover, loosen and displace surface soil, and destroy soil structure, resulting in an increased erosion potential.	Low	3/	Low	3/

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61	High	6/	High	Log skidding results in duff destruction, loss of soil structure, and loosening and displacement of the soil. Subsequent damage results in severe erosion and increased stream sedimentation potential.	Moderate	Soil damage will occur from logs becoming temporarily airborne and then slamming into the ground, resulting in duff destruction, loss of soil structure, and loosening and displacement of soil. Subsequent damage results in severe erosion and increased stream sedimentation potential.	Low to moderate	The significant impact is from access roads on these steep slopes. 2/	Low	3/
62	High	Soil compaction will occur when soil is wet, which is most of the year. Tractor turning, along with log gouging destroys duff and soil structure, as well as loosening and displacing soil increasing erosion and stream sedimentation potential.	Moderate	Log skidding results in duff destruction, loss of soil structure, and loosening and displacement of soil, resulting in increased erosion. Soil compaction will occur in the skid trail when the soil is wet, which is most of the year.	Low to moderate	Occasional gouging will damage protective duff cover, loosen and displace surface soil, and destroy soil structure, increasing soil erosion and stream sedimentation potential.	Low	3/	Low	3/
66	High	6/	High	Log skidding results in duff destruction, loss of soil structure, and loss of porosity; increasing runoff and erosion potential.	Moderate	Occasional gouging will damage protective duff cover, loosen and displace surface soil, and destroy soil structure; resulting in an increased erosion potential. Regeneration is slow, resulting in prolonged exposure to erosion.	Moderate to low	The significant impact is from access roads on these steep slopes. 2/	Low	3/
67	High	6/	High	Log skidding results in duff destruction, loss of soil structure, and loss of porosity; increasing runoff and erosion potential.	Moderate to low	Occasional gouging will damage protective duff cover, loosen and displace surface soil, and destroy soil structure, resulting in an increased erosion potential.	Low to moderate	2/	Low	3/
68	Moderate to high	Compactible material, especially when wet. Log skidding and tractor turning destroys surface structure, and disturbs soil, increasing erosion and stream sedimentation potential.	Moderate	Soil compaction will occur in skid trails, including removal of duff layers, loss of soil porosity and infiltration.	Low	Some soil gouging, and compacting will occur under wet conditions in skid trails.	Low	3/	Low	3/
71	High	6/	High to moderate	Log skidding results in duff destruction, loss of soil structure and porosity, increasing runoff and erosion potential.	Moderate	The primary damage is from logging access roads. Logs skidding along the ground, becoming temporarily airborne and then slamming into the ground, churning the surface soil, making it susceptible to detachment and transport.	Low to moderate	The significant impact is from access roads on these steep slopes. 2/	Low	3/ 4/

1/ Ratings are based on impacts from uphill yarding. The impacts from downhill yarding are generally more severe.
2/ Relative impact depends on road density, design, and steepness of slope. Roads create exposed soil on cutslopes and waste slopes that have potential to ravel, slough, and erode, causing damage to soils and other resources. The potential increases with slope and is generally very high on slopes greater than 60 percent.
3/ Tree felling and limb gouging may loosen soil locally, resulting in some erosion.
4/ Total tree removal may increase water content and reduce soil binding properties of the roots, resulting in an increased mass movement potential.
5/ Less damage to the soil resource when FMC tractors are used by a prudent operator.
6/ Tractors, FMC, and rubber-tired skidders not allowed.

TABLE OF INTERPRETATIONS

POTENTIAL SOIL AND WATER IMPACTS FROM VARIOUS TIMBER HARVEST METHODS

Land-type No.	Potential Impact from Tractor, FMC, and Rubber Tired Skidder Logging 5/	Type of Damage	Potential Impact from High Lead 1/	Type of Damage	Potential Impact from Skyline (Partial Suspension) 1/	Type of Damage	Potential Impact from Skyline (Full Suspension)	Type of Damage	Potential Impact from Helicopter and Balloon	Type of Damage
72	High	Soil compaction will occur because of moderate to heavy surface textures. High soil moisture will intensify compaction. Destruction of duff layer and loosening and displacing of soil occurs with tractor turning and log gouging, resulting in sedimentation and erosion potential.	Moderate	Soil compaction will occur in skid trails. Displacement of the duff and loss of surface porosity and infiltration will increase erosion and stream sedimentation potential.	Moderate to low	The primary damage is from logs skidding along the ground, becoming temporarily airborne and then slamming into the ground, churning the surface soil and making it susceptible to detachment and transport.	Low	3/	Low	3/
76	High	6/	High	Log skidding results in duff destruction, loss of soil structure and porosity, increasing runoff and erosion potential.	Moderate to high	Soils highly susceptible to erosion where duff is removed, and where aggregation is reduced in skid trails.	Low to moderate	The primary impact is from road access on these steep slopes and erosive soils.	Low	3/
77	High	6/	Moderate to high	Log skidding results in duff destruction, loss of soil porosity and infiltration, which decreases infiltration; increasing runoff and erosion potential.	Low to moderate	Occasional gouging will damage protective duff cover, loosen and displace surface soil, and destroy soil structure, resulting in an increased erosion potential.	Low	3/	Low	3/
81	High	6/	High	Log skidding results in duff destruction, loss of soil structure and porosity, increasing runoff and erosion potential. Soil compaction will occur in the skid trails.	Moderate	The primary damage is from logging access roads. Logs skidding along the ground, becoming temporarily airborne and then slamming into the ground, churning the surface soil, making it susceptible to detachment and transport.	Low to moderate	The significant impact is from access roads on these steep slopes. 2/	Low	3/
82	High	6/	Moderate	Soil compaction will occur in skid trails. Displacement of the duff and loss of surface porosity and infiltration will increase erosion and stream sedimentation potential.	Moderate to low	The primary damage is from logs skidding along the ground, becoming temporarily airborne and then slamming into the ground, churning the surface soil, making it susceptible to detachment and transport.	Low	3/	Low	3/
83	High	Soil compaction will occur because of moderate to heavy surface soil textures. High soil moisture will intensify compaction. Destruction of duff layers and loosening and displacing of soil occurs with tractor turning and log gouging increasing sedimentation and erosion potential.	Low to moderate	Soil compaction will occur in skid trails. Displacement of the duff and loss of surface porosity and infiltration will increase erosion and stream sedimentation potential.	Low	The primary damage is from logs skidding along the ground, becoming temporarily airborne and then slamming into the ground, churning the surface soil, making it susceptible to detachment and transport.	Low	3/	Low	3/

1/ Ratings are based on impacts from uphill yarding. The impacts from downhill yarding are generally more severe.
2/ Relative impact depends on road density, design, and steepness of slope. Roads create exposed soil on cutslopes and waste slopes that have potential to ravel, slough, and erode, causing damage to soils and other resources. The potential increases with slope and is generally very high on slopes greater than 60 percent.
3/ Tree felling and limb gouging may loosen soil locally, resulting in some erosion.
4/ Total tree removal may increase water content and reduce soil binding properties of the roots, resulting in an increased mass movement potential.
5/ Less damage to the soil resource when FMC tractors are used by a prudent operator.
6/ Tractors, FMC, and rubber-tired skidders not allowed.

TABLE OF INTERPRETATIONS

POTENTIAL SOIL AND WATER IMPACTS FROM VARIOUS TIMBER HARVEST METHODS

Land-type No.	Potential Impact from Tractor, FMC, and Rubber Tired Skidder Logging 5/	Type of Damage	Potential Impact from High Lead 1/	Type of Damage	Potential Impact from Skyline (Partial Suspension) 1/	Type of Damage	Potential Impact from Skyline (Full Suspension)	Type of Damage	Potential Impact from Helicopter and Balloon	Type of Damage
86	High	5/	High	Log skidding results in duff destruction, loss of soil structure and porosity; increasing runoff and erosion potential.	Moderate to high	Soils highly susceptible to erosion where duff is removed, and aggregation is reduced in skid trails.	Low to moderate	The primary impact is from access roads on these steep rocky slopes.	Low	3/
87	High	5/	High	Log skidding results in duff destruction, loss of soil porosity and infiltration, which decreases infiltration; increasing runoff and erosion potential.	Low to moderate	Occasional gouging will damage protective duff cover, loosen and displace surface soil, and destroy soil structure, resulting in an increased erosion potential.	Low	3/	Low	3/
91	High	5/	High	Log skidding results in duff destruction, loss of minimal structure granitic soils have, and loosening and displacement of the soil, resulting in very severe erosion and stream sedimentation potential.	High to moderate	Soil damage will occur when logs become temporarily airborne and then slam into the soil, resulting in duff destruction, loss of minimal soil structure common to granitic soils and loosening and displacing soil. Subsequent damage results in a very severe erosion and stream sedimentation potential.	Moderate to low	The significant impact is from access roads on these steep, very erosive slopes. 2/	Low	3/
92	High	5/	High	Log skidding results in duff destruction, loss of minimal structure granitic soils have, and loosening and displacement of the soil, resulting in severe erosion and stream sedimentation potential.	Moderate	Soil damage will occur when logs become temporarily airborne and then slam into the soil, resulting in duff destruction, loss of minimal soil structure common to granitic soils and loosening and displacing soil. Subsequent damage results in a severe erosion and stream sedimentation potential.	Low to moderate	The significant impact is from access roads on these erosive slopes. 2/	Low	3/
93	High	Tractor turning and log gouging will expose this highly erodible soil to rain drop detachment and transport. Soil compaction will be a problem when the soil is wet, since granitics tend to form a crust on the surface when they are passed over by equipment when wet.	Moderate	Log skidding results in duff destruction, loss of soil structure, and loosening and displacement of the soil, resulting in increased erosion potential.	Low to moderate	Occasional gouging will damage duff cover, loosen and displace surface soils, and destroy minimal soil structure common to granitic soils resulting in an increased erosion potential.	Low	3/	Low	3/

1/ Ratings are based on impacts from uphill yarding. The impacts from downhill yarding are generally more severe.
2/ Relative impact depends on road density, design, and steepness of slope. Roads create exposed soil on cutslopes and waste slopes that have potential to ravel, slough, and erode, causing damage to soils and other resources. The potential increases with slope and is generally very high on slopes greater than 60 percent.
3/ Tree felling and limb gouging may loosen soil locally, resulting in some erosion.
4/ Total tree removal may increase water content and reduce soil binding properties of the roots, resulting in an increased mass movement potential.
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TABLE OF INTERPRETATIONS

POTENTIAL SOIL AND WATER IMPACTS FROM VARIOUS TIMBER HARVEST METHODS

Land-type No.	Potential Impact from Tractor, FMC, and Rubber Tired Skidder Logging 5/	Type of Damage	Potential Impact from High Lead 1/	Type of Damage	Potential Impact from Skyline (Partial Suspension) 1/	Type of Damage	Potential Impact from Skyline (Full Suspension)	Type of Damage	Potential Impact from Helicopter and Balloon	Type of Damage
95	High	6/	High	Log skidding results in duff destruction, loss of minimal soil structure common to granitic soils, and loosening and displacement of soil, resulting in very severe erosion and stream sedimentation potential.	High to moderate	Soil damage will occur when logs become temporarily airborne, and then slam into the soil, resulting in duff destruction, and loss of minimal soil structure common to granitic soils. Subsequent damage results in a very severe erosion and stream sedimentation potential.	Moderate to low	The significant impact is from access roads on these steep, very erosive slopes. 2/	Low	3/
96	High	6/	High	Log skidding results in duff destruction, loss of soil structure, and loosening and displacement of the soil, resulting in an increased erosion and stream sedimentation potential. Regeneration is slow resulting in prolonged exposure to erosion.	High to moderate	Soil damage will occur when logs become temporarily airborne and then slam into the soil, resulting in duff destruction, loss of soil structure, and loosening and displacing of soil. Subsequent damage results in an increased erosion and stream sedimentation potential.	Moderate to low	The primary impact is from access roads on these steep slopes. 2/	Low	3/
97	High	6/	High	Log skidding results in duff destruction, loss of soil structure, and loosening and displacement of the soil, resulting in an increased erosion and stream sedimentation potential.	Moderate	Soil damage will occur when logs become temporarily airborne and then slam into the soil resulting in duff destruction, loss of soil structure, and loosening and displacing soil. Subsequent damage results in an increased erosion and stream sedimentation potential.	Low to moderate	The primary impact is from access roads. 2/	Low	3/
98	High	Tractor turning and log gouging will expose this erodible soil to detachment and transport. Soil compaction will be a problem when soil is wet, since surface soils have medium textures.	Moderate	Log skidding results in duff destruction, loss of soil structure, and loosening and displacement of the soil, resulting in increased erosion potential.	Low to moderate	Occasional gouging will damage duff cover, loosen and displace surface soils, and destroys soil structure, resulting in an increased erosion potential.	Low	3/	Low	3/
99	High	6/	High	Log skidding results in duff destruction, loss of soil structure, and loosening and displacement of the soil, resulting in an increased erosion and stream sedimentation potential. Regeneration is very slow resulting in prolonged periods of exposure to erosion.	Moderate to high	Soil damage will occur when logs become temporarily airborne and then slam into the soil resulting in duff destruction, loss of soil structure, and loosening and displacing soil. Subsequent damage results in an increased erosion and stream sedimentation potential.	Low to moderate	The primary impact is from access roads. 2/	Low	3/

1/ Ratings are based on impacts from uphill yarding. The impacts from downhill yarding are generally more severe.
2/ Relative impact depends on road density, design, and steepness of slope. Roads create exposed soil on cutslopes and waste slopes that have potential to ravel, slough, and erode, causing damage to soils and other resources. The potential increases with slope and is generally very high on slopes greater than 60 percent.
3/ Tree felling and limb gouging may loosen soil locally, resulting in some erosion.
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POTENTIAL SOIL AND WATER IMPACTS FROM VARIOUS TIMBER HARVEST METHODS

Land-type No.	Potential Impact from Tractor, FMC, and Rubber Tired Skidder Logging 5/	Type of Damage	Potential Impact from High Lead 1/	Type of Damage	Potential Impact from Skyline (Partial Suspension) 1/	Type of Damage	Potential Impact from Skyline (Full Suspension)	Type of Damage	Potential Impact from Helicopter and Balloon	Type of Damage
100	High	Soil compaction will be high when soils are wet, since surface soils are of medium texture. Soils are wet a high percentage of the time.	Moderate to low	Log skidding results in duff destruction, loss of soil structure, and loosening and displacement of the soil, resulting in an increased erosion potential.	Low	Occasional gouging may damage duff cover, loosen and displace soil, and destroy structure, resulting in an increased erosion potential.	Low	3/	Low	3/
120	High	6/	High	Log skidding results in duff destruction, loss of soil porosity and infiltration. Soil loosening and displacement on these very steep slopes greatly increasing erosion and stream sedimentation potential.	High to moderate	Soil damage will occur when logs become temporarily airborne and then slam into the soil, resulting in duff destruction, loss of soil structure, and loosening and displacing of soil. Subsequent damage results an increased erosion and stream sedimentation potential.	Low to moderate	The primary impact is from access roads on these very steep rocky slopes.	Low	3/
121	High	6/	High	Log skidding results in duff destruction, loss of soil porosity and infiltration. Soil loosening and displacement on these steep slopes greatly increases erosion and stream sedimentation potential.	Moderate	The primary damage is from logging access roads, logs skidding along the ground, becoming temporarily airborne and then slamming into the ground, churning the surface soil, making it susceptible to detachment and transport.	Low	The primary impact is from access roads on these steep slopes.	Low	3/
122	High	6/	Moderate to high	Log skidding results in duff destruction, loss of soil porosity and infiltration, which decreases infiltration; increasing runoff and erosion potential.	Low	Occasional gouging may damage duff cover, loosen and displace soil, and destroy structure, resulting in an increased erosion potential.	Low	3/	Low	3/
125	Moderate to high	Soil compaction will be high when soil is wet, because of medium soil textures.	Moderate	Log skidding can destroy surface structure induce puddling, decreasing infiltration and aeration in the surface layer.	Low	Occasional gouging may damage duff cover, loosen and displace soil, and destroy structure, resulting in an increased erosion potential.	Low	3/	Low	3/
176	High	6/	High	Log skidding results in duff destruction, loss of soil porosity and infiltration. Soil loosening and displacement on these steep slopes increases erosion and stream sedimentation potential.	Moderate to high	Soil damage will occur when logs become temporarily airborne and then slam into the soil resulting in duff destruction, loss of soil structure, and loosening and displacing soil. Subsequent damage results in an increased erosion and stream sedimentation potential.	Low	The primary impact is from access roads on these steep slopes. 2/	Low	3/

1/ Ratings are based on impacts from uphill yarding. The impacts from downhill yarding are generally more severe.
2/ Relative impact depends on road density, design, and steepness of slope. Roads create exposed soil on cutslopes and waste slopes that have potential to ravel, slough, and erode, causing damage to soils and other resources. The potential increases with slope and is generally very high on slopes greater than 60 percent.
3/ Tree felling and limb gouging may loosen soil locally, resulting in some erosion.
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POTENTIAL SOIL AND WATER IMPACTS FROM VARIOUS TIMBER HARVEST METHODS

Land-type No.	Potential Impact from Tractor, FMC, and Rubber Tired Skidder Logging 5/	Type of Damage	Potential Impact from High Lead 1/	Type of Damage	Potential Impact from Skyline (Partial Suspension) 1/	Type of Damage	Potential Impact from Skyline (Full Suspension)	Type of Damage	Potential Impact from Helicopter and Balloon	Type of Damage
177	High	Soil compaction potential is high under wet soil conditions. Tractor turning and log skidding disturbs surface structure, decreased infiltration, increases runoff and erosion potential.	Moderate to high	Log skidding results in duff destruction, loss of soil porosity and infiltration, which decreases infiltration, increasing runoff and erosion potential.	Low to moderate	Occasional gouging will damage protective duff cover, loosen and displace surface soil, and destroy soil structure, resulting in an increased erosion potential.	Low	3/	Low	3/
178	High	6/	High	Log skidding results in duff destruction, loss of soil porosity and infiltration. Soil loosening and displacement on these steep slopes increases erosion and stream sedimentation potential.	High to moderate	Soil damage will occur when logs become temporarily airborne and then slam into the soil, resulting in duff destruction, loss of soil structure, and loosening and displacing soil. Subsequent damage results in an increased erosion and stream sedimentation potential.	Low	The primary impact is from access roads on these steep slopes. 2/	Low	3/
186	High	6/	High	Log skidding results in duff destruction, loss of soil porosity and infiltration. Soil loosening and displacement on these steep slopes increases erosion and stream sedimentation potential.	Moderate to high	Soil damage will occur when logs become temporarily airborne and then slam into the soil, resulting in duff destruction, loss of soil structure, and loosening and displacing soil. Subsequent damage results in an increased erosion and stream sedimentation potential.	Low	The primary impact is from access roads on these steep slopes. 2/	Low	3/
191	High	6/	High	Log skidding results in duff destruction, loss of soil porosity and infiltration. Soil loosening and displacement on these steep slopes results in a very severe erosion and stream sedimentation potential.	High to moderate	Soil damage will occur when logs become temporarily airborne and then slam into the soil, resulting in duff destruction, loss of soil structure, and loosening and displacing soil. Subsequent damage results in an increased erosion and stream sedimentation potential.	Low	The primary impact is from access roads on these steep slopes. 2/	Low	3/
192	High	6/	High	Log skidding results in duff destruction, loss of soil porosity and infiltration. Soil loosening and displacement on these steep slopes results in a severe erosion and stream sedimentation potential.	Moderate	Occasional gouging may damage duff cover, loosen and displace soil, and destroy structure, resulting in an increased erosion potential.	Low	The primary impact is from access roads. 2/	Low	3/

1/ Ratings are based on impacts from uphill yarding. The impacts from downhill yarding are generally more severe.
2/ Relative impact depends on road density, design, and steepness of slope. Roads create exposed soil on cutslopes and waste slopes that have potential to ravel, slough, and erode, causing damage to soils and other resources. The potential increases with slope and is generally very high on slopes greater than 60 percent.
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TABLE OF INTERPRETATIONS

POTENTIAL SOIL AND WATER IMPACTS FROM VARIOUS TIMBER HARVEST METHODS

Land-type No.	Potential Impact from Tractor, FMC, and Rubber Tired Skidder Logging 5/	Type of Damage	Potential Impact from High Lead 1/	Type of Damage	Potential Impact from Skyline (Partial Suspension) 1/	Type of Damage	Potential Impact from Skyline (Full Suspension)	Type of Damage	Potential Impact from Helicopter and Balloon	Type of Damage
193	High	Soil compaction can result when logged at moisture contents. Tractor turning and log skidding can dislodge and disturb soil, increasing its ability to erode.	Moderate to high	Log skidding results in duff destruction, loss of soil porosity and infiltration, which decreases infiltration, and increases runoff and erosion potential.	Low to moderate	Occasional gouging will damage protective duff cover, loosen and displace surface soil and destroy soil structure, resulting in an increased erosion potential.	Low	3/	Low	3/
194	High	6/	High	Log skidding results in duff destruction, loss of soil porosity and infiltration. Soil loosening and displacement on these steep slopes increases erosion and stream sedimentation potential.	High to moderate	Soil damage will occur when logs become temporarily airborne and then slam into the soil, resulting in duff destruction, loss of soil structure, and loosening and displacing soil. Subsequent damage results in an increased erosion and stream sedimentation potential.	Low	The primary impact is from access roads on these steep slopes. 2/	Low	3/
196	High	6/	High	Log skidding results in duff destruction, loss of soil structure, and loosening and displacement of the soil, resulting in an increased erosion and stream sedimentation potential. Regeneration is slow, resulting in prolonged exposure to erosion.	High to moderate	Soil damage will occur when logs become temporarily airborne and then slam into the soil, resulting in duff destruction, loss of soil structure, and loosening and displacing soil. Subsequent damage results in an increased erosion and stream sedimentation potential.	Moderate to low	The primary impact is from access roads on these steep slopes. 2/	Low	3/
197	Moderate to high	Some slopes greater than 35 percent. Log skidding results in duff destruction and loss of soil porosity. Erosion and sedimentation potentials are increased due to displacement.	Moderate	Log skidding results in duff destruction, loss of soil structure, and loosening and displacement of the soil, resulting in an increased erosion and stream sedimentation potential. Regeneration is slow, resulting in prolonged exposure to erosion.	Low to moderate	Occasional gouging and duff destruction will increase erosion potential.	Low	3/	Low	3/

1/ Ratings are based on impacts from uphill yarding. The impacts from downhill yarding are generally more severe.
2/ Relative impact depends on road density, design, and steepness of slope. Roads create exposed soil on cutslopes and waste slopes that have potential to ravel, slough, and erode, causing damage to soils and other resources. The potential increases with slope and is generally very high on slopes greater than 60 percent.
3/ Tree felling and limb gouging may loosen soil locally, resulting in some erosion.
4/ Total tree removal may increase water content and reduce soil binding properties of the roots, resulting in an increased mass movement potential.
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APPENDIX VIII

ENGINEERING TEST DATA

Landtype No. 4

Location: NW¼,Sec.31,T.49N.,R.6E.
Depth: -
Liquid Limit: 42
Plasticity Index: 6
Maximum Density - p.c.f.: 105
Optimum Moisture - %: 18.4
Specific Gravity, #10(-) only: 2.58
California Bearing Ratio
95%: 18.6
90%: 7.9
85%: 3.1
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-1-6(0)
UNIFIED	-	GMU

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	100
1 1/2	97.51
1	96.91
3/4	91.42
1/2	91.42
3/8	79.29
#4	60.57
#10	40.49
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	32.34
#40	27.72
#60	25.13
#100	23.31
#200	21.43
Dia. MM 1/	
.0475	18.22
.0193	17.10
.0116	14.70
.0084	12.82
.0061	11.29
.0031	7.52
.0013	4.17

Landtype No. 8

Location: SE¼,SW¼,Sec.19,T.39S.,R.12W.
Depth: -
Liquid Limit: 42
Plasticity Index: 10
Maximum Density - p.c.f.: 102.2
Optimum Moisture - %: 18.5
Specific Gravity, #10(-) only: 2.66
California Bearing Ratio
95%: 7.2
90%: 3.1
85%: 0.2
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-5(1)
UNIFIED	-	SMU

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	100
1	97.37
3/4	94.00
1/2	-
3/8	86.11
#4	76.00
#10	63.90
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	54.34
#40	46.14
#60	41.78
#100	38.46
#200	35.24
Dia. MM 1/	
.0284	31.98
.0231	28.78
.0113	24.88
.0082	22.15
.0059	19.81
.0030	14.82
.0013	9.83

1/ Particle size computed from hydrometer readings.

Landtype No. 8

Location: SE¼,SE¼,Sec.6,T.36S.,R.13W.
Depth: -
Liquid Limit: 39
Plasticity Index: 6
Maximum Density - p.c.f.: 95.4
Optimum Moisture - %: 25.6
Specific Gravity, #10(-) only: 2.654
California Bearing Ratio
95%: 6.6
90%: 4.6
85%: 2.3
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-2-4
UNIFIED	-	SMU

Mechanical Analysis	
Sieve Size	% Passing
3	100
2 1/2	-
2	-
1 1/2	86.36
1	80.93
3/4	80.10
1/2	78.97
3/8	77.79
#4	71.05
#10	50.96
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	44.99
#40	41.26
#60	37.93
#100	34.20
#200	29.63
Dia. MM 1/	
.0298	26.59
.0196	22.73
.0115	20.57
.0083	18.25
.0059	16.70
.0030	12.84
.0013	8.88

Landtype No. 8c

Location: Centr of Sec.6,T.36S.,R.12W.
Depth: -
Liquid Limit: 44
Plasticity Index: 14
Maximum Density - p.c.f.: 97.5
Optimum Moisture - %: 22.3
Specific Gravity, #10(-) only: 2.66
California Bearing Ratio
95%: 9.9
90%: 5.9
85%: 1.8
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-2-7(1)
UNIFIED	-	SMU

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	100
1 1/2	98.93
1	96.35
3/4	94.27
1/2	-
3/8	86.26
#4	73.57
#10	56.18
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	43.77
#40	37.84
#60	35.29
#100	33.38
#200	31.33
Dia. MM 1/	
.029	29.42
.019	26.10
.011	23.52
.0082	21.86
.0059	19.37
.0043	15.27
.0013	10.47

1/ Particle size computed from hydrometer readings.

Landtype No. 8c

Location: SW¼,NW¼,Sec.28,T.38S.,R.13W.
Depth: -
Liquid Limit: 47
Plasticity Index: 10
Maximum Density - p.c.f.: 100.4
Optimum Moisture - %: 19.8
Specific Gravity, #10(-) only: 2.545
California Bearing Ratio
95%: 18.0
90%: 7.0
85%: 3.0
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-2-7(6)
UNIFIED	-	GMU

Mechanical Analysis	
Sieve Size	% Passing
3	100
2 1/2	-
2	-
1 1/2	94.77
1	78.62
3/4	68.41
1/2	60.79
3/8	56.21
#4	42.30
#10	42.69
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	41.96
#40	40.85
#60	38.43
#100	34.11
#200	28.74
Dia. MM 1/	
.0289	22.71
.0120	20.72
.0114	18.29
.0082	16.95
.0059	15.60
.0030	12.49
.0013	9.37

Landtype No. 11

Location: NE¼,NW¼,Sec.30,T.36S.,R.9W.
Depth: -
Liquid Limit: NP
Plasticity Index: NP
Maximum Density - p.c.f.: 105.7
Optimum Moisture - %: 18.7
Specific Gravity, #10(-) only: 2.75
California Bearing Ratio
95%: 19.0
90%: 9.3
85%: 2.3
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-1-b(0)
UNIFIED	-	SMD

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	-
1	100
3/4	99.49
1/2	-
3/8	95.63
#4	83.41
#10	61.87
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	44.25
#40	34.60
#60	29.76
#100	24.86
#200	18.10
Dia. MM 1/	
.0318	11.14
.0181	7.91
.0122	5.96
.0088	4.54
.0062	3.89
.0037	2.13
.0012	.84

1/ Particle size computed from hydrometer readings.

Landtype No. 11-B 1/

Location: SW¼,Sec.21,T.37S.,R.9W.
Depth: 13 to 62 inches
Liquid Limit: 25-35
Plasticity Index: NP-10
Maximum Density - p.c.f.: -
Optimum Moisture - %: -
Specific Gravity, #10(-) only: -
California Bearing Ratio
95%: -
90%: -
85%: -
pH: 6.1-7.3

Classification	Mechanical	Hydrometer
AASHO	A-2	-
UNIFIED	GM	-

Mechanical Analysis	
Sieve Size	% Passing
3	75-90
2 1/2	-
2	-
1 1/2	-
1	-
3/4	-
1/2	-
3/8	-
#4	20-50
#10	15-45
#40	15-40
#100	-
#200	10-35

1/ B refers to subsoil.

Landtype No. 12

Location: NW¼,Sec.8,T.40S.,R.8W.
Depth: -
Liquid Limit: 26
Plasticity Index: 2
Maximum Density - p.c.f.: 116.2
Optimum Moisture - %: 15.9
Specific Gravity, #10(-) only: 2.8902
California Bearing Ratio
95%: 20.0
90%: 10.5
85%: 4.0
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-4-0
UNIFIED	-	SMU

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	100
1	93.82
3/4	93.26
1/2	90.63
3/8	89.58
#4	85.84
#10	76.24
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	67.31
#40	58.90
#60	53.06
#100	47.73
#200	39.29

Landtype No. 14-A 1/

Location: SE¼Sec.11,T.40S.,R.6W.
Depth: 0 to 26 inches
Liquid Limit: -
Plasticity Index: NP
Maximum Density - p.c.f.: -
Optimum Moisture - %: -
Specific Gravity, #10(-) only: -
California Bearing Ratio
95%: -
90%: -
85%: -
pH: 5.6-6.0

Classification	Mechanical	Hydrometer
AASHO	A-1,A-2	-
UNIFIED	GM	-

Mechanical Analysis	
Sieve Size	% Passing
3	75-90
2 1/2	-
2	-
1 1/2	-
1	-
3/4	-
1/2	-
3/8	-
#4	35-60
#10	30-55
#40	20-40
#100	-
#200	10-20

Landtype No. 14-B 2/

Location: SE¼,Sec.11,T.40S.,R.6W.
Depth: 26 to 65 inches
Liquid Limit: -
Plasticity Index: NP
Maximum Density - p.c.f.: -
Optimum Moisture - %: -
Specific Gravity, #10(-) only: -
California Bearing Ratio
95%: -
90%: -
85%: -
pH: 5.1-6.0

Classification	Mechanical	Hydrometer
AASHO	A-1,A-2	-
UNIFIED	SM,GM	-

Mechanical Analysis	
Sieve Size	% Passing
3	30-55
2 1/2	-
2	-
1 1/2	-
1	-
3/4	-
1/2	-
3/8	-
#4	35-70
#10	30-65
#40	20-45
#100	-
#200	10-25

1/ A refers to topsoil.
2/ B refers to subsoil.

Landtype No. 15

Location: SE¼,NW¼,Sec.2,T.41S.,R.8W.
Depth: -
Liquid Limit: 32
Plasticity Index: 7
Maximum Density - p.c.f.: 105.2
Optimum Moisture - %: 19.6
Specific Gravity, #10(-) only: 2.73
California Bearing Ratio
95%: 8.8
90%: 3.8
85%: 1.5
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-2-4(0)
UNIFIED	-	SMU

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	100
1	99.3
3/4	98.48
1/2	-
3/8	95.25
#4	86.32
#10	70.65
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	56.97
#40	44.31
#60	38.79
#100	35.56
#200	32.65
Dia. MM 1/	
.03060	32.54
.0197	29.78
.0117	26.91
.0084	24.71
.0060	21.95
.0030	17.65
.0013	11.69

Landtype No. 15

Location: SW¼,SW¼,Sec.8,T.32S.,R.10W.
Depth: -
Liquid Limit: 36
Plasticity Index: 7
Maximum Density - p.c.f.: 105.9
Optimum Moisture - %: 19.5
Specific Gravity, #10(-) only: 2.72
California Bearing Ratio
95%: 12.3
90%: 7.0
85%: 0.0
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-4(1)
UNIFIED	-	GMU

Mechanical Analysis	
Sieve Size	% Passing
3	100
2 1/2	-
2	98.24
1 1/2	93.41
1	87.85
3/4	84.75
1/2	-
3/8	74.80
#4	65.14
#10	54.93
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	50.96
#40	48.67
#60	47.40
#100	44.44
#200	39.02
Dia. MM 1/	
.0290	28.19
.0192	23.30
.0116	19.06
.0083	17.35
.0060	15.32
.0030	12.38
.0013	9.53

1/ Particle size computed from hydrometer readings.

Landtype No. 16

Location: NE¼,SE¼,Sec.32,T.41S.,R.6W.
Depth: -
Liquid Limit: 37
Plasticity Index: 7
Maximum Density - p.c.f.: 103.7
Optimum Moisture - %: 21.1
Specific Gravity, #10(-) only: 2.83
California Bearing Ratio
95%: 7.8
90%: 3.5
85%: -
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-4(2)
UNIFIED	-	SMU

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	100
1	95.54
3/4	94.86
1/2	-
3/8	87.68
#4	79.81
#10	70.93
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	65.11
#40	59.13
#60	54.96
#100	51.03
#200	45.73
Dia. MM 1/	
.0267	38.04
.0175	33.86
.0106	29.11
.0078	26.32
.0055	23.53
.0028	18.05
.0012	12.93

Landtype No. 17

Location: NW¼,SE¼,Sec.19,T.39S.,R.12W.
Depth: -
Liquid Limit: 44
Plasticity Index: 9
Maximum Density - p.c.f.: 89.4
Optimum Moisture - %: 28.8
Specific Gravity, #10(-) only: 2.61
California Bearing Ratio
95%: 3.8
90%: 1.4
85%: 0.2
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-5(3)
UNIFIED	-	ML

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	100
1 1/2	95.42
1	92.35
3/4	90.06
1/2	-
3/8	84.75
#4	78.51
#10	69.24
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	66.19
#40	62.86
#60	59.61
#100	55.14
#200	49.66
Dia. MM 1/	
.0272	43.13
.0177	40.26
.0107	35.76
.0078	32.80
.0056	30.41
.0029	25.05
.0012	17.88

1/ Particle size computed from hydrometer readings.

Landtype No. 18

Location: SW,Sec.35,T.35S.,R.8W.
Depth: -
Liquid Limit: 47
Plasticity Index: 13
Maximum Density - p.c.f.: 84.7
Optimum Moisture - %: 28.1
Specific Gravity, #10(-) only: 2.65
California Bearing Ratio
95%: 4.5
90%: 0.9
85%: 0.0
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-7-5(5)
UNIFIED	-	ML

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	-
1	-
3/4	-
1/2	100
3/8	98.38
#4	90.81
#10	71.64
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	65.09
#40	59.27
#60	55.74
#100	52.96
#200	50.13
Dia. MM 1/	
.0233	44.10
.0153	41.66
.0094	37.40
.0070	34.35
.0051	30.92
.0027	23.84
.0012	14.70

Landtype No. 18

Location: NW,Sec.34,T.35S.,R.8W.
Depth: -
Liquid Limit: 45
Plasticity Index: 9
Maximum Density - p.c.f.: 94.0
Optimum Moisture - %: 24.5
Specific Gravity, #10(-) only: 2.66
California Bearing Ratio
95%: 5.5
90%: 2.4
85%: 1.2
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-5
UNIFIED	-	SMU

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	-
1	-
3/4	-
1/2	100
3/8	98.71
#4	93.99
#10	73.03
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	57.77
#40	47.86
#60	42.82
#100	39.34
#200	35.96
Dia. MM 1/	
.0305	32.35
.0197	29.44
.0117	25.57
.0084	23.24
.0061	20.34
.0031	13.85
.0013	9.10

1/ Particle size computed from hydrometer readings.

Landtype No. 19

Location: NE¼,Sec.29,T.34S.,R.9W.
Depth: -
Liquid Limit: 53
Plasticity Index: 15
Maximum Density - p.c.f.: 93.4
Optimum Moisture - %: 26
Specific Gravity, #10(-) only: 2.60
California Bearing Ratio
95%: 5.0
90%: 4.1
85%: 2.4
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-7-5(7)
UNIFIED	-	OH

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	100
1	99.53
3/4	99.33
1/2	-
3/8	99.33
#4	90.38
#10	77.94
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	72.19
#40	66.26
#60	61.92
#100	58.27
#200	54.19
Dia. MM 1/	
.0251	54.63
.0163	52.49
.0099	47.16
.0073	41.82
.0053	33.08
.0028	30.94
.0012	21.34

Landtype No. 19

Location: SE¼,SE¼,Sec.9,T.41S.,R.12W.
Depth: -
Liquid Limit: 55
Plasticity Index: 22
Maximum Density - p.c.f.: 85.9
Optimum Moisture - %: 31.1
Specific Gravity, #10(-) only: 2.73
California Bearing Ratio
95%: 5.85
90%: 3.85
85%: 1.8
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-7-5(12)
UNIFIED	-	MH

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	-
1	-
3/4	100
1/2	-
3/8	99.08
#4	96.55
#10	89.80
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	80.13
#40	71.65
#60	67.03
#100	63.15
#200	58.92
Dia. MM 1/	
.026	39.22
.017	35.65
.010	32.00
.0074	30.22
.0054	27.36
.0027	22.46
.0013	17.38

1/ Particle size computed from hydrometer readings.

Landtype No. 19

Location: NW¼,SE¼,Sec.18,T.40S.,R.12W.
Depth: -
Liquid Limit: 49
Plasticity Index: 14
Maximum Density - p.c.f.: 89.3
Optimum Moisture - %: 27.3
Specific Gravity, #10(-) only: -
California Bearing Ratio
95%: 6.2
90%: 3.9
85%: 2.2
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-7-5
UNIFIED	-	ML

Mechanical Analysis	
Sieve Size	% Passing
3	100
2 1/2	100
2	100
1 1/2	100
1	98.71
3/4	98.71
1/2	-
3/8	93.39
#4	87.52
#10	81.37
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	77.12
#40	73.36
#60	69.57
#100	65.58
#200	59.94
Dia. MM 1/	
.0289	53.56
.0187	49.95
.0111	45.62
.0080	42.59
.0057	39.70
.0029	34.94
.0013	27.43

Landtype No. 19

Location: NE¼,SW¼,Sec.31,T.33S.,R.13W.
Depth: -
Liquid Limit: 49
Plasticity Index: 11
Maximum Density - p.c.f.: 94.6
Optimum Moisture - %: 23.6
Specific Gravity, #10(-) only: 2.72
California Bearing Ratio
95%: 14.5
90%: 9.2
85%: 5.7
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-7-5
UNIFIED	-	SMU

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	100
1 1/2	98.95
1	98.24
3/4	96.16
1/2	-
3/8	89.97
#4	78.87
#10	64.39
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	58.27
#40	54.60
#60	51.71
#100	48.44
#200	44.19
Dia. MM 1/	
.0233	39.87
.0151	37.49
.0092	34.78
.0066	33.42
.0049	30.77
.0025	26.76
.0011	21.19

1/ Particle size computed from hydrometer readings.

Landtype No. 21

Location: NE¼,SW¼,Sec.17,T.36S.,R.7W.
Depth: -
Liquid Limit: 32
Plasticity Index: 6
Maximum Density - p.c.f.: 102.1
Optimum Moisture - %: 20.6
Specific Gravity, #10(-) only: 2.547
California Bearing Ratio
95%: 2.7
90%: 0.4
85%: -
pH: -

Classification	Mechanical	Hydrometer
AASHO	A-4(0)	A-4(0)
UNIFIED	ML	ML

Mechanical Analysis	
Sieve Size	% Passing
3	100
2 1/2	100
2	100
1 1/2	100
1	100
3/4	100
1/2	99.47
3/8	99.05
#4	97.77
#10	93.50
#20	78.70
#40	68.95
#60	63.15
#100	58.07
#200	51.90

Hydrometer Analysis	
Sieve Size	% Passing
#20	78.70
#40	68.95
#60	63.15
#100	58.07
#200	51.90
Dia. MM 1/	
.0250	68.20
.0160	66.91
.0093	65.62
.0066	64.33
.0048	61.75
.0024	55.30
.0012	32.83

Remarks: Maximum particle size is 3/4". The shape of the + #10 particles is angular. The MH appears to be weathered mudstone. Dispersion by mechanical agation for 1 minute.

Landtype No. 22

Location: SW¼,NE¼,Sec.20,T.36S.,R.7W.
Depth: -
Liquid Limit: 37
Plasticity Index: 10
Maximum Density - p.c.f.: 97.2
Optimum Moisture - %: 21.7
Specific Gravity, #10(-) only: 2.6315
California Bearing Ratio
95%: 5.4
90%: 2.6
85%: 1.1
pH: -

Classification	Mechanical	Hydrometer
AASHO	A-4(4)	A-4(4)
UNIFIED	ML	ML

Mechanical Analysis	
Sieve Size	% Passing
3	100
2 1/2	100
2	100
1 1/2	100
1	100
3/4	100
1/2	99.77
3/8	98.36
#4	90.34
#10	76.00
#20	69.37
#40	64.07
#60	60.96
#100	58.43
#200	55.05

Hydrometer Analysis	
Sieve Size	% Passing
#20	69.37
#40	64.07
#60	60.96
#100	58.43
#200	55.05
Dia. MM 1/	
.0273	32.11
.0179	29.05
.0106	25.98
.0078	22.91
.0056	20.61
.0028	16.01
.0012	11.08

Remarks: Maximum particle size is 3/4". Particles retained on the 1/2" sieve are angular in shape. Particles passing the 1/2 " sieve and retained on the #10 are rounded to subrounded in shape.

1/ Particle size computed from hydrometer readings.

Landtype No. 26

Location: NE¼,SE¼,Sec.10,T.40S.,R.12W.
Depth: -
Liquid Limit: NA
Plasticity Index: NP
Maximum Density - p.c.f.: 82.0
Optimum Moisture - %: 32.2
Specific Gravity, #10(-) only: 2.52
California Bearing Ratio
95%: 8.2
90%: 5.1
85%: 3.0
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-4(0)
UNIFIED	-	OL

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	-
1	100
3/4	99.36
1/2	-
3/8	93.47
#4	84.32
#10	74.30
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	67.17
#40	61.74
#60	58.69
#100	56.86
#200	54.86
Dia. MM 1/	
.0288	47.20
.0193	40.41
.0117	34.15
.0085	30.70
.0062	27.05
.0031	20.36
.0013	13.89

Landtype No. 26

Location: NE¼,NE¼,Sec.20,T.40S.,R.12W.
Depth: -
Liquid Limit: 39
Plasticity Index: 9
Maximum Density - p.c.f.: 92.5
Optimum Moisture - %: 24.9
Specific Gravity, #10(-) only: -
California Bearing Ratio
95%: 4.2
90%: -
85%: -
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-4(0)
UNIFIED	-	SMU

Mechanical Analysis	
Sieve Size	% Passing
3	100
2 1/2	100
2	100
1 1/2	96.74
1	96.21
3/4	95.05
1/2	-
3/8	88.9
#4	71.34
#10	56.42
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	49.21
#40	45.92
#60	43.95
#100	41.50
#200	36.84
Dia. MM 1/	
.0294	29.96
.0207	25.94
.0114	23.70
.0082	20.67
.0058	18.87
.0030	14.85
.0013	11.72

1/ Particle size computed from hydrometer readings.

Landtype No. 27

Location: NW¼,NW¼,Sec.11,T.40S.,R.12W.
Depth: -
Liquid Limit: 53
Plasticity Index: 13
Maximum Density - p.c.f.: 85.1
Optimum Moisture - %: 29.2
Specific Gravity, #10(-) only: 2.59
California Bearing Ratio
95%: 8.3
90%: 5.1
85%: 2.5
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-7-5(6)
UNIFIED	-	OH

Mechanical Analysis	
Sieve Size	% Passing
3	100
2 1/2	-
2	95.77
1 1/2	95.77
1	95.77
3/4	95.77
1/2	-
3/8	90.82
#4	81.67
#10	72.35
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	67.89
#40	62.92
#60	59.69
#100	56.64
#200	54.11
Dia. MM 1/	
.0290	43.81
.0191	39.42
.0113	35.97
.0082	32.83
.0059	29.17
.003	24.05
.0013	18.09

Landtype No. 31

Location: SE¼,SE¼,Sec.13,T.36S.,R.8W.
Depth: -
Liquid Limit: 26
Plasticity Index: 3
Maximum Density - p.c.f.: -
Optimum Moisture - %: -
Specific Gravity, #10(-) only: -
California Bearing Ratio
95%: -
90%: -
85%: -
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-2-6(0)
UNIFIED	-	SMU

Mechanical Analysis	
Sieve Size	% Passing
3	100
2 1/2	-
2	-
1 1/2	97.78
1	94.58
3/4	91.75
1/2	85.62
3/8	80.57
#4	68.53
#10	55.49
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	48.78
#40	44.04
#60	41.40
#100	39.05
#200	34.01
Dia. MM 1/	
.0265	25.76
.0178	21.40
.0108	17.67
.0078	15.80
.0056	13.93
.0028	10.35
.0012	7.44

1/ Particle size computed from hydrometer readings.

Landtype No. 31

Location: SE¼,SE¼,Sec.2,T.41S.,R.8W.
Depth: -
Liquid Limit: 37
Plasticity Index: 11
Maximum Density - p.c.f.: 102.2
Optimum Moisture - %: 19.8
Specific Gravity, #10(-) only: 2.70
California Bearing Ratio
95%: 3.7
90%: 1.5
85%: -
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-6(3)
UNIFIED	-	SMU

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	100
1 1/2	96.02
1	91.66
3/4	90.14
1/2	-
3/8	79.56
#4	70.16
#10	60.32
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	54.49
#40	49.11
#60	45.74
#100	42.83
#200	39.67
Dia. MM 1/	
.02722	36.54
.01762	34.88
.01052	31.89
.0076	29.82
.0055	27.74
.0028	23.26
.0013	17.52

Landtype No. 32

Location: NW¼,NW¼,Sec.22,T.37S.,R.8W.
Depth: -
Liquid Limit: 42
Plasticity Index: 7
Maximum Density - p.c.f.: 92.8
Optimum Moisture - %: 24.2
Specific Gravity, #10(-) only: 2.632
California Bearing Ratio
95%: 9.5
90%: 4.6
85%: 2.3
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-5(0)
UNIFIED	-	SMU

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	100
1 1/2	97.10
1	95.02
3/4	91.68
1/2	88.77
3/8	85.86
#4	74.53
#10	55.56
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	48.73
#40	44.51
#60	41.75
#100	39.42
#200	36.29
Dia. MM 1/	
.0279	32.29
.0183	29.75
.0109	26.26
.0079	24.07
.0057	22.98
.0029	15.85
.0013	10.03

1/ Particle size computed from hydrometer readings.

Landtype No. 36

Location: NW¼,NE¼,Sec.13,T.34S.,R.12W.
Depth: -
Liquid Limit: 53
Plasticity Index: 10
Maximum Density - p.c.f.: 109.4
Optimum Moisture - %: 15.3
Specific Gravity, #10(-) only: 2.72
California Bearing Ratio
95%: 7.2
90%: 3.6
85%: 1.2
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-2-7(0)
UNIFIED	-	SMU

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	100
1 1/2	98.43
1	93.91
3/4	90.61
1/2	-
3/8	78.48
#4	59.10
#10	39.80
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	30.01
#40	24.70
#60	22.12
#100	20.09
#200	18.15
Dia. MM 1/	
.0293	16.07
.0189	14.49
.0114	12.59
.0082	11.01
.0059	9.95
.0030	7.32
.0013	4.58

Landtype No. 36

Location: SE¼,SW¼,Sec.32,T.37S.,R.12W.
Depth: -
Liquid Limit: NP
Plasticity Index: NP
Maximum Density - p.c.f.: 92.8
Optimum Moisture - %: 23.5
Specific Gravity, #10(-) only: 2.75
California Bearing Ratio
95%: 10.3
90%: 6.6
85%: 3.0
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-2-4(0)
UNIFIED	-	SMD

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	100
1	99.32
3/4	98.04
1/2	-
3/8	93.52
#4	76.09
#10	54.74
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	43.03
#40	37.63
#60	34.42
#100	32.30
#200	28.78
Dia. MM 1/	
.0293	24.78
.0191	21.52
.0114	18.62
.0082	16.44
.0059	14.63
.0030	10.43
.0012	7.03

1/ Particle size computed from hydrometer readings.

Landtype No. 37

Location: NW¼,NE¼,Sec.28,T.37½S.,R.12W.
Depth: -
Liquid Limit: 51
Plasticity Index: 11
Maximum Density - p.c.f.: 90.7
Optimum Moisture - %: 30.2
Specific Gravity, #10(-) only: 3.16
California Bearing Ratio
95%: 5.8
90%: 3.4
85%: 2.1
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-7-5(6)
UNIFIED	-	ML

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	100
1 1/2	98.43
1	97.94
3/4	96.59
1/2	-
3/8	93.54
#4	86.52
#10	74.74
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	69.64
#40	65.87
#60	63.22
#100	60.81
#200	57.35

Landtype No. 37

Location: NE¼,NE¼,Sec.23,T.34S.,R.13W.
Depth: -
Liquid Limit: 42
Plasticity Index: 6
Maximum Density - p.c.f.: 101.4
Optimum Moisture - %: 21.7
Specific Gravity, #10(-) only: -
California Bearing Ratio
95%: 7.9
90%: 3.9
85%: 0.9
pH: -

Classification	Mechanical	Hydrometer
AASHO	A-2-7(0)	A-2-7(0)
UNIFIED	SMU	SMU

Mechanical Analysis	
Sieve Size	% Passing
3	100
2 1/2	100
2	100
1 1/2	100
1	96.89
3/4	94.76
1/2	91.37
3/8	87.06
#4	73.17
#10	57.19
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	51.14
#40	44.62
#60	40.25
#100	36.75
#200	33.01
Dia. MM 1/	
.0290	29.47
.0188	27.12
.0113	23.82
.0081	22.25
.0058	20.68
.0030	13.62
.0013	9.08

1/ Particle size computed from hydrometer readings.

Landtype No. 38

Location: SW¼,NE¼,Sec.15,T.33S.,R.12W.
Depth: -
Liquid Limit: NP
Plasticity Index: NP
Maximum Density - p.c.f.: 114.7
Optimum Moisture - %: 14.7
Specific Gravity, #10(-) only: 2.65
California Bearing Ratio
95%: 10.9
90%: 7.6
85%: 7.3
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-1-9(0)
UNIFIED	-	GMD

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	100
1 1/2	95.86
1	86.64
3/4	79.69
1/2	-
3/8	59.07
#4	42.90
#10	29.77
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	22.92
#40	18.45
#60	16.07
#100	14.16
#200	12.21
Dia. MM 1/	
.0300	10.23
.0194	9.47
.0115	8.57
.0083	7.51
.0060	6.6
.0030	4.72
.0013	2.54

Landtype No. 41

Location: SW¼,SW¼,Sec.13,T.34S.,R.11W.
Depth: -
Liquid Limit: 39.6
Plasticity Index: 9.4
Maximum Density - p.c.f.: 101.6
Optimum Moisture - %: 22.0
Specific Gravity, #10(-) only: 2.697
California Bearing Ratio
95%: 7.0
90%: 3.6
85%: 0.2
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-4(1)
UNIFIED	-	SMU

Mechanical Analysis	
Sieve Size	% Passing
3	100
2 1/2	-
2	91.96
1 1/2	91.96
1	87.61
3/4	84.93
1/2	82.47
3/8	79.65
#4	71.61
#10	60.25
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	55.35
#40	51.22
#60	48.08
#100	44.86
#200	39.57
Dia. MM 1/	
.0266	35.44
.0174	32.18
.0104	28.92
.0075	26.47
.0055	23.85
.0027	19.77
.0011	15.56

1/ Particle size computed from hydrometer readings.

Landtype No. 41

Location: NE¼,Sec.6,T.32S.,R.11W.
Depth: -
Liquid Limit: 28
Plasticity Index: 9
Maximum Density - p.c.f.: 131.1
Optimum Moisture - %: 8.5
Specific Gravity, #10(-) only: 2.79
California Bearing Ratio
95%: 14.7
90%: -
85%: -
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-2-6(0)
UNIFIED	-	GC

Mechanical Analysis	
Sieve Size	% Passing
3	100
2 1/2	-
2	94.86
1 1/2	88.89
1	81.37
3/4	77.27
1/2	-
3/8	64.36
#4	50.50
#10	38.68
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	30.03
#40	24.23
#60	21.34
#100	19.08
#200	16.32
Dia. MM 1/	
.0283	11.10
.0184	9.87
.0111	8.43
.0080	7.39
.0058	6.51
.0029	5.11
.0013	3.55

Landtype No. 41

Location: SE¼,SE¼,Sec.3,T.32S.,R.10W.
Depth: -
Liquid Limit: 33
Plasticity Index: 6
Maximum Density - p.c.f.: 110.4
Optimum Moisture - %: 14.5
Specific Gravity, #10(-) only: 2.62
California Bearing Ratio
95%: 15.9
90%: 6.9
85%: -
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-1-6(0)
UNIFIED	-	GMU

Mechanical Analysis	
Sieve Size	% Passing
3	100
2 1/2	-
2	97
1 1/2	92.31
1	87.82
3/4	82.83
1/2	-
3/8	66.33
#4	50.70
#10	37.95
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	31.87
#40	26.71
#60	23.48
#100	20.51
#200	17.46
Dia. MM 1/	
.0318	15.85
.0205	14.49
.0121	12.86
.0086	12.03
.0062	10.93
.0031	8.64
.0013	6.51

1/ Particle size computed from hydrometer readings.

Landtype No. 42

Location: SW¼,NW¼,Sec.12,T.34S.,R.11W.
Depth: -
Liquid Limit: 40
Plasticity Index: 8
Maximum Density - p.c.f.: 112.4
Optimum Moisture - %: 16.3
Specific Gravity, #10(-) only: 2.76
California Bearing Ratio
95%: 22.8
90%: 7.0
85%: 3.0
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-2-7(0)
UNIFIED	-	SMU

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	100
1	97.10
3/4	94.66
1/2	94.66
3/8	85.40
#4	73.94
#10	46.42
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	38.17
#40	32.51
#60	30.30
#100	28.70
#200	25.81
Dia. MM 1/	
.0282	22.62
.0183	20.52
.0109	18.12
.0079	16.32
.0057	14.52
.0029	10.79
.0012	8.14

Landtype No. 42

Location: NW¼,Sec.5,T.32S.,R.11W.
Depth: -
Liquid Limit: 32
Plasticity Index: 9
Maximum Density - p.c.f.: 109.8
Optimum Moisture - %: 16.1
Specific Gravity, #10(-) only: 2.54
California Bearing Ratio
95%: 7.9
90%: -
85%: -
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-2-6(0)
UNIFIED	-	SC

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	100
1 1/2	98.71
1	97.27
3/4	95.40
1/2	-
3/8	91.80
#4	87.94
#10	82.20
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	75.61
#40	61.70
#60	50.24
#100	41.87
#200	34.08
Dia. MM 1/	
.0322	27.28
.0209	23.26
.0126	18.09
.009	17.23
.0065	13.92
.0032	9.76
.0014	7.03

1/ Particle size computed from hydrometer readings.

Landtype No. 45

Location: SW¼,NE¼,Sec.32,T.33S.,R.13W.
Depth: -
Liquid Limit: 62
Plasticity Index: 15
Maximum Density - p.c.f.: 88.0
Optimum Moisture - %: 27.1
Specific Gravity, #10(-) only: 2.71
California Bearing Ratio
95%: 22.1
90%: 15.3
85%: 8.8
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-2-7
UNIFIED	-	SMU

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	-
1	100
3/4	99.71
1/2	-
3/8	94.70
#4	76.00
#10	47.77
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	36.28
#40	31.66
#60	29.31
#100	27.59
#200	25.67
Dia. MM 1/	
.0268	24.37
.0175	22.75
.0103	21.13
.0075	19.51
.0054	18.49
.0027	15.85
.0012	13.58

Landtype No. 48

Location: NE¼,NW¼,Sec.30,T.32S.,R.14W.
Depth: -
Liquid Limit: 32
Plasticity Index: 5
Maximum Density - p.c.f.: 106.4
Optimum Moisture - %: 18.8
Specific Gravity, #10(-) only: 2.68
California Bearing Ratio
95%: 17.0
90%: 10.3
85%: 2.3
pH: -

Classification	Mechanical	Hydrometer
AASHO	A-1-6(0)	-
UNIFIED	GMU	-

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	100
1 1/2	97.81
1	93.93
3/4	89.04
1/2	80.62
3/8	73.87
#4	53.16
#10	34.37
#40	-
#100	-
#200	-

1/ Particle size computed from hydrometer readings.

Landtype No. 50

Location: SE¼,SW¼,Sec.12,T.35S.,R.11W.
Depth: -
Liquid Limit: 45
Plasticity Index: 12
Maximum Density - p.c.f.: 100.6
Optimum Moisture - %: 22.3
Specific Gravity, #10(-) only: 2.699
California Bearing Ratio
95%: 13.8
90%: 8.1
85%: 4.0
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-2-7
UNIFIED	-	SMU

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	-
1	100
3/4	99.71
1/2	98.21
3/8	96.31
#4	82.40
#10	53.45
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	42.69
#40	34.24
#60	30.59
#100	28.14
#200	25.32
Dia. MM 1/	
.0274	22.91
.0179	20.51
.0106	18.72
.0076	16.92
.0055	14.53
.0028	10.86
.0012	7.80

Landtype No. 51

Location: SE¼,SW¼,Sec.14,T.38S.,R.11W.
Depth: -
Liquid Limit: NP
Plasticity Index: NP
Maximum Density - p.c.f.: 98.6
Optimum Moisture - %: 91.2
Specific Gravity, #10(-) only: 2.67
California Bearing Ratio
95%: -
90%: -
85%: -
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-4(0)
UNIFIED	-	SMD

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	100
1	99.11
3/4	95.90
1/2	-
3/8	86.94
#4	79.59
#10	70.02
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	65.20
#40	61.41
#60	56.18
#100	47.63
#200	37.50
Dia. MM 1/	
.0307	26.41
.0202	21.77
.0120	18.36
.0087	15.96
.0062	14.11
.0031	11.25
.0013	8.02

1/ Particle size computed from hydrometer readings.

Landtype No. 51

Location: NW¼,SE¼,Sec.7,T.41S.,R.11W.
Depth: -
Liquid Limit: 53
Plasticity Index: 15
Maximum Density - p.c.f.: 93.6
Optimum Moisture - %: 26.6
Specific Gravity, #10(-) only: -
California Bearing Ratio
95%: 6.0
90%: 4.0
85%: 2.4
pH: -

Classification	Mechanical	Hydrometer
AASHO	A-7-(8)	A-5(2)
UNIFIED	-	SMU

Mechanical Analysis	
Sieve Size	% Passing
3	100
2 1/2	100
2	100
1 1/2	100
1	99.42
3/4	99.03
1/2	-
3/8	93.09
#4	85.85
#10	76.69
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	70.16
#40	65.56
#60	62.47
#100	60.03
#200	57.13
Dia. MM 1/	
.023	53.03
.015	48.96
.0092	44.43
.0068	41.63
.0050	38.28
.0026	32.76
.0012	26.24

Landtype No. 51

Location: SE¼,SE¼,Sec.14,T.38S.,R.13W.
Depth: -
Liquid Limit: 38
Plasticity Index: 11
Maximum Density - p.c.f.: 1
Optimum Moisture - %: -
Specific Gravity, #10(-) only: 2.60
California Bearing Ratio
95%: -
90%: -
85%: -
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-2-6(0)
UNIFIED	-	GMU

Mechanical Analysis	
Sieve Size	% Passing
3	100
2 1/2	-
2	90.94
1 1/2	81.32
1	68.45
3/4	61.35
1/2	-
3/8	50.56
#4	41.07
#10	32.95
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	29.43
#40	27.22
#60	25.27
#100	23.10
#200	20.93
Dia. MM 1/	
.030	16.34
.019	14.87
.012	12.74
.0083	11.32
.0060	9.80
.0031	6.96
.0014	4.50

1/ Particle size computed from hydrometer readings.

Landtype No. 52

Location: SW¼,SE¼,Sec.19,T.39S.,R.12W.
Depth: -
Liquid Limit: 45
Plasticity Index: 10
Maximum Density - p.c.f.: 93.9
Optimum Moisture - %: 23.0
Specific Gravity, #10(-) only: 2.62
California Bearing Ratio
95%: -
90%: -
85%: -
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-5(1)
UNIFIED	-	SMU

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	100
1 1/2	96.59
1	95.40
3/4	92.82
1/2	-
3/8	84.41
#4	72.20
#10	59.66
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	51.38
#40	47.50
#60	45.20
#100	42.91
#200	38.59
Dia. MM 1/	
.0283	28.02
.0183	25.82
.0110	22.17
.0080	20.41
.0058	18.73
.0030	14.12
.0013	10.90

Landtype No. 52

Location: NW¼,Sec.26,T.33S.,R.10W.
Depth: -
Liquid Limit: 48
Plasticity Index: 12
Maximum Density - p.c.f.: 98.1
Optimum Moisture - %: 22.3
Specific Gravity, #10(-) only: 2.667
California Bearing Ratio
95%: 7.2
90%: 3.8
85%: 1.6
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-7-5(2)
UNIFIED	-	SMU

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	100
1	98.92
3/4	95.1
1/2	92.49
3/8	89.79
#4	78.94
#10	64.61
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	57.57
#40	51.87
#60	48.28
#100	45.05
#200	41.45
Dia. MM 1/	
.0244	36.54
.0162	33.83
.0099	30.10
.0072	27.73
.0053	25.01
.0028	19.11
.0012	14.62

1/ Particle size computed from hydrometer readings.

Landtype No. 52

Location: NW¼,SE¼,Sec.17,T.39S.,R.11W.
Depth: -
Liquid Limit: 67
Plasticity Index: 11
Maximum Density - p.c.f.: 91
Optimum Moisture - %: 25.4
Specific Gravity, #10(-) only: 2.574
California Bearing Ratio
95%: 6.6
90%: 4.6
85%: 2.5
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-2-7(0)
UNIFIED	-	SMU

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	-
1	100
3/4	93.63
1/2	87.23
3/8	81.42
#4	66.24
#10	47.31
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	39.70
#40	35.08
#60	32.43
#100	30.46
#200	28.43
Dia. MM 1/	
.0259	24.97
.0172	22.91
.0104	20.23
.0077	18.03
.0056	16.07
.0029	12.31
.0013	8.09

Landtype No. 52

Location: NE¼,SW¼,Sec.25,T.40S.,R.12W.
Depth: -
Liquid Limit: 54
Plasticity Index: 12
Maximum Density - p.c.f.: 91.5
Optimum Moisture - %: 25.6
Specific Gravity, #10(-) only: 2.628
California Bearing Ratio
95%: 11.0
90%: 7.3
85%: 3.2
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-2-7(0)
UNIFIED	-	GMU

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	100
1	97.78
3/4	96.13
1/2	89.40
3/8	81.75
#4	64.41
#10	49.29
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	44.41
#40	40.15
#60	37.37
#100	35.28
#200	33.03
Dia. MM 1/	
.0293	29.23
.0191	26.74
.0113	24.03
.0082	22.09
.0059	20.15
.0030	14.88
.0012	12.72

1/ Particle size computed from hydrometer readings.

Landtype No. 53

Location: SW¼,NW¼,Sec.17,T.35S.,R.10W.
Depth: -
Liquid Limit: 51
Plasticity Index: 5
Maximum Density - p.c.f.: 101.6
Optimum Moisture - %: 19.6
Specific Gravity, #10(-) only: 2.50
California Bearing Ratio
95%: 10.7
90%: 5.8
85%: 1.1
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-2-5(0)
UNIFIED	-	GMU

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	100
1 1/2	97.52
1	93.47
3/4	90.36
1/2	-
3/8	76.73
#4	59.85
#10	43.42
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	35.38
#40	31.28
#60	28.66
#100	26.12
#200	22.88
Dia. MM 1/	
.0325	17.97
.0211	16.02
.0126	13.51
.0091	11.55
.0065	10.55
.0033	7.26
.0015	4.63

Landtype No. 53

Location: SW¼,SE¼,Sec.18,T.35S.,R.10W.
Depth: -
Liquid Limit: 49
Plasticity Index: 12
Maximum Density - p.c.f.: 99.7
Optimum Moisture - %: 22.3
Specific Gravity, #10(-) only: 2.67
California Bearing Ratio
95%: 6.8
90%: 4.2
85%: 2.3
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-2-7(0)
UNIFIED	-	SMU

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	100
1 1/2	97.03
1	95.95
3/4	95.20
1/2	-
3/8	88.43
#4	76.14
#10	56.91
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	46.20
#40	39.56
#60	36.14
#100	33.13
#200	29.78
Dia. MM 1/	
.0276	26.78
.0181	24.74
.0109	21.82
.0079	20.07
.0058	17.74
.0029	14.59
.0013	10.44

1/ Particle size computed from hydrometer readings.

Landtype No. 53

Location: NE¼,NE¼,Sec.25,T.37S.,R.12W.
Depth: -
Liquid Limit: 35
Plasticity Index: 16
Maximum Density - p.c.f.: 112.1
Optimum Moisture - %: 15.9
Specific Gravity, #10(-) only: 2.71
California Bearing Ratio
95%: 4.5
90%: 2.6
85%: 1.4
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-6(4)
UNIFIED	-	SC

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	100
1 1/2	98.08
1	96.15
3/4	93.28
1/2	-
3/8	85.95
#4	77.68
#10	67.64
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	61.87
#40	59.92
#60	52.53
#100	49.90
#200	45.78
Dia. MM 1/	
.027	36.44
.018	33.07
.011	28.02
.0085	24.66
.0057	22.13
.0029	16.16
.0013	11.87

Landtype No. 53

Location: SW¼,NW¼,Sec.18,T.34S.,R.10½.
Depth: -
Liquid Limit: 56
Plasticity Index: 9
Maximum Density - p.c.f.: 95.6
Optimum Moisture - %: 23.8
Specific Gravity, #10(-) only: 2.63
California Bearing Ratio
95%: 7.0
90%: 4.2
85%: 1.5
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-2-5(0)
UNIFIED	-	GMU

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	100
1 1/2	97.38
1	94.64
3/4	90.78
1/2	-
3/8	78.55
#4	65.42
#10	53.39
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	46.12
#40	40.77
#60	37.59
#100	35.07
#200	32.40
Dia. MM 1/	
.0280	26.53
.0183	24.45
.0110	21.19
.0082	18.22
.0059	15.67
.0031	10.03
.0014	5.52

1/ Particle size computed from hydrometer readings.

Landtype No. 55

Location: NW¼,SE¼,Sec.13,T.39S.,R.12W.
Depth: -
Liquid Limit: 44
Plasticity Index: 10
Maximum Density - p.c.f.: 87.5
Optimum Moisture - %: 27.2
Specific Gravity, #10(-) only: 2.63
California Bearing Ratio
95%: 4.1
90%: 1.8
85%: 0.5
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-5(4)
UNIFIED	-	OL

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	100
1 1/2	98.07
1	97.44
3/4	96.27
1/2	-
3/8	89.86
#4	80.40
#10	71.48
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	69.10
#40	67.02
#60	65.37
#100	62.38
#200	51.75
Dia. MM 1/	
.0254	41.03
.0166	38.53
.0101	34.87
.0073	33.04
.0053	30.46
.0028	24.38
.0013	17.39

Landtype No. 62

Location: SE¼,SW¼,Sec.8,T.36S.,R.12W.
Depth: -
Liquid Limit: 52
Plasticity Index: 25
Maximum Density - p.c.f.: 99.5
Optimum Moisture - %: 22.8
Specific Gravity, #10(-) only: 2.98
California Bearing Ratio
95%: 5.0
90%: 3.0
85%: 1.7
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-7-5(7)
UNIFIED	-	SC

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	100
1	98.24
3/4	96.08
1/2	-
3/8	91.18
#4	84.08
#10	74.19
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	66.08
#40	60.57
#60	57.37
#100	50.59
#200	44.89
Dia. MM 1/	
.026	36.21
.018	31.50
.010	26.69
.0075	24.80
.0054	21.97
.0027	18.11
.0012	13.30

1/ Particle size computed from hydrometer readings.

Landtype No. 62

Location: NW¼,SW¼,Sec.27,T.34S.,R.12W.
Depth: -
Liquid Limit: 53
Plasticity Index: 7
Maximum Density - p.c.f.: 90.3
Optimum Moisture - %: 23.4
Specific Gravity, #10(-) only: 2.69
California Bearing Ratio
95%: 7.2
90%: 3.6
85%: 1.2
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-5(1)
UNIFIED	-	SMU

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	100
1	97.81
3/4	95.95
1/2	-
3/8	89.75
#4	80.56
#10	69.10
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	59.50
#40	53.14
#60	49.76
#100	46.94
#200	43.60
Dia. MM 1/	
.0285	44.45
.0184	41.40
.0111	35.29
.0080	31.63
.0057	28.58
.0029	21.25
.0013	13.68

Landtype No. 62

Location: NE¼,SW¼,Sec.9,T.37S.,R.13W.
Depth: -
Liquid Limit: 46
Plasticity Index: 13
Maximum Density - p.c.f.: 99.2
Optimum Moisture - %: 23.9
Specific Gravity, #10(-) only: 2.77
California Bearing Ratio
95%: 9.8
90%: 3.5
85%: 0.8
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-4(3)
UNIFIED	-	ML

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	-
1	100
3/4	99.12
1/2	99.12
3/8	94.71
#4	87.95
#10	74.74
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	70.39
#40	66.36
#60	63.07
#100	59.15
#200	53.63
Dia. MM 1/	
.0263	46.21
.0172	42.59
.0103	38.46
.0074	35.36
.0054	32.25
.0029	26.87
.0012	21.27

1/ Particle size computed from hydrometer readings.

Landtype No. 66

Location: SW¼,NW¼,Sec.18,T.36S.,R.8W.
Depth: -
Liquid Limit: 45
Plasticity Index: 7
Maximum Density - p.c.f.: -
Optimum Moisture - %: -
Specific Gravity, #10(-) only: -
California Bearing Ratio
95%: -
90%: -
85%: -
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-5(0)
UNIFIED	-	SMU

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	100
1 1/2	96.95
1	94.12
3/4	90.98
1/2	85.13
3/8	80.60
#4	70.60
#10	57.92
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	53.75
#40	50.51
#60	48.34
#100	46.08
#200	40.63
Dia. MM 1/	
.0271	30.04
.0179	26.41
.0108	22.05
.0078	19.87
.0057	16.97
.0029	12.61
.0012	7.95

Landtype No. 66

Location: NE¼,NE¼,Sec.28,T.35S.,R.8W.
Depth: -
Liquid Limit: 27
Plasticity Index: 5
Maximum Density - p.c.f.: 125
Optimum Moisture - %: 11.9
Specific Gravity, #10(-) only: 2.782
California Bearing Ratio
95%: 22
90%: -
85%: -
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-1-a
UNIFIED	-	GMU

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	100
1	98.87
3/4	96.68
1/2	85.1
3/8	75.69
#4	52.69
#10	34.481
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	25.64
#40	20.63
#60	17.74
#100	15.46
#200	12.73
Dia. MM 1/	
.0318	10.50
.0204	9.51
.0122	7.73
.0087	6.94
.0062	6.34
.0031	4.64
.0013	2.78

1/ Particle size computed from hydrometer readings.

Landtype No. 67

Location: SW¼,Sec.28,T.35S.,R.8W.
Depth: -
Liquid Limit: 48
Plasticity Index: 14
Maximum Density - p.c.f.: 97
Optimum Moisture - %: 24.9
Specific Gravity, #10(-) only: 2.758
California Bearing Ratio
95%: 11.9
90%: -
85%: -
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-2-5(2)
UNIFIED	-	SMU

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	100
1	98.77
3/4	97.15
1/2	95.03
3/8	92.92
#4	84.38
#10	65.19
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	55.33
#40	49.17
#60	45.78
#100	43.11
#200	39.82
Dia. MM 1/	
.0293	37.12
.0189	34.61
.0112	31.61
.0081	29.1
.0058	26.80
.0027	23.08
.0012	17.57

Landtype No. 71

Location: SE¼,Sec.17,T.41S.,R.8W.
Depth: -
Liquid Limit: 34
Plasticity Index: 5
Maximum Density - p.c.f.: 107.3
Optimum Moisture - %: 17.9
Specific Gravity, #10(-) only: 2.706
California Bearing Ratio
95%: 12.6
90%: 6.8
85%: 1.2
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-1-6(0)
UNIFIED	-	SMU

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	100
1	97.14
3/4	94.45
1/2	90.35
3/8	85.32
#4	70.95
#10	52.37
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	42.80
#40	34.79
#60	30.26
#100	27.01
#200	23,65
Dia. MM 1/	
.0270	19.49
.0177	17.67
.0108	15.21
.0079	13.52
.0058	11.15
.0029	8.64
.0013	4.64

1/ Particle size computed from hydrometer readings.

Landtype No. 76

Location: SE¼,Sec.27,T.35S.,R.8W.
Depth: -
Liquid Limit: 32
Plasticity Index: 5
Maximum Density - p.c.f.: 105.9
Optimum Moisture - %: 17.5
Specific Gravity, #10(-) only: 2.71
California Bearing Ratio
95%: 23
90%: 14.9
85%: 9.3
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-1-b(0)
UNIFIED	-	SMU

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	-
1	100
3/4	99.50
1/2	-
3/8	97.14
#4	87.98
#10	60.83
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	32.16
#40	22.12
#60	18.83
#100	16.61
#200	14.68
Dia. MM 1/	
.0320	12.36
.0210	10.21
.0120	8.63
.0087	7.12
.0062	6.40
.0031	4.10
.0014	2.52

Landtype No. 76

Location: NW¼,Sec.7,T.37S.,R.8W.
Depth: -
Liquid Limit: 43
Plasticity Index: 6
Maximum Density - p.c.f.: 94
Optimum Moisture - %: 25.3
Specific Gravity, #10(-) only: 2.76
California Bearing Ratio
95%: 8.9
90%: 4.6
85%: 0.6
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-2-5(0)
UNIFIED	-	SMU

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	100
1	100
3/4	98.79
1/2	-
3/8	93.23
#4	83.37
#10	62.92
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	52.80
#40	47.91
#60	44.77
#100	40.88
#200	33.52
Dia. MM 1/	
.0313	23.05
.0203	19.49
.0121	15.93
.0087	13.70
.0064	11.48
.0031	7.56
.0013	4.27

1/ Particle size computed from hydrometer readings.

Landtype No. 76

Location: NW¼,Sec.17,T.37S.,R.8W.
Depth: -
Liquid Limit: 36
Plasticity Index: 6
Maximum Density - p.c.f.: 101.9
Optimum Moisture - %: 21.9
Specific Gravity, #10(-) only: 2.90
California Bearing Ratio
95%: 5.1
90%: 1.5
85%: 0.1
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-4(0)
UNIFIED	-	SMU

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	100
1	99.64
3/4	98.24
1/2	-
3/8	85.91
#4	72.20
#10	62.48
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	57.56
#40	52.81
#60	50.17
#100	47.32
#200	42.41
Dia. MM 1/	
.0288	33.36
.0188	29.18
.0113	23.95
.0081	21.12
.0059	17.88
.0030	12.97
.0013	7.95

Landtype No. 76

Location: NE¼,Sec.5,T.36S.,R.8W.
Depth: -
Liquid Limit: 37
Plasticity Index: 7
Maximum Density - p.c.f.: 107.7
Optimum Moisture - %: 18.8
Specific Gravity, #10(-) only: 2.769
California Bearing Ratio
95%: 6.2
90%: -
85%: -
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-2-4(0)
UNIFIED	-	SMU

Mechanical Analysis	
Sieve Size	% Passing
3	100
2 1/2	-
2	-
1 1/2	98.74
1	98.74
3/4	96.53
1/2	88.12
3/8	81.91
#4	68.41
#10	52.97
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	43.68
#40	36.93
#60	32.92
#100	29.76
#200	25.96
Dia. MM 1/	
.0301	22.97
.0197	20.23
.0116	18.18
.0084	15.44
.0060	14.06
.0030	11.81
.0013	8.93

1/ Particle size computed from hydrometer readings.

Landtype No. 77

Location: NE¼,Sec.9,T.36S.,R.8W.
Depth: -
Liquid Limit: 52
Plasticity Index: 8
Maximum Density - p.c.f.: 85.6
Optimum Moisture - %: 32.6
Specific Gravity, #10(-) only: 2.758
California Bearing Ratio
95%: 5.2
90%: -
85%: -
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-5(10)
UNIFIED	-	MH

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	-
1	-
3/4	100
1/2	99.94
3/8	99.84
#4	98.68
#10	91.50
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	86.02
#40	82.82
#60	80.69
#100	78.41
#200	75.21
Dia. MM 1/	
.0261	70.80
.0167	68.57
.0099	64.86
.0072	61.14
.0052	57.43
.0026	51.05
.0011	42.14

Landtype No. 77

Location: NE¼,Sec.26,T.37S.,R.9W.
Depth: -
Liquid Limit: 49
Plasticity Index: 14
Maximum Density - p.c.f.: 86.9
Optimum Moisture - %: 30.8
Specific Gravity, #10(-) only: 2.63
California Bearing Ratio
95%: 5.3
90%: 2.3
85%: 1.0
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-7-5(10)
UNIFIED	-	ML

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	-
1	-
3/4	-
1/2	100
3/8	98.40
#4	96.95
#10	90.37
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	86.75
#40	81.88
#60	77.99
#100	74.15
#200	69.45
Dia. MM 1/	
.0263	61.94
.0169	59.35
.0102	53.90
.0075	49.47
.0055	44.29
.0028	37.54
.0012	28.75

1/ Particle size computed from hydrometer readings.

Landtype No. 77

Location: SW¼,NW¼,Sec.23,T.37S.,R.9W.
Depth: -
Liquid Limit: 54.8
Plasticity Index: 7.3
Maximum Density - p.c.f.: 73.2
Optimum Moisture - %: 43
Specific Gravity, #10(-) only: 2.72
California Bearing Ratio
95%: 1.7
90%: -
85%: -
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-5(4)
UNIFIED	-	MH

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	100
1	99.46
3/4	99.46
1/2	-
3/8	99.29
#4	99.07
#10	94.87
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	81.34
#40	72.65
#60	66.81
#100	61.13
#200	54.87
Dia. MM 1/	
.0295	45.74
.0191	40.62
.0113	36.86
.0080	34.98
.0058	29.86
.0029	25.26
.0013	18.60

Landtype No. 77

Location: SE¼,NW¼,Sec.23,T.37S.,R.9W.
Depth: -
Liquid Limit: 55
Plasticity Index: 14
Maximum Density - p.c.f.: 82.3
Optimum Moisture - %: 34.9
Specific Gravity, #10(-) only: 2.76
California Bearing Ratio
95%: 8.0
90%: 4.5
85%: 2.3
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-7-5(14)
UNIFIED	-	MH

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	100
1	99.06
3/4	99.06
1/2	-
3/8	98.98
#4	98.85
#10	97.31
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	94.18
#40	90.55
#60	87.14
#100	83.03
#200	77.26
Dia. MM 1/	
.022	71.58
.015	65.29
.0089	61.30
.0065	57.33
.0048	52.30
.0025	46.50
.0012	39.07

1/ Particle size computed from hydrometer readings.

Landtype No. 81

Location: SE¼,Sec.22,T.40S.,R.7W.
Depth: -
Liquid Limit: 30
Plasticity Index: 7
Maximum Density - p.c.f.: 125.6
Optimum Moisture - %: 12.1
Specific Gravity, #10(-) only: 2.754
California Bearing Ratio
95%: 9.6
90%: 6.0
85%: 3.8
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-2-4
UNIFIED	-	SC-SMU

Mechanical Analysis	
Sieve Size	% Passing
3	100
2 1/2	-
2	95.47
1 1/2	91.48
1	87.38
3/4	81.49
1/2	74.36
3/8	69.01
#4	54.55
#10	39.44
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	30.93
#40	24.83
#60	21.37
#100	18.68
#200	15.95
Dia. MM 1/	
.0292	13.94
.0190	12.86
.0112	11.67
.0080	10.87
.0058	9.68
.0029	7.86
.0012	5.51

Landtype No. 81

Location: NE¼,SE¼,Sec.32,T.41S.,R.6W.
Depth: -
Liquid Limit: 28
Plasticity Index: 8
Maximum Density - p.c.f.: 127.6
Optimum Moisture - %: 9.1
Specific Gravity, #10(-) only: 2.80
California Bearing Ratio
95%: .91
90%: .41
85%: -
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-4(4)
UNIFIED	-	CL

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	100
1	98.71
3/4	97.60
1/2	-
3/8	94.06
#4	89.25
#10	80.75
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	74.14
#40	67.36
#60	62.95
#100	58.66
#200	53.55
Dia. MM 1/	
.0252	48.20
.0164	45.21
.0098	41.21
.0072	37.22
.0053	32.23
.0028	19.06
.0013	7.88

1/ Particle size computed from hydrometer readings.

Landtype No. 81

Location: SW¼,Sec.22,T.40S.,R.7W.
Depth: -
Liquid Limit: 33
Plasticity Index: 9
Maximum Density - p.c.f.: 116.5
Optimum Moisture - %: 14.1
Specific Gravity, #10(-) only: 2.673
California Bearing Ratio
95%: 14.2
90%: 6.7
85%: 1.8
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-2-4(0)
UNIFIED	-	SMU

Mechanical Analysis	
Sieve Size	% Passing
3	100
2 1/2	-
2	-
1 1/2	96.55
1	94.37
3/4	91.17
1/2	86.59
3/8	82.71
#4	70.32
#10	55.46
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	47.70
#40	38.78
#60	32.31
#100	26.83
#200	20.77
Dia. MM 1/	
.0322	15.71
.0209	13.39
.0124	11.37
.0089	9.63
.0064	8.48
.0032	6.45
.0013	4.55

Landtype No. 81u

Location: SE¼,SW¼,Sec.9,T.39S.,R.6W.
Depth: -
Liquid Limit: NP
Plasticity Index: NP
Maximum Density - p.c.f.: 95.6
Optimum Moisture - %: 23.4
Specific Gravity, #10(-) only: 2.658
California Bearing Ratio
95%: 8.8
90%: 3.4
85%: 0.4
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-4(0)
UNIFIED	-	SMD

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	100
1	89.84
3/4	87.67
1/2	83.60
3/8	80.62
#4	73.69
#10	66.35
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	57.38
#40	52.92
#60	49.01
#100	45.03
#200	39.55
Dia. MM 1/	
.0294	29.85
.0190	27.52
.0117	21.29
.0084	18.96
.0061	16.01
.0030	12.44
.0013	4.95

1/ Particle size computed from hydrometer readings.

Landtype No. 82

Location: NE¼,SW¼,Sec.2,T.41S.,R.8W.
Depth: -
Liquid Limit: 32
Plasticity Index: 8
Maximum Density - p.c.f.: 110.0
Optimum Moisture - %: 17.0
Specific Gravity, #10(-) only: 2.70
California Bearing Ratio
95%: 15.4
90%: 9.2
85%: 3.0
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-2-4(0)
UNIFIED	-	GP-GMU

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	100
1	93.31
3/4	76.91
1/2	-
3/8	46.23
#4	31.08
#10	22.18
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	16.01
#40	12.47
#60	10.58
#100	9.07
#200	7.46
Dia. MM 1/	
.0318	6.09
.0205	5.61
.0121	4.97
.0086	4.61
.0062	4.12
.0031	3.17
.0014	2.10

Landtype No. 82

Location: SE¼,Sec.4,T.41S.,R.8W.
Depth: -
Liquid Limit: 35
Plasticity Index: 12
Maximum Density - p.c.f.: -
Optimum Moisture - %: -
Specific Gravity, #10(-) only: 2.7192
California Bearing Ratio
95%: -
90%: -
85%: -
pH: -

Classification	Mechanical	Hydrometer
AASHO	A-2-6(0)	-
UNIFIED	SC	-

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	-
1	-
3/4	100
1/2	96.0
3/8	92.0
#4	69.6
#10	43.8
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	39.4
#40	34.2
#60	30.7
#100	27.4
#200	23.3

1/ Particle size computed from hydrometer readings.

Landtype No. 82

Location: SE¼,Sec.4,T.41S.,R.8W.
Depth: -
Liquid Limit: 75
Plasticity Index: 28
Maximum Density - p.c.f.: -
Optimum Moisture - %: -
Specific Gravity, #10(-) only: 2.8277
California Bearing Ratio
95%: -
90%: -
85%: -
pH: -

Classification	Mechanical	Hydrometer
AASHO	A-7-5(17)	-
UNIFIED	MH	-

Mechanical Analysis

Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	-
1	-
3/4	-
1/2	100
3/8	99.0
#4	94.7
#10	88.3
#40	75.5
#100	64.9
#200	58.9

Landtype No. 82

Location: SE¼,Sec.4,T.41S.,R.8W.
Depth: -
Liquid Limit: 58
Plasticity Index: 21
Maximum Density - p.c.f.: -
Optimum Moisture - %: -
Specific Gravity, #10(-) only: 2.7484
California Bearing Ratio
95%: -
90%: -
85%: -
pH: -

Classification	Mechanical	Hydrometer
AASHO	A-7-5(4)	-
UNIFIED	SMU	-

Mechanical Analysis

Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	-
1	-
3/4	100
1/2	98
3/8	96
#4	88
#10	72
#40	54.7
#100	46.1
#200	39.5

Landtype No. 82u-A 1/

Location: NW¼,Sec.16,T.40S.,R.6W.
Depth: 0-3 inches
Liquid Limit: less than 25
Plasticity Index: NP-5
Maximum Density - p.c.f.: -
Optimum Moisture - %: -
Specific Gravity, #10(-) only: -
California Bearing Ratio
95%: -
90%: -
85%: -
pH: 5.6-6.5

Classification	Mechanical	Hydrometer
AASHO	A-4	-
UNIFIED	GM,GM-GC	-

Mechanical Analysis

Sieve Size	% Passing
3	85-100
2 1/2	-
2	-
1 1/2	-
1	-
3/4	-
1/2	-
3/8	-
#4	50-75
#10	45-70
#40	40-70
#100	-
#200	35-65

Landtype No. 82u-B 2/

Location: NW¼,Sec.16,T.40S.,R.6W.
Depth: 3-46 inches
Liquid Limit: less than 25
Plasticity Index: NP-5
Maximum Density - p.c.f.: -
Optimum Moisture - %: -
Specific Gravity, #10(-) only: -
California Bearing Ratio
95%: -
90%: -
85%: -
pH: 6.1-6.5

Classification	Mechanical	Hydrometer
AASHO	A-1,A-2	-
UNIFIED	GM,GM-GC	-

Mechanical Analysis

Sieve Size	% Passing
3	70-100
2 1/2	-
2	-
1 1/2	-
1	-
3/4	-
1/2	-
3/8	-
#4	20-40
#10	15-35
#40	15-30
#100	-
#200	10-25

1/ A refers to topsoil layers.
2/ B refers to subsoil layers.

Landtype No. 83

Location: SW¼,Sec.23,T.40S.,R.7W.
Depth: -
Liquid Limit: 51
Plasticity Index: 14
Maximum Density - p.c.f.: 89.7
Optimum Moisture - %: 26.6
Specific Gravity, #10(-) only: 2.66
California Bearing Ratio
95%: 4.3
90%: 2.2
85%: 0.7
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-7-5(6)
UNIFIED	-	MH

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	100
1	99.44
3/4	98.98
1/2	-
3/8	95.76
#4	86.89
#10	71.70
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	64.92
#40	60.21
#60	57.30
#100	54.78
#200	51.91
Dia. MM 1/	
.0248	47.35
.0164	44.60
.0101	39.36
.00746	35.92
.0055	32.14
.0029	22.26
.0013	13.23

Landtype No. 86

Location: NE¼,Sec.33,T.36S.,R.8W.
Depth: -
Liquid Limit: 50
Plasticity Index: 7
Maximum Density - p.c.f.: -
Optimum Moisture - %: -
Specific Gravity, #10(-) only: 2.75
California Bearing Ratio
95%: -
90%: -
85%: Est. 2
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-5(1)
UNIFIED	-	SMU

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	100
1 1/2	98
1	98
3/4	96.59
1/2	-
3/8	92.63
#4	85.40
#10	70.16
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	60.00
#40	53.40
#60	49.59
#100	45.95
#200	40.59
Dia. MM 1/	
.0436	26.71
.0179	25.59
.0098	22.24
.0064	17.77
.0044	15.64
.0023	12.51
.0013	9.27

1/ Particle size computed from hydrometer readings.

Landtype No. 86

Location: SW¼,Sec.27,T.35S.,R.8W.
Depth: -
Liquid Limit: 38
Plasticity Index: 9
Maximum Density - p.c.f.: -
Optimum Moisture - %: -
Specific Gravity, #10(-) only: 2.74
California Bearing Ratio
95%: 6.4
90%: 2.9
85%: 0.2
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-4(2)
UNIFIED	-	SMU

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	100
1	99.27
3/4	96.33
1/2	-
3/8	89.06
#4	77.89
#10	65.97
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	59.47
#40	54.59
#60	51.19
#100	47.58
#200	42.88
Dia. MM 1/	
.0279	38.40
.0182	35.59
.0109	31.32
.0078	28.72
.0056	26.64
.0029	21.64
.0012	16.44

Landtype No. 86

Location: SW¼,Sec.13,T.35S.,R.8W.
Depth: -
Liquid Limit: 38
Plasticity Index: 13
Maximum Density - p.c.f.: 106.9
Optimum Moisture - %: 19.7
Specific Gravity, #10(-) only: 2.758
California Bearing Ratio
95%: 7.6
90%: -
85%: -
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-6(2)
UNIFIED	-	SMU

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	100
1	99.58
3/4	98.76
1/2	95.42
3/8	91.88
#4	82.32
#10	66.84
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	58.07
#40	51.45
#60	47.27
#100	44.01
#200	40.24
Dia. MM 1/	
.0289	36.66
.0185	34.38
.0109	31.40
.0079	28.41
.0056	26.63
.0028	22.65
.0012	17.97

1/ Particle size computed from hydrometer readings.

Landtype No. 91u-A 1/

Location: NW¼,Sec.23,T.40S.,R.6W.
Depth: 0-4 inches
Liquid Limit: -
Plasticity Index: NP
Maximum Density - p.c.f.: -
Optimum Moisture - %: -
Specific Gravity, #10(-) only: -
California Bearing Ratio
95%: -
90%: -
85%: -
pH: 6.1-6.5

Classification	Mechanical	Hydrometer
AASHO	A-1,A-2	-
UNIFIED	GM,SM	-

Mechanical Analysis	
Sieve Size	% Passing
3	50-75
2 1/2	-
2	-
1 1/2	-
1	-
3/4	-
1/2	-
3/8	-
#4	40-75
#10	35-70
#40	20-50
#100	-
#200	10-30

Landtype No. 91u-B 2/

Location: NW¼,Sec.23,T.40S.,R.6W.
Depth: 4-32 inches
Liquid Limit: -
Plasticity Index: NP
Maximum Density - p.c.f.: -
Optimum Moisture - %: -
Specific Gravity, #10(-) only: -
California Bearing Ratio
95%: -
90%: -
85%: -
pH: 5.6-6.0

Classification	Mechanical	Hydrometer
AASHO	A-1,A-2	-
UNIFIED	GM,SM	-

Mechanical Analysis	
Sieve Size	% Passing
3	25-50
2 1/2	-
2	-
1 1/2	-
1	-
3/4	-
1/2	-
3/8	-
#4	35-95
#10	30-90
#40	20-65
#100	-
#200	10-35

1/ A refers to topsoil layers.
2/ B refers to subsoil layers.

Landtype No. 93

Location: NW¼,Sec.3,T.37S.,R.9W.
Depth: -
Liquid Limit: 60
Plasticity Index: 14
Maximum Density - p.c.f.: -
Optimum Moisture - %: -
Specific Gravity, #10(-) only: 2.57
California Bearing Ratio
95%: 8.8
90%: 4.6
85%: 0.5
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-2-7(1)
UNIFIED	-	SMU

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	-
1	100
3/4	97.65
1/2	-
3/8	88.62
#4	71.85
#10	46.64
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	34.22
#40	30.89
#60	29.58
#100	28.32
#200	26.20
Dia. MM 1/	
.0310	21.96
.0198	21.18
.0120	16.45
.0086	15.44
.0063	13.66
.0032	10.32
.0014	6.52

Landtype No. 95

Location: NW¼,Sec.21,T.39S.,R.6W.
Depth: -
Liquid Limit: 34
Plasticity Index: 6
Maximum Density - p.c.f.: -
Optimum Moisture - %: -
Specific Gravity, #10(-) only: 2.6545
California Bearing Ratio
95%: -
90%: -
85%: -
pH: -

Classification	Mechanical	Hydrometer
AASHO	A-4(2)	-
UNIFIED	ML	-

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	-
1	-
3/4	-
1/2	100
3/8	98.95
#4	94.20
#10	86.70
#40	76.14
#100	66.76
#200	59.57

1/ Particle size computed from hydrometer readings.

Landtype No. 95u-A 1/

Location: NW¼,Sec.32,T.39S.,R.5W.
Depth: 0-16 inches
Liquid Limit: -
Plasticity Index: NP
Maximum Density - p.c.f.: -
Optimum Moisture - %: -
Specific Gravity, #10(-) only: -
California Bearing Ratio
95%: -
90%: -
85%: -
pH: 5.6-6.0

Classification	Mechanical	Hydrometer
AASHO	A-1,A-2	-
UNIFIED	GM	-

Mechanical Analysis	
Sieve Size	% Passing
3	70-90
2 1/2	-
2	-
1 1/2	-
1	-
3/4	-
1/2	-
3/8	-
#4	30-60
#10	25-55
#40	15-40
#100	-
#200	10-25

Landtype No. 95u-B 2/

Location: NW¼,Sec.32,T.39S.,R.5W.
Depth: 16-55 inches
Liquid Limit: -
Plasticity Index: NP
Maximum Density - p.c.f.: -
Optimum Moisture - %: -
Specific Gravity, #10(-) only: -
California Bearing Ratio
95%: -
90%: -
85%: -
pH: 5.6-6.5

Classification	Mechanical	Hydrometer
AASHO	A-1,A-2	-
UNIFIED	GM,GS-GM	-

Mechanical Analysis	
Sieve Size	% Passing
3	50-90
2 1/2	-
2	-
1 1/2	-
1	-
3/4	-
1/2	-
3/8	-
#4	25-60
#10	20-55
#40	10-40
#100	-
#200	5-30

1/ A refers to topsoil layers.
2/ B refers to subsoil layers.

Landtype No. 96

Location: SW¼,Sec.7,T.35S.,R.8W.
Depth: -
Liquid Limit: 45
Plasticity Index: 8
Maximum Density - p.c.f.: 102.5
Optimum Moisture - %: 20.8
Specific Gravity, #10(-) only: 2.70
California Bearing Ratio
95%: 9.2
90%: 4.4
85%: 1.5
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-2-7(0)
UNIFIED	-	GMU

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	100
1 1/2	96.34
1	90.65
3/4	86.67
1/2	-
3/8	71.04
#4	56.77
#10	45.26
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	40.32
#40	37.13
#60	34.69
#100	32.87
#200	29.96
Dia. MM 1/	
.0238	27.27
.0160	24.60
.0098	21.93
.0072	19.75
.0053	18.29
.0027	14.99
.0012	11.01

Landtype No. 99

Location: SE¼,Sec.30,T.36S.,R.9W.
Depth: -
Liquid Limit: NP
Plasticity Index: NP
Maximum Density - p.c.f.: 97.0
Optimum Moisture - %: 23.1
Specific Gravity, #10(-) only: 2.84
California Bearing Ratio
95%: 8.9
90%: 3.5
85%: 9.5
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-4(0)
UNIFIED	-	SMD

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	-
1	100
3/4	99.02
1/2	-
3/8	96.20
#4	88.37
#10	76.33
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	68.91
#40	59.35
#60	51.51
#100	44.21
#200	36.70
Dia. MM 1/	
.0290	25.43
.0191	21.95
.0114	17.70
.0083	15.38
.0060	13.06
.0030	8.89
.0013	5.72

1/ Particle size computed from hydrometer readings.

Landtype No. 99

Location: SE¼,Sec.30,T.36S.,R.9W.
Depth: -
Liquid Limit: 55
Plasticity Index: 11
Maximum Density - p.c.f.: 85.3
Optimum Moisture - %: 35.2
Specific Gravity, #10(-) only: 2.85
California Bearing Ratio
95%: 11.2
90%: 6.3
85%: 3.5
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-7-5(9)
UNIFIED	-	MH

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	-
1	100
3/4	99.74
1/2	98.00
3/8	98.00
#4	97.35
#10	95.52
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	91.11
#40	85.10
#60	79.14
#100	72.64
#200	65.05
Dia. MM 1/	
.0268	53.88
.0175	48.21
.0103	43.95
.0075	39.70
.0054	36.86
.0027	27.36
.0012	20.27

Landtype No. 99-A 2/

Location: SW¼,Sec.21,T.37S.,R.9W.
Depth: 0-12 inches
Liquid Limit: 20-30
Plasticity Index: NP-5
Maximum Density - p.c.f.: -
Optimum Moisture - %: -
Specific Gravity, #10(-) only: -
California Bearing Ratio
95%: -
90%: -
85%: -
pH: 6.1-6.5

Classification	Mechanical	Hydrometer
AASHO	A-2,A-1	-
UNIFIED	GM	-

Mechanical Analysis	
Sieve Size	% Passing
3	85-100
2 1/2	-
2	-
1 1/2	-
1	-
3/4	-
1/2	-
3/8	-
#4	40-55
#10	35-50
#40	30-45
#100	-
#200	20-35

1/ Particle size computed from hydrometer readings.
2/ A refers to topsoil layers.

Landtype No. 100

Location: NE¼,Sec.30,T.36S.,R.9W.
Depth: -
Liquid Limit: 47
Plasticity Index: 7
Maximum Density - p.c.f.: 96.0
Optimum Moisture - %: 23.7
Specific Gravity, #10(-) only: 2.75
California Bearing Ratio
95%: 4.5
90%: 1.8
85%: 1.5
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-5(4)
UNIFIED	-	ML

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	-
1	-
3/4	100
1/2	-
3/8	99.60
#4	99.24
#10	96.40
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	88.52
#40	82.28
#60	77.30
#100	69.95
#200	58.14
Dia. MM 1/	
.0284	44.13
.0185	38.93
.0110	33.74
.0080	28.55
.0057	25.96
.0029	18.56
.0012	13.37

Landtype No. 121

Location: NE¼,Sec.8,T.32S.,R.11W.
Depth: 10-20 inches
Liquid Limit: 39
Plasticity Index: 6
Maximum Density - p.c.f.: 97.6
Optimum Moisture - %: 23
Specific Gravity, #10(-) only: 2.4018
California Bearing Ratio
95%: 5.8
90%: 3.4
85%: 1.4
pH: 6.1

Classification	Mechanical	Hydrometer
AASHO	-	-
UNIFIED	SMu	A-2-6(0)

Mechanical Analysis	
Sieve Size	% Passing
3	100
2	100
1 1/2	100
1	100
3/4	100
1/2	100
3/8	100
#4	99.6
#10	99.3
#20	94.6
#40	70.8
#60	50.3
#100	39.6
#200	30.7

Remarks: Maximum particle size is 3/8". Particle shapes are angular.

1/ Particle size computed from hydrometer readings.

Landtype No. 122

Location: SW¼,Sec.14,T.32S.,R.11W.
Depth: 10-20 inches
Liquid Limit: 37
Plasticity Index: NP
Maximum Density - p.c.f.: 90.7
Optimum Moisture - %: 27
Specific Gravity, #10(-) only: 2.3738
California Bearing Ratio
95%: 6.5
90%: 3.7
85%: 1.7
pH: 6.1

Classification	Mechanical	Hydrometer
AASHO	-	-
UNIFIED	SMu	A-1-6(0)

Mechanical Analysis	
Sieve Size	% Passing
3	100
2	100
1 1/2	100
1	98.1
3/4	96.2
1/2	95.9
3/8	95.2
#4	90.4
#10	82.1
#20	65.1
#40	47.5
#60	27.1
#100	18.1
#200	10.91

Remarks: Maximum particle size is 3/8". Particle shapes are angular.

Landtype No. 125

Location: NE¼,Sec.16,T.32S.,R.11W.
Depth: 10-20 inches
Liquid Limit: 35
Plasticity Index: NP
Maximum Density - p.c.f.: 82.7
Optimum Moisture - %: 33.5
Specific Gravity, #10(-) only: 2.3679
California Bearing Ratio
95%: 4.9
90%: 4.0
85%: 3.2
pH: 5.9

Classification	Mechanical	Hydrometer
AASHO	-	-
UNIFIED	SMu	A-2-6(0)

Mechanical Analysis	
Sieve Size	% Passing
3	100
2	100
1 1/2	100
1	100
3/4	100
1/2	100
3/8	100
#4	99.2
#10	96.7
#20	87.8
#40	63.2
#60	40.2
#100	20.5
#200	13.90

Landtype No. 176

Location: NE¼,SW¼,Sec.23,T.34S.,R.12W.
Depth: -
Liquid Limit: 53
Plasticity Index: 10
Maximum Density - p.c.f.: 109.4
Optimum Moisture - %: 15.3
Specific Gravity, #10(-) only: 2.72
California Bearing Ratio
95%: 7.2
90%: 3.6
85%: 1.2
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-2-7(0)
UNIFIED	-	SMU

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	-
1 1/2	100
1	98.94
3/4	95.14
1/2	-
3/8	86.64
#4	73.54
#10	57.16
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	46.20
#40	38.91
#60	35.14
#100	32.15
#200	29.16
Dia. MM 1/	
.0307	26.61
.0198	24.09
.0117	20.56
.0084	18.04
.0057	16.02
.0030	11.99
.0013	7.26

Landtype No. 177

Location: SW¼,NW¼,Sec.23,T.33S.,R.12W.
Depth: -
Liquid Limit: 35
Plasticity Index: 6
Maximum Density - p.c.f.: 107.9
Optimum Moisture - %: 17.3
Specific Gravity, #10(-) only: 2.6851
California Bearing Ratio
95%: 5.4
90%: 2.8
85%: 0.8
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-1-6(0)
UNIFIED	-	GMU

Mechanical Analysis	
Sieve Size	% Passing
3	100
2 1/2	-
2	-
1 1/2	84.83
1	83.04
3/4	79.11
1/2	72.91
3/8	68.44
#4	57.15
#10	46.91
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	42.18
#40	36.53
#60	32.20
#100	27.46
#200	21.98
Dia. MM 1/	
.0315	17.68
.0204	15.89
.0120	13.90
.0086	11.92
.0062	10.26
.0031	7.75
.0013	5.24

1/ Particle size computed from hydrometer readings.

Landtype No. 177

Location: NE¼,NE¼,Sec.6,T.34S.,R.12W.
Depth: -
Liquid Limit: 41
Plasticity Index: 3
Maximum Density - p.c.f.: 90.5
Optimum Moisture - %: 27.1
Specific Gravity, #10(-) only: -
California Bearing Ratio
95%: 6.6
90%: 2.2
85%: 0.5
pH: -

Classification	Mechanical	Hydrometer
AASHO	A-S(2)	A-S(2)
UNIFIED	ML	ML

Mechanical Analysis	
Sieve Size	% Passing
3	100
2 1/2	100
2	100
1 1/2	100
1	100
3/4	100
1/2	98.77
3/8	96.98
#4	90.98
#10	82.71
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	75.11
#40	71.99
#60	68.64
#100	65.3
#200	60.84
Dia. MM 1/	
.0240	56.55
.0159	52.25
.0099	44.50
.0073	39.12
.0055	31.59
.0029	17.60
.0012	9.22

Landtype No. 178

Location: NE¼,SW¼,Sec.27,T.32S.,R.13W.
Depth: -
Liquid Limit: NP
Plasticity Index: NP
Maximum Density - p.c.f.: 117.3
Optimum Moisture - %: 13.6
Specific Gravity, #10(-) only: 2.79
California Bearing Ratio
95%: 13.8
90%: 7.7
85%: 2.2
pH: -

Classification	Mechanical	Hydrometer
AASHO	-	A-1-b
UNIFIED	-	SMD

Mechanical Analysis	
Sieve Size	% Passing
3	-
2 1/2	-
2	100
1 1/2	95.23
1	92.98
3/4	90.71
1/2	-
3/8	79.80
#4	66.31
#10	52.03
#40	-
#100	-
#200	-

Hydrometer Analysis	
Sieve Size	% Passing
#20	42.68
#40	35.10
#60	30.21
#100	26.14
#200	21.76
Dia. MM 1/	
.030	18.29
.019	16.65
.0115	14.95
.0082	13.85
.0059	12.21
.0030	10.08
.0013	7.50

1/ Particle size computed from hydrometer readings.

SOIL CHEMICAL ANALYSIS

Land-type	Sample Depth (Inches)	pH	P (ppm)	Extractable Cations K (ppm)	Ca (meq/100g)	Mg (meq/100g)	Na (meq/100g)	B (ppm)	Total Nitrogen (%)	CEC (meq/100g)	OM (%)	NH_4+ N (ppm)	NO_3- N (ppm)	Acidity (meq/100g)	Sum % Base Saturation	NH_4 AC % Base Saturation	Ca/Mg
14-1	0-5	6.0	43	456	12.5	4.30	0.26	15.18	-	21.05	9.14	-	-	-	-	-	-
14-2	5-14	6.0	36	672	11.2	4.20	0.30	17.40	-	16.65	9.19	-	-	-	-	-	-
14-3	14-26	5.9	32	490	13.1	4.80	0.28	14.18	-	13.75	7.48	-	-	-	-	-	-
14-4	26-50	5.8	19	640	11.6	3.80	0.21	14.59	-	10.02	0.71	-	-	-	-	-	-
14-5	50-65	5.4	31	106	7.7	2.00	0.21	17.46	-	14.02	5.34	-	-	-	-	-	-
15	0-6	5.6	-	51	10.8	4.50	0.15	-	-	23.05	-	-	-	-	-	-	-
15	0-6	5.4	-	72	13.9	5.50	0.19	-	-	40.02	-	-	-	-	-	-	-
15	0-6	5.2	-	40	4.0	0.89	0.10	-	-	23.64	-	-	-	-	-	-	-
15	0-6	5.3	-	42	5.9	2.20	0.13	-	-	26.65	-	-	-	-	-	-	-
15	7-9	5.2	38	136	1.5	0.59	-	-	-	20.47	5.17	127.9	25.6	-	-	-	-
18	0-6	5.7	-	59	10.3	4.20	0.15	-	-	28.52	-	-	-	-	-	-	-
32u-A	0-7	6.2	5	29	2.4	4.5	0.09	-	-	27.26	5.76	-	-	16.29	30.9	26.7	0.50
32u-B	7-12	6.7	5	9	1.6	6.9	0.09	-	-	14.82	2.69	-	-	13.74	38.7	58.5	0.23
32u-C	12-24	7.1	5	9	1.2	14.0	0.07	-	-	18.42	1.06	-	-	6.68	69.6	83.3	0.09
45	7-9	5.2	10	152	1.5	0.92	-	-	-	19.40	2.53	251.5	59.7	-	-	-	-
45	7-9	5.0	13	186	1.0	0.82	-	-	-	26.00	4.05	336.8	25.6	-	-	-	-
51	0-4	4.8	11	310	1.8	1.20	0.17	-	0.15	27.25	10.13	-	-	-	-	-	-
51	0-4	5.7	90	620	5.1	1.80	0.15	-	0.15	24.46	7.95	-	-	-	-	-	-
51	0-4	4.9	12	250	0.9	0.46	0.13	-	0.13	21.39	7.89	-	-	-	-	-	-
51	0-4	6.0	44	352	8.4	2.50	0.10	-	0.14	24.83	9.71	-	-	-	-	-	-
52	0-4	4.9	18	336	3.4	1.30	0.15	-	0.17	27.25	8.75	-	-	-	-	-	-
52	0-4	5.3	27	330	5.3	1.90	0.15	-	0.15	26.41	7.68	-	-	-	-	-	-
52	7-9	4.8	34	170	0.7	0.30	-	-	-	22.80	5.06	153.0	25.5	-	-	-	-
62	7-9	4.9	129	112	1.0	0.36	-	-	-	24.93	7.08	187.6	89.5	-	-	-	-
66	0-6	5.8	-	55	6.9	0.63	0.23	-	-	6.42	-	-	-	-	-	-	-
76	0-6	5.7	-	108	12.5	1.30	0.15	-	-	32.62	-	-	-	-	-	-	-
77	0-6	5.7	-	72	8.6	1.10	0.15	-	-	32.37	-	-	-	-	-	-	-
82	7-9	5.7	24	156	15.1	4.30	-	-	-	18.04	12.32	489.4	182.9	-	-	-	-
82u-1	0-3	6.0	7	316	15.9	1.30	0.10	18.75	-	32.59	8.95	-	-	-	-	-	-
82u-2	3-9	6.4	5	180	8.4	0.69	0.10	10.84	-	16.14	2.72	-	-	-	-	-	-
82u-3	9-19	6.2	4	164	5.5	0.59	0.10	6.74	-	13.46	1.81	-	-	-	-	-	-
82u-4	19-31	6.1	4	174	5.1	0.59	0.10	13.21	-	11.23	1.69	-	-	-	-	-	-
82u-5	31-46	6.2	7	152	3.5	0.59	0.10	7.33	-	8.60	0.60	-	-	-	-	-	-
91u-1	0-4	6.4	41	36	1.2	0.20	0.13	10.52	-	21.48	8.05	-	-	-	-	-	-
91u-2	4-14	5.6	31	32	0.4	0.16	0.10	28.33	-	15.04	7.74	-	-	-	-	-	-
91u-3	14-32	5.7	30	124	3.2	0.46	0.19	6.22	-	7.95	3.23	-	-	-	-	-	-
92u	7-9	5.9	8	320	8.6	1.10	-	-	-	32.88	4.05	422.7	25.4	-	-	-	-
95u-1	0-2	5.7	77	490	8.8	3.40	0.28	23.09	-	28.14	12.27	-	-	-	-	-	-
95u-2	2-5	5.8	49	274	9.5	3.40	0.21	19.53	-	23.47	10.16	-	-	-	-	-	-
95u-3	5-10	6.0	36	640	10.3	4.00	0.26	12.45	-	19.33	7.02	-	-	-	-	-	-
95u-4	10-30	6.0	29	432	11.6	4.20	0.23	5.90	-	16.32	3.06	-	-	-	-	-	-
95u-5	30-54	6.1	22	586	10.4	3.80	0.26	13.41	-	13.59	3.50	-	-	-	-	-	-
192	7-9	5.3	35	124	0.7	0.25	-	-	-	22.00	15.12	268.5	42.6	-	-	-	-

APPENDIX X

TERMS AND DEFINITIONS OF LANDTYPE UNIT CRITERIA 1/

This appendix contains the terms and definitions used in Soil Resource Inventories. These terms and definitions are used in compiling information for the Table of Bedrock Characteristics of Landtype Units; Table of Soil Characteristics of Modal Sites; Table of Some Landtype Unit Characteristics, Features, and Qualities; and the Landtype Unit Descriptions.

Bedrock Characteristics

These terms are found in the Table of Bedrock Characteristics of Mapping Units.

Bedrock

Consolidated, competent rock, which upon weathering produces loose or unconsolidated soil material. In terminology of soil horizon designation, bedrock is designated at the "R" layer. Bedrock material usually requires ripping and/or blasting. Includes soft materials that are unweathered such as some sedimentary rock which can be bladed. (Example: Sandstone.)

Composition - Bedrock components and percentage. (Example: Sandstone (20), Conglomerates (70), Mudstone (10).)

Color - Color is in narrative terms for fresh, unweathered surfaces.

Hardness - Relative rating based on ease of breaking rock with geology hammer:

Hard - Rock cannot be broken or only with great difficulty.

Moderately hard - Rock can readily be broken with hammer but not by hand.

Soft - Rock can be broken by hand.

Degree of Fracturing - Based on the number or frequency of fractures and joints in a rock unit:

Highly fractured - Entire rock unit is completely dissected by fractures and joints less than 1 foot apart.

Moderately fractured - Fractures divide rock unit into units or blocks generally from 1 to 5 feet apart.

Slightly fractured - Only occasional fractures noted.

Massive - No fractures or very few fractures noted.

Fracture System - Pattern which the rock fractures follow. Example: Horizontal, platy, vertical, blocky, random, etc.

Fracture Surface - Indicates the characterisitics of the fracture surface and void space within fractures.

Regular - Smooth, distinct, sharp, clean-fractured surfaces.

Irregular - Rough, irregular, fragmented fracture surface.

1/ Unless otherwise noted, the following definitions were developed for use in Soil Resource Inventories, R-6.

Competency - Relative inherent strength of rock as it occurs on the landscape, based on degree of weathering, fracturing, hardness, stability, and failures observed:

Competent - No failures within rock unit observed. Rocks of unit are stable and have strong resistance to mass movement.

Moderately competent - Some failures are noted. Rocks of the unit are moderately stable and have some resistance to mass movement.

Incompetent - Failures are common to rock unit. Rocks of the unit are soft, deeply weathered, and have high potential for mass movement.

TABLE OF LANDTYPE UNIT CRITERIA

BEDROCK CHARACTERISTICS

Landtype No.	Composition	Color (Fresh Surface)	Hardness	Degree of Fracturing	Fracture System	Fracture Surface	Competency	Remarks
0	Undifferentiated	N/A	N/A	N/A	N/A	N/A	N/A	River gravels of varied composition
1	Andesites, basalts, gabbros, diorites, gneiss, metavolcanics, metasediments, rhyollites, and dacites	Variable	Hard	Massive to moderately	Blocky and platy	Regular	Competent	Hard rock outcrop
2	Sediments, pyroclastic sediments, tuffs, agglomerates, conglomerates, and sandstones	Variable	Moderately hard	Massive to moderately	Platy and random	Irregular	Moderately competent	Moderately hard rock outcrop
3	Peridotite and serpentine	Yellow through olive green, rust brown, and black	Hard to moderately hard	Highly	Blocky and platy	Regular to irregular	Competent to moderately competent	Hard to moderately hard ultrabasic rock outcrop
4	Undifferentiated	Variable	Hard	Highly	Random	Regular to irregular	Incompetent	Land flow and land slump unit on the east side of the Klamath Mountains
5	Serpentine and peridotite	Yellow through olive green, rust brown, and black	Hard	Highly	Blocky	Regular to irregular	Incompetent	Land flow and land slump unit from ultrabasic rock
6	Undifferentiated	Variable	Soft	Highly	Blocky	Irregular	Incompetent	Wet non-forest land
7	Undifferentiated	Variable	Hard	Highly	Blocky	Irregular	Competent	Dry non-forest land
8	Undifferentiated	Variable	Moderate	Highly	Blocky	Irregular	Incompetent	Land flow and land slump unit on the west side of the Klamath Mountains
8c	Colebrooke schist and phyllites	Silver gray	Soft	Highly	Platy	Irregular	Incompetent	Landflow and land slump unit on the west side of the Klamath Mountains
9	Undifferentiated	Variable	Moderate	Highly	Blocky	Regular to irregular	Incompetent	Land flow and land slump unit on the west side of the Klamath Mountains
9c	Colebrooke schist and phyllites	Silver gray	Soft	Highly	Platy	Irregular	Incompetent	Landflow and land slump unit on the west side of the Klamath Mountains
10	Serpentine and peridotite	Yellow through olive green, rust brown, and black	Soft	Highly	Blocky	Irregular	Incompetent	Very deep alluvial ultrabasic material, adjacent to stream
11	Olivine gabbro	Olive green to black	Soft	Highly	Blocky	Irregular	Incompetent	Very deep colluvial unit, derived from olivine gabbro
12	Serpentine and peridotite	Yellow through olive green, rust brown, and black	Soft	Highly	Blocky	Irregular	Incompetent	Very deep alluvial ultrabasic material, on upper terraces
13	Undifferentiated	Variable	Hard	Highly	Blocky	Regular to irregular	Incompetent	Glacial till and colluvium (above 4,000 feet elevation)
14	Undifferentiated	Variable	Hard	Highly	Blocky	Regular to irregular	Incompetent	Glacial till and colluvium (above 4,000 feet elevation)
15	Undifferentiated	Variable	Hard to soft	Massive	Random	Regular to irregular	Incompetent	Alluvium adjacent to streams
16	Undifferentiated	Variable	Hard to moderately hard	Massive	Random	Regular to irregular	Incompetent	Colluvium on toe slope positions
17	Undifferentiated	Variable	Hard to moderately hard	Massive	Random	Regular to irregular	Incompetent	Colluvium on toe slope positions on the west side of the Klamath Mountains
18	Undifferentiated	Variable	Moderately hard to hard	Highly	Random	Regular to irregular	Incompetent	Colluvium on toe slope positions on the east side of the Klamath Mountains
19	Undifferentiated	Variable	Moderately hard to hard	Highly	Random	Regular to irregular	Incompetent	Colluvium on toe slope positions on the west side of the Klamath Mountains
21	Metagabbro	Dark gray	Moderately hard to hard	Highly	Blocky	Regular to irregular	Competent	Found on the east side of the Klamath Mountains

TABLE OF LANDTYPE UNIT CRITERIA

BEDROCK CHARACTERISTICS

Landtype No.	Composition	Color (Fresh Surface)	Hardness	Degree of Fracturing	Fracture System	Fracture Surface	Competency	Remarks
22	Metagabbro	Dark gray	Moderately hard to soft	Highly	Blocky	Regular to irregular	Moderately competent to incompetent	Found on the east side of the Klamath Mountains
26	Dacite, rhyolite, and syenite	Light gray to dark brown	Moderately hard to hard	Highly	Blocky	Regular	Competent	Generally found on north slopes
27	Dacite, rhyolite, and syenite	Light gray to dark brown	Soft to moderately hard	Highly	Single grained to blocky	Irregular	Incompetent to moderately competent	Generally found on north slopes
28	Dacite, rhyolite, and syenite	Light gray to dark brown	Hard to moderately hard	Highly	Blocky	Regular	Competent	Generally found on south slopes
29	Dacite, rhyolite, and syenite	Light gray to dark brown	Moderately hard to soft	Highly	Single grained to blocky	Irregular	Moderately competent to incompetent	Generally found on south slopes
31	Peridotite and serpentine	Yellow through olive green, rust brown, and black	Moderately hard to hard	Highly	Blocky and platy	Regular to irregular	Moderately competent to competent	Found on the east side of the Klamath Mountains
32	Serpentine and Peridotite	Yellow through olive green, rust brown, and black	Soft to moderately hard	Highly	Platy and blocky	Irregular to regular	Incompetent to moderately competent	Found on the east side of the Klamath Mountains
34	Peridotite and serpentine	Yellow through olive green, rust brown, and black	Hard to moderately hard	Highly	Blocky and platy	Regular	Competent to moderately competent	Found on the east side of the Klamath Mountains
35	Peridotite and serpentine	Yellow through olive green, rust brown, and black	Moderately hard to hard	Highly	Blocky and platy	Regular	Competent to moderately competent	Found on the east side of the Klamath Mountains
36	Serpentine and peridotite	Yellow through olive green, rust brown, and black	Moderately hard	Highly	Blocky and platy	Regular to irregular	Moderately competent	Found on the west side of the Klamath Mountains
37	Serpentine and peridotite	Yellow through olive green, rust brown, and black	Soft to moderately hard	Highly	Platy and blocky	Irregular to regular	Incompetent to moderately competent	Found on the west side of the Klamath Mountains
38	Serpentine and peridotite	Yellow through olive green, rust brown, and black	Moderately hard	Highly	Blocky	Regular to irregular	Moderately competent to incompetent	Found on the west side of the Klamath Mountains
39	Peridotite and serpentine	Yellow through olive green, rust brown, and black	Moderately hard to hard	Highly	Blocky and platy	Regular	Moderately competent	Found on the west side of the Klamath Mountains
41	Bedded sandstones and siltstones of the Umpqua Formation	Light grayish brown to dark brown and black	Moderately hard	Moderately	Horizontal to random	Regular to irregular	Moderately competent	Generally found on the west side of the Klamath Mountains on the south slopes. Localized concentration of siltstones of the Days Creek member of the Umpqua Formation.
42	Bedded sandstones and siltstones of the Umpqua Formation	Light grayish brown to dark brown and black	Moderately hard to soft	Moderately to highly	Horizontal to random	Irregular to regular	Moderately competent to incompetent	Generally found on the west side of the Klamath Mountains. Localized concentration of siltstones of the Days Creek member of the Umpqua Formation.
43	Bedded sandstones and siltstones of the Umpqua Formation	Light grayish brown to dark brown and black	Moderately hard	Moderately	Horizontal to random	Regular to irregular	Moderately competent	Generally found on the west side of the Klamath Mountains on south slopes. Localized concentration of siltstones of the Days Creek member of the Umpqua Formation.
45	Bedded sandstones and siltstones	Light grayish brown, buff, dark brown, and black	Soft to moderately hard	Highly	Random	Irregular to regular	Incompetent to moderately competent	Found on the west side of the Klamath Mountains.
46	Massive conglomerates with thin interbeds of poorly sorted sandstone	Light gray to dark brown	Moderately hard to hard	Massive to highly	Blocky to single grained	Regular to irregular	Moderately competent to competent	Generally found on north slopes on the west side of the Klamath Mountains
48	Massive conglomerates with thin interbeds of poorly sorted sandstone	Light gray to dark brown	Moderately hard to hard	Massive to highly	Blocky to single grained	Regular to irregular	Moderately competent to competent	Generally found on south slopes

TABLE OF LANDTYPE UNIT CRITERIA

BEDROCK CHARACTERISTICS

Landtype No.	Composition	Color (Fresh Surface)	Hardness	Degree of Fracturing	Fracture System	Fracture Surface	Competency	Remarks
50	Volcanic rock of the Dothan and Colebrooke formations	Buff to black	Hard	Highly to locally massive	Blocky	Regular to irregular	Competent	Found on the west side of the Klamath Mountains
51	Sedimentary rock of the Dothan Formation	Buff to dark brown	Moderately hard	Highly	Blocky and platy	Regular to irregular	Moderately competent	Found on the west side of the Klamath Mountains. Generally found on north slopes.
52	Sedimentary rock of the Dothan Formation	Buff to black	Soft to moderately hard	Highly	Platy and blocky	Irregular to regular	Moderately competent to incompetent	Found on the west side of the Klamath Mountains. Generally found on north slopes.
53	Sedimentary rock of the Dothan Formation	Buff to dark brown	Moderately hard	Highly	Blocky and platy	Regular to irregular	Moderately competent	Found on the west side of the Klamath Mountains. Generally found on south slopes.
54	Sedimentary rock of the Dothan Formation	Buff to black	Moderately hard to soft	Highly	Platy and blocky	Irregular to regular	Moderately incompetent to incompetent	Found on the west side of the Klamath Mountains. Generally found on south slopes.
55	Sedimentary rock of the Dothan Formation	Buff to black	Soft to moderately hard	Highly	Platy and blocky	Irregular to regular	Incompetent to moderately competent	Found on the west side of the Klamath Mountains
61	Schists and phyllites of the Colebrooke Formation	Silver gray	Moderately hard	Highly	Platy	Regular and irregular	Moderately competent	Found on the west side of the Klamath Mountains
62	Schists and phyllites of the Codebrooke Formation	Silver gray	Soft	Highly	Platy	Irregular and regular	Incompetent to moderately incompetent	Found on the west side of the Klamath Mountains
66	Amphibole gneiss	Buff to dark brown	Moderately hard to hard	Moderately	Blocky to platy	Regular and irregular	Moderately competent to competent	Found on the east side of the Klamath Mountains
67	Amphibole gneiss	Buff to dark brown	Soft to moderately hard	Highly	Blocky to platy	Irregular to regular	Moderately competent	Found on the east side of the Klamath Mountains
68	Amphibole gneiss	Buff to dark brown	Soft	Massive	Blocky to single grained	Irregular	Incompetent to moderately competent	Found on the east side of the Klamath Mountains
71	Marine sediments	Buff to grayish brown	Moderately hard	Highly	Platy	Regular	Moderately competent	Found on the east side of the Klamath Mountains
72	Marine sediments	Buff to grayish brown	Soft	Highly	Platy	Regular to irregular	Moderately competent to locally incompetent	Found on the east side of the Klamath Mountains
76	Metasediments of the Galice Formation	Buff to black	Hard to moderately hard	Moderately to highly	Platy to blocky	Regular to irregular	Competent to moderately competent	Found on the east side of the Klamath Mountains
77	Metasediments of the Galice Formation	Buff to black	Soft to moderately hard	Highly	Platy to single grained	Irregular to regular	Moderately competent to competent	Found on the east side of the Klamath Mountains
81	Metavolcanics	Pale green to grayish green	Hard to moderately hard	Highly	Blocky	Regular	Moderately competent to competent	Found in the Siskiyou Mountains
82	Metavolcanics	Pale green to grayish green	Moderately hard to soft	Highly	Blocky	Regular	Moderately competent to incompetent	Found in the Siskiyou Mountains
83	Metavolcanics	Pale green to grayish green	Soft to moderately hard	Highly to massive	Variable	Regular to irregular	Incompetent to moderately competent	Found in the Siskiyou Mountains
86	Metavolcanics of the Galice and Rogue Formations	Light gray to greenish gray	Hard	Highly to slightly	Blocky	Regular	Competent	Found on the east side of the Klamath Mountains
87	Metavolcanics of the Galice and Rogue Formations	Light gray to greenish gray	Moderately hard	Highly	Blocky	Regular to irregular	Moderately competent	Found on the east side of the Klamath Mountains
91	Diorites and granodiorites	Light gray to dark gray	Hard	Highly	Blocky	Regular	Competent	Found east of the Klamath Mountains and in the Siskiyou Mountains
92	Diorites and granodiorites	Light gray to dark gray	Moderately hard to soft	Massive to highly	Blocky to single grained	Irregular to regular	Moderately competent	Found east of the Klamath Mountains and in the Siskiyou Mountains

TABLE OF LANDTYPE UNIT CRITERIA

BEDROCK CHARACTERISTICS

Landtype No.	Composition	Color (Fresh Surface)	Hardness	Degree of Fracturing	Fracture System	Fracture Surface	Competency	Remarks
93	Diorites and granodiorites	Light gray to dark gray	Soft	Massive	Single grained	Irregular	Moderately competent to incompetent	Found east of the Klamath Mountains and in the Siskiyou Mountains
95	Diorites and granodiorites	Light gray to dark gray	Soft to moderately hard	Massive to highly	Single grained to blocky	Irregular to regular	Moderately competent to incompetent	Found east of the Klamath Mountains and in the Siskiyou Mountains
96	Gabbros	Dark gray to black	Hard to moderately hard	Highly to moderately	Blocky	Regular	Competent	Found east of the Klamath Mountains and in the Siskiyou Mountains
97	Gabbros	Dark gray to black	Moderately hard	Highly	Blocky	Regular to irregular	Moderately competent	Found east of the Klamath Mountains and in the Siskiyou Mountains
98	Gabbros	Dark gray to black	Soft	Massive to slightly	Single grained to blocky	Irregular	Moderately competent to incompetent	Found east of the Klamath Mountains and in the Siskiyou Mountains
99	Olivine gabbro	Greenish gray to black	Hard to moderately hard	Highly	Blocky	Regular	Competent to moderately competent	-
100	Olivine gabbro	Greenish gray to black	Moderately hard to soft	Massive to slightly	Single grained to blocky	Irregular to regular	Moderately competent to incompetent	-
120	Thickly bedded sandstones with thinly bedded siltstones and mudstones of the Tyee Formation	Buff to gray	Hard to moderately hard	Slightly	Blocky	Regular	Competent	-
121	Thickly bedded sandstones with thinly bedded siltstones and mudstones of the Tyee Formation	Buff to gray	Moderately hard to hard	Slightly	Blocky	Regular	Competent to moderately competent	-
122	Thickly bedded sandstones with thinly bedded siltstones and mudstones of the Tyee Formation	Buff to gray	Moderately hard	Slightly to moderately	Blocky	Regular to irregular	Moderately competent to locally incompetent	-
125	Thickly bedded sandstones with thinly bedded siltstones and mudstones of the Tyee Formation	Buff to gray	Soft to moderately hard	Massive to slightly	Single grain to blocky	Irregular to regular	Moderately competent to locally incompetent	-
176	Metasediments of the Galice and related formations	Buff to dark gray	Hard to moderately hard	Moderately to highly	Blocky to platy	Regular	Competent to locally incompetent	Found on the west side of the Klamath Mountains
177	Metasediments of the Galice and related formations	Buff to dark gray	Moderately hard	Highly	Blocky to platy	Regular to irregular	Moderately competent to incompetent	Found on the west side of the Klamath Mountains
178	Metasediments of the Galice and related formations	Buff to dark gray	Hard to moderately hard	Moderately to highly	Blocky to platy	Regular	Competent to to locally incompetent	Found generally on south slopes on the west side of the Klamath Mountains
186	Metavolcanics of the Galice Formation	Light gray to greenish gray	Hard	Slightly to highly	Blocky	Regular	Competent	Found on the west side of the Klamath Mountains
191	Diorites and quartz diorites	Light gray to dark gray	Hard	Slightly to moderately	Blocky	Regular	Competent	Found on the west side of the Klamath Mountains. Generally found on the north slopes
192	Diorites and quartz diorites	Light gray to dark gray	Moderately hard	Moderately to highly	Blocky	Regular	Moderately competent	Found on the west side of the Klamath Mountains. Generally found on the north slopes.
193	Diorites and quartz diorites	Light gray to dark gray	Soft to moderately hard	Massive to slightly fractured	Single grained to blocky	Irregular to regular	Moderately competent	Found on the west side of the Klamath Mountains. Generally found on the north slopes.
194	Diorites and quartz diorites	Light gray to dark gray	Hard	Slightly to moderately	Blocky	Regular	Competent	Found on the west side of the Klamath Mountains. Generally found on the south slopes.
196	Gabbros	Dark gray to black	Hard	Highly	Blocky	Regular	Competent	Found on the west side of the Klamath Mountains

Landtype Characteristics, Features, and Qualities

Infiltration Rate

Rate of entry of water into soil surface. The rate is dependent upon the type of surface soil texture, rock fragment content, structure, porosity, bulk density, and organic matter content.

Infiltration Rate Classes

Slow - Water stands on surface for long periods. Soils are fine textured, poorly aggregated, and puddle easily.

Moderate - Water enters soil at commensurated rates of normal rainfall or water application. Water may pond for short periods (a few days) following very intensive rainfall. Soils are medium-textured and well aggregated.

Rapid - Water rarely ponds, enters soil surface very rapidy. Soils are coarse textured, porous, loose, and usually single-grained.

Drainage Class 1/ - The rapidity and extent of removal of water from the soil. Based on soil permeability, infiltration, internal drainage, and topographic position.

Poorly drained - Water table at or near the surface a considerable part of the time. Soils of this class usually occupy level or depressed sites and are frequently ponded. Water is removed so slowly that soil remains wet almost all the time.

Somewhat poorly drained - Water removed so slowly that the soil remains wet for significant periods, but not all the time.

Moderately well drained - Soil remains wet for a period somewhat longer (up to one month) than the wet season; may be due in part to a slowly permeable layer, high water table, or lateral seepage.

Well drained - Water is removed from soil readily and these soils are saturated only during the wet season for short periods.

Excessively drained - Water is removed from soil rapidly and these soils are rarely ever saturated. Commonly, these soils are coarse-textured or shallow, stony, and/or occur on steep slopes.

Major Drainage Intensity and Pattern

Number of drainage miles per square mile and dominant drainage pattern.

Intensity Classes

Few - 0 to 1 drainage miles per square mile.
Common - 1 to 3 drainage miles per square mile.
Many - 3 to 5 drainage miles per square mile.
Abundant - Greater than 5 drainage miles per square mile.

Patterns - (States drainage pattern)

1/ Very poorly drained and somewhat excessively drained classes are not used.

Productivity

Combined evaluation of measured and observed production of timber types. Site classes are used.

Timber Site Classes 1/ - Class limits correspond to height (site index) of Douglas-fir and ponderosa pine at 100 years.

Douglas-fir	Ponderosa Pine
Class I - greater than 185 S.I.	Class I - greater than 105 S.I.
Class II - 185 S.I. to 155 S.I.	Class II - 95 S.I. to 105 S.I.
Class III - 155 S.I. to 125 S.I.	Class III - 85 S.I. to 95 S.I.
Class IV - 125 S.I. to 95 S.I.	Class IV - 65 S.I. to 85 S.I.
Class V - less than 95 S.I.	Class V - 55 S.I. to 65 S.I.
	Class VI - 45 S.I. to 55 S.I.
	Class VII - less than 45 S.I.

Fertility

Estimated inherent soil fertility and availability of plant nutrients. This rating is derived by correlating measured productivity with soil factors such as texture, pH, color, and organic matter content.

High - These soils generally have medium to fine texture, dark surface colors, are slightly acid to slightly alkaline, and have abundant incorporated organic matter. Nutrient quantities are adequate and readily available.

Moderate - These soils generally have one or more soil factors that limit nutrient quantity and/or availability.

Low - These soils generally have several factors that are limiting. They may be coarse textured, strongly acid or strongly alkaline, and lacking in sufficient organic matter. Nutrient quantity and/or availability is seriously limiting.

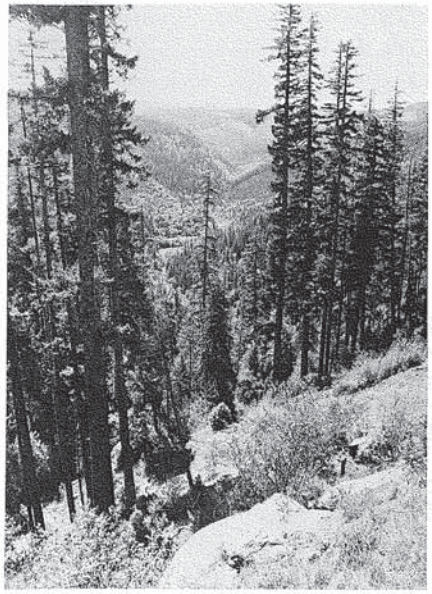
Percent Vegetative Cover

Evaluations of total vegetative cover and the cover of three distinct levels of vegetation above the soil surface. Overstory consists of the timber stand canopy. Understory consists of woody shrubs and timber regeneration. Ground cover consists of ferns, grasses, sedges, and mosses.

Total Vegetative Cover - Estimated percent of total vegetative cover with overstory, understory, and ground cover combined. Maximum of 100 percent.

Vegetative Cover by Each Level - Estimated percent vegetative cover according to species composition, with overstory, understory, and ground cover estimated separately. Maximum of 100 percent for each level.

1/ McArdle, Technical Bulletin 201. All other Timber Site Classes are from R-6 Timber Inventory Procedures Handbook.



Vegetative Cover Type